City of Wilmington, North Carolina

STORMWATER MANAGEMENT PLAN & ANNUAL NPDES PERMIT REPORT

Prepared by:
City of Wilmington, NC
Stormwater Services
PO Box 1810
209 Coleman Drive
Wilmington, NC 28412

NPDES Permit No.: NCS000406

Reporting Year: March 1, 2012 – June 30, 2013

REPORTING CERTIFICATION

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.

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David B. Mayes, P.E. Date

Manager, Stormwater Services

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INTRODUCTION

Stormwater Management Plan Overview

The North Carolina Division of Water Quality issued NPDES Phase II Permit NCS000406 to the City of Wilmington effective November 12, 2012. The Stormwater Management Plan is the City of Wilmington's program to comply with NPDES Phase II permit NCS000406 for stormwater discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The plan defines strategies and guidelines necessary for protecting water quality and reducing pollutant discharges to the maximum extent practicable. The plan also includes reporting results for the current yearly reporting period from March 1, 2012 to June 30, 2013. This extended 15 month period of reporting was completed in order to coincide with the end our fiscal year. The reporting period that follows this year and thereafter will begin on July 1 to June 30.

The plan is a guidance document to be used by the City staff and the general public. The plan is evolving and will address needs and priorities that will be reflected in compliance programs over the 5 year implementation schedule.

As required by EPA regulations for the NPDES Phase II stormwater programs, the following six minimum measures are addressed in the plan:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention and Good Housekeeping for Municipal Operations

Program Implementation Status

The City of Wilmington is pleased to report excellent progress for year 1 compliance with requirements of NPDES Phase II permit NCS000406. Primary areas of work include:

- Continued implementation of amended ordinances related to Post Construction and Illicit Discharge BMPs.
- Continued mapping of stormwater infrastructure along with improvements to the GIS database design.
- Continuation of Public Outreach and Public Participation efforts.
- Finalization of SPPP and SPCC plans and inventory of municipally owned operations with the potential to pollute.
- Hired Watershed Coordinator who began implementation of watershed restoration plan for Bradley and Hewletts Creeks.

Wilmington continues to move forward with implementing the necessary goals and objectives as outlined in their permit. Considerable progress related to Illicit Discharge Detection and Elimination has been made during the past year with respect to dry weather flow monitoring and planning. We continue to have success with our public outreach and participation program and education to the public. The City remains focused on improving the water quality for the areas surrounding water bodies as indicated by UNCW's Center for Marine Science ambient monitoring of water quality on creeks within the City.

CITY OF WILMINGTON STORMWATER SERVICES OVERVIEW

Comprehensive Stormwater Management

Comprehensive stormwater management takes into account both the quantity and quality of stormwater runoff and is reflected in five core components of Wilmington's Stormwater Services program:

Management & Planning

Master planning utilizes the existing stormwater system inventory to develop a long range plan to improve drainage and water quality within an entire watershed. When planning on such a large scale, Stormwater Services seeks involvement and input from citizens and stakeholders. Management activities also include customer service – responding to customer concerns or inquiries and administrative services required for operation of the City stormwater utility.

Regulatory and Enforcement

Regulatory and enforcement activities are outlined in the City's existing stormwater ordinance requiring comprehensive stormwater management and creating technical standards for design and maintenance of private stormwater facilities. Stormwater Services also provides two semi-annual inspections for privately permitted stormwater retention facilities. These inspections are performed in order to ensure compliance with city maintenance standards. Compliance with NPDES Phase II stormwater regulations also fall into this category.

Capital Improvements

The stormwater utility provides dedicated funding and staff resources for planning, designing, and constructing capital projects. These projects are necessary when the existing storm drainage system is inadequate and can result in flooded streets, houses, and businesses. Capital improvement projects require collaboration among City departments, outside agencies, and citizens in affected areas. Whenever possible, capital projects incorporate innovative design or best management practices (BMPs) to improve water quality and reduce the quantity of stormwater runoff.

Operations and Maintenance

The City of Wilmington's Maintenance Division is responsible for maintaining the public drainage system. Maintenance activities consist of open drainage, closed drainage, street sweeping, and best management practices (BMPs). The open drainage system consists of roadside swales, ditches, channels, creeks, and ponds. The closed drainage system consists of pipes, culverts, catch basins, and manholes. Both of these systems are maintained using manual and mechanical techniques to insure that they remain open for proper drainage. Street sweeping provides preventative maintenance to minimize the amount of trash, debris,

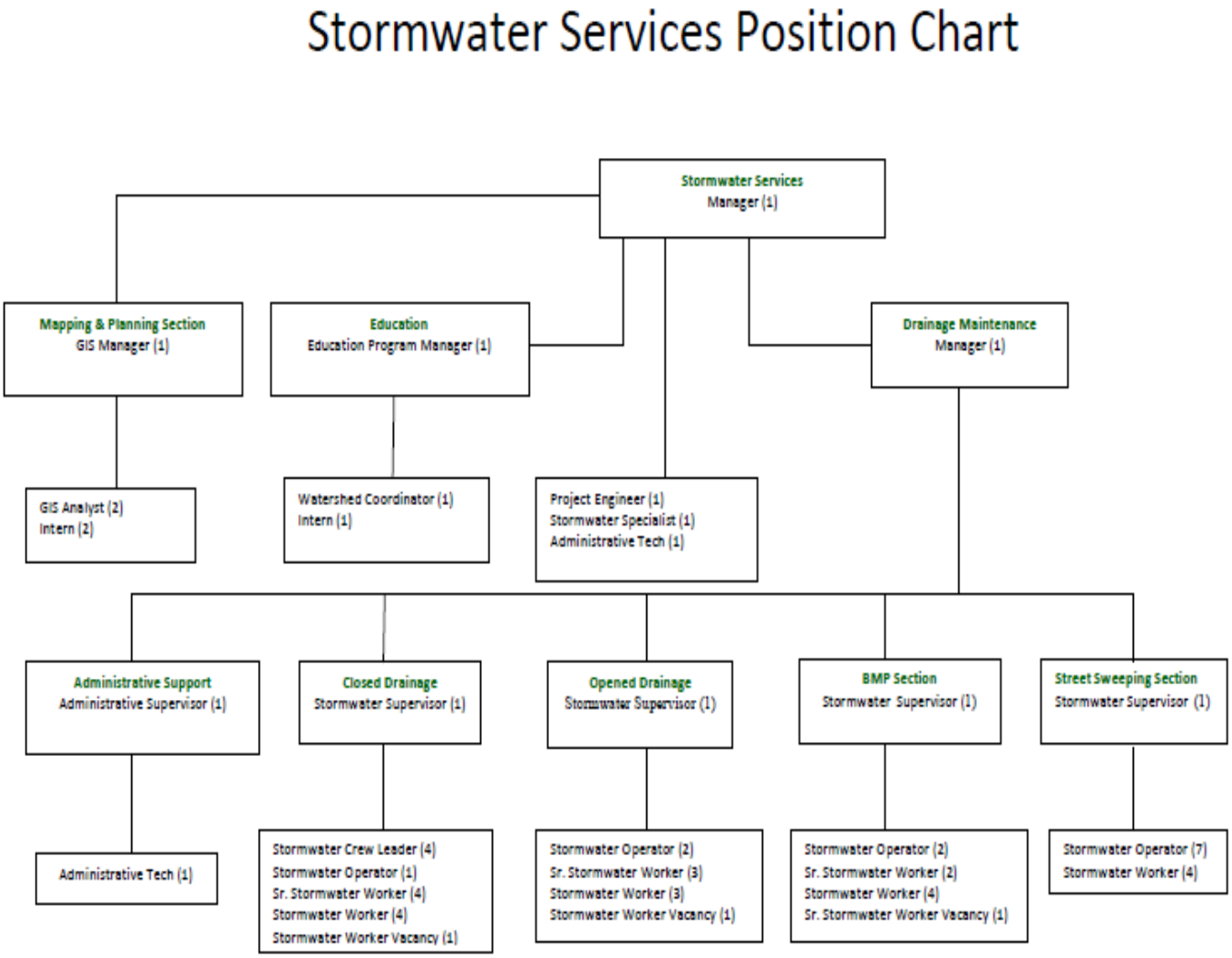
sediment, and other pollutants entering open or closed drainage routes. BMP maintenance consists of activities necessary to keep over 53 BMP sites including ponds, wetlands, and bio-retention areas in fully-functioning condition.

Water Quality

Water quality monitoring is executed by the University of North Carolina at Wilmington under annual contract with the City. Monitoring is performed on specific creeks and waterways within the City limits. Monitoring tests for specific pollutants and resulting data is used to plan capital improvement projects, guide outreach and education efforts, assess water quality at the sites monitored, identify persistent pollutant discharge areas or points, help to build a framework for future detection and tracing of pollutant sources and obtain grant funding. In addition, Stormwater Services implements an extensive outreach, education, and public involvement program that serves the citizens of Wilmington and includes a wide array of water quality education programming and materials. These programs include school presentations, homeowner association outreach, stormwater publications and giveaways, mass media advertising, special event exhibits, workshops, volunteer cleanups and storm drain marking, and collaborative efforts such as grant projects. These efforts strive to educate and engage citizens in protecting and improving local water quality through awareness, education, behavior modification and action.

Management and Planning

Organization Chart of the Stormwater Services Division



Estimated FY 13-14 Stormwater Management Fund Budget for NPDES

	FY 12-13 Adopted	FY 13-14 Estimated
REVENUES		
Storm Water Utility Fees	6,594,254	7,005,774
City Streets Storm Water Fees	1,764,682	1,912,915
Storm Water Discharge permits	20,000	20,000
NCDOT Drainage Maintenance	37,000	37,000
Interest Earnings	25,443	18,418
Miscellaneous	-	-
Appropriated Fund Balance	-	-
TOTAL REVENUES	8,441,379	8,994,107
EXPENDITURES		
Public Services	4,794,904	5,015,591
Nondepartmental	653,439	752,235
Debt Service	1,918,036	2,626,281
Contingency	75,000	100,000
Transfer to Capital Project Fund	1,000,000	500,000
TOTAL EXPENDITURES	8,441,379	8,994,107 [1]

[1] The FY 2014 Estimate is a recommended budget and has not been adopted by the Wilmington City Council.

Regulatory and Enforcement

Public Services Code Enforcement

The City's stormwater ordinance required by this permit has been effective since November 1, 2009. Citizens can report suspected pollution through the Stormwater Hotline and the webpage reporting form. All complaints received by the Stormwater Division either from the public or from City staff is investigated; corrective action is prescribed; documented and followed until the violation is resolved. A Enforcement/Civil Penalty Guidance tool has been developed and is now being used to ensure consistency and help to guide the decision making process for NOVs and Civil Penalty issuance. Any complaints received that have environmental impacts other than stormwater or fall outside the City's regulatory authority are referred to DENR DWQ Wilmington Regional Office.

In an effort to maximize voluntary compliance, the City has, and will continue to develop and distribute educational materials to targeted populations in an aggressive manner. Consequently, all complaints provide the opportunity to educate the public on the issues that threaten stormwater, the best management practices for prevention, the awareness of our city's stormwater program, and the new ordinance.

Compliance through Public Education

The stormwater code enforcement program strives to maximize voluntary compliance through public education and use enforcement through penalties as a last resort. Staff has found that most stormwater ordinance violations can be resolved through public education. Most of the people encountered violating the ordinances are not even aware of their wrongdoings. Teaching them why they are in violation and why it matters works because most people want to do the right thing. There are very few repeat offenders. In FY13, a total of 1 repeat offender was identified. Our enforcement and civil penalties are reserved for 1) serious discharges and spills with the potential of harming human health and the environment, 2) repeat offenders, and 3) as a last resort to achieve compliance.

The program developed an assortment of educational material for targeted audiences, as well as targeted pollutants that teach the public about our stormwater ordinance and pollution prevention. For other circumstance specific letters are written with instructions to guide violators to a solution and compliance expectations. This clear outline of the City's expectations is a powerful tool for preventing future pollution problems.

Yard Waste

Yard waste violations receive a face to face meeting and a standardized letter explaining the ordinance and the reasons why it is necessary. Also highlighted are the expectations for compliance and civil penalties for any future violations. This letter is accompanied by a poster in English or Spanish and in various sizes. The poster's objective is to help educate landscape companies and their employees on the ordinance requirements that keep yard waste out of the drainage system and surface waters and the city's expectations.

Pet Waste

Reports of pet waste violations receive a face to face meeting if possible. A brochure and flyer has been developed explaining the dangers of pet waste bacteria in surface waters that includes the city's expectations of the ordinance and penalty amounts for any violations. Pet waste message flags are used and distributed with ordinance information at parks and public places, such as in specific neighborhoods in response to complaints. The pet waste flyer is also available in a poster size for educating the public in parks and common areas.

Illicit Discharges

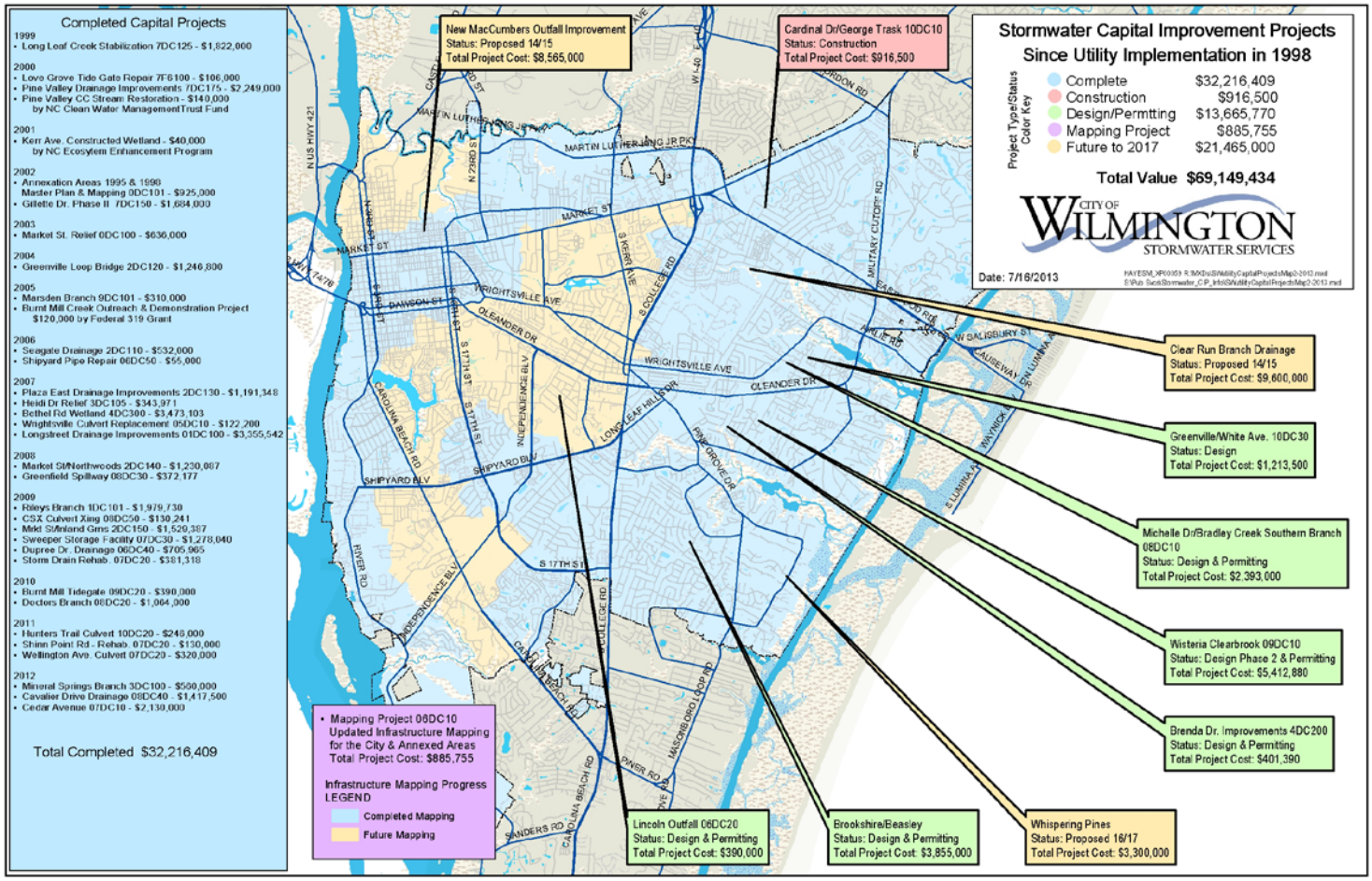
Reports of illicit discharges are addressed on a case by case basis. Informational posters and brochures for general use have been developed for distribution and others for specific common source types. These posters are distributed to specific types of businesses to display for employees in restaurants, vehicle maintenance businesses, construction site on industry specific issues and best management practices to avoid and prevent stormwater pollution.

Cape Fear Public Utility Authority

The Cape Fear Public Utility Authority (CFPUA) currently employs six (6) Environmental Compliance Officers that implement and enforce elements of the City's NPDES Wastewater Discharge Permit to include the City's Collection System Permit. As part of those requirements the group regulates sanitary sewer overflows (SSOs) and eliminates any wastewater or other polluted waters from leaving their system. They respond to reports and investigate leads generated by the public or monitoring results as part of their permit requirement and respond using public education, enforcement and maintenance. The CFPUA copies the City on all SSOs and follows up with monitoring results and clean up measures. The CFPUA has maintained right of entry on the properties that it services. The city and CFPUA are working together to keep open lines of communication, continue to build relationships and combine resources in a continued effort to locate chronic leaks and minimize release to MS4.

The CFPUA and the City continue to utilize the joint policy established in 2011 for the reporting and documentation of SSOs and leaks. This policy provides procedures for CFPUA to follow regarding reporting and documentation of SSOs the impact the City's MS4. These guidelines will enable the City to comply with Phase II reporting requirements as well as provide assistance to CFPUA in mitigating any potential threat to public health and environment. This policy is attached in Appendix D.

Capital Improvements



In-House Projects

Location	Installed/Constructed	Description	Total Cost
S. 10th & Ann St.	Installed structure	1 frame & grate	$8,727.19
S. 10th & Orange St.	Installed structure	1 frame & grate	$13,275.88
S. 9th & Ann St.	Installed/Built structures	1 Bio-retention garden, 1 frame grate & hood	$7,310.46
208 S. 13th St.	Installed structures, pipe	1 inlet complete, 2 frame & grate, 32 ft. pipe	$7,597.13
Jennings & Winston Blvd.	Installed structure	1 frame & grate	$1,508.48
5745 Oleander Dr.	Installed structures, pipe	1 complete manhole, 1 frame & grate, 12 ft. pipe	$13,756.71
5447 Overbrook Dr.			$345.11
Pine Grove Dr.			$9,125.91
2721 Shandy Lane	Installed structure, pipe	1 complete manhole, 104 ft. pipe	$34,108.59
2nd & Orange St	Installed pipe	2 ft. pipe	$191.54
Early & Robert E. Lee Dr.			$982.76
Early & Jeb Stuart Dr.			$2,286.57
120 Sebrell Ave.	Installed pipe	24 ft. pipe	$1,327.99
Kerr Ave. Wetland	Built structure	1 weir wall	$4,207.18
4th & Harnett St.	Installed structure	1 frame & grate	$1,902.35
4702 Bentley Dr.	Installed structure	1 inlet complete	$3,437.30
Front & Walnut St.	Installed structures, pipe	4 complete manholes, 233 ft. pipe	$72,311.37
215 Gores Row	Installed structure	1 complete manhole	$8,012.36
238 Huntington Rd.	Installed structure, pipe	1 frame & grate, 8 ft. pipe	$2,756.48
44 Mercer Ave.	Installed structures, pipe	2 complete manholes, 1 frame, grate & hood, 251.25 ft. pipe	$72,323.76
300 Parkway Dr.	Installed pipe	16 ft. pipe	$1,039.65
131 Rogers Ave.	Installed pipe	40 ft. pipe	$3,195.81
Water & Ann St.	Installed structures, pipe	3 complete manholes, 101 ft. pipe	$43,146.47
113 Nottington Lane	Installed structure	1 frame & grate	$2,839.30
4210 Peachtree Ave.	Built structure	1 headwall	$1,016.17
201 Sunnyvale Dr.	Installed structure	1 complete manhole	$1,400.83
500 Blk. Barksdale Dr.	Installed pipe	16 ft. pipe	$999.17
Total Cost			**$319,132.52**

Operations and Maintenance

Yearly Maintenance Activities Chart

SOP-Activity	Amount	Unit of Measure	Labor Hrs.	Total Cost
Section1: CONSTRUCTION				
C-1 Construction-Structure	29	each	2953.50	$ 112,150.28
C-1 Construction-Pipe	1100.50	feet	4382.50	$ 183,501.55
C-2 Construction-Flume	-	each	-	-
C-2 Construction-Ditch	-	feet	-	-
C-3 Construction-BMP	4	each	931.50	$ 33,572.12
C-0 Construction-Stock pile material	115	load	178.75	$ 8,017.64
C-0 Construction-Plan work	-	-	349.50	$ 10,045.23
				$ 347,286.82
SECTION 2: INSPECTION				
I-1 Inspection-Closed	-	-	8130.75	$ 199,532.68
I-1 Inspection-Video	20040	feet	858.00	$ 21,975.98
I-1 Inspection-Video data management	-	-	142.00	$ 3,171.07
I-1 Inspection-new system	-	each	-	-
I-1 Inspection-Survey	-	-	552.00	$ 11,437.23
I-2 Inspection-Open	-	-	1960.25	$ 44,139.67
I-3 Inspection-BMP	875	each	527.75	$ 10,818.30
I-3 Inspection-Lake	12	each	17.50	$ 368.72
I-4 Inspection-Tide gate	-	each		-
I-0 Inspection-Miscellaneous	-	-	-	-
I-0 Inspection-Plan work	-	-	155.50	$ 3,879.34
				$ 295,322.99
SECTION 3: MAINTENANCE				
M-1 Maintenance-BMP	1088	each	5224.98	$ 138,740.07
M-1 Maintenance-Right of Way	-	-	2153.00	$ 63,747.48
M-2 Maintenance-Ditching manual	411657	feet	9230.00	$ 209,885.46
M-3 Maintenance-Ditching mechanical	26600	feet	2786.75	$ 111,989.76
M-4 Maintenance-Culvert	2082	each	845.00	$ 20,024.28
M-5 Maintenance-Pipe	141589	feet	3300.00	$ 89,737.71
M-5 Maintenance-Structure	16956	each	6063.25	$ 153,462.29
M-5 Maintenance-Reset cover	281	each	340.00	$ 7,244.91
M-6 Maintenance-Lake	122	each	1157.00	$ 35,883.60
M-7 Maintenance-Mowing	468823.19	feet	1962.00	$ 68,500.96
M-7 Maintenance-Mowing right of way	111.55	acre	613.75	$ 18,152.04
M-8 Maintenance-Tide gate	26	each	94.50	$ 1,973.50
M-9 Maintenance-Sweep streets	13752.61	mile	7720.00	$ 489,491.06
M-9 Maintenance-Sweep support	-	-	3730.75	$ 115,553.66
M-10 Maintenance-Haul waste	742	load	744.50	$ 26,981.70
M-10 Maintenance-Screen material	-	-	3423.00	$ 138,650.17
M-11 Maintenance-Vehicle/equipment	-	-	2377.00	$ 72,453.50
M-0 Maintenance-Yard	-	-	1657.80	$ 33,991.10
M-0 Maintenance-Plan work	-	-	50.00	$ 1,269.33
				$ 1,797,732.58
SECTION 4: REPAIR				
R-1 Repair-Pipe failure	190	each	6177.00	$ 204,495.82
R-2 Repair Pipe work	664.50	feet	1560.00	$ 59,235.91
R-2 Repair-Convert structure	17	each	1188.25	$ 39,243.04
R-3 Repair Structure	165	each	3525.50	$ 106,411.76
R-4 Repair Erosion	1113	feet	536.00	$ 32,306.59
R-5 Repair Replace cover	157	each	174.00	$ 20,421.57
R-5 Repair Tide gate	-	-	-	-
R-0 Repair- Plan work	-	-	94.50	$ 2,558.07
				$ 464,672.76

Water Quality

Monitoring Program Overview

In October 1997, the City of Wilmington contracted with the UNCW Center for Marine Science for a project with the goal of assessing water quality in Wilmington City watersheds under base flow conditions. Also, certain sites were analyzed for sediment heavy metals concentrations (EPA Priority Pollutants). New Hanover County also participated in this effort for tidal creeks outside of City jurisdiction. UNCW produced a combined report of results entitled Environmental Quality of Wilmington and New Hanover County Watersheds. Immediately below is an overview of their work methods. Following this overview is the executive summary of their most recent report.

The water quality data in these reports are presented from a watershed perspective. Some of the watersheds cross political boundaries (i.e. parts of the same watershed may lie in the County but not the City). Howe and Whiskey Creeks are examples. Water quality parameters analyzed in the tidal creeks include water temperature, pH, dissolved oxygen, salinity/conductivity, turbidity, nitrate, ammonium, orthophosphate, chlorophyll *a*, and in selected creeks fecal coliform bacteria. Similar analyses were carried out in the City watersheds with the addition of total nitrogen (TKN), total nitrogen (TN), total phosphorus (TP), total suspended solids (TSS) and biochemical oxygen demand (BOD) at selected sites.

Water Quality Methods

Field parameters were measured at each site using a YSI 6920 Multiparameter Water Quality Probe (sonde) linked to a YSI 650 MDS display unit. Individual probes within the instruments measured water temperature, pH, dissolved oxygen, turbidity, salinity, and conductivity. YSI Model 85 and 55 dissolved oxygen meters were also used on occasion. The instruments were calibrated prior to each sampling trip to ensure accurate measurements. The UNCW Aquatic Ecology laboratory is State-Certified for field measurements (temperature, conductivity, dissolved oxygen and pH) and for laboratory chlorophyll *a* measurements.

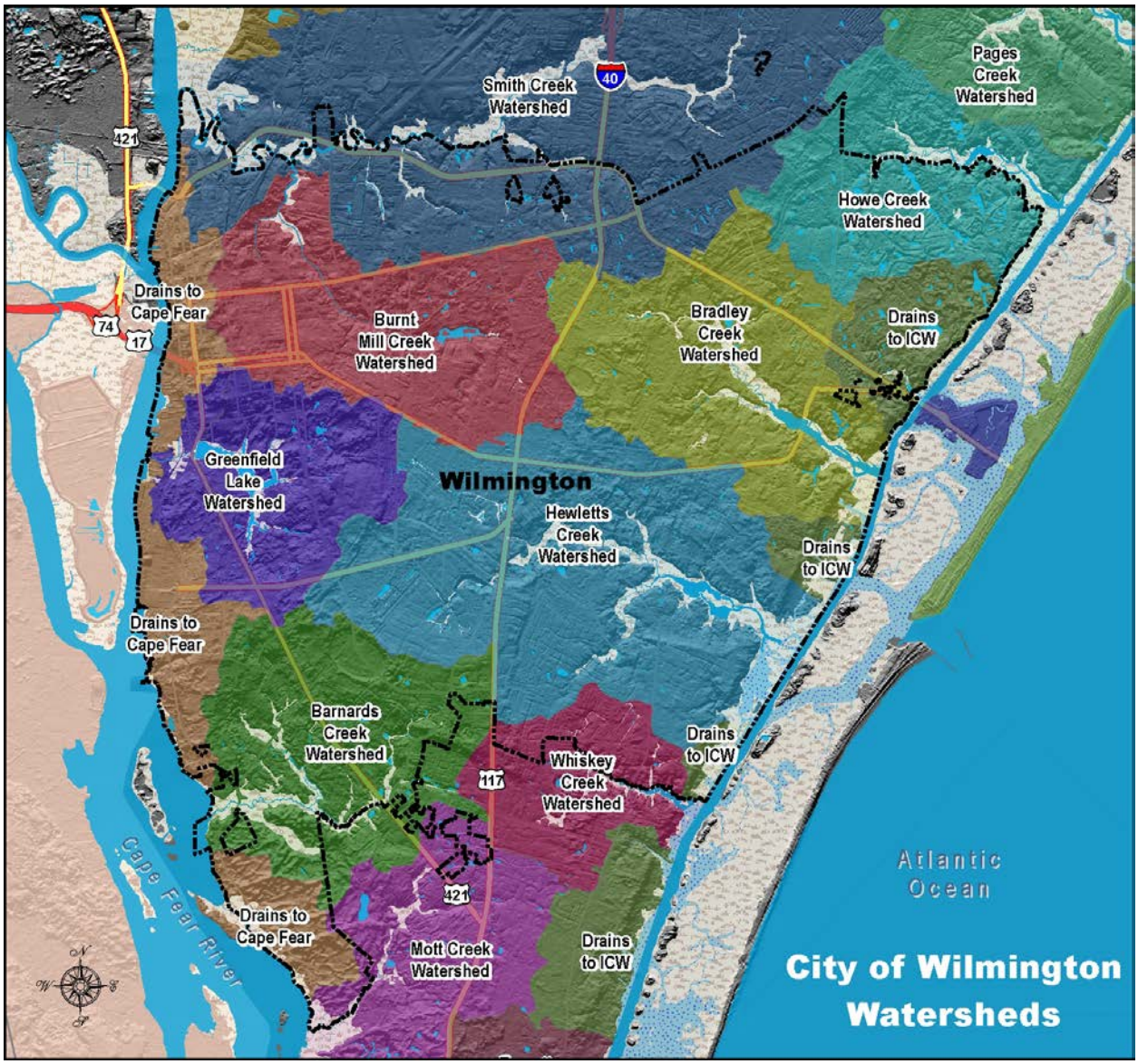
The analytical method used to measure chlorophyll *a* is described in Welschmeyer (1994) and US EPA (1997). Chlorophyll *a* concentrations were determined from the 1.0 micrometer glass fiber filters used for filtering samples for nitrate+nitrite and orthophosphate analyses. All filters were wrapped individually in aluminum foil, placed in an airtight container and stored in a freezer. During the analytical process, the glass filters were separately immersed in 10 ml of a 90% acetone solution. The acetone was allowed to extract the chlorophyll from the material for 18-24 hours. The solution containing the extracted chlorophyll was then analyzed for chlorophyll *a* concentration using a Turner AU-10 fluorometer. This method uses an optimal combination of excitation and emission bandwidths that reduces errors in the acidification technique.

Nutrients (nitrate, ammonium, total Kjeldahl nitrogen, total nitrogen, orthophosphate, and total phosphorus) and total suspended solids (TSS) were analyzed by a state-certified contract laboratory using EPA and APHA techniques. We also computed inorganic nitrogen to phosphorus

molar ratios for relevant sites (N/P). Fecal coliform concentrations were determined using a membrane filtration (mFC) method (APHA 1995).

For a large wet detention pond (Ann McCrary Pond on Burnt Mill Creek) and for a constructed wetland on Kerr Avenue (at the headwaters area of Burnt Mill Creek) UNCW collected data from input (control) and outfall stations. This data was used to test for statistically significant differences in pollutant concentrations between pond input and output stations. The data were first tested for normality using the Shapiro-Wilk test. Normally distributed data parameters were tested using the paired-difference t-test, and non-normally distributed data parameters were tested using the Wilcoxon Signed Rank test. Statistical analyses were conducted using SAS (Schlotzhauer and Littell 1987).

Wilmington Watersheds Map



Wilmington Watersheds Yearly Monitoring Report (UNCW)

ENVIRONMENTAL QUALITY OF WILMINGTON AND NEW HANOVER COUNTY WATERSHEDS, 2012

by

Michael A. Mallin, Lauren E. Bohrer, Matthew R. McIver and Stephanie Protopappas

CMS Report 13-01
Center for Marine Science
University of North Carolina Wilmington
Wilmington, N.C. 28409

May 2013

http://www.uncw.edu/cms/aelab/

Funded by:

The City of Wilmington through the Water Resources Research Institute of the University of North Carolina, NCSU No. 2010-1651-01

Executive Summary

This report represents combined results of Year 14 of the Wilmington Watersheds Project. Water quality data are presented from a watershed perspective, regardless of political boundaries. The 2012 program involved 8 watersheds and 22 sampling stations. In this summary we first present brief water quality overviews for each watershed from data collected between January and December 2012.

Barnards Creek – Barnards Creek drains into the Cape Fear River Estuary. It drains a 4,161 acre watershed that consists of about 17% impervious surface coverage, and a population of approximately 12,200. Water column sampling was not funded during 2012.

Bradley Creek – Bradley Creek drains a watershed of 4,631 acres, including much of the UNCW campus, into the Atlantic Intracoastal Waterway (ICW). The watershed contains about 23% impervious surface coverage, with a population of about 16,470. Three sites were sampled, all from shore. In 2012 there was one significant algal bloom recorded in the south branch of the creek on Wrightsville Avenue (BC-SB). Average dissolved oxygen was fair to poor at the three sites. All three sites sampled were rated poor due to high fecal coliform bacteria, with the south branch site BC-SB and the College Acres station BC-CA both having especially high counts.

Burnt Mill Creek – Burnt Mill Creek drains a 4,252 acre watershed which is extensively urbanized (34% impervious surface coverage) into Smith Creek. Three locations were sampled during 2012. This creek had very poor water quality, with algal blooms occurring on occasion at all of the three sites sampled. High fecal coliform counts occurred, with two of the three sites exceeding the human contact standard > 60% of occasions sampled. These levels of pollution have characterized the system for the past several years. Dissolved oxygen concentrations were fair to poor in 2012.

The effectiveness of Ann McCrary wet detention pond on Randall Parkway as a pollution control device for upper Burnt Mill Creek was mixed for 2012. Comparing inflows to outflows, there was a significant increase in dissolved oxygen and pH, and a significant decrease in fecal coliform counts; whereas there was no change in nutrient concentrations. Several water quality parameters showed a worsening in pollutant levels along the creek from where it exited the detention pond to the downstream Princess Place sampling station, including dissolved oxygen, fecal coliform bacteria, nitrogen and phosphorus.

Greenfield Lake – This lake drains a watershed of 2,551 acres, covered by about 36% impervious surface area with a population of about 10,630. This urban lake has, over the years, suffered from low dissolved oxygen, algal blooms, periodic fish kills and high fecal bacteria counts. The lake was sampled for physical parameters at three tributary sites and for all parameters at three in-lake sites. The three tributaries of Greenfield Lake (near Lake Branch Drive, Jumping Run Branch, and Lakeshore Commons Apartments) all suffered from low dissolved oxygen problems. In 2012 there was good to fair dissolved oxygen at two of the in-lake stations (especially nearest the SolarBees), but low dissolved oxygen concentrations were common at GL-2340, in the upper lake.

Algal blooms are periodically problematic in Greenfield Lake, and have occurred during all seasons, but are primarily a problem in spring and summer. In 2012 algal blooms did occur on several occasions in the lake, but they were decreased from 2011. In the period 2007-2012 there was a statistically significant relationship within the lake between chlorophyll *a* and BOD5, meaning that the algal blooms are likely an important cause of low dissolved oxygen in this lake, along with stormwater runoff of BOD materials into the streams feeding the lake. In 2012 all three in-lake sites had fecal coliform counts that exceeded the State standard on 33% or more of occasions sampled. Station GL-2340 maintained geometric mean concentration of 235 CFU/100 mL, exceeding the standard of 200 CFU/100 mL, and exceeded the standard on four of six occasions sampled. In early July 2012 there was a fish kill in Greenfield Lake, consisting of a

variety of species. High water temperatures coupled with lack of rain and flushing likely led to decreases in dissolved oxygen that caused the kill.

From 2005 to 2012 several steps were taken by the City of Wilmington to restore viability to the lake. Sterile grass carp were introduced to the lake to control (by grazing) the overabundant aquatic macrophytes, and four SolarBee water circulation systems were installed in the lake to improve circulation and force dissolved oxygen from the surface downward toward the bottom. Also, on many occasions a contract firm and City staff applied herbicides to further reduce the amount of aquatic macrophytes. These actions led to a major reduction in aquatic macrophytes lake wide.

Greenfield Lake sediments were sampled at seven sites on October 23. Two in-lake stations, GL-P and GL-YD had elevated concentrations of copper and lead; GL-YD additionally had high zinc concentrations (Table 6.4). Metals were not at excessive concentrations in the streams feeding the lake. Total PAH concentrations were excessive in the sediments of all three in-lake stations, as well as two stream sites; GL-LB (Lake Branch), and especially GL-SS1, the head of the Silver Stream wetland/detention pond complex along Candlewood Dr. Individual PAHs that were excessive in the lake sediments included Phenanthrene, Fluoranthene and Chrysene (Table 6.4). All stream sites had elevated concentrations of Fluoranthene; Lake Branch also had high Chrysene concentrations. Total PCBs were below detection limit at all sites.

Hewletts Creek – Hewletts Creek drains a large (7,435 acre) watershed into the Intracoastal Waterway. This watershed has about 19% impervious surface coverage with a population of about 20,210. In 2012 the creek was sampled at four tidal sites and one non-tidal freshwater site. Incidents of severe hypoxia did not occur in 2012 as no concentrations sampled were below 4.0 mg/L. Turbidity was low, and algal blooms were not problematic in 2012. Fecal coliform bacteria counts were high in three stations sampled in the creek. Counts exceeded State standards 100% of the time at MB-PGR, 83% of the time at NB-GLR and 67% of the time at PVGC-9. The geometric mean at PVGC-9 decreased from 2011.

During 2007 the 7.6 acre JEL Wade wetland (located at the end of Bethel Road) was constructed to treat stormwater runoff from a 589 acre watershed within the Hewletts Creek drainage. Drainage for this wetland enters the south branch of the creek, upstream of the SB-PGR sampling site. This constructed wetland has continued to function extremely well in reduction of nutrients and fecal bacteria from stormwater inputs. Additionally, sampling data collected downstream of the wetland at Station SB-PGR shows a statistically significant decline in ammonium, nitrate and fecal coliform bacteria after completion of the wetland, demonstrating the wetland's benefits to the creek system as a whole.

Howe Creek – Howe Creek drains a 3,518 acre watershed into the ICW. This watershed hosts a population of approximately 6,460 with about 19% impervious surface coverage. Three stations were sampled in Howe Creek in 2012. Two minor algal blooms were seen, both at the uppermost station HW-DT. The uppermost station HW-DT was rated poor for high fecal coliform bacteria

counts, exceeding the state standard on 67% of the times sampled, while HW-GP and HW-FP were rated fair and good, respectively. Dissolved oxygen concentrations were rated poor at the two upper stations in 2012 from being below 5.0 mg/L on 50% of occasions sampled, although the levels seen did not represent extreme hypoxia. Since wetland enhancement was performed in 1998 above Graham Pond the creek below the pond at Station HW-GP has had fewer and smaller algal blooms than before the enhancement.

Motts Creek – Motts Creek drains a watershed of 3,328 acres into the Cape Fear River Estuary with a population of about 9,530. This creek was not sampled by UNCW in 2012.

Smith Creek – Smith Creek drains into the lower Northeast Cape Fear River just upstream of where it merges with the Cape Fear River. It has a watershed of 13,896 acres that has about 33% impervious surface coverage, with a population of about 31,780. One estuarine site on Smith Creek, SC-CH, was sampled by UNCW under the auspices of the Lower Cape Fear River Program (LCFRP). Water quality at this site was poor in 2012, with the dissolved oxygen standard of 4.0 mg/L violated 25% of the time and the turbidity standard of 25 NTU violated on 17% of occasions sampled. Fecal bacteria pollution remained poor in 2012, violating the contact standard 42% of occasions sampled.

Sediment toxin sampling showed that there were no problematic metals or toxin concentrations in either the north or south branches of Smith Creek as sampled at Kerr Avenue (SC-KAN and SC-KAS). However, the lower station at Castle Hayne Road (SC-CH) had elevated concentrations of two PAHs, Fluoranthene and Chrysene; both were at problematic levels, according to established toxic ranges.

Whiskey Creek – Whiskey Creek is the southernmost large tidal creek in New Hanover County that drains into the ICW. It has a watershed of 2,095 acres, a population of about 8,000, and is covered by approximately 19% impervious surface area. One station, on Masonboro Loop Road, was sampled from shore along this creek in 2012. This site had low to moderate nutrient concentrations and no algal bloom problems. Dissolved oxygen was substandard (below 5.0 mg/L) on 67% of occasions sampled, whereas fecal coliform bacteria counts were below standard on all occasions sampled.

Study of Potential Sewage Inputs into Burnt Mill Creek - The UNCW Aquatic Ecology Laboratory at The Center for Marine Science conducted sampling at or near several stormwater sites entering Burnt Mill Creek for potential sewage inputs; these sites were sampled for fecal coliform bacteria and optical brightener concentrations. This project was conducted from June 4th through the month of August 2012, with emphasis toward rain events. Of the seven sites that UNCW collected significant data on, three showed possible sewage influence. These were: BMC-MDW and BMC-MDE, located on Rankin St. between 12th and 13th - these are stormwater pipes flowing into McCumbers Ditch, a tributary to Burnt Mill Creek; and Station 21-NB, located in close proximity to the mouth of Burnt Mill Creek where it meets up with the Northeast Cape Fear

River. This site is a small bridge directly underneath a street storm drain located off of 21st St. between Noble and Brandon.

Water Quality Station Ratings – The UNC Wilmington Aquatic Ecology Laboratory utilizes a quantitative system with four parameters (dissolved oxygen, chlorophyll *a*, turbidity, and fecal coliform bacteria) to rate water quality at our sampling sites. If a site exceeds the North Carolina water quality standard for a parameter less than 10% of the time sampled, it is rated Good; if it exceeds the standard 10-25% of the time it is rated Fair, and if it exceeds the standard > 25% of the time it is rated Poor for that parameter. We applied these numerical standards to the water bodies described in this report, based on 2012 data, and have designated each station as good, fair, and poor accordingly (Appendix B).

Fecal coliform bacterial conditions for the entire Wilmington City and New Hanover County Watersheds system (19 sites sampled for fecal coliforms) showed 21% to be in good condition, 5% in fair condition, but **74%** in poor condition, similar to 2011. Dissolved oxygen conditions system-wide (22 sites) showed 18% of the sites were in good condition, 23% were in fair condition, and 59% were in poor condition, a worse showing than in 2011. For algal bloom presence, measured as chlorophyll *a*, 61% of the 18 stations sampled were rated as good, 28% as fair and 11% as poor (Greenfield Lake) an improvement from 2011. In terms of turbidity 21 of the 22 sites sampled were rated as good, while one site, Smith Creek at Castle Hayne Rd. was rated fair. It is important to note that the two water bodies with the worst water quality in the system also have the most developed watersheds with the highest impervious surface coverage; Burnt Mill Creek – 34% impervious coverage; Greenfield Lake – 36% impervious coverage.

2012-2013 NPDES PROGRAM HIGHLIGHTS & ANNUAL REPORTING

Public Education & Outreach

- 65 presentations delivered to 8th grade science classes in New Hanover County serving approximately 2000 students
- Year 1 of a three-year survey to Restaurants in the City of Wilmington conducted
- Mass media efforts included advertising on digital billboards, television, radio and an advertising partnership with Keep America Beautiful of New Hanover County to have stormwater ads on the outside of a Wave Transit bus for 1.5 years

Public Involvement & Participation

- Public input meetings held for the following stormwater improvement projects: Greenville Avenue, Water & Ann St., Walnut & Front St, Antelope Trail & Kelly Road and Brookshire & Beasley Road.
- Public input meeting held for Bradley & Hewletts Creek Watershed Restoration project
- 8 watershed cleanups involving 163 volunteers contributing 382 volunteer hours and collecting over 155 thirty gallon bags of trash
- 39 storm drain markers were placed in the Carolina Heights and Forest Hills neighborhoods and around Greenfield Lake this year

Illicit Discharge Detection and Elimination (IDDE)

- Stormwater infrastructure mapping has continued with the goal of mapping the public drainage system throughout the City. Concurrent with this effort, major outfalls and receiving waterbodies have been mapped according to guidance for industrial or non-industrial source areas as required. The stormwater infrastructure data model accommodates multiple inspection records for any given outfall.
- The City has updated the IDDE manual to include *Intelligov* documentation additions of ID incidents as well as more information and protocol for the Dry Weather Flow Program for this year.

Post-Construction Site Runoff Controls

- Continued implementing the City's Land Ordinance Code to provide post construction controls to meet the requirements of the City's Phase II permit and to bring the ordinance into compliance with the recent Coastal Stormwater Legislation.
- Conducted inspections on privately owned BMPs located within the City limits in order to ensure that maintenance requirements were being met by property owners.

Pollution Prevention and Good Housekeeping for Municipal Operations

- The City completed recommended BMPs in SPPP for Fleet Maintenance Facility.
- Deployed spill kits for SPCC plan recommended locations at Operations Complex and Police Headquarters
- Conducted inventory of City owned facilities with potential to pollute stormwater.

Voluntary Watershed Restoration Plan

- Hiring of Watershed Coordinator to oversee implementation of the restoration plan

- Branding of the restoration plan as Heal Our Waterways including a plan logo and website
- Initial educational mailing to target watershed residents introducing restoration effort and explaining City water systems
- Program awarded a $358,496 grant from NERRS, in partnership with UNCW and the North Carolina Coastal Federation for public education and the installation of residential and municipal BMPs

PUBLIC EDUCATION AND OUTREACH

1. Objectives for Public Education and Outreach

a. Implement a public outreach and education program, locally or through cooperative or contractual agreement, which includes a combination of approaches designed to reach the public and target audiences with stormwater pollution prevention messages.

b. Distribute educational materials and information and conduct outreach/education activities for the community, which address the impacts of stormwater discharges on water bodies and the steps the public can take to reduce stormwater pollution.

2. BMPs for Public Education and Outreach

The permittee shall implement the following BMPs to meet the objectives of the Public Education and Outreach Program.

BMP	Measurable Goals
a. Define outreach/education program goals including a description of the target pollutants, sources, and target audiences	Define goals and objectives of the outreach/education program to include a description of target pollutants or stressors, likely residential and/or industrial and commercial sources of these pollutants, target audiences for each pollutant and why they were selected, and key outreach messages. Update this section as necessary to reflect changes in the target audience, public awareness, etc.

Accomplishments:

A comprehensive plan including outreach/education program goals and objectives and target pollutants, sources and audiences is included in the Public Education and Outreach Appendix. The plan defines the origin and sources of each pollutant, target audience(s), and includes suggested outreach strategies and key outreach messages. Staff regularly uses this information as a guide for planning and implementing outreach and education efforts throughout the city. This summary will be updated and modified as pollutant sources, target audience demographics, public awareness, and other program variables change over time.

b. Distribute public education materials and information to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.	The permittee shall distribute stormwater educational materials and information to appropriate target groups. Instead of developing its own materials, the permittee may rely on Public Education and Outreach materials supplied by the state, and/or other entities through a cooperative or contractual agreement, as available, when implementing its own program.

Accomplishments:

Stormwater education and code enforcement staff began an effort to educate restaurants within the Wilmington city limits and evaluate our education efforts and public awareness through a return survey. Staff worked in cooperation with Stormwater Code Enforcement to develop targeted educational and enforcement materials and a survey that will be mailed to approximately 500+ restaurants over the course of 3 years. This first year, in January 2013, survey packets were mailed to 165 of these restaurants, and the rest will be mailed over the course of the remaining two years. The results of the survey gauge whether or not restaurant owners/managers awareness and perceptions of the following:

The City of Wilmington Stormwater Services is providing water pollution prevention tips and ordinance information to area restaurants. Please help us gauge our education efforts by answering the following questions.
Responses are completely ANONYMOUS! ***Please return by January 25, 2013; no postage necessary.*** *We appreciate your response!*

1. **Water entering storm drains or ditches goes to:** *(circle answers)*
   A treatment plant Waterway(s) I'm not sure

   ***Please write Restaurant Zip Code:_____**

2. **How important is it to *you* for our area to have clean waterways?**
   Very important Important Somewhat Important Not important

3. ***AFTER*** **reviewing the educational materials, are you now aware of:**
   How improper restaurant practices can pollute waterways?
   Yes No Still Unclear Understood before

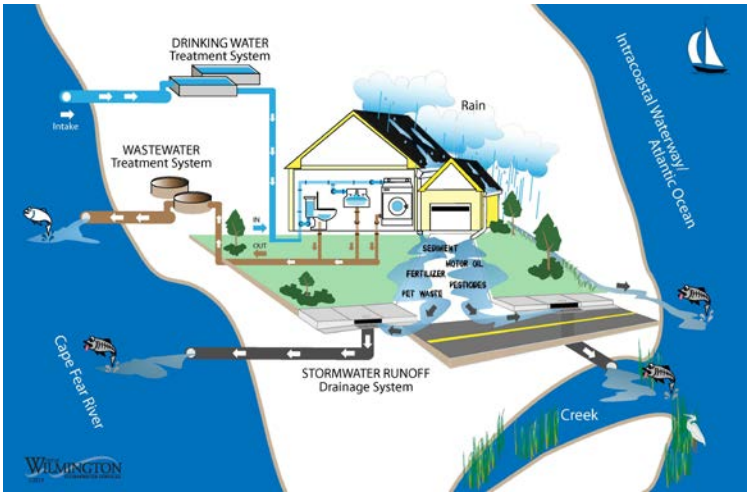
   The City's stormwater ordinance pertaining to restaurant practices?
   Yes No Still Unclear Understood before

4. **Based on the information you received, are you likely to implement new restaurant practices or modify existing practices to protect our waterways and comply with the ordinance?** *(circle any that apply)*
   Implement new practices Modify existing practices No Already using practices on poster
   Comments: _____

5. **How can we improve our outreach efforts or the educational materials?** _____

Based on the survey questions that could solicit correct responses (questions 1, 3, 4), it was determined that 90% of respondents answered the survey questions correctly. (Total # of correct surveys answers for educational questions/total survey responses received).

A full-color Water Systems Graphic was developed in cooperation with New Hanover Soil & Water Conservation District that depicts the wastewater, drinking water and stormwater systems in an easy to understand graphic format. This graphic was debuted at the annual Earth Day Festival and will be included in all 8th grade Enviroscape programs as well as in educational brochures and website content.



Cape Fear River Watch (CFRW), a contracted agency, distributed brochures about Burnt Mill Creek and the Kerr Avenue Wetland, to surrounding businesses whose runoff drains directly into the wetland, which then flows into Burnt Mill Creek.

New Hanover Soil & Water Conservation District (NHSWCD), another contracted agency, participated in several pet-related events, such as the Pet Expo and Battleship Splash, with the Canines for Clean Water program and booth. This is a program developed by the city that is used by both agencies to educate pet owners about the problems of uncollected pet waste and fecal coliform bacterial pollution.

c. Informational Web Site	The permittee shall promote and maintain an internet web site designed to convey the program's message(s).

Accomplishments:
The internet is a powerful tool for disseminating stormwater education and information. Stormwater staff continues to maintain and update our well-developed website on a regular basis. The website features stormwater education information, current news and events, capital project notices and descriptions, hotline reporting form, Enviroscape 8th grade program information, storm drain marking program program, UNCW monitoring data, maintenance activities, educational print materials and videos (brochures, newsletters, local watershed map, posters, documentaries, PSAs, etc), and much more.

On the main webpage, the "What's New?" section has enabled staff to add pertinent and timely news. The "Capital Project Notices" section includes notifications about the status of current capital projects. The "Contact Us" page includes a "Stormwater Calling Card" of helpful stormwater contact numbers within the city.

We will continue to promote and drive citizens to our website via inclusion on business cards, print materials, paid television and radio public service announcements (PSAs), stormwater website, etc. The shorter web addresses for pages has proven invaluable and easier for citizens to find website content. The main stormwater web address is included on all educational materials and media promotions: wilmingtonnc.gov/stormwater

Maintain Hotline/Help line	The permittee shall promote and maintain a hotline for citizens and businesses to report suspected stormwater pollution and illicit discharges occurring within the City.

Accomplishments:
The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from the citizens, businesses and employees to report illicit discharges and other instances of potential stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to each hotline report. The hotline and online reporting webform are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional

outreach items including pens, refrigerator magnets, and post-it notes for giveaways to the public. Six calls were placed to the City's Stormwater hotline and online webform for this reporting period. The results of the hotline reports are found in the Enforcement section of the Appendix.

d. Extent of Exposure/Reporting Requirements	For each event, activity, or media, including those elements implemented locally or through a cooperative or contractual agreement, the permittee shall estimate and record the extent of exposure.

Accomplishments:

The extent of exposure requirement is extensively documented in tables in the Public Education appendix, as well as the Public Involvement appendix. Documentation includes the date of event or activity, the type of event/activity, audience reached, who delivered the content, the method of delivery and/or message, and the resulting attendance or participation.

Assessment of Program Implementation

The outreach and education program continues to implement a variety of activities and programs that meet or exceed the minimum requirements of our NPDES permit. For instance, this year we completely revised our Public Education and Involvement Plan including program goals, target pollutants, sources and audiences. A three year effort to raise awareness and evaluate our education efforts was begun and focuses on 500 restaurants in Wilmington. The Canines for Clean Water program continues to have a large amount of public participation at pet events. Pet owners sign a pledge promising to clean up their pet's waste and owners receive a goodie bag and chance to show off their pooch online. The website received a refresh including new material and fixing broken links, a task we have put on a more regular schedule. In summary, the outreach/education program met NPDES requirements and internal goals for the reporting period.

Objectives for Next Year

- Continue to add relevant content to the Stormwater Services website, including adding a News Rotator to the site.
- Implement year 2 of the targeted Restaurant evaluation survey and education effort.
- Create and post new signage for the Stormwater Hotline on existing watershed delineation signs throughout the city.
- Continue to deliver the Enviroscape Watershed program to all 8th grade science classes in New Hanover County Schools.
- Continue to pursue a high-profile mass media campaign including billboards, radio, television and alternative mediums.
- Develop content for the 2014 Spring Annual Water Quality citywide public newsletter, to include UNCW's annual water quality data.

PUBLIC INVOLVEMENT AND PARTICIPATION

1. Objectives for Public Involvement and Participation

Involve the community in the development and implementation of the stormwater program by implementing a public involvement and participation program locally or through cooperative or contractual agreement.

2. BMPs for Public Involvement and Participation

The permittee shall implement the following BMPs to meet the objectives of the Public Involvement and Participation Program.

BMP	Measurable Goals
a. Volunteer community involvement program	The permittee shall include and promote volunteer opportunities designed to promote ongoing citizen participation, implemented locally or through cooperative or contractual agreement.

Accomplishments:

The City of Wilmington Stormwater Services contracts annually with Cape Fear River Watch (CFRW) and New Hanover Soil & Water Conservation District (NHSWCD) to implement public involvement and participation activities, as well as public education and outreach services. Both organizations sign an annual contract with the City which specifies services and deliverables that enable the Stormwater Services to meet many of its NPDES public education and involvement requirements. In addition to full time staff, each agency taps into a volunteer base and encourages citizens to be involved in the implementation of public involvement and public participation activities.

Services performed by CFRW & NHSWCD include activities such as volunteer watershed clean-up events (i.e. regular cleanups and Big Sweep Annual Cleanup, invasive species removals), volunteer creek monitoring, wetland monitoring and plantings, educational workshops for the schools and the public, participation in the Lower Cape Fear Stewardship Awards program, monthly rain barrel sale, LID consultation, volunteer storm drain marking, public eco-tours and high school Envirothons, community stormwater BMP installations via NC CCAP, website updates, and more.

Each agency provides the City with a quarterly progress report and invoice for services performed. The Year End progress report for each agency is included in the Public Involvement and Participation Appendix of this annual report.

b. Mechanism for Public involvement	The permittee shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program, implemented locally or through cooperative or contractual agreement. These mechanisms could include public meetings, citizen/business surveys, citizen portal website feedback, public event participation, one-on-one citizen contact, etc.

Accomplishments:

Stormwater Services engaged citizens and businesses through public notices and/or public input meetings for stormwater improvement projects in the areas of Greenville Avenue, Water & Ann St., Walnut & Front St, Antelope Trail & Kelly Road and Brookshire & Beasley Road.
In addition, a public input meeting was held for the Bradley & Hewletts Creek Watershed Restoration effort and the plan was subsequently adopted by City Council.

Stormwater education and code enforcement staff began an effort to educate restaurants within the Wilmington city limits and evaluate our education efforts and public awareness through a return survey. Staff worked in cooperation with Stormwater Code Enforcement to develop targeted educational and enforcement materials and a survey that will be mailed to approximately 500+ restaurants over the course of 3 years. This first year, in January 2013, survey packets were mailed to 165 of these restaurants, and the rest will be mailed over the course of the remaining two years. The results of the survey gauge whether or not restaurant owners/managers awareness and perceptions of the following:

- Where does water entering storm drains or ditches go?
- How important is it to you for our area to have clean waterways?
- After reviewing the educational materials:
    - Are you now aware of how improper restaurant practices can pollute waterways?
    - Are you now aware of the city's stormwater ordinance pertaining to restaurant practices?
- Based on the information received, are you more likely to implement or modify existing practices to protect our waterways and comply with the stormwater ordinance?
- How can we improve our outreach efforts or the educational materials?

Based on the objective survey question responses and correct responses, 90% of respondents answered the questions correctly. (Total # of correct surveys answers for educational questions/total survey responses received).

Cape Fear River Watch engaged volunteers in watershed cleanups, invasive species vegetation removals, creek monitoring, storm drain marking, and Enviroscape 8th grade school presentations.

New Hanover Soil & Water Conservation District coordinated the joint monthly rain barrel sale to the public on the 2nd Thursday of every month. This fulfills both a stormwater reduction and water conservation objective. NHSWCD also implemented the Canines for Clean Water program at pet related events in the area. The program provides a fun, interactive way to educate residents

about uncollected pet waste and fecal coliform bacteria. NHSWCD also provided volunteer storm drain marking opportunities for volunteer groups, worked with the NC Coastal Federation to develop a high school downspout reroute pilot program, and delivered Enviroscape 8th grade school presentations.

Hotline/Help line	The permittee shall promote and maintain a hotline for citizens and businesses to report suspected stormwater pollution and illicit discharges occurring within the City.

Accomplishments:

The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from the public to report illicit discharges and other instances of potential stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to hotline reports. The hotline and online reporting form are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional outreach items including pens, refrigerator magnets, and post-it notes for giveaways to the public. Six calls were placed to the City's Stormwater hotline and online outreach reporting form for this reporting year. The results of those calls are found in the Enforcement section of the Appendix.

Assessment of Program Implementation

The City has continued to partner with contract agencies to implement public involvement and participation activities. These contractual agreements have resulted in numerous public and action-oriented activities such as watershed cleanups, storm drain marking, educational workshops, a monthly rain barrel sale, eco-tours, BMP installations, and more. This past year, the city also conducted efforts to reach out to the public regarding the implementation of drainage projects in the areas of Greenville Avenue, Water & Ann St., Walnut & Front St, Antelope Trail & Kelly Road, and Brookshire & Beasley Road. A public input meeting was also conducted for the newly adopted Bradley & Hewletts Creek Watershed Restoration Plan. The plan was also adopted by city council and a Watershed Coordinator was hired to implement the plan.

Objectives for Next Year

- Utilize partner agencies to implement community-focused initiatives such as storm drain marking, watershed cleanups and invasives removal, Canines for Clean Water events, etc.
- Conduct public outreach and meetings for upcoming stormwater drainage projects.
- Work with Code Enforcement to promote the Stormwater Hotline and Web Reporting Form.

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)

1. Objectives for Illicit Discharge Detection and Elimination

a. Implement and enforce a program to address the detection and elimination of illicit discharges into the MS4.

b. Maintain a storm sewer system map, showing the location of all major outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

c. Prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges except as allowed in this permit and implement appropriate enforcement procedures and **actions;**

d. Implement a plan to detect and address non-storm water discharges, including illegal dumping, to the MS4;

e. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste; and

f. Address non-storm water discharges or flows as identified in Part I, Paragraph (8).

2. BMPs for Illicit Discharge Detection and Elimination

The permittee shall implement the following BMPs to meet the objectives of the Illicit Discharge Detection and Elimination Program and shall notify the Division prior to modification of any goals.

BMP	Measurable Goals
a. Maintain adequate legal authorities	The permittee shall annually review the permittee's IDDE ordinances or other regulatory mechanisms, or adopt any new ordinances or other regulatory mechanisms that provide the permittee with adequate legal authority to prohibit illicit connections and discharges and enforce the approved IDDE Program.

Accomplishments:

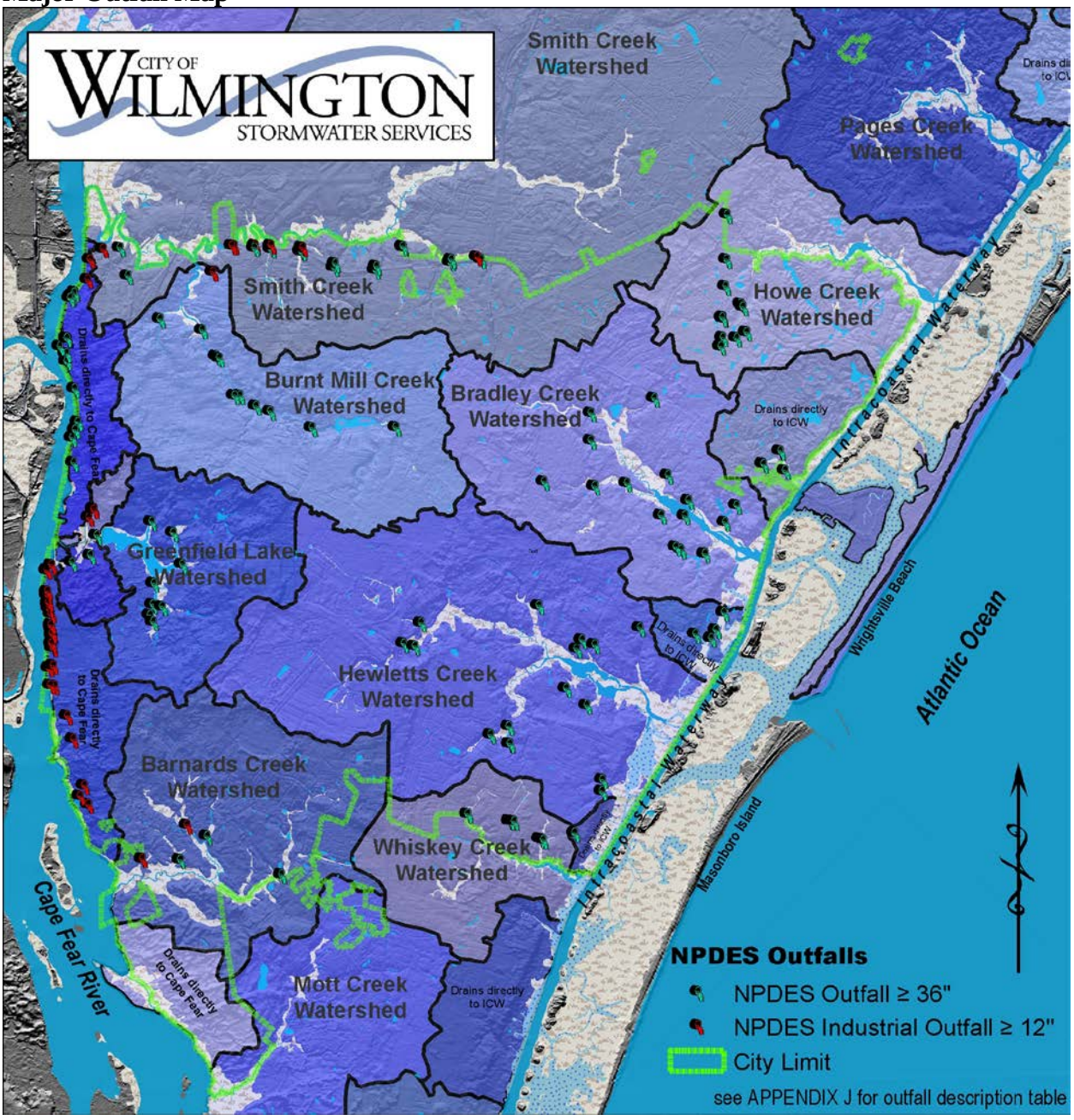
The City continues to utilize the existing ordinances in place to address illicit discharges to its system. The City passed the Ordinance to amend Chapter 12 of the City Code on 9/15/2009 to address illicit discharges to the stormwater system and to protect public water and sewer systems. This Ordinance change went into effect on November 1, 2009.

The current Cape Fear Public Utility Authority (CFPUA) ordinance defines wastewaters that are required to be discharged into the sanitary sewer system. The City utilizes CFPUA's ordinance to address discharges of regulated wastewaters to the City's MS4 and other natural outlets.

The City will continue to review its ordinance annually to make sure we are providing adequate legal authority.

b. Maintain a Storm Sewer System Base Map of Major Outfalls.	The permittee shall maintain a current map showing major outfalls and receiving streams

Major Outfall Map



Accomplishments:

The City continues to maintain a basemap of major outfalls and receiving water bodies. Outfalls are classified and added to the GIS dataset as mapping of the City MS4 proceeds. Additionally, the City has made significant improvements to the GIS mapping of watershed

boundaries using the best available data.

c. Detect dry weather flows	The permittee shall develop and implement a program for conducting dry weather flow field observations in accordance with a written procedure for detecting and removing the sources of illicit discharges.

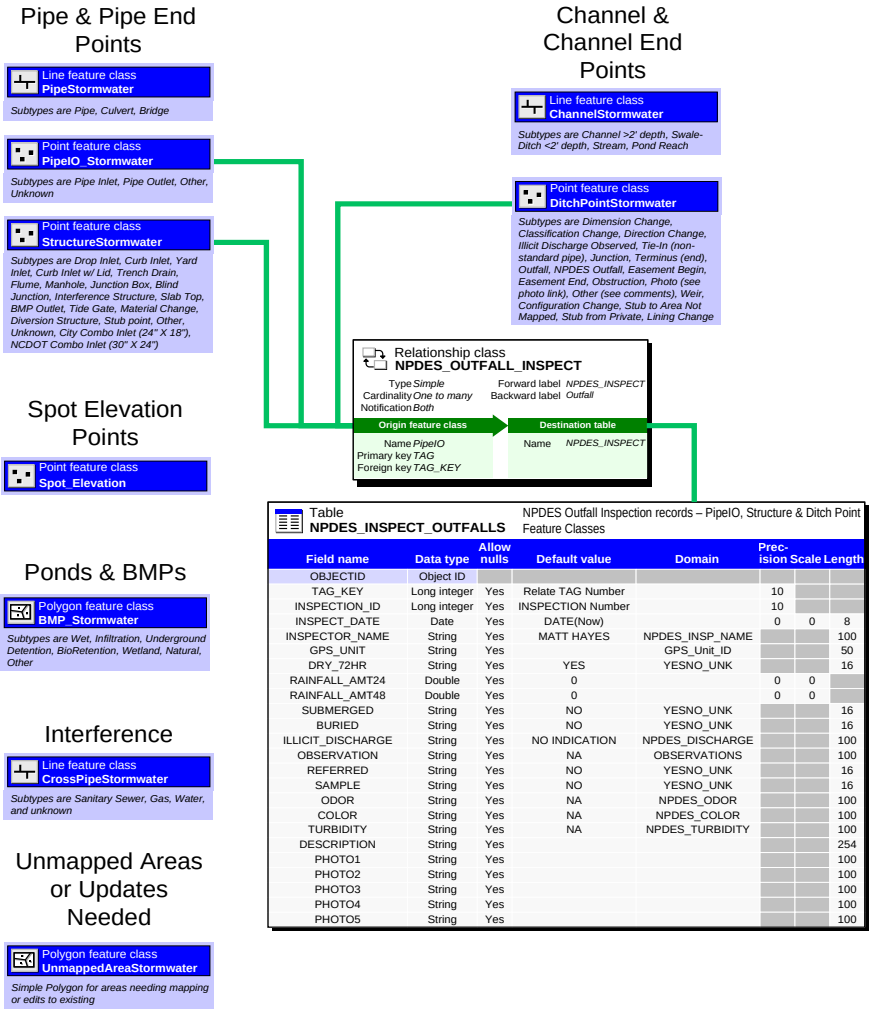
Accomplishments:

The City finalized written procedures for its dry weather flow monitoring program and will begin implementing them through the next reporting period. This document is included in Appendix D.

In-house GPS data collection routines are ongoing to provide updates to the stormwater system GIS database and enable tabular data collection resulting from dry weather inspections.

The diagram below shows the main structural elements of the stormwater GIS and allows for storing inspection records conducted to detect dry weather flows.

Stormwater GIS Elements & Inspection Table Relationships



Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
TAG_KEY	Long integer	Yes	Relate TAG Number		10		
INSPECTION_ID	Long integer	Yes	INSPECTION Number		10		
INSPECT_DATE	Date	Yes	DATE(Now)		0	0	8
INSPECTOR_NAME	String	Yes	MATT HAYES	NPDES_INSP_NAME			100
GPS_UNIT	String	Yes		GPS_Unit_ID			50
DRY_72HR	String	Yes	YES	YESNO_UNK			16
RAINFALL_AMT24	Double	Yes	0		0	0	
RAINFALL_AMT48	Double	Yes	0		0	0	
SUBMERGED	String	Yes	NO	YESNO_UNK			16
BURIED	String	Yes	NO	YESNO_UNK			16
ILLICIT_DISCHARGE	String	Yes	NO INDICATION	NPDES_DISCHARGE			100
OBSERVATION	String	Yes	NA	OBSERVATIONS			100
REFERRED	String	Yes	NO	YESNO_UNK			16
SAMPLE	String	Yes	NO	YESNO_UNK			16
ODOR	String	Yes	NA	NPDES_ODOR			100
COLOR	String	Yes	NA	NPDES_COLOR			100
TURBIDITY	String	Yes	NA	NPDES_TURBIDITY			100
DESCRIPTION	String	Yes					254
PHOTO1	String	Yes					100
PHOTO2	String	Yes					100
PHOTO3	String	Yes					100
PHOTO4	String	Yes					100
PHOTO5	String	Yes					100

d. Investigations into the source of all identified illicit discharges.	The permittee shall maintain, and evaluate annually written procedures for conducting investigations of identified illicit discharges.

Accomplishments:
The City has continued to utilize and improve an Illicit Discharge Detection Elimination (IDDE) Policy and Procedures Manual document. The purpose of this document is to provide guidance and information for the effective and efficient implementation of the Illicit Discharge Detection and Elimination Program within the City of Wilmington. The document outlines the investigation, testing, coordination with other authorities, GIS inventory, follow up, and documentation procedures to be taken to resolve a questionable dry weather flow.

The City worked on finalizing reporting and documentation procedures through *Intelligov*, our data management system. All details reported are entered in at the time of the report and as the investigation progresses until it is closed. This documentation into *Intelligov* will allow for the extraction of data for evaluation of our program, and assessment to identify repeat offenders and chronic violators as well as serve as help us identify areas of the City with higher violation reports. Development of the data tables to store dry weather inspections that are related to associated outfalls is complete. Procedures and scheduling of dry weather inspections have been developed and the City will evaluate these procedures for improvements or changes at the end of the next reporting period (if necessary).

e. Track investigations and document illicit discharges	The permittee shall track all investigations and document the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

Accomplishments:
The City continued to address illicit discharges to the stormwater system and to protect public water under its Ordinance. This Ordinance change went into effect on November 1, 2009. The City continues to update the Illicit Discharge Detection Elimination (IDDE) Policy and Procedures manual as the program evolves. The purpose of this document is to provide standards for protocol, field guidance and information for the effective and efficient implementation of the Illicit Discharge Detection and Elimination (IDDE) Program. Updates were added for procedures for entering data into the City's tracking database *Intelligov*.

The City has updated the IDDE manual to include *Intelligov* documentation additions of ID incidents as well as more information and protocol for the Dry Weather Flow Program for this year.

f. Employee Training	The permittee shall implement and document a training program for appropriate municipal staff who as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system.

Accomplishments:
The City conducted training sessions for the Stormwater Services Maintenance Division on detecting and reporting Illicit Discharges. See Appendix A.

g. Provide Public Education	The permittee shall inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

Accomplishments:
Stormwater education and code enforcement staff began an effort to educate restaurants within the Wilmington city limits and evaluate our education efforts and public awareness through a return survey. Staff worked in cooperation with Stormwater Code Enforcement to develop targeted educational and enforcement materials and a survey that will be mailed to approximately 500+ restaurants over the course of 3 years. This first year, in January 2013, survey packets were mailed to 165 of these restaurants, and the rest will be mailed over the course of the remaining two years.

Cape Fear River Watch (CFRW), a contracted agency, distributed brochures about Burnt Mill Creek and the Kerr Avenue Wetland, to surrounding businesses whose runoff drains directly into the wetland, which then flows into Burnt Mill Creek.

New Hanover Soil & Water Conservation District (NHSWCD), another contracted agency, participated in several pet-related events, such as the Pet Expo and Battleship Splash, with the Canines for Clean Water program and booth. This is a program developed by the city that is used by both agencies to educate pet owners about the problems of uncollected pet waste and fecal coliform bacterial pollution.

h. Public reporting mechanism	The permittee shall promote, publicize, and facilitate a reporting mechanism for the public and staff to report illicit discharges and establish and implement citizen request response procedures.

Accomplishments:
The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from the public to report illicit discharges and other instances of potential stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to hotline reports. The hotline and online reporting form are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional outreach items including pens, refrigerator magnets, and post-it notes for giveaways to the public. Six calls were placed to the City's Stormwater hotline and online outreach reporting form for this reporting year. The results of those calls are found in the Enforcement section of the Appendix.

i. Enforcement	The permittee shall implement a system to track the issuance of notices of violation and enforcement actions as administered by the permittee. The data maintained in this system shall enable permittee to identify chronic violators for initiation of actions to reduce noncompliance.

Accomplishments:

The City of Wilmington uses *Intelligov* data management system to track all requests for service. This includes illicit discharge reports from the public and from City staff. This system allows us to enter all relevant data from an investigation and then analyze, map, and track various aspects of the incident including enforcement actions and repeat offenders in order to identify chronic violators. For year 2012-2013 there was one repeat offender for Illicit Discharges. See Appendix I for enforcement actions summary for this reporting year.

Assessment of Program Implementation

The City continues to implement and enforce its IDDE program to address the detection and elimination of illicit discharges. The City has finalized its dry weather flow monitoring program to address the major components of how it will be implemented. The effectiveness of this program will be monitored throughout the first full year and reevaluated at the end of the period.

The City continues to utilize the existing ordinances in place to address illicit discharges to its system. To date, no changes to the ordinance have been necessary as it provides the adequate legal authority to prohibit illicit connections and discharges and enforce the approved IDDE Program at this time.

The City worked on finalizing reporting and documentation procedures through *Intelligov*, our data management system. Improved reporting and documentation into *Intelligov* will allow for the extraction of data for evaluation of our program, and assessment to identify repeat offenders and chronic violators as well as serve as help us identify areas of the City with higher violation reports.

Public education to the public regarding illicit discharges continues to be one of the major goals for the City. Staff worked in cooperation with Stormwater Code Enforcement to develop targeted educational and enforcement materials and a survey that will be mailed to approximately 500+ restaurants over the course of 3 years. The success of these mailings will need to be evaluated after the first full year and then over the succeeding years to determine the frequency of incidents to areas addressed.

Objectives for Next Year

- Evaluate success of the dry weather flow monitoring to determine if changes need to be addressed.
- Evaluate effectiveness of *Intelligov* reporting practices. Assess locations of offenders to determine repeat violations and make recommendations to address those sites.
- Determine effectiveness of public education efforts to restaurants by looking at frequency of violations in those areas.

CONSTRUCTION SITE RUNOFF CONTROLS

The permittee relies on New Hanover County to comply with this minimum measure. The New Hanover County Sediment and Erosion Control Program effectively meets the requirements of the Construction Site Runoff Controls 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 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.

New Hanover County Erosion Control Program information supplied in Appendix D.

POST CONSTRUCTION SITE RUNOFF CONTROLS

1. Objectives for Post-Construction Site Runoff Controls

a. Implement and enforce a program to address storm water runoff from new development and redevelopment projects that require a CAMA major development permit or a Sedimentation and Erosion Control Plan. The program shall ensure that controls are in place that would prevent or minimize water quality impacts.

b. Implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community;

c. Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects; and

d. Adequate long-term operation and maintenance of BMPs.

2. BMPs for Post-Construction Site Runoff Controls

The permittee shall implement the following BMPs to meet the objectives of the Post-Construction Stormwater Management Program. To the extent there is any conflict between this permit and the post-construction ordinances adopted by the permittee as approved by the N.C. Division of Water Quality, the post-construction ordinances shall apply with regard to permit compliance.

BMP	Measurable Goals
a. Adequate legal authorities	Maintain through an ordinance, or other regulatory mechanism, adequate legal authorities to meet the objectives of the Post-Construction Site Runoff Controls program. The permittee shall have the authority to review designs and proposals for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained. The permittee shall have the authority to request information such as stormwater plans, inspection reports, monitoring results, and other information deemed necessary to evaluate compliance with the Post-Construction Stormwater Management Program. The permittee shall have the authority to enter private property for the purpose of inspecting at reasonable times any facilities, equipment, practices, or operations related to stormwater discharges to determine whether there is compliance the Post-Construction Stormwater Management Program.

Accomplishments:
The City continues to utilize the Land Development Code that was amended and adopted on September 15, 2009 to provide post construction controls in order to meet the requirements of the City's Phase II permit and to bring the ordinance into compliance with the new Coastal Stormwater Legislation.

b. Strategies which include BMPs appropriate for the MS4	The permittee shall adopt the DWQ BMP Design Manual or certify that the local BMP Design Manual meets or exceeds the requirements in the DWQ BMP Design Manual.

Accomplishments:
The DWQ BMP manual was adopted when the stormwater ordinance was amended in 2009. This ordinance contains provisions addressing the use of combinations of structural and non-structural BMPs to manage stormwater runoff. Some examples of these include providing peak attenuation flow for the 2, 10 and 25 year storm event, requiring (new development) a 50 foot set back from surface waters, and stricter built-upon requirements for projects near SA waters.

c. Plan reviews	The permittee shall conduct site plan reviews of all new development and redeveloped sites that disturb greater than or equal to one acre (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review shall address how the project applicant meets the performance standards and how the project will ensure long-term maintenance.

Accomplishments:
The City continues to conduct site plan reviews utilizing the City's Land Development Code in order to provide post construction controls to meet the requirements of the City's Phase II permit. A summary of the plan review activities for this reporting year is available in Appendix F.

d. Inventory of projects with post-construction structural stormwater control measures	The permittee shall maintain an inventory of projects with post-construction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the permittee's corporate limits that are covered by its post-construction ordinance requirements.

Accomplishments:
The City's Plan Review Engineers created a spreadsheet of projects with stormwater control measures installed. This spreadsheet includes the dates permits were issued, review times for projects, types of projects (new development, redevelopment), and the types and numbers of BMPs per project location. This spreadsheet will continue to be used for future permits issued and evaluated or modified if data extraction is warranted.

e. City Code, Permitting Regulations, Easement, and/or Deed Restrictions and Protective Covenants	Ensure development activities will maintain the project consistent with approved plans.

Accomplishments:
Current City of Wilmington stormwater management ordinance stipulates among other requirements for stormwater management after construction that:

Record (as-built) drawings (reproducible mylar) for all stormwater management facilities certified by an authorized registered professional must be provided to the City for permanent record.

When deemed necessary by the City, an easement in a form approved by the City attorney, granting the City and its agents and representatives adequate and perpetual access to the facility and sufficient area for inspection and maintenance, if necessary, by the City, its agents and representatives. Said easement shall be filed in the New Hanover County Registry, at the expense of the applicant, and shall bind all subsequent owners and assigns of the facility and of the property on which the facility is located.

The following excerpt from the new stormwater ordinance became operational upon adoption City Council:

The approval of the stormwater permit shall require an enforceable restriction on property usage that runs with the land, such as recorded deed restrictions or protective covenants, to ensure that future development and redevelopment maintains the site consistent with the approved project plans.

Additionally, the new ordinance has provisions to ensure that conveyance of the property does not terminate the original developer's obligations until a replacement permit has been issued. The original developer will be required to record in the deed conveying the property a notice of the existence of any stormwater devices and the purchaser's obligations to maintain and inspect them and to obtain a permit. There are also specific and detailed special requirements for property owner associations regarding operation and maintenance of stormwater devices, escrowing funds to ensure maintenance and remedies for the City in the event of failed compliance.

f. Provide a mechanism to require long-term operation and maintenance of structural BMPs.	The permittee shall implement or require an operation and maintenance plan for the long-term operation of the structural BMPs required by the program.

Accomplishments:
The DWQ BMP manual was adopted when the stormwater ordinance was amended in 2009. This ordinance contains provisions addressing the use of combinations of structural and non-structural BMPs to manage stormwater runoff. With this adoption, the City also reviews and approves the O&M requirements and plans of the State through the review process.

g. Inspections of Structural Stormwater Control Measures	To ensure that all stormwater control measures meet the permittee's performance standards and are being maintained pursuant to the maintenance agreement, the permittee shall develop and implement a written inspection program for structural stormwater controls installed pursuant to the permittee's post-construction program. The permittee shall document and maintain records of inspections, findings and enforcement actions and make them available for review by the permitting authority.

Accomplishments:
Under the current stormwater management ordinance of the City, permitees of structural BMPs are required to properly maintain their stormwater management systems to ensure long term operation. The City conducted biannual compliance inspections for privately owned stormwater BMPs in order to ensure maintenance responsibilities are being undertaken by property owners. Inspections were conducted by a City Staff member who has completed the Stormwater BMP Inspection and Maintenance Certificate offered through NC State's Biological and Agricultural Engineering Department (certification #182). Recertification occurred in March 2013. An inspection summary is included in Appendix F. In addition, sample inspection reports are provided.

The City finalized a manual for all O&M plans for known City owned and/or maintained BMPs under their respective NCDWQ stormwater permits. This manual provides access to BMP schedules for O&M and permit renewal dates.

We are also in the process of updating the inspection process and database design to help reinforce documentation procedures and to help in future extraction of information from that database if necessary. This should be completed in late summer 2013.

h. Educational materials and training for developers	The permittee shall make available through paper or electronic means, ordinances, post-construction requirements, design standards checklist, and other materials appropriate for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.

Accomplishments:
Currently all ordinances, design standards, application forms, BMP Manual and Technical Standards for developers are found online at the City's website. The city provides instruction online for the forms so that developers can provide the necessary documentation for the process review.

i. Enforcement	The permittee shall track the issuance of notices of violation and enforcement actions as administered by the permittee. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.

Accomplishments:
The City has tracked the issuance of violations through its current inspection process since the implementation of the stormwater ordinance. The City is currently finalizing the inspection process and its associated database for private BMPs. The updated database will not only allow for improved documentation of City inspections but also provide for easier data extraction that may be specific to an individual inquiry, such as chronic violators. We hope to finalize the database in late summer 2013.

Assessment of Program Implementation
The City has continued to maintain adequate legal authorities to meet the objectives of the Post-Construction Site Runoff Controls program through its Land Development Code. In addition, the City continues to conduct site plan reviews utilizing the City's Land Development Code in order to provide post construction controls to meet the requirements of the City's Phase II permit.

The City's Plan Review Engineers have made improvements to their database in order to track projects with stormwater control measures installed. This spreadsheet provides relevant information regarding new development and redevelopment projects. This spreadsheet will continue to be used for future permits issued and evaluated or modified if data extraction is warranted.

Objectives for Next Year
- Review ordinances to determine if any changes are needed to improve the post-construction requirements.
- Evaluate database of new or redeveloped projects to determine if information can be improved, if documentation is adequate, and if modification for data extraction is needed.
- Start evaluating BMP inspection database at end of second bi-annual inspection of reporting year to look for repeat violators. Repeat violators may not be readily apparent after the first reporting year so we will continue to monitor the data. This effort may be reinforced through future outreach and education to property owners.

3. Post-construction Stormwater Runoff Controls for New Development

a. In order to fulfill the post-construction minimum measure program requirement the permittee may use the Department's model ordinance, design its own post-construction practices that meet or exceed the Department's Stormwater Best Management Practices Manual on scientific and engineering standards, or develop its own comprehensive watershed plan that is determined by the Department to meet the post-construction stormwater management measure required by 40 Code of Federal Regulations§ 122.34(b)(5)(l July 2003 Edition).

b. The permittee shall meet the State's stormwater requirements for projects that are performed by, or under contract for, the permittee.

c. Adoption of the Universal Stormwater Management Program (USMP) meets the requirement to develop and implement a Post-Construction Program by the local government adopting an ordinance that complies with the requirements of l5A NCAC 02H .1020 and the requirements of 15A NCAC 02B .0104(f). Adoption of the USMP may not satisfy water quality requirements associated with the protection of threatened or endangered species or those requirements associated with a Total Maximum Daily Load (TMDL).

d. Compliance with the stormwater management and water quality protection promulgated in Rules 15A NCAC 2H .1000 and Session Law 2008-211 effectively meets the Post- construction Stormwater Runoff control requirements within the 20 coastal counties.

POLLUTION PREVENTION AND GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

1. Objective for Pollution Prevention and Good Housekeeping for Municipal Operations

a. Implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

b. Provide employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

2. BMPs for the Pollution Prevention and Good Housekeeping for Municipal Operations

The permittee shall implement the following BMPs to meet the objectives of the Pollution Prevention and Good Housekeeping Program.

BMP	Measurable Goals
a. Inventory of municipally owned or operated facilities	The permittee shall maintain a current inventory of facilities and operations owned and operated by the permittee with the potential for generating polluted stormwater runoff.

Accomplishments:

The City took steps this year to identify some of its facilities with the potential for generating polluted runoff. The City currently has a Spill Prevention Control and Countermeasure plan (SPCC) for the Operations Complex and a separate Stormwater Pollution Prevention Plan (SPPP) for the Fleet Maintenance building located within the complex. A SPCC is also in place for the Police Headquarters location.

The Parks and Recreation (P&R) facilities located at Legion Stadium, Burnett Ave. (main P&R facilities), and Olsen Park were evaluated for their good housekeeping procedures and on-site maintenance activities. The City is currently writing up the findings of our investigation of these sites and will compile a document noting buildings on each site and their activities, locations and descriptions of possible pollution sources, and recommendations for improving the activities and practices at each location (if necessary). This should be completed in Fall 2013.

In addition, the City will be looking into other locations in the coming year (Street Sweeping Garage, Fire Stations) to address the same concerns and make recommendations to improve maintenance practices and storage of materials at these sites

b. Operation and Maintenance (O&M) for municipally owned or operated facilities	The permittee shall maintain and implement, evaluate annually and update as necessary an Operation and Maintenance (O&M) program for municipally owned and operated facilities with the potential for generating polluted stormwater runoff. The O&M program shall specify the frequency of inspections and routine maintenance requirements.

Accomplishments:
Currently, The City relies on a SPCC plan and a SPPP for the Operations Complex and Fleet Maintenance building. These plans focus on the activities at Fleet Maintenance and also preventive inspections at the City's fueling islands, 2 -10,000g. fuel tanks and the 6 generators on site. An additional SPCC for the Police Headquarters addresses inspections for their fueling island and backup generator as well.

Staff training of site managers has taken place this year to ensure that BMPs identified in SPCC or SPPPs have been completed and that documentation of plans is occurring.

c. Spill Response Procedures	The permittee shall have written spill response procedures for municipally- owned or operated facilities.

Accomplishments:
Spill Response procedures are identified in the City's SPCC plans for the Operations Complex and Police Headquarters and also in the SPPP for Fleet Maintenance. The City will continue to follow these plans and make any changes if necessary and also ensure documentation is occurring within the plans.

d. Streets, roads, and public parking lots maintenance	The permittee shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits. Within 12 months, the permittee must update its Stormwater Plan to include the BMPs selected.

Accomplishments:
The City currently utilizes BMPs that help reduce polluted stormwater runoff from streets, roads, and public parking lots within its jurisdictional area. Stormwater crews sweep City streets with curbing (on average) twice/month, NCDOT owned roads once/month, and City owned parking lots from once/month to once/ quarter. City owned parking lots include City operations facilities, City Hall, parks locations, and recreation facilities.

In reporting year 2012/13, street sweepers swept 13,752.6 curb miles while collecting 3,966.4 tons of debris, sediment, vegetation and trash potentially diverted from the stormwater sewer system.

In fiscal year 2012/13, hand maintenance and vacuum trucks cleaned 141,589 linear feet of pipe and removed blockages and cleaned 16,956 drainage inlets and manholes while collecting 1,611.75 tons of debris, sediment, vegetation and trash potentially diverted from being

discharged into our receiving waters.

In addition, the City is also a member of the Urban Stormwater Consortium of the Water Resources Research Institute of the University of North Carolina. This group is funding a research proposal to look at nutrient and carbon loading in gross solids in urban catch basins. Because gross solids in stormwater runoff are an un-quantified (or under quantified) source of nutrients to receiving waters, the study will partner with the City of Wilmington and three other NC municipalities to select four drain inlets with up to four land types represented per the study. Data collected will be analyzed for mass, volume, bulk density, total nitrogen, total phosphorus, total carbon, and composition of material.

e. Streets, roads, and public parking lots maintenance	Within 24 months, the permitee must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots.

Accomplishments:
See above 2.(d).

f. Operation and Maintenance (O&M) for municipally - owned or maintained catch basins and conveyance systems	Within 12 months, the permittee shall develop and implement an O&M program for the stormwater sewer system including catch basins and conveyance systems that it owns and maintains.

Accomplishments:
The City currently has a program for the operation and maintenance of all City owned structural BMPs, storm sewer system, and street sweeping. This program includes repair, inspection and maintenance of all City owned right of ways and officially accepted easements. This information was previously included in this report under *Operations/Maintenance – Yearly Maintenance Activities Table* on page 11.

The City also keeps and updates a BMP Manual for all of its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance.

g. Identify structural stormwater controls	The permittee shall maintain a current inventory of municipally-owned or operated structural stormwater controls installed for compliance with the permittee's post-construction ordinance.

Accomplishments:
The City keeps and updates a BMP Manual for all of its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance.

h. O&M for municipally-owned or maintained structural stormwater controls	The permittee shall maintain and implement an O&M program for municipally-owned or maintained structural stormwater controls installed for compliance with the permittee's post-construction ordinance. The O&M program shall specify the frequency of inspections and routine maintenance requirements. The permittee shall inspect and maintain municipally-owned or maintained structural stormwater controls in accordance with the schedule developed by permittee. The permittee shall document inspections and maintenance of all municipally-owned or maintained structural stormwater controls.

Accomplishments:

The City keeps and updates a BMP Manual for all its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance. Documentation occurs with every BMP site visit and maintenance activity.

i. Pesticide, Herbicide and Fertilizer Application Management.	The permittee shall ensure municipal employees and contractors are properly trained and all permits, certifications, and other measures for applicators are followed.

Accomplishments:

The City has compiled all pesticide, herbicide and fertilizer application certifications for its Parks and Recreation and Stormwater personnel to ensure that they are current. These certifications are updated and renewed annually.

j. Staff training	The permittee shall implement an employee training program for employees involved in implementing pollution prevention and good housekeeping practices.

Accomplishments:

The City is currently working on an updated Good Housekeeping and Pollution Prevention presentation for its employees. Training for Fleet Maintenance personnel is scheduled for August –September 2013. The City will then evaluate which other departments could benefit from the training and plan accordingly with those facility supervisors. A supervisor training record for Fleet Maintenance is found in Appendix G.

k. Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	The permittee shall describe and implement measures to prevent or minimize contamination of stormwater runoff from all areas used for vehicle and equipment cleaning.

Accomplishments:
Maintenance and cleaning conducted at the City's Operations Complex continues to occur at a wash down station equipped with an oil water separator that accepts wash water and directs it to the sanitary sewer.

Small engine repair (line trimmers, blowers, chain saws, compacters, etc.) and cleaning for various City activities occurs in individual departments maintenance garages. In the event of an accidental discharge, the garages have drains located within the floor that connect to an oil water separator located on each site within the Operations Complex.

The Parks and Recreation Dept., located away from the Operations Complex, is located in an older section of the City. Although the buildings are somewhat older, they do not have any floor drains located within them. Minor small engine repair does occur within some of the maintenance buildings. If a minor spill was to occur, it is promptly taken care of with an absorbent granular material and disposed of in containers. Part of the recommendations for BMP (a.) in this section is to ensure that this absorbent is being properly disposed of. The City is currently finalizing this matter with P&R supervisors.

Vehicle maintenance for all City vehicles is conducted at the Fleet Maintenance building located at the Operations Complex. In the event of an accidental spill, floor drains are connected to on site oil water separators. Used vehicle fluids are collected and disposed and/or recycled of properly in their respective, protective containers.

Assessment of Program Implementation
The City was successful in implementing its SPCC and SPPP for designated City owned facilities with the potential to pollute receiving waters. Recommended BMPs have been completed and documentation has been addressed with building supervisors.

In addition, the City began maintaining a current inventory of its own facilities and operations with the potential for generating polluted stormwater runoff. These locations are not identified as requiring a SPCC or SPPP due to the nature of activities and limited fuel storage capacity on site. Parks and Recreation facilities were inspected for practices and procedures and documented. This information is currently being compiled into a report with recommendations to site supervisors for pollution prevention/good housekeeping measures.

The City reviewed and compiled current herbicide, pesticide and fertilizer licenses to determine if personnel are current in their training.

Objectives for Next Year

- The City will continue to inventory additional sites that it owns in order to inspect and document work practices and procedures with the potential to pollute. The City will make recommendations as needed.

- Finalize document of Parks and Recreation facilities and implement good housekeeping measures. Work with site supervisors to provide documentation as needed.

- Conduct additional employee training per SPPP and SPCC plan.
- Update BMP records of Division of Water Quality permitted locations as needed for City owned facilities.
- Ensure documentation for SPCC and SPPP are being completed for various site locations.

TOTAL MAXIMUM DAILY LOADS (TMDLs)

1. Objective

a. Determine whether a TMDL has been developed and approved or established by EPA for the receiving water(s) of the MS4 stormwater discharge and/or downstream waters into which the receiving water directly flows.

b. Develop and implement BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP) if the permittee is or becomes subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater.

c. If subject to an approved TMDL, the permittee is in compliance with the TMDL if the permittee complies with the conditions of this permit, including developing and implementing appropriate BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP). While improved water quality is the expected outcome, the NPDES MS4 permit obligation is to reduce non-point source pollutant loading to the maximum extent practicable (MEP). The MS4 permittee is not responsible for attaining water quality standards (WQS) at the ambient monitoring stations. The Division expects attaining WQS will only be achieved through reduction from the MS4, along with reductions from other nonpoint source contributors.

2. Best Management Practices (BMPs)

At any time during the effective dates of this permit, if the permittee is or becomes subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater, the permittee shall implement the following BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP):

BMP	Measurable Goals
a. Identify, describe and map watershed, outfalls, and streams	Within 12 months the permittee shall prepare a plan that: • Identifies the watershed(s) subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater, • Includes a description of the watershed(s), • Includes a map of watershed(s) showing streams & outfalls • Identifies the locations of currently known major outfalls within its corporate limits with the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments and • Includes a schedule to discover and locate other major outfalls within its corporate limits that may be

BMP	Measurable Goals
	contributing to the cause of the impairment to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments.

b. Existing measures	Within 24 months the permittee's plan: • Shall describe existing measures being implemented by the permittee to enhance water quality in the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to enhance water quality.

c. Assessment of available monitoring data	Within 24 months the permittee's plan shall include an assessment of available monitoring data. Where long-term data is available, this assessment should include an analysis of the data to show trends.

d. Monitoring Plan	Within 36 months the permittee shall develop and submit to the Division a Monitoring Plan for each pollutant of concern or cause of impairment as specified in the TMDL. The permittee shall maintain and implement the Monitoring Plan as additional outfalls are identified and as accumulating data may suggest. Following any review and comment by the Division the permittee shall incorporate any necessary changes to monitoring plan and initiate the plan within 6 months. Modifications to the monitoring plan shall be approved by the Division. Upon request, the requirement to develop a Monitoring Plan may be waived by the Division if the existing and proposed measures are determined to be adequate to enhance water quality and reduce non-point source pollutant loading to the maximum extent practicable (MEP).

e. Additional Measures	Within 36 months the permittee's plan: • Shall describe additional measures to be implemented by the permittee to enhance water quality in the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to enhance water quality.

f. Implementation Plan	Within 48 months the permittee's plan shall: • Describe the measures to be implemented within the remainder of the permit term to enhance water quality in the watershed to which the TMDL applies and • Identify a schedule for completing the activities.

g. Incremental Success	The permittee's plan must outline ways to track and report successes designed to reduce non-point source pollutant loading to MEP. Successes could include increased inspections, expanded and/or tailored BMPs within the scope of the six minimum measures, structural and non-structural BMP installed and/or implemented, including retrofits, and strategies developed and implemented for development and redevelopment that include green infrastructure and LID practices.

h. Reporting	The permittee shall conduct an annual assessment of the program to enhance water quality in the watershed to which the TMDL applies and submit a report of the assessment to the Division. Any monitoring data and information generated from the previous year are to be submitted with each annual report.

3. If no stormwater waste load allocation is specified in the TMDL

If there was no stormwater waste load allocation in the TMDL, in lieu of developing a Water Quality Recovery Plan, the permittee shall evaluate strategies and tailor and/or expand BMPs within the scope of the six minimum measures to enhance water quality recovery strategies in the watershed(s) to which the TMDL applies. The permittee shall describe the strategies and tailored and/or expanded BMPs in their Stormwater Management Plan and annual reports.

4. Watershed Restoration Plan approved by the Division

Voluntary implementation of a Watershed Restoration Plan approved by the Division constitutes compliance with this requirement and will allow deferment of TMDL development if tracking and monitoring are provided that demonstrate progress in implementing stormwater BMPs and/or enhancing water quality.

Accomplishments:

The Bradley and Hewletts Creek Watershed Restoration Plan has made strides in its development since accepted by Wilmington City Council and the North Carolina Division of Water Quality in 2012. In November 2012, a Watershed Coordinator was hired to direct the implementation of the plan, now branded for the public as the Heal Our Waterways (HOW) program. The program brand includes a logo, which has been used to brand an event booth display, giveaway items, and was included in a generalized water systems informational mailing sent out to target watershed residents. The Watershed Coordinator participated in three separate certification trainings through NC State University and the NC Cooperative Extension as preparation for future projects. Those trainings included Residential Rain Garden Certification, Low Impact Development Fast-Track Certification, and Stormwater BMP & Maintenance Certification. In the future, the Watershed Coordinator will also participate in the BMP Retrofitting Certification.

Initial public outreach included an electronic billboard campaign in the targeted watersheds emphasizing the connection between stormwater and the creeks, as well as a public webpage devoted to the program. The billboard advertisements ran for two months with 1200 impressions per day. The Heal Our Waterways webpage is currently in development as a tool for education and public participation. The website also offers a direct link to the GIS Atlas created by Withers and Ravenel Engineers to monitor and track the installation of BMPs in the watersheds and the subsequent effects on the hydrograph. The GIS Atlas has gone through a series of revisions to address technical issues with the software as well as aesthetic and practical challenges that arise when appealing to the general public. It is the hope of the program and its partners that the GIS Atlas, once in its final version, can be used by other organizations and municipalities for similar watershed projects.

In April 2013, the Heal Our Waterways program partnered with UNCW and Tidal Creek Co-op in an effort to install a large commercial bioretention cell in the Hewletts Creek Watershed. The project would be located adjacent to a parking-lot on an off- campus portion of land owned by the university and would treat runoff coming from that parking lot. The project would not only treat polluted stormwater before it reached the creek, but, being in a highly visible area, it will also serve to educate and engage the community through volunteer opportunities and educational signage. A representative from North Carolina State University (NCSU) Biological and Agricultural Engineering Department met with the group and offered the services of a team of graduate students who would design the project as a senior assignment. Some funding has already been secured and the project team is searching for other potential grant opportunities. The project has not been without challenges, however. Working with state and municipal government to determine the limits and boundaries of stormwater rules and their application in a project like this, has at times, been difficult. Because this kind of installation is not yet common in Wilmington outside of a defined stormwater plan, it can be a problem to get all parties to agree on the categorization of any single installation. However, if successful, the bioretention cell installation

will raise public awareness of stormwater as a water quality issue, as well as serving as an example to residents and businesses of the overall potential of BMPs.

In May 2013, a collaborative composed of the North Carolina Coastal Federation, UNCW, the North Carolina Coastal Reserve and National Estuarine Research Reserve (NERR), and the City of Wilmington was notified by the National Estuarine Research Reserve System 2013 Science Collaborative proposal review committee that a grant for $358,496.00 for the installation and monitoring of BMPs in Hewletts Creek and Wrightsville Beach had been awarded. The City of Wilmington's role in the one year grant is to develop and implement a neighborhood pilot program for outreach, education and residential BMP installation. This grant will provide the primary outside funding source for the program in the next fiscal year. Lessons learned from this pilot project will then used in a broader application as the Heal Our Waterways program gains momentum and recognition.

A voluntary watershed restoration plan such as Heal Our Waterways requires a great deal of time and effort to launch successfully. The program is built from the ground up; therefore exhaustive research must be done in the planning stages. Staff needs to develop proper understanding of the target audiences and determine how the audiences within the watershed should best be approached in order to meet the goals of the project. Educational and program materials, a clear message, and a set of progressive steps for the program as a whole must all be developed before any introduction to the public takes place. These efforts can be tedious and time consuming but are necessary to the overall success of the program. Without providing a strong foundation and clear message from the very beginning the program risks delivering a first impression that is atonal, disorganized, and weak. Ultimately a bad first impression can do irreparable damage to the reputation of the program and hinder its ability to be successful in the long term.

5. Information regarding North Carolina TMDLs

Information regarding North Carolina TMDLs is available at:
http://portal.ncdenr.org/web/wq/ps/mtu/trndlltmdls

APPENDICES

APPENDIX A: PROGRAM IMPLEMENTATION INCLUDING MODIFICATIONS AND JUSTIFICATION

Post Construction Site Runoff Controls

g. Inspections of Structural Stormwater Control Measures

The City regularly conducts biannual compliance inspections for privately owned stormwater BMPs in order to ensure maintenance responsibilities are being undertaken by property owners. During the summer of 2012, only a partial inspection of all private BMPs was accomplished due to the restructuring of the compliance inspection process and database that extended into the early fall. Because a winter inspection was already scheduled for later in the year, the City opted to leave the partial inspection as is so as not to have the two inspection periods so close together in the calendar year. The City is now back on schedule with its inspections for the next reporting year.

APPENDIX B: PUBLIC EDUCATION AND OUTREACH

Included in this section:

- Public Outreach, Education and Involvement Plan including program goals, description of target pollutants, sources, and target audiences
- BMP Reporting Table

DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION
BMP a. Define outreach/education program goals including a description of the target pollutants, sources, and target audiences					
Outreach and education program goals, as well as a description of the target pollutants, sources, and target audiences, why they were selected and key outreach messages are thoroughly identified in the Appendix. This section is updated as necessary to reflect changes in the target audience characteristics, awareness, etc.					
BMP b. Distribute public education materials and information to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.					
In addition to public outreach efforts in this category, the Stormwater Compliance Officer also distributes education materials to the public and targeted user groups (i.e. pet owners, auto shops, restaurants, residents, etc) and issues NOVs and Fines to citizens and businesses that have been identified as non-compliant with the City's stormwater codes. Information about code enforcement actions are included in the Appendix.					
3/7/2012	UNCW Off Campus Housing Fair	Off Campus Students	Stormwater Enforcement staff	Display booth with stormwater info and giveaways; direct contact with students	500 attendees
3/21/2012	IPMA Human Resources conference	IPMA Conference attendees	HR Staff	General stormwater education info and giveaways for conference attendees	100+ people
4/1/2012	Paws for People 5k at UNCW	Pet owners	NHSWCD staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets and can submit photos to be featured on city website	32 pet owners signed pledge and received dog bandana, treats, and stormwater literature.
4/2/2012	Wildlife Feeding Signage	Staff in Medical Buildings	Stormwater Enforcement staff	Wildlife Feeding Signage posted next to retention ponds at medical buildings off Physicians Drive	Medical staff from adjacent medical buildings that are feeding wildlife.
4/22/12	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater staff (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth to promote native plants and the reduction in the use of fertilizers/pesticides/water.	Stormwater information distributed. 4,000+ attendees
4/26/2012	City Employee Picnic at Greenfield Lake	City employees	Stormwater staff	Gave away stormwater tote bags with stormwater literature and promos	2 employees won tote bag prizes
5/5/2012	Greenfield LakeFest	Festival patrons	Stormwater staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets and can submit photos to be featured on city website	16 pet owners signed pledge and received dog bandana, treats, and stormwater literature.

5/12/2012	Battleship Splash Dog Event	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	10+ pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
5/25/2012	Career Day at Winter Park Elementary	5th graders	Stormwater staff	Display and presentations to small groups of students	105 students
6/18/2012	Targeted direct mail	Residents	Stormwater staff	Letter & pet waste brochure mailed to residents on Somersett Lane (complaint driven)	Inform businesses of improper practices that impact water quality and the City's ordinance/fines.
6/28/2012	Bradley & Hewletts Creek Public Input Meeting	Watershed residents Media General Public	City Stormwater Services, Planning, & Engineering Divisions NC Coastal Fed. Town of WB UNCW Withers & Ravenel	Powerpoint Presentation Watershed Stations Public input form Q & A	Contacted homebuilders, environmental groups and issued press releases and web updates prior to meeting
12/12/2012	Targeted doorhangers	Residents and commercial businesses affected by Water & Ann Street stormwater project	Stormwater staff	Water & Ann Street Project information	Project info, map, and lane closure doorhanger notice distributed to local residents
12/12/2012	Targeted doorhangers	Residents and commercial businesses affected by Walnut & Front Street stormwater project	Stormwater staff	Walnut & Front Street Project information	Project info, map, and lane closure doorhanger notice distributed to local residents
1/7/2013	Direct mailing to Restaurants in Wilmington city limits (Year 1 of mailing and survey)	Wilmington Restaurants	Stormwater staff	Mailed code enforcement letter, restaurant education poster, and return mail survey	Year 1 of the education effort resulted in 15 returned surveys and a 90% correct response rate
2/20/2013	Targeted direct mail	Residents in vicinity of 18th & Princess	Stormwater staff	Pet Waste enforcement letter and Pet Waste Brochure mailed to residents	Inform residents of the problem with uncollected pet waste, the impacts on water quality, and the City's ordinance/fines.
2/23/13	Pet Expo @ the Schwartz Center	Pet owners	NHSWCD staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets	30+ pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
3/1/2013	Water Systems Graphic development	General public, Property owners, 8th grade students	Stormwater staff	Do You Know How Your Water Flows? Graphic	Graphic illustrates the three water systems in Wilmington: Drinking Water, Wastewater, and Stormwater

3/15/2013	Targeted direct mail	Antelope Trail & Kelly Road residents	Stormwater staff	Letter and map mailed to residents to announce upcoming public meeting	Stormwater drainage project information and public meeting announcement mailed to residents
3/23/2013	Walk for Those Who Can't Pet Walk	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	33 pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
4/16/2013	Going Green Earth Expo	Hospice workers and volunteers	Stormwater staff	Featuring vendors for home, health and the environment.	Debuted the Water Systems Graphic and "tested" participants
4/20/2013	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater Services (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth, interactive game and giveaways to promote stormwater pollution prevention by installing native plants	Approx 4,000 attendees
5/1/2013	Targeted direct mail	Brookshire and Beasley Road residents	Stormwater staff	Letter and map mailed to residents to announce upcoming public meeting	Stormwater drainage project information and public meeting announcement mailed to residents
5/4/2013	Battleship Splash Dog Event	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	37 pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
5/31/2013	Career Day at Winter Park Elementary	4 & 5th graders	Stormwater staff	Interactive booth	100 students

BMP c. Informational Web Site					
Ongoing/ Regular Updates	City of Wilmington Stormwater Services webpages	General public, website viewers	Stormwater staff	Dedicated stormwater website	Updates to the Stormwater website are ongoing. The site is regularly updated with fresh content including current projects, PSAs, news, upcoming events, education publications, videos, printed material, etc.
Ongoing	Stormwater Hotline info advertised on City website pages and Facebook page	General public	Stormwater Services Communications Div.	Stormwater hotline and web reporting form for public; posted on website under What's New section and on City's Facebook page	Stormwater website, city website, Facebook fans, general public
March 2012	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Unique Stormwater Project provided info to the public about the Street Retrofits installed on 12th & Dock Streets	City of Wilmington Website viewers and Facebook fans

April 2012	Cape Fear River Watch (CFRW) posted wildlife feeding content on website	CFRW website viewers	CFRW staff	Wildlife Feeding info about dangers of feeding waterfowl and alligators was posted on CFRW website and provided to members via email newsletter	Website viewers
4/26/2012	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Dawson St. stormwater improvements	City of Wilmington Website viewers and Facebook fans
6/25/2012	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Watershed restoration public meeting	City of Wilmington Website viewers and Facebook fans
6/7/2012	City of Wilmington Facebook News	General public	Communications Staff	FB Social media blurb: Dechlorinating pool and spa water before discharging	City of Wilmington Facebook fans
7/11/2012	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Greenfield Lake fish cleanup	City of Wilmington Website viewers and Facebook fans
7/19/2012	City of Wilmington Website News	General public	Communications Staff	City Webpage article - Cedar Avenue stormwater project nearing completion	City of Wilmington Website viewers and Facebook fans
8/10/2012	City of Wilmington Facebook News	General public	Communications Staff	FB Social media blurb: Recycling rainwater using rain barrels	City of Wilmington Facebook fans
8/3/2012	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Heavy rains no match for stormwater projects	City of Wilmington Website viewers and Facebook fans
11/21/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Greenfield Lake to be lowered	City of Wilmington Website viewers and Facebook fans
12/28/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Stormwater improvement projects	City of Wilmington Website viewers and Facebook fans
1/24/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Walnut/Front St drainage project	City of Wilmington Website viewers and Facebook fans
2/19/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Downtown stormwater drainage projects	City of Wilmington Website viewers and Facebook fans
2/28/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Cardinal Drive drainage project	City of Wilmington Website viewers and Facebook fans

4/19/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Earth Day Festival announcement, Stormwater sponsorship	City of Wilmington Website viewers and Facebook fans
5/1/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Ann St. Rain Garden	City of Wilmington Website viewers and Facebook fans
5/13/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Cardinal Drive drainage improvements	City of Wilmington Website viewers and Facebook fans
5/20/2013	City of Wilmington Website News and Facebook news	General public Web Viewers	Communications Staff	City Webpage article - Drainage improvements on Oleander	City of Wilmington Website viewers and Facebook fans
5/1/2013	City of Wilmington Website News and Facebook news	General publicWeb Viewers	Communications Staff	City Webpage article - Ann St. Rain Garden	City of Wilmington Website viewers and Facebook fans

BMP d. Maintain Hotline/Help line

The Stormwater Pollution Prevention Hotline was established in January 2010 to field calls from the citizens, businesses, and city employees regarding illicit discharges and other reports of stormwater pollution. The hotline phone # is **910-341-1020** and the web address is **www.wilmingtonnc.gov/reportstormwaterpollution.** Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to all hotline reports. Information regarding hotline reports is included in the Enforcement Appendix section including type of number of hotline phone and web reports and the nature of the reports.

Ongoing	Stormwater Hotline info advertised using various outreach methods: truck magnets, signs, billboards, etc.	General public	Stormwater staff	Hotline poster, website, GTV-8 and promo items (pens, magnets, sticky notes) are used to raise awareness of the Stormwater Hotline	Developed to raise public awareness about the stormwater hotline and web reporting form

BMP e. Extent of Exposure/Reporting Requirements

Media Campaigns

December 2012-February 2013	Mass Media - WECT-6 & Bounce network, WECT website campaign	General public	Stormwater Services	:30 second stormwater PSA on network TV -Fish PSA 34 spots total	Target Audience: General public TV Reach: 81.3% for viewers age 35-64 TV Frequency: 3.6 WECT.com Website Reach: 250,000 unique visitors per month 1,200,000 average pageviews per month Total cost: $4090
March 2012	Mass Media - Cumulus Radio Broadcasting - Coast 97.3 & WKXS 94.5 (The Hawk)	General public	Stormwater Services	Two :30 second PSAs on broadcast radio stations -Johnny Fishpatrick PSA -Litter PSA 240 ads total: 120 purchased, 120 free	Target Audience: Landscapers, Pet owners, General public Reach: 67,507 adults Frequency: 5.0 times Total cost: $2500

March 2012	Mass Media - WECT-6 & Bounce network, WECT Mobile Device App, and Website campaign, featuring Top Story Web Wrap	General public	Stormwater Services	:30 second stormwater PSA on network TV -Fish PSA 34 spots total	Target Audience: General public TV Reach: 72.3% for viewers age 35-64 TV Frequency: 3.2 WECT.com Website Reach: 250,000 unique visitors per month 1,200,000 average pageviews per month Total cost: $1724
Spring 2012	Going Green Magazine - Magazine Article	General public Adults	Stormwater Services	Print and digital online magazine article with photo- Canines for Clean Water Promote Pet Waste Disposal	Target Audience: Adults/general public Environmental groups Reach & Frequency: 8000 printed, also available online Total cost: Free
March 2012-June 2013	WAVE Transit Public Transportation System - Mobile Advertising	MotoristsPedestrians	Stormwater Services	Stormwater advertising on both exterior sides of a public transit hybrid bus for 9 months-Pollution Prevention Ad- What Goes in Here, Ends up Here Partnership with Keep America Beautiful of New Hanover County	Target Audience: General publicReach: Motorists, PedestriansFrequency: On bus continuouslyTotal cost: $5500
February - May 2013	Mass Media - Cumulus Radio Broadcasting - Coast 97.3 & WKXS 94.5 The Hawk	General public	Stormwater Services	Two :30 second PSAs on broadcast radio stations -Stormwater Basics PSA -Pet Waste PSA 240 ads total: 120 purchased, 120 free	Target Audience: Landscapers, Pet owners, General public Reach: 67,507 adults Frequency: 5.0 times Total cost: $4466
March 2013	Mass Media - WECT-6 Production	General public	Stormwater Services	:30 second stormwater recorded by WECT Stormwater staff wrote script and directed PSA	Recorded for the purpose of airing on WECT and GTV-8 and also posting on the Stormwater website
March-May 2013	Mass Media - WECT-6 & Bounce network, WECT Mobile Device App, and Website campaign, featuring Top Story Web Wrap	General public	Stormwater Services	:30 second stormwater PSA on network TV -Stormwater Basics PSA 91 spots total	Target Audience: General public TV Reach: 81.8% for viewers age 35-64 TV Frequency: 3.7 WECT.com Website Reach: 250,000 unique visitors per month 1,200,000 average pageviews per month Total cost: $4500
April 2013-October 2013	WAVE Transit Public Transportation System - Mobile Advertising	Motorists Pedestrians	Stormwater Services	Stormwater advertising on the side of a public transit hybrid bus for 9 months -Pollution Prevention Ad- What Goes in Here, Ends up Here Partnership with Keep America Beautiful of New Hanover County	Target Audience: General public Reach: Motorists Frequency: On bus daily Total cost: $3200

April - June 2013	Fairway Outddor Advertising	Motorists Pedestrians	Stormwater Services	Billboard Ad "What Goes in Here, Ends up Here"	Target Audience: General public Reach: Motorists Frequency: Rotating - shown for 8 seconds every minute 24/7 Total cost: $3400
Cumulus Media is no longer purchasing Arbitron or Nielson ratings systems. This is a cost-cutting measure on their part, but it means they no longer have the ability to provide me with reach and frequency data for the campaigns I run on their stations. The data provided references prior years available reach and frequency data for these stormwater outreach campaigns. Approved per M. Randall, NC DWQ.					

Local Cable Access (GTV-8)

Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Monthly rain barrel sale to the public	Inform public about opportunity to purchase reduced price rain barrels
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Re-route your downspout	Inform public about re-directing downspouts to let water soak in, instead of runoff
Airs on rotating schedule	GTV-8 City's cable access channel (video slideshow)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Shortnose Sturgeon narrated slideshow	Inform public about the Shortnose Sturgeon, an endangered species in the Cape Fear River
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Pet waste ordinance slides, detailing ordinance rules and fines	Inform public of pet waste ordinance
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Yard waste ordinance slides, detailing ordinance rules and fines	Inform public of yard waste ordinance
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Illicit discharge ordinance slides, detailing ordinance rules and fines	Inform public of illicit discharge ordinance
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Stormwater hotline info	Inform public of pollution prevention hotline and web-based reporting tool
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	4 part poster series (based on stormwater truck magnets)	Inform public of pollution prevention hotline and web-based reporting tool
Airs on rotating schedule	GTV-8 City's cable access channel (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Scrolling info	Upcoming events slides (i.e. monthly rain barrel sale)
Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	UNCW Buffers PSA
Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Hard to Train a Human
Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Stormwater Basics 2103 PSA
Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Johnny Fishpatrick PSA - NC DENR

Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Keep America Beautiful Grasshopper PSA
Airs on rotating schedule	GTV-8 City's cable access channel (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Not your Ashtray PSA
Airs on rotating schedule	GTV-8 City's cable access channel (documentary)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Documentary	Yard Waste documentary
Airs on rotating schedule	GTV-8 City's cable access channel (documentary)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Documentary	Airlie Gardens documentary
Airs on rotating schedule	GTV-8 City's cable access channel (documentary)	Cable access TV viewers	Stormwater staffGTV-8 Staff	Documentary	Puget Sound Urban Pollution documentary

News Coverage

3/15/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article-Rain barrels prevent pollution, save money	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
3/21/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Wilmington proposes plan to restore Bradley and Hewletts Creeks	Stats: -Daily print newspaper and online website -94,492 print readers -628,086 monthly unique visitors to online website
3/22/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Division of Water Quality classifies 17 area waterways as impaired	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
4/23/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Utility's mistake spills sewage	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
4/23/2012	WECT TV6 story	Station viewers	WECT staff	TV news coverage - Sewer spill into Kerr Avenue Wetland	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average pageviews per month
4/24/2012	Star News editorial	Newspaper and online readers	Star News staff	Print and online newspaper article-CFPUA must explain what happened at Kerr Avenue site	Stats: -94,492 print readers -628,086 monthly unique visitors to online website

3/22/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- Paddling the Cape Fear Watershed (CFRW cleanups)	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
3/28/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- Inland Greens to Undergo Stormwater Improvements	Stats: -Weekly print newspaper and online website-6345 print readers/wk-6700 weekly online readers
6/14/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- Bradley Creek Rain Gardens Installed by Walmart, NCCF volunteers	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
6/25/2012	WECT TV6 story	Station viewers	WECT staff	TV news coverage - Bradley & Hewletts Creek plan and public meeting	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average pageviews per month
7/8/2012	WWAY-TV3 story	Station viewers	WECT staff	TV news coverage - Greenfield Lake Park experiencing difficulties with heat	Stats: -WWAYTV3.com reaches 23,522 unique visitors/month and 70,565 unique page views/month
7/8/2012	WECT TV6 story	Station viewers	WECT staff	TV news coverage - Dead fish raising eyebrows at Greenfield Lake	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average pageviews per month
7/9/2012	WWAY-TV3 story	Station viewers	WECT staff	TV news coverage - Heat beating city's efforts to oxygenate Greenfield Lake	Stats: -WWAYTV3.com reaches 23,522 unique visitors/month and 70,565 unique page views/month
7/10/2012	WECT TV6 story	Station viewers	WECT staff	TV news coverage - Wilmington takes action to help fish at Greenfield Lake	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average pageviews per month

7/10/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Fish cleanup should be done Tuesday	Stats:-94,492 print readers-628,086 monthly unique visitors to online website
7/10/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Cooler, wetter weather should help critters of Greenfield Lake	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
7/15/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article-Local watersheds subject of restoration project	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
7/20/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- No enforcement for boat wash runoff	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
7/20/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- Pray for rain	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
7/26/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article-Marinas volunteer to clean up water quality	Stats: Weekly print newspaper and online website 6345 print readers each week 6700 weekly online readers
9/29/2012	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article-Inland Greens park planned (stormwater improvements)	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers
8/14/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Cape Fear River to get man-made oyster reef	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
10/15/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Commercial oyster season begins, runs through March	Stats:-94,492 print readers-628,086 monthly unique visitors to online website
10/19/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article-Editorial - Heaven on the half shell	Stats: -94,492 print readers -628,086 monthly unique visitors to online website

10/23/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article- NC's inlets give oysters unique flavors	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
10/24/2012	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article- Intercept survey will help track recreational fishing (mentions shellfishing)	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
1/2/2013	City GTV-8 and City website	Online readers and TV viewers	City Communications Staff	Stormwater improvement projects	City of Wilmington government website and cable access channel (GTV-8)
1/2/2013	Canines for Clean Water article in Dog Living Magazine	Magazine readers	NHSWCD staff	Magazine article	150,000 online website viewers, print magazine stats unavailable
1/3/2013	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- Benefits welcomed in greenway plan	Stats: Weekly print newspaper and online website 6345 print readers each week 6700 weekly online readers
3/11/2013	Star News article	Newspaper and online readers	Star News staff	Print and online newspaper article- UNCW professors study Splenda in Cape Fear River	Stats: -94,492 print readers -628,086 monthly unique visitors to online website
3/20/2013	New Hanover County Schools Public Communications	Online readers	NHCS Comm. Staff	Significant achievement award for Bradley Creek School Wetlands - cooperative project	Stats: -Sent to a variety of local media news sources
4/22/2013	City Press Release	Mass media	City Communications Staff	City installing rain gardens to help clean stormwater runoff	Stats: -Sent to a variety of local media news sources
5/2/2013	Star News article	Newspaper and online readers	Star News staff	Street-side rain gardens built in Wilmington	Stats:-94,492 print readers-628,086 monthly unique visitors to online website
5/2/2013	Lumina News article	Newspaper and online readers	Lumina News staff	Print and online newspaper article- City rain gardens benefit Burnt Mill Creek Watershed	Stats: -Weekly print newspaper and online website -6345 print readers/wk -6700 weekly online readers

Distributing promos/giveaways

10/12/11	Wilmington Regional Association of Realtors	Property Management Council	Stormwater staff	Presentation and distributed complimentary education items	8 property managers/realtors received promo items
4/22/12	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater staff (SWS is an annual sponsor of Earth Day)	Display booth, interactive game, and giveaways distributed. Focus: Native Plants	Approx 4000

4/20/13	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater staff (SWS is an annual sponsor of Earth Day)	Display booth, interactive game, and giveaways distributed. Focus: Water Systems & Watersheds	Approx 4000
Ongoing	Public Meetings, events, displays, city buildings	General public	Stormwater staff	Distribute items or leave in strategic locations where citizens will pick them up	Spread stormwater messages via freebies/promos at events such as Earth Day, Canines for Clean Water, etc.

Brochures, Displays, Signs, Welcome Packets, Pamphlets

9/1/2012	Hewletts Creek Watershed Signs installed	Hewletts Creek Watershed residents; motorists	Stormwater staff	Sign installation along Greenville Avenue by Bradley Creek School	Various
12/14/12	Pet Waste Signs installed along Dr. Branch project	Apartment residents and neighborhood residents along Dr. Branch project	Stormwater staff	Pet waste signage installation at Dr. Branch project (complaint driven by stormwater staff)	Various
Ongoing	Truck Magnets	Motorists Passengers	Stormwater staff Enforcement staff	24 stormwater vehicle awareness magnets created for all the Stormwater Services field vehicles	Messages promote awareness of the City's stormwater hotline, pet waste, yard waste and the destination of polluted runoff
Ongoing	Wildlife Feeding signage creation	Visitors to Greenfield Lake Park	Stormwater staff	Reasons Not To Feed Waterfowl & Alligators signage created	Educates lake patrons about reasons and laws about not feeding wildlife

Newsletters

2011-2012 Progress Report	Citywide Public Information Report	City residentsPublic librarySpecial events	Stormwater staffCommunications Div.	Stormwater Projects article - Cedar Avenue, Cardinal Drive, Cavalier Drive project updates, stormwater maintenance update	40,000+ newsletters mailed to city residents
Spring 2012	Citywide Public Information Report	City residents Public library Special events	Stormwater staff Communications Div.	UNCW Annual Water Quality Report Green Streets article Hotline ad	40,000+ newsletters mailed to city residents
Summer 2012	Citywide Public Information Report	City residents Public library Special events	Stormwater staff Communications Div.	Stormwater Projects article	40,000+ newsletters mailed to city residents
Winter 2013	Citywide Public Information Report	City residents Public library Special events	Stormwater staff Communications Div.	Stormwater Projects article - Flooding Relief coming to Cardinal Drive Area	40,000+ newsletters mailed to city residents
Spring 2013	Citywide Public Information Report	City residents Public library Special events	Stormwater staff Communications Div.	UNCW Annual Water Quality Report Green Streets article Hotline ad Cardinal Drive project update	40,000+ newsletters mailed to city residents

Weekly Update Articles for City Council / City Staff / Media

Weekly	Weekly Email Update	City Council Employees Media	City staff	Weekly update of city news, events, projects, etc.	Stormwater information was included in 22 Weekly Updates

Stormwater Staff / Employee Trainings

5/21/13	Illicit Discharge Training	Stormwater Maintenance Crews and Surveyors	Stormwater staff	Illicit Discharge Power Point, Examples, and Discussion	49 staff in attendance

Grant Projects

Ending June 2013	319 Street Retrofit Grant with NCSU	Burnt Mill Creek	NCSU Stormwater Services	Stormwater improvement project on city streets in downtown area of BMC Watershed	MLK Center participants helped plant Ann St. Rain Garden
Ongoing	Developed watershed restoration plan for Hewletts and Bradley Creeks, now being implemented by Watershed Coordinator	Hewletts & Bradley Creek watershed residents and businesses	Partners: Stormwater Services NC Coastal Federation (grant administrator) Town of Wrightsville Beach Stormwater Division	Heal Our Waterways program implementation	Watershed restoration plan implementation began in 2013.

Citizen Contacts

Ongoing/ regularly	Stormwater office via phone, email or walk-in	Citizens/ Businesses	Stormwater staff	Responses to requests for information, literature, etc.	Information provided regarding specific nature of contact

LEGEND:

NHSWCD = New Hanover Soil & Water Conservation District
CFRW = =Cape Fear River Watch
WECT-TV6 = NBC station
CUMULUS = radio stations
NCSU = NC State University
FB = Facebook

CITY OF WILMINGTON
STORMWATER SERVICES

Public Outreach & Education, Public Involvement & Participation Plan

Compiled
August 2012

Table of Contents

Introduction

Stormwater runoff is water from rain or irrigation that flows over land and into local creeks, streams and waterways. According to the US Environmental Protection Agency (EPA), stormwater runoff is the #1 source of surface water pollution.

Impervious surfaces are hard surfaces that water cannot penetrate, such as driveways, streets, parking lots and rooftops, which prevent stormwater runoff from naturally soaking into the ground. Instead, runoff flows over these surfaces picking up pollutants such as pet waste, auto fluids, fertilizers, pesticides, litter, and yard waste and carries them through the stormwater drainage system, directly into our waterways.

In Wilmington, runoff travels through a complex, interconnected system of storm drains, pipes, ditches, creeks and other natural and man-made features. In Wilmington, the storm drainage system consists of approximately:

- 9,000 catch basins and manholes
- 220 miles of pipe
- 200 miles of open drainage (ditches, creeks, and channels)
- 145 acres of retention ponds including Randall Pond and Silver Stream Pond
- 12 miles of culverts under roads
- Greenfield Lake, Love Grove Tidegates
- Stormwater BMPs such as Kerr Avenue Wetland, Park Avenue Bioretention Area, Wade Wetland, etc.

This plan for Public Education and Outreach and Public Participation and Involvement is a segment of the City of Wilmington's Comprehensive Stormwater Management Plan (hereinafter referred to as Stormwater Plan), as required by the State of North Carolina Department of Environment and Natural Resources Division of Water Quality Permit No. NCS000406. The permit authorizes the City of Wilmington to discharge stormwater from their municipal separate storm sewer system (MS4) to the receiving waters of the State within the Cape Fear and White Oak River Basins, under Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Program.

As required by the NPDES Permit, the City of Wilmington's Stormwater Plan must detail the City's outreach program for the five-year term of the stormwater permit. This document serves as the Outreach and Education Plan.

Since 1993, scientists at the UNC Wilmington Center for Marine Science Research have been assessing the water quality of Wilmington's major waterways. Approximately 70 sampling sites assess the water quality of 10 of Wilmington's tidal creeks, as well as Greenfield Lake, and the Cape Fear River. The findings are reported annually and serve as a valuable tool to gauge changes in water quality in the area.

Public education, outreach, and participation are essential tools to develop stewardship and awareness of stormwater pollution issues in Wilmington. By successfully reaching out to citizens

and businesses, we can reduce the pollution in our local surface waters preserving them as a healthy, beautiful resource for our area.

Mission of Stormwater Services

The City of Wilmington Stormwater Services provides comprehensive management of the stormwater drainage system in order to protect our community and environment.

Goals & Objectives ~ Outreach, Education, Involvement Program

The City of Wilmington Stormwater Services strives to improve local water quality by creating awareness of stormwater runoff issues through public education and outreach and public participation and involvement.

Through education, outreach, and involvement we educate citizens, businesses and employees about the stormwater drainage system, sources of stormwater pollution, the direct impacts of stormwater pollution on local waterways, and what we can do as a community to prevent and reduce stormwater pollution. The program complies with the City's NPDES stormwater permit.

The education program addresses the following facts as a basis for education efforts:

- Storm drains and drainage conveyances (i.e. ditches) carry water directly to local waterways without any treatment. Only rain should go down the storm drain!

- Impervious surfaces increase the speed and volume of polluted stormwater runoff entering the stormwater drainage system.

- Polluted stormwater runoff flows directly into local waterways where it impacts water quality, aquatic habitat, shellfish harvest areas, and drinking water supplies.

- Plants, shrubs, trees, and other vegetation greatly reduce stormwater pollution by absorbing and filtering stormwater runoff and preventing soil from washing away.

- Reduce the amount of polluted stormwater runoff entering local waterways by utilizing BMPs (Best Management Practices). BMPs are any action or on-the-ground practice that reduces the amount of stormwater and pollution flowing into waterways. BMPs such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allow stormwater runoff to soak into the ground and be cleaned and filtered naturally.

The program also addresses the six major pollutants that impact Wilmington's waterways:

1) Fecal coliform bacteria
2) Nutrients
3) Sediment
4) Chemicals
5) Litter
6) Vehicle Pollution

Target Pollutants, Sources, and Audiences

The following pollutants have been identified as significant sources of pollution in Wilmington's waterways. Many of these pollutants also negatively impact the proper functioning of the stormwater drainage system. These particular pollutants were chosen based on several sources including UNCW's water quality monitoring data, New Hanover Animal Control statistics, and the 2006 NC Statewide Stormwater Survey of North Carolina residents.

This is a working document; therefore the goals and target pollutants will change over time based on the target audiences' knowledge and implementation of stormwater-friendly practices, as well as water quality data and trends.

Target Pollutant	**Pollutant Origin**	**Likely Pollutant Sources / Target Audience** (Residential & Commercial/Industrial)
Fecal Coliform Bacteria	• Domestic & wild animal waste	- Pet owners and their pets - Stray dogs, feral cats - Boarding kennels - Veterinarian facilities - Pet-related businesses
Nutrients (nitrogen and phosphorous)	• Fertilizers • Yard waste	- Homeowners - Gardeners - Landscapers/Landscaping Companies - Turf maintenance professionals - Golf courses
Sediment (sand, soil, etc)	• Eroding stream banks • Exposed soil • Construction	- Construction sites/land-disturbing activities - Landscapers/landscaping companies - Homeowners
Chemicals	• Pesticides • Pressure washing chemicals • Vehicle and boat washing soaps	- Homeowners - Pressure washing businesses - Mobile detailers - Pressure washers - Turf/landscape professionals - Restaurants
Litter	• Plastics • Paper • Cigarette butts	- Motorists - Smokers - Restaurants - Retail centers - Construction sites
Vehicle Pollution	• Vehicle fluids (motor oil, antifreeze, etc) • Vehicle washing soaps/detergents	- Motorists' vehicles - Backyard mechanics - Vehicle maintenance repair shops - Mobile detailers - Dealership lots

Target Pollutant: FECAL COLIFORM BACTERIA (domestic and wild animal waste)

Nutrients, such as nitrogen and phosphorus, enter our waterways in excessive amounts via stormwater runoff that carries fertilizers and yard waste into the storm drainage system. High nutrient loads cause algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitats.

Pollutant Source:

Likely Residential Sources: Domesticated Animals, Stray and Feral Animals
Likely Commercial/Industrial Sources: Boarding Kennels, Veterinarian Facilities, Pet-Related Businesses

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Fecal coliform bacteria is the #1 pollution problem impacting Wilmington's creeks and waterways, as identified through water quality monitoring. The primary source of this bacterial pollution is canine and outdoor cat waste.
- Stormwater runoff washes bacteria, parasites, viruses, and nutrients from animal waste directly into our waterways.
- There is a direct correlation between the amount of impervious surface coverage and fecal coliform bacteria counts in Wilmington's waterways.
- Once in our waterways, these pathogens can cause shellfish bed closures, swimming advisories, algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitat.
- High levels of fecal coliform bacteria can cause diseases and infections in humans upon contact such as roundworm, salmonellosis, toxoplasmosis, E. coli, and gastroenteritis.

Target Pollutant: FECAL COLIFORM BACTERIA (domestic and wild animal waste)

Key Outreach Messages:

- Messages should connect uncollected pet waste to water quality problems and human health impacts.
- Dogs waste is a major source of bacterial pollution considering their population, daily defecation rate, and bacterial production. Outdoor cats are also a major problem for these same reasons; steps should be taken to control their waste as well.
- Bacteria can cause diseases in humans and other animals.
- Pet owners have a responsibility to clean up after pets and dispose of the waste properly.
- Debunk barriers to cleaning up after pets (i.e. it's not fertilizer, it's okay to use a bag to pick it up with your hand, pet waste is still a problem even if it's in your own backyard, etc).
- Pet owners should be aware of and abide by the City's Pet Waste Ordinance:
  - Fully and immediately clean up after pets on any public property. *(Public property consists of streets, sidewalks, right of ways, parks, plazas, stream banks, public accesses, pathways, drainageways, storm drains, creeks, officially accepted easements, etc.)*
  - Carry a clean-up device (i.e. bag, scooper) at all times.
  - Show the clean-up device to a Code Enforcement Official, if requested.
  - Bag and dispose of pet waste in a closed trash receptacle or refuse container.
  - Do not flush pet waste down the toilet (Cape Fear Public Utility Authority ordinance).
  - Fines for non-compliance with the City's pet waste ordinance are $250 per occurrence.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Pet Owners	By right of ownership, a pet owner has the power to reduce pet waste-contaminated runoff by cleaning up after their pet. Survey data reports both females and males should be targeted, with a slightly higher % of males not picking up.	• Educate citizens about the City's pet waste ordinance via the stormwater website and GTV • Participate in local pet-related events (i.e. Paw Jam) • Continue Canines for Clean Water program (C4CW) • Post educational signs at pet waste stations • Distribute pet waste education brochures and flyers during special events • Air public service announcements in paid spots • Direct mail enforcement letter to neighborhoods with complaints • Include blurbs in the citywide newsletter • Utilize enforcement actions when necessary for violators of the pet waste ordinance
Pet-Related Businesses	Targeting pet-related businesses will educate those in the profession about best practices for pet waste management and also serve as a conduit to deliver outreach messages to the public. Businesses include: - Veterinarians - Animal hospitals - Kennels - Pet stores - Groomers - Trainers - Petsitters - Doggie day care	• Encourage businesses to be models for environmental stewardship at their place of business (i.e. install pet waste receptacles in parking lot islands or properly design kennel runs for waste removal) • Encourage businesses to post the pet waste education poster and/or brochures for customers to view

	- Local pet magazines - Local adoption agencies - NHC Animal Control - NH Humane Society	
Management/ Residents of Apartment Complexes	Apartment complexes often experience problems with uncollected pet waste on their property. In Wilmington, a large number of college students with pets reside in these complexes. Management can play a key role in educating their residents about pet waste and implementing and enforcing a pet waste management policy on their property.	• Provide materials to educate the management of apartment complexes on how to institute a pet waste policy, as well as provide a consistent policy for enforcement • Encourage apartment complex management to educate their residents by distributing the City's pet waste education materials to each apartment • Encourage management to post the pet waste education poster and/or brochure in common areas for their residents to view • Encourage management to be make it easy for their residents to manage pet waste by installing pet waste receptacles around the property
Assessment & Evaluation		
• Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality monitoring, specifically Fecal Coliform counts in local waters • Periodically assess the habits of pet owners and pet industry professionals by: - Direct observation of habits *(collects vs. doesn't collect, where dispose, etc.)* - Count of citations issued for pet waste violations - Count of reported complaints to Stormwater Hotline regarding pet waste violations		

Target Pollutant: NUTRIENTS (fertilizers, yard waste)

Nutrients, such as nitrogen and phosphorus, enter our waterways in excessive amounts via stormwater runoff that carries fertilizers and yard waste into the storm drainage system. High nutrient loads cause algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitats.

Pollutant Source:
Likely Residential Sources: Homeowners, Gardeners, etc.
Likely Commercial/Industrial Sources: Landscapers, Turf Maintenance, Golf Courses, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Lawn fertilization is one of the most widespread watershed behaviors by homeowners and landscaping companies.
- Improper application of fertilizer results in the introduction of nutrients into our waterways via stormwater runoff.
- Yard waste (i.e. grass clippings, leaves, pinestraw) are often improperly blown or directed into streets, storm drains, and ditches leading to clogged stormwater conveyances resulting in flooding of streets and property. This organic matter can also flow through the drainage system introducing nutrients and pesticides into waterways.
- Fertilizers and yard waste that end up in local surface waters impact aquatic life by introducing an overabundance of nutrients, a process known as eutrophication.
- Eutrophic water conditions cause algal blooms. Once the excess nutrients are used up in a water body, the algae will decompose using up the dissolved oxygen in the water, which aquatic organisms (i.e. fish) need to survive. This can lead to fish kills.
- Algal blooms produced from eutrophic conditions also prevent sunlight from reaching benthic (bottom-dwelling) aquatic plants and organisms.
- Some types of algal blooms are toxic to plants and animals, including humans.

Target Pollutant: NUTRIENTS (fertilizers, yard waste)

Key Outreach Messages:

- A direct link exists between improper fertilizer application and yard waste disposal and poor water quality resulting in algal blooms, fish kills, and habitat degradation.
- Grasscycle! Leave grass clippings on the lawn to reduce or eliminate the need for fertilizer. Clippings conserve soil moisture and are a natural fertilizer.
- Compost yard waste and use the resulting material in your landscape or garden
- Contain yard waste for City pickup.
- Before fertilizing, get a free soil test from NHC Cooperative Extension. It will tell you the exact nutrients your lawn needs and could save you money spent on fertilizer.
- Design and maintain lawns with the goal of absorbing runoff. For instance, minimize the use of lawn area and fertilizer by replacing with native trees, shrubs, plants and groundcover.
- Use alternatives to fertilizer such as organic fertilizer, compost, grasscycling, worm poop, etc.
- If fertilizer must be used, read the label and apply correctly. Improper application includes over-applying by frequency or volume, applying the wrong type, applying before rain, and failure to clean excess fertilizer from driveways and streets after application.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.
- Improper disposal of yard waste (leaves, grass clippings, pine straw) can clog the storm drainage system causing flooding of streets and property.
- Landscapers/Property owners should be aware of and abide by the City's Yard Waste Ordinance:
    - It is unlawful to rake, sweep, blow, wash, direct or place any debris into the storm drainage system. (*The storm drainage system consists of streets, storm drains, ditches, swales, creeks, lakes, rights-of-way, dedicated easements, etc).*
    - Property owners shall keep all ditches, drains, swales, and other drainageways on their property free from obstructions which would impede the flow of water.
    - Fines for non-compliance with the City's yard waste ordinance are $250 per occurrence.
- Landscaping company employees should be trained on proper fertilization and yard waste disposal practices.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Homeowners/ Residents	Many citizens improperly apply fertilizer and/or blow yard waste into the street or storm drain. Target audience is majority male homeowners for self-application of fertilizer and yard waste disposal. Also target households that hire landscaping companies.	• Distribute fertilizer and yard waste education brochures and soil test kits to Wilmington residents during HOA presentations and special events like Earth Day • Inform residents about proper disposal methods for yard waste including grasscycling, composting, and collecting yard waste for pick-up by posting info on GTV • Post educational lawn care poster on stormwater website • Air public service announcements on mass media outlets • Include blurbs in citywide newsletter • Submit periodic press releases to the media

Landscapers and Turf Maintenance Professionals	Landscaping and turf maintenance companies frequently use fertilizers and produce a large amount of yard waste on a regular basis. Employees are often male and of Hispanic background.	• Distribute large format education poster about yard waste disposal to landscapers and lawn maintenance companies, available in both English and Spanish • Emphasize proper staff training on practices like fertilization application and yard waste disposal • Distribute fertilizer education info to golf course management • Post outreach materials in English and Spanish on stormwater website and GTV • Utilize enforcement actions when necessary for violators of yard waste ordinance
Assessment & Evaluation		
• Periodically assess the habits of homeowners and landscape industry professionals by: - Direct observation of the fertilizer application habits of homeowners and landscape industry - Surveys of the fertilizer application habits of homeowners and landscape industry professionals • Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically nitrogen, phosphorus, BOD, and algal bloom frequencies and locations		

Target Pollutant: SEDIMENT (sand, dirt, gravel, clay, soil particles)

Sediment is generated by the process of natural or accelerated erosion and consists of sand, dirt, clay, or soil particles. Sedimentation occurs when stormwater runoff carries soil particles from a disturbed land area or eroding stream bank to surface waters. Sediment can quickly fill in a waterbody, clog the storm drainage system, and cause turbidity and problems for aquatic life.

Pollutant Source:
Likely Residential Sources: Yards, Driveways, etc.
Likely Commercial/Industrial Sources: Construction Sites, Landscapers, Clear-cut Land, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Both natural and accelerated erosion produce sediment. Natural erosion is the process of weathering that forms soil. Accelerated erosion is a result of land-disturbing activities by humans that loosen topsoil, making the land more prone to erode quickly (i.e. construction-related activities).
- While natural erosion contributes sediment to waterways, the majority of sediment comes from areas where accelerated erosion has occurred. Stormwater runoff carries soil particles from a disturbed area of land to local creeks and streams. The waves created by boaters can also cause accelerated erosion near the banks.
- Excessive sedimentation can fill in a water body or clog the storm drainage system, leading to flooding. Sedimentation also impacts bottom-dwelling organism by smothering fish eggs, shellfish, coral and benthic (bottom-dwelling) plants.
- Sediment can also cause water to become cloudy, also known as turbidity. Turbidity impairs the photosynthesis of aquatic plants, as well as the ability of aquatic animals to breathe and see prey/predators.
- Sediment serves as a “transport vehicle” for other pollutants such as nutrients, metals, and bacteria. These pollutants attach to sediment particles and cause additional water quality issues when the sediment gets stirred up (i.e. boating, hurricanes, etc) and re-pollutes the water.
- Other sources of sediment include poorly vegetated areas in a yard or landscape.

Target Pollutant: SEDIMENT (eroding streambanks, construction, exposed soil)

Key Outreach Messages:

- Any land-disturbing activity including gardening, planting, construction, etc. can produce sediment which can lead to flooding of streets and property when the sediment is carried into the storm drainage system via stormwater runoff.
- There is a direct link between sediment and poor water quality, in addition to impacts on aquatic life and habitat.
- Residents can plant groundcover, shrubs, and trees to hold soil in place and prevent erosion. Use native plants whenever possible – they don't need fertilizers and pesticides. For properties with sandy soil, mix organic matter (i.e. compost) in with the sand to allow plants to grow better.
- Mulch should be used to cover exposed soil and prevent it from washing away.
- Sediment should be collected off paved surfaces and not rinsed or blown into the drainage system.
- Lack of vegetation along waterfront property and streambanks can produce significant erosion. These types of property owners should be encouraged to plant vegetative buffers.
- Developers should follow all sedimentation and construction site laws and practices. Construction site violations can be reported to the State Hotline: 1-800-STOP-MUD
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas, allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
General Public/ Homeowners	The environmental consequences of sedimentation are not widely understood by citizens. Sources of sediment in our surface waters are primarily the result of human-related activities. Homeowners may have exposed soil in lawns or landscape beds or poorly vegetated areas on their property. Target both males and females.	• Encourage homeowners to plant vegetation or apply mulch to anchor soil in place and prevent erosion during HOA or community presentations • Post outreach materials on stormwater website and GTV • Lack of vegetation along waterfront property and streambanks can produce significant erosion. These types of property owners should be encouraged to plant vegetative buffers. • The public should be made aware of the City's yard waste ordinance via GTV and paid spots on mass media
Construction/ Landscape Professionals	Construction, landscape, and related industries significantly contribute to sediment loading in waterways. Employees in this field are often male.	• Promote compliance with the land development code and sedimentation and erosion control laws • Encourage proper staff training with construction, landscaping, and related businesses • Post outreach materials on stormwater website and GTV • Construction workers and landscapers should be aware of the City's yard waste ordinance which prohibits sediment from being blown into streets and storm drains. Provide landscaping companies with the yard waste poster that addresses sediment

Assessment & Evaluation

- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically Total Suspended Solids (TSS)
- Gather information from NHC Sedimentation and Erosion program about violations within the city

Target Pollutant: CHEMICALS (pesticides, pressure washing and cleaning soaps)

Stormwater runoff washes harmful chemicals found in pesticides, pressure washing cleaners, vehicle washing soaps and other illicit discharges directly into our waterways. All of these pollutant sources contain toxic chemicals that can persist in the environment, causing toxicity in humans and aquatic organisms, in addition to contaminating drinking water resources.

Pollutant Source:
Likely Residential Sources: Homeowners, Gardeners, Car/Boat Owners, etc.
Likely Commercial/Industrial Sources: Pressure Washers, Vehicle Washing Businesses, Turf/Landscape Professionals, Restaurants, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- An illicit discharge is any unlawful disposal, placement, emptying, dumping, spillage, leakage, pumping, pouring, emission, or other discharge of any substance other than stormwater into the storm drainage system.
- Chemicals and cleaning agents used to wash cars, boats, driveways and other surfaces are carried into storm drains and eventually into our waterways. These chemicals can destroy the external mucus layer on fish that protects them from bacteria and parasitic infections.
- Commonly used organophosphate pesticides are present in stormwater runoff and are toxic to aquatic life in receiving water bodies. Pesticides bio-accumulate up the food chain and are harmful to beneficial insects, humans and other wildlife, as well as entire aquatic ecosystems.

Target Pollutant: CHEMICALS (pesticides, pressure washing/vehicle washing soaps and cleaners, etc.)

Key Outreach Messages:

- There is a direct link between the use of chemicals on land (i.e. pesticides, pressure washing cleaners) and water quality and habitat impacts (i.e. frogs with six legs).
- Install native plants which do not require pesticides or fertilizers.
- Use alternatives to pesticides such as ladybugs, weeding by hand, and organic pesticides.
- If you must apply pesticides, read the labels and apply the correct amounts. Do not apply before rain.
- Suggest less toxic, environmentally-friendly alternatives to chemicals.
- Promote info on how to properly dispose of chemicals and other household chemicals, including promotion of Household Hazardous Waste Collection Days.
- Pressure washing surfaces and washing cars/boats using soaps or cleaning agents of any toxicity level can negatively affect water quality. These surfaces can only be washed legally with plain, clear water.
- Wash on grassy areas that can absorb and filter the chemicals and wastewater naturally.
- Businesses are required to capture and discharge the wastewater legally in a treatment system.
- The City's Illicit Discharge ordinance specifies that it is unlawful to dispose of or discharge any substance other than stormwater into the storm drainage system. Fines are up to $10,000 per offense.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Homeowners / Residents	All citizens have the potential to contribute chemical pollution by washing outdoors (i.e. driveways, homes, lawn furniture) or by using pesticides around their property. Target a higher % of males.	• Distribute educational materials to residents about practicing environmentally safe gardening/lawn maintenance and washing of materials outdoors • Emphasize compliance with the City's Illicit Discharge ordinance • Promote the stormwater hotline to report illicit discharges • Post outreach materials on stormwater website and GTV • Promote Household Hazardous Waste Collection Days
Mobile Detailers, Pressure Washers	Businesses that wash surfaces often use cleaning agents containing chemicals that are harmful to our waterways. These chemicals can be easily washed into the storm drainage system. Target males.	• Mail educational info to pressure washing businesses and mobile detailers • Post outreach materials on stormwater website and GTV
Landscape/Turf Maintenance Professionals	Landscape/turf maintenance professionals frequently use pesticides. Employees in this field are often male.	• Promote training of workers for proper application of pesticides • Emphasize use of pesticides as a last resort; promote alternatives • Post outreach materials on stormwater website and GTV
Restaurants	Restaurants often clean equipment or dump mop wash water outdoors. The discharge of any type of wastewater into the storm drainage system is unlawful.	• Distribute educational poster to local restaurants • Disseminate business checklist to ensure stormwater-friendly practices • Encourage employee training on wastewater practices, proper chemical use and disposal, etc. • Promote compliance with the illicit discharge ordinance via GTV and website

Assessment & Evaluation

- Conduct a survey of restaurants to gauge compliance with local stormwater ordinances and stormwater-friendly practices

- Periodically assess the pesticide application habits of homeowners and landscape professionals by:
    - Direct observation of pesticide application habits of homeowners and landscape professionals
    - Surveys of pesticide application habits of homeowners and landscape professionals
- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically focusing on illicit discharge tested locations

Target Pollutant: LITTER (plastic, paper, cigarette butts, etc.)

Litter is generated as a result of improperly discarded plastics, food wrappers, cigarette butts, etc. that can wash into waterways via the storm drainage system and impact habitat, wildlife, and water quality.

Pollutant Source:
Likely Residential Sources: Motorists, Smokers, General public, Trash pickup incidental litter, etc.
Likely Commercial/Industrial Sources: Restaurants, Retail Centers, Construction Sites, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Litter is carried by stormwater runoff into the drainage system where it can clog storm drains and drainage routes and cause flooding on streets and property.
- Litter that washes into local surface waters can be mistaken by fish, birds and other wildlife for food that become sick or die from ingesting it. Wildlife also can become entangled in litter and die as a result.
- Litter is often produced as a result of being dropped during trash pickup.
- Litter introduces chemical pollutants into waterways, such as plastics and cigarette butts.
- Cigarette butts are a major source of litter and contain many dangerous toxins that can leach into waterways.
- Littered areas beget litter; areas that are clean tend to repel litter.

Target Pollutant: LITTER (plastic, paper, cigarette butts, etc.)

Key Outreach Messages:

- Flooding of streets/property is sometimes attributed to the accumulation of litter in the drainage system.
- A direct link exists between animal impacts, habitat destruction, and water quality as a result of littering.
- Cigarette butts leach chemicals such as cadmium, lead, and arsenic into the aquatic environment within one hour of contact with water.
- The 2011 Ocean Conservancy International Coastal Cleanup identified cigarette butts as the #1 most littered item.
- Litter attracts wildlife to the side of the road where they are likely to get hit by oncoming vehicles.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally. BMPs can also trap litter so it doesn't wash away.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Youth (8th grade presentations)	Litter habits cannot be confined to a particular demographic in most cases. However, targeting 8th graders during yearly presentations should be a priority since they are in the developmental stage of thinking and forming opinions.	• Make students aware of the impact of littering and the toxicity of many littered items • Emphasize easy solutions to littering - using trash or recycling receptacles • Promote the 5 R's: Reduce, Reuse, Recycle, Refuse, Repurpose • Explain the negative impacts on wildlife species (i.e. plastic bags look like jellyfish to sea turtles)
Smokers	Cigarette butts are the largest environmental litter problem both locally and worldwide. Target both male and female smokers.	• Display signs encouraging proper disposal of cigarette butts in public areas (i.e. Wave Transit buses) • Post outreach materials on stormwater website and GTV • Encourage use of ashtrays for smokers • Distribute pocket ashtrays at public events
Motorists and Pedestrians	Along roadways, motorists (52%) and pedestrians (23%) are the largest contributors of litter. Target males and females.	• Educate citizens about North Carolina's Swat-A-Litterbug program via website and GTV • Remind motorists about the proper disposal of trash by displaying educational signs on public transportation vehicles (i.e. Wave Transit buses) • Encourage use of car litterbags for proper trash disposal

Assessment & Evaluation

- Conduct an informal poll before 8th grade presentations to gauge how many students litter and then pledge not to litter after the presentation.
- Elicit count of Stormwater Maintenance Department responses to clogged stormwater drainage system components as a result of litter.
- Have Stormwater Maintenance crews continually provide field observations of problem litter areas for clean-up by community service workers or Cape Fear River Watch.
- Periodically assess the litter disposal habits of Wilmington residents by:
  - Direct observation of habits
  - Surveys of habits
  - Count of citations issued pertaining to improper litter disposal habits
  - Count of reported violations to Stormwater Hotline, Keep America Beautiful of NHC, or Swat-a-Litterbug from New Hanover county

Target Pollutant: VEHICLE POLLUTION (vehicle fluids, washing soaps/detergents, etc.)

Vehicle pollution comes from the intentional or unintentional disposal of vehicle fluids into our waterways, some of which washes off impervious surfaces into the drainage system or is disposed of improperly. These fluids are insoluble and can easily contaminate water resources, as well as poison fish and other aquatic organisms.

Pollutant Source:
Likely Residential Sources: Motorists, Backyard Mechanics
Likely Commercial/Industrial Sources: Vehicle Maintenance Repair Shops, Mobile Detailers, Dealership Lots

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Vehicles have seals and gaskets that have the potential to leak a variety of fluids, such as oil and grease. An accumulation of these fluids on roadways and parking lots gets carried away by stormwater runoff emptying into our waterways.
- Commonly, it is the backyard mechanic that is illegally dumping or draining vehicle fluids.
- 1 quart of motor oil can contaminate 250,000 gallons of water.
- Once vehicle pollution enters a body of water, it disperses quickly and forms a film on the water's surface, making oxygen transfer from the surface to the bottom difficult, as well as toxic for aquatic organisms.
- It is a common watershed behavior to wash vehicles on impervious (hard) surfaces
- Washing vehicles or boats can cause nutrients, heavy metals, hydrocarbons and grime to wash down the street and into waterways.
- Soaps and detergents used to wash vehicles or boats are carried into storm drains and eventually into our waterways. These chemicals can destroy the external mucus layer on fish that protects them from bacteria and parasitic infections.
- Vehicle washers are typically unaware of the content of washing soaps and detergents and their impact on water quality.

Target Pollutant: VEHICLE POLLUTION (vehicle fluids, washing soaps/detergents)

Key Outreach Messages:

- There is a direct link between the introduction of vehicle fluids and water quality degradation, habitat destruction and plant/animal death.
- All vehicles, machinery, and equipment that utilize vehicle fluids (i.e. oil, grease) for operation have the potential to leak and contribute to water pollution.
- Keep vehicles tuned up, check and repair leaks, check tire pressure, and recycle or properly dispose of vehicle fluids and batteries.
- Properly clean up vehicle leaks and fluid spills using an absorbent material (i.e. kitty litter) to soak up the spill. Sweep up contaminated absorbent, put in a sealed bag and place in the trash.
- Driving less, carpooling or using alternative transportation are some of the best ways to prevent vehicle pollution.
- Washing vehicles or boats using soaps/detergents can negatively affect water quality by contaminating them with chemicals, debris, or sediment that is washed off of vehicles, driveways, parking lots, etc.
- Wash vehicles on the grass using a phosphate-free detergent, and/or use a commercial car wash which recycles and treats wash water. If you must wash on pavement, use plain, clear water and no chemicals.
- On-site storage (i.e. fluids, batteries) has the potential to leak during filling, emptying, storage unit failure, or vandalism.
- Business owners should be aware of and abide by the City's Illicit Discharge Ordinance which states that
  - Anyone found responsible for causing a polluting substance to enter the storm drainage system will be subject to a fine up to $10,000 per violation.
  - The city will have the authority to enter property to inspect for illicit discharges, and if found, to require that they be disconnected and permanently closed.
  - Commercial businesses will not be permitted to wash vehicles, equipment, or any other surfaces with any soaps or solvents or dislodge any other substance that may be harmful to surface waters, unless the resulting wastewater is diverted to the sanitary sewer system.
  - Restaurants will not be permitted to discharge any wastewater outside.
  - Dumpster lids must be kept closed and dumpster plugs in place.
  - Swimming pool water must be de-chlorinated before discharging.
  - Floor drains in old buildings, connected to the storm drainage system, will be required to be disconnected and permanently closed.
  - Residents and businesses will be expected to prevent harmful substances from running off into the storm drainage system.
  - Fines for non-compliance with the City's illicit discharge ordinance are up to $10,000 per offense.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
General Public/ Backyard Mechanics	All citizens of driving age have the potential to contribute to vehicle pollution by nature of driving the vehicle or washing it. For backyard dumping of auto fluids, target males.	• Emphasize vehicle maintenance is the #1 priority (i.e. tune ups) • Post outreach materials on stormwater website and GTV • Promote alternative methods of transportation (i.e. public transportation, carpooling, bikes, walking, bio-fuels) • Encourage the utilization of the stormwater hotline to report illegal fluid dumping • Encourage environmental stewardship to practice eco-friendly vehicle washing using commercial car wash businesses or washing vehicles in a grassy area to absorb polluted runoff • Mark storm drains in visible areas to prevent illegal dumping
Vehicle Maintenance Repair, and Auto Parts	Businesses in auto parts or maintenance/repair-related fields deal with vehicle fluids on a regular basis. Most	• Distribute Auto Care educational poster to businesses for employees to learn about proper vehicle maintenance, fluid storage and disposal methods, and the City's Illicit Discharge

Businesses	employees are male.	ordinance • Post outreach materials on stormwater website and GTV
Pressure Washers, Vehicle Washing Businesses, Dealership Lots	Vehicle washing businesses often use cleaning agents containing chemicals that are harmful to our waterways. These chemicals, along with other vehicle fluids, can be easily washed into the storm drainage system. Employees are typically male.	• Distribute educational flyer to businesses • Encourage environmental stewardship to practice eco-friendly vehicle washing using commercial car wash businesses or washing vehicles in a grassy area, or washing using plain water and no chemicals over pavement • Post outreach materials on stormwater website and GTV

Assessment & Evaluation

- Periodically assess vehicle fluid disposal habits of Wilmington residents and businesses
  - Direct observation of habits
  - Surveys of habits
  - Count of reported violations pertaining to chemical leaks or disposal habits to Stormwater Hotline
- Periodically assess vehicle washing and exterior home washing habits of Wilmington residents by:
  - Direct observation of habits
  - Surveys of habits
- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality monitoring

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APPENDIX C: PUBLIC INVOLVEMENT AND PARTICIPATION

Included in this section:

- BMP Reporting Table
- Cumulative Year End Reports for Contractual/Cooperative Agreements with:
  - Cape Fear River Watch
  - New Hanover Soil & Water Conservation District

DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION
BMP a. Volunteer community involvement program					
Community Event/Participation					
3/7/2012	UNCW Off Campus Housing Fair	Off Campus Students	Stormwater Enforcement staff	Display booth with stormwater info and giveaways; direct contact with students	500 attendees
4/1/2012	Paws for People 5k at UNCW	Pet owners	NHSWCD staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets and can submit photos to be featured on city website	32 pet owners signed pledge and received dog bandana, treats, and stormwater literature.
4/22/12	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater staff (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth to promote native plants and the reduction in the use of fertilizers/pesticides/water.	Stormwater information distributed. 4,000+ attendees
5/5/2012	Greenfield LakeFest	Festival patrons	Stormwater staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets and can submit photos to be featured on city website	16 pet owners signed pledge and received dog bandana, treats, and stormwater literature.
5/12/2012	Battleship Splash Dog Event	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	10+ pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
6/28/2012	Bradley & Hewletts Creek Public Input Meeting	Watershed residents Media General Public	City Stormwater Services, Planning, & Engineering Divisions NC Coastal Fed. Town of WB UNCW Withers & Ravenel	Powerpoint Presentation Watershed Stations Public input form Q & A	Contacted homebuilders, environmental groups and issued press releases and web updates prior to meeting
2/23/13	Pet Expo @ the Schwartz Center	Pet owners	NHSWCD staff	Canines for Clean Water booth - interactive event where pet owners sign a pledge to be clean up after their pets	30+ pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website

3/23/2013	Walk for Those Who Can't Pet Walk	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	33 pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
4/16/2013	Going Green Earth Expo	Hospice workers and volunteers	Stormwater staff	Featuring vendors for home, health and the environment.	Debuted the Water Systems Graphic and "tested" partcipants
4/20/2013	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater Services (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth, interactive game and giveaways to promote stormwater pollution prevention by installing native plants	Approx 4,000 attendees
5/5/2013	Battleship Splash Dog Event	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pets	37 pet owners signed pledge and received dog bandana, treats, and stormwater literature. Dogs have a chance to be featured on city website
5/31/2013	Career Day at Winter Park Elementary	4 & 5th graders	Stormwater staff	Interactive booth	100 students

Monthly Public Rain Barrel Sale

Ongoing - 2nd Thursday of every month	Monthly Rain Barrel Sales	General public	Stormwater staff NHSWCD	Monthly rain barrel sale to the general public; held 2nd Thursday of each month at NHC Government Center with partner agency, NHSWCD	Stormwater runoff reduction and water conservation education 2 different rain barrels offered to public

Storm Drain Marking

Ongoing campaign	Campaign to place storm drain markers and educational doorhangers throughout the City	City residents, businesses, landscapers	Contract agencies: CFRW NHSWCD	Stormwater awareness and pollution prevention	Markers were placed in the Greenfield Lake Watershed, Carolina Heights, and Forest Hills neighborhood this year

Stream & Litter Clean-ups

March 2012-June 2013	8 watershed cleanup events including the Annual Big Sweep event	Volunteers	Cape Fear River Watch staff and volunteers	Watershed cleanup and/or invasive species vegetation removal Areas cleaned include Greenfield Lake, Smith Creek, Cape Fear River, Randall Pond, Kerr Avenue Wetland	8 cleanup events 163 volunteers contributed a total of 382 hours. Collected 155 (30 gallon) and 10 (40 gallon) bags of trash and/or invasive species vegetation

Watershed Watch Creek Monitoring

July 1, 2012- June 30, 2013	Volunteer monitoring of creek segments	CFRW Volunteers	CFRW	Volunteers conduct bi-monthly observations in area creeks and provide monitoring reports to Stormwater Services	Observations include creek and corridor conditions, vegetation and wildlife present, litter quantity and suggestions for remediation.

Contracts/Cooperative Agreements

The City of Wilmington contracts annually with Cape Fear River Watch (CFRW) and New Hanover Soil & Water Conservation District (NHSWCD) to implement additional public involvement and participation activities, as well as education and outreach activities. Both organizations sign a yearly contract with the City of Wilmington that includes specific deliverables that enable the City to meet many of the NPDES requirements. Copies of these contracts and a year end report are included in the Appendix. Below is a summary of each organization's annual deliverables in regards to NPDES and facilitating volunteer community involvement activities:

CFRW - 8th grade Enviroscape classroom presentations, community education programs and eco-tours, volunteer storm drain marking, volunteer watershed cleanup events, volunteer creek monitoring program, grant projects and local water quality initiatives partnership, Greenfield Lake & Kerr Ave. monitoring/education, support for NPDES public meetings and education efforts, quarterly reporting and administration.

NHSWCD - 8th grade Enviroscape classroom presentations, pet waste (fecal coliform) education and pet events, Stormwater 101 presentations, local community outreach events, LID education, community presentations, environmental field days, education website promoting stormwater awareness,volunteer storm drain marking, grant projects and local water quality initiatives partnership, NCCAP BMP administration and implementation, monthly Rain Barrel Sale, Stewardship Award Program coalition member, Hewletts Creek conservation easement administrator, support for NPDES public meetings and education efforts, quarterly reporting and administration.

BMP b. Mechanism for Public involvement

Public Meetings

6/28/2012	Bradley & Hewletts Creek Public Input Meeting	Watershed residents Media General Public	City Stormwater Services, Planning, & Engineering Divisions NC Coastal Fed. Town of WB UNCW Withers & Ravenel	Powerpoint Presentation Watershed Stations Public input form Q & A	Contacted homebuilders, environmental groups and issued press releases and web updates prior to meeting
10/15/12	Targeted direct mail	Greenville Ave residents	Stormwater staff Dewberry Consulting	Project information and public meeting announcement	Mailed to citizens & businesses in the area of the Greenville Ave. drainage project
11/1/12	Public Input Meeting	Greenville Ave residents	Stormwater staff Dewberry Consulting	Project information and citizen input	Approx 12 residents from the Greenville Ave area attended the public meeting
12/12/2012	Targeted doorhangers and public input	Residents and commercial businesses affected by Water & Ann Street stormwater project	Stormwater staff	Water & Ann Street Project information	Project info, map, and lane closure doorhanger notice distributed to local residents

12/12/2012	Targeted doorhangers and public input	Residents and commercial businesses affected by Walnut & Front Street stormwater project	Stormwater staff	Walnut & Front Street Project information	Project info, map, and lane closure doorhanger notice distributed to local residents
1/7/2013	Direct mailing to Restaurants in Wilmington city limits (Year 1 of mailing and survey)	Wilmington Restaurants	Stormwater staff	Mailed code enforcement letter, restaurant education poster, and return mail survey	Year 1 of the education effort resulted in 15 returned surveys and a 90% correct response rate
4/8/2013	Public Input Meeting	Antelope Trail & Kelly Road residents affected by stormwater project	Stormwater staff	Public meeting to discuss drainage project with residents	15 residents in attendance
4/8/2013	Public Input Meeting	Brookshire & Beasley Roads affected by stormwater project	Stormwater staff	Public meeting to discuss drainage project with residents	50 residents in attendance

BMP c. Maintain Hotline/Help line

The Stormwater Pollution Prevention Hotline was established in January 2010 to field calls from the citizens, businesses, and city employees regarding illicit discharges and other reports of stormwater pollution. The hotline phone # is **910-341-1020** and the web address is **www.wilmingtonnc.gov/reportstormwaterpollution.** Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to all hotline reports. Information regarding hotline reports is included in the Enforcement Appendix section including type of number of hotline phone and web reports and the nature of the reports.

Ongoing	Stormwater Hotline info advertised using various outreach methods: truck magnets, signs, billboards, etc.	General public	Stormwater staff	Hotline poster, website, GTV-8 and promo items (pens, magnets, sticky notes) are used to raise awareness of the Stormwater Hotline	Developed to raise public awareness about the stormwater hotline and web reporting form

Cumulative Year End Contract Agency Reports

CAPE FEAR RIVER WATCH
617 Surry Street
Wilmington, NC 28401
(910) 762-5606
www.capefearriverwatch.org

Quarterly Progress Report #4: April 1 - June 30, 2013

Cape Fear River Watch, Inc. (CFRW), under contract with the City of Wilmington Stormwater Services, will provide the following services for the time period consistent with the City's fiscal year from **July 1, 2012** through **June 30, 2013** for the agreed amount of $**15,000**. These contracted services assist the City in meeting requirements of the federal NPDES Stormwater Permit.

Public Education/Outreach *Total Allocated Cost: $5000*

Conduct Enviroscape Presentations for at least 1/3 of 8th grade science classes in New Hanover County Schools each semester for the entire school year. The Enviroscape presentation is an integral component of the 8th grade science curriculum in New Hanover County Schools. Presentations will be done in coordination with other environmental agencies and will focus on the specific NC Essential Standard and objectives for the Hydrosphere unit. Enviroscape instructors will be trained, certified, and follow all applicable Enviroscape policies and procedures as set forth by the City of Wilmington Stormwater Services. A maximum of 3 trained Enviroscape instructors from each agency (which includes the Enviroscape supervisor) are permitted to deliver presentations in 8th grade. CFRW will also work cooperatively with Stormwater Services to provide additional presentations in addition to the 8th grade program, as needed. A summary will be provided for each additional presentation given. CFRW was provided with city funds to purchase an Enviroscape for the express purpose of being available to conduct 8th grade presentations. Additional presentations should not conflict with the 8th grade presentations in any fashion. **($2500)**

July 1 - September 30, 2012

Other Enviroscape Presentations				
Date	**School/Event**	**Grade**	**# of presentations**	**# of students**
7/13/12	Eco Camp	3 - 8	1	11

October 1 - December 31, 2012

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**

10/17/12	Lake Forest Academy	8	1	25
10/23/12	Roland Grise	8	2	45
10/24/12	Roland Grise	8	1	28
11/28/12	Holly Shelter	8	2	45
12/5/12	Trask	8	3	55
12/6/12	Trask	8	1	28

January 1 - March 31, 2013

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
3/5/13	Murray	8	2	45
3/12/13	Murray	8	1	24
3/13/13	Murray	8	2	45
3/21/13	Myrtle Grove	8	2	43

April 1 – June 30, 2013

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
4/11/13	Noble	8	3	65
4/23/13	Williston	8	1	25
Other Enviroscape Presentations				
Date	**School/Event**	**Grade**	**# of presentations**	**# of students**
6/17/13	Eco Camp	3 - 8	1	6

Provide educational programs for Wilmington residents. Educational programs include First Saturday Seminars, presentations to community and civic organizations, and other scheduled talks in the community. Educational programs for homeowners associations should be planned and coordinated with Stormwater Services. Educational programs will also include eco-tours and birding tours at Greenfield Lake and Smith Creek paddling tours. Efforts will be made to inform the local media about educational programs. **($2500)**

July 1 - September 30, 2012

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
7/7/12	Fire in the Coastal Plains	Angie Carl – from the Nature Conservancy	60
8/4/12	ocean garbage gyres	Bonnie Monteleone - UNCW	65
9/1/12	Sustainable Landscaping	Matt Collogan – Airlie Gardens	65
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
8/4/12	Sierra Club Mtg.	Water Quality/Kemp Burdette	35
8/22/12	Girl Scouts	Water Quality/Kemp Burdette	6
9/17/12	UNCW	Water Quality/Kemp Burdette	25
9/20/12	UNCW	Water Quality/Kemp Burdette	35
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
7/17/12	WaterKeeper Camp	Eco Tour GFL	12
8/14/12	Eco Camp	Eco Tour GFL	11
9/15/12	UNCW Writing Class	Eco Tour GFL	12

October 1 - December 31, 2012

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
10/6/12	Water quality panel	Roger Shew, Larry Cahoon, Rick Shiver	70
11/3/12	Water quality movie - "FLOW"	Kemp Burdette – opening comments	50
12/1/12	History of Moores Creek	Chris Fonvielle	60
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
10/25/12	Solomon Towers	Water Quality/Kemp Burdette	20
11/1/12	Rankin Terrace	Water Quality/Kemp Burdette	20
11/29/12	UNCW OLLI	Water Quality/Kemp Burdette	100
11/29/12	Taylor Homes	Water Quality/Kemp Burdette	30
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
10/30/12	UNCW students	Eco Tour GFL by kayaks and canoes	11
11/5/12	Sunset Park 4th graders	Eco Tour GFL and Water Quality paddle boat tour	100
11/17/12	Girl Scouts 2nd and 3rd graders	Eco Tour GFL focusing on Water Quality	12

January 1 - March 31, 2013

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
02/02/13	Barrier Island Dynamics	Suzanne Dorsey	68
03/02/13	SE NC Butterflies	Gloria Kidd	62
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
01/19/13	StriperFest Education Day	Anadromous fish in the CF river/Kay Lynn	300
02/04/13	Cape Fear Audobon	Water Quality/Kemp Burdette	20
02/05/13	Cape Fear Ski and Outing Club	Water Quality/Kemp Burdette	50
02/06/13	GOPC Kayak Club	Water Quality/Kemp Burdette	20
02/07/13	Boy Scouts	Water Quality/Kemp Burdette	4
02/20/13	Civitans	Cape Fear River Environmental Educ./Kay Lynn	75
02/27/13	UNCW OLLI	Water Quality/Kemp Burdette	30
02/28/13	Rotary	Water Quality/Kemp Burdette	25
03/02/13	Boy Scouts	Water Quality/Kemp Burdette	3
03/10/13	ASU	Water Quality/Kemp Burdette	15
03/13/13	UNCW Class	Water Quality/Kemp Burdette	3
03/14/13	Cape Fear Garden Club	Water Quality/Kemp Burdette	20
03/17/13	Boy Scouts	Water Quality/Kemp Burdette	3
03/20/13	DREAMS	Cape Fear River Environmental Educ./Kay Lynn	20
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
03/02/13	HS political science class	Eco tour by water/Stormwater +/GFL	12
03/20/13	Forest Hills Elementary 4th Graders	Eco Tour/Raindrop Journey/ GFL	60

April 1 - June 30, 2013

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**

04/6/13	Offshore Wind	Zac Keith	62
05/4/13	Endocrine Disruptors in Water	Dr. Susanne Brander	50
06/1/13	Sea Level Rise and Coastal Issues	Dr. Roger Shew	60
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
4/9/13	Snipes Elementary	Stormwater and eco-camps	300
4/12/13	NHHS Senior geography class	Water quality and enviro. Protection	25
4/22/13	UNCW OLLI	Greenfield Lake	35
4/24/13	UNCW History Dept.	Environmental history/issues of Cape Fear Region	30
4/25/13	UNCW OLLI	Greenfield Lake	25
6/12/13	UNCW Island Ecology	Environmental Issues of the CFR Basin/KLH	20
6/21/13	UNCW MPA Program	Environmental issues in Lower Cape Fear	20
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
4/3/13	Trask students	Walking Eco Tour/GFL	120
4/4/13	Trask students	Walking Eco Tour/GFL	120
4/10/13	Snipes 4th Grade	Raindrop Journey/GFL	90
4/18/13	Master Gardeners	Walking Eco Tour/Native Plants/GFL	10
4/12/13	Boy Scouts	Walking Eco Tour/GFL	15
4/29/13	Snipes 2nd Grade	Walking Eco Tour/GFL	87
5/4/13	LakeFest	Walking Eco Tours/GFL	60
6/20/13	Eco Campers	Walking Eco Tour/GFL	6
6/26/13	Eco Campers	Walking Eco Tour/GFL	14

Public Involvment/Volunteer Efforts

Total Allocated Cost: $5000

Encourage public involvement by engaging city residents/businesses/civic groups in a volunteer Storm Drain Marking program in the city to educate residents about stormwater pollution. A minimum of 2 separate volunteer days is required. For each outing day, a minimum of 7 markers will be applied per volunteer group and doorhangers will be distributed to surrounding residences/businesses. Staff will assist in identifying areas to mark drains, train volunteers in marking and safety, educate volunteers about the purpose of the program, use supplied markers, and help provide oversight of the program. A trained CFRW staff member is required to be present during all storm drain marking activities and with each volunteer group. **($500)**

October 1 - December 31, 2012

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**Volunteers**	**Area Marked & # of Storm Drains Marked**
10/30/12	UNCW Service Course Volunteers	6	21st St. and Pender, 8
12/15/12	Girl Scouts	10	Keaton Ave., 7

Coordinate volunteer clean-ups of local, city watersheds. These cleanups will focus on Greenfield Lake, Smith Creek, Burnt Mill Creek, Barnards Creek, the Cape Fear River, and as the need is discovered by the city or Watershed Watch volunteers. A minimum of 7 clean-ups will be completed including at least one site for Big Sweep, an annual international clean-up. Local watershed clean-ups may also include volunteer efforts to remove wetland and aquatic invasive

plants with a focus on Greenfield Lake, Kerr Ave, and the Mary Bridger Wetland. A summary of each clean-up will be completed and submitted to Stormwater Services. *Reports will be submitted using supplied templates and within 10 days of the cleanup event.* Reports will include: the specific watershed, the location within the watershed that was cleaned, number of participants, hours worked, estimate of the quantity of waste materials removed, and if possible photographs to document work completed. Efforts will be made to inform the local media about upcoming cleanup events. **($2500)**

July 1 - September 30, 2012

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# Volunteers/Hours Contributed**
8/11/12	Burnt Mill Creek	Randall Pond	Seventeen 30 gal. bags of trash	18/36
9/29/12	Greenfield Lake	Lake, Park, and adjacent areas – Big Sweep event	Sixty eight 30 gal. bags of trash, tires, a tent	62/153

October 1 - December 31, 2012

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# Volunteers/Hours Contributed**
10/24/12	Barnards Creek	Keg Island	Ten 40 gal. bags of trash and five tires	10/45

January 1 - March 31, 2013

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# Volunteers/Hours Contributed**
01/12/13	Greenfield Lake	Greenfield Lake, Park and Gardens	Eighteen 30 gal. bags of trash	15/33.75
02/09/13	Burnt Mill Creek	Randall Pond and park	Thirty 30 gal. bags of trash	21/42
03/09/13	Burnt Mill Creek	Empie Park	Eight 30 gal. bags of trash	8/8

April 1 - June 30, 2013

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# Volunteers/Hours Contributed**
5/11/13	Burnt Mill Creek	Forest Hills Dr.	ten **30** gallon bags	15/30
6/22/13	Barnards Creek	Keg Island	four **30** gallon bags	14/35

Conduct a volunteer watershed monitoring program and alert Stormwater Services when volunteers find problem areas. Every other month Watershed Watch volunteer monitoring activities will be conducted and will target high priority creeks or creek sections identified in cooperation with Stormwater Services. A monitoring report with basic field observations and photo documentation will be maintained and submitted for review to Stormwater Services at least every other month. In addition, significant water quality problems identified during observation monitoring will be reported immediately to the appropriate officials. *Reports will be submitted within 10 days of monitoring.* **($2000)**

July 1 - September 30, 2012
Watershed Watch Reports were submitted in both August and September for Burnt Mill Creek/Shirley Rd. and also for Burnett Blvd. ditch beside Cape Fear Outdoor Equipment in the Greenfield Lake Watershed and also for Burnt Mill Creek/Grace St..

October 1 - December 31, 2012
Watershed Watch Reports were submitted for November for Smith's Creek/Shirley Rd. and also for Burnett Blvd. ditch beside Cape Fear Outdoor Equipment in the Greenfield Lake Watershed and also for Burnt Mill Creek/Grace St..

January 1 - March 31, 2013
Watershed Watch Reports were submitted for both January and March for Smith's Creek/Shirley Rd. and also for Burnett Blvd. ditch beside Cape Fear Outdoor Equipment in the Greenfield Lake Watershed and also for Burnt Mill Creek/N. 19th St..

April 1 - June 30, 2013
Watershed Watch Reports were submitted for June for Smith's Creek/Shirley Rd. and also for Burnt Mill Creek/N. 19th St..

Programs/Partnerships

Total Allocated Cost: $1000

Serve as an active partner organization on local grant projects and initiatives that benefit local surface water quality and water resources. Examples may include the Greenfield Lake wildlife feeding project, NCSU street retrofit grant project, and the Smith Creek paddle trail. **($1000)**

July 1 - September 30, 2012
Project Title: The Cape Fear River Community Watershed Protection Program
EPA Environmental Justice Grant
Partners: SEACC, Working Films and Martin Luther King Center - The purpose of the Watershed Protection program is twofold: to give underserved children between the ages of 8-17 access to quality environmental education programs, and to create an educational foundation for these youth which will serve as a long term watershed protection program. The project started in July and is still ongoing.
Greenfield Lake Boat Rental Staff have spoken to several dozen park visitors, informing them about the Wildlife Feeding Education Campaign and directing them to the newly erected signs explaining the harm caused by feeding wildlife. CFRW has posted the message translated into Spanish by a local teacher who assigned the translation to her classes as a homework assignment.

Two CFRW board members and one staff member participated in a local watershed stewardship focus group hosted by the UNC Institute for the Environment.

October 1 - December 31, 2012
Greenfield Lake Boat Rental Staff have spoken to several dozen park visitors, informing them about the Wildlife Feeding Education Campaign and directing them to the newly erected signs explaining the harm caused by feeding wildlife.

CFRW representatives Roger Shew and Bill Murray actively participated in the Nov 15th Kerr Avenue joint meeting with COW SWS.

January 1 – March 31, 2013

Greenfield Lake Boat Rental Staff have spoken to several dozen park visitors, informing them about the Wildlife Feeding Education Campaign and directing them to the erected signs explaining the harm caused by feeding wildlife.

CFRW Education Specialist has included a lesson regarding the Wildlife Feeding Education Campaign for both land and water eco-tours, at GFL. 72 people educated during this quarter.

April 1 - June 30, 2013

Eagles Island Coalition Paddle - May 10. CFRW is a partner in the coalition and we organized and provide kayaks for participants.

CFRW is participating in the Lower Cape Fear Sustainable Communities Consortium FOCUS program-it's a sustainable planning effort. Meetings 4/10 and 5/2 with FOCUS staff.

CFRW's Executive Director is a member of the COW Comprehensive Plan Steering Committee which has met several times during the quarter.

Greenfield Lake Boat Rental Staff have spoken to several dozen park visitors, informing them about the Wildlife Feeding Education Campaign and laws regarding alligators.
The CFRW Education Specialist worked in the Wildlife Feeding Project initiative into environmental education events including all walking eco tours of GFL, Raindrop Journey, Eco Camp, Waterkeeper Camp, Paddling Eco tours of GFL, LakeFest, etc. An estimated 696 people have been educated about the consequences of feeding waterfowl and alligators this quarter.

Monitoring Activities

Total Allocated Cost: $3000

Monitor, maintain, and provide outreach/education for the Kerr Avenue Stormwater Wetland. Activities include clean-ups, maintenance of plants as needed, and evaluation/ feedback on larger maintenance needs. A brief monitoring report will be sent monthly via e-mail to Stormwater Services for the period of April through November. *Observations will be conducted between the 20th – 24th of each month and reports will be submitted using supplied templates within 10 days of observation*. The monitoring report will include observations such as water clarity, invasive species, algae, wildlife, maintenance/restoration opportunities, photographs, and if applicable, the number of participants, hours worked, and brief description of the work/activity completed. Outreach/education activities will include presentations to groups or periodic outreach such as information provided to educate business owners/operators and property owners in close proximity to the Kerr Ave wetland. **($1350)**

July 1 - September 30, 2012

Monitoring Reports for July, August, and September were completed and submitted.

October 1 - December 31, 2012

Monitoring Reports for October and November were completed and submitted.

Kerr Ave. Public Outreach conducted by volunteer, Josh Warmack November 27th 2012. Businesses visited include: Wellness Therapies, Goodnight Sleepstore, Cookout, Burger King, K-Mart, Taco Bell, McAlister's Deli, Apple Annies, Long Island Eatery, Dicks Sporting Goods, Harris Teeter, Chili's, PT's Grill. A Southern Tyme, Lifeline Pregnancy Center, A Shear Distinction, Still Waters Salon, Silver Shears Hair Styling, Anthony's Hair and Body, Tonia's Exclusive Hair Gallery, Hairlinz Design Group, Trolly Stop Hot Dogs, Art and Frame Center, C and S Paint, ILM Furniture and Mattress Co., ACE Laundromat, $2.50 Cleaners, Taqueria La Tapatia, Warehouse 9.com Radio Control Hobby Store, Sally Beauty Supply, A Place to Bead, Bling Mart, Elly Dee's Fine Consignment, Teacher's Aid Education Superstore, Big Gal's Boutique, Kwik Tan

April 1 - June 30, 2013
Monitoring Reports for April, May, and June were completed and submitted.

Monitor and evaluate the condition of Greenfield Lake, including the aquatic vegetation management techniques implemented to improve the water quality of the lake. A brief monitoring report will be sent monthly via e-mail to Stormwater Services for the period of April through November. *Observations will be conducted between the 26th – 30th of each month and reports will be submitted using supplied templates within 10 days of observation.* The monitoring report will include observations from specified locations around the lake highlighting water clarity, invasive species, algae, wildlife, spillway depth, maintenance and restoration opportunities, and photographs. **($1650)**

July 1 - September 30, 2012
Monitoring Reports for July, August, and September were completed and submitted.

October 1 - December 31, 2012
Monitoring Reports for October and November were completed and submitted.

January 1 – March 31, 2013
Monitoring Reports for January and March were completed and submitted.

April 1 - June 30, 2013
Monitoring Reports for April, May, and June were completed and submitted.

Contract Administration

Total Allocated Cost: $1000

Quarterly progress reports and invoices will be submitted in accordance with the following provisions: *Quarterly reports and invoices are due within 10 days of the quarter end date and will follow templates and instructions set forth by Stormwater Services.* Reports and invoices that do not follow templates/instructions will be returned for correction; payment will be processed once updated reports and invoices are received, reviewed, and approved.

Submit cumulative quarterly progress reports according to the following quarters: July 1 - Sept 30; October 1 - Dec. 31; January 1 -March 31; April 1 - June 30. The 4th quarter progress report will serve as a compiled year end summary report.

The quarterly invoice should use the supplied template which shows the % of each service completed each quarter, invoice amount, and amount remaining to be paid. Invoices will be paid once quarterly progress report and invoice are received and reviewed by the City for adequate progress. Non-performance or inadequate progress may result in non-payment. No pre-payment of services will occur.

Contact person: Stormwater Services requires one main point of contact for the implementation, management, and communication and reporting of this annual contract. This staff person will be the individual that implements the majority of contract services, and therefore will be the most familiar with the contract. The designated contact person is: **Scott Whitham ($1000)**

Other: ***Do not assign a cost.***
Assist Stormwater Services in implementing additional public outreach, education, involvement, and participation activities required by federal NPDES stormwater permit. Summary reports and information may be included in the City's NPDES yearly report to the State.

The contract administrator has voluntarily received permission and posted educational signs at Cypress Grove Apts. regarding litter, wildlife feeding, and pet waste.

The contract administrator has voluntarily logged dozens of hours each month picking up and properly disposing trash from in and around Greenfield Lake.

Report compiled by: **Scott Whitham** **Date:** 7/1/13

NEW HANOVER SOIL & WATER CONSERVATION DISTRICT
230 Market Place Drive, Suite 100
Wilmington, NC 28403

Quarterly Progress Report #4: April 1 – June 30, 2013

New Hanover Soil & Water Conservation District (NHSWCD), under contract with the City of Wilmington Stormwater Services, will provide the following services for the time period consistent with the City's fiscal year from **July 1, 2012** through **June 30, 2013** for the agreed amount of **$26,500**. These contracted services assist the City in meeting requirements of the federal NPDES Stormwater Permit.

Public Education/Outreach

Total Allocated Cost: $13,250

Conduct Enviroscape Presentations for at least 1/3 of 8th grade science classes in New Hanover County Schools each semester for the entire school year. The Enviroscape presentation is an integral component of the 8th grade science curriculum in New Hanover County Schools. Presentations will be done in coordination with other environmental agencies and will focus on the specific NC Essential Standard and objectives for the Hydrosphere unit. Enviroscape instructors will be trained, certified, and follow all applicable Enviroscape policies and procedures as set forth by the City of Wilmington Stormwater Services. A maximum of 3 trained Enviroscape instructors from each agency (which includes the Enviroscape supervisor) are permitted to deliver presentations in 8th grade. Additional presentations should not conflict with the 8th grade presentations in any fashion. Other efforts may include assisting with curriculum development, outreach, teacher relations, and training instructors. **($1987.50)**

July 1 - September 30, 2012

Attended training 8/30/12 at City Stormwater Services. Provided feedback on new script to meet new core standards in North Carolina, as well as trained current intern on procedure of presentation. Also attended scheduling meeting 9/11/12 where we also gave input on the county-wide watershed delineation map.

October 1 - December 31, 2012

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
10/24/2012	Roland Grise	8th	2	62
10/25/2012	Roland Grise	8th	2	54
11/27/2012	Holly Shelter	8th	2	46
11/28/2012	Holly Shelter	8th	2	46
12/4/2012	Trask	8th	2	60

January 1 - March 31, 2013

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
3/19/2013	Myrtle Grove	8th	2	66
3/21/2013	Myrtle Grove	8th	4	124

Attended meeting 2/13/13 regarding redesign of underground pipe system that carries different sources of water. Provided drawing and comments via email after meeting regarding design of final graphic to be introduced next year. Also attended enviroscape scheduling meeting 2/22/13.

April 1 - June 30, 2013

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
4/23/2013	Williston	8th	1	23
4/24/2013	Williston	8th	2	54
5/1/2013	Noble	8th	3	95

Increase awareness and public education about pet waste/fecal coliform bacteria. Implement education about pet waste, fecal bacteria, and the city's pet waste ordinance. Provide outreach and education materials via K-12 education programs, public meetings, agency website, and by participating/staffing the Canines for Clean Water booth at a minimum of 3 pet-related events (with pets present at a minimum of 2 events) which target city residents. The expectation is to target well-attended events **($1325)**

July 1 - September 30, 2012

We have successfully reserved a booth to attend the February 17, 2013 Pet Expo at the Schwartz Center.

October 1 - December 31, 2012

We wrote an article promoting the Canines for Clean Water program for Dog Living Magazine, that is due out in the January edition of the e-magazine.

January 1 - March 31, 2013

Attended Pet Expo 2/17/13 and promoted Canines for Clean Water program. Had 38 citizens sign the pledge. Attended Walk For Those Who Can't 5K and Doggie Dash on 3/23/13 at Hugh MacRae Park. Had 33 citizens sign the pledge.

April 1 - June 30, 2013

Attended Battleship Splash on 5/4/13 and promoted Canines for Clean Water program; 37 citizens signed the pledge.

Conduct at least 2 "Stormwater 101" presentations to HOAs, garden clubs, community/civic groups, developers, or during watershed-wide meetings. Initiate direct contact with potential audiences, promote program, and schedule presentations. **($662.50)**

January 1 - March 31, 2013

Stormwater 101 Presentations			
Date	**Organization/Audience**	**Method of Delivery/Materials/Etc.**	**Attendance**

3/13/13	UNCW~ Master's in Environmental Studies	Stormwater 101 power point presentation, non-point source pollution brochures passed out	23

April 1 - June 30, 2013

Stormwater 101 Presentations			
Date	**Organization/Audience**	**Method of Delivery/Materials/Etc.**	**Attendance**
4/9/13	Project WET workshop	Stormwater 101 power point presentation, non-point source pollution brochures passed out	10

Participate in local annual community outreach events. NHSWCD is a founding member of the Earth Day Alliance which organizes, implements, fundraises, and provides publicity for the Lower Cape Fear Earth Day Festival each spring. NHSWCD staff will attend and provide BMP and rain barrel sale information at the annual Wilmington Garden Show, or its equivalent. NHSWCD may also assist with TreeFest, an annual program which distributes tree saplings to New Hanover County citizens. In addition, NHSWCD will display program and educational information at the annual Cape Fear Fair and Expo. **($2650)**

July 1 - September 30, 2012

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
8/21/12	New Hanover County Schools Vendor Fair	Ashley High School	Manned display booth/table. Materials about District education and outreach programs for students and teachers distributed as well as sign-up sheet to send information to teachers.	1500
8/25/12	Earth Day Volleyball Tournament Fundraiser	Captain Bill's Volleyball Courts	Raising money for Earth Day Event 2013. Information about event as well as education materials regarding environmental stewardship provided to participates.	35
9/20/12	New Hanover County Farmer's Market	Hugh McRae Park	Manned display booth/table. Materials about District education al programs, monthly rain barrel sale and Big Sweep were distributed. Had interactive game to teach water cycle.	250
9/29/12	Big Sweep	Trails End boat ramp	Participated in Big Sweep clean up by cleaning waterway at Trails end from kayak.	1

Staff attended 1 Keep America Beautiful (KAB) meeting (7/18/12), 1 Earth Day Alliance (EDA) meeting (7/25/12), and 1 TreeFest meeting (9/29/12) in this quarter as well as the events listed above.

October 1 - December 31, 2012

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
10/23 – 11/5	Cape Fear Fair & Expo	ILM Airport fair grounds	Set up an agency educational booth with fair theme, "Going Green, Sustainability and Biodiversity"	**40,000**

Staff attended 1 Keep America Beautiful (KAB) meeting (10/17/12), 2 Earth Day Alliance (EDA) meeting (10/25/12, 11/15/12), and 1 TreeFest meeting (11/14/12) in this quarter as well as the event(s) listed above.

January 1 - March 31, 2013

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**

1/25-1/26	TreeFest	Independence Mall	Talked with citizens about benefits of planting trees to reduce stormwater runoff flow, while distributing free seedlings to them. Gave away over 7000 seedlings and grass plugs.	993
2/16-2/17	Wilmington Garden Show	Schwartz Center	Provided citizens with information regarding monthly rain barrel sales, CCAP program, and education programs provided by the District.	1000
2/23	UNCW Environmental Film Forum	UNCW - King's Hall	Discussed importance of environmental stewardship and promoted local organizations within local area to assist citizens in doing so.	32
3/21	Tree Fest Award ceremony & planting	Pine Valley E.S.	School wide ceremony in honor of Tree Fest poetry winner. MC-d the event and talked about the importance of trees in fighting pollution and runoff.	300
3/23	Operation Medicine Drop	New Hanover Regional Medical Mall	Educate citizens regarding effects of flushing unused medicine down the toilet or washing them down a drain.	193

Staff attended 2 Keep America Beautiful (KAB) meetings (1/16/13, 3/7/13), 2 Earth Day Alliance (EDA) meetings (2/26/13, 3/26/13), and 1 Medicine Drop meeting (1/11/13) in this quarter as well as the events listed above. Staff also coordinated and participated in contest judging for SWCD poster, essay and speech contests (1/23/13 8th grade speech at Trask and 3/8/13 7th grade speech at Noble), and served as judges at the NHC Science Fair (1/24/13) this quarter.

April 1 - June 30, 2013

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
4/20/13	Earth Day	Hugh MacRae	Educational booth promoting LID, community conservation, educational programs, and BMPs including rain barrels at local festival. Also served as integral committee members who arranged, hosted and staffed the festival booths.	3000
4/26/13	Kure Beach BMP park grand opening	Kure Beach	Attended the opening of the new park at Kure Beach. This park has provided examples of stormwater BMPs, and the town distributed information to citizens regarding stormwater and pollution attributed to runoff.	200
5/4/13	Science Olympiad, elementary school	Anderson HS	Served as station leader and grader at elementary school science Olympiad competition. Also wrote one of the exams (Biome Bonanza).	30 at station
5/10/13	State speech contest	Raleigh		14 students
5/20 through 5/24	Poster display week	County Government Center	County government center. art display of winners and honorable mentions for "Water, the Cycle of Life" contest cycle. Culminated in recognition ceremony with county and city council reps present.	20+ student works
5/31/13	Winter Park Career Day	Winter Park E.S.	Winter Park ES 5th grade science career day.	80
6/9/13	Green Schools Award	Airlie Gardens	KAB Green School Awards ceremony. Staff helped set up, clean up and run the ceremony.	30
6/20/13	New Hanover Community Market	Hugh MacRae	Staffed district booth with program information and rain barrel sale demos and fliers	50

Staff attended 1 Keep America Beautiful (KAB) meeting (4/2/13) and 1 Earth Day Alliance (EDA) meeting (5/13/13) in addition to the events listed above.

Promote/consult on LID to developers, engineers, architects, property owners, HOAs, etc.
Promote LID and the local LID manual, provide input to City and NHC Technical Review

Committees, as well as provide education and technical assistance as the need arises for property owners. **($662.50)**

July 1 – September 30, 2012

Attended two NHC Technical Review Committee (TRC) meetings to review plans; one plan was reviewed at each meeting. A soil report with LID information was also submitted to NHC for one additional plan this quarter. Provided comments for five concept reviews and four first reviews for City TRC.

October 1 - December 31, 2012

Attended one NHC Technical Review Committee meeting to review plans. A soil report with LID information was submitted to NHC for this plan this quarter. Provided comments for one concept review for City TRC.

January 1 - March 31, 2013

Submitted one set of plans electronically and attended one NHC Technical Review Committee meeting to review plans. Provided comments for 3 concept review for City TRC.

April 1 - June 30, 2013

Attended two NHC TRC meetings to review plans; three plans in total were reviewed. A soil report with LID information was also submitted with each plan. Provided comments for three concept reviews and two first reviews for City TRC.

Facilitate additional environmental education presentations in the community that highlight stormwater issues for local residents, students, teachers, camps, business owners, etc. Topics include, but are not limited to natural resource management, sustainability, and wildlife. Presentation topics will tie into water quality and conservation issues. **($2650)**

July 1 – September 30, 2012

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**#presentations**	**Attendance**
7/11/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	16
7/18/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
7/25/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
8/1/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
8/8/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
8/15/12	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
9/22/12	Girl Scout Troop 1549	2nd	Water quality and conservation	1	7

October 1 - December 31, 2012

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**#presentations**	**Attendance**
10/22/12	Trask Middle School	6th	Water conservation	1	23
10/24/12	Trask Middle School	6th	Water conservation	1	15

11/7/12	Pine Valley Elementary	4th & 5th	Geology & erosion	2	42
11/13/12	Codington	4th	Geology & erosion	2	36
11/13/12	Boy Scout Pack 211	1-6th	Water quality & conservation	1	68
11/16/12	Codington	4th	Geology & erosion	2	43
11/21/12	Hoggard High School	9th	Water cycle & poster contest	2	40
11/26/12	Trask Middle School	6th	Water conservation	1	25
11/27/12	Trask Middle School	6th	Water conservation	1	23
11/28/12	Trask Middle School	8th	Water cycle & poster contest	2	60
12/12/12	Rachel Freeman	4th	Erosion & weathering	1	18
12/13/12	Rachel Freeman	4th	Erosion & weathering	1	18
12/14/12	Rachel Freeman	4th	Erosion & weathering	1	18
12/18/12	Blair Elementary	4th	Erosion & weathering	2	49
12/19/12	Blair Elementary	4th	Erosion & weathering	2	52

January 1 - March 31, 2013

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**#presentations**	**Attendance**
1/3/13	Trask	6th	Water conservation	1	25
1/4/13	Trask	6th	Water conservation	1	32
1/4/13	Holly Tree Elementary	4th & 5th	Water cycle & poster contest	2	42
1/14/13	Anderson Elementary	3rd	Plants and Soils	2	47
1/15/13	Anderson Elementary	3rd	Plants and Soils	2	49
1/16/13	Anderson Elementary	3rd	Plants and Soils	1	30
2/4/13	Pine Valley Elementary	3rd – 5th	Water cycle & poster contest	1	275
2/13/13	Trask	6th	Water conservation	1	21
2/14/13	Trask	6th	Water conservation	1	17
3/13/13	UNCW	Graduate	Forests of the World (PLT)	1	23

April 1 - June 30, 2013

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**#presentations**	**Attendance**
4/9/13	Holly Tree ES	3rd	Plants and Soils	2	41
4/10/13	Holly Tree ES	3rd	Plants and Soils	2	42
4/23/13	Rachel Freeman ES	3rd	Plants and Soils	1	20
4/24/13	Rachel Freeman ES	3rd	Plants and Soils	1	20
4/25/13	Castle Hayne ES	3rd	Plants and Soils	2	36
4/29/13	Castle Hayne ES	3rd	Plants and Soils	2	36
5/2/13	Myrtle Grove Christian	7th	Geology (rocks & minerals)	2	45
5/21/13	Rachel Freeman ES	1st	Wildlife conservation	1	18
5/22/13	Rachel Freeman ES	1st	Wildlife conservation	1	18
5/28/13	Blair ES	3rd	Plants and Soils	2	39
5/29/13	Blair ES	3rd	Plants and Soils	2	60
6/4/13	Rachel Freeman ES	1st	Wildlife conservation	1	17
6/11/13	New Heights Taekwondo Camp	K-6	Wildlife conservation	1	6
6/12/13	Wrightsville Beach Surf Camp	K-4	Water Quality	1	14
6/18/13	New Heights Taekwondo Camp	K-6	Plant hike	1	4
6/19/13	Wrightsville Beach Surf Camp	K-4	Water Quality	1	15
6/25/13	New Heights Taekwondo Camp	K-6	Rocks and Minerals	1	10
6/26/13	Wrightsville Beach Surf Camp	2nd	Water quality and conservation	1	16

Organize/facilitate at least two Environmental Field Day a year serving an entire grade at a New Hanover County School. Provide Envirothon competition information and guidance to teachers and interested student organizations. Envirothon topics include aquatics/water quality, soils/erosion, forestry, wildlife, and other environmental issues. **($1987.50)**

July 1 - September 30, 2012

Successfully scheduled a 3rd grade field day for Gregory Elementary School that will take place in the second quarter, October 19th. And also scheduled lessons for all 1st, 3rd and 5th grade students at Rachel Freeman Elementary that will take place, in the second and third quarters.

October 1 - December 31, 2012

Environmental Field Day				
Date	**School(s)**	**Grade**	**Topics/Activities**	**Attendance**
10/19/12	Gregory E.S.	3rd	Water Cycle, Plants, Soils, Forestry	61

Successfully scheduled a 6th grade field day for Trask Middle School that will take place in the fourth quarter, April 3rd through 5th. Scheduled grade level presentations in lieu of field days at Anderson, Blair and Freeman Elementary Schools.

January 1 - March 31, 2013

Environmental Field Day				
Date	**School(s)**	**Grade**	**Topics/Activities**	**Attendance**
3/19/13	Coastal Envirothon	5-12	Soils, aquatics, wildlife, forestry, current environmental concerns	230

April 1 - June 30, 2013

Environmental Field Day				
Date	**School(s)**	**Grade**	**Topics/Activities**	**Attendance**
4/3/13-4/4/13	Trask M.S	6th	Water Quality, Plants, Soils, EcoTour	240

Update and maintain agency website and social media outlets including materials related to stormwater education. The website will also provide links to stormwater education materials in Spanish in an effort to reach more minorities in our region. CCAP project pictures will continue to be updated. A map showing CCAP and other BMP projects will continue to be updated and available on the website. Website will be promoted on local government TV. **($1325)**

July 1 - September 30, 2012

Continue to monitor links and make corrections/clarifications to the posted material on the web site. Facebook has been getting weekly updates and postings and our 'friends' base is slowly growing.

October 1 - December 31, 2012

Verified with City and County government media reps that rain barrel sale and monthly meetings are being advertised monthly, if not more regularly. Continued Facebook updates have been made. Small amount of updates have been made to the web site. A stormwater management (BMP) and Outdoor Education Learning Center needs survey was distributed electronically to all county teachers and school staff – heard back from 29 individuals. A paper flier was hand delivered to all

3rd through 9th grade teachers in the county as well advertising the SWCD contests with theme, "Water, The Cycle of Life." Several schools are participating in the contest this year as a result and inviting us in to give water conservation lessons. A major URL check is scheduled for our web site at the beginning of the third quarter.

January 1 - March 31, 2013

Attended a county management meeting on January 31st to discuss integrated web site design. County will supply a template for us if we wish to overhaul the site to be in line with their new design. Launch is targeted for beginning of next fiscal year. BMP map was reposted to the web site this quarter under "What is a BMP" and on the Conservation Programs page. Contest documents were updated. Several broken links were reset and will be continually monitored. Verified with City and County government media reps that rain barrel sale and monthly meetings are still being advertised monthly and send monthly reminds for those postings. Continued Facebook updates have been made.

April 1 - June 30, 2013

Met with County Public Affairs Manager, Carey Ricks (4/17/13, 5/9/13, 5/30/13), to integrate our web site into the new County web site design. Development is moving forward; templates and floor plans have been designed and material is being populated by web designers. Roll out date of "sometime in July" has been pushed back to "late July, early August". Facebook updates were regularly posted throughout this quarter and staff will continue to make those postings.

Public Involvement/Volunteer Efforts *Total Allocated Cost: $1325*

Encourage public involvement by engaging city residents/businesses/civic groups in a volunteer Storm Drain Marking program in the city to educate residents about stormwater pollution. A minimum of 2 separate volunteer days is required. For each outing day, a minimum of 7 markers will be applied per volunteer group and door hangers will be distributed to surrounding residences/businesses. Staff will use supplied markers, identify areas to mark drains, train volunteers in marking and safety and educate them about the purpose of the program, and help provide oversight of the program. A trained NHSWCD staff member is required to be present during storm drain marking activities and volunteer efforts. **($1325)**

July 1 - September 30, 2012

Successfully scheduled two outings in the second quarter. The first outing is with Girl Scout Troop 1549 who we met on 9/22/2012 for three lessons on water quality and conservation, including a modified Enviroscape presentation. The lessons gave the girls the background before we mark the drains in November. We are also meeting Cub Scout Pack 211 on November 13th for similar lessons and then marking (date TBD).

October 1 - December 31, 2012

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**Volunteers**	**Area Marked & # of Storm Drains Marked**
11/3/12	Girl Scout Troop 1549	5 girls, 4 adults, 3 NHSWCD	Forrest Hills E.S. #8 marked

We met with Cub Scout Pack 211 on November 13th for three lessons on water quality and conservation, including a modified Enviroscape presentation. The lessons gave the boys the necessary background before marking drains in the Spring.

April 1 - June 30, 2013

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**Volunteers**	**Area Marked & # of Storm Drains Marked**
6/20/13	YWCA Students	27 students, 4 adults, 3 NHSWCD	Forrest Hills E.S. 15 marked

The YWCA group was split into 3 groups: group A marked 7 drains (8 students), group B marked 8 drains (9 students), and group C (10 students) hung door hangers on 43 homes.

Programs/Partnerships

Total Allocated Cost: $7950

Serve as an active partner organization on local grant projects and initiatives that benefit local surface water quality and water resources. Examples include, but are not limited to, providing education and other programs related to a local grant, Hewletts & Bradley Creek Watershed restoration plan implementation, or development of a school BMP/outdoor educational center. **($1987.50)**

July 1 - September 30, 2012

Grant Projects/Water Quality Initiatives/Partnerships		
Date	**Topic/Discussion**	**Progress Made/Next Steps**
9/25/12	Meeting with NCCF on District involvement in downspout disconnect program.	Assigned responsibilities and roles to District in education component of project, deadline to have comments and draft of materials to use is the end of October 2012.

October 1 - December 31, 2012

Grant Projects/Water Quality Initiatives/Partnerships		
Date	**Topic/Discussion**	**Progress Made/Next Steps**
11/6/12	Meeting with NCCF and pilot project teachers.	Discussed as a group what the teachers already knew and had access to and what they needed and who could provide what lessons.
12/14/12	Meeting with NCCF on District involvement in downspout disconnect program.	Developed and revised presentation material for teachers and students. Helped design a learning field day at Randall Lake. Continued progress on pilot project that will launch in 3rd quarter.

January 1 - March 31, 2013

Grant Projects/Water Quality Initiatives/Partnerships		
Date	**Topic/Discussion**	**Progress Made/Next Steps**
2/1/13	CCAP BMP Tour for new City Watershed Coordinator	Provided tour for new city staff to become familiar with current types and locations of BMPs installed throughout New Hanover County and City of Wilmington. Also gave background and information on areas were BMP installation were not successful due to various factors.
2/8/13	H.O.W Atlas Training	Provide input on how BMP tracking through and online atlas can be used to full potential as well as comments about experience working with similar online program in the past.
3/11/13	Downspout reroute picture tour	Compiling photos for use in the 9th grade pilot lessons on water quality and the reroute initiative.

Downspout disconnect 9th grade pilot project was further developed. Lesson plans have been developed. Scheduling has begun for BMP field day tours and in-class lessons on site selection and stormwater runoff calculation methods. Pilot field trip and lessons will take place in fourth quarter.

April 1 - June 30, 2013

Grant Projects/Water Quality Initiatives/Partnerships		
Date	**Topic/Discussion**	**Progress Made/Next Steps**
4/30/13	6th Grade Education Pilot Program with CFRW	Timeline has been created to develop pilot project lesson plans and pre- and post-assessment material for teachers, identify and apply for grant funding, and partner organizations have committed to help execute the curriculum.
5/6/13	Downspout reroute lesson at Laney H.S.	Provided students with presentation and hands-on examples regarding the impact and importance of rerouting downspouts to pervious surfaces. 27 students.
5/7/13	Downspout reroute lesson at Ashley H.S.	Provided students with presentation and hands-on examples regarding the impact and importance of rerouting downspouts to pervious surfaces. 26 students
5/13/13	Downspout reroute lesson at Hoggard H.S	Provided students with presentation and hands-on examples regarding the impact and importance of rerouting downspouts to pervious surfaces. 21 students
5/15/13	Downspout reroute field trip to Randall Parkway Stormwater Park	Provide hands-on experience on how to modify gutters, show examples of stormwater BMPs, and complete water quality sampling and test to collect data regarding water pollution due to runoff. 74 students

Met with City Stormwater staff twice regarding creating a new watershed map for New Hanover County. Also help coordinate connection to NHC staff to become involved with the project.

Administer the NC Community Conservation Assistance Program (CCAP) in New Hanover County. Provide assistance with the demonstration, purchase, and installation of stormwater Best Management Practices (BMPs) for City/County residents and businesses. Activities may include identifying new BMPs and standards, updating BMP cost estimates, developing conservation plans for CCAP clients, assisting with the design and/or installation of stormwater BMPs, managing CCAP BMP project sites, and conducting annual spot checks. In addition, NHSWCD staff will promote CCAP through agency website, educational programs, publications, public/local government television, and to interested groups. NHSWCD will also continue to update the watershed map of CCAP BMPs installed/cost-shared by the district in the county and post map on agency website. **($2385)**

July 1 - September 30, 2012

Made one site visit to an individual's home to give guidance on a vegetative cover plan. Work on this project was completed 9/25/12. Request for payment will be processed in October. Two applications were accepted by the District board. One applicant is an apartment complex looking for sediment reduction and is interested in curb cuts and rain gardens. The other applicant is interested in a rain garden or back yard wetland and is located within 100 feet of the ICW. Both applications ranked medium. A contract for one or both (depending on funding) will be written in January if no other applications rank higher before then. Both applicants will receive free technical assistance regardless of funding.

Monitored the construction of an Outdoor Education Learning Center (OELC) on charter school Cape Fear Center for Inquiry's campus that was funded through NHSWCD and the Foundation for Soil & Water. The grant was awarded in April 2012 but construction was delayed until the end of the school year. Construction took place over several weekends and a ribbon cutting took place on

9/13/12 for the entire school and was covered by local media. The District was formally recognized on 9/18/12 at the school's board meeting, as well.

October 1 - December 31, 2012
Received one application for a Cistern project in the Hewletts Creek Watershed. Application was approved, and staff will continue to work on a contract for the project. The project is located at Holly Tree Elementary School.

January 1 - March 31, 2013
CCAP application for Holly Tree Elementary School Cistern was cancelled upon the request of the applicant. Cancellation was due to the resource no longer being needed since on site wells were restored to operating order. Completed a site visit at the Lamer History House in downtown Wilmington. Historic group associated with the location is interested in restoring the current underground cistern to a working capacity.

April 1 - June 30, 2013
Completed spot checks on six CCAP projects. These six projects represent 25% of the total BMPs installed. According with the general guidelines of the program at least 25% of the current contracts must be checked every year. Contracts that are viewed are chosen at random. All six contracts were in compliance with some maintenance needed at the bioretention area located at Believers Destiny Church. The District has also submitted its FY 13-14 strategy plan to the Division of Soil & Water. This plan includes District needs regarding funds for BMPs, supplies, and staff that help administer all cost share programs. Also provided a presentation to Kure Beach Environmental Committee 4/9/13 regarding CCAP program and how the District may be able to partner with the municipality in improving water quality through reducing stormwater pollution in the future. Also made a site visit to an individual's home regarding stormwater drainage no longer working. Citizen was a county resident. It was determined that the homeowner was placing yard waste in the path of flow and materials need to be moved to a different area to prevent flooding and water back up in the yard.

Administer and partner with the City of Wilmington Stormwater Services to hold a public rain barrel sale. NHSWCD will utilize local government television, local events including Earth Day and the Cape Fear Garden Show, agency website, and periodic press releases to the media to promote the sale. **($1192.50)**

July 1 - September 30, 2012
Rain barrel sales were conducted the following dates and with the following inventory sold:
7/12/12: 11 Moby, 1Ivy
8/09/12: 5 Moby, 2 Ivy
9/13/12: 2 Moby, 3 Ivy

October 1 - December 31, 2012
Rain barrel sales were conducted the following dates and with the following inventory sold:
10/11/12: 7 Moby, 1 Ivy
11/08/12: 1 Moby, 0 Ivy
12/13/12: *5 Moby, 1 Ivy

*The five Moby barrels in the December tally were sold to an Eagle Scout (Jason Raynor) for his project at the new sea turtle hospital in Topsail. Rain Water Solutions and NHSWCD each donated one barrel to the project for a total of 7 barrels. The scout is a Wilmington resident, who was aware of the water capturing techniques and he wanted to help the hospital conserve water for irrigation purposes and reduce runoff on the sound site. The project has a huge educational component; Jason is producing glossy brochures educating visitors about rain water harvesting and stormwater reduction. The hospital gets thousands of visitors a year, so these brochures and educational signage around the hospital will promote stormwater education and water conservation.

January 1 - March 31, 2013
1/10/13: 6 Moby, 1 Ivy
2/14/13: 2 Moby, 5 Ivy
3/14/13: 7 Moby, 1 Ivy

April 1 - June 30, 2013
4/11/13: 9 Moby, 1 Ivy
5/9/13: 33 Moby, 22 Ivy, 4 short-stack
6/13/13: 3 Moby, 3 Ivy

Serve as an integral partner to facilitate the Lower Cape Fear Stewardship Development Award Program. The program recognizes developers for demonstrating outstanding environmental stewardship such as stormwater reduction and LID practices through the protection and awareness of our natural resources. **($2385)**

July 1 – September 30, 2012
District Director was re-elected to serve as Treasurer for Lower Cape Fear Stewardship Development Coalition (LCFSDC) for the next fiscal year. Attended monthly board meetings on 7/11/12, 8/8/12, and 9/12/12. Also serving on the awards committee, which met 9/11/12 to review 2013 applications. Site visits and judging will occur in November 2012. Also coordinated and manned booth at NC American Planners Association Annual Conference held in Wilmington, NC September 26-18, 2012. Provided information to planners across the state (including local planners) about the LCFSDC program.

October 1 - December 31, 2012
Attended monthly board meetings on 10/10/12, 11/14/12, and 12/12/12. Attended the project judging on 11/12/12. Currently 5 applicants have applied, three in New Hanover County, and two in Brunswick County. All applicants will be receiving some level of recognition at the 2013 event. Continued to provide guidance and information for SDC contract employee as well.

January 1 - March 31, 2013
Attended monthly board meetings 1/9/13 and 3/13/13, as well as the awards luncheon 2/27/13. Continued to manage and provide guidance and information for SDC contract employee. Provided accounts information regarding spending for the luncheon to the committee.

April 1 - June 30, 2013

Attended monthly board meetings 4/10/13 and 6/12/13. The meeting scheduled 5/8/13 was cancelled due to lack of a quorum. Continued to manage and provide guidance regarding SDC finances. Composed a draft FY13-14 budget for the committee to consider going into the new fiscal year. Also volunteered to serve on the nominating committee, and will be preparing documents for the audit committee.

Monitoring Activities

Total Allocated Cost: $1325

Serve as the lead agency for managing land conservation easements in the Hewletts Creek Watershed and other potential sites. Annually monitor currently held conservation easements, distribute easement information to property owners adjacent to conservation easements, and provide educational contact with residents in the Hewletts Creek Watershed. In addition, NHSWCD will work with organizations/groups to provide stormwater education programs at the J.E.L. Wade Stormwater Wetland, as the need arises. **($1325)**

July 1 – September 30, 2012

Education Presentations				
Date	**Audience/Topic**	**Grade**	**# presentations**	**# of students**
7/6/12	YWCA – wildlife senses	preK	1	21
7/10/12	YWCA – wildlife senses	3rd through 7th	2	41
7/17/12	YWCA – nature hike & wildlife hunt	2nd & 3rd	2	40
7/24/12	YWCA – water conservation	3rd through 7th	2	42
8/7/12	YWCA – forestry	K through 3rd	2	45
8/20/12	YWCA – soil and water conservation	K through 7th	4	90
8/22/12	YWCA – seed art	K through 7th	5	90

January 1 - March 31, 2013

Conducted annual easement check of properties along Holly Tree Road and Warlick Estates area on 3/6/13. One supervisor attended the easement check as well. Took pictures and documented improvements adjacent landowners could make, such as picking up trash. Noted that silt fence from original development was still in place in many areas boarding the easement.

April 1 - June 30, 2013

Education Presentations				
Date	**Audience/Topic**	**Grade**	**# presentations**	**# of students**
6/13/13	YWCA – wildlife foraging	K & 1	1	33
6/27/13	YWCA – wildlife conservation	2 & 3	2	32

Distributed annual newsletter to approximately 220 citizens along the Tumors Creek branch of the Hewletts Creek watershed. The newsletter included information on cost share programs, education and outreach programs and contest winners, and outdoor education learning center initiative in FY 13/14.

Contract Administration

Total Allocated Cost: $2650

Quarterly progress reports and invoices will be submitted in accordance with the following provisions: Quarterly reports and invoices are due within 10 days of the quarter end date and will follow templates and instructions set forth by Stormwater Services. Reports and invoices that do not follow templates/instructions will be returned for correction; payment will be processed once updated reports and invoices are received, reviewed, and approved.

Submit cumulative quarterly progress reports according to the following quarters: July 1 - Sept 30; October 1 - Dec. 31; January 1 -March 31; April 1 - June 30. The 4th quarter progress report will serve as a compiled year end summary report.

The quarterly invoice should use the supplied template which shows the % of each service completed each quarter, invoice amount, and amount remaining to be paid. Invoices will be paid once quarterly progress report and invoice are received and reviewed by the City for adequate progress. Non-performance or inadequate progress may result in non-payment. No pre-payment of services will occur.

Contact person: Stormwater Services requires one main point of contact for the implementation, management, and communication and reporting of this annual contract. This staff person will be the individual that implements the majority of contract services, and therefore will be the most familiar with the contract. The designated contact person is: **Dru Harrison. ($2650)**

Other:

Do not assign a cost.

Assist Stormwater Services in implementing additional public outreach, education, involvement, and participation activities required by federal NPDES stormwater permit. Summary reports and information may be included in the City's NPDES yearly report to the State.

Report compiled by: Dru Harrison **Date:** **6/28/13**

APPENDIX D: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)

Employee Training

5/31/12 - Conducted training for Identifying Illicit Discharges in the Field for UNCW water quality sampling contractor and graduate student.

10/15/12 - Conducted training for Identifying Illicit Discharges in the Field for contractor Cape Fear River Watch volunteers.

5/14/13 - Conducted training for Identifying Illicit Discharge in the Field presentation to 49 to Stormwater Maintenance Employees.

Nature of Compliant	# of Calls
Pet Waste	15
Illicit Discharge/Dumping	64
Total	79

Policy for Reporting and Documentation of Sanitary Sewer Overflows and System Leaks

Cape Fear Public Utility Authority and City of Wilmington

Purpose:

The purpose of this document is to establish agreed upon procedures for the Cape Fear Public Utility Authority (CFPUA) to follow regarding reporting and documentation of sanitary sewer overflows (SSO) that impact the City of Wilmington Municipal Separate Storm Sewer System (MS4). These guidelines will enable the City to comply with NPDES Phase II Stormwater permit reporting requirements as well as to provide assistance to CFPUA in mitigating any potential threat to public health or the environment.

Reporting Requirements:

All SSOs resulting in discharge to the City of Wilmington MS4, or causing possible contamination of stormwater discharging to the storm system, must be reported to the City within 48 hours of occurrence in accordance with City Code Chapter 12, section 12-24. Failure to comply may result in a notice of violation (NOV) for the CFPUA. Fines for non compliance range up to $10,000 based on quantity, risk to the public, environment damage and degree of negligence as documented in the City Code. The following table documents the minimum information required for sanitary sewer overflows and sewage leaks that may impact the City's MS4.

	Date of Spill/Leak	Location	Volume	Corrective Action	NCDWQ Form	Analytical Data
SSO						
< 1000 gal	x	x	x	x		
> 1000 gal	x	x	x	x	x	x
System Leak	x	x	x	x	x	as needed

Spills greater than 1,000 gallons require an additional completed copy of the DWQ's Collection System Sanitary Sewer Overflow Reporting Form (CS-SSO) provided at the same time as when provided to the State. Failure to comply may result in an NOV for CFPUA. Clean up requirements are in accordance with the CFPUA's Clean up Procedure Policy. This information will also be used in documenting the compliance with the City of Wilmington's annual NPDES Phase II Stormwater report to NCDWQ.

City of Wilmington Contact Information:

Spills less than 1,000 gallons

Use the Pollution Prevention Hotline: 910-341-1020
Or go to: www.wilmingtonnc.gov/reportstormwaterpollution and fill out the on line form.

Spills greater than 1000 gallons or system leaks

1) Beth Nunnally
Stormwater Compliance Officer
910-341-0092
beth.nunnally@wilmingtonnc.gov

2) Jim Quinn
Stormwater Specialist
910-341-4694
Jim.quinn@wilmingtonnc.gov

3) Layton Lomax
Drainage Manager
910-341-4646
Harvey.london@wilmingtonnc.gov

4) David Mayes
Stormwater Services Manager
910-341-5880
Dave.Mayes@wilmingtonnc.gov

(From Page 8 of City of Wilmington Illicit Detection and Elimination Program Manual)

Dry Weather Flow Inspection Program

In accordance with permit requirements for detecting dry weather flows, the City is developing and implementing a program for conducting inspections throughout the MS4 to detect dry weather flows. Dry weather flows are defined as any flow in the MS4 that occurs after a 72 hour period without rain. The objective is to identify and eliminate flows that contain pollutant or pathogen loads. Such flows vary in source, content, and frequency, thereby imparting variable impacts within the larger MS4 and the final receiving water bodies. Promptly identifying dry weather flows is instrumental in recognizing and addressing deleterious illicit discharges. As the program develops, procedures will be evaluated and modified with the aim of more effectively detecting and eliminating illicit discharges.

Employees of the City familiar with outfall inspection procedures will conduct the inspections. Inspections will be conducted only during dry periods to facilitate identification of only those flows unassociated with allowable stormwater flows. Furthermore, those outfalls located along tidally influenced reaches will be inspected at low tide; should the outfall still be submerged at low tide, the stormwater conduit will then be traced upgrade to the nearest manhole or observable location beyond tidal influence, where an inspection will be more likely to detect a dry weather flow. A similar modified observation procedure will be used for those points where direct inspection of the outfall point is not possible; observations will be made immediately upgrade in the system at an appropriate location for dry weather inspection.

The inspection itself will consist of an initial visual inspection of the outfall to determine the presence or absence of water or liquid flow. Photographs will be taken of the inspection location and saved along with the inspection record containing data describing the conditions observed at the outfall or observation point. . The detection of any suspicious dry weather flow will prompt a service request for a field screening as described in later sections of this manual outlined as Steps 1-4, in which physical, chemical, and biological parameters may be analyzed to determine the nature and source of any illicit discharge.

The inspection records will be stored in the GIS as tables. Screen shots of the actual ArcPad routine and a diagram showing the database designed for storing these records is shown in Appendix E: *Field Data Collection of Dry Weather Inspections using ArcPad.*

Given that the City is located in a coastal area with tidal influence in parts of the MS4 and numerous groundwater sources infiltrating or directly routed into the MS4, our strategy for performing the observations will be adjusted accordingly. The initial location of all major outfall points has provided the starting point for the Dry Weather Flow Inspection Program. Each of the major outfall points will be inspected, photographed and have an observation record saved to the GIS database as described above. Following completion of this effort, a similar systematic inspection of major trunk lines and areas of interest will begin.

The selection of major trunk lines for inspection will be a strategically targeted effort to isolate those portions of the drainage system that may be contributing to any dry weather flow. At this point, we envision inspections progressing up a selected trunk line from the outfall so that any contributing dry weather flow source areas can be identified and investigation into the source can begin. MS4 structures which have sewer cross pipes associated with them are at the greatest risk for sewage contamination; therefore along with the trunk line inspection effort, special attention will be given to inspecting any MS4 structures or junctions which have a sewer cross pipe passing through the structure. Any identified illicit discharge encountered during the both the trunk line and sewer cross pipe inspection process will result in a service request being generated.

The selection of major trunk lines and points along the trunk line for inspection will be scheduled with consideration given to several influencing factors including: weather conditions, the degree to which stormwater infrastructure mapping is reliable and complete within a given area, suspicion of negative inputs to the MS4 based upon annual water quality reports, 303d listings, and/or industrial land use designations. Also, indications of illicit discharge observations from the MS4 mapping crew will prompt inspections. Dry weather inspections will be performed at a minimum of four locations along one or more trunk lines during any given month depending on weather conditions.

APPENDIX E: CONSTRUCTION SITE RUNOFF CONTROLS

Included in this section:

New Hanover County Erosion & Sedimentation Control Ordinance

New Hanover County Ordinance:

The following are excerpts culled from the New Hanover County Erosion and Sedimentation Control Ordinance:

The New Hanover County erosion and sedimentation control ordinance is adopted for the purposes of:

(1) Regulating certain land disturbing activity to control accelerated erosion and sedimentation in order to prevent the pollution of water and other damage to lakes, watercourses, and other public and private property by sedimentation; and

(2) Establishing procedures through which these purposes can be fulfilled.

General requirements of the permit include among others:

(a) *Plan required.* No person shall initiate any land disturbing activity which uncovers more than one acre without having an erosion control plan approved by the county. No land disturbing activity may be initiated until the county is notified of the date that the land disturbing activity will begin.

(b) *Protection of property.* Persons conducting land disturbing activity shall take all reasonable measures to protect all public and private property from damage caused by such activity.

(c) *More restrictive rules shall apply.* Whenever conflicts exist between federal, state, or local laws, ordinances, or rules, the more restrictive provision shall apply.

(e) *Inspections.* Any and all applicable intermediate inspections may be held in any trade (building, mechanical, electric and/or plumbing) if any land disturbing activity, on a tract, including single-family residences, is found not to be in compliance with any part of this article.

(f) *Building finals.* Building finals and/or certificates of occupancy may not be issued if any land disturbing activity, including single-family residences, is found not to be in compliance with any part of this article.

Mandatory Standards For Land Disturbing Activity

No land disturbing activity subject to the control of this article shall be undertaken except in accordance with the following mandatory standards:

(1) *Buffer zone*.

a. No land disturbing activity during period of construction or improvement to land shall be permitted in proximity to a lake or natural watercourse unless a buffer zone is provided along the margin of the watercourse of sufficient width to confine visible siltation within the 25 percent of the buffer zone nearer the land disturbing activity. Waters that have been classified as trout waters

by the environmental management commission shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation within the 25 percent of the buffer zone nearest the land disturbing activity, whichever is greater. Provided, however, that the county may approve plans which include land disturbing activity along trout waters when the duration of said disturbance would be temporary and the extent of said disturbance would be minimal. This subdivision shall not apply to a land disturbing activity in connection with the construction of facilities to be located on, over, or under a lake or natural watercourse.

b. Unless otherwise provided, the width of a buffer zone is measured from the edge of the water to the nearest edge of the disturbed area, with 25 percent of the strip nearer the land disturbing activity containing natural or artificial means of confining visible siltation.

c. The 25-foot minimum width for an undisturbed buffer zone adjacent to designated trout waters shall be measured horizontally from the top of the bank.

d. Where a temporary and minimal disturbance is permitted as an exception by subsection (1)a. of this section, land disturbing activities in the buffer zone adjacent to designated trout waters shall be limited to a maximum of ten percent of the total length of the buffer zone within the tract to be distributed such that there is not more than 100 linear feet of disturbance in each 1,000 linear feet of buffer zone. Larger areas may be disturbed with the written approval of the director.

e. No land disturbing activity shall be undertaken within a buffer zone adjacent to designated trout waters that will cause adverse temperature fluctuations, as set forth in 15 NCAC 2B.0211 "Fresh Surface Water Classification and Standards", in these waters.

(2) Graded slopes and fills. The angle for graded slopes and fills shall be no greater than the angle, from zero to nineteen degrees, which can be retained by vegetative cover or other adequate erosion control devices or structures. Only when approved by the county may slopes be steeper than two foot of run to one foot of rise. In any event, slopes left exposed will, within 15 working days or 30 calendar days, whichever is shorter, of completion of any phase of grading, be planted or otherwise provided with ground cover, devices, or structures sufficient to restrain erosion.

(3) Ground cover. Whenever land disturbing activity is undertaken on a tract comprising more than one acre, if more than one acre is uncovered, the person conducting the land disturbing activity shall install such sedimentation and erosion control devices and practices as are sufficient to retain the sediment generated by the land disturbing activity within the boundaries of the tract during construction upon and development of said tract, and shall plant or otherwise provide a permanent ground cover sufficient to restrain erosion after completion of construction or development. Except as provided in section 23-238(b)(5), provisions for a ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days following completion of construction or development whichever period is shorter.

(4) Prior plan approval. No person shall initiate any land disturbing activity on a tract if more than one acre is to be uncovered unless, 30 or more days prior to initiating the activity, an erosion and sedimentation control plan for such activity must be both filed with and approved by the county. The county shall forward to the director of the division of water quality a copy of each erosion and sedimentation control plan for a land disturbing activity that involves the utilization of ditches for the purpose of dewatering or lowering the water table of the tract.

Design and Performance Standards.

(a) Except as provided in subsection (b)(2) of this section, erosion and sedimentation control measures, structures and devices shall be so planned, designed and constructed as to provide protection from the calculated maximum peak of runoff from the ten-year storm. Runoff rates shall be calculated using the procedures in the USDA, Soil Conservation Service's "National Engineering Field Manual for Conservation Practices," or other acceptable calculation procedures.

(b) In high quality water (HQW) zones, the following design standards shall apply:

(1) Uncovered areas in HQW zones shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. Only the portion of the land disturbing activity within an HQW zone shall be governed by this section. Larger areas may be uncovered within the boundaries of the tract with the written approval of the director.

(2) Erosion and sedimentation control measures, structures and devices within HQW zones shall be so planned, designed and constructed to provide protection from the runoff of the 25-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Service's "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.

(3) Sediment basins within HQW zones shall be designed and constructed such that the basin will have a settling efficiency of at least 70 percent for the 40-micron (0.04 mm) size soil particle transported into the basin by the runoff of that two-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Services "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.

(4) Newly constructed open channels in HQW zones shall be designed and constructed with side slopes no steeper than three horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion.

(5) Ground cover sufficient to restrain erosion must be provided for any portion of a land disturbing activity in a HQW zone within 15 working days or 60 calendar days following completion of construction or development, whichever period is shorter.

Responsibility For Maintenance.

During the development of a site, the person conducting the land disturbing activity shall install and/or maintain all temporary and permanent erosion and sedimentation control measures as required by the approved plan or any provision of this article, the act, or any order adopted pursuant to this article or the act. After site development, the land owner or person in possession or control of the land shall install and/or maintain all necessary permanent erosion and sediment control measures, except those measures installed within a road or street right-of-way or easement accepted for maintenance by a governmental agency.

The full text of this article can be found under Chapter 23, Article VI of the Code of Ordinances County of New Hanover, North Carolina.

APPENDIX F: POST-CONSTRUCTION SITE RUNOFF CONTROLS

Included in this section:

Inspection Reporting Summary
Inspection Letter
Stormwater Detention Facility Compliance Inspection Report

Dates of Inspections	**Summer 2012**	**Winter 2012-13**
Total # Sites Inspected	104[1]	320
Response Letter Severity		
Level 1 (first letter)	8	28
Level 2 (second letter)*	0	0
Level 3 (third letter)**	0	0
# of Sites Requiring Maintenance	8	28

*If no response from first letter after 60 days, second letter is sent

**If no response from second letter after 60 days, third letter is sent

[1] Partial inspection due to restructuring of inspection process

SAMPLE LETTER

Date

«OWNER»
«CO_OWNER»
«OWN_ADDR»
«OWN_CITY», «OWN_STATE» «OWN_ZIP»

RE: Storm Water Maintenance Inspection - «SUBD_NAME»
(Parcel # «PIN»)

The City of Wilmington Storm Water Services Section has recently completed a routine inspection of the storm water management facilities at «SIT_ADDR» for the above referenced site. The facility was inspected for compliance with the operation and maintenance requirements as outlined in the City's Technical Standards Manual. The City will be conducting these inspections a minimum of twice a year. Our ---------- (date) inspection indicates that the storm water facilities at the above property does not comply with current maintenance standards as listed on the attached Compliance Inspection Report.

According to the storm water management specifications and standards and the inspection and maintenance agreement from the responsible entities, corrective action must be taken within a reasonable time period. The City will be reinspecting the above storm water facilities to track the progress of any corrective action. I will be happy to work with you toward a satisfactory resolution of this matter. If you have questions, please contact me at 341-4694. Your cooperation and assistance in the City's storm water management efforts is greatly appreciated.

Sincerely,

Jim Quinn
Stormwater Specialist
Stormwater Services

Stormwater Detention Facility

Compliance Inspection Report

SITE:

DATE:

LOCATION:

The Stormwater Management for Post-Construction Ordinance requires a bi-annual inspection of all structural water quality detention facilities to ensure that they are being properly maintained and are functioning as originally designed.

The results of this inspection are as follows:

☐ **Visual inspection found no apparent problems with the facility.**
☐ **Please complete the following repairs and/or maintenance items within 60 days of this report**

Slopes
☐Repair eroded pond slopes
☐Repair erosion at pond inlet
☐Repair erosion at outlet structure
☐Re-seed and/or repair bare areas
☐Mow and regularly maintain vegetation
☐Regrade slopes and/or aquatic shelf

Inlets
☐Remove vegetative obstruction
☐Remove sediment accumulation within pipes

Emergency Spillway
☐Remove debris located in spillway
☐Remove trees and woody vegetation
☐Repair eroded areas and/or rip-rap

Outlet Structure
☐Remove debris obstructing outlet structure
☐Remove obstruction to orifice
☐Repair and/or replace trash rack
☐Repair trash screen for lower orifice
☐Remove vegetation around outlet structure

Pond Main Body
☐Repair vegetative shelf
☐Remove sediment accumulation
☐Remove floating debris and/or debris on slopes
☐Remove vegetation in pond that has reduced surface area

Other
☐
☐

Additional comments and maintenance concerns:

_____
_____
_____
_____
_____
_____
_____

Proper operation and maintenance are the sole responsibility of the property owner, and a vital part of ensuring the effectiveness of your detention facility. If you fail to complete the above maintenance in a timely manner, please be advised that the City of Wilmington reserves the right to complete the maintenance, and assess the owner for any costs or damages incurred. You will be notified if the City chooses to pursue this action.

Please inform this office of the date when work is completed, and if you should have any questions or comments concerning these items or future maintenance issues, please feel free to contact me at (910) 341-4694.

Inspected by: Jim Quinn Title: Stormwater Specialist

Summary of Plan Review Activities

PROJECT NAME	Project Type	Permit #	Permit Issued	Type BMP
Masonboro Baptist Church	SWP (HD)	2012011	5/29/2012	Wet Pond
Wright Retirement Properties	Drain Plan	2012008	4/27/2012	
5th Ave Baptist Church	Drain Plan	2012031	10/12/2012	
Tauheed Islamic Center	Drain Plan	2012012	8/16/2012	
Greenwood Estates	SWP (LD)	2012006	3/19/2012	Dry Detention, Swales
Carquest Raleigh St	SWP (HD)	2012003	3/6/2012	Infiltration Basin
Hanover Center Master Stormwater Permit	SWP (HD)	2012007	4/3/2012	Existing Wet Pond
Enterprise Car Rental	Drain Plan	2012005	3/14/2012	Permeable Pavement
Audi Wilmington	SWP (HD)	2012013	6/13/2012	Infiltration Basin and Trench
Walgreens - Hospital Plaza (parking lot addn)	SWP (Rev)	2007061R1	3/23/2012	
The Reserve at Forest Hills (clubhouse renovation)	Drain Plan	1998046R1	3/26/2012	
Amberleigh Shores	SWP (HD)	2012016	7/24/2012	Wet Ponds
Carquest on Market	Drain Plan	2012020	8/9/2012	
CAP Wilmington (Trader Joes)	SWP (HD)	2012010	5/4/2012	Infiltration Basin and Trench
NOFO 8	No permit req'd	N/A	3/14/2012	
Corning Baghouse Draw Expansion	Drain Plan	2000008R2	3/13/2012	
City Block Apartments	SWP (HD)	2012018	7/30/2012	Infiltration Trench
Paws and Claws Animal Hospital	Drain Plan	2012009	4/30/2012	Permeable Pavement
Bojangles Carolina Beach Rd/Medical Center Dr	SWP (Offsite)	2012015	7/12/2012	
Tidal Creek Driveway Connection	No permit req'd	N/A	4/13/2012	
4_S Earthworks Storage Facility	Drain Plan	2012012	5/15/2012	
Mayfaire Office II	SWP (Offsite)	2012019	7/27/2012	
Bob King Mercedes Expansion	Drain Plan	1992048R4	7/12/2012	
Friendzy's	SWP (Offisite)	2012023	8/22/2012	
Ken Baker Originals	Drain Plan	2012022	8/20/2012	
Market St Heights Lots 3&4	Drain Plan	2012028	9/12/2012	
Kacynski Professional Office	Drain Plan	2012030	10/11/2012	
Shinnwood West	SWP (LD)	2013012	4/29/2013	Grassed Swales
Holly Tree Elementary	Drain Plan	1995050R1	10/23/2012	
Essential Office Building	SWP (HD)	2012036	12/21/2012	Permeable Pavement
Hew Hope Missionary Baptist Church	Drain Plan	2012027	9/11/2012	
Mattress Firm Market St	Drain Plan	2012026	9/12/2012	Permeable Pavement
The Lighthouse Apts (aka the Hub at UNCW)	SWP (HD)	2013016	6/7/2013	Infiltration Basins
Starbucks Oleander & Independence	Drain Plan	2012033	11/29/2012	
Chipotle Mexical Grill	SWP (Rev)	2011031R2	9/20/2012	
Hackney Dental Office	Drain Plan	2012032	11/19/2012	Permeable Pavement
ATC University Center	No Permit Req'd	N/A	9/4/2012	
Camden Forest	SWP (HD)	2012029	10/15/2012	Wet Pond
Evermore Apartments	SWP (HD)	2013018	6/12/2013	Permeable Pavement
Mayfaire Office III	SWP (Offsite)	2013002	2/26/2013	
Mattress Firm Oleander	Drain Plan	2012035	12/20/2012	Permeable Pavement
Harris Teeter #158 Bldg Expansion & Renovation	Drain Plan	2013008	3/22/2013	
Oleander Dr Self Storage	SWP (HD)	2013004	3/1/2013	Inf. Basins, Permeable Pavement
New Centre TSP	SWP (Offsite)	2012034	12/20/2012	
Hawthorne at the Station	SWP (HD)	2013006	3/1/2013	Inf. Basins, Permeable Pavement
Eastern Instruments	Drain Plan	2013010	4/8/2013	
Fiat of Wilmington	SWP (HD)	2013009	4/8/2013	Permeable Pavement
The Lofts at Randall	SWP (HD)	2013001	2/11/2013	Permeable Pavement
Honey Baked Ham	No permit req'd	N/A	1/31/2013	
Williamson Medical Offices	Drain Plan	2013003	3/8/2013	
Bullzeye Shooting Sports	Drain Plan	2013008	3/28/2013	
Lower Cape Fear Hospice	SWP (Offsite)	2013015	6/6/2013	
Tiburon Park Apartments	SWP (Offsite)	2013020	6/28/2013	
Scuba Now Scuba School	No permit req'd	N/A	3/20/2013	
Jordon Lane Townhomes	SWP (HD)	2013013	5/15/2013	Infiltration Basin
St Andrews on the Sound	Drain Plan	2013014	5/23/2013	
Campus Walk Clubhouse Replacement	Drain Plan	2013005	3/11/2013	
Pizza Hut Takeout	Drain Plan	2013019	6/14/2013	
NHC Social Services Parking Exp	No permit req'd	N/A	5/17/2013	
Kenan Chapel at Landfall	SWP (Rev)	2000032R1	6/19/2013	
O2 Fitness	SWP (Rev)	2012007R1	6/28/2013	
Cambridge Village	SWP (HD)	2012004	3/9/2012	SW Wetlands, Permeable Pavement

APPENDIX G: POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

Form G-7 Sheet 1 of 1

EMPLOYEE TRAINING CHECKLIST

TRAINING TOPIC	SCHEDULE	ATTENDEES
NPDES PERMIT REQUIREMENTS Purpose of NPDES Program Permit Conditions	Annually	Members of Pollution Prevention Team
STORMWATER POLLUTION PREVENTION PLAN Purpose of SPPP Identification of potential pollutant sources Methods to reduce pollutants in stormwater Best Management Practices	Annually	Members of Pollution Prevention Team
SPILL PREVENTION AND RESPONSE PLAN Identification of potential spill areas Location of potential pollutant sources Spill response team Spill response procedure Spill response equipment Spill reporting procedure	Annually	All employees (other than administrative)
PREVENTATIVE MAINTENANCE Identify equipment (if any) Facility inspection requirement and schedule Documentation	Annually	All employees (other than administrative)
GOOD HOUSEKEEPING PROGRAM Regular cleanup procedures Material storage practices Facility inspection requirement and schedule Documentation	Annually	All employees (other than administrative)

The employee signature below indicates completion of the Stormwater Pollution Prevention training program.

Employee Signature: JOHN FORDUN FLEETMANAGER 6/17/13

Type/Print Employee Name and Title:

Date Training Received: 6/17/13 AND 8/6/13

Instructor:

APPENDIX H: TOTAL MAXIMUM DAILY LOADS (TMDL)

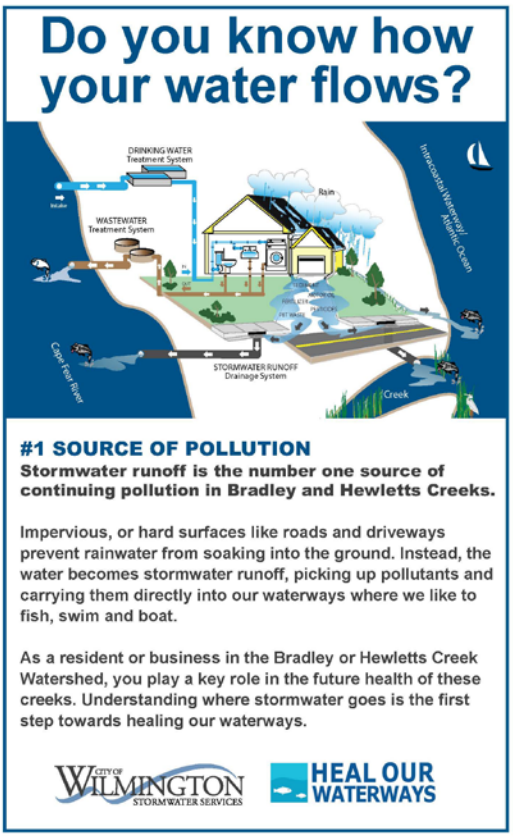
Bradley & Hewletts Creek Voluntary Watershed Restoration Plan Activities:

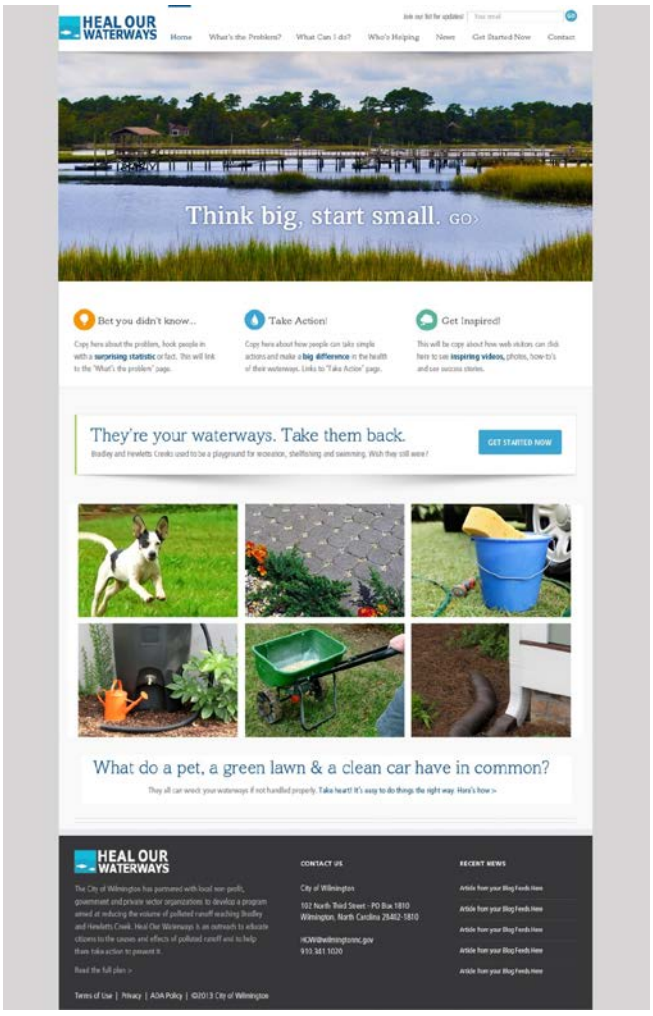
DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION
4/20/13	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Watershed Coordinator-Stormwater Staff	Display booth to promote watershed/ stormwater awareness One on one interaction with attendees	4000 attendees
5/1/13	Stormwater Postcard Mailing	Residents Bradley and Hewletts Creek	Stormwater/ Heal Our Waterways	Mailing/ "Do You Know How Your Water Flows?" water system graphic/information	16,521 Postcards Sent to Watershed Residents/ Businesses
5/30/13	Public Meeting for Beasley Road Drainage Project	Residents immediately affected by the project	Watershed Coordinator-Stormwater Staff	Display booth to promote Heal Our Waterways program/ One on One interaction with residents	60 meeting attendees
May-June 2013	Billboard Stormwater PSA	Local Residents	Stormwater/ Heal Our Waterways	Electronic Billboards in Hewletts Creek/ Watershed and Stormwater Pollution Awareness (What Goes in Here, Ends up Here)	8 second message/ 1200 impressions per day

The Heal Our Waterways logo was developed to provide a graphic identity for the program

HEAL OUR WATERWAYS

The first mailing specifically targeting residents in the Bradley and Hewletts Creek watersheds was sent out in May 2013. The mailing introduced the logo and education residents on the water systems in the city, including the direction connection between stormwater and our creeks.





HealOurWaterways.com was developed to provide the public with a central source of education and information about the restoration program. The site is set up to track public participation through the use of the GIS Atlas and works to inform and inspire residents in the target watersheds.

APPENDIX I: REGULATORY ENFORCEMENT ACTIONS

In 12-13 the Public Services Department compliance Officer provided stormwater education and investigated approximately 102 requests. The majority were reports of illicit discharges to the storm drainage system followed by reports of violation of the Pet Waste section of the Stormwater Ordinance. The following table is a detail summary of the requests for compliance intervention for stormwater pollution issues.

ENFORCEMENT ACTIONS 2012-2013

ID	Nature of Complaint	Number of Reports	Resolved thru Public Education	NOVs Incidents	Referred to DWQ	# Civil Penalties
1	Pet Waste	15	100%	0	N/A	0
2	Outreach	23		0	N/A	N/A
3	Illicit Discharge/Sediment	64	95.3%	3	16	2
3a	*Illicit Connection*	*2*	*50.0%*	*1*	*1*	*1*
3b	*Dry Weather Flow*	*6*	*100.0%*	*0*	*0*	
3c	*SSO*	*15*	*86.7%*	*2*	*12*	*1*
	Totals for 1,2 and 3	102	97%	3	16	2

CIVIL PENALTIES 2012-2013

Nature of Compliant	Responsible Party	Address of violation	Date of Violation	Total Penalty
SSO & Illicit Connection	CFPUA	837 Kerr Ave	4/12/12	$12,500.00
SSO Illicit Discharge	CFPUA	Barnard Creek at River Rd	9/6/12	$150.00

DEFINITIONS: Nature of Complaint

Yard Waste (Part 2, Sec. 12-29)

Yard waste complaints include calls the City received reporting violations of the City's stormwater ordinance which prohibits the intentional raking, sweeping, blowing, washing, directing or placing of yard waste into any part of the public drainage system which might impede the flow of water through the system or compromise water quality. Resolution of an incident includes distribution of educational material and/or explanation of the ordinance with the possible fines.

Illicit Discharge/Sediment (Part 1, Sec. 12-22)

Complaints include issues reported as illicit discharges as defined by the ordinance. Reports include legal as well as illegal discharges which was determined after the investigation was completed. Resolution of an incident includes education to the public regarding stormwater pollution and awareness of the City ordinance with the potential fines for non compliance and repeat offenders. Written NOVs may be issued for more serious offences.

Illicit Connection (Part 1, Sec. 12-23)

Reports were the result of an illicit connection that impacted the City's stormwater system with a non-allowable discharge. All complaints in this category are the result of an investigation and the confirmation of illicit connection. Resolution of an incident includes education on the impacts to water quality, the City's ordinance requirements, and the potential fines for a violation. Additionally, follow up to the incident would include making sure the illicit connection was permanently closed.

Pet Waste (Part 2, Sec. 12-28)

The pet waste complaint category included any report of violation of the City's Pet Waste Ordinance. These complaints which were called in by citizens or City employees, due to their nature, may or may not have been substantiated after the investigation. Resolution of an incident includes education to all parties involved on the potential adverse health effects of pet waste pollution, prevention, the City's ordinance requirements and the potential fines for each violation.

Blockages (Part 2, Sec. 12-29)

Blockage reports include any complaint reported which were thought to have the potential to impede the flow of stormwater in the City's maintained drainage system. Resolution of the incident includes education to citizens involved directly or within the immediate area of the incident explaining how to prevent willful blockages of the stormwater system.

SSO (Part 1, Sec.12-24)

Sewer overflows from the CFPUA system, both reportable and not reportable. Resolution of the incident includes reviewing the DWQ reporting form for completion of corrective action items and review of educational material distributed near the incident.

APPENDIX J: MAJOR OUTFALL LOCATIONS AND DESCRIPTION TABLE

Watershed	Latitude	Longtitude	Size	Material	Number	Classification	Map Date	Condition
Barnards Creek	34.15865	-77.91188	6.0 X 8.0	RCP	Double	NPDES outfall found	2/20/2012	Good
Barnards Creek	34.16482	-77.92585	60	RCP	Double	NPDES outfall found	2/20/2012	Good
Barnards Creek	34.16657	-77.92957	60	RCP	Triple	NPDES Industrial outfall found	11/21/2011	Good
Barnards Creek	34.16113	-77.93105	42	RCP	Single	NPDES outfall found	11/2/2011	Good
Barnards Creek	34.16134	-77.93815	18	RCP	Quad	NPDES Industrial outfall found	11/14/2011	Good
Bradley Creek	34.20898	-77.83556	3.0 X 5.0	RCP	Single	NPDES outfall found	1/6/2012	Good
Bradley Creek	34.21320	-77.82715	2.0 X 4.0	RCP	Single	NPDES outfall found	8/29/2000	Good
Bradley Creek	34.21952	-77.84568	90	CAP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21911	-77.85177	72	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.20939	-77.83654	54	RCP	Single	NPDES outfall found	1/6/2012	Good
Bradley Creek	34.23066	-77.85234	54	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.23284	-77.84028	54	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21585	-77.82498	48	CMP	Single	NPDES outfall found	1/31/2012	Good
Bradley Creek	34.21997	-77.86130	42	CMP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.22630	-77.85231	42	CMP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.20829	-77.83101	36	RCP	Single	NPDES outfall found	1/6/2012	Fair

Bradley Creek	34.20899	-77.83554	36	CMP	Single	NPDES outfall found	1/6/2012	Poor
Bradley Creek	34.20900	-77.83553	36	CMP	Single	NPDES outfall found	1/6/2012	Fair
Bradley Creek	34.21669	-77.83399	30	CMP	Single	NPDES outfall found	1/31/2012	Fair
Bradley Creek	34.21427	-77.83470	24	RCP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21440	-77.83926	24	RCP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.22066	-77.83784	24	RCP	Single	NPDES outfall found	1/31/2012	Good
Burnt Mill Creek	34.22878	-77.90517	11.0 X 12.0	RCP	Double	NPDES outfall found	2/28/2012	Good
Burnt Mill Creek	34.22870	-77.88923	5.0 X 6.0	CMP	Double	NPDES outfall found	2/28/2012	Good
Burnt Mill Creek	34.24617	-77.93366	72	SMP	Single	NPDES outfall found	2/28/2012	Fair
Burnt Mill Creek	34.23148	-77.91302	66	RCP	Single	NPDES outfall found	11/24/2010	Good
Burnt Mill Creek	34.24430	-77.92571	60	RCP	Single	NPDES outfall found	9/29/2010	Good
Burnt Mill Creek	34.23402	-77.91972	54	RCP	Single	NPDES outfall found	10/26/2010	Good
Burnt Mill Creek	34.23232	-77.91568	42	RCP	Double	NPDES outfall found	11/9/2010	Good
Burnt Mill Creek	34.23397	-77.91877	42	RCP	Single	NPDES outfall found	11/24/2010	Good
Burnt Mill Creek	34.23989	-77.92258	36	RCP	Single	NPDES outfall found	10/5/2010	Good
Burnt Mill Creek	34.24025	-77.92318	36	RCP	Single	NPDES outfall found	10/5/2010	Good
Burnt Mill Creek	34.25344	-77.92354	30	RCP	Double	NPDES outfall found	3/2/2012	Good

Drains directly to ICW	34.19570	-77.83301	48	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.19629	-77.82915	48	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.22229	-77.81978	48	IRON	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22234	-77.81985	48	IRON	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.19503	-77.83000	36	RCP	Single	NPDES outfall found	11/22/2011	Good
Drains directly to ICW	34.19904	-77.82758	36	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.22121	-77.81566	36	RCP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22432	-77.81658	30	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22433	-77.81659	30	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22432	-77.81658	24	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.16461	-77.85628	2.5 X 5.0	CMP	Single	NPDES outfall found	7/19/2011	Fair
Greenfield Lake	34.19852	-77.93558	4.0 X 6.0	CMP	Triple	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20094	-77.93381	60	RCP	Double	NPDES outfall found	2/22/2012	Good

Greenfield Lake	34.21255	-77.93161	60	CMP	Quad		2/22/2012	Good
Greenfield Lake	34.21429	-77.93563	48	RCP	Single	NPDES outfall found	2/23/2012	Good
Greenfield Lake	34.20127	-77.93568	42	RCP	Double	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.19964	-77.93615	36	RCP	Single	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20462	-77.93537	36	RCP	Single	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20751	-77.92997	30	RCP	Triple	NPDES outfall found	2/22/2012	Good
Hewletts Creek	34.18153	-77.86851	5.0 X 16.0	OTHER	Other	NPDES outfall found	11/17/2011	Good
Hewletts Creek	34.18020	-77.87198	90	CMP	Single	NPDES outfall found	11/3/2011	Good
Hewletts Creek	34.19421	-77.85211	60	CMP	Single	NPDES outfall found	11/21/2011	Fair
Hewletts Creek	34.17296	-77.85090	48	RCP	Double	NPDES outfall found	7/28/2011	Good
Hewletts Creek	34.18735	-77.85761	48	RCP	Single	NPDES outfall found	11/3/2011	Good
Hewletts Creek	34.19359	-77.85549	48	RCP	Triple	NPDES outfall found	11/18/2011	Good
Hewletts Creek	34.17112	-77.85107	42	RCP	Single	NPDES outfall found	7/19/2011	Good
Hewletts Creek	34.17879	-77.86842	42	RCP	Single	NPDES outfall found	2/16/2001	Good
Hewletts Creek	34.19498	-77.85447	42	RCP	Double	NPDES outfall found	11/18/2011	Good
Hewletts Creek	34.19680	-77.84352	42	CMP	Single	NPDES outfall found	11/22/2011	Fair
Hewletts Creek	34.20042	-77.86258	42	CMP	Single	NPDES outfall found	11/8/2011	Fair

Hewletts Creek	34.18468	-77.85373	36	RCP	Single	NPDES outfall found	2/26/2001	Good
Hewletts Creek	34.17878	-77.86844	30	RCP	Single	NPDES outfall found	11/7/2011	Good
Hewletts Creek	34.19419	-77.85209	18	RCP	Single	NPDES outfall found	2/6/2001	Good
Hewletts Creek	34.19430	-77.88617	2.0 X 4.4	RCP	Single	NPDES outfall found	2/24/2011	Good
Hewletts Creek	34.19471	-77.88822	6.0 X 8.0	RCP	Triple	NPDES outfall found	2/2/2011	Good
Hewletts Creek	34.19793	-77.88484	7.7 X 15.0	CAP	Single	NPDES outfall found	2/24/2011	Good
Howe Creek	34.24536	-77.82717	7.0 X 9.0	RCP	Double	NPDES outfall found	5/16/2007	Good
Howe Creek	34.25450	-77.82624	72	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24701	-77.82334	66	CMP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24211	-77.82454	60	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.24226	-77.82714	48	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.24700	-77.82333	48	CMP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.26158	-77.82611	48	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24225	-77.82718	42	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.25029	-77.82655	42	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.25030	-77.82655	42	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24083	-77.82759	36	RCP	Single	NPDES outfall found	5/16/2007	Good

Howe Creek	34.24304	-77.82263	36	RCP	Double	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24519	-77.82714	36	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24551	-77.82710	36	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24749	-77.82369	36	CMP	Single	NPDES outfall found	2/1/2012	Good
Cape Fear River	34.20807	-77.95086	10.0 X 10.0	RCP	Single	NPDES outfall found	3/15/2011	Good
Cape Fear River	34.21225	-77.94608	5.8 X 8.4	RCP	Triple	NPDES outfall found	3/25/2011	Good
Cape Fear River	34.19774	-77.95482	66	RCP	Single	NPDES Industrial outfall found	11/14/2011	Good
Cape Fear River	34.20913	-77.94735	48	RCP	Double	NPDES outfall found	4/1/2011	Good
Cape Fear River	34.18028	-77.95095	36	RCP	Single	NPDES Industrial outfall found	11/14/2011	Good
Cape Fear River	34.16995	-77.94822	30	RCP	Single	NPDES Industrial outfall found	11/29/2011	Good
Cape Fear River	34.21504	-77.94755	24	RCP	Single	NPDES Industrial outfall found	3/21/2011	Good
Cape Fear River	34.17135	-77.94984	18	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Cape Fear River	34.17294	-77.94902	18	RCP	Single	NPDES Industrial outfall found	11/29/2011	Good
Cape Fear River	34.18391	-77.95205	18	RCP	Single	NPDES Industrial outfall found		Good
Cape Fear River	34.24197	-77.95273	3.0 X 10.0	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.21631	-77.94661	54	RCP	Single	NPDES Industrial outfall found	3/15/2011	Good
Cape Fear River	34.21646	-77.94663	54	RCP	Single	NPDES Industrial outfall found	4/11/2011	Good

Cape Fear River	34.22374	-77.95034	54	RCP	Single	NPDES outfall found	9/28/2009	Good
Cape Fear River	34.23969	-77.95146	48	RCP	Single	NPDES outfall found	5/27/2011	Inaccessible
Cape Fear River	34.24087	-77.95156	42	RCP	Single	NPDES outfall found	6/8/2011	Good
Cape Fear River	34.24089	-77.95155	42	RCP	Single	NPDES outfall found	6/8/2011	Good
Cape Fear River	34.24333	-77.95131	36	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24991	-77.95037	36	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25033	-77.94992	36	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25729	-77.94434	36	RCP	Single	NPDES Industrial outfall found	6/10/2011	Good
Cape Fear River	34.24314	-77.95131	30	CPP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24977	-77.95055	30	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25050	-77.94980	30	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.22764	-77.95054	24	CMP	Single	NPDES outfall found	5/16/2011	Good
Cape Fear River	34.22889	-77.94994	24	CMP	Single	NPDES outfall found	9/28/2009	Fair
Cape Fear River	34.24200	-77.95272	24	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24319	-77.95121	24	CMP	Single	NPDES outfall found	6/10/2011	Fair
Cape Fear River	34.24964	-77.95067	24	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25245	-77.94726	24	RCP	Single	NPDES Industrial outfall found	6/14/2011	Good
Cape Fear River	34.25728	-77.94432	24	RCP	Single	NPDES Industrial outfall found	6/10/2011	Good

Cape Fear River	34.24335	-77.95138	12	RCP	Single	NPDES outfall found	6/10/2011	Poor
Cape Fear River	34.25565	-77.94679	12	VCP	Single	NPDES Industrial outfall found	6/14/2011	Poor
Cape Fear River	34.23014	-77.94946	Inaccessible - submerged	RCP	Single	NPDES outfall	5/25/2011	Inaccessible
Smith Creek	34.25505	-77.87846	6.8 X 8.0	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25536	-77.87357	9.0 X 11.0	RCP	Double	NPDES Industrial outfall found	2/21/2012	Good
Smith Creek	34.25739	-77.94108	Not Found	UNKNOWN	Single	NPDES outfall submerged	2/28/2012	Unknown
Smith Creek	34.25711	-77.90656	7.0 X 8.0	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25756	-77.91249	6.0 X 7.0	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Smith Creek	34.25718	-77.90675	72	RCP	Triple	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25403	-77.89263	66	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25297	-77.93964	48	RCP	Single	NPDES outfall found	2/28/2012	Good
Smith Creek	34.25437	-77.90027	48	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25718	-77.88761	42	RCP	Single	NPDES outfall found	2/21/2012	Fair
Smith Creek	34.25761	-77.91556	42	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Whiskey Creek	34.16376	-77.86289	72	CMP	Single	NPDES outfall found	3/27/2001	Good
Whiskey Creek	34.16654	-77.86775	42	RCP	Single	NPDES outfall found	7/18/2011	Good

Whiskey Creek	34.16362	-77.86228	36	RCP	Single	NPDES outfall found	3/27/2001	Good
Whiskey Creek	34.16670	-77.86858	36	RCP	Single	NPDES outfall found	7/18/2011	Good
Whiskey Creek	34.16671	-77.86860	36	RCP	Single	NPDES outfall found	7/18/2011	Good
Whiskey Creek	34.16779	-77.87648	5.5 X 7.0	CMP	Single	NPDES outfall found	7/18/2011	Good

APPENDIX K: DEFINITIONS

Act
See Clean Water Act.

Best Management Practice (BMP)
Measures or practices used to reduce the amount of pollution entering surface waters. BMPs can be structural or non-structural and may take the form of a process, activity, physical structure or planning (see non-structural BMP).

Built-upon Area
That portion of a development project that is covered by impervious or partially impervious surface including, but not limited to, buildings; pavement and gravel areas such as roads, parking lots, and paths; and recreation facilities such as tennis courts. "Built-upon area" does not include a wooden slatted deck, the water area of a swimming pool, or pervious or partially pervious paving material to the extent that the paving material absorbs water or allows water to infiltrate through the paving material.

Clean Water Act
The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), as amended, 33 USC 1251, et. seq.

Common Plan of Development
A construction or land disturbing activity is part of a larger common plan of development if it is completed in one or more of the following ways:

- In separate stages
- In separate phases
- In combination with other construction activities

It is identified by the documentation (including but not limited to a sign, public notice or hearing, sales pitch, advertisement, loan application, drawing, plats, blueprints, marketing plans, contracts, permit application, zoning request, or computer design) or physical demarcation (including but not limited to boundary signs, lot stakes, or surveyor markings) indicating that construction activities may occur on a specific plot. It can include one operator or many operators.

Department
Department means the North Carolina Department of Environment and Natural Resources

Division (DWQ)
The Division of Water Quality, Department of Environment and Natural Resources.

Director
The Director of the Division of Water Quality, the permit issuing authority.

Dry Weather Flow
Any flow in the MS4 that occurs after a 72 hour period without rain.

EMC
The North Carolina Environmental Management Commission.

Illicit Discharge
Any discharge to a MS4 that is not composed entirely of stormwater except .discharges pursuant to an NPDES permit (other than the NPDES MS4 permit), allowable non-stormwater discharges, and discharges resulting from fire-fighting activities.

Industrial Activity
For the purposes of this permit, industrial activities shall mean all industrial activities as defined in 40 CFR 122.26.

Large or Medium Municipal Separate Storm Sewer System
All municipal separate storm sewers that are either:

(a) Located in an incorporated place with a population of 100,000 or more as determined by the Decennial Census by the Bureau of Census; or
(b) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
(c) Owned or operated by a municipality other than those described in paragraph (a) or (b) and that are designated by the Director as part of the large or medium separate storm sewer system.

Major municipal separate storm sewer outfall (or "major outfall")
Major municipal separate storm sewer outfall (or "major outfall") means a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Municipal Separate Storm Sewer System (MS4)
Pursuant to 40 CFR 122.26(b)(8) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

(a) Owned or operated by the United States, a State, city, town, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the Clean Water Act (CWA) that discharges to waters of the United States or waters of the State.

(b) Designed or used for collecting or conveying stormwater;
(c) Which is not a combined sewer; and
(d) Which is not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2

Non-stormwater Discharge Categories
The following are categories of non-stormwater discharges that the permittee shall address if it identifies them as significant contributors of pollutants to the storm sewer system: water line flushing, landscape irrigation, diverted stream flows, rising groundwater, uncontaminated groundwater infiltration, [as defined in 40 CFR 35.2005(20)], uncontaminated pumped groundwater, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the definition of illicit discharge and only need to be addressed where they are identified as significant sources of pollutants to waters of the United States).

Non-structural BMP
Non-structural BMPs are preventive actions that involve management and source controls such as: (I) Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space, provide buffers along sensitive water bodies, minimize impervious surfaces, and/or minimize disturbance of soils and vegetation; (2) policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure; (3) education programs for developers and the public about minimizing water quality impacts; (4) other measures such as minimizing the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention.

Outfall
Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

Permittee
The owner or operator issued this permit.

Point Source Discharge of Stormwater
Any discernible, confined and discrete conveyance including, but not specifically limited to, any pipe, ditch, channel, tunnel, conduit, well, or discrete fissure from which stormwater is or may be discharged to waters of the state.

Redevelopment
Means any rebuilding activity unless that rebuilding activity;
(a) Results in no net increase in built-upon area, and
(b) Provides equal or greater stormwater control than the previous development.

Representative Storm Event
A storm event that measures greater than 0.1 inches of rainfall and that is preceded by at least 72 hours in which no storm event measuring greater than 0.1 inches has occurred. A single storm event may contain up to 10 consecutive hours of no precipitation. For example, if it rains for 2 hours without producing any collectable discharge, and then stops, a sample may be collected if a rain producing a discharge begins again within the next 10 hours.

Storm Sewer System
Is a conveyance or system of conveyances which are designed or used to collect or convey stormwater runoff that is not part of a combined sewer system or treatment works. This can include, but is not limited to, streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains that convey stormwater runoff.

Stormwater Associated with Industrial Activity
The discharge from any point source which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw material storage areas at an industrial site. Facilities considered to be engaged in "industrial activities" include those activities defined in 40 CFR 122.26(b)(l4). The term does not include discharges from facilities or activities excluded from the NPDES program

Stormwater Management Program (SWMP)
The term Stormwater Management Program (SWMP) refers to the stormwater management program that is required by the Phase I and Phase II regulations to be developed by MS4 permittees.

Stormwater Plan
The Stormwater Plan is the written plan that is used to describe the various control measures and activities the permittee will undertake to implement the stormwater management program. The Stormwater Plan is a consolidation of all of the permittee's relevant ordinances or other regulatory requirements, the description of all programs and procedures (including standard forms to be used for reports and inspections) that will be implemented and enforced to comply with the permit and to document the selection, design, and installation of all stormwater control measures.

Stormwater Runoff
The flow of water which results from precipitation and which occurs immediately following rainfall or as a result of snowmelt.

Total Maximum Daily Load (TMDL)
A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is a detailed water quality assessment that provides the scientific foundation for an implementation plan. The implementation plan outlines the steps necessary to reduce pollutant loads in a certain body of water to restore and maintain water quality standards in all seasons. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.

Watershed Restoration Plan
For purposes of this permit, a Watershed Restoration Plan is any plan developed in consultation with the Division for voluntary implementation with the intent of enhancing water quality and/or implementing stormwater BMPs within 303(d) listed waters.