Model Program for Existing Development Stormwater For Falls and Jordan Watersheds

&

Supporting Information for Affected Parties

For the July 2013 EMC

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I. Overview

Regulatory Drivers, Timelines and Actions

Regulations targeting nutrient loading from existing developed lands in both the Jordan and Falls Lake watersheds require the Division of Water Quality to develop a model program that local governments and state and federal entities may use to guide development of mandated load reduction plans. Jordan requirements enacted through session law in August 2009 and Falls requirements included in rules effective January 2011 both call for model programs to be brought to the NC Environmental Management Commission by July 2013. The regulations direct the Division to work with affected parties and the NC Nutrient Scientific Advisory Board in developing these model programs. The Jordan legislation requires Commission approval of a model by December 2013 while the Falls rule sets no specific deadline.

The two watersheds also differ in the trigger for and timing of local program development and implementation. Jordan compliance is triggered by results of ongoing lake monitoring as reported in March 2014 for the Upper New Hope subwatershed and in March 2017 for the remaining subwatersheds. Failure to meet nutrient-related standards at these or subsequent 3-year intervals can trigger Division notification to develop programs. In Falls watershed, development of programs is triggered by Commission approval of the model; local programs are to be submitted and simultaneously implemented within another 6 months.

Programs submitted by affected parties will be reviewed individually by Division staff for how fully they address the information described, and meet the approval standards identified in this model program. Staff will provide written feedback to parties identifying information needs or program deficiencies, and will request modifications accordingly. The Jordan regulation provides the Division 6 months following program submittal in which to recommend approval or disapproval to the Commission, while the Falls rule provides at least 14 months for Division review and recommendation to the Commission. If the Commission disapproves a program, both regulations set follow-up timelines for revision, resubmittal and return to the Commission.

About the Model Program and Supporting Information Document

This model program outlines an organizing structure for affected parties to utilize and elements to include in their program submittals. The model is intended as a useful guide that will also help affected parties meet rule requirements.

The Division does not consider this draft of the model program to be as complete as desired by the Division or by affected parties. A key element requiring additional development is the 'toolbox' of nutrient-reducing measures. Efforts are currently underway to expand the toolbox through

development of credit methods, design standards and a Division approval process for additional measures. Affected parties desire the broadest set of options supportable for compliance along with best available estimates of cost-effectiveness. Existing Development control requirements are a recent regulatory innovation in North Carolina and nationwide, and to this point rely primarily on relatively costly retrofitting of stormwater BMPs into developed landscapes. However many promising alternative nutrient-reducing measures have been identified, and credit methods are emerging in other parts of the country. The Division currently has a contract underway for credit development for a number of measures, and the Department has very recently granted funds to the Upper Neuse River Basin Association to add to monies pooled by its member governments for a contract now under development to establish credit for a significantly larger number of measures.

Division staff is working closely with affected parties and technical experts to develop a model program that will provide a reasonably well-equipped toolbox and will otherwise allow regulated parties to make well-informed decisions on how to comply with the Jordan and Falls Existing Development regulations. Current plans are to return to the Commission with a complete model program for its approval within approximately twenty-four months. Staff will accordingly request deferral of action on the model program by the Commission at its July 2013 meeting.

The Falls rules require a model program to be developed for state and federal entities while the Jordan rules and session law do not. While the model is intended for both local governments and state and federal entities, much of its logic and program elements will not be applicable to state and federal entities with parcel-sized holdings in the watershed. However the model's structure should be useful for larger state and federal entities such as universities and state lands in Butner.

Following the model program is a companion document containing supporting information and guidance for affected parties. A set of appendices contains reference information including: relevant rules and session law comprising the Falls and Jordan nutrient strategies, other rules referenced by the rules or session law, an outline of a Division approval process for additional nutrient measures, and other support information that affected parties may find useful.

II. Required Elements of Local Programs

This section of the model program provides instructions and clarifies expectations for addressing the detailed programmatic information each affected party is required to include in their local program submittal to the EMC for review and approval. The two primary elements of the local program described below are the measures feasibility assessment and implementation plan. These two elements complement each other in that the feasibility assessment provides an evaluation of available measures information addressing which nutrient reducing practices provide the most promise within your jurisdiction. The implementation plan builds on the feasibility assessment and provides details on where, when, and how the practices will be implemented and the reductions they are expected to achieve. Additional clarification concerning the staging of plans and level of detail that is required is provided following the outline of required information.
While local programs do not necessarily need to follow the exact organizational framework outlined below, affected parties are required (in Falls) or recommended (in Jordan) to provide the following minimum information in their submittals for Commission approval.

Measures Feasibility Assessment

Affected parties should conduct and provide the results of a measure-by-measure evaluation of the nitrogen and phosphorus load reduction potential, opportunities, constraints and overall feasibility using the currently available set of measures identified in the *Measures* section of this model. The *Measures* section identifies both currently approved measures and many for which the Division may approve credit in the future. Such Division approval of new measures may occur subsequent to Commission adoption of this model program. Thus local governments may propose using additional measures beyond those noted as currently available in this model document, but in the fully detailed, first stage of their implementation plan they should do so only if those measures have been approved by the Division pursuant to the *Measures Approval Process* that is attached to this guidance as ***Appendix B.*** Parties may propose using measures that have not been approved by the Division in the less detailed, later stages of their implementation plans, but are cautioned to limit any reliance on such unapproved measures commensurate with the level of speculation and uncertainty tied to their nutrient value at the time. Any proposal to utilize currently unapproved measures in a subsequent implementation stage should also discuss the best alternative approach should the unapproved measures not receive approval in time to allow their use in that stage.

Scoping-Level Assessment

With regard to the process of conducting the feasibility assessment, we believe some level of a measures inventory and prioritization is needed first in order to have a full understanding with which to identify potentially suitable sites where measures can be implemented. Such an assessment would be done at the planning level initially by evaluating planning level cost-effectiveness data and other BMP specific factors to create an initial list of suitable tools. Some measures may be ruled out at this stage

based on lack of opportunity or poor cost-effectiveness. In the event a measure is deemed unlikely to be used a brief explanation should be included providing the rationale for its exclusion from a more detailed feasibility assessment.

This initial planning level feasibility assessment will include evaluation and reporting on the following factors to the extent applicable for each type of measure:

a) Nitrogen and phosphorus load reduction cost-effectiveness. The following is a preliminary list of scoping-level cost-effectiveness ranges for the currently available set of nutrient reducing measures. These ranges were developed by staff based on NC-specific cost equations found in Hunt et al.[1], combined with load reduction estimates based on use of the Jordan/Falls Lake Stormwater Nutrient Load Accounting Tool, a.k.a. the Jordan/Falls Tool. The values below are not final scoping-level estimates since the costs used are construction costs only and do not include land acquisition or operation and maintenance costs. Division staff will develop full scoping level cost-effectiveness values for a final model program. However, for present planning purposes the relative ordering of cost-effectiveness seen below should not change significantly in those final scoping level values. For comparative purposes, the practices below are arranged in general order of decreasing cost-effectiveness for nitrogen removal.

Table 1. Projected Cost-Effectiveness of Retrofit Practices

Practice	$/lb N removed	$/lb P Removed
Level Spreader/Filter Strip	$8 - $200	$8 - $300
Constructed Wetland	$18 - $236	$76 - $1,600
Dry Detention	$50 - $440	$34 - $3,900
Bioretention with IWS	$80 - $670	$300 - $54,000
Bioretention w/o IWS	$85 - $850	$320- $6,700
Rainwater Harvesting	$90- $1,000	$170 – $8,200
Grassed Swale	$146 - $2,200	$164 - $1,700
Wet Detention	$220 - $5,300	$100 - $7,300
Sand Filter	$630 - $2,900	$2,200 – $42,800
Permeable Pavement	$2,000 - $3,000	$7,300 – 26,500
Green Roof	$4,900 - $7,400	$35,400 - $53,100

More specifically, load reduction ranges seen above result from running scenarios with the Jordan/Falls Tool capturing a full range of possible land cover types and impervious fractions, as well as using two different life expectancy assumptions, 20 and 30 years. Construction costs were spread over these life expectancies and compared against load

[1] Hunt, William F., U. Hatch & K. Debusk, 2011. *Watershed Retrofit and Management Evaluation for Urban Stormwater Management Systems in North Carolina, Including Projected .Costs and Benefits*. WRRI Project No. 50382. August 2011. 60pp.

reductions for the same time periods. In developing final scoping level values, staff expects to narrow the ranges seen above to make them more useful for planning purposes.

b) Other benefits valued by the community, e.g.:
   - Other water quality treatment functions
   - Runoff reduction, stream hydrograph improvement, flooding reduction
   - Groundwater recharge
   - Aesthetic value
   - Other ecosystem services or community benefits

c) Other considerations by the community, e.g.:
   - Current landowner acceptance and improvement potential via education campaign
   - Experience, comfort level with measure
   - Longevity considerations, anticipated level of uncontrolled variables
   - Compatibility of measure administrative burdens
   - Relative uncertainty of nutrient benefit Tier assignment
   - Long-term planning considerations

Watershed Assessment

The initial planning level assessment of measures would be followed by a watershed or sub-watershed level assessment focused on land cover patterns and the resulting extent and locations of potential sites in watersheds within the jurisdiction. Such an assessment should consider the level of connectivity to the impaired water body recognizing that measures implemented in closer proximity to the lake will have a greater impact than those implemented further away. Such a watershed level assessment would describe the methods used to conduct a retrofit inventory, an assessment of candidate sites, screening process for priority projects, and evaluation of their expected cumulative benefit. For guidance on choosing the best locations in a subwatershed for retrofitting as well as methods to assess retrofit potential at the subwatershed level, the Division recommends affected parties review the *Urban Stormwater Retrofit Practices - Manual No. 3*[2].

Where affected parties have already conducted watershed planning and have already identified programs or practices for initial implementation, and have documents summarizing those planning efforts, those planning documents may be referenced in their local programs. Practices and programs identified by those plans that the affected party expects to implement should be included in the implementation plan. Where practices or other activities have already been implemented and for which credit is due, it is recommended that the affected party at least list the credit projects/programs in their local program, with documentation of credits to follow in annual reports.

The watershed level assessment should refine the set of potential sites considering factors including the following to the extent applicable for each type of measure identified in the initial assessment:

[2] CWP, 2007. Manual 3: Urban Stormwater Retrofit Practices. Urban Subwatershed Restoration Manual Series. Center for Watershed Protection, Ellicott City, MD, USA. 250pp.

- Extent of public and private lands
- Extent of amenable land use types
- Lands within and outside the jurisdiction
- Likelihood of complicating or disqualifying site factors

Site-Level Assessment

Practice feasibility and cost-effectiveness are ultimately site-dependent determinations. The results of the higher-level feasibility evaluations described above should be used to focus resources on a prioritized set of candidate sites. Site factors that can influence final determination of opportunities and priorities include:

- Physical: utility conflicts, space constraints, slope, bedrock, catchment size, depth to storm water system, outfall suitability.
- Logistical: scale economy, serial inefficiency, maintainability.
- Temporal: future changes to drainage area.
- Social: landowner willingness, public acceptance.
- Regulatory: permitting hurdles.

The path to implementation may be simple for some measures or projects, and much more complex for others. A more complex example may involve initial screening of measures for feasibility and cost-effectiveness, selection of target measures for the initial planning period, identification of site selection criteria for the selected measures, select potential sites or locations (typically a GIS mapping evaluation,) field assessment of potential feasibility, then some projects may have preliminary designs produced, with many of these moving to funding, design and construction. Affected parties may pursue projects that require the more complex path because they are cost-effective. These projects may require years to implement, and thus details discussed below may not be available at the time the local program is submitted. Affected parties using this approach for a significant portion of their reduction should report on status or each potential project, should include contingencies, and should provide progress updates in annual reports.

Implementation Plan

A plan that lays out a projected implementation schedule, annual implementation expectations regarding the number and type of measures and activities to be implemented and the associated nutrient reductions to be achieved. See the section below for additional explanation of the level of detail expected. The plan will include the following elements:

- Description of the programmatic approach planned, including:
    - Organizational structure to be used to carry out the program;
    - Description of the overall plan for implementing measures, including:
        - Most important overall considerations and controlling factors;

        - Funding approach: mechanisms to be utilized, including current and projected funding levels from different sources, steps taken or planned to secure potential sources, realized or anticipated increase in per capita cost of implementing the local stormwater program;
        - Intended use of ordinances, plans for adopting or amending;
        - Potential for use of eminent domain, intentions toward doing so, process;
        - Education program – current and intended revisions to, objectives for;
        - Inter-jurisdictional cooperation;
    - Plan for periodic verification and long-term, sustained performance of implemented measures for their intended duration.
- A relative prioritization of all individual measures based on the feasibility assessments conducted above;
- Proposed implementation plan, addressing:
    - Load reduction needs and load allocations:
        - Quantify baseline load, post-baseline increases and decreases including those resulting from annexation, provide supporting calculations;
        - Quantify extent of existing post-baseline measures, resulting reduction credits, provide supporting calculations;
        - Quantify net current load reduction needs and current allocations.
    - Per-unit estimation of annual N and P load reductions by measure, based on Division-approved methods or proposed alternative;
    - Breakdown projection of numbers of measures, acres treated or other unit metrics, proportional load reductions by measure;
    - (Mandatory for Eno and Little River jurisdictions) Discharging sand filter and malfunctioning septic management program;
    - Intended duration of measures and plan for periodic re-verification of performance
    - Expectations for refining or revisiting the plan, including more detailed watershed assessments being conducted or planned;
    - Identified support activities that are contingent on additional funding or personnel.
    - (Jordan) Intent to seek additional or alternative load-reduction credits based on site-specific monitoring data. If an affected party chooses to utilize this monitoring option, methods for site-specific monitoring should be proposed.

Staging of Plans

We recognize that there are differences in the requirements and implementation timelines between Falls and Jordan subwatershed programs that may necessitate differing levels of detail in different stages of programs. As stated in the overview section of this model, the two watersheds differ in the trigger for and timing of local program development and implementation. Jordan compliance does not hinge on model approval by the Commission, but rather is triggered by results of ongoing lake monitoring as reported in March 2014 for the Upper New Hope subwatershed and in March 2017 for Lower New Hope and Haw subwatersheds. Failure to meet nutrient-related standards at these or

subsequent three-year intervals will trigger Division notification to develop local Jordan programs, at which time affected parties will have six months to develop and submit a program. In the Falls watershed, development of programs is triggered by Commission approval of the model program; local programs are to be submitted and simultaneously implemented within six months after approval.

The Falls Watershed and the Upper New Hope Subwatershed in Jordan have the most pressing implementation deadlines. Some key implementation steps have already been taken in Falls, most notably the completion of existing development inventories. These inventories provide some of the necessary background information needed to develop a more detailed feasibility analysis and implementation plans. Since Jordan affected parties did not have the same requirement for developing inventories, many may not be as well-positioned as Falls parties for developing detailed implementation plans at this point in time.

The implementation plan should propose a year-by-year, annual pace of N and P load reductions. Given the inherent uncertainty of long-range planning, particularly in this emerging regulatory field where new tools are being introduced at a relatively rapid rate, the implementation plan should provide full site-level specificity for only the first two to three years of implementation and may give commensurately less detail for succeeding intervals. The plan should include a discussion of the key relative uncertainties in longer-range planning. A detailed implementation plan for the first three years would include a full prioritization of practices with site level details concerning the actual number and type of BMP retrofits planned, geographic locations where they will be located in the watershed, and estimated reductions they will achieve. Watershed-level assessment may be acceptable for the succeeding five-year period, and scoping-level assessment may suffice for the five-year interval beyond that.

Because affected parties in the Upper New Hope Arm of Jordan watershed may be required to begin developing their programs in March 2014, it would be reasonable for them to develop fully detailed plans for only two or three years of implementation, recognizing that a significant expansion in available measures should become available by early- to mid-2016 as described in the *Addition of Measures* section of the *Supporting Information* document, and it is expected that they will revise their programs in light of these new measures.

Since Falls Lake local programs will not be submitted until after the measures tool box is expanded, and in Jordan the Haw and Lower New Hope subwatersheds have a much later implementation trigger timeframe of March 2017, we would expect parties in these watersheds to have prepared more fully developed watershed and site-level assessments and implementation plans.

Local programs in both watersheds have the flexibility of being updated at any time so should more cost-effective measures be identified, or more suitable sites become available a local government has the flexibility of modifying their implementation plan.

Program Approval Standards

The Jordan and Falls rules include very similar language regarding program approval standards to be used by the Commission.
Section 3.(d)(2)(f) of the Jordan Session Law 2009-216 provides a non-inclusive list of factors that the Commission will consider when determining if a local program should be approved:

> *"The Commission shall approve the program if it meets the requirements of this subdivision, unless the Commission finds that the local government can, through the implementation of reasonable and cost-effective measures not included in the proposed program, meet the reductions in nutrient loading established by the Department pursuant to sub-subdivision b. of this subdivision by a date earlier than that proposed by the local government. If the Commission finds that there are additional or alternative reasonable and cost-effective measures, the Commission may require the local government to modify its proposed program to include such measures to achieve the required reductions by the earlier date… In determining whether additional or alternative load reduction measures are reasonable and cost effective, the Commission shall consider factors including, but not limited to, the increase in the per capita cost of a local government's stormwater management program that would be required to implement such measures and the cost per pound of nitrogen and phosphorus removed by such measures."*

While the Falls rule dictates the completion date of the Stage 1 requirements, the implementation pace towards this date will still be evaluated for reasonable annual progress. The Falls rule identifies the same factors covered in the Jordan legislation and references additional factors at Sub-Item (4)(o) for Commission consideration, which affected parties are also to consider in developing their plans for submittal:

i. Extent of physical opportunities for installation;
ii. Landowner acceptance;
iii. Incentive and education options for improving landowner acceptance;
iv. Existing and potential funding sources and magnitudes;
v. Practice cost-effectiveness;
vi. Increase in per capita cost of a local government's stormwater management program to implement the program;
vii. Implementation rate without the use of eminent domain; and
viii. Need for and projected role of eminent domain.

Measures

In developing the implementation plans above, affected parties should (in Jordan) and are required (in Falls) to evaluate and explain the extent to which they plan to implement the various nutrient reducing measures listed below to achieve their reduction requirements. Nutrient-reducing measures are arranged in six categories ranging from engineered structural stormwater best management practices, to programmatic measures and nutrient offsets purchased from third party sellers. A brief description of each category and the measures it includes is provided below:

Extent of Load Reduction Proposed from Stormwater Measures / Activities

The following are primarily structural stormwater best management practices and measures that would be put in place as stormwater retrofit projects on existing developed land. In describing the extent of implementation of these practices describe the estimated number of each practice you plan to implement, the type of land or properties that will be affected and the anticipated reduction achieved by the individual measure and the category of Stormwater measures and activities as a whole.

-Bioretention
-Constructed Wetland
-Sand filter
-Filter Strip
-Grassed swale
-Infiltration device
-Extended dry detention
-Rainwater harvesting system
-Treatment of redevelopment
Overtreatment of new development
-Removal of imperious surface
-Permeable Pavement
-Off-line regional treatment systems
-Redirecting runoff from impervious areas
- Retrofitting treatment into existing stormwater ponds
- Retrofitting bioretention & grassed swales
-Downspout Disconnection
-Linking Multiple practices
-Soil Amendments
(*Italics*) Indicates practice in need of DWQ approved accounting

Extent of Load Reduction Proposed from Ecosystem Measures /Activities

This category embodies actions taken to restore or enhance the physical environment and ecosystem functions within the affected party's jurisdiction. In describing the extent of implementation of these practices, describe the estimated number of each practice you plan to implement, the type of land or properties that will be affected and the anticipated reduction achieved by the individual measure and the category of Ecosystem measures and activities as a whole.

-Wetland or riparian buffer restoration
-Reforestation w/ conservation easement or protective covenant
-Land Improvement (bare patches -> vegetation)
-Land conversion to wetlands
-Stream Restoration
(*Italics*) Indicates practice in need of DWQ approved accounting

Evaluation of the Load Reduction Potential from Wastewater Measures / Activities

The measures included here apply to municipal waste water treatment plants as well as nutrient reductions achieved from individual residential onsite waste water treatment systems. Plans to implement these measures should detail the anticipated number of onsite systems to be connected to municipal sewer in addition to the estimated nutrient reductions achieved.

-Creation of surplus relative to an allocation provided through rule.
-Expansion of surplus allocation through regionalization
-Connection of DSFs & malfunctioning septic systems to central sewer or replacement
-Removal of illegal discharges
-Improvement of wastewater collection systems
(*Italics*) Indicates practice in need of DWQ approved accounting

Evaluation of the Load Reduction Potential from Programmatic Measures / Activities

These are measures that local government can implement through use of local ordinances and policies. They are generally management actions performed on a regular basis rather than traditional engineered stormwater BMPs.

-Improved Street Sweeping
-Source Control (Pet waste, fertilizer ordinances)
-Improved gross solids capture & disposal (leaf litter)
-Existing stormwater programs that achieve existing development load reductions
(*Italics*) Indicates practice in need of DWQ approved accounting

Other Nutrient Reducing Measures Affected Parties' Propose to Implement

The division recognizes that as the science evolves additional nutrient reduction measures may be identified in the future. Local governments may also propose nutrient-reducing measures that are not currently listed in Section V of this model. However, certain steps will need to be followed as described in Section IX of the Supporting Information in order to establish credit for these measures before reduction credit can be assigned. In addition, as detailed in the Measures Approval Process portion of Section IX, another option regards measures that lack sufficient research data. Local governments may obtain year-to-year load reduction credit based on monitoring such a measure's performance.

Use of Nutrient Offset Banks & Nutrient Trading Programs

Affected parties have the option of purchasing nutrient offset credit from third party sellers like EEP or private bankers. The extent to which this practice is used must be described in the local program.

III. Methods to Quantify Load Reduction Needs

This section discusses the calculation methods to be used in developing estimates of load reduction needs for the current stage of implementation by local governments in the Falls and Jordan Lake watersheds. Given the differences in implementation requirements between the two watersheds for the current stage, the methods we will use to determine the Falls Lake Stage I jurisdictional loads and reduction needs will be in part different than those we will use to calculate those values for the Jordan watershed. The Jordan requirement to establish both baseline loads and post-baseline load increases at this stage necessitates the use of a watershed model that uses instream water quality and flow monitoring data from stations throughout the watershed to make complete estimates of loading from all developed lands within jurisdictions. The model under development for Jordan watershed should provide both baseline loads for jurisdictions and loads as of 2010, and these estimates should represent total loading from developed lands including both surface runoff and subsurface inputs to streams and then to the lake. To estimate Jordan development load increases from 2010 until EMC-approved new development programs are initiated, another method will be needed. In Falls watershed where the baseline period is 2006, the current stage, Stage I, requires offsetting post-baseline load increases but does not require establishing baseline loads as part of that process. Thus, for the current stage the same methods can be used for both Jordan post-2010 and Falls post-2006 load estimation. Development can produce nutrient loading from not only stormwater runoff but other types of sources on the landscape as well. The Division will conduct a collaborative process with affected local governments and others to develop estimates of Jordan post-2010 and Falls Stage I load reduction needs. To the extent possible, nitrogen and phosphorus load increases from the following sources will be estimated and aggregated to produce total nutrient load increases from lands developed during the specified time period within a jurisdiction.

- Stormwater Surface Runoff
- Malfunctioning Onsite Systems
- Discharging Sand filter Systems
- Leaking Collection Systems

To address methods for estimating loads from these sources, we will first cover certain basic terms and concepts that are common to both watersheds, and then discuss common methods for estimating stormwater load increases, followed by watershed-specific differences. In the next section we will discuss methods for developing estimates of loads from the wastewater sources listed above.

Basic Terms and Concepts

We discuss the following terms and concepts to provide a common understanding for the discussion of estimating loads that follows. Other terms and basic rule requirements and concepts are covered in the Supporting Information document that is provided as a companion to this Model Program.

Nutrient Load Units

Existing development load reduction needs in both Falls and Jordan, and load allocations in Jordan, will be expressed in the form of annual mass loads, in pounds per year of total nitrogen and total phosphorus. In Jordan these loads will be estimated as loads delivered to one of the three arms (Upper New Hope, Lower New Hope, and Haw) of Jordan Lake from a jurisdictional area. The Jordan watershed model will also quantify the same parameters at-source; that is, delivered to streams or to the mouths of hydrologic units, for each jurisdiction, as this may be useful implementation information. In Falls, given that the Falls rules did not recognize significant differences in delivery of nutrients from streams in different parts of the watershed to arms of Falls Lake, Stage I loads will be expressed as loads delivered to stream only.

Baseline Development vs. Post-Baseline Development

Existing development consists of two categories of lands: those developed prior to or during the baseline period, referred to here as *baseline development*; and those developed subsequent to the baseline period and that are not subject to requirements of the new development rule by virtue of being developed prior to implementation of, or having vested rights relative to, local new development ordinances. The latter category is referred to here as *post-baseline development*. Vested post-baseline development may occur for several years beyond initial new development rule implementation date and will add to an affected party's load reduction need. At some point, all vested post-baseline development will have occurred, and reduction need there forward will change only as a result of either jurisdictional boundary changes (see appendix) or through implementation of load-reducing measures.

Load Reduction Need, Load Allocation

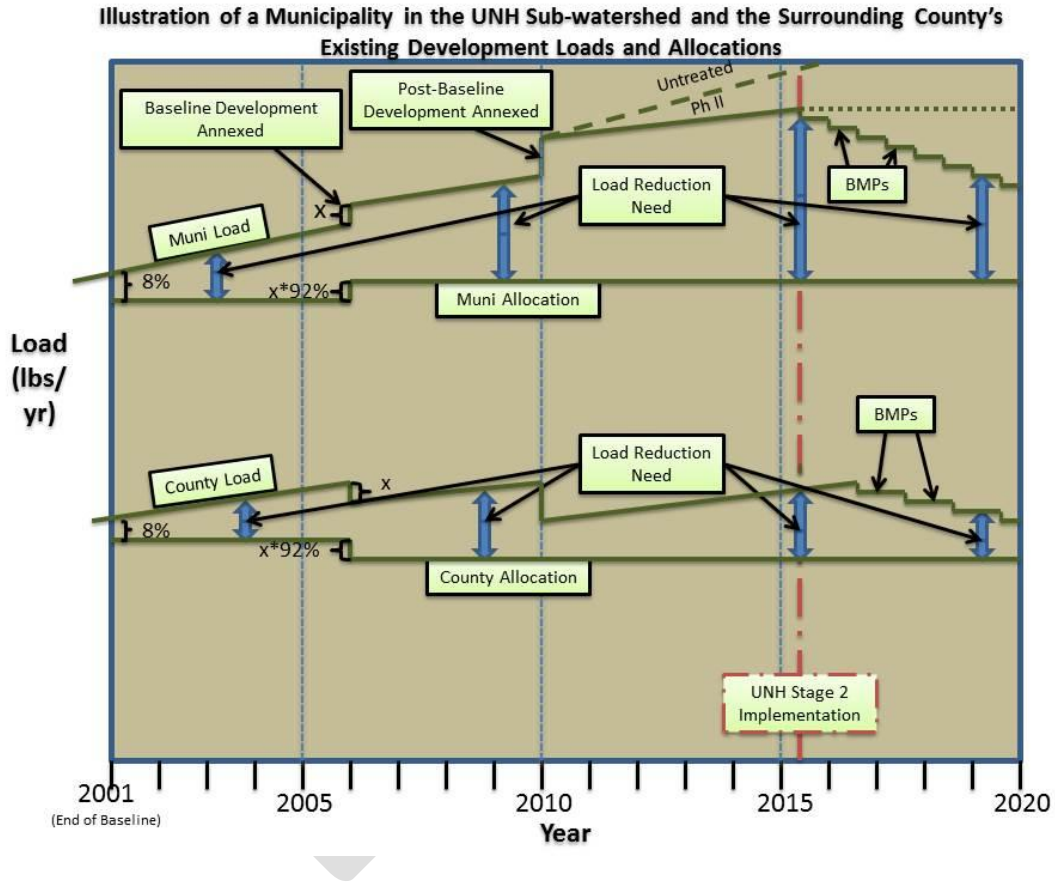
Baseline development generates baseline loads that local governments are ultimately, conditionally charged with reducing by strategy reduction goal percentages or, in some Jordan cases, interim lesser goal percentages. This application of reduction percentages to baseline loads establishes *load allocations*. These allocations will be established for Jordan parties in the current stage of implementation while for Falls parties this will occur for Stage II beginning in 2021. Post-baseline development within a jurisdiction adds loads to that jurisdiction's *reduction need* for a given nutrient without affecting its allocation. In effect, post- baseline development adds loads to an assumed average pre-development condition for these lands, and these added loads must be offset to the specified percent reduction requirements. The resulting reduction need is added to the *reduction need* that stems from baseline development . Figure xx below illustrates these concepts.

Greenfield Development and Redevelopment

Post-baseline development will be in the form of either greenfield development or redevelopment. The term *greenfield development* will be used here to mean any development occurring on previously undeveloped lands, or lands that lacked impervious or partially pervious cover, as of the end of the baseline period. This is distinguished from *redevelopment*, which rebuilds on or adds development to previously developed lands.

In both Falls and Jordan, load reduction needs are based on comparison to the baseline condition. For redevelopment, this may need to be a site-specific evaluation. For greenfield development, this could in theory be done site-specifically but practically will likely need to be based on comparison to an assumed average undeveloped condition. In Falls, the Stage I requirement is to offset development load increases back to the baseline condition. Parties are given the option to use assumed average pre-development loading rates for N and P that are provided in the rule. In Jordan, the Stage II requirement is to achieve 8% N and 5% P reductions from baseline conditions. We provide a calculation below using the same logic as that used to develop the Falls pre-development loading rates, then apply the reduction percentages to those rates to yield reference loading rates to which post-baseline development must be offset in Jordan.

Figure 1. Illustration of City and Adjacent County Load Reduction Needs and Allocations, Jordan



Estimating Post-Baseline Stormwater Loads

As described and illustrated above, estimating a load reduction need stemming from development requires estimating both the development's load and the reference loading condition to which the load must be reduced. Here we will first discuss the common method that should be used for estimating the first quantity, development's load. Subsequent sections discuss watershed-specific needs for estimating the reference loading conditions called for in each of the regulations and other aspects of establishing overall load reduction needs.

Stormwater Nutrient Load Estimation Method

To estimate stormwater runoff loads due to post-baseline development in Falls and post-2010 development in Jordan, affected parties should plan to utilize the *Jordan/Falls Lake Stormwater Nutrient Load Accounting Tool*, or Jordan/Falls Tool, any subsequent revisions to it, or an equivalent customization of this tool. This tool will also be the method for estimating load reduction credit resulting from BMP implementation on developed lands. While a number of tools are currently available to estimate annual stormwater runoff nutrient load reduction benefits from structural stormwater BMPs, we recommend that affected parties use the Jordan/Falls Tool. It is the most recent and most sophisticated tool developed for such purposes for the Division and we consider it the current 'best available' method. It incorporates significant advances in scientific understanding regarding BMP performance, more specific land cover breakouts, more defensible science on runoff loading, greater versatility for existing development settings, more accurate rainfall inputs, and improved versatility. The tool also includes certain BMPs not provided for in previous ones – a bioretention design variation, green roof, water harvesting and permeable pavement. The Division envisions that future method advances and improvements will be based on this tool. In fact, the Division has currently let a contract for improvements to the Jordan/Falls Tool through which we expect to provide a refined version of the tool by the end of 2013. Where an affected party has developed its own customization of the Jordan/Falls Tool, we would accept that provided it can be shown to function in an equivalent manner.

While some local governments have historically used earlier versions of a Simple Method tool to permit new development projects relative to nutrient rule compliance, going forward we expect that they will shift to use of the Jordan/Falls Tool for both new development permitting and existing development BMP crediting for the advantages identified above. For these local governments, the use of different tools to estimate post-baseline loads and BMP crediting would be inconsistent and appears problematic in the long run. Thus we recommend consistent use of the current best tool for all existing development applications.

Regarding potential issues faced by local governments that have to date used an earlier tool, we believe that resource requirements for shifting to the Jordan/Falls Tool can be minimized while achieving reasonably consistent load estimates by the approach used to developing the input data. The tool provides greater definition of land cover types than previous ones, but if only more basic land cover

types are realistically available, they can be entered into the tool. We discuss developing input data in the following section.

Developing Data and Calculations

We recognize that an affected party's ability to fully estimate development loads may depend upon several factors including the extent of that development, a jurisdiction's recordkeeping practices, the resources currently available for assembling data, and the amount of time provided by the Division for development of estimates. Since these factors vary across jurisdictions or watersheds, affected parties should use and document a best reasonable method that demonstrates a good faith effort. Parties are encouraged to discuss their intended approach with Division staff.

Affected parties will first need to complete an inventory of their records and spatial data regarding lands developed during the subject time period to determine the extent of their records regarding land cover information about the developed sites and BMPs installed. The Jordan/Falls Tool assigns event mean runoff concentrations to up to eight different impervious and pervious land cover types on a development. It also takes into account reductions achieved on site by any best management practices put in place.

Approaches to developing estimates can range from project-by-project calculations to aggregated approaches. Small jurisdictions with relatively little development activity may find it feasible to do project-specific calculations. Aggregated approaches can be considered based on determination of total acreages of each different type of development and development of sound estimates of percentages of each different land cover type on each development type, with the land cover categories determined by available records and a reasonable approach to deriving information from those records.

Jordan-Specific Calculations

Regulatory Requirements

Session Law 2009-216 replaced the EMC's Existing Development Stormwater rule for local governments, establishing a different approach to addressing this source. The subsequent SL 2009-484 made similar revisions to portions of the existing development requirements in the State and Federal Entities stormwater rule. Section 3.(d)(2)b. of Session Law 2009-216 directs DENR to quantify existing development load reduction goals for local governments:

> *"The Department shall establish a load reduction goal for existing development for each municipality and county required to implement a Stage 2 adaptive management program to control nutrient loading from existing development. The load reduction goal shall be designed to achieve, relative to the baseline period 1997 through 2001, an eight percent (8%) reduction in nitrogen loading and a five percent (5%) reduction in phosphorus loading reaching Jordan Reservoir from existing developed lands within the police power jurisdiction of the local*

> *government.... The baseline load for a municipality or county shall not include nutrient loading from lands under State or federal control or lands in agriculture or forestry. The load reduction goal shall be adjusted to account for nutrient loading increases from lands developed subsequent to the baseline period but prior to implementation of new development stormwater programs.*

Similar language is included in SL 2009-484 regarding state and federal entities. Thus, DENR is required to establish separate nutrient load reduction needs from existing development for all municipalities, counties, and state and federal entities in the Jordan watershed. Affected parties' reduction needs will reflect application of the stated percentage reduction targets to affected parties' baseline nutrient loadings. Reduction needs will also need to be adjusted for increases in loading from development occurring since the baseline period but prior to implementation of local Jordan New Development programs.

Section 3.(d)(2)b. of Session Law 2009-216 also describes how the load reduction goal assignments will be estimated:

> *"The baseline load shall be calculated by applying the Tar-Pamlico Nutrient Export Calculation Worksheet, Piedmont Version, dated October 2004, to acreages of different types of existing development within the police power jurisdiction of the local government during the baseline period. The baseline load may also be calculated using an equivalent or more accurate method acceptable to the Department and recommended by the Scientific Advisory Board established pursuant to Section 4(a) of this act."*

Estimating Jordan Baseline and 2010 Loads

The Division in consultation with the Nutrient Scientific Advisory Board, which was also established by the Session Law, determined that the Tar-Pamlico Accounting Tool and the new Jordan/Falls Stormwater Load Accounting Tool were not appropriate to estimate jurisdictional baseline loading from existing developed lands in the watershed, with the exception of smaller state and federal entities. Both tools use the simple method to calculate runoff and loads, and as stated in the JFSLAT user's manual, the simple method should only be used on catchments with areas of one square mile or less. In addition, the simple method only accounts for pollutants leaving a site via stormwater runoff. The Division and the NSAB determined that a watershed model would be the best available means for determining loads from jurisdictional areas. The existing watershed model was first explored, but it was determined it was not sufficient and could not separate loading based on jurisdictional boundaries. Therefore it was decided that a new watershed model would need to be developed. In spring 2012, the Division used 319 grant funds to initiate a contract with TJCOG, through which the consultant TetraTech was chosen to develop the model through a competitive RFQ process. The model is scheduled for completion by the end of 2013, and peer reviews are expected to wrap-up in early 2014. The model will estimate loading up until 2010, the most recent year for which suitable land cover data can be obtained. A method to determine load changes from 2010 until an affected party begins implementing their new development program is described above and in more detail below. More information on development of the watershed model, including the scope of work and a modeling quality assurance project plan can

be found at TJCOG's website: http://www.tjcog.org/jordan-jurisdictional-allocation-model-development.aspx

Estimating Jordan Loads Post-2010

To estimate a baseline undeveloped loading rate for all greenfield development, we make a uniform undeveloped land cover assumption. We assume a weighted average unit-area loading rate reflecting the presence of cropland, pasture and forest in the same proportions that they existed across the respective watersheds in the baseline period, reducing forest by the acres known to be protected from development. This is the same logic used to derive both the Falls & Jordan New Development loading rate targets.

In Jordan, resulting baseline aggregate developable lands loading rates will be reduced by ED reduction goal percentages to yield target or reference loading rates against which post-baseline development will be compared to determine its 'added' loads.

Table 2 below provides our calculation of Jordan subwatershed reference or target loading rates against which greenfield post-baseline development should be compared to determine its net load reduction need. The table first provides aggregate N and P loading rates for developable lands as of the baseline period for each subwatershed, and then reduces those rates by the ED reduction goal percentages set out in SL 2009-216. Since for the Upper and Lower New Hope subwatersheds these ED percentage goals differ from overall strategy percentage goals, the target rates in those subwatersheds differ accordingly from those in the New Development rule, which applies overall strategy goal percentages.

Table 2. Target Unit-Area Loading Rates for Greenfield Post-Baseline Development in the Jordan Lake Watershed

	Subwatershed							
	Upper New Hope		Lower New Hope			Haw		
	N	P	N	P		N	P	
Greenfield Developable Lands Average Loading Rates (lb/ac/yr)	3.3	0.86	4.4	0.78		4.1	1.51	
ED Reduction Goals (SL 2009-216)	8%	5%	8%	5%		8%	5%	
Greenfield Development Loading Rate Targets (lb/ac/yr)	3.0	0.82	4.0	0.74		3.8	1.43	

Falls-Specific Calculations

In this section we elaborate on Falls Existing Development rule excerpts to further explain the approach to estimating the reference condition against which post-baseline development loads estimated as described above will be compared to establish load reduction needs for Falls Stage I implementation.

Sub-Item (3)(a) of The Falls Lake Existing Development Rule (.0278) establishes the following load reduction requirement for Stage I of implementation:

> *" In Stage I, a local government subject to this Rule shall implement a load reduction program that provides estimates of, and plans for offsetting by calendar year 2020, nutrient loading increases from lands developed subsequent to the baseline period and not subject to the requirements of the local government's Falls Lake new development stormwater program."*

Sub-Item (3)(a) goes on to explain the general approach required to calculate the load reduction need from these lands developed after the 2006 baseline and before July 2012:

> *"For these post-baseline existing developed lands, the current loading rate shall be compared to the loading rate for these lands prior to development for the acres involved, and the difference shall constitute the load reduction need in annual mass load, in pounds per year. Alternatively, a local government may assume uniform pre-development loading rates of 2.89 pounds/acre/year N and 0.63 pounds/acre/year P for these lands."*

This rule language provides local governments the option of assuming uniform pre-development loading rates to compare current loading rates against. The uniform loading rate approach alternative recognizes that some local governments may lack the historical site information needed to calculate site specific pre-development loading rates for a particular site. Given that several of the Falls lake local governments were implementing stormwater programs under the existing Neuse Rules as of 2006, the need for the uniform loading rate approach may be limited to those local governments who were not implementing stormwater programs as of the baseline year or where even Neuse Stormwater local governments lack sufficient historical information. Should a local government choose to utilize the uniform pre-development loading rate approach they should be prepared to demonstrate in their local program submittal that they first exhausted all reasonable efforts to obtain the necessary historical site information.

IV. Onsite Wastewater and Collection System Load Accounting

Effluent from malfunctioning onsite wastewater treatment systems and discharging sand filter systems have been identified as potential sources of nutrients to Jordan and Falls Lake. Conventional onsite wastewater treatment systems are not designed to achieve nutrient removal with most of the nutrient treatment occurring in the soil layers underneath the distribution drain field. Single pass sand filters, a common onsite system found in areas of the Jordan and Falls watersheds with Triassic basin soils, produce a variable range of effluent water quality and in some cases have direct surface discharges. As a result both types of systems represent potential sources of nutrient loading, and credit for nutrient reductions if corrective action is taken to repair or remove the source.

While this source is not explicitly addressed in the Jordan Session Law, the Falls Lake Existing Development Rule requires loading from onsite wastewater treatment systems to be calculated as part of the existing development nutrient load. Sub-Item (4)(g) of the Falls Existing Development rule states the "Nitrogen and phosphorus loading from existing development, including loading from onsite wastewater treatment systems to the extent that accounting methods allow, shall be calculated by applying the accounting tool described in Sub-Item (7)(a)...". Sub-Item (7)(a)(iii) of the rule directs DWQ to provide "Methods to account for discharging sand filters, malfunctioning septic systems, and leaking collection systems;" in the model program.

Division staff has developed the following preliminary, per-unit method of load estimation for malfunctioning septic systems and discharging sand filters. However given the nature of these nutrient sources a programmatic approach will likely need to be developed for credit accounting. central challenging issue in assigning credit for these sources relates to determining improvements relative to the strategy baseline period. Since it may not be possible to determine that a failing onsite system or individual SSO is a chronic event and occurred during the baseline, this presents challenges for using a direct per unit credit calculation approach. It may be more appropriate to utilize a programmatic approach that looks at overall failure rates over time and gives credit for programmatic improvements since the baseline that have yielded quantifiable reductions in incidents of failures and SSO's. Such programmatic improvement may include actions like decreased response time for addressing / enforcing repairs on onsite failures and improved inspection and maintenance of collection system assets resulting in an overall reduction of SSO incidents. Looking at present-day and future programmatic improvements in comparison to conditions during the baseline, coupled with per unit benefit metrics that will be developed through the ongoing 205 J measures project may provide a sound basis for quantifying load reduction credit earned through programmatic improvements.

As the Division refines this approach we will continue to seek input from experts and affected parties and consider all available research toward a scientifically defensible calculation method. To date DWQ has reviewed the methodology used to represent onsite systems in the Falls, Jordan, and High Rock lake watershed models and available data from the Chesapeake Bay expert panel that is also currently developing recommendations for onsite. DWQ has also been provided a study completed by consultants on behalf of the City of Raleigh in July 2013 entitled "A Review of Onsite Wastewater System Performance and Nutrient Trading to Support Falls Lake Nutrient Strategy Development".

The Division and the Nutrient Scientific Advisory Board recently awarded a 205J grant to fund work that will result in developing loading estimates for malfunctioning onsite wastewater systems and discharging sand filter systems and will recommend crediting methods. The consulting firm TetraTech Engineering, P.C. has been selected to perform this work.

Conceptual Nutrient Accounting Approach for Onsite Systems

At this time DWQ is proposing a conceptual approach to developing estimates of nutrient loading from onsite wastewater systems and discharging sand filters. This conceptual accounting approach takes the following seven factors listed below into account:

- The type of system (i.e. Conventions Septic, Discharging Sand Filter etc...)
- Effluent Concentrations (based on field data and/ or available research)
- Designed Flow vs. Average flow
- Distance from surface waters (attenuation between drain field and surface water)
- Available Delivery Factors
- Age of System / whether the unit is considered to be functioning properly or malfunctioning.

Onsite Wastewater Load Conceptual Accounting

*(TN & TP Effluent Concentrations mg/l) * (Designed Flow gallons/day) *(364 day/yr)*Severity Factor*Seasonality Factor*Attenuation*Delivery Factor*

Along with the factors included in the conceptual accounting approached described above a full inventory of conventional onsite and discharging sand filter systems is also needed. Such an inventory was completed by all 14 Falls Lake local governments in January 2013. However, no such inventories were conducted in Jordan and moving forward some local governments in Falls may need to further refine these inventories to provide specific location data in order to account for attenuation and delivery factors.

Leaking Collection Systems Load Accounting

Leaking wastewater collection systems may also be a source of nutrient loading in the Falls and Jordan watersheds. Leaking wastewater collection systems can contribute nitrogen and phosphorus loading to surface waters through sanitary sewer overflows (SSOs) and leaking sanitary sewer pipes.

Sanitary Sewer Overflows are releases of untreated sewage into the environment and have always been illegal under the Clean Water Act. These sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout, or broken pipe. Implementation of effective preventive maintenance programs including maintaining the collection system infrastructure, pump stations, force mains, and sewers lines is necessary in order to significantly reduce the frequency and volume of untreated sewage discharges (USEPA, 2013).

Conceptual Accounting Approach for Leaking Collection Systems

This section provides a conceptual load accounting method for collection systems by proposing an approach for estimating loading from sanitary sewer overflows. As the model program is further developed we hope to revise this approach based on additional input from affected parties and incorporate the ongoing work by the Chesapeake Bay Wastewater Workgroup for inclusion in the final Model Program document. At this point, the conceptual approach for developing estimates of loads from leaking collection systems focuses only on sanitary sewer overflows and takes the following factors listed below into account:

- Frequency of overflows
- Volume of overflows (gallons)
- Raw Sewage Concentrations (Obtained from the local WWTP)
- Designed Flow vs. Average Flow of the System
- Distance of SSO from surface waters
- Available Delivery Factors
- Miles of Sewer Lines
- Age of System

To estimate the nutrient contributions from SSO's within a jurisdiction, several assumptions must first be made. First it is assumed that the nutrient concentrations in SSO's are the same as daily average concentrations of flows entering wastewater treatment plants. Second, it is assumed that the estimated volume of the SSO and resulting nutrient load reaches a nearby surface water and to become a delivered load to the lake. And finally, in order to provide credit for eliminating an SSO it is assumed that the same number of SSOs occur with the same volumes annually. Using these three basic assumptions a local government can develop estimates of the contributions from SSO's during the baseline year and earn nutrient reduction credit for reductions achieved by repairing areas within their collection systems that are known to experience SSO's on a regular basis.

Along with the eight factors listed above, an inventory of systems is also needed. This inventory was completed by all 14 Falls Lake local governments by January 2013. However, moving forward some local governments may need to further refine these inventories to provide specific location data and details about the condition of the various assets within their system (like age and condition of lift stations etc.)

Collection System Reference Materials

Local governments can review helpful material developed by the USEPA for additional information about collection system issues and how to design effective maintenance programs to limit the frequency of sanitary sewer overflows. Links to the EPA Waste Water Collection Systems "Toolbox" and FAQ are provided below:

EPA Wastewater Collection Systems Toolbox: http://www.epa.gov/region1/sso/toolbox.html

EPA Sanitary Sewer Overflow FAQ- http://cfpub.epa.gov/npdes/faqs.cfm?program_id=4

V. Available Nutrient Measures and Methods to Quantify Credits

This final section of the model program provides details on existing development nutrient reducing measures that currently have DWQ approved credit accounting in place. At present, the available options are those currently used to meet new development requirements as well as certain procedural measures involving developed and developing lands. These measures have established accounting methods for estimating load reductions, and substantial improvements to the central accounting tool was approved by the Environmental Management Commission in March 2011. Currently approved nutrient measures are grouped into four categories: 1) Structural Stormwater BMPs, 2) Procedural Practices, 3) Land Cover Modification Practices, and 4) Riparian Buffer Restoration. Each of these is described in more detail below.

Session Law 2009-216, which primarily established existing development stormwater requirements for Jordan watershed communities, also created a Nutrient Scientific Advisory Board. The session law tasked this Board with identifying management measures that could be used by any local governments subject to existing development requirements to reduce nutrient loading from existing development toward meeting such requirements. In a July 2012 report to the Secretary of DENR, the Board identified the set of measures below as those currently available. In that report, the Board also identified a range of potentially creditable measures for further investigation. Those measures are discussed in the Supporting Information guidance document accompanying this model program.

Structural Stormwater Practices (Stormwater BMPs)

Structural stormwater practices currently in use for new development load reduction are equally suitable for existing development. Table 1 below identifies these practices and associated accounting methods approved by the Commission. Most of these measures can be found in the Division's Stormwater Best Management Practices Manual and are used to meet new development requirements under Neuse and Tar-Pamlico nutrient strategies. These practices will also be used to meet new development requirements of the Jordan and Falls rules. The accounting tool for most of these measures, the Jordan/Falls Nutrient Load Accounting Tool, was developed by stormwater researchers with the NCSU Biological and Agricultural Engineering Department, and was approved by the Commission in March 2011 as the compliance tool for new development activities in the Jordan and Falls watersheds.

A challenge with applying stormwater BMPs to existing developed landscapes is that drainage and space constraints can result in practices being undersized or oversized for the available catchment. An innovation incorporated in the Jordan/Falls tool is the option of oversizing or undersizing BMPs for commensurate additional or reduced nutrient reduction credit. The tool can be found at http://portal.ncdenr.org/web/jordanlake/implementation-guidance-archive.

To help gauge the relative benefit of stormwater BMPs, Table 1 includes for each one ranges of estimated percent removal efficiency of nitrogen and phosphorus that result from applying the Jordan/Falls Tool to the full range of possible development land cover types, from zero to 100% impervious.

Jordan Watershed Delivery Factors

The Jordan existing development session law includes a requirement that load assignments be set and load reductions be calculated and judged in terms of delivered-to-lake values. The original Jordan watershed model included delivery factors for all 58 14-digit hydrologic units comprising the Jordan watershed. Table 1 identifies these delivery factors as appropriate for estimation of delivered fractions of at-source N and P loads produced by the Jordan/Falls Tool. Delivery factors are not currently available for the Falls lake watershed, but may be developed and incorporated into a future revision of this model program document.

Other Available Load-Reducing Measures

In additional to conventional stormwater BMPs, Table 1 identifies a number of other practices that are available to affected parties. Several are procedural options for local governments, while others identify creditable modifications to developed or other land covers.

Procedural Practices

- Redevelopment projects that exceed land disturbance thresholds and increase built-upon area are required by state new development rules to reduce loads. In these cases, by implementing state requirements loads are being reduced from existing developed lands, and local governments and state or federal entities may credit those net reductions towards their existing development needs. Over time, a local government could make substantial progress toward existing development goals.
- Local governments could also go beyond state minimums on redevelopment and require through ordinance load reductions on redevelopment that does not increase built-upon area. Again the local government could retain the net load reductions from the previously developed condition toward existing development needs.
- Local governments could by ordinance set more stringent loading rate targets for new development than those required by the state and retain the 'extra' reductions toward existing development needs. This would include obtaining treatment on development projects that fall below the state's new development loading rate targets without treatment. This option would be more feasible for Lower New Hope and Haw watershed communities, where state loading rate targets are not particularly stringent.
- Local governments could adopt ordinances that require treatment on other new development that is not required to treat under the state's new development rules. This would include development that does not exceed land disturbance thresholds or projects that would be vested under the state's implementation timeframes.

- Local governments could purchase nutrient reduction credits from private banks or the NC Ecosystem Enhancement Program.

Land Cover Modification Practices

- Removal of existing impervious cover or replacement of existing pavement with permeable pavement would decrease runoff and increase infiltration, decreasing nutrient loading. Local governments could seek such opportunities on lands they control or on private lands. To facilitate such projects, communities could revisit parking requirements in existing ordinances for the potential to reduce mandates, to allow for shared parking, or other approaches.
- Reforestation of managed open space on developed lands combined with protection through conservation easement or other protective instrument could decrease runoff and nutrient loading. Using the Jordan/Falls Tool, the load reductions attributed to conversion of managed landscape to forest are over 50% for both nitrogen and phosphorus.

Riparian Buffer Restoration

Local governments and state and federal entities may restore riparian buffers on developed or agricultural lands where riparian zones are currently under cultivation or other managed vegetative cover. Buffers restored to meet other regulatory mitigation requirements may not also be credited for existing development purposes. Nutrient load reductions are estimated using the Division's credit yield calculation method, available at http://portal.ncdenr.org/web/wq/nutrient-offset-practices.

Table 3. Load-Reducing Practices with DWQ-Approved Accounting

Practice[1]	Accounting Method	Removal Efficiency	Design Specifications
Stormwater Wetland	Jordan/Falls Tool[2] + DF[3]	TN = 32 - 56% TP = 61 - 86%	State Stormwater BMP Manual
Bioretention w/ IWS **Bioretention w/o IWS**	Jordan/Falls Tool[2] + DF[3]	TN = 61-73% TP = 61 - 84% TN = 48 - 66% TP = 49 - 80%	State Stormwater BMP Manual
Wet Detention Basin	Jordan/Falls Tool[2] + DF[3]	TN = 28 - 52% TP = 34 -76%	State Stormwater BMP Manual
Sand Filter	Jordan/Falls Tool[2] + DF[3]	TN = 30 - 55% TP = 17 - 75%	State Stormwater BMP Manual
Level Spreader + Filter Strip	Jordan/Falls Tool[2] + DF[3]	TN = 48 - 66% TP = 43 - 88%	State Stormwater BMP Manual
Dry Extended Detention Basin	Jordan/Falls Tool[2] + DF[3]	TN = 8 - 41% TP = -21 - 75%	State Stormwater BMP Manual
Grassed Swale	Jordan/Falls Tool[2] + DF[3]	TN = 8 - 50% TP = -59 – 78%	State Stormwater BMP Manual
Green Roof	Jordan/Falls Tool[2] + DF[3]	TN = 50 - 51% TP = 48 – 76%	State Stormwater BMP Manual
Permeable Pavement - CP/Sandhills	Jordan/Falls Tool[2] + DF[3]	TN = -10 – 35% TP = -82% - 65%	State Stormwater BMP Manual

[1] To qualify, practices shall meet design specifications in current version of DWQ Stormwater BMP Manual except as noted.
[2] *Jordan/Falls Lake Stormwater Nutrient Load Accounting Tool*, approved by NC EMC March 2011 for load compliance accounting under Jordan & Falls New Development rules. Uses the Simple Method, does not account for stormwater routing. Recommended only for catchments $\leq$ 1mi^2 (640 acres).
[3] For Jordan watershed applications only, nonpoint source N, P delivery factors translating 14-digit HU loads to lake-delivered loads. Estimated with SPARROW-based Stream Network Delivery Model by Tetra Tech, Inc. for DWQ. Approved by NC EMC 11/03. Delivery factors available at http://portal.ncdenr.org/web/jordanlake/home.

Table 3 (continued). Load-Reducing Practices with DWQ-Approved Accounting

Practice[1]	Accounting Method	Design Specifications
(Rooftop) Rainwater Harvesting (See also Table 2a)	Jordan/Falls Tool[2] + DF[3]	State Stormwater BMP Manual
Require Treatment of New Development Where DWQ Does Not	Jordan/Falls Tool[2] + DF[3]	N/A
Overtreatment of New Development	Jordan/Falls Tool[2] + DF[3]	N/A
Load Reduction on Redevelopment	Jordan/Falls Tool[2] + DF[3]	N/A
Removal of Impervious Surface	Jordan/Falls Tool[2] + DF[3]	N/A
Restoration of Riparian Buffer	DWQ Credit Yield Calculation[4] + DF[3]	N/A
Upland Reforestation on Developed Land	Jordan/Falls Tool[2] + DF[3]	N/A
Payment to EEP or Private Bank	DWQ Credit Yield Calculation[4] or Jordan/Falls Tool[2]	N/A

[1] To qualify, practices shall meet design specifications in current version of DWQ Stormwater BMP Manual except as noted.
[2] *Jordan/Falls Lake Stormwater Nutrient Load Accounting Tool*, approved by NC EMC March 2011 for load compliance accounting under Jordan & Falls New Development rules. Uses the Simple Method, does not account for stormwater routing. Recommended only for catchments $\leq$ 1mi^2 (640 acres).
[3] For Jordan watershed applications only, nonpoint source N, P delivery factors translating 14-digit HU loads to lake-delivered loads. Estimated with SPARROW-based Stream Network Delivery Model by Tetra Tech, Inc. for DWQ. Approved by NC EMC 11/03. Delivery factors available at http://portal.ncdenr.org/web/jordanlake/home.
[4] N and P load reduction estimate for riparian buffer restoration, developed by DWQ and NCWRP, 1998. Used as credit value in setting of EEP and private bank nutrient offset rates for buffer restoration under stormwater rules for Neuse, Tar-Pamlico, Jordan and Falls watersheds. Available at http://portal.ncdenr.org/web/wq/nutrient-offset-practices

Supporting Information for Affected Parties For the July 2013 EMC

Companion Document to the Model Program for Existing Development Stormwater for Falls and Jordan Nutrient Strategies

This document provides supplemental program guidance for local governments and state and federal entities on how to implement or comply with the requirements of the Jordan and Falls Existing Development Stormwater rules. This is a companion document to the Model Program for Existing Development Stormwater for Falls and Jordan watersheds, which contains specific requirements for the content of local program submittals to the Division. Much of the supporting information discussed below was prompted in part by questions raised by and during discussions with the Nutrient Scientific Advisory Board and the Upper Neuse River Basin Association.

VI. Additional Terms & Concepts

Division discussions with the NSAB highlighted the need for further clarification of certain concepts included in the regulations for implementation purposes. Several of those concepts are addressed in the Model Program to enable discussion there of establishing load reduction needs and allocations. Here we provide interpretive guidance on additional key terms that were not essential to understanding the load estimation discussion.

Existing Development

The Falls rule and Jordan session law establish jurisdictional bounds for existing development that are applicable to each affected party, stating that a jurisdiction is responsible for existing developed lands within its police power, and that its loads shall not include those from lands under state or federal control, nor loads from agriculture or forestry.

This section provides clarification on what types of land and development are considered "existing development" for the purpose of being included or specifically excluded from any calculations performed to develop jurisdictional load responsibilities.

The Jordan & Falls Definitions rules define existing development from an administrative standpoint focused more on the term '*existing*'; that is from a temporal standpoint, which developments are subject to Existing Development, or ED requirements.

From Falls Definition Rule (.0276)

> *"'"Existing development" means development, other than that associated with agricultural or forest management activities that meets one of the following criteria:*
>
> *(A) It either is built or has established a vested right based on statutory or common law as interpreted by the courts, as of the effective date of either local new development stormwater programs implemented under 15A NCAC 02B .0277 for projects that do not require a state permit or, as of the applicable compliance date established in 15A NCAC 02B .0281(5) and (6); or*
>
> *(B) It occurs after the compliance date set out in Sub-Item (5)(d) of Rule .0277 but does not result in a net increase in built-upon area;"*

What is Considered 'Development'?

For definition of the word 'development', the two watershed's Definitions rules point to the one provided in Division rule 15A NCAC 2B .0202. That definition is "*any land disturbing activity which adds to or changes the amount of impervious or partially impervious cover on a land area or which otherwise decreases the infiltration of precipitation into the soil*".

Clearly this definition of development is broad and not particularly instructive on how to discern development for the regulatory purposes of these rules. Thus we offer the following recommendations on distinguishing existing development for use in estimating loads. Below we provide clarification on land covers and development types generally considered as development and provide clarification about special case like existing development on agriculture land, forest land, and in the public domain.

1. ***Land covers***
   Existing development generally includes impervious and managed pervious covers, including those with a tree canopy. Managed vegetated areas on developed lands typically have more compacted, poorer infiltrating soils than those in undeveloped areas, and some have been graded to shed runoff more efficiently, all of which add to their potential to export nutrients.

2. ***Development types***
   Existing development includes all types of development typically regulated, e.g. residential, commercial, industrial, institutional, mixed use, etc. It includes both private and public landholdings, although state and federal entities' existing development is regulated under separate rules from that of local governments.

3. ***Agriculture Land Exclusion***
   ED should not include agricultural land. The sections of the Falls & Jordan Agriculture rules that define agriculture are provided in ***Appendix XX***. Agriculture generally includes all commercial production of crops, horticultural products other than trees, livestock or poultry. For livestock, the commercial criterion does not apply; instead the rule sets numeric thresholds of applicability by livestock type. 'Commercial' is defined in the rule as "*primarily for financial profit*".

   We consider agricultural land to include structures and travelways that directly support agricultural activity, but not the residences of agricultural producers and workers or the roads/driveways accessing those residences.

4. ***Forest Land Exclusion***
   Existing development should not include forest. Forest for our purposes is land with a tree canopy and a vegetated understory/ground cover that is not, at least occasionally maintained during a typical year. Forest does not require a specific tax status, management status, or protective zoning, regulatory or ownership status or other protective legal status. Developed land that is impervious or managed pervious cover with a well-developed tree canopy should be treated as the underlying cover for estimating loads until a method can be established that adequately represents the loading benefits provided by that tree cover. Such a method would need to be applied to both baseline and post-baseline conditions.

Police Powers

Language in both the Falls Rule and Jordan Session Law bases the assignment of load reductions on lands that fall within a local government's "police powers" or “police powers jurisdiction”, as follows:

- From Falls Sub-Item(4)(e) *"A local government's load reduction need shall be based on the developed lands that fall within its general police powers and within the Falls watershed;"*

- From Falls Sub-Item (4)(f) *“The load reduction need shall not include lands under state or federal control, and a county shall not include lands within its jurisdictional boundaries that are under municipal police powers;*

- From Jordan SL 2009-216 Section 3.(d)(2)(b*) " The load reduction goal shall be designed to achieve [reduction in loading] reaching Jordan Reservoir from existing developed lands within the police power jurisdiction of the local government. The baseline load shall be calculated by applying the Tar-Pamlico Nutrient Export Calculation Worksheet, Piedmont Version, dated October 2004, to acreages of different types of existing development within the police power jurisdiction of the local government during the baseline period."*

- From Jordan SL 2009-216 Section 3.(d)(2)(e) *“Any credit for reductions achieved or obtained outside of the police power jurisdiction of a local government shall be adjusted based on transport factors…”*

Division staff sought input from faculty of the UNC School of Government regarding interpretation of this term within the context of these regulations. Based on their input we offer the following interpretation of the terms above.

Police powers are the general ordinance-making powers conferred by the legislature that allow local governments to govern their affairs and the conduct of people within their jurisdictions. Police powers give local governments the authority to “*define, prohibit, regulate, or abate acts, omissions, or conditions, detrimental to the health, safety or welfare of its citizens and the peace and dignity of the city (county), and may define and abate nuisances*” [G.S. 160A-174(a) (G.S. 153A-121(a))]. Within the police power article, cities also have more explicit authority at G.S. 160A-185 to regulate, restrict, or prohibit the emission of pollutants to land, water or air.

For cities, police power jurisdiction coincides with municipal boundaries unless the legislature expressly authorizes an extension for specific purposes, which it has not for the purposes of stormwater control on existing development. Similarly, county police power applies to any part of a county not within a city. Thus it appears that load assignments under the existing development regulations for both cities and counties should be based on municipalities’ corporate limits.

Police power jurisdiction is distinguished from "planning jurisdiction", the area in which planning and regulation of development occurs through zoning, subdivision and other ordinances. Planning jurisdiction generally includes the extraterritorial jurisdiction as well as the area bounded by corporate limits. It makes sense for *new* development stormwater ordinances for Jordan, Falls, and other state stormwater regulations to be enacted based on planning authorities and to be implemented by municipalities both within their corporate limits and through their ETJ's.

Given this interpretation regarding existing development, concerns have been raised by counties over the character of ongoing development. Municipalities typically control the nature of development that has occurred since the strategy baseline period and will continue to occur until new development programs are implemented. This 'interim' development will be considered part of existing development for rule purposes and will be assigned to counties as part of their existing development nutrient load responsibilities. This lack of control over the character of new loading sources understandably presents an inequity from the county perspective. The only apparent offset to this inequity is the potential that municipalities in many cases may ultimately annex lands within their ETJ's and to that extent, based on the policy proposed elsewhere in this guidance, would regain the load deficits that they permitted originally for lands meeting the existing development definition.

Separate from the question of load assignments, cities and counties have the ability to regulate stormwater through either police power authority or development-related authority. Recent statutes G.S. 160A-459 and 153A-454 give local governments stormwater-specific ordinance-making authority. To the extent that a local government may contemplate some kind of regulation to facilitate its existing development load-reducing activities, police power authority may be the most appropriate basis for that regulation, but it would be useful to seek additional expert guidance on the advisability and implications of using different authorities for different kinds of ordinances regarding existing development.

Two articles authored by staff of the UNC School of Government on police powers are David W. Owens' January 2006 paper, *The North Carolina Experience with Municipal Extraterritorial Planning Jurisdiction* and A. Fleming Bell II's 2007 article under the heading of County and Municipal Government in NC, *The Police Power*.

VII. Key Rule Requirements

The Falls Lake existing development stormwater rules and Jordan session laws require local governments and state & federal entities in both watersheds to develop and implement load reduction programs to reduce nutrient loading from existing developed lands within their jurisdictions. The Falls rule and Jordan session law establish jurisdictional bounds for existing development that are applicable to each affected party, stating that a jurisdiction is responsible for existing developed lands within its police power, and that its loads shall not include those from lands under state or federal control, nor loads from agriculture or forestry. Annual reports to the Division are required from affected parties in both Falls and Jordan to document efforts undertaken and demonstrate the ongoing progress to achieve the required reduction goals. There are critical differences in the timing and implementation of existing development requirements in both watersheds and are discussed below.

Falls - Key Requirements

The Falls rules establish two stages of implementation which vary by their reduction goals and geographic application in the watershed. The first stage (Stage I) requires all local governments and state and federal entities throughout the entire watershed to develop and implement a Stage I load reduction program within three years of the rule effective date to reduce loading from existing developed lands to 2006 baseline levels by end of calendar year 2020. Preceding the development of this Stage I program, local governments are required to conduct inventories of their existing developed land so they have the information needed to develop their Stage I local programs. The division is required to provide a model Stage I Program to the EMC by July 2013. The model program includes nutrient accounting tools and programmatic guidance for affected parties to use in developing their own local programs for implementation.

While the rule calls for a model program to be submitted to the EMC by July 2013 there is no deadline included in the rule by which the EMC must approve the model. The Division and the Upper Neuse River Basin Association are engage in discussions concerning the need for more time to develop additional crediting for nutrient removal measures that can be added to the BMP "tool box" of available measures in the model program. DWQ will bring a model program to the July 2013 EMC but will recommend a delay before final approval to allow more time to work with the UNRBA and affected parties on a mutually agreeable timeframe for expanding the measures in the BMP tool box. Once the tool box is expanded and the model program is approved by the EMC, the rule requires affected parties to submit their local Stage I programs and concurrently begin implementing nutrient reducing measures within six months of the EMC's approval of the model program. DWQ will work in collaboration with affected parties to develop their Stage I jurisdictional loads and Stage I reduction needs which local governments will provide in the Stage I local program submittals. The calculation of jurisdictional loads and load reduction needs will be done using the tools and accounting methods discussed in Section VIII of the this

document.

Stage II load reduction programs are required in 2021 for local governments and state and federal entities with jurisdictions including land located in the upper watershed. Stage II load reduction programs will include compliance timeframes proposed by the affected parties to meet the overall strategy goal of a 40% reduction in total nitrogen and 77% reduction in total phosphorus. As implementation continues, affected parties are required to submit revised Stage II plans for EMC approval every five years until the reductions are achieved. The EMC will approve load reduction plans that it finds achieve the maximum level of reductions that is technically and economically feasible within the proposed timeframe of implementation based on plan elements identified in the rule.

The Falls Lake Existing Development Rule requires local governments and state & federal entities to develop and implement within three years of rule effective date a Stage I load reduction program to reduce loading from existing developed lands to 2006 baseline levels by 2021. Stage II load reduction plans would be required for local governments with jurisdictions including land located in the upper watershed. Stage II load reduction programs will include compliance timeframes proposed by the local government and shall meet explicit criteria established in the rule.

Jordan - Key Requirements

The Jordan Rules requires a two-stage adaptive management program to be implemented by affected local governments. State and Federal entities are not required to develop Stage 1 programs.
Local governments were required to submit their Stage 1 adaptive management programs to the Department by December 31, 2009. State 1 programs were required to propose methods to meet the following five measures: a public education program on nutrient loading from stormwater; a mapping program that includes municipal separate storm sewer systems and waters of the United States, a program to identify and remove illegal discharges; a program to identify opportunities for retrofits and other nutrient reducing practices; and a BMP maintenance program. All local governments' programs were approved by the EMC, and are currently being implemented. Local governments are required to report annually to the Department on implementation of their program.
The Session Law required the Division to establish a water quality assessment plan to monitor water quality in each of the three arms of the lake. Water sampling data may also be accepted from a local government or nonprofit organization's monitoring program, provided that the data meets quality assurance standards established by the Division. Beginning on March 1, 2014, and every three years after, the Division is required to report the monitoring results to the Environmental Review Commission.
The Jordan Water Quality Assessment Plan can be found here:
http://portal.ncdenr.org/web/jordanlake/data-and-monitoring

Development and implementation of Stage 2 adaptive management programs are dependent on the results of the aforementioned water quality assessment plan reports. If the March 1, 2014 report, or any subsequent report shows that the Upper New Hope arm shows that nutrient-related water quality

standards are not being met in the Upper New Hope Arm of the lake, affected parties in the Upper New Hope arm will be notified to begin developing a Stage 2 program for their jurisdiction that falls within that subwatershed. Because the Lower New Hope Arms and Haw Arms of the lake are less impaired, they will be notified to begin developing their Stage 2 programs if the March 1, 2017 monitoring report shows those arms are not meeting nutrient-related water quality standards. Once notified, affected parties will have six months to develop and submit their local Stage 2 programs. The Department will then have six months to review these programs and recommend that the Commission approve or disapprove the program. Approval will based upon whether the program meets the requirements of the Rule. See Section 2 – Program Approval Standards for a description of factors that will be considered by the Commission for program approval. When approved, local governments will have three months to begin implementing their programs.

Stage 2 programs shall be designed to achieve the nutrient reduction needs established by the new Jordan watershed model described in Section III by early 2014. Initially these needs are based on an 8% reduction in nitrogen and 5% reduction in phosphorus, relative to the baseline load and adjusted for increases that have occurred since. If by 2023, the monitoring report shows that the Upper New Hope arm of the lake still isn't meeting water quality standards in the lake, affected parties will need to modify their program to achieve a 35% reduction in Nitrogen. Programs shall propose implementation timelines. Other requirements of local programs can be found in the "Required Elements of Local Programs" in Section II.

VIII. Adjusting Load Allocations and Reduction Needs

This section of supporting information discusses how a local government's existing development N and P allocations and load reduction needs may be adjusted both initially for BMPs implemented post-baseline to date, and over time due to changes in jurisdictions through post-baseline development and annexation. While the concept of adjusting allocations and load reduction needs applies to both Falls and Jordan, there are differences between the two watersheds' regulatory requirements. Where a passage is specific to one watershed it will be noted in the text.

Common Principles of Falls & Jordan Existing Development Reduction Needs

While the timeframes and staging of load reduction requirements differ between Falls and Jordan existing development rule requirements, the same principles operate in both watersheds with regard to adjusting allocations and load reduction needs over time. Here we identify both differences and common principles. Jordan and Falls requirements differ in that in Stage I of the Falls rule, reduction requirements are limited to loading increases from development that has occurred since the baseline period and that is not subject to the Falls New Development Stormwater Requirements. The same post-baseline offset requirement occurs in Jordan, but it is one part of the current stage's calculation, which also includes achieving percentage reductions from baseline loads. That is, the Jordan existing development load reduction need for nitrogen and phosphorus in the current stage is the sum of those needs from baseline development and post-baseline development (note that the percent reduction requirements for the current stage of Jordan are 8% N and 5% P regardless of subwatershed, leaving the strategy 35% N requirement in Upper New Hope Arm for a further stage conditioned on that arm's recovery). In Falls watershed, this percent reduction relative to baseline load does not occur until the second stage of implementation beginning in 2021.

In both watersheds, additional post-baseline development may occur for several years hence and will add to a LG's reduction need. At some point, all post-baseline development will have occurred, and reduction need there forward will change only as a result of either jurisdictional boundary changes (see Annexation discussion below) or through implementation of load-reducing measures.

Load reduction needs (both watersheds) and load allocations (Jordan only in the current stage) are both tied to the timeframe on which the assignments are based. While load reduction needs in both watersheds will change as a result of additional post-baseline development, implementation of measures, and jurisdictional changes, load allocations in Jordan are determined from baseline loads and will change only as a result of jurisdictional boundary changes, perhaps less frequently than load reduction needs.

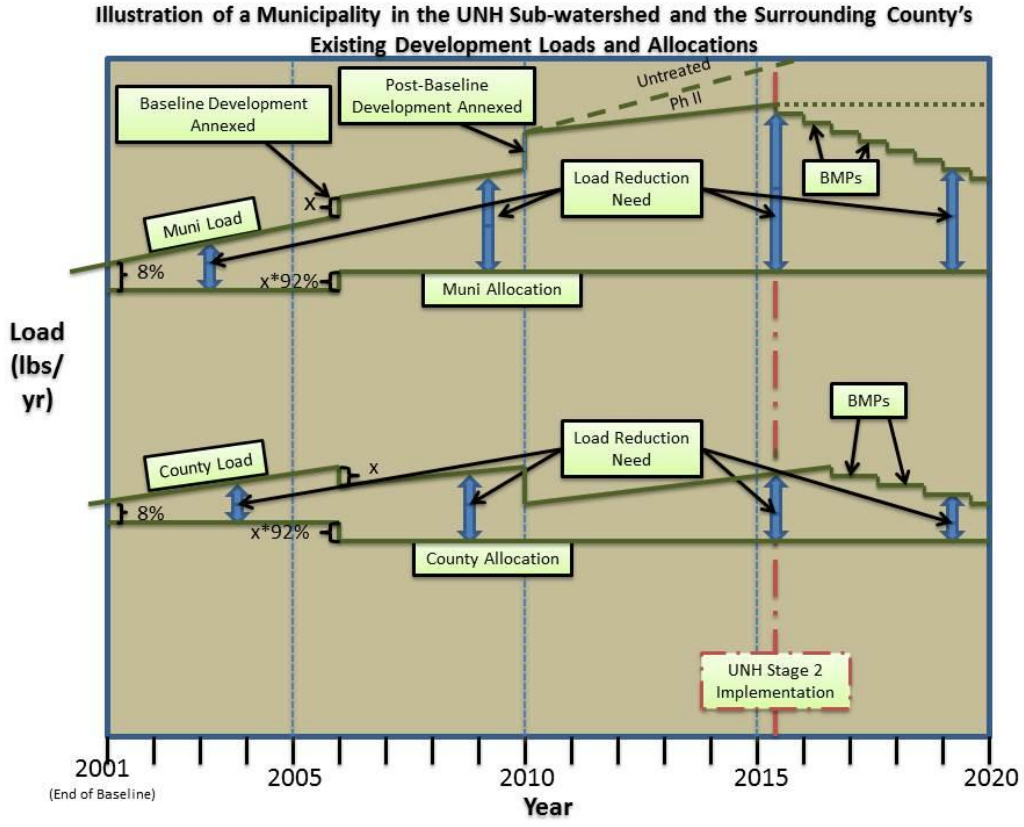
Local governments in both watersheds will need to include in annual reports information on whether jurisdictional boundaries have changed, and if so will calculate the resulting load transfers and will

include them in revised load reduction needs in both watersheds and revised load allocations in Jordan. The Division will review and respond to this information. Annual reporting is addressed in a separate section of this additional information.

Jordan Assignment/Revision of Reduction Needs and Allocations

In Jordan, baseline development generates baseline loads that local governments are charged with reducing by strategy reduction goal percentages. This will be the case for Stage II of Falls beginning in 2021. The Jordan calculation involving baseline load dictates load allocations. E.g. Haw affected parties are charged with reducing baseline development N loads by 8%; their N allocations are correspondingly 92% of baseline load. Post-baseline development adds loads to an affected party's reduction need without affecting its allocation. In effect these added loads must be offset in their entirety in addition to the reduction need that stems from baseline development. The following graphic illustrates the logic of how allocations and load reduction needs are adjusted in the current Jordan stage, and will be adjusted in Falls Stage II.

Figure 2. Illustration of City and Adjacent County Load Reduction Needs and Allocations, Jordan



Adjusting Load Reduction Needs & Allocations: Credit for Baseline BMPs

This section addresses the question of how stormwater BMPs in place as of the end of the baseline period, which we will call *baseline BMPs*, will be accounted for in terms of crediting. This is directly relevant for the current stage of Jordan implementation, and will be relevant in 2021 for Falls, when the second stage of that program is implemented.

In concept, functioning water quality BMPs that were in place prior to the end of the baseline period were removing nutrient loads from stormwater runoff, and therefore reducing nutrient loading during the baseline period. As described in the Estimating Load Reduction Needs section of the Model Program, a watershed model will be used to estimate baseline nutrient loading in the Jordan watershed and potentially in the Falls. BMPs will not be specifically accounted for in the Jordan watershed model, but model calibration to instream water quality data will reflect water quality improvements provided by existing BMPs for drainage areas captured by each calibration point. Thus, applying separate, post-model credits for baseline BMPs would in total amount to double crediting, which would be inappropriate. We recognize the theoretical potential for cases where one jurisdiction above a calibration point required significant numbers of water quality BMPs during the baseline period and another jurisdiction in the catchment did not, while the watershed model distributes the resulting water quality benefit evenly across both jurisdictions. While we believe for reasons we describe below that in practice this will not be an issue in Jordan watershed, we will provide the opportunity for affected parties to present specifics to make the case for baseline load adjustments.

Baseline BMPs in Jordan Watershed

During Jordan watershed model development, the NSAB Model Subcommittee in discussions with the modeling contractor, TetraTech, accepted the approach of not including water quality BMPs specifically in the model based on certain observations:

- Best available data suggest that there were relatively few water quality BMPs installed before or during the baseline period. The vast majority of these would likely have been implemented to comply with Water Supply Watershed requirements, which were not established until the mid-90s, just prior to the baseline period. Other than Water Supply Watershed regulations, elective local ordinance or a voluntary watershed project would have been the only other likely driver for installation of qualifying BMPs.
- An estimated 58% of Water Supply Watershed areas (roughly 300,000 out of 520,000 acres) are located above smaller reservoirs within the watershed, sometimes above more than one nested reservoir, which have a much greater beneficial influence on nutrient concentration and thus model calibration at points below than any BMPs above them. Given that virtually all water quality BMPs appear to be located within these Water Supply Watersheds, model calibration is largely unaffected by the lack of specific BMP representation in the model.

More on this subject can be found in Tetra Tech's January 30, 2013 memorandum, *Recommendation not to explicitly model stormwater BMPs for the Jordan watershed*, provided as Appendix D.

Thus, while we believe that the extent of water quality BMPs in place during the baseline in Jordan watershed was small and any measurable benefit will be captured by the watershed model and reflected in baseline load estimates, we will provide the opportunity for affected parties to present specifics to make the case for baseline load adjustments if there is evidence of significant disparities in BMP implementation between jurisdictions above model calibration points. For evaluating this concern, we offer the following clarifications on the nature of BMPs that would be assumed to have a water quality benefit. These would be baseline BMPs that were built in compliance with the water quality design standards in DWQ's then-current BMP Manual or of comparable water quality design.

Adjusting Allocations & Load Reduction Needs: Crediting Post-Baseline BMPs

Given that affected parties' load reduction needs in both watersheds are set relative to a baseline time period, load reductions achieved by BMPs that have been installed since the baseline may be credited towards affected parties' load reduction needs. This section addresses qualifying criteria for those measures, and discusses approaches and appropriate tools for estimating credit. The following discussion will be in terms of structural stormwater BMPs assuming these will comprise the great majority of existing practices. Where other measures have been implemented and the concepts below do not apply, Division staff will develop guidance applicable to the type of measure.

Creditable Water Quality Practices

Creditable practices are those functioning nutrient-reducing practices installed after the baseline period and over which the affected party has either direct control or jurisdiction. To qualify as nutrient-reducing, practices must conform to a Division design standard for which nutrient credit accounting has been established. Creditable stormwater BMPs existing at the time of program submittal may include those installed by developers to comply with other State stormwater regulations such as Neuse New Development Stormwater, NPDES Phase II or Water Supply Watershed regulations, those installed by developers under elective local ordinances, or measures installed independently by the affected party. BMPs that were built for volume control purposes would not qualify but could be candidates for retrofitting to meet water quality design standards. In addition, the Division has currently let a contract to develop design specifications and credit accounting for volume pond retrofits where site constraints force the use of non-standard designs. Such non-standard retrofit options may become available by early 2014.

The following BMPs will not be eligible for credit, with caveats:

- BMPs built for volume control purposes that did not meet the water quality design standards of DWQ's BMP manual will not be eligible for credit. However, retrofitting these BMPs to meet water quality standards may potentially generate load reductions that could be credited towards an affected party's load reduction needs.

- BMPs that had stopped functioning prior to the end of the baseline period will not be eligible for baseline credit.
    - If these non-functioning BMPs were built to meet State stormwater regulations, then they need to be repaired. Even after repair, these BMPs would not receive credit because those malfunctioning BMPs should have already been repaired.
    - If these non-functioning BMPs were built voluntarily, then the repair of these BMPs would have the potential to generate credit towards an affected party's load reduction needs, but not towards baseline loading and load allocations.

Developing Data on Existing Water Quality Practices

Recognizing that only functioning water quality practices will qualify, affected parties will need to establish and demonstrate the functionality of the set of existing BMPs included in estimates. For BMPs that exist at the time of program submittal, which may include baseline BMPs in addition to post-baseline BMPs, we recognize that the ability to confirm functionality will depend upon the extent of candidate measures, a jurisdiction's recordkeeping practices, the resources currently available for verification of function, and the time available to do so. Since these factors vary across jurisdictions, affected parties should use and document a best reasonable method demonstrating a good faith effort. Parties are encouraged to discuss their intended approach with Division staff. Demonstration of function includes both field verification of existing function and prospective provision for sustained function. Field verification needs to include at least some representative sampling of the candidate population. Field review should seek to confirm: properly constructed water quality design conforming to the Division Stormwater BMP Manual or reasonably similar design standards; proper sizing of BMP for drainage area; proper routing of stormwater to BMP; evidence of effective, regular maintenance; evidence of hydraulic function as intended; structural integrity and reasonable expectation of sustained function for life of practice. Prospective assurance should include documentation of responsible parties and processes established by those parties for operation and maintenance and reporting, resources for repair and renovation, methods for periodic verification of performance by the affected party, and plans for annual reporting by the affected party to the Division.

Credit Estimation Tools

For structural stormwater BMPs credit calculations, affected parties should use the Jordan/Falls Tool or subsequent revisions to the tool. The reasoning for this is provided in the model program document in the section on estimating loads.

It should be noted that the Jordan watershed model will estimate loading up until 2010, which is the most recent year for which suitable land cover data can be obtained. For both baseline and post-baseline loading, the model will not account for specific BMPs. However, unlike the modeling for the baseline loads, the model will not be calibrated for 2010, and will not inherently account for the nutrient reductions of baseline BMPs. Therefore, the model will overestimate post-baseline loading, and the Jordan/Falls tool should be used to estimate baseline-BMP credits and to adjust post-baseline loading.

Adjusting Allocations & Load Reduction Needs Due to Annexation

As jurisdictional boundaries are moved, control over lands that generate baseline loads follows, so the baseline load reduction portion of reduction needs based on 2001 boundaries (Jordan) and 2006 boundaries (Falls) will need to change accordingly. Transfer of either baseline development lands or post-baseline development lands between jurisdictions necessitates the transfer of associated load reduction needs, but specifics differ between the two types.

Policy Approach

Where annexation at any point after the baseline period involved or involves *baseline* development, the baseline loads of affected LGs shall be adjusted to reflect the transfer of those lands between jurisdictions. Load *allocations* shall also be adjusted accordingly, in turn affecting overall load reduction needs.

Where annexation at any point after the baseline period involves *post-baseline* development, whether the post-baseline development occurred prior to or occurs following annexation, baseline loads and allocations shall not be adjusted. Instead, load increases from such development shall be added to the overall *reduction needs* of the annexing municipality and deducted from the overall *reduction needs* of the annexed county.

The following two subsections provide the Division's rationale for this policy approach.

Rationale for Policy Approach - Annexation of Baseline Development

The theoretical load adjustment options we considered associated with annexation of baseline development include: 1) no changes, 2) adjust current loads to reflect new jurisdictions, and 3) adjust baseline loads to reflect new jurisdictions.

- **No adjustment** would mean that a county's load assignment would in part reflect lands and associated load reduction opportunities over which it no longer has control. Conversely the annexing municipality would gain load reduction opportunities with no increase to its reduction needs. This approach would yield an increasing disconnect with each annexation between reduction expectations and land base for achieving reductions on the part of both LGs, detrimentally so for the county and beneficially for the municipality. We would consider this approach inappropriate on its face from logical connection and equity standpoints.

- **Adjusting current loads of both LGs** would preserve the baselines of both and would credit the entirety of the load in question toward the county's reduction need while adding that entire load to the municipality's reduction need. Since the load in question is pre-existing, both credit and debit would occur in the absence of any actual loading change. In theory, a county could potentially satisfy its ED rule requirements in full without ever implementing a load reduction practice, while a municipality could concurrently, without allowing any development,

accumulate an insurmountable load reduction burden. This scenario, as does the first, appears to be inherently unreasonable from logical and equity perspectives.

- **Adjusting baseline loads of both LGs** would equitably reflect the lands over which each retains control. Proportional adjustments would follow to load allocations and load reduction needs of both. In contrast to the second scenario, loads added to one's reduction need and deducted from the others would stem from logically consistent changes to their baselines and would be on the scale of the goal percentage of the load in question instead of the entire load in question. This appears to be the only equitable and rationally consistent method.

    - The municipality's baseline would increase by the full added loads of the assimilated development, its load allocation would increase proportionally as the percent of baseline load not targeted for reduction, and its load reduction need would increase as the reduction goal percentage of the full added load. To its advantage, the municipality would have potential reduction opportunities in its assimilated developed lands.
    - The beneficial effect on the county's baseline, allocation and reduction need would be the converse of the added burden described for the municipality. At the same time, by relinquishing the developed lands and reducing its load responsibilities it would accordingly forego those future reduction opportunities.

Rationale for Policy Approach - Annexation of Post-Baseline Development

What adjustments are needed for post-baseline development? Briefly, the same three theoretical load assignment options could be considered as for the Baseline Development case: 1) no changes, 2) adjust current loads to reflect new jurisdictions, and 3) adjust baseline loads to reflect new jurisdictions. It is apparent that option 2 is the only appropriate one given that the new load in question is additional to baseline load and needs to be offset in its entirety. The 'no changes' option makes no sense for similar reasons as described above, and option 3, increasing a LG's baseline load to address post-baseline development, would fail to provide the level of reductions needed to meet rule requirements since it would require offsetting only the goal percentage of the new load in question.

As with the baseline development case, we believe the new loads should be assigned to the LG retaining control over the lands in question. Where post-baseline development is in place at the time that annexation is considered, the participating LGs may want to factor the transfer of those load responsibilities into their considerations.

Annexing Land with BMPs in Place

Annexed land may include development with stormwater BMPs in place. Depending on whether the case is baseline or post-baseline development, and creditable or non-creditable BMPs, it affects the reduction credit value of those BMPs as described in the previous section. Negotiating LGs would want to confirm BMP credit status as part of their discussions.

IX. Addition of Nutrient Measures

Existing Development control requirements are a recent regulatory innovation in North Carolina and nationwide, and to this point rely primarily on relatively costly retrofitting of stormwater BMPs into developed landscapes. The set of currently available measures for existing development is addressed in the Measures section of the model program that this guidance accompanies. However, parties regulated under Falls and Jordan existing development requirements seek the broadest set of options for compliance along with best available information on cost-effectiveness. Beyond existing measures, many promising nutrient-reducing measures in need of further development have been identified and crediting has been established for some measures in some geographies.

Session Law 2009-216, which primarily established existing development stormwater requirements for Jordan watershed communities, also created a Nutrient Scientific Advisory Board. The session law tasked this Board with identifying management measures that could be used by local governments subject to existing development requirements to reduce nutrient loading toward meeting such requirements. In a July 2012 report to the Secretary of DENR, the Board went beyond current measures to identify a range of potentially creditable measures for further investigation. While most of those measures have yet to be established for use by affected parties, progress is being made. The status of additional measures is discussed further in this section.

In its report, the Nutrient Board also recognized the importance of a transparent approval pathway for effectively fostering the establishment of new measures. It proposed to assist the Division in establishing such an approval process to accompany the model program. The product of those efforts is discussed as the second part of this Measures section.

Measures Approval Process

The Nutrient Scientific Advisory Board identified the need for a transparent approval pathway for new nutrient measures to efficiently and effectively foster the establishment of such measures. The Board suggested the use of some kind of tiered, progressively rigorous approval system to both incentivize identification and submittal of new measures and to provide for defensible and reliable crediting. The Board called for a well-delineated approval process that would provide several needed benefits to facilitate existing development compliance:

- Expediency, consistency and predictability in review of candidate types of nutrient measures;
- A clear and transparent pathway that may incentivize a range of interested parties to identify and pursue development of promising measures; and
- Efficient expansion of the set of tools available for regulated parties to cost-effectively achieve existing development and other nutrient source load reductions.

Responding to these interests, the Division developed the Measures Approval Process that is attached to this guidance as ***Appendix B***. The process utilizes three approval tiers reflecting increasing levels of certainty in credit value estimation based on the extent and quality of supporting research. Practices given Tier 1 or 2 approval would be eligible for crediting only toward existing development stormwater requirements, while the greatest-certainty Tier 3-approved practices could be used for new development applications as well.

Affected parties generate Tier 1 credits with the understanding that values are the most likely to be refined after additional study, and credit balances of affected parties will be *adjusted accordingly for existing individual installations* of such types of measures in addition to use of the revised credit values for subsequent new installations of such types of measures. Adjustable credit for installed measures of the more experimental type is attractive to local governments in that it incentivizes new measures, allows for planning and credit accounting, and provides the possibility that credit for existing measures could increase with additional research findings. Adjustable credit is made possible by the facts that parties regulated under existing development requirements are public entities with an established, long-term presence and a commitment to responsible stewardship of public trust waters, and that these regulations to date have lengthy compliance time horizons that allow for adaptation.

Tier 2 and 3 credits are fixed for the lifetime of individual measures installed under a given Tier 2 or 3 measure type approval. The Division will estimate Tier 1 load reduction values most conservatively and Tier 2 and 3 values commensurately less so, reflecting the uncertainties associated with available research data on a case-specific basis. For the adjustable Tier 1 credits, future refinements to credit values are more likely to provide additional credit to affected parties for existing installed measures than they are reduced credit.

The measures approval process is designed largely for approval of *types* of measures for subsequent individual applications, but also sets up the ability to seek approval of individual measures that have not been approved as a type of measure. Such individual approvals are a means of providing direct annual credit that is adjusted year-by-year for measures that are under study, based on the results of monitoring data.

Overall, the tiered approval system that includes credit for less certain measures is considered useful and reasonable to provide a greater diversity of control options under Existing Development Stormwater rules while facilitating cost-effective progress by regulated parties and incentivizing establishment of new measures.

Potential Measures

Part of the legislative charge to the Nutrient Scientific Advisory Board in SL 2009-216 was to identify measures that could be used by local governments to reduce nutrient loading from existing development. In its second annual report to the Secretary of DENR in July 2012, the Board identified the set of nutrient practices currently available as well as a roster of potentially creditable measures for further investigation. This section reproduces that list of measures and describes activities currently underway to develop crediting and design standards for the highest priority measures from that list.

The set of potential nutrient measures is not a discrete, predetermined list. It evolves based on current understanding and the extent of science that supports that understanding. The ability to bring measures to fruition depends on the depth of available science and the resources available to digest the science and develop technically supportable credit accounting methods along with sufficient design specifications regarding key nutrient processing mechanisms. Regulatory accountability requires a reasonable level of certainty regarding the performance of measures to justify their approval for use by regulated parties. The preceding section provided a framework for making such approvals.

Activities Toward Additional Measures

In recent years, the Chesapeake Bay strategy has increasingly focused on developing or refining nutrient crediting approaches for various activities in addition to conventional stormwater practices. Recently a system was established by the Chesapeake Bay Program to create expert panels for a range of measures. Funding is provided for panel participants to screen available research literature and develop credit accounting protocols and measure design criteria. Within the last year, these panels have begun to yield reports, which are elevated through a series of review and approval steps to final approval. At present, a few measures have received full approval and more are in various stages of planning, development and approval. The NSAB and the Division are following this process and its products closely, and expect to gain significantly from the work being done there. These panels' products provide strong starting points for efforts to expand the toolbox of options for Jordan and Falls watersheds.

In early 2013, Division Planning staff obtained a small 205j grant to fund development of crediting for several nutrient measures that were chosen as highest priority by the NSAB. Those measures are:

- Remedying malfunctioning septic systems
- Alternatives to discharging sand filter onsite wastewater systems
- Non-standard volume stormwater pond retrofits
- Improved street sweeping
- Stream restoration
- Diverting impervious runoff to pervious areas

The contract is to be completed by the end of September 2013. The products of the contract will presumably then become the first measures reviewed under the Division's Measures Approval Process.

This is likely to be a several-month process, and will hopefully yield creditable accounting for the entire set of measures listed above by early 2014.

The Upper Neuse River Basin Association is currently cooperating with DENR to fund and contract development of credit and standards for a large set of additional nutrient measures. A contractor is currently being selected for this project, which may require 18 to 24 months to complete. The intent is to complete measures for Division approval for inclusion in a final Model Program for Falls watershed. Division approval for such a large number of measures may require on the order of another year. A full set of approved measures may then be available by early- to mid-2016.

Based on input from the Division, the NC Water Resources Research Institute has included the development of crediting and standards for nutrient measures as a research priority in its annual Request for Proposals for the last two years. The latest, 2014-2015 RFP is funding projects that will complete by mid-2015.

In addition, the Division continues to seek and evaluate other potential grant funding opportunities that would support the development of crediting and standards for additional nutrient measures.

Potential Measures Identified by the Nutrient Scientific Advisory Board

The NSAB included the tables of potentially creditable nutrient measures on the following pages in its second annual report to the Secretary of DENR in July 2012. Many of these measures are on the list of those to be evaluated by Chesapeake expert panels. The set of measures currently under 205j contract was drawn from these tables.

Table 4. Potentially Creditable Nutrient Load-Reducing Practices

Table 4a: Stormwater Practices

Practice	Potential Accounting Method	Description
Permeable Pavement (See also Table 1)	Modify Jordan/Falls Tool[2]	Statewide infiltration credit, soil-specific
Table 1 BMP Modifications: • **Rainwater Harvest** • **LS/Filter Strip** • **Bioretention** • **Green Roof** • **Permeable Pavement** • **Grass Swales**	Jordan/Falls Tool[2]& DF[3]	Various research efforts in progress - Dr. Hunt: • Credit updates based on additional research • Design modifications for improved removal • Undersize/oversize treatment effects
Retrofit Stormwater Ponds: • **BMP Manual Designs** • **Floating Wetlands**	Jordan/Falls Tool[2]	Improve volume control ponds for nutrient removal
Infiltration Devices, including Infiltration Basins	Modify Jordan/Falls Tool[2]	• SW routed to BMP, fully infiltrated • Data needed: effluent concentrations, volume reduction • Consider using BMP manual specs
Rainwater Harvesting (See also Table 1)	Modify Jordan/Falls Tool[2]?	Expand dedicated uses to allow for directing SW to vegetated area for infiltration
Divert Impervious Runoff to Pervious Areas	Modify Jordan/Falls Tool[2]	Develop criteria, e.g.: o Area & dimensional ratios o Soil and slope variables
Soil Amendments	Calculation based on literature findings	Reduce runoff volume via improved infiltration
Repairing Failing BMPs or Updating Design Standards	Jordan/Falls Tool[2]	• Investigate potential with DWQ SPU • Would require evidence of failure during baseline
Off-line Regional Treatment	Jordan/Falls Tool[2]	Route large catchment to treatment with ponding retrofit practice
Proprietary Devices	Depends	• DWQ has process for evaluating and approving • Credit BMP-specific o Tree boxes, hydraulic vortex units….
Peak Flow Control	Watershed Remodel?	• Study load benefits instream • Flow Modification • Prevent Erosion

Abbreviations:

- BMP = Best Management Practice
- BUA = Built-upon area
- DF = Delivery Factors
- EMC = Event Mean Concentration
- ET = Evapotranspiration
- IWS = Internal Water Storage
- PP = Permeable Pavement
- SW = Stormwater
- WW = Wastewater

Table 4b: Ecosystem Restoration Practices

Practice	Potential Accounting Method	Description

Riparian Buffer Restoration, Variable Width	DWQ Draft Method & DF[3]	• DWQ Draft Method
		  ○ Diminishing credit with increased width
		  ○ Site-specific elements

Repairing/Enhancement of Existing Riparian Buffers	Watershed Model or separate calculation (additional data required)	• Literature review, research
		• Potential Activities
		  ○ Hydrologic restoration including diffuse flow
		  ○ Removal of invasive species
		• Credit will depend on type of improvement

Stream restoration	Calculation based on literature findings	• Reduce erosion of stream bank soils • Restore stream assimilation functions
Flood Plain Restoration	DWQ Draft Credit Yield Method?	• Increase floodplain storage; encourage stream to overflow in larger storms; increase infiltration; remove structures; add grade-control structures, etc.
Increase Tree Canopy	Calculation based on literature findings or WS Remodel	• Reduce runoff via interception – potential volume/load reduction • Requires means of tracking and assurance of long-term maintenance
Land/Forest Protection		

Abbreviations:

- BMP = Best Management Practice
- BUA = Built-upon area
- DF = Delivery Factors
- EMC = Event Mean Concentration
- ET = Evapotranspiration
- IWS = Internal Water Storage
- PP = Permeable Pavement
- SW = Stormwater
- WW = Wastewater

Table 4c: Agricultural Practices

Practice	Potential Accounting Method	Description
Agriculture BMPs w/ Credit Method Available • **Cropland Conversion to Trees/Grass** • **Buffer Restoration** • **Exclusion** • **Excluded Buffers**	• Calculation • DWQ Credit Yield Method • Calculation • Calculation	• Literature-based export coefficient comparison • Revisions currently being drafted • Pasture Point System Method with export coefficients • Pasture Point System Method with export coefficients and DWQ Draft Buffer Credit Yield
Other Ag BMPs • **Managed Grazing** • **Water Control Structures** • **Cover Crops** • **Conservation Tillage**	Calculation based on literature findings or WS Remodel	Have BMP efficiencies, need load reductions in-stream
Potential Ag BMPs • **Pond creation** • **Pond renovation**	Calculation based on literature findings or WS Remodel	Work with agriculture community to develop specifications

Table 4d: Programmatic Practices

Practice	Potential Accounting Method	Description
Improved street sweeping	Calculation based on literature findings or WS Remodel	Decrease organic matter entrained in runoff to surface water
Source control, such as pet waste and fertilizer ordinances	Calculation based on literature findings or WS Remodel	Decrease "fertilizer rates" to landscape areas
Emission Reduction (Atmospheric Deposition)	Watershed Remodel?	• Correlate emission reductions to deposition reduction to impervious surfaces, effect on event mean concentrations
Improved Biosolids Management	Calculation based on literature findings or WS Remodel	• Reduce application rates blow Fertilizer Management Rule requirements • Sampling design to determine reduction in loading to surface
Non-Stormwater Discharge Programs	Comparative calculation	• Programs to systematically reduce SSO's, contain SSO spills, remove illegal connections, educate businesses, improve collection systems

Table 4e: Wastewater Practices

Practice	Potential Accounting Method	Description
Overtreatment of WW	Calculation of annual mass load difference between existing and new treatment of discharge volume	Long-term dedication of unused allocation
Improvement/ Regionalization of WW facilities	Calculation of annual mass load difference between existing and new treatment of discharge volume	Redirecting discharge not treated for nutrients into larger system that does, or adding nutrient removal to an existing system
Remedy Discharging Sand Filter	Calculation of annual mass load difference between existing and replacement	Options: • Connect to central sewer; • Replace with non-discharge alternative; • Replace with higher nutrient removal type.
Repair Malfunctioning Septic System	Calculation based on literature findings or WS Remodel	• Restore nutrient removal functions • Connect to central sewer, improve treatment, or replace with non-discharge alternatives • Sampling of discharge and calculation of annual mass load discharge difference between existing and proposed
Improvement of Functioning Septic System	Calculation based on literature findings or WS Remodel	• Increase nutrient removal efficiency • Account for different flows • Account for rising groundwater table
Removal of Illegal Discharges to Surface Waters	Calculation of specific discharges	Decrease illegal discharges to stormwater system or directly to streams, including: • Sanitary sewer overflows • Piped connections to stormwater system • Commercial site surface discharges
Improvement of Wastewater Collection Systems	Calculation of annual mass load difference between existing and improved	• Reduce dry weather leaks to surface water • Reduce wet weather overflows

Abbreviations:

- BMP = Best Management Practice
- BUA = Built-upon area
- DF = Delivery Factors
- EMC = Event Mean Concentration
- ET = Evapotranspiration
- IWS = Internal Water Storage
- PP = Permeable Pavement
- SW = Stormwater
- WW = Wastewater

X. Trading

The content of this section will be provided in the final model program.

XI. Program Implementation and Annual Reporting Requirements

Implementing Approved Programs

Implementation of measures can be considered to involve three stages: implementation and initial confirmation of performance; regular inspection, maintenance and repair; and long-term re-verification of performance. Affected parties should establish protocols for documenting each of these stages, retaining their documentation and tracking this information for internal purposes, for annual reporting and for audits or other Division inquiries.

The question of what constitutes implementation may not be entirely clear for some management measures that have not yet received Division approval, however our expectation is that the design specifications required for approval of such measures will provide sufficient definition of their essential elements to establish expectations for successful implementation.

As stated elsewhere in this guidance, to qualify as nutrient-reducing, practices must conform to a Division design standard for which nutrient credit accounting has been established. For newly installed practices, parties will need to field-verify and document successful implementation. For structural measures, field review should seek to confirm: properly constructed water quality design conforming to Division design standards or Division-approved alternative; proper sizing for drainage area or other inputs; proper routing of stormwater or other loading inputs; demonstration of hydraulic or other key physical functions as intended; structural integrity and reasonable expectation of sustained function for life of practice. Management measures will require other assessment to determine successful implementation; standards will be established, as recognized above, based on design specifications for each measure.

Prospective assurance of measure function should include documentation of responsible parties and processes and legal mechanisms established by those parties for operation and maintenance and reporting, resources for repair and renovation, methods for periodic verification of performance, and plans for annual reporting to the Division.

Once measures are implemented, regular inspection and maintenance (structural) or review (management) is required. Parties should inspect and maintain all measures at least annually, and document their activities. I&M may be conducted by staff, contractors, or potentially other trained and certified personnel. Parties should identify their plans for addressing I&M in their program submittals.

For longer-term measures, the Division will require affected parties to periodically re-verify performance in order to renew annual credits for a succeeding time interval. Our initial expectation is that long-term measures will be assigned a 5-year credit term that would be renewed for additional 5-year intervals upon documentation that performance has been re-verified. Staff expects to review other program

examples for potential refinements, perhaps for example by practice type, for inclusion in the final model program, and invites input from affected parties on the subject.

Annual Reporting

Item (7)(e) of the Falls Existing Development Rule and Section (3) of Jordan S.L. 2009-216 require local governments to track and report on their ongoing progress towards achieving their load reduction requirements by submitting annual reports to the Division. These annual reports will document the details of implementation activities for the past year demonstrating ongoing compliance with the rule and session law requirements. Annual reports will also provide insight for future implementation planning efforts and inform the adaptive implementation process in both watersheds. The applicable rule and session law language is provided below, followed by additional explanation and clarification concerning the type of information and analysis to include in the annual report submittals.

Falls Lake Existing Development Rule - Annual Report Requirements - .0278 (7)(e)

"Upon implementation of the programs required under Item (4) of this Rule, local governments shall provide annual reports to the Division documenting their progress in implementing those requirements within three months following each anniversary of program implementation date until such time the Commission determines they are no longer needed to ensure maintenance of reductions or that standards are protected. Annual reports shall include accounting of total annual expenditures, including local government funds and any state and federal grants used toward load reductions achieved from existing developed lands. Local governments shall indefinitely maintain and ensure performance of implemented load-reducing measures;"

Jordan Session Law - Annual Report Requirements - S.L. Section (3)

"Each local government implementing a Stage 2 adaptive management program to control nutrient loading from existing development shall submit an annual report to the Department summarizing its activities in implementing its program."

The following is an outline basic expectation of the type of information and discussions to be addressed in annual report submittals. The overall goal of the annual reporting process is to track progress by documenting ongoing implementation activities and provide a look ahead at planned activities and their anticipated reductions relative to the overall reductions needs called for in the watershed. The annual report also provides the opportunity to share implementation challenges and document corrective actions and ongoing resource needs. Programs should plan to include the following information in their reports, including values for both nitrogen and phosphorus:

1. Summary of existing development load reducing activities implemented and terminated.
    a. Types and number of new activities implemented and any terminated for that reporting cycle

b. Types and acres of existing developed land affected, or other practice-appropriate metric of scale of load inputs or load reduction or increase
c. Estimated annual reductions or increases from each activity (lb/yr)
d. Duration of anticipated loading reductions for new activities (yrs)
e. Type and number of measures due and proposed for credit renewal, and annual reductions affected (lb/yr)
f. Costs/efficiencies of each activity (to extent possible)
g. Total annual expenditures (Including Local Government funds and State & Federal Grants)

For new activities, the report should indicate that the design and load accounting conformed to Division standards or, if not, should discuss the approved alternative standards used.

2. Accounting / Tracking Progress
    a. Reductions achieved by new measures, load increases from terminated measures, and resulting net change in loading from actions taken in that reporting cycle (lb/yr)
    b. Adjustments to allocations & load reduction needs via annexation – cities and counties will need to coordinate and provide the same load transfer information (ac, lb/yr)
    c. Summary tabulation of load reduction progress and comparison to that proposed in approved program (lb/yr)

3. Inspection and maintenance activities and issues
    a. Numbers of types of measures inspected relative to cumulative number of measures
    b. Summary of maintenance and repairs performed
    c. Parties performing inspections, maintenance and repairs

4. Evaluation of implementation challenges or obstacles encountered
    a. Issues encountered
    b. Actions taken / Addition resource needs

5. Summary of anticipated activities for the next reporting period
    a. Measures planned for next reporting cycle
    b. Anticipated reductions (lb/yr)
    c. Comparison of current reductions and planned reductions to overall reduction needs (lb/yr)

Annual Report Due Date

The Division supports the concept of consolidating reporting requirements to the greatest extent feasible. It appears that an October timeframe would allow local governments to report on Phase II stormwater, New Development Stormwater, Falls Existing Development Stage I, and Jordan Existing Development Stage 1 and II all in one report if they find that advantageous. We propose then to require submittal of annual reports by the end of October of each year. Annual Reports should report on activities conducted from July 1st through June 30th.

The Division understands that affected parties that have multiple programs that require annual reporting may wish to stagger the development and submittal of their annual reports. Affected parties may propose alternative annual report submittal dates. However, we would prefer that they be submitted close to October, and that they still report on the activity period of July 1st through June 30th .

Appendices

Appendix A: Rules/Session Laws

15A NCAC 02B .0278 FALLS WATER SUPPLY NUTRIENT STRATEGY: STORMWATER MANAGEMENT FOR EXISTING DEVELOPMENT

This Rule establishes a staged, adaptive approach by which municipalities and counties shall contribute to achieving the nonpoint source loading objectives of the Falls Reservoir nutrient strategy by reducing or otherwise offsetting nutrient contributions from existing development. It provides local governments three years to develop programs that propose Stage I load reduction actions to the Division and requires local governments to begin and track measures to reduce nutrient loads from existing developed lands within their jurisdiction by January 15, 2014, as specified in Item (7). Local governments shall submit for approval and implement Stage II load reduction programs by January 15, 2021 and submit revised load reductions programs every five years thereafter. The following is the watershed stormwater strategy, as prefaced in Rule 15A NCAC 02B .0275, for existing development in the Falls watershed:

(1) PURPOSE. The purposes of this Rule are as follows:
  (a) To achieve and maintain the nonpoint source nitrogen and phosphorus percentage reduction objectives established for Falls Reservoir in Rule 15A NCAC 02B .0275 on nutrient loading from existing development in the Falls watershed relative to the baseline period defined in that rule. Existing development is defined in Rule 15A NCAC 02B .0276; and
  (b) To protect the water supply, aquatic life, and recreational uses of Falls Reservoir.

(2) APPLICABILITY. This Rule shall apply to municipalities and counties in the Falls watershed as identified in Rule 15A NCAC 02B .0275.

(3) STAGED AND ADAPTIVE IMPLEMENTATION REQUIREMENTS. Local governments shall employ the following staged and adaptive implementation program. All local governments subject to this Rule shall develop load-reducing programs for submission to and approval by the Commission that include the following staged elements and meet the associated minimum standards for each stage of implementation:
  (a) In Stage I, a local government subject to this Rule shall implement a load reduction program that provides estimates of, and plans for offsetting by calendar year 2020, nutrient loading increases from lands developed subsequent to the baseline period and not subject to the requirements of the local government's Falls Lake new development stormwater program. For these post-baseline existing developed lands, the current loading rate shall be compared to the loading rate for these lands prior to development for the acres involved, and the difference shall constitute the load reduction need in annual mass load, in pounds per year. Alternatively, a local government may assume uniform pre-development loading rates of 2.89 pounds/acre/year N and 0.63 pounds/acre/year P for these lands. The local government shall achieve this Stage I load reduction by calendar year 2020. This Stage I program shall meet the criteria defined in Item (4) of this Rule;
  (b) By January 15, 2021 and every five years thereafter, a local government located in the Upper Falls Watershed shall submit and begin implementing a Stage II load reduction program that meets the following requirements:
    (i) If a local government achieves the Stage I reduction objectives described in this Item, a local government's initial Stage II load reduction program shall, at the local government's election, either (A) achieve additional annual reductions in nitrogen and phosphorus loads from existing development greater than or equal to the average annual additional reductions achieved in the last seven years of Stage I or (B) provide for an annual expenditure that equals or exceeds the average annual amount the local government has spent to achieve nutrient reductions from existing development during the last seven years of Stage I. A local government's expenditures shall include all local government funds, including any state and federal grant funds used to achieve nutrient reductions from existing developed lands. The cost of achieving reductions from municipal wastewater treatment plants shall not be included in calculating a local government's expenditures. Notwithstanding this requirement, the EMC may approve an initial Stage II load reduction program based on a lower annual level of reduction or a lower annual level of expenditure if the local government demonstrates that continuing the prior annual level of reduction or annual level of expenditure is not reasonable or cost-effective given the reductions that will be achieved, or the expenditure would cause serious financial hardship to the local government;

(ii) If Stage I reduction objectives are not achieved, a local government's initial Stage II load reduction program shall, at the local government's election, either (A) achieve additional annual reductions in nitrogen and phosphorus loads from existing development greater than or equal to the average annual additional reductions achieved in the highest three years of implementation of Stage I or (B) provide for an annual expenditure that equals or exceeds the average annual amount the local government has spent to achieve nutrient reductions from existing development during the highest three years of implementation of Stage I. Annual expenditures shall be calculated in accordance with Sub-Item (3)(b)(i) of this Item;

(iii) Subsequent five year programs shall be designed to achieve the Stage II percent load reduction goals from existing developed lands in a local government's jurisdiction, shall include timeframes for achieving these goals and shall meet the requirements of Item (4) of this Rule;

(4) ELEMENTS OF LOAD REDUCTION PROGRAMS. A local government's Stage I and Stage II load reduction program shall address the following elements:

(a) Jurisdictions in the Eno River and Little River subwatersheds shall, as a part of their Stage I load reduction programs, begin and continuously implement a program to reduce loading from discharging sand filters and malfunctioning septic systems discharging into waters of the State within those jurisdictions and subwatersheds;

(b) Jurisdictions within any Falls subwatershed in which chlorophyll a levels have exceeded 40 micrograms/liter in more than seventy-five percent of the monitoring events in any calendar year shall, as part of their Stage I load reduction programs, begin and continuously implement a program to reduce nutrient loading into the waters of the State within those jurisdictions and that subwatersheds;

(c) The total amount of nutrient loading reductions in Stage I is not increased for local jurisdictions by the requirements to add specific program components to address loading from malfunctioning septic systems and discharging sand filters or high nutrient loading levels pursuant to Sub-Items (4)(a) and (b) of this Item;

(d) In preparation for implementation of their Stage I and Stage II load reduction programs, local governments shall develop inventories and characterize load reduction potential to the extent that accounting methods allow of the following by January 2013:

(i) Wastewater collection systems;

(ii) Discharging sand filter systems, including availability of or potential for central sewer connection;

(iii) Properly functioning and malfunctioning septic systems;

(iv) Restoration opportunities in utility corridors;

(v) Fertilizer management plans for local government-owned lands;

(vi) Structural stormwater practices, including intended purpose, condition, potential for greater nutrient control; and

(vii) Wetlands and riparian buffers including potential for restoration opportunities;

(e) A local government's load reduction need shall be based on the developed lands that fall within its general police powers and within the Falls watershed;

(f) The load reduction need shall not include lands under state or federal control, and a county shall not include lands within its jurisdictional boundaries that are under municipal police powers;

(g) Nitrogen and phosphorus loading from existing development, including loading from onsite wastewater treatment systems to the extent that accounting methods allow, shall be calculated by applying the accounting tool described in Sub-Item (7)(a) and shall quantify baseline loads of nitrogen and phosphorus to surface waters in the local government's jurisdiction as well as loading changes post-baseline. It shall also calculate target nitrogen and phosphorus loads and corresponding load reduction needs;

(h) The Commission shall recognize reduction credit for early implementation of policies and practices implemented after January 1, 2007 and before timeframes required by this Rule, to reduce runoff and discharge of nitrogen and phosphorus per Session Law 2009-486. The load reduction program shall identify specific load-reducing practices implemented to date

subsequent to the baseline period and for which the local government is seeking credit. It shall estimate load reductions for these practices and their anticipated duration using methods provided for in Sub-Item (5)(a);

(i) The program shall include a proposed implementation schedule that includes annual implementation expectations. The load reduction program shall identify the types of activities the local government intends to implement and types of existing development affected, a prioritization of practices, magnitude of reductions it expects to achieve from each, and the costs and efficiencies of each activity to the extent information is available. The program shall identify the duration of anticipated loading reductions, and may seek activities that provide long-term reductions;

(j) The load reduction program shall identify anticipated funding mechanisms or sources and discuss steps take or planned to secure such funding;

(k) The program shall address the extent of load reduction opportunities intended from the following types of lands:
- (i) Lands owned or otherwise controlled by the local government;
- (ii) Each land use type of privately owned existing development including projected redevelopment, on which the local government's load reduction need is based as described in this Item; and
- (iii) Lands other than those on which the local government's load reduction need is based as described in this Item, including lands both within and outside its jurisdiction and including the use of interlocal agreements and private third party sellers;

(l) The program shall address the extent of load reduction proposed from the following stormwater and ecosystem restoration activities:
- (i) Bioretention;
- (ii) Constructed wetland;
- (iii) Sand filter;
- (iv) Filter strip;
- (v) Grassed swale;
- (vi) Infiltration device;
- (vii) Extended dry detention;
- (viii) Rainwater harvesting system;
- (ix) Treatment of redevelopment;
- (x) Overtreatment of new development;
- (xi) Removal of impervious surface;
- (xii) Retrofitting treatment into existing stormwater ponds;
- (xiii) Off-line regional treatment systems;
- (xiv) Wetland or riparian buffer restoration; and
- (xv) Reforestation with conservation easement or other protective covenant;

(m) The program shall evaluate the load reduction potential from the following wastewater activities:
- (i) Creation of surplus relative to an allocation established in Rule 15A NCAC 02B .0279;
- (ii) Expansion of surplus allocation through regionalization;
- (iii) Connection of discharging sand filters and malfunctioning septic systems to central sewer or replacement with permitted non-discharge alternatives;
- (iv) Removal of illegal discharges; and
- (v) Improvement of wastewater collection systems;

(n) A local government may propose in its load reduction program the use of the following measures in addition to items listed in (l) and (m), or may propose other measures for which it can provide accounting methods acceptable to the Division:
- (i) Redirecting runoff away from impervious surfaces;
- (ii) Soil amendments;
- (iii) Stream restoration;
- (iv) Improved street sweeping; and

(v) Source control, such as pet waste and fertilizer ordinances;

(o) The program shall include evaluation of load reduction potential relative to the following factors:

(i) Extent of physical opportunities for installation;

(ii) Landowner acceptance;

(iii) Incentive and education options for improving landowner acceptance;

(iv) Existing and potential funding sources and magnitudes;

(v) Practice cost-effectiveness (e.g., cost per pound of nutrient removed);

(vi) Increase in per capita cost of a local government's stormwater management program to implement the program;

(vii) Implementation rate without the use of eminent domain; and

(viii) Need for and projected role of eminent domain;

(5) The Commission shall approve a Stage I load reduction program if it is consistent with Items (3) and (4) of this Rule. The Commission shall Approve a Stage II load reduction program if it is consistent with Items (3) and (4) of this Rule unless the Commission finds that the local governments can, through the implementation of reasonable and cost-effective measures not included in the proposed program, meet the Stage II nutrient load reductions required by this Rule by a date earlier than that proposed by the local government. If the Commission finds that there are additional or alternative reasonable and cost-effective measures, the Commission may require the local government to modify its proposed program to include such measures to achieve the required reductions by the earlier date. If the Commission requires such modifications, the local government shall submit a modified program within two months. The Division shall recommend that the Commission approve or disapprove the modified program within three months after receiving the modified program. In determining whether additional or alternative load reduction measures are reasonable and cost effective, the Commission shall consider factors identified in Sub-Item (4)(o) of this Rule. The Commission shall not require additional or alternative measures that would require a local government to:

(a) Install or require installation of a new stormwater collection system in an area of existing development unless the area is being redeveloped;

(b) Acquire developed private property; or

(c) Reduce or require the reduction of impervious surfaces within an area of existing development unless the area is being redeveloped.

(6) A municipality shall have the option of working with the county or counties in which it falls, or with another municipality or municipalities within the same subwatershed, to jointly meet the loading targets from all lands within their combined jurisdictions within a subwatershed. A local government may utilize private or third party sellers. All reductions involving trading with other parties shall meet the requirements of Rule 15A NCAC 02B .0282.

(7) RULE IMPLEMENTATION. This Rule shall be implemented as follows:

(a) By July 2013, the Division shall submit a Stage I model local program to the Commission for approval that embodies the criteria described in Items (3)(a) and (4) of this Rule. The Division shall work in cooperation with subject local governments and other watershed interests in developing this model program, which shall include the following:

(i) Model local ordinances as applicable;

(ii) Methods to quantify load reduction requirements and resulting load reduction assignments for individual local governments;

(iii) Methods to account for discharging sand filters, malfunctioning septic systems, and leaking collection systems; and

(iv) Methods to account for load reduction credits from various activities;

(b) Within six months after the Commission's approval of the Stage I model local program, subject local governments shall submit load reduction programs that meet or exceed the requirements of Items (3) and (4) of this Rule to the Division for review and preliminary approval and shall begin implementation and tracking of measures to reduce nutrient loads from existing developed lands within their jurisdictions;

(c) Within 20 months of the Commission's approval of the Stage I model local program, the Division shall provide recommendations to the Commission on existing development load reduction programs. The Commission shall either approve the programs or require changes

based on the standards set out in Item (4) of this Rule. Should the Commission require changes, the applicable local government shall have two months to submit revisions, and the Division shall provide follow-up recommendations to the Commission within two months after receiving revisions;

(d) Within three months after the Commission's approval of a Stage I local existing development load reduction program, the local government shall complete adoption of and begin implementation of its existing development Stage I load reduction program;

(e) Upon implementation of the programs required under Item (4) of this Rule, local governments shall provide annual reports to the Division documenting their progress in implementing those requirements within three months following each anniversary of program implementation date until such time the Commission determines they are no longer needed to ensure maintenance of reductions or that standards are protected. Annual reports shall include accounting of total annual expenditures, including local government funds and any state and federal grants used toward load reductions achieved from existing developed lands. Local governments shall indefinitely maintain and ensure performance of implemented load-reducing measures;

(f) By January 15, 2021 and every five years thereafter until accounting determines that assigned load reductions have been achieved, standards are met in the lake, or the Commission takes other actions per Rule 15A NCAC 02B .0275, local governments located in the upper Falls watershed as defined in Item (3) of Rule 15A NCAC 02B .0275 shall submit and begin implementation of a Stage II load reduction program or program revision to the Division. Within nine months after submittal, the Division shall make recommendations to the Commission on approval of these programs. The Commission shall either approve the programs or require changes based on the standards set out in this Rule. If the Commission require changes, the applicable local governments shall submit revisions within two months, and the Division shall provide follow-up recommendations to the Commission within three months after receiving revisions. Upon program approval, local governments shall revise implementation as necessary based on the approved program;

(g) A local government may, at any time after commencing implementation of its load reduction program, submit program revisions to the Division for approval based on identification of more cost-effective strategies or other factors not originally recognized;

(h) Once either load reductions are achieved per annual reporting or water quality standards are met in the lake per Rule 15A NCAC 02B .0275, local governments shall submit programs to ensure no load increases and shall report annually per Sub-Item (e) on compliance with no increases and take additional actions as necessary;

(i) At least every five years after the effective date, the Division shall review the accounting methods stipulated under Sub-Item (7)(a) to determine the need for revisions to those methods and to loading reductions assigned using those methods. Its review shall include values subject to change over time independent of changes resulting from implementation of this Rule, such as untreated export rates that may change with changes in atmospheric deposition. It shall also review values subject to refinement, such as nutrient removal efficiencies.

History Note: *Authority G.S. 143-214.1; 143-214.5; 143-214.7; 143-214.12; 143-214.21; 143-215.3(a)(1); 143-215.6A; 143-215.6B; 143-215.6C; 143-215.8B; 143B-282(c); 143B-282(d); S.L. 2005-190; S.L. 2006-259; S.L. 2009-337;*
Eff. January 15, 2011 (this permanent rule replaces the temporary rule approved by the RRC on December 16, 2010).

15A NCAC 02B .0281 FALLS WATER SUPPLY NUTRIENT STRATEGY: STORMWATER REQUIREMENTS FOR STATE AND FEDERAL ENTITIES

The following is the stormwater strategy, as prefaced in Rule 02B .0275, for the activities of state and federal entities within the Falls watershed.

(1) PURPOSE. The purposes of this Rule are as follows.
  (a) To achieve and maintain, on new non-road development lands, the nonpoint source nitrogen and phosphorus percentage reduction objectives established for Falls Reservoir in 15A NCAC 02B .0275 relative to the baseline period defined in Rule, to provide the highest practicable level of treatment on new road development, and to achieve and maintain the percentage objectives on existing developed lands by reducing loading from state-maintained roadways and facilities, and from lands controlled by other state and federal entities in the Falls watershed;
  (b) To ensure that the integrity and nutrient processing functions of receiving waters and associated riparian buffers are not compromised by erosive flows from state-maintained roadways and facilities and from lands controlled by other state and federal entities in the Falls watershed; and
  (c) To protect the water supply, aquatic life, and recreational uses of Falls Reservoir.

(2) APPLICABILITY. This Rule shall apply to all existing and new development, both as defined in 15A NCAC 02B .0276, that lies within or partially within the Falls watershed under the control of the NC Department of Transportation (NCDOT), including roadways and facilities, and to all lands controlled by other state and federal entities in the Falls watershed.

(3) NON-NCDOT REQUIREMENTS. With the exception of the NCDOT, all state and federal entities that control lands within the Falls watershed shall meet the following requirements:
  (a) For any new development proposed within their jurisdictions that would disturb one quarter acre or more, non-NCDOT state and federal entities shall develop stormwater management plans for submission to and approval by the Division;
  (b) The non-NCDOT state or federal entity shall include measures to ensure maintenance of best management practices (BMPs) implemented as a result of the provisions in Sub-Item (a) of this Item for the life of the development; and
  (c) A plan to ensure enforcement and compliance with the provisions in Sub-Item (4) of this Rule for the life of the new development.

(4) PLAN APPROVAL REQUIREMENTS. A developer's stormwater plan shall not be approved unless the following criteria are met:
  (a) Nitrogen and phosphorus loads contributed by the proposed new development activity shall not exceed the following unit-area mass loading rates for nitrogen and phosphorus, respectively, expressed in units of pounds/acre/year: 2.2 and 0.33. Proposed development that would replace or expand structures or improvements that existed as of December 2006, the end of the baseline period, and that would not result in a net increase in built-upon area shall not be required to meet the nutrient loading targets or high-density requirements except to the extent that the developer shall provide stormwater control at least equal to the previous development. Proposed development that would replace or expand existing structures or improvements and would result in a net increase in built-upon area shall have the option either to achieve at least the percentage loading reduction objectives stated in 15A NCAC 02B .0275 as applied to nitrogen and phosphorus loading from the previous development for the entire project site, or to meet the loading rate targets described in this item. These requirements shall supersede those identified in 15A NCAC 02B .0104(q). The developer shall determine the need for engineered stormwater controls to meet these loading rate targets by using the loading calculation method called for in Sub-Item (4)(a) of 15A NCAC 02B .0277 or other equivalent method acceptable to the Division;
  (b) The developer shall have the option of offsetting part of their nitrogen and phosphorus loads by implementing or funding offsite offset measures. Before using an offsite offset option, a development shall implement onsite structural stormwater controls that achieve one of the following levels of reductions:
    (i) Proposed new development activity disturbing at least one quarter acre but less than one acre of land, except as stated in this Item, shall achieve 30 percent or more of

the needed load reduction in both nitrogen and phosphorus loading onsite and shall meet any requirements for engineered stormwater controls described in this item;

(ii) Except as stated in this Item, proposed new development activity that disturbs one acre of land or more shall achieve 50 percent or more of the needed load reduction in both nitrogen and phosphorus loading onsite and shall meet any requirements for engineered stormwater controls described in this Item; or

(iii) Proposed development that would replace or expand structures or improvements that existed as of December 2006, the end of the baseline period, and that increases impervious surface within a designated downtown area, regardless of area disturbed, shall achieve 30 percent of the needed load reduction in both nitrogen and phosphorus onsite, and shall meet any requirements for engineered stormwater controls described in this Item;

(c) Offsite offsetting measures shall achieve at least equivalent reductions in nitrogen and phosphorus loading to the remaining reduction needed onsite to comply with the loading rate targets set out in this Item. A developer may use any measure that complies with the requirements of Rules .0240 and .0282 of this Section;

(d) Proposed new development subject to NPDES, water supply, and other state-mandated stormwater regulations shall comply with those regulations and with applicable permit limits in addition to the other requirements of this sub-item. Proposed new development in any water supply watershed in the Falls watershed designated WS-II, WS-III, or WS-IV shall comply with the density-based restrictions, obligations, and requirements for engineered stormwater controls, clustering options, operation and maintenance responsibilities, vegetated setbacks, land application, and landfill provisions described in Sub-Items (3)(b)(i) and (3)(b)(ii) of the applicable rule among 15A NCAC 02B .0214 through .0216. Provided, the allowance in water supply watershed rules for 10 percent of a jurisdiction to be developed at up to 70 percent built-upon area without stormwater treatment shall not be available in the Falls watershed;

(e) Stormwater systems shall be designed to control and treat at a minimum the runoff generated from all surfaces in the project area by one inch of rainfall. The treatment volume shall be drawn down pursuant to standards specific to each practice as provided in the July 2007 version of the *Stormwater Best Management Practices Manual* published by the Division, or other at least technically equivalent standards acceptable to the Division;

(f) To ensure that the integrity and nutrient processing functions of receiving waters and associated riparian buffers are not compromised by erosive flows, at a minimum, the new development shall not result in a net increase in peak flow leaving the site from pre-development conditions for the one-year, 24-hour storm event;

(g) New development may satisfy the requirements of this Rule by meeting the post-development hydrologic criteria set out in Chapter 2 of the *North Carolina Low Impact Development Guidebook* dated June 2009, or the hydrologic criteria in the most recent version of that guidebook; and

(h) Proposed new development shall demonstrate compliance with the riparian buffer protection requirements of 15A NCAC 02B .0233 and .0242.

(5) NON-NCDOT STAGED AND ADAPTIVE IMPLEMENTATION REQUIREMENTS. For existing development, non-NCDOT state and federal entities shall develop and implement staged load reduction programs for achieving and maintaining nutrient load reductions from existing development based on the standards set out in this Item. Such entities shall submit these load-reducing programs for approval by the Commission that include the following staged elements and meet the minimum standards for each stage of implementation:

(a) In Stage I, entities subject to this rule shall implement a load reduction program that provides estimates of, and plans for offsetting by calendar year 2020, nutrient loading increases from lands developed subsequent to the baseline (2006) and not subject to the requirements of the Falls Lake new development stormwater program. For these existing developed lands, the current loading rate shall be compared to the loading rate for these lands prior to development for the acres involved, and the difference shall constitute the load reduction need in annual mass load, in pounds per year. Alternatively, a state or federal entity may

assume uniform pre-development loading rates of 2.89 pounds per acre per year N and 0.63 pounds per acre per year P for these lands. The entity shall achieve this stage one load reduction by calendar year 2020. This Stage I program shall meet the criteria defined in Item (4) of 15A NCAC 02B.0278; and

(b) By January 15, 2021, and every five years thereafter, a state or federal entity located in the Upper Falls Watershed as defined in Item (11) of 15A NCAC 02B .0276 shall submit and begin implementing a Stage II load reduction program or revision designed to achieve the percent load reduction objectives from existing developed lands under its control, that includes timeframes for achieving these objectives and that meets the criteria defined in Items (5) and (6) of this Rule.

(6) ELEMENTS OF NON-NCDOT LOAD REDUCTION PROGRAMS. A non-NCDOT state or federal entity load reduction program shall address the following elements:

(a) State and federal entities in the Eno River and Little River subwatersheds shall, as part of their Stage I load reduction programs, begin and continuously implement a program to reduce loading from discharging sand filters and malfunctioning septic systems owned or used by state or federal agencies discharging into waters of the State within those subwatersheds;

(b) State and federal entities in any Falls subwatershed in which chlorophyll a levels have exceeded 40 ug/L in more than seventy-five percent of the monitoring events in any calendar year shall, as part of their Stage I load reduction programs, begin and continuously implement a program to reduce nutrient loading into the waters of the State within that subwatersheds;

(c) The total amount of nutrient loading reductions in Stage I is not increased for state and federal entities by the requirements to add specific program components to address loading from malfunctioning septic systems and discharging sand filters or high nutrient loading levels pursuant to Sub-Items (a) and (b) of this Item;

(d) In preparation for implementation of their Stage I and Stage II load reduction programs, state and federal entities shall develop inventories and characterize load reduction potential to the extent that accounting methods allow for the following:

(i) Wastewater collection systems;

(ii) Discharging sand filter systems, including availability of or potential for central sewer connection;

(iii) Properly functioning and malfunctioning septic systems;

(iv) Restoration opportunities in utility corridors;

(v) Fertilizer management plans for state and federally owned lands;

(vi) Structural stormwater practices, including intended purpose, condition, potential for greater nutrient control; and

(vii) Wetlands and riparian buffers including potential for restoration opportunities.

(e) A state or federal entities load reduction need shall be based on the developed lands owned or used by the state or federal entity within the Falls watershed;

(f) Nitrogen and phosphorous loading from existing developed lands, including loading from onsite wastewater treatment systems to the extent accounting methods allow, shall be calculated by applying the accounting tool described in Item (13) and shall quantify baseline loads of nitrogen and phosphorus to surface waters from the lands under the entity's control as well as loading changes post-baseline. It shall also calculate target nitrogen and phosphorus loads and corresponding reduction needs;

(g) Nitrogen and phosphorus loading from existing developed lands, including loading from onsite wastewater treatment systems to the extent accounting methods allow, shall be calculated by applying the accounting too described in Item (13) of this Rule and shall quantify baseline loads of nitrogen and phosphorus to surface waters from state and federal entities as well as loading changes post-baseline. It shall calculate target nitrogen and phosphorus loads and corresponding load reduction needs;

(h) The Commission shall recognize reduction credit for implementation of policies and practices implemented after January 1, 2007 and before January 15, 2011, to reduce runoff and discharge of nitrogen and phosphorus per Session Law 2009-486. The load reduction program shall identify specific load-reducing practices implemented subsequent to the

baseline period and for which the entity is seeking credit. It shall estimate load reductions for these practices and their anticipated duration using methods provided for in Item (13);

(i) The program shall include a proposed implementation schedule that includes annual implementation expectations. The load reduction program shall identify the types of activities the state or federal entity intends to implement and types of existing development affected, relative proportions or prioritization of practices, relative magnitude of reductions it expects to achieve from each, and the relative costs and efficiencies of each activity to the extent information is available. The program shall identify the duration of anticipated loading reductions, and may seek activities that provide long-term reductions;

(j) The load reduction program shall identify anticipated funding mechanisms or sources and discuss steps taken or planned to secure such funding;

(k) The program shall address the extent of load reduction opportunities intended from the following types of lands:
- (i) Lands owned or otherwise controlled by the state or federal entity; and
- (ii) Lands other than those on which the entity's load reduction need is based as described in this Item, including lands both within and outside its jurisdiction and third party sellers.

(l) The program shall address the extent of load reduction proposed from, at a minimum, the following stormwater and ecosystem restoration activities:
- (i) Bioretention;
- (ii) Constructed wetland;
- (iii) Sand filter;
- (iv) Filter Strip;
- (v) Grassed swale;
- (vi) Infiltration device;
- (vii) Extended dry detention;
- (viii) Rainwater harvesting system;
- (ix) Treatment of Redevelopment;
- (x) Overtreatment of new development;
- (xi) Removal of impervious surface;
- (xii) Retrofitting treatment into existing stormwater ponds;
- (xiii) Off-line regional treatment systems;
- (xiv) Wetland or riparian buffer restoration; and
- (xv) Reforestation with conservation easement or other protective covenant.

(m) The program shall evaluate the load reduction potential from the following wastewater activities:
- (i) Creation of surplus relative to an allocation established in 15A NCAC 02B .0279;
- (ii) Expansion of surplus allocation through regionalization;
- (iii) Connection of discharging sand filters and malfunctioning septic systems to central sewer or replacement with permitted non-discharge alternatives;
- (iv) Removal of illegal discharges; and
- (v) Improvement of wastewater collection systems.

(n) A state or federal entity may propose in its load reduction program the use of the following measures in addition to items listed in (l) and (m), or may propose other measures for which it can provide equivalent accounting methods acceptable to the Division:
- (i) Redirecting runoff away from impervious surfaces;
- (ii) Soil amendments;
- (iii) Stream restoration;
- (iv) Improved street sweeping; and
- (v) Source control, such as waste and fertilizer controls.

(o) The program shall include evaluation of load reduction potential relative to the following factors:
- (i) Extent of physical opportunities for installation;
- (ii) Landowner acceptance;
- (iii) Incentive and education options for improving landowner acceptance;

(iv) Existing and potential funding sources and magnitudes;
(v) Practice cost-effectiveness (e.g., cost per pound of nutrient removed);
(vi) Increase in per capita cost of a non-NCDOT state or federal entity's stormwater management program to implement the program;
(vii) Implementation rate without the use of eminent domain; and
(viii) Need for and projected role of eminent domain.

(7) The Commission shall approve a non-NCDOT Stage I load reduction program if it meets the requirements of Items (5) and (6) of this Rule. The Commission shall approve a Stage II load reduction program if it meets the requirements of Items (5) and (6) of this Rule unless the Commission finds that the local non-NCDOT state or federal entity can, through the implementation of reasonable and cost-effective measures not included in the proposed program, meet the Stage II nutrient load reductions required by this Rule by a date earlier than that proposed by the non-NCDOT state or federal entity. If the Commission finds that there are additional or alternative reasonable and cost-effective measures, the Commission may require the non-NCDOT state or federal entity to modify its proposed program to include such measures to achieve the required reductions by the earlier date. If the Commission requires such modifications, the non-NCDOT state or federal entity shall submit a modified program within two months. The Division shall recommend that the Commission approve or disapprove the modified program within three months after receiving the modified program. In determining whether additional or alternative load reduction measures are reasonable and cost effective, the Commission shall consider factors including, but not limited to those identified in Sub-Item (6)(o) of this Rule. The Commission shall not require additional or alternative measures that would require a non-NCDOT state or federal entity to:
(a) Install a new stormwater collection system in an area of existing development unless the area is being redeveloped; or
(b) Reduce impervious surfaces within an area of existing development unless the area is being redeveloped.

(8) A non-NCDOT state or federal entity shall have the option of working with the county or counties in which it falls, or with a municipality or municipalities within the same subwatershed, to jointly meet the loading targets from all lands within their combined jurisdictions within a subwatershed. The entity may utilize private or third party sellers. All reductions involving trading with other parties shall meet the requirements of 15A NCAC 02B .0282.

(9) NCDOT REQUIREMENTS. The NCDOT shall develop a single Stormwater Management Program that will be applicable to the entire Falls watershed and submit this program for approval by the Division according to the standards set forth below. In addition, the program shall, at a minimum, comply with NCDOT's then-current stormwater permit. This program shall:
(a) Identify NCDOT stormwater outfalls from Interstate, US, and NC primary routes;
(b) Identify and eliminate illegal discharges into the NCDOT's stormwater conveyance system;
(c) Establish a program for post-construction stormwater runoff control for new development, including new and widening NCDOT roads and facilities. The program shall establish a process by which the Division shall review and approve stormwater designs for new NCDOT development projects. The program shall delineate the scope of vested projects that would be considered as existing development, and shall define lower thresholds of significance for activities considered new development. In addition, the following criteria shall apply:
(i) For new and widening roads, weigh stations, and replacement of existing bridges, compliance with the riparian buffer protection requirements of Rules 15A NCAC 02B .0233 and .0242 shall be deemed as compliance with the purposes of this Rule;
(ii) New non-road development shall achieve and maintain the nitrogen and phosphorus percentage load reduction objectives established in 15A NCAC 02B .0275 relative to either area-weighted average loading rates of all developable lands as of the baseline period defined in 15A NCAC 02B .0275, or to project-specific pre-development loading rates. Values for area-weighted average loading rate targets for nitrogen and phosphorus, respectively, are expressed in units of pounds per acre per year: 2.2 and 0.33. The NCDOT shall determine the need for engineered stormwater controls to meet these loading rate targets by using the loading calculation method called for in Item (13) of this Rule or other equivalent method

acceptable to the Division. Where stormwater treatment systems are needed to meet these targets, they shall be designed to control and treat the runoff generated from all surfaces by one inch of rainfall. Such systems shall be assumed to achieve the nutrient removal efficiencies identified in the July 2007 version of the *Stormwater Best Management Practices Manual* published by the Division provided that they meet associated drawdown and other design specifications included in the same document. The NCDOT may propose to the Division nutrient removal rates for practices currently included in the BMP Toolbox required under its NPDES stormwater permit, or may propose revisions to those practices or additional practices with associated nutrient removal rates. The NCDOT may use any such practices approved by the Division to meet loading rate targets identified in this Sub-item. New non-road development shall also control runoff flows to meet the purpose of this Rule regarding protection of the nutrient functions and integrity of receiving waters; and

(iii) For new non-road development, the NCDOT shall have the option of offsetting part of their nitrogen and phosphorus loads by implementing or funding offsite management measures. Before using an offsite offset option, a development shall implement structural stormwater controls that achieve 50 percent or more of the needed load reduction in both nitrogen and phosphorus loading onsite and shall meet any requirements for engineered stormwater controls described in this Item. Offsite offsetting measures shall achieve at least equivalent reductions in nitrogen and phosphorus loading to the remaining reduction needed onsite to comply with the loading rate targets set out in this Item. The NCDOT may use any measure that complies with the requirements of Rules .0240 and .0282 of this Section.

(d) Establish a program to identify and implement load-reducing opportunities on existing development within the watershed. The long-term objective of this effort shall be for the NCDOT to achieve the nutrient load objectives in 15A NCAC 02B .0275 as applied to existing development under its control, including roads and facilities:

(i) The NCDOT may achieve the nutrient load reduction objective in 15A NCAC 02B .0275 for existing roadway and non-roadway development under its control by the development of a load reduction program that addresses both roadway and non-roadway development in the Falls watershed. As part of the accounting process described in Item (13) of this Rule, baseline nutrient loads shall be established for roadways and industrial facilities using stormwater runoff nutrient load characterization data collected through the National Pollutant Discharge Elimination System (NPDES) Research Program under NCS0000250 Permit Part II Section G;

(ii) The program shall include estimates of, and plans for offsetting, nutrient load increases from lands developed subsequent to the baseline period but prior to implementation of its new development program. It shall include a technical analysis that includes a proposed implementation rate and schedule. This schedule shall provide for proportionate annual progress toward reduction objectives as practicable throughout the proposed compliance period. The program shall identify the types of activities NCDOT intends to implement and types of existing roadway and non-roadway development affected, relative proportions or a prioritization of practices, and the relative magnitude of reductions it expects to achieve from each;

(iii) The program to address roadway and non-roadway development may include stormwater retrofits and other load reducing activities in the watershed including: illicit discharge removal; street sweeping; source control activities such as fertilizer management at NCDOT facilities; improvement of existing stormwater structures; use of rain barrels and cisterns; stormwater capture and reuse; and purchase of nutrient reduction credits;

(iv) NCDOT may meet minimum implementation rate and schedule requirements by implementing a combination of at least six stormwater retrofits per year for existing development in the Falls watershed or some other minimum amount based on more

accurate reduction estimates developed during the accounting tool development process;

(v) To the maximum extent practicable, retrofits shall be designed to treat the runoff generated from all surfaces by one inch of rainfall, and shall conform to the standards and criteria established in the most recent version of the Division-approved NCDOT BMP Toolbox required under NCDOT's NPDES stormwater permit. To establish removal rates for nutrients for individual practices described in the Toolbox, NCDOT shall submit technical documentation on the nutrient removal performance of BMPs in the Toolbox for Division approval. Upon approval, NCDOT shall incorporate nutrient removal performance data into the BMP Toolbox. If a retrofit is proposed that is not described in the NCDOT BMP Toolbox, then to the maximum extent practicable, such retrofit shall conform to the standards and criteria set forth in the July 2007 version of the *Stormwater Best Management Practices Manual* published by the Division, or other technically equivalent guidance acceptable to the Division;

(e) Initiate a "Nutrient Management Education Program" for NCDOT staff and contractors engaged in the application of fertilizers on highway rights of way. The purpose of this program shall be to contribute to the load reduction objectives established in 15A NCAC 02B .0275 through proper application of nutrients, both inorganic fertilizer and organic nutrients, to highway rights of way in the Falls watershed in keeping with the most current state-recognized technical guidance on proper nutrient management; and

(f) Address compliance with the riparian buffer protection requirements of 15A NCAC 02B .0233 and .0242 through a Division approval process.

(10) NON-NCDOT RULE IMPLEMENTATION. For all state and federal entities that control lands within the Falls watershed with the exception of the NCDOT, this Rule shall be implemented as follows:

(a) Upon Commission approval of the accounting methods required in Item (13) of this Rule, subject entities shall comply with the requirements of Items (3) and (4) of this Rule;

(b) By July 15, 2013, the Division shall submit a Stage I model local program to the Commission for approval that embodies the criteria described in Items (5) and (6) of this Rule. The Division shall work in cooperation with subject state and federal entities and other watershed interests in developing this model program, which shall include the following:

(i) Methods to quantify load reduction requirements and resulting load reduction assignments for individual entities;

(ii) Methods to account for discharging sand filters, malfunctioning septic systems, and leaking collection systems; and

(iii) Methods to account for load reduction credits from various activities;

(c) Within six months after the Commission's approval of the Stage I model local program, subject entities shall submit load reduction programs that meet or exceed the requirements of Items (5) and (6) of this Rule to the Division for review and preliminary approval and shall begin implementation and tracking of measures to reduce nutrient loads from existing developed lands owned or controlled by the responsible state or federal entity;

(d) Within 20 months of the Commission's approval of the Stage I model local program, the Division shall provide recommendations to the Commission on existing development load reduction programs. The Commission shall either approve the programs or require changes based on the standards set out in Item (4) of this Rule. Should the Commission require changes, the applicable state or federal entity shall have two months to submit revisions, and the Division shall provide follow-up recommendations to the Commission within two months after receiving revisions;

(e) Within three months after the Commission's approval of a Stage I existing development load reduction program, the affected entity shall complete adoption of and begin implementation of its existing development Stage I load reduction program;

(f) Upon implementation of the programs required under Item (4) of this Rule, state and federal entities subject to this Rule shall provide annual reports to the Division documenting their progress in implementing those requirements within three months following each anniversary

of program implementation date until such time the Commission determines they are no longer needed to ensure maintenance of reductions or that standards are protected. State and federal entities shall indefinitely maintain and ensure performance of implemented load-reducing measures;

(g) By January 15, 2021 and every five years thereafter until either accounting determines load reductions have been achieved, standards are met, or the Commission takes other actions per 15A NCAC 02B .0275, state and federal entities located in the upper Falls watershed as defined in Item (3) of 15A NCAC 02B .0275 shall submit and begin implementation of Stage II load reduction program or program revision to the Division. Within nine months after submittal, the division shall make recommendations to the Commission on approval of these programs. The Commission shall either approve the programs or require changes based on the standards set out in this Rule. Should the Commission require changes, the applicable state or federal entity shall submit revisions within two months, and the Division shall provide follow-up recommendations to the Commission within three months after receiving revisions. Upon approval, the state or federal entity shall adjust implementation based on its approved program;

(h) A state or federal entity may, at any time after commencing implementation of its load reduction program, submit program revisions to the Division for approval based on identification of more cost-effective strategies or other factors not originally recognized;

(i) Once either load reductions are achieved per annual reporting or water quality standards are met in the lake per 15A NCAC 02B .0275, state and federal entities shall submit programs to ensure no load increases and shall report annually per Sub-Item (10)(f) on compliance with no increases and take additional actions as necessary; and

(j) Beginning January 2016 and every five years thereafter, the Division shall review the accounting methods stipulated under Sub-Item (10)(a) to determine the need for revisions to those methods and to loading reductions assigned using those methods. Its review shall include values subject to change over time independent of changes resulting from implementation of this Rule, such as untreated export rates that may change with changes in atmospheric deposition. It shall also review values subject to refinement, such as nutrient removal efficiencies.

(11) NCDOT RULE IMPLEMENTATION. For the NCDOT, this Rule, shall be implemented as follows:

(a) By July 2013, the NCDOT shall submit the Stormwater Management Program for the Falls watershed to the Division for approval. This Program shall meet or exceed the requirements in Item (9) of this Rule;

(b) By January 15, 2014, the Division shall request the Commission's approval of the NCDOT Stormwater Management Program;

(c) By January 15, 2014, the NCDOT shall implement the Commission-approved Stormwater Management Program; and

(d) Upon implementation, the NCDOT shall submit annual reports to the Division summarizing its activities in implementing each of the requirements in Item (9) of this Rule. This annual reporting may be incorporated into annual reporting required under NCDOT's NPDES stormwater permit.

(12) RELATIONSHIP TO OTHER REQUIREMENTS. A party may in its program submittal request that the Division accept its implementation of another stormwater program or programs, such as NPDES stormwater requirements, as satisfying one or more of the requirements set forth in Items (4) or (5) of this Rule. The Division shall provide determination on acceptability of any such alternatives prior to requesting Commission approval of programs under this Rule. The party shall include in its program submittal technical information demonstrating the adequacy of the alternative requirements.

(13) ACCOUNTING METHODS. By July 15, 2012, the Division shall submit a nutrient accounting framework to the Commission for approval. This framework shall include tools for quantifying load reduction assignments on existing development for parties subject to this Rule, load reduction credits from various activities on existing developed lands, and a tool that will allow subject parties to account for loading from new and existing development and loading changes due to BMP implementation. The Division shall work in cooperation with subject parties and other watershed interests in developing this framework. The Division shall periodically revisit these accounting methods to

determine the need for revisions to both the methods and to existing development load reduction assignments made using the methods set out in this Rule. It shall do so no less frequently than every 10 years. Its review shall include values subject to change over time independent of changes resulting from implementation of this Rule, such as untreated export rates that may change with changes in atmospheric deposition. It shall also review values subject to refinement, such as BMP nutrient removal efficiencies.

History Note: *Authority G.S. 143-214.1; 143-214.3; 143-214.5; 143-214.7; 143-215.1; 143-215.3; 143-215.3(a)(1); 143-215.6A; 143-215.6B; 143-215.6C; 143-215.8B; 143B-282(c); 143B-282(d); S.L. 2005-190; S.L. 2006-259; S.L. 2009-337; S.L. 2009-486;*
Eff. January 15, 2011 (this permanent rule replaces the temporary rule approved by the RRC on December 16, 2010).

SESSION LAW 2009-216
HOUSE BILL 239

AN ACT TO PROVIDE FOR IMPROVEMENTS IN THE MANAGEMENT OF THE JORDAN WATERSHED IN ORDER TO RESTORE WATER QUALITY IN THE JORDAN RESERVOIR.

The General Assembly of North Carolina enacts:

SECTION 1. Definitions. – The following definitions apply to this act and its implementation:

(1) The definitions set out in G.S. 143-212 and G.S. 143-213.
(2) The definitions set out in 15A NCAC 02B .0262 (Jordan Water Supply Nutrient Strategy: Purpose and Scope) and 15A NCAC 02B .0263 (Jordan Water Supply Nutrient Strategy: Definitions).
(3) "Existing Development Rule 15A NCAC 02B .0266" means 15A NCAC 02B .0266 (Jordan Water Supply Nutrient Strategy: Stormwater Management for Existing Development), adopted by the Commission on May 8, 2008, and approved by the Rules Review Commission on November 20, 2008.
(4) "Wastewater Discharge Rule 15A NCAC 02B .0270" means 15A NCAC 02B .0270 (Jordan Water Supply Nutrient Strategy: Wastewater Discharge Requirements) adopted by the Commission on May 8, 2008, and approved by the Rules Review Commission on October 16, 2008.

SECTION 2.(a) Wastewater Discharge Rule 15A NCAC 02B .0270. – Until the effective date of the revised permanent rule that the Commission is required to adopt pursuant to Section 2(c) of this act, the Commission and the Department shall implement the Wastewater Discharge Rule 15A NCAC 02B .0270, as provided in Section 2(b) of this act.

SECTION 2.(b) Implementation. – Notwithstanding sub-subdivision (c) of subdivision (6) of Wastewater Discharge Rule 15A NCAC 02B .0270, each existing discharger with a permitted flow greater than or equal to 0.1 million gallons per day (MGD) shall limit its total nitrogen discharge to its active individual discharge allocation as defined or modified pursuant to Wastewater Discharge Rule 15A NCAC 02B .0270 no later than calendar year 2016.

SECTION 2.(c) Additional Rule-Making Authority. – The Commission shall adopt a rule to replace Wastewater Discharge Rule 15A NCAC 02B .0270. Notwithstanding G.S. 150B-19(4), the rule adopted by the Commission pursuant to this section shall be substantively identical to the provisions of Section 2(b) of this act. Rules adopted pursuant to this section are not subject to G.S. 150B-21.9 through G.S. 150B-21.14. Rules adopted pursuant to this section shall become effective as provided in G.S. 150B-21.3(b1) as though 10 or more written objections had been received as provided by G.S. 150B-21.3(b2).

SECTION 3.(a) Existing Development Rule 15A NCAC 02B .0266 Disapproved. – Pursuant to G.S. 150B-21.3(b1), Existing Development Rule 15A NCAC 02B .0266, as adopted by the Environmental Management Commission on May 8, 2008, and approved by the Rules Review Commission on November 20, 2008, is disapproved.

SECTION 3.(b) References in the North Carolina Administrative Code to the rule cited in Section 3(a) of this act shall be deemed to refer to the equivalent provisions of this act.

SECTION 3.(c) Nutrient Monitoring. – The Department shall maintain an ongoing program to monitor water quality in each arm of Jordan Reservoir. The Department shall also accept water quality sampling data from a monitoring program implemented by a local government or nonprofit organization if the data meets quality assurance standards established by the Department. On March 1, 2014, the Department shall report the results of monitoring in

each arm of Jordan Reservoir to the Environmental Review Commission. The Department shall submit an updated monitoring report under this section every three years thereafter until such time as the lake is no longer impaired by nutrient pollution.

SECTION 3.(d) Control of Nutrient Loading From Existing Development. – The Department shall require implementation of reasonable nutrient load reduction measures for existing development in each subwatershed of the Jordan Reservoir, as provided in this act. The Department shall determine whether nutrient load reduction measures for existing development are necessary in each subwatershed of Jordan Reservoir and require implementation of reasonable nutrient reduction measures in accordance with an adaptive management program as follows:

(1) Stage 1 Adaptive Management Program to Control Nutrient Loading From Existing Development. –

a. Municipalities and counties located in whole or in part in the Jordan watershed shall implement a Stage 1 adaptive management program to control nutrient loading from existing development in the Jordan watershed. The Stage 1 adaptive management program shall meet the requirements set out in 40 C.F.R. § 122.34 as applied by the Department in the NPDES General Permit for municipal separate storm sewer systems in effect on July 1, 2009. The Stage 1 adaptive management program shall include all of the following measures:

1. A public education program to inform the public of the impacts of nutrient loading and measures that can be implemented to reduce nutrient loading from stormwater runoff from existing development.
2. A mapping program that includes major components of the municipal separate storm sewer system, including the location of major outfalls, as defined in 40 Code of Federal Regulations §122.26(b)(5) (July 1, 2008) and the names and location of all waters of the United States that receive discharges from those outfalls, land use types, and location of sanitary sewers.
3. A program to identify and remove illegal discharges.
4. A program to identify opportunities for retrofits and other projects to reduce nutrient loading from existing developed lands.
5. A program to ensure maintenance of best management practices implemented by the local government.

b. The Department shall accept local government implementation of another stormwater program or programs meeting the standards set out in this section as satisfying one or more of the requirements set forth in sub-subdivision a. of this subdivision. The local government shall provide technical information sufficient to demonstrate the adequacy of the alternative program or program elements.

c. A Stage 1 adaptive management program to control nutrient loading from existing development shall be implemented as follows:

1. No later than December 31, 2009, each local government shall submit its Stage 1 adaptive management program to the Commission for review and approval.
2. Within six months following submission of a Stage 1 adaptive management program, the Department shall recommend that the Commission approve or disapprove the program. The Commission shall either approve the program or require changes based on the standards set out in sub-subdivision a. of this subdivision. If the Commission requires changes, the local government shall submit revisions responding to the required changes within two months and the Department shall provide follow-up recommendations to the Commission within two months after receiving revisions.

3. Within three months following Commission approval of a Stage 1 adaptive management program, the local government shall begin implementation of the program. Each local government shall report annually to the Department on implementation of its program.

(2) Stage 2 Adaptive Management Program to Control Nutrient Loading From Existing Development. –

a. If the March 1, 2014 monitoring report or any subsequent monitoring report for the Upper New Hope Creek Arm of Jordan Reservoir required under Section 3(c) of this act shows that nutrient-related water quality standards are not being achieved, a municipality or county located in whole or in part in the subwatershed of that arm of Jordan Reservoir shall develop and implement a Stage 2 adaptive management program to control nutrient loading from existing development within the subwatershed, as provided in this act. If the March 1, 2017 monitoring report or any subsequent monitoring report for the Haw River Arm or the Lower New Hope Creek Arm of Jordan Reservoir required under Section 3(c) of this act shows that nutrient-related water quality standards are not being achieved, a municipality or county located in whole or in part in the subwatershed of that arm of Jordan Reservoir shall develop and implement a Stage 2 adaptive management program to control nutrient loading from existing development within the subwatershed, as provided in this act. The Department shall defer development and implementation of Stage 2 adaptive management programs to control nutrient loading from existing development required in a subwatershed by this subdivision if it determines that additional reductions in nutrient loading from existing development in that subwatershed will not be necessary to achieve nutrient-related water quality standards. In making this determination, the Department shall consider the anticipated effect of measures implemented or scheduled to be implemented to reduce nutrient loading from sources in the subwatershed other than existing development. If any subsequent monitoring report for an arm of Jordan Reservoir required under Section 3(c) of this act shows that nutrient-related water quality standards have not been achieved, the Department shall notify the municipalities and counties located in whole or in part in the subwatershed of that arm of Jordan Reservoir and the municipalities and counties shall develop and implement a Stage 2 adaptive management program as provided in this subdivision.

b. The Department shall establish a load reduction goal for existing development for each municipality and county required to implement a Stage 2 adaptive management program to control nutrient loading from existing development. The load reduction goal shall be designed to achieve, relative to the baseline period 1997 through 2001, an eight percent (8%) reduction in nitrogen loading and a five percent (5%) reduction in phosphorus loading reaching Jordan Reservoir from existing developed lands within the police power jurisdiction of the local government. The baseline load shall be calculated by applying the Tar-Pamlico Nutrient Export Calculation Worksheet, Piedmont Version, dated October 2004, to acreages of different types of existing development within the police power jurisdiction of the local government during the baseline period. The baseline load may also be calculated using an equivalent or more accurate method acceptable to the Department and recommended by the Scientific Advisory Board established pursuant to Section 4(a) of this act. The baseline load for a municipality or county shall not include nutrient loading from lands under State or federal control or lands in agriculture or forestry. The load reduction goal shall be

adjusted to account for nutrient loading increases from lands developed subsequent to the baseline period but prior to implementation of new development stormwater programs.

c. Based on findings under sub-subdivision a. of this subdivision, the Department shall notify the local governments in each subwatershed that either:
   1. Implementation of a Stage 2 adaptive management program to control nutrient loading from existing development will be necessary to achieve water quality standards in an arm of the reservoir and direct the municipalities and counties in the subwatershed to develop a load reduction program in compliance with this section.
   2. Implementation of a Stage 2 adaptive management program to control nutrient loading from existing development is not necessary at that time but will be reevaluated in three years based on the most recent water quality monitoring information.

d. A local government receiving notice of the requirement to develop and implement a Stage 2 adaptive management program to control nutrient loading from existing development under this section shall not be required to submit a program if the local government demonstrates that it has already achieved the reductions in nutrient loadings required by sub-subdivision b. of this subdivision.

e. Within six months after receiving notice to develop and implement a Stage 2 adaptive management program to control nutrient loading from existing development, each local government shall submit to the Commission a program that is designed to achieve the reductions in nutrient loadings established by the Department pursuant to sub-subdivision b. of this subdivision. A local government program may include nutrient management strategies that are not included in the model program developed pursuant to Section 3(e) of this act in addition to or in place of any component of the model program. In addition, a local government may satisfy the requirements of this subdivision through reductions in nutrient loadings from other sources in the same subwatershed to the extent those reductions go beyond measures otherwise required by statute or rule. A local government may also work with other local governments within the same subwatershed to collectively meet the required reductions in nutrient loadings from existing development within their combined jurisdictions. Any credit for reductions achieved or obtained outside of the police power jurisdiction of a local government shall be adjusted based on transport factors established by the Department document Nitrogen and Phosphorus Delivery from Small Watersheds to Jordan Lake, dated June 30, 2002.

f. Within six months following submission of a local government's Stage 2 adaptive management program to control nutrient loading from existing development, the Department shall recommend that the Commission approve or disapprove the program. The Commission shall approve the program if it meets the requirements of this subdivision, unless the Commission finds that the local government can, through the implementation of reasonable and cost-effective measures not included in the proposed program, meet the reductions in nutrient loading established by the Department pursuant to sub-subdivision b. of this subdivision by a date earlier than that proposed by the local government. If the Commission finds that there are additional or alternative reasonable and cost-effective measures, the Commission may require the local government to modify its proposed program to include such measures to achieve the required reductions by the earlier date. If the Commission requires such

modifications, the local government shall submit a modified program within two months. The Department shall recommend that the Commission approve or disapprove the modified program within three months after receiving the local government's modified program. In determining whether additional or alternative load reduction measures are reasonable and cost effective, the Commission shall consider factors including, but not limited to, the increase in the per capita cost of a local government's stormwater management program that would be required to implement such measures and the cost per pound of nitrogen and phosphorus removed by such measures. The Commission shall not require additional or alternative measures that would require a local government to:

1. Install or require installation of a new stormwater collection system in an area of existing development unless the area is being redeveloped.
2. Acquire developed private property.
3. Reduce or require the reduction of impervious surfaces within an area of existing development unless the area is being redeveloped.

g. Within three months after the Commission's approval of a Stage 2 adaptive management program to control nutrient loading from existing development, the local government shall complete adoption and begin implementation of its program.

h. Each local government implementing a Stage 2 adaptive management program to control nutrient loading from existing development shall submit an annual report to the Department summarizing its activities in implementing its program.

i. If at any time the Department finds, based on water quality monitoring, that an arm of the Jordan Reservoir has achieved compliance with water quality standards, the Department shall notify the local governments in the subwatershed. Subject to the approval of the Commission, a local government may modify its Stage 2 adaptive management program to control nutrient loading from existing development to maintain only those measures necessary to prevent increases in nutrient loading from existing development.

SECTION 3.(e) Model Stage 2 Adaptive Management Program to Control Nutrient Loading From Existing Development. – No later than July 1, 2013, the Department shall submit a model Stage 2 adaptive management program to control nutrient loading from existing development to the Commission for approval. The model program shall identify specific load reduction practices and programs and reduction credits associated with each practice or program and shall provide that a local government may obtain additional or alternative load-reduction credits based on site-specific monitoring data. In developing the model program, the Department shall consider the findings and recommendations of the Scientific Advisory Board established pursuant to Section 4(a) of this act and comments submitted by municipalities and counties identified in 15A NCAC 02B .0262(7) (Jordan Water Supply Nutrient Strategy: Purpose and Scope). The Commission shall review the model program and either approve the program or return it to the Department with requested changes. The Department shall revise the model program to address changes requested by the Commission. The Commission shall approve a final model program no later than December 31, 2013.

SECTION 3.(f) Additional Measures to Reduce Nitrogen Loading From Existing Development in the Upper New Hope Creek Arm of the Jordan Reservoir. – If the March 1, 2023, monitoring report or any subsequent monitoring report for the Upper New Hope Creek Arm of Jordan Reservoir shows that nutrient-related water quality standards are not being achieved, a municipality or county located in whole or in part in the Upper New Hope Creek Subwatershed shall modify its Stage 2 adaptive management program to control nutrient loading from existing development to achieve additional reductions in nitrogen loading from existing development. The modified Stage 2 adaptive management program shall be designed

to achieve a total reduction in nitrogen loading from existing development of thirty-five percent (35%) relative to the baseline period 1997 through 2001. The Department shall notify local governments of the requirement to submit a modified Stage 2 adaptive management program. Submission, review and approval, and implementation of a modified Stage 2 adaptive management program shall follow the process, timeline, and standards set out in sub-subdivisions e. through g. of subdivision (2) of Section 3(d) of this act.

SECTION 3.(g) Enforcement. – The Department shall enforce the provisions of this act as provided in G.S. 143-215.6A, 143-215.6B, and 143-215.6C.

SECTION 3.(h) Collective Compliance. – Local governments that are subject to regulation under this act may establish collective programs to comply with the requirements of this act.

SECTION 3.(i) Report. – The Department shall report annually to the Commission regarding the implementation of adaptive management programs to control nutrient loading from existing development in the Jordan watershed.

SECTION 3.(j) Additional Rule-Making Authority. – The Commission shall adopt a rule to replace Sections 3(c) through 3(i) of this act. Notwithstanding G.S. 150B-19(4), the rule adopted by the Commission pursuant to this section shall be substantively identical to the provisions of Sections 3(c) through 3(f) of this act. Rules adopted pursuant to this section are not subject to G.S. 150B-21.9 through G.S. 150B-21.14. Rules adopted pursuant to this section shall become effective as provided in G.S. 150B-21.3(b1) as though 10 or more written objections had been received as provided by G.S. 150B-21.3(b2).

SECTION 3.(k) No Change to Existing Regulatory Authority. – Nothing in this act shall be construed to limit, expand, or modify the authority of the Commission to undertake alternative regulatory actions otherwise authorized by State or federal law, including, but not limited to, the reclassification of waters of the State pursuant to G.S. 143-214.1, the revision of water quality standards pursuant to G.S. 143-214.3, and the granting of variances pursuant to G.S. 143-215.3.

SECTION 4.(a) Scientific Advisory Board for Nutrient-Impaired Waters Established. – No later than July 1, 2010, the Secretary shall establish a Nutrient Sensitive Waters Scientific Advisory Board. The Scientific Advisory Board shall consist of no fewer than five and no more than 10 members with the following expertise or experience:

(1) Representatives of one or more local governments in the Jordan Reservoir watershed. Local government representatives shall have experience in stormwater management, flood control, or management of a water or wastewater utility.

(2) One member with at least 10 years of professional or academic experience relevant to the management of nutrients in impaired water bodies and possessing a graduate degree in a related scientific discipline, such as aquatic science, biology, chemistry, geology, hydrology, environmental science, engineering, economics, or limnology.

(3) One professional engineer with expertise in stormwater management, hydrology, or flood control.

(4) One representative of the Department of Transportation with expertise in stormwater management.

(5) One representative of a conservation organization with expertise in stormwater management, urban landscape design, nutrient reduction, or water quality.

SECTION 4.(b) Duties. – No later than July 1, 2012, the Scientific Advisory Board shall do all of the following:

(1) Identify management strategies that can be used by local governments to reduce nutrient loading from existing development.

(2) Evaluate the feasibility, costs, and benefits of implementing the identified management strategies.

(3) Develop an accounting system for assignment of nutrient reduction credits for the identified management strategies.

(4) Identify the need for any improvements or refinements to modeling and other analytical tools used to evaluate water quality in nutrient-impaired waters and nutrient management strategies.

SECTION 4.(c) Report; Miscellaneous Provisions. – The Scientific Advisory Board shall also advise the Secretary on any other issue related to management and restoration of nutrient-impaired water bodies. The Scientific Advisory Board shall submit an annual report to the Secretary no later than July 1 of each year concerning its activities, findings, and recommendations. Members of the Scientific Advisory Board shall be reimbursed for reasonable travel expenses to attend meetings convened by the Department for the purposes set out in this section.

SECTION 5. No Preemption. – A local government may adopt and implement a stormwater management program that contains provisions that are more restrictive than the standards set forth in Sections 2 and 3 of this act or in any rules concerning stormwater management in the Jordan watershed adopted by the Commission. This section shall not be construed to authorize a local government to impose stormwater management requirements on lands in agriculture or forestry.

SECTION 6. Construction of Act. –

(1) Except as specifically provided in Sections 2(c) and 3(j) of this act, nothing in this act shall be construed to limit, expand, or otherwise alter the authority of the Commission or any unit of local government.

(2) This act shall not be construed to affect any delegation of any power or duty by the Commission to the Department or subunit of the Department.

SECTION 7. Note to Revisor of Statutes. – Notwithstanding G.S. 164-10, the Revisor of Statutes shall not codify any of the provisions of this act. The Revisor of Statutes shall set out the text of Section 2 of this act as a note to G.S. 143-215.1 and may make notes concerning this act to other sections of the General Statutes as the Revisor of Statutes deems appropriate. The Revisor of Statutes shall set out the text of Section 3 of this act as a note to G.S. 143-214.7 and may make notes concerning this act to other sections of the General Statutes as the Revisor of Statutes deems appropriate.

SECTION 8. Effective Date. – This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 23rd day of June, 2009.

s/ Walter H. Dalton
President of the Senate

s/ Joe Hackney
Speaker of the House of Representatives

s/ Beverly E. Perdue
Governor

Approved 5:30 p.m. this 30th day of June, 2009

SESSION LAW 2009-484
SENATE BILL 838

AN ACT TO AMEND CERTAIN ENVIRONMENTAL AND NATURAL RESOURCES LAWS TO: (1) REQUIRE ELECTRONIC REPORTING OF ENVIRONMENTAL LEAD TEST RESULTS AND BLOOD LEAD TEST RESULTS; (2) CLARIFY THE FEE STRUCTURE FOR FOOD AND LODGING PERMITS; (3) REVISE THE SUNSET PROVISION FOR NUTRIENT OFFSET PAYMENTS; (4) AMEND THE SOLID WASTE DISPOSAL TAX TO STREAMLINE THE PROCESS WHEN A LOCAL GOVERNMENT IS SERVED BY A SOLID WASTE MANAGEMENT AUTHORITY; (5) REPEAL THE REQUIREMENT THAT SEASONAL STATE PARK EMPLOYEES WEAR A UNIFORM VEST; (6) CLARIFY IMPLEMENTATION OF NUTRIENT OFFSETS UNDER THE JORDAN LAKE RULES; (7) CLARIFY IMPLEMENTATION OF THE JORDAN LAKE RULES RELATED TO FEDERAL AND STATE ENTITIES; (8) MAKE CLARIFYING, CONFORMING, AND TECHNICAL AMENDMENTS TO VARIOUS LAWS RELATED TO THE ENVIRONMENT AND NATURAL RESOURCES; (9) AMEND OR REPEAL VARIOUS ENVIRONMENTAL REPORTING REQUIREMENTS; AND (10) DELAY THE EFFECTIVE DATES FOR LAWS GOVERNING THE MANAGEMENT OF DISCARDED COMPUTER EQUIPMENT AND DISCARDED TELEVISIONS TO JULY 1, 2010.

The General Assembly of North Carolina enacts:

PART I. AMEND ENVIRONMENTAL AND NATURAL RESOURCES LAWS.

SECTION 1. G.S. 130A-131.8 reads as rewritten:

"**§ 130A-131.8. Laboratory ~~Reports~~ reports.~~of blood levels in children.~~**

(a) All laboratories doing business in this State shall report to the Department all environmental lead test results and blood lead test results for children less than six years of age and for individuals whose ages are unknown at the time of testing. Reports shall be made by electronic submission within five working days after test ~~completion on forms provided by the Department or on self-generated forms containing:~~ completion.

(b) Reports of blood lead test results shall contain all of the following:

(1) ~~the~~ The child's full name, date of birth, sex, race, ethnicity, address, and Medicaid number, if ~~any;~~ any.

(2) ~~the~~ The name, address, and telephone number of the requesting health care ~~provider;~~ provider.

(3) ~~the~~ The name, address, and telephone number of the testing ~~laboratory;~~ laboratory.

(4) ~~the~~ The laboratory results, whether the specimen ~~type~~ type is venous or capillary; the laboratory sample number, and the dates the sample was collected and analyzed. ~~The reports may be made by electronic submissions.~~

(c) Reports of environmental lead test results shall contain all of the following:

(1) The address where the samples were collected.

(2) Sample type, such as dust, paint, soil, or water.

(3) Surface type, such as floor, window sill, or window trough.

(4) Collection location.

(5) The name, address, and telephone number of the testing laboratory.

(6) The laboratory results, unit of measurement, the laboratory sample number, and the dates the sample was collected and analyzed."

SECTION 2.(a) If Senate Bill 202, 2009 Regular Session, does not become law then G.S. 130A-248(d) reads as rewritten:

"(d) The Department shall charge each establishment subject to this section, except nutrition programs for the elderly administered by the Division of Aging and Adult Services of the Department of Health and Human Services, establishments that prepare and sell meat food products or poultry products, and public school ~~cafeterias, an annual fee of fifty dollars ($50.00).~~ cafeterias, a fee of fifty dollars ($50.00) for each permit issued. This fee shall be reassessed annually for permits that do not expire. The Commission shall adopt rules to implement this subsection. Fees collected under this subsection shall be used for State and local food, lodging, and institution sanitation programs and activities. No more than thirty-three and one-third percent (33 1/3%) of the fees collected under this subsection may be used to support State health programs and activities."

SECTION 2.(b) If Senate Bill 202, 2009 Regular Session, does become law then G.S. 130A-248(d) reads as rewritten:

"(d) The Department shall charge each establishment subject to this section, except nutrition programs for the elderly administered by the Division of Aging and Adult Services of the Department of Health and Human Services, establishments that prepare and sell meat food products or poultry products, and public school cafeterias, ~~an annual~~ a fee of seventy-five dollars ~~($75.00).~~ ($75.00) for each permit issued. This fee shall be reassessed annually for permits that do not expire. The Commission shall adopt rules to implement this subsection. Fees collected under this subsection shall be used for State and local food, lodging, and institution sanitation programs and activities. No more than thirty-three and one-third percent (33 1/3%) of the fees collected under this subsection may be used to support State health programs and activities."

SECTION 3.(a) Section 2 of S.L. 2007-438 reads as rewritten:

"**SECTION 2.** No later than ~~1 September 2009,~~1 September 2010, the Department of Environment and Natural Resources shall develop and implement a plan to transition the North Carolina Ecosystem Enhancement Program nutrient offset program from a fee-based program to a program based on the actual costs of providing nutrient credits. The new program shall use the least cost alternative for providing nutrient offset credits consistent with rules adopted by the Environmental Management Commission for implementation of nutrient management strategies in the Neuse River Basin and the Tar-Pamlico River Basin."

SECTION 3.(b) Section 5 of S.L. 2007-438 reads as rewritten:

"**SECTION 5.** This act becomes effective 1 September 2007 and applies to all nutrient offset payments, including those set out in 15A NCAC 2B .0240, as adopted by the Environmental Management Commission on 12 January 2006. The fee schedule set out in Section 1 of this act expires ~~1 September 2009.~~ 1 September 2010."

SECTION 4. G.S. 105-187.63 reads as rewritten:

"**§ 105-187.63. Use of tax proceeds.**

From the taxes received pursuant to this Article, the Secretary may retain the costs of collection, not to exceed two hundred twenty-five thousand dollars ($225,000) a year, as reimbursement to the Department. The Secretary must credit or distribute taxes received pursuant to this Article, less the cost of collection, on a quarterly basis as follows:

(1) Fifty percent (50%) to the Inactive Hazardous Sites Cleanup Fund established by G.S. 130A-310.11.

(2) Thirty-seven and one-half percent (37.5%) to cities and counties in the State on a per capita basis, using the most recent annual estimate of population certified by the State Budget Officer. One-half of this amount must be distributed to cities, and one-half of this amount must be distributed to counties. For purposes of this distribution, the population of a county does not include the population of a city located in the county.

A city or county is excluded from the distribution under this subdivision if it does not provide solid waste management programs and services and is not responsible by contract for payment for these programs and services. ~~services, unless it is served by a regional solid waste management authority established under Article 22 of Chapter 153A of the General Statutes.~~ The Department of Environment and Natural Resources must provide the Secretary with a list of the cities and counties that are excluded under this subdivision. The list must be provided by May 15 of each year and applies to distributions made in the fiscal year that begins on July 1 of that year.

Funds distributed under this subdivision must be used by a city or county solely for solid waste management programs and services. ~~A city or county that receives funds under this subdivision and is served by a regional solid waste management authority must forward the amount it receives to that authority.~~

(3) Twelve and one-half percent (12.5%) to the Solid Waste Management Trust Fund established by G.S. 130A-309.12."

SECTION 5. G.S. 113-35.1 is repealed.

SECTION 5.1. Section 5 of S.L. 2009-406 reads as rewritten:

"**SECTION 5.** This act shall not be construed or implemented to:

(1) Extend any permit or approval issued by the United States or any of its agencies or instrumentalities.

(2) Extend any permit or approval for which the term or duration of the permit or approval is specified or determined pursuant to federal law.

(3) Shorten the duration that any development approval would have had in the absence of this act.

(4) Prohibit the granting of such additional extensions as are provided by law.

(5) Affect any administrative consent order issued by the Department of Environment and Natural Resources in effect or issued at any time from the effective date of this act to December 31, 2010.

(6) Affect the ability of a government entity to revoke or modify a development approval or to accept voluntary relinquishment of a development approval by the holder of the development approval pursuant to law.

(7) Modify any requirement of law that is necessary to retain federal delegation by the State of the authority to implement a federal law or program."

PART II. AMEND CERTAIN JORDAN WATER SUPPLY NUTRIENT STRATEGY RULES.

SECTION 6.(a) S.L. 2009-216 is amended by adding a new subsection to read:

"**SECTION 2.(d)** Section 2(b) of this act expires on the date that rules adopted pursuant to Section 2(c) of this act become effective."

SECTION 6.(b) S.L. 2009-216 is amended by adding a new subsection to read:

"**SECTION 3.(k)** Sections 3(c) through 3(i) of this act expire on the date that rules adopted pursuant to Section 3(j) of this act become effective."

SECTION 6.(c) Section 3(k) of S.L. 2009-216 reads as rewritten:

"~~**SECTION 3.(k)**~~**SECTION 3.(l)** No Change to Existing Regulatory Authority. – Nothing in this act shall be construed to limit, expand, or modify the authority of the Commission to undertake alternative regulatory actions otherwise authorized by State or federal law, including, but not limited to, the reclassification of waters of the State pursuant to G.S. 143-214.1, the revision of water quality standards pursuant to G.S. 143-214.3, and the granting of variances pursuant to G.S. 143-215.3."

SECTION 7.(a) S.L. 2009-216 is amended by adding a new section to read:

"**SECTION 5.(a)** Definition. – As used in this section, "New Development Rule 15A NCAC 02B .0265" means 15A NCAC 02B .0265 (Jordan Water Supply Nutrient Strategy: Stormwater Management for New Development) adopted by the Commission on May 8, 2008, and approved by the Rules Review Commission on November 20, 2008.

"**SECTION 5.(b)** New Development Rule 15A NCAC 02B .0265. – Until the effective date of the revised permanent rule that the Commission is required to adopt pursuant to Section 5(d) of this act, the Commission and the Department shall implement New Development Rule 15A NCAC 02B .0265, as provided in Section 5(c) of this act.

"**SECTION 5.(c)** Implementation. – Notwithstanding sub-subdivision (vii) of sub-subdivision (a) of subdivision (3) of New Development Rule 15A NCAC 02B .0265, New Development Rule 15A NCAC 02B .0265 shall be implemented as follows:

(1) New development that would exceed the nitrogen or phosphorus loading rate targets set out in sub-subdivision (i) of sub-subdivision (a) of subdivision (3) of New Development Rule 15A NCAC 02B .0265 without the use of engineered stormwater controls and that is not subject to more stringent stormwater requirements under S.L. 2006-246 or rules adopted pursuant to G.S. 143-214.5 shall have engineered stormwater controls that meet the

design requirements set out in sub-subdivision (iv) of sub-subdivision (a) of subdivision (3) of New Development Rule 15A NCAC 02B .0265 and achieve eighty-five percent (85%) removal of total suspended solids.

(2) A developer may offset part of the nitrogen and phosphorus load from a new development by implementing or funding off-site management measures in accordance with this subdivision. New development shall comply with requirements for engineered stormwater controls as set out in this act and in New Development Stormwater Rule 15A NCAC 02B .0265. On-site stormwater controls shall achieve a maximum nitrogen loading rate that does not exceed six pounds per acre per year for single-family detached and duplex residential development and 10 pounds per acre per year for other development, including multifamily residential, commercial, and industrial. Off-site management measures may be used to offset the difference between the nitrogen and phosphorus loading rates achieved through compliance with the stormwater control requirements of this act and the loading rate targets set out in sub-subdivision (i) of sub-subdivision (a) of subdivision (3) of New Development Rule 15A NCAC 02B .0265. Off-site offsetting measures shall achieve at least the reduction in nitrogen and phosphorus loading equivalent to the remaining reduction needed to comply with the loading rate targets set out in sub-subdivision (i) of sub-subdivision (a) of subdivision (3) of New Development Rule 15A NCAC 02B .0265. A developer may make offset payments to the North Carolina Ecosystem Enhancement Program contingent upon acceptance of payments by that Program. A developer may use an offset option provided by the local government in which the development activity occurs. A developer may propose other offset measures to the local government, including providing his or her own off-site offset or utilizing a private seller. All offset measures identified above shall meet the requirements of subdivisions (2) through (4) of 15A NCAC 02B .0273.

"**SECTION 5.(d)** Additional Rule-Making Authority. – The Commission shall adopt a rule to replace New Development Rule 15A NCAC 02B .0265. Notwithstanding G.S. 150B-19(4), the rule adopted by the Commission pursuant to this section shall be substantively identical to the provisions of Section 5(c) of this act. Rules adopted pursuant to this section are not subject to G.S. 150B-21.9 through G.S. 150B-21.14. Rules adopted pursuant to this section shall become effective as provided in G.S. 150B-21.3(b1) as though 10 or more written objections had been received as provided by G.S. 150B-21.3(b2).

"**SECTION 5.(e)** Sunset. – Section 5(c) of this act expires on the date that rules adopted pursuant to Section 5(d) of this act become effective."

SECTION 7.(b) S.L. 2009-216 is amended by adding a new section to read:

"**SECTION 6.(a)** Definitions. – The following definitions apply to this section and its implementation:

(1) The definitions set out in G.S. 143-212 and G.S. 143-213.

(2) The definitions set out in 15A NCAC 02B .0262 (Jordan Water Supply Nutrient Strategy: Purpose and Scope) and 15A NCAC 02B .0263 (Jordan Water Supply Nutrient Strategy: Definitions).

(3) "State and Federal Rule 15A NCAC 02B .0271" means 15A NCAC 02B .0271 (Jordan Water Supply Nutrient Strategy: Stormwater Requirements for State and Federal Entities), adopted by the Commission on May 8, 2008, and approved by the Rules Review Commission on October 16, 2008.

(4) "Riparian Buffer Rule 15A NCAC 02B .0267" means 15A NCAC 02B .0267 (Jordan Water Supply Nutrient Strategy: Protection of Existing Riparian Buffers), adopted by the Commission on May 8, 2008, and approved by the Rules Review Commission on November 20, 2008.

"**SECTION 6.(b)** State and Federal Rule 15A NCAC 02B .0271. – Until the effective date of the revised permanent rule that the Commission is required to adopt pursuant to Section 6(d) of this act, the Commission and the Department shall implement the State and Federal Rule 15A NCAC 02B .0271, as provided in Section 6(c) of this act.

"**SECTION 6.(c)** Implementation. – Notwithstanding State and Federal Rule 15A NCAC 02B .0271, the Commission shall implement the State and Federal Rule 15A NCAC 02B .0271 as follows:

(1) The load reduction goal for existing North Carolina Department of Transportation roadway and nonroadway development shall be established as provided in this subdivision. The load reduction goal shall be designed to achieve, relative to the baseline period 1997 through 2001, an eight percent (8%) reduction in nitrogen loading and a five percent (5%) reduction in phosphorus loading reaching Jordan Reservoir from existing roadway and nonroadway development in the Upper New Hope and Haw subwatersheds. The load reduction goal for the Lower New Hope arm shall be designed to maintain no increases in nitrogen and phosphorus loads from existing roadway and nonroadway development relative to the baseline period 1997 through 2001. Load reduction goals for each subwatershed shall be calculated from baseline loads for existing North Carolina Department of Transportation development present during the baseline period. Baseline loads shall be established for roadways and industrial facilities using stormwater runoff nutrient load characterization data collected through the National Pollutant Discharge Elimination System (NPDES) Research Program under NCS0000250 Permit Part II Section G. Baseline loads for other nonroadway development shall be calculated by applying the Tar-Pamlico Nutrient Export Calculation Worksheet, Piedmont Version, dated October 2004, to acreages of nonroadway development under the control of North Carolina Department of Transportation during the baseline period. The baseline load for other nonroadway development may also be calculated using an equivalent or more accurate method acceptable to the Department and recommended by the Scientific Advisory Board established pursuant to Section 4(a) of S.L. 2009-216. The load reduction goal shall be adjusted to account for nutrient loading increases from existing roadway and nonroadway development subsequent to the baseline period but prior to implementation of new development stormwater programs pursuant to 15A NCAC 02B .0271(4)(c).

(2) Sub-subdivision (b) of subdivision (3) and sub-subdivision (d) of subdivision (4) of State and Federal Rule 15A NCAC 02B .0271 shall be implemented as follows:

a. If the March 1, 2014, monitoring report or any subsequent monitoring report for the Upper New Hope Creek Arm of Jordan Reservoir required under Section 3(c) of S.L. 2009-216 shows that nutrient-related water quality standards are not being achieved, State and federal entities shall develop and implement a program to control nutrient loading from existing development within the subwatershed, as provided in this section and State and Federal Rule 15A NCAC 02B .0271. If the March 1, 2017, monitoring report or any subsequent monitoring report for the Haw River Arm or the Lower New Hope Creek Arm of Jordan Reservoir required under Section 3(c) of S.L. 2009-216 shows that nutrient-related water quality standards are not being achieved, State and federal entities shall develop and implement a program to control nutrient loading from existing development within the subwatershed, as provided in this section and State and Federal Rule 15A NCAC 02B .0271. The Department shall defer development and implementation of a program to control nutrient loading from existing development required in a subwatershed by this sub-subdivision if it determines that additional reductions in nutrient loading from existing development in that subwatershed will not be necessary to achieve nutrient-related water quality standards. In making this determination, the Department shall consider the anticipated effect of measures implemented or scheduled to be implemented to reduce nutrient loading from sources in the subwatershed other than existing development. If any subsequent monitoring report for an arm of Jordan Reservoir required under Section 3(c) of S.L. 2009-216 shows that nutrient-related water quality standards have not been achieved,

the Department shall notify each State and federal entity, and each entity shall develop and implement a program to control nutrient loading from existing development as provided in this section and State and Federal Rule 15A NCAC 02B .0271.

b. If the Commission requires additional reductions in nutrient loading from local governments pursuant to Section 3(f) of S.L. 2009-216, the Commission shall require State and federal entities to modify their nutrient reduction programs for the Upper New Hope Creek subwatershed to achieve a total reduction in nitrogen loading from existing roadway and nonroadway development in nitrogen loading from existing development of thirty-five percent (35%) relative to the baseline period 1997-2001.

(3) Notwithstanding sub-subdivision (d) of subdivision (4) of State and Federal Rule 15A NCAC 02B .0271, the North Carolina Department of Transportation may achieve the nutrient load reduction goal in subdivision (1) of this section for existing roadway and nonroadway development under its control by development of a load reduction program that addresses both roadway and nonroadway development in the watershed for each arm of Jordan Reservoir. A combined program to address roadway and nonroadway development may include stormwater retrofits and other load-reducing measures in the watershed including, but not limited to, illicit discharge removal; street sweeping; source control activities such as pet waste reduction and fertilizer management at NCDOT facilities; improvement of existing stormwater structures; alternative stormwater practices such as use of rain barrels and cisterns; stormwater capture and reuse; and purchase of nutrient reduction credits. NCDOT may meet minimum implementation rate and schedule requirements by implementing a combination of three stormwater retrofits per year for existing roadway development in the Jordan Lake watershed and other load-reducing measures identified in the program to control nutrient loading from existing development developed pursuant to State and Federal Entities Rule 15A NCAC 02B .0271 and this act and approved by the Commission.

"**SECTION 6.(d)** Additional Rule-Making Authority. – The Commission shall adopt a rule to replace State and Federal Rule 15A NCAC 02B .0271. Notwithstanding G.S. 150B-19(4), the rule adopted by the Commission pursuant to this section shall be substantively identical to the provisions of Section 6(c) of this act. Rules adopted pursuant to this section are not subject to G.S. 150B-21.9 through G.S. 150B-21.14. Rules adopted pursuant to this section shall become effective as provided in G.S. 150B-21.3(b1) as though 10 or more written objections had been received as provided by G.S. 150B-21.3(b2).

"**SECTION 6.(e)** Sunset. – Section 6(c) of this act expires on the date that rules adopted pursuant to Section 6(d) of this act become effective.

"**SECTION 6.(f)** Riparian Buffer Rule 15A NCAC 02B .0267. – Until the effective date of the revised permanent rule that the Commission is required to adopt pursuant to Section 6(h) of this act, the Commission and the Department shall implement the Riparian Buffer Rule 15A NCAC 02B .0267, as provided in Section 6(g) of this act.

"**SECTION 6.(g)** Implementation. – Notwithstanding Riparian Buffer Rule 15A NCAC 02B .0267, the Commission shall implement Riparian Buffer Rule 15A NCAC 02B .0267 as provided in this section.

(1) For purposes of implementing Riparian Buffer Rule 15A NCAC 02B .0267, the Commission may only use one of the following types of maps for purposes of identifying a water body subject to the riparian buffer protection requirements of Riparian Buffer Rule 15A NCAC 02B .0267:

a. The most recent version of the soil survey map prepared by the Natural Resources Conservation Service of the United State Department of Agriculture.

b. The most recent version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States Geological Survey.

c. A map approved by the Geographic Information Coordinating Council and by the Commission. Prior to approving a map under this sub-subdivision, the Commission shall provide a 30-day public notice and opportunity for comment.

(2) Alternative maps approved by the Commission under subdivision (1) of this section shall not be used for buffer delineation on projects that are existing and ongoing within the meaning of subdivision (6) of Riparian Buffer Rule 15A NCAC 02B .0267.

(3) Sub-subdivision a. of subdivision (4) of Riparian Buffer Rule 15A NCAC 02B .0267 shall be interpreted to prohibit only those activities conducted outside the buffer that have the effect of altering the hydrology in violation of the diffuse flow requirements set out in subdivision (8) of Riparian Buffer Rule 15A NCAC 02B .0267.

"**SECTION 6.(h)** Additional Rule-Making Authority. – The Commission shall adopt a rule to replace Riparian Buffer Rule 15A NCAC 02B .0267. Notwithstanding G.S. 150B-19(4), the rule adopted by the Commission pursuant to this section shall be substantively identical to the provisions of Section 6(g) of this act. Rules adopted pursuant to this section are not subject to G.S. 150B-21.9 through G.S. 150B-21.14. Rules adopted pursuant to this section shall become effective as provided in G.S. 150B-21.3(b1) as though 10 or more written objections had been received as provided by G.S. 150B-21.3(b2).

"**SECTION 6.(i)** Sunset. – Section 6(g) of this act expires on the date that rules adopted pursuant to Section 6(h) of this act become effective."

SECTION 8. Sections 5 through 8 of S.L. 2009-216 read as rewritten:

"~~**SECTION 5.**~~**SECTION 7.** No Preemption. – A local government may adopt and implement a stormwater management program that contains provisions that are more restrictive than the standards set forth in Sections ~~2 and 3~~2, 3, and 5 of this act or in any rules concerning stormwater management in the Jordan watershed adopted by the Commission. This section shall not be construed to authorize a local government to impose stormwater management requirements on lands in agriculture or forestry.

"~~**SECTION 6.**~~**SECTION 8.** Construction of Act. –

(1) Except as specifically provided in ~~Sections 2(c) and 3(j)~~Sections 2(c), 3(j), 5(d), and 6(h) of this act, nothing in this act shall be construed to limit, expand, or otherwise alter the authority of the Commission or any unit of local government.

(2) This act shall not be construed to affect any delegation of any power or duty by the Commission to the Department or subunit of the Department.

"~~**SECTION 7.**~~**SECTION 9.** Note to Revisor of Statutes. – Notwithstanding G.S. 164-10, the Revisor of Statutes shall not codify any of the provisions of this act. The Revisor of Statutes shall set out the text of Section 2 of this act as a note to G.S. 143-215.1 and may make notes concerning this act to other sections of the General Statutes as the Revisor of Statutes deems appropriate. The Revisor of Statutes shall set out the text of Sections 3, 4, 5, and 6 of this act as a note to G.S. 143-214.7 and may make notes concerning this act to other sections of the General Statutes as the Revisor of Statutes deems appropriate.

"~~**SECTION 8.**~~**SECTION 10.** Effective Date. – This act is effective when it becomes law."

PART III. ENVIRONMENTAL TECHNICAL CORRECTIONS.

SECTION 9. G.S. 120-70.61(c) reads as rewritten:

"**§ 120-70.61. Membership; cochairs; vacancies; quorum.**

(c) Except as otherwise provided in this section, a legislative member of the Commission shall ~~continue to~~ serve for so long as the member remains a member of the General Assembly and no successor has been appointed. A member of the General Assembly who does not seek reelection or is not reelected to the General Assembly may complete a term of service on the Commission until the day on which a new General Assembly convenes. A legislative member of the Commission who resigns or is removed from service in the General Assembly shall be deemed to have resigned or been removed from office on the Commission. Any vacancy that occurs on the Commission shall be filled in the same manner as the original appointment."

SECTION 10. G.S. 146-64(9) reads as rewritten:

"(9) "Vacant and unappropriated lands" means all State lands title to which is vested in the State as sovereign, and land acquired by the State by virtue of being sold for taxes, except ~~swamplands as hereinafter defined.~~swamplands."

SECTION 11. G.S. 130A-310.11 reads as rewritten:

"**§ 130A-310.11. Inactive Hazardous Sites Cleanup Fund created.**

(a) There is established under the control and direction of the Department the Inactive Hazardous Sites Cleanup Fund. This fund shall be a revolving fund consisting of any monies appropriated for such purpose by the General Assembly or available to it from grants, taxes, and other monies paid to it or recovered by or on behalf of the Department. The Inactive Hazardous Sites Cleanup Fund shall be treated as a nonreverting special trust fund and shall be credited with interest by the State Treasurer pursuant to G.S. 147-69.2 and G.S. 147-69.3.

(b) Funds credited to the Inactive Hazardous Sites Cleanup Fund pursuant to G.S. 130A-295.9 shall be used only as provided in ~~G.S. 130A-309.295.9(c).~~ G.S. 130A-295.9(1) and G.S. 130A-310.5(c)."

PART IV. REPORTS CONSOLIDATION.

SECTION 12. G.S. 106-744(i) reads as rewritten:

"(i) The Advisory Committee shall report no later than ~~May 1~~ October 1 of each year to the Joint Legislative Commission on Governmental Operations, the Environmental Review Commission, and the House of Representatives and Senate Appropriations Subcommittees on Natural and Economic Resources regarding the activities of the Advisory Committee, the agriculture easements purchased, and agricultural projects funded during the previous year."

SECTION 13. G.S. 113-44.15(c) reads as rewritten:

"(c) Reports. – The North Carolina Parks and Recreation Authority shall report no later than October 1 of each year to the Joint Legislative Commission on Governmental Operations, the House and Senate Appropriations Subcommittees on Natural and Economic Resources, the Fiscal Research Division, and the Environmental Review Commission on allocations from the Trust Fund from the prior fiscal year. ~~The Authority also shall provide a progress report no later than March 15 of each year to the same recipients on the activities of and the expenditures from the Trust Fund for the current fiscal year.~~"

SECTION 14. G.S. 113-77.9(e) reads as rewritten:

"(e) Reports. – The Secretary shall maintain and annually revise ~~twice each year~~ a list of ~~acquisitions~~ grants made pursuant to this Article. The list shall include the acreage of each tract, the county in which the tract is located, the amount ~~paid~~ awarded from the Fund to acquire the tract, and the State department or division responsible for managing the tract. The Secretary shall furnish a copy of the list to each Trustee, the Joint Legislative Commission on Governmental Operations, the House and Senate Appropriations Subcommittees on Natural and Economic Resources, the Fiscal Research Division, and the Environmental Review Commission ~~within 30 days after each revision.~~ no later than October 1 of each year."

SECTION 15. G.S. 143-58.2(f) is repealed.

PART V. DELAY EFFECTIVE DATES FOR LAWS GOVERNING THE MANAGEMENT OF DISCARDED COMPUTER EQUIPMENT AND DISCARDED TELEVISIONS.

SECTION 16.(a) Section 16.6 of S.L. 2007-550, as amended by Section 7 of S.L. 2008-208, as amended by Section 11.4 of S.L. 2008-198, reads as rewritten:

"**SECTION 16.6.(a)** Part 2E of Article 9 of Chapter 130A of the General Statutes, as enacted by Section 16.1(a) of this act, becomes effective as follows:

(1) G.S. 130A-309.90 becomes effective ~~1 January~~July 1, 2010.
(2) G.S. 130A-309.91 becomes effective ~~1 January~~ July 1, 2010.
(3) G.S. 130A-309.92 becomes effective ~~1 January~~ July 1, 2010.
(4) G.S. 130A-309.93(a) becomes effective ~~1 January~~ July 1, 2010.
(5) G.S. 130A-309.93(b) becomes effective ~~1 January~~ July 1, 2010.
(6) G.S. 130A-309.93(c) becomes effective ~~1 January~~ July 1, 2010.
(7) G.S. 130A-309.93(d) becomes effective ~~1 January~~ July 1, 2010.
(8) G.S. 130A-309.93(e) becomes effective ~~1 January~~ July 1, 2010.
(9) G.S. 130A-309.93(f) becomes effective ~~1 January~~ July 1, 2010.
(10) G.S. 130A-309.93(g) becomes effective ~~1 February~~ February 1, 2011.

(10a) G.S. 130A-309.93A(a) through (f) become effective ~~1 January~~ July 1, 2010.
(10b) G.S. 130A-309.93A(g) becomes effective ~~1 October~~October 1, 2011.
(10c) G.S. 130A-309.93B becomes effective ~~1 January~~ July 1, 2010.
(11) G.S. 130A-309.94 becomes effective ~~1 January~~ July 1, 2010.
(12) G.S. 130A-309.95(1) becomes effective ~~1 January~~ July 1, 2010.
(13) G.S. 130A-309.95(2) becomes effective ~~1 January~~ July 1, 2010.
(14) G.S. 130A-309.95(3) becomes effective ~~1 January~~ July 1, 2010.
(14a) G.S. 130A-309.95(4) becomes effective July 1, 2010.
(15) G.S. 130A-309.96 becomes effective ~~1 January~~ July 1, 2010.
(16) G.S. 130A-309.97 becomes effective ~~1 January~~ July 1, 2010.
(17) G.S. 130A-309.98 becomes effective ~~15 January~~ January 15, 2011.

"**SECTION 16.6.(b)** Section 16.2 of this act becomes effective ~~1 January~~ July 1, 2010. Sections 16.3 and 16.4 of this act become effective ~~1 January~~ January 1, 2011. Section 16.5 of this act becomes effective ~~1 July~~ July 1, 2010. Subsection (b) of Section 16.1 of this act, Section 16.6 of this act, and any other provision of Section 16 of this act for which an effective date is not specified become effective ~~1 January~~ July 1, 2010."

SECTION 16.(b) Section 8 of S.L. 2008-208 reads as rewritten:

"**SECTION 8.** Sections ~~3, 4, and 5~~3 and 4 of this act become effective ~~1 January~~ January 1, 2011. The remainder of this act becomes effective July 1, 2010. ~~The remainder of this act is effective when it becomes law.~~"

PART VI. EFFECTIVE DATE.

SECTION 17. Sections 12, 13, 14, and 15 of this act become effective January 1, 2010. The remaining sections of this act are effective when this act becomes law.

In the General Assembly read three times and ratified this the 11th day of August, 2009.

s/ Walter H. Dalton
President of the Senate

s/ Joe Hackney
Speaker of the House of Representatives

s/ Beverly E. Perdue
Governor

Approved 1:35 p.m. this 26th day of August, 2009

Appendix B: Proposed DWQ Process for Approving Design Standards and Associated Credit for Candidate Nutrient Load-Reducing Measures

Purpose

The purpose of this guidance is to provide an explicit framework for the Division of Water Quality to apply to approve credit-worthy nutrient load-reducing measures for use by parties subject to existing development stormwater nutrient requirements. This framework may also be useful for approving stormwater measures for purposes of satisfying other Division stormwater rules. For nutrient measures, approval would encompass load reduction methods and values and associated practice design standards. Approval of a measure will add it to the set of those available to parties subject to Division nutrient rules. Candidate measures for review under this process may be developed by the Division or proposed by others. A well-delineated approval process will provide a number of benefits, such as:

- Expediency, consistency and predictability in review of candidate types of pollutant reduction measures across types and across regulatory frameworks;
- A clear and transparent pathway that may incentivize a range of interested parties to identify and pursue development of promising measures, particularly for existing development use;
- Efficient expansion of the set of tools available for regulated parties to cost-effectively achieve existing development and other nutrient source load reductions.

Nature of Approval

Types of Measures: The primary purpose of the process outlined here is to guide approval of ***types*** of nutrient load-reducing measures, and is intended to establish design standards and load reduction crediting methods that will allow site-specific estimation of credit values in all subsequent, conforming individual applications. Types of measures approved under this process are sanctioned by the Division as available for use in individual project applications across Division nutrient strategies as may be limited by the assignment of an approval tier (described more fully below) that reflects the level of confidence in the estimated load reduction benefits and the sustained achievement of those reductions. As described below, the approval tier may limit a measure's applicability to existing development stormwater rule use only, or allow its use across all rules. As with any regulated management practice, the Division's approval of a type of measure would be subject to specified design standards.

Individual Measures: It is also possible for a regulated party to seek approval of an ***individual application of a measure*** under the process described here. This option is envisioned for cases where no significant database of research findings exists for the design in question – e.g. it does not conform to Division-established design specifications or it uses proprietary elements that lack independent testing acceptable to the Division – or where existing research on the design in question has not yet been assembled for Division review of that type of measure. The applicant will be required to rigorously monitor and quantify nutrient load reduction performance of the

individual measure in exchange for receiving year-to-year credit based on the preceding year's monitoring results. The Division would encourage any party considering this option to seek Division input on and review of draft monitoring plans.

This ***conditional, annual approval*** option provides the potential for direct award of credit while a database of performance is being accumulated for the measure in question. Individual measures that receive this approval would not need to meet the eligibility and review expectations outlined later in this guidance, as those are designed to support the lifetime, presumptive performance credit awarded to types of measures. Determination of the point at which sufficient confidence exists in the performance of an individual measure to allow its approval as a new type of measure and thus eligible for a lifetime annual reduction credit value assignment will be case-specific based on the factors identified elsewhere in this guidance. In a given case, it may be appropriate to reach that point gradually via iteratively reduced frequencies of monitoring to verify ongoing credit award.

Once the Division has approved a *type* of measure for nutrient credit, a party would not be able to monitor an individual measure of that type and elect to use such monitoring results as their credit basis. Instead, the Division would at some point expect to add such monitoring results to the knowledge base for that type of measure, potentially resulting in adjustment of the credit already established for that type of measure. The question of whether a given individual measure should be considered sufficiently different from an approved type of measure to seek conditional, annual credit through monitoring would be addressed on a case-specific basis.

Given that this ***conditional, annual approval*** differs from the presumptive lifetime approval given to types of measures as described above, such an individually approved measure would not be included in a Division manual of approved types of measures.

Measures that have not received ***type*** approval or ***conditional, annual*** approval from the Division under the processes outlined here are not recognized by the Division for nutrient compliance credit, and are undertaken at the risk of the implementer.

Regulations Supported

Nutrient Rules: This guidance is intended to establish a Division approval process for nutrient load-reducing measures for use under the following state nutrient rules, as further constrained in the Approval Tiers section below:

- Existing Development Stormwater rules in Jordan and Falls nutrient strategies,
- New Development Stormwater rules across nutrient strategies,
- for potential nutrient "trading" use by any regulated source – agriculture or point source in addition to new or existing development - following Division approval pursuant to "Options for Offsetting Nutrient Loads" rules in Jordan and Falls strategies and under the Nutrient Offset Payments rule 2B .0240, and

- Other similar nutrient rules that may be adopted by the Commission in the future.

State Stormwater and NPDES Stormwater Rules: The Division may elect to use this process to approve new stormwater control measures for addition to its Stormwater Best Management Practices Manual where practices fall within the scope of the manual. DWQ's BMP Manual generally provides guidance for structural engineered stormwater practice design standards for compliance with all state stormwater rules and federally mandated NPDES stormwater rules addressing new development post-construction stormwater controls. For those programs, the Division would require candidate practices to address removal of total suspended solids as well as nutrients, and to meet a high level of confidence in sustained performance of credited load reductions, as described below.

Scope of Approval

For a given ***type*** of measure, Division approval will encompass all aspects of the type of measure considered relevant to its sustained nutrient or TSS reduction capability. This would be expected to include the following:

- ***The Measure:*** Description of intended settings for the type of measure and the character of loads being reduced. Characterization of the nature and range of all design elements and operation requirements (structural measures) or implementation requirements (management measures) that are recognized as having significant bearing on its sustained nutrient or TSS removal performance. The bounds of credit-worthy settings for installation or implementation of the measure, e.g. in-situ soils, meteorology, input loading rates, hydrology, hydraulics, maintenance requirements and frequency, failure warning properties, failure modes, etc. Quantification of significant variations in design or implementation with respect to nutrient removal.
- ***Nutrient, TSS Reduction:*** Establishment of a method, formula or set of values for estimating annual mass nutrient or TSS load reduction associated with specific design or implementation parameters set out in the type of measure description and specifications. The estimator will provide all values or value options needed along with identification of all reasonably available site information to be supplied by the user to yield annual mass load reduction values. The method should provide estimates of mass load reduced to perennial or intermittent stream or other water body. Further extrapolation of load reduction values will vary by individual regulation.

Tiered Approval of Types of Measures

Uncertainty/Risk-Based Approval Tiers: The Division will utilize a 3-tiered approval system reflecting the uncertainty associated with estimated load reductions and with their sustained performance based on review of the information compiled for a given type of measure. The approval tier will connote suitable regulatory applications and the potential for subsequent revision of credit values:

- ***Tier 1*** represents the lowest level of confidence in estimated reductions and their sustained performance that is considered reasonably sufficient to approve a type of practice for regulatory compliance use. Types of measures receiving Tier 1 approval may be used for *Existing Development Stormwater compliance only*. Affected parties generate Tier 1 credits with the understanding that values are likely to be refined after additional study, and credit balances of affected parties will be *adjusted accordingly for existing individual installations* of such types of measures in addition to use of the revised credit values for subsequent new installations of such types of measures. The Division will seek to estimate Tier 1 load reduction values conservatively so that future refinements are more likely to provide additional credit to affected parties than they are reduced credit. The degree of conservatism will be measure-specific. Wherever possible, the judgment will be quantitatively based on use of uncertainty statistics or other available uncertainty information.

- ***Tier 2*** reflects a higher level of confidence in the Division's estimate of sustained reductions than Tier 1. While Tier 2 measures, like Tier 1, may be used only for *Existing Development Stormwater compliance*, the higher confidence level allows the Division to attach the credit value in place at the time of any particular given installation of a Tier 2 measure for the *lifetime of that installed measure*. Should the Division revise credit values in the future, parties who relied on a previous Tier 2 credit assignment toward Existing Development load requirements will not have existing credit balances retroactively modified. As with Tier 1, the Division will seek to estimate Tier 2 values conservatively based on uncertainty information provided in the evaluation.

- ***Tier 3*** reflects a sufficiently high level of confidence to attach a credit value to a given installation of a measure for the *life of that measure's performance under any Division rule*. Tier 3 measures are thus suitable for use in meeting any Division rule requirement including new development applications. While credit values may be adjusted for a Tier 3 type of measure in the future, and subsequently applied to particular applications of that type of measure for their lifetime, the Division's confidence level is intended to be on par with that associated with practices currently included in the state stormwater BMP manual. Should credit values change in the future, parties who rely on Tier 3 estimates of load reduction to comply with new development rule or other nutrient rule requirements will neither be retroactively subjected to additional requirements (if new credit values are lower) nor eligible to claim additional reduction credit (if new credit values are higher) for use or sale to others. While the Division

will, as with Tier 1 and 2 measures, estimate values conservatively, the higher levels of confidence associated with measure performance data will enable the smallest degree of conservatism of any tier.

With sufficient improvements to a type of measure's supporting research data, and the associated reduction in uncertainties, the Division may move a type of measure from Tier 1 to 2 or from Tier 2 to 3. When a type of measure is moved from Tier 1 to 2, the credit assignment established at that time will be applied to all existing individual installations of that type of measure as a final credit adjustment. As with other Tier 2 measures, the new credit value will apply for the lifetime of any individual installations of that type of measure from that point forward.

Rationale for a Tiered Approval System: Emerging nutrient practices vary in level of risk to the state and to the regulated entity when considered for application under a regulatory requirement. New development applications are inherently riskiest to the state given that they require a high level of practice pollutant removal performance for the intended resource protection purposes, and they offer little to no practical recourse for the state should a practice prove less effective either initially or over time than assumed at the time of installation. Thus new development applications may use only measures in which the Division has the greatest confidence that will allow an irreversible presumption that water quality objectives are fully and sustainably met.

A tiered system that includes approval of less certain measures is considered useful and reasonable to provide a greater diversity of control options under Existing Development Stormwater rules while also facilitating cost-effective progress by regulated parties. Existing Development control requirements are a recent regulatory innovation in North Carolina and nationwide, and to this point rely primarily on relatively costly retrofitting of stormwater BMPs into developed landscapes. At the same time, many promising nutrient-reducing measures in need of further development have been identified, and crediting has been established for some measures in some geographies. Regulated parties are public entities with an established, long-term presence and a commitment to responsible stewardship of public trust waters. Existing development regulations to date in North Carolina have lengthy compliance time horizons that, combined with the established presence and public interest of regulated parties and the emerging nature of various nutrient control technologies, support a reasoned approach to management adaptation over time. Regulated parties seek the broadest set of options for compliance along with best available information on cost-effectiveness. They also seek a transparent state pathway for improving the set of available options over time, giving them the ability to contribute to those improvements.

Trading of Tiered Nutrient Credits: Tier 3 load reduction credits are effectively fixed in value and can be traded across all nutrient strategy rules pursuant to rule and strategy requirements. Tier 1 and 2 credits may be traded only toward existing development rule requirements by parties subject to those rules, and the assigned credit tier must be identified as part of the trade. Traded Tier 1 credits will be subject to adjustment the same as non-traded Tier 1 credits, while traded Tier 2 and 3 credit values are fixed for a measure's lifetime as with non-traded Tier 2 and 3 credits.

Eligible Measures

Any form of nutrient load-reducing measure may be considered for approval. This may include new engineered structures or modifications to existing ones, human or other animal behavioral management activities, pump-and-treat systems, asset operation/maintenance improvements, ecosystem or landscape improvements, waste management improvements, or others. To obtain Division approval, a type of measure will have:

- Detailed, scientifically supported load reduction estimation methods along with all necessary values or ranges of values needed to estimate nutrient load reduction credit, and/or TSS credit if applicable, for the specified range of cases, and
- Sufficiently detailed measure descriptions and design specifications containing characterization of essential load-influencing design or operational features.
- Suitable practice settings and limits shall be described and areas of design, operation or estimation uncertainty shall be characterized along with future refinement needs.

Review and Approval of Candidate Types of Load-Reducing Measures

Credit methods and specifications for candidate types of measures may be developed by the Division or proposed by others. The Division will generally utilize the following process to review candidate types of measures for approval:

- The Division considers external vetting and review, when supportable and when internal expertise is limited, to be a valuable part of measure approval for purposes of strengthening design specifications and judgments on credit assignment. This is particularly true given the non-specific nature of the review factors identified below, which is driven by the potentially widely varying nature of candidate types of measures. To the extent that it can be supported, the Division will seek to establish and utilize subject-specific external technical expert review panels as needed to more effectively and efficiently evaluate candidate measures and provide recommendations back to Division staff. For nutrient measures, the Division intends to coordinate this process through the Nutrient Scientific Advisory Board.

- For a candidate type of measure, staff will first review the information provided for sufficiency and request any additional information they consider necessary to allow review. On receipt of a sufficient proposal, staff will evaluate the candidate measure based on applicable factors detailed below. Also when supportable and needed, staff will forward the candidate measure to an appropriate subject matter expert panel for review. The more complete a measure's design specifications and credit method/calculations, the more expediently staff and a panel will be able to make an approval determination.

- Staff will produce draft findings and, when utilizing an expert review panel will obtain draft findings from the panel and will compare them to internal findings to determine the nature of further interactions with the panel. Once interactions with the panel are complete, staff will either draft an approval determination or return a submittal to the proponent. A returned

submittal will either include identification of factors that prohibit approval or it will request or propose modifications to submittal elements. For submitted proposals, the Division will gauge the need for clarification of stakeholder interests regarding a type of measure's character and utility, and may solicit input from potential users in the process of accepting or completing design standards.

- After drafting an approval determination, the Division will provide as full a vetting of a draft measure with affected parties as measure complexity, level of innovation and stakeholder interest suggests. At minimum, an informally noticed 60-day comment period will be provided following release of a draft approved, Tier-assigned measure. Depending on the complexity of a type of measure or the level of concerns raised about it, staff may conduct stakeholder meetings either preceding or concurrent with a comment period to obtain more thorough feedback. Staff may gauge the need for follow-on iterations of public review to adequately address practitioner and third party interests based on the nature and extent of comments received during the comment period.

Approval of Proprietary Systems: Types of measures may be proposed that utilize proprietary technologies. Candidate proprietary systems typically present high levels of uncertainty regarding any number of review factors identified below. To the extent that such technologies prevent or limit understanding of a measure's nutrient removal functions, performance data will need to be commensurately more substantial for a given level of approval to address the performance uncertainties associated with the type of measure. Requirements specific to proprietary stormwater treatment systems for new development post-construction regulatory applications have been set forth in the NC Stormwater BMP Manual. Proprietary systems seeking Tier 3 approval shall meet those requirements in addition to the requirements outlined in this guidance.

Evaluation Factors

To evaluate a candidate type of measure for approval and to assign it an uncertainty Tier, Division staff will consider a range of factors regarding the technical information supporting that type of measure. The following set of factors is intended as a fairly comprehensive reference list that will apply to varying degrees depending on the type of measure. Candidate proposals will also vary in the degree to which they address applicable factors, and this will guide the assignment of a tier. There will also likely be a correlation between the extent of research on a candidate measure and the supportable extent of design specification. Thus, for example, a Tier 3 approval would require a substantial research base reasonably addressing most factors listed below along with a commensurate level of design specification. The level of design specification provided for practices in the NC Stormwater BMP Manual represents perhaps the most thorough to be expected, and would suit a potential Tier 3 approval. It may be reasonable to expect a novel load reduction measure to advance sequentially through approval tiers with time as it increasingly proves its effectiveness in reducing pollutant loads and as knowledge is amassed on design factors controlling nutrient performance.

Measure Design and Operation Specifications

- Sufficiency of design to support intended duration of load reductions
- Structural integrity of design for the intended implementation circumstances
- Adequacy of specification for essential design parameters influencing load reduction values
- Adequacy of operation/implementation requirements
- Provisions for ensuring intended duration of function
- Provisions for reporting/demonstrating continued function
- Provisions for warning of impending failure or maintenance demands

Load Estimation Method

- Appropriate to character of measure type, reasonably addressing its scope, complexity, input and operational variables
- Complete, functionally sound, bug-free
- Supporting research, data synthesis, data and references included
- Design reasonably suited to potential user needs, including physiographic/climatic settings
- Design suited to future improvements commensurate with nature of type of measure
- User guidance included

Uncertainties in Measure Data Collection Approach, Nutrient Transformation Processes, and Estimation Method Design

- Applicability to North Carolina settings and robustness of data quantifying annual mass loads reduced to stream by measure, and of source input loads if appropriate – see Studies Factors below
- Complexity of processes involved in load reduction by measure, and in input loading as appropriate, extent of existing knowledge on processes involved, new information needed
- Level at which estimation method represents processes involved in loading and load reduction
- Extent of use and validation of estimation method, including in North Carolina settings

Studies Factors - Where scientific/technical studies are provided to support load or load reduction estimates or parameters used in estimation methods, staff will evaluate the applicability to North Carolina settings and the robustness of available data based on factors including the following:

Set of Studies

- Number of studies
- Diversity of conditions and designs across studies
- Comparability of study settings to North Carolina conditions
- Variability in results across studies
- Ability to explain variability in results

Each Study

- Climatic, physiographic, geologic setting relative to North Carolina settings
- Characterization of loading input source
- Characterization of measure's design
- Data robustness:
    - Total # observations
    - Extent, depth of observations across range of seasonal variation
    - Extent, depth of observations across range of potential source conditions
    - Extent, depth of observations specific to practice design, operation variations
- QA measures employed, extent of review/approval by others
- Extent/level of peer review of study
- Qualifications of Investigators

Revision of Credit Values or Design Specifications

As additional research sufficiently improves knowledge on design needs or performance of an approved type of measure, the Division will conduct a review process for revision of the applicable elements. Division staff will likely follow a scaled-down version of the measure approval process outlined above, the nature of which including steps included will be commensurate with the significance of the contemplated revision. Minimum approval process steps will likely include internal review, noticing and comment period on draft findings.

Maintenance and Verification of Credit

It is important to recognize that the process outlined in this guidance addresses approval of types of measures or individual measures for adjustable lifetime, fixed lifetime or annual nutrient reduction credit, but that this guidance does not address requirements for verification of ongoing performance of individual installations of types of measures. Verification of ongoing performance for maintenance of assigned credit is different than adjustment of credit assignment for Tier 1 measures. Verification of ongoing performance is an important part of continued crediting of installed measures and is addressed in separate guidance specific to each regulation.