

# NC STATE UNIVERSITY

Annual Report  
August 2008



**Stormwater Management**  
Environmental Health and Public Safety Center  
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## Executive Summary

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### **Report Objective**

This report is prepared in compliance with the requirements of NPDES (National Pollution Discharge Elimination System) Permit No. NCS000376.

The purpose of this annual report is to summarize the University's Permit responsibilities and activities and track compliance requirements for the third year of the five-year term. The Permit identifies several key areas of responsibility with various objectives, management measures, and measurable goals designed to assist the University in improving the quality and quantity of stormwater run-off and discharges. This report will address how the University has met the Permit requirements and goals and describe future plans for maintaining compliance and improving the program.

Information contained in this report covers activities beginning the effective date of the permit and continuing through July 30, 2008. The report will discuss program summary and assessment, the status of various management measures and goals, proposed changes to the stormwater management program or implementation schedule, and successes, failures and milestones or accomplishments of the management program.

### **Background**

North Carolina State University (University, NC State) currently holds a Permit to Discharge Stormwater under the National Pollutant Discharge Elimination System (NPDES). Permit Number NCS000376 was issued on April 18, 2005 with an effective date of May 1, 2005.

The University began implementation of the stormwater management programs to mitigate stormwater pollution impacts on local water quality in 1994, along with the preparation of NPDES Permit Application Parts 1 and 2. Program activities include: implementation of the Stormwater Management Plan and Sediment and Erosion Control Requirements, installation and maintenance of various both structural and non-structural best management practices, stormwater discharges and water quality monitoring, storm sewer system mapping and education, outreach and public involvement.

The University's Stormwater Management Program is developed and administered by Environmental Affairs, a division within the Environmental Health and Public Safety Center. Other University departments such as Facilities Operations, Transportation, Construction Management, Athletics, the Office of the University Architect, and Design and Construction Services work in cooperation with the Stormwater Program Manager to implement specific programs developed in accordance with the Permit requirements.

**May 2007 – July 2008 Highlights**

Below is a summary of accomplishments by activity category.

<b>Table 1: Accomplishments</b>	
<b>Activity Category</b>	<b>Comments</b>
Education, Outreach and Public Involvement	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Developed a Plan to conduct educational training, workshops and seminars designed to promote, publicize and facilitate proper management of stormwater runoff.</li> <li>• Currently working with component organizations (regulated community) to provide applicable stormwater-related information.</li> <li>• Developed awareness information in the form of articles, flyers, mailers, and brochures</li> <li>• Developed an educational website</li> <li>• Established a hotline</li> <li>• Participated in special events such as Earth Day</li> </ul>
Illicit Discharge Detection and Elimination	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Developed procedures for investigating and correcting reported illicit connections, discharges, spills and illegal dumping</li> <li>• Corrected four reported problems and currently working to resolve two other issues</li> <li>• Developed an on-line reporting form.</li> <li>• Currently using form to better track progress of investigations and corrective actions</li> </ul>
Sediment & Erosion Control	<p>Activities:</p> <ul style="list-style-type: none"> <li>• On-going, monthly site evaluations of all active construction sites</li> <li>• Continued implementation of the Sediment and Erosion Control Program</li> <li>• Currently up-dating requirements to reflect recent changes</li> </ul>
Pre- & Post-Construction Stormwater Management	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Updated and implemented the Stormwater Management Plan Requirements</li> <li>• Development and implementation of an Inspection and Maintenance Program for permanent stormwater control device</li> </ul>
Pollution Prevention and Good Housekeeping	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Continued to implement existing programs</li> <li>• Developed an “environmental concerns” report form available on the website for anyone to submit concerns, questions or suggestions.</li> <li>• Working with regulated community to provide guidance and technical support in matters related to stormwater management.</li> </ul>
Monitoring	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Developed a Stormwater Discharges and Water Quality Monitoring Plan</li> <li>• Contracted with an independent consultant to implement Plan and provide written report</li> <li>• Monitor retrofits and temporary BMPs</li> </ul>
Retrofits	<p>Activities:</p> <ul style="list-style-type: none"> <li>• Investigating retrofit locations, suggestions and proposals</li> <li>• Several options are being evaluated, prioritized and when funds become available action will be taken.</li> </ul>

# Education, Outreach and Public Involvement Program

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## **A. Education, Outreach and Public Involvement**

North Carolina State University believes an integral part of stormwater management involves the education of the campus community about our local water resources, how we affect water quality, and what we can do to minimize pollution, damage and lessen our impact on the environment. In this context, the University has developed an Education, Outreach & Public Involvement Program that includes the dissemination of stormwater awareness materials, water quality related publications, awareness training, an informational website, educational partnerships, public involvement activities and special events participation.

The worksheets found in Appendix A summarize our Education and Outreach Plan. The worksheets include information about what has already been implemented and plans for continuing our education effort. Sheets A1 through B2 outline activities designed to raise awareness and educate the campus population about water quality, non-point source pollution and the effects of everyday activities on water quality and nutrient loading. In addition to these activities, NC State Stormwater Management will work in cooperation with other state agencies and organizations in an effort to provide quality education, outreach and public involvement opportunities.

# Illicit Discharge Detection and Elimination Program

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## A. Illicit Discharges

NC State's Stormwater Program has specific illicit discharge regulations in place. These regulations mandate that no person shall cause or allow the discharge, emission, disposal, pouring, or pumping directly or indirectly to any stormwater conveyance, the waters of the State, or upon the land in manner and amount that the substance is likely to reach a stormwater conveyance or the waters of the State, any liquid, solid, gas, or other substance, other than stormwater; provided that non-stormwater discharges associated with the following activities are allowed and provided that they do not significantly impact water quality:

- Water line flushing;
- Landscape irrigation;
- Diverted stream flows;
- Rising ground waters;
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
- Uncontaminated pumped ground water;
- Discharges from potable water sources;
- Foundation drains;
- Air conditioning condensation;
- Irrigation water;
- Springs;
- Water from crawl space pumps;
- Footing drains;
- Fountain drainage;
- Lawn watering;
- Individual residential car washing;
- Flows from riparian habitats and wetlands;
- Dechlorinated swimming pool discharges;
- Street wash water; and
- Other non-stormwater discharges for which a valid NPDES discharge permit has been approved and issued by the State of North Carolina, and provided that any such discharges to the municipal separate storm sewer system shall be authorized by (name of Phase II jurisdiction).

Prohibited substances include but are not limited to: oil, anti-freeze, chemicals, animal waste, paints, garbage, and litter.

## B. Illicit Connections

NCSU's Stormwater Program prevents the university from creating illicit connections. The University abides by the following regulations.

1. Connections to a stormwater conveyance or stormwater conveyance system that allow the discharge of non-stormwater, other than the exclusions described in section (A) above, are unlawful. Prohibited connections include, but are not limited to: floor drains, waste water from washing machines or sanitary sewers, wash water from commercial vehicle washing or steam cleaning, fountains, and waste water from septic systems.
2. Where such connections exist in violation of the Universities Administrative Rules and said connections were made prior to the adoption of this provision or any other policy prohibiting such connections, the property owner or the person using said connection shall remove the connection within one year following the effective date of these Rules. However, the one-year grace period shall not apply to connections which may result in the discharge of hazardous materials or other discharges which pose an immediate threat to health and safety, or are likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat.
3. Where it is determined that said connection:
  - a. May result in the discharge of hazardous materials or may pose an immediate threat to health and safety, or is likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat, or
  - b. Was made in violation of any applicable regulation or policy, other than this section; the Stormwater Program Manager shall designate the time within which the connection shall be removed. In setting the time limit for compliance, the Stormwater Program Manager shall take into consideration:
    - i. The quantity and complexity of the work,
    - ii. The consequences of delay,
    - iii. The potential harm to the environment, to the public health, and to public and private property, and
    - iv. The cost of remedying the damage.

### **C. Spills**

Spills or leaks of polluting substances released, discharged to, or having the potential to be released or discharged to the stormwater conveyance system, shall be contained, controlled, collected, and properly disposed. All affected areas shall be restored to their preexisting condition. Persons in control of the polluting substances immediately prior to their release or discharge, and persons owning the property on which the substances were released or discharged, shall immediately notify the appropriate University department of the release or discharge, as well as making any required notifications under state and federal law. Notification shall not relieve any person of any expenses related to the restoration, loss, damage, or any other liability which may be incurred as

a result of said spill or leak, nor shall such notification relieve any person from other liability which may be imposed by State or other law.

#### **D. Nuisance**

Illicit discharges and illicit connections which exist within the property boundaries of North Carolina State University, as defined on the Stormwater Map are hereby found, deemed, and declared to be dangerous or prejudiced to the public health or public safety and are found, deemed, and declared to be public nuisances. Such public nuisances shall be abated in accordance with these Rules and applicable University Requirements.

#### **E. Illicit Discharge Reporting**

An Illicit Discharge Incident Tracking Form can be downloaded from the Stormwater webpage and e-mailed directly to the Stormwater Program Manager. Sample forms are shown in Appendix B of this report.

In addition to the on-line report form, the University has established a hotline for reporting environmental concerns. The Safety Hotline was established to help maintain the safest possible environment at NC State University. Faculty, staff, students, and the general public are encouraged to report safety or environmental concerns, complaints, suggestions or comments via phone (515-5445) or fax (515-9804).

The Safety Hotline is available 24 hours a day. You can talk directly to the Safety Hotline Coordinator from 8 a.m. to 5 p.m., Monday through Friday. After these hours, callers are able to leave a message. Callers may remain anonymous.

Comments, concerns and/or suggestions can also be reported via phone call or e-mail transmission to any member of the Environmental Health & Safety Center (EHS). All inquiries will be thoroughly investigated by the appropriate personnel. A report form will be completed for each inquiry then investigated. If necessary, appropriate corrective actions will be taken and recorded. Records shall be kept on file and accessible for the duration of the permit.

The Hotline as well as EHS contact information is accessible through the EHS Webpage at the following address: <http://www.ncsu.edu/ehs> and will be published in all pollution prevention material.

Table 3 summarizes reports collected from January 2007 through August 2008.

<b>Table 3: Illicit Discharge Reports</b>			
<b>January 2007 – August 2008</b>			
<b>Case ID</b>	<b>Status</b>	<b>Comments</b>	<b>Findings Location Information</b>
EEM0L	CLOSED	Reported 5/7/07	Discharge upstream of boulder basin of Rocky Branch. Investigation found floor drains in Mann Hall are connected to the storm sewer system. The problem was corrected and the floor drains are now connected to the sanitary sewer.
G4MIM	CLOSED	Reported 8/21/07	Two manholes were clogged and overflowing. Lines were cleared and the University hired a company to vacuum the underground settling tank.
BMVN5	CLOSED	Reported 8/8/07	Talley Fountain – connection to the storm sewer system. Fountain will not be filled until the SW Program Manager receives a written copy of the drainage procedures.
S5I21	CLOSED	Reported 11/14/07	Manhole overflow outside Dabney Hall leaking sewage into Free Expression Tunnel. The spill was caused by improper items placed into the sanitary sewer system. The City of Raleigh performed a TV inspection of the sewer line and crews cleaned the line to ensure the line was clean and flowing properly. The storm drain to Rocky Branch was power washed.
PFBOH	CLOSED	Reported 11/27/07	Cooking oil spill at the Clark Hall's loading dock. Developed SOPs for dining hall staff.
UEU41	OPEN	Reported 7/10/08	Reported fish kill in North Creek. Pending, preliminary indication is that sediment in creek was caused by water main break and/or insufficient sediment and erosion control measures at one or more sites in the area.
6JK60	CLOSED	Reported 8/11/08	Construction at Meredith College contributed to sediment in Rocky Branch. It was reported to the City of Raleigh and they found a breach in a sediment trap.

### **E. Stormwater System Inventory and Prioritization Program**

In order to effectively implement the IDDE program, the University will be updating the current inventory and collecting specific information related to the storm sewer system. The information will be entered into the University's GIS system, which will allow for capturing, managing, analyzing, and displaying all forms of geographically referenced information. The GIS system is a static annual system, not a hydraulic (Stormwater flow) model and will be used as a schematic representation as opposed to an engineering model. The GIS system will be used to generate new, updated maps showing the most current information.

The enhancements to the GIS system are scheduled to conclude by December 2008. The system is not yet available to the public. The enhancements are meant to make the system more user friendly, improve capabilities, etc. The system is currently capable of importing data and graphics from other sources (like USGS, Wake County, etc.) and linking mapping elements to the data already in the database. The Center for Earth Observation is going to send some storm water management information, which will then be imported into the system. The data side of the system is currently set to enter and manage storm sewer data relating to manholes, structures, piping, etc. In the future this system should be capable of managing the following information.

- Current inventory & location of drainage structures
- Updated storm sewer system map
- Individual outfalls categorized by receiving water and include location, drainage area to outfall (subwatershed), and amount of impervious area within sub-watershed, contributions of offsite drainage, reference number, size, and type of structure, apparent condition and dry-weather flow.
- Identification of industrial activities and associated outfalls
- Identification of outfalls and Stormwater utilities associated with new construction
- Identification & location of permanent Stormwater control devices
- Surface water features (from Soil Survey and USGS Quads)

**F. Mapping and Field Screening for High Priority Areas**

The University has developed a field screening process used to identify high priority areas within its property boundaries. Using the new GIS system and updated maps, the campuses will be delineated according to sub-watershed areas. Within each subwatershed, outfalls will be surveyed for dry weather flow. Figure C-1 illustrates the process that will be used for conducting field screening activities and follow-up of any findings of dry weather flow.

A standard Field Screening Report Form has been developed to log all pertinent information. The form includes the following information:

Field Screening Report Form		
General Information	Visual Observations	Sampling Analysis*
Outfall ID number	Photographs	Temperature
Date & Time	Odor	pH
Date/Quantity of last rain event	Color	Bacteria
Location of Outfall	Clarity	Chlorine
Sub-watershed Basin	Floatables	Copper
Type of Outfall	Vegetation Condition	Dissolved Oxygen
	Structural Condition	Nitrates
		Iron
		Phosphates

Flow Chart Here

## Sediment and Erosion Control Program

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NC State Stormwater Management has been implementing a Sediment and Erosion Control Program since 2004. Components of the program include:

1. Written requirements detailing the proper design, installation and maintenance of BMPs
2. Identification of approved/accepted structural BMPs
3. Inspection and Maintenance requirements of temporary BMPs
4. Public Involvement
5. Training
6. Recordkeeping

Currently, there are seven active construction sites on the campuses of NC State University. A representative of Stormwater Management evaluates each site by means of a monthly inspection. A written report is generated to document the findings. The report is sent via e-mail to the University Project Manager, the Director of Construction Management, the Director of Construction Management and NC DENR Land Quality Section. The University Project Manager is responsible for ensuring that all necessary corrective actions have been taken.

The University hired an outside contractor to assist in the development of a handheld Sediment Erosion Control evaluation tool. This handheld device is currently in use and is very effective at pinpointing specific areas of concern on construction sites. Pictures that are taken in the field are inserted into the final report along with the appropriate descriptions and/or regulatory citations. Final reports are kept on file for a minimum of five years.

## Pre- and Post-Construction Stormwater Management Program

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NC State Stormwater Management has developed and implemented a Pre- and Post-Construction Stormwater Management Program in accordance with the Neuse River Basin Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements (15A NCAC 2B .0235).

All projects are required to develop a plan based on the Stormwater Management Plan Requirements. Requirements are available at the following website:  
<http://www.ncsu.edu/ehs/environ/Stormwater.htm>

New development projects are required to meet the 30% nitrogen reduction goal by implementing planning considerations and best management practices. Additionally, all new construction shall meet the nitrogen-loading limit of 3.6 pounds per acre per year (lb/ac/yr).

Each project is required to incorporate permanent BMPs into the design. If the project can demonstrate that it is simply not feasible to do so, written justification is required. The project will then have the option of partially offsetting projected nitrogen loads by paying an offset fee. However, the total nitrogen-loading rate cannot exceed 6.0 lbs./acre/year for residential development or 10 lbs/acre/year for non-residential development.

Diffuse flow of runoff must be maintained in the riparian buffer by dispersing concentrated flow and reestablishing vegetation. Concentrated runoff from ditches or manmade conveyances are to be converted to diffuse flow before the runoff enters Zone 2 of the riparian buffer. If diffuse flow cannot be achieved, the stormwater must pass through an approved Best Management Practices (BMPs) for a total nitrogen reduction of 30% or greater.

Currently, the University is conducting a survey of all permanent BMPs. The survey will be used to identify and prioritize maintenance requirements. All permanent structural BMPs will be inspected and maintained in accordance with the University's BMP Inspection and Maintenance Program. Stormwater BMP Maintenance Update can be found in Appendix C of this report.

## Pollution Prevention and Good Housekeeping

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NC State Stormwater Management and various affected departments will continue to implement the non-structural best management practices, preventative measures and innovative programs currently in place. Worksheets from our Athletics and Transportation Departments can be found in Appendix D, each department has a set of worksheets G1 through G1i. Stormwater Management will continue to work with the regulated community in an effort to develop consistent, applicable best management practices.

Annual educational seminars and training will be made available to promote practices conducive to the reduction of pollution and improve awareness about the impacts polluted storm water runoff discharges can have on water quality. As individuals become more informed about the effects their activities have on the quality of the natural environment around them, they are more likely to support and comply with policies to protect the environment.

## Permanent Best Management Practices Inspection and Maintenance

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NC State Stormwater Management will work in cooperation with Facilities Operations to inspect and maintain all permanent structural BMPs. The following requirements have been developed to meet the requirements of the Permit.

The management of stormwater runoff can be achieved through proper design, installation, inspection and maintenance of various types of Best Management Practices (BMPs). BMPs are defined as activities or structures that help reduce the quantity and improve the quality of stormwater runoff. It is common to categorize BMPs as either structural or non-structural, depending on whether there is a physical control or a management approach to reducing pollution. This document will discuss the inspection and maintenance of structural BMPs only.

The following is a list of devices accepted by the University as structural BMPs for new construction and/or retrofits within the existing landscape:

- Wet Detention Basins
- Constructed Wetlands
- Open Channel Practices
- Riparian Buffers
- Vegetative Filter Strips w/ Level Spreaders
- Bioretention Areas (Rain Gardens)
- Sand Filters
- Proprietary BMP devices
- Green Tree Reservoirs

All designs must be based on the latest edition of the North Carolina Department of Environment and Natural Resources (NC DENR) Design Manual. Any deviation from the Design Manual will require written documentation from the designer proving the design will sufficiently meet all University requirements.

## Current Inventory of Permanent BMPs

SWBMP_ID	Pictures	GIS	Report	Description
SW-111-RG1	1	1	1	entrance to building
SW-111-RG2	1	1	1	between buildings
SW-111-RG3	1	1	1	below basketball center
SW-126-WD2	1	1	1	wet pond behind sullivan site operation bldg
SW-215-RG1	1	1	1	Rain Garden to east of Admin Services III
SW-222-CW4	1	1	1	constructed wetland south of EH&S
SW-222-SF1	1	1	1	sand volleyball court for wolf village - south side
SW-222-WD3	1	1	1	wet pond between wolf village and EH&S
SW-250-RG1	1	1	1	rain garden at NW corner Flex Lab parking
SW-250-WD1	1	1	1	dry pond below Flex Lab parking
SW-250-WD2	1	1	1	wet pond below Flex Lab parking
SW-47-RG1	1		1	DH Hill Founders Dr. entrance by bus stop
SW-58-ID1				new addition to Jordan Hall in 2007
SW-705-LS1	1	1	1	level spreader to west of CCUP
SW-775-SF1	1		1	parking lot median
SW-775-SF2	1		1	parking lot median
SW-782-RG1	1	1	1	rain garden on West side of EB2
SW-782-RG2	1	1	1	rain garden on East side of EB2
SW-782-WD1	1	1	1	wet pond west of EB2
SW-792-RG1	1	1	1	Centennial Campus Middle School parking lot
SW-792-RG2	1	1	1	CCM School pond by parking lot
SW-87-OC1		1		behind south west corner of Lee dorm
SW-87-RG1	1	1	1	behind Lee dorm near parking lot
SW-93-RG1	1	1	1	courtyard between Turlington, Carroll Dorms and Free Expression Tunnel
SW-G126-WD1	1	1	1	wet pond at entrance to Sullivan site operations
SW-G127-PR1				ESK Village - underground?
SW-G132-LS1				grassy swales at visitor center along Varsity Dr
SW-G158-WD1	1	1	1	Wet pond between Tennis complex and motor pool
SW-G164-DD1	1	1	1	dry pond at Dearstyne Avian
SW-G222-DD1	1	1	1	dry pond (3 in series of devices)
SW-G222-RG1	1	1	1	parking lot rain garden
SW-G222-RG2	1	1	1	parking lot rain garden
SW-G222-RG3	1	1	1	parking lot rain garden
SW-G222-WD1	1	1	1	wet pond 1 (series)
SW-G222-WD2	1	1	1	wet pond 2 (series)
SW-G272-DD1	1	1	1	dry pond between Avent Ferry parking and apts.
SW-G301-CW1				series of 3 ponds near Hillsborough St

SW-G301-CW2				series of 3 ponds near Hillsborough St
SW-G301-CW3				series of 3 ponds near Hillsborough St
SW-G705-WD1	1	1	1	wet pond behind CCUP
SW-G710-PR1	1			plunge pool below parking lot rain gardens at toxicology
SW-G710-RG1	1			Partners 2 / Toxicology parking lot rain gardens
SW-G710-RG2	1			Partners 2 / Toxicology parking lot rain gardens
SW-G710-RG3	1			Partners 2 / Toxicology parking lot rain gardens
SW-G710-RG4	1			Partners 2 / Toxicology parking lot rain gardens
SW-G731-CW1	1	1	1	common area along creek, greenway
SW-G731-WD1	1			common area along creek, greenway
SW-G731-WD2	1			common area along creek, greenway
SW-G756-PR1	1			plunge pool, field between main campus drive & COE
SW-G782-WD1	1	1	1	off partners way below COE
SW-G786-OC1	1	1	1	channel below wet pond east of Alumni Center
SW-G786-WD1	1	1	1	pond east of alumni center, below Lake Raleigh dam
SW-G792-CW	1	1	1	adjacent to wet pond across from main building
SW-G792-WD1				wet pond across street from main building
SW-GCC-PR1	1	1	1	plunge pool off Achievement Dr. near farm pond
SW-GCC-WD				pond off main campus drive near alumni entrance
SW-GLRAL-LS1	1			at Lake Raleigh
SW-GLRAL-PR1	1			plunge pool at Lake Raleigh
SW-GLRAL-PR2	1			Lake Raleigh Dam (earthen)
SW-GOVL-RG1	1	1	1	rain gardens w/in Oval Dr. median
SW-GOVL-RG2	1	1	1	rain gardens w/in Oval Dr. median
SW-GOVL-RG2.1	1	1	1	rain gardens w/in Oval Dr. median
SW-GOVL-RG3	1	1	1	rain gardens w/in Oval Dr. median
SW-GPP-LS1	1	1	1	level spreader below wet pond at parking bays
SW-GPP-OC1	1			open channel to east of parking bays off centennial pkwy
SW-GPP-RG1	1	1	1	perimeter parking lot island
SW-GPP-RG2	1	1	1	perimeter parking lot island
SW-GPP-RG3	1	1	1	perimeter parking lot island
SW-GPP-RG4	1	1	1	perimeter parking lot island
SW-GPP-RG5	1	1	1	perimeter parking lot island
SW-GPP-RG6	1	1	1	perimeter parking lot island
SW-GPP-WD1	1	1		wet basin below perimeter parking bays
SW-GSUL-RG1				Sullivan Dr. at Dan Allen next to Rocky Branch
SW-GSUL-RG2	1	1		bioretention area along Sullivan drive near Admin Services

SW-GSUL-RG3	1	1		bioretention area along Sullivan Dr across from Admin I
SW-GVAR-WD1	1	1		wet pond on varsity across from visitor center
SW-GVEN-WD1	1			large pond between Venture Deck and greenway
SW-GVLOT-DD1	1	1		dry pond at Varsity Dr parking lot near Marcom St
SW-GWCHL-DD1	1			dry pond at West Chiller Plant by Wolf Village
SW-GWRC-PR1	1	1	1	plunge pool
SW-WRC-CW1	1			wetland below Wildlife HQ
SW-WRC-LS1	1			base of hill from Wildlife HQ bldg
SW-WRC-RG1	1			rain garden in front of Wildlife HQ
SW-WRC-RG2	1			rain garden in front of Wildlife HQ
SW-WRC-RG3	1			rain garden behind Wildlife HQ

## A. Stormwater Discharges and Water Quality Monitoring

NC State Stormwater Management has contracted with Research and Analytical Laboratories, Inc. to conduct stormwater discharge and water quality monitoring. Initially, twelve (12) locations throughout the campuses of NC State will be sampled. The table below details each location.

Sample No.	NCSU Sample Location Name	Campus Location	Outfall or In-stream	Location Information
1	RBS69	Main Campus – Rocky Branch	Outfall	Corner of Sullivan & Gorman
2	RBS40	Main Campus – Rocky Branch	Outfall	Corner of Dan Allen & Sullivan
3	RBS14	Main Campus – Rocky Branch	Outfall	Outfall at Morrill Dr culvert
4	RBN10	Main Campus – Rocky Branch	Outfall	Outfall directly to Rocky Branch
5	RBN00	Main Campus – Rocky Branch	In-stream	Before Pullen Rd culvert
6	NB100	Centennial Campus – North Creek	Outfall	Beginning of North Creek
7	SWP02	Centennial Campus – North Creek	Outfall	Stormwater Mgmt Pond #2
8	NA105	Centennial Campus – North Creek	Outfall	Outfall at constructed wetland
9	SWP03	Centennial Campus – North Creek	In-stream	Under pedestrian crossing
10	HCV01	Centennial Biomedical Campus	Outfall	Outfall of constructed wetland
11	HVC02	Centennial Biomedical Campus	In-stream	In-stream grab sample
12	HVC03	Centennial Biomedical Campus	In-stream	In-stream grab sample

Samples will be collected in pre-labeled containers specific to each sampling location. Following collection, samples will be placed on ice into laboratory provided coolers and transported to the laboratory for analysis.

**Samples 1, 2, 3, 4, 6, 7, 8, and 10** will be collected from a **stormwater outfall** and will be analyzed for the following parameters:

Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Oil and Grease, Fecal Coliform, Fecal Strptococcus, pH, Total Kjeldahl Nitrogen (TKN), Nitrate plus nitrite, Dissolved Phosphorus, Total ammonia plus organic nitrogen, Total Phosphorus, and Table II (organic toxic pollutants) and Table III (other toxic pollutants and total phenols) found in 40 CFR 122.

**Samples 5, 9, 11 and 12** will be collected from a **stream channel** and will be analyzed for the following parameters:

Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Oil and Grease, Fecal Coliform, Fecal Strptococcus, pH, Total Kjeldahl Nitrogen (TKN), Nitrate plus nitrite, Dissolved Phosphorus, Total ammonia plus organic nitrogen, Total Phosphorus.

Once samples have been analyzed, a written report will be generated and contain a map, field notes, analytical results, a narrative describing the storm event sampled and rainfall data.

Stormwater Discharges and Water Quality Sampling results for this reporting period can be found in Appendix E.

*B. Stormwater Wetland, Stream and Buffer Restoration Monitoring*

A constructed stormwater wetlands and restored stream and buffer located on the Centennial Biomedical Campus (CBC) and the enhanced buffer located at the Lake Wheeler Road Field Laboratory was proposed and implemented to offset mitigation owed for other impacts caused by previous NCSU development projects.

The goal of the project was to improve water quality by reducing sediment from eroding stream banks and by reducing nutrient input through the establishment of a permanent riparian buffer and the stormwater wetland. The area is fenced off to prevent grazing and direct access by cattle to the stream and buffer. This will improve the stream and buffer habitat.

Monitoring was conducted based on the North Carolina Division of Water Quality Stream Mitigation Guidelines as described for Level 1 projects. The monitoring period is 5 years and is conducted annually. Appendix F contains a copy of the 2007 Monitoring Report, Measurement Year 03 for the above-referenced project.

*A. Construction Sites*

Construction sites are required to monitor temporary Sediment and Erosion control devices. An application for, and approval of an Erosion and Sediment Control Plan results in coverage with the NCG010000 Construction Stormwater Permit. Section B. 1. states that all erosion and sedimentation control facilities shall be inspected by or under the direction of the permittee at least once every seven calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24-hour period. A rain gauge shall be maintained. NCSU's construction sites keep records of their inspection activities, the Universities Stormwater Program reviews these records on a monthly basis.

## Retrofits

North Carolina State University was granted authority by NC DENR to collect internal offset payments and utilize the money for retrofit BMPs that would improve nitrogen reduction elsewhere on campus. Offset payment fees are collected from projects that do not exceed the export limits for new development projects, yet exceed the 3.6 lbs/acre/yr requirement.

NC State Stormwater Management has contributed funds to various retrofit projects around campus. The table below summarizes the most recent contributions.

<b>Project Name</b>	<b>Location</b>	<b>Contribution</b>
North Creek	Centennial Campus	<b>\$15,000</b>
Rocky Branch Phase II project Repairs	Central Campus behind Derr Track	<b>\$15,000</b>
Rocky Branch Phase III project	Central Campus behind Carmichael Gymnasium	\$75,000
Tucker/Owen	Main Campus	\$25,000

Several additional retrofit options are being evaluated, prioritized and when funds become available action will be taken.

## Environmental Management System

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The Environmental Health and Safety Center at North Carolina State University has initiated a computer based environmental compliance information management system to store, maintain, automate and report environmental compliance data related to its environmental programs. The purpose of the electronic database is to develop a user-friendly system that will be used by the environmental managers and his staff to track the status of regulatory compliance at three NC State campuses and to ensure NC State's ability to maintain compliance.

The electronic Compliance Information Management System incorporates the following major features:

- Ability to generate reports of applicable environmental requirements;
- Query tools to easily sort data (i.e. provide all requirements due next month or provide all requirements associated with a specific staff member, etc):
- Integrated, automatic e-mail notification of upcoming regulatory deadlines;
- Data entry, editing and exporting routines; and
- Ability to mark tasks as complete.

The data management system provides a tool for NC State managers to track and maintain regulatory compliance and ultimately gives the managers decision-making tools to manage complex programs and access important environmental data quickly and easily, saving time and maximizing existing resources.

## Certification

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"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed

Name: Mr. Charles D. Leffler

Title: Vice Chancellor for Finance and Business

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**APPENDIX A**  
**EDUCATION & OUTREACH SUMMARY SHEETS**

**APPENDIX B**

**ILLICIT DISCHARGE TRACKING FORMS**

**APPENDIX C**  
**STORMWATER BMP UPDATE**

**APPENDIX D**

**POLLUTION PREVENTION & GOOD HOUSEKEEPING  
PROGRAM SUMMARY SHEETS**

**APPENDIX E**

**STORMWATER DISCHARGES AND WATER QUALITY  
SAMPLING RESULTS**

## **APPENDIX F**

### **Stormwater Wetland, Stream and Buffer Restoration Monitoring**

**November 2007**

**Stormwater Sampling and Analysis**

**August 2008**

**Stormwater Sampling and Analysis**