



NPDES Permit Annual Report

to

**NC Department of Environmental Quality
Division of Energy, Mineral, and Land Resources**

Term IV, Year 1: July 1, 2015 – June 30, 2016

NC Department of Transportation

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This report documents the activities the North Carolina Department of Transportation (NCDOT) conducted in the first year of its Term IV National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit (NCS000250). The Clean Water Act permit was renewed by the North Carolina Division of Energy, Mineral and Land Resources (NCDEMLR) for a fourth five-year permit term effective October 1, 2015 and the annual reporting period was adjusted to align with the state fiscal year. The NPDES permit authorizes NCDOT to discharge stormwater runoff from general roadways including weigh stations and tolling facilities, construction activities disturbing greater than one acre, borrow pits/waste piles, industrial facilities, office buildings, rest areas, and NCDOT-owned railways. Activities conducted by the North Carolina Turnpike Authority are covered under this permit, as well as the public education requirements for the Global Transpark Authority's NPDES permit through a 2012 memorandum of agreement with that agency.

Select Accomplishments for Year 1 of Permit Term IV (July 1, 2015 – June 30, 2016)

Outlined are a few of the notable accomplishments achieved by NCDOT during Year 1 of Permit Term IV to comply with the permit and streamline processes to support project delivery.

- **Post-Construction Stormwater Program** – NCDOT continued to implement the NPDES stormwater management policy under this program for new transportation projects. The program policy, approved by the North Carolina Department of Environmental Quality (DEQ), streamlines project delivery by consolidating related state and federal requirements into a single program and eliminates the need for state stormwater permits for individual projects. Further enhancements to the Post-Construction Stormwater Program are under development in partnership with Federal Highway Administration (FHWA) and United States Geological Survey (USGS). These include enhancing a computer model originally developed by these two agencies with more North Carolina specific pollutant loading, precipitation, and stream flow information. This model, called the Stochastic Empirical Loading and Dilution Model (SELDLM), will allow for improved, data driven National Environmental Policy Act (NEPA)/401 stormwater management decisions for new transportation projects.
- **Industrial Activities Program** - NCDOT implemented and maintained 198 Stormwater Pollution Prevention Plans for its industrial facilities across the state. Each plan is customized to the facility and identifies numerous good housekeeping practices and pollution prevention measures to prevent spills and properly store chemicals and other materials.
- **Retrofits Program** – During the permit year, 11 drainage retrofit projects were completed which improved runoff quality and in several cases addressed maintenance issues. Eighteen additional projects were also initiated and were in the construction phase by the end of the permit year.
- **External Education Program** – Leveraging expertise within the Department's Office of Education Initiatives (OEI), NCDOT hosted a Summer Science, Technology, Engineering and Mathematics

(STEM) Session for a group of Wake County middle school teachers. The session included presentations on stormwater management and associated lesson plans that teachers can incorporate into their science and math curricula. At the invitation of two middle schools attending the Summer STEM Session, NCDOT taught lessons to over one hundred students on stormwater best management practices (BMPs) for their school's campus. In addition to numerous other public education efforts state-wide, NCDOT partnered with the United States Marine Corps Society of American Military Engineers to provide instruction to students for a stormwater BMP design-build exercise at Camp Lejeune. The high school student participants from across the country were divided into teams and competed in a variety of engineering problem solving and leadership development events.

- Research Program – With the support of its university partners, NCDOT continued research on a wide variety of stormwater management technologies intended to enhance support for project delivery. Research projects ranged from improvements to erosion control practices to enhanced design guidance for post-construction stormwater management devices such as bioswales. The Department is also participating in FHWA Pooled Fund studies with other state DOTs to investigate various culvert rehabilitation technologies.

Considerations for Permit Year 2017

In accordance with Session Law 2015-241 NCDOT initiated a review in fiscal year 2016 of its operations and organizational structure with the intent to identify processes that yield a better business model for the delivery of highway projects. The review identified three major objectives which are being implemented in fiscal year 2017. These objectives include:

- Enhance authority for project decision making at the Division level,
- Individualize accountability for the delivery of highway projects, and
- Right size the organization and align staffing levels with strategic goals.

From a NPDES perspective implementation of these objectives will translate into the Divisions shouldering a greater level of responsibility for permit compliance, especially with respect to the Construction and Post-Construction Stormwater Management Program requirements. To make sure there is consistent state-wide compliance with NCDOT's NPDES permit, the organizational review identified that Central Office subject matter experts in the Hydraulics Unit and Roadside Environmental Unit will continue to provide overall guidance and compliance management oversight. In permit year 2017 significant enhancements to the Internal Education Program are being planned to ensure Division staff responsible for NPDES permit compliance have the knowledge and tools necessary to be successful.

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AGC	Association of General Contractors
AMP	Assessment and Monitoring Plan
BMP	Best Management Practices
BUA	Built Upon Area
CFR	Code of Federal Regulations
DEMLR	Division of Energy, Minerals and Land Resources
EE	External Education
EMC	Environmental Management Commission
ESC	Erosion and Sediment Control
ESM	Environmental Sensitivity Map
FHWA	Federal Highway Administration
FIP	Field Inventory Procedure
GIS	Geospatial Information System
GPS	Global Positioning System
GREEN	Guided Reduction of Excess Environmental Nutrients
HRDB	Highway Runoff Database
HSP	Highway Stormwater Program
HU	Hydraulics Unit
I&M	Inspection and Maintenance
ICA	Immediate Corrective Action
IDDEP	Illicit Discharge Detection and Elimination Program
IE	Internal Education
ILT	Interagency Leadership Team
IRMA	Industrial and Roadway Maintenance Activities
KNCB	Keep North Carolina Beautiful
LID	Low Impact Development
LMS	Learning Management System
LOS	Level of Service
MQA	Maintenance Quality Assurance
NC	North Carolina
NCAC	North Carolina Administration Code
NCDA&CS	North Carolina Department of Agriculture & Customer Services
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCDOT	North Carolina Department of Transportation
NCDOT-JLSLAT	NCDOT Jordan Lake Stormwater Nutrient Loading Accounting Tool
NCDWR	North Carolina Department of Water Resources
NCSU	North Carolina State University

NCVMA	North Carolina Vegetation Management Association
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NSAB	Nutrient Scientific Advisory Board
OEI	Office of Education Initiatives
PAM	Polyacrylamide
PCSP	Post Construction Stormwater Program
PY	Permit Year
RCP	Reinforced Concrete Pipe
RoF	Report of Findings
REU	Roadside Environmental Unit
SCC	Sedimentation Control Commission
SECREP	Sediment and Erosion Control Research Evaluation Facility
SELDL	Stochastic Empirical Loading and Dilution Model
SCMS	Stormwater Controls Management System
SMP	Stormwater Management Plans
SPCA	Sedimentation Pollution Control Act
SPCC	Spill Prevention Control and Countermeasure
SPPP	Stormwater Pollution Prevention Plan
SSIP	Stormwater System Inventory and Prioritization
STEM	Science, Technology, Engineering, and Mathematics
STORMDATA	Stormwater Research Monitoring Database
TMDL	Total Maximum Daily Load
TS4	Transportation Separate Storm Sewer System
US	United States
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WLA	Waste Load Allocation

1.0 Introduction

The Highway Stormwater Program was established in 1998 to manage compliance with the Department's statewide Phase I National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit. The NPDES permit authorizes North Carolina Department of Transportation (NCDOT) to discharge stormwater runoff from the following activities:

- General roadway including weigh stations and tolling facilities
- Construction activities disturbing greater than one acre
- Borrow pits/waste piles (including mines)
- Industrial facilities with the following activities
 - Ferry terminals and maintenance
 - Vehicle and equipment maintenance
 - Pesticide and fertilizer storage
 - Salt and deicing chemical storage
 - Material storage areas
 - Asphalt and concrete plants (NCDOT owned and operated only)
 - Rail maintenance
- Non-roadway non-industrial facilities (i.e., office buildings and rest areas)
- General railway

Activities conducted by the North Carolina Turnpike Authority are also covered under this permit, as well as the public education requirements for the Global Transpark Authority's NPDES permit through a 2012 memorandum of agreement with that agency.

In order to implement the permit, NCDOT has organized the HSP into thirteen (13) main program areas. Compliance activities associated with the NPDES permit are co-managed by the Hydraulics Unit (HU) and the Roadside Environmental Unit (REU) and are implemented by business units across NCDOT.

This annual report describes the various achievements and compliance activities by program area for Year 1 of Permit Term IV, covering the period of July 1, 2015 through June 30, 2016. Additionally, Section 15 at the end of this report includes a summary of NCDOT's implementation of the stormwater requirements for state and federal entities in the Jordan and Falls Reservoir watersheds in compliance with state nutrient load reduction rules. Inclusion of the annual reporting requirements for these two watersheds into NPDES annual reporting is allowed by 15A NCAC 02B .0271 (8)(c) and 15A NCAC 02B .0281 (11)(d).

The Department's NPDES permit was reissued in the Fall of 2015 (effective October 1, 2015). Since this is the fourth permit, NCDOT refers to it as the Term IV permit. With this reissuance the reporting period for the annual report was changed to align with the Department's fiscal year to facilitate planning.

Throughout this document, reporting years are referred to as Permit Year 20## (or PY20##) to denote the following time frames:

- PY2015: September 1, 2014 – August 31, 2015 (Year 5 of the previous Term III permit)
- PY2016: July 1, 2015 – June 30, 2016 (Year 1 of the Term IV permit)
- PY2017: July 1, 2016 – June 30, 2017 (Year 2 of the Term IV permit)

As shown above, PY2016 overlaps PY2015 by two months. Any activities performed during this overlap period are noted in the text.

2.0 Illicit Discharge Detection and Elimination Program

NPDES Permit Part II.A

Objectives and Measureable Goals

The program objectives are to:

- i. Implement an Illicit Discharge Detection and Elimination Program (IDDEP) to detect illicit discharges, spills, and illegal dumping into the NCDOT transportation separate storm sewer system (TS4).
- ii. NCDOT shall implement appropriate procedures and actions to report illicit spills, discharges and illegal dumping for appropriate enforcement or other action by North Carolina Department of the Environment Quality (NCDEQ).

Management Measures	Measurable Goals
(a) Provide illicit discharge identification training.	NCDOT shall provide annual training for appropriate staff and contractors. Training shall include identification and reporting of illicit discharges and illegal dumping.
(b) Perform illicit discharge inspections.	NCDOT shall perform inspections for illicit discharges to the stormwater drainage system and illegal dumping activities when performing other work on the NCDOT system. Inspections shall be documented when illicit discharges are verified.
(c) Maintain a standard point of contact.	NCDOT shall maintain a standard reporting format and contact for all complaints and reports of illicit discharges.
(d) Report illicit discharges.	NCDOT shall investigate all reports of illicit discharges or illegal dumping. NCDOT shall report verified illicit discharges to the appropriate NCDEQ Regional Office within 30 days of verification.
(e) Maintain a tracking database.	NCDOT shall maintain a tracking database for reports of illicit discharges.

Program Overview

The IDDEP was developed and implemented to detect and eliminate illicit discharges/spills and illegal dumping into the NCDOT TS4. The program provides training for NCDOT staff and contractors on performing inspections, identification of illicit discharges and illegal dumping, and reporting to NCDEQ. NCDOT maintains a tracking database and standard point of contact for the program.

Accomplishments

NCDOT continues to maintain its IDDEP to detect illegal dumping, spills, and discharges along the state's roadway system. NCDOT employees participate in training to help enable them to identify potential illegal dumping, spills, and discharges when performing other work on the NCDOT system, and report them to the HSP IDDEP Manager, who acts as the primary point of contact for the program.

As summarized in Table 1, from July 1, 2015, to June 30, 2016, NCDOT identified three new illegal discharges across the state, which makes 454 total illegal discharges reported since the initiation of the program in June 1999. One report concerning animal waste discharged into an NCDOT lateral ditch occurred within the Cape Fear River Basin, one report concerned a chemical spill on I-40 Eastbound within the Neuse River Basin, and one report concerned a tractor trailer spill that occurred at an NCDOT Rest Area located within the Tar-Pamlico River Basin.

Table 1. IDDEP Accomplishments

Accomplishments	
Number of illicit discharges identified since 1999	454
Number of illicit discharges identified during reporting period	3
Number of NCDOT staff trained during reporting period	407

This year, NCDOT worked on updating forms and procedures in its Inventory Program and Construction Program to document when illicit discharges are not encountered on a site as well as when an illicit discharge is observed. This effort provides documentation that the Department is actively looking for these discharges and provides a reminder to staff in the field to report any issues they may find.

Ongoing IDDEP Training – As required by Internal Education Program Management Measures (a) and (b) and IDDEP Management Measure (a), NCDOT HSP staff continues to provide training to NCDOT employees on how to recognize and report illicit discharges and illegal dumping activities. IDDEP training is provided in conjunction with other training events, including the annual spring training workshops for each NCDOT Division, and during various Division meetings. In the spring of 2016, NCDOT HSP staff provided IDDEP training to 407 NCDOT employees as part of NCDOT's Stormwater Pollution Prevention Plan and Spill Prevention Control and Countermeasures Level I and II Training Workshops. NCDOT utilizes a train-the-trainer approach so the trained division supervisors/staff pass on this IDDEP training to their employees throughout the divisions. NCDOT continues to post Illegal Dumping educational posters and IDDEP brochures at maintenance facilities. Hardcopies of NCDOT's IDDEP Field Report and the "Illegal Discharge: Know What to Do" brochures are provided to NCDOT employees at various meetings. NCDOT also distributed over 800 IDDEP brochures through the NC State Fair, and held more than 14 group presentations, event displays (e.g., Tourism Day and local fairs) and field training sessions. See External Education for additional details on other stormwater educational materials distributions to the general public or Adopt-A-Highway volunteers. These materials are related to litter, illicit discharges, and illegal dumping, and help raise awareness on reporting illicit discharges and illegal dumping found on NCDOT roadways.

Tracking and Reporting Illicit Discharges – NCDOT continues to maintain its IDDEP website, which consists of a web-based tracking system and database for identified illicit connections and illegal dump sites found along NCDOT roadways. When an illegal discharge is identified along NCDOT roadways, an IDDEP Field Report form is used to capture applicable information. The Division that identifies the discharge or dump site typically performs a preliminary investigation following NCDOT safety procedures to verify the identified illicit discharge or illegal dumped materials. Once the site has been investigated and verified, the Division notifies the IDDEP Manager, who then reports the discharge to the appropriate NCDEQ Regional Office within 30 days of the illicit discharge verification date.

Considerations for Permit Year 2017

NCDOT plans to continue to maintain the IDDEP procedures in Permit Year 2017. NCDOT will evaluate the program's internal processes to identify any new opportunities for improvement and to help the HSP target certain areas that may need additional IDDEP education or coordination assistance. Asset inventory field crews have been identified as a business unit within the Department which could be leveraged to expand the number of staff trained to identify illicit discharges.

3.0 Stormwater System Inventory and Prioritization Program

NPDES Permit Part II.B.1

Objectives and Measureable Goals

The program objectives are to:

- i. Maintain the statewide NCDOT stormwater outfall inventory for the purpose of supporting other permit programs.
- ii. Maintain a stormwater outfall geospatial information system (GIS) data layer to map and prioritize sensitive water crossings.
- iii. Maintain a field inventory procedure to be used for NCDOT/ Division of Energy, Minerals and Land Resources- (DEMLR) identified priority areas.

Management Measures	Measurable Goals
(a) Maintain a stormwater outfall inventory of existing stormwater outfalls to sensitive waters.	NCDOT will maintain a GIS-based implicit stormwater outfall inventory to include outfalls from primary and secondary roadways.
(b) Include in the inventory implicit outfalls from newly completed construction projects.	The stormwater outfall inventory shall be updated annually to include implicit outfalls from newly completed construction projects.
(c) Include outfalls for NCDOT industrial facilities in the inventory.	The stormwater outfall inventory shall be updated annually to include changes or additions to previously inventoried NCDOT industrial facilities.
(d) Field outfall inventory procedure for priority areas.	NCDOT will maintain the field outfall inventory procedure. The annual report shall document implementation of the procedure, identify future priority areas, and define a schedule for implementing the procedure within the identified priority areas.

Program Overview

NCDOT implemented a Stormwater System Inventory and Prioritization (SSIP) Program to support other permit programs with information regarding NCDOT's TS4. Operationally, NCDOT defines a stormwater outfall as the point at which concentrated runoff is discharged to waters of the United States. SSIP Program activities include maintaining a stormwater system GIS map which prioritizes sensitive water crossings, and developing and implementing a Field Inventory Protocol (FIP) for priority areas identified collaboratively by NCDOT and NCDEQ. During its Term II permit (April 2005-March 2010), NCDOT

developed a geospatial processing methodology to estimate the locations of outfalls, establishing a baseline inventory. This inventory of implicit outfalls is updated annually.

Accomplishments

The stormwater outfall inventory is updated using the three processes established for HSP:

- Implicit outfalls are updated using geospatial processing to identify locations where roads cross streams,
- Industrial outfalls are updated using changes reported by industrial facilities, and
- Field verified outfalls are captured using the FIP.

Table 2 lists the number of outfalls inventoried by these processes as of PY2016.

Table 2. Outfalls Identified as of PY2016

Outfall Type	Inventoried
Implicit Outfalls	117,661
Industrial Outfalls and Discharge Points	588
Field Verified Outfalls	250

Upgraded Application – The HSP has committed to conducting at least one FIP collection per fiscal year. The SSIP Program over the past permit year upgraded their FIP custom application in order to be compatible with a Windows Operating System 7 or 8 environment on tablets. The global positioning system (GPS) software in use for the past six years had become obsolete and was replaced with new software. The NCDOT HSP is currently in the process of acquiring NCDOT-approved tablet hardware to be used with the upgraded FIP application. The HSP is investing in more efficient software and supported hardware.

Lower Falls Lake Outfall Collection – In PY2016, NCDOT completed an FIP Tier 1a collection of outfalls on primary routes in the Lower Falls Lake Sub-Watershed. The inventory identified 122 field-verified outfalls. See the Guided Reduction of Excess Environmental Nutrients (GREEN) Section 15.0 of this report for more details on this effort.

Considerations for Permit Year 2017

In PY2017 the HSP will initiate field outfall inventory data collection in the Upper Falls Lake Sub-Watershed. Upon completion the data will be integrated with the Lower Falls Lake Sub-Watershed dataset to complete the inventory of outfalls along primary routes for the entire Falls Lake Watershed. The Falls Lake Watershed outfall inventory dataset will be used to support the BMP retrofit planning efforts as discussed in Section 15 of this report.

4.0 BMP Retrofits Program

NPDES Permit Part II.B.2

Objectives and Measureable Goals

The program objectives are to:

- i. Develop, implement and support the NCDOT program to be consistent with NPDES post-construction control measures and support development of the BMP Toolbox.
- ii. Use retrofits to address pollutant loading from existing NCDOT activities.
- iii. Retrofits should not be associated with meeting the requirements of any other NCDEMLR or NCDWR program, unless otherwise allowed.

Management Measures	Measurable Goals
(a) Identify appropriate retrofit sites.	Identify a minimum of fourteen (14) potential retrofits per year.
(b) Implement retrofits.	Maintain a program to implement retrofits. Complete a total of seventy (70) retrofits over the 5-year period of this permit. The retrofits will be appropriate for the identified pollutants of concern. Include in the annual report the number of retrofits completed.

Program Overview

NCDOT has implemented a BMP Retrofits Program that is consistent with NPDES post-construction control practices. It incorporates both structural and non-structural stormwater retrofits to address pollutant loading from existing NCDOT activities and to evaluate new stormwater controls. Retrofits implemented under the program are not associated with meeting the requirements of any other NCDEQ program, unless otherwise allowed. Each year, potential sites are evaluated and selected for BMP retrofits under this program. The BMP Retrofits Program collaborates with the Research and BMP Toolbox Programs to design, construct, and assess new and innovative BMP types or components.

Accomplishments

Eleven (11) BMP retrofits listed in Table 3 were completed during the reporting period from July 1, 2015 to June 30, 2016. These BMP retrofits were completed during the overlapping reporting period and were reported in the previous annual report as well. The bioswales constructed will be monitored as part of research project (RP) 2016-18 being conducted by students within NC State University (NCSU) – Biological and Agricultural Engineering Department’s advanced degree programs.

Table 3. BMP Retrofits Completed During the Reporting Period

Identification No.	BMP Type	County	Location
IM-5-92-BS-3300	Bioswale	Wake	NC 50 & NC 98
IM-5-92-BS-3301	Bioswale	Wake	NC 50 & NC 98
IM-5-92-BS-3302	Bioswale	Wake	NC 50 & NC 98
IM-5-92-BS-3303	Bioswale	Wake	NC 50 & NC 98
IM-5-92-BS-3304	Bioswale	Wake	NC 50 & NC 98
IM-5-92-BS-3305	Bioswale	Wake	NC 50 & NC 98
IM-5-92-FB-3306	Filtration Basin	Wake	NC 50 & NC 98
IM-5-92-DDB-3307	Dry Detention Basin	Wake	NC 50 & NC 98
IM-5-92-DDB-3308	Dry Detention Basin	Wake	NC 50 & NC 98
IM-5-92-S-3309	Swale	Wake	NC 50 & NC 98
IM-5-92-S-3310	Swale	Wake	NC 50 & NC 98

Designs for the following BMP retrofits identified in Table 4 were completed and are now in the construction phase. The construction phase includes the Bidding and Letting process through construction completion.

Table 4. BMP Retrofits Currently Under Construction

Identification No.	BMP Type	County	Location
D-3-10-SF-2872	Sand Filter	Brunswick	SR 1172 (Sunset Blvd.)
D-7-41-FB-3030	Filtration Basin	Guilford	I-40 & SR 4121 (W. Gate City Blvd.)
D-5-92-FB-3389	Filtration Basin	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-FB-3390	Filtration Basin	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-FB-3391	Filtration Basin	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-DDB-3392	Dry Detention Basin	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-BS-3393	Bioswale	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-BS-3394	Bioswale	Wake	I-540 & SR 1005 (Six Forks Rd.)
D-5-92-FB-3395	Filtration Basin	Wake	I-540 & SR 2000 (Falls of Neuse Rd.)

Identification No.	BMP Type	County	Location
D-5-92-FB-3396	Filtration Basin	Wake	I-540 & SR 2000 (Falls of Neuse Rd.)
D-7-1-FB-3397	Filtration Basin	Alamance	I-40 & NC 49
D-13-59-HSB-3398	Hazardous Spill Basin	McDowell	I-40 EB Rest Area
D-13-50-FB-3399	Filtration Basin	Jackson	US 23, US 74 & US 24bus. Interchange
D-13-50-FB-3400	Filtration Basin	Jackson	US 23, US 74 & US 24bus. Interchange
D-13-56-FB-3401	Filtration Basin	Macon	US 23/441 Park and Ride Lot
D-13-56-FB-3402	Filtration Basin	Macon	US 23/441 Park and Ride Lot
D-3-65-IS-3405	Infiltration Swale	New Hanover	NC 132 (College Rd.)
D-3-65-IS-3406	Infiltration Swale	New Hanover	NC 132 (College Rd.)

Additionally, HSP staff identified twenty-six (26) potential site locations during the permit year for future installation of a BMP retrofit. These and other potential sites are stored within files on NCDOT HU servers. Target areas for new BMP retrofits included the Falls Lake Watershed and various impaired waters located within the three geographic regions of NC. After construction, BMP retrofits are tracked in NCDOT's Stormwater Control Management System (SCMS) along with other BMPs.

Considerations for Permit Year 2017

The BMP Retrofits Program will continue to identify potential sites and deliver projects which meet the program's objectives. The BMP Retrofits Program also plans to finalize the NCDOT BMP Retrofits Program Project Cycle document. This document describes the project components that will occur during each cycle (project identification through construction) and will outline the project cycle schedule of activities which will occur during each permit year.

5.0 BMP Toolbox for Post-Construction Runoff Program

NPDES Permit Part II.B.3

Objectives and Measureable Goals

The program objectives are to:

- i. Maintain and update as necessary a BMP Toolbox to aid in the siting, design, and construction of stormwater quality BMPs with guidance on the suitability of each for NCDOT applications.
- ii. Evaluate BMPs for applicability to a linear highway system.

Management Measures	Measurable Goals
(a) Maintain a BMP Toolbox.	Maintain a stormwater BMP Toolbox to provide design guidance for post-construction stormwater control measures. The BMP Toolbox will include appropriate uses/anticipated applications and design criteria. Proprietary BMPs will be evaluated in keeping with DEMLR requirements for permitting new stormwater technologies.
(b) Update the toolbox as necessary	As necessary, evaluate new BMP types or design components for potential updates to the BMP Toolbox. If applicable to NCDOT applications, the BMP Toolbox will be updated to include this new information.
(c) Submit proposed BMP Toolbox revisions to DEMLR for approval.	New guidance on proposed BMPs will be submitted for DEMLR approval prior to implementation.

Program Overview

NCDOT developed the BMP Toolbox to aid in the siting, design, and construction of stormwater quality BMPs with guidance on the suitability of each for NCDOT applications. New guidance developed for inclusion in the BMP Toolbox must be approved by NCDEQ. The original version of the BMP Toolbox was completed in 2008 and updates were published in PY2015. Since that time, efforts have been focused on evaluating other BMP technologies to assess their practical need in the NCDOT TS4 and inclusion in the BMP Toolbox. The BMP Toolbox Program works collaboratively with the NCDOT's Research and BMP Retrofits Programs to evaluate research on existing and new BMP types for potential inclusion in the manual. If considered for inclusion, proprietary BMPs will be evaluated in keeping with the current NCDEQ policy on new stormwater treatment technologies.

Accomplishments

Through NCDOT's Post-Construction Stormwater Program, the HSP provides on-call training on an as needed basis when engineers and designers have questions regarding the design of NCDOT Toolbox BMPs. Often guidance is provided individually to address questions regarding project-specific implementation. HSP staff use these experiences when considering if revisions are needed to improve the BMP Toolbox. No revisions were identified as necessary in PY2016.

In addition, NCDOT staff assessed the need to include additional BMP types in the BMP Toolbox. After reviewing current BMP Toolbox content, recent research results, and NCDOT's needs to address post-construction stormwater treatment at the facility types covered by the permit, it was determined that no new BMPs need to be added at this time.

Considerations for Permit Year 2017

NCDOT will continue to review the BMP Toolbox and research to identify additional BMPs or changes to existing BMP designs that should be added to the BMP Toolbox. Research on bioswale design and pollutant removal performance is currently underway (RP 2016-18) and will inform decisions regarding the suitability of bioswales for inclusion in the BMP Toolbox. Emphasis this year will focus on efficient delivery of stormwater controls through design tools that will improve construction and reduce maintenance. Roadway standard drawings and specifications will be improved to facilitate streamlined design. Training and implementation of the BMP Toolbox will continue under the direction of the Post-Construction Stormwater Program.

6.0 BMP Inspection and Maintenance Program

NPDES Permit Part II.B.4

Objectives and Measureable Goals

The program objectives are to:

- i. Maintain a BMP Inspection and Maintenance Program to aid in the inspection, operation, and maintenance of BMPs.
- ii. Maintain and update as necessary the BMP Inspection and Maintenance Manual.

Management Measures	Measurable Goals
(a) Evaluate new BMP inspection and maintenance needs.	Evaluate new BMPs included in the BMP Toolbox or otherwise needed for inspection and maintenance needs. The evaluation will include consideration of the BMP type, typical siting conditions, and expected function.
(b) Maintain BMP Inspection and Maintenance Manual.	Maintain written procedures outlining the inspection and maintenance requirements for various types of stormwater BMPs. Written procedures will outline the regular inspection frequency, and include an inspection checklist, "how-to" instructions for regular maintenance, evaluation and reporting procedures for non-routine maintenance, and an inspection and maintenance tracking mechanism. As modifications are needed, update the Manual to address needed changes to inspection and maintenance techniques.
(c) Implement a BMP Inspection and Maintenance Program.	Implement a BMP Inspection and Maintenance Program. The program will include annual training for appropriate NCDOT staff and contractors.
(d) BMP Inspection and Maintenance information.	BMP Inspection and Maintenance Program information will be made available upon request to DEMLR.

Program Overview

NCDOT has implemented a BMP Inspection and Maintenance (I&M) Program to aid in the inspection, operation, and maintenance of BMPs. As part of the program, NCDOT maintains and updates its Stormwater Control Inspection and Maintenance Manual. This manual includes written procedures

outlining the inspection and maintenance of stormwater control measures, including the inspection frequency. It also includes inspection checklists and provides instructions for routine and non-routine maintenance. The I&M Program assists NCDOT in better managing their stormwater infrastructure assets. Concurrent with, or prior to, new BMPs being added to the BMP Toolbox, the I&M Program will evaluate them for inspection and maintenance needs, and develop new chapters for the I&M Manual if needed. The program also oversees a comprehensive database system, SCMS, which maintains an inventory of NCDOT's stormwater BMPs and tracks their inspection and maintenance records. The I&M Program coordinates training for staff and contractors with other program areas, as necessary.

Accomplishments

Approximately forty (40) new stormwater devices were added to the BMP inventory in 2016. The total number of stormwater devices by Division are shown in Table 5. NCDOT continues to add new stormwater controls as new projects are built or as part of the BMP Retrofits Program.

Table 5. NCDOT's Stormwater Control I&M Program Inventory Update

NCDOT Division	Number of Stormwater Devices*
1	82
2	177
3	129
4	205
5	541
6	49
7	117
8	119
9	45
10	69
11	49
12	56
13	72
14	32
Total	1,742

*Includes structural and pet waste stations (a non-structural BMP) in maintenance phase as of June 30, 2016

As noted above NCDOT has developed and maintains a Stormwater Control I&M Manual. The manual provides general guidance on the inspection and maintenance protocols of selected stormwater control measures, details for each stormwater control type, and inspection checklists for use in the field. The manual contains specific chapters on the following stormwater control measures:

- Bioretention Basin
- Stormwater Wetland
- Filtration Basin
- Swale

- Infiltration Basin
- Dry Detention Basin
- Wet Detention Basin
- Hazardous Spill Basin
- Level Spreader
- Permeable Pavement
- Preformed Scour Hole

NCDOT continuously evaluates the potential addition of new chapters for the stormwater control measures that may be part of NCDOT's BMP Toolbox or that are being used in the field. In this permit year, HSP staff worked on a comprehensive update to the original Stormwater Control I&M Manual developed in 2010. This is the first overall manual update and includes new guidance based on feedback received from the internal I&M Program reviews and field inspectors. Other revisions were made to improve the manual and update it to reflect changes made to NCDOT's BMP Toolbox in PY2015. The update is anticipated to be completed in the next permit year.

Division personnel are responsible for conducting field inspections of stormwater control measures and assigning a Level of Service (LOS) for each device. This permit year REU staff visited randomly-selected stormwater devices and conducted an independent review and LOS assessment as part of ongoing continuous process improvement checks. The information obtained from this review will be used to update the training and training materials for staff conducting inspections. Based on the 2016 LOS assessment, NCDOT continues to maintain an overall BMP rating above 90.

HSP staff also continue to work on updating SCMS to enhance the functionality based on user experience. Examples upgrades include modifying the inspection and maintenance schedule and reporting process, adding automated trigger dates for inspections needed, removing unused data fields, linking maintenance reports to inspection reports, and other minor improvements to make SCMS more user friendly. The enhancements are expected to be completed in the next permit year.

Considerations for Permit Year 2017

NCDOT will continue to inspect and maintain its stormwater control devices. In addition to completing the Stormwater Control I&M Manual and SCMS updates in the upcoming permit year, the HSP staff plans to explore modifying SCMS to make it available on a mobile platform. The goal is to be able to fill out the inspection and maintenance forms electronically while in the field, which will increase efficiency and reduce data entry errors.

7.0 Post-Construction Stormwater Program

NPDES Permit Part II.B.5

Objectives and Measureable Goals

The program objectives are to:

- i. In cooperation with NCDEQ, implement a post-construction stormwater program to regulate stormwater from new NCDOT development and redevelopment for new built upon area (BUA) by requiring structural and non-structural best management practices (BMPs) to protect water quality, reduce pollutant loading, and minimize post-construction impacts to water quality.

Management Measures	Measurable Goals
a) Implement a Post-Construction Stormwater Program.	Implement a Post-Construction Stormwater Program (PCSP) to control runoff from new NCDOT development and redevelopment. The PCSP shall define implementation of the approved NCDOT BMP Toolbox and post-construction stormwater control measures.
b) Submit revisions to the Post-Construction Stormwater Program to DEMLR for approval.	NCDOT updates and/or revisions shall be submitted to the DEMLR for approval prior to implementation.

Program Overview

The Post-Construction Stormwater Program (PCSP) was implemented to regulate stormwater from new NCDOT development and redevelopment for new BUA. The PCSP requires structural and non-structural BMPs to reduce pollutant loading and minimize post-construction impacts to water quality. An updated PCSP guidance document was approved by NCDEQ in 2014. The PCSP defines how post-construction controls in the approved BMP Toolbox should be implemented for projects, and describes a training program for NCDOT staff and contractors to implement the BMP Toolbox and to incorporate watershed quality strategies.

Accomplishments

The focus for the PCSP in PY2016 has been on building capacity to deliver on-demand electronic training on the program's requirements and preparation of stormwater management plans (SMPs). Additionally, NCDOT in partnership with United States Geological Survey (USGS) initiated a multi-year project to enhance a water quality model (SELDM) which predicts pollutant loads from roadways and subsequent reductions after implementation of BMPs. This model is envisioned as a decision support tool for select

projects subject to the PCSP (see below for additional discussion). North Carolina specific enhancements to the model are expected to be completed in calendar year 2017.

Applying the PCSP. NCDOT continues to apply the PCSP through the routine use of its PCSP Manual and BMP Toolbox to influence the selection, design, and documentation of BMPs. The PCSP is implemented on all roadway and nonroadway projects initiated by NCDOT which propose to increase BUA. Briefly, steps associated with applying the PCSP include evaluating the stormwater management needs of a project site; implementing minimum measures, drainage design for conveying runoff in a diffuse and non-erosive manner, and if needed, additional structural BMPs to treat stormwater pollutants; communication between engineers, designers, regulatory agents, and other stakeholders to discuss the intended approach; and documentation of the process through the SMP. Minimum measures are actions taken on every project, during both planning and design phases, that protect water quality, minimize pollutant loading, and minimize post-construction impacts to water quality. Examples include avoiding sensitive areas, minimizing side slopes, and maximizing vegetative cover. Many of the minimum measures embody the concepts of conservation and use of on-site natural features to retain or treat runoff close to the source.

SELDM – As noted above NCDOT is currently working with USGS to enhance the Stochastic Empirical Loading and Dilution Model (SELDM) with North Carolina-specific stream flow, precipitation, and water quality data. As part of this initiative, NCDOT reviewed research projects funded by the Department since 1998 to compile hydrological data from 2,751 storm events at 71 post-construction roadway sites, and evaluated water quality characterization of 162 analytes associated with these precipitation events. The result of this review and data compilation yielded a total of 33,579 event mean concentrations which will be incorporated into the national Federal Highway Administration (FHWA) Highway Runoff Database (HRDB) which drives SELDM. These North Carolina-specific enhancements are intended to improve the reliability of the model's predictions and support Maximum Extent Practical (MEP) decisions associated with implementing the PCSP. Training for both NCDOT and NCDEQ staff will be conducted as part of the project. The STORMDATA (Stormwater Research Monitoring Database) database currently being developed by NCDOT's Research Program will be used to house data to support additional SELDM enhancements in the future (see Research Program Accomplishments in Section 13 of this report).

Considerations for Permit Year 2017

The planned focus for the PY2017 will be on assessing the level of compliance with the PCSP documentation practices, training staff (see Internal Education), and development of the NC-focused SELDM model.

8.0 Vegetation Management Program

Objectives and Measureable Goals

NPDES Permit Part II.B.6

The program objectives are to:

- i. Manage application of pesticides, fertilizers, and other vegetation management materials to minimize pollutant potential of stormwater runoff.
- ii. Use only approved vegetation management materials.

Management Measures	Measurable Goals
(a) Implement appropriate pest control methods and practices.	Continue to consult with North Carolina Department of Agriculture and Consumer Services (NCDA&CS) and North Carolina State University (NCSU), as needed, in selecting appropriate pest control methods and implementation practices. NCDOT will maintain and update the NCDOT Roadside Vegetation Management Manual as new technology and procedures are adopted by NCDOT.
(b) Use appropriate vegetation management materials as identified in the measureable goal.	Restrict pesticide and fertilizer usage to those materials approved by USEPA/NCDA&CS. Pesticide and fertilizer shall be used in accordance with label restrictions.
(c) Provide training on vegetation management.	Provide annual training for vegetation management personnel and contractors, or require equivalent training for contractors. The training shall consist of appropriate uses and applications of pest control methods used by NCDOT. This training shall be designed to increase awareness of proper mowing techniques, release of biological and chemical agents, appropriate spill response, the correct use and handling of products and the potential for water quality impacts.

Program Overview

Through the Vegetation Management Program, NCDOT manages application of pesticides, fertilizers, and other vegetation management materials to minimize pollutant potential of stormwater runoff. Management measures of the permit include implementing appropriate pest control practices through consultation with the NCDA&CS and NCSU, using appropriate vegetation management materials (only those approved by USEPA or the NCDA&CS, updating NCDOT's Vegetation Management Manual as new technology and procedures are developed, and providing training to staff and contractors regarding the appropriate uses and applications of pest control methods used by NCDOT.

Accomplishments

NCDOT Pesticide Recertification Training – NCDOT’s central REU sponsored two regional pesticide license recertification training sessions in March of 2016. Eighty (80) staff from Divisions 1 through 6 and Division 8 were trained in Goldsboro and 105 staff from Divisions 7 and Divisions 9 through 14 were training in Hickory. Agenda topics included Pesticide Safety and Inventory Control, Aquatic Pesticide Regulations (NPDES Overview) and Aquatic Weed Identification, Pesticide Families and Label Change Update, Information on GPS-enabled Tracking of Herbicide Applications, and Work Functions as they relate to Pesticide Applications and Data Tracking. Presenters included NCDOT REU central office staff, NCSU researchers, NCDA&CS regional pesticide inspectors, and technology vendors.

NCDA&CS approved the trainings for 4 credit hours each day. These credits included recertification credits in the following pesticide sub-classifications: Rights of Way (H), Aquatic (A), Ornamental and Turf (L), Research and Demonstration (N), Dealer (D), and Private Applicator (X). Also, NCDOT participated in the North Carolina Vegetation Management Association (NCVMA) Symposium on December 9 and 10, 2015. Pesticide recertification credits were offered at this training as well.

Continued Use of Approved Materials – NCDOT continues to use materials and practices that are approved by USEPA and NCDA&CS. It was not necessary to consult with these agencies in PY 2016 as NCDOT’s practices and methods had not changed.

Considerations for Permit Year 2017

The Vegetation Management Program plans to continue turfgrass and pesticide evaluation and research to provide and maintain permanent groundcover on NCDOT roadsides throughout the state. The annual REU Vegetation Management Conference is planned for December 2016 which will offer pesticide recertification credits to NCDOT REU staff. Additionally, NCDOT anticipates updating its Roadside Vegetation Management Manual in 2017.

9.0 Construction Program

NPDES Permit Part II.C.1 (Sediment and Erosion Control Program)

NPDES Permit Part II.C.2 (Borrow Pit/Waste Pile Activities)

Objectives and Measureable Goals

The program objectives are to:

- i. Continue to control development activities disturbing one or more acres of land surface including activities by NCDOT contractors.
- ii. Require construction site operators to implement appropriate erosion and sediment control practices.
- iii. Require site inspection and enforcement of control measures.
- iv. Establish requirements for construction site operators to control waste that may cause adverse impacts to water quality such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site.
- v. Continue to implement sediment and erosion control measures and reclamation plans on all borrow pit and waste pile projects, including activities at Ferry Terminals associated with dredging activities and contractor owned or leased borrow pits associated with NCDOT projects in keeping with the sediment and erosion control program delegated by the North Carolina Sediment Control Commission.

Management Measures	Measurable Goals
(a) Maintain the delegation agreement with NCDEQ DEMLR Erosion and Sediment Control (ESC) Program on an annual basis.	Implementation of the NCDENR Division of Energy, Mineral and Land Resources Erosion and Sediment Control Program delegated to NCDOT by the Sedimentation Control Commission in February, 1991, and as may be subsequently amended, for NCDOT construction projects and implementation of the applicable requirements of General Permit NCG010000 effectively meets the objectives above by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development. This program is authorized under the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. This program includes procedures for public input, sanctions to ensure compliance, requirements for construction site operators to implement appropriate erosion and sediment control practices, review of site plans which incorporates consideration of potential water quality impacts, and procedures for site inspection and enforcement of control measures. This program has been delegated to and implemented by NCDOT.

Management Measures	Measurable Goals
(b) Maintain compliance with the applicable requirements of the General Permit NCG010000.	NCDOT shall incorporate the applicable requirements of NCG010000, the North Carolina General Permit to Discharge Stormwater under the National Pollutant Discharge Elimination System associated with construction activities issued August 3, 2011 and as may be subsequently amended, into its delegated Erosion and Sediment Control Program, pursuant to "NCDOT Applicable Requirement from NPDES General Permit No. NCG010000 for Construction Activities and Guidance for Complying with Those Applicable Requirements" in the memorandum dated June 9, 2014 or as updated.
(c) Implement erosion and sediment control measures on all non-commercial borrow pits/waste piles.	NCDOT shall implement erosion and sediment control measures on all non-commercial borrow pit and waste pile projects. The measures utilized shall be in keeping with the erosion and sediment control program established by the North Carolina Sedimentation Control Commission.
(d) Implement approved reclamation plans on all non-commercial borrow pits/waste piles.	NCDOT shall implement the approved reclamation plan on all non-commercial borrow pit/waste pile projects. The reclamation measures utilized shall be in keeping with the reclamation program established by the North Carolina Mining and Energy Commission.
(e) Borrow Pit Discharge Management Program	<p>NCDOT in coordination with DEMLR will implement the Borrow Pit Discharge Management Program. This process will consist of the following tasks:</p> <ul style="list-style-type: none"> ● Implement appropriate management measures to treat borrow pit wastewater for given conditions. ● Implement an inspection and maintenance program. ● Maintain training material and instruct field personnel overseeing borrow pit operations. ● Evaluate and implement appropriate new/innovative technologies.

Program Overview

NCDOT's Construction Program controls the potential impacts to water quality from land disturbance at construction sites and from borrow pit and waste pile activities.

NCDOT implements the Erosion and Sediment Control (ESC) Program, which was delegated to NCDOT by the Sedimentation Control Commission (SCC) in February 1991, which incorporates the requirements of General Permit NCG010000 and includes implementation of appropriate erosion and sediment controls on construction projects.

The delegation agreement allows for the Department to review and approve ESC plans based on compliance with Sedimentation Pollution Control Act (SPCA), water quality regulations, and permit conditions associated with each project. The agreement also authorizes the Department to perform compliance inspections for land disturbing activities associated with highway construction. Although the SCC delegates compliance inspection to the Department, it did not grant enforcement authority. Since the Department cannot issue a fine to itself, a series of policies and procedures were developed to correct compliance issues with highway and maintenance construction projects. The following summarizes the processes involved to make sure the Department's projects are in compliance.

Public Involvement - NCDOT incorporates additional guidance and protective measures when public concerns are raised over assets that may be in proximity to the land disturbing activity such as private ponds and aesthetically pleasing landscaped areas.

Daily Project Inspection - Project personnel inspect and monitor the construction of a project on a daily basis and record daily activities and rainfall amounts. In the event that a compliance issue develops, the project personnel in conjunction with the contractor will address the issue and corrective actions are made. If the corrections are deemed severe by the project engineer then operations on the project are ceased until the compliance issue is rectified.

Monthly Project Inspection - Roadside Environmental Field Operations staff performs a secondary level of compliance inspections on land disturbing projects to determine if the ESC plans are implemented accordingly and that the necessary maintenance is occurring. Permit conditions are evaluated and jurisdictional areas are inspected for compliance. NPDES documentation is reviewed and noted if any deficiencies are identified. If the compliance inspection identifies a situation that is not being corrected or can be corrected in a timely manner then an Immediate Corrective Action (ICA) notice is issued. The ICA alerts NCDOT Management of an issue that needs immediate attention. The project personnel is then charged with correcting the situation as directed by the Chief Engineer. A follow up inspection is then made to determine that the situation was corrected and that steps were taken to prevent a reoccurrence.

The ICA notice is supported by the policies and procedures outlined by the Chief Engineer. The policy outlines the steps that will be taken and the consequences associated with failing to comply. Notification and subsequent reports on projects that have received an ICA are distributed to the Chief Engineer, Division Engineer, Regional Land Quality Engineer, State Sediment Specialist, and the State Roadside Environmental Engineer. A final report is prepared and delivered to the Chief Engineer describing what happened to cause the ICA and what steps were taken by the Division to verify future compliance.

Reclamation Process - NCDOT operates under its exemption from the Mining Act for borrow pits provided all materials are used "in connection with the construction, repair, and maintenance" of our road system. Therefore, all provisions for erosion and sedimentation control and stabilization with

ground cover for waste/borrow sites fall under the conditions of NCDOT's delegated program under the Mining Act and SPCA.

Currently, NCDOT requires reclamation plans for all waste/borrow sites. These plans address temporary erosion control, staged seeding and mulching, fertilizer topdressing, and permanent stabilization. Final inspections are conducted on all waste/borrow sites at project completion or prior to project completion if property owners elect to resume/commence agricultural land disturbing activities on the site(s).

Reclamation sites that require dewatering operations will require an evaluation to determine setbacks to minimize the risk of impacts to adjacent jurisdictional areas. Effluent from dewatering operations will be monitored and the appropriate management procedures will be used to make sure NCDOT is in compliance with the applicable regulations.

New Technology – NCDOT continues to identify new technologies to improve the effectiveness of current BMPs. Research and field trials are beneficial with evaluating new technologies and determining how well it performs under real world conditions.

Accomplishments

Certification - The Biological & Agricultural Engineering and Soil Science Departments at NCSU are partnering with NCDOT to offer an Erosion and Sediment Control/Stormwater Certification Program. The certification program provides the required personnel training to ensure compliance with Erosion and Sediment Control/Stormwater provisions on NCDOT projects.

NCDOT requires all contractors and consultants to have a certified supervisor and foreman to oversee operations on NCDOT projects to ensure compliance with the Sedimentation Pollution Control Act as well as other environmental regulations.

Certification must be renewed every three years.

Certification Levels

- Level I: Erosion & Sediment Control/Stormwater Inspector/Installer
Currently Certified - 2956 persons
- Level II: Erosion & Sediment Control/Stormwater Site Management.
Currently Certified - 7135 persons
- Level III: Design of Erosion and Sediment Control Plans
Currently Certified - 724 persons

Inspections - NCDOT is responsible for two types of inspections on each project: NPDES Self-Monitoring and SPCA Self-Inspections. NPDES Self-Monitoring and SPCA Self-Inspections are conducted at least weekly by a project inspector from the office of the resident engineer for design-build or contract construction, or from the office of the county or district engineer for maintenance projects. There are seven REU Field Operations Engineers, each covering two of the 14 divisions in the State. The REU Field Operations Engineers each have generally one technician, who inspects secondary road projects and some contract construction. REU Field Operations staff inspects all DOT projects. Projects are inspected monthly. Each project is evaluated on a scale of 1-10 for installation of measures, maintenance of measures, effectiveness of measures, plan implementation and overall project evaluation. A score of 6 or less results in the issuance of an ICA report. The weekly project inspections and monthly REU inspections are reviewed for each project.

Field data is collected on ESC measure installation, maintenance, and effectiveness. Timely provision of ground cover, adequacy of right-of-way, phasing of grading, field revisions, and sedimentation damage are also evaluated. Each project is evaluated for overall compliance with the NPDES, NCG010000, and the Sedimentation Pollution Control Act.

Inspections Performed Annually - The following represents the typical range of inspections performed annually during the fiscal year (July 1 – June 30) for each category of land disturbing activity.

- Contract Construction Projects 4,750 – 5,500
- Maintenance Projects 900 – 1,200
- Vertical Construction Projects 45 – 55
- Bridge Maintenance Projects 300 – 500
- Resurfacing Projects 300 – 400

Research – NCDOT continues to invest substantial financial resources into research efforts that will improve existing practices and procedures associated with NCDOT's Construction Program. The following is a list of currently active research projects performed by Dr. Richard A. McLaughlin at NCSU as part of NCDOT's Construction Program:

- Evaluation of Flocculants: Optimizing Characteristics and Screening Methods
- Performance Standards for Straw Mulch Binding Agents
- Turbidity Reduction and Monitoring Research
- Comparing Low-Cost Methods to Stabilize Temporary Diversions and Ditches

Considerations for Permit Year 2017

NCDOT will continue to maintain the Construction Program's existing policies and procedures for inspections, reclamation process, training, and research in Permit Year 2017.

Also, NCDOT will continue to develop new permanent stormwater and temporary ESC BMP details as needed to address unique needs. Where these new controls are found to be beneficial and applicable to other projects, they may become standard details and specifications that can be applied to other future projects.

10.0 Industrial Activities Program

NPDES Permit Part II.D.1 and 2

Objectives and Measureable Goals

The program objectives are to:

- i. Maintain and implement a Stormwater Pollution Prevention Plan (SPPP or Plan) for each facility with an industrial activity that is covered by this permit.
- ii. Develop and implement a Plan prior to operation of any new industrial facilities.
- iii. Evaluate the effectiveness of the industrial Stormwater Pollution Prevention Plans (SPPP) for each industrial facility.
- iv. Perform required qualitative monitoring at stormwater discharge points or outfalls identified in the SPPPs or during supplemental inspections for new sources and discharges as required.

Management Measures	Measurable Goals
(a) Maintain and implement a SPPP for each covered industrial activity and related facility.	NCDOT shall maintain and implement a site specific Stormwater Pollution Prevention Plan (SPPP) for each covered facility with an industrial activity. For new activities or facilities, the SPPP shall be developed and implemented prior to operation. New Activities and facilities shall be identified in the annual report and include a brief description and location information.
(b) Perform visual monitoring at each facility.	Qualitative monitoring shall be performed at each industrial stormwater outfall twice per year, once in the spring (April - June) and once in the fall (September - November). Qualitative monitoring requires an inspection of each stormwater outfall or discharge point for the following parameters: color, odor, clarity, floating solids, suspended solids, foam, oil sheen, and erosion at or immediately below the stormwater discharge point or outfall, and other obvious indicators of stormwater pollution. Qualitative monitoring is for the purpose of evaluating the effectiveness of the SPPP. No analytical tests are required. NCDOT will pursue correction of stormwater quality where qualitative monitoring indicates degradation of quality in comparison to previous monitoring events.

Program Overview

As part of the Industrial Activities Program, NCDOT maintains and implements a SPPP for each facility with an industrial activity that is covered by the NPDES permit. Specific requirements for the SPPPs are provided in Part II.D of the NPDES permit. NCDOT SPPPs describe potential pollution sources at each

facility and provide BMPs to minimize potential impacts on stormwater from on-site industrial activities. The Spill Prevention Control and Countermeasure (SPCC) Plan requirements of 40 CFR 112 have been fully integrated into the SPPPs to emphasize oil spill prevention and response practices at NCDOT industrial facilities. In addition, NCDOT must conduct qualitative monitoring for each stormwater discharge point or outfall through site inspections at each industrial facility at least twice per year, once in the spring and once in the fall.

Accomplishments

The Industrial Activities Program has been operational for eighteen years with well-defined activities that are implemented and refined annually. Most activities focus on maintaining SPPPs, conducting inspections, and providing the on-going education needed to keep employees aware of the requirements. A summary of the key activities completed in the past year is provided in Table 6 below and the following paragraphs.

Table 6. Industrial Activities Program Accomplishments in the Reporting Period

Accomplishments	Total Number
SPPPs maintained and implemented	198
SPPPs updated	11
New SPPPs prepared	1
SPPP/SPCC Plan Implementation Training Workshops	12

SPPP Implementation – NCDOT continues to maintain and implement site-specific SPPPs at its industrial facilities, which includes county maintenance yards, equipment shops, ferry terminals and a ferry maintenance facility, roadside environmental shops, traffic services shops, bridge maintenance yards, a rail maintenance facility, and remote salt and material storage locations. NCDOT SPPPs describe potential pollution sources and structural BMPs at each facility and provide non-structural BMPs to minimize potential impacts on stormwater from on-site industrial activities. NCDOT continues to incorporate the SPCC requirements from 40 CFR 112 into the appropriate facility SPPPs as part of its Industrial Activities Program. NCDOT SPCC Plans describe spill prevention measures, inspections of SPCC-regulated oil containers, and spill response and notification procedures. Additionally, NCDOT includes quantitative monitoring requirements and documentation of the resulting observations at its industrial stormwater discharge points/outfalls in the SPPPs.

During the permit year, SPPP updates were performed for various NCDOT industrial facilities because of changes to the facilities such as new buildings constructed on-site or changes in industrial activities or facility staffing. There was one new facility constructed this permit year, the Wake County (Green Level Road) Salt Storage Yard located at the intersection of Green Level Road and NC-540 in Cary, NC. The covered salt storage facility was designed to hold 2,000 tons of salt and is predominantly used by North

Carolina Turnpike Authority contractors to treat NC-540. There was also one storage yard that discontinued operations; the property was transferred and it was removed from NCDOT's inventory.

NCDOT emphasizes employee training to meet part of the SPPP requirements, utilizing many unique approaches to train Division personnel on stormwater pollution prevention, good housekeeping, and spill prevention. NCDOT uses videos for initial or annual refresher training, individual or group training sessions, posters and handouts for program reminders, and NCDOT's Industrial & Roadway Maintenance Activities (IRMA) BMP Guidance Manual for training briefings at the Division level. NCDOT conducted 12 SPPP/SPCC Implementation Training Workshops with both Level I (introductory review of SPPP/ SPCC Plans) and Level II (advanced SPPP/SPCC update and review) sessions in the spring of 2016 that provided new training for Division staff and advanced level training to NCDOT SPPP Team Leaders and team members.

NCDOT continues to utilize its SPPP website to help manage and track SPPP/SPCC implementation at each industrial facility. The SPPP website allows Industrial Activities Program managers and Division-level engineers to track the overall program implementation and also allows personnel at each facility to document SPPP/ SPCC task completion, including qualitative monitoring of stormwater discharges, facility inspections, employee training, and BMP implementation.

Ongoing Internal Maintenance Yard Review – NCDOT continues to conduct internal reviews of NCDOT maintenance yards throughout the state, including two internal reviews performed during this permit year (Wake CMY and Yadkin CMY). Each internal review includes an evaluation of the facility's SPPP/SPCC Plan, review of documentation of completed tasks, an interview with the SPPP Team Leader and discussion of site-specific changes or needs for the facility, and an in-depth site inspection of the maintenance yard. Verbal BMP recommendations are provided during the internal review and written BMP recommendations are provided later. The internal reviews also serve as an opportunity to gather appropriate site data to fully update the SPPP/SPCC Plans when needed.

The primary goals of the internal maintenance yard reviews are to help the Divisions identify potential stormwater pollution concerns, evaluate their SPPP/SPCC Plan implementation, and provide additional BMP recommendations if needed. The internal reviews also aid Division management in prioritizing any major stormwater related expenditures. The internal reviews also serve as additional one-on-one stormwater pollution prevention training for facility staff which supplements other annual training they perform.

Level I Training & Level II Advanced Training for Division personnel - NCDOT HSP staff continues to provide annual SPPP/SPCC training for NCDOT's Division personnel. NCDOT held 12 training workshops across the state in the spring 2016. Baseline BMPs such as good housekeeping, preventative maintenance, and spill prevention practices were reviewed with all attendees. For the fifth straight year, two different training workshop levels were provided each day.

This permit term NCDOT conducted a new Level I training morning course specific to the Adopt-A-Highway Program. Training included information regarding roles and responsibilities, costs, planning and scheduling, and volunteer requirements. Information was also presented on the Sponsor-A-Highway and the Swat-A-Litterbug programs. New training materials were specifically developed for the Level I training and 150 copies of the new posters were provided to Division Maintenance staff and other appropriate Division staff.

Level II Advanced SPPP/SPCC Training was provided in the afternoons to SPPP Team Leaders (typically County Maintenance Engineers) for each NCDOT industrial facility and other key team members. The topics vary each year for the advanced training. This year, attendees were provided with summary updates on the SPPP/SPCC program, SPPP website, and other SPPP/SPCC implementation issues relevant to Team Leaders. The instructors also reviewed spill prevention and cleanup updates, IDDEP procedures, and nutrient management guidance for Division staff located in Jordan Lake and Falls Lake watersheds.

Training was provided for 407 individuals, including 145 in the morning sessions and 262 in the afternoon sessions. The afternoon session included 67 individuals from Divisions 5, 7, and 8 who received the additional nutrient management training. The Level I and II training approach adopted by NCDOT HSP over the last several years has been extremely effective by providing more targeted training to address where it is needed most. NCDOT utilizes the train-the-trainer approach so Facility and unit supervisors that attend the training workshops pass knowledge to additional staff back at their respective facilities.

Considerations for Permit Year 2017

NCDOT will continue to maintain and implement site-specific SPPPs at its industrial facilities in Permit Year 2017. NCDOT staff will also continue to assist Division personnel by conducting training workshops, providing guidance on structural SPPP BMPs at industrial facilities, performing site reviews at selected facilities, and supporting the divisions with other aspects of the Industrial Activities Program as needs arise.

11.0 Internal Education Program

NPDES Permit Part II.E.1

Objectives and Measureable Goals

The program objectives are to:

- i. Implement a program to train NCDOT staff and contractors about the importance of stormwater quality.
- ii. The training should include topics such as spill control, chemical application, illicit discharges and illegal dumping, etc.

Management Measures	Measurable Goals
(a) Provide pollution prevention awareness training for construction workers.	NCDOT shall provide annual stormwater pollution awareness training for appropriate NCDOT personnel and contractors involved in construction and maintenance activities. NCDOT may require contractors to have equivalent training in lieu of NCDOT-provided training. Training shall include general stormwater awareness, NPDES stormwater permit NCG010000 implementation, identification of stormwater pollution potential, appropriate spill response actions and contacts for reporting spills and illicit discharges/illegal dumping.
(b) Provide pollution prevention awareness training for maintenance workers.	NCDOT shall maintain a program of annual stormwater pollution awareness training for appropriate NCDOT maintenance staff. NCDOT shall also maintain an ongoing awareness program for Adopt-A-Highway volunteers and prison inmate laborers. NCDOT may require contractors to have equivalent training in lieu of NCDOT-provided training. Training shall include general stormwater awareness, identification of stormwater pollution potential and appropriate contacts for reporting spills and illicit discharges/illegal dumping.
(c) Provide pollution prevention awareness training for NCDOT staff.	NCDOT shall provide annual Stormwater Pollution Prevention Plan training for appropriate NCDOT staff. Training shall include general stormwater pollution awareness, site-specific Stormwater Pollution Prevention Plan awareness, and reporting/documentation procedures.
(d) BMP Implementation Training	NCDOT shall provide training to appropriate NCDOT personnel on implementation of post-construction BMPs in keeping with the Toolbox, Inspection and Maintenance Manual, and the Post-Construction Stormwater Program. NCDOT may require

Management Measures	Measurable Goals
	contractors to have equivalent training in lieu of NCDOT-provided training.
(e) Maintain Internal Education and Involvement Plan.	Maintain the Internal Education and Involvement Plan. The plan shall include the requirements for the measureable goals above.

Program Overview

The Internal Education (IE) Program was implemented to provide planning, oversight, and tracking of stormwater quality training for NCDOT staff and contractors. The NPDES permit requires training for construction and maintenance workers along with general pollution prevention training, specifying several education topics for each. Additionally, selected other programs have specific educational requirements which are supported by the IE Program. The IE Program works closely with other HSP program areas to monitor training activities and to provide support for training development.

Accomplishments

Over the reporting period, HSP team members provided training to NCDOT employees and contractors, and continued to develop their knowledge of stormwater management through participation in conferences and training. Table 7 summarizes the types of training received by NCDOT staff and provided by NCDOT.

Table 7. Summary of Internal Education Training Activities

Training / Trainee(s)	Description	Training Provider
SPPP-SPCC Plan Implementation Training/ Division Staff	Conducted 12 workshops in the spring of 2016 for each Highway Division, Ferry Division, Equipment Depot, and Rail Division. Workshops included Level I (morning) sessions for general stormwater pollution prevention, good housekeeping, and spill prevention and response training; and Level II (afternoon) advanced training sessions for SPPP Team Leaders. All sessions included IDDEP training and sessions in Divisions 5, 7, and 9 included Nutrient Management training.	REU
Pesticide Recertification Training/ NCDOT Staff and Contractors	REU held two regional pesticide recertification trainings on March 15, 2016 in Goldsboro (80 participants) and March 16, 2016 in Hickory (105	REU

Training / Trainee(s)	Description	Training Provider
	participants). The NCDA&CS approved the trainings for 4 credit hours each day. These credits included recertification credits in the sub-classifications: Rights of Way, Aquatic, Ornamental and Turf, Research and Demonstration, Dealer, and Private Applicator.	
Maintenance Quality Assurance (MQA) Field Inspection Practices Webinar / HSP team members	This webinar focused on how states are developing MQA programs, and the benefits that they are receiving from these programs. MQA Programs cover all assets in general but pertinent to stormwater assets.	Transportation Research Board / NCDOT was a presenter
Bioswale Construction / HSP Team members	HSP staff from Hydraulics Unit and REU observed construction of bioswales for an NCSU research project. Goal was to understand design and construction concepts critical for inclusion in design drawings.	NCSU
2016 Association of General Contractors (AGC)-NCDOT Workshops/ NCDOT Division Staff and Contractors	These workshops facilitate communication between NCDOT and its contractors, and included three separate two-day events across NC: February 24-25, 2016 in Atlantic Beach, March 8-9, 2016 in Asheville, and March 21-22, 2016 in Raleigh. NCDOT REU presented an environmental update to attendees that included information on NCDOT's HSP with an emphasis on NCDOT's Erosion and Sediment Control program.	REU
REU Annual Conference/ REU Central Management	REU Statewide Meeting held on December 8, 2015. Reviewed REU programs and held discussions, presentations on various topics including updates to I&M, ESC, VM programs.	REU
NCVMA 2015 Annual Symposium/ REU staff and Contractors	NCVMA Conference held on December 9-10, 2015. Annual conference with presentations, displays, vendor demonstrations on various vegetative management techniques, application methods, and products.	REU

Training / Trainee(s)	Description	Training Provider
BMP Inspection and Maintenance Certification / HSP staff	Specialized training to perform inspection and maintenance on water quality treatment devices	NCSU

Following the successful completion of a Learning Management System (LMS) pilot study conducted during PY2015, the IE program developed procedures defining how the LMS should be used by the HSP. The procedures were used for the first time this permit year to schedule and manage rosters for the SPPP/SPCC Plan Implementation training sessions (see Industrial Activities Program in Section 10). Using the LMS provided several benefits such as improved tracking of attendees as well as lessons learned, including the importance of upfront coordination with individual Division training coordinators on using LMS.

A new initiative for the first year of Term IV is the development of e-learning modules for PCSP and SMP training. Using the training materials from the successful classroom training provided to the Hydraulics Unit staff and to Division Environmental Officers during PY2015, e-learning modules were developed to provide the same overview of PCSP and SMP guidance in a form that is accessible to NCDOT staff or contractors. The LMS provides on-demand training and makes it easy to track who has taken the training.

In addition to the formal training events, HSP team members continued internal outreach efforts within NCDOT. Additional details on internal education and training are described in the Accomplishments sections for IDDEP, Industrial Activities, Vegetation Management, Research, and TMDL Programs.

Considerations for Permit Year 2017

NCDOT will continue to implement its IE Program to conduct and track ongoing stormwater related training for NCDOT staff and contractors in Permit Year 2017.

In 2017 NCDOT will be continuing its reorganization efforts which include the outcome of increasing the number of projects for which the Divisions will be responsible for managing the delivery process. Division points of contact will be designated by the Chief Engineer to coordinate with the Central office on PCSP and other NPDES compliance programs. Efforts in 2017 will focus on identifying training needs at the Division level under the new organizational structure. It is anticipated that training efforts will include a combination of on-demand and instructor lead training platforms. The e-Learning modules for PCSP and SMP training will be completed and their availability publicized to the target audience. Additional PCSP and BMP Toolbox training materials will be developed for specialized audiences such as the membership of the American Council of Engineering Companies.

12.0 External Education Program

NPDES Permit Part II.E.2

Objectives and Measureable Goals

The program objectives are to:

- i. Implement a program to educate the public about the importance of stormwater quality, and what they could do to support it.
- ii. Maintain diverse educational materials to engage and educate the public from different social, economic and age groups.
- iii. Encourage public involvement in NCDOT stormwater quality programs.

Management Measures	Measurable Goals
(a) External Education and Involvement Plan.	Maintain the External Education and Involvement Plan. The plan shall include the requirements for the measurable goals below.
(b) Provide pollution prevention awareness educational materials to general public.	Provide stormwater pollution prevention awareness information to the general public.
(c) Maintain a public education website	Maintain a public education website to document NCDOT pollution prevention programs and promote stormwater quality. The website will include information on stormwater quality, stormwater projects and activities, and ways to contact stormwater management program staff.
(d) Develop educational partnerships.	Work with NCDENR and other agencies to promote and distribute public education materials.
(e) Continue public involvement programs.	Continue the Adopt-a-Highway Program. Additional programs may also be developed.

Program Overview

NCDOT implemented the External Education (EE) Program to educate the public about the importance of stormwater quality, including awareness of the impacts of chemical application, illicit discharges and

illegal dumping and other activities that may add pollutants to stormwater runoff. The EE Program encourages public involvement in NCDOT stormwater quality programs and maintains diverse educational materials to engage and educate the public from different social, economic, and age groups. As part of the EE Program, NCDOT maintains an External Education and Involvement Plan, a public education website, and an area on its website, Connect NCDOT, to distribute stormwater educational materials. The program actively seeks partnerships with other NCDOT departments, other state agencies, and organizations with shared outreach goals.

Accomplishments

The HSP EE activities this year focused on continuing to strengthen educational partnerships while maintaining on-going efforts started in previous years.

Education Partnerships – Based on the results of a self-assessment and on input from external reviewers last year, the EE Program launched a new effort to build partnerships with schools and other organizations focused on education. The expectation was that by providing teachers with information and tools for stormwater education, a self-sustaining and perpetuating outreach program would be created. The initial effort has already started to pay off. HSP management's participation in the Office of Education Initiatives (OEI) NCDOT Summer STEM Session on July 16, 2015 led to two additional outreach activities described below. STEM stands for Science, Technology, Engineering, and Mathematics.

- An invitation to speak at Rolesville Middle School in October 2015: HSP team members gave teachers and students a guided tour of stormwater BMPs on their school campus and explained the role of BMPs in protecting water quality.
- An invitation to help judge stormwater projects at Wake Forest Middle School in December 2015: an NCDOT HSP team member was a member of a panel that listened to and judged stormwater management projects for four separate classes, with a total of about 13 different student group presentations. The teacher who led the competition provided a judging form that included 0-4 scoring assessments of each required element (e.g., project description/size, potential stormwater pollutants, solutions [pre- or post-construction BMPs selected], innovation/unique solutions, cost and practicability considerations, group/individual presentation skills, research/links to videos, and bibliography) and overall percent rankings for each element group. Winners for each class and an overall winner for the day were selected.

Other organizations that promote educational outreach to school children are being explored for partnership opportunities. In PY2016, HSP staff partnered with US Marine Corps Society of American Military Engineers (SAME) to provide instruction to 40 high school students for a Stormwater BMP design-build exercise as part of SAME's Construction Camp at Camp Lejeune on June 22, 2016. The high school students from across the country were divided into teams and competed in the Stormwater BMP event, as well as other engineering, team building, leadership development, and problem solving events.

The students were presented a hypothetical scenario in which the base was at risk of being found in violation of environmental regulations. They were charged with designing and constructing a stormwater BMP to mitigate the conditions causing the violation. HSP staff presented the hypothetical situation, a summary of pollutants found in stormwater runoff and their sources, and an introduction to the physical and chemical mechanisms BMPs employ to remove pollutants.

Students were required to design (providing engineering calculations) the stormwater BMP to balance the competing variables of Minimizing Construction Time, Minimizing Drawdown Time to Empty, Minimizing BMP Volume, and Minimizing BMP Surface Area. Designs were approved by the HSP staff and were subsequently built by the students. Upon completion of construction, HSP staff scored the BMPs and announced the winners of the competition.

Websites Update and Maintenance – The revised HSP subsite under the Hydraulics site on *Connect NCDOT* was published in 2016. The information on the site was expanded significantly with more text focused on educating public users about the various program areas. Separate pages were created for key products of the program. Products include many documents – such as the BMP Toolbox – which are provided to the public through this site. Also, through this site, NCDOT is providing public access to the Environmental Sensitivity Maps (ESM). The ESM website was originally developed as an internal tool for use by the HSP team to analyze and identify areas of concern for water quality. However, because of the site’s usefulness to roadway designers and others to help identify environmental impacts of proposed projects, the site is now available to any interested user. Finally, links to related websites such as the sample lesson plans prepared by OEI as part of the Summer STEM Session (mentioned previously) and posted on the OEI website are included under the Educational Materials. The Connect NCDOT subsite includes links to YouTube videos with short tutorials for users. NCDOT is currently redesigning their ncdot.gov website, and updates to the HSP pages are planned.

In addition to NCDOT-managed websites, the City of Burlington, City of Graham, and NCDOT have partnered to develop and launch the Little Alamance 4b Project website (www.littlealamancecreek.com). The commitments within the Category 4b Demonstration Plan require the website to be a public website that is accessible for both the general public and water quality specialists and that is used for distribution of information to all users.

Partnership with Office of Beautification – HSP continued to build on successful on-going activities with HSP’s first partner in external education – the Office of Beautification. Through various on-going programs, NCDOT distributed the following stormwater-related items:

- Distributed eight (8) IDDEP brochures through the 2015 NC State Fair, and at more than 14 group presentations, event displays (Tourism Day and local fairs) and field training;
- Gave out hundreds of Stormwater worksheets, Stormwater Flash Facts, Secure Your Load and Litter Law Fliers at the State Fair;

- Supplied more than 9,500 students with Stormwater worksheets, Stormwater Flash Facts, Secure Your Load flier, Litter Law fliers, Swat-A-Litterbug Cards, car litterbags with a stormwater litter prevention message and “No litter” bumper stickers through packages requested by teachers;
- Provided over 13,000 pairs of gloves to NCDOT Maintenance offices to be distributed to Adopt-A-Highway volunteers and Litter Sweep participants;
- Provided 5,370 tarps to Keep North Carolina Beautiful for distributing to the residential patrons of landfills and convenience centers to help the motorists better secure their cargoes;
- Distributed more than 28,000 car litterbags having a stormwater litter prevention message through various NC Welcome centers; and
- Issued 8,689 informational Swat-A-Litterbug letters, which include Litter Law inserts.

HSP team members continued in PY2016 to participate in conferences, presentations, and other public opportunities to share stormwater management knowledge with stormwater practitioners, researchers, and the general public such as a presentation to the Interagency Leadership Team (ILT) in February 2016. Attendees included the NCDEQ Division of Water Resources, USEPA, USACE, Fish and Wildlife Services, and other agencies involved in the Merger Program.

Considerations for Permit Year 2017

The EE Program plans to continue fostering relationships with education partners such as the OEI in order to leverage their expertise and resources. In addition to strengthening the relationship with Wake County schools, the EE Program will evaluate options for extending the educational opportunities to other parts of the state. HSP will also continue to partner with the Office of Beautification’s outreach initiatives and NCDOT’s Office of Communications to update the HSP’s stormwater website page on the ncdot.gov site, and plans to participate in the Summer STEM session again.

13.0 Research Program

NPDES Permit Part II.F

Objectives and Measureable Goals

The program objectives are to:

- i. Conduct research with faculty and staff at state universities or other designated institutions that result in independent quantitative assessment of stormwater from NCDOT permitted activities and/or measure structural BMP effectiveness.
- ii. Conduct research to enhance or improve existing practices or develop new methods or processes to meet future permit requirements.

Management Measures	Measurable Goals
(a) Research Plan	<p>Maintain a Research Plan. The Plan shall be in keeping with the guidelines established by the Federal Highway Administration (FHWA) Evaluation and Management of Highway Runoff Water Quality Manual (FHWA-PD-96-032) and FHWA's National Highway Runoff and Data methodology Synthesis (FHWA-EP-03-054, or any updates.</p> <p>The Research Program will include:</p> <ol style="list-style-type: none"> 1) A description of the Research Program and process for requesting funding. 2) A process that identifies research needs that will evaluate program improvement areas.
(b) Submit the Research Plan to DEMLR.	Modifications to the NCDOT Research Program shall be submitted to DEMLR.
(c) Implement the Research Plan	NCDOT shall continue to perform and sponsor research to fulfill the Research Plan.

Program Overview

The Research Program's primary mission is to support all aspects of the HSP through development of immediate and practical solutions to stormwater management information needs. NCDOT conducts research with faculty and staff at state universities or other designated institutions that result in independent quantitative assessment of stormwater from NCDOT permitted activities and/or measure

structural BMP effectiveness. NCDOT also conducts research to enhance or improve existing practices or develop new methods or processes to meet future permit requirements. As part of the program, NCDOT maintains a Research Plan that describes the processes to request funding, to evaluate effectiveness of structural BMPs, and to identify research needs.

Accomplishments

NCDOT has continued to implement research projects in collaboration with various universities as required by the permit. Several elements of the HSP have been guided by research data, such as the development of NCDOT-specific stormwater load accounting tools for the Jordan Lake and Falls Lake watersheds (NCDOT-Jordan Lake Stormwater Nutrient Loading Accounting Tool [NCDOT-JLSLAT] discussed in the TMDL section). NCDOT also has continued to evaluate data gaps in its program and to identify research projects to close these gaps. Research projects are generated through the Department's annual research cycle, through out-of-cycle funding, and using technical assistance agreements, as detailed in NCDOT's Research Plan.

Research Projects Nearing Completion - In PY2016, NCDOT completed data collection on several research projects, with a draft or final report in progress:

- Under Research Project (RP) 2011-35 (master services contract with NCSU), NCSU is currently finalizing a report on biofiltration conveyance monitoring at two locations, one roadside site and another at a rest area. The preliminary data indicate that this emerging BMP may show promise for limited applications, converting runoff to subsurface hydrology and therefore filtration-based treatment.
- As part of another task order under RP 2011-35, NCSU is also revising a draft report on a study characterizing particle size distributions and gross solids loads in stormwater runoff from highways, which was used to develop a model to predict stormwater removal in vegetated swales.
- NCSU monitored the effectiveness of check dams to retrofit swales, with pre- and post-retrofit monitoring as part of RP 2014-17. One site featured a rock check dam while the other used wattles with and without adsorptive media to enhance phosphorous removal.
- Another component of RP 2014-17 was a joint study by NCSU and Coastal Carolina University that was recently completed of bacterial removal in a bioswale in Brunswick County.

Ongoing Research – NCDOT continues to fund research annually through its research cycle, soliciting calls for proposals and evaluating research. This process is detailed in NCDOT's Research Plan. Some active research projects of interest include:

- RP 2014-17 is a study of tillage practices to improve infiltration in post-construction BMPs. Tests in controlled plots at NCSU's Sediment and Erosion Control Research and Evaluation Facility (SECREf) found tillage improved vegetative cover and bulk density. Preliminary findings include that infiltration rates over 18 months increased by an order of magnitude in the treated plots compared to the control plot. Interestingly, the results were independent of the type of amendment – compost, cross-linked polyacrylamide (PAM) or gypsum. NCSU also initiated runoff volume monitoring along the side of an I-40 site.
- Under RP 2016-18, construction is complete for six bioswales at NCSU's SECREf which will receive synthetic runoff from a simulated 1-inch storm event. Researchers are currently retrofitting the site with monitoring equipment. Synthetic runoff will be spiked with concentrations of parameters of concern in line with typical highway runoff, with controlled tests with ambient pond water. Effluent and underdrain concentrations will be monitored. The study will investigate the impact of longitudinal slope, bioswale length, and the presence of check dams and could be used to influence a future bioswale chapter in NCDOT's BMP Toolbox.
- RP 2014-21 involves NCSU evaluating methods to stabilize temporary diversions and ditches that may erode resulting in substantial sediment export from the site. In the last year, NCSU continued to test lining ditches with jute, jute + PAM, excelsior or PosiShell liners, as well as methods to secure the liners and a comparison of results with predicted performance using RUSLE2.
- FHWA Pooled Fund Study 1399 titled *Contaminant Release from Storm Water Culvert Rehabilitation Technologies: Understanding Implications to the Environment and Long-Term Material Integrity*. This study with six other states is studying how to reduce the impacts to water quality from cured-in-place-pipe (CIPP) as well as evaluate structural integrity.
- FHWA Pooled Fund Study 1426 titled *Structural Design Methodology for Spray Applied Pipe Liners in Gravity Stormwater Conveyance Conduits*. This study with three other states is studying the proper installation procedures and structural integrity of centrifugal cast concrete pipe (CCCP).

Research Data Repository – NCDOT has been designing a new database solution to house research data called STORMDATA. The schema for STORMDATA is based on the HRDB developed by FHWA and USGS but has been modified to include NCDOT requirements including the inclusion of BMP performance data. This modification is necessary because the FHWA database is designed to be a repository for edge-of-pavement runoff data only. NCDOT has developed a Business Plan that includes not only the technical approach to implementing STORMDATA but also the processes and responsibilities for maintaining the database. STORMDATA will also house data in a format that will support the HSP's SELDM initiative (see PCSP Accomplishments in Section 7 of this report).

Research Programmatic Initiatives – In recognition of the value of research data, the Research Program has developed a Quality Assurance Program Plan (QAPP) to advise researchers on minimum quality standards and to better document study quality assurance procedures. HSP staff are working with NCDOT's Research Unit on new contractual requirements for producing Project QAPPs (P-QAPPs). Starting with the recent swale optimization project, researchers have been encouraged to develop P-QAPPs that will not only document quality management procedures but also result in projects that can be incorporated into STORMDATA.

Considerations for Permit Year 2017

In the next permit year, the Research Program will continue to monitor active research projects, including (among others) continuing monitoring of bioswales and swales both at SECREP and in field sites currently being designed, and adding a new field site to the study investigating tillage effects. The HSP will be initiating a new research project with NCSU looking at the effect of using wildflower versus grass vegetation on the infiltration capacity of stormwater BMPs both in controlled experimental facilities and by retrofitting existing field BMPs. The expectation is that since many perennial wildflowers have deeper root structures and accumulate larger biomass due to the lack of mowing, they might result in greater infiltration rates compared to mowed grasses. Wildflower beds could result in reduced maintenance costs and may provide ecosystem benefits by helping support pollinator populations.

Planning for research projects in 2018 will occur in the upcoming year and will include research on dry detention basins and an update to the multi-precipitation estimator (MPE) application.

A major focus of the HSP in the upcoming years will be to implement project QAPPs on new research projects and integrating monitoring data into STORMDATA.

14.0 Total Maximum Daily Load Program

NPDES Permit Part III.C

Objectives and Measureable Goals

The program objectives are:

- i. Address impaired waters identified in Total Maximum Daily Loads (TMDLs) in which NCDOT is named as a significant contributor of the pollutant and an assigned Waste Load Allocation

Permit Requirements

- 1) At any time during the effective dates of this permit, NCDOT will develop and implement a program ("Program") to address impaired waters identified in TMDLs in which NCDOT is named as a significant contributor of the pollutant addressed by the TMDL and that assigns NCDOT a wasteload allocation (WLA) separate from other point sources.
- 2) NCDOT's Program shall summarize the locations of NCDOT outfalls that are identified in its implicit Stormwater Outfall Inventory that have the potential to discharge the TMDL pollutant of concern into the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments.
- 3) NCDOT's Program shall implement an Assessment & Monitoring Plan ("Plan"). The Plan shall include an evaluation of the need for additional data collection related to the NCDOT's discharge of the TMDL pollutant of concern. Additional data collection to be evaluated may include (but does not require) a supplemental inventory of NCDOT outfalls, monitoring, an assessment of the effectiveness of existing BMPs, and an assessment of non-NCDOT discharges entering NCDOT's conveyance system and negatively impacting the quality of NCDOT stormwater discharge. If the Plan proposes analytical monitoring, then it shall include a description of the sample types, frequency, and seasonal considerations, if applicable. Where appropriate, NCDOT may reduce its monitoring burden by monitoring outfalls that DEMLR considers substantially similar to other outfalls. The Plan may be adjusted as additional outfalls are identified.
- 4) The Plan shall include a schedule for implementing the proposed assessment and monitoring activities. The Plan shall be submitted to DEMLR for comments no later than 12 months after notification by NCDENR that NCDOT has been assigned a WLA. DEMLR shall complete its review of the Plan within 6 months of receiving the plan from NCDOT.
- 5) NCDOT shall initiate implementation of the Plan within 6 months of receiving Plan approval from DEMLR. In accordance with the Plan implementation schedule, NCDOT shall provide a summary of the assessment and monitoring activities performed within a reporting period in subsequent annual reports.

Permit Requirements

- 6) Within 6 months of completing the assessment and monitoring activities outlined in the Plan, NCDOT shall submit a report of its findings to DEMLR. The report shall include an assessment of whether additional structural and/or non-structural BMPs are necessary to meet NCDOT's WLA. If necessary, the report will also document why BMPs are infeasible to meet the WLA and discuss BMPs to reduce the load to the maximum extent practicable. The report shall include a schedule for implementing such BMPs. Upon approval by DEMLR, NCDOT shall implement any approved BMPs in accordance with the schedule. Subsequent annual reports will provide updates on the implementation of the Plan.
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Program Overview

As part of the TMDL Program, NCDOT has developed and implemented a program to address impaired waters identified in TMDLs in which NCDOT is named as a significant contributor of the pollutant and is assigned a WLA. The program includes preparation of assessment and monitoring plans, schedules for plan execution, and submittal of findings reports to NCDEQ. The TMDL Program relies heavily on data that is collected under the Research Program to inform pollutant loading and water quality and watershed modeling decisions. TMDL compliance is also supported through the BMP Retrofits Program and its efforts to identify suitable locations for stormwater retrofits and successfully implement controls that achieve NCDOT WLAs.

Accomplishments

Key accomplishments include continued implementation of the NCDOT's Protocol for Determining Significant Contributor Status in NC TMDLs, assessment of WLA-compliance activities in the Southeast White Oak River watershed and BMP-related enhancements to NCDOT's TMDL tracking database. NCDOT's involvement in nutrient and watershed modeling studies also continued in 2016 through HSP involvement on the High Rock Lake nutrient modeling study Technical Advisory Committee.

NC TMDLs Approved in 2016 – TMDLs to address five low pH impaired stream segments (6-34-(15.5), 11-38-34-14, 11-29-22, 7-2-52-(1) and 11-38-32-9ut3) were developed by NCDWR and approved by USEPA over the past year. These TMDLs were based on a Tennessee Department of Environment and Conservation 2010 low pH TMDL for waters located in the Great Smoky Mountains National Park. The North Carolina impairments include five mountain streams that drain high elevation undeveloped forested areas in western North Carolina. A possible cause for lower pH in these waters is atmospheric acidity from sulfate and nitrate deposition that has over time reduced the acid neutralizing capacity of these watersheds. NCDOT was not named as a significant contributor to impairment or issued a unique WLA in any of the original or 2016 TMDL streams. For these reasons, NCDOT is not required to develop a Program (per Part III, Section C.1.) specific to these waterbodies.

One TMDL to address turbidity in Muddy Creek ((12-94-0.5)b2b) in the Yadkin River Basin was drafted by NCDWR in 2016 and is under USEPA review. This TMDL report cites reductions that were approved as

part of a 2011 TMDL for other segments of Muddy Creek. The 2016 Muddy Creek TMDL does not identify NCDOT as a significant contributor and does not assign a WLA to NCDOT. The 2011 Muddy Creek TMDL does not assign a WLA to NCDOT and states that “The NCDOT, Village of Clemmons, and Winston-Salem are currently in compliance with their NPDES stormwater permits, and will continue to implement measures required by their permits.” For these reasons, NCDOT is not required to develop a Part III, Section C.1 Assessment and Monitoring Plan or a Report of Findings specific to this waterbody. However, for streams impaired for turbidity NCDOT implements enhanced erosion control design standards for its construction projects as outlined in its Erosion and Sediment Control Manual.

Southeast White Oak TMDL Compliance Update – In 2009, NCDEQ prepared a TMDL report to address fecal coliform bacteria impairment in Boathouse Creek (ID# 20-31), Hills Bay embayment (ID# 20-(18)c4) and Dublin Creek (ID# 20-30) in the White Oak River Basin. Two of these TMDLs (Boathouse Creek and Hills Bay embayment) identified NCDOT as a contributor to impairment and assigned NCDOT a unique WLA. As required under Part III, Section C of NCDOT’s NPDES permit, NCDOT prepared an Assessment and Monitoring Plan (AMP) in 2011 which described NCDOT’s strategy for field assessing assets and identifying load reduction opportunities in the Boathouse Creek and Hills Bay watersheds, followed by a Report of Findings (RoF) in 2013, which describes the results of NCDOT’s AMP implementation activities, including field exercises and BMP retrofit feasibility studies.

As documented in the AMP and RoF, between 2011 and 2013 NCDOT completed a range of watershed assessment activities to identify potential sources of bacteria in the NCDOT ROW and evaluate potential BMP retrofit opportunities. This work included the following assessments:

- Field inventory of NCDOT’s stormwater conveyance system
- Potential bacteria sources that could enter NCDOT’s ROW
- Illicit discharges into NCDOT’s stormwater drainage system, and
- BMP feasibility study at four sites within the Boathouse Creek and Hills Bay watersheds.

The RoF’s feasibility study identified one of the four study sites as a viable retrofit location at the time. NCDOT has since acted on the RoF’s recommendation and completed construction of a linear infiltration basin in 2014. Located in the Boathouse Creek watershed, the BMP (“Site #2” in the RoF) is located within an NCDOT permanent drainage easement along NC 24 (Cedar Point Boulevard). This BMP has a drainage area of 23.1 acres and includes approximately 10.9 acres of impervious area (47.2% of the watershed). Upon implementing the linear infiltration basin, NCDOT reduced their bacteria loading rate to 6.30E+09 counts per day and achieved the fecal coliform WLA (9.91E+09 counts per day) for Boathouse Creek.

The BMP feasibility study in the Hills Bay watershed also considered a number of potential BMP types and resulted in two alternatives near the intersection of NC-24 and Bluff Road (“Site #1” in the RoF). The

first alternative was an online configuration where all stormwater is routed through an underground infiltration device. This alternative was eliminated due to the unacceptable safety risk posed by a potential blockage backing up water and flooding NC-24, a vital hurricane evacuation route. The second option was an offline configuration which bypassed higher flows and lessened maintenance and safety concerns. Site constraints limited the BMP's infiltration capacity to approximately 0.1 inches of runoff due to high water table levels. Additionally, these designs would have required considerable costs to relocate an existing water main and water lateral utilities at the site. Due to the safety and aesthetic concerns related to the site's close proximity to the town street and adjoining property owners, high construction costs, limited treatment, and challenges associated with the conflicting utilities and high water table, these options were considered infeasible.

NCDOT regularly maintains and inspects the Boathouse Creek infiltration basin to verify that the designed treatment and function is sustained and that the WLA continues to be achieved. NCDOT also continues to evaluate opportunities to reduce bacteria loading in the Hills Bay watershed. In 2016, staff conducted desktop exercises and field visits to the Hills Bay watershed to:

- Inspect the NCDOT outfall at Bluff Road and classify the downstream receiving waterbody as intermittent or perennial. This evaluation confirmed the presence of an intermittent receiving waterbody directly downstream of the categorization of the discharge point as an outfall at Bluff Road.
- Inspect the NCDOT drainage for potential illicit discharges. This inspection resulted in no illicit discharges identified.
- Conduct additional source assessment within the NCDOT right-of-way. This assessment resulted in no discernible bacteria sources being identified.

While no feasible options have been identified in the Hills Bay watershed at this time, NCDOT remains committed to identifying strategies for reducing bacteria loading in this watershed. NCDOT will continue to pursue this objective through re-evaluation of watershed strategies, collaboration with local municipal and watershed-based organizations and partners, and evaluating the feasibility of future BMP technologies as they become available and show potential for reducing bacteria.

NCDOT TMDL Tracking Database Enhancements – The TMDL Program monitors the completion of draft and final TMDLs and maintains a database that is used to track TMDL development and related NCDOT permit requirements. This database allows NCDOT managers to quickly identify compliance requirements and schedules. Over the past year, several enhancements to the database were initiated. These enhancements include improvements to reporting features and new functionality to track details associated with new and existing BMPs. These improvements will help NCDOT report on load reductions associated with stormwater and nutrient controls implemented to meet TMDL waste load allocations as well as NCDOT requirements in watersheds in which nutrient rules have been developed.

Considerations for Permit Year 2017

NCDOT will continue to support NCDEQ in the development of TMDLs statewide and assessments of NCDOT loading as part of those TMDLs using the protocol document and continue to develop and implement our strategy for addressing bacteria loadings in Boathouse Creek and Hills Bay watersheds. Further development and improvements to the TMDL tracking database will be implemented in 2017.

15.0 Falls and Jordan Lake GREEN Programs

Jordan Lake Rules:

15A North Carolina Administration Code

(NCAC) 02B .0262-.0273, .0311, and

NC Session Laws 2009-216, 2009-484

Falls Lake Rules:

15A NCAC 02B .0275—.0282

Requirements

Watershed	Rule Requirements
Jordan Lake	<p>Identify NCDOT stormwater outfalls from Interstate, US, and NC primary routes.</p> <p>Identify and eliminate illegal discharges into the NCDOT's stormwater conveyance system.</p> <p>Implement a Nutrient Management Education Program for NCDOT staff and contractors engaged in the application of fertilizers on highway rights of way.</p> <p>Meet riparian buffer and diffuse flow requirements on new and widening road projects.</p> <p>Achieve sub-watershed specific nutrient reduction targets on new non-road development projects using NCDOT-JLSLAT or through another calculation method that is acceptable to NCDWR.</p> <p>Provide an estimate of, and plans for offsetting, nutrient load increases from lands developed subsequent to the baseline period but prior to implementation of the new development program (currently stayed, see below).</p> <p>Implement three stormwater retrofit BMPs per year in the Jordan Lake watershed to reduce nutrient loads until NCDOT has either achieve the nutrient load goals in 15A NCAC 02B .0262 or the lake's designated uses are restored (currently stayed, see below).</p>
Falls Lake	<p>Identify NCDOT stormwater outfalls from Interstate, US, and NC primary routes.</p> <p>Identify and eliminate illegal discharges into the NCDOT's stormwater conveyance system.</p> <p>Implement a Nutrient Management Education Program for NCDOT staff and contractors engaged in the application of fertilizers on highway rights of way.</p> <p>Meet riparian buffer and diffuse flow requirements on new and widening road projects.</p> <p>Achieve nutrient reduction targets on new non-road development projects using</p>

Watershed	Rule Requirements
	<p>NCDOT-JLSLAT or through another calculation method that is acceptable to NCDWR.</p> <p>Provide an estimate of, and plans for offsetting, nutrient load increases from lands developed subsequent to the baseline period but prior to implementation of the new development program.</p> <p>Implement six stormwater retrofit BMPs per year in the Falls Lake watershed to reduce nutrient loads until NCDOT's existing development load reduction requirements are achieved or the lake's designated uses are restored.</p>

Program Overview

The NC Environmental Management Commission (EMC) adopted permanent nutrient management rules for Jordan Lake and Falls Lake which became effective in 2009 and 2011, respectively. In response, NCDOT initiated the Guided Reduction of Excess Environmental Nutrients (GREEN) Program to integrate and enhance NCDOT's stormwater and nutrient management practices and to facilitate NCDOT's compliance with the Jordan Lake and Falls Lake Rules.

The Jordan Lake GREEN outlines the Department's approach to managing nutrients from new development, including new and widened roads and new non-road developments. The EMC approved the Jordan Lake GREEN Program on November 8, 2012. The Rules also include retrofit requirements to reduce nutrient loads from existing NCDOT development; however, multiple Session Laws have delayed this requirement.

The Falls Lake GREEN addresses the Department's approach to managing nutrients from new and existing developments consisting of new and widened roads, new non-road development, and existing road and non-road development. The EMC approved the Falls Lake GREEN Program on January 9, 2014. Among other things, these regulations require NCDOT to implement training for staff and contractors, and calculate nutrient loads resulting from stormwater controls. Both GREEN programs are currently in effect. A notable requirement of the Falls Lake rules is the mandate for the Department to construct retrofits at a rate of six per year in the watershed.

Accomplishments

The roll-out of the JLSLAT and the development of associated training was the main achievement this year. This and other activities are summarized below.

Nutrient Accounting Tool Training Videos¹ – A series of six training videos were prepared by NCDOT to support staff and contractors when using the NCDOT nutrient accounting tool, NCDOT-JLSLAT, on new non-road development projects. The 8-12 minute videos cover topics such as an introduction to the

¹ This was also included in the Permit Year 2015 Annual Report; due to the change in the reporting period, it is included in this report as well.

GREEN Program, an overview of NCDOT-JLSLAT, model routing scenarios, simple and complex site examples and how to “set-up” a new project using NCDOT-JLSLAT. The videos are made available to staff and contractors as needed and are available on NCDOT’s YouTube channel.

New Non-Road Development Projects in PY2016 –There were no non-road projects completed in 2016 which triggered the GREEN Program.

Retrofit Projects to meet Existing Development Requirements - Eleven (11) stormwater BMP retrofits were constructed during the summer of 2015 in the NC Highway 98 and NC Highway 50 interchange. The interchange is located in the Lower Falls Lake Watershed in northwestern Wake County. Existing concrete-lined ditches inside all four of the interchange loops were removed to decrease impervious area. These lined ditches were replaced with two (2) grassed swales and six (6) bioswales. The bioswales constructed include a trapezoidal grassed swale surface with the addition of a minimum two feet depth of engineered filtration media and underdrains. False sumps were provided to create ponding and encourage infiltration. Two of the bioswales incorporate internal water storage. One (1) filtration basin and two (2) dry detention basins were also installed. The filtration basin was constructed in the same manner as a bioswale but with a larger footprint. The dry detention basins were installed to attenuate storm flows because of severe erosion in deeply incised receiving channels outside of NCDOT rights-of-way.

NCDOT does not presently have data to quantify the treatment capabilities of bioswales. However, research is scheduled for this location to determine the reduction in TN and TP loads. The TN and TP treatment characteristics of a bioswale should more closely resemble a bioretention cell than a grassed swale. In the absence of performance data for the bioswales and filtration basin NCDOT conservatively modeled them in the NCDOT-JLSLAT as grassed swales. Also, NCDOT has limited data from actual NCDOT installed and maintained dry detention basins. As with the bioswales future research will better define influent and effluent event mean concentrations (EMCs) and TN and TP load reductions for these BMPs. At present there is no approved credit methodology for sediment load reduction. When a method is approved NCDOT may amend the accounting procedure accordingly.

Modeling these BMPs in their as-built conditions in the NCDOT-JLSLAT resulted in reducing the load of TN from 5.67 pounds per acre per year to 2.91 pounds per acre per year, a load reduction of 49%. TP was reduced from 0.58 pounds per acre per year to 0.51 pounds per acre per year, a load reduction of 12%.

If future research shows that these BMPs perform differently than assumed in the current NCDOT-JLSLAT, NCDOT will coordinate with NCDEQ to amend the accounting procedure accordingly.

Additionally, NCDOT has designed eight (8) additional BMP retrofits within the I-540 & Six Forks Road and I-540 & Falls of the Neuse Road interchanges; these are currently within the construction contracting phase. The devices to be installed in the I-540 & Six Forks Road interchange include three

(3) filtration basins, two (2) bioswales, and one (1) dry detention basin. The I-540 & Falls of the Neuse interchange will be retrofitted with two (2) filtration basins.

NCDOT is not required to implement stormwater retrofits under the Jordan Lake GREEN program at this time.

Rehabilitation of Existing Stormwater Controls – NCDOT’s SCMS database is used to track inspection and maintenance of structural BMPs located within the Jordan Lake and Falls Lake watersheds. NCDOT Division REU Engineers actively maintain BMPs in the Jordan and Falls Lake watersheds. In 2016, no significant rehabilitation needs were identified or reported. As such, no nutrient load reduction/performance changes associated with significant BMP maintenance or rehabilitation are known to have occurred during this reporting year.

Summary of Outfalls from Primary Roads – NCDOT performed a Tier 1a outfall inventory in the lower Falls Lake subwatershed area in PY2016. The Tier 1a inventory includes locations of true outfalls to waters of the state at or within the right-of-way boundary. This inventory utilized the latest field inventory procedure that was developed by NCDOT for priority areas such as Falls Lake. The inventory procedure identified 122 field verified outfalls.

Nutrient Scientific Advisory Board (NSAB) Support – NCDOT remained an active member of the NSAB in 2016 and supported NCDEQ and the Board through participating in meetings, review and comments on nutrient measures for existing development stormwater, and the nutrient rules re-adoption process. NCDOT continues to work closely with NCDEQ to develop defensible jurisdictional loads for tracking rule implementation.

Considerations for Permit Year 2017

NCDOT will continue to implement the Department’s GREEN Program and achieve the applicable requirements set forth for new and existing road and nonroad development in the Jordan Lake and Falls Lake watersheds. NCDOT will continue to partner with NCDWR on nutrient reduction strategies and to engage staff and contractors on nutrient-related requirements and watershed goals through educational tools and training opportunities.