

2015 VPDES Permit Annual Report

Prepared by -

Fairfax County, Virginia -
VPDES Permit No. 0088587 -

Submitted to -

Virginia Department of Environmental Quality -

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To request this information in an alternate format, -
call the Stormwater Planning Division at 703-324-5500, TTY 711. -

Table of Contents

A.	Discharges Authorized Under this State Permit	1 -
1.	Permittee Responsibilities	1 -
2.	MS4 Program Resources.....	1
3.	Permit Maintenance Fees.....	2 -
4.	MS4 Program Plan.....	2
B.	Stormwater Management	2 -
1.	Planning	2 -
2.	MS4 Program Implementation.....	2 -
a)	Construction Site Runoff and Post Construction Runoff.....	2 -
b)	Retrofitting on Prior Developed Lands	4 -
c)	Roadways	4 -
d)	Pesticide, Herbicide and Fertilizer Application	5 -
e)	Illicit Discharges and Improper Disposal	5 -
f)	Spill Prevention and Response.....	7 -
g)	Industrial & High Risk Runoff	8 -
h)	Stormwater Infrastructure Management	9 -
i)	County Facilities	10 -
j)	Public Education/Participation	11 -
k)	Training	16 -
l)	Water Quality Screening Programs.....	16 -
1)	Dry Weather Screening.....	16 -
2)	Wet Weather Screening.....	16 -
m)	Infrastructure Coordination.....	17 -
C.	Monitoring.....	17 -

List of Tables

Table 1:	Illicit Discharges	5 -
Table 2:	List of Facility Outfalls Inspected	9 -
Table 3:	Public Education Activities	11 -

List of Appendices

- Appendix 1: FY 2016 Fairfax County Adopted Budget Plan (Vol. 2), Stormwater Services Budget
- Appendix 2: Fairfax County Wet Weather Screening Program Plan (2014)

The following annual report is submitted to the Virginia Department of Environmental Quality (DEQ) in compliance with Fairfax County's Virginia Stormwater Management Program (VSMP) permit. The permit was issued on April 1, 2015. Under the provisions of the permit, Fairfax County is updating its MS4 Program Plan. As required by Part I.E.1), this report covers the reporting period from April 1, 2015 through June 30, 2015 and describes the continued activities performed to satisfy the county's permit requirements and a status update of efforts toward the deadlines and requirements of the renewed permit.

NOTE: Annual Report requirements as specified in the permit are indicated below by **bold** section headings and the annual reporting requirements as specified in the permit are in *italics* directly beneath the applicable section heading.

A. Discharges Authorized Under this State Permit

1. Permittee Responsibilities

Each annual report shall include a list of roles and responsibilities.

Responsible Parties for individual elements are listed with each Best Management Practice (BMP) in the MS4 VPDES Permit Stormwater Management Plan dated March 24, 2015. Overall compliance with Fairfax County's MS4 permit is tracked and coordinated by the MS4 Program Coordination Section of the Department of Public Works and Environmental Services (DPWES).

Each annual report shall include a list of those circumstances of non-compliance outside of the permittee's control.

From April 1, 2015 to June 30, 2015 there were no circumstances of non-compliance outside of the permittee's control.

2. MS4 Program Resources

A copy of the fiscal year's budget including proposed capital and operation and maintenances expenditures necessary to accomplish the activities required by this permit shall be submitted with each annual report.

In fiscal year (FY) 2006 the Board of Supervisors dedicated the value of one penny of the real estate tax, or approximately \$20 million annually to stormwater capital projects. As part of the FY 2010 Adopted Budget Plan, a new service district was created to support the stormwater management program, as authorized by Virginia Code Annotated Sections 15.2-2400. As part of the FY 2016 budget, the Board of Supervisors increased the stormwater service district levy to \$0.0250 (two and a half cents) per \$100 of assessed real estate value. The stormwater service district will generate approximately \$56.5 million in FY 2016 that will be dedicated to funding the entire stormwater management program which includes both staff operating requirements and stormwater capital projects.

A copy of the FY 2016 Fairfax County Adopted Budget Plan (Vol. 2), Stormwater Services Budget has been included in Appendix 1.

3. Permit Maintenance Fees

A statement regarding payment of the applicable MS4 permit maintenance fee, including check date and check number shall be included with each annual report. Note: Please do not include copies of checks or other bank records.

Fairfax County's MS4 permit maintenance fee was mailed to DEQ on September 16, 2014. The check was number 1000339126 and dated September 15, 2014.

4. MS4 Program Plan

Fairfax County's current MS4 program plan is available to the public on the Fairfax County website at the following link: <http://www.fairfaxcounty.gov/dpwes/stormwater/ms4permit.htm>.

5. MS4 Program Review and Updates

Fairfax County is in the process of updating its existing MS4 Program Plan in accordance with the requirements of the renewed permit. All modifications and proposed modifications will be reported in accordance with Part I. A. 7 of the permit.

B. Stormwater Management

1. Planning

The permittee shall provide the Department a web link to the plans no later than 12 months after the effective date of this state permit and with each annual report.

The watershed management planning process is one component of the county's MS4 Program and is part of the Fairfax County Board of Supervisors' Environmental Agenda. A total of 13 plans, which cover all 30 watersheds in the county, have been developed through a watershed planning initiative that began in 2003. The plans were developed with the assistance of the community through public meetings and individual plan stakeholder groups. This public involvement process helped to ensure that the plans meet the needs in the watershed and have the support of county residents. The county completed and adopted six watershed plans between 2005 and 2008 as part of the first round of planning. By early February 2011, the seven remaining watershed management plans were completed and adopted by the Fairfax County Board of Supervisors.

The watershed management plans can be found on the Fairfax County website at the following link: <http://www.fairfaxcounty.gov/dpwes/watersheds/>

2. MS4 Program Implementation

a) Construction Site Runoff and Post Construction Runoff from Areas of New Development and Development on Prior Developed Lands

Each annual report shall contain the number of regulated land disturbing activities approved and the total number of acres disturbed.

From April 1, 2015 to June 30, 2015 a total of 218 erosion and sediment (E&S) control plans for projects that would disturb a land area of 2,500 square feet or more were submitted and approved. The total disturbed acres associated with those plans approved is 229.5. Written monthly reports listing individual sites were submitted to DEQ in accordance with 9VAC25-840-65.

From April 1, 2015 to June 30, 2015 a total of 23 stormwater management plans for projects that would disturb a land area of 1 acre or more were submitted and approved. The total disturbed acres associated with those plans approved is 223.4 acres. VSMP program implementation information is reported to DEQ in accordance with 9VAC25-870-126.

Each annual report shall contain the number of land disturbing activity inspections conducted and the number and type of each enforcement action taken.

Fairfax County's E&S control program is fully approved by DEQ and is implemented by the Land Development Services (LDS) business area of DPWES. Between April 1, 2015 and June 30, 2015, 7,040 E&S inspections were performed through the county's Alternative Inspection Program on all sites under construction. Those E&S inspections represent 50 percent of the 14,064 total site inspections that were performed by Site Development and Inspection Division (SDID) personnel.

Between April 1, 2015 and June 30, 2015, SDID wrote 95 E&S control inspection reports (formerly called "20/30 reports"), which identify the E&S control deficiencies construction site operators must correct within five days. Failure to comply within the specified time frame can result in issuance of a violation to the developer. Between April 1, 2015 and June 30, 2015 SDID issued 1 violation which was later resolved.

The Land Disturbance and Post Occupancy Branch of LDS investigate complaints alleging violations of Fairfax County's Erosion and Sediment Control Ordinance (Chapter 104 of Fairfax County Code). The branch also investigates complaints alleging violations of the county's Chesapeake Bay Preservation Ordinance (Chapter 118). Between April 1, 2015 and June 30, 2015, the branch received 66 total complaints. In most instances, there was either no violation or there was timely compliance if a violation was cited. The branch issued 17 Notices of Violations (no Resource Protection Area (RPA) violations and 17 land disturbance violations). Currently all 17 of the violations are being resolved.

Residents may report complaints about erosion and sedimentation to the county by phone, through e-mail, or anonymously on the web. Residents can visit the following website to find contacts for specific land development issues:

http://www.fairfaxcounty.gov/dpwes/sitedevelopment/land_dev_concerns.htm

Each annual report shall include a summary of actions taken by the permittee to implement Part I.B.2.a)1) and 2) of this state permit.

Fairfax County has implemented local Virginia E&S Control Program (VESCP) and local Virginia Stormwater Management Program (VSMP) consistent with the applicable state regulations. The VESCP and VSMP programs are fully approved by DEQ and are implemented by the Land Development Services (LDS) business area of DPWES.

b) Retrofitting on Prior Developed Lands

Each annual report shall include a status update for those projects for which implementation began during the reporting period.

Fairfax County agencies completed two retrofit projects to enhance stormwater management functionality between April 1, 2015 and June 30, 2015. The projects included a dry extended detention pond retrofit and a bioretention. The results of the county's retrofit efforts are summarized as follows:

- Projects were completed in two of the county's 30 watersheds: Mill Branch and Difficult Run.
- Both projects were retrofitting opportunities specifically mentioned in county watershed management plans.
- The impervious area treated by the retrofits totals approximately 9.1 acres while the total area treated was more than 55 acres.
- Combined, the two retrofits are estimated to remove nitrogen, phosphorus, and sediment at rates of approximately 115 pounds/year, 9 pounds/year, and 5,540 pounds/year, respectively.
- The cost of these retrofits is more than \$500,000.

Retrofit project documentation is maintained by the Stormwater Planning Division (SWPD) of DPWES.

c) Roadways

The Virginia Department of Transportation (VDOT), which is covered by a separate Phase II MS4 permit, is responsible for maintenance and operation of public roads (interstate, primary, secondary, and residential) in Fairfax County. The county is only responsible for maintaining several miles of discontinuous road segments, many of which are unpaved. A significant component of Fairfax County's roadways program is sweeping parking lots associated with county facilities such as government centers, libraries, public schools (funded by Fairfax County Public Schools), fire stations, police stations, health centers, bus transit facilities, park and ride lots, commuter rail stations, public housing facilities, and staffed park locations.

In an effort to limit the discharge of pollutants from parking lots into the county's streams, the county provides sand and chemical treatment only when dictated by safety. The county sweeps material from each treated parking area annually. As part of a continued effort to limit the discharge of pollutants from county facilities, the county follows Standard Operating Procedures (SOPs) developed for both Snow Removal Operations and Street Sweeping. These SOPs are used county-wide by Fairfax County agencies involved in snow removal and parking lot sweeping.

The county's parking lot sweeping program and snow removal operations are currently carried out by three organizations: DPWES, Department of Housing and Community Development (DHCD), and Fairfax County Park Authority (FCPA). DPWES plows and treats snow at county government facilities and sweeps parking lots at county government and public schools sites as well as paved county road segments, where feasible. DHCD sweeps parking lots on

residential developments such as apartment complexes, townhouse developments, group homes, and senior facilities that are owned and operated by the county. FCPA maintains (plows and/or treats) essential use parking areas at staffed park locations on a case-by-case basis to remove snow and provide for safe driving and footing. From April 1, 2015 to June 30, 2015, 279 cubic yards of material were removed from 75 county government facilities and 13 public schools sites through sweeper trucks and hand sweeping.

d) Pesticide, Herbicide and Fertilizer Application

Each annual report shall include the number of acres managed under Integrated Pest Management Plans.

A working group of County agencies has been meeting to identify lands owned or operated by Fairfax County where nutrients are applied to a contiguous area greater than one acre. A list of such lands will be submitted with the 2016 annual report. Agencies involved include the Stormwater Planning Division of DPWES, the Fairfax County Park Authority, and Fairfax County Public Schools.

County agencies involved in the administration of parks and athletic fields currently have some form of nutrient and pest management plans. County personnel and private contractors develop and implement the plans per the Virginia Department of Conservation and Recreation's nutrient management guidelines, the Virginia Department of Agriculture and Consumer Services' guidelines, and the Virginia Pesticide Control Act.

The Park Authority currently has two Virginia state-certified nutrient management planners on staff, one for parks and a recently certified planner for golf courses. To date FCPA has nutrient management plans for approximately 491 acres of golf course area and 252 acres of natural turf athletic fields where nutrients are applied (an additional 3,001 acres are addressed under a nutrient management plan, but do not receive any nutrients). Thirty one acres of park land are managed under an integrated pest management plan. An additional 872 acres of FCPA managed turf do not receive any fertilization or pesticide application.

For the period of April 1, 2015 to June 30, 2015, the Northern Virginia Soil and Water Conservation District's (NVSWCD) certified nutrient management planner prepared nutrient management plans for a total of 81.2 acres in agricultural use. These included 33.2 acres with "new" plans (i.e., plans prepared for tracts that never had a nutrient management plan), and 48 acres of "revised" plans (i.e., plans prepared for tracts that had plans that were about to expire, or had already expired).

e) Illicit Discharges and Improper Disposal

Each annual report shall include a list of illicit discharges identified, the source, a description of follow-up activities and whether the illicit discharge has been eliminated.

Fairfax County enforces illicit discharges through County Code Chapters 62 (Fire Protection) and 124 (Stormwater Management). Chapter 124 integrated previous Chapters 105 and 106 into Article 9 which addresses illicit discharges to state waters and to the MS4. The Fire and Rescue Department's (FRD) Fire and Hazardous Materials Investigative Services (FHMIS) section enforces Chapter 62 which includes police powers to investigate and prosecute certain offenses including those related to storage, use, and transportation of hazardous materials

and hazardous waste, as well as environmental crimes. DPWES enforces County Code Chapter 124 which addresses the prevention, investigation and enforcement of discharges of prohibited substances into the County MS4 and state waters and illicit connections to the County MS4.

Illegal Dumping is addressed by County Code Chapter 46, Health or Safety Menaces. Procedural Memorandum No. 71-01, Illegal Dump Site Investigation, Response, and Cleanup, outlines the process of follow-up action for non-emergency incidents; illegal dumping; establishes action under Chapter 46; and provides referrals for action on complaints. Standard operating procedure (SOP) "Stormwater Planning Division Investigations of Illicit Discharges and Improper Disposal (IDID)" (2015) outlines procedures for illicit discharge investigations.

SWPD continued to resolve four illicit discharges into this this reporting period. From April 1, 2015 to June 30, 2015, SWPD responded to four additional suspected illicit discharges to the County MS4. The investigations are summarized Table 1 below. Illicit Discharges may also be identified through the County's Dry Weather Screening Program (discussed in more detail in section B. 2. I) 1) of this report).

Table 1: Illicit Discharges from April 1, 2015 to June 30, 2015

IDID Number	Type	Source	Action	Status
IDID-0048	Vehicle wash with detergent	Carwash	Notified operator that the discharge is not allowed and sent information for vehicle washing.	Open: under resolution
IDID-0065	Other	Cooling tower, air conditioner and unknown	Discharge found during IHRR inspection, but not coming from facility. Tracked discharges to two cooling towers and owner eliminated discharge by plumbing to sanitary. Tracked third source of flow to air conditioning condensate.	Open: source tracking
IDID-0074	Other	Undetermined	Report forwarded to Fairfax Water for investigation.	Open: source tracking
IDID-0081	Other	Fairfax Water cleaning clay sediment with fire hydrant and allowing it to run into storm drain and stream.	Clay sediment runoff from Fairfax Water repair water main break. Advised to be aware of cleaning their site up after work is completed.	Closed: discharge eliminated
IDID-0082	Other	Sump pump	Complaint received of discharge coming from pool; however, onsite inspection verified that the discharge was from the sump pump. Recommended to the property owner that the sump pump pipe should be cut back to allow for the discharge to flow over grass instead of directly onto driveway and sidewalk.	Closed: not an illicit discharge
IDID-0089	Chlorinated swimming pool discharge	Swimming Pool Water	Received complaint of a chlorine smell from coming from the stream. A nearby curb inlet manhole lid was pulled and flow was present. A sample was taken and analyzed in the field. High chlorine levels were present. Contacted swimming pool maintenance contractor on the same day of investigation and reported findings. A process to dechlorinate the water for both the main and wading pools prior to discharge is being put into place.	Open: under resolution
IDID-0090	Chlorinated swimming pool discharge	Indoor swimming pool	Health Department performed inspection and noted a storm drain manhole in the pump room that raised some concern. Further	Open: under resolution

IDID Number	Type	Source	Action	Status
			investigation revealed that the pool backwash was discharged to the pond with high levels of Chlorine. Corrective Action Notice has been issued to address the chlorine levels in pool backwash water.	
IDID-0092	Fats, oils and grease (FOG)	–Food Service Establishment	Observed numerous issues around Fats, Oils, and Grease, wash water, and waste management. Requested all businesses to clean up grease, litter and empty dumpster. Follow up inspection revealed washing of tools with sediment outside. Requested they stop & clean up. On 6-18-15 issued a Corrective Action Notice to Property Owner and Food Service Establishment A follow up on verified issues were addressed.	Closed: discharge eliminated

Each annual report shall include the amount of linear feet of sanitary sewer inspected during the reporting year.

Programs that can help to prevent, detect, and eliminate illicit discharges of sanitary wastes into the MS4 are implemented and documented by the Wastewater Management (WWM) and Capital Facilities (CAP) business areas of DPWES, and the Fairfax County Health Department (FCHD). The Sanitary Sewer Infiltration Abatement Program conducts wastewater flow measurements and analysis to identify areas of the wastewater collection system with excessive inflow/infiltration problems, and uses closed circuit television (CCTV) to inspect trunk sewer mains in an effort to proactively identify defective sewer lines for repair and rehabilitation. Between April 1, 2015 and June 30, 2015, 335,754 linear feet of old sewer lines and 9,848 linear feet of new sewer lines were inspected, resulting in the identification of sanitary sewer lines and manholes needing repair and rehabilitation. From April 1, 2015 to June 30, 2015, 20,358 linear feet of sanitary sewer lines were rehabilitated.

The Sanitary Sewer Extension and Improvement Program implemented by CAP, addresses pollution abatement and public health considerations by providing sanitary sewer service to areas identified by FCHD as having non-repairable, malfunctioning septic systems. Between April 1, 2015 and June 30, 2015, no Extension and Improvement projects were completed.

f) Spill Prevention and Response

When requested by first responders, 911 dispatch protocols or the Fire Marshal’s Office, FRD’s Hazardous Materials Response Team (HMRT) responds to reported incidents of hazardous material releases, spills and discharges in the county (regardless of whether the material has potential to enter the county-operated MS4, another system such as VDOT’s, or waters of the state). The department maintains and tracks firefighter training/certification under OSHA 29 CFR 1910.120 (q) and NFPA 472. The HMRT conducts monthly training on each of the three shifts. For the period April 1, 2015 to June 30, 2015 each shift as well as unassigned hazmat team members conducted at a minimum 200 hours of training per month regarding hazmat technician operations for a total of 2,200 hours per shift. The entire fire department operational personnel received 4 hours per person of hazmat operations refresher training totaling approximately 4,000 hours during March April and May. The refresher training covers topics relating to hazard classes, container shapes, initial actions and chemical/physical

properties. The Fire Marshal’s Office maintains a contract with a major commercial hazardous materials response company to provide additional containment and clean-up support for large-scale incidents.

Between April 1, 2015 and June 30, 2015 FHMIS received 191 complaints. Approximately 75 of the complaints involved the actual release of various petroleum or chemical substances. Of the 75 releases, most involved the release of petroleum products including diesel fuel (10), home heating fuel oil (2), gasoline (5), motor oil (3), or hydraulic oil (5). Other releases investigated involved antifreeze, paint, sewage, waste water discharges, water treatment chemicals and mercury. Six of the releases reached storm drains or water ways. Documentation of individual releases and the county’s responses is maintained by FHMIS.

In both emergency and non-emergency spills that reach the MS4, FHMIS enforces appropriate codes and ordinances to ensure that responsible parties take appropriate spill control and cleanup actions to protect and restore the environment.

FHMIS monitors, on a long-term basis, contaminated sites that have a potential for the contaminant coming in contact with surface waters or stormwater management facilities. As a part of the oversight program, FHMIS, as an agent of the Director of DPWES, accepts, reviews and processes requests to discharge treated groundwater from remedial activities at contaminated sites into county storm sewers. FHMIS then monitors the discharge for the duration of the agreement. As of June 30, 2015, HMRT monitored seven oversight cases. Most of these oversight files involve contaminated underground storage tank sites.

The FRD continued to maintain membership in the Fairfax Joint Local Emergency Planning Committee (FJLEPC), which includes representatives of Fairfax County, the City of Fairfax, and the towns of Vienna and Herndon. FRD updates its Hazardous Material Emergency Response Plan annually.

g) Industrial & High Risk Runoff

Fairfax County’s current inventory of Industrial and High Risk Runoff (IHRR) facilities discharging to the county’s MS4 is 144.

From April 1, 2015 to June 30, 2015, SWPD’s Code Specialists inspected 16 facilities from the IHRR list in accordance with County SOPs (as shown in Table 2 below). No significant pollutant discharges were discovered during the inspections. Educational materials on stormwater best management practices were provided to facilities as part of the inspections.

Table 2: List of Facility Outfalls Inspected April 1, 2015 to June 30, 2015

Facility ID	VPDES Permit Type (if applicable)	Primary SIC Code	Primary SIC Description	Inspection Date	Findings
IHR069203308		4119	Limousine Service	4/28/2015	Business not located at this address. SIC no long applicable.
IHR039204632		8731	Electronic Research & Development	5/5/2015	Business has relocated. SIC no longer applicable.

Facility ID	VPDES Permit Type (if applicable)	Primary SIC Code	Primary SIC Description	Inspection Date	Findings
IHR070101991		3281	Cut Stone & Stone Products (Mfrs)	4/28/2015	Business not located at this address. SIC no long applicable.
IHR077101775		5231	Paint-Retail	4/28/2015	No significant pollutants found.
IHR049303997		5531	Automobile Parts & Supplies-Retail-New	6/29/2015	No significant pollutants found.
IHR039404509		4119	Limousine Service	5/5/2015	No significant pollutants found.
IHR049202156		3714	Automobile Parts & Supplies-Mfrs	6/29/2015	Business operations changed. SIC no long applicable.
VPD113200407	General Stormwater Industrial	5171	Petroleum Bulk Stations And Terminals.	4/1/2015	No significant pollutants found.
IHR078201207		1311	Oil & Gas Producers	4/21/2015	Business is closed.
VPD049205462	Industrial Stormwater (General)		Local Trucking Without Storage	6/29/2015	Business not located at this address. SIC no long applicable.
IHR049402525		4225	Storage-Household & Commercial	6/29/2015	No significant pollutants found.
IHR048403929		7331	Mailing & Shipping Services	5/5/2015	No significant pollutants found.
IHR039404473		4311	Post Offices	5/5/2015	No significant pollutants found.
VPD077302825	Concrete Products Facilities	3271		4/22/2015	No significant pollutants found.
VPD040302838	Concrete Products Facilities	3273		5/28/2015	No significant pollutants found.
VPD080202815	Concrete Products Facilities	3272		5/28/2015	No significant pollutants found.

Each annual report shall include a list of referrals to the Department.

There were no referrals to DEQ during the reporting period.

h) Stormwater Infrastructure Management

Each annual report shall include a list of activities including inspections, maintenance, and repair of stormwater infrastructure operated by the permittee as required in Part I.B.2.h) 1), including the type and number of stormwater structures inspected and maintained; the total number of stormwater structures owned or operated by the permittee; the total linear feet of storm sewer system owned and/or operated by the permittee; and the linear feet of storm sewer system inspected.

From April 1, 2015 to June 30, 2015 the county inspected 407 (22 percent) of the 1,820 county-maintained stormwater management (SWM) and best management practice (BMP) facilities. Currently, these inspections are being tracked on a fiscal year basis, resulting in approximately 980 inspections per fiscal year. Out of the 407 county-maintained facilities inspected, two were State-Regulated Dams.

From April 1, 2015 to June 30, 2015 the county cleaned and/or mowed 796 dam embankments. Cleaning involves removing trash, sediment, and debris from the trash rack, control structure, and all inflow channels leading to the control structure. At each stormwater management facility, deposited sediment is removed from the trickle ditch upstream of the control structure and disposed of offsite. The cleaning helps keep the facility functioning properly by conveying water and performing the BMP function as it was designed. The county completed 1,077 maintenance work orders to address maintenance issues and correct deficiencies in publicly maintained SWM/BMP facilities, which includes 796 routine maintenance work orders.

Between April 1, 2015 and June 30, 2015, the GIS inventory of stormwater structures was updated with new as-built plans and field verification of system components within identified easements. Sixteen as-built construction plans were digitized while continuing efforts to review the inventory's completeness and spatial accuracy resulted in updates to 45 tax map grids. Routine maintenance of the GIS-based stormwater easement database continued through 2015.

The county continued implementation of its infrastructure inspection and rehabilitation program. Over 3,700 pipe segments and over 500 storm structures were inspected with ground surface inspections and video or photo documentation between April 1, 2015 and June 30, 2015. Under the condition assessment program, more than 71 miles of pipe were videoed. The videos document the existing structural and service conditions of the interior of the storm drainage system. All of the inspection efforts represent more than 83 miles being photographed or screened for obvious deficiencies. The inventory continues to be assessed for ongoing repair of identified deficiencies. As a result of the inspection efforts, 0.6 miles on 20 storm pipe segments were rehabilitated or repaired through replacement or by lining entire pipe segments using cured-in-place pipe lining methods.

Each annual report shall include a list of activities including inspections performed and notifications of needed maintenance and repair of stormwater facilities not operated by the permittee as required by Part I.B.2.h)2).

From April 1, 2015 to June 30, 2015, the county inspected 504 (approximately 13 percent) of the 3,990 privately-maintained facilities, with the goal of inspecting all privately-maintained facilities at least once every five years as required by the permit.

Each annual report shall provide a summary of actions taken by the permittee to address failure of privately maintained SWM facilities owners to abide by maintenance agreements.

From April 1, 2015 to June 30, 2015, the County did not take enforcement actions (issue any Notice of Violations) against any stormwater facility owner.

i) County Facilities

In anticipation of the permit renewal, Fairfax County began gathering data on county sites to determine those with activities that have the potential to impact stormwater runoff. The county is working to identify a list of all high priority sites for submittal with the annual report due October 1, 2016.

j) Public Education/Participation

Fairfax County’s public education program is an essential component of stormwater management. The program raises awareness about stormwater challenges throughout the county and offers opportunities for residents to become involved in efforts to restore and protect Fairfax County’s local waterways, the Occoquan Reservoir, the Potomac River and the Chesapeake Bay. A number of county organizations contribute to the public education program including SWPD, Solid Waste Management (SWM), FCPA and NVSWCD as well as the regional Clean Water Partners (CWP). County staff used a variety of methods to provide public education including in-person presentations, print publications, television, radio and online resources.

Between April 1, 2015 and June 30, 2015, the county’s public education program reached several thousand adults and children including public school students, homeowners, businesses and members of the general public. A detailed listing of public education efforts is provided in Table 3 below. The program addressed topics such as watersheds; recognition and reporting of illicit discharges into the MS4; proper management and disposal of wastes, pesticides, herbicides and fertilizers; and stream cleanups and other stewardship opportunities.

Fairfax County’s MS4 permit, the current MS4 program plan, are available to the public on the Fairfax County website at the following link:

<http://www.fairfaxcounty.gov/dpwes/stormwater/ms4permit.htm>.

Previous MS4 Annual Reports are also available here: -

<http://www.fairfaxcounty.gov/dpwes/stormwater/ms4reports.htm>. -

Table 3: Public Education Activities from April 1, 2015 to June 30, 2015

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Public events (incl. Earth Day/Arbor Day/Springfest, Green Breakfast presentation about dam rehabilitation and restoration, Fall for Fairfax is in Oct. Not April, May, June)	Environmental awareness, watershed-friendly behaviors, proper waste management and recycling, tree care, only rain down the storm drain, stream restoration projects	General public	Several thousand visitors	Fairfax County
Podcasts (aired on Fairfax County website and The County Conversation on Fairfax County radio)	Tree care and pest control; protecting water quality; Fats, oils and grease (FOG); protecting the Chesapeake Bay; the fall cankerworm; fertilizers, gypsy moths;	General public	350 listeners per program (each program airs for two weeks)	Department of Public Works and Environmental Services (DPWES)

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Fairfax County's Environmental Facebook Page	General tree care, "Stream Crime Investigations," LEED Silver or Gold Certification; gypsy moths; car washing the right way; proper Latex paint disposal; recycling; rain barrels; sustainable garden tour; saving monarch butterflies; water reuse program; Brookfield Pond restoration.	General public	653 "Likes"	DPWES
SlideShare PowerPoint Presentations (online)	Stream restoration projects, completed projects, outfall stabilizations, pond retrofits, illicit discharge and improper disposal, industrial and high risk runoff, fall cankerworm, , Pohick Dams repaired; trash and recycling; landfills and sewage treatment.	General public	30,042 for the year up to July 14, 2015	DPWES
Public Service Announcements (County website, television and YouTube)	Plastic bags, "Stormy the Raindrop," cigarette butts, flood prevention, tree pests, Fats, Oils, and Grease, Only Rain Down the Drain, litter, , installing native plants, water quality monitoring; stream restorations.	General public	20,009 views	DPWES, Fairfax County Channel 16
Stormwater Presentations	Watersheds, ecosystem health, and stormwater management	Elementary school students	More than 475 students	Stormwater Planning Division (SWPD)
		Middle school students	280 were reached through riparian zone hikes (MWEE)	
		High school students	More than 25 students	
Stormwater Improvement Project Websites	Project information and completed projects	General public	Updated project specific pages for new or completed projects and posted completed project presentations to Slideshare	SWPD
News Releases	Floodplain management plan progress report, CRS rating, fall cankerworm	Media	News release sent to the media; resulted in radio, television, and newspaper coverage with subject matter experts	SWPD, WWM, UFMD
Staff Interviews (Local and National Media)	Sanitary sewers, wastewater trouble response, Pohick Creek water quality improvements, charity car washes, the MS4 permit, the stormwater ordinance, water reuse, stream restorations and more.	General public	Approximately 6 interviews by television, radio and print reporters	SWPD, WWM, Urban Forestry

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Fish Ecology	Fish populations and Monitoring	Master Naturalist	24	SWPD
Sewer Science Laboratory	Distinguishing between storm drainage versus sanitary sewer systems	High school students	83 students and 1 teacher	Wastewater Management (WWM)
Water Quality Field Day	Water Quality and stormwater/wastewater management	Elementary school students	134 students and 8 teachers	SWPD, WWM
Clean Fairfax Council Online Information	Litter, environment	General public	Approximately 100,000 impressions (i.e., web hits, tweets, Facebook)	Clean Fairfax Council
SpringFest Fairfax	Environmental Fair	General Public and Environmental Groups	More than 5,000 attendees and approximately 35 environmental organizations and vendors	Clean Fairfax Council
#PlasticFreeProduce program to eliminate single use plastic bags from Farmers Market	Litter, Environmental Education, Reuse	General Public; vendors who participate in Farmers Market, farmers market shoppers	500 reusable net produce bags distributed at Farmers Market	Clean Fairfax Council
Television, print, internet advertising, www.onlyrain.org , banner ads and public service announcements	Pet waste, used motor oil, over fertilization of lawns and general stormwater pollution reduction measures	General public	TV ads and Banner ads were aired ; Awaiting viewership statistic report	Clean Water Partners
Meaningful Watershed Educational Experience (MWEE)	Runoff, water quality, potable water, streams, soils, benthic macroinvertebrates, healthy watersheds, nonpoint and point source pollution, stewardship	Middle school students	Over 2,000 students and chaperones All 7th graders	Fairfax County Park Authority (FCPA)
Earth and Sky School Program	Weathering, Erosion, Stormwater	Elementary school students	300 students	FCPA
Wetlands Awareness Day at Huntley Meadows Park	Healthy watersheds	General public	800 people attended	FCPA
Helping Our Land Heal posters	Runoff, water quality, potable water, streams, soils, benthic macroinvertebrates, healthy watersheds, nonpoint and point source pollution stewardship	1st Grade students	700 1st grade classrooms received posters	FCPA
Lake and Stream Valley Cleanup Days	Litter, water protection, stewardship	General public	No activity during the reporting period	FCPA
Lake Barcroft's Earth Day Community Event	Healthy watersheds exhibit booth	General Public	Hundreds of people	FCPA
Storm Drain Marking Program	Stewardship, nonpoint source pollution, proper disposal of wastes	General public	14 projects, 1,067 storm drains, 4,408 households educated, 237 volunteers contributing 900 volunteer hours. Storm drain labels for 2016 to be ordered in fall	Northern Virginia Soil and Water Conservation District (NVSWCD)
Enviroscape® Model Presentations	Nonpoint source pollution prevention, watersheds	Children	373 students and scouts (21 presentations)	NVSWCD

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Watershed Calendar	Watershed Events and Trainings	General Public	1,338 recipients	NVSWCD
Volunteer Stream Monitoring Program	Watershed awareness, stream health	General Public	21 site leaders monitored 17 sites four times per year; 142 residents attended workshops and field trips	NVSWCD
<i>Conservation Currents</i> Newsletter	Stream health, stream monitoring, stream restoration, stewardship	General public	2,500 copies distributed in print, via email; posted online	NVSWCD
Technical Assistance Site Visits	Drainage and erosion	Homeowners and HOAs	90 site visits	NVSWCD
Solving Drainage and Erosion Problems Website for Homeowners	Drainage and erosion, controlling runoff, promoting BMPs	Homeowners	58,466 page views, 47,739 visits	NVSWCD
NVSWCD Website	Managing land, protecting water quality, controlling stormwater, preventing erosion, encouraging native vegetation	Homeowners	123,580 views by 85,390 visits	NVSWCD
Earth Friendly Suburban Horse Farming Publication	Stewardship	Horse-keeping community	Distributed at events and online with more than 7,000 views of guide and related articles	NVSWCD
Conservation Planning	Nutrient management and composting	Horse-keeping operations	Managers of 81.2 acres received education. Conservation plans included instructions for 2,027 linear feet of new vegetated buffer and 1,777 linear feet of replanted buffers.	NVSWCD
"Build-your-own" Composter Workshops	Composting	General public	Workshops planned for February and August to build tumbler-style composters	NVSWCD
Watershed Friendly Garden Tour (June)	LID practices (that can be adopted at home or area schools)	General public	Eight sites were featured with more than 170 participants	NVSWCD
Rain Garden Workshops	LID practices	Residents and industry professionals	No rain garden workshops were held in the time period.	NVSWCD
<i>Residential LID Landscaping Guide</i> (hard copy and electronic formats)	LID, design and installation information, sources of supplies, plant materials	Homeowners	Published, 262 downloads	NVSWCD
Northern Virginia Rain Barrel Initiative	LID practices	General public	Five build-your own rain barrel workshops with 141 participants, 173 rain barrels. Since 2007 barrels distributed capture more than 200,000 gallons of stormwater from county roofs annually.	NVSWCD

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Artist Rain Barrel Program	LID practices	Students	12 local artists painted rain barrels which were on display across Northern Virginia region. 36 teams of students painted and decorated rain barrels for auction at an Earth Day event.	NVSWCD in partnership with Northern VA Rain Barrel Program
<i>Rain Garden Design and Construction: A Northern Virginia Homeowner's Guide</i> (hard copy and electronic formats)	LID practices, instructions and calculations needed to build a rain garden	Homeowners	Distributed in print and online with 3,898 downloads	NVSWCD, FCPA
SCRAPmail	Electronic resource available by email subscription (news, event announcements, updates, reviews of environmental education resources available to county schools)	Teachers, students, school administrators	250 subscribers (messages sent quarterly)	Schools/County Recycling Action Partnership
Household Hazardous Waste Management Program	Proper disposal of household hazardous wastes	County residents	Program now available 7 days per week	Solid Waste Management (SWM)
E-Waste Recycling Program	Recycling	County residents	Program now available 7 days per week	SWM
Used cooking oil recycling	Program for recycling used cooking oil	County residents	Used cooking oil collected sent for use as alternative fuel	SWM
Solid Waste Management Recycling Web Content	Recycling and Source Reduction	General public	70,582 visits (most viewed portion of the DPWES website)	SWM
Solid Waste Management Outreach and Facility Tours	Solid waste management	General public	About 12 tours	SWM
Solid Waste Management "listserv"	Trash collection and Leaf Collection	Residents	2,115 subscribers (messages sent monthly)	SWM
Shredding Sponsored Events	Document shredding	Residents	3 Shredding events collecting approximately 50,000 pounds	SWM
Rechargeable Battery Recycling	Recycling	General public	Collection boxes available at County Board of Supervisors' offices and county government buildings	SWM with industry-funded Rechargeable Battery Recycling Corporation Program
Annual <i>Go Recycle</i> Radio Campaign	Recycling	General public	Two weeks of announcements regarding recycling on five major Washington DC radio stations	SWM with the Metropolitan Washington Council of Governments

Public Education Effort	Topics Addressed	Audiences	Statistics	Lead Organizations
Regional KnowToxics Program	Federal and state regulations requiring proper disposal or recycling of spent fluorescent lamps, rechargeable batteries, computers and related electronics	Business owners		SWM with the Northern Virginia Regional Commission (NVRC)
Solid Waste Managers "train the trainer"	Proper management of universal waste and hazardous waste	Commercial Property Managers and General Public	75 attendees	SWM with NVRC

k) Training

In anticipation of the permit renewal, Fairfax County began gathering data on current employee stormwater-related training. The county is working to identify appropriate employees and any outstanding training needs and will report on the training program with the annual report due October 1, 2016. Additionally, the county has also been providing spill response training as required under OSHA 29 CFR 1910.120 (q) and NFPA 472, as stated in Section B.2.f) Spill Prevention and Response of this report.

l) Water Quality Screening Programs

1) Dry Weather Screening

Each annual report shall include a list of locations upon which dry weather screening was conducted, the results and any follow-up actions including maintenance and/or repair of infrastructure or outfalls performed as a result of the dry weather screening.

Fairfax County's Dry Weather Screening is conducted during the fall months to increase the likelihood of identifying illicit discharges due to weather conditions and visibility and accessibility of outfalls. No Dry Weather Screening was conducted between April 1, 2015 and June 30, 2015.

2) Wet Weather Screening

No later than 12 months after the effective date of the state permit, the permittee shall submit to the Department the written procedures for wet weather screening.

The county's written procedures for wet weather screening, titled "Fairfax County Wet Weather Screening Program Plan" (2014), are included as Appendix 2.

The county updated its wet weather screening program in 2014. During the April 1, 2015 to June 30, 2015 reporting period, two sites were monitored in June collecting a total of two samples. A storm sampled on 6/2/2015 yielded exceedances at site B (zinc and copper). Sampling for the 6/2/2015 event failed at site A and Fairfax County is awaiting analytical results for a storm sampled on 6/20/2015 at that location.

m) Infrastructure Coordination

As part of its Annual Report, the permittee shall document any coordination efforts with VDOT that occurred during the reporting year pursuant to requirements (1) through (7) of the permit.

Due to the interconnectedness of the Fairfax County and VDOT MS4 systems, the County and VDOT have been meeting for several years to coordinate on MS4 issues. The county and VDOT are working collaboratively to identify and determine responsibility for regulated outfalls and to coordinate the reporting and resolution of illicit discharges and improper disposal. A meeting was held on May 29, 2015.

C. Monitoring

1. Biological Stream Monitoring

Fairfax County is selecting sites to be monitored during the term of the permit and updating monitoring protocols to ensure compliance with the MS4 permit. Reporting of the biological stream monitoring will be consistent with the deadlines specified in the permit.

2. In-Stream Monitoring

Fairfax County is selecting sites to be monitored during the term of the permit and updating monitoring protocols to ensure compliance with the MS4 permit. Reporting of in-stream monitoring will be consistent with the deadlines specified in the permit.

3. Floatables Monitoring

Fairfax County is selecting sites to be monitored during the term of the permit and updating monitoring protocols to ensure compliance with the MS4 permit. Reporting of floatables monitoring will be consistent with the deadlines specified in the permit.

4. Structural and Source Controls Compliance Monitoring and Tracking

Each annual report shall include a summary of the program to ensure maintenance of private stormwater management facilities.

Section B.2.h) Stormwater Infrastructure Management, of this report summarizes inspections and actions taken to ensure maintenance of private stormwater management facilities.

Each annual report shall include a summary of the program to ensure maintenance of stormwater management facilities maintained by the permittee.

Section B.2.h) Stormwater Infrastructure Management, of this summarizes inspections and maintenance of stormwater management facilities maintained by Fairfax County.

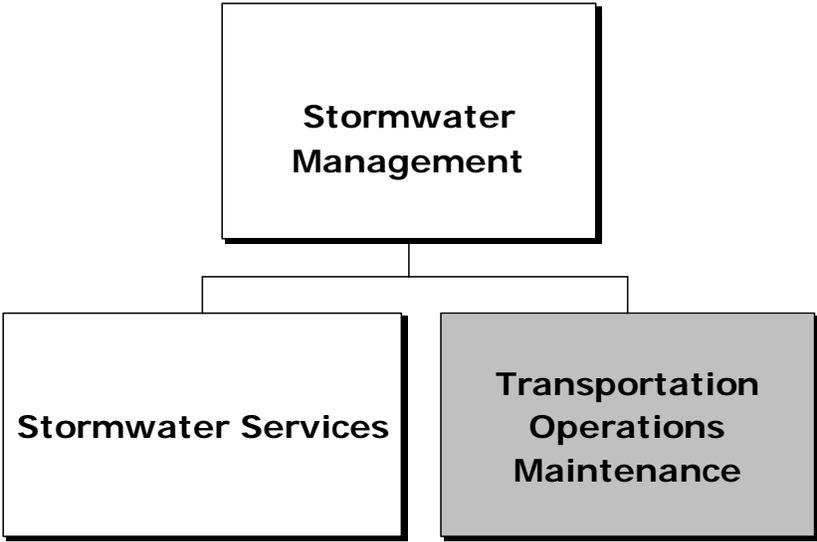
D. TMDL ACTION PLAN AND IMPLEMENTATION

In anticipation of the permit renewal, Fairfax County began gathering data to support development of Chesapeake Bay and local TMDL action plans consistent with DEQ guidance. Reporting of TMDL action plans and implementation will be consistent with the deadlines specified in the permit.

Appendix 1

FY 2016 Fairfax County Adopted Budget Plan (Vol. 2), Stormwater Services Budget

Fund 40100 Stormwater Services



 Denotes functions that are included in both the General Fund, Agency 87, Unclassified Administrative Expenses, and Fund 40100, Stormwater Services.

Mission

To develop and maintain a comprehensive watershed and infrastructure management program to protect property, health and safety; to enhance the quality of life; and to preserve and improve the environment for the benefit of the public. To plan, design, construct, operate, maintain and inspect the infrastructure, and perform environmental assessments through coordinated stormwater and maintenance programs in compliance with all government regulations utilizing innovative techniques, customer feedback and program review; and to be responsive and sensitive to the needs of the residents, customers and public partners.

Focus

Stormwater Services are essential to protect public safety, preserve property values and support environmental mandates such as those aimed at protecting the Chesapeake Bay and the water quality of other local jurisdictional waterways. Projects in this fund include repairs to stormwater infrastructure, measures to improve water quality such as stream stabilization, rehabilitation, safety upgrades of state regulated dams, repair and replacement of underground pipe systems, surface channels, structural flood proofing and best management practices (BMP), site retrofits and improvements. This funding also supports the implementation of watershed master plans, public outreach efforts, and stormwater monitoring activities as well as operational maintenance programs related to the existing storm drainage infrastructure as it pertains to stormwater conveyance and stormwater quality improvements.

Fund 40100 Stormwater Services

As part of the FY 2010 Adopted Budget Plan, a special service district was created to support the Stormwater Management Program and provide a dedicated funding source for both operating and capital project requirements, as authorized by Code of Virginia Ann. Sections 15.2-2400. In FY 2016, the stormwater service rate will increase from \$0.0225 to \$0.0250 per \$100 of assessed real estate value. In FY 2015, staff developed a five-year rate plan and a phased approach for funding and staffing to support the anticipated regulatory increases. The 5-year spending plan includes approximately \$225 million in required projects and operational support; therefore, the plan includes an annual increase in the rate of ¼ penny each year. This increase will support a number of goals. First, it will provide for constructing and operating stormwater management facilities, including stream restorations, new and retrofitted ponds, and installation of Low Impact Development (LID) techniques, required to comply with the federally mandated Chesapeake Bay Program. This program requires the County to reduce Phosphorus, Nitrogen, and sediment loads to the Potomac River and Chesapeake Bay. MS4 Permit holders must achieve 5 percent of the required reductions in the first five years; 35 percent of the required reductions in the second five years; and 60 percent of the required reductions in the third five years. The Capital Improvement Program includes a gradual increase that will help meet these requirements. Second, the increase will aid in the planning, construction, and operation of stormwater management facilities required to comply with state established local stream standards by reducing bacteria, sediments, and Polychlorinated Biphenyl (PCB) entering local streams. It is estimated that between 70 and 80 percent of the streams in the County are currently impaired. Third, the increase will support the federally mandated inspecting, mapping, monitoring, maintaining, and retrofitting of existing stormwater facilities. The County currently maintains 1,540 stormwater management facilities that are valued at \$500 million. Fourth, the increase will aid in collecting stormwater data and reporting the findings; providing community outreach and education, supporting new training programs for employees; and developing new Total Maximum Daily Loads (TMDL) Action Plans for impaired streams related to the MS4 Permit requirements. Fifth, the increase will improve dam safety by supporting annual inspections of 19 state-regulated dams in the County and by developing Emergency Action Plans required by the state. The Emergency Action Plans will be updated annually and a new plan will be prepared for each dam every six years. In addition, these plans will include annual emergency drills and exercises, and flood monitoring for each dam. Finally, the increase will facilitate the maintaining, rehabilitating, and reinvesting in the County's conveyance system. The County's conveyance system includes 43,000 structures and 1,600 miles of pipes and paved channels, and it is valued at more than \$1 billion. The FY 2016 rate of \$0.0250 per \$100 of assessed real estate value is consistent with the 5-year plan.

Stormwater staff annually evaluates funding required to meet the increasing federal and state regulatory requirements pertaining to the Municipal Separate Storm Sewer System (MS4) Permit requirements, and State and Federal mandates associated with controlling water pollution delivered to local streams and the Chesapeake Bay.

The FY 2016 levy of \$0.0250 will generate \$56,500,000, supporting \$19,663,141 for staff and operational costs; \$35,711,859 for capital project implementation including, infrastructure reinvestment, regulatory requirements, dam safety, and contributory funding requirements; and \$1,125,000 transferred to the General Fund to partially offset central support services such as Human Resources, Purchasing, Budget and other administrative services supported by the General Fund which benefit this fund.

Fund 40100

Stormwater Services

Stormwater Services Operational Support

Fund 40100, Stormwater Services, provides funding for staff salaries, Fringe Benefits, and Operating Expenses for all stormwater operations. In addition, Fund 40100 also includes 23/23.0 FTE positions related to transportation operations maintenance provided by the Maintenance and Stormwater Management Division. All funding for the transportation related salary expenses and equipment is recovered from General Fund Agency 87, Department of Public Works and

Environmental Services (DPWES) Unclassified Administrative Expenses, as they do not qualify for expenses related to the stormwater service district.

Stormwater Services supports the following County Vision Elements:



Maintaining Safe and Caring Communities



Connecting People and Places



Practicing Environmental Stewardship

Fund 40100 also supports the Urban Forestry Management Division (UFMD). The UFMD was established to mitigate tree loss and maximize tree planting during land development, enforce tree conservation requirements and suppress populations of Gypsy Moth, Emerald Ash Borer and other forest pests. The division also implements programs needed to sustain the rich level of environmental, ecological and socio-economic services provided by the County's tree canopy. The UFMD is aligned with the mission of Stormwater Services as it strives to "*improve water quality and stormwater management through tree conservation.*" Tree canopy and forest soils contribute significant levels of water pollution and stormwater runoff mitigation services. Recent analysis has estimated that the County would need to invest \$1.9 billion dollars in infrastructure to match the level of stormwater management that is provided by its tree canopy during a ten-year storm event.

Stormwater Regulatory Program

The County is required by federal law to operate under the conditions of a state issued Municipal Separate Storm Sewer System (MS4) Permit. The MS4 Permit allows the County to discharge stormwater from its stormwater systems into state and federal waters. The County currently owns and/or operates approximately 7,000 piped outfalls within the stormwater system that are governed by the permit. The current permit was issued in 2002 and expired in 2007, and the County has been operating under a state issued administrative extension, while the state and the Environmental Protection Agency (EPA) agree to new permit requirements. A draft permit has been prepared for the County which indicates that significant enhancements to all facets of the program will be required. The permit requires the County to better document the stormwater management facility inventory, enhance public outreach and education efforts, increase water quality monitoring efforts, provide stormwater management and stormwater control training to all County employees, and thoroughly document all of these enhanced efforts. Staff is currently evaluating County programs to identify potential implementation targets and developing the procedures to implement these additional permit requirements. The permit also requires the county to implement stormwater retrofit projects that will reduce the nutrients and sediment delivered to the Chesapeake Bay in compliance with the Chesapeake Bay TMDL implementation plan adopted by the State. Funding in the amount of \$6.0 million is included for the Stormwater Regulatory Program in FY 2016.

Fund 40100

Stormwater Services

Dam Safety and Facility Rehabilitation

There are currently more than 6,000 Stormwater management facilities in service that range in size from small rain gardens to large state regulated flood control dams. The County is responsible for inspecting both County owned and privately owned facilities and for maintaining County owned facilities. This inventory increases yearly and is projected to continually increase as new developments and redevelopment sites are required to install stormwater management controls. In addition, the County is required to provide a facility retrofit program to improve stormwater management controls on existing stormwater management facilities that were developed and constructed prior to current standards being in place.

This program maintains the control structures and dams that control and treat the water flowing through County owned facilities. This initiative also includes the



removal of sediment that occurs in both wet and dry stormwater management facilities to ensure that adequate capacity is maintained to treat the stormwater. The program results in approximately 25 retrofit projects annually that require redesign and construction management activities as well as contract management and maintenance responsibilities. Funding in the amount of \$6.5 million is included for Dam Safety and Facility Rehabilitation in FY 2016.

Conveyance System Rehabilitation

The County owns and operates approximately 1,600 miles of underground stormwater pipes and paved channels with an estimated replacement value of over one billion dollars. The County began performing internal inspections of the pipes in FY 2006. The initial results showed that more than 5 percent of the pipes were in complete failure and an additional 15 percent of them required immediate repair. Increased MS4 Permit regulations apply to these 1,600 miles of



existing conveyance systems and 43,000 stormwater structures. Acceptable industry standards indicate that one dollar re-invested in infrastructure saves seven dollars in the asset's life and \$70 dollars if asset failure occurs. The goal of this program is to inspect pipes on a 10-year cycle and rehabilitate pipes and paved channels before total failure occurs. Funding in the amount of \$6.0 million is included for Conveyance System Rehabilitation in FY 2016.

Fund 40100 Stormwater Services

Stream and Water Quality Improvements

This program funds water quality projects necessary to mitigate the impacts to local streams and the Chesapeake Bay resulting from urban stormwater runoff. This includes water quality projects such as construction of stormwater management ponds, implementation of low impact development techniques on stormwater facilities, stream restorations, and approximately 1,700 water quality projects identified in the completed countywide Watershed Management Plans. In addition, Total Maximum Daily Load (TMDL) requirements for

local streams and the Chesapeake Bay are the regulatory process by which pollutants entering impaired water bodies are reduced. The Chesapeake Bay TMDL was established by the EPA and requires that MS4 communities as well as other dischargers implement measures to



significantly reduce the nitrogen, phosphorous and sediment loads entering waters draining to the Bay by 2025. Compliance with the Bay TMDL will require the County to undertake construction of new stormwater facilities, retrofit existing facilities and properties, and increase maintenance. Preliminary estimates indicate that the projects needed to bring the County's stormwater system into compliance with the Bay TMDL could cost between \$70 and \$90 million per year. The Bay TMDL pollutant reduction requirement is additive to the current design and construction efforts associated with 1,700 Watershed Plan projects and ongoing stream and flood mitigation projects. Funding in the amount of \$15.24 million is included for Stream and Water Quality Improvements in FY 2016.

Emergency and Flood Response Projects

This program supports flood control projects for unanticipated flooding events that impact storm systems and flood residential properties. The program will provide annual funding for scoping, design, and minor construction activities related to flood mitigation projects. Funding in the amount of \$1.0 million is included for the Emergency and Flood Response Projects in FY 2016.

Stormwater Allocation to Towns

On April 18, 2012, the State Legislature passed SB 227 which entitles the Towns of Herndon and Vienna to all revenues collected within their boundaries by Fairfax County's stormwater service district. An agreement was developed for a coordinated program whereby the Towns will remain part of the County's service district and the County will return 25 percent of the revenue collected from properties within each town. This allows for services that towns provide independently such as maintenance and operation of stormwater pipes, manholes, and catch basins. The remaining 75 percent will remain with the County and the County will take on the responsibility for the Towns' Chesapeake Bay TMDL requirements as well as other TMDL and MS4 requirements. This provides for an approach that is based on watersheds rather than on jurisdictional lines. Funding in the amount of \$371,247 is included for the Stormwater Allocations to Towns project in FY 2016.

Fund 40100

Stormwater Services

Stormwater Related Contributory Program

Contributory funds are provided to the Northern Virginia Soil and Water Conservation District (NVSWCD) and the Occoquan Watershed Monitoring Program (OWMP). The NVSWCD is an independent subdivision of the Commonwealth of Virginia that provides leadership in the conservation and protection of Fairfax County's soil and water resources. It is governed by a five-member Board of Directors, three of whom are elected every four years by the voters of Fairfax County and two who are appointed by the Virginia Soil and Water Conservation Board. Accordingly, the work of NVSWCD supports many of the environmental efforts set forth in the Board of Supervisors' Environmental Excellence 20-year Vision Plan. The goal of the NVSWCD is to continue to improve the quality of the environment and general welfare of the citizens of Fairfax County by providing them with a means of dealing with soil, water conservation and related natural resource problems. It provides County agencies with comprehensive environmental evaluations for proposed land use changes with particular attention to the properties of soils, erosion potential, drainage and the impact on the surrounding environment. NVSWCD has consistently been able to create partnerships and leverage state, federal and private resources to benefit natural resources protection in Fairfax County. FY 2016 funding of \$485,064 is included in Fund 40100 for the County contribution to the NVSWCD.

The OWMP and the Occoquan Watershed Monitoring Laboratory (OWML) were established to ensure that water quality is monitored and protected in the Occoquan Watershed. Given the many diverse uses of the land and water resources in the Occoquan Watershed (agriculture, urban residential development, commercial and industrial activity, water supply, and wastewater disposal), the OWMP plays a critical role as the unbiased interpreter of basin water quality information. FY 2016 funding of \$115,611 is included in Fund 40100 for the County contribution to the OWMP.

Budget and Staff Resources

Category	FY 2014 Actual	FY 2015 Adopted	FY 2015 Revised	FY 2016 Advertised	FY 2016 Adopted
FUNDING					
Expenditures:					
Personnel Services	\$16,273,488	\$17,257,850	\$17,785,628	\$18,799,696	\$18,839,458
Operating Expenses	2,178,606	2,441,995	2,574,051	2,443,495	2,443,495
Capital Equipment	43,010	737,800	936,510	701,130	701,130
Capital Projects	32,601,462	29,961,954	83,952,669	35,751,621	35,711,859
Subtotal	\$51,096,566	\$50,399,599	\$105,248,858	\$57,695,942	\$57,695,942
Less:					
Recovered Costs	(\$2,466,223)	(\$2,214,599)	(\$2,267,770)	(\$2,320,942)	(\$2,320,942)
Total Expenditures	\$48,630,343	\$48,185,000	\$102,981,088	\$55,375,000	\$55,375,000
AUTHORIZED POSITIONS/FULL-TIME EQUIVALENT (FTE)					
Regular	174 / 174	176 / 176	180 / 180	181 / 181	181 / 181

Fund 40100

Stormwater Services

<u>Maintenance and Stormwater Management (MSMD)</u>	<u>Field Operations</u>	<u>Stormwater Planning Division</u>
<u>Administration</u>		
1 Director, Maintenance and SW	4 Env. Services Supervisors	1 Director, Stormwater Planning
1 Management Analyst IV	1 Public Works-Env. Serv. Manager	2 Engineers V
1 Management Analyst II	3 Senior Maintenance Supervisors	4 Engineers IV
1 IT Programmer Analyst III (1)	8 Maintenance Supervisors	2 Senior Engineers III
1 Network/Telecom. Analyst I	5 Maintenance Crew Chiefs	9 Engineers III
1 Information Technology Tech. III	12 Senior Maintenance Workers	4 Project Managers II
1 Business Analyst II	6 Maintenance Workers	3 Project Coordinators
1 Safety Analyst	9 Heavy Equipment Operators	2 Ecologists IV
1 Administrative Assistant V	10 Motor Equipment Operators	4 Ecologists III
1 Administrative Assistant IV	2 Masons	5 Ecologists II
2 Administrative Assistants III	1 Vehicle Maintenance Coordinator	1 Emergency Mgmt. Specialist III
2 Administrative Assistants II	1 Engineering Technician III	2 Landscape Architects III
1 Financial Specialist II	1 Carpenter I	1 Engineering Technician III
	1 Equipment Repairer	1 Administrative Assistant III
	1 Welder II	2 Management Analysts II
		1 Communication Specialist II
<u>Contracting Services/</u>	<u>Infrastructure Branch</u>	
<u>Material Support</u>	1 Engineer V	2 Code Specialists II
1 Material Mgmt. Specialist III	2 Engineers IV	1 Contract Specialist II
1 Engineering Technician III	2 Engineers III	1 GIS Analyst II
1 Management Analyst II	1 Project Manager II	1 Financial Specialist I
1 Contract Analyst I	2 Project Managers I	
1 Inventory Manager	5 Engineering Technicians III	<u>Urban Forestry</u>
	4 Engineering Technicians II	1 Director, Urban Forestry Division
<u>Dam Safety and Maintenance</u>	1 Engineering Technician I	2 Urban Foresters III
<u>Projects/Projects and</u>	1 Senior Engineering Inspector	6 Urban Foresters II
<u>LID/Inspection and Maintenance</u>	1 GIS Analyst III	
1 Public Works-Env. Serv. Manager	1 GIS Analyst I	
1 Engineer IV	1 GIS Technician	
2 Engineers III		
1 Ecologist III		
1 Ecologist II		
3 Engineering Technicians III		
1 Engineering Technician II		
1 Engineering Technician I		
2 Project Managers II		
3 Project Managers I		
TOTAL POSITIONS		
181 Positions (1) / 181.0 FTE (1.0)		() Denotes New Position

FY 2016 Funding Adjustments

The following funding adjustments from the FY 2015 Adopted Budget Plan are necessary to support the FY 2016 program. Included are all adjustments recommended by the County Executive that were approved by the Board of Supervisors, as well as any additional Board of Supervisors' actions, as approved in the adoption of the budget on April 28, 2015.

- ◆

Employee Compensation

An increase of \$485,053 in Personnel Services includes \$168,222 for a 1.10 percent market rate adjustment (MRA) for all employees and \$316,831 for performance-based and longevity increases for non-uniformed merit employees, both effective July 2015.

\$485,053
- ◆

Other Post-Employment Benefits

An increase of \$14,835 in Personnel Services reflects required adjustments associated with providing Other Post-Employment Benefits (OPEBs) to retirees, including the Retiree Health Benefits Subsidy.

\$14,835

Fund 40100 Stormwater Services

For more information on Other Post-Employment Benefits, please refer to Fund 73030, OPEB Trust Fund, in Volume 2 of the FY 2016 Adopted Budget Plan.

- ◆ **New Position** **\$128,365**

An increase of \$128,365 in Personnel Services is necessary to fund salary and fringe benefits requirements associated with the approval of 1/1.0 FTE IT Programmer Analyst III position in FY 2016. The IT Programmer Analyst III will support all of Stormwater Services programming and system support needs. The new position will create and maintain reports and other tools used to analyze data associated with asset management, work orders, remote flood monitoring, MS4 permit tracking, watershed management, pro rata program management, and other Stormwater functions. The new position will also be involved in two new initiatives that are currently under development, i.e. the MS4 Data Coalescing Application and the Automatic Vehicle Locator (AVL)/Snow Application Technology that offer great benefits to the County through enhanced coordination and speed/efficiency of response. The IT Programmer Analyst III will assist with the growing number of programming needs within the fund and will improve the quality and timeliness of the IT services that are currently being contracted out.

- ◆ **Position Supporting Land Development Process** **\$0**

On December 2, 2014, the Board of Supervisors approved increases to Land Development Services and Fire Prevention Division (Fire Marshal) fees for plan review, permits, and inspection services. The fee increase will support additional staff resources in a variety of agencies supporting the plan review, permits and inspection process. The goal of the additional staff is to assist the County in improving customer service, work plan implementation efforts, supporting minimum submission review for grading plans and tenant work, electronic plan submissions and reducing plan review timeframes. To support this effort, 1/1.0 FTE Urban Forester II position was added to Fund 40100, Stormwater Services, in FY 2015. An increase of \$106,343 in Personnel Services for salary and Fringe Benefits is required to support this position. This increase will be offset by an increase of \$106,343 in Recovered Costs. The approved fee increases are anticipated to result in additional revenue of approximately \$2.1 million in FY 2015 and \$5.1 million in FY 2016 to support land development projects in Fairfax County.

- ◆ **Operational Requirements** **\$848,512**

An increase of \$848,512, including \$847,012 in Personnel Services and \$1,500 in Operating Expenses, is required to fund Stormwater Services operational budget primarily based on increases in Fringe Benefits costs, Personnel Services costs based on actual experience, and PC Replacement costs.

- ◆ **Capital Equipment** **\$701,130**

Capital Equipment funding of \$701,130 is included for requirements associated with replacement equipment that has outlived its useful life and new equipment critical to carryout stormwater services activities. Replacement equipment in the amount of \$676,936 includes: \$393,477 to replace backhoes and excavators that are essential to support emergency response programs; \$64,782 to replace trailers that are used to transport heavy equipment to and from sites; \$14,000 to replace a utility vehicle that is critical for accessing difficult work locations; \$47,063 to replace a forklift that transports large loads; \$150,000 to replace a dump truck that supports all aspects of Stormwater maintenance and emergency response programs; and \$7,614 to replace an electrofisher that is used during the annual sampling/biological monitoring required by the MS4 Permit. In addition, funding in the amount of \$24,194 is required for the purchase of new equipment including a mid-size passenger hybrid fleet car that will support Urban Forestry field work.

Fund 40100 Stormwater Services

- ◆ **Capital Projects** **\$35,711,859**
Funding in the amount of \$35,711,859 has been included in FY 2016 for priority stormwater capital projects.

Changes to FY 2015 Adopted Budget Plan

The following funding adjustments reflect all approved changes in the FY 2015 Revised Budget Plan since passage of the FY 2015 Adopted Budget Plan. Included are all adjustments made as part of the FY 2014 Carryover Review, FY 2015 Third Quarter Review, and all other approved changes through April 30, 2015.

- ◆ **Carryover Adjustments** **\$53,606,190**
As part of the FY 2014 Carryover Review, the Board of Supervisors approved funding of \$53,606,190 based on the carryover of unexpended project balances in the amount of \$52,872,035 and a net adjustment of \$734,155. This adjustment included the appropriation of \$474,607 from Stormwater operational budget savings to support additional positions associated with the new Stormwater Ordinance approved by the Board of Supervisors on January 28, 2014, the carryover of \$156,222 in operating and capital equipment encumbrances, and an increase to capital projects of \$103,326. The net adjustment to capital projects was based on the appropriation of the remaining operational savings of \$180,100 and the appropriation of \$496 in miscellaneous revenues received in FY 2014, partially offset by a reduction of \$77,270 due to lower than anticipated Stormwater Service district tax receipts.

- ◆ **Position Movement** **\$0**
During FY 2015, a realignment of stormwater construction management requirements led to a net increase of 3/3.0 FTE positions in Fund 40100. This was the result of the transfer of 2/2.0 FTE Engineering Technician II positions from Agency 31, Land Development Services, and 1/1.0 FTE Maintenance Worker position from Fund 40140, Refuse Collection and Recycling Operations, to Fund 40100, Stormwater Services.

- ◆ **Third Quarter Adjustments** **\$2,003,188**
As part of the FY 2015 Third Quarter Review, the Board of Supervisors approved funding of \$2,003,188 to support the rehabilitation of Pohick Creek tributary stream, Rabbit Branch tributary stream, Banks Property stream, and South Lakes stream. In addition, on December 2, 2014, the Board of Supervisors approved increases to Land Development Services and Fire Prevention Division (Fire Marshal) fees for plan review, permits, and inspection services. The fee increase will fund additional staff resources in a variety of agencies supporting the plan review, permits and inspection process. As a result of the fee increase, 1/1.0 FTE was added in FY 2015 to Fund 40100, Stormwater Services, to support increased development activity within the County. An increase of \$53,171 in Personnel Services for salary and Fringe Benefits is required to support this position. This increase will be offset by an increase of \$53,171 in Recovered Costs.

Fund 40100 Stormwater Services

Key Performance Measures

Indicator	Prior Year Actuals			Current Estimate	Future Estimate
	FY 2012 Actual	FY 2013 Actual	FY 2014 Estimate/Actual	FY 2015	FY 2016
Stormwater Services					
MS4 Permit violations received	0	0	0/0	0	0
Percent of Emergency Action Plans current	100%	100%	100%/100%	100%	100%
Percent of commuter facilities available 365 days per year	100%	100%	100%/100%	100%	100%

A complete list of performance measures can be viewed at www.fairfaxcounty.gov/dmb/fy2016/adopted/pm/40100.pdf

Performance Measurement Results

The objective to receive no MS4 Permit violations related to inspection and maintenance of public and private stormwater management facilities was met in FY 2012, FY 2013, and FY 2014. It is expected that this objective will also be met in FY 2016. It should be noted that the current MS4 Permit was issued in 2002 and expired in 2007, and the County has been operating under a state issued administrative extension, while the state and the EPA agree to new permit requirements. The objective to update 100 percent of the emergency action plans that Stormwater is responsible for was met in prior years. It is estimated that this trend will continue in FY 2016. Lastly, the objective to keep 100 percent of the commuter facilities operational for 365 days was met in prior years. It is expected that this goal will be met in FY 2016.

Fund 40100 Stormwater Services

FUND STATEMENT

Fund 40100, Stormwater Services

	FY 2014 Actual	FY 2015 Adopted Budget Plan	FY 2015 Revised Budget Plan	FY 2016 Advertised Budget Plan	FY 2016 Adopted Budget Plan
Beginning Balance	\$29,474,154	\$0	\$22,235,357	\$0	\$0
Revenue:					
Stormwater Service District Levy	\$41,122,730	\$49,185,000	\$49,185,000	\$56,500,000	\$56,500,000
Sale of Bonds ¹	0	0	30,000,000	0	0
Natural Resources Conservation Service NRCS Grant ²	1,268,320	0	557,543	0	0
Virginia Department of Environmental Quality DEQ Grant ³	0	0	2,003,188	0	0
Miscellaneous	496	0	0	0	0
Total Revenue	\$42,391,546	\$49,185,000	\$81,745,731	\$56,500,000	\$56,500,000
Total Available	\$71,865,700	\$49,185,000	\$103,981,088	\$56,500,000	\$56,500,000
Expenditures:					
Personnel Services	\$16,273,488	\$17,257,850	\$17,785,628	\$18,799,696	\$18,839,458
Operating Expenses	2,178,606	2,441,995	2,574,051	2,443,495	2,443,495
Recovered Costs	(2,466,223)	(2,214,599)	(2,267,770)	(2,320,942)	(2,320,942)
Capital Equipment	43,010	737,800	936,510	701,130	701,130
Capital Projects ⁴	32,601,462	29,961,954	83,952,669	35,751,621	35,711,859
Total Expenditures	\$48,630,343	\$48,185,000	\$102,981,088	\$55,375,000	\$55,375,000
Transfers Out:					
General Fund (10001) ⁵	\$1,000,000	\$1,000,000	\$1,000,000	\$1,125,000	\$1,125,000
Total Transfers Out	\$1,000,000	\$1,000,000	\$1,000,000	\$1,125,000	\$1,125,000
Total Disbursements	\$49,630,343	\$49,185,000	\$103,981,088	\$56,500,000	\$56,500,000
Ending Balance⁶	\$22,235,357	\$0	\$0	\$0	\$0
Tax Rate Per \$100 of Assessed Value	\$0.0200	\$0.0225	\$0.0225	\$0.0250	\$0.0250

Fund 40100

Stormwater Services

¹ On November 6, 2012, the voters approved a bond referendum in the amount of \$30 million to make storm drainage improvements to prevent flooding and soil erosion, including acquiring any necessary land. It is planned to use this bond money to prevent flooding in the Huntington community.

² On June 4, 2013, the Board of Supervisors approved a joint project between the Natural Resources Conservation Services (NRCS), the Northern Virginia Soil and Water Conservation District (NVSWCD), and Fairfax County. The estimated total cost of the project is \$2,809,020. The NRCS will pay 65 percent of the cost (\$1,825,863) while Fairfax County will be required to fund 35 percent of the final costs (\$983,157), less any in-kind service credits. Funding for the County share is available in existing appropriations in project SD-000033, Dam Safety and Facility Rehabilitation.

³ On October 1, 2014, the Board of Supervisors approved a joint project between the Virginia Department of Environmental Quality (DEQ) and Fairfax County. The estimated total cost of the project is \$4,006,376. The DEQ will pay 50 percent of the cost (\$2,003,188) and Fairfax County will be required to fund 50 percent of the final costs (\$2,003,188). Funding for the County share is available in existing appropriations in project SD-000031, Stream and Water Quality Improvements.

⁴ In order to account for expenditures in the proper fiscal year, an audit adjustment in the amount of \$813,290.01 has been reflected as an increase to FY 2014 Capital Projects expenditures. This impacts the amount carried forward and results in a decrease of \$813,290.01 to the *FY 2015 Revised Budget Plan*. The projects affected by this adjustment are SD-000031, Stream and Water Quality Improvements, SD-000033, Dam Safety and Facility Rehabilitation, and SD-000034, Conveyance System Rehabilitation. The audit adjustment was included in the FY 2014 Comprehensive Annual Financial Report (CAFR). Details of the audit adjustment were included in the FY 2015 Third Quarter package.

⁵ Funding in the amount of \$1,000,000 is transferred to the General Fund to partially offset central support services supported by the General Fund which benefit Fund 40100. These indirect costs include support services such as Human Resources, Purchasing, Budget and other administrative services.

⁶ Capital projects are budgeted based on the total project costs. Most projects span multiple years, from design to construction completion. Therefore, funding for capital projects is carried forward each fiscal year, and ending balances fluctuate, reflecting the carryover of these funds.

Fund 40100 Stormwater Services

FY 2016 Summary of Capital Projects

Fund 40100, Stormwater Services

Project	Total Project Estimate	FY 2014 Actual Expenditures	FY 2015 Revised Budget	FY 2016 Advertised Budget Plan	FY 2016 Adopted Budget Plan
Conveyance System Inspection/Development (2G25-028-000)	\$1,325,000	\$0.00	\$1,325,000.00	\$0	\$0
Conveyance System Rehabilitation (SD-000034)	28,690,695	6,222,382.39	7,149,022.08	6,000,000	6,000,000
Dam Safety and Facility Rehabilitation (SD-000033)	25,187,730	4,387,419.33	9,559,834.42	6,500,000	6,500,000
Emergency and Flood Response Projects (SD-000032)	6,186,091	860,537.90	975,980.00	1,000,000	1,000,000
Flood Prevention-Huntington Area-2012 (SD-000037)	30,000,000	992,347.14	28,997,684.86	0	0
Laurel Hill Adaptive Reuse Infrastructure (SD-000038)	750,000	0.00	750,000.00	0	0
NVSWCD Contributory (2G25-007-000)	2,742,820	460,064.00	485,064.00	485,064	485,064
Occoquan Monitoring Contributory (2G25-008-000)	678,406	112,559.00	112,559.00	115,611	115,611
Stormwater Allocation to Towns (2G25-027-000)	1,589,676	387,414.00	459,768.05	371,247	371,247
Stormwater Regulatory Program (2G25-006-000)	34,546,651	6,023,238.67	10,930,182.26	6,000,000	6,000,000
Stream & Water Quality Improvements (SD-000031)	62,619,593	13,155,499.57	23,207,574.45	15,279,699	15,239,937
Total	\$194,316,662	\$32,601,462.00	\$83,952,669.12	\$35,751,621	\$35,711,859

Appendix 2

Fairfax County Wet Weather Screening Program Plan (2014)

**FAIRFAX COUNTY
WET WEATHER SCREENING
PROGRAM PLAN 2014**

Prepared for

Watershed Planning & Assessment Branch
Stormwater Planning Division
Fairfax County Department of Public Works and Environmental Services
12000 Government Center Parkway, Suite 449
Fairfax, Virginia 22035-0052

Prepared by

Versar, Inc.
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April 30, 2014

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TABLE OF CONTENTS

	Page
1.0 INTRODUCTION AND PURPOSE	1-1
2.0 SITE SELECTION AND PRIORITY DETERMINATION	2-1
2.1 GENERAL FACTORS FOR IDENTIFYING CANDIDATE SITES.....	2-1
2.1.1 MS4 Service Area.....	2-1
2.1.2 Categorization of Parcels using Land Use.....	2-1
2.1.3 Easement.....	2-2
2.1.4 Industrial and Commercial Facilities.....	2-2
2.2 SITE SELECTION PROTOCOL	2-3
2.3 FIELD RECONNAISSANCE PROTOCOL	2-6
3.0 FIELD PROTOCOL FOR WET WEATHER MONITORING	3-1
3.1 SAMPLING METHODS.....	3-1
3.2 ANALYTES	3-1
3.3 SAMPLING FREQUENCY	3-2
3.4 ANTECEDENT DRY PERIOD AND RAINFALL CRITERIA	3-2
3.5 HEALTH AND SAFETY	3-3
4.0 DATA MANAGEMENT/QUALITY CONTROL	4-1
4.1 DOCUMENTATION OF FIELD MONITORING	4-1
4.2 CHAIN OF CUSTODY	4-1
4.3 ISCO MODEL 6712 PORTABLE AUTOMATED SAMPLER.....	4-1
5.0 NOTIFICATION	5-1
6.0 ANTICIPATED PRODUCTS OF THE PROGRAM	6-1
7.0 REFERENCES.....	7-1
APPENDICES	
A LAND USE CODES AND INDEX VALUES FOR WET WEATHER POLLUTANT DISCHARGE POTENTIAL	A-1
B FIELD RECONNAISSANCE DATA SHEET.....	B-1
C EQUIPMENT INSTALLATION, OPERATION, AND SAMPLING PROCEDURES.....	C-1
D HEALTH AND SAFETY GUIDANCE FOR WET WEATHER SCREENING FIELD WORK	D-1

TABLE OF CONTENTS (CONTINUED)

	Page
E FIELD DATA SHEET	E-1
F CHAIN OF CUSTODY FORM.....	F-1
G EXAMPLE WATER CHEMISTRY SPREADSHEET FORMAT	G-1
H SELECTED SIC CODES THAT OCCUR WITHIN FAIRFAX COUNTY MS4 SERVICE AREAS.....	H-1
I STORMWATER PLANNING DIVISION “WHO TO CALL” LIST	I-1

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LIST OF TABLES

Table No.		Page
2-1.	General index of potential for pollutant discharge during wet weather based on land use.	2-2
2-2.	GIS layers and data to be used to select and prioritize industrial/commercial parcels for monitoring.....	2-4
2-3.	Index value 4 land uses that occur within Fairfax County MS4 service areas	2-5
2-4.	Fairfax County 2014 wet weather screening site selection results	2-6
3-1.	Laboratory analytes and detection limits for Fairfax County’s wet weather screening and industrial/high risk monitoring program.....	3-2
5-1.	Laboratory analytes and detection limits for Fairfax County’s wet weather screening and industrial/high risk monitoring program.....	5-1

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1.0 INTRODUCTION AND PURPOSE

Uncontrolled stormwater runoff from urban areas has been a major source of nonpoint source pollutants entering the nation's surface waters over the past century. In many urban areas, the storm sewer network delivers large volumes of untreated runoff directly to rivers, streams, and lakes. In recent years, a variety of efforts have been made to reduce contributions of pollutants from nonpoint sources to surface waterways, especially by implementing control measures required by the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits. In Virginia, this program is administered by the Department of Environmental Quality (DEQ) through the Virginia Pollutant Discharge Elimination System (VPDES) municipal stormwater permit program. Along with other jurisdictions with large populations, Fairfax County holds a Phase I VPDES MS4 permit.

Under the MS4 permit, Fairfax County is required to investigate and address known areas contributing excess levels of pollutants to the MS4 by conducting wet weather screening. Sampling stormwater runoff from areas that may be contributing excess pollution is a method used as a first step to locate, isolate, and remediate areas that may be responsible for polluted stormwater discharges that may ultimately impact the quality of receiving waters. In response to these requirements, Fairfax County has initiated a program for wet weather screening and industrial/high risk monitoring.

Fairfax County's VPDES MS4 permit (2002) includes provisions for wet weather screening of areas that may be contributing excessive levels of pollutants to the MS4. The applicable monitoring requirement of the permit states:

Wet Weather Screening Program: The permittee shall investigate, and address known areas within their jurisdiction that are contributing excessive levels of pollutants to the Municipal Separate Storm Sewer System. The Permittee shall specify the sampling and nonsampling techniques to be used for initial screening and follow-up purposes. Sample collection and analysis need not conform to the requirements of 40 CFR Part 136.

In 2005, Fairfax County's Department of Public Works and Environmental Services (DPWES) conducted a preliminary GIS screening to select sites for monitoring based on land use and whether the site had an industrial stormwater permit with DEQ. Thirty-four locations were identified and field screening was performed on nine of the sites. During 2007-2013, Fairfax County conducted additional screening of industrial and commercial facilities that were identified through desktop GIS analysis.

This program plan describes Fairfax County's site selection, field reconnaissance, and wet weather monitoring protocols for evaluating areas that may be contributing stormwater pollution to the County's MS4. Wet weather monitoring in this case is intended as a screening tool rather than a long-term monitoring at any particular site.

This document contains the following:

- a site selection protocol that uses geographic information system (GIS) data to identify problem areas and rank them according to their potential to contribute pollutants to the MS4 and other criteria of interest to Fairfax County
- documentation of field reconnaissance and wet weather monitoring protocols to be used for screening a subset of those areas each year

The County will be employing automated samplers and electronic flow logging techniques to sample runoff from potentially high-polluting areas that may adversely impact waters of the State. Stenstrom and Lee (2005) emphasize that automated sampling allows for monitoring runoff throughout an entire storm because concentrations of pollutants may vary during a storm. It also allows for unattended monitoring in the case of overnight storms and offers additional advantages over other sampling methods for assessing stormwater runoff (Harmel et al. 2006). Automated sampling and associated continuous flow-logging also enable researchers to calculate pollutant load.

2.0 SITE SELECTION AND PRIORITY DETERMINATION

2.1 GENERAL FACTORS FOR IDENTIFYING CANDIDATE SITES

Fairfax County seeks to identify and monitor the most likely sources of excessive levels of pollutants entering the MS4 system. The County will use available data to target appropriate sites for investigation and possible wet weather monitoring. Categories of criteria that were used to identify suitable areas for wet weather screening during the desktop GIS analysis are described below.

2.1.1 MS4 Service Area

The County will focus wet weather screening activities on those areas that are regulated under its VPDES MS4 discharge permit. The County's MS4 service area consists of those drainage areas that discharge to an MS4. An MS4 outfall is defined as a point of discharge from the stormwater network to surface waters of the State. Outfalls draining MS4 service areas must also be accessible via County maintenance and repair easement (see section 2.1.3).

2.1.2 Categorization of Parcels using Land Use

One key factor in selecting candidate areas for monitoring is land use, as represented by the County's land use codes for parcels. These codes are assigned by the County when individual parcels are created. Each code has been assigned an index value (Versar 2006) that represents the relative potential for parcels with that code to discharge pollutants during wet weather (Appendix A). A brief description of the index appears in Table 2-1. Index values were assigned based on general expectations for a land use class, to provide a practical means for targeting field investigations to areas of greatest concentrations of land use classes that are most likely to be sources of pollution via runoff. This was done to facilitate a countywide approach to priority service area selection using GIS. For example, in general, an automotive repair facility (Index Value 3) would be a more likely source of runoff pollution than a single-family residence (Index Value 1).

Land uses were organized into index values according to the predominant activities occurring on the parcel that consist of: (a) transferring, storing, or employing hazardous materials consistently in an industrial, manufacturing, or treatment process (Index Value 4), (b) occurrences of drips, spills, or deposits of petroleum or commercial products on impervious areas that are exposed to precipitation and can be subsequently carried to the MS4 (Index Value 3), c) permanent storage of retail inventory or commercial waste in centralized, exposed areas and which may leach onto impervious surfaces (Index Value 2), and d) occasional exterior use and storage of household chemicals and waste (Index Value 1).

Table 2-1. General index of potential for pollutant discharge during wet weather based on land use	
Index Value	Description
1	No or insignificant potential (e.g., residences, schools, offices)
2	Slight risk (e.g., department stores, supermarkets, and other retail outlets with no obvious potential to pollute)
3	Moderate risk (e.g., warehouses, mass transit rights-of-way and terminals, restaurants, golf courses, and gasoline stations)
4	High risk (e.g., manufacturing, industry, waste treatment and disposal, utility rights-of-way)

Examples of sites that could contribute polluted runoff to a given service area include carwashes, gas stations, other automotive repair facilities, scrap yards, truck stops, shopping centers, restaurants, golf courses, home improvement retailers, plant nurseries and garden centers, research and testing facilities, industrial parks, mass transit terminals and maintenance facilities, pipeline rights-of-way and pressure control stations, and manufacturers. Information to identify such sites within the county’s jurisdiction is available from several sources.

2.1.3 Easement

Maintenance and repair easements are required in the MS4 service areas to allow the County to legally enter the storm drain network for the purpose of conducting monitoring of runoff. The easements allow the County and its agents to access portions of the MS4 on private property.

2.1.4 Industrial and Commercial Facilities

The County has identified industrial and commercial facilities (ICFs) that operate within its boundaries. When businesses are established, they are assigned a standard industrial classification (SIC) code that describes the nature of the business. As part of this site selection methodology, certain SIC codes have been identified that have an elevated potential for discharge of polluted stormwater runoff from the premises. Examples of businesses that have the SIC codes of elevated concern are: automobile service and repair, recreation, wholesale chemicals and cleaning, retail shopping centers, industrial processes, and appliance repair (Appendix H).

2.2 SITE SELECTION PROTOCOL

The wet weather and industrial/high risk screening program employs a two-tiered site selection method that (1) identifies service areas with high densities of commercial and industrial facilities, and (2) identifies specific service areas that have the greatest potential for contributing polluted runoff via ranking using scoring criteria. The method uses GIS data and supplemental information to rank parcels. Table 2-2 lists Fairfax County's GIS coverages and data sets relevant to this effort.

The goal of the site selection process is to establish a systematic strategy for targeting areas that have the greatest potential for discharging excessive levels of pollutants to the MS4. This process increases the likelihood of finding possible pollution sources while reducing the amount of staff time spent at unlikely sites. The site selection procedure is detailed below. This procedure may be modified over time as additional data are gathered or as the needs of Fairfax County's program change.

Level 1: Characterize Subwatersheds

Step 1: Identify MS4 service area catchments that drain to outfalls located within an easement that allows for maintenance access.

Step 2: Overlay MS4 service area catchments with ICF points. Conduct a spatial join of ICF points and MS4 service areas in order to get a count of the number of ICFs within each MS4 service area.

Step 3: Calculate the ICF density within each MS4 service area by dividing the number of ICFs in a given MS4 service area by the surface area of that MS4 service area.

Step 4: Calculate the number of Index Value 4 parcels (those parcels that have the greatest potential to contribute pollution to the MS4) within each MS4 service area. This is accomplished by selecting all of the land use codes (LUCs) associated with Index Value 4 parcels, creating a new GIS parcel layer that solely contains these LUCs, and conducting a spatial join of the new Index Value 4 layer with the MS4 service area layer. The LUCs occurring within Fairfax County's MS4 service areas that are identified as being Index Value 4 are listed in Table 2-3.

Table 2-2. GIS layers and data to be used to select and prioritize industrial/commercial parcels for monitoring			
Description	Dataset Name	Source File Date	Areal Extent
MS4 service area	StormNet_Industrial_Parcel_Info.gdb	2013	County
Industrial and commercial facilities	IHRR_P3_Facilities.mdb	2013	County
Orthophotography	2011_orthophoto_1ft.sid	2011	County
Fairfax hydrography layer	Various	2006	County
Current land use	CountywideLU_File_081511.gdb	2011	County
Easements	StormNet_Industrial_Parcel_Info.gdb	2013	County
Stormwater network - arcs	StormNet_Industrial_Parcel_Info.gdb	2013	County
Stormwater network - point features	StormNet_Industrial_Parcel_Info.gdb	2013	County

Land Use Code	Description
111	Planned industrial park
112	Industrial conglomeration
121	Durable manufacturing
131	Nondurable manufacturing
135	Printing and publishing
140	Research and test, where not in office building or office park
160	Contract construction
190	Other industrial NEC
221	Electric, including transmission rights-of-way, generation plants, regulating substations, etc.
222	Gas, including pipeline rights-of-way, treatment plants, storage, irrigation distributional channels, pressure control stations, etc.
223	Water, including pipeline rights-of-way, treatment plants, storage, irrigation distributional channels, pressure control stations, etc.
224	Sewage, including treatment plants, pressure control stations, etc.
226	Pipeline rights-of-way and pressure control stations, NEC (such as petroleum)

Step 5: Determine which ICFs have the greatest potential to contribute pollution to the MS4 (Appendix H), and calculate the number of these facilities which fall within each MS4 service area. SIC (Standard Industrial Classification) codes associated with industries having the highest potential to produce polluted runoff (e.g., automobile repair and service shops, oil refiners, petroleum stations, golf courses) are used in selecting specific ICFs, and a spatial join of the selected ICFs and the MS4 service areas is used to get a count of the selected ICFs within each MS4 service area.

Level 2: Score and Rank Parcels

Rank each MS4 service area by assigning each a pollution probability score based on the four criteria discussed above (number of ICFs, ICF density, number of Index Value 4 parcels, number of ICFs with selected SIC codes). Calculation of the scores is discussed below.

Step 6: Normalize the four criteria to their maximum values. This will result in a highest score of one (1) for an individual criterion.

Step 7: Sum the four scores for each MS4 service area. The sum of the four scores represents the final score that is used to rank all MS4 service areas.

Step 8: Generate a list of the 28 highest scored MS4 service areas and include two (2) additional sites of concern provided by the County which may have a history of or elevated concern for polluted runoff potential (Table 2-4).

Level 3: Investigate Candidate Sites

Step 9: Field staff will visit the candidate MS4 service areas (see Section 2.3) and their associated outfalls, to evaluate each for pollution potential, access to the outfall, and feasibility of monitoring. Hotspot Site Investigations (USEPA 2005) will be conducted at each site to aid in the selection of the 10 most suitable MS4 service areas for wet weather sampling.

Table 2-4 presents the results for the first two levels of this site selection protocol and includes two areas of County concern.

Table 2-4. Fairfax County 2014 wet weather screening site selection results					
Rank	Service Area ID	Score	Rank	Service Area ID	Score
1	STMN1013494095	1.794	16	STMN0543047308	0.932
2	STMN0491419552	1.733	17	STMN0171005215	0.896
3	STMN0493423969	1.507	18	STMN0292013841	0.888
4	STMN0991489095	1.494	19	STMN0781457949	0.884
5	STMN0993495728	1.378	20	STMN0343027642	0.863
6	STMN0294016861	1.278	21	STMN0924479620	0.830
7	STMN0293017600	1.188	22	STMN0902474164	0.819
8	STMN0974496911	1.130	23	STMN0901474668	0.798
9	STMN0343030307	1.124	24	STMN0792455798	0.788
10	STMN0991505083	1.114	25	STMN0723444697	0.759
11	STMN0612426502	1.082	26	STMN0163407466	0.741
12	STMN0991488356	1.058	27	STMN0891475778	0.740
13	STMN0931471031	1.045	28	STMN0991488353	0.722
14	STMN0813464266	1.015	N/A	STMN1134502798*	N/A
15	STMN1074058314	1.014	N/A	STMN0992487769*	N/A
*County site of concern					

2.3 FIELD RECONNAISSANCE PROTOCOL

Sites identified as candidates for monitoring according to the site selection protocol will be visited to obtain additional information regarding suitability for monitoring and ease of access for use in selecting priority sites for wet weather monitoring. Field maps prepared for reconnaissance will include streams, watersheds, outfalls, the storm sewer network, and major and minor roads. The candidate sites will be photographed. The field reconnaissance protocol will consist of the following steps:

1. Evaluate the service area visually for the presence of trash, poor maintenance practices, suspicious spills or stains, and the presence (or absence) and condition of

secondary controls (USEPA 2005). Record observations on standard data sheet (Appendix B). Site investigations encompassing a portion or the entirety of a service area will use the Service Area Site Investigation Field Data Sheet; individual businesses will use a hotspot investigation field data sheet.

2. Locate outfall(s) and verify orifice diameter to enable calculation of flow rate (discharge) using appropriate Manning's coefficients.
3. Evaluate site accessibility, landowner permission, and security of the area for the purpose of locating an automated sampler. If access to the outfall is impeded by dangerous terrain or fences, or it is not visible due to immersion in receiving waters or blocked by sediment, then a manhole up-network from the outfall can be considered as an alternative sampling point. The location of non-outfall monitoring locations should be within County easements. Open manholes and determine the suitability of placing a compact automated sampler within the manhole or at-grade adjacent to the manhole. Verify the diameter of the pipe and depth of the hole to determine the need for personnel trained and certified to work in confined spaces and to identify the required inserts for monitoring equipment (spring ring, scissors ring, or weir). Traffic control authorization and training may be required.
4. If the service area is large (i.e., greater than 20 acres) and drains several non-target land use areas (e.g., residential), then field staff should investigate smaller sections of infrastructure within the service area to determine whether a smaller portion of the network that services a smaller commercial or industrial drainage can be effectively monitored. In many instances, several points of inter-connection exist that contribute cumulative discharge to the MS4 outfall that drains the entire service area. Staff should evaluate the location of the inter-connection as in Step 3 above. Lack of easement availability at the point of inter-connection should be noted.

Field data sheets will be used to document the visual screening performed in Step 1 of the Field Reconnaissance Protocol (Appendix B). Sites will be ranked from highest to lowest according to a hotspot status score, which is the total number of elements tallied on the field reconnaissance data sheet divided by the acreage of the service area. Sites with the highest hotspot status scores will be considered to have the highest priority for monitoring. Factors considered in Steps 2 through 4 of the Field Reconnaissance Protocol could hinder monitoring or eliminate a site from consideration (e.g., inaccessibility, relative lack of security). Candidate sites that are not eliminated during field reconnaissance must be approved by the Fairfax County DPWES, Stormwater Planning Division prior to commencing monitoring activities. The County may have to obtain permission from the landowner to access selected monitoring sites. The approved wet weather screening sites will be revisited and prepared for monitoring according to procedures outlined in Section 3 and Appendix C.

3.0 FIELD PROTOCOL FOR WET WEATHER MONITORING

This section provides details of the protocols to be followed during wet weather monitoring deployments and includes descriptions of sampling equipment, analytes, sampling frequency, and antecedent condition requirements. Specific instructions for sampling procedures and health and safety procedures are provided in Appendix C and Appendix D, respectively.

3.1 SAMPLING METHODS

The preferred sampling method is an electronic, automated sampler, which collects discrete samples of runoff at specific intervals throughout a storm. Sampling repeatedly throughout a storm is important because various pollutants of interest will mobilize and be delivered to the MS4 at different times depending on the rate and duration of rainfall.

Field technicians will sample storm runoff flows by attaching automated samplers to MS4 outfalls located within or terminating a target service area. Flow rates will be logged at all sampling points to enable flow-weighted compositing of samples. A flow-weighted composite sample provides an accurate representation of the overall concentration of a given analyte in the runoff. The flow-logging apparatus will be secured (e.g., with scissors ring) within the pipe for the duration of screening at a site (i.e., four storm events). The automated sampler (ISCO model 6712 or equivalent) will collect water samples at fixed intervals over the course of each sampled rainfall. Individual samples will be combined into a discharge volume-weighted composite sample. One composite sample will be obtained at each sampling point and transported to an approved analytical laboratory to be tested for the analytes listed in Table 3-1. Field technicians will measure composite pH and specific conductance before delivering samples to the laboratory.

3.2 ANALYTES

Categories of pollutants to be tested are nutrients, metals, and sediment. Each category consists of specific pollutants that provide information about suspended material transport, contamination of impervious surfaces from heavy metals, and deposition and mobilization of nutrients commonly used in detergents and fertilizers. This analyte suite consists of pollutants shown to be commonly found in urban runoff (from a review of the literature) and has been refined through experience with sampling wet weather runoff from these areas within Fairfax County. Water hardness (as mg/L CaCO₃) will be monitored so that analytical results can be directly compared to Virginia surface water criteria. Total petroleum hydrocarbons (TPH) will be monitored to identify deposition problems in high-vehicular activity areas resulting from petroleum-based residue. Note that TPH will be sampled using manual (grab) methods when practical. When TPH sampling using manual means is impractical due to site conditions or time of storm onset, the automated sampler will be programmed to obtain a “first flush” grab for this parameter by using a flow rate or rainfall trigger.

Table 3-1. Laboratory analytes and detection limits for Fairfax County's wet weather screening and industrial/high risk monitoring program		
Parameter	Detection Limit	Method
TSS	1 mg/L	SM 2540 B
Zinc	20 µg/L	EPA 200.8
Cadmium	2 µg/L	EPA 200.8
Copper	2 µg/L	EPA 200.8
Lead	2 µg/L	EPA 200.8
Chromium	2 µg/L	EPA 200.8
Nickel	2 µg/L	EPA 200.8
COD	10 mg/L	EPA 410.4
Total phosphorus	0.01 mg/L	SM 4500 P-E
Orthophosphate	0.01 mg/L	SM 4500 P-E
Total Kjeldahl nitrogen	0.5 mg/L	SM 4500 NH3-C
Nitrate and nitrite	0.02 mg/L	SM 4500NO3-H
Hardness	1 mg/L	SM 2340 B
TPH	5 mg/L	EPA 1664

3.3 SAMPLING FREQUENCY

The County's permit does not specify a sampling frequency or duration for areas of interest. Wet weather sampling of MS4 service areas is intended as a water quality screening activity; however, seasonal storm event capture will be undertaken to assess seasonal variability of service area conditions. Under this protocol, sampling will be successfully performed once per quarter during a yearly monitoring period at each wet weather screening site.

The program is designed for monitoring two areas concurrently on a quarterly basis. On the anniversary of the monitoring program, two new areas begin quarterly wet weather screening. Optionally, the County may add a third site of interest, if warranted.

3.4 ANTECEDENT DRY PERIOD AND RAINFALL CRITERIA

Sampling after a dry period is beneficial because it reduces the possibility of sampling immediately after surfaces have been washed relatively clean by a prior storm. Antecedent dry periods required by discharge permits typically range from 48 hours for BMP effectiveness studies to 72 hours for standard discharge permit monitoring programs (USEPA 1992). Experience has shown that attempting to wait for a 72-hour antecedent dry period may preclude timely storm sampling, especially during periods of frequent storms (i.e., daily, generally in summer months). A 48-hour antecedent dry period is required for wet-weather monitoring (USEPA 2002) and will be observed in Fairfax County's program.

Storms that are forecast to deliver 0.3 in. or more of rain within 24 hours are eligible for monitoring. A rainfall depth of 0.3 in. represents a moderate quantity that should produce sufficient runoff to allow automated sampling. The minimum rainfall depth may be revised if it provides insufficient runoff for automated sampling.

Eligible storms will be identified by staff meteorologists. Meteorologists will notify field staff when an anticipated storm is expected to deliver at least 0.3 in. of rainfall at a targeted service area monitoring location. Rainfall depth delivered by a given storm will be estimated from regional rainfall accumulation as determined by Doppler radar or from a local rain gauge identified by the County.

3.5 HEALTH AND SAFETY

Ensuring the health and safety of field personnel is the responsibility of every member of the staff for the project. The collective effort of all staff members in providing a healthy and safe work environment will minimize or eliminate the potential for accidents. In general, the following safety protocol will be followed to protect the field staff:

1. Perform field work in teams of at least two.
2. Bring cell phone and first aid kit on all field site visits.
3. Exercise caution when encountering any wildlife and hazardous plants. In addition, many outfalls are located in remote areas that may be near gathering places for homeless or transient individuals. Do not enter a potentially hostile area.
4. Use common sense during electrical storms and/or when severe conditions (e.g., high wind, hail) develop. The safety of field staff overrides all other considerations.
5. Storm sewers contain a variety of water-borne bacteria and other harmful chemicals. Wash hands or use anti-bacterial wipes or hand gels liberally, especially prior to lunch breaks, etc.
6. Confined spaces entry shall only be performed by certified staff using appropriate equipment.

Additional information on Health and Safety may be found in Appendix D, including information on field staff conduct, personal protective equipment, confined space entry, dangerous flora and fauna, unknown hazardous substances and wastes, bloodborne pathogens, remote areas, hand tool safety, weather-related hazards, and heat and cold stress.

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4.0 DATA MANAGEMENT/QUALITY CONTROL

4.1 DOCUMENTATION OF FIELD MONITORING

Documentation of the wet weather screening effort will include the following:

- results of field reconnaissance in preparation for the wet weather screening
- construction, orientation, and size of the MS4 conduit that is being used as the sampling point for the site of interest
- the unique ID and physical location of the outfall or manhole that is being accessed (if any)
- GPS coordinates of the outfall or manhole being accessed if it is not on Fairfax County's stormwater infrastructure GIS layer
- description of hardware inserted into the pipe at sampling point

For storm events, a dedicated data sheet (Appendix E) will be used to document sample location, rainfall depth, date of sampling initiation, serial numbers of automated sampler and flow module, names of field crew, discrete sample interval, discharge volume represented by each discrete sample, proportional aliquot of discrete sample used in compositing, date and time of sample composite.

4.2 CHAIN OF CUSTODY

Chain of custody (COC) forms, used for all samples, are a permanent record of transfer of sample custody. Custom COC forms for this project are preprinted with the analytes and partial laboratory numbers particular to the activity at hand (e.g., composite; Appendix F). Field staff need only to complete the laboratory numbers, complete the columns designated for other information, line out any samples that will not be submitted, and sign the form. When picking up the samples for delivery to the laboratory, the laboratory courier signs and dates the COC form in the "Received By" box and leaves a photocopy for project records. Copies of the COC form are provided with certificates of analysis.

4.3 ISCO MODEL 6712 PORTABLE AUTOMATED SAMPLER

The sampler assembly consists of a keypad, pump, tubing, and sample bottle container which holds 24 plastic bottles. The 24 bottles are used to contain the discrete samples collected at intervals throughout the storm. Required maintenance involves checking the integrity of the suction tubing, checking to see that suction tubing is securely attached to the pump tubing (when sampler is attached), making sure that pump tubing is properly threaded through the distributor

arm, running the internal electronic maintenance cycle (includes electronic tests of RAM and ROM, mechanical tests of sample pump and distributor arm), and making sure the knurled knob that holds the distributor arm to the frame is tight. Monthly maintenance consists of running the sample pump to check for suction line integrity. The suction line at a sampling point is replaced when the apparatus is moved to a new site upon completion of sampling. The pump tubing is replaced annually. A step is included in the automated sampler program to rinse the suction tubing with sample water prior to sampling.

5.0 NOTIFICATION

Appropriate staff of Fairfax County’s DPWES – Stormwater Planning Division (SWPD) will be notified when analytes exceed criteria established in this plan (Table 5-1) or otherwise suggest substantial pollutant inputs from a site. Standard laboratory analysis reporting time is two weeks; project personnel will notify SWPD, if necessary, within four hours of results receipt. A description of the location of the service area, chemical results, hotspot investigation results, and date and time of screening will be conveyed to SWPD by phone and e-mail to Shannon Curtis, project manager (703-324-5811, shannon.curtis@fairfaxcounty.gov) and/or Takisha Cannon, Industrial and High Risk Runoff program coordinator (703-324-5885, takisha.cannon@fairfaxcounty.gov). SWPD will then immediately contact DEQ and other county agencies later by phone, e-mail, and/or letter, as necessary. The County’s water quality “Who to Call List” outlines the appropriate individuals and agencies to be notified for various water quality incidents and concerns (Appendix I) and will be utilized in this process. The “Who to Call List” is updated on a regular basis, as needed.

Note: If a hazardous material spill is suspected, staff will immediately call the county’s Fire and Rescue Hazardous Material Investigative Service (703-246-2300) and SWPD.

Table 5-1. Laboratory analytes and detection limits for Fairfax County’s wet weather screening and industrial/high risk monitoring program		
Parameter	Detection Limit	Exceedance Criterion
TSS ^(a)	1 mg/L	100 mg/L
Zinc ^(b)	20 µg/L	120 µg/L ^(c)
Cadmium ^(b)	2 µg/L	3.9 µg/L ^(c)
Copper ^(b)	2 µg/L	13 µg/L ^(c)
Lead ^(b)	2 µg/L	120 µg/L ^(c)
Chromium ^(b)	2 µg/L	570 µg/L ^(c)
Nickel ^(b)	2 µg/L	180 µg/L ^(c)
COD ^(a)	10 mg/L	120 mg/L
Total phosphorus ^(a)	0.01 mg/L	2 mg/L
Orthophosphate	0.01 mg/L	N.A.
Total Kjeldahl nitrogen ^(a)	0.5 mg/L	1.5 mg/L
Nitrate and nitrite ^(a)	0.02 mg/L	0.68 mg/L
Hardness	1 mg/L	N.A.
TPH ^(a)	5 mg/L	15 mg/L

(a) Virginia State Water Control Board 2009
 (b) Virginia State Water Control Board 2011
 (c) Acute water quality criterion for metals is hardness-dependent. Values above reflect hardness standardized to 100 mg/L as CaCO₃. See Virginia State Water Control Board (2009) for explanation of factors used to adjust acute criterion based on hardness for specific metals.
 N.A. = No EPA or Virginia acute standard available

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6.0 ANTICIPATED PRODUCTS OF THE PROGRAM

For the Wet Weather Screening Program, Fairfax County will produce individual storm reports, permit yearly reports, and monitoring yearly reports to document permit compliance data collection efforts.

6.1 EVENT MONITORING REPORT

For each storm even monitored, an event monitoring report well be created for all sites monitored during that event. An MS Excel format file will be prepared that includes the following information:

- Site evaluation and reconnaissance data;
- Site setup information;
- Storm setup and sample collection information;
- Sample analysis results;
- Continuous flow rate and rainfall data (in 10-minute intervals);
- Discrete volume worksheet;
- Pass/fail screening status; and
- Reference values for exceedance criteria.

The event monitoring report will also include a PDF of the laboratory certificate of analysis. The laboratory will provide analytical results within two weeks.

6.2 PERMIT YEARLY REPORT

At the end of each MS4 permit year, a brief summary of wet weather screening activities will be prepared that will be used in the development of the County's annual MS4 reports to DEQ. The reports will be no more than one page in length (front and back) and will summarize screening activities, describe sites that were monitored, and state whether any monitoring results were found to be above exceedance criteria.

6.3 MONITORING YEARLY REPORT

At the end of the monitoring year (four consecutive monitoring quarters), a report on wet weather screening of potential pollution runoff areas will be prepared. The report will contain narrative discussions of each area screened and briefly describe results.

The yearly report will include the following:

- compilation of analytical results, flow, and rainfall data for each site,
- narrative discussions of each site screened and briefly describe results.

Year 2 through Year 5 reports will include comparisons to prior years monitoring efforts and results. The Year 5 report will also include an overall summary of the five years of monitoring and recommendations for future wet weather screening efforts. A summary spreadsheet will also be submitted with each annual report that will contain analytical results, flow, and rainfall data. A template of the summary spreadsheet can be found in Appendix G.

7.0 REFERENCES

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- USEPA. 2005. Unified Subwatershed And Site Reconnaissance: A User's Manual, Version 2.0, Prepared for Office of Water Management, U.S. Environmental Protection Agency by Center for Watershed Protection, Ellicott City, MD.
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- Virginia State Water Control Board. 2009. General VPDES Permit for Industrial Activity Storm Water Discharges, Permit No. VAR05 Fact Sheet. Virginia Department of Environmental Quality, Richmond, VA. April.
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APPENDIX A
LAND USE CODES AND WET WEATHER POLLUTANT
DISCHARGE POTENTIAL INDEX VALUES

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Table A-1. Land uses and attached index of potential wet weather pollution discharge (1=least, 4=most risk for contributing excess pollutants via wet weather discharge) for parcels in Fairfax County, Virginia. Note that codes were established only for three-digit land use codes. Land use codes were obtained from Fairfax County Department of Tax Administration.

Land Use Code	Description	Index
0	Residential	
003	Retail Trade	1
01	Single-family, Detached or Semidetached	
011	Single-family, detached	1
012	Single-family, semidetached or garden court	1
013	Two or more single-family, detached on single parcel (including guest house or unit in detached auxiliary building)	1
014	Single-family structure NEC	1
015	Single-family residences located in an area where value may be influenced by commercial or industrial properties.	1
02	Two-family	
021	Duplex, either vertical or horizontal	1
029	Two-family NEC	1
03	Townhouse or Multiplex	
031	Townhouse, in ownership development	1
032	Townhouse, in condominium development	1
033	Townhouse, in rental development	1
034	Multiplex (except duplex) in ownership development	1
035	Multiplex (except duplex) in condominium development	1
036	Multiplex (except duplex) in rental development	1
037	Combination of structure types, predominantly townhouses and/or multiplexes	1
039	Townhouse or multiplex structures NEC, including cooperatives	1
04	Apartments	
040	Garden apartments, rental (up to and including 4 stories)	1
041	Garden apartments, condominium (up to and including 4 stories)	1
042	Medium rise apartments, rental (5 to 8 stories)	1
043	Medium rise apartments, condominium (5 to 8 stories)	1
044	High rise apartments, rental, without commercial/professional (9 or more stories)	1
045	High rise apartments, condominium, without commercial/ professional (9 or more stories)	1
046	High rise apartments, rental, with commercial/professional (9 or more stories)	1
047	High rise apartments, condominium, without commercial/ professional (9 or more stories)	1
048	Combination of structure types, predominantly apartments	1
049	Apartments, NEC, including cooperatives	1
05	Mobile Homes	
051	Mobile homes in park or court	1

Land Use Code	Description	Index
052	Mobile homes not in park or court	1
06	Residential Structures (originally designed for hotels and motels but now primarily used as dwelling units)	
060	Residential hotels and motels	1
07	Group Quarters	
071	Rooming and boarding houses	1
072	Membership lodgings	1
073	Residence halls and dormitories	1
074	Retirement homes and orphanages	1
075	Religious quarters	1
076	Nursing homes	1
079	Other group quarters NEC (except military and correctional)	1
08	Transient Lodging	
081	Motel without restaurant and/or other commercial amenities	1
082	Motel with restaurant and/or other commercial amenities	1
083	Hotel without restaurant and/or other commercial amenities	1
084	Hotel with restaurant and/or other commercial amenities	1
085	Tourist Home	1
089	Other transient lodging NEC	1
09	Other Residential	
091	Garage, barn, outhouse, shed, etc., on separate but adjacent parcel from unit	4
092	Private open space, swimming pool, tennis courts, private roads, parking areas, etc., with a planned development or subdivision (owned by an owners' association)	2
093	Private open space, swimming pool, tennis courts, private roads, parking areas, etc., NOT in a planned development or subdivision (NOT owned by an owners' association)	2
099	Other residential NEC	1
1	Industrial	
11	Industrial Park or Conglomeration	
111	Planned industrial park	4
112	Industrial conglomeration	4
12	Durable Manufacturing, where not in industrial parks	
121	Durable manufacturing	4
126	Durable manufacturing (where in a condominium development)	4
127	Durable manufacturing (where in a cluster development)	4
13	Nondurable Manufacturing, where not in industrial parks	
131	Nondurable manufacturing	4
135	Printing and publishing	4
136	Nondurable manufacturing (where in a condominium development)	4
137	Nondurable manufacturing (where in a cluster development)	4
14	Research and Testing, where not in industrial parks	
140	Research and test, where not in office building or office park	4

Land Use Code	Description	Index
146	Research and testing (where in a condominium development)	4
147	Research and testing (where in a cluster development)	4
15	Wholesale, Warehousing and Storage, where not in industrial parks	
150	Wholesale, warehousing and storage	3
151	Mini-warehouses	3
156	Wholesale, warehousing and storage (where in a condominium development)	3
157	Wholesale, warehousing and storage (where in a cluster development)	3
16	Contract Construction, where not in industrial parks	
160	Contract construction	4
166	Contract construction (where in a condominium development)	4
167	Contract construction (where in a cluster development)	4
19	Other Industrial NEC	
190	Other industrial NEC	4
2	Transportation, Utilities, Communications (operating facilities not including offices)	
21	Transportation	
211	Railroad, including right-of-way, terminals, maintenance	3
212	Rail rapid transit, including right-of-way, terminals, maintenance	3
213	Bus, including terminals, maintenance and special rights-of-way	3
214	Motor freight transportation	3
215	Street and highway right-of-way	3
216	Auto parking	3
217	Air including runways, terminals and maintenance	3
218	Marine terminals	3
219	Other transportation NEC (including freight forwarding services and taxi transportation services)	3
22	Utilities	
221	Electric, including transmission rights-of-way, generation plants, regulating substations, etc.	4
222	Gas, including pipeline rights-of-way, production plants, storage and distribution points, pressure control stations, etc.	4
223	Water, including pipeline rights-of-way, treatment plants, storage, irrigation distributional channels, pressure control stations, etc.	4
224	Sewage, including treatment plants, pressure control stations, etc.	4
225	Solid waste disposal including refuse incineration, garbage grinding stations, composting plants, sanitary landfills, refuse disposals, etc.	4
226	Pipeline rights-of-way and pressure control stations, NEC (such as petroleum)	4
229	Other utilities, NEC	3
23	Communications	
231	Telephone and telegraph	3
232	Radio and television	3
239	Other communications, NEC 3 Retail Trade	3

Land Use Code	Description	Index
31	Shopping Centers (a group of commercial establishments with on-site parking which are planned, developed, owned and managed as a unit, and related in location)	
311	Neighborhood Center	2
312	Specialty Center - consists of numerous small tenants with no anchor tenant.	2
313	Community Center	2
314	Regional Center	2
315	Super Regional Center	2
316	Promotional Center	2
317	Town Center	2
318	Condo Center	2
32	Building Materials, Hardware, Farm Equipment (where not included in shopping centers)	
320	Building materials, hardware, farm equipment	3
33	General Merchandise, Apparel, Home Furnishings, Drugs (where not included in shopping centers)	
331	Department stores	2
332	Discount stores	2
333	Variety or junior department stores	2
334	Apparel and accessories	2
335	Furniture, house furnishings	2
336	Drug stores	2
337	Condo Retail - Specialty type store located in a predominantly office or industrial condominium complex.	2
34	Food Stores (where not included in shopping centers)	
341	Supermarket	2
342	Supermarket plus general merchandise	2
343	Convenience grocery	2
349	Other food NEC (including fruit, meat, fish, etc.)	2
35	Eating and Drinking (where not included in shopping centers)	
351	Restaurant with alcohol	3
352	Restaurant without alcohol	3
353	Carry-out Kitchen	3
354	Carry-out with seating	3
36	Automotive, Marine, Aircraft and Accessories (where not included in shopping centers)	
361	Motor vehicle sales (new and used)	2
362	Gasoline and Service Station	3
363	Gasoline Sale Only	3
364	Gasoline Sales and Car Wash	3
365	Service Station out of operation, but not yet converted to another use. Service equipment and pumps may or may not have been removed.	2
369	Other automotive, marine, aircraft and accessories NEC	3

Table A-1. (Continued)		
Land Use Code	Description	Index
39	Other Retail NEC (where not included in shopping centers)	
390	Other retail NEC	2
4	Office Buildings and Office Parks	
41	Office Park	
410	Office Park	1
42	Low Rise Office (up to and including 4 stories)	
421	General low rise office	1
422	Medical and/or dental low rise office	1
423	Government leased low rise office (90% or more floor area leased to government)	1
424	Government owned low rise office	1
425	Condominium Office (General, Low Rise)	1
426	Condominium Office (Medical and/or Dental, Low Rise)	1
427	Cluster Office (General, Low Rise)	1
428	Cluster Office (Medical and/or Dental, Low Rise)	1
429	Converted Residential Office (ex-dwellings which have been totally converted for office use)	1
43	Medium and High Rise Offices (5 or more stories)	
431	General medium or high rise office	1
432	Medical and/or dental medium high rise office	1
433	Government leased medium or high rise office (90% or more floor area leased to government)	1
434	Government owned medium or high rise office	1
435	Condominium Office (General, Medium or High Rise)	1
436	Condominium Office (Medical and/or Dental, Medium or High Rise)	1
49	Other Office NEC	
490	Other office NEC	1
5	Consumer and Business Service land uses (where not included in office buildings or shopping centers; usually in converted houses or converted stores)	
510	Finance, insurance, real estate and professional services	1
520	Personal services including laundry, photo, beauty, barber, funeral, apparel, repair, etc.	1
530	Motor vehicle repair when provided separately from motor vehicle sales dealers and gasoline stations.	3
540	Other repair services NEC	1
550	Veterinary hospitals	1
590	Other consumer and business service land uses NEC	1
6	Public and Quasi Public Service land uses (where not included in office buildings or shopping centers)	
610	Cemeteries	1
620	Hospital and health facilities (except nursing homes)	1
630	Post offices	1
640	Police stations	1

Land Use Code	Description	Index
650	Fire and rescue stations	1
660	Correctional institutions	1
670	Military institutions	1
680	Welfare and charitable services	1
690	Other public and quasi public service land uses NEC	1
7	Cultural, Educational and Entertainment Service	
71	Churches, Synagogues	
710	Churches, synagogues	1
72	Civic, Social, Fraternal, Professional, Business Associations	
720	Civic, social, fraternal, professional, business associations	1
73	Libraries	
730	Libraries	1
74	Permanent Exhibition	
740	Permanent exhibitions including museums, art galleries, monuments, planetaria, aquariums, historic	1
75	Education	
751	Nursery schools (may include kindergarten)	1
752	Public elementary, intermediate, secondary, high and special class schools	1
753	Private schools; kindergarten through 12 or combination of these grades; may include nursery if school contains graded classes.	1
754	College, universities, including junior colleges and professional schools (law, medicine, etc.)	1
755	Special training schools including vocational and trade schools, business, stenographic, barber, beauty, art, music, driving, etc.	1
759	Other educational services NEC	1
76	Public Assembly, Both Indoor and Outdoor	
760	Places of public assembly including theaters, stadiums, auditoriums, exhibition halls, race tracks, etc.	1
79	Other Cultural and Entertainment Service land uses NEC	
790	Other cultural and entertainment service land uses NEC	1
8	Recreation	
81	Recreation Facilities and Parks - Outdoor (except golf courses and except swimming pools not in public parks)	
811	Private (except for homeowner association facilities)	1
812	Commercial - open to public	1
813	Government-owned - open to public with or without fee	1
82	Recreation Facilities - Indoor (except swimming pool)	
821	Private	1
822	Commercial - open to public	1
823	Government-owned - open to public with or without fee	1
83	Golf Courses	
831	Private	3
832	Commercial	3

Table A-1. (Continued)		
Land Use Code	Description	Index
833	Government-owned	3
84	Swimming Pools (except homeowners association pools).	
841	Swimming pools - outdoor	3
842	Swimming pools - indoor	3
85	Boat Slips	
850	Boating Marinas - public and private	2
851	Condominium Boat Slips - private for sale	2
9	Resource Uses and Undeveloped Areas	
91	Agricultural Activities	
910	Agricultural activities and related services	3
92	Forestry Activities and Related Services	
920	Forestry activities and related services	3
93	Horticulture Activities	
930	Horticulture activities and related services	3
94	Resource Production and Extraction	
941	Sand and gravel quarrying	3
949	Other resource production and extraction	3
95	Permanent Conservation Areas	
950	Permanent conservation areas, including wildlife preserves	1
96	Water Areas	
960	Water areas	1
97	Vacant Land	
971	Vacant land	1
972	"Improved land with dilapidated structure of no visible use, incidental shed, etc."	1
99	Other Resource Uses and Undeveloped Area NEC	
990	Other resource uses and undeveloped area NEC	1

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APPENDIX B
FIELD RECONNAISSANCE
DATA SHEET

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Fairfax County MS4 Service Area Site Investigation Field Data Sheet

I.D.: STMN _____

Investigator(s) Initials: _____

Date: _____

Photo Numbers: _____

1. POLLUTION POTENTIAL

B-3

Hotspot Element	No.	# near inlet	Comments/Severity
Outside storage of materials (uncovered, hazardous, leaking)			
Waste management (leaking dumpsters, blowing trash)			
Parking lot stains			
Outside maintenance of vehicles (uncovered)			
Outside fueling of vehicles			
Outside industrial processes			
Other			

General housekeeping comments:

2. LAND USE CHARACTERIZATION

Percent breakdown of: Residential _____ Commercial _____ Industrial _____ Institutional _____

Example names of businesses:

3. STORMWATER INFRASTRUCTURE

Stormwater controls: None _____ Few _____ Pervasive _____

Describe: _____

4. MS4 OUTFALL CONFIGURATION

Concrete Ditch _____ Pipe Conduit _____ Natural Channel _____

Pond Outfall? _____ Pipe Diameter: _____ Pipe Shape: _____ Submerged? _____

Available real estate to place sampler? _____ Rain gauge? _____

Access constraints: Fenced in _____ Difficult Terrain _____ Denied Access _____ Other _____

Describe configuration and accessibility of feeder outfalls to natural channel or concrete ditch:

Hotspot Site Investigation

HSI

WATERSHED:		SUBWATERSHED:		UNIQUE SITE ID:	
DATE: ____/____/____		ASSESSED BY:		CAMERA ID:	
MAP GRID:		LAT ° ____ ' ____ " LONG ° ____ ' ____ "		LMK #	
A. SITE DATA AND BASIC CLASSIFICATION					
Name and Address: _____		Category: <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Miscellaneous			
_____		<input type="checkbox"/> Institutional <input type="checkbox"/> Municipal <input type="checkbox"/> Golf Course			
_____		<input type="checkbox"/> Transport-Related <input type="checkbox"/> Marina <input type="checkbox"/> Animal Facility			
SIC code (if available): _____		Basic Description of Operation: _____			
NPDES Status: <input type="checkbox"/> Regulated				INDEX*	
<input type="checkbox"/> Unregulated <input type="checkbox"/> Unknown					
B. VEHICLE OPERATIONS <input type="checkbox"/> N/A (Skip to part C)				Observed Pollution Source? <input type="checkbox"/>	
B1. Types of vehicles: <input type="checkbox"/> Fleet vehicles <input type="checkbox"/> School buses <input type="checkbox"/> Other: _____					
B2. Approximate number of vehicles: _____					
B3. Vehicle activities (circle all that apply): Maintained <input type="checkbox"/> Repaired <input type="checkbox"/> Recycled <input type="checkbox"/> Fueled <input type="checkbox"/> Washed <input type="checkbox"/> Stored <input type="checkbox"/>					
B4. Are vehicles stored and/or repaired outside? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
Are these vehicles lacking runoff diversion methods? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
B5. Is there evidence of spills/leakage from vehicles? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
B6. Are uncovered outdoor fueling areas present? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
B7. Are fueling areas directly connected to storm drains? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
B8. Are vehicles washed outdoors? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
Does the area where vehicles are washed discharge to the storm drain? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C. OUTDOOR MATERIALS <input type="checkbox"/> N/A (Skip to part D)				Observed Pollution Source? <input type="checkbox"/>	
C1. Are loading/unloading operations present? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
If yes, are they uncovered and draining towards a storm drain inlet? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C2. Are materials stored outside? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell If yes, are they <input type="checkbox"/> Liquid <input type="checkbox"/> Solid Description: _____					
Where are they stored? <input type="checkbox"/> grass/dirt area <input type="checkbox"/> concrete/asphalt <input type="checkbox"/> bermed area					
C3. Is the storage area directly or indirectly connected to storm drain (circle one)? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C4. Is staining or discoloration around the area visible? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C5. Does outdoor storage area lack a cover? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C6. Are liquid materials stored without secondary containment? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
C7. Are storage containers missing labels or in poor condition (rusting)? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
D. WASTE MANAGEMENT <input type="checkbox"/> N/A (Skip to part E)				Observed Pollution Source? <input type="checkbox"/>	
D1. Type of waste (check all that apply): <input type="checkbox"/> Garbage <input type="checkbox"/> Construction materials <input type="checkbox"/> Hazardous materials					
D2. Dumpster condition (check all that apply): <input type="checkbox"/> No cover/Lid is open <input type="checkbox"/> Damaged/poor condition <input type="checkbox"/> Leaking or evidence of leakage (stains on ground) <input type="checkbox"/> Overflowing					
D3. Is the dumpster located near a storm drain inlet? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
If yes, are runoff diversion methods (berms, curbs) lacking? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell					
E. PHYSICAL PLANT <input type="checkbox"/> N/A (Skip to part F)				Observed Pollution Source? <input type="checkbox"/>	
E1. Building: Approximate age: _____ yrs Condition of surfaces: <input type="checkbox"/> Clean <input type="checkbox"/> Stained <input type="checkbox"/> Dirty <input type="checkbox"/> Damaged					
Evidence that maintenance results in discharge to storm drains (staining/discoloration)? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Don't know					

*Index: ○ denotes potential pollution source; denotes confirmed polluter (evidence was seen)

APPENDIX C
EQUIPMENT INSTALLATION, OPERATION,
AND SAMPLING PROCEDURES

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WET WEATHER SCREENING EQUIPMENT

The automated sampler to be employed will be an ISCO Model 6712 portable sampler capable of collecting up to 24 1000-mL water samples. The samples are contained in Propak liners constructed of polyethylene which are inserted into plastic frames to provide rigidity. The size of the samples and number of bottles will assure that several bottles will be filled corresponding to all portions of the storm event hydrograph. The automated sampler will be transported to the sampling sites prior to the storm event and removed after event conclusion. During the event, each sampler will be covered by a lid to protect it from the effects of weather. The samplers will be powered by 12-volt Ni-Cd rechargeable batteries. The sampler will be secured against theft when practical using bicycle locks attached to fixed objects such as fence posts.

Should site conditions require, an ISCO Model 6712C compact portable sampler may be used. This sampler is of a size and configuration that will allow it to be inserted and retrieved from a manhole and suspended using a pro-hanger and appropriate harness (for manholes 18 to 24 inches in diameter). Alternatively, the samplers may be secured using rebar loops inserted into the ground and combination bicycle locks to discourage theft.



Figure C-1. Automated sampler placed in manhole using hanger and spring ring

Attached to all automated samplers will be an ISCO Model 730 bubbler flow module that will log the water flow rate in the pipes of interest. The flow module measures water level within the pipe based on overlying water pressure exerted on bubbles pumped from the module

that exit the bubbler tubing at the base of the pipe. Flow rates are calculated from the water level measurements based on Manning's Equation. The bubbler line is mounted to a "spring ring" or "scissors ring" that is secured within the pipe. If backwater conditions exist at an outfall or within the MS4, an ISCO Model 750 area-velocity flow module and appropriate probe may be substituted in order to accurately determine flow rate.

C1. ON-SITE EQUIPMENT INSTALLATION

Materials, Equipment and Supplies:

1. Confined Spaces entry apparatus (if necessary) consisting of tripod, winch, lanyard, harness, oxygen meter.
2. Scissors ring or spring ring with appropriate extensions, where applicable
3. Remote installation tool
4. Bubbler line or area-velocity probe
5. Suction line and stainless steel low-flow strainer
6. Ratchet set, English
7. Sensor carrier
8. Cable ties

Confined-spaces entry-certified personnel (see Appendix C) and apparatus are to be used if installation is to be within a pipe inlet to a below-grade junction (pipes greater than > 15" diameter only; for pipes less than 15", see step 3).

1. Measure outfall pipe and assemble scissors ring with designated extensions. Retract brace by rotating nut counter-clockwise with ratchet.
2. Install sensor carrier and attach bubbler line to sensor carrier. Attach suction line to low-flow strainer and attach strainer to sensor carrier using cable ties. Insert scissors ring in pipe just upstream of outlet orifice; orient scissors ring so that metal bubbler line outlet is in the invert of pipe, pointing downstream.
3. In the case of 15" diameter or less pipes for within-network installations (i.e., not at an outfall), a remote, street-level installation tool can be used. Sensor carrier, strainer, and tubing are to be attached as described above.
4. The tubing can be secured by attaching to fixed objects such as tree roots or fencing to prevent tubing from laying in the waterway where it may become a target of debris snags. For within-network installations, the tubing can be tied off at the upper step of the closed manhole or threaded through manhole cover and secured on nearby brush until such time as storm event is monitored.

C2. PREPARATION FOR STORM EVENT

Materials, Equipment, and Supplies:

1. Programmable, automated sampler equipped with flow module
2. 24 1,000-mL bottle configuration (or 500 mL, if applicable)
3. Pro-hanger and harness for automated sampler, if applicable
4. Ice
5. Bike locks or chain and padlocks
6. Ni-Cd battery, fully charged

Meteorology

Obtain storm forecast from staff meteorologist. The meteorologist should be, beforehand, made aware of antecedent dry-time criteria (48 hours); minimum rainfall depth requirement (0.3 inches); and lead time required to gather sampling equipment, travel to the site, obtain ice, and place and program sampler. Such lead time will vary with distance from equipment storage.

1. Attach bubbler line (or area-velocity probe) and suction tubing to sampler. Attach suction line (other end) to low-flow strainer in pipe (if not already).
2. Make sure sampler is level.
3. Place ice in center of sampler.
4. When putting sampler back on top of bottom, make sure straps are outside, so distributor arm doesn't catch (or slip straps between bottle carrier and sampler bottom)
5. Program sampler to capture entire flow event. Program duration should reflect both the duration of the rain and estimated time allowance for sampling of trailing limb (rule of thumb for highly impervious catchments: 4 hours). To determine sample interval in minutes, multiply sum of the rainfall and trailing limb allowance in hours by 2.5.
6. Secure samplers to fencing or manhole steps using bike lock. Stabilize with line if necessary.
7. Attach sampler cover. Be sure that neither the suction line nor the bubbler tubing is pinched between the cover and sampler body. Also check the lines to be sure there are no holes.
8. If placing sampler in manhole using pro-hanger and harness, replace manhole cover by gently sliding horizontally over the hole. If the angle of the manhole is too great as it nears seating, it may press down on the pro-hanger with enough force to dislodge it and cause the sampler to drop to the bottom of the manhole.

C3. STORM SAMPLE COMPOSITING



Figure C-2. Discrete samples collected by automatic sampler

Materials, Equipment, and Supplies:

1. Laptop PC running Flowlink software
2. Discrete sample bottle caps
3. Ice
4. Graduated cylinders (100-mL and 500 mL)

Methodology:

1. Open sampler body and examine bottles for presence of liquid. Cap each discrete bottle if containing liquid. Replenish with ice if necessary. Close sampler body and transport it to office/laboratory for sample processing.
2. Download sampler data to laptop PC. Create hydrograph of downloaded level data covering the time that the sampler was onsite in the field. Convert continuous level data to flow rate using Manning's equation and input appropriate coefficients for the specific pipe.

3. Export combined level and flow rate data into.csv file (e.g., “sitename levelflow [date of storm].csv”).
4. Import level and flow rate data (name of level & flow files will appear as sites).
5. Construct table of discharges in the usual way, using flow rate data just imported and appropriate sample interval.
6. Export table of discharges to another .csv file (e.g., “sitename discharge [date of storm].csv”).
7. Open discharge export file in spreadsheet. Copy 1st 24 bottles and times to template file. The template file will automatically calculate discrete volumes (volumes to add to composite bottle) once the formula is corrected to reflect volume at peak discharge [discrete volume = 1,000 mL or 500 mL for compact sampler].
8. Save the discrete volume file just created in Excel as a new file (e.g., “sitename discrete [date of storm].xls”). Print the spreadsheet and refer to it when compositing. Reduce discrete volumes by a proportional amount if the total volume is greater than the capacity of the 4-L bottle.
9. Use graduated cylinders to measure discrete aliquots.
10. After compositing, wash and rinse plastic bottles with soap, 10% nitric acid solution, and distilled water.

Note: because of variations in water level in pipe over time, a discrete sample may be low or nonexistent despite a measurable discharge volume represented by the discrete sample as measured by the flowmeter. This is due to the fixed time frame that the sampler takes samples. At the time that the sampler takes the sample, there may be insufficient water in the pipe despite the fact that there was sufficient water at a different time during the interval between discrete samplings.

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APPENDIX D

**HEALTH AND SAFETY GUIDANCE FOR
WET WEATHER SCREENING FIELD WORK**

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GENERAL

Health and safety responsibility and accountability involves every employee. The collective effort of all employees in providing a healthy and safe work environment will minimize or eliminate the potential for accidents. In general, field sampling will require the following safety protocol to protect the field staff:

1. Perform field work in teams of at least two.
2. Bring cell phone and first aid kit on all field site visits.
3. Exercise caution when encountering any wildlife and hazardous plants. In addition, many outfalls are located in remote areas that may be near gathering places for homeless or transient individuals. Do not enter a potentially hostile area.
4. Use common sense during electrical storms and/or when severe conditions (e.g., high wind, hail) develop. The safety of field staff overrides all other considerations.
5. Storm sewers contain a variety of water-borne bacteria and other harmful chemicals. Wash hands or use anti-bacterial wipes or hand gels liberally, especially prior to lunch breaks, etc.

D1. CONDUCT

All field staff are expected to:

- Understand and comply with health and safety policies. Each employee is not only responsible and accountable for his/her own actions, but for those others around him/her.
- All employees shall show professional courtesy to fellow employees, clients, subcontractors, regulators, and visitors.
- Understand and follow good health and safety practices.
- Horseplay, practical joking, inattention to work or other inappropriate accident-causing behavior will not be tolerated.
- Smoking, eating, drinking and chewing shall be conducted only in designated areas.
- Use of alcohol or controlled substances is prohibited.
- While traveling to and from the job site, employees shall: obey all federal, state and local regulations regarding seat belt use, all traffic laws, and any other laws regarding proper conduct in public areas.

D2. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Engineering and administrative controls will be used as the primary means of exposure control, as required by OSHA standards. However, PPE may also be necessary to further minimize potential employee exposure. All employees shall dress appropriately for the tasks to be performed. Specialized health and safety equipment, including personal protective equipment, monitoring equipment, and other devices designed to protect the employee shall be issued to the employee on an as-needed basis.

Employees performing field activities and certain laboratory functions have the potential of coming in contact with hazardous materials. Many of these hazardous materials can cause significant injury or illness through acute or chronic exposures. For field work (including industrial operations), all field employees are required to wear the following basic PPE:

- Appropriate work clothing
- ANSI-approved steel-toed, steel-shank boots
- ANSI-approved safety glasses
- ANSI-approved hard hat (when overhead hazards exist)
- Hearing Protection (when appropriate)
- Rain Gear (when appropriate)

D3. CONFINED SPACE ENTRY PROGRAM

A confined space is any location not intended for human occupation, has limited or no ventilation, has the potential for containing dangerous or lethal atmospheres, and has limited ingress/egress. OSHA has addressed confined space entry requirements and procedures in 29 CFR 1910.146 (Permit Required Confined Spaces) and 1926.651 (Excavations). Confined space entry, if necessary, will be performed in accordance with OSHA confined space entry procedures, industry-standard practices, and will be performed by confined space trained personnel.

The Team Leader will provide ongoing, real time ambient air monitoring of the locations to be sampled to determine the need for personal protection. Entry of the sampling personnel will be allowed if the following criteria are met:

- Oxygen level greater than 19.5%. Atmospheres with oxygen concentrations less than 19.5% are considered oxygen deficient and must be treated as Immediately Dangerous to Life and Health (IDLH) atmospheres.
- Lower explosive limit (LEL) reading is less than 3%

D4. DANGEROUS FLORA AND FAUNA

During the course of field activities, employees may come in contact with a wide range of dangerous or toxic animals and plants. Dangerous animals may include: black widow and brown recluse spiders; fire ants; mosquitoes and biting flies; bees, wasps and hornets; ticks and chiggers; microbial organisms (e.g., found in water, soil, and air and on carrier/host organisms); rabid mammals; and poisonous snakes. Dangerous plants may include: thorny plants; poison ivy, oak, and sumac; and molds, mildews, and fungi (which may cause allergic reactions). Contact with these organisms can cause effects from simple discomfort (such as from thorny bush scratches) to severe allergic reactions and possibly death. If interactions do occur, take appropriate actions related to specific interaction and individual response to interaction.

D5. UNKNOWN HAZARDOUS SUBSTANCES AND WASTES

The nature of environmental consulting often times requires the investigation of hazardous substances or wastes whose identity is not known. Because of the serious personal and environmental consequences of unintentional release of chemicals, very specific health and safety procedures must be implemented to monitor ambient conditions, mitigate releases to the environment, and protect workers from exposure. Most of these procedures dovetail with site investigation, sampling, and remediation techniques outlined by EPA policy and should be included in the project comprehensive work plan.

D6. BLOODBORNE PATHOGENS

Exposure to bloodborne pathogens (BBP) is possible in the case of certain emergency situations. Personnel may be exposed to body fluids such as blood, saliva, vomit, mucus or others. These fluids could contain pathogens that have the potential for causing disease in humans. Should personnel be required to administer life saving procedures, such as CPR, the following procedures will be followed to minimize the potential for exposure:

- 1) Wear disposable gloves when hand contact with blood, mucus membranes, non-intact skin or other potentially infectious materials could be involved;
- 2) Use disposable mouthpieces, pocket masks or other ventilation devices for administering artificial ventilation;
- 3) Wash hands with soap and water after administering first aid;
- 4) In the case of eye contact, flush eyes using an eye wash for at least 15 minutes;
- 5) Remove garments contacted by blood or other body fluids as soon as possible;
- 6) Do not eat, drink, smoke or handle contact lenses in areas with possible BBP exposure; and

- 7) Persons cleaning up an accident scene should not pick up broken glass or other sharp objects by hand. All clothes and other items at the first aid scene should be safely secured prior to leaving.

Employees who may have been exposed to BBPs should report the incident at once.

D7. REMOTE AREAS

The sampling team may be located in areas not readily accessible by vehicle. Radio communication will be maintained from the sampling team to a base station in the event of an emergency.

D8. HEAVY LIFTING

It may be necessary to carry sampling equipment (e.g., coolers, sampling containers, and equipment) during the course of the field activities. Care must be taken to avoid injury while carrying equipment to the sampling locations.

D9. HAND TOOLS

Some of the field activities and sampling procedures may require the use of hand tools with sharp edges including machetes, scissors, clippers, knives, and razor blades. Care must be taken during their use to prevent injuries from cuts.

D10. WEATHER-RELATED HAZARDS

Weather-related hazards include the potential for heat or cold stress, electrical storms, treacherous weather-related working conditions, high winds, and limited visibility. These hazards correlate with the season in which site activities occur. In the event of adverse weather conditions, the Field Team Leader will determine if work can continue without endangering the health and safety of site personnel.

D11. HEAT AND COLD STRESS

This section is applicable to all personnel involved in field work as well as any other workers who may be exposed to temperature stress conditions.

D12.1 Heat Stress

Heat stress is a significant potential hazard during the warmer months. Heat stress manifests itself as one of three conditions: heat cramps, heat exhaustion, or heat stroke. Heat cramps are brought about by a prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, triggering painful muscle cramps. The signs and symptoms of heat cramps include:

- Severe muscle cramps, usually in the legs and abdomen;
- Exhaustion, often to the point of collapse; and
- Dizziness or periods of faintness.

First aid treatment includes shade, rest, and fluid replacement. The individual will drink electrolyte-replacement fluids (e.g., Gatorade, Squencher, 10-K), which will be made available to field personnel. If the individual has not recovered within ½ hour, then he/she will be transported to the hospital for medical attention.

Heat exhaustion usually occurs in a healthy individual who has been exposed to excessive heat while working or exercising. Blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion include:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin, with heavy perspiration;
- Skin appears pale;
- Fatigue, weakness, and/or dizziness; and
- Elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids. If the individual has not recovered within ½ hour, he/she will be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat, and their body systems become overwhelmed by heat and begin to stop functioning. This condition is a medical emergency, requiring the immediate cooling of the victim and transport to the hospital immediately. The signs and symptoms of heat stroke include:

- Victim has stopped sweating;
- Dry, hot, red skin;
- Body temperature approaching or above 105° F;
- Dilated (large) pupils; and
- Loss of consciousness; victim may lapse into a coma.

Local weather conditions may produce an environment which will require restricted work schedules in order to protect employees. The Field Team Leader will observe workers for any potential symptoms of heat stress. Adaptation of work schedules and training in recognition of heat stress conditions will help prevent heat-related illnesses from occurring.

D12.2 Cold Stress

Cold stress is a danger at low temperatures and when the wind chill factor is low. Cold stress is generally described as a local cooling (frost nip, frost bite, and freezing) or a general cooling (hypothermia). Personnel working outdoors in temperatures at or below freezing may be subject to local cooling. Areas of the body that have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. The three categories of local cooling include:

- Frost nip - characterized by a blanching or whitening of the skin;
- Frost bite - skin has a waxy or white appearance and is firm to the touch, but the tissue beneath is resilient; and
- Freezing - skin tissue is cold, pale, and solid.

Frost nip and frost bite first aid includes covering the affected area with warmth and retreating to a warm area. Frozen tissue is a medical emergency, and the victim will be transported to the hospital immediately.

General cooling (hypothermia) occurs when exposure to cold reduces body temperature. With prolonged exposure, the body becomes unable to maintain its proper internal temperature. Without treatment, hypothermia will lead to stupor, collapse, and death. The signs and symptoms of mild hypothermia include:

- Shivering;
- Numbness; and
- Drowsiness.

First aid for mild hypothermia includes using heat to raise the individual's body temperature. Heat may be applied to the victim in the form of heat packs, hot water bottles, and blankets.

The signs and symptoms of severe hypothermia include:

- Unconsciousness;
- Slowed respiration or respiratory arrest;
- Slowed pulse or cardiac arrest;
- Irrational or stuporous state; and
- Muscular rigidity.

First aid for severe hypothermia includes handling the victim very gently; rough handling may set off an irregular heart beat. Do not attempt to re-warm the severely hypothermic victim; re-warming may cause the development of an irregular heart beat. Severe hypothermia is a medical emergency, and the victim will be transported to the hospital immediately.

Prevention of cold stress is a function of whole body protection. Adequate insulated clothing will be worn when the air temperature drops below 50 °F. Reduced work periods may be necessary in extreme conditions to allow adequate periods in a warm area.

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APPENDIX E
WET WEATHER SCREENING FIELD DATA SHEET

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STORM EVENT
FAIRFAX COUNTY WET WEATHER SCREENING FIELD DATA

CREW
Setup Comp. STATION SVC AREA ID: _____ YEAR MONTH DAY

STORM DURATION (hr) SAMPLE INTERVAL (min) SAMPLE BEGIN TIME

TOTAL STORM PRECIP (in) SAMPLE END

SLOPE: _____ DIAMETER: _____

SAMPLE COLLECTION DATA:

CONSTRUC. MAT'L: _____ ROUGHNESS: _____

FIRST FLUSH SAMPLES
DATE/TIME OF COLLECTION _____

HYDROGRAPH/COMPOSITE INFORMATION:

COMPOSITE SAMPLES
DATE/TIME OF COLLECTION _____

Bottle	Time	Interval discharge (cf)	Discrete vol
1 1			
1 2			
1 3			
1 4			
1 5			
1 6			
1 7			
1 8			
1 9			
2 0			
2 1			
2 2			
2 3			
2 4			

F X S T G W Q

INSERT TYPE: _____

MANHOLE ID: _____

LATITUDE: _____

LONGITUDE: _____

SAMPLER SERIAL: _____

MODULE SERIAL: _____

REVIEWED BY _____ DATE: _____

TSJ 03/14

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APPENDIX F
CHAIN OF CUSTODY FORM

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APPENDIX G
EXAMPLE WATER CHEMISTRY SPREADSHEET FORMAT

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APPENDIX H
SELECTED SIC CODES THAT OCCUR WITHIN FAIRFAX COUNTY
MS4 SERVICE AREAS

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Table H-1. Selected SIC Codes that Occur within Fairfax County MS4 Service Areas	
SIC Code	Description
241	Dairy Farms
751	Livestock Grooming
752	Dog Training/Pet Boarding Sitting & Kennels/Pet Services/Pet Funeral Services/Pet Training/Pet Washing & Grooming
1311	Oil & Gas Producers
1611	Paving Contractors
2752	Printers (Mfrs)
2841	Soaps, Detergents, and Cleaning Preparations
2851	Paint Removers-Manufacturers
2911	Oil Refiners (Mfrs)/Petroleum Products-Manufacturers
2951	Asphalt Paving Mixtures and Blocks
4119	Limousine Service
4212	Hauling Debris Removal
4953	Garbage Collections/Junk Removal/Landfills- Sanitary/Pet Waste Removal/Refuse Systems/Waste Disposal-Hazardous/Medical
5015	Automobile Wrecking (Whls)
5084	Printer Cartridges (Whls)
5093	Recycling Centers (Whls)/Scrap Metals & Iron (Whls)
5169	Chemicals (Whls)/Chemicals-Storage & Handling (Whls)/Cleaning Compounds/Lubricants-Synthetic (Whls)/ Sealers-Asphalt, Concrete, Etc (Whls)
5171	Petroleum Bulk stations and Terminals
5172	Oils-Lubricating-Wholesale/Oils-Petroleum (Whls)
5191	Animal Health Products (Whls)/ Feed-Dealers (Whls)/Fertilizers (Whls)
5211	Building Materials
5261	Garden Centers/Mulches/Nurserymen
5511	Automobile Dealers-New Cars/Used Cars/ Limousine-Dealers
5541	Oils-Lubricating-Retail/Service Stations-Gasoline & Oil
5571	Mopeds/Motorcycles & Motor Scooters-Accessories/Dealers/Supplies
5999	Pet Supplies & Foods-Retail
6512	Shopping Centers & Malls
7342	Deodorizing & Disinfecting/Pest Control
7349	Janitor Service
7359	Carpet Rug & Cleaning Equipment-Rental/Contractours-Equipments \$ Supls-Renting
7514	Automobile Renting
7532	Automobile Body-Repairing & Painting/Automobile Customizing
7533	Mufflers & Exhaust Systems-Engine
7536	Glass Coating and Tinting
7537	Transmissions-Automobile
7538	Automobile Repairing & Servicing/Automobile Machine Shop Service/Truck Repairing & Service
7539	Automobile Radiator Repair/Automotive Repair Shops/Brake Service/Carburetors
7542	Automobile Detail & Clean-Up Service/Car Washing & Polishing
7549	Automobile Lubrication Service/Automobile Inspection Stations New/Used/Wrecker Service
7623	Refrigerating Equip-Commercial-Service/Refrigerators & Freezers-Service/Repair
7933	Bowling Centers
7992	Golf Courses
7997	Swimming Pools-Private
7999	Golf Courses-Miniature/Golf Instruction/Golf Practice Ranges/7999 – Swimming Pools-Public

Table H-1. (Continued)	
SIC Code	Description
8071	Laboratories – Clinical/Medical
8731	Cryogenic Research and Development/ Environmental & Ecological Services/Laboratories
8734	Laboratories – Testing
8999	Services NEC

APPENDIX I
STORMWATER PLANNING DIVISION “WHO TO CALL” LIST

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Who To Call

Spills, Complaints, Illicit Discharges

DPWES-SWPD, March 2014



What To Report	
What you observed	<ul style="list-style-type: none"> • Describe the discharge/spill including information such as color, odor, or sheen, if present. Why do you think this is illicit or a spill? • Did the discharge reach a stream and/or a storm drain? • Estimate how much spilled or discharged • Take photos if you have a camera & email • Was any corrective action taken? • Your contact information
Where you saw the discharge	Address, intersection, where on property
When you noticed the discharge	Date and time
Who was responsible	Possible source of discharge/spill
Complainant contact information	Complainants phone number, email, and/or address