



Stormwater Management in Carrboro:

Comprehensive Stormwater Management Plan



March 2012

NPDES Phase II: Storm Water Management in Carrboro

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Section 1

1. STORM SEWER SYSTEM INFORMATION.....

- 1.1. Population Served: 19,479
- 1.2. Growth Rate: estimated at 2% annually
- 1.3. Jurisdictional and MS4 Service Areas:
 - 1.3.1. Town Limits: 63 sq. mi.
 - 1.3.2. ETJ: 2.9 sq. mi.
 - 1.3.3. Transition Area: 12 sq. mi.
- 1.4. MS4 Conveyance System

Carrboro's current conveyance system utilizes a combination of conveyance devices. These range from sheet flow from streets, sidewalks and shoulders into curb/gutter, concrete piping, grassed swales, rip rap or armored ditches with a combination of retention, detention and dissipation systems at outlets prior to entering receiving waters.

Maintenance activities consist of periodic inspection, repair, vegetation control, street sweeping, and debris removal.

1.5. Land Use Composition Estimates

<i>ESTIMATED PERCENTAGE OF JURISDICTIONAL AREA CONTAINING THE FOLLOWING FOUR LAND USE ACTIVITIES:</i>	
Residential	57 % (estimated from Land Use Database)
Commercial	3 % " "
Industrial	1 % " "
Open Space	39 % " "
Total =	100 %

1.6. Estimate Methodology:

Estimated from the Land Use GIS database in which land use categories were assigned to individual parcels. Parcels for each of the different land use types were selected, based on their designation, summed the area, and calculated the relative percentage of the area of planning jurisdiction.

17. **TMDL Identification:** The most downstream extent of Bolin Creek in Carrboro’s jurisdiction has been identified on the impaired streams list. University Lake, has been identified on the 303(d) Impaired Streams list for nutrient impairment. Jordan Lake has a TMDL for nutrient impairment.

Section 2

2. RECEIVING WATERS.....

Table 1. Carrboro Watershed: Cape Fear River Basin

Receiving Stream Name	Stream Segment	Water Quality Classification	Use Support Rating	Water Quality Issues
Bolin Creek	16-41-1-15-1-(0.5)	C	NSW	Development in headwaters of watershed; listed on 303(d) list for ecological/biological integrity- benthos
Morgan Creek	16-41-2-1 Partial	WS-II	HQW, NSW	Some agricultural impacts, possible impacts from quarry, low density development; listed on draft 2010 303(d) list for ecological/biological integrity- benthos
Morgan Creek (University Lake)	16-41-2-(1.5)	WS-II	HQW, NSW,CA	Some agricultural impacts, low density development; listed on final 2010 303(d) list for chlorophyll a/nutrient impairment
Morgan Creek	16-41-2-(5)	C	NSW	Urban runoff;

Section 3

3. EXISTING WATER QUALITY PROGRAMS.....

3.1. Local Programs

This section summarizes local programs that influence the Town's surface water protection and restoration efforts. Details of programs that fall within the six NPDES categories are discussed in subsequent sections.

- 3.1.1. The Town Land Use Ordinance was put in place effective November 25, 1980, replacing the earlier, separate subdivision regulations and zoning ordinance. The ordinance has been updated on multiple occasions to address water supply watershed protection, buffers, stormwater management, and Jordan Lake rules. Links to the ordinance are provided in the Appendix.
- 3.1.2. The Water Supply Watershed Protection Program for Carrboro's jurisdiction was approved by the State on December 12, 1996. The Watershed Protection ordinance is included as part of the Land Use Ordinance.
- 3.1.3. Benthic macroinvertebrate monitoring – The Town has contracted with water quality consultants to evaluate the condition of the benthic macroinvertebrate community in Bolin Creek within the Town's jurisdiction. In 2001, four quarterly baseline studies were conducted at three sites on the creek. Subsequently, at a minimum, annual monitoring has been pursued, with twice a year sampling occurring as well. The Town has recently added new monitoring sites, and is performing less frequent “snapshots” to provide finer spatial resolution.
- 3.1.4. Carrboro contracted with the Town of Chapel Hill Engineering Department to monitor water quality from 1993 to 2008 to gauge the effectiveness of stormwater management programs, establish a baseline chemical database, and actively monitor the quality of the Town's three major watersheds. Monthly testing included three sites in Carrboro. The waters at each site have been tested for water temperature, pH level, dissolved oxygen content (and percent saturation), specific conductivity and total dissolved solids. Grab samples have been tested at the lab for turbidity, nutrients, metals, and the presence of fecal coliform bacteria. The results of these tests have been communicated to Carrboro and the Town follows up with any parameters that seem to warrant attention. In 2009, Chapel Hill discontinued this program and is implementing new, more effective monitoring approaches, including more extensive benthic monitoring. Carrboro is collaborating with Chapel Hill in this effort.
- 3.1.5. OWASA Water Quality Monitoring - OWASA provides water quality monitoring services if the potable water distribution system or sanitary sewer system is potentially involved. OWASA may also sample in response to customer/public inquiries.
- 3.1.6. Volunteer Monitoring. Nonprofit organizations are pursuing volunteer monitoring in Carrboro. The Haw River Assembly (Riverwatch) and Friends of Bolin Creek have pursued benthic monitoring, and coordinated efforts through the statewide Muddy Water Watch program. Universities and local schools have pursued monitoring for educational and research purposes.

3.2. State programs

- 3.2.1. Jordan Lake Rules. The Town is pursuing measures pursuant to the passing of new State rules to protect Jordan Lake for water quality buffers, nutrient management, and stormwater management from new and existing development.

- 3.2.2. Watershed Assessment and Restoration Project (WARP) assessment of the Little/Bolin/Booker Creek Watershed was funded by the Clean Water Management Trust Fund, and was completed in (2003).
- 3.2.3. Cooperative Local Watershed Planning Initiative – Carrboro participated with the North Carolina Ecosystem Enhancement Program in a local watershed planning initiative that includes all of Carrboro’s receiving waters (2004).
- 3.2.4. Carrboro helped form and is actively participating in efforts of the Bolin Creek Watershed Restoration Team. Bolin Creek has been designated for restoration based in part on local efforts and commitments to restoration. The Town has participated in a CWMTF mini-grant for a geomorphological assessment, a successful 319 grant application with Chapel Hill, and a separate 319 grant application independently. These 319 projects are nearing completion.
- 3.2.5. The Town will rely upon State implementation of BMPs for the state owned roadways and other land and associated drainage within the Town’s jurisdiction.

Section 4

4. PERMITTING INFORMATION.....

4.1. **Responsible Party Contact List** Provide a list or table of each measurable goal and the contact information for the person and/or position that is responsible for implementation of each goal listed. Contact information for existing positions must include name, position, phone, fax and e-mail. Contact information for proposed positions must include the position title, and a contact phone and fax number.

NPDES PHASE II MEASURES	Contact/lead Person(s)	Position	Phone	Fax	e-mail
Program Implementation	1)Randy Dodd 2)David Poythress 3)Henry Wells 4)Reynold Ivins 5)Martin Roupe 6)Christina Moon	1)Environmental Planner 2) Streets Supervisor 3) Town Engineer 4)Orange County Erosion and Sedimentation Control Officer 5)Development Review Administrator 6) Planning Administrator	①919-918-7326 ②919-918-7432 ③919-859-2243 ④919-245-2586 ⑤919-918-7333 ⑥919-918-7325	①919-918-4454 ②919-968-7728 ③919-859-6258 ④919-644-3002 ⑤919-918-4454 ⑥919-918-4454	① rdodd@ci.carrboro.nc.us ② dpoythress@ci.carrboro.nc.us ③ hwells@sungatedesign.com ④ rivins@co.orange.nc.us ⑤ mroupe@ci.carrboro.nc.us ⑥ cmoon@ci.carrboro.nc.us
Public Education and Outreach	1)Randy Dodd* 2)Dennis Joines	1)Environmental Planner* 2)Recreation Administrator	①919-918-7326 ②919-918-7378	①919-918-4454 ②919-918-4475	① rdodd@ci.carrboro.nc.us ② djoines@ci.carrboro.nc.us
Public Participation/ Involvement	Randy Dodd	1)Environmental Planner	①919-918-7326	①919-918-4454	① rdodd@ci.carrboro.nc.us
Illicit Discharge Detection and Elimination	1)Randy Dodd 2) ????? 3)David Poythress 4)Ruth Heaton 5)????? 6)Rob Maddy	1) Environmental Planner* 2) Planning Specialist** 3) Streets Supervisor 4) GIS Specialist 5) Investigator 6) Fire Marshall	① 919 918-7326 ②919-918-???? ③919-918-7432 ④919-929-3905 ⑤919-918-???? ⑥919-918-7352	① 919-918-4454 ②919-968-4454 ③919-968-7728 ④919-918-4454 ⑤919-918-???? ⑥919-918-5359	① rdodd@ci.carrboro.nc.us ② ?????? ③ dpoythress@ci.carrboro.nc.us ④ rheaton@ci.carrboro.nc.us ⑤ ????@ci.carrboro.nc.us ⑥ rmaddy@ci.carrboro.nc.us
Construction Site Runoff Control	1)Reynolds Ivins 2) Martin Roupe	1) Orange County Erosion and Sedimentation Control Officer 2) Development Review Administrator	①919-245-2586 ②919-918-7333	①919-644-3002 ②919-918-4454	① rivins@co.orange.nc.us ② mroupe@ci.carrboro.nc.us
Post-Construction Runoff Control	1)Henry Wells 2)Martin Roupe 3)Christina Moon 4) ????? 5) Randy Dodd	1)Town Engineer 2) Development Review Administrator 3) Planning Administrator 4) Planning Specialist** 5) Environmental Planner	①919-918-7333 ②919-918-7325 ③919-859-2243 ④919-918-???? ⑤919-918-7326	①919-918-4454 ②919-918-4454 ③919-859-6258 ④919-918-4454 ⑤919-918-4454	① mroupe@ci.carrboro.nc.us ② cmoon@ci.carrboro.nc.us ③ hwells@sungatedesign.com ④ ????@ci.carrboro.nc.us ⑤ rdodd@ci.carrboro.nc.us
Pollution Prevention/Good Housekeeping	1)David Poythress 2)Vacant	1) Streets Supervisor 2) Landscape Supervisor	①919-918-7432 ②919-918-7431	①919-968-7728 ②919-918-7728	① dpoythress@ci.carrboro.nc.us ② ????@ci.carrboro.nc.us
Impaired Waters	1)Randy Dodd 2)Henry Wells	1)Environmental Planner 2)Town Engineer	①919-918-7326 ②919-859-2243	①919-918-4454 ②919-859-6258	① rdodd@ci.carrboro.nc.us ② hwells@sungatedesign.com

*to be replaced by new Planning Specialist in this role in 2012-13 **to be hired in 2012-13

- 4.2. **Organizational Chart:** The Town's Organizational Chart is included in the Appendix.
- 4.3. **Signing Official:** The statement of the signing official is included in Section VI of the Application.
- 4.4. **Duly Authorized Representative:** NOT APPLICABLE

Section 5

5. **CO-PERMITTING INFORMATION (if applicable):** NOT APPLICABLE
 - 5.1. Co-Towns: NOT APPLICABLE
 - 5.2. Legal Agreements NOT APPLICABLE
 - 5.3. Responsible Parties NOT APPLICABLE

Section 6

6. **RELIANCE ON OTHER GOVERNMENT ENTITY**
 - 6.1. Measure Implemented: Implementation of Construction Site Runoff Control
 - 6.1.1. Name of Entity: Orange County
 - 6.1.2. Contact Information
 - 6.1.2.1. Name: Reynolds J. Ivins
 - 6.1.2.2. Address: P.O. Box 8181, Hillsborough, NC 27278
 - 6.1.2.3. Phone: 919-245-2586
 - 6.1.3. Legal Agreements: The Town empowered Orange County by resolution adopted October 4, 1976.

Section 7: The Plan

7. STORMWATER MANAGEMENT PROGRAM PLAN

The Town is required to implement and enforce a stormwater management program (SWMP) designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act.

The elimination and reduction of storm water laden with pollutants can be best addressed by implementing an integrated storm water management program that includes both source control and delivery reduction measures. Benefits from an effective and comprehensive storm water management program can be:

- Improved surface water quality
- Improved drinking water quality

- Land preservation due to erosion control measures
- Reduction of sanitary sewer overflows because of storm water infiltration
- Improved /preserved animal habitats
- Increased viability for fish
- Improved wetland and estuary habitats of waterfowl and other animal life.
- Decreased flooding related problems

The Town has designed this stormwater management program to: 1) reduce the discharge of pollutants to the “maximum extent possible” (MEP); 2) protect water quality; and 3) satisfy the appropriate water quality requirements of the Clean Water Act. In order to achieve the goal of the NPDES Phase II Regulations and derive the benefits, the Town will develop and implement cost effective operations, maintenance, and training programs using both non-structural and structural BMP's to satisfy each minimum control measures.

The following table provides an overview of the control measures along with a summary of Carrboro’s basic strategy for meeting or exceeding the regulatory requirements:

NPDES PHASE II MEASURES	BASIC STRATEGY
<p>1. Program Implementation; requires that a program be in place to administer, fund, staff, assess, and report on the program.</p>	<p>Carrboro will conduct an annual analysis of the expenditures and staff resources needed, allocated, and utilized to meet the permit requirements. Carrboro will annually update this Stormwater Plan. Carrboro will maintain adequate records to document permit compliance.</p>
<p>2. Public Education and Outreach; requires that a program be in place to deliver information to the community offering ways to eliminate polluted storm water.</p>	<p>Carrboro will continue to implement its own basic education and outreach program and take advantage of the successful programs that have already been implemented locally and regionally.</p>
<p>3. Public Participation/Involvement: requires the town to follow its public notice requirements and recommends the involvement of citizen advisory committees.</p>	<p>The Town held a public hearing on its initial stormwater plan, and will hold a public meeting for this renewed plan. The Town already has an Environmental Advisory Board that can be instrumental in supporting public participation and involvement. The Town has an active citizenry and nonprofits to support public participation.</p>
<p>4. Illicit Discharge Detection and Elimination: develop and implement a plan to detect and eliminate illicit discharges including the mapping of the storm water system.</p>	<p>The Town has developed an illicit discharge detection and elimination (IDDE) ordinance and program, and has conducted training in IDDE. The Town has mapped the storm water system. The Town has pursued water quality stream monitoring with the Town of Chapel Hill and is working with Chapel Hill to evaluate the need for new/ redesigned monitoring efforts. The Town has developed appropriate enforcement measures. The Town is pursuing outfall reconnaissance surveys.</p>
<p>5. Construction Site Runoff Control: develop, implement, and enforce an erosion and sedimentation control program for land disturbances greater than 1 acre.</p>	<p>Orange County enforces erosion and sedimentation control on land disturbances greater than 20,000-sq. ft. in Carrboro’s planning area (reference 15-264 of the Town Land Use Ordinance). Section 15-263 of the Carrboro Land Use Ordinance requires developments to be constructed so that they do not cause damage from stormwater runoff upstream or downstream, and generally requires the design and implementation of site-specific storm water management plans. Article VII establishes enforcement procedures.</p>
<p>6. Post-Construction Runoff Control: develop, implement, and enforce a program to address discharges of post-construction storm water runoff from new development.</p>	<p>The Town’s land use ordinance establishes site design requirements that address post- construction storm water runoff from new developments. The town’s storm water management requirements 15-261 through 263 and Appendix I “Storm Drainage Design Manual” regulate new developments so as not to cause damage in terms of water quality or quantity. Appropriate stream buffer and impervious surface restrictions are provided for in sections 15-266 through 15-269. The arrangement of development to minimize water quality impacts is provided for by the town’s open space requirements, which seek to protect and recognize “natural constraints” (section 15-198). The Town has also provided regulations for low to medium-density districts that control the amount of development (density) with regard to the degree of natural constraints (section 15-182.3). The Town is updating its ordinance to comply with requirements under the Jordan Lake rules.</p>
<p>7. Pollution Prevention/Good Housekeeping: develop and implement a program with the goal of preventing or reducing pollutant runoff from municipal operations.</p>	<p>The Town is using good housekeeping components such as street sweeping, integrated pest management, and spill prevention at Town facilities.</p>
<p>8. Impaired Waters</p>	<p>Carrboro will continue to pursue watershed restoration efforts for Bolin Creek as part of the Use Restoration Waters program and in collaboration with the Bolin Creek Watershed Restoration Team. Carrboro will implement requirements under the Jordan Lake rules. Carrboro will use Jordan Lake rules requirements to address nutrient impairments in University Lake.</p>

7.1.....*Program Implementation*

Regulatory Requirements

The Town will implement, manage and oversee all provisions of its Stormwater Plan to control to the maximum extent practical the discharge of pollutants from its municipal storm sewer system associated with stormwater runoff and illicit discharges, including spills and illegal dumping. The overall program implementation will be subject to, at a minimum, annual review by the North Carolina DWQ to determine implementation status and progression toward meeting the pollutant control intent of the Stormwater Plan. This includes, but is not limited to, the following areas:

1. The Town will develop and maintain adequate legal mechanism, such as regulations, ordinances, policies and procedures to implement all provisions of the Stormwater Plan. DWQ will be notified of major modifications of these authorities, the reasons and justifications for these changes. DWQ may comment on these modifications as deemed necessary to assure appropriate implementation of the Stormwater Plan.
2. The Town must evaluate program compliance, the appropriateness of best management practices, and progress towards achieving measurable goals at least annually.
3. The Town will maintain adequate funding and staffing to implement and manage the provisions of the Stormwater Plan and meet all requirements of this permit. The Stormwater Plan shall identify a specific position(s) responsible for the overall coordination, implementation, and revision to the Plan. Responsibilities for all components of the Plan shall be documented and position(s) assignments provided.
4. The Town will implement provisions of the Stormwater Plan and evaluate the performance and effectiveness of the program components at least annually. Results will be used by the Town to modify the program components as necessary to accomplish the intent of the Stormwater Program. If the Town implements the six minimum control measures and the discharges are determined to cause or contribute to non-attainment of an applicable water quality standard, to address the non-attainment, the Town shall expand or better tailor its BMPs within the scope of the six minimum control measures.
5. The Town is required to keep the Stormwater Plan up to date. Where the Town determines that modifications are needed to address any procedural, protocol, or programmatic change, such changes shall be made as soon as practicable, but not later than 90 days, unless an extension is approved by DWQ. Major modifications to the Stormwater Plan shall be submitted to DWQ for approval. The Town is required to make available its Stormwater Plan to DWQ upon request. At a minimum, the Town shall include ordinances, or other regulatory mechanisms or a list identifying the ordinances, or other regulatory mechanisms providing the legal authority necessary to implement and enforce the requirements of the permit. DWQ may review reports submitted by the Town to assure that the Stormwater Plan is implemented appropriately to address the requirements of the

permit. DWQ may require modifications to any part of the Town's Stormwater Plan where deficiencies are found. If modifications to the Stormwater Plan are necessary then DWQ will notify the Town of the need to modify the Stormwater Plan to be consistent with the permit and will establish a deadline to finalize such changes to the program.

6. Pursuant to 40 CFR 122.35, an operator of a regulated small MS4 may share the responsibility to implement the minimum control measures with other entities provided:
 - a. The other entity, in fact, implements the control measure;
 - b. The particular control measure, or component thereof, is at least as stringent as the corresponding NPDES permit requirement; and
 - c. The other entity agrees to implement the control measure on behalf of the MS4.

The Town remains responsible for compliance if the other entity fails to perform the permit obligation and may be subject to enforcement action if neither the Town nor the other entity fully performs the permit obligation.

7. The Town shall maintain, and make available to DWQ upon request, written procedures for implementing the minimum control measures. Written procedures shall identify specific action steps, schedules, resources and responsibilities for implementing the minimum measures. Written procedures can be free standing, or where appropriate, integrated into the Storm Water Management Plan.

The Town's annual reporting and monitoring activities in support of this permit will be used to document and indicate progress in implementation, and evaluate the effectiveness and results of the Stormwater Plan and individual components of the program. DWQ may request additional reporting and monitoring information as necessary to evaluate the progress and results of the Town's Stormwater Plan.

1. Implementation of the Stormwater Plan will include documentation of all program components that are being undertaken including, but not limited to, inspections, maintenance activities, educational programs, implementation of BMPs, enforcement actions, and other stormwater activities. Documentation will be kept on-file by the Town for a period of five years and made available to DWQ upon request.
2. The Town's Stormwater Plan will be reviewed and updated as necessary, but at least on an annual basis to identify modifications and improvements needed to maximize Stormwater Plan effectiveness to the maximum extent practicable. The Town shall develop and implement a plan and schedule to address the identified modifications and improvements. The Town must submit annual reports to the Department within twelve months from the effective date of this permit. Subsequent annual reports must be submitted every twelve months from the scheduled date of the first submittal. Annual reports that include appropriate information to accurately describe the

progress, status, and results of the Town's Stormwater Plan will include, but not be limited to, the following components:

- a. The Town will give a detailed description of the status of implementation of the Stormwater Plan as a whole. This will include information on development and implementation of each major component of the Stormwater Plan for the past year and schedules and plans for the year following each report.
 - b. The Town will adequately describe and justify any proposed changes to the Stormwater Plan. This will include descriptions and supporting information for the proposed changes and how these changes will impact the Stormwater Plan (results, effectiveness, implementation schedule, etc.).
 - c. The Town will document any necessary changes to programs or practices for assessment of management measures implemented through the Stormwater Plan.
 - d. The Town will include a summary of data accumulated as part of the Stormwater Plan throughout the year along with an assessment of what the data indicates in light of the Stormwater Plan.
 - e. The annual report shall include an assessment of compliance with the permit, information on the establishment of appropriate legal authorities, inspections, and enforcement actions.
3. DWQ may notify the Town when the Stormwater Plan does not meet one or more of the requirements of the permit. Within 90 days of such notice, the Town will submit a plan and time schedule to DWQ for modifying the Stormwater Plan to meet the requirements. DWQ may approve the plan, approve a plan with modifications, or reject the proposed plan. The Town will provide certification in writing in accordance with Part IV, Paragraph 7(c) to DWQ that the changes have been made. Nothing in this paragraph shall be construed to limit DWQ's ability to conduct enforcement actions for violations of this permit.
 4. DWQ may request additional reporting information as necessary to evaluate the progress and results of the Town's Stormwater Plan.

REPORTING AND RECORD KEEPING REQUIREMENTS

Records

The Town shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of DWQ.

Annual Reporting

- a. Completion and submittal of the reporting information contained within the online BIMS Stormwater Management Program Assessment (SMPA) meets the annual reporting requirements of this permit.
- b. The Town may propose an alternative annual reporting format for DWQ review to satisfy annual reporting requirements.

Twenty-four Hour Reporting

- a. The Town shall report to DWQ any noncompliance that may constitute an imminent threat to health or the environment. Any information shall be provided orally within 24 hours from the time the Town became aware of the circumstances. A written submission shall also be provided within 5 days of the time the Town becomes aware of the circumstances.
- b. The written submission shall contain a description of the noncompliance, and its causes, the period of noncompliance and if the noncompliance has not been corrected, the anticipated time compliance is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

Additional Reporting

In order to properly characterize the Town's MS4 discharges or to assess compliance with this permit, DWQ may request reporting information on a more frequent basis as deemed necessary either for specific portions of the Town's Stormwater Plan, or for the entire Program.

Other Information

Where the Town becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or in any report to DWQ, it shall promptly submit such facts or information.

Planned Changes

The Town shall give advance notice to DWQ of any planned modifications to the Stormwater Plan. Notice of any changes is required at least through the annual report. Notice shall be given as soon as possible when deleting a provision of the approved Stormwater Plan; or the modification could significantly change the timeframe for implementation of parts of the program or negatively influence the effectiveness of the approved program.

Carrboro Strategy

The Town’s primary strategy for documentation is to house all stormwater program information on the Town’s servers for a minimum of 5 years. The Town intends to review and update this plan annually. The Town intends to prepare an annual report. The Town intends to provide 24-hour reporting for incidents clearly or potentially requiring reporting.

7.1.1. BMP Summary Table

BMPs and Measurable Goals for Program Implementation

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Lead Position/ Supporting Positions
1	Maintain adequate legal mechanism, such as regulations, ordinances, policies and procedures.	Update Town’s ordinances to comply with Jordan Lake rules. Annually review ordinances, policies, and procedures for all components of plans to insure ordinance complies with permit.	X	X	X	X	X	Planning Administrator/ Attorney/Zoning Administrator/ Environmental Planner
2	Evaluate program compliance, the appropriateness of best management practices, and progress towards achieving measurable goals at least annually.	Submit annual report to DWQ. Develop and use new annual report format and content to serve both regulatory reporting requirements and community	X	X	X	X	X	Environmental Planner/Planning Specialist*/ Streets Superintendent
3	Maintain funding and staffing to implement and manage the provisions of the Stormwater Plan. Identify a specific position(s) responsible for the overall coordination, implementation, and revisions to the Plan. Responsibilities for all components of the Plan shall be documented and position(s) assignments provided.	Develop and implement a financial and staffing plan. Document the staffing responsibilities in the Stormwater Plan.	X	X	X	X	X	Town Manager/ Planning Director/ Planning Administrator/ Finance Director/ Public Works Director/ Rec and Parks Director/ Police and Fire Chiefs
4	Evaluate the performance and effectiveness of the program components at least annually. Use results to modify program components as necessary. If stormwater is determined to cause or contribute to non-attainment of a water quality standard, the Town shall improve BMPs within the scope of the six minimum control measures.	The Town will: submit an annual report to DWQ by November of each year that includes information on implementation for the past year and schedules and plans for the next year; adequately describe and justify any proposed changes to the Stormwater Plan; document any necessary changes to programs or practices for assessment of management measures; include a summary of data accumulated; assess compliance with the permit, establishment of legal authorities, inspections, and enforcement actions.	X	X	X	X	X	Environmental Planner/ Planning Administrator/ Planning Director/ Public Works Director

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Lead Position/ Supporting Positions
5	Keep the Stormwater Plan up to date. Where the Town determines that modifications are needed to address any procedural, protocol, or programmatic change, such changes shall be made as soon as practicable, but not later than 90 days, unless an extension is approved by DWQ.	Implementation of the Stormwater Plan will include documentation of all program components that are being undertaken including, but not limited to: inspections, maintenance activities, educational programs, implementation of BMPs, enforcement actions, and other stormwater activities. The Town shall give advance notice to DWQ of any planned modifications to the Stormwater Plan. Notice shall be given as soon as possible if the modification could negatively influence the effectiveness of the approved program.	X	X	X	X	X	Environmental Planner /Planning Specialist*/ Planning Director/ Planning Administrator/ Public Works Director
6	Share the responsibility to implement requirements with other entities ¹ .	Orange County is responsible for the Construction Site Erosion Control management measure.	X	X	X	X	X	Development Review Administrator /Planning Administrator
7	The Town shall maintain, and make available to DWQ upon request, written procedures for implementing the six minimum control measures. Written procedures shall identify specific action steps, schedules, resources and responsibilities for implementing the measures. Procedures can be free standing, or where appropriate, integrated into this plan.	The Stormwater Plan shall be the primary document for written procedures. More detailed documents will be prepared for specific control measures or BMPs.	X	X	X	X	X	Environmental Planner /Planning Director/ Planning Administrator/ Public Works Director
8	Additional Reporting	The Town shall report to DWQ any noncompliance that may constitute an imminent threat to health or the environment. This shall be provided orally within 24 hours of the Town becoming aware of the circumstances. A written submission shall also be provided within 5 days. Where the Town becomes aware that it failed to submit any relevant facts or submitted incorrect information in any way to DWQ, it shall promptly submit such facts or information.	X	X	X	X	X	Environmental Planner /Planning Administrator/ Planning Director/ Development Review Administrator/ Public Works Director/ Police and Fire Chiefs/ Recreation and Parks Director

*to be hired in FY12-13

¹ Provided: a. the other entity, in fact, implements the control measure; b. the particular control measure, or component thereof, is at least as stringent as the corresponding NPDES permit requirement; and c. the other entity agrees to implement the control measure on behalf of the MS4. The Town remains responsible for compliance if the other entity fails to perform the permit obligation and may be subject to enforcement action if neither the Town nor the other entity fully performs the permit obligation

7.2. Public Education and Outreach

Regulatory Requirements

The Town is required to distribute educational materials to the community or conduct equivalent outreach activities addressing the impacts of storm water discharges on water bodies and the steps the public can take to reduce pollutants in storm water runoff.

Guidance

The Town may use storm water educational materials provided by the state; EPA; environmental, public interest, or trade organizations; or other local governments. The public education program should inform individuals and households about the steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance and use and disposal of landscape and garden chemicals (including fertilizers and pesticides) and household hazardous waste (including used motor oil), and protecting and restoring riparian vegetation. EPA recommends that the program inform individuals and groups how to become involved in local stream activities, as well as activities that are coordinated by the Town, service and conservation corps or other citizen groups. EPA recommends that the public education program be tailored, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling and watershed and beach cleanups. In addition, EPA recommends that some of the materials or outreach programs be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, outreach can be provided to restaurants on the impact of grease clogging storm drains, and to garages on the impact of oil discharges. The Town is encouraged to tailor the outreach program to address the viewpoints and concerns of all citizens, particularly minority and disadvantaged communities, as well as any special concerns relating to children.

Carrboro Strategy

Carrboro will continue to work with CWEP and rely on CWEP for regional level media outreach and education. Carrboro will rely on CWEP to document campaign reach and frequency to public for radio and TV. Carrboro will continue to focus on the goals, stressors, audiences, and issues presented above in working with local media and developing and distributing local outreach and educational materials and offering educational programming.

Carrboro will assess its stormwater education/outreach program annually. Carrboro will adjust its educational materials and the delivery of such materials to address any shortcomings found as a result of this assessment. Carrboro will assess changes in public awareness and behavior resulting from the implementation of the program. Carrboro will use the following tools to measure awareness/behavior:

- Interviews
- Surveys
- Tracking of educational materials disseminated
- Tracking the number of attendees
- Tracking the number of stormwater-related calls/emails/letters received

The Town will continue to install storm drain labels, and work with interested volunteer groups, homeowners associations, and schools for assistance with storm drain label installation.

7.2.1. **BMP Summary Table**

BMPs and Measurable Goals for Public Education and Outreach

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Lead Position/ Others
1	Goals and Objectives	Defined goals and objectives of the Local Public Education and Outreach Program based on high priority, community-wide issues: <ol style="list-style-type: none"> 1. Reduction of nitrogen runoff from the MS4 2. Increased interception, infiltration, impervious disconnection and reduction, and stormwater volume control in the MS4 3. Improved maintenance of existing BMPs; and 4. Reduction of illicit discharges in the MS4 	X	X	X	X	X	Environmental Planner / Engineer/Development Review Administrator/ CWEP/ Environmental Advisory Board
2	Identify target pollutants and stressors	Carrboro's target stressors are nitrogen, stormwater volume, hydrologic, geomorphic, and riparian alteration, sediment, and toxics. These stressors will be reviewed annually.	X	X	X	X	X	Environmental Planner /Environmental Advisory Board
3	Identify priority audiences	Carrboro's priority audiences are homeowner's and homeowners associations, rental property managers, downtown and Highway 54 businesses, and schools. These audiences have been chosen based on Carrboro's land use and their effectiveness in reaching Carrboro's citizenry. These audiences will be reviewed annually.	X	X	X	X	X	Environmental Planner / Planning Administrator /Environmental Advisory Board
4	Identify residential and industrial/commercial issues	Priority residential and industrial/commercial issues include: Residential issues: <ul style="list-style-type: none"> • Rainwater harvesting • Rain gardens and backyard wetlands • Converting lawns to natural areas and improving soil quality • Impervious disconnection • Permeable pavement • Disposal of household hazardous waste • Litter prevention • Preventing soil erosion • Public reporting of water quality issues Industrial/commercial issues: <ul style="list-style-type: none"> • Illicit discharge detection and elimination • Waste disposal (especially food service) • Rainwater harvesting • Permeable pavement • Impervious disconnection • Redevelopment opportunities • Automobile and equipment repair and maintenance 	X	X	X	X	X	Environmental Planner/ Environmental Advisory Board
5	Informational Web Site	Carrboro shall continue to maintain, assess and update as necessary content on its internet web site. Examples include, but are not limited to: newsletter articles on stormwater, information on water quality, stormwater projects and activities, and ways to contact stormwater management program staff. Carrboro will	X	X	X	X	X	Environmental Planner*/IT

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Lead Position/ Others
		continue to work with CWEP and link to CWEP's website, and will link to other useful web resources.						
6	Distribute public education materials to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.	Carrboro will continue work with CWEP and rely on CWEP for regional level media outreach and education. Carrboro will continue to focus on the goals, stressors, audiences, and issues presented above in developing and distributing local outreach and educational materials. Carrboro will work with other educational partners, including but not limited to Orange County Cooperative Extension, Chapel Hill's Stormwater program, Bolin Creek Watershed Restoration Team, UNC, NCSU, local nonprofits (e.g., the Friends of Bolin Creek, Morgan Creek Valley Alliance, Bolin Creek Watershed Restoration Team, and Haw River Assembly), OWASA, and Chapel Hill Carrboro City Schools.	X	X	X	X	X	Environmental Planner*/CWEP/ Recreation Administrator/ Environmental Advisory Board /
7	Maintain Hotline/ Helpline	The Town shall promote and maintain a stormwater hotline/helpline.	X	X	X	X	X	Environmental Planner*
8	Implement a Public Education and Outreach Program.	Carrboro's outreach program, will include: (but not necessarily be limited to): <ul style="list-style-type: none"> • Newspaper articles and/or inserts • Kiosks and signage • Public meetings • Community events • Storm drain marking • Stream and litter cleanups • Workshops and class room outreach • Brochures and pamphlets Carrboro will track the extent of exposure for elements completed locally, and will rely on CWEP to do so for regional media.	X	X	X	X	X	Environmental Planner*/CWEP/ Environmental Advisory Board/ Recreation Administrator/ Streets Supervisor

*Carrboro intends to hire a Planning Specialist in 2012-13 that will assume responsibility for these measures

7.2.2. **The primary target pollutant sources** for the program are household sources of pollution (due to the fact that the vast majority of land in Carrboro is used for residential purposes), sediment, and nutrients.

7.2.3. **The target audience** for Carrboro's stormwater management public education is the residents and businesses within Carrboro.

7.2.4. **The primary vehicles of communication** are intended to be readily available brochures, printed media, the internet, and meetings from neighborhood to town wide in scale. The Town will annually review participating with regional educational efforts, including the Clean Water Education Program managed by the Triangle J Council of Governments.

Some examples of messages to be conveyed to the public about storm water runoff pollutants from household sources that they can directly influence might include:

- ☞ **Detergent, fertilizer, pet waste-** These substances contain nutrients - one of the pollution problems of most concern. The nutrients nitrogen and phosphorus not only cause grass to grow, but an excessive amount also causes algae to grow in our waterways. Algae blooms can contribute to fish kills and block sunlight for the underwater vegetation needed by fish and shellfish for food and cover. Pet waste in our waterways, like human

waste, can carry disease and can make water unusable for fishing, swimming, and drinking. Residents and businesses will be educated on minimizing use of chemical lawn products, and proper methods of disposal of these waste materials.

- ***Automotive products such as motor oil and antifreeze; hazardous waste such as household cleaners and paints; and pesticides (herbicides, insecticides, fungicides, rodenticides)*** - These materials are toxic, so they are harmful to humans and animals as well as the environment. Toxins in our waterways can make water unusable for fishing, swimming, and drinking. Our streams feed lakes used as drinking water reservoirs. Educational materials will describe proper methods of disposal, and locations that accept these materials for disposal.
- ***Yard waste and litter*** - These items decompose in water, removing oxygen needed for aquatic life. Yard waste can also clog the storm water system, contributing to street flooding. Litter often ends up floating in streams and lakes or washing up on the shore. Plastic litter endangers aquatic animals that might eat it mistakenly or become entangled in it. Educational materials will emphasize preferred management techniques, such as backyard composting, and promote NC Big Sweep involvement and other clean up programs.
- ***Sediment (soil, sand, silt, clay)*** - Sediment from unvegetated or unstable disturbed areas clogs fish gills, blocks sunlight for underwater vegetation, and smothers shellfish and fish habitat. It is the largest contributor of storm water pollution by volume. The educational message will emphasize proper soil control methods for homeowners and small contractors, and provide contact information to report problem areas.

7.2.5. **Outreach:** Additionally, the Town will provide liaison, information and technical assistance to accomplish outreach through local groups, including:

- ◆ Local interest groups, such as Friends of Bolin Creek, Morgan Creek Valley Alliance
- ◆ Town Environmental Advisory Board and Planning Board.
- ◆ Homeowners Associations and neighborhood groups
- ◆ Civic and environmental groups
- ◆ Schools

7.2.6. **Decision Process:** The Planning Department will solicit input and voluntary cooperation from citizen groups and school officials. The Public Works Department will continue to pursue storm drain labeling. These processes and responsible individuals are detailed in the BMP table above.

7.2.7. **Evaluation:** of this component will be accomplished by assessing achievements and progress toward reaching each of the measurable goals listed in the summary table. Progress will be reported each year in the annual report to the State.

7.3. Public Involvement and Participation

Regulatory Requirements

The Town must implement a Public Involvement and Participation program to provide opportunities for the public, including major economic and ethnic groups, to participate in program development and implementation.

Guidance

EPA recommends that the public be included in developing, implementing, and reviewing the storm water management program, and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts.

Carrboro Strategy

7.3.1. BMP Summary Table:

BMP's and Measurable Goals for *Public Involvement and Participation**

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
1	Administer a Public Involvement Program	The Town shall include and promote volunteer opportunities designed to promote ongoing citizen participation	X	X	X	X	X	Environmental Planner / EAB
2	Mechanism for Public involvement	The Town shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program. Environmental Advisory Board will serve as a vehicle for review of implementation and input to program	X	X	X	X	X	Environmental Planner / EAB
3	Hotline/Help line	The Town shall promote and maintain a hotline/helpline for the purpose of public involvement and participation.	X	X	X	X	X	Environmental Planner

*Carrboro intends to hire a Planning Specialist in 2012-13 that will assume responsibility for this measure

7.3.2. Target Audience: Residents, schools, the Environmental Advisory Board, and local stream protection groups are the target audience for the ongoing public participation efforts. These audiences and information about outreach is elaborated upon in the Public Education and Outreach section.

7.3.3. Participation Program:

7.3.3.1. The Town has participated in the NC Big Sweep program. Carrboro will continue to participate and increase promotion. Advance planning will identify target areas and focus efforts where bigger problems exist.

7.3.3.2. The Town has worked with citizen volunteers to educate them and to assist in educating their groups about watershed protection issues. The Town has worked with public school students to conduct storm drain stenciling in parts of the Town.

7.3.3.3. The Town Planning Department has worked with volunteer stream monitors and the Muddy Water Watch program, as well as the EAB, Friends of Bolin Creek and the

Morgan Creek Valley Alliance – two local watershed protection citizen groups, and the Bolin Creek Watershed Restoration Team.

Decision Process: The Planning Department will continue to solicit input and voluntary cooperation from citizen groups and school officials, monitor progress and success, and coordinate activities and inputs from other departments. These processes and responsible individuals are detailed in the BMP table above.

Evaluation: of this component will be accomplished by assessing achievements and progress toward reaching each of the measurable goals listed in the summary table.

7.4. Illicit Discharge Detection and Elimination

Illegal discharges include the disposal of chemicals or liquid and solid waste and debris into storm drains but also the more complex problem of illegal connections to the storm drains from homes and businesses. These illegal connections allow untreated wastewater from toilets, sinks, floor drains, and other sources to be discharged into surface waters instead of into treatment facilities. In addition, illicit discharges may occur as a result of poorly maintained sewer lines that leak, and from improperly functioning septic tanks.

Regulatory Requirements

- (i) The Town must implement, and enforce a program to detect and eliminate illicit discharges (as defined at in the Federal Register, Sec. 122.26(b)(2)).
- (ii) The Town must:
 - (A) Describe how the Town will maintain a current storm sewer inventory and map showing the location of major outfalls and the names and location of all receiving waters. Describe the sources of information for the maps and how the map was developed.
 - (B) Describe the mechanism (ordinance or other regulatory mechanism) used to effectively prohibit illicit discharges into the MS4.
 - (C) Describe the plan to ensure appropriate enforcement procedures and actions such that the illicit discharge ordinance (or other regulatory mechanism) is implemented.
 - (D) Describe the program to detect and address illicit discharges to the system, including discharges from illegal dumping and spills. Consider the use of Best Management Practices (BMPs) such as dry weather field screening for non-storm water flows, field tests of selected chemical parameters as indicators of discharge sources and on-site sewage disposal systems that flow into the storm drainage system. The description must address the following, at a minimum:
 - Procedures for locating priority areas which includes areas with higher likelihood of illicit connections (e.g., areas with older sanitary sewer lines, for example) or ambient sampling to locate impacted reaches.
 - Procedures for tracing the source of an illicit discharge, including the specific techniques the Town will use to detect the location of the source.
 - Procedures for removing the source of the illicit discharge.

- Procedures for evaluation of the plan to detect and eliminate illicit discharges.

Non Stormwater Discharges: The Town should address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if the Town identifies them as significant contributors of pollutants to the small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR §35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).

The Town may also maintain a list of other similar occasional incidental non-storm water discharges that will not be addressed as illicit discharges. These non-storm water discharges must not be reasonably expected to be significant sources of pollutants to the Municipal Separate Storm Sewer System, because of either the nature of the discharges or conditions the Town have established for allowing these discharges to the MS4 (e.g., activity with appropriate controls on frequency, proximity to sensitive waterbodies, BMPs). The Town must document in the SWMP any local controls or conditions placed on the discharges. The Town must include a provision prohibiting any individual non-storm water discharge that is determined to be contributing significant amounts of pollutants to the MS4.

Outreach: Describe how the Town plans to inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. Include in the description how this plan will coordinate with the public education minimum measure and the pollution prevention/good housekeeping minimum measure programs.

Staff Training: Describe how the Town plans to conduct training for appropriate municipal staff on detecting and reporting illicit discharges.

Evaluation: Explain how the Town will evaluate the effectiveness of this minimum measure, including the measurable goals for each of the BMPs.

Guidance

EPA recommends that the plan to detect and address illicit discharges include the following four components: procedures for locating priority areas likely to have illicit discharges; procedures for tracing the source of an illicit discharge; procedures for removing the source of the discharge; and procedures for program evaluation and assessment. EPA recommends visually screening outfalls during dry weather and conducting field tests of selected pollutants as part of the procedures for locating priority areas. Illicit discharge education actions may include storm drain stenciling; a program to promote, publicize, and facilitate public reporting of illicit connections or discharges; and distribution of outreach materials.

Carrboro Strategy

Carrboro’s strategy for illicit discharge detection and elimination is described in a separate document and summarized below.

7.4.1. **BMP Summary Table:**

BMP’s and Measurable Goals for Illicit Discharge Detection and Elimination

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	Y R 5	Responsible Position/Party
1	Maintain adequate legal authorities	The Town will annually review and revise as necessary the Town’s IDDE ordinance, and adopt any additional regulatory mechanisms that provide the Town with adequate legal authority to prohibit illicit connections and discharges and enforce the approved IDDE Program.	X	X	X	X	X	Environmental Planner/ Planning Administrator/Town Attorney
2	Maintain storm water system inventory, including major outfalls that discharge to waters of the State	The Town shall maintain a current map of the stormwater system that includes major outfalls and receiving streams and stormwater inlets	X	X	X	X	X	GIS Specialist/ Town Engineer/Streets Supervisor/Environmental Planner*
3	Detect dry weather flows and investigate the source of all identified illicit discharges.	The Town shall develop and implement a program for conducting dry weather flow field observations with a written procedure for detecting and removing the sources of illicit discharges. The Town shall maintain, and evaluate annually written procedures for conducting investigations of identified illicit discharges.	X	X	X	X	X	Environmental Planner*/ Code Enforcement Supervisor/Streets Supervisor
4	Track investigations and document illicit discharges.	The Town shall track all investigations and document the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.	X	X	X	X	X	Environmental Planner*/ Police Captain/ Code Enforcement Supervisor/Streets Supervisor/Fire Marshall
6	Employee Training	The Town shall implement and document a training program for appropriate municipal staff, who, as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system.	X	X	X	X	X	Streets Superintendent/ Environmental Planner*/
7	Provide Public Education	The Town will inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.	X	X	X	X	X	Environmental Planner*
8	Public reporting mechanism	The Town will promote, publicize, and facilitate a reporting mechanism for the public and staff to report illicit discharges and establish and implement citizen request response procedures.	X	X	X	X	X	Environmental Planner*
9	Enforcement	The Town shall implement a mechanism to track the issuance of notices of violation and enforcement actions administered by the Town. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.	X	X	X	X	X	Police Captain/ Code Enforcement Supervisor/Environmental Planner*/Town Attorney

*Carrboro intends to hire a Planning Specialist in 2012-13 that will assume responsibility for these measures

- 7.4.2. **Legal Authority:** The Town has developed an illicit discharge ordinance. The ordinance addresses: discharges that are prohibited; discharges that are permissible; exemptions; requirements for correction; and enforcement and penalties. The ordinance is available at <http://www.townofcarrboro.org/TC/PDFs/TownCode/TownCodeCh05.pdf>. The Town relies on the Orange County Director of Environmental Health Services for regulation of onsite wastewater systems, and OWASA for regulating the sanitary sewer system within OWASA easements.
- 7.4.3. **Stormwater System Inventory:** The Town initiated a detailed stormwater mapping program in 2000. The program involves inventorying all storm drainage facilities within the Town's corporate limits and ETJ. All drainage structures (public and private) have been mapped, including surveying of public structures. Mapping has been enhanced as new digital and as-built information has become available. The mapping program includes determination of the following:
- Horizontal and vertical location of storm drainage structures and open end culverts
 - Sizes and types of the piping connecting the drainage structures
 - Type and condition of storm drainage structures.
 - Visual inspection of each structure to detect illicit discharges or other irregularities.
 - All outfalls greater than 36" diameter or draining greater than 50 acres are considered to be major outfalls. Additional major outfalls have been identified based primarily on land use in the contributing drainage area.

Field location of the facilities and other information related to each structure have been input into GIS by a survey team using a lap top computer. Elevations of the tops and inverts of the storm drainage structures have been field surveyed using available vertical control (i.e. NCGS monuments, OWASA manholes, other bench marks) and into GIS. Subsequent GIS analyses have been completed to connect open channel conveyances and distinguish between these conveyances and ephemeral streams. As new field determinations of state regulated intermittent and perennial streams are completed, the GIS database is updated, resulting in a connected stormwater/surface water database.

The Town completed a major update to stream data in FY2008-2009 that improved the accuracy and classification of perennial, intermittent, and ephemeral streams. The Town also completed a major update to the mapped stormwater system that included drainage areas, outfalls, ditches, BMPs, and new system features subsequent to the original mapping. The Town is maintaining and improving this data on an ongoing basis.

- 7.4.4. **Dry Weather Flows:** The Town began implementing a dry weather flow monitoring program in 2008-2009, and has completed outfall reconnaissance at 16 outfalls to date.. A priority area currently being focused on includes much of downtown and adjacent areas draining to Tanbark Branch, Tom's Creek, and an unnamed tributary flowing south from downtown. The Town is using guidance and data tracking developed by the Center for Watershed Protection to pursue this monitoring. A goal during this permit cycle is to visit each major outfall at least once a year. Additional staff will need to be hired to achieve this goal. The Planning Department is the lead department for this measure. Further documentation of procedures is provided in the illicit discharge program plan.

7.4.5. **Track and Document Illicit Discharges:** The Town has initiated detection and elimination procedures and will continue to explore ways to improve upon these procedures. This effort involves coordination with existing Town staff that routinely are out in the community (Public Works, Police, Fire and Rescue, Building Inspectors, Zoning Staff) as the front line in identifying potential problems. By training these staff in identifying potential problems and proper response protocol, the Town can efficiently use existing resources to implement a detection team approach to this part of the program. Town staff are also coordinating with OWASA. More details about detection tracking procedures is provided in the illicit discharge program plan.

7.4.6. **Employee Training:** The Town has worked with NCSU/Cooperative Extension Service to provide IDDE training and will provide one or more similar trainings during this permit period. Training materials are also available on the staff file server.

7.4.7. **Public Education:** Raising community wide awareness of storm water issues will assist the Town in its efforts to reduce pollutant run-off. Informative outreach and training programs will be continued and expanded to train and inform residents, businesses, and town personnel of:

- ◆ Unpermitted practices
- ◆ Proper avenues for incident response
- ◆ Proper disposal of waste
- ◆ How chemical or solvent run-off has detrimental effects on the environment
- ◆ Irresponsible storm water management and the effect on the environment.

The Town participated in an initiative led by UNC and Chapel Hill focusing on IDDE education for several priority business sectors, and will use lessons learned to focus efforts for those sectors. The Town is working with and relying on Orange County Environmental Health Services for outreach regarding onsite wastewater systems.

7.4.8. **Public Reporting:** The Town's stormwater hotline will serve as the primary means for public reporting of potential illicit discharges. Contact information will be disseminated on outreach materials and the Town's website.

7.4.9. **Enforcement:** The Town will continue to enforce its ordinance. Planning staff will work with other departments and other agencies to enforce the ordinance, with specific responsibilities depending on the details of a given incident/responsible party.

7.4.10. **Decision Process:** The Planning Department will maintain the system map. The Planning Department will also coordinate with the Fire Department and Public Works Department development of the detection and elimination program and employee training. These processes and responsible individuals are detailed in the BMP table above.

7.4.11. **Evaluation:** of this component will be accomplished by assessing achievements and progress toward reaching each of the measurable goals listed in the summary table. Progress will be reported each year in the annual report.

7.5. Construction-Site Stormwater Runoff Control

Regulatory Requirements

The Town must implement and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. Small MS4 may rely on the State Erosion and Sediment Control Program (or a locally delegated program) and DWQ general stormwater permit for construction activities to meet these requirements. If the Town choose to develop and implement the own construction site stormwater runoff control program, then the Town must provide the following information.

Regulatory Mechanism: Describe the mechanism (ordinance or other regulatory mechanism) the Town uses to require erosion and sediment controls at construction sites. Include a copy of the relevant sections as an appendix. The Town must establish requirements for:

- Construction site operators to implement appropriate erosion and sediment control best management practices;
- Construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

Plan Reviews: Describe the procedures for site plan review, including the review of preconstruction site plans, which incorporate consideration of potential water quality impacts. Describe the procedures and the rationale for how the Town will identify certain sites for site plan review, if not all plans are reviewed. Describe the estimated number and percentage of sites that will have pre-construction site plans reviewed.

Enforcement: Describe the plan to ensure compliance with the erosion and sediment control regulatory mechanism, including the sanctions and enforcement mechanisms the Town will use to ensure compliance. Describe the procedures for when the Town will use certain sanctions. Possible sanctions include non-monetary penalties (such a stop work orders), fines, bonding requirements, and/or permit denials for non-compliance.

Inspections: Describe the procedures for site inspection and enforcement of control measures, including how the Town will prioritize sites for inspection.

Public Information: Explain the procedures for receipt and consideration of information submitted by the public. Consider coordinating this requirement with the public education program.

Evaluation: Explain how the Town will evaluate the effectiveness of this minimum measure, including the measurable goals for each of the BMPs.

Guidance

Examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance. EPA recommends that procedures for site plan review include the review of individual pre-construction site plan to ensure consistency with local erosion and sedimentation control requirements. Procedures for site inspections and enforcement of control measures could include steps to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

The Town is encouraged to provide appropriate educational and training measures for construction site operators. The Town may wish to require a storm water pollution prevention plan for construction sites within the jurisdiction that discharge into the system. See Sec. 122.44(s) (NPDES permitting authorities' option to incorporate qualifying State, Tribal and local erosion and sediment control programs into NPDES permits for storm water discharges from construction sites). Also see Sec. 122.35(b) (The NPDES permitting authority may recognize that another government entity, including the permitting authority, may be responsible for implementing one or more of the minimum measures on the behalf).

Carrboro Strategy

7.5.1. **BMP Summary Table**

BMP's and Measurable Goals for Construction Site Stormwater Runoff Control

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
1	Continue to implement a program for erosion and sediment control	Continue to require erosion and sediment controls at construction sites and provide for sanctions to ensure compliance. Orange County implements and enforces construction site stormwater runoff control.	X	X	X	X	X	Orange County Soil and Erosion Control / Zoning Department
2	Implement a construction site waste management program	Require construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste that may cause adverse impacts to water quality.	X	X	X	X	X	Development Review Administrator/ Zoning Department
3	Public notification of erosion and sedimentation problems	Provide and promote a means for the public to notify the appropriate authorities of observed erosion and sedimentation problems. The Town may implement a plan promoting the existence of the NCDENR, Division of Land Resources "Stop Mud" hotline to meet the requirements of this paragraph.	X	X	X	X	X	Orange County Erosion Control

7.5.2. **Regulatory Mechanism:** Orange County implements and enforces construction site stormwater runoff control within the Town's jurisdiction as stated in the following jurisdictional clause within the County Ordinance.

Sec. 32-6. Jurisdiction and effect.

(a) *Jurisdiction.* This chapter shall apply within the county, including the municipalities of Carrboro, Hillsborough, and the portion of Mebane within the county, but excluding the municipal boundaries and planning extraterritorial limits of Chapel Hill.

(b) *Effect.*

(1) It shall be unlawful, within the jurisdiction of this chapter, to engage in land disturbing activity, except as provided in this chapter, without first obtaining a permit as required by this chapter and without complying with the conditions of the issuance of the permit.

The Town Land Use Ordinance requires compliance with all requirements of the Orange County Erosion Control Officer before issuance of a permit for any regulated developments and authorizes the County to enforce the County Ordinance within the Town as specified in the following excerpt from the Land Use Ordinance:

SECTION 15-264 SEDIMENTATION AND EROSION CONTROL.

(a) No zoning, special use, or conditional use permit may be issued and final plat approval for subdivision may be given with respect to any development that would cause land disturbing activity subject to the jurisdiction of the Orange County Erosion Control Officer or the North Carolina Sedimentation Control Commission unless such officer or agency has certified to the town; either that:

- (1) Any permit required by such officer or agency has been issued or any erosion control plan required by such officer or agency has been approved; or
- (2) Such officer or agency has examined the preliminary plans for the development and it reasonably appears that any required permit or erosion control plan can be approved upon submission by the developer of more detailed construction or design drawings. However, in this case, construction of the development may not begin (and no building permits may be issued) until such officer or agency issues any required permit or approves any required erosion control plan.

(b) For purposes of this section, "land disturbing activity" means any use of the land by any person in residential, industrial, educational, institutional or commercial development, highway and road construction and maintenance that results in a change in the natural cover or topography and that may cause or contribute to sedimentation. Sedimentation occurs whenever solid particulate matter, mineral or organic, is transported by water, air, gravity, or ice from the site of its origin.

(c) The Orange County Erosion Control Officer is authorized by resolution of the Carrboro Board of Aldermen to enforce within the town the Orange County Soil Erosion and Sedimentation Control Ordinance. **(AMENDED 12/7/83)**

- 7.5.3. **Plan Reviews:** The County Erosion and Sediment Control Officer performs plan reviews according to the Ordinance

- 7.5.4. **Enforcement:** The County Erosion and Sediment Control Officer enforces according to the Ordinance. The Town reports problems, potential violations, and citizen complaints to the County Officer.
- 7.5.5. **Inspections:** The County Erosion and Sediment Control Officer conducts inspections according to the Ordinance.
- 7.5.6. **Public Information:** The Town directs inquiries and complaints from the public to the County Erosion and Sediment Control Officer.
- 7.5.7. **Decision Process:** The Planning Department coordinates with the County Erosion and Sediment Control Office on a regular basis. All plans that meet the plan review threshold are submitted for approval to the County and approval of permits depends on issuance of approval of the erosion and sediment control plan for the project. These processes and responsible individuals are detailed in the BMP table above.
- 7.5.8. **Evaluation** of this component will be accomplished by an ongoing evaluation of the effectiveness of the County's program and other agency projects. Noted deficiencies and/or enhancements will be reported each year in the annual report.

7.6. Postconstruction Stormwater Management

Regulatory Requirements

The Town must implement and enforce a post-construction stormwater program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the small MS4. The program must implement strategies, which include a combination of structural, and/or non-structural best management practices (BMPs) appropriate for the community.

Legal Authority: The Town must use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. This mechanism must be reviewed and approved by DWQ prior to implementation. Subsequent reviews will occur, at a minimum, every five years. Regulated public entities without ordinance making powers, shall demonstrate similar actions taken in their post construction stormwater management program to meet the minimum measure requirements.

BMP Design Requirements: The Town must explain how the program ensures post-construction stormwater controls are in place that prevent or minimize water quality impacts from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the small MS4.

Plan Reviews: The Town must explain how the program performs plan reviews to demonstrate compliance with the post construction ordinance and BMP design requirements from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the small MS4. The reviews must address how the applicant will meet performance standards and how the project will ensure long term maintenance.

Inventory of Structural Control Measures: The Town must maintain an inventory of both public and private post construction structural stormwater control measures located within the corporate limits that are covered by the ordinance requirements.

Deed Restrictions and Protective Covenants: The Town shall provide mechanisms such as recorded deed restrictions and protective covenants so that development activities maintain the project consistent with approved plans.

Operation and Maintenance: The Town must describe how the Town will ensure the long-term operation and maintenance (O&M) of the selected BMPs, including ensuring that future O&M responsibilities are clearly identified. The Town shall implement or require an operation and maintenance plan for the long-term operation of the structural BMPs required by the program. The operation and maintenance plan shall require the owner of each structural BMP to perform and

maintain a record of inspections of each structural BMP. Inspection of permitted structural BMPs shall be performed by a qualified professional.

Inspections: The Town shall conduct and document inspections of each project site covered under performance standards, at least one time during the permit term. Before issuing a certificate of occupancy, or temporary certificate of occupancy, the Town shall conduct a postconstruction inspection to verify that the Town's performance standards have been met or a bond is in place to guarantee completion. The Town shall document and maintain records of inspection findings and enforcement actions and make them available for review by the permitting authority.

Educational Materials for Developers: The Town shall make available to developers ordinances, post-construction requirements, design standards checklist, and other materials. New materials may be developed by the Town, or the Town may use materials adopted from other programs.

Enforcement: The Town shall track the issuance of notices of violation and enforcement actions. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.

Evaluation: The Town shall explain how the Town will evaluate the effectiveness of its post construction program, including the measurable goals for each of the BMPs.

Guidance

If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the BMPs chosen be appropriate for the local community, minimize water quality impacts, and attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, EPA encourages the Town to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens.

When developing a program that is consistent with this measure's intent, EPA recommends that the Town adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing the program, the Town should consider assessing existing ordinances, policies, programs, and studies that address storm water runoff quality. In addition to assessing these existing documents and programs, the Town should provide opportunities to the public to participate in the development of the program.

The Town will explain how the program ensures that best management practice for reducing nutrient loading are selected while still meeting the requirements of 15A NCAC .0126(10)(e) and a nutrient application (both inorganic fertilizer and organic nutrients) management program has been developed and included in the stormwater management program.

Nonstructural BMPs: Describe any non-structural BMPs in the program, including, if appropriate:

- Policies and ordinances that provide requirements and standards to direct growth to

identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation;

- Policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure;
- Education programs for developers and the public about project designs that minimize water quality impacts; and
- Other measures such as minimization of the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention.

Structural BMPs: Describe any structural BMPs in the program, including, if appropriate:

- Storage practices such as wet ponds and extended-detention outlet structures;
- Filtration practices such as grassed swales, bioretention cells, sand filters and filter strips; and
- Infiltration practices such as infiltration basins and infiltration trenches.

EPA recommends that the Town ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and EPA recommends that the requirements be responsive to these changes, developments, or improvements in control technologies.

Natural Resource Protection:

- Describe the policies, regulations and incentives in place to protect natural resource areas (e.g., forests, prairies) and critical habitat (e.g., conservation corridors, buffer zones, wildlife preserves) from future development. Protection of significant tracts of critical lands and wildlife habitat will aid in protecting and improving water quality by increasing infiltration and groundwater recharge, preventing erosion and contamination of ground water and surface water resources, and protecting sources of drinking water.
- Describe buffer zones and other protective tools in place around wetlands, riparian areas, lakes, rivers, estuaries and floodplains to improve/protect water quality. The use of these practices will reduce pollutant loads and hydrologic alterations to water bodies.
- Describe protection measures for source water protection areas from current or potential sources of contamination through land use controls and stewardship activities. These practices will help safeguard community health, reduce the risk of water supply contamination, and potentially reduce water treatment costs.

Open Space Protection:

- Describe open space provided for both developed and greenfield areas of the community. In addition to providing open space throughout a community as an amenity, such a network can provide large areas that contribute little to stormwater loads and can provide large areas for the infiltration and purification of stormwater.

Tree Preservation:

- Describe measures taken to protect and maintain trees on public and private property, rights-of-way and plant additional trees to enhance the urban tree canopy. Mature trees provide multiple environmental, economic, and community benefits, including improved water and air quality, reduced heat island effects, lowered energy costs, and improved community aesthetics.
- Describe measures taken to preserve trees on private property and require replacement when trees are removed or damaged during development.
- Describe measures taken to encouraged or require street trees as part of road and public right-of-way capital improvement projects. Street trees can help manage and reduce stormwater runoff while proving multiple public and environmental benefits.

Redevelopment:

Describe incentives in place to direct development to previously developed areas. Municipalities can realize a significant reduction in regional runoff if they take advantage of underused properties, such as infill, brownfield, or greyfield sites. Redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots rather than paving greenfield sites for new development can dramatically reduce total impervious area while allowing communities to experience the benefits and opportunities associated with growth.

Development in Areas with Existing Infrastructure:

Describe measures taken to direct growth to areas with existing infrastructure, such as sewer, water, and roads. Sewer and water authorities can play a major role in directing a region's growth by determining when and where new infrastructure investment will occur. Well-drafted facility planning areas can direct growth by providing sewer service in areas least likely to impact water resources.

Mixed-Use Development:

Describe measures taken to allow mixed use and transit-oriented developments. Mixed use developments allow for the co-locating of land uses, which decreases impervious surfaces associated with parking and also decreases vehicle miles traveled—resulting in a reduction of hydrocarbons left on roadways and reduced air deposition. Transit oriented development (TOD) produces water quality benefits by reducing: (1) land consumption due to smaller site footprints; (2) parking spaces and the impervious cover associated with them; and (3) average vehicle miles traveled, which, in turn, reduces deposition of air pollution into water bodies.

Street Design:

Describe measures taken to allow for street design standards and engineering practices that encourage streets to be no wider than is necessary to effectively move traffic, thereby reducing overall imperviousness. The width of travel lanes, parking lanes and sidewalks should be tailored to the urban setting. Where appropriate, narrowing travel lane width to 10-11 feet, rather than the standard 12-13 feet, can significantly reduce the total amount of impervious surfaces. Such streets can also substantially improve conditions for walking, biking, and using transit, which reduces automobile use and overall demand for parking spaces.

Describe measures taken to allow for shared driveways, reduced driveway widths, twotrack driveways, and rear garages and alleys and encourage alternative forms and decreased dimensions of residential driveways and parking areas. Off-street parking and driveways contribute significantly to the impervious areas on a residential lot. Reducing such dimensions can minimize the amount of stormwater runoff from a site.

Green Infrastructure Elements and Street Design:

- Describe measures taken to integrate green infrastructure practices as a standard part of construction, maintenance, and improvement plans. Formally integrate green infrastructure into standard roadway construction and retrofit practice. Projects to improve or repair streets provide opportunities to include green infrastructure retrofits as part of larger project budget, design and construction.
- Describe measures taken to promote use of pervious materials for all paving areas, including alleys, streets, sidewalks, crosswalks, driveways and parking lots. Streets, sidewalks, and other hard surfaces contribute a large portion to a municipality's total imperviousness. Making these impervious surfaces more permeable protects water quality, reduces flooding and can recharge groundwater.

Reduced Parking Requirements: Describe measures taken to provide for alternative parking requirements (e.g., shared parking, off-site parking) that match parking requirements to the level of demand and allow flexible arrangements to meet parking standards. Inflexible parking requirements that do not allow for alternative approaches, as well as standards that require too much parking for specific uses increase the amount of impervious surface in a development.

Over-parking a development also encourages greater vehicle use and detracts from the overall pedestrian environment.

Transportation Demand Management Alternatives: Describe measures taken to allow alternative measures such as transportation demand management or in-lieu payments to reduce required parking to reduce parking in exchange for specific actions that reduce parking demands on site. Incentives such as transit passes, van pool arrangements, flexible work schedules, market-priced facilities, and separate leasing for spaces in apartments and condos have quantifiable impacts on parking demand. Incorporating them into parking requirements creates the opportunity to meet demand with less impervious cover.

Minimizing Stormwater From Parking Lots: Describe measures taken to require landscaping to help reduce runoff. Parking lots generate a large amount of impervious cover. Requiring landscaping reduces the environmental impact of parking and can provide additional community benefits by providing shade and, if appropriately placed, creating natural barriers between pedestrians and cars.

Green Infrastructure Practices:

- Describe measures taken to encourage green infrastructure practices as legal and preferred for managing stormwater runoff. Green infrastructure approaches have been proven to be more effective and cost efficient than conventional stormwater management practices in many instances and provide other substantial community benefits.
- Describe measures taken to allow all types of green infrastructure and remove all impediments to using green infrastructure, such as limits on infiltration in rights-of-way and permeable pavements, and restrictions on the use of cisterns and rain barrels.
- Describe measures taken to ensure stormwater management plan reviews take place early in the development review process. (Incorporate stormwater plan comments and review into the early stages of development review/site plan review and approval, preferably at pre-application meetings with developers). Pre-site plan review is an effective tool for discussing with developers alternative approaches for meeting stormwater requirements. This can ensure that green infrastructure is incorporated into new projects at early design stages, well before construction begins.
- Describe measures taken to allow harvested rain water for non-potable uses, such as irrigation and non-potable interior uses such as toilet flushing. Stormwater reuse is important for dense, urban areas with limited spaces for vegetated green infrastructure practices.

- Describe provisions available to meet stormwater requirements in other ways, such as off-site management within the same sewer shed or “payment in lieu” of programs, to the extent that on-site alternatives are not technically feasible. In some cases, it is impracticable or infeasible to treat all or even some of the stormwater runoff on site. In such instances alternative means should be provided through contribution to off-site mitigation projects or off-site stormwater management facilities (preferably green infrastructure facilities).

Green Infrastructure Strategies: Identify short-, medium-, and long-term strategies for revising local policies to better support green infrastructure.

Carrboro Strategy

7.6.1. BMP Summary Table

BMP’s and Measurable Goals for Post-Construction Stormwater Runoff Control

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
1	Maintain adequate legal authorities	The Town shall: maintain through an ordinance, adequate Post Construction Runoff legal authorities. The Town shall have the authority to: review plans for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained; request information such as stormwater plans, inspection reports, monitoring results, and other information deemed necessary to evaluate compliance with the Post-Construction Stormwater Management Program; enter private property for the purpose of inspecting at reasonable times any stormwater facilities, equipment, practices, or operations.	X	X	X	X	X	Planning Director/ Town Attorney/ Planning Administrator/ Environmental Planner/ Development Review Administrator
2	BMP Design Requirements	The Town will continue to rely on the DWQ BMP Design Manual.	X	X	X	X	X	Engineer/ Environmental Planner
3	Plan reviews	The Town shall conduct site plan reviews of all new development and redeveloped sites that disturb greater than or equal to one acre (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review shall address how the project applicant meets the performance standards and how the project will ensure long-term maintenance.	X	X	X	X	X	Development Review Administrator/ Engineer/ Environmental Planner
4	Inventory of projects with postconstruction structural control measures	The Town shall maintain an inventory of projects with postconstruction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the Town's corporate limits that are covered by its post construction ordinance requirements.	X	X	X	X	X	Environmental Planner*/Engineer/ GIS Specialist
5	Deed Restrictions and Protective Covenants	The Town shall provide mechanisms such as recorded deed restrictions and protective covenants so that development activities maintain the project consistent with approved plans.	X	X	X	X	X	Development Review Administrator/ Town Attorney
6	Provide a mechanism to require long-term operation and maintenance of structural BMPs.	The Town shall implement or require an operation and maintenance plan for the long-term operation of the structural BMPs required by the program. The operation and maintenance plan shall require the owner of each structural BMP to perform and maintain a record of annual inspections of each structural BMP. Annual inspection of permitted structural BMPs shall be performed by a qualified professional.	X	X	X	X	X	Development Review Administrator/ Environmental Planner/ Zoning and Inspections Staff/ Engineer
7	BMP Inspections	The Town shall conduct and document inspections of each project site covered under performance standards, at least one time during the permit term. Before issuing a certificate of occupancy, or temporary certificate of occupancy, the Town shall conduct a postconstruction inspection to verify that the Town's performance standards have been met or a bond is in place to guarantee completion. The Town shall document and maintain records of inspection findings and enforcement actions and make them available for review by the permitting authority.	X	X	X	X	X	Development Review Administrator/ Environmental Planner*/ Zoning and Inspections/ Staff/ Engineer
8	Educational materials and training for	The Town shall make available to developers ordinances, post-construction requirements, design standards checklist, and other	X	X	X	X	X	Development Review

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
	developers	materials. New materials may be developed by the Town, or the Town may use materials adopted from other programs.						Administrator/ Environmental Planner*/ Engineer
9	Enforcement	The Town shall track the issuance of notices of violation and enforcement actions. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.	X	X	X	X	X	Development Review Administrator/ Zoning and Inspections Staff

*Carrboro intends to hire a Planning Specialist in 2012-13 that will assume responsibility for these measures

7.6.2. **Non-Structural BMPs:** The town's Land Use Ordinance establishes site design requirements that address post- construction storm water runoff from new developments. The town's storm water management requirements in sections 15-261 through 263 and Appendix I (*Storm Drainage Design Manual*) of the Land Use Ordinance (see this report's Appendix) regulate new developments so as not to cause damage in terms of water quality or quantity. Appropriate stream buffer and impervious surface restrictions are provided for in sections 15-266 through 15-269. The arrangement of development that benefits water quality is provided for by the town's open space requirements, which seek to protect and recognize "natural constraints" including stream buffers, slopes, and wetlands (section 15-198). The town also provides regulations for its low to medium density districts that control the amount of development (density) with regard to the degree of natural and other constraints (section 15-182.3).

The Town has been encouraging developers to utilize non conventional low impact development (LID) approaches to stormwater management that go beyond water quantity and quality controls to include prevention, infiltration, and a water budget approach. For example developers are encouraged to take into account the hydrological lay of the land, preserve existing wetlands, grade the lots for stormwater runoff into raingardens, and design stormwater management systems to maintain pre-development hydrology after post-development buildout, thereby minimizing perturbation to the current ecological equilibrium of the local watershed. One development in Carrboro is used by NCSU for LID educational purposes. The Town has implemented LID language for day care uses in the Land Use Ordinance. The Town is also evaluating and encouraging use of successful pervious pavement surface applications and other means of reducing impervious surfaces. Various policies and provisions of the land use ordinance encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure.

7.6.3. **Structural BMPs:** The Town's stormwater system utilizes a combination of conveyance systems. These range from sheet flow from street, sidewalks and shoulders into curb/gutter, concrete piping, grassed lined swales, rip rap or armored ditches with a variety of types of treatment devices and dissipation systems at their outlets prior to entering receiving waters. The Town recognizes all structural BMPs included in the DENR BMP Manual, and has permitted several proprietary devices in order to evaluate potential innovative systems.

7.6.4. **Regulatory Mechanism:** The Town will apply the current Land Use Ordinance to address post-construction runoff from new developments and redevelopments and modify it as needed to address any additional issues identified in implementation of this plan. The most relevant portions of the Land Use Ordinance are included in the Appendix. The Town has been preparing for the Jordan Lake rules by submitting plans to DENR for existing development nutrient reductions and adopting ordinance provisions for nutrient management and water quality buffers, and will be preparing ordinance provisions for new development during this permit period.

7.6.5. **Operation and Maintenance:** In Carrboro as elsewhere, the push to construct BMPs has been stronger than the push to engage active maintenance programs. Maintenance programs are subject to budget constraints, lack of staffing, and limited knowledge of the BMP-specific maintenance needs. Successful operation and maintenance of BMPs requires significant effort and planning.

Recognizing this challenge, The Town has been requiring operation and maintenance plans for stormwater BMPs. The Town formalized these requirements by ordinance in 2007, including an annual

self-reporting protocol, as part of pre-construction requirements. Subsequently, the Town has been developing details for its maintenance and inspection program, and has worked to enforce these details as of 1/2010 in approximately 20% of the BMPs in the Town's jurisdiction. These details will be posted on the Town website in 2010. The Town uses the DENR BMP manual and guidance from NCSU and the Center for Watershed Protection, and has developed tracking mechanisms, outreach materials, and standardized forms detailing the program. The primary challenge during this permit period will be performing outreach to Homeowners Associations and other private parties that are responsible for BMP maintenance for BMPs more than 5-10 years old, and insuring adequate staff resources to pursue maintenance and inspection in a time of limited local capacity expansion. The Town does not monitor or require monitoring of structural BMPs in terms of water quantity or water quality. The Town does routinely inspect BMPs and require maintenance and inspection from landowners. The Town tracks maintenance and inspection activities in a database.

- 7.6.6. **New Development and Redevelopment:** The requirements for all land disturbing activities greater than 5,000 square feet are included in 15-263 of the land use ordinance. The Town has a long history of progressive means to limit sprawl. One source of information about the Town's vision for new development and redevelopment is A New Vision for Downtown Carrboro, 2001; Carrboro Vision 20/20, 2000. The land use ordinance has multiple provisions that implement this vision. Incentives that the Town is pursuing to enact this vision are described in the report "Creating Carrboro's Economic Future" (RTS, 2006). Mixed use zones are included in the Town's Zoning Districts, with one permitted Village Mixed Use development and other areas being pursued. Carrboro has entered into a joint planning agreement with Orange County and Chapel Hill that recognizes northern Carrboro as a growth area, with a rural buffer provided in the county outside of Carrboro. Much of southern and western Carrboro is protected from growth by location in a water supply watershed. Eastern Carrboro abuts Chapel Hill.
- 7.6.7. **Nutrient Sensitive Waters.** The Town's ordinance includes a provision that BMPs that reduce nutrient loadings shall be employed. The Town Code includes nutrient management provisions for properties with 2 or more acres of land receiving nutrient applications. The Town is working with the Cooperative Extension Service to implement these provisions. The Town is also pursuing means to comply with the Jordan Lake rules. This will include identifying existing development retrofit opportunities, including financing of retrofits. The Town has passed buffer ordinance provisions to comply with the Jordan lake rules. The Town is in the process of implementing new development requirements for nutrients to comply with the Jordan Lake rules.
- 7.6.8. **Natural Resource Protection:** The Town identifies primary and secondary natural constraints in the land use ordinance to protect natural resource areas and critical habitat.
- 7.6.9. **Buffer Zones:** The Town has adopted buffer requirements consistent with the Jordan Lake rules. In addition the Town includes protective buffers for ephemeral streams, and protects a wider buffer than required in the rules for intermittent and perennial streams.
- 7.6.10. **Source Water Protection:** The Town has had watershed protection provisions in place in the land use ordinance for the University Lake watershed for over 2 decades.

- 7.6.11. **Open Space Protection:** The land use ordinance includes open space protection requirements in Article XIII. The Town requires new residential development in most zoning districts to set aside 40% of the area in open space. The Town also maintains public parks, greenways, and has purchased a large property near downtown (the Adams Tract) to provide open space and passive recreational amenities.
- 7.6.12. **Tree Preservation:** Hardwood forests are recognized as primary conservation areas wooded areas are recognized as secondary conservation areas and granted protection in Article XIII of the land use ordinance. Sections 15-314-318 of the land use ordinance address required trees along streets; retention and protection of large trees; trees for shading; and protection of trees during construction;
- 7.6.13. **Street Design:** Street design standards are provided in Section XIV of the land use ordinance. Alley, minor, and local streets all accommodate narrow lanes. Shared driveways, reduced driveway widths, two track, driveways, and rear garages and alleys are all allowed.
- 7.6.14. **Green Infrastructure Elements:** The Town has not formally or systematically defined the term “green infrastructure.” The Town is committed via policies, plans, and ordinance provisions to green infrastructure in the form of and provisions for open space, natural areas, and greenways. The Town has installed/required pervious pavement in private and public areas. The native soils limit the utility of pervious pavement in Carrboro. Parking requirements are specified in Article XVIII of the land use ordinance. Flexible requirements and implementation are provided for in the ordinance and development review process to minimize creation of unnecessary parking. Water conservation provisions help support rainwater harvesting implementation. The Town is currently investigating statutory authority for removing green infrastructure restrictions such as in Homeowner Association covenants. Water conservation provisions and development review encourage rain water harvesting for non-potable uses. These measures will help ensure that green infrastructure practices are monitored and tracked over time and remain in proper working condition to provide the performance required by the stormwater ordinance. The Town’s short term strategy for revising local policies to better support green infrastructure is to continue to pursue watershed restoration efforts in the Bolin Creek watershed and to update the land use ordinance to implement Jordan Lake rule requirements. Longer term strategies include reviewing the ordinance for consideration of additional LID features and protection of forests, review of additional roadside and parking lot BMP opportunities, general ordinance review in consideration of recommendations from the Rocky Mountain Land Use Institute, and consideration of LEED for Neighborhoods.
- 7.6.15. **Transportation Demand Management Alternatives:** Carrboro contributes a considerable portion of its annual budget to support Chapel Hill Transit, a model of fare free transit. Section 15-292.1 of the land use ordinance provides for payment in lieu of providing parking spaces. The Town’s Transportation Advisory Board and Planning Department are pursuing a variety of transportation demand measures.
- 7.6.16. **Minimizing Stormwater From Parking Lots:** Stormwater BMPs are required for parking lots. Landscaping in the form of shade trees and screening is required and helps reduce runoff generated. Additional recommendations for “green parking lots” are provided during the development review process.

- 7.6.17. **Development Review Process:** The Town has a thorough process to insure that stormwater related issues are addressed early and throughout the development review process. This is described in the Carrboro Development Guide. The process involves planning and engineering staff as well as review from the Environmental Advisory Board. Staff routinely go over stormwater requirements at a pre-application stage.
- 7.6.18. **Mitigation:** The Town is currently exploring via ordinance review and Jordan Lake rule implementation off-site mitigation and offsets to the extent that on-site alternatives are not technically feasible.
- 7.6.19. **Decision Process:** The Planning Department will take the lead in evaluating and implementing. The Planning Department will coordinate with other departments to refine and implement the operations and maintenance program. Developers are responsible for preparing operations and maintenance plans for any stormwater system on private property and property owners / owners associations will be responsible for implementing the operations and maintenance program and self-reporting. These processes and responsible individuals are detailed in the BMP table above.
- 7.6.20. **Evaluation:** of this component will be accomplished by assessing achievements and progress toward reaching each of the measurable goals listed in the summary table. Progress will be reported each year in the annual report.

7.7. Pollution Prevention/Good Housekeeping

Regulatory Requirements

The Town must develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, the State, Tribe, or other organizations, the program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

The Town should include the following information to explain the proposed program to meet these requirements:

Affected Operations: Specifically list the municipal operations that are impacted by this operation and maintenance program. The Town must also include a list of industrial facilities the Town own or operate that are subject to NPDES Stormwater General Permits or individual NPDES permits for discharges of storm water associated with industrial activity that ultimately discharge to the MS4. Include the permit number and certificate of coverage number for each facility.

Training: Describe any employee training program the Town will use to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. Describe any existing, available materials the Town plan to use. Describe how this training program will be coordinated with the outreach programs developed for the public information minimum measure and the illicit discharge minimum measure.

Maintenance and Inspections: Describe maintenance activities, maintenance schedules, and long-term inspection procedures for controls to reduce floatables and other pollutants to the MS4.

Vehicular Operations: Describe the controls for reducing or eliminating the discharge of pollutants from municipal parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations and snow disposal areas the Town operate.

Waste Disposal: Describe the procedures for the proper disposal of waste removed from the MS4 and the municipal operations, including dredge spoil, accumulated sediments, floatables, and other debris.

Other Operations: If other aspects of the municipal operation were evaluated, please describe the program feature and the results of the evaluation.

Evaluation: Explain how the Town will evaluate the effectiveness of this minimum measure, including the measurable goals for each of the BMPs.

Guidance

EPA recommends that, at a minimum, the Town consider the following in developing the program: maintenance activities, maintenance schedules, and long-term inspection procedures for structural and nonstructural storm water controls to reduce floatables and other pollutants discharged from the separate storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by the Town, and waste transfer stations; procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris); and ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices. Operation and maintenance should be an integral component of all storm water management programs. This measure is intended to improve

the efficiency of these programs and require new programs where necessary. Properly developed and implemented operation and maintenance programs reduce the risk of water quality problems.

Carrboro Strategy.....

7.7.1. BMP Summary Table

BMP's and Measurable Goals for Pollution Prevention / Good Housekeeping

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
1	Inventory of municipally owned or operated facilities	The Town shall maintain a current inventory of facilities and operations owned and operated by the Town with the potential for generating polluted stormwater runoff.	X	X	X	X	X	Streets Superintendent/ Fire Marshall/Facilities Administrator
2	Operation and Maintenance (O&M)	The Town will maintain and implement, evaluate annually and update as necessary an Operation and Maintenance (O&M) program for municipal owned and operated facilities and stormwater controls. The O&M program will specify the frequency of inspections and routine maintenance requirements.	X	X	X	X	X	Streets Superintendent/ Fire Marshall/Facilities Administrator /Town Engineer
3	Spill response procedures	The Town shall have written spill response procedures for municipal operations for municipally owned or operated facilities.	X	X	X	X	X	Streets Superintendent/ Fire Marshall/Police Dept./
4	Streets, roads, and public parking lots maintenance	The Town shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within their corporate limits. Within 12 months, the Town must update its Stormwater Plan to include the BMPs selected.	X	X	X	X	X	Streets Superintendent/ Transportation Planner/ Environmental Planner/ Facilities Administrator/Town Engineer
5	Streets, roads, and public parking lots maintenance	Within 24 months, the Town must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots. The Town must evaluate the effectiveness of these BMPs based on cost and the estimated quantity of pollutants removed.		X	X	X	X	Streets Superintendent/ Transportation Planner/ Environmental Planner/ Facilities Administrator/Town Engineer
6	Operation and Maintenance (O&M) for municipally owned or maintained catch basins and conveyance systems	Within 12 months, the Town shall develop and implement an O&M program for the stormwater sewer system including catch basins and conveyance systems that it owns and maintains.	X	X	X	X	X	Streets Superintendent/Streets Crew
7	Identify structural stormwater controls	The Town shall complete a current inventory of municipally-owned or operated structural stormwater controls installed for compliance with the permittee's post-construction ordinance.	X	X	X	X	X	Streets Superintendent/Environmental Planner*/Town Engineer/GIS Specialist
8	O&M for structural stormwater BMPs	The Town shall maintain and implement an O&M program for municipally-owned or maintained structural stormwater controls installed for compliance with the permittee's post-construction ordinance. The O&M program shall specify the frequency of inspections and routine maintenance requirements. The Town will inspect and maintain if necessary, all municipally-owned or maintained structural stormwater controls in accordance with the schedule developed by the Town. The Town will document inspections and maintenance of all municipally-owned or maintained structural stormwater controls.	X	X	X	X	X	Streets Superintendent/Environmental Planner*/Town Engineer
9	Pesticide, Herbicide and Fertilizer Application Management.	The Town will ensure that municipal employees and contractors are properly trained and all permits, certifications, and other measures for applicators are followed.	X	X	X	X	X	Landscape supervisor**/ Landscape Crew
10	Staff training	The Town shall implement an employee training program for employees involved in implementing pollution prevention and good housekeeping practices.	X	X	X	X	X	Streets Superintendent/ Environmental Planner /Planning Specialist*/ Landscape Supervisor**
11	Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	The Town shall describe and implement measures to prevent or minimize contamination of the stormwater runoff from all areas used for vehicle and equipment cleaning.	X	X	X	X	X	Fleet Supervisor/Streets Superintendent

*Carrboro intends to hire a Planning Specialist in 2012-13 that will assume responsibility for these measures

**Position currently vacant

7.7.2. **Affected Operations:** All Town operations are impacted by the operation and maintenance program discussed in this section, specifically:

- 7.7.2.1. Town Hall maintenance
- 7.7.2.2. Public Works operations and maintenance and storage facilities
- 7.7.2.3. Fire Station and equipment maintenance
- 7.7.2.4. Century Center maintenance
- 7.7.2.5. Parks and Recreation facilities and grounds maintenance
- 7.7.2.6. Grounds maintenance
- 7.7.2.7. Streets and drainage system maintenance
- 7.7.2.8. Town Parking Lots

The Public Works main facility has a separate NPDES permit

7.7.3. **Training:** The Town will continue to implement targeted training for all departments to improve employee awareness of the corrective measures that are identified for the various operations and facilities. The Planning and Public Works Departments will coordinate this training with training of departments that will have a role in illicit discharge detection and elimination. The Town worked with NCSU/Cooperative Extension on training and will continue to collaborate. In addition, public education on the measures put in place under this component will be incorporated into the public education program to inform public users of Town facilities of what is expected as proper use of facilities.

7.7.4. **Maintenance and Inspections:** The Town has implemented several notable measures that prevent or reduce pollutants entering receiving waters during storm events. These include:

- ♦ **Integrated Pest Management Program (IPM)** - The Town has adopted an IPM policy and program as a comprehensive approach that gives priority to prevention and management of pests including insects, weeds, and plant disease by the least toxic method. The policy will reduce the environmental and health risks associated with pest management. Reduced loading of toxics in stormwater runoff is one of the direct benefits of this program.
- ♦ **Street Sweeping** – The Town has a vacuum sweeper truck for removal of sediments and pollutants from street surfaces in the downtown district and on some arterial roads twice per week. Residential roads will be swept on a rotating schedule as staff resources allow. It is estimated that the rotation will probably take a month, so that most residential streets will be cleaned monthly. A total of approximately 34 miles of Town streets will be swept in this program.
- ♦ **Basin Clean Out Program** - currently on as needed basis with more attention given to on-going problem locations. A more systematic and routine schedule for conducting periodic maintenance will be possible upon completion of the storm system map, and inspection protocol. The Town's new sweeper is equipped with a "wander hose"

attachment that allows removal of debris and sediments from curb inlets and catch basins.

- ♦ **Reduction of Road Salt Runoff** - The majority of the time Town crews utilize a mixture of 2/3 sand to 1/3 salt with an occasional pure roadway salt application only when there is significant ice accumulation anticipated. Applications are targeted to hills, stop, and intersection approaches and locations that tend to stay frozen longer due to daytime shading rather than treatment of the full width and length of paved street. There are no “Bare Pavement” routes designated at this time within the Town’s Maintained Street system. In addition, the storage of the Town’s sand/salt is contained within concrete slab/filled concrete block perimeter walls and protected from run-off by a roofed structure covering the entire storage area.
- ♦ **Vehicle Wash Area** - Public Works has a wastewater separator tank that is connected to a sanitary sewer system. Periodically, the contents of tank are removed by a licensed and regulated disposal company.

One significant area of concern is the location in the flood plain of the Town Public Works facility. Past flooding events have inundated portions of the Public Works site and cut-off access to the facility. The Town is developing a plan for a new Public Works facility to be located outside of the flood plain, which combined with proper decommissioning of the existing facility, will eliminate this concern.

Until the Public Works facility is relocated, it will be necessary for the evaluation of the Town operations to include an evaluation of the Public Works site. A large part of the site drainage goes directly into Morgan Creek as run-off from storm events. The following potential sources need to be evaluated and corrective measures taken:

- Leachate from composting activities
- Storage of solvents and chemicals
- Storage of salt and sand and other materials
- Storage of street sweepings
- Fuel Storage and fueling activities
- Vehicle and equipment storage and maintenance areas

7.7.5. **Other Operations:** Other corrective measures, maintenance activities, and schedules will be developed as part of implementation of this plan to include controls for preventing release of pollutants from town operations. Specific operational areas that will be evaluated might include:

- Streets and Infrastructure: Scheduling of maintenance activities and inspection procedures for street sweeping, leaf collections, and solid waste collections;
- Vehicle/Equipment Storage Facilities / Town Parking lots: Identifying target areas where oils and liquids drip from vehicles/ equipment and are subject to being transported to surface waters by storm water run-off;

- Daily House Keeping Activities: Identifying improper disposal of cleaning agents and rinse water from wash down of floors, surfaces, and equipment;
- Park Facilities: Identifying improper disposal of cleaning agents and rinse water from wash down of restrooms,
- Portable toilets: Securing toilets from being spilled and developing spill remediation protocol;
- Town Property Sewer Systems (remediation of spills or overflows)
- Storm Water Conveyance Systems: Formalize protocol and schedule for cleaning swales, catch basins, and pipe systems and proper disposal of waste from clean-up operations;
- Road Salt/Sand: Evaluate storage conditions and application protocol and rates;
- Vegetation Control: Evaluate current chemical or herbicide storage and applications (refer to IPM program) and evaluate mowing or right-of-way maintenance schedules;
- Town Building Floor Drains: Identify any improperly routed drains, and improper employee use;
- Solid Waste Operations: Evaluate debris and liquids from waste collection equipment cleaning operations;
- Composting Facilities: Evaluate leachate management;
- Fleet Maintenance Operations: Identify improper disposal, storage, or insufficient containment of oil and other automotive/ equipment fluids and chemicals;
- Vehicle washing activities: Ensure all vehicles are washed only in appropriate facilities.

7.7.6. **Decision Process:** The Public Works Department will take the lead with activities under this measure, and coordinate with staff from other departments to develop a strategy for operation and maintenance, evaluation, and targeted employee training. Each department within the Town will be responsible for implementation with oversight and assistance provided by the Public Works and Fire Departments. A cross-department collaboration will be used to identify structural BMPs to implement. The Planning Department will assist with tracking and reporting on implementation.

7.7.7. **Evaluation** of this component will be accomplished by assessing achievements and progress toward reaching each of the measurable goals listed in the summary table. Progress will be reported each year in the annual report.

7.8. Impaired Waters

Regulatory Requirements

The Clean Water Act requires that specific measures be pursued to restore waters that are impaired to designated uses. Specifically, the Act requires responsible parties to: a. minimize any pollutants causing the applicable receiving waterbody to be listed as impaired through implementation of additional controls that are tributary to the impaired water body segments and that are likely to generate such impairment pollutants; b. achieve Water Quality Standards (WQS); c. reduce levels of the pollutant of concern in accordance with approved Total Maximum Daily Loads (TMDLs). The Act also requires Towns to implement appropriate BMPs to control the Waste Load Allocation (WLA) portion of the pollutant load for the pollutant(s) of concern to the maximum extent practicable.

Guidance

The Total Maximum Daily Load (TMDL) Program is a Federal program authorized under the Clean Water Act to address waters that are not meeting water quality standards. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The TMDL is then used to establish limits on sources of the pollutant which are classified as either point sources (waste load allocation), and non point sources (load allocation). The TMDL must account for seasonal variation in water quality and include a margin of safety to ensure that the TMDL allocations will be adequate to protect the body of water. The Modeling/TMDL Unit with DWQ publishes the 303(d) list and develops TMDLs based on EPA guidance.

All states are required by Section 303(d) of the 1972 Federal Clean Water Act (CWA) to develop TMDLs for water bodies that are impaired (too polluted to maintain their beneficial uses). The list of the lakes, rivers, streams, and estuaries in North Carolina that may need TMDLs and implementation plans is published in the report North Carolina Clean Water Act Section 303(d) List.

Federal regulations prohibit the addition of certain new sources and new discharges of pollutants to waters listed on the North Carolina 303(d) List until a TMDL is established. Under federal law, if North Carolina does not develop its own TMDLs, the U.S. Environmental Protection Agency (EPA) must develop them.

Local input in the TMDL process is essential to determining which controls will be the most effective to implement. Additional sampling will also be required to determine the effectiveness of the chosen controls. If the controls are found to be inadequate, then the implementation plan will be revised and more stringent measures may be adopted.

Carrboro Strategy.....

Carrboro will continue to pursue watershed restoration efforts for Bolin Creek that have been pursued since 2006 as part of participation in the Bolin Creek Watershed Restoration Team. Carrboro will implement requirements under the Jordan Lake rules. Carrboro will use Jordan Lake rules requirements to address nutrient impairments in University Lake and Morgan Creek. Carrboro’s strategy for identifying and prioritizing retrofit opportunities for the Jordan Lake watershed has been approved by DWQ.

7.8.1. BMP Summary Table

BMP’s and Measurable Goals for Impaired Waters

	BMP	Measurable Goals	YR 1	YR 2	YR 3	YR 4	YR 5	Responsible Position/Party
1	Establish a program to identify and prioritize opportunities for retrofits or other nutrient load-reducing activities	Carrboro will fully document all retrofit opportunities or other nutrient load reducing activities in the MS4, and update this list annually. Carrboro will establish two nutrient load monitoring stations to better assess current actual nutrient loads	X	X	X	X	X	Environmental Planner /Engineer
2	Pursue restoration activities in Bolin Creek	Carrboro will continue to identify and pursue restoration opportunities in the Bolin Creek watershed as part of participation in the Bolin Creek Watershed Restoration Team. Carrboro will specifically: Complete active grant projects being pursued in the Bolin Creek watershed Continue to pursue benthic monitoring in the watershed Help develop a watershed restoration plan Collaborate with partners to pursue priority restoration opportunities; commit to completing one new significant restoration project Continue to pursue targeted outreach in the Bolin Creek watershed to encourage widespread citizen adoption of BMPs.	X	X	X	X	X	Environmental Planner / Planning Administrator
3	Carrboro will develop a mechanism for funding of retrofits.	Carrboro will pursue establishment of a stormwater utility or other mechanism for funding of retrofits and other watershed restoration measures.	X	X	X	X	X	Planning Director/Planning Administrator/ Town Attorney/ Town Manager