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City of Goldsboro  
Stormwater Management  
Program For Nitrogen Control  
In the Neuse River Basin

**P R E P A R E D F O R**

\_\_\_\_\_  
Goldsboro, North Carolina

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## **1. Introduction**

### **1.1 Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy**

The goal of the Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy (final adoption in August 1998) is to achieve a 30 percent nitrogen reduction from each controllable and quantifiable source of nitrogen in the basin. These sources are Wastewater Treatment, Urban Stormwater, and Agriculture and Nutrient Application. The NSW Strategy also includes a rule to protect riparian buffers (the Riparian Buffer Rule, 15A NCAC 2B .0233) to maintain their existing nitrogen removal capabilities.

The Neuse Stormwater Rule (15A NCAC 2B .0235) only applies to the largest and fastest-growing local governments in the Neuse River Basin (there are 15); Goldsboro is one of the affected governments. The rule establishes a broad set of objectives for reducing nitrogen runoff from urban areas and sets up a process for the Division of Water Quality (DWQ) to work with the affected local governments to develop a model stormwater program for meeting the objectives. The timeframe for implementation of the rule is as follows:

- September 9, 2000: Deadline for submittal of local Stormwater Management Program (including ordinances) to the Environmental Management Commission (EMC).
- March 9, 2001: Deadline for local governments to begin implementing local Stormwater Management Programs.

Each stormwater management program must include the following general elements: New Development Review/Approval, Illegal Discharges, Retrofit Locations, and Public Education. Following implementation of the local Stormwater Management Programs, local governments are required to make annual progress reports to EMC by October 30 of each year that include nitrogen loading reduction estimates.

This document details the City of Goldsboro's Stormwater Management Program for Nitrogen Control in the Neuse River Basin. It closely follows the guidance provided in the *Neuse River Basin: Model Stormwater Program for Nitrogen Control* dated August 30, 1999. The implementation dates listed above differ from those listed in the model plan. The EMC committee decision to approve the model local government stormwater program occurred on September 9, 1999; the Stormwater Rule allows 12 months from EMC approval before the subject local governments must submit their local stormwater management program plans to the Commission for review and approval, and 18 months before the programs must be implemented.

### **1.2 Goldsboro's Stormwater Management Program**

#### **1.2.1 Program Goals**

The City of Goldsboro is taking a proactive approach to the management and control of stormwater in both the City proper and in its Extraterritorial Jurisdictions (ETJs). Rather than simply meet the requirements for nitrogen control as dictated by the Neuse NSW Strategy, Goldsboro is structuring their Stormwater Management Program to also address the concerns and expected requirements of EPA's Phase II Stormwater Rule. The City has also prepared their program to be no less stringent

than the program for Wayne County, which is also subject to the Neuse Stormwater Rule. Teaming possibilities with Wayne County will continually be explored, particularly in the areas of public education and outreach, and public participation/involvement. In this way, Goldsboro and its constituents will garner the benefits of an integrated stormwater management program that requires the least expenditure of financial and personnel resources and avoids duplication of effort.

Another goal of this program is to provide uniform guidelines and requirements for development and growth in both the City of Goldsboro and throughout Wayne County. Although the process may differ in each jurisdiction, the program elements and requirements of both Stormwater Management Programs will be consistent. Fee schedules and penalties will be no less rigorous than those required by Wayne County. Other incorporated areas will be considered in this process. This will serve not only to avoid inappropriate and unbalanced development as a result of program implementation, but will provide standardized requirements for unincorporated areas which undergo annexation.

#### 1.2.2 Organization of this Stormwater Management Program

This document reflects the basic organization of the *Neuse River Basin: Model Stormwater Program for Nitrogen Control*, and incorporates some additional components from EPA's Phase II Stormwater Rule. Section 2.0 presents Goldsboro's Program Plan for New Development. Section 3.0 discusses their Program Plan for Illegal Discharges. Section 4.0 explains the methodology for Identifying Retrofit Locations. Public Education and Public Involvement are discussed in Section 5.0. Section 6.0 discusses the Phase II requirements for Pollution Prevention/Good Housekeeping. Section 7.0 details the annual Evaluation and Reporting requirements.

#### 1.2.3 Responsibilities

The implementation of this Stormwater Management Program for Nitrogen Control will be the responsibility of the City Manager. Oversight will be provided by an internal Steering Committee, comprised of representatives from the following departments: Manager's Office, General Services, Planning, Community Affairs, Engineering, Finance, and Recreation and Parks. This Steering Committee, in conjunction with the City Manager, assigned responsibilities for program implementation, considered staffing and budgetary requirements, identified obstacles to implementation, and developed strategies to remove obstacles and/or provide incentives for program participation. Meetings will be held on a quarterly basis to review the implementation of the program and to address any new issues which may arise.

## **2. Program Plan for New Development**

### **2.1 Controlling Nitrogen Through the New Development Review/Approval Process**

Section 32.088 of Goldsboro's Code of Ordinances states that no new or redevelopment project may proceed before all permits are secured, which requires that the site plan be submitted to and approved by the Planning and Engineering Departments of the city. It will be during this established development review process that the City will review the Neuse Stormwater Rule components of any project falling under the "New Development" definition. Appendix A contains "An Ordinance to

Implement Stormwater Management Regulations for New Development” to establish the authority to require compliance with the Program Plan for New Development within the City proper and its ETJ, as detailed in this section. The developer or builder will be required to comply with these provisions for any new development which falls under either of the following definitions:

- Any activity that disturbs greater than one acre of land in order to establish, expand, or modify a single family or duplex residential development or a recreational facility. [Land disturbance is defined as grubbing, stump removal, and/or grading.]
- Any activity that disturbs greater than one-half an acre of land in order to establish, expand, or modify a multifamily residential development or a commercial, industrial, or institutional facility.

To fund this additional new development review process, the City Council may set a fee structure for the cost of reviewing all Building Permit applications for compliance with the ordinance. All such projects will be required to meet the goal of a 30 percent nitrogen reduction by implementation of planning considerations and best management practices (BMPs). Agriculture, mining, or forest activities, and property owners with vested rights are not subject to the requirements of new development and will receive a waiver. Vested rights must be demonstrated by the property owner as of the effective date of this Stormwater Management Program (as adopted by the City Council) and may be based on at least one of the following:

- substantial expenditures of resources as determined by the Engineering Department (time, labor, money) based on a good faith reliance upon having received a valid local government approval to proceed with the project, or
- having an outstanding valid building permit in compliance with G.S. 153A-344.1 or G.S. 160A-385.1, or
- having an approved site specific or phased development plan in compliance with G.S. 153A-344.1 or G.S. 160A-385.1.

Projects that require a state permit, such as landfills, NPDES wastewater discharges, land application of residuals and road construction activities shall be considered to have vested rights if a state permit was issued prior to the effective data of this Local Stormwater Management Program.

Currently, Recreation and Parks projects for the City do not require permits. To ensure that all such projects comply with the provisions of the Neuse Stormwater Rule, and eventually EPA’s Phase II Rule, all park projects will be required to undergo an internal review by the Planning and Engineering Departments.

New development will be limited to 3.6 pounds per acre per year (lbs/ac/yr) nitrogen loading. Property owners will have the option to partially offset projected nitrogen loads by funding wetland or riparian area restoration through the NC Wetlands Restoration Program (WRP). As established by Rule \*15A NCAC 2B .0240, the rate shall be \$28.35/lb/yr, at an amount sufficient to fund 30 years of nitrogen reduction. The result is a one-time offset payment of \$850.50/lb/ac which must be paid prior to approval of the development plan. However, no new residential development will be permitted to exceed a total nitrogen loading rate of 6.0 lbs/ac/yr, and no new nonresidential development will be permitted to exceed 10.0 lbs/ac/yr.

The nitrogen export standard of 3.6 lbs/ac/yr was estimated by the EMC to be 70 percent of the average nitrogen load contributed by the nonurban areas in the Neuse River basin (as defined using 1995 LANDSAT data). It is understood that the EMC may periodically update the performance standard based on the availability of new scientific information.

#### 2.1.1 Calculating Nitrogen Export from New Development

The nitrogen export from each new development will be calculated. Annual reports must contain the computed baseline and net change in nitrogen export from new development that year. Goldsboro will utilize the methodologies as they are detailed below. The Inspection Department will supply the necessary worksheets for the developer or builder to perform these calculations at new development sites as part of their building permit submission (to ensure that the 30 percent reduction has been attained or that appropriate and sufficient BMPs have been planned and/or offset fees paid). The calculations will be verified by the Engineering Department then, and again prior to issuance of the Certificate of Occupancy (to ensure that the site was developed as planned, and that any required BMPs have been constructed properly).

1. **Method 1** for residential developments where lots are shown but the actual footprint of buildings are not shown on site plans. The impervious surface resulting from building footprints is estimated based on typical impervious area associated with a given lot size. Figure 2.1 contains the worksheet for this calculation.
2. **Method 2** for residential, commercial, and industrial developments when the entire footprint of the roads, parking lots, buildings, and any other built-upon area is shown on the site plans. Figure 2.2 contains the worksheet for this calculation.
3. **For nonresidential subdivisions where the impervious surfaces are not shown on the plans at the time of submittal**, the developer or builder will specify areas of impervious surface, undisturbed open space, and managed open space in their Building Permit application, assuming the maximum impervious surfaces and minimum open space for the project design. The City has established the Building Permit as a legal, enforceable mechanism to hold the developer or builder accountable for their estimations of each land use type. The developer or builder will then use Method 2 (Figure 2.2) for their calculation.
4. **For redevelopment projects**, Method 2 must be used to estimate the nitrogen loading from the site before and after the redevelopment project takes place. As long as the redevelopment project does not increase the nitrogen loading from the site, the developer shall be exempt from the program requirements for nitrogen control on new development.

To determine how a site should be defined in terms of new development or redevelopment, developers should consult Table 2.1 Decision Tree and read the summary that follows. Terms that are used in Table 2.1 are defined in Table 2.2 Definitions.

Table 2.1 Decision Tree

|   |         |  |
|---|---------|--|
| Is the site defined properly, i.e., 1) if a subdivision for single family housing or duplexes, are all the individual lots and common areas included in the tract of land submitted by the developer, 2) if a multifamily, industrial, retail, or commercial development without any subdivision, is all the land on the site included as one lot or parcel, or 3) if a subdivided multifamily, industrial, retail, or commercial development, all land that is not part of the subdivision is contained within one lot or parcel, and all lots are included in the tract of land submitted by the developer? | NO<br>→ | Resubmit the site plan once the site has been correctly defined.   |
| YES↓  |         |  |
| Will the activity at the site disturb greater than one-half acre (for a multifamily residential development or a commercial, industrial, or institutional facility) or one acre (single family or duplex residential development or a recreational facility) of land?   | NO<br>→ | The site does not fall under the purview of the City/County's SWMP   |
| YES↓  |         |  |
| Will the activity at the site add to or change the amount of impervious or partially impervious surface of the site, or otherwise decrease the infiltration of precipitation?   | NO<br>→ | The site does not fit the definition of development as shown in 15A NCAC 02B.0202 (23) and therefore does not fall under the purview of the City/County's SWMP |
| YES↓  |         |  |
| Has the site or a portion of the site ever been developed?  | NO<br>→ | Follow the rules in the SWMP for new development.  |
| YES↓  |         |  |
| Is the footprint of the built-up/impervious areas of the site known?  | NO<br>→ | Follow the rules in the SWMP for new development   |
| YES↓  |         |  |
| Is the new use of the site the same as its previous use?  | NO<br>→ | Follow the rules in the SWMP for new development   |
| YES↓  |         |  |
| Does the site or portion of the site have existing buildings, roadways, parking areas, or other built-up areas?   | NO<br>→ | Follow the rules in the SWMP for redevelopment.  |
| YES↓  |         |  |

|   |          |   |
|---|----------|---|
| Will any portion of the existing built-up area be rebuilt, demolished and/or removed?   | YES<br>→ | Follow the rules in the SWMP for redevelopment.   |
| NO↓   |          |   |
| Will buildings, roadways, parking, or other built-up areas be added to the site?  | YES<br>→ | Follow the rules in the SWMP for new development for that portion of the site where activity will occur after the effective date of the SWMP (March 1, 2001). |
| NO↓   |          |   |
| Will the land-disturbing activity result in an increase of impervious or partially impervious area, such as the managed portions of a golf course?  | YES<br>→ | Follow the rules in the SWMP for new development for that portion of the site where activity will occur after the effective date of the SWMP (March 1, 2001). |
| NO↓   |          |   |
| As long as the site does not increase the impervious or partially impervious area of the site, and provides equal or greater stormwater control than the previous development, the site meets the requirements of the SWMP. |          |   |
| <b>STOP</b>   |          |   |

Summary:

An activity is considered **new development** if the site meets any one of the following:

- The site has never been developed.
- The site was developed and then demolished and no footprint of the previous impervious area is available.
- The site was developed and then demolished and the previous use of the site has changed.
- If a portion of a site is undergoing redevelopment and another portion of this site that was previously undeveloped is undergoing improvement, then the activity on the previously undeveloped portion of this site is considered new development.

An activity is considered **redevelopment** if the site meets any one of the following:

- The site was developed and then demolished and a footprint of the previous impervious area is available.
- The site was developed prior to March 1, 2001, which is the implementation date of the City's ordinance for Stormwater Management for New Development.

In addition, for either new development or redevelopment, the **site boundaries** must contain only one parcel, lot or tract of land. Adjoining parcels, lots or tracts of land cannot be utilized for calculation of nitrogen export and/or peak runoff unless the adjoining parcels, lots or tracts of land are combined with the original site into one parcel in accordance with the City's Subdivision Regulations.

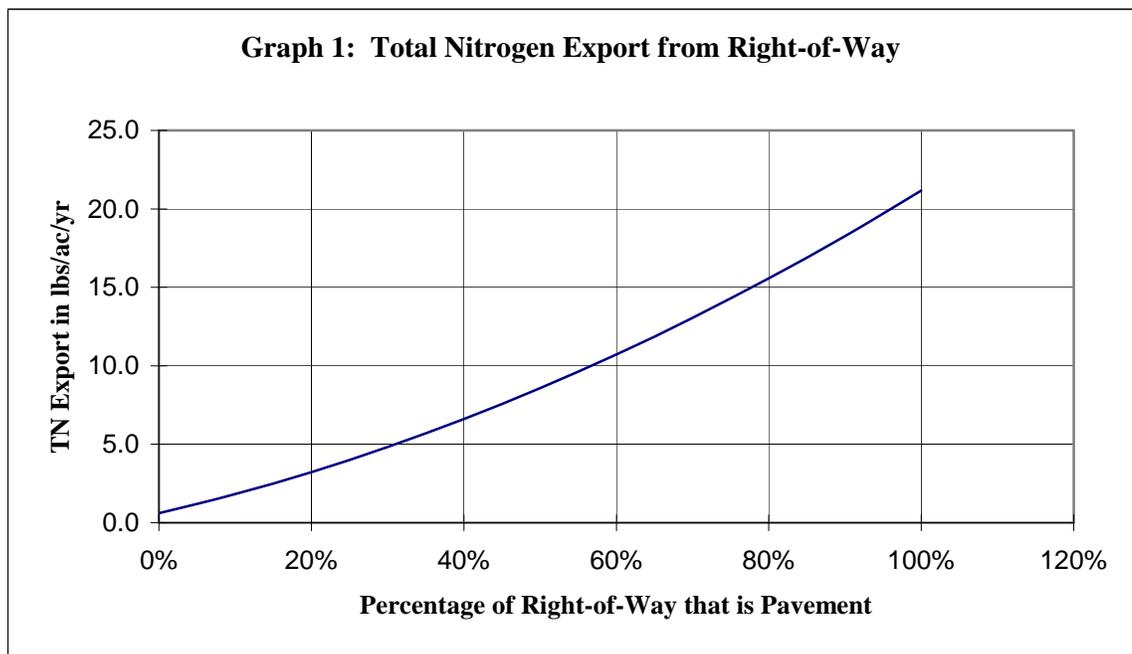
Table 2.2 Definitions

| Terms           | Definitions and Source   |
|-----------------|--|
| Development     | 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 (North Carolina Administrative Code, NCAC).   |
| New Development | Development that has occurred since March 1, 2001 and previously developed sites that add built-upon area after March 1, 2001 (Goldsboro's Stormwater Management Program, SWMP).   |
| Redevelopment   | Previously developed sites that undergo rebuilding activity after March 1, 2001 (SWMP).  |
| Built-upon Area | Built-upon Area means that portion of a development project that is covered by impervious or partially impervious cover including buildings, pavement, gravel areas (e.g. roads, parking lots, paths), recreation facilities (e.g. tennis courts), etc. (Note: Wooden slatted decks and the water area of a swimming pool are considered pervious) (NCAC). |
| Rebuild         | 1) To build again. 2) To make extensive structural repairs on. 3) To remodel or make extensive changes in: <i>tried to rebuild society</i> (Dictionary).   |
| Lot             | A portion of a subdivision or any other parcel of land intended as a unit for transfer of ownership or for development or both (Goldsboro Ordinance).  |
| Subdivision     | Includes all divisions of a tract or parcel of land into two or more lots, building sites, or other divisions, for the purpose, whether immediate or future, of sale or building development, and . . . (Goldsboro Ordinance).   |
| Tract           | 1) An extended area, as of land or water. 2) A development. (Dictionary)   |

**Figure 2.1 Worksheet for Method 1: Quantifying Total Nitrogen Export from Residential Developments when Building and Driveway Footprints are Not Shown**

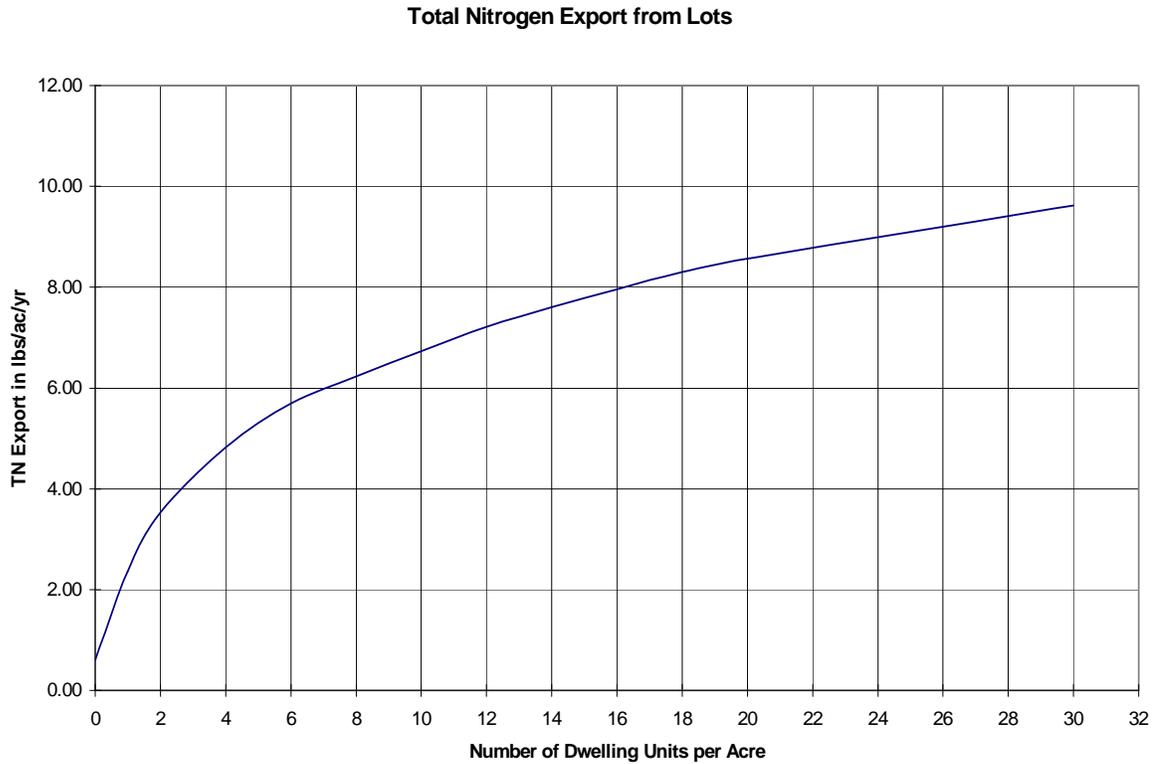
- Step 1: Determine area for each type of land use and enter in Column (2).
- Step 2: Total the areas for each type of land use and enter at the bottom of Column (2).
- Step 3: Determine the TN export coefficient associated with right-of-way using Graph 1.
- Step 4: Determine the TN export coefficient associated with lots using Graph 2.
- Step 5: Multiply the areas in Column (2) by the TN export coefficients in Column (3) and enter in Column (4).
- Step 6: Total the TN exports for each type of land use and enter at the bottom of Column (4).
- Step 7: Determine the export coefficient for site by dividing the total TN export from uses at the bottom of Column (4) by the total area at the bottom of Column (2).

| (1)<br>Type of Land Cover   | (2)<br>Area<br>(acres) | (3)<br>TN export coeff.<br>(lbs/ac/yr) | (4)<br>TN export from use<br>(lbs/yr) |
|---|------------------------|--|---------------------------------------|
| <b>Permanently protected undisturbed open space</b> (forest, unmown meadow) |                        | 0.6                                    |                                       |
| <b>Permanently protected managed open space</b> (grass, landscaping, etc.)  |                        | 1.2                                    |                                       |
| <b>Right-of-way</b> (read TN export from Graph 1)                           |                        |  |                                       |
| <b>Lots</b> (read TN export from Graph 2)                                   |                        |  |                                       |
| <b>TOTAL</b>  |                        |  |                                       |



**Figure 2.1 (cont'd). Worksheet for Method 1: Quantifying Total Nitrogen Export from Residential Developments when Building and Driveway Footprints are Not Shown**

**Graph 2: Total Nitrogen Export from Lots**



**Figure 2.2 Worksheet for Method 2: Quantifying Total Nitrogen Export from Residential/Industrial/Commercial Developments when Footprints of all Impervious Surfaces are Shown**

- Step 1: Determine area for each type of land use and enter in Column (2).  
 Step 2: Total the areas for each type of land use and enter at the bottom of Column (2).  
 Step 3: Multiply the areas in Column (2) by the TN export coefficients in Column (3) and enter in Column (4).  
 Step 4: Total the TN exports for each type of land use and enter at the bottom of Column (4).  
 Step 5: Determine the export coefficient for site by dividing the total TN export from uses at the bottom of Column (4) by the total area at the bottom of Column (2).

| (1)<br>Type of Land Cover   | (2)<br>Area<br>(acres) | (3)<br>TN export coeff.<br>(lbs/ac/yr) | (4)<br>TN export from use<br>(lbs/yr) |
|---|------------------------|--|---------------------------------------|
| <b>Permanently protected undisturbed open space</b> (forest, unmown meadow)                   |                        | 0.6                                    |                                       |
| <b>Permanently protected managed open space</b> (grass, landscaping, etc.)                    |                        | 1.2                                    |                                       |
| <b>Impervious surfaces</b> (roads, parking lots, driveways, roofs, paved storage areas, etc.) |                        | 21.2                                   |                                       |
| <b>TOTAL</b>  |                        | ---                                    |                                       |

The rule requires that all new developments achieve a nitrogen export of less than or equal to 3.6 pounds per acre per year. If the development contributes greater than 3.6 lbs/ac/yr of nitrogen, then the options shown in Table 2.2a are available based on whether the development is residential or nonresidential.

**Table 2.2a: Nitrogen Export Reduction Options**

| Residential  | Commercial / Industrial   |
|--|---|
| If the computed export is less than 6.0 lbs/ac/yr, then the owner may either: <ol style="list-style-type: none"> <li>1. Install BMPs to remove enough nitrogen to bring the development down to 3.6 lbs/ac/yr.</li> <li>2. Pay a one-time offset payment of \$850.50/lb to bring the nitrogen down to the 3.6 lbs/ac/yr.</li> <li>3. Do a combination of BMPs and offset payment to achieve a 3.6 lbs/ac/yr export.</li> </ol> | If the computed export is less than 10.0 lbs/ac/yr, then the owner may either: <ol style="list-style-type: none"> <li>1. Install BMPs to remove enough nitrogen to bring the development down to 3.6 lbs/ac/yr.</li> <li>2. Pay a one-time offset payment of \$850.50/lb to bring the nitrogen down to the 3.6 lbs/ac/yr.</li> <li>3. Do a combination of BMPs and offset payment to achieve a 3.6 lbs/ac/yr export.</li> </ol> |
| If the computed export is greater than 6.0 lbs/ac/yr, then the owner must use on-site BMPs to bring the development's export down to 6.0 lbs/ac/yr. Then, the owner may use one of the three options above to achieve the reduction between 6.0 and 3.6 lbs/ac/yr.   | If the computed export is greater than 10.0 lbs/ac/yr, then the owner must use on-site BMPs to bring the development's export down to 10.0 lbs/ac/yr. Then, the owner may use one of the three options above to achieve the reduction between 10.0 and 3.6 lbs/ac/yr.   |

**Peak Runoff Worksheet**  
For Small Drainage Areas in Mid-Neuse Basin

| <b>Pre-Development</b>                   |   |         |            |              |
|--|---|---------|------------|--------------|
|  | Undisturbed                                       | Managed | Impervious | Total        |
| Area                                     | $A_U =$   | $A_M =$ | $A_I =$    | $A_T =$      |
| $C_{(weighted\ average)}$                | 0.2   | 0.3     | 0.9        |              |
| <i>Equation 1</i>                        | $C_w = (0.2 * A_U + 0.3 * A_M + 0.9 * A_I) / A_T$ |         |            | $C_w =$      |
| <b>Time of Concentration</b>             |   |         |            |              |
| Height of most remote point above outlet |   |         |            | H =          |
| Length (maximum) of stormwater travel    |   |         |            | L =          |
| <i>Equation 2</i>                        | $T_{OC} = [ ( L^3 / H )^{0.385} ] \div 128$       |         |            | $T_{OC} =$   |
| Intensity                                |   |         |            |              |
| <i>Equation 3</i>                        | $I = 112 / (20 + T_{OC})$                         |         |            | I =          |
| Quantity of Flow                         |   |         |            |              |
| <i>Equation 4</i>                        | $Q_{PRE} = A_T * C_w * I$                         |         |            | $Q_{PRE} =$  |
| <b>Post-Development</b>                  |   |         |            |              |
|  | Undisturbed                                       | Managed | Impervious | Total        |
| Area                                     | $A_U =$   | $A_M =$ | $A_I =$    | $A_T =$      |
| $C_{(weighted\ average)}$                | 0.2   | 0.3     | 0.9        |              |
| <i>Equation 1</i>                        | $C_w = (0.2 * A_U + 0.3 * A_M + 0.9 * A_I) / A_T$ |         |            | $C_w =$      |
| <b>Time of Concentration</b>             |   |         |            |              |
| Height of most remote point above outlet |   |         |            | H =          |
| Length (maximum) of stormwater travel    |   |         |            | L =          |
| <i>Equation 2</i>                        | $T_{OC} = [ ( L^3 / H )^{0.385} ] \div 128$       |         |            | $T_{OC} =$   |
| Intensity                                |   |         |            |              |
| <i>Equation 3</i>                        | $I = 112 / (20 + T_{OC})$                         |         |            | I =          |
| Quantity of Flow                         |   |         |            |              |
| <i>Equation 4</i>                        | $Q_{Post} = A_T * C_w * I$                        |         |            | $Q_{Post} =$ |

Notes:

May use Figure 8.03a (Nomograph) from NC Erosion and Sediment Control Planning and Design Manual

Use equation or nomograph for

- natural basins with well defined channels,
- overland flow on bare earth,
- and mowed grass roadside channels.

For overland flow, grassed surfaces, multiply  $T_{OC}$  by 2

For overland flow, concrete or asphalt surfaces, multiply  $T_{OC}$  by 0.4

For concrete channels, multiply  $T_{OC}$  by 0.2

Prepared by \_\_\_\_\_ Date \_\_\_\_\_  
Project \_\_\_\_\_

### 2.1.2 Methodology for Calculating Peak Runoff Volumes

The Neuse Stormwater Rule states that there can be no net increase in peak flow leaving a new development site from the predevelopment conditions for the 1-year, 24-hour storm. The Inspection Department will provide the developer or builder with a worksheet (Figure 2.3) that employs The Rational Method to determine the peak flow from both the pre-development (performed prior to issuance of the Building Permit) and post-development (performed prior to issuance of the Certificate of Occupancy) conditions. The Rational Method is the most common method for computing the peak rate of runoff from small drainage basins (up to 150 acres). If peak runoff needs to be calculated from a larger drainage area (more than 150 acres), the Peak Discharge Method as described in the USDA Soil Conservation Service's Technical Release Number 55 (TR-55) will be employed. This methodology will be used for computing pre- and post-development conditions. (Note: The Putnam Method, while allowed by the Model Plan, was developed specifically for the Piedmont region of North Carolina, and will not be used for calculations in Goldsboro, which lies in the Coastal Plain.)

The equation for calculating peak runoff under the Rational Method is:

$$Q_p = Aci$$

where

- $Q_p$  = peak runoff, cfs
- $A$  = drainage area, acres
- $c$  = runoff coefficient, dimensionless
- $i$  = rainfall intensity, inches/hour

The acreage for each land use type will already be known from calculating the nitrogen export as described in Section 2.1.1. The runoff coefficients for a variety of surface types can be gotten from a table, such as the one developed by the American Society of Civil Engineers (ASCE) & Water Environmental Federation (in *Design and Construction of Urban Stormwater Management Systems*, 1972). However, as stated by John E. Gribbin in *Hydraulics and Hydrology for Stormwater Management* (1997), typical design values for runoff coefficients are 0.90 for impervious surfaces, 0.30 for permanently protected managed open space (such as lawns), and 0.20 for permanently protected undisturbed open space (such as woods and brush).

In keeping with the spirit of the rule, and to maintain consistency with the approach taken to calculate total nitrogen export (where total nitrogen export coefficients are set), Goldsboro will adopt these typical design values for the runoff coefficient. This will result in a more consistent, objective, and straightforward calculation of peak runoff that does not need to take into account the effects of soils, rainfall intensity and duration, slope, and impervious surface. A worksheet has been prepared for the Rational Method peak runoff calculation (Figure 2.3) which is patterned after the method outlined in the NC Erosion and Sedimentation Control Planning and Design Manual.

The peak runoff calculation will be performed by the developer or builder for their Building Permit submission. Prior to issuance of a Building Permit, the post-development peak flow must be calculated to be equal to or less than the pre-development peak flow (which may require the implementation of one or more BMPs), unless one of the two following conditions are met:

- The increase in peak flow between the pre- and post-development conditions does not exceed ten percent.
- The proposed new development meets all of the following criteria: overall impervious surface is less than 15 percent, and the remaining pervious portions of the site are utilized to the maximum extent practical to convey and control the stormwater runoff (as determined by the City Engineering Department).

Upon completion of the development project, and prior to approval of a Certificate of Occupancy, the post-development peak flow will again be calculated to ensure compliance with the regulations detailed above. Section 32.089 of the City Ordinances establishes the administrative procedure for ensuring this step by stating, “No Certificate of Occupancy shall be issued by the Building Inspector until the Planning Department and the Engineering Department of the city have certified that site improvements have been completed in accordance with the plan previously submitted and approved.”

Because of the existence of local flooding problems, peak flow calculations may indicate the need for stormwater detention in areas that would actually increase flooding problems as a result of their implementation. For sites that are in (or drain to) these flood-prone areas, exemptions may be granted on a case-by-case basis. Chapter 151 of the City Code of Ordinances details Flood Damage Prevention and addresses this problem, and is included in Appendix B. Section 151.04 (E) states that this ordinance is designed to “Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.”

#### 2.1.3 Goldsboro’s Choice for Protection of Riparian Buffers in New Developments

The Neuse Stormwater Rule requires local governments to ensure that riparian areas are protected on new developments in accordance with the Riparian Buffer Rule (15A NCAC 2B .0233). The rule requires protecting and maintaining the 50-foot riparian buffers on all sides of intermittent and perennial streams, ponds, lakes, and estuaries in the Neuse River Basin. These waters must be shown on the most recent version of either a Natural Resources Conservation Service (NRCS) Soil Survey county map or a 1:24,000 scale (7.5 minute quadrangle) topographic map prepared by the US Geological Survey (USGS).

The City of Goldsboro will refrain from issuing local approvals for any new development activity that is proposed to take place within the first 50 feet adjacent to an affected water body, unless:

- a. the person requesting the approval does not propose to impact the riparian buffer of a surface water indicated on the NRCS or USGS maps listed above, or
- b. the property owner has received approval by DWQ. DWQ approval could be:
  - an on-site determination from DWQ that surface waters are not present,
  - an Authorization Certificate for a use designated as Allowable,
  - an Authorization Certificate and approval on a mitigation plan for a use designated as Allowable with Mitigation, or

- a variance.

As part of this Stormwater Management Program, Goldsboro will record riparian areas to be protected on new or modified plats.

## 2.2 Best Management Practices (BMPs)

### 2.2.1 Choosing BMPs

Site planning practices that reduce nitrogen loadings from new development (including reducing impervious surfaces and protecting open spaces) will be encouraged; however, BMPs may still be required. Property owners will be instructed to consider the ability of the BMP(s) to reduce their nitrogen loading within acceptable limits, as well as the issues of aesthetics, long-term maintenance, safety, and reliability of the BMP design.

In conjunction with the Public Education component of this plan (Section 5.0), information sources will be made available to property owners and developers explaining the benefit to them of incorporating site planning practices into their new development plans from the onset (reducing road widths, reducing minimum parking requirements, minimizing use of curb and gutter, allowing cluster or open-space developments, allowing traditional neighborhood developments, and others). If they do not choose to incorporate these practices, or if BMPs are still required, information sources may be provided on the various BMPs available for nitrogen reduction, their individual effectiveness and cost, as well as data on which methods work best for the area's soil type(s). If more than one BMP is installed in series on a development, then the removal rate shall be determined through serial rather than additive calculations. As research and development in this field progresses, information sources on new BMP techniques or improvements in established BMP techniques may also be disseminated as part of the Public Education Action Plan.

The BMPs which may currently be utilized for reducing nitrogen from new developments are listed below. The estimated total nitrogen removal rate for each BMP is included in parenthesis.

- Dry detention ponds 10%
- Wet detention ponds (25%)
- Constructed wetlands (40%)
- Open channel practices (20%)
- Riparian buffers (30%)
- Bioretention (25%)
- Vegetated filter strips with level spreader (20%)
- Sand filters (35%)

- Proprietary BMPs (varies)

If a builder or developer includes one or more BMPs as part of the site design, they will be required to provide an engineering certification of the design at the time they submit their Building Permit application. Prior to issuance of a Certificate of Occupancy, the builder or developer will be required to submit an engineering certification that the BMP was constructed as designed and is operating properly.

#### 2.2.2 Long-Term Maintenance Plan for BMPs

The Inspection Department will conduct annual inspections of all BMPs as part of their inspection program. An annual inspection fee will be charged to fund this additional inspection program (as adopted by the City Council). A current list of all BMPs, their location, and status will be maintained by the Engineering Department to assist in the inspection process. BMPs will be required to be on the same lot as the new development, unless waived because of potential flooding problems, or unless an off-site location for the BMP has been approved by the City's Planning and Engineering Departments.

The City of Goldsboro took the following approach for the long-term maintenance of BMPs:

The City will notify the owner upon finding that maintenance is needed on a BMP. If the owner does not complete the maintenance in a timely manner (180 days), then the City will contract out the maintenance and recover costs in the manner it determines most appropriate.

The Stormwater Management Ordinance (Appendix A) details the allowable BMPs as well as the maintenance of BMPs. The maintenance section refers to Section 96 of the Code of Ordinances, which contains the following subchapters: Improperly Operating BMPs are Prohibited, Responsibility for Maintenance; Compliance with Provisions; and Inspections and Annual Inspection Fee.

#### 2.3 Local Ordinance Review of Land-Use Planning and Design Techniques

The Model Plan addresses the use of land-use planning provisions to reduce impervious surfaces with design techniques and thereby reducing the need for BMPs and associated maintenance concerns. Jurisdictions are required to show they reviewed local ordinances with regard to the following planning techniques (and the general advantages and disadvantages of incorporating these approaches at the local level) and show that they have provided adequate flexibility for developers to utilize planning measures to reduce impervious surfaces. This review is intended to look for opportunities where these measures could be allowed, or obstacles to their use could be removed.

- Reducing road widths
- Reducing minimum parking requirements
- Minimizing curb and gutter use
- Cluster or open-space developments

- Traditional neighborhood developments
- Mixed-use developments

This review is underway by the Planning and Engineering Departments. It is anticipated that Goldsboro will insert verbiage into the City Ordinances as well as in the Technical Design and Details Manual which encourages, and allows for, variances in the items listed above. Variations in those planning and design techniques will be considered on a case-by-case basis provided that the measures would decrease impervious surface area, while still fulfilling the basic needs of the Planning and Engineering Departments.

#### **2.4 Jurisdiction-Wide and Inter-local Approaches**

Jurisdiction-wide and inter-local approaches may be incorporated into the City’s Stormwater Management Program if appropriate information shows how they will achieve the nitrogen loading reduction requirements applicable to new development. Some ideas include:

- Creating regional stormwater management facilities (such as ponds). Would require on-site controls to locally protect against water quality degradation and flooding, and Neuse buffer requirements may impact the feasibility of some approaches.
- “Land Banking” within the same watershed where development is occurring. Land should have significant water quality value and secured in a permanent conservation easement or equivalent legal mechanism prohibiting both farming and unapproved logging practices, tracked on GIS, and recorded on the plat or deed.

Prior to incorporating such approaches into the City’s Stormwater Management Program, it will demonstrate and quantify the associated nitrogen removals to DWQ and the EMC.

#### **2.5 EPA’s Phase II Stormwater Requirements**

EPA’s Phase II Stormwater Rule contains two minimum control measures which fall within this Program Plan for New Development: Construction Site Runoff Control and Post-Construction Runoff Control. Because of the way the Neuse Stormwater Rule is structured – limiting nitrogen export, freezing peak runoff volumes, establishing protection for riparian buffers in new development, and requiring the installation and maintenance of BMPs where necessary – the majority of the Phase II requirements for development controls are addressed through this Program Plan. However, modifications have been incorporated into this SWMP to comply with the Phase II program in the future.

##### **2.5.1 Construction Site Runoff Control**

The Construction Site Runoff Control Minimum Control Measure requires a regulatory mechanism to control polluted runoff from construction sites; a site plan review process to control erosion and sediment and other waste at the site; an inspection and enforcement program of control measures to deter infractions; and a procedure for the receipt and consideration of public enquires, concerns, and information submitted regarding local construction activities. The State Sedimentation Control Act

(Title 15A, Chapter 4) and the State’s NPDES general stormwater permit for construction activities substantially address all of these issues.

#### 2.5.2 Post-Construction Runoff Control

The Post-Construction Site Runoff Control Minimum Control Measure requires the development and implementation of strategies which include a combination of structural and/or nonstructural BMPs; an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls; and a method to ensure adequate long-term operation and maintenance controls. These provisions are included in this Stormwater Management Program.

### **3. Program Plan for Illegal Discharges**

#### **3.1 Establishing Legal Authority to Control Illegal Discharges**

The Neuse Stormwater Rule requires that selected local governments establish a program to prevent, identify, and remove illegal discharges. Under Title XV, Land Usage, the Goldsboro City Council has adopted a new chapter (Chapter 156) for their Code of Ordinances entitled “An Ordinance to Implement Regulations Regarding Illegal Stormwater Discharges Related to the City of Goldsboro’s Stormwater Management Program” to establish this authority within the City proper and its ETJ. This ordinance is included as Appendix C of this Stormwater Management Program and shows that Goldsboro will be able to:

- Control the contribution of pollutants to the stormwater collection system associated with industrial activity.
- Prohibit illegal discharges to the stormwater collection system.
- Prohibit discharge of spills and disposal of materials other than stormwater to the stormwater collection system.
- Determine compliance and noncompliance.
- Require compliance and undertake enforcement measures in cases of noncompliance.

Tables 3.1 and 3.2, respectively, identify some discharges that are and are not allowed to the stormwater collection system.

#### **3.2 Collecting Jurisdiction-Wide Information**

The City will collect geographic information at three increasing levels of detail:

- First, most cursory level of information shall be collected for the entire jurisdiction.
- Second level is a more detailed screening for high priority areas within the jurisdiction.

**Table 3.1 Discharges that May be Allowable to the Stormwater Collection System**

|   |  |  |
|---|--|--|
| Waterline Flushing                        | Landscape Irrigation   | Diverted Stream Flows  |
| Uncontaminated Rising Ground Water        | Uncontaminated Ground Water Infiltration to Stormwater Collection System | Uncontaminated Pumped Ground Water                                 |
| Discharges from Potable Water Sources     | Foundation Drains  | Uncontaminated Air Conditioning Condensation                       |
| Irrigation Water                          | Springs  | Water from Crawl Space Pumps                                       |
| Footing Drains                            | Lawn Watering  | Non-commercial Car Washing   |
| Flows from Riparian Habitats and Wetlands | NPDES Permitted Discharges   | Street Wash Water  |
| Fire Fighting Emergency Activities        | Wash Water from the Cleaning of Buildings                                | Dechlorinated Backwash and Draining Associated with Swimming Pools |

**Table 3.2 Types of Discharges that are not Allowed to the Stormwater Collection System**

|  |  |   |
|--|--|---|
| Dumping of Oil, Anti-freeze, Paint, Cleaning Fluids              | Commercial Car Wash  | Industrial Discharges                             |
| Contaminated Foundation Drains                                   | Cooling Water Unless No Chemicals Added and Has NPDES Permit | Washwaters from Commercial/ Industrial Activities |
| Sanitary Sewer Discharges  | Septic Tank Discharges                                       | Washing Machine Discharges                        |
| Chlorinated Backwash and Draining Associated with Swimming Pools |  |   |

- Third level is a very detailed investigation that shall be done upon the discovery of an illegal discharge.

The purpose of collecting jurisdiction-wide information (which must be completed by the second annual report in October 2002) is to assist with identifying potential illegal discharge sources and characterizing illegal discharges after they are discovered. The Engineering Department will be responsible for collecting and mapping the jurisdiction-wide information which will be compiled at a scale no greater than 1:24,000 to show the following:

- Location of sanitary sewers in areas of the major stormwater collection systems and the location of areas that are not served by sanitary sewers.
- Waters that appear on the NRCS Soil Survey Maps and the USGS 1:24,000 scale topographic maps.

- Land uses. Categories, at a minimum, should include undeveloped, residential, commercial, agriculture, industrial, institutional, publicly owned open space, and others.
- Currently operating and known closed municipal landfills and other treatment, storage, and disposal facilities, including for hazardous materials.
- Major stormwater structural controls, to include major stormwater outfalls and identification of their receiving waters (as required by Phase II).
- Known NPDES permitted discharges to the stormwater collection system (this list can be obtained from DWQ).

Written descriptions will be provided for map components as follows:

- A summary table of municipal waste facilities that includes the names of the facilities, the status (open/closed), the types, and addresses.
- A summary table of the NPDES permitted dischargers that includes the name of the permit holder, the address of the facility and permit number.
- A summary table of the major structural stormwater control structures that shows the type of structure, area served, party responsible for maintaining, and age of structure.
- A summary table of publicly owned open space that identifies size, location, and primary function of each open area.

### 3.3 Mapping and Field Screening in High Priority Areas

As part of the October 2002 annual report, the Engineering Department will identify a high priority area for more detailed mapping and field screening (at least 20 percent of the jurisdiction area). Each subsequent year, another high priority area of at least 20 percent size will be chosen. In this way, Goldsboro will complete their high priority area mapping by 2007, which will meet expected EPA Phase II requirements.

“High Priority” means the areas where it is most likely to locate illegal discharges (e.g., older development). The basis of the annual selection of each high priority area will be explained in the annual report.

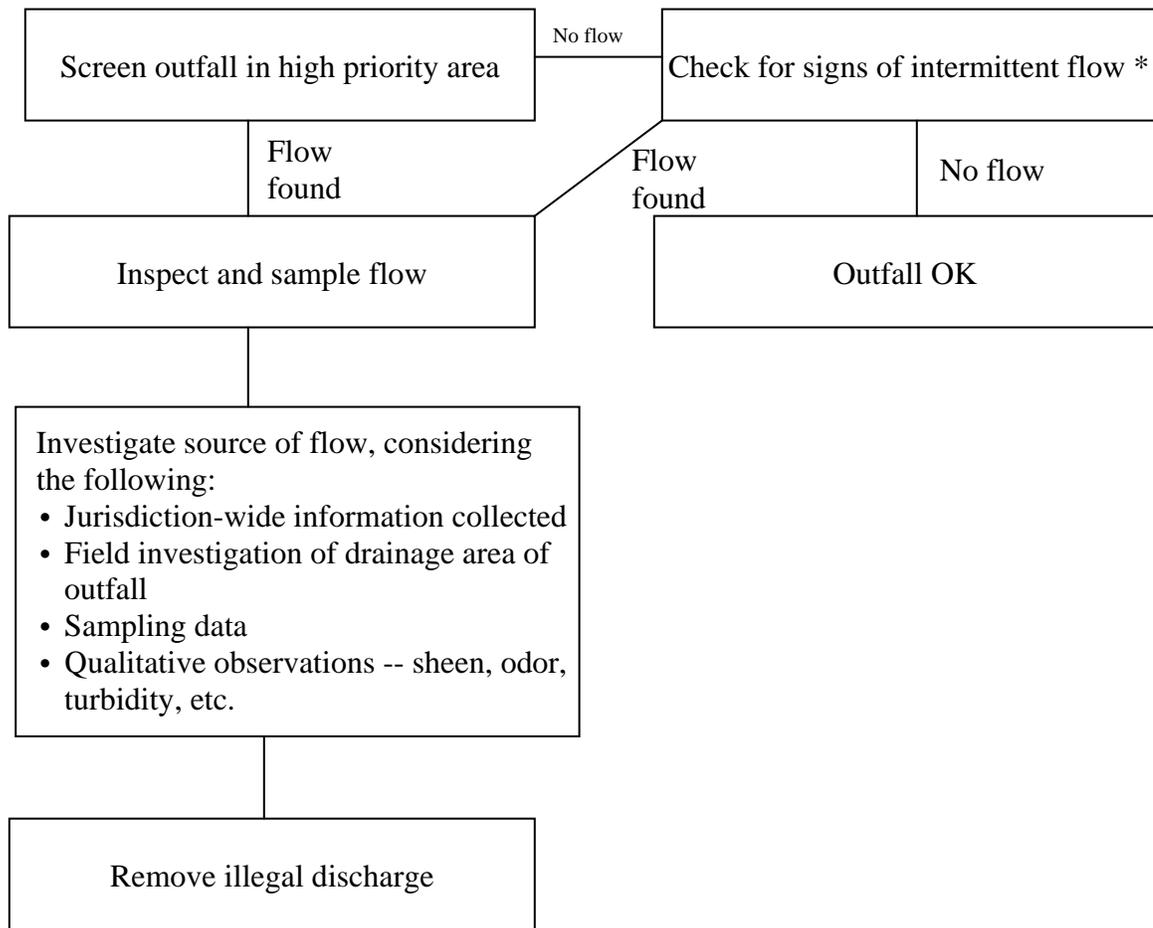
The **first part of the screening process** for the selected area is mapping of the stormwater system, which should include:

- Locations of the outfalls of any pipes from nonindustrial areas that are greater than or equal to 36 inches.
- Locations of the outfalls of any pipes from industrial areas that are greater than or equal to 12 inches.
- Locations of drainage ditches that drain more than 50 acres of nonindustrial land.

- Locations of drainage ditches that drain more than 2 acres of industrial land.
- An accompanying summary table listing the outfalls that meet the above criteria that includes outfall ID numbers, location, primary and supplemental classification of receiving water, and use-support of receiving water.

The **second part of the screening process** is conducting a dry weather field screening of all outfalls that meet the criteria to detect illegal discharges. The General Services Department will be responsible for overseeing the dry weather field screening which will not be conducted during or within 72 hours following a rain event of 0.1 inches or greater. In residential areas, field screening will be scheduled either before 9:00 am or after 5:00 pm (if possible), hours when citizens are most likely to be home and illegal discharges are more likely to be evident. A field screening process, such as that illustrated in Figure 3.1, will be followed.

**Figure 3.1 Field Screening Process**



\* Checking for intermittent flow includes rechecking outfall at a later date as well as visual observations for evidence of intermittent flow.

Note: Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

If field screening shows that an outfall is dry, then the outfall should be checked for intermittent flow at a later date. If the field screening shows that an outfall has a dry weather flow, then a screening report for the outfall will be completed. The field screening report will contain information similar to that detailed in Table 3.3 (general information, field site description, visual observations, and any required sampling analyses). Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system. Screening reports will be kept for five years.

Outfalls with flow will be screened again within 24 hours for the parameters included in the field screening report. Any tests for ammonia and nitrate/nitrite that are purchased will be sensitive for 0.1 to 10 mg/L.

**Table 3.3 Field Screening Report Information**

|                        |   |  |
|------------------------|---|--|
| General Information    | Sheet Number<br>Outfall ID Number<br>Date<br>Time<br>Date, Time and Quantity of Last Rainfall Event |  |
| Field Site Description | Location<br>Type of Outfall<br>Dominant Watershed Land Use(s)                                       |  |
| Visual Observations    | Photograph<br>Odor<br>Color<br>Clarity<br>Floatables  | Deposits/Stains<br>Vegetation Condition<br>Structural Condition<br>Biological<br>Flow Estimation |
| Sampling Analysis *    | Temperature<br>pH<br>Nitrogen-Ammonia   | Nitrogen-Nitrate/Nitrite<br>Fluoride or Chlorine   |

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\* Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

### 3.4 Identifying and Removing Illegal Discharges

After the field screening is complete, the General Services Department will take measures to identify and remove illegal discharges. The jurisdiction-wide information compiled as the first step in this process will be consulted for information on land uses, infrastructure, industries, potential sources, and types of pollution that exist in the drainage area of the outfall.

After potential sources have been identified, the General Services Department will be responsible for planning a systematic field investigation to minimize the amount of resources required to identify the source. Several field methods may be used for identifying illegal discharges, with the simplest approach recommended, if that will suffice. From simplest to more complex, the recommended approaches are:

- Site investigation.
- Additional chemical analysis (recommend testing for fecal coliform if the ammonia concentration is found to exceed 1.0 mg.L).

- Flow monitoring (multiple site visits recommended rather than a depth indicator).
- Dye testing (fluorescent dye is recommended).
- Smoke testing.
- Television inspection.

Documentation of the results of the office and field investigations will be kept on file for five years with the screening report.

After the source of an illegal discharge is identified, enforcement action will be taken to have the source removed or redirected to the sanitary sewer. Appendix C, which contains the adopted ordinance to establish authority to control illegal discharges, also contains the authority to order a source removed (or redirected) and penalties for noncompliance. Records of compliance actions will be kept for five years with the screening report.

In addition to keeping all screening reports on file, the Engineering Department will maintain a map of:

- Points of identified illegal discharges.
- Watershed boundaries of the outfalls where illegal discharges have been identified.
- An accompanying table that summarizes the illegal discharges that have been identified that includes location, a description of pollutant(s) identified, and removal status.

City personnel will be trained in how to conduct a thorough field screening, how to review the field screening results in conjunction with the jurisdiction-wide information collected previously, and how to plan an effective field investigation to identify the source of an illegal discharge. The training of City personnel to undertake the process of investigating and identifying illegal discharges will be multi-phased. Training materials (pamphlets, flyers, and/or booklets) will be disseminated to all involved personnel as part of Goldsboro's Public Education Action Plan (Section 5.0). It is anticipated that most (if not all) of these materials can be obtained from agencies such as DWQ and the US Environmental Protection Agency (EPA). In addition, the written training materials may be accompanied by seminars and hands-on field training. The General Services Department will be responsible for coordinating personnel training and for scheduling all illegal discharge activities.

### **3.5 Preventing Discharges and Establishing a Hotline**

The Planning and Finance Departments will contact persons who are responsible for establishments that are likely sources of illegal discharges (e.g., auto sales, rental, and repair businesses, lawn care companies, cleaners, and certain types of contractors). A letter (see sample letter in Appendix D) will be mailed to all such businesses that can be identified. The mailing list will be compiled from sources such as the Chamber of Commerce listings, the local Yellow Pages, and business tax rolls, and will be mailed before the first annual report is due in October 2001.

By October 2001, the Community Affairs Department will establish an illegal discharge hotline as a cost-effective way to identify illegal discharges. There will be a recording advising citizens what to do if they call during nonbusiness hours, or in the case where an illegal discharge is perceived to be an emergency. The Inspection Department will investigate all potential illegal discharges identified through the hotline. Part of the Public Education Action Plan (discussed in Section 5.0) will be to educate citizens about what types of discharges should not go to the stormwater collection system and make them aware of the hotline.

Table 3.4 is a summary table showing the phased implementation schedule for illegal discharges.

**Table 3.4 Phased Implementation Schedule for Illegal Discharge Activities**

| Year                            | Implementation Requirements  | Annual Report requirements  |
|---------------------------------|--|---|
| By March 9, 2001                | <ul style="list-style-type: none"> <li>Establish legal authority to address illegal discharges.</li> </ul>   | <ul style="list-style-type: none"> <li>Submit report identifying established legal authority to meet requirements.</li> </ul>   |
| By October 2002                 | <ul style="list-style-type: none"> <li>Collect jurisdiction-wide information.</li> <li>Select high priority area for additional screening.</li> <li>Initiate illegal discharge hotline.</li> </ul>   | <ul style="list-style-type: none"> <li>Report on completion of jurisdiction –wide information collection.</li> <li>Submit map of high priority areas and reason for selection.</li> <li>Report on initiation of illegal discharge hotline.</li> </ul>   |
| Each subsequent year after 2002 | <ul style="list-style-type: none"> <li>Complete mapping and field screening for high priority area.</li> <li>Select next high priority area.</li> <li>Identify and remove illegal discharges as encountered.</li> <li>Continue operating illegal discharge hotline.</li> </ul> | <ul style="list-style-type: none"> <li>Submit map of stormwater collection system in high priority area upon request by DWQ.</li> <li>Document illegal discharges found and resulting action.</li> <li>Report on hotline usage and actions taken.</li> <li>Submit map of next high priority area and reason for selection.</li> </ul> |

**3.6 EPA’s Phase II Stormwater Requirements**

The Program Plan for Illegal Discharges outlined above for the Neuse Stormwater Rule, in conjunction with the Public Education Action Plan detailed in Section 5.0, addresses the expected requirements of EPA’s Phase II Stormwater, Illicit Discharge Detection and Elimination Minimum Control Measure. Adjustments have been made to this Stormwater Management Program to comply

with the requirements of EPA's Phase II Stormwater rule based upon NCDENR's instructions for the Phase II Stormwater Permit. The Phase II Program includes the following:

- ***A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the US that receive discharges from those outfalls.*** During the collection of jurisdiction-wide information, all waters will be mapped that appear on NRCS Soil Survey Map and USGS 1:24,000 scale topographic map. Outfalls will be mapped during the mapping and field screening of each high-priority area; however, the outfall mapping schedule for this program (Neuse Stormwater Rule) must be accelerated to meet the expected Phase II requirements.
- ***That an ordinance, or other regulatory mechanism, establish a prohibition on non-storm water discharges into the municipal separate storm sewer systems (MS4), and appropriate enforcement procedures and actions.*** The ordinances established in response to the Neuse Stormwater Rule will fulfill this requirement.
- ***A plan to detect and address non-storm water discharges, including illegal dumping, into the MS4s.*** The ordinances established in response to the Neuse Stormwater Rule will fulfill this requirement.
- ***The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste.*** The Public Education Action Plan (detailed in Section 5.0) lays the groundwork for a comprehensive stormwater education program for the City of Goldsboro. The required Phase II elements are already a part of this program. Additional elements have been added to the Action Plan for the Neuse Stormwater Rule now that the State has issued the Phase II Permit.
- ***The determination of appropriate best management practices and measurable goals for this minimum control measure.*** The Phase II Stormwater rules recommend four steps for their plan: (1) locate problem areas, (2) find the source, (3) remove/correct illicit connections, and (4) document actions taken. This Program Plan for Illegal Discharges addresses all of the Phase II components, and required only minimal changes to comply with Phase II Stormwater requirements.

## **4. Retrofit Locations**

### **4.1 Annual Retrofit Actions**

Goldsboro will establish a program to identify places within existing developed areas that are suitable for retrofits. Based on their current census figures, Goldsboro will identify a minimum of three retrofit locations each year. Possible sites for retrofits will be selected by the Planning and Engineering Departments. The Engineering Department will then conduct a feasibility study of each site before compiling a final list of acceptable sites. This list will be submitted to the Stakeholders Committee to set the priority for each site, and then to the Steering Committee for approval of the final selections (see Section 5.0 for more information on the Stakeholders and Steering Committees). The retrofit information tables, which must be included in the annual report, will be prepared by the Engineering Department during each feasibility study.

Retrofit opportunities will be considered acceptable if all of the following conditions have been investigated:

- The retrofit, if implemented, clearly has the potential to reduce nitrogen loading to the receiving water.
- The watershed is clearly contributing nitrogen loading above background levels.
- The landowner where the retrofit is proposed is willing to have the retrofit installed on his property (often the most difficult aspect of implementing a retrofit).
- There is adequate space and access for the retrofit.
- It is technically practical to install a retrofit at that location.

Sites may be carried over to meet minimum requirements for up to two subsequent years provided that BMPs/retrofits have not been implemented and the site continues to meet the criteria above on an annual basis.

**4.2 Data Collection and Notification**

Each retrofit opportunity that is identified will be accompanied by information to describe the location of the retrofit, the type of retrofit being proposed, the property owner, as well as basic information about the watershed and the receiving water. Table 4.1 (Table 4b from the Model Plan) or one very similar to it will be completed for each retrofit opportunity and be submitted on October 30 of each year, beginning in 2001, as part of the annual report.

**Table 4.1 Retrofit Opportunity Table**

|   |  |
|---|--|
| Location description, including directions from a major highway |  |
| Type and description of retrofit opportunity                    |  |
| Current property owner  |  |
| Is the property owner willing to cooperate?                     |  |
| Land area available for retrofit (sq. ft.)                      |  |
| Accessibility to retrofit site                                  |  |
| Drainage area size (acres)                                      |  |
| Land use in drainage area (percent of each type of land use)    |  |
| Average slope in drainage area (%)                              |  |

|   |  |
|---|--|
| Environmentally sensitive areas in drainage area (steep slopes, wetlands, riparian buffers, endangered/ threatened species habitat) |  |
| Approximate annual nitrogen loading from drainage area (lbs/acre/year) *  |  |
| Potential nitrogen reduction (lbs/ac/yr)  |  |
| Estimated cost of retrofit  |  |
| Receiving water   |  |
| DWQ classification of receiving water   |  |
| Use support rating for receiving water  |  |
| Other important information   |  |

\* Suggested methodology: Use Figure 2.2 from Section 2.0 (Method 2) to compute nitrogen export from the drainage area based on the amount of impervious surface, landscaped area and forested area in the watershed.

DWQ will be responsible for posting the retrofit opportunities on its Web Page and also for notifying a minimum of 11 organizations of the opportunities for retrofitting within existing developed areas.

#### 4.3 Mapping Identified Retrofit Locations

Goldsboro will prepare maps which show the locations of the retrofit opportunities (the mapping may be accomplished by using computers or with existing hard copy maps). The scale of the map will be large enough to adequately identify the following required parameters:

- Drainage area to retrofit opportunity site.
- Land uses within the drainage area.
- Location of retrofit opportunity.
- Property boundaries in the vicinity of the retrofit opportunity.
- Significant hydrography (as depicted on USGS topographic maps and NRCS Soil Survey maps).
- Roads.
- Environmentally sensitive areas (steep slopes, wetlands, riparian buffers, endangered/threatened species habitat – where available).
- Publicly owned parks, recreation areas, and other open lands.

## 5. Public Education and Public Involvement

### 5.1 Public Education Action Plan

The Neuse Stormwater Rule requires that Goldsboro develop a locally administered environmental education program (a Public Education Action Plan) to address nitrogen loading issues. This Action Plan will outline the proposed education activities for the upcoming year, and will identify target audiences and anticipated costs of the program. Goldsboro will submit their annual Action Plan to DWQ for approval prior to October 1 of each year, starting October 1, 2001.

The Action Plan will consist of activities from each of the two categories listed in Table 5.1. Innovative activities not included in this table may be considered on a case-by-case basis. All activities must be designed to raise awareness and educate the audience about water quality, nonpoint source pollution, and the effects of everyday activities on water quality and nutrient loading. At least one of these activities will be directed at educating the citizens about what types of discharges should not go to the stormwater collection system and to making them aware of the illegal discharge hotline. In addition to the Category 1 and 2 activities, this Action Plan will include two technical workshops in the first year and a toll free hotline for reporting illegal discharges.

**Table 5.1 Public Education Action Plan Category 1 and 2 Activities**

| <b>Category 1</b>   | <b>Category 2</b>                      |
|---|--|
| Demonstration Sites (for BMPs)                                    | Fact Sheets                            |
| “Adopt-a-Program”   | Environmental Freebies                 |
| Quarterly local newspaper articles                                | Fertilizer Tags                        |
| Storm drain marking   | Flyers                                 |
| Recognition Program (recognize environment friendly participants) | Postmarks                              |
| Web page  | Utility bill inserts                   |
| Local Cable TV program  | Close-out Packages (new homeowners)    |
| Toll free hotline for reporting environmental problems            | Speak to civic organizations quarterly |
| Environmental field day   |  |
| Technical Workshop (only applicable after 1 <sup>st</sup> year)   |  |
| Environmental Contest   |  |

As discussed in Section 2.2.1, information sources will be provided to property owners and developers explaining the benefit to them of incorporating site planning practices into their new development plans from the onset. Information sources may also be provided on the various BMPs available for nitrogen reduction as well as information on new BMP techniques or improvements in established BMP techniques.

For the training of City personnel to identify and remove illegal discharges (Section 3.4), training materials such as pamphlets, flyers, and/or booklets will be disseminated to all involved personnel

by the General Services Department. It is anticipated that most (if not all) of these materials can be obtained from agencies such as DWQ and the US EPA. In addition, the written training materials may be accompanied by seminars and hands-on field training.

#### 5.1.1 Planned Activities

Goldsboro (with a population of less than 60,000) will include two Category 1 activities and two Category 2 activities in their annual Action Plan. The combination of activities selected by the City will be chosen so as to provide a general awareness of nitrogen loading issues and address a diverse audience.

The ultimate goal of the Public Education Program is to utilize major media advertising (television, radio, and newspaper) to reach a broad audience (but may be cost prohibitive). Should Goldsboro use effective major media advertising, either independently or through a cooperative effort, then Goldsboro will be exempt from the minimum Category 1 and 2 requirements.

As part of Goldsboro's integrative approach to managing their Stormwater Management Program, two separate advisory committees were formed to aid in the development of the City's Stormwater Plan: The Steering Committee, an internal management group; and a Stakeholder's Committee, a select community group. Both committee's were convened on July 12 and August 17, 2000 to provide direct input into this Program Plan.

The Steering Committee is composed of representatives from the City Manager's office, and the General Services, Recreation and Parks, Planning, Engineering, Community Affairs, and Finance Departments. The Charge to the Steering Committee included the need to assign responsibilities for program elements, consider manpower and budgetary needs, obstacles to implementation, and steps that could be taken to remove obstacles and/or provide incentives for program participation. It is anticipated that the Steering Committee will continue to meet on a quarterly basis to review the implementation of the program and to address any new issues which may arise.

For the Stakeholder's Committee, individuals from the following concerns were invited to participate, along with representatives from the City Manager's office: the Chamber of Commerce, Seymour Johnson Air Force Base, Industry, Commercial Development, Wayne Community College, the Economic Development Corp., the Neuse River Foundation, a large and small developer, an engineer, and a concerned property owner (and flood victim). Although compliance with the Neuse River Rule (and eventually EPA's Phase II Rule) is mandatory, the City wanted to establish a means for active involvement and input by affected citizenry. It was explained to the Stakeholder's that only by voicing their concerns about program implementation, and by sharing their ideas for public education/participation and specific program incentives, could the program be tailored to best serve the citizens of Goldsboro.

It is anticipated that this group, or one structured very similar to it, will continue to meet on a quarterly basis to discuss any problems and concerns they encounter during program implementation. This group is an excellent starting place for later community involvement in carrying out the program, and will help provide support for enforcement and funding initiatives.

In addition, Goldsboro already has several entities in place which are useful in disseminating information to the public and for garnering their involvement. Community Affairs will utilize these groups as avenues for public education and outreach, and public participation/involvement.

- The Commission of Community Affairs was established to “inform the general public of existing local, state and federal policies, regulations and programs and how these particular policies, regulations and programs directly affect the lives of area residents.” In addition, their purpose is to create a forum which permits open discussion and invites the free expression of public opinion, as well as to achieve and sustain an effective degree of citizen involvement.
- The Planning Commission was established to serve as an advisory board to make recommendations to the City Council on any matter presented to them by the Director of Planning and Community Development, by any local governing board, or by any Board member.
- The Advisory Committee on Community Development consists of ten citizens and residents of the City, with special efforts made to include a majority of members who are low- and moderate-income persons, members of minority groups, residents of area where significant amounts of activity are proposed or on-going, the elderly, the handicapped, the business community, and civic groups who are concerned about community development. At least two members from each community development area must be included. This committee, or one structured like it, could be used to play an active role in educating the general public on stormwater related issues.
- The Youth Council offers an organization through which the youth of the community may benefit both themselves and their community. Stormwater concerns would be an excellent opportunity to initiate programs and projects that are of benefit to the youth and to the City of Goldsboro.

#### 5.1.2 Technical Workshops

During the first year of program implementation, General Services will take responsibility for conducting two technical workshops. One shall be designed to educate local government officials and staff, and the other for the development community (including engineers, developers, architects, contractors, surveyors, planners, and realtors). In subsequent years, workshops are considered an option under Category 2 activities, and will be considered for inclusion in the annual Education Action Plan.

#### 5.2 Incorporating Existing Resources and Programs

Community teaming is encouraged in the Stormwater Rule, and Goldsboro will make every effort to research and incorporate existing resources and stormwater education programs. Although Goldsboro’s unique Action Plan will fulfill all public education requirements from the onset, the City recognizes that utilizing existing resources will not only result in a more consistent education effort for communities of all sizes, but will make the most efficient use of available resources and will reduce duplication of efforts.

Teaming possibilities with Wayne County will continually be explored, particularly in regards to the following Public Education activities:

- **Major Media Advertising:** If the City and County could implement effective major media advertising (radio, television, newspaper), they will become exempt from minimum Category 1 and 2 activities.

- **Category 1 and 2 activities:** If effective major media advertising is not employed, it may prove easiest and most cost efficient to conduct planned activities together.
- **Workshops:** The two technical workshops that must be conducted during the first year (one to educate local government officials and staff, and the other for the development community) could be sponsored jointly, thereby reducing costs and duplication of efforts.

### 5.3 EPA's Phase II Stormwater Requirements

As detailed earlier in this section, Goldsboro already has several entities in place which are useful in disseminating information to the public and for garnering their involvement. These groups may become an integral part of Goldsboro's Phase II Stormwater Management Program which requires public education and outreach, and public participation/involvement. For Phase II, educational materials and strategies will be tailored to activities relevant to local situations and issues, while reaching a variety of audiences and communities including ethnic, minority, and low-income communities; academia and educational institutions; neighborhood and community groups; children; outdoor recreation groups; and business and industry. Goldsboro's Public Education Action Plan for the Neuse Stormwater Rule will serve as an excellent foundation for the City's Phase II efforts, and will be expanded and/or tailored on an annual basis.

## 6. Pollution Prevention/Good Housekeeping

Another component of the Phase II Rule is the Pollution Prevention/Good Housekeeping Minimum Control Measure. The General Services Department has responsibility for the development and implementation of a maintenance program with the ultimate goal of preventing and reducing pollutant runoff from municipal operations into the storm sewer system. In addition, the program will include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations. If such components are not already an integral part of Goldsboro's Action Plan by the time this Minimum Control Measure is required by the Phase II Rule, these particular education and training initiatives will be incorporated into the SWMP by reference to the Public Education Action Plan.

## 7. Evaluation and Reporting

Annual Neuse River Basin Stormwater Management Program reports must be submitted to DWQ by October 30 of each year beginning in 2001. An implementation schedule for all of the major Neuse Stormwater Rule components is included in Appendix E. All reports must contain the following information:

### A. New Development Review/Approval

The following information will be submitted as part of the annual reporting requirement:

- Acres of new development and impervious surface based on plan approvals.

- Acres of new development and impervious surface based on Certificates of Occupancy.
- Summary of BMPs implemented and use of offset fees.
- Computed baseline and net change in nitrogen export from new development that year (see Table 7.1 for specific reporting requirements).
- Summary of maintenance activities conducted on BMPs.
- Summary of any BMP failures and how they were handled.
- Summary of results from jurisdictional review of planning issues.

**Table 7.1 Specific Annual Nitrogen Loading Reporting Requirements\***

|   |
|---|
| <p><b>1. The predevelopment nitrogen load from all land developed during the past year.</b> This can be determined by:</p> <ul style="list-style-type: none"> <li>• Taking total acres of cropland developed multiplied by 13.6 lbs/ac/yr, and adding</li> <li>• Total acres of pasture developed multiplied by 4.4 lbs/ac/yr for pasture, and adding</li> <li>• Total acres of forested land developed multiplied by 1.7 lbs/ac/yr, and adding</li> <li>• Total acres of residential land redeveloped multiplied by 7.5 lbs/ac/yr, and adding</li> <li>• Total acres of commercial and industrial lands redeveloped multiplied by 13.0 lbs/ac/yr.</li> </ul> |
| <p><b>2. The post development nitrogen load from all land developed during the past year without structural BMPs.</b></p>   |
| <p><b>3. The post development nitrogen load from all land developed during the past year with structural BMPs.</b> Unfortunately, it will be very difficult to document the improvements in nitrogen loading due to the implementation of nonstructural BMPs. However, jurisdictions are more than welcome to attempt this if they wish.</p>  |
| <p><b>4. Pounds of nitrogen bought by developers making offset payments to the Wetland Restoration Program.</b></p>   |
| <p><b>5. The net change in nitrogen loading for the year.</b> This would be (Item 3 - Item 1) - Item 4. A positive number would denote an increase; a negative number would denote a decrease.</p>  |
| <p><b>6. The reductions in nitrogen loading due to structural BMPs and Wetland Restoration Program payments.</b> This would be (Item 2 - Item 3) + Item 4. This should be a positive number that represents the pounds of nitrogen removed that year as a result of implementing the Neuse Stormwater Rule.</p>   |

\* This list of items that should be accounted for was agreed upon by the Neuse Stormwater Team during their June 1, 2000 meeting.

**B. Illegal Discharges**

The annual reporting requirements for illegal discharges are detailed in Table 7.2.

**Table 7.2 Annual Illegal Discharge Reporting Requirements**

| Year                            | Annual Report requirements   |
|---------------------------------|--|
| By March 9, 2001                | <ul style="list-style-type: none"><li>• Submit report identifying established legal authority to meet requirements.</li></ul>  |
| By October 2002                 | <ul style="list-style-type: none"><li>• Report on completion of jurisdiction-wide information collection.</li><li>• Submit map of high priority areas and reason for selection.</li><li>• Report on initiation of illegal discharge hotline.</li></ul>   |
| Each subsequent year after 2002 | <ul style="list-style-type: none"><li>• Submit map of stormwater collection system in high priority area upon request by DWQ.</li><li>• Document illegal discharges found and resulting action.</li><li>• Report on hotline usage and actions taken.</li><li>• Submit map of next high priority area and reason for selection.</li></ul> |

**C. Retrofit Locations**

- Data on each retrofit opportunity (Table 4.1 or equivalent),
- Maps of potential retrofit sites as specified in Section 4.3, and
- The status of any retrofit efforts that have been undertaken within the jurisdiction.

**D. Public Education**

The report must summarize the next years Action Plan and evaluate the implementation of the previous years Action Plan (if applicable). The report should include goals, activities completed, realized education program costs, explanation of experienced shortfalls, and a plan as to how the locality will address shortfalls.

**8. EPA Phase II Measurable Goals**

The City of Goldsboro has designed their Stormwater Management Program to:

- Reduce the discharge of pollutants to the “maximum extent practicable”
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water Act.

Implementation of the MEP standard requires the development and implementation of BMPs and the achievement of measurable goals to satisfy each of the six minimum control measures. Under the Phase II Rule, the City of Goldsboro’s Stormwater Management Program has six elements that, when implemented in concert, is expected to result in significant reductions of pollutants discharge into receiving water bodies.

The six MS4 program elements, termed “minimum control measures,” are outlined in Appendix F. Each is followed by a preliminary schedule of measurable goals, which is required for each minimum control measure, and is intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they were chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure.