



Annual Report for FY15 NPDES Municipal Separate Storm Sewer System Permit



Published by the Montgomery County Department of Environmental Protection
for the Maryland Department of the Environment

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List of Acronyms

| | |
|-------|---|
| ANS | Anacostia Naturalist Society |
| ARP | Anacostia River Restoration |
| BIBI | Benthic Index of Biological Integrity |
| BMP | Best Management Practice |
| BOD | Biochemical Oxygen Demand |
| BUP | Bethesda Urban Partnership |
| CBT | Chesapeake Bay Trust |
| CCTV | Closed Circuit Television |
| CD | Compact Disk |
| CIP | Capital Improvement Program |
| CMP | Clarksburg Monitoring Partnership |
| CPV | Channel Protection Volume |
| CWF | Chesapeake Watershed Forum |
| CWP | Center for Watershed Protection |
| DA | Drainage Area |
| DEP | Department of Environmental Protection |
| DEPC | Division of Environmental Policy and Compliance |
| DHCA | Department of Housing and Community Affairs |
| DHS | Division of Highway Services |
| DOT | Department of Transportation |
| DPS | Department of Permitting Services |
| DGS | Department of General Services |
| DSWS | Division of Solid Waste Services |
| DTS | Division of Transit Services |
| ESD | Environmental Site Design |
| EMC | Event Mean Concentration |
| EMTOC | Equipment Maintenance and Transit Operations Center |
| EPA | Environmental Protection Agency |
| ESC | Erosion and Sediment Control |
| ESD | Environmental Site Design |
| FFG | Functional Feeding Group |
| FIBI | Fish Index of Biological Integrity |

| | |
|---------|--|
| FMD | Fleet Management Division |
| FOG | Fats, Oils, Grease |
| FOSC | Friends of Sligo Creek |
| GIS | Geographic Information Systems |
| HEC-RAS | Hydrologic Engineering Center-River Analysis System |
| HUC | Hydrologic Unit Code |
| HVAC | Heating, Ventilation and Air Conditioning |
| IBI | Index of Biological Integrity |
| IDDE | Illicit Discharge Detection and Elimination |
| IPM | Integrated Pest Management |
| LID | Low Impact Development |
| MC | Mean Concentration |
| MCPS | Montgomery County Public Schools |
| MDE | Maryland Department of the Environment |
| MEP | Maximum Extent Practicable |
| M-NCPPC | Maryland-National Capital Park and Planning Commission |
| MOU | Memorandum of Understanding |
| MS4 | Municipal Separate Storm Sewer System |
| MWCOG | Metropolitan Washington Council of Governments |
| NOI | Notice of Intent |
| NOVs | Notice of Violation |
| NPDES | National Pollutant Discharge Elimination |
| P2 | Pollution Prevention |
| PHED | Planning, Housing and Economic Development |
| POSWP | Public Outreach and Stewardship Work Plan |
| ROW | Right of Way |
| SHA | State Highway Administration |
| SPA | Special Protection Area |
| SPCC | Spill Prevention Control and Countermeasure |
| SSO | Sanitary Sewer Overflow |
| SWM | Stormwater Management |
| SWPPP | Stormwater Pollution Prevention Plan |
| TKN | Total Kjeldahl Nitrogen |
| TMDL | Total Maximum Daily Load |

| | |
|-------|--|
| TN | Total Nitrogen |
| TOC | Time of Concentration |
| TP | Total Phosphorous |
| TPH | Total Petroleum Hydrocarbons |
| TSS | Total Suspended Solids |
| UST | Underground Storage Tank |
| WIP | Watershed Implementation Plan |
| WLA | Wasteload Allocation |
| WMATA | Washington Metropolitan Area Transit Authority |
| WMD | Watershed Management Division |
| WQPC | Water Quality Protection Charge |
| WQv | Water Quality Volume |
| WTM | Watershed Treatment Model |
| ZTA | Zoning Text Amendment |

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- MDENPDES15.accdb Required information in ACCESS 2000 database
- A. GIS Storm Drain System Mapping Associated with GIS Coverage (Part III.C.1), 1998 through June 30, 2015
 - B. Urban Best Management Practices Associated with GIS Coverage (Part III.C.2)
 - C. Impervious Surfaces Associated with GIS Coverage (Part III.C.3)
 - D. Watershed Restoration Project Locations Associated with GIS Coverage (Part III.C.5)
 - E. Monitoring Site Locations Associated with GIS Coverage (Part III.C.4.)
 - E.1. Monitoring Site Locations- Use for Multiple Land Use Values in the Drainage Area
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 - G. Pollutant Load Reductions Associated with GIS Coverage (Part III.J.)
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 - H. Biological and Habitat Monitoring (Part III.H.1.b and c.)
 - I. Illicit Discharge Detection and Elimination (Part III.E.3)
 - J. Responsible Person Certification (Part III.E.2.b)
 - K. Quarterly Grading Permit Information Associated with GIS Coverage (Part III.E.2.c)
 - L. Fiscal Analysis (Part III.I)

Appendix B. MDE Letter Approving the Strategy after review.

Appendix C. MCPS Report to the County on MS4 Activities in FY 2015.

Appendix D. EPA MS4 inspection Findings and County Response

Appendix E. Implementing ESD_Report_FINAL_110910.pdf
Zoning Code ESD changes

Appendix F. MDE SW Triennial Review Letter with County Response

Appendix G. *IDDE Reports*

Appendix H. Updated SWP3 Plans for County Facilities, SWPPP Annual Inspections FY13, MDE NOI
Acceptance Letters

Appendix I. Lower Monocacy Watershed Implementation Plan
Potomac Direct Watershed Implementation Plan
Patuxent River Watershed Implementation Plan
Seneca Creek Watershed Implementation Plan

Appendix J. Detailed Watershed Restoration Project Tables

Appendix K. Strategy Guidance Document

Appendix L. NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo
Creek, 2009-2014
Breewood Project Fact Sheet

Rationale to Use Breewood tributary for NPDES Required Monitoring

Appendix M. Montgomery County NPDES 2003 Annual MS4 Report

**MONTGOMERY COUNTY MARYLAND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGE PERMIT**

I. Background

The Montgomery County Department of Environmental Protection's (DEP) submission to the Maryland Department of the Environment (MDE) fulfills the annual progress report requirement as specified in Part IV of Permit Number 06-DP-3320 MD0068349 (the Permit). The 5-year Permit term began February 16, 2010, covering stormwater discharges from the MS4 in Montgomery County, Maryland (the County). This is the sixth report in this current permit cycle (February 16, 2010-February 15, 2015) and covers the County's Fiscal Year 2015 (FY15) for July 1, 2014 to June 30, 2015. In addition, in August, 2015, the County submitted a supplement to the FY14 MS4 Annual Report that detailed the County's watershed restoration efforts over the first five years of the Permit cycle. The supplemental report is titled "Restoring Our Watersheds, Montgomery County's 2010-2015 MS4 Watershed Restoration Achievements."

The Permit has been in litigation since the Permit was issued in February 2010. On March 11, 2016 the Maryland Court of Appeals found that the Maryland Department of the Environment's decision to issue several stormwater discharge permits to counties in Maryland [including Montgomery] is supported by substantial evidence, is not arbitrary and capricious, and is legally correct. Additionally, these permits satisfy federal monitoring requirements and do not violate public participation mandates.

Significant accomplishments in the County's stormwater management program during FY15 are highlighted in the Overview. The report itself has been organized based on the headings in the Permit's Part III, Standard Permit Conditions, to document implementation of required elements. Information required by the Permit's Attachment A, Annual Report Databases, Parts A. through L. can be found electronically on the compact disc (CD) submission in Appendix A.

The DEP Watershed Management Division (WMD) has primary responsibility for the majority of the Permit requirements, including interagency coordination, annual reporting, source identification, discharge characterization, monitoring, stormwater facility inspection and maintenance, enforcement, watershed public outreach, watershed assessment and restoration. WMD is also responsible for assessment of stormwater controls, and for tracking progress towards meeting the County's Total Maximum Daily Load (TMDL) urban stormwater wasteload allocations (WLA) in applicable watersheds. The DEP Division of Solid Waste Services (DSWS) is responsible for all solid waste related programs, including programs to increase awareness of waste reduction and recycling. The DEP Division of Environmental Policy and Compliance (DEPC) is responsible for illicit discharge detection and elimination, and the environmental enforcement, including investigation of water pollution and illegal dumping incidents.

The Department of Permitting Services (DPS) is responsible for reviewing and permitting plans for stormwater management (SWM) and erosion and sediment control (ESC), and for ensuring plan compliance.. The Department of Transportation (DOT) is responsible for storm drains, road and roadside maintenance. The Department of General Services, (DGS), DEP's DSWS, and

DOT are responsible for property maintenance activities at County-owned facilities covered under the NPDES General Permit for Stormwater Discharges Associated with Industrial Activity.

The Permit required DEP to develop and submit a countywide implementation plan within 1 year of Permit issuance to identify how the County would achieve Permit requirements within the 5-year permit cycle. In February 2011, DEP submitted the draft Montgomery County Coordinated Implementation Strategy (the Strategy) and associated Watershed Implementation Plans to MDE with the FY10 MS4 Annual Report. The Strategy presents the restoration and outreach initiatives that are needed to meet the watershed-specific restoration goals and water quality standards, and is referenced frequently in this report. Specifically, the Strategy provides the planning basis for the County to:

1. Meet Total Maximum Daily Loads (TMDLs) and Wasteload Allocations (WLAs) approved by the U.S. Environmental Protection Agency (EPA).
2. Provide additional stormwater runoff management on impervious acres equal to 20 percent of the impervious area for which runoff is not currently managed to the maximum extent practicable (MEP).
3. Meet commitments in the *Trash Free Potomac Watershed Initiative 2006 Action Agreement* which include support for regional strategies and collaborations aimed at reducing trash, increasing recycling, and increasing education and awareness of trash issues throughout the Potomac Watershed.
4. Educate and involve residents, businesses, and stakeholder groups in achieving measurable water quality improvements.
5. Establish a reporting framework that will be used for annual reporting as required in the County's Permit.
6. Identify necessary organizational infrastructure changes needed to implement the Strategy.

The MDE approved the Strategy in July 2012. The approval letter can be found in the electronic attachment to this report in Appendix B. A final version of the Strategy, and Watershed Implementation Plans, are accessible on DEP's website at:

<http://www.montgomerycountymd.gov/DEP/water/county-implementation-strategy.html>.

Montgomery County Wins National Award for Its MS4 Program Management

Montgomery County was one of six recipients of the new national municipal stormwater and green infrastructure awards at the 88th Annual Water Environment Federation (WEF) Technical Exhibition and Conference held September 28, 2015, in Chicago. Montgomery County won the Phase I program management category for its multifaceted and effective MS4 program and was recognized as a national leader in stormwater management.

Developed through a cooperative agreement with the U.S. Environmental Protection Agency, the award recognizes high-performing, regulated MS4s and inspires municipal government agencies to exceed requirements through innovative and cost-effective approaches.

“Montgomery County has made tremendous progress in meeting our water quality goals,” said Lisa Feldt, director of the County’s Department of Environmental Protection. “We are very grateful to be recognized on a national scale for our continued efforts to address stormwater pollution and to work to restore our streams and rivers and ultimately the Chesapeake Bay. This award reflects the close coordination and cooperation among County departments, agencies and co-permittees and the strong commitment they share for watershed management, restoration and improved water quality, while also working hand-in-hand to achieve sustainable economic growth.”

“The awards were developed to inspire MS4 program leaders toward innovation that is both technically effective and financially efficient,” said WEF Executive Director Eileen O’Neill. “The success of this first year shows great promise for the program as a means to continually support, encourage and recognize this important and growing segment of the water sector.”

II. Overview

This Overview highlights County progress in meeting Permit requirements for FY15, and where possible, over the 6-year Permit term.

Legal Authority

The Permit requires the County to maintain adequate legal authority in accordance with NPDES regulations 40 CFR Part 122 throughout the term of the Permit.

Chapter 19 of the Montgomery County Code- The Stormwater Management Ordinance:

Chapter 19 establishes minimum requirements and procedures to control the adverse impacts associated land disturbance and increased stormwater runoff from developed and developing lands. Chapter 19 includes:

- Article I - Establishes the County's legal authority to administer a Sediment and Erosion Control program
- Article II - Establishes the County's legal authority to administer a Stormwater Management Program
- Article IV - Establishes the County's authority to regulate discharges of pollutants to County streams, and establish inspection and enforcement procedures and penalties for non-compliance.

Chapter 19 was modified during the current Permit cycle to add:

Stormwater Management

In July 2010 and March 2011, the County Council passed Bill 40-10 and Expedited Bill 7-11, amending the County's stormwater management law to require management of stormwater runoff through the use of nonstructural best management practices (BMPs) to the maximum extent practicable (MEP) for new development and redevelopment projects approved by DPS. The bills then brought the County's stormwater management law into compliance with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010.

Sediment and Erosion Control

On March 29, 2013, the County Council passed Expedited Bill 1-13, Erosion and Sediment Control, which brings local erosion and sediment control requirements into compliance with the Maryland Stormwater Management Act of 2007 and the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control.

Water Quality Protection Charge

In April 2013, the County Council passed Bill 34-12, Stormwater Management-Water Quality Protection Charge (WQPC). Bill 34-12 modified the structure of the County's original WQPC to comply with the 2012 State HB 987, the Stormwater Management- Watershed Protection and Restoration Program Bill.

In April, 2015, the County Council passed Bill 2-15, which extended the deadline for submittal of both credit and financial hardship exemptions to September 30 of each year, after annual property tax bills are posted in July.

In November 2015, the Council enacted legislation (Bill 45-15, Stormwater Management - Water Quality Protection Charge – Curative Legislation) to designate the WQPC as an excise tax instead of a fee to address concerns raised in a Circuit Court opinion. This legislation was enacted outside the FY15 reporting period.

Coal Tar Sealants

In September 2012, the County Council passed the Coal Tar Pavement Products Law, Bill 21-12, that banned the use of coal tar products, effective December 18, 2012.

Other Legislation Enacted During the Current Permit Cycle:

Carryout Bag Law

The County's Carryout Bag Tax, Bill 11-8, went into effect on January 1, 2012. The law taxes 5 cents to a customer of certain retail establishments for each paper and plastic bag provided at the point of sale. The Department of Finance is responsible for enforcement of the Bag Tax. The law was passed to increase awareness of plastic bag litter pollution and reduce the use of carryout bags.

Expanded Polystyrene Food Service Ware

In January 2015, the County passed Bill 41-14, which bans the use and sale of expanded polystyrene food service ware and loose fill packaging. The Bill requires that disposable food service ware purchased and used in the County be either recyclable or compostable. The legislation is effective for County agencies, contractors and lessees by January 1, 2016, and for all other food service businesses by January 1, 2017.

Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions

County Bill 52-14, Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions, became law on October 20, 2015. This law:

1. Regulates the use of certain substances on lawns in the County, and permits only those substances that (a) contain active ingredients recommended by the National Organic Standards Board or (b) that are designated as minimum risk pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This provision takes effect January 1, 2018.
2. Places additional notification requirements on pesticide retailers and applicators.
3. Requires the implementation of a public outreach and education campaign related to the law.
4. Requires Montgomery County Parks to implement a pesticide-free parks program.

Source Identification

The Permit requires the County to submit information for all County watersheds in geographic information systems (GIS) format with associated tables.

The County continues to improve its storm drain mapping to facilitate identification of pollution sources from the MS4.

The DEP's Urban BMP database as of June 30, 2015, with associated coverage is included in Appendix A, Part B. Over the Permit term, DEP made progress towards updating the drainage areas of all stormwater BMPs.

The County's 2009 impervious area associated with GIS coverage, which was used in the Strategy development, is included in Appendix A, Part C. In this Permit cycle, the County evaluated success towards meeting its Permit restoration requirements using the 2009 impervious coverage. In FY15, DEP continued to digitize and update impervious areas for other Permit requirements and for the County's stormwater utility charge, the WQPC, based on 2014 aerial photography.

The DEP's monitoring locations and locations of watershed restoration projects are also included electronically in Appendix A, Parts D. and E.

Management Programs

Stormwater Management (SWM) Facility Maintenance and Inspection

The Permit requires the County to conduct preventative maintenance inspections of all SWM facilities (BMPs) on at least a triennial basis.

The DEP SWM Facility Maintenance and Inspection Program oversees the triennial inspections, and structural and nonstructural maintenance of all SWM BMPs under the County's jurisdiction. From FY11- FY15, the number of SWM BMPs under County jurisdiction increased from 4,200 to over 8,740. From FY11- FY15, DEP oversaw 6,639 triennial inspections and 9,934 SWM BMPs were maintained by either the DEP structural maintenance program or by the private owner of the facility. DEP also issued over 600 Notice of Violations (NOVs) for correction of deficiencies noted during the triennial inspections. Additionally, DEP sent more than 531 routine maintenance notification letters to property owners. DEP also performed a total of 167 unscheduled inspections. These occurred in response to public complaints, at facilities being considered for transfer into DEP's SWM facility maintenance program, or to assess conditions after a large storm event.

During the Permit term, the SWM Facilities Maintenance and Inspection Program developed new protocols to remain in compliance with County and State SWM facility maintenance requirements while remaining fiscally responsible:

- In December 2012, DEP acquired contractual services for routine maintenance of publically owned environmental site design (ESD) practices, including Roadway Right-of-Way (ROW), beginning one of the first ESD maintenance programs in the Washington metropolitan area.

- During FY13, DEP developed a protocol to rank maintenance need levels for privately owned and maintained facilities. The new protocols ensure that the BMPs with the most serious repair needs are addressed in a timely manner.
- In FY13-FY14, DEP also modified the inspection protocol for public and private underground facilities. The new inspection protocol requires a pre-maintenance inspection of the facility to determine maintenance needs. Facilities deemed acceptable and functioning properly pass inspection and do not need maintenance until the next pre-maintenance inspection or triennial inspection.
- In FY15, many of the first permitted and installed ESD facilities were due for triennial inspections. The inspections were not performed because DEP does not have the legal authority via right of entry agreements to access facilities on private property. DEP is working with DPS to include right of entry agreements for all sediment and erosion control permits.

Implementing Maryland’s Stormwater Management Act of 2007

The Permit requires the County to implement SWM design policies, principles, methods, and practices found in the 2000 Maryland Stormwater Design Manual and provisions of Maryland’s Stormwater Management Act of 2007. The Permit requires the County to modify its SWM ordinances, regulations and new development plan approval processes within one year after State adoption of regulations; April 24, 2009, with an effective date of May 4, 2009. The Permit also requires the County to review local codes and ordinances to identify impediments to and opportunities for promoting ESD to the MEP within one year, and to remove those impediments within two years of the Permit’s issuance.

As described under the section “Legal Authority”, in July 2010 and March 2011, the County Council passed Bill 40-10 and Bill 7-11 amending the County’s stormwater management law to comply with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010.

In 2010, the County released *Implementing Environmental Site Design in Montgomery County*, a report that summarizes how the County's codes, regulations, programs, and policies may need to be updated to allow the use of ESD techniques to the MEP. The most significant updates required were accomplished through the Zoning Code rewrite, completed by the Planning Department of the Maryland-National Capital Park and Planning Commission (M-NCPPC). The zoning code rewrite, Zoning Text Amendment (ZTA) 13-04 was approved by Council March 5, 2014, and took effect October 30, 2014.

The DEP’s Watershed Restoration Program identifies opportunities for impervious area control, including ESD practices, in County watersheds through comprehensive watershed assessments. DEP prioritizes those projects that can be combined with other watershed restoration to implement a holistic program that captures, and infiltrates stormwater while creating and maximizing ecological benefits and increasing connection of green areas in the County. DEP’s Watershed Restoration CIP budget reflects the commitment to implementing ESD practices on public property; since 2010, funding for ESD practices increased from 26% in the approved FY2011-FY2016 CIP budget to 39% in the approved FY2015-FY2020 CIP budget

In FY16, DEP is working with community partners to evaluate and develop future approaches to incorporate ESD and other green infrastructure practices into DEP watershed restoration planning, and ultimately into other Countywide programs. DEP and its partners are developing a green infrastructure definition that will reflect DEP’s support of ESD, and also recognize ecological benefits of DEP’s restoration priorities. DEP has begun drafting an official Department wide policy that will reflect the Department’s focus of incorporating green infrastructure approaches. DEP is also working with community partners to identify and implement an innovative green infrastructure pilot project.

Erosion and Sediment Control (ESC)

The Permit requires the County to maintain an acceptable ESC program, including implementing program improvements identified in any MDE evaluation of the County’s application for the delegation of ESC enforcement authority, conduct responsible personnel certification classes and report quarterly information on earth disturbances exceeding one acre or more.

Table II.1, below, summarizes the County’s Erosion and Sediment Control Inspection and Enforcement Program over the Permit term.

| Table II.1. County Erosion and Sediment Control Program Enforcement Action Summary | | | | | | |
|--|----------|----------|----------|----------|----------|-----------|
| | FY11 | FY12 | FY13 | FY14 | FY15 | Total |
| Inspections | 13,472 | 11,191 | 12,439 | 18,151 | 20,793 | 76,046 |
| NOVs | 343 | 248 | 235 | 520 | 511 | 1,857 |
| Citations | 146 | 105 | 103 | 160 | 162 | 676 |
| Fines Collected | \$43,926 | \$55,750 | \$67,000 | \$82,350 | \$94,955 | \$343,981 |

Illicit Discharge Detection and Elimination (IDDE)

The Permit requires the County to implement an inspection and enforcement program to ensure that all discharges to and from the MS4 system that are not composed entirely of stormwater are either permitted by MDE or eliminated. The Permit requires the County to field screen 150 outfalls annually, conduct routine surveys of commercial and industrial areas, and maintain an enforcement program to address discharges, dumping and spills.

In FY15, DEP performed outfall screening in subwatersheds of the Northwest Branch of the Anacostia watershed. DEP screened 159 outfalls and found 75 with dry weather flow. DEP performed field testing for permit required water chemistry parameters and also for ammonia, potassium and fluoride. Twenty-three outfalls had elevated parameters, and follow up investigations were performed. Of those 23 outfalls, 18 were found to have normal water chemistry parameters during follow up visits. Table II.2 shows the problems identified at the remaining outfalls.

| Table II.2. Investigation Results of Suspected Illicit Discharges During FY15 | | | |
|---|--------------------|--|--|
| Outfall ID | Location | Problem Found | Resolution |
| KP122P6632 | 10110 New Hamp Ave | Organic matter buildup | Property Management unclogging outfall |
| KP122P6633 | 10110 New Hamp Ave | Outfall destabilized with high specific conductivity | State Highway Association (SHA) repairing and cleaning outfall |
| KP122P6647 | Capital Beltway | Outfall destabilized with high specific conductivity | SHA repairing and cleaning outfall |
| KP122P6635 | 10142 New Hamp Ave | Elevated detergents | Investigation ongoing |
| KP123P0285 | 10214 Royal Rd | Elevated ammonia | Site to be CCTV'ed and investigated further |

Table II.3, below, summarizes DEP's IDDE program during the Permit term. From FY11-FY15, DEP assessed 716 outfalls by walking the entire reach of waterbodies in four separate subwatersheds, capturing most of the existing outfalls in each drainage area. DEP is targeting subwatersheds with the highest percentages of commercial and industrial areas to identify and eliminate pollutant sources in those areas.

| Table II.3. Illicit Discharge Detection and Elimination Summary, FY11-FY14 | | |
|--|-----|---------------------------------|
| | | % of Total |
| Outfalls Screened | 875 | |
| Outfalls Unmapped | 606 | 70% of Total Outfalls Screened |
| Suspected Illicit Discharges | 119 | 13% of Total Outfalls Screened |
| Resulting Investigations | 79 | 9% of Total Outfalls Screened |
| Problem Resolved | 16 | 1.8% Of Total Outfalls Screened |

Enforcement Actions

DEP's Division of Environmental Policy and Compliance (DEPC) implements a highly effective environmental enforcement program that has great success in eliminating discharges reported by the public. Over the Permit term, the group has responded to 998 water quality related complaints, which led to 157 enforcement actions.

Most complaints are reported to DEP through the County's call center for non-emergency services (311), or through the DEP website.

DEPC also investigates illegal dumping complaints. Details on the enforcement actions over the Permit term are summarized in Table II.4.

| Table II.4. Summary of Enforcement Actions, FY11-FY15 | | | | | | |
|---|---------|---------|---------|---------|---------|----------|
| | FY11 | FY12 | FY13 | FY14 | FY15 | Total |
| Water Quality Investigations | 122 | 208 | 206 | 238 | 224 | 998 |
| NOV | 16 | 17 | 14 | 28 | 24 | 99 |
| Citations | 18 | 14 | 11 | 6 | 9 | 58 |
| Fines Collected | \$9,000 | \$7,000 | \$6,000 | \$3,000 | \$4,500 | \$29,500 |
| Illegal Dumping Cases | 471 | 450 | 377 | 354 | 385 | 2,037 |
| NOVs | 34 | 36 | 16 | 18 | 8 | 112 |
| Citations | 7 | 11 | 0 | 2 | 0 | 20 |
| Fines | \$3,500 | \$5,500 | 0 | \$1,000 | 0 | \$10,000 |

Trash and Litter

The Permit requires the County to meet its obligations under the Potomac River Watershed Trash Treaty, including trash abatement program implementation, education, and evaluation.

The Strategy includes trash reduction work plans designed to meet the Potomac Trash Free Treaty goals and the MS4 wasteload allocations for the 2010 Anacostia Trash TMDL. The County is also working with the Anacostia Watershed Restoration Partnership, the Alice Ferguson Foundation, and other partners to meet regional trash reduction goals. Initiatives directly related to the regional campaigns include ongoing education and outreach for recycling and litter reduction, mass media outreach campaigns, and litter removal from streets, stormwater ponds, and transit stops.

On January 1, 2012, the County's Carryout Bag Tax, Bill 11-8, was passed to reduce plastic bag pollution in streams and communities. The Carryout Bag Tax requires certain retailers to charge customers 5 cents for each paper and plastic bag provided to carry purchases. From the implementation to June 2015, over 209 million bags were sold in Montgomery County. In FY15, approximately 62 million carryout bags were sold. This represents an average of a little less than five disposable bags bought per county resident each month. As of June 2015, there are 1,251 registered retailers in the system. Carryout Bag Tax data analysis to date suggests a slight downward trend; however, DEP does not have enough data to definitively report a change in bag usage for the County.

In FY16, DEP is working with the County Department of Finance to increase awareness of the law among retailers and the public by expanding Carryout Bag Tax outreach. The goals of the program are to increase retailer compliance and public awareness of plastic bag pollution. Elements of the program include updating and distributing outreach materials, direct contact with retailers, and a public re-useable bag distribution through libraries, Manna food distribution centers, and community aid offices. DEP will reanalyze Carryout Bag Tax data after one year of the expanded outreach effort to determine effectiveness.

In FY15, DEP DSWS also took steps to reduce expanded polystyrene, another material frequently found to pollute local communities and streams. In January 2015, the County Council enacted Bill 41-14 which bans the use and sale of expanded polystyrene food service ware and loose fill packaging and instead requires that disposable food service ware purchased and used in the County be either recyclable or compostable. The Bill requires all county agencies, contractors, and lessees to use compostable or recyclable food service ware by January 1, 2016. All other food service businesses must use compostable or recyclable food service ware by January 1, 2017. Expanded polystyrene (PS) #6 products are not recyclable in the County. In FY15, DEP DSWS developed an education campaign to inform food service businesses, certain retailers and consumers about the requirements and the deadlines for compliance.

The DEP continues via contract to conduct trash monitoring and assessment in the Anacostia Watershed. FY15 highlights include:

- Completed five cycles of post-TMDL trash monitoring in the Anacostia. The Anacostia tributary monitoring follows the same protocols for stream-level and land-based surveys as those used for trash TMDL development. As of FY15, there is a general decreasing trend for plastic bag, plastic bottle and Styrofoam trash categories.
- The Anacostia monitoring program identified the White Oak neighborhood of Silver Spring as an area with high levels of litter. In FY15, DEP conducted three additional types of observation surveys within that focus area. The surveys included a bus stop survey, walking survey, and storm drain inlet survey. Results will be used to develop targeted trash reduction outreach strategies that can then be measured for effectiveness, and help inform future litter reduction efforts.

Property Management

The Permit requires the County to ensure that a Notice of Intent (NOI) has been submitted to MDE, and a pollution prevention plan developed, for each County owned and municipal facility requiring a NPDES General Permit for Stormwater Associated with Industrial Activities.

Table II.5 lists the County facilities covered under the MDE General Discharge Permit for Storm Water Associated with Industrial Activities (the General Permit). The MDE accepted Notices of Intent (NOI's) for these facilities in August 2014 for coverage until December 31, 2018.

| Table II.5. County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities | |
|---|-----------------------------------|
| Name of Facility / Responsible Agency | Watershed / Acreage |
| Colesville Highway Maintenance Depot (DOT) | Anacostia/Paint Branch; 12 acres |
| Damascus Highway Maintenance Depot (DOT) | Potomac/Great Seneca: 1.4 acres |
| Gaithersburg: Highway Maintenance Facility (DOT) | Potomac/Rock Creek: 15.1 acres |
| Gaithersburg: Equipment Maintenance and Transit Operations Center (EMTOC) (DGS) | |
| Poolesville Highway Maintenance Facility (DOT) | Potomac/Dry Seneca Creek: 4 Acres |

| Table II.5. County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities | |
|---|--|
| Name of Facility / Responsible Agency | Watershed / Acreage |
| Bethesda/Seven Locks Automotive Service Center (DGS) | Potomac/Cabin John Creek: 19 Acres |
| Bethesda/Seven Locks Highway Maintenance Facility, Sign Shop and Signal Shop (DGS) | |
| Kensington Small Transit Service Maintenance Facility at Nicholson Court | Potomac/Rock Creek: 3.31 acres |
| Silver Spring/Brookville Road Highway Maintenance Facility (DOT) | Potomac/Rock Creek: 18 Acres |
| Silver Spring/Brookville Road Transit Center/ Fleet Maintenance Center (DGS) | |
| Shady Grove Processing Facility (DEP) | Potomac/Rock Creek; 43 out of 52.5 acres |
| Gude Landfill (DEP) | Potomac/Rock Creek; 120 acres |
| Oaks Landfill (DEP) | Patuxent/Hawlings River (355 acres) and Potomac/Rock Creek;(190 acres) |

In 2008, new Capital Improvement Program (CIP) funding dedicated to environmental compliance was added to the DGS budget. In 2015, the following environmental compliance CIP initiatives were accomplished:

- DGS is replacing a major transit bus refueling station in Silver Spring, and is installing 3 above ground diesel refueling tanks to replace 2 aging underground tanks. The bus wash steam bay was also upgraded with improved waste water treatment structures.
- DGS is also currently replacing underground storage tanks with aboveground storage tanks at County fire stations and other government facilities.
- Design continued for FY16 planned improvements including three new permanent structures for the bulk storage of highway maintenance materials (topsoil, sand, salt & gravel). The fabric canopy at the Silver Spring depot was replaced, as it was showing signs of failure.
- Two bioretention basins, and a bioswale feature were installed at the Colesville Highway Maintenance depot, to improve the stormwater quality of this facility, which is located within a Special Protection Area. In addition, three large fabric canopies, and an enlarged truck shed area are being constructed for the covered storage of roadway materials and equipment.
- New antifreeze and motor oil handling tanks and distribution systems were installed at the Seven Locks automotive shop.

- DGS/DOT has begun routine mechanical sweeping of all the industrial facilities, and increasing the cleaning frequency of facility oil/grit separators. In FY15, all depots were swept.
- At the Bethesda Depot, the bulk salt storage barn was repaired and repainted to prevent wood deterioration.

The MCPS conducted pollution prevention (P2) training for staff, prepared and implemented SWPPP and SPCC plans at all industrial sites. P2 improvements have been implemented at these sites as recommended by the annual inspections. MCPS also continued to implement an Integrated Pest Management Program (IPM) program at all facilities. Table II.6 lists the MCPS facilities covered under the MDE General Discharge Permit for Storm Water Associated with Industrial Activities (the General Permit).

| Table II.6. Inventory and Status of MCPS Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities (12-SW) | | |
|---|-------------------------------|--|
| Name of Facility / Responsible Agency | Watershed / Acreage | Status |
| Bethesda Fleet Maintenance / Bethesda Facilities Maintenance Depot | Cabin John Creek 6.2 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Randolph Fleet Maintenance / Randolph Facilities Maintenance | Anacostia 9.3 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Shady Grove Fleet Maintenance / Shady Grove Facilities Maintenance | Rock Creek 15 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| West Farm Transportation Depot | Anacostia River 5.06 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Clarksburg Fleet Maintenance/Clarksburg Facilities | Seneca Creek 15.11 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |

Road Maintenance

The Permit requires the County to continue to implement a program to reduce pollutants associated with road maintenance activities.

Street Sweeping

In FY15, the County continued its street sweeping program, focusing on twice monthly sweeping of 229 miles in selected arterial routes, removing 327 tons of material. The sweeping frequency provides impervious acreage control equivalence and pollutant reduction credit in accordance

with MDE's August 2014 "*Accounting for Stormwater Wasteload Allocations and Impervious Acreage Treated*" guidance document. For FY15, the County controlled an impervious acreage equivalent of 130 acres and reduced 1143 pounds of Total Nitrogen (TN) and 458 pounds of Total Phosphorous (TP) through its arterial street sweeping program.

The DOT completed annual sweeping for all residential routes. In FY15, DOT swept a total of 4,055 residential curb miles once per year, removing 1,265 tons of material.

Inlet Cleaning

For FY15, DOT reported cleaning 2,218 storm drain inlets, and 31,180 linear feet of storm drain, collecting 346 tons of material, resulting in an impervious acre control equivalence of 138 impervious acres.

Use of Herbicides

The County's roadside noxious weed spraying program is conducted by Montgomery Weed Control Inc., a cooperative weed control program between Montgomery County Department of Economic Development, Agricultural Services Division, and the Maryland Department of Agriculture, Plant Protection and Weed Management Section. The County uses no other pesticides or any fertilizers for roadside vegetation management.

Application of Sand and Salt

The DOT reported applying 87,900 tons of salt and 36,400 gallons of salt brine to County roadways during December through March, 2015. Salt brine is a 23 percent salt solution created in a brine maker that has a lower freezing point than salt. In FY15, over 606 lane miles of both primary and secondary roads received salt brine applications using contracted and County equipment.

Public Education and Outreach

The Permit requires the County to implement a public education and outreach program to reduce stormwater pollutants.

Over the Permit term, DEP continued to expand its education and outreach programs to meet Permit requirements as outlined in the Strategy's Public Outreach and Stewardship Work Plan (POSWP). The POSWP identified eight major areas of stormwater impact education, including pet waste management, lawn stewardship, anti-littering, stormwater awareness, and establishing a volunteer Stream Stewards program. Through FY15, DEP has participated in 459 events focused on stormwater awareness, representing direct contact with an estimated 47,798 residents. The RainScapes program hosted an additional 144 workshops on small scale stormwater practices for homeowners and landscape professionals, reaching an additional 6,500 residents.

The DEP tracks details on watershed outreach events, and has included event information in the Permit required Annual Report Database, Part D, found electronically in Appendix A. DEP hopes to eventually quantify pollutant reductions associated with behavior changes resulting from its education and outreach programs.

Summary of Stormwater Outreach Efforts During the Permit Term

The DEP expanded its outreach and stewardship during this fiscal year and throughout the Permit cycle. Outreach and stewardship highlights include:

- General watershed outreach activities increased 800 percent from FY10 to FY15
- Created the Montgomery County Watershed Restoration and Outreach Grant Program, which funds community based restoration projects and programs focused on public engagement through education, outreach and stewardship. Administered by the Chesapeake Bay Trust, \$371,756 was awarded to 13 nonprofit organizations in FY15.
- Creating a “My Green Montgomery” website as a public interactive website to promote green initiatives and activities.
- Creating additional outreach programs, including:
 - The Stream Stewards Volunteer Outreach Program
 - A Pet Waste Management Program targeted to homeowners’ associations
 - A Storm Drain Art Program
 - The Montgomery County FrogWatch USA chapter
 - The Greenfest annual community event
 - Worked with other DEP sections to display comprehensive information on DEP programs to over 5,000 visitors at the 2014 Montgomery County Agricultural Fair
 - The “Caching the Rain” stormwater awareness geotrail
- Focused outreach to culturally diverse communities increased, including translations for 22 publications.
- Creation of 43 new outreach publications.
- Achieving a social media presence by creating DEP Facebook, Twitter, Instagram, Flickr and blog accounts including five group listserves and e-newsletters.
- Creating a watershed group capacity building effort which helped eight watershed groups build stronger organizational structures.
- Two new watershed groups were created since FY10: Muddy Branch Alliance and the Watts Branch Alliance.
- The Water WatchDogs group, started by the Friends of Sligo Creek watershed group as a means to raise public awareness on water pollution and enhance an email alert mechanism for reporting pollution incidents.

Watershed Assessment

The Permit requires the County to conduct a systematic assessment of water quality within all of its watersheds, including identification of water quality improvement opportunities, and the development and implementation of plans to control stormwater discharges to the MEP.

Watershed Implementation Plans

In FY14, DEP completed preliminary assessments of the Lower Monocacy, Patuxent River, Upper and Lower Potomac Direct, Dry Seneca and Little Seneca watersheds. These assessments include identification of ESD opportunities, stormwater pond retrofits, new stormwater control opportunities, and potential stream restoration. Watershed implementation plans were completed in early FY15 that built on the preliminary assessments and contain more detailed implementation planning and schedules to meet regulatory and programmatic targets.

Stream Monitoring

The County conducts biological monitoring for fish and benthic macroinvertebrates (aquatic insects) on a calendar year basis. In 2014, DEP monitored 52 stations in the Potomac River Direct, and Cabin John watersheds and subwatersheds of the Seneca Creek watershed. The results remained fairly consistent with monitoring conducted between 1996 and 2002. Stream conditions generally improve toward the western part of the county where land use is more rural and part of the agricultural reserve. The more urban areas with older stormwater management generally have poorer and/or declining conditions.

Restoration projects have been focused in urban, southern and eastern county watersheds of Little Falls and Cabin John. Most projects in Little Falls were completed prior to 2008 and impacts appear limited to date. Since 2002, the average stream conditions have been constant. Average stream conditions in Cabin John also continue to be constant. The restoration projects generally have been completed close to the 2014 monitoring cycle, allowing little time for recovery.

In 2015, DEP monitored the Monocacy watershed including Bennett Creek, Little Bennett Creek, and Furnace Branch, and the Patuxent watershed including the Tridelphia Reservoir watershed, and the Rocky Gorge Reservoir watershed. Results of that monitoring will be presented in the FY16 MS4 Annual report.

Watershed Restoration

The Permit requires the County to implement practices identified in its watershed assessments to control stormwater discharges to the MEP. The Permit specifically requires the County to complete the implementation of restoration projects identified in the previous Permit term to restore 10% of the County's impervious surface area. The permit also requires the County to complete the implementation of restoration to restore an additional 20% of the County's impervious surface area that is not restored to the MEP.

The Strategy provides the planning basis to meet the Permit's restoration requirement. DEP developed the Strategy using 2009 data, including impervious area and BMP drainage areas.

The DEP is implementing watershed restoration projects to add stormwater management, improve water quality and minimize physical impacts to streams from uncontrolled urban runoff. Stormwater management facility retrofits, new stormwater facilities, ESD practices and stream restoration projects are planned and designed through DEP's Watershed Restoration Program and constructed by the DEP's Construction Section. DEP continues to assess emerging stormwater control guidance and County data critical to watershed planning to ensure that the most beneficial, and cost effective projects are selected for implementation.

The County continues to improve GIS data to accurately account for the impervious area controlled within the MS4 boundary. Data improvements include digitizing impervious areas, updating the urban BMP database and refining existing BMP's drainage areas.

In August 2015, DEP released a supplement to the MS4 FY14 Annual Report that summarized the County's progress and achievements towards meeting the Permit restoration requirements over the 5 year Permit term. This supplement is titled "Restoring Our Watersheds, Montgomery County's 2010-2015 MS4 Watershed Restoration Achievements".

<https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/water-reports/npdes/MoCo-RestorationAchievements-080715REV2.pdf>

Progress Towards Meeting the 2010 MS4 Permit Watershed Restoration Goal

The DEP has an aggressive watershed restoration program to meet the current Permit's requirement to add control to 20 percent of the impervious areas not currently controlled to the MEP (3,777 impervious acres). Since 2009 and through FY15, the County and its partners have:

- Completed projects through FY15, adding control to 1,774 impervious acres.
- Begun construction of projects during FY16 that will treat an additional 170 uncontrolled impervious acres.
- Released task orders to DEP's water resources engineering consultants to design watershed restoration projects that will control more than 2,400 additional acres of uncontrolled impervious area.
- Facilitated partnership projects with other County and external agencies. These projects are currently in design and under construction, and include facility modification and modernizations performed by DOT, DGS, and MCPS, and WSSC's stream restoration activities during their asset modernization. They also include the Maryland State Highway Administration's (SHA's) Inter County Connector (ICC) stewardship partnership projects.
- Installed over 470 small scale ESD stormwater practices along County roadways to capture previously uncontrolled impervious (DEP Green Streets).
- Restored over 5 miles of County streams.
- Constructed over 13 new/upgraded stormwater ponds.
- Reforested 6 pervious acres.

- Developed an interactive web map for DEP's Watershed Restoration website that provides project details and schedules to residents.
- Created and began utilization of enhanced data management tools including a business intelligence tool, a portfolio tool, and an upgraded database.

Meeting Wasteload Allocations in Watersheds with EPA approved Total Maximum Daily Loads

The Permit requires the County to report progress toward meeting any applicable WLAs developed under EPA approved TMDLs in watersheds where restoration has occurred.

The Strategy used the Watershed Treatment Model (WTM) to verify pollutant baseline loads in TMDL watersheds, and estimate pollutant load reductions by SWM BMPs and retrofits constructed after TMDL baseline years. DEP then calculated pollutant reductions from stream restoration projects using efficiencies provided in MDE's August 2014 *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*. County stormwater controls and watershed restoration initiatives implemented in County watersheds with TMDLs after the TMDL baseline years have made progress towards meeting watersheds WLAs by removing a combined estimated:

- 1,137 billion MPN/year of E.coli,
- 33,622 billion MPN/year Enterococci,
- 4,481 tons/year of sediment,
- 17,966 pounds/year of nitrogen,
- 7,903 pounds/year of phosphorus,
- 11,124 pounds/ year of trash from the Anacostia watershed.

Since 2010, the baseline year of the Chesapeake Bay TMDL, an estimated 25,216 pounds of nitrogen, and 4,916 pounds of phosphorous total have been removed from Countywide stormwater runoff. This estimate includes restoration work in all County watersheds, including those with and without TMDLs for nitrogen and phosphorous.

RainScapes Program

The DEP's RainScapes program promotes and implements environmentally friendly landscaping, small scale stormwater control and infiltration projects on residential, institutional, and commercial properties. DEP offers technical and financial assistance to property owners for eligible RainScapes techniques, such as rain gardens, tree planting, rain barrels, and conservation landscaping. The RainScapes program consists of RainScapes Rewards, a rebate program, and the RainScapes Communities, which evaluates targeted neighborhoods and other communities for on-lot stormwater runoff reduction approaches and facilitates neighborhood participation. To date in FY15, almost 20 impervious acres are being controlled through RainScapes projects for at least the first inch of rainfall, with many projects controlled up to the 1-year storm event. The RainScapes Program is funded through the WQPC.

Restoration Funding Sources

During FY15, DEP continued to identify funding sources to support project implementation. The approved SWM CIP budget for FY15-FY20 totals \$363.7 million, an increase of \$128.7 million, or 55 percent from the amended approved FY13-FY18 program of \$235 million, reflecting the significant increase in implementation that will be needed to meet the Permit's restoration requirement. This increase in stormwater management activity will be financed primarily through water quality protection bonds. The debt service for these bonds will be supported by the County's WQPC. The budget assumes \$60 million in State aid over the 6 year CIP cycle.

Assessment of Controls

The Permit requires that the County use discharge characterization monitoring, along with biological and physical monitoring to assess "the effectiveness of stormwater management programs, County watershed restoration projects, and to document progress towards meeting wasteload allocations (WLAs) indicated in the Total Maximum Daily Loads (TMDLs) approved by the U.S. Environmental Protection Agency (EPA) for watersheds or stream segments located in the County". The Permit specifically requires monitoring where the cumulative effects of watershed restoration activities (the Breewood Tributary) and the effectiveness of stormwater management practices for stream channel protection (Clarksburg Special Protection Area) can be assessed.

Watershed Restoration Assessment

The DEP targeted the Breewood tributary of Sligo Creek (Anacostia watershed) for comprehensive watershed restoration efforts and assessment of controls. The Permit requires water chemistry, biological and physical monitoring of the watershed, both pre and post restoration. By FY15, DEP has completed construction of 10 ROW ESD facilities along residential roads, and three RainScapes projects on private property within the Breewood tributary watershed. Additionally, 1,299 feet of stream restoration was completed. Monitoring in 2014 reflected changing conditions in the watershed.

In 2014, water samples were collected at an instream station and a stormwater outfall station for a total of 49 storms and 65 baseflow events monitored from 2009 through 2014. For each station, baseflow mean concentrations (MC) were calculated for all Permit required parameters over the 3-year monitoring period. MCs were also calculated for total petroleum hydrocarbons (TPH) and Enterococcus during first flush stormflow.

Storm event mean concentrations (EMCs) represent the weighted average pollutant concentrations based on samples collected at discrete intervals during a storm. EMCs were calculated and averaged over the three-year monitoring period for each parameter except TPH and Enterococcus. The average EMCs and MCs of each parameter at each station were compared:

- Storm samples generally had more concentrated pollutants at the outfall than at the instream station.
- At the instream station, there was not a consistent relationship between flow types and results.
- At the outfall, no clear trends in pollutant concentrations by flow type were found.

The 2010 thru 2014 biological and physical monitoring results provide evidence that the Breewood tributary is impaired and will likely benefit from stream restoration. Monitoring will continue annually to evaluate improvements to the biology and habitat that are anticipated as a result of the restoration efforts.

Stormwater Management Assessment

Maryland Design Manual Monitoring in Clarksburg

DEP monitors the developing Newcut Road Neighborhood tributary to Little Seneca Creek “test” area in the Clarksburg SPA and compares results to those from the undeveloped Soper’s Branch, Little Bennett subwatershed “control” area to evaluate the effectiveness of the Maryland Design Manual criteria to protect the stream channel. Development in the test area’s drainage is mostly complete, and ESC BMPs are being converted to SWM BMPs. The land uses in the Soper’s Branch control area remained unchanged.

In 2014, the natural hydrology of the test area has been altered by the development process. On average, the overall amount of precipitation infiltrating into the ground or lost via evapotranspiration has declined in the test area while remaining fairly constant in the control area. The results indicate the stream channel at the test area may still be in a state of flux as the system responds to the conversion from S&EC to SWM structures. Post-construction monitoring has not yet been completed. DEP has observed changes in the test area channel morphology as evidenced by straightening, down-cutting, and enlargement of the channel

Program Funding

The Permit requires that the County submit annual expenditures for the capital, operation, and maintenance expenditures in database format specified in Permit Part IV.

The required database is included in electronic format on CD in Attachment A. During FY15, the reported costs associated with Permit requirements were \$53,505,725.

Total Maximum Daily Loads

The Permit requires development of implementation plans showing how the County will meet the MS4 WLAs for any EPA approved TMDLs within one year of EPA approval.

The County Strategy addressed all existing TMDLs in September 2009, the baseline year for the Strategy. Since the baseline date, EPA has approved additional TMDLs, which are shown in Table II.7 below, with the status of their implementation plans. The plans are included in the electronic attachment to this report in Appendix I.

| Table II.7. TMDLs Approved Since 2009 | | |
|---------------------------------------|-------------|---------------------------------------|
| Watershed | TMDL | Status of Implementation Plan |
| Anacostia | PCB | Implementation Plan Submitted in 2013 |
| Cabin John Creek | Sediment | Required Reductions Shown in Strategy |
| Lower Monocacy | Bacteria | Implementation Plan Complete 2014 |
| Lower Monocacy | Phosphorous | Implementation Plan Complete 2014 |
| Potomac River Direct | Sediment | Implementation Plan Complete 2014 |
| Rock Creek | Sediment | Required Reductions Shown in Strategy |
| Rock Creek | Phosphorous | Required Reductions Shown in Strategy |
| Seneca Creek | Sediment | Implementation Plan Complete 2014 |

III. Standard Permit Conditions

A. Permit Administration

Table III.A.1, below, shows County personnel responsible for major NPDES program tasks. These are the County's contacts as of February 2016.

| Table III.A.1. Organization Chart for Montgomery County Permit-Required Programs | | | | |
|--|-------------------|-------------------|---|--------------|
| Part III. Standard Permit Elements | Responsible Party | | | |
| | Department | Name | Title | Telephone |
| A. Organization Chart-Liaison with MDE for Permit Implementation | DEP/WMD | Pam Parker | Acting Manager/ Senior Planning Specialist | 240-777-7758 |
| B. Legal Authority | OCA | Walter Wilson | Associate County Attorney | 240-777-6759 |
| C. Source Identification | | | | |
| 1. Storm Drain GIS | DEP/WMD | Craig Carson | Manager | 240-777-7713 |
| | DEP/DO | Vicky Wan | IT Manager | 240-777-7722 |
| 2. Urban Best Management Practices GIS | DEP/WMD | Amy Stevens | Manager | 240-777-7766 |
| 3. Impervious Surfaces GIS | DEP/DO | Vicky Wan | IT Manager | 240-777-7722 |
| 4. Monitoring Locations | DEP/WMD | Jennifer St. John | Senior Water Quality Specialist | 240-777-7740 |
| D. Discharge Characterization (as described in Part III H. Assessment of Controls) | | | | |
| E. Management Programs | | | | |
| 1. Stormwater Management | | | | |
| 1.a. Stormwater Facility Inspections and Maintenance | DEP/WMD | Amy Stevens | Manager | 240-777-7766 |
| 1.b. Stormwater Management Permitting and Plan Review-Implement 2000 Maryland Stormwater Design Manual, and provisions of Maryland's Stormwater Management Act of 2007 | DPS | Richard Brush | Manager | 240-777-6343 |
| 2. Erosion and Sediment Control | DPS | Derek Isensee | Manager | 240-777-6344 |

| Table III.A.1. Organization Chart for Montgomery County Permit-Required Programs | | | | |
|--|-------------------|-------------------|---|--------------|
| Part III. Standard Permit Elements | Responsible Party | | | |
| | Department | Name | Title | Telephone |
| 3. Illicit Connection Detection and Elimination Program | DEP/DEPC | Steve Martin | Field Program Manager | 240-777-7746 |
| 4. Trash and Litter | DEP/WMD | Leslie Wilcox | Planning Specialist | 240-777-7786 |
| | DEP/DSW | Eileen Kao | Manager | 240-777-6402 |
| Property Management | DGS | David E. Dise | Director | 240-777-9910 |
| Road and Roadside Maintenance | DOT | Richard Dorsey | Highways Services Division Chief | 240-777-7600 |
| Public Education | DEP/WMD | Pamela Parker | Acting Manager | 240-777-7758 |
| | DEP/WMD | Ryan Zerbe | Watershed Outreach Planner | 240-777-7744 |
| F. Watershed Assessment | | | | |
| Countywide Monitoring | DEP/WMD | Jennifer St. John | Senior Water Quality Specialist | 240-777-7740 |
| Assessments and Project Implementation | DEP/WMD | Craig Carson | Manager | 240-777-7713 |
| G. Watershed Restoration | | | | |
| Assessments and Project Implementation | DEP/WMD | Craig Carson | Manager | 240-777-7713 |
| Annual Reporting | DEP/WMD | Pamela Parker | Acting Manager/ Senior Planning Specialist | 240-777-7758 |
| H. Assessment of Controls (also see D. Discharge Characterization) | | | | |
| H.1. Watershed Restoration Assessment | | | | |
| Water Chemistry Monitoring | DEP/WMD | Pamela Parker | Acting Manager/ Senior Planning Specialist | 240-777-7758 |
| Biological and Physical Habitat Monitoring | DEP/WMD | Jennifer St. John | Senior Water Quality Specialist | 240-777-7740 |
| Design Manual Criteria Evaluation | DEP/WMD | Jennifer St. John | Senior Water Quality Specialist | 240-777-7740 |
| | DPS | Leo Galanko | Senior Permitting Services Specialist | 240-777-6242 |
| H.2. Stormwater Management Assessment | | | | |
| Geomorphology / Hydrologic | DEP/WND | Jennifer St. John | Senior Water Quality Specialist | 240-777-7740 |
| I. Program Funding | DEPC/WMD | Stan Edwards | Division Chief | 240-777-7748 |
| | DEP/WMD | Steve Shofar | Division Chief | 240-777-7736 |
| | DPS | Richard Brush | Division Chief | 240-777-6310 |
| | DOT | Ligia Moss | Senior Engineer | 240-777-7514 |

| Table III.A.1. Organization Chart for Montgomery County Permit-Required Programs | | | | |
|--|-------------------|------------------------------|---|------------------------------|
| Part III. Standard Permit Elements | Responsible Party | | | |
| | Department | Name | Title | Telephone |
| | DOT DGS | Richard Dorsey David Dise | Division Chief Director | 240-777-7600 240-777-9910 |
| J. TMDL | DEP/WMD | Pamela Parker | Acting Manager | 240-777-7758 |
| Part IV. Program Review and Annual Progress Reporting | DEP/WMD | Pamela Parker | Acting Manager/ Senior Planning Specialist | 240-777-7758 |
| Part V. Special Programmatic Conditions | DEP/WMD | Pamela Parker | Acting Manager | 240-777-7758 |

DEPARTMENT ADDRESSES:

DEP/DEPC: *Department of Environmental Protection/Division of Environmental Policy and Compliance*
255 Rockville Pike, Ste 120, Rockville MD 20850

DEP/DO: *Department of Environmental Protection/ Director's Office*
255 Rockville Pike, Ste 120, Rockville MD 20850

DEP/WMD: *Department of Environmental Protection//Watershed Management Division*
255 Rockville Pike, Ste 120, Rockville MD 20850

DGS: *Department of General Services*
101 Monroe Street, 9th Floor, Rockville, MD 20850

DPS: *Department of Permitting Services/Division of Land Development Services*
255 Rockville Pike, 2nd floor, Rockville MD 20850

DOT/DHS: *Department of Transportation/Division of Highway Services*
101 Orchard Ridge Dr. 2nd Flr. Gaithersburg MD 20878

DOT/DO: *Department of Transportation/Division of Operations*
101 Orchard Ridge Dr. 2nd Flr. Gaithersburg MD 20878

OCA: *Office of the County Attorney*
101 Monroe St. 3rd Floor, Rockville, MD 20850

B. Legal Authority

The County maintains all legal authority required to meet the requirements of the MS4 permit. Including:

Chapter 19 of the Montgomery County Code - The Stormwater Management Ordinance

Chapter 19 was established to protect, maintain and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to control the adverse impacts associated land disturbance and increased stormwater runoff from developed and developing lands. Chapter 19 includes:

- Article I - Establishes the County’s legal authority to administer a Sediment and Erosion Control program.

- Article II - Establishes the County's legal authority to administer a Stormwater Management Program.
- Article IV - Establishes the County's authority to regulate discharges of pollutants to County streams, and establish inspection and enforcement procedures and penalties for noncompliance.

Chapter 19 was modified during the current Permit cycle to add:

Stormwater Management

In July 2010 and March 2011, the County Council passed Bill 40-10, later amended to Expedited Bill 7-11, which amends the County's stormwater management law to require management of stormwater runoff through the use of nonstructural BMPs to the MEP for new development and redevelopment projects approved by DPS. The bills brought the County's stormwater management law into compliance with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010.

The revised County stormwater management law maintained more stringent requirements than State law for redevelopment sites to protect water quality. Specifically, the Maryland Stormwater Management Act of 2007 requires management of the first inch of runoff from 50% of the redevelopment site using Environmental Site Design (ESD) to the MEP. County law requires stormwater management of the water quality volume (WQv- the first inch of runoff) and channel protection volume (CPv-the expected runoff from a 1-year 24-hour duration rainfall) from 100 percent of the redevelopment site, and requires the use of ESD to the MEP to meet these standards.

Sediment and Erosion Control

On March 29, 2013, the County Council passed Expedited Bill 1-13, Erosion and Sediment Control, which brings local erosion and sediment control requirements into compliance with the Maryland Stormwater Management Act of 2007 and the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The County legislation mirrors the requirements in State law and regulations, including more stringent stabilization requirements and the establishment of maximum grading unit criteria.

Water Quality Protection Charge

In April 2013, the County Council passed Bill 34-12, Stormwater Management-WQPC. Bill 34-12 modified the structure of the County's original WQPC to comply with the 2012 State HB 987, the Stormwater Management- Watershed Protection and Restoration Program Bill.

In April, 2015, the County Council passed Bill 2-15, which extended the deadline for submittal of both credit and financial hardship exemptions to September 30 of each year, after annual property tax bills are posted in July.

In November 2015, the Council enacted legislation (Bill 45-15, Stormwater Management - Water Quality Protection Charge – Curative Legislation) to designate the WQPC as an excise tax instead of a fee to address concerns raised in a Circuit Court opinion.

Coal Tar Sealants

In September 2012, the County Council passed the Coal Tar Pavement Products Law, Bill 21-12, that banned the use of coal tar products, effective December 18, 2012. Under the law, use of a coal-tar based sealant can lead to a fine of up to \$1,000—for both the property owner and the applicator.

Carryout Bag Law

The County passed the Carryout Bag Law, Bill 8-11, in January, 2012, to help the County meet Permit requirements for litter reduction. The goal of the law was to increase awareness of disposable bag litter pollution and to reduce the use of carryout bags. The Carryout Bag Law taxes 5 cents for each paper and plastic bag that a customer takes from certain retail establishments to carry purchases. The Department of Finance is responsible for enforcement of the Bag Law.

Expanded Polystyrene Food Service Ware

In January 2015, the County passed Bill 41-14, which bans the use and sale of expanded polystyrene food service ware and loose fill packaging. The Bill requires that disposable food service ware purchased and used in the County be either recyclable or compostable. The legislation is effective for County agencies, contractors and lessees by January 1, 2016, and for all other food service businesses by January 1, 2017. DEP DSWS will develop an education campaign to inform food service businesses, certain retailers and consumers about the requirements and the deadlines for compliance.

Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions

County Bill 52-14, Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions, became law on October 20, 2015. This law:

5. Regulates the use of certain substances on lawns in the County, and permits only those substances that (a) contain active ingredients recommended by the National Organic Standards Board or (b) that are designated as minimum risk pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This provision takes effect January 1, 2018.
6. Places additional notification requirements on pesticide retailers and applicators.
7. Requires the implementation of a public outreach and education campaign related to the law.
8. Requires Montgomery County Parks to implement a pesticide-free parks program.

A final version of the adopted legislation can be found at

http://www.montgomerycountymd.gov/COUNCIL/Resources/Files/bill/2014/20151006_52-14A.pdf.

Adding Co-Permittees

The MDE modified the County's Permit effective January 26, 2004 to add six small localities as co-permittees for coverage under the Phase II of the NPDES MS4 Permit Program. In FY15, the County continued its oversight, inspection, and enforcement authority over the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights. Municipality contacts are shown in Table III.B.1.

| Table III.B.1. List of Contacts for Municipalities Co-permittees | | | |
|--|---|--|--------------|
| Municipality | Contact Name and Title | Address | Telephone |
| Chevy Chase Village | Shana R. Davis-Cook, Manager Michael Younes, Director of Municipal Operations | Village Hall 5906 Connecticut Avenue Chevy Chase, MD 20915 | 301-654-7300 |
| Friendship Heights | Julian Mansfield, Village Manager | 4433 South Park Avenue Chevy Chase, MD 20815 | 301-656-2797 |
| Town of Chevy Chase | Todd Hoffman, Town Manager | 4301 Willow Lane Chevy Chase, MD 20815 | 301-654-7144 |
| Town of Kensington | Sanford Daily, Town Manager | 3710 Mitchell Street Kensington, MD 20895 | 301-949-2424 |
| Town of Poolesville | Wade Yost, Town Manager | P.O. Box 158 Poolesville, MD 20827 | 301-428-8927 |
| Town of Somerset | Jeffrey Slavin, Mayor Rich Charnovich, Town Manager | 4510 Cumberland Avenue Chevy Chase, MD 20815 | 301-654-1258 |

In January, 2010, MDE added MCPS to the County’s Permit as a co-permittee. MCPS designated Brian Mullikin, Environmental Team Leader, Division of Maintenance, and Agustin Diaz, Environmental Specialist, as staff responsible to implement stormwater management programs and coordinate on Permit issues. MCPS provided a detailed annual report on MS4 related activities, *MCPS Report to the County on MS4 Activities in FY 2015*, which can be found in Appendix C in the CD attachment to this report. This report includes information on MCPS MS4 related activities as appropriate.

EPA Region III Inspection

On June 27 and 28, 2013, EPA Region III inspected the County’s MS4 Permit programs, including office visits and field inspections. The inspection primarily focused on the County’s SWM Facility Maintenance and Inspections Program, Sediment and Erosion Control Program, IDDE program, and inspection of County facilities covered under the NPDEA General Permit for Stormwater Discharges Associated with Industrial Activity.

On February 18, 2014, EPA sent an electronic copy of their inspection findings. The County submitted a response on March 14, 2014. Both the EPA report and County response, with supporting documentation can be found in Appendix D. As of July 1, 2015, EPA has not yet submitted a final inspection report.

C. Source Identification

The following information is submitted for all County watersheds in GIS format as required by the Permit in Part IV. and Attachment A, Annual Report Databases, Parts A.-L. The information can be found in this report's CD attachment in Appendix A, MDENPDES15.accdb, Parts A-L.

C.1 Storm Drain System

The County's storm drain inventory is found in Appendix A, MDENPDES15.accdb, Part A. Storm Drain System Mapping Associated with GIS Coverage. Each storm drain feature type is a feature class. Each feature class is a table in the database including both spatial and attribute information.

Storm drain mapping is continuing to improve, thanks to strong leadership by DOT, and consistent interdepartmental collaboration. Significant progress has been made in compiling datasets from many entities in a cohesive and central database, resolving conflicts, and rectifying duplicate or overlapping data. Much work is also being devoted to standardizing attribute tables from the various data sources, QA/QC of older data, and data quality improvements at all stages of the process. New data is also being regularly added from right of way (ROW) and sediment control permits, field surveys, and other sources, building the overall comprehensiveness of the inventory. Looking ahead, DOT will soon be dynamically linking the storm drain database to maintenance work orders, and discussions about ways to streamline the data input process, and take advantage of technological improvements are on-going.

C.2 Urban Best Management Practices

The County's Urban BMP database as of June 30, 2015 with associated coverage is included electronically in Appendix A, MDENPDES15.mbd, Part B. The database uses the format required by the Permit's Attachment A., Annual Report Databases and Table B, Urban BMPs. There are 8,740 records in this database, shown by structure type in Table III.C.1. The greatest numbers of structure types are Dry Wells (2,386), Flow Splitters (980), Sand filters (760), and Infiltration Trenches (661). The numbers reported this year should be considered more accurate than those reported in the past. DEP reconciled two databases in FY15 to better reflect the current inventory of BMPs. As a result, this report excludes:

- 1) BMPs that are no longer in existence
- 2) BMPS that are maintained but not under County MS4 jurisdiction (there are several incorporated jurisdictions within the County that have their own MS4 requirements. DEP is responsible for maintenance only).
- 3) BMPs that are being maintained, but are still under a sediment and erosion control permit while as-builts are being approved.

There are a few data fields in the Urban BMP database with consistently missing data or data irregularities. Explanation for why data is missing, and what actions DEP is taking to complete the data, follows:

Drainage Area (DA)

Some structure drainage areas have not been delineated for a number of reasons. Pretreatment and diversion devices have identical DA's to their parent SWM BMPs and are not delineated separately. DEP is not delineating drainage areas for ESD practices at this time due to the level of effort needed to delineate a very small drainage area for a large number of practices (of the DAs left blank in the database, over 2,700 are ESD practices). DEP is instead concentrating on delineating the drainage areas of other, more significant SWM structures that are currently back logged.

Built Date

Built date was not recorded and cannot be determined from existing paper files for many of the pre-1996 structures. DEP is adding built date data for the facilities entered into the database after 1996 where possible. Those facilities where a date cannot be determined have an entry date of 01/01/1900.

Structure Type

DEP frequently uses the MDE structure type designated as "Other". An explanation of how DEP classifies structures with an MDE "Other" structure type is included in general comments and the "Description" column of Table III.C.1.

Several ESD practices are not coded as ESD in the STRUCT_TYPE field because the type code was also used for similar practices that were permitted before the passing of the Stormwater Management Act of 2007. In FY16, DEP will reclassify some of the data points to better reflect the actual number of ESD approved per requirements of Chapter 5 of the 2000 Maryland Stormwater Design Manual.

Permit Number

The DEP has included a "place-holder permit number" for the facilities that were built prior to 1986 and do not have a permit number. Because many of these facilities were built prior to Montgomery County's authority to permit such facilities, DEP will not be able to recover a permit number from the paper files. This place holder number is "0000000000" and represents DEP's final attempt to recover the data from the paper files. All original permit numbers known for the facilities built prior to 1986 have been entered into the database (typically a 6 digit number). In addition, a 10 digit place holder number beginning with 900118XXXX was also entered for those facilities built prior to 1986. This number was created by DPS in order for those facilities to be entered into their database system. The DEP has kept this permit number in order to allow interface with the DPS database. There are also data missing in the permit number field for facilities built after 1986. The remaining 446 are being left blank in the case the permit number is discovered.

ADC Map

The DEP is no longer using this data field because all data is now geospatially located in the GIS database with an x and y coordinate. This data has not been populated or updated since FY13, and is very likely not consistent with the latest ADC map.

Runoff Curve Number (RCN)

The DEP’s new asset and maintenance management system requires a number for all number fields. Those records with an RCN of “0” are records where the RCN was not provided in the paper files.

Construction Purpose

This is information that we are not currently tracking in our database. The data in this field is blank.

Impervious Area

This is information that we are not currently tracking in our database. All entries for this field are 0.

Last Inspection Date

All but 5 records in Table B, Urban BMPs have an inspection date. The data reported is either: 1) inspection dates from 2013 to 2015, 2) dates scheduled but not yet completed, or 3) future scheduled dates based on our triennial inspection schedule.

WQ Volume

This is information that we are not currently tracking in our database. The data in this field is blank.

Table III.C.1. FY15 Total Number of Storm Water BMP Facilities by Structure Type Designation

| Practice Type | Code | Description | Number |
|--|------|---|--------|
| Attenuation Swale | SW | Includes dry swales, wet swales, grass swales | 272 |
| Bioretention | BR | Includes bioretention, microbioretention, and rain garden | 481 |
| Detention Structure | DP | Includes dry ponds | 658 |
| Dry Well | DW | Includes dry wells, stormchambers, raintanks | 2,386 |
| Environmental Site Design | ESD | Includes Environmental Site Design practices | 261 |
| Extended Detention, Dry | EDSD | Includes dry ponds with extended detention | 65 |
| Extended Detention, Wet | EDSW | Includes wet ponds with extended detention | 155 |
| Flow Splitter | FLSP | Includes flow splitters | 980 |
| Hydrodynamic Structure: Oil Grit Separator | OGS | Includes Oil Grit Separators and water quality inlets | 640 |
| Hydrodynamic Structure: BaySaver | BS | Includes Baysavers | 136 |
| Hydrodynamic Structure: Stormceptor | SC | Includes Stormceptors | 243 |

| Table III.C.1. FY15 Total Number of Storm Water BMP Facilities by Structure Type Designation | | | |
|--|------|---|--------------|
| Practice Type | Code | Description | Number |
| Infiltration Basin | IB | Includes infiltration basins with quality and quantity control | 61 |
| Infiltration Trench | IT | Includes, infiltration trench with quality and quantity control, and buried surface fed, | 661 |
| Other | OTH | Includes structure types not identified by an MDE code, including Stormfilters, Aquafilters, Aquaswirls, Bayseparator-flowsplitters, Snouts, Treeboxes, Vortecnic, Vortsentry, and V2B1 | 345 |
| Porous Pavement | PP | Includes porous concrete, asphalt, and pavers, and | 93 |
| Sand Filter | SF | Includes surface sand filters and underground sand filters | 760 |
| Shallow Marsh | SM | Includes all constructed wetlands, artificial wetlands, shallow wetlands, and wetlands with extended detention | 118 |
| Wet Pond | WP | Includes retention ponds and wet ponds | 46 |
| Underground Storage | UGS | Includes underground storage vaults, pipes, and storage pipes with infiltration | 379 |
| Total Number of Facilities | | | 8,740 |

C.3 Impervious Surfaces

The County’s 2009 impervious area with associated coverage can be found in Appendix A, MDENPDES15.mbd, Part C. Impervious Surfaces Associated with GIS Coverage. This impervious information was used to develop the Strategy.

In FY15, DEP continued to digitize and update impervious areas for the Permit requirements and the WQPC, based on 2014 aerial photography. DEP is also updating the drainage areas of all SWM BMPs.

C.4 Monitoring Locations

The GIS coverage and associated attribute information for locations established for chemical, biological, and physical monitoring of watershed restorations efforts required in Part III.H. Assessment of Controls, (Tables E., E.1., and E.2.; Monitoring Site Locations) can be found in Appendix A, MDENPDES15.accdb, Part E., E.1., and E.2. Monitoring Site Locations Associated with GIS Coverage.

C.5 Watershed Restoration

The GIS coverage and associated attribute information for watershed restoration projects proposed, under construction and completed with associated drainage areas can be found in Appendix A, MDENPDES15.accdb, Part D. Water Quality Improvement Project Locations Associated with GIS Coverage.

D. Discharge Characterization

The Permit requires that the County use discharge characterization monitoring gathered since the early 1990s and additional monitoring data required under the Permit to assess the effectiveness of its SWM programs and watershed restoration projects. The County must also document progress towards meeting the WLAs in EPA approved TMDLs for watersheds or stream segments located in the County. Discharge characterization results and County progress towards meeting WLAs can be found in Appendix A, MDENPDES15.accdb, Parts F., G., G.1., G.2., and H. Details about this monitoring can be found in Part III. H. *Assessment of Controls*.

E. Management Programs

E.1 Stormwater Management Program

Section E.1.a of the Permit requires the County to conduct preventative maintenance inspections of all SWM facilities on at least a triennial basis.

SWM Facility Inspections and Maintenance

The DEP Stormwater Facility Maintenance (SWFM) Program oversees inspection and maintenance of all SWM facilities in the County. Program staff includes a manager, two field supervisors, six inspectors, three engineers, a planning specialist, a landscape architect, an office assistant and contractors.

The DEP performs structural maintenance on facilities owned by the County, MCPS, MNCPPC, private practices where maintenance responsibility has been transferred, and ESD practices located on County property and rights-of-way (ROW). All ESD facilities located on private property remain the responsibility of the property owners.

In 2003, the County enacted legislation giving DEP the authority to perform structural maintenance on residential SWM facility types defined in Chapter 3 of the 2000 Maryland Stormwater Design Manual. DEP then developed a process for private property owners, including Homeowner Associations (HOAs), to transfer their facilities into the DEP structural maintenance program, including executing maintenance agreements. Private property owners are responsible for all maintenance of facilities not transferred into the DEP's program.

The data reported for FY15 represents DEP's inspection and maintenance responsibilities as defined in County Code (Chapter 19) and Part III.E.1 of the Permit. DEP's SWFM Program is funded by the WQPC.

SWM Facility Inspections

The DEP oversees inspection of all SWM facilities under County jurisdiction to assess repair and maintenance needs. In FY15, there were over 8,700 SWM facilities. DEP uses a contractor to inspect all facilities every 3 years (triennial inspections). The County is divided into three geographical regions for triennial inspections (Figure III.E.1).

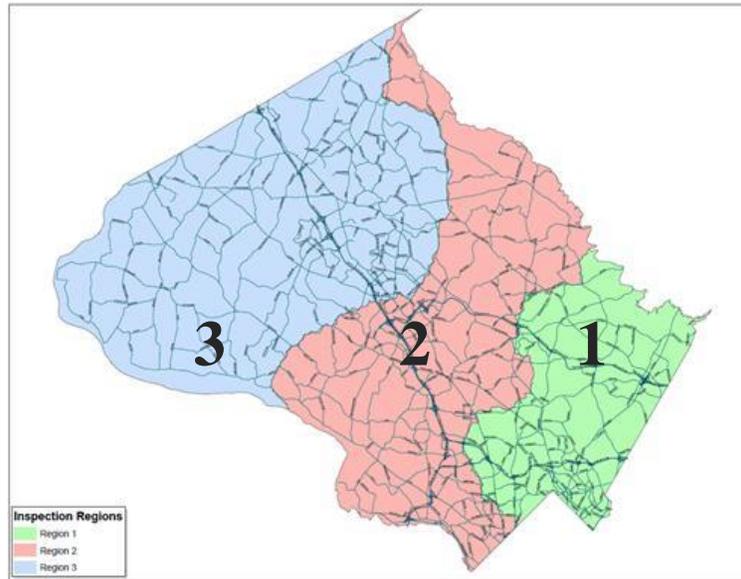


Figure III.E.1. Map of the Stormwater Facility Maintenance Regions

In addition to overseeing the triennial inspections, DEP staff inspects underground facilities annually. Inspection staff also performs inspections to ensure maintenance performed by contractors is acceptable, and in accordance with maintenance requirements and contract terms. Inspection staff also performs unscheduled and compliance follow-up inspections as needed. In this reporting period, DEP staff or contractors performed nearly 5,000 inspections, as shown in Table III.E1.

| Table III.E.1. Total Number of Inspections | | | |
|--|------------------|-----------------|-------|
| Inspection Type | Publically Owned | Privately Owned | Total |
| Triennial Inspections | | | |
| Environmental Site Design | 72 | 0 | 72 |
| Filtering Systems ¹ | 113 | 301 | 414 |
| Stormwater Infiltrations ² | 53 | 146 | 199 |
| Oil/Grit Separators | 70 | 178 | 248 |
| Proprietary Hydrodynamic ³ | 62 | 117 | 179 |
| Stormwater Ponds ⁴ | 56 | 238 | 294 |
| Underground Storage | 29 | 94 | 123 |

| Table III.E.1. Total Number of Inspections | | | |
|--|------------------|-----------------|--------------|
| Inspection Type | Publically Owned | Privately Owned | Total |
| Stormwater Wetlands | 9 | 29 | 38 |
| Open Channel Systems ⁵ | 1 | 2 | 3 |
| Other ⁶ | 65 | 283 | 348 |
| Subtotal Triennial Inspections | 530 | 1,388 | 1,918 |
| Inspections Not Completed (as of June 30, 2015) | 25 | 202 | 227 |
| Unscheduled Inspections | 29 | 37 | 66 |
| Annual Pre-Maintenance Inspections (UG Facilities) | 327 | 558 | 885 |
| Follow-up Maintenance Compliance Inspections | 431 | 1,187 | 1,618 |
| Total Inspections in FY15 | | | 4,714 |

¹This includes all aboveground and underground sand filters, proprietary filters such as Stormfilters, and Chapter 3 bioretention

²This includes trenches and basins

³This includes BaySaver, Stormceptor, vortechinices, and other proprietary hydrodynamic devices

⁴This includes all dry and wet ponds, and ponds with extended detention

⁵This includes dry swales and bioswales

⁶This includes all other type of devices not captured, including flow splitters

During FY15, DEP staff and contractors performed triennial inspections in Regions 2 and 1. Of the 2,145 SWM facilities due for triennial inspection, 1,918 inspections were conducted. The remaining 227 facilities were not inspected due to site conditions or are currently scheduled to be completed in FY16. DEP schedules work on a calendar year basis, thus reports by fiscal year will always include information on inspection and maintenance in two regions. The majority of the triennial inspections, as shown in Table III.E.1, occurred at three structure types—filtering systems (414), other types (348), and ponds (294). DEP requires the inspection of flow splitters at the time of any stormwater facility inspection; these are included in the “Other” category.

The DEP also performed inspections in addition to the triennial inspections. There were 66 unscheduled inspections that occurred in response to public complaints, at facilities being considered for transfer into DEP’s SWFM Program, and to assess conditions after a large storm event. 885 pre-maintenance inspections were completed at underground facilities in order to screen for maintenance needs (see Modified Inspection Protocol for DEP Maintained Underground SWM Facilities). DEP staff also performed 1,618 follow-up inspections of privately maintained above ground and underground facilities. Follow up inspections are required to ensure that repair work is completed when a facility’s maintenance need is ranked as “high” or “emergency” (see *Privately Owned and Maintained Facilities: Determining Maintenance Criticality and Enforcement*). Follow up inspections of County maintained SWM facilities are also required to ensure that DEP contractors have completed cleaning/maintenance in accordance with maintenance requirements and contract terms.

Maintenance

In addition to inspections, the DEP SWFM Program oversees structural and nonstructural maintenance of all SWM facilities under the County's jurisdiction. In FY15, 2,623 facilities were maintained, either by DEP contractors or by the facility owner's contractor. All maintenance was performed under the guidance of DEP inspection staff. There are two work sections in DEP that are organized based on whether the SWM facilities are structurally maintained by DEP or by the private property owner:

- SWM facilities publically or privately owned and structurally maintained by DEP include 3,550 facilities, of which 1,751 are privately owned (i.e., facilities that serve residential properties) and over 1,799 are publicly owned (i.e., facilities that serve public schools).
- DEP's program ensures and enforces maintenance on 5,190 SWM facilities that are privately owned and structurally maintained by the private property owners.

Maintenance Program Modifications During the Permit Cycle

During the Permit cycle, DEP modified the SWM Facility Maintenance Program in two ways to increase program efficiency and reduce costs.

Privately Owned and Maintained Facilities: Determining Maintenance Need Level and Enforcement

During FY12-FY13, DEP launched a new protocol to rank the maintenance need level for privately owned and maintained facilities. DEP assigns a maintenance need level using results of the triennial inspection, which then informs the follow up notifications and enforcement actions DEP will initiate with the property owners. DEP defined the following maintenance need levels:

- **EMERGENCY:** Failure to perform repairs may result in a threat to public health and safety or significant structure failure and must be corrected immediately.
- **HIGH:** Repairs necessary to ensure the proper functioning of the facility, which, if not performed, could affect the structural integrity of the facility and impact water quality within the watershed. Deficiencies must be corrected within 60 days (aboveground) or 45 days (underground).
- **ROUTINE:** Repairs necessary to ensure proper functioning of the facility, which must be performed regularly and should be corrected within 60 days. If the deficiencies are not performed within the following 12 months, they could elevate criticality of repairs to high level.

Modified Inspection Protocol for Underground SWM Facilities

In FY13, DEP developed and piloted a new inspection protocol for DEP maintained underground SWM facilities. Prior to FY13, DEP cleaned and inspected each underground facility annually regardless of the facility's condition, and performed maintenance if needed. DEP inspectors observed that certain facilities did not appear to require annual cleaning to function properly. DEP began performing an annual pre-maintenance inspection, using inspection criteria developed from best professional judgment, engineering expertise, and

manufacturers’ recommendations. Facilities deemed acceptably clean and functional were not cleaned, allowing the County to save maintenance costs.

The DEP found that over half of the DEP maintained facilities did not require any maintenance and could be expected to continue to function properly for at least another year without it. DEP continues to gather data on the condition of the underground facilities and their tendency to require less than yearly maintenance. Note that each underground facility is cleaned, inspected and maintained every 3 years at minimum as part of the required triennial inspection.

In January 2014, DEP extended the modified inspection protocol to privately maintained facilities. The new protocol includes an inspection in the 2 years between triennial inspections to assess the condition of the facility (presence of sediment, trash, and debris, and/or repairs) and the need for maintenance. If the facility is a privately maintained facility, and fails the inspection, an NOV is delivered to the owner requiring maintenance within 45 days of the NOV. If the facility is a DEP maintained structure, a maintenance work order is opened and the County’s contractor cleans and maintains the facility. Resulting savings to property owners and tax payers will help manage the maintenance costs of the increasing number of underground SWM structures installed to control stormwater runoff from new County development and redevelopment.

FY15 Repairs and Maintenance

Table III.E.2 provides numbers of repairs and maintenance at facilities during FY15. During FY15, 2,623 SWM facilities were maintained by either the DEP SWFM Program or by the private owner of the facility.

| Table III.E.2. FY15 Repairs and Maintenance | |
|--|----------------------|
| Privately Owned and Maintained | Number of Facilities |
| Aboveground | 123 |
| Underground | 684 |
| DEP Maintenance | Number of Facilities |
| Aboveground Structurally Maintained | 395 |
| Routine Sand Filter Maintenance | 174 |
| Mowing and Trash Removal | 13 |
| Underground Structurally Maintained | 1,053 |
| ESD/LID Routine Maintenance | 149 |
| ESD/LID Facilities Repaired | 32 |
| Total Number of Facilities Maintained | 2,623 |

Privately Maintained Aboveground Facilities

During FY15, DEP issued 134 NOV's requiring correction of deficiencies noted during the triennial inspection. As a result, 85 facilities with a high or emergency maintenance need level were maintained by the private owner. DEP conducted a final inspection for each of these facilities to assure that the facilities were in compliance and properly functioning. DEP also transmitted over 131 routine maintenance notification letters to property owners in FY15. Inspectors conducted approximately 246 follow-up inspections to ensure compliance on the work orders.

Privately Maintained Underground Facilities

Private facilities are inspected in the 2 years between triennial inspections to assess the condition of the facility (presence of sediment, trash, and debris, and/or repairs) and the need for maintenance. If the facility fails the inspection, an NOV is delivered to the owner. DEP inspectors perform a final inspection on each facility to ensure it was maintained properly and notifies the property owner once the work is completed to satisfaction. In FY15, 684 underground facilities were privately maintained. Any repairs identified in the triennial inspection are also required to be completed at that time.

DEP Maintained Aboveground Facilities

In FY15, DEP used a general contractor to perform structural maintenance on 395 aboveground SWM facilities. This number includes all inspection repairs identified in triennial inspections, removing minor accumulations of sediment, unblocking clogged low flows, minor concrete repair, erosion repair, restoring/replenishing media, and debris removal. DEP also performs routine maintenance on all sand filters for facilities in the maintenance program. DEP performed routine sand filter maintenance (i.e., scarification) of 174 surface sand filters. Additionally, DEP issued 50 work orders to contractors to perform regular mowing and monthly trash removal.

DEP Maintained Underground Facilities

During FY15, DEP performed cleaning and repairs on 1,053 underground facilities. The facilities included 43 located at County maintenance depots that are maintained twice a year, 3 BaySavers at a bus depot that are maintained 6 times a year, and 3 Stormceptors at the Transfer Station that are maintained 3 times a year.

Maintenance of ESD Facilities on County Property

The DEP is constructing many new ESD projects on County property and ROWs as one strategy to meet the Permit's impervious area control requirement. In FY15, DEP expanded routine contract maintenance to those publically owned ESD facilities, from 58 bioretention or rain gardens maintained in FY14, to 149 in FY15. In addition, 32 County owned ESD facilities were repaired. The facilities were maintained monthly using a trained and dedicated crew to ensure consistency. The contractor was compensated on average for one hour of labor per crew at a cost of \$135/per facility per month. Additional costs for materials, including plants, mulch, and watering, concrete, stone, and soils, brought the estimated total cost to approximately \$2,000 per facility per fiscal year for maintenance. Routine maintenance tasks varied according to season

and included weeding, removing trash and other debris, edging, removing sediment, mulch redistribution and replenishment, pruning, watering and plant replacement. In FY15, the number of publically owned ESD facilities will continue to grow as DEP completes construction of additional facilities.

Frequency and type of maintenance varies depending on several factors including size, drainage area, plant composition, impacts from stormwater, humans and vehicles, site safety, and visibility. Monthly maintenance of the ESD facilities successfully addresses the maintenance variability and ensures that the practices are functioning as designed. DEP has incorporated lessons learned to improve inspection and contracting needs for ESD practices, to better educate the public, landowners, school, and park administrators with ESD facilities, and to lower overall costs through more efficient maintenance planning. Community residents have expressed appreciation for the ESD facilities, and DEP maintenance, as well as DEP's efforts to address community concerns.

DEP is now a more significant stakeholder of the ROWs, sharing spaces with gas lines, water lines, power lines, and transportation. The maintenance program has worked to develop new and mutually cooperative relationships with public utilities such as Washington Gas and WSSC, as well as DOT, to manage maintenance needs among all groups sharing the ROW.

Inspection and Maintenance Outreach Activities

In FY15, the DEP SWFM Program continued to create publications and hosted several presentations to increase understanding and awareness of County SWM facility maintenance. In addition, the Program staff works with DEP outreach staff providing SWM maintenance related publications for dissemination at public events. The two sections work together to provide an opportunity for County resident volunteers to learn about the function of SWM ponds during annual pond clean up events. For more information, please see Part III.E.7. Public Education.

Inspection of ESD on Single Family Residential Property

During the Permit cycle, DEP continued to work on developing a program to address the inspection of ESD practices on single family residential lots. In FY15, many of the first permitted and installed ESD facilities were due for triennial inspections. These inspections have not been performed because DEP lacks the legal authority (right of access agreements) to go on private property to perform inspections. DEP is working with DPS to make right of access agreements a requirement for all new sediment and erosion control permits.

In addition, utilizing staff expertise and consultants, DEP is developing policies and procedures for ESD related inspections, enforcement and administrative processes. The Urban BMP Database (Attachment A) provides the proposed inspection date for each ESD facility, which is the first step toward addressing the inspection of over 2,500 ESD and non-structural practices. In order to remain in compliance with County and State SWM facility maintenance requirements and regulations while remaining fiscally responsible, the DEP finds itself faced with the need to be innovative. Therefore, DEP is developing policies that will tackle this issue in two ways:

1. In FY16, DEP is developing, and hopes to pilot, a residential ESD self-inspection and maintenance program with DEP QA/QC audit inspections. DEP is planning to work with property owners to provide the resources they need to perform yearly inspections and required maintenance on the ESD facilities on their property. DEP will recommend

owners inspect the facilities on an annual basis and perform maintenance as necessary. DEP is developing an on-line inspection form to assist owners in inspecting and maintaining the facilities. The form will be tied to the County's WQPC Program, making it easy for the owner to apply for a credit at the time of inspection. As long as the property owner is using the on-line form DEP developed, and performs their inspection and maintenance on a yearly basis, DEP intends to use the inspection data to count toward the triennial inspection requirement. In addition, DEP will also conduct a number of audit inspections every 3 years to ensure the practices are functioning properly. In August 2015, DEP secured a Chesapeake Bay Trust (CBT) Chesapeake Conservation Corps (CCC) intern to assist in this workload.

2. Beginning in FY17, DEP plans to hire a contractor who will begin inspections of ESD measures (subject to appropriation). This contractor will be performing the audit inspections of the properties that are submitting their self-inspection forms, and in cases where owners are not able to inspect their own system(s) or require some assistance, the contractor will conduct the inspections. When needed, DEP staff will perform compliance inspections.

Co-Permittee Structural and Nonstructural Maintenance on SWM BMPs-MCPS

The MCPS Division of Maintenance upgraded and repaired existing underground and aboveground SWM facilities in FY15, in preparation for transferring maintenance responsibility to DEP in accordance with a MOU signed by both parties in 2007. The MCPS also performed nonstructural maintenance on aboveground SWM facilities, and maintained several underground facilities not eligible for transfer to the County. MCPS contracts out the maintenance on ESD facilities (113 bioretention facilities and 571,000 square feet of green roof). The cost of the FY15 MCPS SWM facility maintenance and inspection program was \$858,874.

Stormwater Management Plan Review and Permitting

Complying with the Maryland Stormwater Management Act of 2007

Section III.E.1.b of the Permit requires the County to implement the SWM design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual* and the provisions of Maryland's *Stormwater Management Act of 2007*. The Permit requires the County to modify its SWM ordinances, regulations and new development plan approval processes within 1 year after State adoption of regulations; April 24, 2009, with an effective date of May 4, 2009.

As described under Section III.B., Legal Authority, in July 2010 and March 2011, the County Council passed Bills 40-10, and 7-11, which amended the County's SWM law to require management of stormwater runoff through the use of nonstructural BMPs to the MEP for new development and redevelopment projects approved by DPS. The bills then brought the County's stormwater management law into compliance with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010.

The DPS has been reviewing all development projects submitted since then to assure compliance with the 2007 Stormwater Design Manual. Consequently, there has been a considerable increase in type and number of nonstructural practices for new development and redevelopment in the County.

Stormwater Management Plan Review and Permitting – Incorporating ESD

The Permit also requires the County to review local codes and ordinances to identify impediments to and opportunities for promoting ESD to the MEP within 1-year, and to remove those impediments within 2 years of the Permit's issuance.

In December 2010, the County released the report "*Implementing Environmental Site Design in Montgomery County*", which summarizes how the County's codes, regulations, programs, and policies may need to be updated to allow the use of ESD and ESD techniques to the MEP. The most significant barriers, gaps and opportunities were identified in the County's Zoning Ordinance and the Development Review Process. The report is included in Appendix E in the electronic submission included with this report.

In 2007, the M-NCPPC Department of Planning conducted a rewrite of the County's antiquated zoning code, Chapter 59, as ordered by the Montgomery County Council. The Planning Department worked with a consultant, a citizen's advisory group (Zoning Advisory Panel), and with other County agencies to accomplish the rewrite. A summary of ESD code review recommendations and how they were addressed during the Zoning Code rewrite can be found on the CD attachment to this Report in Appendix E. There were significant opportunities for comment during the Public Hearing Draft Review period, and in the Planning Board and County Council review processes. The new Zoning Code, Chapter 59 of the Montgomery County Code, took effect on October 30, 2014.

Additional Efforts to Incorporate ESD

The DPS, fellow agencies and members of the stormwater management construction community formed a Policy and Design Committee and a New Products Committee to assess design aspects of various ESD practices. The committee's goal is to assure that these practices provide cost-effective designs that provide maximum runoff reduction and pollutant removal without increasing average maintenance cost per facility. DPS is continually refining ESD practice design standards beyond those contained in Maryland's Stormwater Design Manual, and posts their improved designs on the DPS website. DPS also requires stormwater control systems to be located in stormwater easements to ensure access for future maintenance.

The DEP's Watershed Restoration Program identifies opportunities for impervious area control, including ESD practices, in County watersheds through comprehensive watershed assessments. DEP prioritizes those projects that can be combined with other watershed restoration to implement a holistic program that captures, and infiltrates stormwater while creating and maximizing ecological benefits and increasing connection of green areas in the County. DEP's Watershed Restoration CIP budget reflects the commitment to implementing ESD practices on public property; since 2010, funding for ESD practices increased from 26% in the approved FY2011-FY2016 CIP budget to 39% in the approved FY2015-FY2020 CIP budget.

One example of DEP's commitment to ESD is the DEP's Green Streets program, a collaboration with DOT to include ESD measures in the County ROW. For more information see Part G. Watershed Restoration. County partners have learned much through the evaluation, design, and

construction process, particularly working with limitations presented by existing gray infrastructure that cannot be readily re-located. DEP and DOT are now drafting technical standards for some of these practices, which will greatly facilitate implementation and reduce overall costs for using these practices as retrofits.

The DEP invests considerable staff time and resources to promote ESD outreach to communities. DEP hopes to increase community acceptance of these practices and future stewardship for routine maintenance of the roadside ESD practices. Watershed groups, such as the Audubon Naturalist Society (ANS) and the Friends of Sligo Creek (FOSC) provided assistance to DEP outreach efforts, both for the Green Streets pilot and also for residential properties retrofits through the RainScapes Neighborhoods program. In FY13, DEP's SWM Facility Maintenance Program also developed numerous fact sheets designed to provide assistance to residents on how to maintain their ESD practices including rain barrels, rain gardens, grass swales, buried dry wells, porous pavements, and green roofs. The fact sheets are available on DEP's website at <http://www.montgomerycountymd.gov/DEP/water/stormwater-facilities.html>.

In FY16, DEP is working with community partners to evaluate and develop future approaches to incorporate ESD and other green infrastructure practices into DEP watershed restoration planning, and ultimately into other Countywide programs. DEP and its partners are developing a green infrastructure definition that will reflect DEP's support of ESD, and also recognize ecological benefits of DEP's restoration priorities. DEP has begun drafting an official Department wide policy that will reflect the Department's focus of incorporating green infrastructure approaches. DEP is also working with community partners to identify and implement an innovative green infrastructure pilot project.

MDE Review of the County's Stormwater Management Program

Section III.E.1.c. of the Permit requires the County to maintain programmatic and implementation information according to the requirements established as part of MDE's triennial stormwater program review.

In April 2013, MDE completed a review of the County's stormwater management program, including evaluation of implementing ESD to the MEP in the County's plan review and approval process. MDE found the County's program to be acceptable under State law and in compliance with Part III.E.1 of the Permit. MDE's approval letter, with the County's response, can be found in Appendix F.

E.2 Erosion and Sediment Control

Section III.E.2 of the Permit requires the County to maintain an acceptable erosion and sediment control program, including implementation of improvements identified in MDE's biennial evaluation of the County's ESC program. The Permit also requires the County to conduct responsible personnel certification classes to educate construction site operators regarding erosion and sediment control compliance, and to report quarterly information regarding earth disturbances exceeding 1 acre.

MDE performed a biennial evaluation of the County's ESC program as part of their review of the County's application for the delegation of ESC enforcement authority in November of 2013. Continued delegation was granted through June 30, 2016 by Brian Clevenger, Program Manager

of MDE's Sediment, Stormwater and Dam Safety Program in a letter dated January 6, 2014. In that letter, MDE "has also determined that the County's program is in compliance with the erosion and sediment control program elements stipulated in Part III.E.2 of the Montgomery County MS4 Permit".

In FY15, 20,793 ESC inspections were performed. Enforcement actions included 511 NOVs, 46 Stop Work Orders, and 162 civil citations which collected \$94,995.

Responsible Personnel Certification (RPC)

In FY14, MDE developed an online class to certify responsible personnel in erosion and sediment control. Ray Bahr, in a personal communication with the DPS Field Supervisor Derek Isensee, indicated that the online class "will constitute Montgomery County's RPC efforts and comply with the County's MS4 permit conditions".

Quarterly Grading Permits

Quarterly grading permit information for earth disturbances in the County of 1 acre or more can be found in Appendix A, MDENPDES15.mbd, Part K. Quarterly Grading Permit Information.

E.3 Illicit Discharge Detection and Elimination (IDDE)

The Permit requires the County to implement an inspection and enforcement program to ensure that all non-stormwater discharges to the municipal separate storm sewer system are either permitted by MDE or eliminated. The permit requires field screening of at least 150 outfalls annually, with field water chemistry analysis of dry weather discharges according to parameters specified in the Permit's Attachment A, Annual Report Databases, Part I. Illicit Discharge Detection and Elimination.

Outfall Screening

During March, April and May 2015, DEP Division of Environmental Policy and Compliance (DEPC) performed outfall screening in the Lower and Middle Mainstem subwatersheds of the Northwest Branch of the Anacostia Watershed (Figure III.E.2 below). Screening teams walked the entire length of the stream beds within the watershed to identify all outfalls. This method allowed DEP to identify 88 new outfalls that were previously not mapped in the storm drain inventory. Of the 71 outfalls with existing permanent ID numbers, 7 were either improperly identified as outfalls or missing in the field. Errors in outfall location or type as shown on the existing maps were reported and will be corrected in the GIS inventory; the 88 new outfalls identified will be added to existing maps. In addition to the permit required water chemistry parameters, DEP checked dry weather flows for ammonia and fluoride. DEP screened a total of 159 outfalls and found 75 to have flow (29 with dry weather flows and 46 piped streams).

Of the 75 outfalls found to have dry weather flow, 23 were flagged as requiring follow up investigations due to elevated water quality parameters measured during the initial screening. During the follow up investigations, 18 of the 23 were found to be dry or have normal water chemistry parameters. Five outfalls were found to have continuing problems, which are summarized in Table III.E.5. The storm drain pipe outfalling to KP122P6632 was clogged with

organic matter which was unclogged by the property owner. Both KP122P6633 and KP122P6647 are both owned and maintained by the Maryland State Highway Administration (SHA). SHA was contacted about both outfalls and stated they would stabilize and clean both outfalls. KP122P6635 is also maintained by SHA. DEP is still actively investigating the source of elevated detergents from this outfall. KP123P0285 has been flagged as a target for Closed Circuit Television (CCTV) inspection as the source of the flow was lost underground. Detailed investigation reports can be found in Appendix G.

| Outfall ID | Location | Problem Found | Resolution |
|------------|--------------------|--|--|
| KP122P6632 | 10110 New Hamp Ave | Organic matter buildup | Property Management unclogging outfall |
| KP122P6633 | 10110 New Hamp Ave | Outfall destabilized with high Specific Conductivity | State Highway Association (SHA) repairing and cleaning outfall |
| KP122P6647 | Capital Beltway | Outfall destabilized with high Specific Conductivity | SHA repairing and cleaning outfall |
| KP122P6635 | 10142 New Hamp Ave | Elevated detergents | Investigation ongoing |
| KP123P0285 | 10214 Royal Rd | Elevated ammonia | Site to be CCTV'ed and investigated further |

For FY15 DEP will screen outfalls in the Middle Mainstem, Lamberton Tributary and Glenallen Tributary subwatersheds of the Northwest Branch of the Anacostia Watershed.

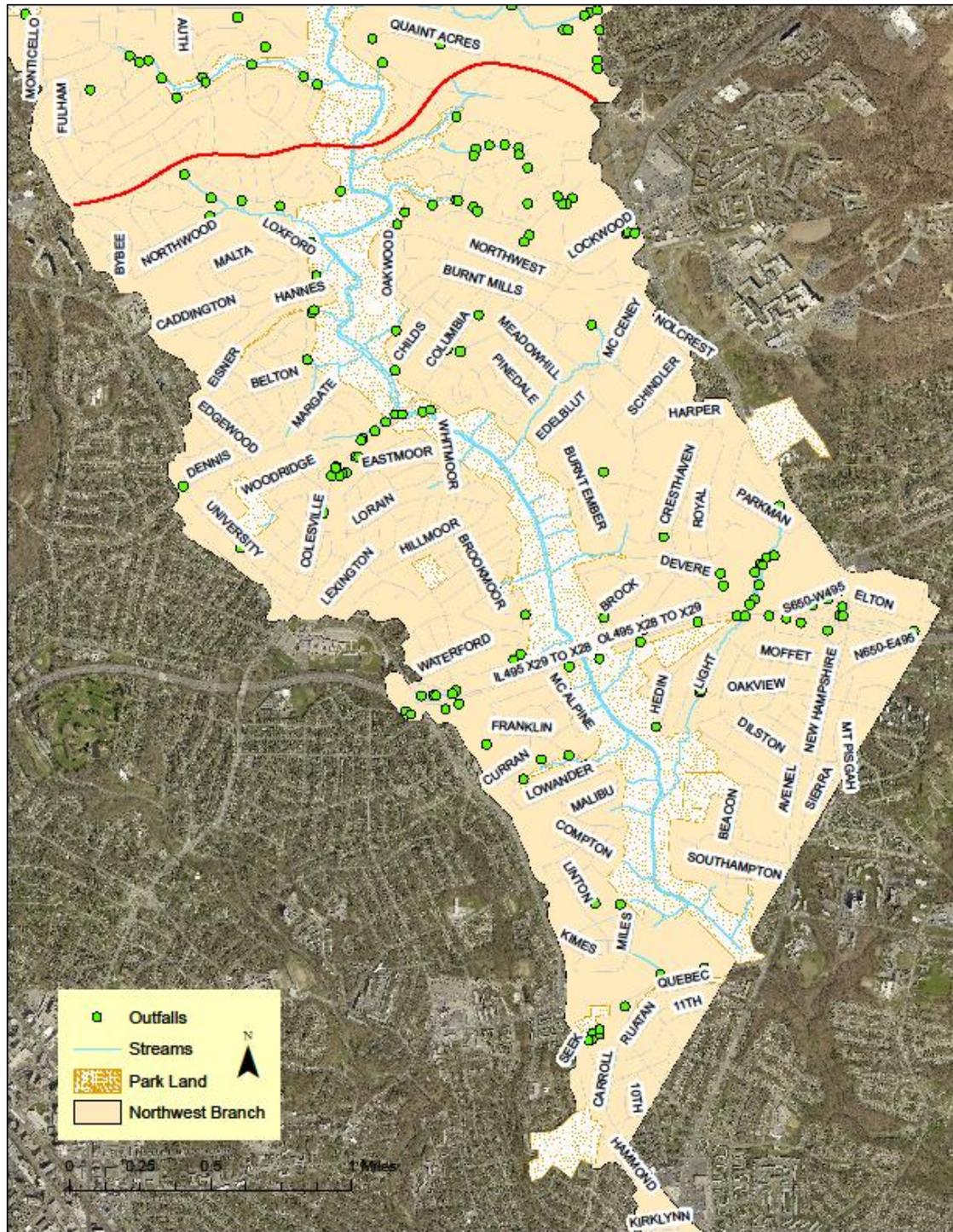


Figure III.E.2. FY15 Outfall Screening – Lower and Middle Mainstem Subwatersheds of the Northwest Branch of the Anacostia Watershed

Routine Surveys of Commercial and Industrial Areas

The Permit also requires the County to conduct routine surveys of commercial and industrial areas.

In FY15, DEP conducted a routine survey of the Southlawn Lane industrial area in Rockville, Maryland. The results of the survey are reported below in Table III.E.6. Detailed investigation reports can be found in Appendix G.

| Facility Name | Location | Date Visited | Issues Identified and Corrected |
|-----------------------|---------------------|--------------|--|
| Montgomery Scrap | 1500 Southlawn Ln. | 2/13/15 | Discharge pipe from a wash machine was draining outside onto impervious surface, multiple open topped storage bins were leaking residual cutting oil, shearing machine discharge and auto batteries observed store outdoors. |
| Georgetown Paper | 14820 Southlawn Ln. | 2/13/15 | Evidence of paper fiber discharge at outfall pipe, and excessive windblown litter throughout the site. |
| Wilcoxon Construction | 15120 Southlawn Ln. | 2/25/15 | Uncovered buckets of auto fluids exposed to the elements, diesel fuel being used as a concrete form release aid, evidence of concrete/pool grout discharge from materials handling and waste storage areas. |
| Rockville Fuel & Feed | 14901 Southlawn Ln. | 4/9/15 | Wastewater pit almost filled to capacity with sediment, uncovered containers of auto fluids and oil filters exposed to the elements, fluid spills and housekeeping issues inside the maintenance shop, concrete residual drag out onto Southlawn Lane. |
| Schuster Concrete | 15121 Southlawn Ln. | 4/15/15 | High pH discharge from CO2 wastewater treatment system, minor fluid stains on the ground in the truck parking area, open-topped metal drum containing oil filters and used oil stored outside exposed to the elements. |

WSSC Sanitary Sewer Overflow (SSO) Follow Up Investigations

DEP performed 72 follow-up site visits for reported SSO's in the County in FY15. DEP verifies that the SSO has been corrected, ensures adequate cleanup and treatment of all affected areas, and ensures adequate public notice signage has been posted. Also, DEP is continuing to work with WSSC's Fats, Oils and Grease (FOG) Program regarding restaurant grease issues, which have direct effects on storm water quality in Montgomery County.

Water Quality Investigations During FY15 (7/1/14 – 6/30/15)

For FY15, DEP investigated 224 water quality issues (152 complaints and 72 SSO's) and 29 hazardous materials related cases, which resulted in the issuance of 35 formal Enforcement Actions (9 Civil Citations with fines totaling \$4,500 and 24 Notices of Violation (NOVs)) and 59 Warning Letters. The formal Enforcement Actions are summarized in the following Table III.E.7.

| Table III.E.7. FY15 Stormwater Discharge Enforcement Cases | | | | | | |
|--|-------------|------------|---------|------------|---------------------------|------------|
| No. | Case Number | Date | \$ Fine | Case Type | Case Sub-Type | Citation # |
| 1 | 2014945 | 7/1/2014 | \$500 | Stormwater | Pollutant Discharge | 4Z39882042 |
| 2 | 20141155 | 8/28/2014 | \$500 | Stormwater | Pollutant Discharge | 2Z39883237 |
| 3 | 20141212 | 9/18/2014 | \$500 | Stormwater | Pollutant Discharge | 4Z39889665 |
| 4 | 20151380 | 4/7/2015 | \$500 | Hazmat | Improper Storage/Handling | 2Z39889733 |
| 5 | 20151262 | 4/10/2015 | \$500 | Stormwater | Pollutant Discharge | 1Z39889732 |
| 6 | 20151482 | 4/25/2015 | \$500 | Stormwater | Pollutant Discharge | 5Z39882043 |
| 7 | 20151347 | 5/1/2015 | \$500 | Stormwater | Pollutant Discharge | 5Z39889736 |
| 8 | 20151648 | 5/15/2015 | \$500 | Stormwater | Pollutant Discharge | 5Z39889666 |
| 9 | 20151482 | 6/30/2015 | \$500 | Stormwater | Pollutant Discharge | 6Z39889737 |
| 10 | 20141062 | 7/31/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 11 | 20141132 | 8/27/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 12 | 20141294 | 10/15/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 13 | 20141317 | 10/27/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 14 | 20141363 | 11/7/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 15 | 20141484 | 11/26/2014 | NOV | Stormwater | Pollutant Discharge | N/A |
| 16 | 20151046 | 1/21/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 17 | 20151046 | 1/21/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 18 | 20151014 | 2/5/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 19 | 20151014 | 2/5/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 20 | 20151141 | 2/25/2015 | NOV | Hazmat | Improper Storage/Handling | N/A |
| 21 | 20151271 | 4/8/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 22 | 20151194 | 4/10/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 23 | 20151427 | 4/10/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 24 | 20151347 | 4/10/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 25 | 20151452 | 4/16/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 26 | 20151193 | 4/16/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 27 | 20151347 | 5/1/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 28 | 20151648 | 5/15/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 29 | 20151244 | 5/20/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 30 | 20151670 | 5/22/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 31 | 20151669 | 5/26/2015 | NOV | Stormwater | Pollutant Discharge | N/A |

| Table III.E.7. FY15 Stormwater Discharge Enforcement Cases | | | | | | |
|--|-------------|-----------|---------|------------|---------------------|------------|
| No. | Case Number | Date | \$ Fine | Case Type | Case Sub-Type | Citation # |
| 32 | 20151776 | 6/17/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 33 | 20151803 | 6/23/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 34 | 20151817 | 6/23/2015 | NOV | Stormwater | Pollutant Discharge | N/A |
| 35 | 20151829 | 6/23/2015 | NOV | Stormwater | Pollutant Discharge | N/A |

E.4 Trash and Litter

FY15 County Trash Reduction Initiatives

The Permit requires the County to implement multi-faceted trash abatement and anti-littering programs to meet goals of the Potomac River Watershed Trash Treaty, and achieve trash reductions to meet the County’s WLA in the Anacostia River Trash TMDL. Specific Permit requirements include County participation in regional strategies to reduce trash and increase recycling, public outreach and education workplans to increase residential and commercial recycling rates, improve trash management, and reduce littering, and a trash reduction strategy for the Anacostia Watershed. The workplans and Anacostia Trash Reduction Strategy were developed as part of the County’s overall Strategy. Current County trash reduction efforts include anti-litter campaigns, recycling education, enforcement, the Carryout Bag Law, increased litter removal from County “hot spots”, such as Transit stops, and trash related monitoring. They are discussed in the following sections.

Structural Trash Removal in the Anacostia

The DEP’s Watershed Restoration Program, described in Section III.G, is actively installing SWM practices to meet the Permit’s impervious area stormwater control requirement. Many of these practices are structural, and while not designed to capture trash, do not allow trash to pass. Debris tends to build up around forebays, around plants and internal elements, and around the outlets. DEP ensures that the trash is removed from the facilities through the Stormwater Facility Maintenance Program. In the Anacostia, BMPs installed or retrofitted after the baseline year of the Trash TMDL, have removed 11,124 pounds of trash per year from the watershed, a 6.60% reduction from the TMDL baseline.

Anti-Litter Public Awareness Campaigns

The County is working with the Anacostia Watershed Restoration Partnership, the Alice Ferguson Foundation, and other regional partners to implement initiatives that will help the region meet the goal of a Trash Free Potomac and the Anacostia TMDL for trash. DEP’s outreach and education programs for anti-littering can be found in Part III.E.7, Public Outreach and Education.

Recycling and Waste Diversion Initiatives

According to the MDE's Calendar Year 2013 Maryland Waste Diversion Rates & Tonnages Report, Montgomery County's overall recycling and waste diversion rate, was 60.2 percent. The County has a goal to reduce waste and recycle 70 percent of all waste by 2020.

During FY15, DSWS staff continued efforts to conduct on-site consultations to businesses, organizations, and local, state and federal government facilities providing technical assistance, hands-on guidance, and specific recommendations on setting up, maintaining, and expanding waste reduction, recycling, and buying recycled programs. DSWS also continued efforts to educate all residents of single-family homes and multi-family properties, and businesses about recycling, waste reduction, buying recycled products, grasscycling and backyard or on-site composting.

The DSWS has a robust recycling and waste reduction outreach program, with a strong volunteer component. During FY15, staff and DSWS Recycling Program volunteers participated in 334 outreach and education events, providing 41,270 people with assistance and information on waste reduction, recycling, buying recycled, composting, grasscycling and other topics. Volunteers contributed nearly 1,218 hours of direct service with an estimated value of \$30,457. More detailed information on DSWS's outreach activities and other trash and litter reduction measures can be found in the Division's Quarterly Reports, posted at:

<http://www.montgomerycountymd.gov/sws/about/quarterly-reports.html>

The DSWS constantly monitors the recycling markets to identify potential opportunities to remove additional materials from the waste stream:

- DSWS operates a model food scrap recycling collection demonstration project at the Montgomery County Executive Office Building in Rockville since November 2011. This project, in which pre-consumer food scraps generated in the building's cafeteria are separated for recycling collection, has diverted a total of 69 tons of food scraps for commercial composting through the end of FY15.
- DSWS accepts unused paint and offers it to residents or donates it to charities. In FY15, the county gave away 739 gallons of paint through the free paint program.
- DSWS participates in the "Bikes for the World" program. In FY15 they removed 5 tons of restorable bikes from the waste stream and shipped them worldwide.
- The County Transfer Station has a vendor that accepts Waste Vegetable Oil (WVO) for the sole purpose of bio-diesel production; in FY15, 31 tons of straight vegetable oil was shipped out for processing into biodiesel.
- The county also gave away 12 tons of usable donated construction materials and 17 tons of books dropped off for donation at the Transfer Station.

Illegal Dumping Enforcement

The County has a call center (311) for non-emergency services where citizens can report incidents involving environmental problems, including illegal dumping. Outside normal business hours citizens can report issues through the MC311 and DEP websites. During FY15,

there were 385 complaints concerning the illegal dumping of solid waste, which resulted in the issuance of 8 Notices of Violation (NOVs) and numerous Warning Letters. The vast majority of complaints concerned bags of trash, vegetation (leaves and brush), or other unwanted materials either dumped or being stored on private or public property. Only a small percentage of these cases represented a potential for direct runoff of contaminated material into a storm drain or receiving system. Complaint resolution invariably involved removal and proper disposal of trash and debris and proper storage (i.e. under cover) of other materials.

Anti-Litter Enforcement in FY15

The County's Police Force participated in the annual Litter Enforcement Month, conducting additional vigilance and community engagement on litter, especially with teens in urban areas.

The Department of Housing and Community Affairs (DHCA) Code Enforcement Division investigates and enforces violations of litter codes on private property. In FY15, they handled 3,790 trash/rubbish related complaints, and issued 407 civil citations. DHCA estimates that 353 tons of trash was removed as a result of their "clean or lien program". DHCA also conducts an Alternative Community Service (ACS) litter removal program, a weekly collection of street debris in targeted neighborhoods.

The DSWS also investigates and enforces compliance with the County's solid waste and recycling regulations.

Carryout Bag Tax

From the implementation of the Carryout Bag Tax (January 2012) to June 2015, there have been a total of 209 million bags sold in Montgomery County. Approximately 62 million were sold in FY15, about 5.2 million non-reusable bags sold per month. According to the Census Bureau, the County population estimate for 2013 is 1,016,667 people. This continues to average out to about five disposable bags bought per County resident each month. In FY15, registered retailers paying the bag fee increased from 1,188 to 1,251. Figure III.E.3, below, suggests a slight decline in the number of bags reported per retailer from January 2012 through June 2015, however DEP does not have enough data to definitively report a change in bag usage for the County.

In FY16, DEP is working with the County Department of Finance to expand Carryout Bag Tax outreach to increase awareness of the law among retailers and the public. The goals of the program are to increase retailer compliance and public awareness of plastic bag pollution. Elements of the program include updated outreach materials, direct contact with retailers, and a public re-useable bag distribution through libraries, Manna food distribution centers, and community aid offices. DEP will reanalyze Carryout Bag Tax data after one year of the expanded outreach effort to determine effectiveness.

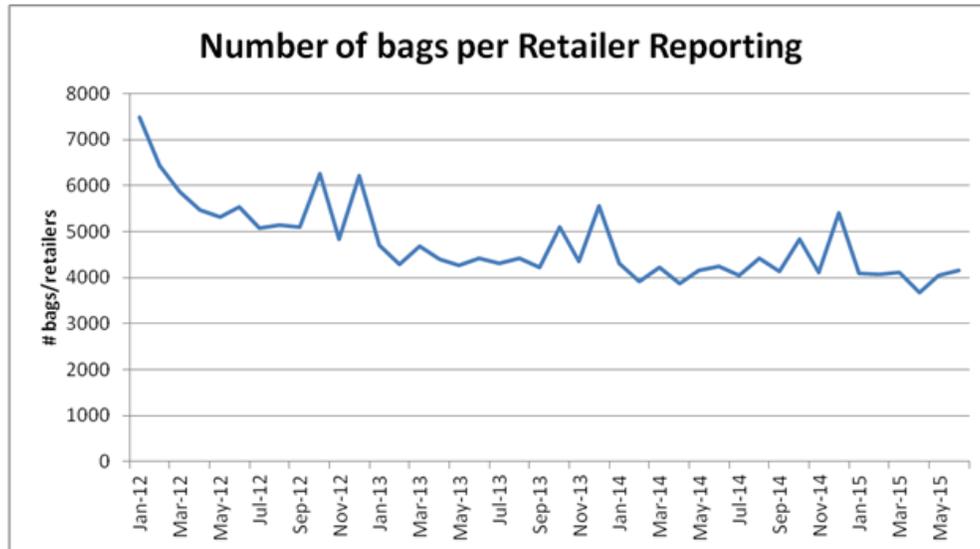


Figure III.E.3. Number of Bags Reported per Retailer Reporting

Ban on Use and Sale of Expanded Polystyrene Materials

In FY15, DEP DSWS also took steps to address another material frequently found to pollute local communities and streams; expanded polystyrene. In January 2015, the County Council enacted Bill 41-14 which bans the use and sale of expanded polystyrene food service ware and loose fill packaging and instead requires that disposable food service ware purchased and used in the County be either recyclable or compostable. The Bill requires all county agencies, contractors, and lessees to use compostable or recyclable food service ware by January 1, 2016, and all other food service businesses by January 1, 2017. Expanded polystyrene (PS) #6 products are not recyclable in the County. In FY15, DEP DSWS developed an education campaign to inform food service businesses, certain retailers and consumers about the requirements and the deadlines for compliance.

Increased Litter Removal from County Owned Public Areas

The DGS is responsible for maintaining outdoor public areas and dedicates resources to ensure that adequate litter disposal receptacles are readily available to the public. The DGS works with the County’s Regional Service Centers and Urban Districts to strategically place units in the most heavily used areas.

The DGS has also partnered with other agencies, and community groups to enhance placement of litter receptacles, and to pilot advanced technology recycling and litter containers. The Wheaton Urban District, part of the Mid County Regional Service area, with grant funds from the State, added approximately 20 solar powered Big Belly litter and recycling units in the downtown area. Big Belly units compact trash at the point of collection, reducing overflows and allowing for less frequent collection. The units can contain over 150 gallons of trash and are fully enclosed. The Silver Spring Urban District, part of the Silver Spring Regional Service Center area, is also piloting Big Belly litter and recycling units.

The Bethesda Urban Partnership (BUP), the Urban District Corporation for the Bethesda Urban District, owns and maintains hundreds of trash containers in the public ROW throughout the downtown area. The BUP also maintains several recycling containers and has partnered with community groups and local businesses to purchase additional recycling containers.

Transit stops (bus stops) are prime litter hotspots. DOT maintains litter containers at all 500 sheltered bus stop locations, 5 transit centers and other high activity areas around the County. Placement of containers is prioritized based on stop activity, and many of the locations are shared by both the County Ride On Transit System and the Washington Metropolitan Area Transit Authority (WMATA) buses. In FY15, the DOT program to remove trash dumped at transit stops around the County netted a total of 421 tons of trash with a budget of \$482,989.

Trash Removal from County ROW

The County 311 call center tracks all calls related to litter on County roads, and cleanup is handled by DOT. This information is conveyed to the County's Police force in order to increase surveillance of these roadside hotspots.

The DOT's Adopt-A-Road Program supplies 392 community groups who adopt 409 roads (some groups adopt more than one road) with equipment in exchange for their voluntary service of picking up trash and litter along roadways. 159 groups reported 647 clean ups, picking up a total of 2,438 bags of trash in FY15.

Trash Removal at Stormwater Facilities

The County contracts the removal of organic debris and trash from County maintained SWM facilities. These trash collections are augmented by citizen volunteer clean-ups. In FY15 there were 27 trash collections at 13 different facilities. Five of the 22 collections were performed by volunteers. Cleanings are scheduled on an as-needed basis and are related to number of storms that wash in large amounts of trash.

A total of 2,320 pounds of inorganic trash (including aluminum, plastic, and glass containers, plastic bags, tires, styrofoam, paper and miscellaneous items) were removed in FY15. This is an increase of 258 pounds from the amount of inorganic trash removed in FY14. The increase is likely related to the additional cleanings and varying annual rainfall patterns which move material into the facilities.

In FY15, as shown in Table III.E.8 and Figure III.E.4, by weight 82.3% of the material collected was organic debris, collected on two dates in June from the Wheaton Pond. Of the inorganic material collected, 74.2 percent was plastic bottles, plastic bags or miscellaneous items (Figure III.E.5). Recyclable materials (aluminum, glass and plastic bottles, styrofoam and paper) comprised 54 percent of the inorganic materials found. These materials could easily have been removed from the waste stream through the County's recycling program. Over the past 5 years there has been a clear shift away from glass bottles and a corresponding increase in plastic bottles. In FY15 plastic bottles made up 30 percent by weight of the items collected at the ponds. More pounds of plastic bottles were collected than any of the other categories besides organic debris and miscellaneous trash. Future trash source control efforts will need to focus on additional ways to keep plastic bottles and the other recyclables from entering waterways.

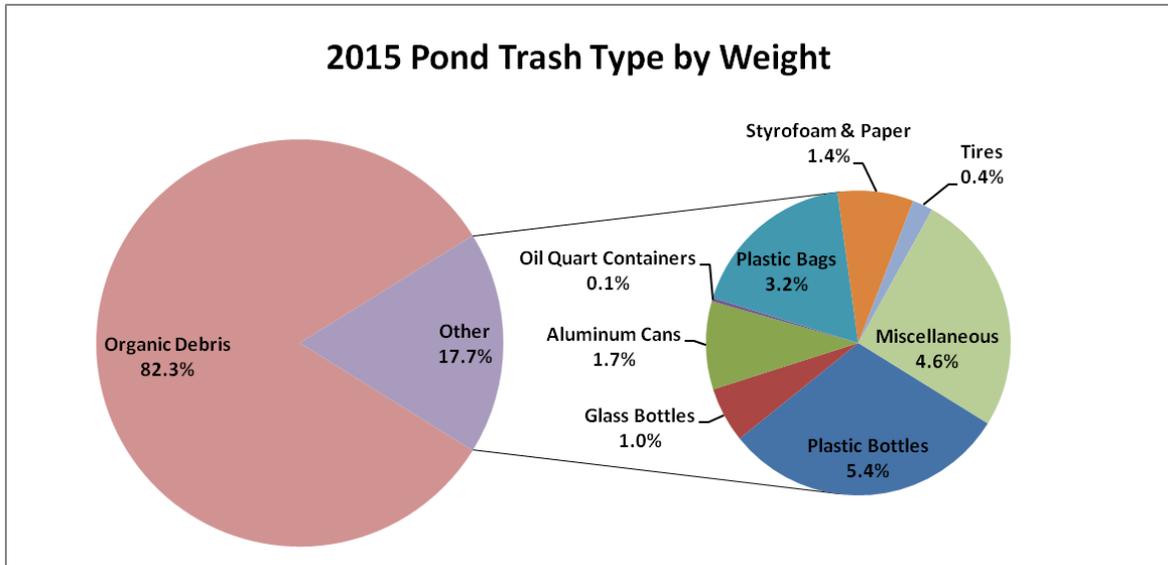


Figure III.E.4. Pond Trash Collected in FY15 by Type

| Table III.E.8. Trash Collected From Ponds FY2015 (Pounds) | | | | | | | | | | | |
|---|---------------|-------------|---------------|----------------------|--------------|-----------------|-------------------|-------------|----------------|-------------|---------------|
| Date | Ponds Cleaned | Aluminum | Glass bottles | Oil quart containers | Plastic Bags | Plastic Bottles | Styrofoam & Paper | Tires | Organic Debris | Misc | Total |
| 7/30/2014 | 1 | 2 | 1 | | | 28 | | 17 | | 46 | 94 |
| 10/9/2014 | 3 | 34 | 29 | 0 | 44 | 56 | 19 | 10 | 0 | 29 | 221 |
| 10/10/2014 | 3 | 7 | 0 | 0 | 16 | 11 | 8 | 0 | 0 | 16 | 58 |
| 10/13/2014 | 1 | 24 | 25 | 0 | 73 | 96 | 23 | 0 | 0 | 17 | 258 |
| 10/18/2014 | 1 | 3 | 1 | | | 23 | | 19 | | 58 | 102 |
| 10/26/2014 | 1 | 19 | 6 | | | 99 | | | | 209 | 333 |
| 11/14/2014 | 1 | 6 | 3 | 0 | 20 | 40 | 5 | 5 | 0 | 11 | 90 |
| 12/2/2014 | 1 | 3 | 1 | 3 | 12 | 25 | 6 | 0 | 0 | 6 | 56 |
| 4/9/2015 | 3 | 69 | 19 | 2 | 24 | 53 | 19 | 0 | 0 | 35 | 221 |
| 4/10/2015 | 5 | 19 | 17 | 1 | 63 | 47 | 44 | 0 | 0 | 34 | 224 |
| 4/14/2015 | 2 | 7 | 1 | 1 | 28 | 19 | 14 | 0 | 0 | 6 | 76 |
| 4/16/2015 | 1 | 7 | 17 | 2 | 103 | 120 | 34 | 0 | 0 | 4 | 287 |
| 4/18/2015 | 1 | 1 | | | | 12 | | | | 37 | 50 |
| 4/19/2015 | 1 | 1 | | | | 26 | | | | 76 | 104 |
| 6/17/2015 | 1 | 16 | 17 | 0 | 35 | 50 | 15 | 0 | 8400 | 15 | 8548 |
| 6/30/2015 | 1 | | | | | | | | 2400 | | 2400 |
| Total | 27 | 217 | 136 | 9 | 418 | 705 | 187 | 51 | 10800 | 599 | 13120 |
| Percent | | 1.7% | 1.0% | 0.1% | 3.2% | 5.4% | 1.4% | 0.4% | 82.3% | 4.6% | 100.0% |

The Carryout Bag Tax which went into effect on January 1, 2012 (FY12) does not appear to be reducing the amount of bags collected at the ponds. As seen on Figure III.E.5, there were about 122 more pounds of plastic bags collected in FY15 than in FY14

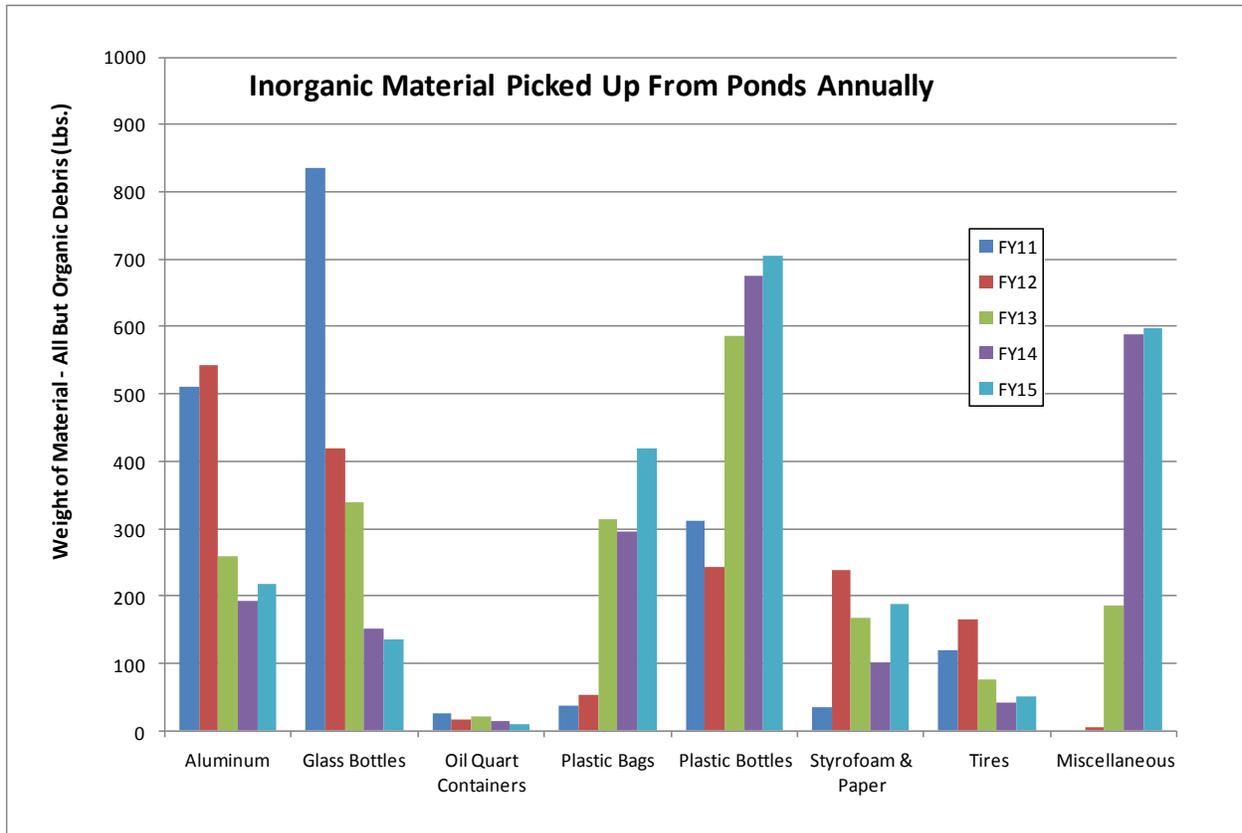


Figure III.E.5. Inorganic Material Removed from the SWM Ponds Annually

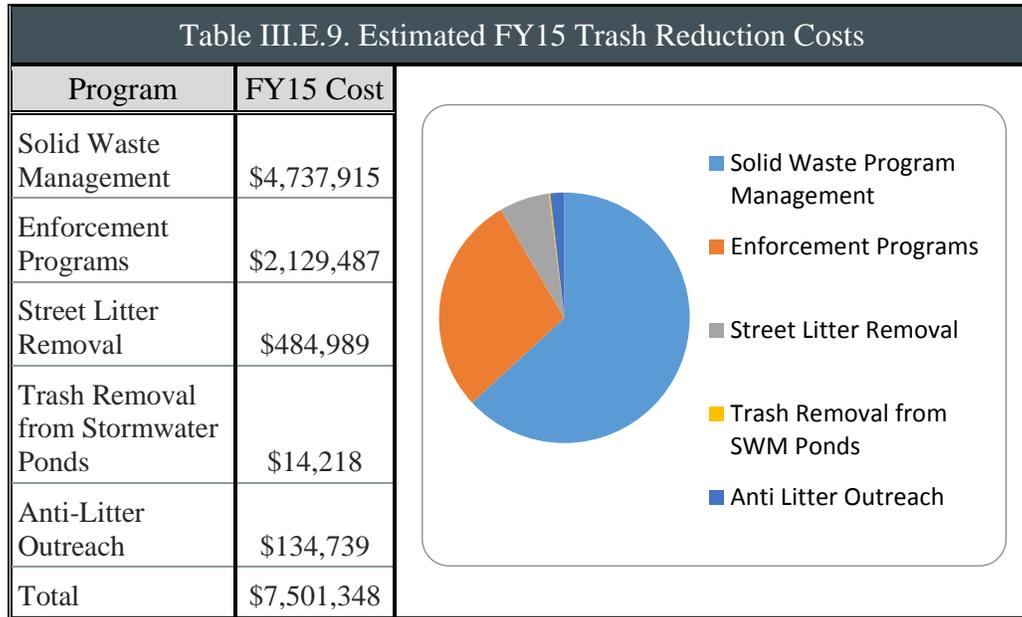
Anacostia Trash Monitoring- Post TMDL

The DEP continues to conduct trash monitoring and assessment in the Anacostia through a contract with the Metropolitan Washington Council of Governments (MWCOG). Monitoring to date includes:

- Completed five cycles of post-TMDL trash monitoring in the Anacostia. The Anacostia tributary monitoring follows the same protocols for stream-level and land-based surveys as those used for trash TMDL development. As of FY15, there is a general decreasing trend for plastic bag, plastic bottle and Styrofoam trash categories.
- Completed three additional types of observation surveys within the White Oak neighborhood of Silver Spring, an area that drains to the stream monitoring station found to contain high amounts of litter. The observation surveys included a bus stop survey, walking survey, and storm drain inlet survey. This data will be used to analyze the effectiveness of future litter control projects in this neighborhood.

Cost of Trash Reduction Efforts

For FY15, the County invested an estimated \$7,501,348 in trash reduction strategies and programs (Table III-E.9).



E.5 Property Management

Table III.E.10 lists the County facilities covered under the MDE General Discharge Permit for Storm Water Associated with Industrial Activities (the General Permit). The MDE accepted NOI's for these facilities in August 2014 for coverage until December 31, 2018. MDE's acceptance letters, as well as the most current stormwater pollution prevention plans (SWPPPs) can be found in Appendix H.

For most of the facilities, DGS has the overall responsibility for meeting the requirements of the General Permit, including updates to the facilities' SWPPP. Agencies housed at the facilities are responsible for implementing portions of the SWPPP that relate to their operations, and include: DOT (Division of Highway Services [DHS] and Division of Transit Services [DTS]); DEP (DSWS and WMD); and DGS Fleet Management Division (FMD). Both the FMD and DHS have Program Managers responsible for environmental compliance for their respective operations at these facilities.

| Table III.E.10. Inventory and Status of County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities | | |
|---|---|--|
| Name Of Facility/ Responsible Agency | Watershed/Acreage | Most Recent Pollution Prevention Inspection and/or Plan (Electronic File included on CD enclosed) |
| Colesville Highway Maintenance Depot (DOT) | Anacostia/Paint Branch; 11.73 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Damascus Highway Maintenance Depot (DOT) | Potomac/Great Seneca: 1.4 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Gaithersburg: Highway Maintenance Facility (DOT) | | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Gaithersburg: EMTOC (DGS) | Potomac/Rock Creek: 15.1 acres | |
| Poolesville Highway Maintenance Facility (DOT) | Potomac/Dry Seneca Creek: 4 Acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Seven Locks Automotive Service Center (DGS) | Potomac/Cabin John Creek: 18.86 Acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Bethesda Highway Maintenance Facility, Sign Shop and Signal Shop (DGS) | | |
| Kensington Small Transit Service Maintenance Facility at Nicholson Court | Potomac/Rock Creek: 3.31 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Silver Spring/Brookville Road Highway Maintenance Facility (DOT) | Potomac/Rock Creek: 17.47Acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Silver Spring/Brookville Road Transit Center/ Fleet Maintenance Center (DGS) | | |
| Shady Grove Processing Facility (DEP) | Potomac/Rock Creek: 43 out of 52.5 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |

| Table III.E.10. Inventory and Status of County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities | | |
|---|--|--|
| Name Of Facility/ Responsible Agency | Watershed/Acreage | Most Recent Pollution Prevention Inspection and/or Plan (Electronic File included on CD enclosed) |
| Gude Landfill (DEP) | Potomac/Rock Creek: 120 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Oaks Landfill (DEP) | Patuxent/Hawlings River (355 acres) and Potomac/Rock Creek (190 acres) | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |

All County facilities have annual comprehensive stormwater pollution prevention (P2) inspections. They are also inspected monthly or quarterly. In FY15, DGS and DOT managed sites consistently had the following P2 related needs, as shown in Table III.E.11.

| Table III.E.11. FY15 Pollution Prevention Needs at County Facilities Covered Under the State General Discharge Permit for Storm Water Associated with Industrial Activities | |
|---|--|
| Pollution Prevention Need | Action Taken |
| Depot lots need more frequent sweeping. | DGS is now funding routine depot lot sweeping. |
| More frequent (daily) housekeeping inspections and small spill clean-up. | Facility personnel are trained annually in proper spill clean-up and preventative housekeeping. |
| Sites need better storage facilities for equipment. | Recommended capital improvements are being evaluated for implementation. |
| Covered storage areas for loose gravels and similar materials with retaining walls separating each product. | Recommended capital improvements are being evaluated and implemented. |
| Most sites need to be repaved and resurfaced. | |
| Improved storage area for waste oil recycling was recommended for the Poolesville Depot. | Covered storage area for the solid waste receiving area is being evaluated. The site is routinely inspected by County contractors. |

| | |
|---|---|
| Parking lot cleaning and inlet protection needed at the Transit area of the Brookville Depot. | The County has a contractor to clean the depot parking lots. The contractor will clean the lots using inlet protection to prevent the wash water from entering the storm drain. |
| | New stormwater quality structures are being added to the Transit bus area at the Brookville Depot. |

Pollution Prevention at DSWS Facilities

The DEP's DSWS is responsible for meeting the General Permit requirements at the Gude and Oaks Landfills and the Shady Grove Processing Facility. The DSWS Environmental Compliance Manager is responsible for ensuring environmental compliance at Solid Waste operational facilities.

The DSWS quarterly stormwater inspection reports indicate that the Oaks and Gude Landfills and the Shady Grove Processing Facility are in good shape. Litter is picked up on the sites and along the perimeter fence lines regularly and the landfills are well vegetated. The Gude Landfill is routinely inspected and stormwater depressions and leachate seeps are identified and repaired as required. The Shady Grove Processing Facility storm drain inlet screens and "capture" bags that screen trash are routinely inspected and cleaned.

In FY15, DOT, DGS, and DEP continued to deliver yearly training on the General Permit requirements to all facility operation employees. Operation specific training, incorporating annual P2 inspection findings, was delivered at each facility location. Assessments, needs and improvements were covered in this training as well as ways to reduce hazardous substances, pollutants, or contaminants.

Pollution Prevention Capital Improvement Program (CIP) Projects

Since 2008, DGS has implemented environmental compliance projects at the County industrial facilities. In FY15, the following environmental compliance CIP initiatives were accomplished:

- DGS is replacing a major transit bus refueling station in Silver Spring, and is installing 3 above ground diesel refueling tanks to replace 2 aging underground tanks. The bus wash steam bay was also upgraded with improved waste water treatment structures.
- DGS is also currently replacing underground storage tanks with aboveground storage tanks at County fire stations and other government facilities.
- Design continued for FY16 planned improvements including three new permanent structures for the bulk storage of highway maintenance materials (topsoil, sand, salt & gravel). The fabric canopy at the Silver Spring depot was replaced, as it was showing signs of failure.
- Two bioretention basins, and a bioswale feature were installed at the Colesville Highway Maintenance depot, to improve the stormwater quality of this facility, which is located within a Special Protection Area. In addition, three large fabric canopies, and an enlarged

truck shed area are being constructed for the covered storage of roadway materials and equipment.

- New antifreeze and motor oil handling tanks and distribution systems were installed at the Seven Locks automotive shop.
- DGS/DOT has begun routine mechanical sweeping of all the industrial facilities, and increasing the cleaning frequency of facility oil/grit separators. In FY15, all depots were swept.
- At the Bethesda Depot, the bulk salt storage barn was repaired and repainted to prevent wood deterioration.

County Co-Permittees Property Management

Town of Poolesville

The Town of Poolesville is the only one of the six small municipal co-permittees that is required to have a General Permit NOI. The Town of Poolesville has a maintenance yard associated with the Poolesville Wastewater Treatment Plant, with outside truck and materials storage, and maintains a current SWPPP for the site. The Town's Public Works Director is responsible for the SWPPP on this site and conducts weekly inspections to assure compliance. The Town reported no changes for FY15.

MCPS

MCPS runs and operates five industrial sites that require coverage under the Maryland General Permit for Discharges Associated with Industrial facilities, Permit 12-SW. The facilities are listed below in Table III.E.12. Most of the facilities are maintained by the MCPS Department of Facilities Management-Division of Maintenance, and Department of Transportation- Division of Fleet Maintenance. The exception is West Farm, which is managed by the Department of Transportation only. All facilities submitted an NOI for coverage under the current General Permit in FY14. MCPS treats 100% of the impervious surfaces at the five industrial sites as confirmed by an engineering assessment of the stormwater facilities.

During FY15, MCPS performed the annual evaluation of the SWPPP and SPCC Plans for all five industrial facilities. Improvements have been implemented at these sites as recommended by the annual inspections. MCPS also maintains 28 underground storage tanks at 17 facilities in compliance with MDE regulations. In FY15, MCPS spent \$263,102 on facility pollution prevention.

| Table III.E.12. Inventory and Status of MCPS Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities (12-SW) | | |
|---|-------------------------------|---|
| Name Of Facility/ Responsible Agency | Watershed/Acreage | Status |
| Bethesda Fleet Maintenance/ Bethesda Facilities Maintenance Depot | Cabin John Creek 6.2 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Randolph Fleet Maintenance/ Randolph Facilities Maintenance | Anacostia 9.3 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Shady Grove Fleet Maintenance/ Shady Grove Facilities Maintenance | Rock Creek 15 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| West Farm Transportation Depot | Anacostia River 5.06 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |
| Clarksburg Fleet Maintenance/Clarksburg Facilities | Seneca Creek 15.11 acres | NOI accepted for registration under the NPDES General Permit. SWPPP updated in FY14. |

MCPS is responsible for training employees in positions that have particular potential for storm water pollution; primarily maintenance and transportation staff. In FY12, an MCPS contractor performed in depth in-house storm water and pollution prevention training for staff in the Facilities Maintenance Division. In FY15, refresher training was provided to Fleet Maintenance staff. MCPS plans to provide online stormwater awareness training to all MCPS support services staff on a 5-year cycle.

The MCPS has programs in place to reduce the amount of pesticides, herbicides and fertilizers on MCPS property. MCPS implements an IPM program at all schools, centers and facilities, with an emphasis on physical rather than chemical measures for pest control, in accordance with MCPS Regulation ECF-RB, Pesticides Use in Schools. Under Maryland Law, only licensed and registered pest control workers may apply any pesticides or herbicides in a school building or on school grounds (COMAR 15.05.02.10). In addition, only certain products are approved for use in and around MCPS facilities by certified pest applicators and all chemicals used undergo a thorough safety review by professional staff. State law also enumerates specific requirements about the storage, use, signage and notification required for pesticide applications. MCPS IPM staff work with facility occupants to stress the need for proper sanitation measures and structural exclusion to control pests, using pesticides only when all other measures have failed. To have more centralized controls in place over fertilizer and herbicide applications, MCPS has a process

to pre-qualify contractors whom perform athletic field maintenance at high school athletic fields in order to. In FY15, MCPS spent \$252,116 on IPM and fertilizer management.

The MCPS continues to work with the WSSC's FOG program to reduce and eliminate SSOs that could potentially originate from MCPS sites and negatively impact stream water quality. As part of this process, MCPS has scheduled the installation and clean out of grease interceptors, provided training, and implemented operational BMPs in all school cafeterias.

E.6 Road Maintenance

The Permit requires the County to reduce pollutants associated with roadways by implementing a road maintenance program that includes street sweeping, inlet cleaning, reducing the use of pesticides, herbicides, fertilizers and other pollutants associated with roadway vegetation management, and controlling the overuse of winter weather deicing materials.

Montgomery County Street Sweeping Program

The DOT and DEP oversee a street sweeping program that uses funding from both agencies. In FY15, DOT funded street sweeping on residential routes, and DEP funded arterial route sweeping (arterial routes are larger roads with more commercial activity, traffic and more observed trash). County contractors use a mechanical broom sweeper.

The DOT sweeps 56 residential routes shown on Figure III.E.6 at least once per year. Nineteen of these routes have been designated as priority residential routes based on the average tons per curb mile collected, lack of adequate stormwater management, and water quality impairment from sediment. These routes also tend to coincide with areas in the County of the highest annual average daily traffic as shown on Figure III.E.7. Sweeping is scheduled so that the priority residential routes are swept first early in the spring to more effectively recover material applied during winter storms.

The remaining 37 DOT swept routes are considered "non-priority" residential routes, and are generally swept once per year following priority residential route sweeping. Some residential roads in rural areas (western and northern) of the County are not swept. The relatively low amount of vehicle traffic and the lack of curbs in these areas make street sweeping impractical. As in past years, more material was collected in FY15 from the priority areas (0.53 tons/curb mile) than the non-priority areas (0.21 tons/curb mile).

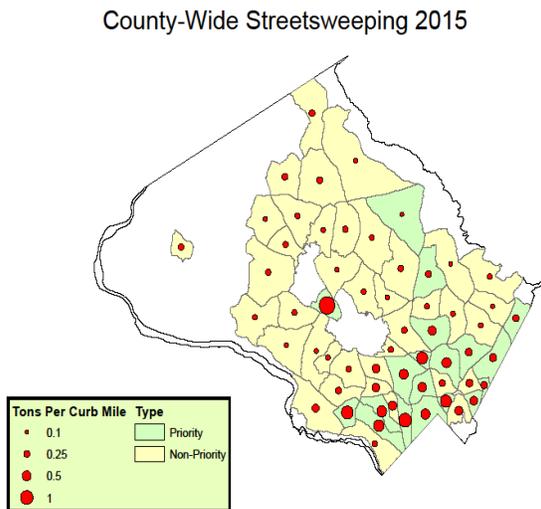


Figure III.E.6. Countywide Street Sweeping

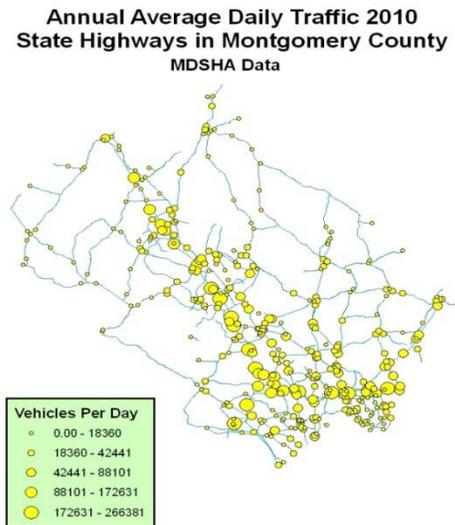


Figure III.E.7. Annual Average Daily Traffic 2010

The DEP funded sweeping of 229 curb miles on arterial routes, shown on Figure III.E.8. The routes are swept at night when traffic volumes are low. Sweeping is only done on segments of the roads without residential housing because of noise considerations. In FY15, DEP swept the arterial routes 23 cycles.

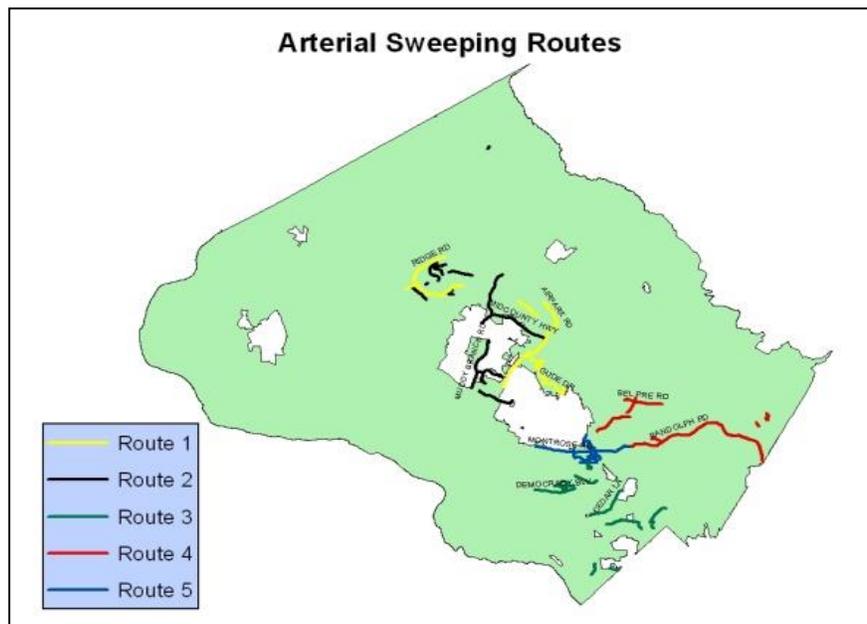


Figure III.E.8. Montgomery County Arterial Street Sweeping Routes

A summary of the County’s FY15 street sweeping program is shown in Table III.E.13.

| Table III.E.13. Summary of County’s FY15 Street Sweeping Program | | | | | | |
|--|--------------------------|------------------|-------------------------|--------------|--------------------|---------------|
| Category | Materials Removed (tons) | Curb Miles Swept | Tons Material/Curb Mile | Cost per ton | Cost per curb mile | Total Cost |
| Priority Residential Routes | 676.81 | 1271 | 0.53 | \$ 137.12 | \$ 73.00 | \$ 92,802.71 |
| Non-Priority Residential Routes | 589.03 | 2785 | 0.21 | \$ 345.10 | \$ 73.00 | \$ 203,275.80 |
| Arterial Routes 23 cycles | 327.02 | 5275.51 | 0.06 | \$ 645.28 | \$ 40.00 | \$ 211,020.40 |
| Totals | 1592.86 | 9331.38 | | | | \$ 507,098.91 |
| County Average Tons Material/Curb Mile | | | 0.17 | | | |

Figure III.E.9 shows tons of materials removed annually by street sweeping from 1999 to present. The tons of sand and salt applied were not reported for FY09 and FY10. In 2002, no County street sweeping was conducted due to lack of funding. The amount of material removed seems related to the amount of sand applied for de-icing, which is related to winter precipitation. More snow and ice increases the need for application of sand to the roads, which then becomes more available for collection during street sweeping. In 2012, DOT stopped mixing sand and salt as a routine practice. DOT now applies a salt brine solution before storms and granular salt to accumulated snow. Sand is still used as a spot treatment and during icy conditions, but the amounts of sand used have declined dramatically. In FY15, no sand was used with 87,900 tons of salt used during 28 mobilizations.

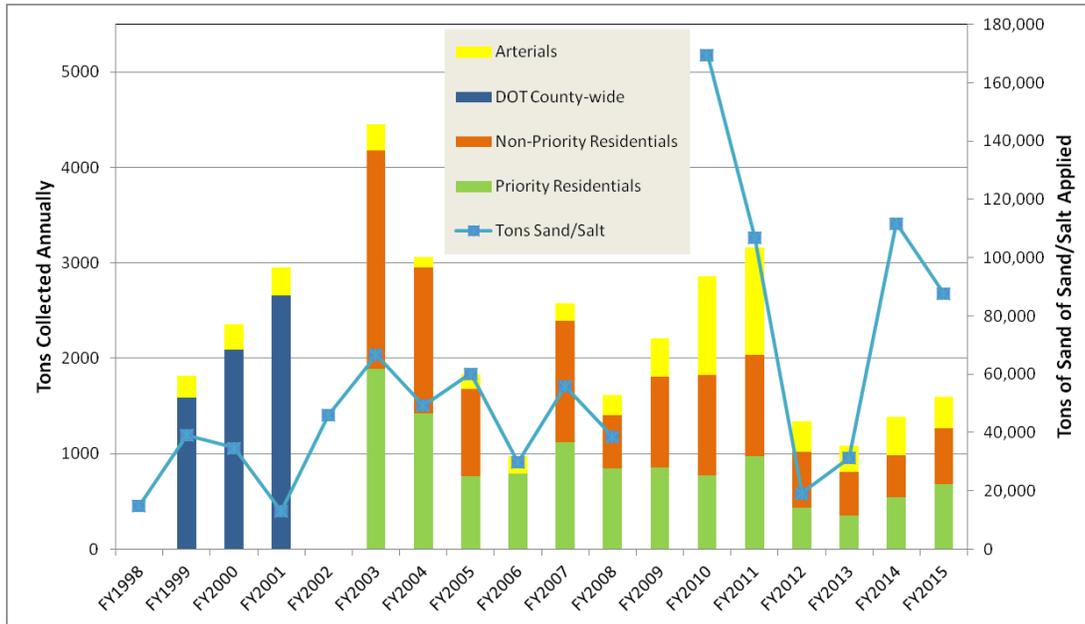


Figure III.E.9. Tons of Material Applied During Winter Activities and Collected by Street Sweeping 1998-2014

Figure III.E.10 below shows the mileage swept per year by route category. Overall average cost per mile remains low as the County continues to emphasize arterial sweeping. (Figure III.E.11).

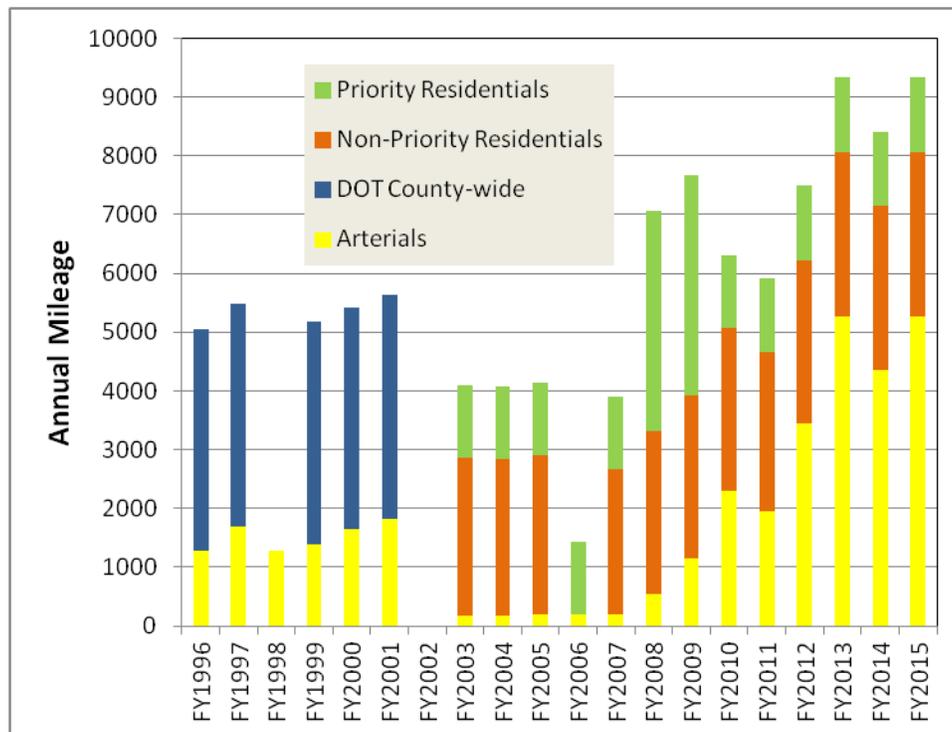


Figure III.E.10. Annual Montgomery County Street Sweeping Mileage 1996-2013

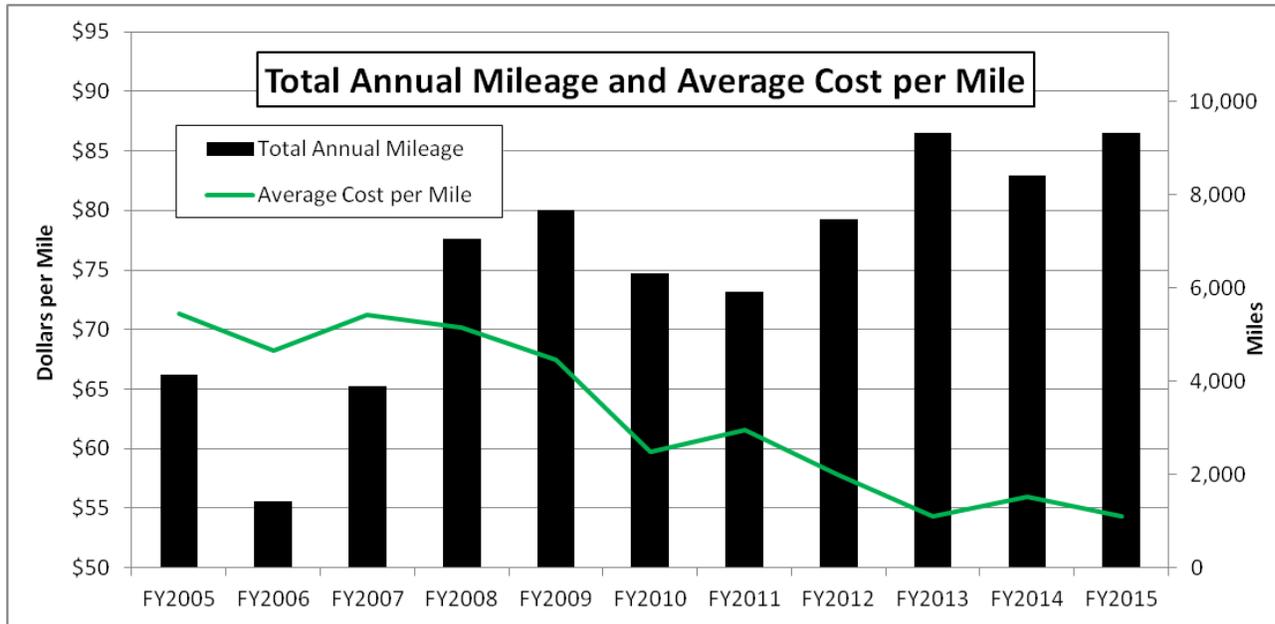


Figure III.E.11. Montgomery County Street Sweeping Mileage and Average Cost 2005-2015

In FY15, DEP decided to update the arterial street sweeping program to identify routes in watersheds with TMDL’s. Street sweeping would then be located in areas with water quality impairments that could benefit from additional pollution controls. DEP has assembled a set of arterial routes in the Anacostia and Rock Creek watersheds, which both have TMDLs for sediment and phosphorous. In selecting these routes, DEP prioritized roads with high traffic volumes and those serving commercial, industrial or multi-family residential land uses. The changes went into effect in November of 2015 and will be discussed in the FY16 Annual report.

Calculating Equivalent Impervious Acreage and Pollutant Reductions for TMDL Watersheds and Countywide

In FY12, the County began sweeping 229 miles of roadway identified as arterial routes twice monthly. Table III.E.14 shows the miles of arterial routes, along with the percent of the total arterial routes, for each watershed. This sweeping frequency allows the County to take credit for stormwater control for impervious acreage equivalent and stormwater pollutant load reductions both Countywide and in applicable 8 digit watersheds with approved TMDLs. The credits were calculated according to MDE’s August 2014 Draft Guidance “Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated”, Table 3.E. Alternative Urban BMPs.

| Table III.E.14. Arterial Street Sweeping by Watershed FY15 | | | | | | | |
|--|------------------------|-------|---------------------------------------|-------------------|------------------|------------------|--------------------|
| Arterial Street Sweeping by Watershed | | | | | | | |
| MD8DIG | Watershed | Miles | Percent of Roadway Swept by Watershed | IA Credit (acres) | TN Removed (lbs) | TP Removed (lbs) | TSS Removed (tons) |
| 02131108 | Brighton Dam Reservoir | 0.1 | 0.1% | 0.1 | 0.7 | 0.3 | 0.0 |
| 02140202 | Potomac Direct | 28.8 | 12.5% | 16.3 | 143.1 | 57.2 | 8.6 |
| 02140205 | Anacostia | 28.7 | 12.5% | 16.3 | 143.1 | 57.2 | 8.6 |
| 02140206 | Rock Creek | 86.4 | 37.7% | 49.0 | 431.5 | 172.6 | 25.9 |
| 02140207 | Cabin John Creek | 26.9 | 11.7% | 15.2 | 134.2 | 53.7 | 8.0 |
| 02140208 | Seneca Creek | 58.3 | 25.4% | 33.0 | 290.7 | 116.3 | 17.4 |
| 02140302 | Lower Monocacy | 0.1 | 0.1% | 0.1 | 0.7 | 0.3 | 0.0 |
| Grand Total | | 229.4 | 100.0% | 130 | 1143.9 | 457.6 | 68.6 |

Notes:

Total Amount of Material Collected in Arterial Routes in FY14= 406.4 tons

IA= Impervious Area

TN= Total Nitrogen

TP= Total Phosphorous

TSS= Total Suspended Solids

Inlet Cleaning

Table III.E.15, below, compares the DOT inlet cleaning program for this Permit cycle from 2010-2015. FY15 impervious acres equivalence treated is 138 acres, as calculated using guidance from “Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated”, MDE, August 2014.

| Table III.E.15. DOT Inlet Cleaning, by Fiscal Year 2010-2015 | | | | | |
|--|------------------|--------------------|-------------------------|------------------------|--------------|
| Year | # Inlets Cleaned | Linear Ft. Cleaned | Debris Collected (tons) | IA Equivalence Treated | Cost |
| FY15 | 2,218 | 31,180 | 346 | 138 | \$353,226 |
| FY14 | 648 | 20,710 | 217 | 86 | \$418,353 |
| FY13 | 803 | 15,769 | 494 | | \$246,200 |
| FY12 | 811 | 14,382 | 367 | | \$275,392 |
| FY11 | 1,191 | 17,604 | 107 | | \$269,593 |
| 2010 | 2,011 | 24,128 | 181 | | Not Reported |

Roadside Vegetation Management

Montgomery Weed Control, Inc. conducts the County’s State required roadside weed spraying program for noxious weeds. Specialized spray equipment achieves cost efficient control with minimal use of herbicides. Operational (BMPs) are always followed. All personnel employed by Montgomery Weed Control Inc. are pesticide applicators registered and trained in compliance with the State Pesticide Applicator’s Law.

Other than for noxious weed control, the County uses no other pesticides, and no fertilizers, for roadside vegetation management. Table III.E.16 shows the amount of herbicides applied along County roadways from 2011-2015.

| Table III.E.16. Herbicide Usage by Montgomery Weed Control Inc. on Montgomery County Rights of Way | | | | | |
|--|---------------------|---------------------|---------------------|----------------------|----------------------|
| Purpose | 2015 | 2014 | 2013 | 2012 | 2011 |
| State-mandated Treatment for Noxious Weeds | 8.29 Gal Clopyralid | 7.35 Gal Clopyralid | 4.84 Gal Clopyralid | 4.78 Gal. Clopyralid | 5.20 Gal. Clopyralid |
| | 1.10 Gal Glyphosate | 2.58 Gal Glyphosate | 4.10 Gal Glyphosate | 4.55 Gal. Glyphosate | 4.55 Gal. Glyphosate |
| Program Cost | \$22,000 | \$22,000 | \$22,765 | \$22,000 | \$20,000 |

Note: Herbicide use is directly correlated to growing conditions for each season

Winter Weather Materials Application

The DOT uses plowing and salting to achieve a desired level of winter weather roadway treatment. The DOT follows the October 2011 Maryland State Highway Administration Salt Management Plan. All application equipment is calibrated once a year. In FY11, DOT launched a new on-line system to track the status and progress of roadway treatment and plowing during winter weather events. In FY12, the Snow Tracking Application was revised to include salt used per route to identify trends in salt usage and improve salt use management. In 2012, the DOT discontinued ordering sand for use in de-icing roads.

In 2009, DOT began a salt brine pilot program on 240 lane miles of primary roads. Salt brine is a 23 percent salt solution created in a brine maker and stored in tanks until used. Brine has a freezing point of -6 degrees F and continues to work when salt, which loses effectiveness at 20 degrees F, does not. A contractor sprays the salt brine on highways 2 hours to 2 days prior to the onset of frozen precipitation to prevent snow and ice from bonding to pavements. In 2010, over 400 lane miles of both primary and secondary roads received salt brine applications using contracted and County equipment. In the 2011-2012 winter seasons, DOT purchased additional salt brine making equipment and storage tanks and developed the salt brine treatment program to include 678 lane miles of primary, secondary and some neighborhood roads. In FY15, DOT sprayed a total of 36,400 gallons to treat 606 miles.

Table III.E.17, below, compares DOT’s winter weather deicing materials use from FY10-FY15.

| Table III.E.17. DOT Winter Weather Deicing Material Usage from FY10-FY15. NR=not Reported | | | | | | |
|---|--------|---------|--------|---------|--------|--------------------------------|
| | FY15 | FY14 | FY13 | FY12 | FY11 | FY10 |
| Salt, tons | 87,900 | 111,787 | 31,309 | 15,200 | 85,600 | 169,633 sand and salt combined |
| Sand, tons | 0 | 10,000 | 0 | 3,800 | 21,400 | |
| Salt Brine, gallons | 36,400 | 121,787 | 93,005 | 122,031 | NR | NR |

E.7 Public Education and Outreach

Compliance Hotline

The Permit requires the County to establish and publicize a compliance hotline for public reporting of spills, illegal dumping and suspected illicit discharges. The County maintains a call center that allows citizens to call one number (311) for all concerns in the County, including surface water quality concerns. More information can be found on the 311 home page at: <http://www3.montgomerycountymd.gov/311/Home.aspx>

DEP Communications

In FY15, the My Green Montgomery online education portal (www.mygreenmontgomery.org) continued its long term strategy as the news and communication arm of the DEP Office of Sustainability. The website was redesigned for mobile responsiveness so that the public can easily access information “on-the-go” with an engaging blog design, search functionality, a new “Your Stories” blog feed and the elimination of the “Green Plan” registration. The website is more colorful, dynamic and easier to navigate no matter the device.

My Green Montgomery also launched an instagram site, @MyGreenMC. It is one of the first instagram accounts in the County.

Social Media Statistics for DEP

- Facebook “likes” grew from 305 to 560, an 83.6% percent increase in reach.
- Twitter followers grew from 415 to 696, a 67% percent increase in reach.
- Instagram was launched and had 55 followers as of end of the fiscal year.

More than 5,800 pictures and videos were placed on DEP’s Flickr website, nearly all related to water, restoration and watershed outreach activities.

Newsletters

The My Green Montgomery monthly newsletter grew from 399 recipients to 956, a 139 percent increase in readers.

My Green Montgomery Website

Eighty-eight blogs were posted in FY15 with 34 focused on water issues. The most visited water focused blogs were on the RainScapes trainings, the success of the bag law, stormwater pond winter safety and the winners of the storm drain art contest.

The My Green Montgomery website had 14,074 users in FY15 (a 31.5% increase over the previous fiscal year) and 31,008 unique page views.

DEP Website

The DEP website (www.montgomerycountymd.gov/dep) received 373,045 users making more than a million and a half page views. 122,820 of the page views were for water related pages with the most visited pages being the RainScapes and stormwater facilities pages.

Montgomery County GreenFest website

The Montgomery County GreenFest website (www.montgomerycountygreenfest.org) launched on February 22nd, in advance of the GreenFest one month later. Between February 22nd and March 28th, the site had 22,542 page views with 5,188 users. On GreenFest itself, there were also 787 users alone.

Summary of FY15 Stormwater Outreach Efforts

In FY15, DEP events focused on targeting audiences, increasing stormwater awareness, encouraging directionally correct measures, and establishing baseline information through surveys. The baseline information will help guide follow-up measures. DEP will continue to search for ways to estimate pollutant reductions from behavior change, beyond those documented in the Strategy, or will default to criteria when established by MDE.

The DEP hosted or participated in 150 outreach events in FY15. There were 14,798 attendees directly educated as a result of outreach efforts in FY15. Figure III.E.11 represents the steady increase in outreach activity by DEP over the past 5 years of the Permit cycle. Figure III.E.12 represents a breakdown of stormwater outreach events by DEP section in FY15.

The number of public outreach meetings focused on specific CIP watershed restoration projects saw a five-fold increase over the Permit term with the total number of people reached through public meetings increasing four-fold from 200 to over 800. In the future, as restoration projects shift increasingly towards small-scale ESD practices, public outreach efforts will continue to increase. Smaller scale practices are more integrated into neighborhoods, have more potential impact on nearby residents, and will require increased public coordination to ensure project acceptance.

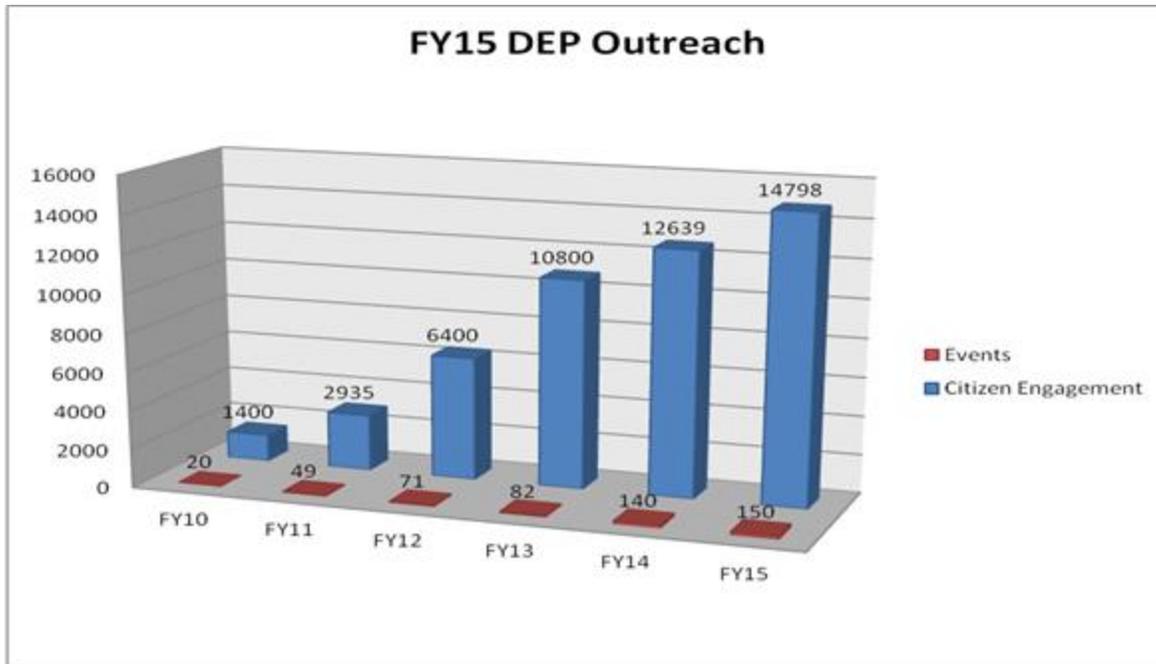


Figure III.E.12- DEP Stormwater Related Outreach Events and Public Participation FY10-FY15

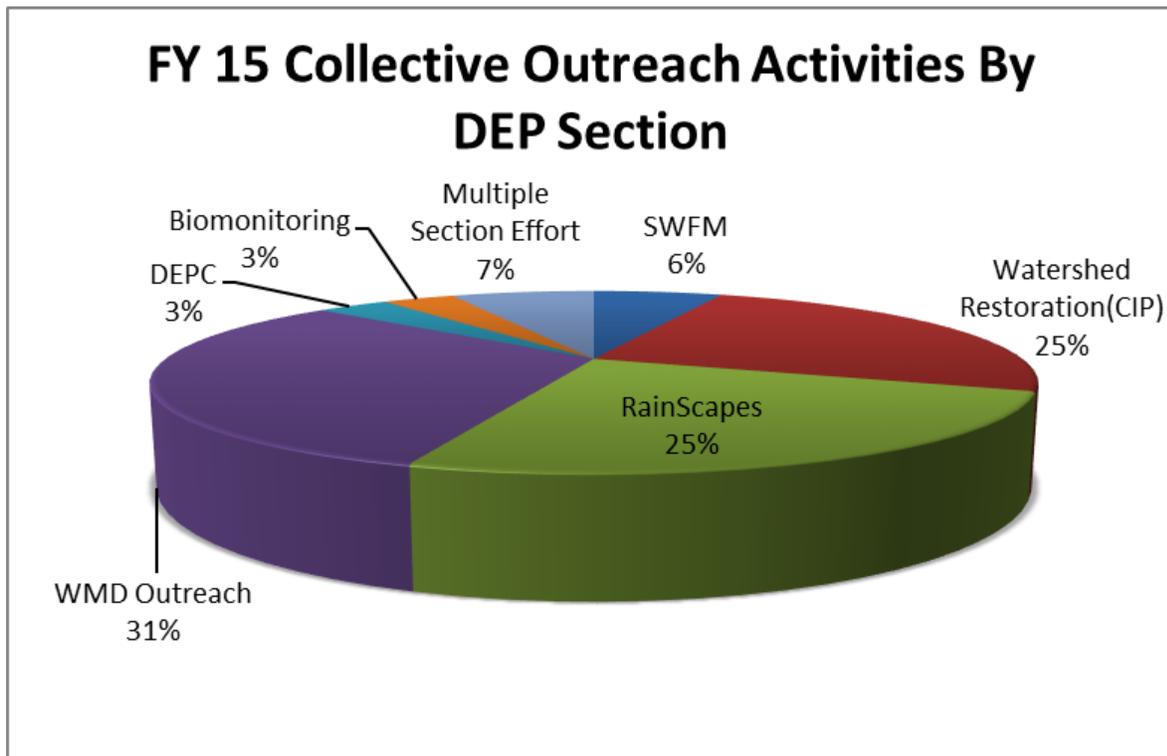


Figure III.E.13- Program Outreach by DEP Section

| Table III.E.18. Areas of Increased Outreach | | |
|---|---|--------------------------|
| Public Outreach | Activity | % Increase in Engagement |
| Outreach Events | | 17.0% |
| Social Media Presence | Facebook | 83.6% |
| | Twitter Followers | 67.0% |
| | My Green Montgomery Newsletter | 139.0% |
| | My Green Montgomery Website | 31.5% |
| | | |
| Stream Stewards | Volunteer Participation | 141.0% |
| | Donated Hours & Service Value to County | 66.5% |
| | Volunteer Events | 70.0% |
| | Litter & Recyclables Collected | 80.0% |

Outreach Database

In FY15, DEP developed a new outreach database that tracks outreach activities across multiple DEP programs, including watershed restoration. The new database increases reporting efficiency by standardizing data required for each outreach effort. DEP planners use the database to coordinate events that occur in close proximity or time frames, allowing for enhanced outreach. Metrics tracked include:

Focused Efforts to Provide Outreach to Culturally Diverse Communities

In 2015, the population in Montgomery County increased 6 percent since 2010. According to the US Census Bureau, 46 percent of the population affiliated themselves as White, non-Hispanic. Hispanic and African American populations were both 19 percent, respectively and the Asian population increased to 15.2 percent*. Approximately 39% of households speak a language other than English in the home. DEP recognizes the need to develop outreach targeted to the County’s increasingly diverse demographics, and provides translation services for many of its public outreach materials. DEP also provides onsite translations at DEP restoration projects and during enforcement.

(*<http://quickfacts.census.gov/qfd/states/24/24031.html>).

Public Outreach and Stewardship Work Plan (POSWP) Implementation

1. Public Outreach and Stewardship Work Plan (POSWP)

The Permit requires the County to develop and implement a public outreach and education program focused on stormwater pollution reduction. To meet this requirement, the County developed a POSWP as part of the County's overall Strategy. The POSWP includes practice sheets for eight specific outreach campaigns such as: pet waste management, lawn stewardship, anti-littering, stormwater awareness, establishing a volunteer program, riparian reforestation, roof runoff reduction and parking lot recharge. Each practice sheet identifies performance goals, key messages, intended outcomes, targeted audiences, partnerships to develop, delivery techniques, startup costs, measurement objectives, timelines and milestones from start up through 2025. The practice sheets along with outreach recommendations developed for each County Watershed Implementation Plan make up the POSWP. The practice sheets can be found online at

<http://www.montgomerycountymd.gov/DEP/Resources/Files/ReportsandPublications/Water/Countywide%20Implementation%20Strategy/Watershed-Outreach-Plan-2012.pdf>

2. Pet Waste Management Program (POSWP Priority Practice #1)

In FY14, DEP initiated a pet waste pilot program in three homeowner association (HOA) communities in the Rock Creek watershed. DEP funded installation of seven pet waste stations, and one year of maintenance. After one year, the HOAs then had the option to "adopt" the stations and assume maintenance responsibility. In FY15, the pilot program ended, and all seven stations were adopted by the participating HOA communities. Over the one year pilot, DEP collected **1,669** pounds of dog waste, removing a source of bacteria, nitrogen and phosphorous pollution to Rock Creek.

In FY15, DEP worked with the County's Commission on Common Ownership Communities (CCOC) to promote the program to HOAs in the Cabin John Creek and Anacostia watersheds. DEP also ran targeted ads in the local newspaper, developed lawn signs for HOAs that adopted pet waste stations, distributed 1,447 door hangers publicizing the program, and developed a pop-up banner for community outreach events. Four HOAs in the Anacostia participated and DEP established 21 stations. As in the pilot program, DEP funded installation and one year of maintenance. In FY15, a total of 1,637 pounds of pet waste were collected. Figure III.E.13 shows example outreach advertisement for DEP's pet waste program. Table III.E.19 summarizes the number of pet waste stations and waste collected by watershed and fiscal year.

| Table III.E.19. DEP Pet Waste Program | | | | |
|---------------------------------------|----------------------------|-------------------------------|---|---|
| Watershed | Number of Stations FY14 | Number of Stations FY15 | Amount of Dog Waste Collected FY14 (lbs) | Amount of Dog Waste Collected FY15 (lbs) |
| Rock Creek | 7 | 10 | 1,669 | 705 |
| Anacostia River | NA | 11 | NA | 932 |
| Cabin John Creek | NA | 0 | NA | 0 |
| Total | 7 | 21 | 1,669 | 1,637 |



Figure III.E.14- An Example of DEP’s Pet Waste Campaign Advertisement.

The DEP also surveyed the four new Anacostia HOA communities as part of an ongoing effort to identify components of successful programs to change behavior. 1,447 surveys were mailed out and 515 responses were received for a 36 percent response rate. So far, respondents indicated that their primary concerns are accessible locations of the pet waste stations, and keeping their community clean. There was little to no connection to improving water quality. DEP uses the results of these surveys to inform future outreach efforts.

DEP also continued to promote a pet waste pledge where citizens can promise to pick up after their pet. For their pledge, citizens received a portable bag holder that affixes to a leash. In FY15, an additional 120 citizens signed the pet waste pledge (395 citizens have participated since creating the pledge in FY14).

3. Anti-Litter Campaign (POSWP Priority Practice #3)

In FY15, DEP's WMD worked with active community groups to support and expand local cleanup efforts particularly in the Anacostia watershed. IMPACT Silver Spring, a local nonprofit, partnered with DEP to conduct two community cleanups near the East County Community Center. A total of 79 volunteers removed over 985 pounds of trash and the group has agreed to lead three community cleanups per year.

In addition, DEP outreach on the County's Carryout Bag Tax has increased in focus. At the end of FY15, outreach planners were working with the County's public information office to make improvements to the Carryout Bag tax website <http://www.montgomerycountymd.gov/bag> and create new focused advertising to retailers, restaurants and the general public. In FY15, DEP distributed 2,590 reusable bags to the community.

The DEP also continues to participate in the regional anti-littering campaign led by the Alice Ferguson Foundation.



Figure III.E.15 Rock Creek Conservancy Stream Team Volunteers

4. Stream Stewards Outreach and Stewardship Campaign (POSWP Priority Practice #5)

This priority practice includes programs that promote champions for neighborhood streams and increased community involvement in stormwater issue awareness and watershed protection.

Stream Stewards Volunteer Program

The DEP Stream Stewards Program trains volunteers to assist DEP at outreach events (Watershed Ambassadors), and to adopt and help maintain ESD practices on public property (Watershed Keepers). In FY15, DEP trained 205 volunteers, a 141 percent increase from FY14. Volunteers donated 1214 hours through the program, a 66.5 percent increase from FY14. Finally, the volunteers participated in 22 events (a 70 percent increase) and collected 1,935 pounds of trash and recyclables (an 80 percent increase). The service value of these individuals donating their time to improve water quality in the County was \$27,892.70.

This represents a 66.5 percent increase from FY14. Results from the program are shown in Table III.E.20.

| Table III.E.20. Stream Stewards Volunteer Activities FY15 | | | |
|---|------------------|----------------------|---------------|
| Volunteer Opportunity | Number of Hours | Number of Volunteers | Service Value |
| Office Assistance | 92 | 1 | \$ 2,120.60 |
| Orientation | 133 | 78 | \$ 3,065.65 |
| Watershed Ambassador | 430 | 108 | \$ 9,911.50 |
| Watershed Keeper | 559 | 208 | \$ 12,884.95 |
| Office Assistance | 92 | 1 | \$ 2,120.60 |
| Total Events in FY15 | 22 events | | |

*Total number of volunteers, not total times a volunteer participated, some volunteers participate multiple times.

*Service value per Independent Sector (http://www.independentsector.org/volunteer_time)

In FY15, the 205 volunteers participated in over 20 activities including:

- 2014 Montgomery County Agricultural Fair
- Clarksburg Day, October 10, 2014
- DEP sponsored (4) and supported (3) cleanups collecting over 1,935 pounds of trash and recyclables
- Installed storm drain art projects to increase stormwater awareness(9)
- Thirty three volunteers participated in three FrogWatch trainings, including one onsite training

Watershed Management Interns

The DEP Biological Monitoring Section conducts detailed biological, chemical, and physical assessments of County watersheds on a 5-year rotating basis (see III.F. Watershed Assessment). DEP recruits and trains volunteer interns each year to assist with the monitoring and laboratory analysis. In FY15, eight volunteers donated a total of 1,797 hours to the program helping staff to analyze and monitoring water quality and area resource conditions in the County. This results in a service value to the County in the amount of \$41,420.85. In combination with the Stream Stewards program this results in over 3,000 hours of donated time to the County, a total service value from the community of nearly \$70,000.00.

Watershed Group Capacity Building

The DEP works with County watershed groups to develop organizational capacity, fostering sustainable local groups that can provide additional outreach to their communities on stormwater pollution prevention, education programming, and fostering behavior change in the County.



Figure III.E.16. Watershed Group Members Attending the 2014 Chesapeake Watershed Forum

For the 5th year, DEP provided funding for one representative from each watershed group to attend the annual Chesapeake Watershed Forum (CWF) sponsored by the Alliance for the Chesapeake Bay. The CWF sessions provided information on grass roots approaches for watershed outreach and implementation. DEP also recruited assistance from the River Network to perform contractual trainings on group development. All groups participated in the trainings. FY15 focused on strategic planning and group assessment. Due to their efforts in group capacity building, DEP outreach staff was invited to present at the 2015 River Rally held in Sante Fe, New Mexico.

Watershed Group Accomplishments

During FY15, eight watershed groups actively recruited members and conducted special activities including educational events, roadway and watershed clean-ups, and invasive plant work days. These groups include the Friends of Sligo Creek, the Neighbors of Northwest Branch, the Rock Creek Conservancy, the Little Falls Watershed Alliance, the Friends of Cabin John Creek, the Muddy Branch Alliance, the Seneca Creek Watershed Partners and the Watts Branch Alliance. Four of the eight groups applied and received watershed restoration and outreach grants (see page III.E.63) from DEP in FY15.

The DEP continued its focus on tracking litter removal and community outreach by the watershed groups. In FY15, DEP notes that activities from all the groups have noticeably increased. Highlights include:

Rock Creek Conservancy

The Rock Creek Conservancy worked with DEP on two projects in FY15: Storm Drain Art (described below) and the Pet Waste pilot (described previously). They also individually completed the following activities in their watershed:

- Hosted 10 educational events
- Mobilized 446 volunteer for 1009 volunteer service hours (226% & 279% increase respectively)
- Collected 240 bags of trash and 50 bags of invasive plant material removed (37% increase)
- In coordination with DEP, installed 4 storm drain mural art projects
- Received a watershed restoration and outreach grant to implement a backyard habitat program



Figure III.E.17 Rock Creek Conservancy Stream Team Volunteers

Seneca Creek Watershed Partners

- Established a board of directors, mission & vision statements
- Received their 501c3 status
- Established a membership fee structure
- Established the groups new website, <http://senecacreekwatershedpartners.wildapricot.org/>

Watts Branch Alliance

- Began the process of establishing a Board of Directors and 501c3

Neighbors of Northwest Branch

- Hosted one cleanup and collected 6 bags of recyclables, 10 bags of trash, 3 tires, lawn chairs, hubcaps, pipes, boards, and a car bumper involving 25 volunteers
- Held 6 board meetings and about a dozen public events
- Partnered on the St. Camillus Parish conservation landscape installations.
<https://www.youtube.com/watch?v=WFNeSeV0pVk>
- Provided testimony for Bill 52-14, Non-Essential Pesticides bill to County Council.

Friends of Cabin John

- Received a watershed restoration and outreach grant
- Hired a part-time outreach coordinator
- Received their 501c3 status

Friends of Sligo Creek (FOSC)

- Conducted their biannual Sweep the Creek events
<http://www.fosc.org/LitterCommittee.htm>
- Received a watershed restoration and outreach grant for the expansion of the WaterWatchDogs program.

Little Falls Alliance

- Annual activities from their 62 events can be viewed in the group's annual report
<http://www.lfwa.org/annual-reports>
- Hired a part time executive director
- Increased their social media presence - 196 likes on Facebook:
<https://www.facebook.com/Little-Falls-Watershed-Alliance-157671030936633/>
- Received 44 donations via a one day "Do More" campaign raising \$2,205
- Coordinated hundreds of volunteers during regular stream cleanups
- Collected 62 bags of trash and 18 bags of recyclables.

Muddy Branch Alliance

- Participated in or hosted 162 events
- Received the City of Gaithersburg Environmental Achievement and Organization of the Year awards (Figure III.E.16)
- Received a watershed restoration and outreach grant to develop the Montgomery County Watershed Stewards Academy
- Continued to be an incubator to the Seneca Creek Watershed Partners and Watts Branch Alliance



Figure III.E.18. Muddy Branch Alliance Members Receiving the City of Gaithersburg Organization of the Year Award

5. Innovative Stormwater Management Outreach and Stewardship (POSWP Practice #4)

This priority practice focuses on promoting public understanding and support of stormwater management practices, particularly ESD, and watershed restoration.

H2O Summit and First Annual Montgomery County Greenfest

The Montgomery County H2O Summit is an annual event, created in 2011 to provide County watershed groups a venue to share information and network. The H2O Summit received a National Association of Counties achievement award in FY15. For the 2015 event, the summit was held as part of a larger event, the Montgomery County Greenfest. The Greenfest was developed with the creation of a public-private partnership that included 13 organizations to reach an even larger community audience. The event was held at the Montgomery College Silver Spring/Takoma Park campus and was composed of a family friendly festival, green living workshops. Although attendance was tracked it is estimated that 700-1000 citizens were in attendance. Attendees were surveyed (Table III.E.21) about their actions and behaviors and were also asked to voluntarily participate in commitment pledges. Thirty-one attendees made pledges on the commitment boards (Figure III.E.17). Follow up will be taken at the 2016 GreenFest.



Figure III.E.19 Montgomery County Greenfest Participant

Survey highlights: Results By Question (99 respondents)

- 1) 41% of respondents categorized themselves as “Baby Boomers”
- 2) 56% stated they Always recycled plastic bags
- 3) 64% stated they Always or Frequently carry their own water bottle.
- 4) 44% Always or Frequently gave up meat in a meal. 43% stated sometimes.
- 5) 36% stated they Always or Frequently take public transportation, 52% stated sometimes.
- 6) 66% stated they Always or Frequently consider the environment when making a purchase decision.
- 7) 43% of respondents stated they had planted a tree or garden in the past few months.
- 8) 44% stated they had contributed to an environmental organization in the past few days.
- 9) 65% stated they had Never calculated their personal carbon footprint.
- 10) 36% and 42%, respectively, felt that the most pressing issue related to climate change was the insecurity of our food and water and the loss of biodiversity/extinction of species.
- 11) 83% of the event respondents felt they owned enough “stuff”

Several videos covering the event by the media can be viewed:

- https://www.youtube.com/watch?t=16&v=hb7_H4fW3P8
- <https://www.youtube.com/watch?v=pD7IBkTAJaw&feature=youtu.be>
- https://www.youtube.com/watch?v=gunXkTP_23U

- Event Photos:
https://drive.google.com/folderview?id=0B9pyJIP6k_iTfkxTWndwQjNsQm01VjduLTJWUTJdGVJdEh00UU2SWJfcWY0MXJ5aFBMNVk&usp=sharing
- GreenFest attendees used Twitter to show their support during the event:
<https://storify.com/MyGreenMC/montgomery-county-greenfest-2015-2016>

| Table III.E.21. FY15 H2O Summit Survey Responses | |
|---|--|
| 2014 H2O Summit | |
| Total Attendance | 490 |
| Reason for attending | Expand Environmental knowledge, Networking, Interest in Stormwater Management |
| Collective Workshop ratings | 8.85 out of 10 |
| Likelihood of attending future events | 97.4% |
| DEP’s effectiveness rating of protecting the County’s water resources | 7 out of 10 |
| Household pollution habits (117) | Recycling (32%), Not applying fertilizers/ pesticides (28%), Not littering/picking up litter (28%) |
| Registered attendees average age (174) | 43.4 years |

Caching the Rain

The “Caching the Rain” trail is a scavenger hunt geocaching activity with a stormwater pollution outreach focus. DEP set up geocaches at six locations primarily in the down county area near stormwater facilities. Participants answer stormwater related trivia questions at each station and verify their answers in a survey once they complete the trail. DEP launched the pilot program on June 28, 2014. Since the launch, the six locations have been visited over 750 times, collectively. Other facts include:

- 120 citizens have completed the geotrail and received a souvenir coin.
- The Caching the Rain Geotrail has been “favorited” and shared by participants a total of 42 times.
- Of the behaviors/action steps the participants learned about during the geotrail, 66% said they would be highly interested/likely to add a RainScape practice to their property.
- 46% were willing to reduce the amount of fertilizer and pesticides they use on their property.

- 46% were also willing to plant a native tree on their property.
- 37% stated they would be likely to volunteer for an environmental cause
- 84% stated they recycle on a regular basis.



Figure III.E.20. "Caching the Rain" Participants With Sample Question

Storm Drain Art (POSWP Priority Practices #4 and 5)

This project expanded from a pilot to a program in FY15 including innovative outreach with volunteer engagement to raise stormwater pollution awareness and effect behavior change. In FY14, DEP and Stream Steward volunteers initiated a storm drain art pilot project with the Rock Creek Conservancy. FY15 saw this develop further into a larger program to include an art contest (Figure III.E.21), and coloring book (Figure III.E.20). DEP also took over the storm drain marking program, previously administered by DOT.

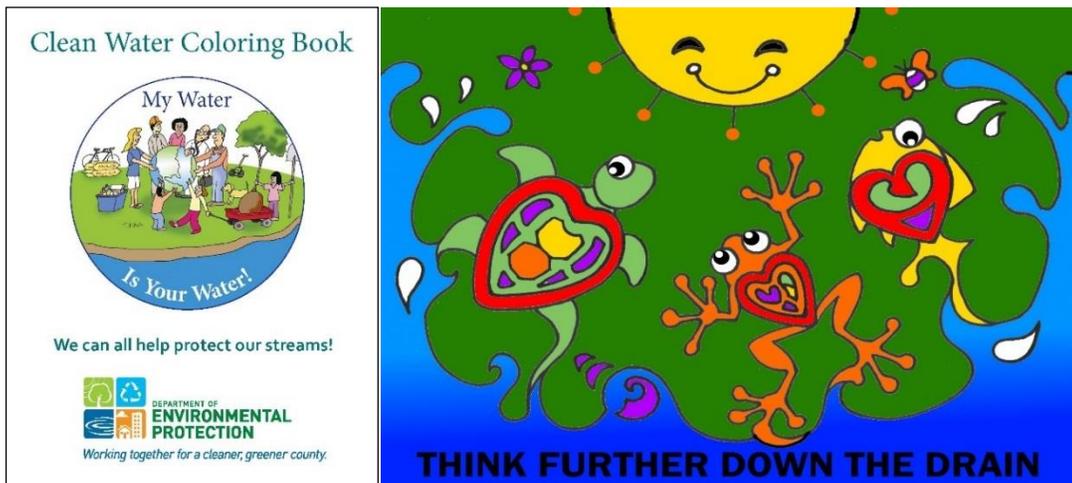


Figure III.E.21. Storm Drain Art Design and Coloring Book



Figure III.E.22. The Winner of DEP’s Storm Drain Art Contest at the White Oak Regional Services Center.

Storm Drain Art Program Highlights:

- Launched and held first storm drain art contest which later resulted in a coloring book.
- Educated residents about storm drains by painting educational messages on 9 storm drains. Storm drains were picked based on high traffic areas and issues with litter in the community. These issues were complaints from community residents and documented data about high levels of litter in the community. All storm drains were painted with help of volunteers overall 25 volunteers helped with painting the storm drains at different times in the year.
- First storm drain painted on private property! One of the storm drains was picked because of a recurring issue of cooking oil being illegally placed/thrown into the drain. After coordinating with DEP enforcement staff and the owner of the business the storm drain was painted with art and a message to protect our waters. To date, no additional complaints have been received at this site.

FrogWatch (POSWP Priority Practices #4 and 5)

The County established a local chapter of the national FrogWatch program in February 2014. FY15 saw continued interest in the program with 33 people attending two indoor trainings and one field training. The volunteers donated a total of 78 hours to this program, observing 103 total frog and toad observations. FY15 also resulted in two observations of the green

tree frog, thought to not occur in the area. These observations can help the DEP Biological Monitoring Section staff determine population trends and inform conservation decisions during the planning of SWM facility retrofits. The program was also featured on a “Did You Know” segment on County Cable in June. <http://youtu.be/q2F-iJNgmWs>.

Water WatchDogs Program: POSWP Priority Practice #4 and 5

Water WatchDogs is a partnership between a Sligo Creek neighborhood group, the FOSC watershed group, and DEP’s Environmental Enforcement section. During FY13, the partnership developed an email alert mechanism for reporting water pollution incidents discovered by the community. FOSC keeps track of the pollution reports that result from the email alerts, and relays information to the community through their action log blogging system. Three volunteers administer the program, including advertising through community presentations and trainings. The program continues to be featured on the FOSC website, <http://www.fosc.org/WaterWatchDog> including the reporting form. <http://www.fosc.org/WWDReport>). In FY15, there were 19 incidents reported through the system, doubling the number of reports since the program began.

Watershed Restoration and Outreach grants

The DEP developed the Montgomery County Watershed Restoration and Outreach Grant Program in FY15 for eligible non- profit organizations. The grant program funds projects that reduce pollutants through community-based restoration practices as well as projects focused on public engagement through education, outreach, and stewardship. The Chesapeake Bay Trust (CBT) was contracted to administer the program which is funded by the WQPC. RFPs were released in September and grants were ranked then approved in February of 2015. A total of \$371,756.00 was allocated to 13 different nonprofit organizations in FY15 (Table III.E.22)

Approved projects include:

- Three grant projects funding improvements on congregational land to install cisterns, plant trees, and conservation landscaping and conduct educational workshops. There are 524 congregations in Montgomery County who control more than 767 acres of impermeable surface, 18% of the Permit’s 20% restoration goal. 354 congregational sites with 316 impervious acres have no stormwater management. One grant, awarded to the National Wildlife Federation (NWF) linked habitat and stormwater management outreach. NWF’s project ‘Public Outreach and Stewardship on Sacred Grounds: Engaging in the Faith-Based Community of Montgomery County in Watershed Management’ delivered two workshops in Montgomery County, which hosted a total of 37 congregations to learn about the DEP RainScapes Congregations program and the National Wildlife Federation Sacred Grounds program. The other congregational grants focused on cisterns and tree installations and are on-going.
- Four grants awarded to local watershed groups: Friends of Cabin John, Friends of Sligo Creek, Muddy Branch Alliance and Rock Creek Conservancy. These grants ranged from installing conservation landscaping and rain barrels to developing a Countywide nonprofit- led watershed academy.

- Other awarded grants include stormwater educational workshops and videos, performing a full site stormwater assessment, conducting community-wide outreach and installing stormwater demonstration projects. Applicants ranged from private schools to community and civic associations.

| Table III.E.22. DEP Watershed Restoration and Outreach Grant Recipients | | | |
|--|--|---|----------------------|
| Grant # | Title | Applicant | Award Amount |
| 12820 | Public Outreach and Stewardship: Montgomery County Watershed Stewards Academy | Muddy Branch Alliance | \$ 10,000.00 |
| 12797 | Public Outreach and Stewardship; and Community-Based Restoration Implementation: Neighbor to Neighbor (N2N) | Carderock Springs Citizens Association | \$ 11,930.00 |
| 12795 | Public Outreach and Stewardship Project for the Cabin John Creek Watershed | Friends of Cabin John Creek (and) Watershed | \$ 42,000.00 |
| 12794 | Public Outreach and Stewardship- Watershed and Stormwater Management Education Videos | Chesapeake Conservation Landscaping Council | \$ 15,000.00 |
| 12793 | a) Public Outreach and Stewardship and b) Community-Based Restoration Implementation: Creating a Watershed Restoration Public Demonstration Center at Woodend Nature Sanctuary | Audubon Naturalist Society of the Central Atlantic States, Inc. | \$ 26,331.00 |
| 12792 | Public Outreach and Stewardship - Stakeholder engagement at Glenville Road and Grand Bell II | Montgomery Housing Partnership | \$ 20,000.00 |
| 12790 | Public Outreach and Stewardship and Community-Based Restoration Implementation at Sandy Spring Friends School | Sandy Spring Friends School | \$ 49,997.00 |
| 12789 | Trees for Sacred Places Montgomery County | Alliance for the Chesapeake Bay, Inc. | \$ 31,256.00 |
| 12787 | Enhancing the Green on Greenery Lane Demonstration Project | Bethesda Green | \$ 32,000.00 |
| 12786 | Public Outreach and Stewardship on Sacred Grounds: Engaging the Faith-Based Community of Montgomery County in Watershed Management | National Wildlife Federation | \$ 51,557.00 |
| 12785 | Community-Based Restoration Implementation: Churches to increase cistern and rain garden ripples through Montgomery County | Anacostia Riverkeeper | \$ 27,685.00 |
| 12784 | Public Outreach and Stewardship- Rock Creek Park In Your Backyard | Rock Creek Conservancy | \$ 38,000.00 |
| 12782 | Public Outreach and Stewardship: Expanding the Water WatchDog Program in the Sligo Creek Watershed | Friends of Sligo Creek | \$ 15,000.00 |
| | Total | | \$ 370,756.00 |

Stormwater Management Facility Maintenance and Inspection Program Outreach

In FY15, the DEP SWFM Program hosted several presentations and created additional publications to promote understanding and awareness of the County's program.

- DEP held public meetings for the Chadswold emergency dam repairs as well as site walks/public meetings for Lake Whetstone and Gunners Lake hydraulic dredge projects.
- DEP continues to produce fact sheets on SWM facility maintenance, actions the public can take to keep facilities in proper working condition and where to go for additional information. The fact sheets specifically address structural and non-structural maintenance.
- DEP completed the design work on 10 interpretive signs. The signs are geared to the general public and attempt to explain the function and importance of SW BMPs. Signs will be installed in public places (to include MCPS and M-NCPPC property) in FY16. Both signs and fact sheets are available on DEP's website at <http://www.montgomerycountymd.gov/DEP/water/stormwaterfacilities.html> (See Facility Maintenance Fact Sheet tab at right).
- DEP distributed 4 seasonal BMP maintenance e-newsletters to over 900 subscribers. The newsletters include helpful seasonal tips on SWM facility maintenance.
- For stormwater professionals, DEP conducted two trainings for contractors and one training for DEP's ESD maintenance contractor. These trainings focused on the procedures and requirements for performing maintenance on stormwater facilities in Montgomery County.
- DEP SWM Facility Maintenance and Inspection Program partnered with the DEP WMD Outreach group to involve residents in the clean-up of storm water ponds. The residents received education about the SWM Facility Maintenance and Inspection Program and the importance of SWM measures throughout the county.

RainScapes Program Outreach

The DEP's RainScapes program promotes and implements small scale stormwater control and infiltration projects on residential, institutional, and commercial properties. The multi-faceted program is designed to provide information and training to residents and landscape professionals, as well as incentives and project delivery to County sites. For more information on the incentive programs; RainScapes Rewards and RainScapes Neighborhoods, please see Part III.G. The following is an update on RainScapes Program outreach efforts in County schools, professional training and communities.

RainScapes Programs in MCPS

Since FY10, two RainScapes programs are offered through MCPS; the RainScapes for Schools and the RainScapes for Schools Growing program:

The RainScapes for Schools program implements ESD projects on MCPS property. Projects installed include rain gardens and conservation landscapes which provide runoff reduction while also providing a hands on location for curriculum lessons (Figure III.E.22). Since 2008, the program has supported 16 school based projects accessible to students from K-12. Locations of participating schools are shown in Figure III.E.23.

The RainScapes for Schools Growing program provides native plants, and educational materials to several MCPS high school and Montgomery College horticulture classes to support instruction on using plants in stormwater management. Plants from the program have been used in community based projects and in RainScapes workshops as take home materials. This program has actively supported the new MCPS Environmental Horticulture Program, which now includes storm water management as part of their horticulture curriculum.



Figure III.E.23. RainScapes for Schools Conservation Landscape Garden Filtering Storm Water and providing Monarch Butterfly Habitat at the Seven Locks Elementary School

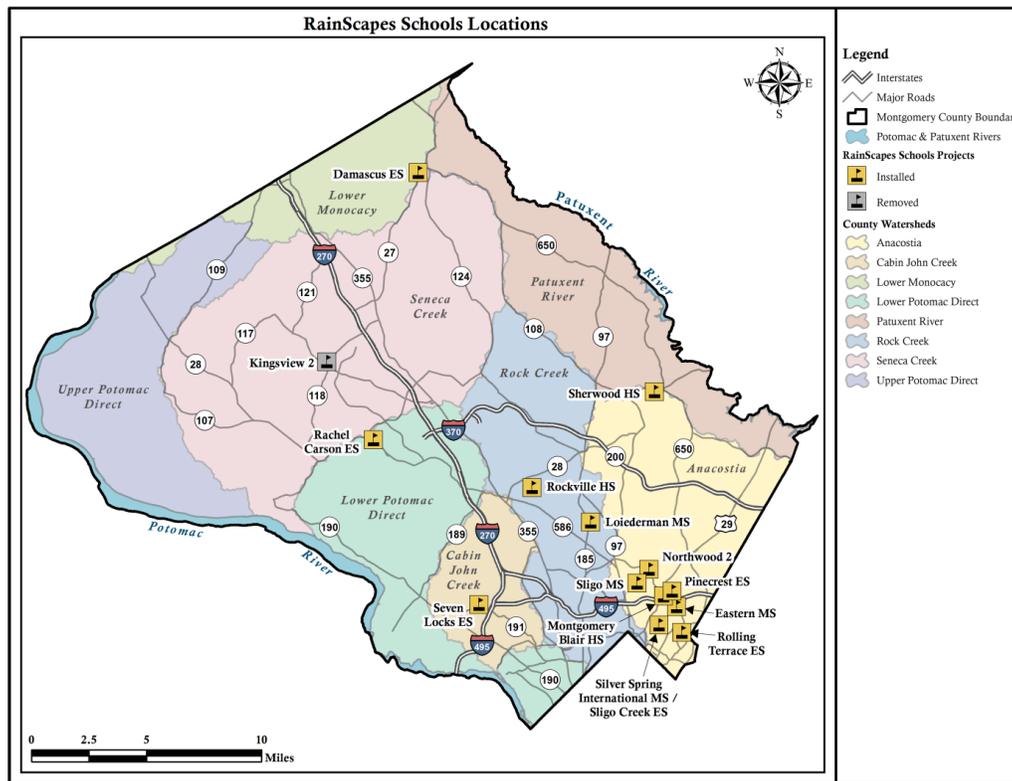


Figure III.E.24. RainScapes for Schools Demonstration Project Locations

RainScapes Workshops and Professional Training

In FY15, DEP trained 68 local designers and contractors via a charrette focusing on site assessment, rain garden design, and project requirements for RainScapes Rewards and RainScapes Neighborhoods. In addition, DEP provided training in cooperation with the Landscape Technology Program of Montgomery College, and at conferences in Maryland, Pennsylvania, and West Virginia. RainScapes program staff also provided training to other MS4 municipalities starting up similar incentive based programs. Materials, including technical information, inspection documents, process details and formats, lessons learned were shared freely with several Maryland and Virginia jurisdictions.

RainScapes Training for Communities and Watershed Groups

In FY15, the DEP RainScapes team provided 24 outreach presentations to community groups, reaching 2224 individuals. The team continued to provide hands-on workshops focused on RainScapes Rewards Rebate qualified practices, reaching another 188 individuals. From 2008-2015, 1680 residents have participated in these hands on workshops. An additional six workshops were added for RainScapes Neighborhoods.

For FY16 and FY17, DEP RainScapes is continuing to develop customized outreach approaches to specific focus communities such as faith based organizations, civic associations, home owner associations, private pools and the commercial sector. In FY15, a number of materials were translated and new materials created to address the needs of identified target audiences.



Figure III.E.25 RainScapes and Stormwater Facility Maintenance Staff Performing Maintenance to an ESD Facility

FY15 Highlights of RainScapes program outreach include:

- Provided outreach and education materials to over 2200 residents, business owners, and stakeholders at local and regional events. This represents a doubling of impressions made. The RainScapes program was also represented at the Montgomery County Agricultural Fair and Greenfest.
- Offered twelve workshops on rain gardens, rain barrels, conservation landscapes and RainScapes site assessments to County residents, representing a 100% increase in workshop offerings.
- Created booth displays at local home shows, reaching property owners actively looking to do home and landscape improvements.
- Wrapped the RainScapes van in an illustrative graphic that advertises RainScapes as we travel around the County (Fig. III.E.24).
- Advertised the RainScapes Program on local radio.
- Created new social media content on Pinterest and the My Green Montgomery Blog and Facebook pages.
- Provided advanced storm water training for Master Gardeners at the state level.
- Created and posted a Schoolyard Report Card on the RainScapes for Schools website. School groups can use the report card to assess their school sites for a wide range of environmental factors including runoff, trash, and other sustainability factors.

- Application numbers for RainScapes Rewards continued to be strong, with more projects capturing larger amounts of stormwater in FY15, suggesting effective outreach efforts and effective educational materials and training of professionals. Figure III.E.25 shows the growth in RainScapes Reward Projects submitted since 2008; 1303 projects had been submitted by the end of FY15.

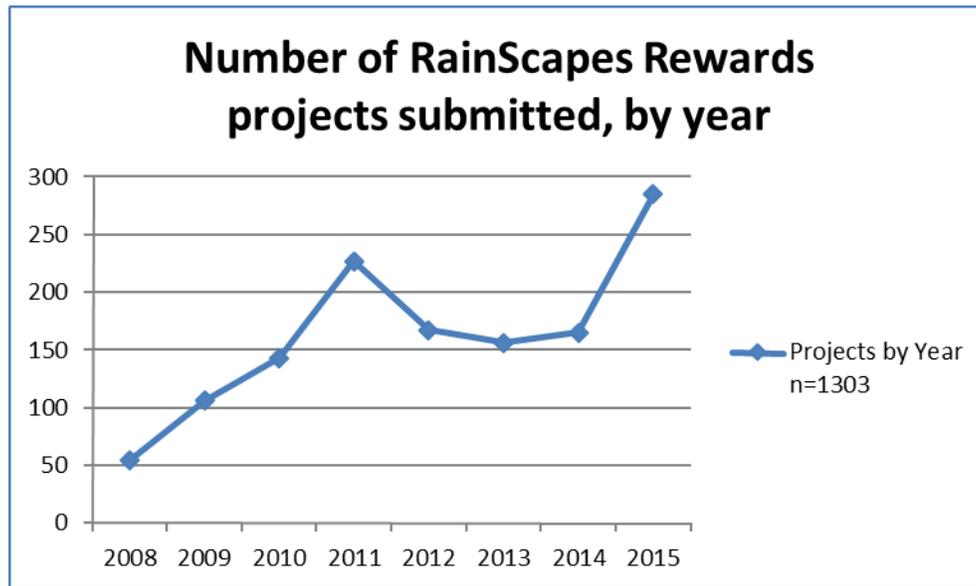


Figure III.E.25. Number of RainScape Reward Projects Submitted FY08-FY2015

F. Watershed Assessment

As required by the Permit, DEP continues to develop watershed assessments by evaluating current water quality and identifying and ranking structural, non-structural and programmatic watershed restoration opportunities for each County watershed. Full watershed assessments include field investigations, prioritized project (action) inventories with structural and non-structural project concepts, and cost estimates. Watershed implementation plans include results from the watershed assessments, and present more detailed implementation planning and schedules to meet regulatory and programmatic targets.

Watershed Assessments in the Montgomery County Coordinated Implementation Strategy (The Strategy)

At the beginning of the Permit cycle in 2010, the Strategy was developed from implementation plans or pre-assessments for each of the County's 8-digit watershed groupings. These are shown in Table III.F1. The final version of the Strategy can be found online at:

<https://www.montgomerycountymd.gov/DEP/water/county-implementation-strategy.html>

In the Strategy, implementations plans were developed for those watersheds with existing EPA approved TMDLs in 2009, and also for watersheds where existing assessments and project inventories had been previously compiled (Muddy and Watts Branch). These plans identified BMPs, quantified treatment by those practices, determined the watershed restoration potential, evaluated the ability of the watersheds to meet applicable TMDLs, and provided schedules and cost estimates. More information on implementation plan development for EPA approved TMDLs is shown in Part III. J. Total Maximum Daily Loads.

The status and schedule of watershed restoration planning is shown in Table III.F2. As shown in Table III.G.9, in Part III.G. Watershed Restoration, DEP budgeted \$749,130 in FY11, \$502,244.23 in FY12, \$879,435 in FY13, \$1,658,518 in FY14, and \$659,634 in FY15 for watershed assessment and planning.

| Table III.F1. Montgomery County Watershed Groupings and Plans Found in the Strategy | | |
|---|---------------------|----------------|
| | Implementation Plan | Pre-Assessment |
| Watershed Grouping | | |
| Anacostia | X | |
| Rock Creek | X | |
| Cabin John Creek | X | |
| Seneca Creek | | |
| Great Seneca (including Clopper Lake) | X | |
| Dry Seneca and Little Seneca | | X |
| Lower Monocacy | X | |
| Upper Potomac Direct (West of Seneca Creek, not described in any other grouping) | | X |
| Lower Potomac Direct (East of Seneca Creek, not described in any other grouping) | | |
| Muddy Branch and Watts Branch | X | |
| All other subwatersheds | | X |
| Patuxent (Triadelphia/Brighton Dam and Rocky Gorge) | X | |

| Table III.F2. Status of Montgomery County Watersheds' Assessments | | |
|---|---|---|
| 8 Digit Watershed | Watershed Assessment Status | TMDLs (Issue Date) |
| Anacostia | Anacostia Watershed Restoration Plan (ARP)(2010) Strategy WIP (2011) PCB WIP (2012) | Bacteria (2007) Sediment (2007) Nitrogen (2008) Phosphorous (2008) Trash (2010) PCB (2011) |
| Rock Creek | Strategy WIP (2011) | Bacteria (2007) Sediment (2011) Phosphorous (2013) |
| Cabin John Creek | Strategy WIP (2011) | Bacteria (2002) Sediment (2011) |
| Seneca Creek | Strategy WIP (2011)- Completed for Great Seneca Subwatershed, including Clopper Lake | Clopper Lake : Phosphorus and Sediment (2002) |
| | WIP Completed FY14 | Sediment (2009) |
| Lower Monocacy | Updated WIP Completed FY14 | Sediment (2009) Bacteria (2009) Phosphorus (2013) |
| Potomac Direct | WIP Completed FY14 | Sediment (2011) |
| Patuxent- Rocky Gorge and Tridelphia Reservoirs | WIP Complete FY14 | Rocky Gorge-Phosphorous (2008) Tridelphia-Phosphorous (2008) Tridelphia- Sediment (2008) |

Current Status of Watershed Assessments (FY15)

In FY14, DEP developed complete watershed implementation plans for two 8 digit watersheds not fully addressed in the Strategy; the Seneca Creek watershed, and Potomac Direct watershed. DEP also developed updated WIPs for the Lower Monocacy and Patuxent watersheds (Rocky Gorge Reservoir and Tridelphia Reservoir). The WIPs include data review, field assessments, and project inventories for potential restoration projects. The Lower Monocacy, Seneca, and Potomac Direct WIPs include timelines and schedules to meet the WLAs of TMDLs approved subsequent to Strategy development in 2009. Final watershed assessment reports were completed October 2014. The four new WIPs are included in Appendix I in the CD attachment to this report. More information on the WIPs, including timelines showing pollutant reductions to meet the TMDL WLAs can be found in Section J, TMDLs.

Great Seneca and Muddy Branch Watersheds Study

During 2004, DEP began the watershed inventories in the Great Seneca and Muddy Branch watersheds as cooperative efforts with the USACE, the City of Gaithersburg, and MNCPPC. These areas represent roughly one-third of the total County land area and include drainage from the densely developed areas of Gaithersburg and Germantown. The study was to be completed by FY13, but is delayed indefinitely due to limited Federal funding. Projects identified in the study are included in the new Seneca WIP, and in DEP's project planning.

Anacostia River Watershed Restoration Plan (ARP) (February 2010)

The final report for the inter-jurisdictional restoration of the Anacostia, *Anacostia River Watershed Restoration Plan and Report*, was completed in February 2010 (<http://www.anacostia.net/plan.html>). Currently, DEP is conducting an ecosystem restoration feasibility study with the USACE to develop stream restoration design concepts for 9.6 miles of streams identified in the ARP. After the concepts are developed and the feasibility study is complete in FY16, the study recommendations will be submitted for future USACE funding authorization to finalize designs for future construction. These selected projects contribute towards reducing future WLAs and accounting towards the County impervious area restoration goal.

Watershed Screening

The Department of Environmental Protection's Stream Monitoring Group monitors the biological community and stream habitat conditions at representative stations in all County watersheds on a rotating basis over a five year cycle (Figure III.F1). DEP then uses a multi-metric Index of Biological Integrity (IBI) to develop narrative ratings of biological conditions in water bodies. A benthic IBI (BIBI) is calculated using benthic macroinvertebrate sampling results. A fish IBI (FIBI) is calculated using fish sampling results. For the purposes of this report, a combined IBI for benthic insects and fish is used for second, third and fourth order streams. The combined IBI score is converted to a percentage with 100 % being the highest possible score. Biological conditions in the water body are then described as *excellent*, *good*, *fair*, and *poor*.

BIBIs based on benthic insects (BIBIs) only are used in smaller drainage areas of first order streams. These small streams typically only support pioneering fish species. Because of their adaptability to changing habitat and flow conditions, pioneering species are not reliable indicators for rating impairments.

In 2014, DEP monitored 52 stations for benthic macroinvertebrates and/or fish in 11 watersheds: Rock Run, Horsepen Branch, Little Falls, Little Monocacy, Dry Seneca, Broad Run, Potomac Direct, Cabin John, Little Seneca, Watts Branch, and Muddy Branch. Collection methods and data analysis techniques have been documented in previous MS4 Permit annual reports. At a majority of these stations, monitoring began between 1996 and 2002 and results are used to track cumulative changes in stream conditions.

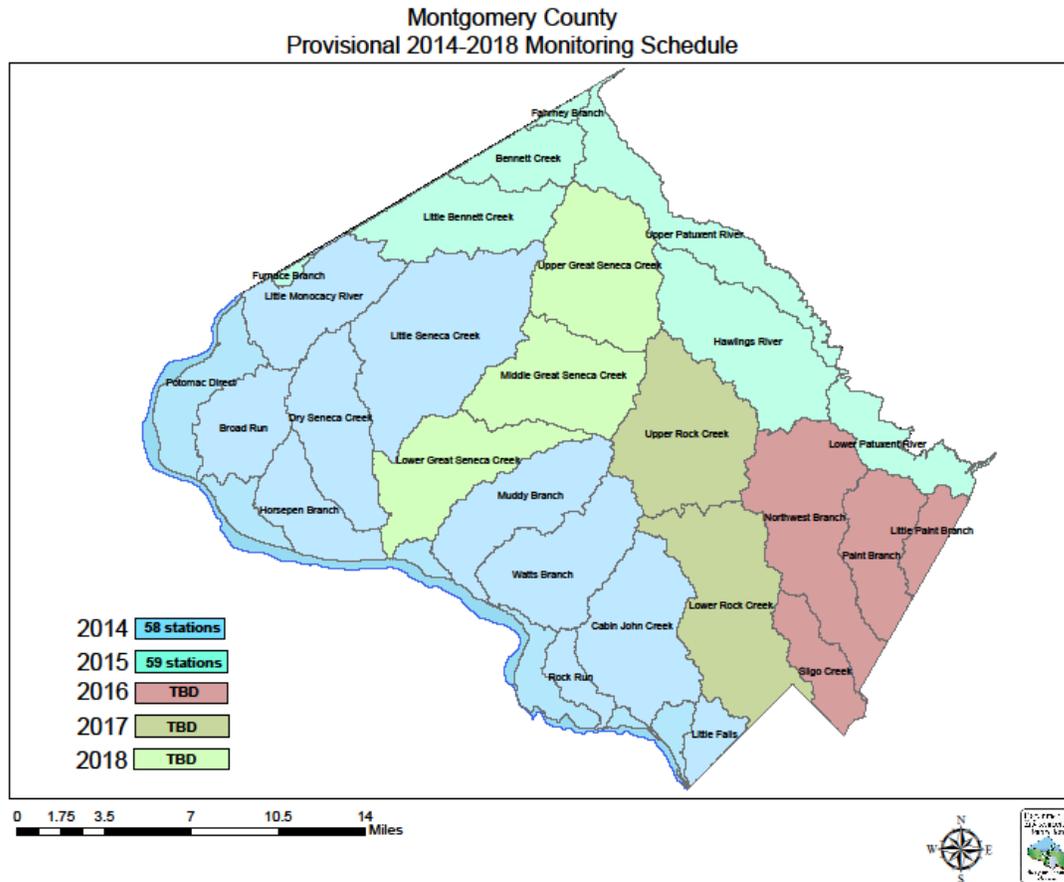


Figure III.F1. Montgomery County Provisional 2014-2018 Monitoring Schedule

Conclusions

The stream conditions for the watersheds sampled during the 2014 monitoring cycle have remained fairly consistent since monitoring began (Figure III.F2). Stream conditions generally improve toward the western part of the county where land use is more rural and part of the agricultural reserve. The more urban areas with older stormwater management generally have poorer and/or declining conditions.

Restoration projects have been focused in urban, southern and eastern county watersheds of Little Falls and Cabin John. Most projects in Little Falls were completed prior to 2008 and impacts appear limited to date. Since 2002, the average stream conditions have been constant. Average stream conditions in Cabin John also continue to be constant. The restoration projects generally have been completed close to the 2014 monitoring cycle, allowing little time for recovery.

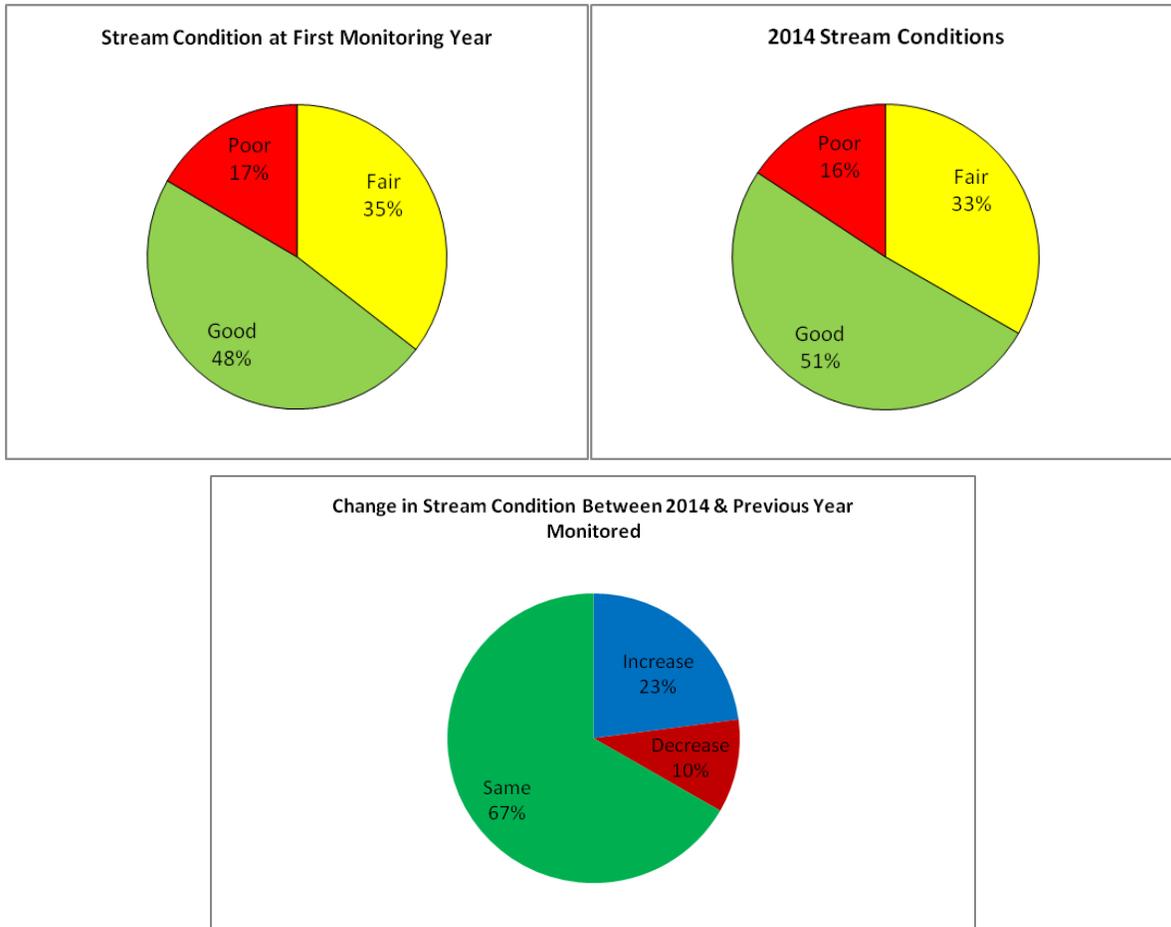


Figure IILF2. Overall Stream Condition Change Summary for Rock Run, Horsepen Branch, Little Falls, Little Monocacy, Dry Seneca, Broad Run, Potomac Direct, Cabin John, Little Seneca, Watts Branch, and Muddy Branch Watersheds, 2014

G. Watershed Restoration

The Permit requires the County to implement restoration practices identified through watershed assessments to control twenty percent of the County's impervious area not already controlled to the MEP. The Strategy provides the planning basis to meet the Permit's restoration requirement. DEP developed the Strategy using 2009 data, including impervious area and BMP drainage areas. DEP notes that the Strategy was developed prior to MDE guidance for accounting for stormwater wasteload allocations and impervious acres treated. Figure III.G.1, below, shows the County impervious area subject to the Permit (2009).

The DEP is implementing watershed restoration projects to add stormwater management, improve water quality and minimize physical impacts to streams from uncontrolled urban runoff. Stormwater management facility retrofits, new stormwater facilities, ESD practices and stream restoration projects are planned and designed through DEP's Watershed Restoration program and constructed by the DEP's Construction section. DEP continues to assess emerging stormwater control guidance and County data critical to watershed planning to ensure that the most beneficial, and cost effective projects are selected for implementation.

The County continues to improve GIS data to accurately account for the impervious area controlled within the MS4 boundary. Data improvements include digitizing impervious areas, updating the urban BMP database and refining existing BMP's drainage areas.

In August 2015, DEP released a supplement to the MS4 FY14 Annual Report that summarized the County's progress and achievements towards meeting the Permit restoration requirements over the 5 year Permit term. This supplement is titled "Montgomery County's 2010-2015 MS4 Watershed Restoration Achievements".

<https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/water-reports/npdes/MoCo-RestorationAchievements-080715REV2.pdf>

Green Infrastructure

The DEP has taken a watershed-based approach to applying green infrastructure at many scales across the County. The U.S. EPA describes green infrastructure as using "*vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water.*"

(U.S. Environmental Protection Agency (EPA), Green Infrastructure Basics, *What is Green Infrastructure?*, <<http://water.epa.gov/infrastructure/greeninfrastructure/>>, Accessed 06/15/2015)

Most County restoration projects fall within the realm of green infrastructure, as described by EPA. Stream restoration, reforestation and impervious cover removal contribute to the County's network of green corridors and patches that provide habitat, filter pollutants and absorb stormwater runoff. Even stormwater pond retrofits help to improve water quality and enhance habitat.

In addition to its more traditional, larger-scale restoration and retrofit projects, the County has worked to progressively increase its implementation of green infrastructure at the neighborhood and site scale. Environmental Site Design (ESD) practices have been and will continue to be implemented on public and private properties countywide through a variety of delivery methods.

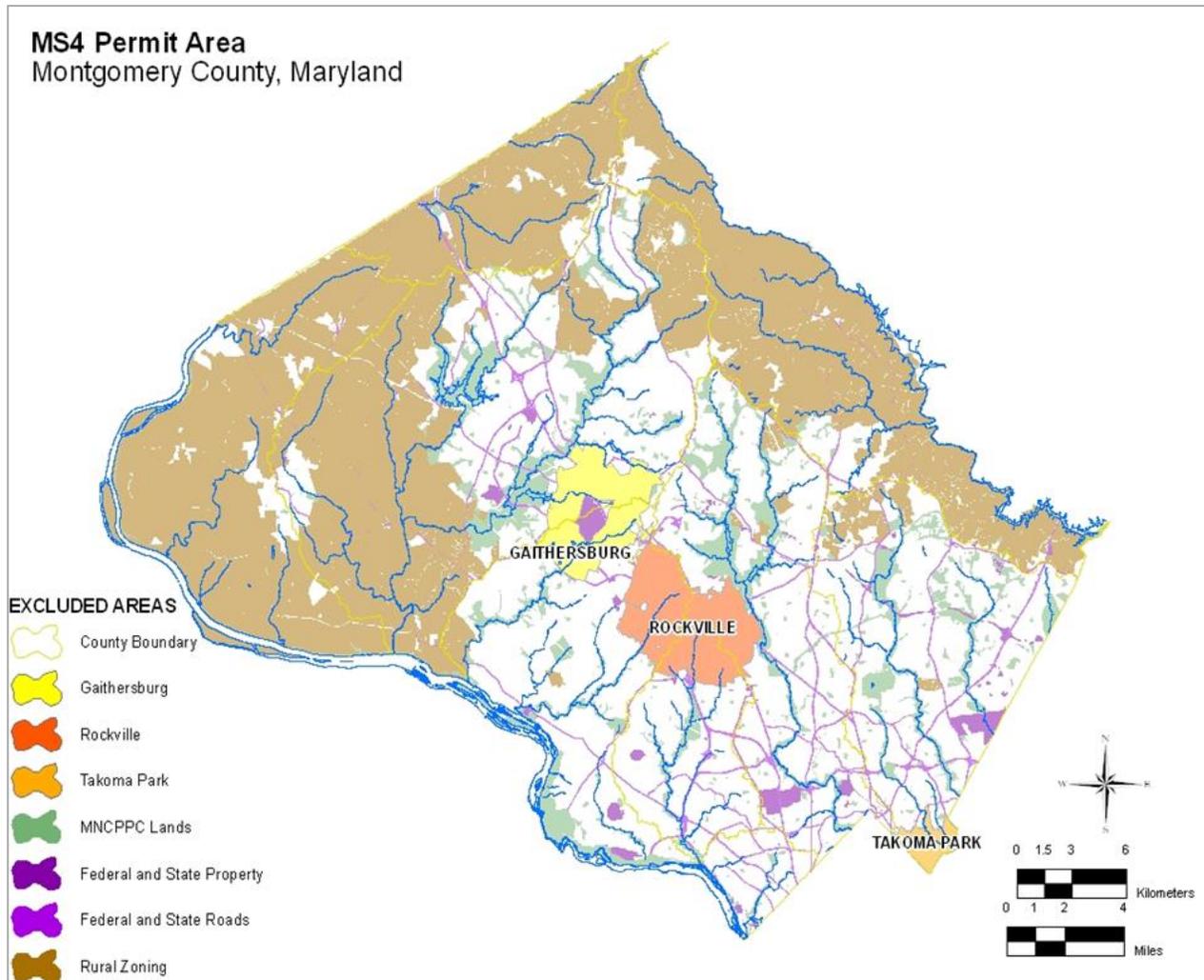


Figure III.G.1. County Area Subject to the MS4 Permit

Table III.G.1, below, summarizes County controlled and uncontrolled impervious area. Based upon the analysis, the County is required to control 3,777 impervious acres.

| Table III.G.1. MS4 Permit Restoration Requirement Calculation | | |
|---|--|---------------|
| | Description | Area in Acres |
| A. | County MS4 Impervious Area (IA) for the 2010-2015 MS4 Permit | 25,119 |
| | | |
| B. | County IA Controlled to the MEP in 2009 | |
| | Calculated in the Strategy | 3661.0 |
| | Updated BMP Tracking and Drainage Area Delineations | 691.2 |
| | MEP Verification of Existing Facilities | 1,597.3 |
| | Credit for Existing Roadside Swales | 278.3 |
| | Credit for Large Lot Disconnection | 7.4 |
| | TOTAL | 6235.2 |
| | | |
| C. | County MS4 IA Under/Uncontrolled (2015 Revision) (A-B) | 18,884 |
| | IA Restoration Requirement (2015 Revision) (20% of C) | 3,777 |

Progress Towards Meeting the Permit Impervious Restoration Goal

Since 2009, and through FY15, the County has:

- Implemented projects restoring 1,774 impervious acres (Table III.G.2) through County and Agency and Department Partnerships.
- Projects under construction in FY16 will treat an additional 170 uncontrolled impervious acres.
- Projects under task order for design by DEP’s water resources engineering consultants will control more than 2,400 additional acres of uncontrolled impervious area.

Facilitated partnership projects currently in design and under construction with other County and external agencies. These projects include facility modification and modernizations performed by DOT, DGS, and MCPS, and WSSC’s stream restoration activities during their asset modernization. They also include the Maryland State Highway Administration’s (SHA’s) Inter County Connector (ICC) stewardship partnership projects.

- Installed over 470 small scale ESD stormwater practices along County roadways to capture previously uncontrolled impervious.

- Restored over 5 miles of County Streams.
- Constructed over 13 new/upgraded stormwater ponds.
- Reforested 6 pervious acres of equivalent impervious acre credits .
- Revamped County Restoration Website to provide residents project details and schedules based upon on interactive web map
- Created and began utilization of an enhanced data management tools including a Business Intelligence Tool, a Portfolio Tool, and a upgraded database

Table III.G.2, below, shows the County’s progress towards meeting its 20% impervious area restoration requirement. At the end of FY15, DEP and DEP/ agency partnership projects that are completed, under construction or in design will achieve stormwater control for more than the Permit required 3,777 impervious acres.

| Table III.G.2. FY15 Restoration Implementation Progress Summary | |
|---|---|
| Description | Area in Acres, Using Updated Data FY 15 |
| 2010 MS4 Permit 20% Impervious Area Restoration Goal | 3,777 |
| Total Impervious Area Control Implemented Since 2009 | 1,774 |
| Impervious Area Associated with Watershed Restoration Projects Under Construction in FY15 | 145 |
| Impervious Area Associated with Watershed Restoration Projects in Design as of FY15 | 2,277 |
| Impervious Area Associated with Agency and Department Partnerships Under Construction in FY15 | 25 |
| Impervious Area Associated with Agency and Department Partnerships in Design as of FY15 | 153 |
| Total Acres Restored, Under Construction, In Design as of FY15 | 4,374 |

Completed Watershed Restoration Program (CIP) Projects

Table III.G.3, below summarizes the number and types of restoration projects that DEP completed through FY15. Detailed tables showing project specific information for completed projects, projects under construction in FY15, and projects in design, and can be found in Appendix J.

| Table III.G.3. County Projects Completed Through FY15 | | |
|--|--------------|-----------------|
| CATEGORY | Complete | |
| | Count | Impervious (Ac) |
| Capital Improvements Program Projects | 123 | 690.8 |
| Stream Restoration | 6 | 101.5 |
| Green Streets | 93 | 19.1 |
| Government Facilities and County Schools | 11 | 3.2 |
| Stormwater Retrofits | 13 | 567 |
| Residential / Voluntary / Private Property Implementation | 826 | 42.7 |
| RainScapes | 773 | 19.7 |
| Water Quality Protection Charge Credits | 53 | 23 |
| Complementary Restoration Projects | 79 | 6.1 |
| Reforestation | 38 | 6 |
| Impervious Surface Removal | 41 | 0.1 |
| Management Programs | 0 | 268 |
| Street Sweeping | 0 | 130 |
| Catch Basin Cleaning and Storm Drain Vacuuming | 0 | 138 |
| New Development and Redevelopment | 2,399 | 305.2 |
| Montgomery County Public Schools | 12 | 12.8 |
| Properties Purchased by MNCPPC | 55 | 3.3 |
| Private Redevelopment | 54 | 53.4 |
| New BMPs Treating Existing Impervious Cover | 2,278 | 235.7 |
| Agency and Department Partnerships | 434 | 461.4 |
| Intercounty Connector | 266 | 252.7 |
| Washington Suburban Sanitary Commission | 6 | 23.3 |
| Montgomery County Department of General Services | 1 | 1.0 |
| Montgomery County Public Schools | 1 | 0.7 |
| Montgomery County Department of Transportation | 154 | 47.7 |
| U.S. Army Corps of Engineers | 6 | 136.1 |
| PROGRESS TOTAL | 3,861 | 1,774.2 |

Watershed Restoration Projects (CIP) Under Construction and In Design in FY15

Table III.G.4 summarizes projects under construction and in design in FY15. Projects in construction in FY15 will control 170 impervious acres, and projects in design will add control to greater than 2,400 additional acres. The majority of projects in design in FY15 are programmed for construction over the next four years.

| Table III.G.4. County Projects under Construction and In Design through FY15 | | | | | | |
|--|-----------------|-----------------|------------|-----------------|------------|-----------------|
| CATEGORY | In Construction | | In Design | | Total | |
| | Count | Impervious (Ac) | Count | Impervious (Ac) | Count | Impervious (Ac) |
| Capital Improvements Program Projects | 10 | 125.0 | 142 | 2,268.1 | 152 | 2,393.2 |
| Stream Restoration | 1 | 44.7 | 15 | 510.2 | | |
| Green Streets | 5* | 0.6 | 11* | 90.4 | | |
| Government Facilities and County Schools | 0 | - | 16** | 34.1 | | |
| Stormwater Retrofits | 4 | 79.7 | 100 | 1,633.5 | | |
| Complementary Restoration Projects | 3 | 19.7 | 1 | 8.5 | 4 | 28.2 |
| Reforestation | 2 | 19.7 | 1 | 8.5 | | |
| Impervious Surface Removal | 1 | 0 | 0 | - | | |
| Agency and Department Partnerships | 4 | 25.5 | 18 | 153.4 | 22 | 178.8 |
| Intercounty Connector | 1 | 16.9 | 2 | 58.8 | | |
| Washington Suburban Sanitary Commission | 3 | 8.6 | 16 | 94.5 | | |
| PROGRESS TOTAL | 17 | 170.2 | 161 | 2,430 | 178 | 2,600.2 |

*Project counts represent entire green streets neighborhoods and will result in multiple ESD facilities once completed

**Project counts represent individual Government Facility and County School sites which will result in multiple ESD facilities once completed

Watershed Projects Identified for Future Restoration

Table III.G.5 presents a summary of projects identified through watershed assessments as potential future projects. This summary includes projects identified in the County's new Patuxent, Lower Monocacy, Potomac Direct, and Seneca Creek WIPs.

| Table III.G.5 Summary of Watershed Restoration Potential Opportunity Projects Identified for Future Consideration | | | |
|--|--------------------|--|-----------------|
| Watershed and Potential Opportunity Project Type | Number of Projects | Proposed Impervious Area Treated (Acre)† | |
| Anacostia River | 895 | | 4,696.41 |
| LID Project | 367 | 2,175.40 | |
| Existing Stormwater Facility Verification to the MEP** | 1 | 1.04 | |
| Stream Restoration | 253 | 1,498.89 | |
| Stormwater Outfall Stabilization Potential Opportunity: | 1 | 4.50 | |
| New Stormwater Pond | 7 | 66.06 | |
| Stormwater Pond Retrofit | 190 | 947.79 | |
| New Wetland | 34 | 2.73 | |
| Reforestation | 42 | 0 | |
| Cabin John Creek | 32 | | 765.97 |
| LID Project | 15 | 71.76 | |
| Existing Stormwater Facility Verification to the MEP** | 2 | 29.00 | |
| Stream Restoration | 13 | 605.05 | |
| Stormwater Pond Retrofit | 2 | 60.16 | |
| Lower Monocacy River | 11 | | 14.61 |
| LID Project | 9 | 12.52 | |
| Reforestation | 2 | 2.09 | |
| Potomac Direct | 238 | | 3,364.68 |
| LID Project | 55 | 91.69 | |
| Existing Stormwater Facility Verification to the MEP** | 9 | 137.43 | |
| Stream Restoration | 150 | 1,743.21 | |
| Stormwater Pond Retrofit | 16 | 1,386.75 | |
| Reforestation | 8 | 5.60 | |
| Rock Creek | 81 | | 1,585.26 |

| Table III.G.5 Summary of Watershed Restoration Potential Opportunity Projects Identified for Future Consideration | | | |
|--|-----------------------|---|------------------|
| Watershed and Potential Opportunity Project Type | Number of Projects | Proposed Impervious Area Treated (Acre)† | |
| LID Project | 40 | 386.03 | |
| Existing Stormwater Facility Verification to the MEP** | 11 | 54.93 | |
| Stream Restoration | 15 | 565.40 | |
| New Stormwater Pond | 3 | 497.00 | |
| Stormwater Pond Retrofit | 12 | 81.90 | |
| Rocky Gorge Dam | 45 | | 1,002.95 |
| LID Project | 18 | 73.13 | |
| Existing Stormwater Facility Verification to the MEP** | 3 | 47.87 | |
| Stream Restoration | 14 | 754.94 | |
| Stormwater Pond Retrofit | 3 | 86.73 | |
| Reforestation | 7 | 40.28 | |
| Seneca Creek | 145 | | 2,057.90 |
| LID Project | 49 | 141.96 | |
| Existing Stormwater Facility Verification to the MEP** | 7 | 49.29 | |
| Stream Restoration | 62 | 1,310.79 | |
| Stormwater Pond Retrofit | 24 | 555.29 | |
| Reforestation | 3 | 0.57 | |
| Upper Patuxent River | 5 | | 10.76 |
| LID Project | 5 | 10.76 | |
| Total for all Watersheds | 1,447 | | 13,498.54 |

LID=low impact development

*The Potential Opportunity Projects have not been determined to be fully feasible and some may be dropped during the planning design stage

**Existing stormwater facilities, previously not credited to the MS4 permit which are being verified they meet the New Stormwater Regulation Requirements. A Site Specific Report will be generated once the facility is fully evaluated to determine credit towards MS4 Permit requirements.

†The proposed impervious drainage area is an estimate and does not reflect final project computations.

Highlights of FY15 Watershed Restoration Projects

Table III.G.6-8, and Figures III.G.2-4 below shows highlighted projects the DEP has constructed as part of meeting its goals of the MS4 Permit.

Table III.G.6

Stream Restoration Case Study: Hollywood Branch Tributary

Project Quick Facts

Location: Silver Spring, MD

Watershed: Paint Branch

Drainage Area: 844 acres, 18% impervious cover

Impervious Area Treatment Credits: 44.7 Acres

Total Cost: \$1.58M

Partners: Maryland National Capital Parks & Planning
Commission, Chesapeake & Atlantic Coastal Bays Trust Fund

Timeline

Design and Permitting Start:
September 2009

Construction Start:
May 2014

Estimated Completion of Construction:
October 2015

Summary

In 2006, the Hollywood Branch Tributary, a Designated Use III cold water stream system, was identified as a high priority candidate for stream restoration due to severe streambank erosion, high sedimentation, channel enlargement, and degraded instream habitat conditions for aquatic biota. Restoration strategies included stabilizing and reconstructing streambanks, shifting the channel, creating log/boulder step pools, creating new wetland areas, and raising and stabilizing stream channel with construction of instream features to manage flows.

Highlights

Large-scale stream restoration addressed severely degraded conditions reducing erosion, re-connecting the floodplain, protecting utilities, improving water quality, and enhancing aquatic habitat.

Canon Road Green Streets improvement projects completed in surrounding neighborhoods will also contribute to the long-term success of the stream restoration.



Figure III.G.3 Hollywood Branch Stream Restoration

Table III.G.7 Green Streets Case Study: Dennis Avenue

Project Quick Facts

Location: Silver Spring, MD
 Watershed: Sligo Creek
 Impervious area treatment credits: 17.32 Acres
 Total Cost: \$3.4M
 Partners: DOT, Chesapeake & Atlantic Coastal Bays Trust Fund

Timeline

Design and Permitting Start:
 October 2012

Construction Start:
 June - November 2013 (Two phases)

Completion of Construction:
 August 2014

Summary

The Dennis Avenue Green Streets project treats runoff from impervious surfaces within medium to high density residential areas that would be otherwise untreated through conventional stormwater management facilities. The project, which was identified as high priority in early watershed assessments, used rain gardens, bioretention gardens, curbside extension swales, Filterra tree boxes, and a regenerative step-pool conveyance swale along Dennis Avenue. The elements were designed to provide water quality treatment that approached ESD volumes as defined in MDE guidelines. The project was divided into two phases. Phase 1 addressed Dennis Avenue West (3.57 acres) and Phase 2 addressed Dennis Avenue East (20 acres).

Highlights

Installed 23 new green streets facilities.

Template/design-build approach minimized permitting and expedited implementation.

Partnership with DOT facilitated right-of-way permitting and expedited project design and construction.

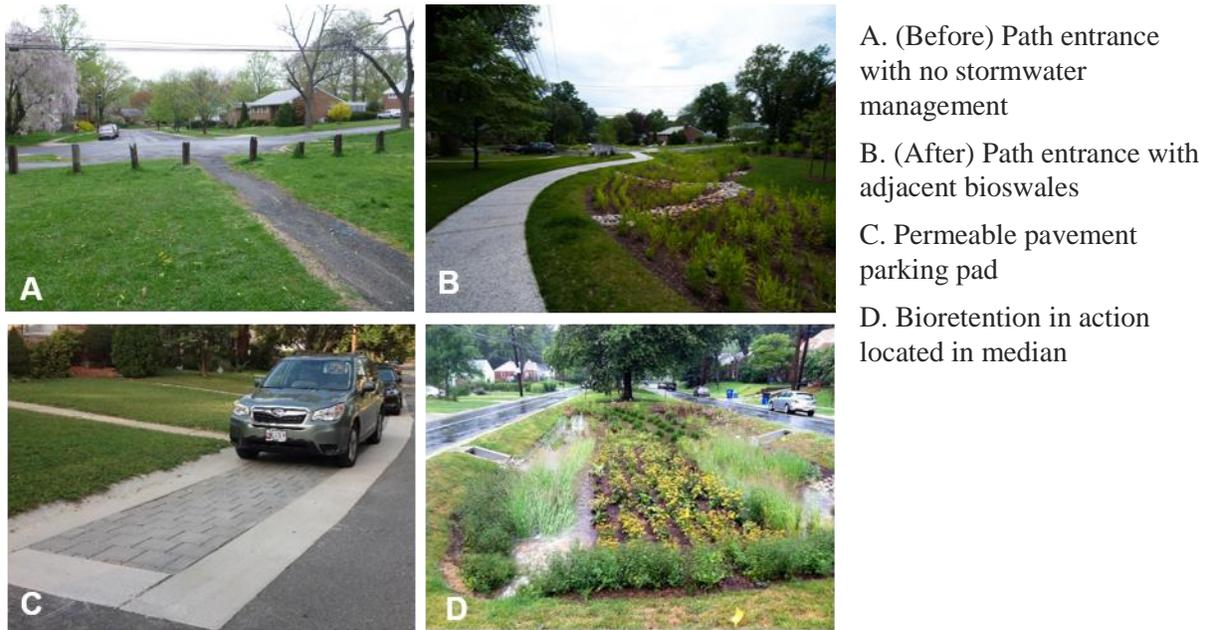


Figure III.G.4 Dennis Avenue Green Streets

Table III.G.8.

Stormwater Retrofit Case Study: Naples Manor Pond Retrofit

Project Quick Facts

Location: Silver Spring, MD
 Watershed: Anacostia
 Impervious area treatment credits: 10.6 Acres
 Total Cost: \$321K
 Partners/Stakeholders: Homeowners Association

Timeline

Design and Permitting Start:
April 2010
Construction Start:
January 2014
Completion of Construction:
July 2014

Summary

The pond at Naples Manor was identified as a potential pond retrofit because of its deteriorated condition and because it was built before the current state and local stormwater management regulations were in place. Prior to the retrofit, the pond provided only partial stormwater management for the upland drainage area and did not meet current MDE stormwater requirements. The pond had an outdated concrete riser, minimally protected or unprotected storm drain outfalls entering the pond, internal earth berms, and collected sediment that reduced its stormwater treatment capacity. Modifications were made to the facility to meet current MDE stormwater requirements for CPv. The retrofit included replacement of the existing concrete riser a new concrete riser designed to better control stormwater and an expansion of the dry basin designed to extend detention of flows, thus reducing downstream erosion and enhancing water quality. Native plantings in the basin help filter pollutants and support a diverse community of insects and birds. In order to accommodate safety requirements, the dam was raised by approximately one foot. Storm drain inflow pipes near the dam were protected with rock to reduce the velocity and erosive nature of discharged flows.

Highlights

Full channel protection volume was provided in what was previously a flood control basin only.

The pond was improved by the addition of vegetation, the updating of a deteriorating riser and outfall structure and by updating the dam to current safety standards.

The project was exempt from forest conservation due to minimal vegetation impact.



A. Original stormwater pond pre-construction

B. Area during construction

C. Retrofitted pond post-construction



Figure III.G.5. Naples Manor Pond Retrofit

Public Property ESD

During FY15, the DEP continued to design and implement ESD projects on public property, including school grounds, libraries and community centers and along county roadways within the public ROW. Figure III.G.5 shows project locations and status of various school and public facilities through FY15. These projects are used to educate residents and children with regards to stormwater management.

As part of the County’s strategic planning and implementation of projects, small scale stormwater practices are installed in conjunction with other projects or where no other larger scaled projects are feasible.

Montgomery County Government Facilities and Schools (July 2015)

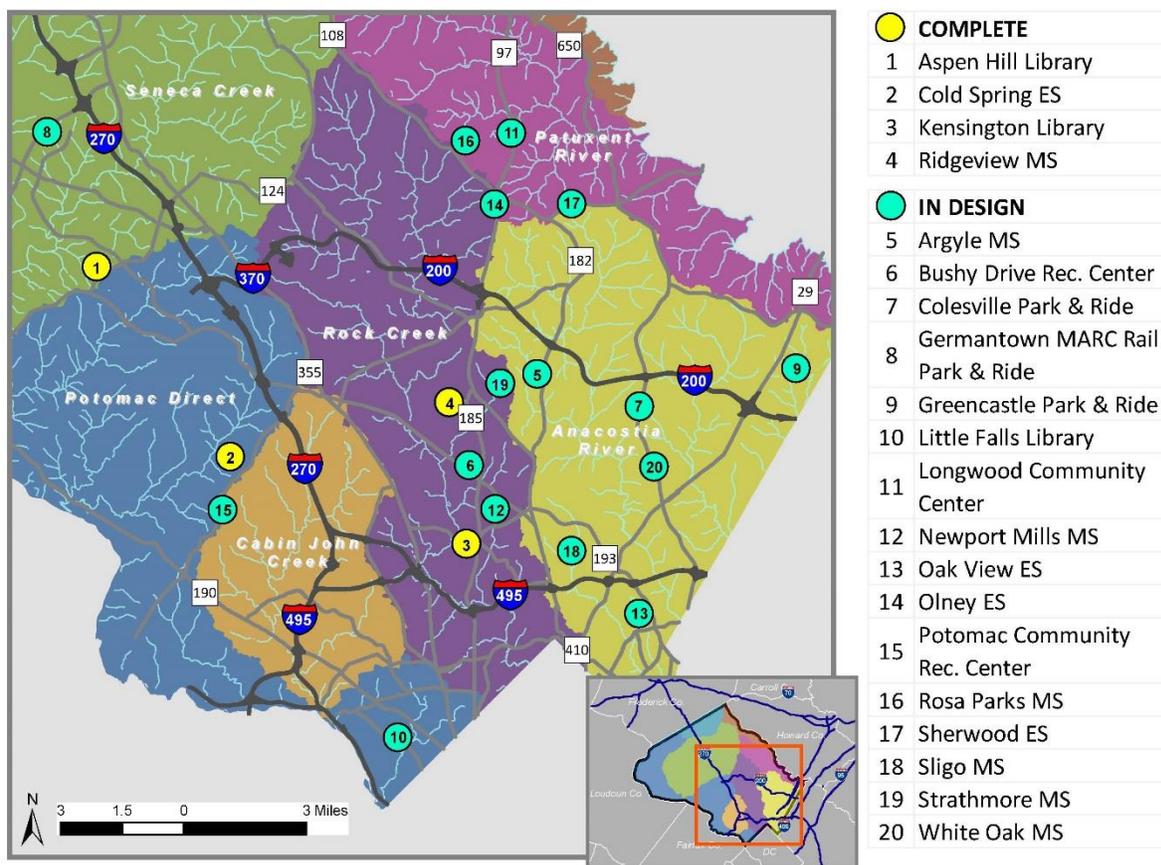


Figure III.G.6 Public Property ESD Projects

Green Streets

“Green Streets” are roadways where ESD practices are constructed within the street right-of-ways to capture stormwater runoff. DEP collaborates with DOT to implement “Green Street” projects in areas where DOT is schedule to do roadway maintenance or renovation. “Green Streets” are part of a County initiative to capture stormwater runoff in neighborhoods with minimal stormwater controls and little open space to install large stormwater practices. This

initiative creates aesthetically attractive streetscapes, providing natural habitat, and helping to visually connect neighborhoods, schools, parks, and business districts. Figure III.G.6 illustrates 15 neighborhoods where multiple small scale stormwater practices are either complete or in design to create greener communities in the Rock Creek and Anacostia River watersheds.

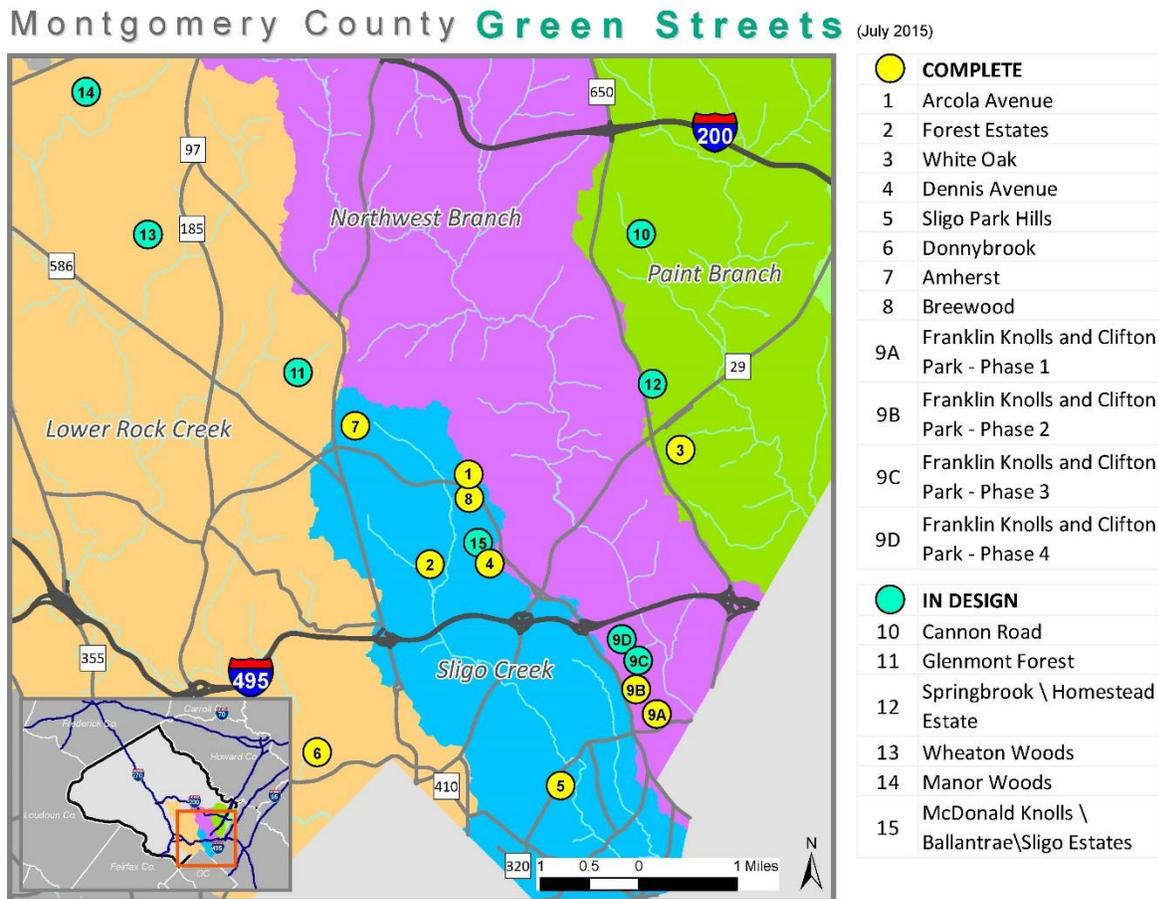


Figure III.G.7 DEP/DOT Green Streets Projects

Program Honors



Figure III.G.8. DEP Restoration Program Awards

During the Permit term, the County is proud to receive the following awards for its efforts in restoration:

- **National Recreation Award April 2014 American Council of Engineering Companies (ACEC) Engineering Excellence Awards Competition**
Project: Stoney Creek Stormwater Management Pond at National Institute of Health
- **Engineering Excellence Honor Award in Design 2013-2014 ACEC of Metropolitan Washington**
Project: Stoney Creek Stormwater Management Pond at National Institute of Health
- **Achievement Award Winner 2012 National Association of Counties**
Project: Arcola Avenue Green Street Project

Grants

The County has aggressively secured over \$20 million in grant funding to support the implementation of the County's Watershed Restoration Program MS4 Permit's 20% impervious requirement. Montgomery County extends a thank you to our grant funding sources:

- Department of Natural Resources Chesapeake and Atlantic Coastal Bays Trust Fund
- Maryland Department of the Environment
- National Fish and Wildlife Foundation Grant

Smart integrated stormwater management system demonstration partnership with Washington Council of Governments

Private Property ESD – RainScapes Program

The DEP's RainScapes program promotes and implements environmentally friendly landscaping and small-scale ESD projects on residential, institutional, and commercial properties. The program offers technical and financial assistance (rebates funded by the County's WQPF) to encourage property owners to implement eligible RainScapes techniques, such as rain gardens, rain barrels or cisterns, conservation landscaping, pavement removal and/or replacement and canopy trees. RainScapes projects are designed to provide water quantity benefits by controlling, at a minimum, the first inch of rainfall from a specified impervious area using runoff reduction techniques. The RainScapes program has added impervious runoff reduction to just over 18 impervious acres in Montgomery County for at least the first inch of rain.

Since FY14, the RainScapes program has been working as a multi-strand program. RainScapes Rewards is a rebate program that provides a financial incentive to residents willing to implement RainScapes projects. RainScapes Communities encourages projects in priority neighborhoods and also works with faith based organizations. RainScapes Schools implements projects on MCPS property. Other elements are focused on RainScapes outreach and training, and are described in Part III.E.7, Public Education and Outreach.

RainScapes Rewards

RainScapes Rewards provides rebates to private residential and institutional property owners who install qualified small-scale stormwater projects. RainScapes Rewards Rebate projects provide a visible presence for stormwater management on private lots across the County and, due to their distribution countywide, are serving to raise both public awareness and demonstration of how small measures and individual actions can have a local impact across the county.

Figure III.G.8 shows a map of RainScapes Rewards project locations that have been installed Countywide as of the end of FY15. Overall the RainScapes Rewards projects have provided runoff reduction for at least the first inch of rain from 16 impervious acres.

By the end of FY15, over 1300 projects had been received and reviewed by the RainScapes team. In FY15, 285 new projects were reviewed as compared to 165 in FY14, a 172% increase in one year. By the end of FY15, 691 RainScapes Rewards Rebate projects have been completed in the County.

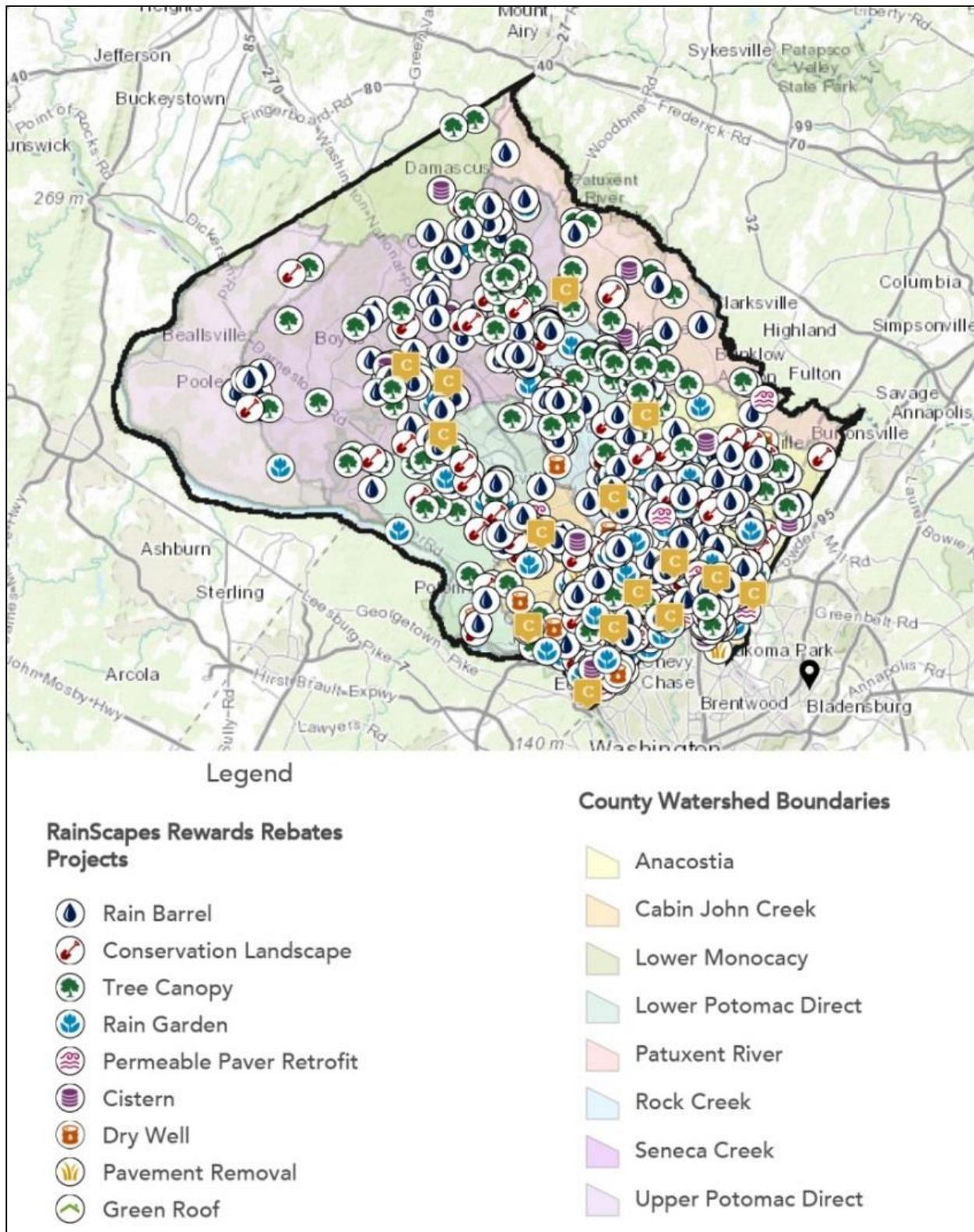


Figure III.G.9. RainScapes Rewards Projects Countywide Through FY15

RainScapes Communities: Congregations

In FY15, DEP developed a strategic plan to focus retrofit opportunities on congregational properties, and launched the RainScapes Congregations program. To date, 27 RainScapes projects have been completed at Congregational sites, adding treatment 54,012 sf impervious area (1.24 impervious acres)(Figure III.G.9). An average of 3,600 sf of impervious area is treated per site.

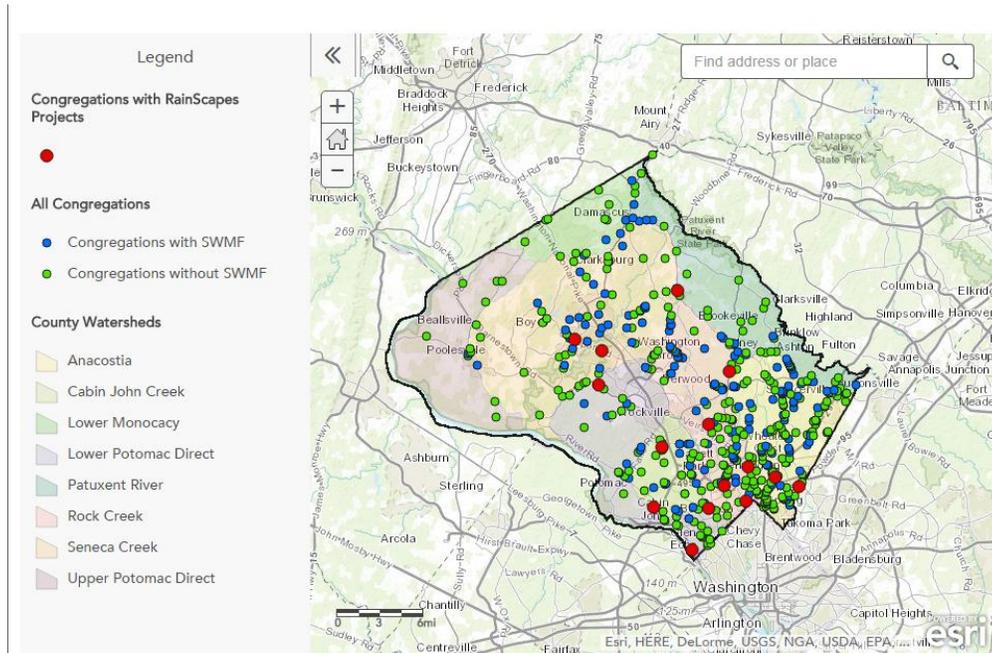


Figure III.G.10. RainScapes Rewards Projects on Congregational Sites Countywide Through FY15

RainScapes Communities: Neighborhoods

The RainScapes Neighborhoods Program evaluates small, targeted neighborhood-scale catchments for on-lot stormwater runoff reduction. In prior Fiscal Years, projects were directly installed by DEP and affiliated watershed groups. However, DEP found that many owners were not motivated to allow a project to be installed on their properties. After five years of effort in six designated neighborhoods, only 1.75 impervious acres were controlled on private property using a County installed approach.

In FY15, DEP began a new outreach and assessment approach for RainScapes Neighborhoods. This approach combines DEP led site level assessment for RainScapes Rewards Rebate projects with a community led (Neighbor to Neighbor (N2N)) model to engage participation. The program has been piloted in neighborhoods in priority watersheds (Anacostia, Rock Creek, and Lower Potomac) with active citizens' group or watershed organizations to leverage education and outreach efforts (Figure III-G.10). In the future, as feasible, a small number of demonstration projects on publically accessible, but private, sites will be planned and installed, as a way to provide visible local examples of RainScapes projects and further engage the community.

As a result of the new FY15 approach, 120 site assessments were conducted in selected Neighborhoods (Town of Chevy Chase, Town of Somerset, and Carderock Springs). A number of those assessments have led to projects being designed and installed by property owners using the RainScapes Rewards Rebate program. The RainScapes Program staff track the conversion rates of site assessments into RainScapes Rewards projects to allow for evaluation of the approach after two years of effort.

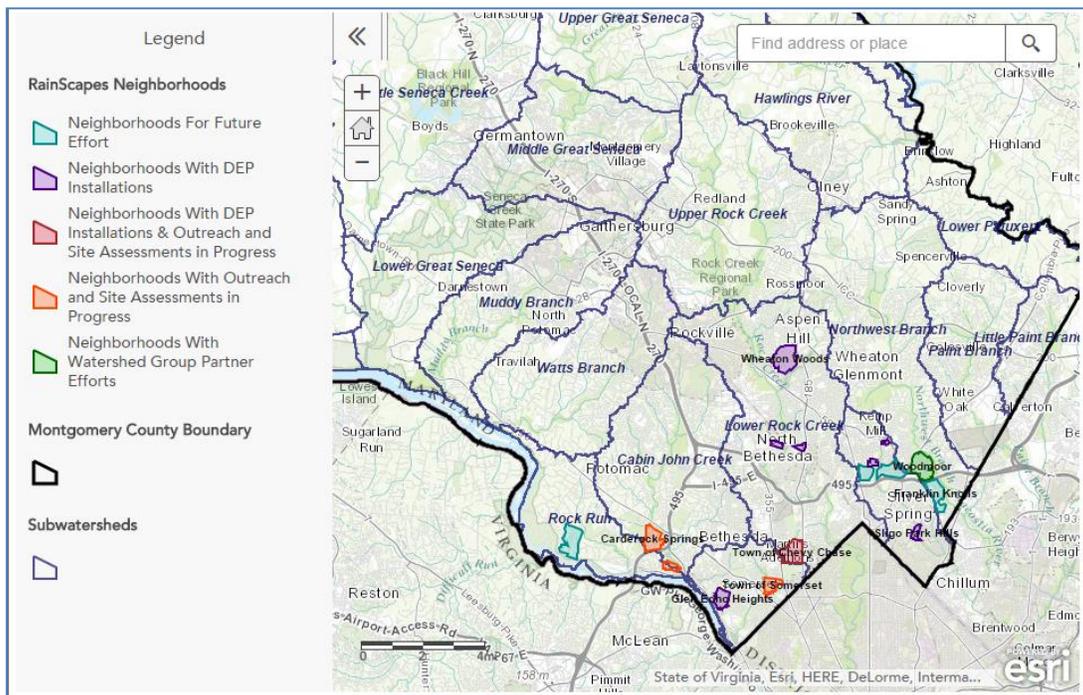


Figure III.G.11. Locations of FY15 RainScapes Neighborhoods

RainScapes for Schools and other Demonstration Projects

RainScapes demonstration projects have been installed with watershed groups and through the RainScapes for Schools program. Some projects are on private property HOA parcels, others on individual lots as well as institutional properties and on MCPS School sites. These projects were placed to provide locally accessible examples to the public and to support MCPS curricular lesson planning with “hands on” opportunities for students. These demonstration sites were also used to train both professionals and local watershed group members on site assessment and installation for RainScapes practices.

Restoration Completed By Co-Permittees

The Town of Chevy Chase recently installed a rain garden in Zimmerman Park (Figure III.G12). They also reinstated their Consulting Water Management Program to help residents identify and remedy storm water issues on private property. The Town’s Water Ordinance also establishes minimum requirements and procedures to control the adverse impacts associated with water drainage. According to the ordinance, “proper management of water drainage will

minimize damage to public and private property, reduce the effects of development on land, control stream channel erosion, reduce local flooding, and maintain after development, as nearly as possible, the pre-development runoff characteristics.”

Chevy Chase Village over the summer replaced the pervious Brookville Road Sidewalk with a new pervious surface gravel sidewalk. The total square footage was 8,500 sq. ft.



**Figure III.G.12. Rain garden
Installed by The Town of Chevy
Chase**

FY15 Watershed Restoration Costs

The Permit requires the County to submit estimated costs and actual expenditures for watershed restoration program implementation. Table III.G.9 shows a summary of FY10 thru FY15 CIP costs for both watershed assessments and watershed restoration projects.

| Table III.G.9. FY10-FY15 Capital Improvement Program Costs for Watershed Assessment and Restoration | | | | | | |
|--|-------------|-------------|-------------|--------------|--------------|--------------|
| Fiscal Year (FY) | FY10 | FY11 | FY12 | FY13 | FY14 | FY15 |
| Total annual cost for watershed assessment | \$433,800 | \$749,130 | \$502,244 | \$879,435 | \$1,658,517 | \$659,634 |
| Total annual cost for watershed restoration | \$2,942,100 | \$3,904,222 | \$8,168,571 | \$9,274,295 | \$16,490,211 | \$16,934,497 |
| Total Costs | \$3,375,900 | \$4,653,352 | \$8,670,815 | \$10,153,730 | \$18,148,728 | \$17,594,131 |

The Watershed Restoration CIP Budget

During FY15, DEP continued to identify funding sources to support project implementation. The approved FY15-FY20 SWM CIP budget reflects the significant increase in implementation that will be needed to meet the Permit requirement for adding runoff management. As shown in Tables III.G.10 and III.G.11, the approved budget for FY15 is \$53,345,000 compared to \$35,000,000 for FY14 and \$25,000,000 for FY13.

The approved FY15-FY20 SWM Program totals \$363.7 million, an increase of \$128.7 million, or 55 percent from the amended approved FY13-FY18 program of \$235 million. This increase in stormwater management activity will be financed primarily through water quality protection bonds. The debt service for these bonds will be supported by the County’s WQPF. The budget assumes \$60 million in State aid based on past funding received from the State through grants.

Highlights of the FY15-FY20 SWM CIP Budget include expanded construction of stormwater management facilities, retrofits of old stormwater management facilities, repairs to damaged stream channels and tributaries in stream valley parks and priority watersheds, and structural repairs to County maintained stormwater management facilities. DEP will also expand the design and construction of ESD SWM facilities, County facilities, roads and schools.

Table III.G.10. Department of Environmental Protection Approved (May 2012) FY13-18 Stormwater Management (SWM) Capital Improvement Program Budget (in 000\$)

| Projects | CIP Cycle Total | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| SWM Retrofit | 127,010 | 11,710 | 19,700 | 20,600 | 20,000 | 25,000 | 30,000 |
| SWM Retro-Government Facilities. Low Impact Development | 11,425 | 1,125 | 1,900 | 2,100 | 2,100 | 2,100 | 2,100 |
| SWM Retrofit- Roads | 49,425 | 6,015 | 7,410 | 9,000 | 9,000 | 9,000 | 9,000 |
| SWM Retrofit Schools | 20,100 | 1,270 | 1,010 | 3,270 | 4,850 | 4,850 | 4,850 |
| Miscellaneous Stream Valley Improvement | 9,870 | 2,070 | 2,070 | 2,070 | 1,220 | 1,220 | 1,220 |
| SWM Facility Planning | 6,750 | 1,150 | 1,150 | 1,150 | 1,100 | 1,100 | 1,100 |
| SWM Retrofit Anacostia | 1,620 | 310 | 310 | 310 | 230 | 230 | 230 |
| Major Structural Repair | 8,800 | 1,350 | 1,450 | 1,500 | 1,500 | 1,500 | 1,500 |
| Total | 235,000 | 25,000 | 35,000 | 40,000 | 40,000 | 45,000 | 50,000 |

Table III.G.11. Department of Environmental Protection Approved (May 2014) FY15-20 Stormwater Management (SWM) Capital Improvement Program Budget (in 000\$)

| Projects | CIP Cycle Total | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| SWM Retrofit | 146,470 | 18,726 | 22,968 | 23,408 | 23,732 | 27,696 | 29,940 |
| SWM Retro-Government Facilities. Low Impact Development | 17,732 | 3,026 | 2,816 | 2,820 | 3,270 | 2,900 | 2,900 |
| SWM Retrofit- Roads | 98,420 | 12,740 | 14,080 | 26,320 | 16,010 | 15,170 | 14,100 |
| SWM Retrofit Schools | 24,930 | 3,470 | 6,280 | 3,480 | 3,900 | 3,900 | 3,900 |
| Miscellaneous Stream Valley Improvement | 42,573 | 6,393 | 5,440 | 9,640 | 8,900 | 6,100 | 6,100 |
| SWM Facility Planning | 8,400 | 1,150 | 1,250 | 1,350 | 1,450 | 1,550 | 1,650 |
| SWM Retrofit Anacostia | 2,060 | 310 | 350 | 350 | 350 | 350 | 350 |
| Major Structural Repair | 23,070 | 7,530 | 3,540 | 3,000 | 3,000 | 3,000 | 3,000 |
| Total | 363,655 | 53,345 | 56,724 | 70,368 | 60,612 | 60,666 | 61,940 |

Progress Towards Meeting Wasteload Allocations for EPA Approved TMDLs

The Permit requires development of implementation plans to meet County MS4 WLAs for any EPA approved TMDL in County watersheds within 1 year of EPA approval. The County must also report progress towards meeting those WLAs where watershed restoration is occurring. Implementation plan development is addressed in Part III. J. Total Maximum Daily Loads of this report.

The County successfully submitted the Strategy to meet Permit requirements, including meeting the TMDL WLAs, in February 2011, 1 year after issuance of the Permit. The Strategy used the WTM to verify pollutant baseline loads in TMDL watersheds, and estimate pollutant load reductions of a variety of completed and planned structural, non-structural, and programmatic watershed restoration practices. Pollutant load reduction efficiencies were selected based on the best information available during model development. The model estimated pollutant treatment by SWM BMPs and retrofits constructed after TMDL baseline years. Details on the WTM assumptions can be found in the *Montgomery County Coordinated Strategy, Appendix B, Modeling Framework*, which can be found in Appendix K.

Table III.G.12, below summarizes watershed-specific TMDLs and pollutant reductions achieved by watershed restoration projects constructed after TMDL baseline data date. The reductions include nutrients and sediment reductions from stream restoration projects using efficiencies provided in MDE's August 2014 *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*. The FY15 pollutant load reduction information can also be found in this report's electronic (CD) attachment in Appendix A, MDENPDES15.mbd, Parts G., G.1., and G.3.

The Strategy land cover loading rates and BMP reduction efficiencies do not match those published in the subsequent August 2014 MDE guidance. For the next permit cycle, DEP will run the WTM again and address the inconsistencies by correcting the WTM assumptions. This iterative approach will refine the current pollutant reduction estimates and lead to a clearer picture of the reductions associated with the County's watershed restoration efforts.

| Table III.G.12. TMDL Summary by Impairment | | | | | | | | | |
|--|-----------------------|------------|-------------|--------------------------|-------------------|------------------|-------------------------|--|-------------------------|
| Impairment | Watershed | Issue Date | Pollutant | County MS4 Baseline Load | Annual Allocation | Units | WLASw Percent Reduction | Percent Reduction Since Baseline Date* | TMDL Baseline Data Date |
| Bacteria | Cabin John Creek | 2007c | E. coli | 44,257 | 30,670 | (Billion MPN/yr) | 30.7% | 0.40% | 2003 |
| | Rock Creek | 2007d | Enterococci | 453,669 | 18,195 | (Billion MPN/yr) | 96.0% | 3.54% | 2003 |
| | Anacostia River | 2007b | Enterococci | 247,809 | 29,978 | (Billion MPN/yr) | 87.9% | 6.60% | 2003 |
| | Lower Monocacy River | 2009e | E. coli | 67,452 | 9,848 | (Billion MPN/yr) | 85.4% | 1.50% | 2003-2004 |
| Sediments | Anacostia River | 2007a | TSS | 7,682 | 1,101 | (tons/yr) | 85.7% | 25.30% | 1997 |
| | Triadelphia Reservoir | 2008b | TSS | 29 | 29 | (tons/yr) | 0.0% | 0.02% | 2003 |
| | Clopper Lake | 2002 | TSS | 13 | 13 | (tons/yr) | 0.0% | 0.00% | 2002 |
| | Lower Monocacy River | 2009d | TSS | 253 | 99 | (tons/yr) | 60.8% | 2.80% | 2000 |
| | Seneca Creek | 2011 | TSS | 5,735 | 3,185 | (tons/yr) | 44.6% | 21.80% | 2005 |
| | Rock Creek | 2011 | TSS | 8,667 | 5,345 | (tons/yr) | 38.3% | 10.91% | 2005 |
| | Cabin John Creek | 2011 | TSS | 3,143 | 2,430 | (tons/yr) | 22.7% | 4.00% | 2005 |
| | Potomac River Direct | 2011 | TSS | 4,365.00 | 2,783.20 | (tons/yr) | 36.20% | 6.52% | 2005 |
| Nutrients | Clopper Lake | 2002 | Phosphorus | 101 | 55 | (lbs/yr) | 45.4% | 0.00% | 2002 |
| | Anacostia River | 2008a | Nitrogen | 206,312 | 38,959 | (lbs/yr) | 81.8% | 10.50% | 1997 |
| | Anacostia River | 2008a | Phosphorus | 20,953 | 3,947 | (lbs/yr) | 81.2% | 30.40% | 1997 |
| | Triadelphia Reservoir | 2008b | Phosphorus | 438 | 373 | (lbs/yr) | 15.0% | 0.30% | 2003 |
| | Rocky Gorge Reservoir | 2008b | Phosphorus | 4,268 | 3,628 | (lbs/yr) | 15.0% | 8.45% | 2003 |
| | Lower Monocacy River | 2013 | Phosphorus | 1,872 | 1,305 | (lbs/yr) | 30.0% | 0.26% | 2009 |
| | Rock Creek | 2013 | Phosphorus | 12,503 | 8,089 | (lbs/yr) | 35.0% | 4.89% | 2009 |

| Table III.G.12. TMDL Summary by Impairment | | | | | | | | | |
|--|--------------------------------|------------|-----------|--------------------------|-------------------|----------------|-------------------------|--|-------------------------|
| Impairment | Watershed | Issue Date | Pollutant | County MS4 Baseline Load | Annual Allocation | Units | WLASw Percent Reduction | Percent Reduction Since Baseline Date* | TMDL Baseline Data Date |
| Trash | Anacostia River | 2010 | Trash | 228,683 | - | lbs/yr removed | 100.0% | 6.60% | 2010 |
| PCB | Anacostia River- Non Tidal-NWB | 2011 | PCB | 134.5** | 2.56 | g/yr | 98.1% | | |
| PCB | Anacostia River- Non Tidal-NEB | 2011 | PCB | 112.57** | 1.53 | g/yr | 98.6% | | |

Adapted from "2010 Status of Approved Stormwater Wasteload Allocations for NPDES Regulated Stormwater Entities in Montgomery County," April 27, 2010 by Jeff White, MDE, and additional email 11/13/13

*Percent reduction of pollutant by BMPs completed after the TMDL baseline data collection period, as of FY15

**For all known NPDES stormwater discharges in Montgomery County portions of the NEB and the NWB, as identified in the TMDL

H. Assessment of Controls

The Permit requires the County to assess the effectiveness of its stormwater management program and control measures using pre-restoration and post restoration watershed monitoring, which includes chemical, physical and biological monitoring. The County must also document progress towards meeting the watershed restoration goals identified in Part III.G and any applicable WLAs developed under the EPA approved TMDLs. DEP is responsible for requirements under this part of the Permit.

Breewood Tributary Restoration Project

The DEP targeted the Breewood tributary for comprehensive watershed restoration efforts. In 2009, MDE approved DEP's proposal to conduct pre and post restoration monitoring required in Part III.H.1, Watershed Restoration Assessment, to assess effectiveness of the Breewood tributary restoration efforts.

The tributary is located within the Sligo Creek subwatershed of the Anacostia River watershed as shown on Figure III.H.1. Figure III.H.2 shows the Breewood tributary drainage area and locations of chemical, physical and biological monitoring stations. The Breewood tributary is a 1,200-foot first order stream in a small catchment (63 acres) containing 35 percent impervious.

The catchment is predominantly medium density (quarter acre) residential, and also contains a condominium complex, townhouse development, senior living center, high school and church. There are two primary roads, University Boulevard and Arcola Avenue in the upper portion of the catchment. Curb and gutter designed streets support residential development located in the middle and lower sections of the catchment. The majority of the stormwater runoff from the impervious areas is not controlled and has led to a severely unstable stream channel which transports sediment, and other associated pollutants downstream.

The DEP's Breewood Tributary Restoration Project is an innovative comprehensive management approach which will link neighborhood outreach and upland watershed source control measures to achieve measurable water quality improvements. Stormwater control measures will include ESD practices with stream and wetland restoration. The outreach efforts will focus on increasing resident awareness and active stewardship to protect the tributary and associated local park from trash and runoff pollutants. In FY14, DEP launched a website dedicated to the entire project where project details, information, and status updates are shared. The webpage is located at: <http://www.montgomerycountymd.gov/DEP/Restoration/breewood.html>

The DEP completed construction of 10 ROW ESD practices along residential roads and 3 RainScapes projects on individual residential properties. Overall these projects address runoff from 54 residential properties. Additionally, 1,200 linear feet of stream restoration was completed in FY15. The DEP is currently designing 12 ESD practices to treat runoff from the University Towers and 1 ESD practice at the Northwood Presbyterian Church.

Benefits of these restoration projects include:

- stabilize the banks to prevent erosion,
- add new trees and plants along stream banks,
- reduce the amount of sediment entering Sligo Creek,
- reduced storm flow in the Breewood Tributary

- improve water quality in both the Breewood Tributary and Sligo Creek,
- reconnect the stream to its floodplain, and
- improve the ecological health of the Breewood Tributary and adjacent floodplain areas.
- improved citizen awareness of stormwater impacts and methods to address them.

A summary of projects proposed for the Breewood tributary is on the electronic attachment in Appendix L. Figure III.H.3 shows the locations of the restoration projects.

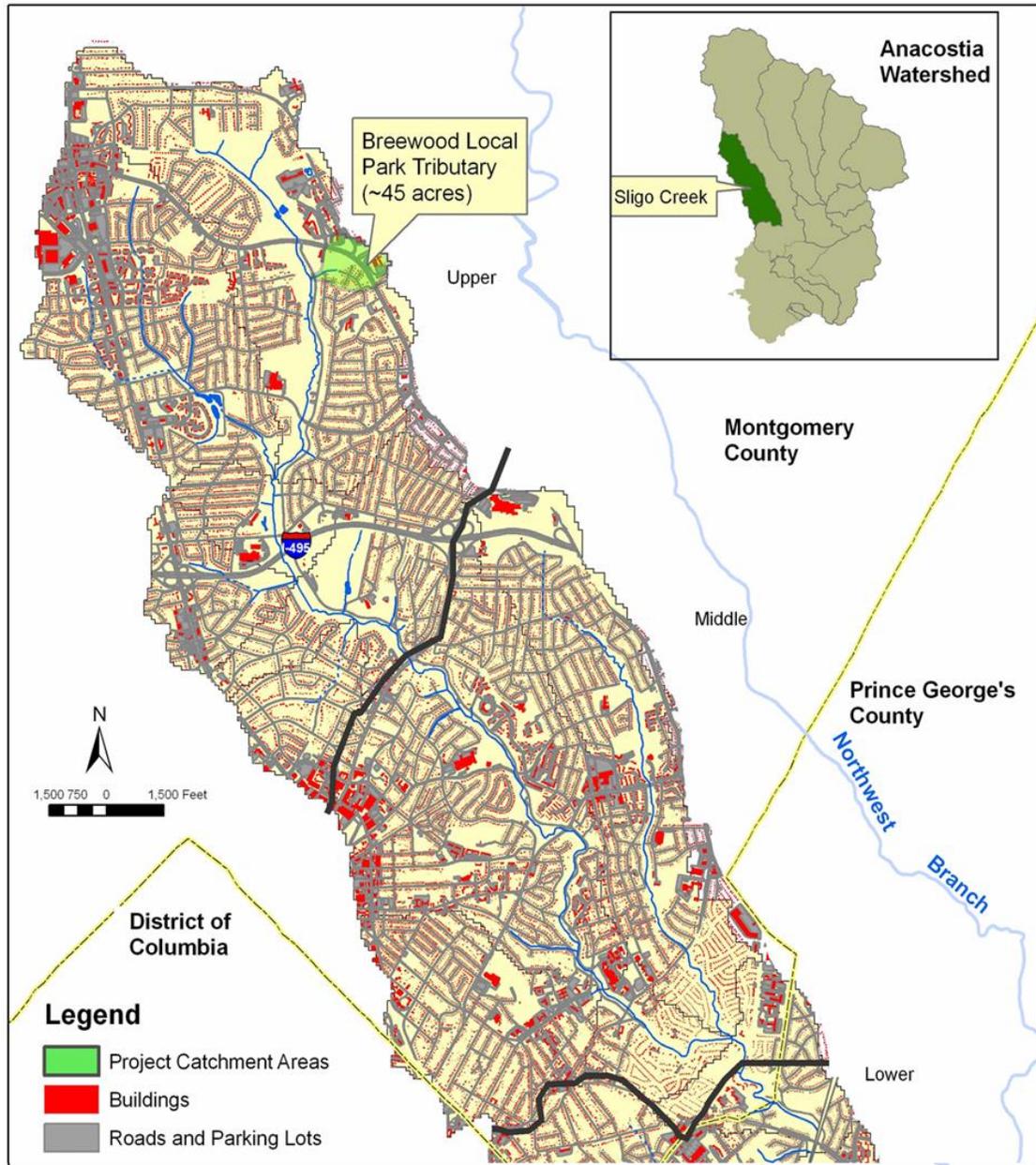


Figure III.H.1. Location of the Breewood Tributary within the Sligo Creek Subwatershed of the Anacostia. Note that the actual size of the Breewood tributary drainage area is 63 acres according to a recent recalculation.



Figure III.H.2. Locations of Stream Chemistry, Biological, Physical Habitat and Geomorphology Monitoring Stations, Breewood Tributary of Sligo Creek

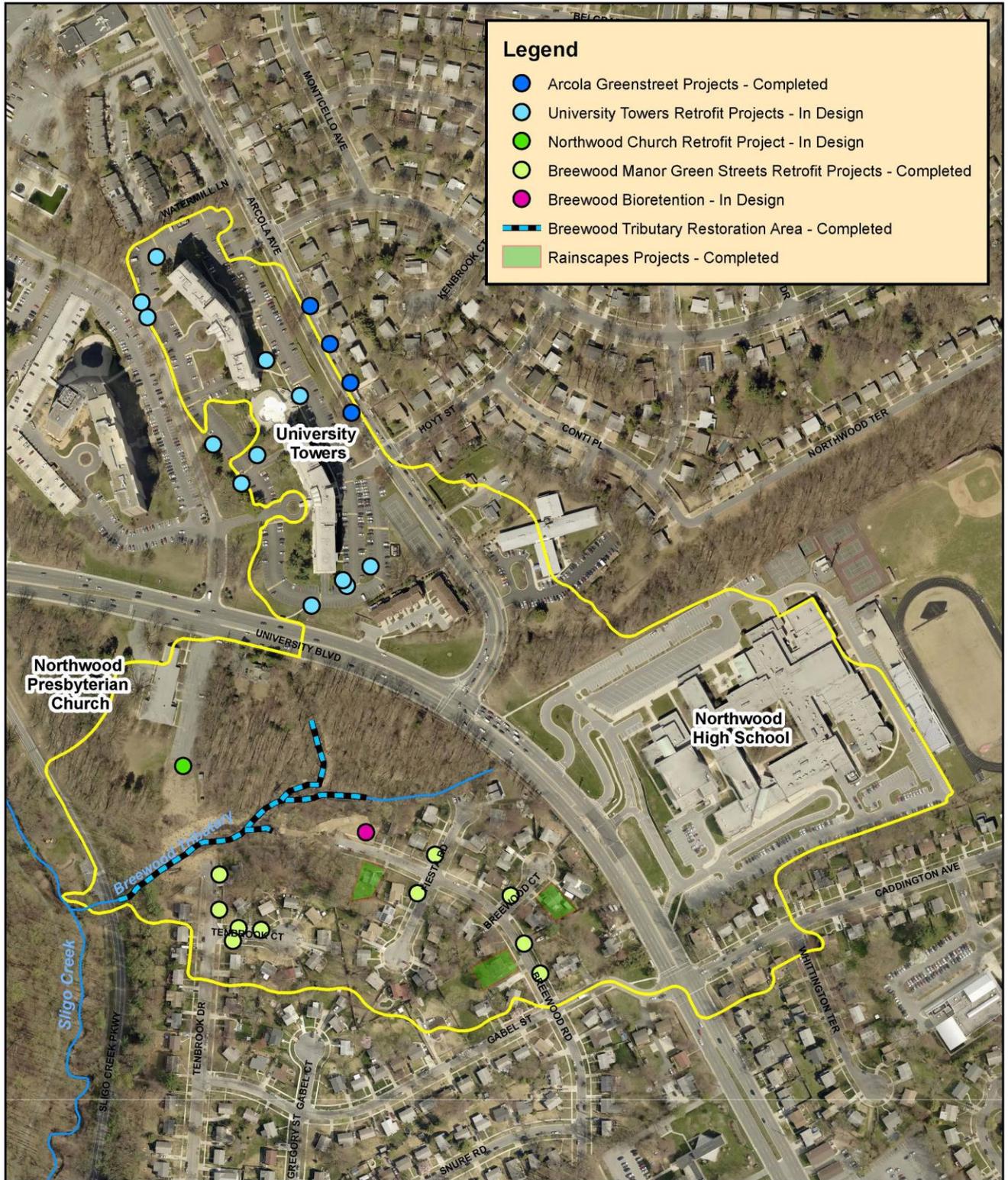


Figure III.H.3. Locations of the Breewood Tributary Restoration Projects

H.1 Watershed Restoration Assessment

Breewood Tributary Chemical Monitoring

During 2014, DEP continued water chemistry monitoring in the Breewood tributary at one storm drain outfall draining University Boulevard and points north (the outfall station) and an instream station downstream of a culvert underneath Sligo Creek Parkway (the instream station), as shown on Figure III.H.2. A continuously recording rain gauge is located at the Wheaton Branch stormwater ponds in Silver Spring, approximately 1 mile southwest of the monitoring stations. Once project implementation is completed, a variety of monitoring approaches will be employed to evaluate effectiveness

The Permit required chemical monitoring data is included electronically in Appendix A, MDENPDES15.accdb, Part F. The summary report *NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek 2009-2014* is also included in the electronic attachment in Appendix L.

Table III.H.1 shows the drainage area to each water chemistry station. Table III.H.2 shows the contribution of impervious land uses to total impervious area in the drainage area.

| Location | Acres |
|--|-------|
| Total DA to the outfall water chemistry station | 16.9 |
| Total DA to the instream water chemistry station | 62.9 |
| Total DA | 63 |

| Impervious | Property Type | Acres | Percent of Impervious Area | Percent of Watershed |
|---|------------------------------------|-------|----------------------------|----------------------|
| Buildings (Includes accessory structures) | | 8.12 | 31% | 13% |
| | Multi-family Residence | 1.02 | 4% | 2% |
| | Non Residential | 0.53 | 2% | 1% |
| | Residential Single Family Attached | 0.25 | 1% | 0% |
| | Residential Single Family Detached | 1.96 | 7% | 3% |
| | School | 4.36 | 16% | 7% |
| Parking/Driveway | | 11.69 | 44% | 19% |
| | Multi-family Residence | 4.01 | 15% | 6% |
| | Parks and Planning | 0.02 | 0% | 0% |

| Table III.H.2. Breewood Tributary Impervious Area 2012 | | | | |
|--|------------------------------------|-------|----------------------------|----------------------|
| Impervious | Property Type | Acres | Percent of Impervious Area | Percent of Watershed |
| | Non Residential | 1.23 | 5% | 2% |
| | Right of Way | 0.24 | 1% | 0% |
| | Residential Single Family Attached | 0.09 | 0% | 0% |
| | Residential Single Family Detached | 0.57 | 2% | 1% |
| | School | 5.54 | 21% | 9% |
| Road | | 6.09 | 23% | 10% |
| | Road | 6.09 | 23% | 10% |
| All other impervious | | 0.72 | 3% | 1% |
| | Multi-family Residence | 0.54 | 2% | 1% |
| | Right of Way | 0.10 | 0% | 0% |
| | Residential Single Family Detached | 0.08 | 0% | 0% |
| Grand Total | | 26.63 | 100% | 42% |

Hydrology Modeling

The Permit requires that rainfall to runoff characteristics of the contributing watershed be evaluated using a standard, accepted hydrology model. The County produced a Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the Breewood Tributary watershed as part of the stream restoration design process. The model was completed in FY14.

Summary of Water Chemistry Monitoring Results

The DEP’s contractor installed the monitoring stations, performed water chemistry monitoring (e.g., metals, nutrients), water quality monitoring (e.g., pH, specific conductivity, temperature, dissolved oxygen), continuous flow monitoring, and continuous rainfall monitoring according to methods described in the Quality Assurance and Quality Control Document for Water Chemistry Monitoring at Breewood Road Tributary (Hage and Jones 2010). Field teams collected baseflow samples monthly and conducted automated storm runoff monitoring, targeting three events per quarter. A total of 49 storms and 65 baseflow events were monitored from 2009 through 2014. For each storm event, samples were collected along the rising, peak, and falling limbs of the hydrograph and then subsequently, a storm EMC calculated from the results of these three samples.

Stream restoration construction began in November 2014. Two storms (November 21, 2014 and December 6, 2014) were successfully monitored during the restoration construction. Once all planned Breewood watershed restoration projects are completed, a variety of monitoring approaches will be employed to evaluate effectiveness.

Drainage area size and land use to both the outfall and instream stations affected flow rate, total stormflow volume, and response of flow to rainfall. As expected for rain events, rise in stream stage at the instream station occurred later than the first appearance of flow at the outfall station. Stormflow appears at the outfall faster because its drainage area contains higher percentages of impervious area and connectivity. Flow rate values and total stormflow volumes were generally greater at the instream station as expected given its greater drainage area. The instream station also is somewhat less responsive to small events because of the relatively lower amount of impervious area and greater travel time through the system.

For each station, baseflow MC were calculated for all Permit- required parameters over the 6-year monitoring period.

Storm EMCs represent the weighted average pollutant concentrations based on samples collected at discrete intervals during a storm. EMCs were calculated and averaged over the 5-year monitoring period for each parameter except TPH and Enterococcus. Stormflow samples for these parameters were collected only during first flush so MCs were calculated rather than EMCs. The average EMCs and MCs (Table III.H.3) of each parameter at each station were compared:

- Storm samples generally had higher concentrations of pollutants at the outfall than at the instream station.
 - Mean storm EMCs for 5-day biochemical oxygen demand (BOD), total Kjeldahl nitrogen (TKN), copper, zinc, and storm MCs for TPH, and Enterococcus were higher at the outfall than at the instream station.
- At the instream station, there was not a consistent relationship between flow type and results.
 - Mean storm EMCs were higher than baseflow MCs for BOD, TKN, TP, total suspended solids (TSS), and metals.
 - First flush storm MCs were higher than baseflow MCs for TKN and *Enterococcus*.
 - Mean storm EMCs were lower than baseflow MCs for nitrate plus nitrite, and hardness.
- At the outfall station, it was not possible to relate results to flow type.
 - The outfall station was generally dry, except following rainfall or other activities in the catchments. Baseflow samples could only be obtained on three occasions. In these samples, the baseflow MCs for Enterococcus and TPH were lower than stormflow MCs.

| Analyte | Mean Storm EMC | | Baseflow MC | |
|--|------------------------------------|------------------------------------|----------------------------------|----------------------------------|
| | Outfall | Instream | Outfall | Instream |
| Biochemical Oxygen Demand (5-day) | 5.0 ± 4.3 | 4.2 ± 3.6 | 16.3 ± 10.5 | 0.1 ± 0.6 |
| Total Kjeldahl Nitrogen | 0.918 ± 0.645 | 0.802 ± 0.529 | 2.106 ± 1.783 | 0.069 ± 0.209 |
| Total Phosphorus | 0.037 ± 0.067 | 0.073 ± 0.133 | 0.066 ± 0.132 | 0.000 ± 0.000 ^(b) |
| Nitrate+Nitrite | 0.335 ± 0.223 | 0.53 ± 0.27 | 1.417 ± 2.191 | 2.645 ± 0.228 |
| Total Suspended Solids | 53.7 ± 57.2 | 146.6 ± 128.9 | 32.4 ± 20.6 | 3.3 ± 5.0 |
| Total Cadmium | 0.000000 ± 0.000002 ^(c) | 0.000001 ± 0.000005 ^(c) | 0.00000 ± 0.00000 ^(b) | 0.00000 ± 0.00000 ^(b) |
| Total Copper | 0.028 ± 0.016 | 0.022 ± 0.012 | 0.165 ± 0.186 | 0.007 ± 0.012 |
| Total Lead | 0.007 ± 0.007 | 0.013 ± 0.014 | 0.005 ± 0.004 | 0.001 ± 0.002 |
| Total Zinc | 0.082 ± 0.048 | 0.056 ± 0.034 | 0.435 ± 0.544 | 0.017 ± 0.007 |
| Total Petroleum Hydrocarbon ^(a) | 4 ± 5 | 1 ± 3 | 3 ± 3 | 1 ± 4 |
| Enterococcus ^(a) | 10,648 ± 29,082 | 3,016 ± 10,104 | 1,132 ± 996 | 246 ± 468 |
| Hardness | 34 ± 17 | 43 ± 14 | 172 ± 127 | 110 ± 10 |

^(a)EMCs are not calculated for TPH or Enterococcus. These values are arithmetic averages of first flush grab results.

^(b)Analytical results below detection limits and therefore means set to zero.

^(c)Additional digits added to storm EMC and baseflow MC results to illustrate difference in results.

Analysis of the flow and water chemistry data collected for this project will be used to evaluate the effectiveness of watershed restoration efforts at improving hydrology and water chemistry. Data collected to date document baseline conditions, prior to retrofit construction, and during construction. In the future, a variety of approaches will be employed to evaluate retrofit effectiveness, including analyzing changes in hydrograph sensitivity to rainfall and annual pollutant loadings.

Annual Pollutant Loadings

Annual pollutant loadings for each station during 2014 were computed from separate baseflow annual loadings and stormflow annual loadings. Stormflow annual load for a given parameter at each station was determined by multiplying the average annual EMC (in mg/l) by the total annual stormflow discharge (in CF) and converting units. Baseflow annual load was determined by multiplying the average annual baseflow MC by the total annual baseflow discharge. The total annual baseflow discharge was obtained by separating baseflow values from the flow rate data record. The total annual stormflow discharge was determined by subtracting total annual

baseflow discharge from the total annual discharge (determined by plotting the annual hydrograph in Flowlink). Loading values were calculated from baseflow MCs, stormflow MCs and stormflow EMCs and are presented in Table III.H.4. reported in the electronic attachment to this report, Appendix A., MDENPDES14.accdb, Part G.2. Pollutant Loads Associated with GIS Coverage.

| Table III.H.4. Baseflow, Stormflow, and Total Annual Loadings (lbs.) in Breewood Tributary, 2014 | | | | | | |
|--|-------------------|------------------|------------------|------------------|---|------------------|
| Analyte | Stormflow Loading | | Baseflow Loading | | Total Loading (Stormflow plus Baseflow) | |
| | Outfall | Instream | Outfall | Instream | Outfall | Instream |
| Biochemical Oxygen Demand (5-day) | 782 | 1,923 | 2 | 0 ^(a) | 784 | 1,923 |
| Total Kjeldahl Nitrogen | 179 | 428 | 0.071 | 0.000 | 179 | 428 |
| Total Phosphorus | 7 | 66 | 0.02 | 0 ^(a) | 7 | 66 |
| Nitrate+Nitrite | 63 | 241 | 0.02 | 2 | 63 | 243 |
| Total Suspended Solids | 8,618 | 76,470 | 1.571 | 3.536 | 8,620 | 76,473 |
| Total Cadmium | 0 ^(a) | 0 ^(a) | 0 ^(a) | 0 ^(a) | 0 ^(a) | 0 ^(a) |
| Total Copper | 4 | 11 | 0.001 | 0.002 | 4 | 11 |
| Total Lead | 1 | 10 | 0 ^(a) | 0 ^(a) | 1 | 10 |
| Total Zinc | 15 | 30 | 0.005 | 0.015 | 15 | 30 |
| Total Petroleum Hydrocarbons | 544 | 573 | 0 ^(a) | 1.195 | 544 | 574 |
| Enterococcus | 251,906 | 1,892,791 | 101 | 78 | 252,007 | 1,892,869 |
| Hardness | 7,745 | 23,039 | 13 | 71 | 7,758 | 23,109 |

^(a) Zero load indicates all concentration data below detection limits.

NS = no concentration data collected during baseflow events at the outfall station.

Continuous Water Quality Monitoring

In June 2014, DEP began continuous monitoring at the instream and outfall station for dissolved oxygen, specific conductivity, temperature, and turbidity. Through this monitoring, DEP hopes to gain additional information on the nature of the stream biological community degradation, specifically any effect due to dissolved oxygen concentration. Beginning in November of 2014, some low dissolved oxygen readings were observed. Instrumentation problems associated with fouling of the dissolved oxygen sensor by stream growth were also identified. These problems made it difficult to evaluate the data. The instrumentation problems have been addressed and additional data has been collected. The FY16 report will contain information on the results of this monitoring including an evaluation of the impacts of the project on stream dissolved oxygen concentration and recommendations for future project designs.

Breewood Tributary Biological Monitoring

In March 2010, DEP established a biological monitoring station (SCBT101) in the Breewood tributary. As shown on Figure III.H.2, the station is located upstream of the Sligo Creek Parkway and the instream water chemistry monitoring station. Station SCBT101 is monitored each spring for benthic macroinvertebrates. No fish monitoring is conducted because of the extremely small drainage area of the tributary.

The DEP uses a BIBI to assess stream conditions at SCBT101. Pre-restoration benthic community analysis will be compared with post-restoration data to help evaluate watershed restoration success. DEP will analyze eight metrics of benthic macroinvertebrate community composition and function. The metrics include examining the percentage of functional feeding groups (FFGs) present, evaluating taxa richness, taxa composition, and pollution tolerance. Each measurement responds in a predictable way to increasing levels of stressors. Changes in the metrics will be seen as the biological community improves and may be seen before the overall BIBI score increases.

FFG classifications organize benthic macroinvertebrates by their feeding strategies (Camann, 2003 and Cummins in Loeb and Spacie, 1994). The five FFGs usually examined in a bioassessment are *collector gatherers*, *filtering collectors*, *shredders*, *scrapers*, and *predators*. Collector gatherers are the most generalized in feeding and habitat needs and are usually the most abundant FFG because their food source of fine particulate organic matter is abundant. Shredders reduce coarse material (like leaves) into fine material which can then be transported downstream for use by collectors. Shredders are considered specialized feeders and sensitive organisms and are typically well-represented in healthy streams (U.S. EPA 2008). Other FFGs include scrapers and predators. Scrapers scrape and graze on diatoms and other algae, are sensitive to environmental degradation and are associated with high quality streams. Predators attack and consume other insects and macroinvertebrates.

In 2010, the BIBI score for the tributary was 14 out of a possible 40, indicating a *poor* benthic community. Only six taxa were present, indicating low species richness. Shredders accounted for only 2 percent of the total sample collected at SCBT101 and no scrapers were found. Collector gatherers accounted for 57 percent of the sample collected at SCBT101. Filterers accounted for 3 percent and predator organisms composed 38 percent of the total sample.

In 2011, the BIBI score for the tributary was 18 out of a possible 40, indicating a *fair* benthic community. There were 14 taxa present, indicating moderate species richness. Shredders accounted for 11 percent of the total sample collected at SCBT101 and no scrapers were found. Collector gatherers accounted for 52 percent of the sample collected at SCBT101. Filterers accounted for 6 percent and predator organisms composed 31 percent of the total sample.

In 2012, the BIBI score for the tributary was 14 out of a possible 40, indicating a *poor* benthic community. There were thirteen taxa present, indicating moderate species richness. Shredders accounted for 2 percent of the total sample collected at SCBT101 and no scrapers were found. Collector gatherers accounted for 64 percent of the sample collected at SCBT101. Filterers accounted for 4 percent and predator organisms composed 26 percent of the total sample.

In 2013, the BIBI score for the tributary was 16 out of a possible 40, indicating a *poor* benthic community. There were 19 taxa present, indicating moderately high species richness. Shredders accounted for 5 percent of the total sample collected at SCBT101, but like in 2012 no scrapers

were found. Collector gatherers accounted for 70 percent of the sample collected at SCBT101. Filterers accounted for 6 percent and predator organisms composed 17 percent of the total sample.

In 2014, the BIBI score for the tributary was 8 out of a possible 40, indicating a *poor* benthic community, with only 39 individuals found in the sample. There were 13 taxa present, indicating moderate species richness. Shredders accounted for 15 percent of the total sample. As in previous years, no scrapers were found. Collector gatherers accounted for 15 percent of the sample (down from 72 percent the year before). Filterers accounted for 15 percent of the sample and predator organisms comprised 52 percent of the total sample.

Figure III.H.4 shows the average proportion of each FFG at SCBT101 and in a reference stream reach, the Good Hope tributary to Paint Branch (PBGH108). The benthic community of PBGH108 was rated *good* in 2010 and *fair* in 2011 thru 2013. The reference station was not monitored in 2014. Note that the relative percentage of predator taxa decreases and the percentages of filterer, shredder, and scraper taxa increases with an increase in benthic community rating.

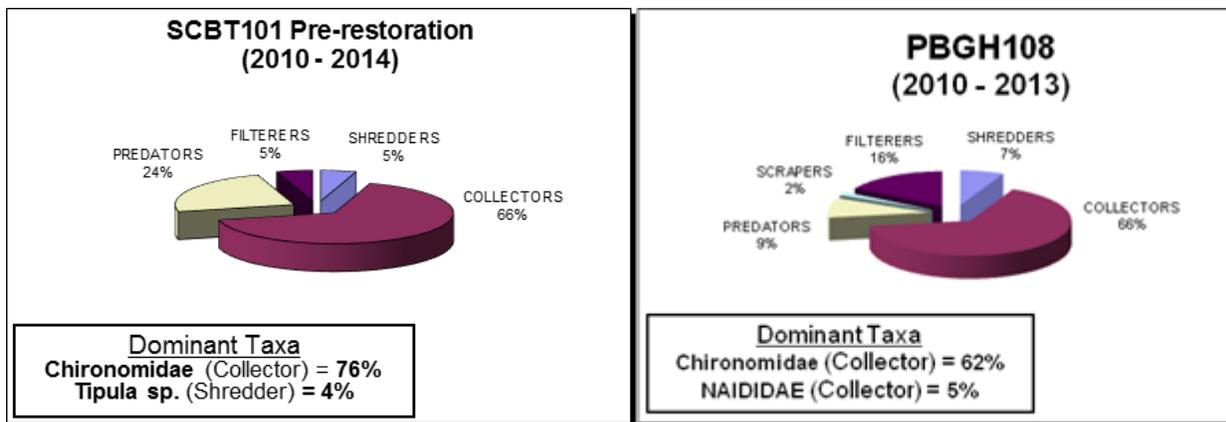


Figure III.H.4. Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108)

DEP used additional metrics to characterize the benthic macroinvertebrate community of the Breewood tributary in 2014. The biotic index, which measures tolerance to organic pollution, was 6.2 (out of 10), indicating a moderately high tolerance to organic pollution. In addition, the dominant taxa in the Breewood assessment were members of the Chironomidae (midge) family, which tend to be tolerant of pollution and other environmental stressors (Pedersen and Perkins 1986; Jones & Clark 1987). DEP identified a steady decline in the percent of Chironomidae in the samples (down from 91 percent in 2010 to 55 percent in 2014), but not an obvious cause. The BIBI score analysis also includes determining the presence of EPT taxa (commonly known as mayfly, stonefly, and caddisfly) which are sensitive species commonly associated with high quality streams. In the 2014 Breewood tributary benthic macroinvertebrate sample, there were very few EPT taxa present.

Breewood Tributary Physical Habitat Assessment

Starting in 2010, DEP performed yearly physical habitat assessments at SCBT101. Pre-restoration monitoring will establish a baseline for comparison with future habitat assessments. Results indicate that the habitat is consistently rated fair, receiving a score of 84 (out of a possible 200) in 2014. Scores from 2010 to 2014 ranged from 71 to 97. DEP found that the stream has poor riffle quality, high embeddedness values, bank instability, and a narrow riparian zone, which lowered the overall habitat score. DEP observed an increase in riffle quality in 2011 and 2012, which contributed to the overall increase in habitat score. In 2013 and 2014, however; DEP again noted reduced riffle quality, and higher embeddedness due in part to pre-restoration activities, and overland flow diverted from a non-functioning storm drain. Figure III.H.5 shows a comparison of the Breewood tributary BIBI and habitat conditions with those in the Paint Branch reference stream reach from 2010 to 2014. Note: The reference station PBGH108 was not monitored in 2014.

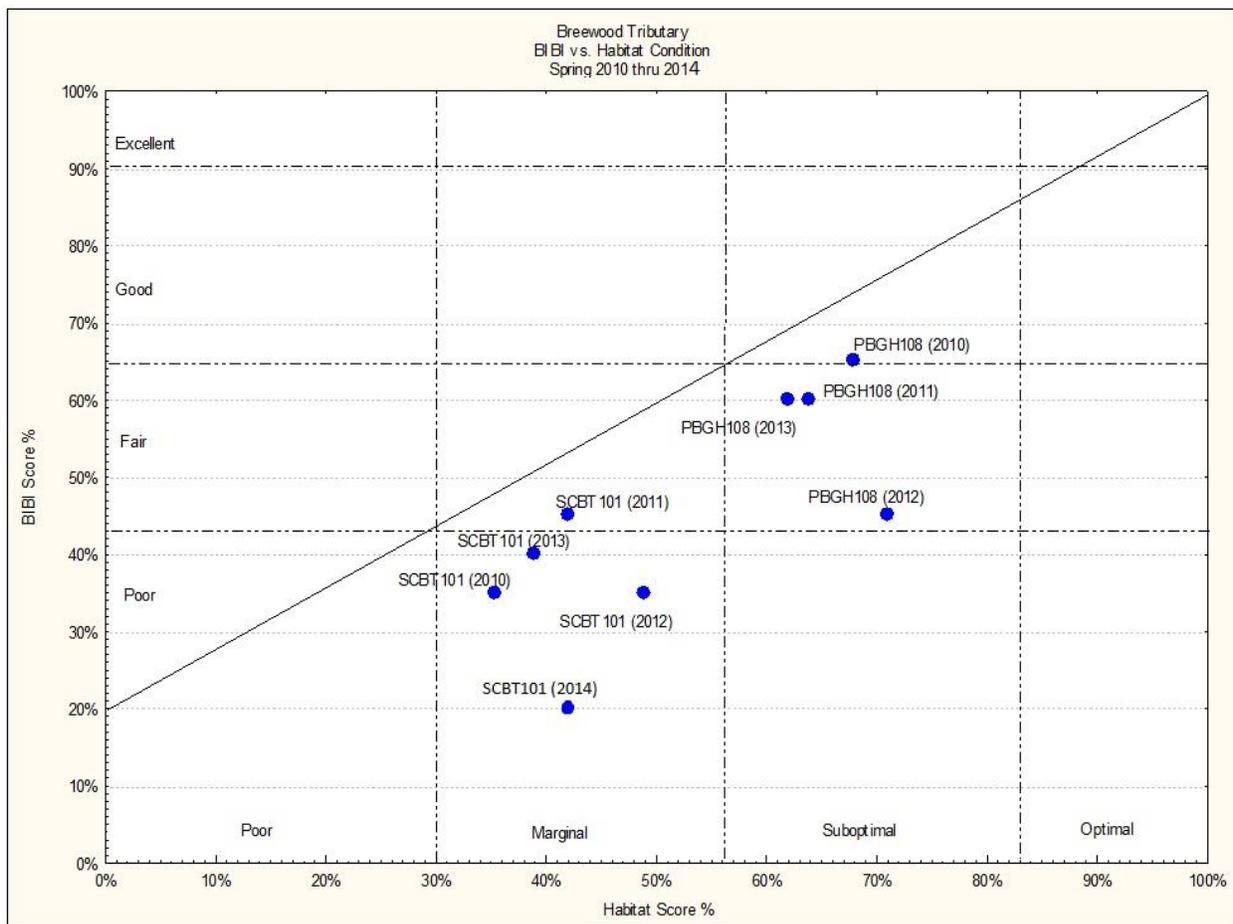


Figure III.H.5. BIBI vs. Habitat Condition at Breewood Tributary and Reference Stream, Spring 2010 thru Spring 2014

The DEP field team recorded in-situ water chemistry measurements in the Breewood tributary and the reference stream concurrent with the physical habitat assessment. As shown in Table III.H.5, most water quality parameters (dissolved oxygen, pH and temperature) were within the expected range at SCBT101 and the reference stream. Conductivity was the only parameter which consistently differed among the streams, being elevated (max. 966 umhos) at SCBT101 compared to (max. 212 umhos) at the reference stream. Salt in road runoff from the University Blvd. outfall upstream of the station is the most likely explanation for the unusually high conductivity values recorded. Conductivity values will continue to be tracked to evaluate if this is a consistent pattern and therefore a chronic influence on the benthic community.

| Table III.H.5. In-Situ Water Chemistry Results at Breewood Tributary (SCBT101) and at the Good Hope Tributary (PBGH108) Reference Stream | | | | | | | | | |
|--|---------|--------------------------|-----------|---------------------------|-------------------------------|------|-----------------------------|-------------------|---------------------|
| Station | Type | Benthic Community Rating | Date | Dissolved Oxygen (>5mg/l) | % Dissolved Oxygen Saturation | pH | Conductivity (<= 300 umhos) | Air Temp. (deg C) | Water Temp. (deg C) |
| SCBT101 | Benthic | Poor | 5/7/2010 | 8.73 | 87 | 7.30 | 566 | 21 | 15.4 |
| SCBT101 | Benthic | Fair | 3/9/2011 | 10.57 | 87 | 7.83 | 727 | 5 | 7.8 |
| SCBT101 | Benthic | Poor | 3/19/2012 | 10.35 | 90 | 5.9 | 565 | 22 | 14.3 |
| SCBT101 | Benthic | Poor | 3/21/2013 | 11.47 | 95 | 7.86 | 660 | 2 | 6.9 |
| SCBT101 | Benthic | Poor | 3/20/2014 | 9.05 | 83 | 7.56 | 966 | 12 | 12.0 |
| PBGH108 | Benthic | Good | 4/22/2010 | 10.69 | 90 | 6.24 | 166 | 12 | 11.0 |
| PBGH108 | Benthic | Fair | 4/18/2011 | 10.60 | 104 | 6.79 | 143 | 17 | 14.4 |
| PBGH108 | Benthic | Fair | 4/11/2012 | 11.27 | 110 | 7.36 | 157 | 14 | 10.6 |
| PBGH108 | Benthic | Fair | 3/20/2013 | 12.31 | 102 | 6.27 | 212 | 9 | 7.2 |

Breewood Tributary Physical Geomorphic Assessment

In 2010-2011, DEP established two study areas for physical geomorphic monitoring (20-bankfull widths) in the Breewood tributary (Figure III.H.2). Study Area 2 extends downstream from the end of Tenbrook Drive to just upstream from Sligo Creek Parkway and includes the biological monitoring station at SCBT101. A second study area (Study Area 1) extends from the outfall channel below University Boulevard to the Breewood tributary.

Figure III.H.6 provides representative cross section views of Study Area 1. In 2011, the average particle size of the channel substrate below the bankfull channel height was 0.062 mm, which is classified as fine sand. In 2012 and 2013, the average particle size of the channel substrate below the bankfull channel height was slightly coarser, at 0.65 mm in 2012 and 0.55 in 2013, which is classified as coarse sand. This area of the stream is predominated by riffles and runs. In 2011, riffles accounted for 39 percent of the reach surveyed and runs accounted for 38 percent of the reach surveyed. In 2012 and 2013, riffles accounted for approximately 48 percent of the

reach surveyed and runs accounted for 31 percent of the reach surveyed. The results of the survey indicate a degraded channel with low sinuosity, and high erosion potential. A geomorphic assessment of the Breewood tributary was not conducted in 2014 due to ongoing stream restoration activities.

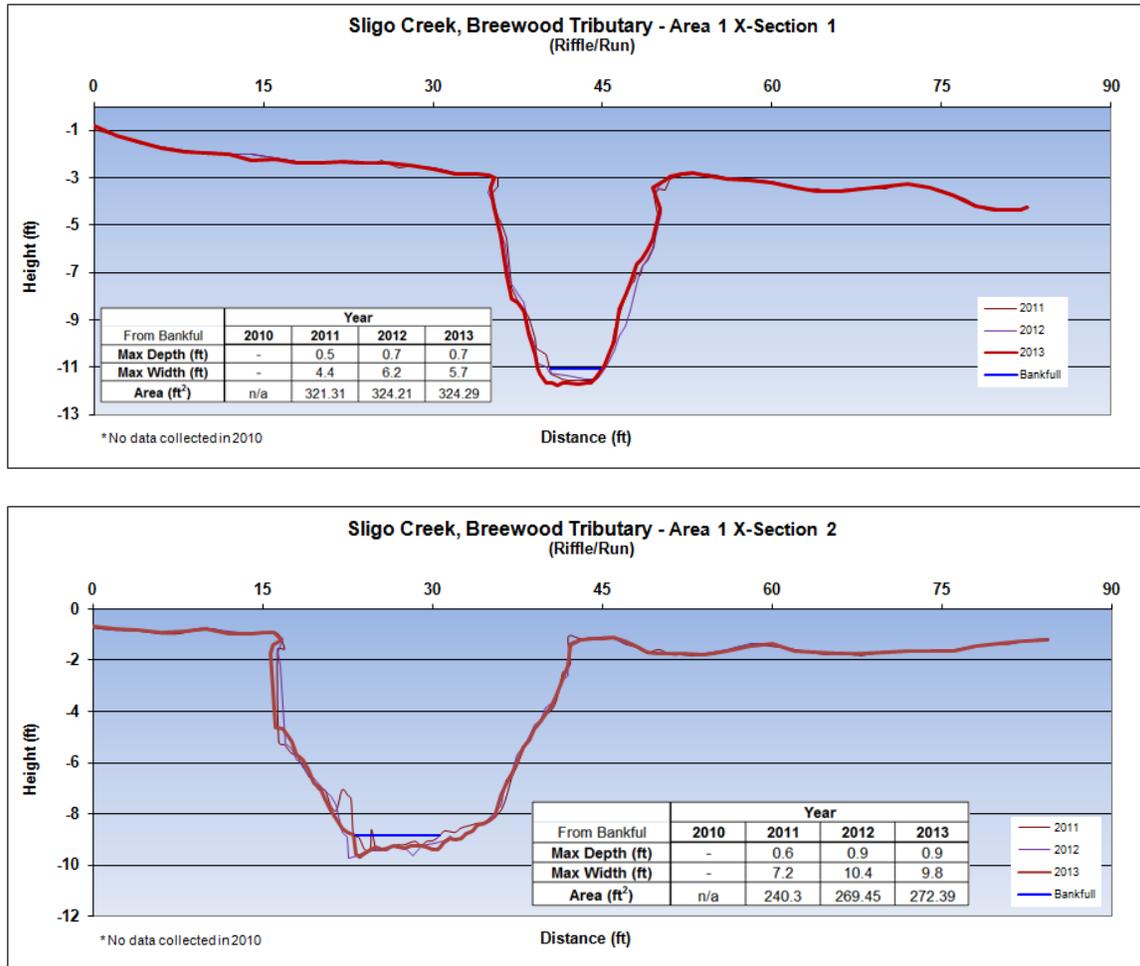


Figure III.H.6. Representative Cross Sections from Breewood Tributary, Study Area 1

Figure III.H.7 provides representative cross section views of Study Area 2. The average particle size of the channel substrate below the bankfull channel height ranged from 2.8 mm (very fine gravel) in 2010 to 12 mm (medium gravel) in 2011. In 2013 the average particle size was 8 mm (fine gravel). This area of the stream is predominated by riffles, which accounted for between 47 percent and 54 percent of the reach surveyed. The results of the survey also indicate a degraded channel with low sinuosity, and high erosion potential. More annual variability is noted in the cross sections at Study Area 2 than at Study Area 1.

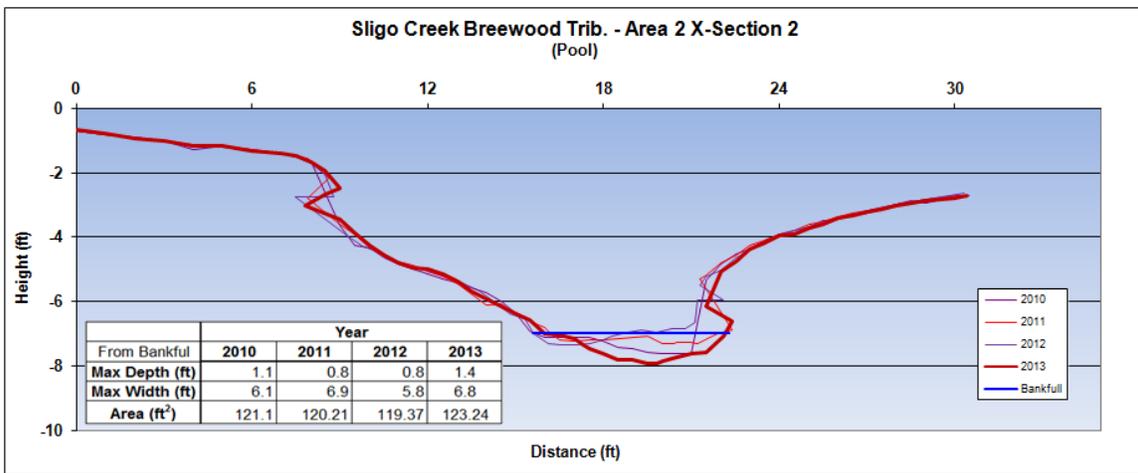
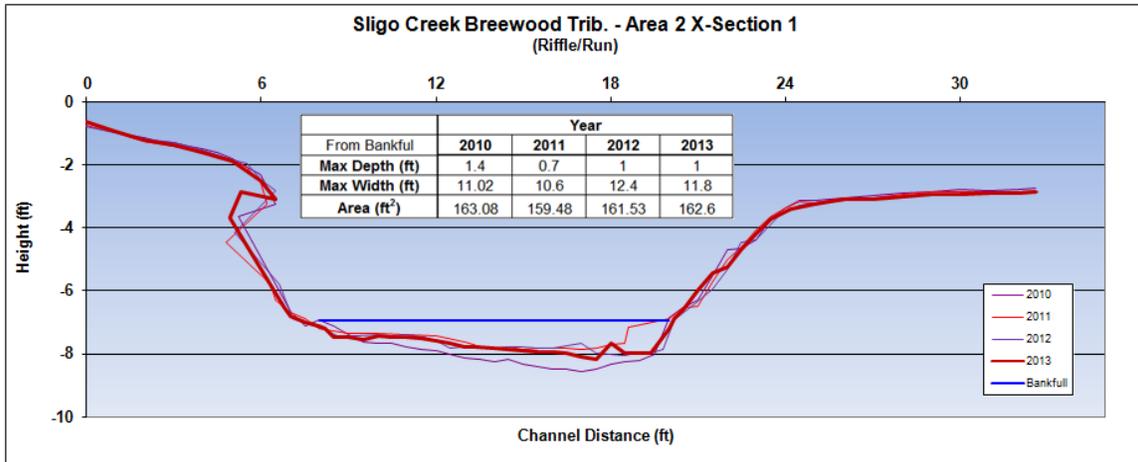


Figure III.H.7. Representative Cross Sections From Breewood Tributary, Study Area 2

Figure III.H.8 provides a photograph of a representative cross-section with Study Area 1, demonstrating the severe down-cutting that has occurred in this part of the Breewood tributary. Figure III.H.9 shows the Breewood tributary post restoration.



**Figure III.H.8. Upstream View of Sligo Creek,
Breewood Tributary, Study Area 1- Cross Section 1. Pre-Restoration**



**Figure III.H.9 Breewood Tributary, Study Area 1- Cross Section 1. Post
Restoration**

Summary of Biological and Physical Monitoring of the Breewood Tributary

The 2010 thru 2014 monitoring results document pre-restoration conditions and provide evidence that the Breewood tributary is impaired and will likely benefit from stream restoration. Monitoring will continue annually to evaluate improvements to the biology and habitat that are anticipated as a result of the restoration efforts.

Additional Monitoring: Countywide Watershed Restoration Project Monitoring

In addition to the Permit required monitoring, DEP monitors stream restoration projects and some associated stormwater retrofits to assess whether project goals are met and to determine how future projects will be designed and built to ensure a positive impact on the aquatic ecosystem. The purpose of restoration monitoring is to document whether specific project goals have been met and whether desired improvements to the watershed, as a whole, have been reached. Short-term monitoring (usually within 5 years) can often show the effect of a specific project on a stream, but long term monitoring (at least 10 years) is needed to show trends within a watershed.

Montgomery County's watershed restoration monitoring program has evolved over the years to collaborate more with the design of the projects themselves. In the early days of the program, monitoring not as well integrated and resulted in lack of pre-construction data or lack of relevant data in general. Projects are now typically developed with a clear set of quantifiable goals that can be monitored. Monitoring conducted prior to the construction of a project aids in the design of the project. There is adequate time to collect necessary pre-construction data and ensure a sampling design that fits the design of the specific project. Also, after many years of continued restoration efforts, certain watersheds have had enough comprehensive restoration performed and enough years of monitoring to begin to show cumulative results. These more recent reports are forthcoming and , when available, will be posted on the MCDEP website.

H.2 Stormwater Management Assessment

The Permit requires the County to assess effectiveness of stormwater management practices found in the *2000 Maryland Stormwater Design Manual* for stream channel protection. During the previous permit cycle, MDE approved DEP's proposal to conduct the required monitoring within a developing area of the Clarksburg SPA. Specific monitoring requirements include an annual stream profile and survey of permanently mounted cross-sections, and comparison to baseline conditions.

The DEP established monitoring stations in two drainage areas: a "positive control" where the drainage area will remain undeveloped and mostly forested and a "test area" where development occurs in the contributing drainage area. The test area is located in the Newcut Road Neighborhood tributary to Little Seneca Creek (LSLS104). The control area is located in Soper's Branch to the Little Bennett Creek (LBSB101). Methodology is described in the County's 2003 NPDES Report, Part III.D2, attached to this report as Appendix M. Figure III.H.9 shows the locations of the two areas and their contributing drainage areas, with the

control area shown in yellow labeled “Soper’s Branch”, and the test area shown in red labeled “Trib 104”.

Both drainage areas include a stream gage at the bottom of each study catchment. The test and control areas are also visited once per year to monitor biological conditions, habitat and physical-chemical data. Benthic macroinvertebrates are monitored during the spring index period (March 15 through April 30). Fish were not used as indicators for the small first order streams since there is often limited fish habitat.

Figure III.H.9 also shows the locations of four other areas monitored as part of the Clarksburg Monitoring Partnership (CMP), a consortium of local and federal agencies and universities. Two additional test areas were initially selected for the CMP: one area also in the Newcut Road Neighborhood (shown as Trib109) and one in the Cabin Branch Neighborhood (shown as Cabin Branch). One additional control area (shown as Crystal Rock) was set up in an existing developed area in Germantown. More recently, a test area has been established within the Ten Mile Creek watershed. All the test and control areas have USGS flow gages installed, where continuous stream flow data is being collected. Four rain gages monitor area rainfall and document local rainfall intensities to correlate rainfall to stream flow. One gage is located at Little Bennett Regional Park, two gages are located within Black Hill Regional Park, and one gage is located within the headwaters of Ten Mile Creek at the Kingsley School Environmental Center. Figure III.H.9 also depicts the location of a new study area (shown in red) located in the Ten Mile Creek watershed. This study area contains two USGS flow gages as well as two rain gages.

The CMP is using a *Before, After, Control, Impact (BACI) design or paired catchment (watershed) design* (Farahmand et al. 2007) approach to assess the land use changes and the impacts to stream conditions. The CMP has been monitoring since 2004. The CMP is also using Light Detection and Ranging (LiDAR) imagery to provide greater resolution in mapping landscape changes at this smaller drainage area scale than is possible using traditional aerial photography.

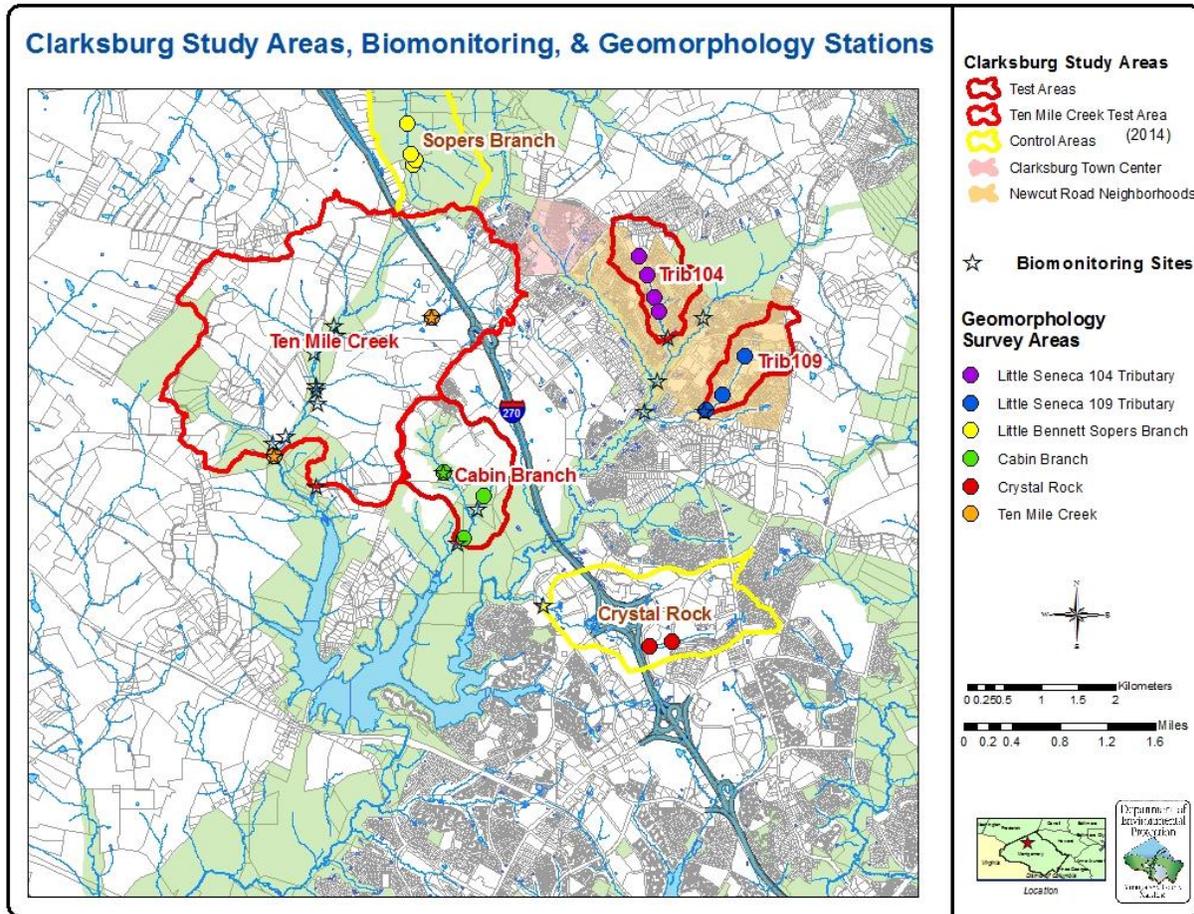


Figure III.H.10. Location of the Clarksburg Monitoring Partnership three test areas and two control areas. Also included are biological monitoring stations and geomorphic survey locations.

DEP performs additional physical stream characteristic and biological stream monitoring throughout the Clarksburg SPA to study the cumulative effects of development. The County annual SPA report includes the results of stream and BMP monitoring and presents a comprehensive analysis of all available biological, chemical, and physical data collected from 1994 through the current reporting calendar year. The County SPA Report and Technical Appendices are available on the Montgomery County website at:

<http://www.montgomerycountymd.gov/dep/water/spareports.asp>.

Status of Development in the Clarksburg SPA Permit Required Test Area

The drainage catchment to the test area (LSLS104) primarily contains two developments. The Greenway Village Phases I thru IV are completed, and sediment and erosion control (S&EC) structures have been converted to stormwater management (SWM) structures. The Clarksburg Village Phase I transitioned from construction to post construction in 2011. There are two small

portions within the test area (Clarksburg Village Phase II and Greenway Village Phase V) that, although largely stabilized, are still categorized in the S&EC phase. The land composition in the control area drainage catchment remains unchanged.

Precipitation, Infiltration, and Annual Flows

Average annual precipitation is about 42 inches in the Baltimore-Washington area (NWS 2008). Average monthly precipitation varies slightly throughout the year but localized spring and summer thunderstorms can cause significant variations in precipitation among nearby locations (Doheny et al. 2006; James 1986). To assure that such localized events were accurately captured, two rain gages were established for the Clarksburg Monitoring Partnership at Black Hill Regional Park in Cabin Branch (2004) and Little Bennett Regional Park in Soper’s Branch (2003). Two additional rain gages were recently installed to monitor precipitation events in Ten Mile Creek (2014). The data collected provides statistics on pattern and amount of rainfall, storm durations, storm mean intensity, and storm peak intensity.

Hydrologic Data Analysis and Interpretation

Stream flow gages continue to provide data that allows the calculation of instantaneous peak discharge and daily mean discharge as well as stream height response during storm events. Descriptive information on the seven flow gages is presented in Table III.H.6.

| Table III.H.6. Descriptions of the Five USGS Stream Gages in the Clarksburg Study Area | | | | | |
|--|---|--------------|-----------------------|------------|------------------------------|
| Gage Id. Number | Name | Date Started | DA (mi ²) | DA (acres) | Closest Test or Control Area |
| 01644371 | Newcut Road Neighborhood tributary to Little Seneca Creek Near Clarksburg, MD (“Test Area”) | 5/2004 | 0.43 | 275.2 | Test Area (LSLS104) |
| 01643395 | Soper’s Branch at Hyattstown, MD (“Control Area”) | 2/2004 | 1.17 | 748.8 | Control Area (LBSB201) |
| 01644375 | Little Seneca Creek Tributary Near Germantown, MD | 6/2004 | 1.35 | 864 | Crystal Rock |
| 01644372 | Little Seneca Creek Tributary at Brink, MD | 6/2004 | 0.37 | 236.8 | LSLS109 |
| 01644380 | Cabin Branch Near Boyds, MD | 6/2004 | 0.79 | 505.6 | Cabin Branch |
| 01644388 | Ten Mile Creek Near Clarksburg | 6/2013 | 3.37 | 2156.8 | LSTM301A |
| 01644390 | Ten Mile Creek Near Boyds | 10/2010 | 4.48 | 2867.2 | LSTM304 |

Annual runoff from stream gages in the test area (USGS gage 01644371) and the control area (USGS Gage 01643395) was compared to rainfall data from the Cabin Branch and Soper’s Branch rain gages to determine how much average annual precipitation infiltrates into the groundwater or is released into the atmosphere through evapotranspiration within the drainage areas of the gages. Data were obtained from the online Water Year Reports published by the USGS, Baltimore Office (Doheny 2009, personal communication) for water years 2005 through 2014. Water Years cover the period from October 1 of 1-year to September 30 of the next year.

The 2014 USGS Water Data Report for the two stream gages is available at:

<http://wdr.water.usgs.gov/wy2014/pdfs/01643395.2014.pdf> (Soper’s Branch control area)

<http://wdr.water.usgs.gov/wy2014/pdfs/01644371.2014.pdf> (Little Seneca Creek test area)

Summary information on stream characteristics at the test area and the control area will be provided in the 2014 Special Protection Area Report. The report will be available on the Montgomery County website at:

<http://www.montgomerycountymd.gov/dep/water/spareports.asp>.

Time of Concentration

Time of concentration (TOC) is defined as the difference in time between the start of rainfall and when discharge begins to increase at the gaging station (Doheny et al. 2006). This parameter is useful in understanding the stream response to clearing and grading and subsequent land use changes and increasing imperviousness. With less area for precipitation to infiltrate, runoff reaches the stream in a shorter amount of time. The Maryland E&SC requirements attempt to moderate this during construction by providing storage for 1 inch of rainfall from the site undergoing construction. However, local site constraints and weather patterns may not allow for storage of 1 inch of rainfall from the site for every storm. For example, the storms may be back-to-back storms or an unexpected condition discovered such as the BMP being located so that the local groundwater is intercepted.

Since 2005, TOC has been calculated for 136 storm events. Flow and rain data collection has not been consistent over the study period due to issues such as equipment malfunction. The number of storms considered for each station is listed in Table III.H.7 and only include storm events where a response occurred. Storm events were chosen over a variety of durations, intensities and seasons.

| Station Name | Drainage Area (acres) | Year / Number of Storms | | | | | | | |
|------------------------------------|-----------------------|-------------------------|------|------|------|------|------|------|------|
| | | 2005 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Soper’s Branch | 749 | 13 | 10 | 11 | 18 | 17 | 11 | 7 | 18 |
| Newcut Road Neighborhood Tributary | 275 | 21 | 0 | 6 | 18 | 20 | 11 | 8 | 28 |
| Cabin Branch | 506 | 16 | 13 | 12 | 19 | 20 | 11 | 6 | 30 |

TOC at Soper’s Branch has been variable over the course of the study period. No pre-construction results are available for the Newcut Road Neighborhood Tributary; the USGS flow gage was not installed at this time. In general, the TOC at the Newcut Road Neighborhood Tributary tends to be shorter than at Soper’s Branch, and in 2012 and 2013, continued to be less than observed at Soper’s Branch or Cabin Branch. In addition, the time it takes for stream flow from storms is substantially shorter during post construction compared to during construction. This is expected with the increase in impervious surfaces post construction providing a better avenue for runoff. Interestingly, preconstruction results for Cabin Branch were in a more compressed range than similar years for Soper’s Branch, possibly related to the active agriculture occurring during this time. During construction, less variability is seen between years compared to preconstruction. Trends will continue to be monitored over time.

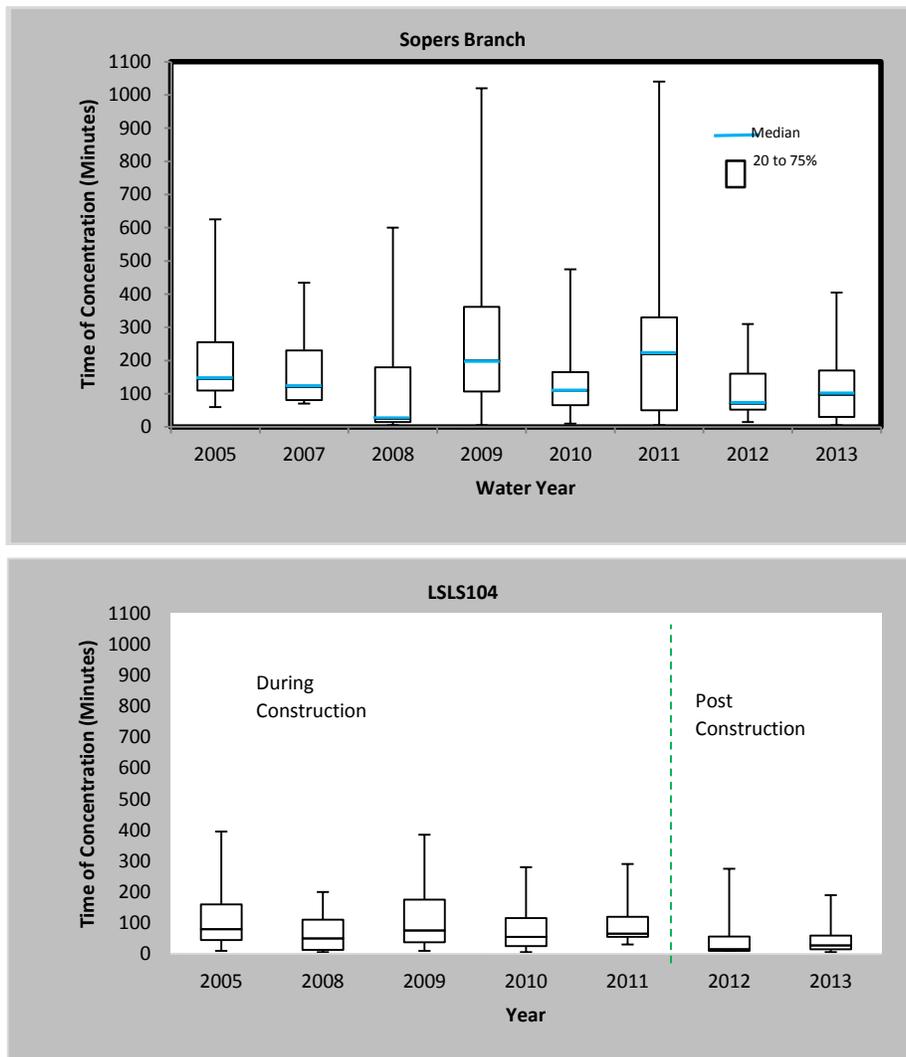


Figure III.H.10 Time of Concentration for Soper's Branch and Newcut Road Neighborhood Tributary 2005 to 2013

Stream Geomorphology Monitoring

Figures III.H.11 A and B provide survey locations for the stream geomorphology monitoring in the test area tributary and in the control area. Multiple surveys were completed in both areas to document the temporal change in stream channel morphology. Survey information includes longitudinal profiles, cross sections, bed composition (pebble counts), and sinuosity.

Surveys were established within similar habitat sections of each study stream. At that time, the upstream habitat sections were steeply-graded, straight channels (low sinuosity index) consisting mostly of riffle habitat. More downstream sections were characterized by decreasing slopes, increasing sinuosity and pools become more prevalent. There are four channel cross-section locations in both study areas, labeled from 1-4, with location 4 representing the most downstream cross-section location. All cross sections used in this comparison were measured in riffle/run stream areas. Riffle/run areas serve as grade control for the stream and are areas that resist changes to cross-section features.

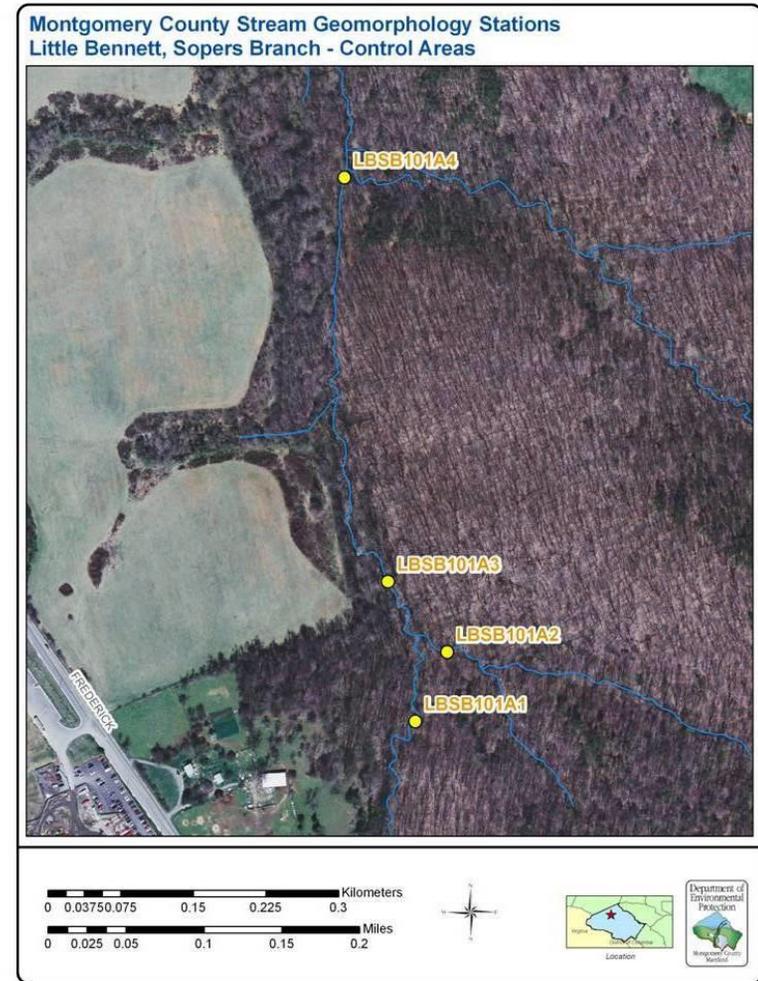
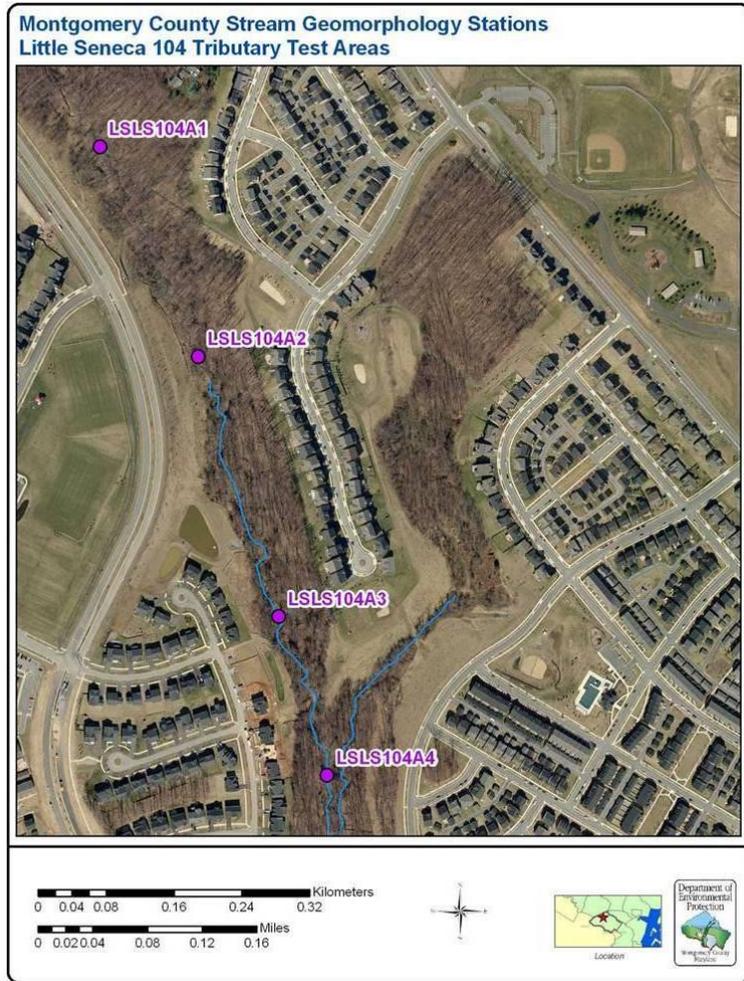


Figure III.H.12. Geomorphology Survey Locations: Test Area (A), Control Area (B)

Data Analysis and Interpretation

As development alters an area's surface hydrology, rainfall infiltration will decrease and stormwater runoff will increase, with corresponding higher peak flows and scour in the receiving stream channel. The eroded material is carried away and deposited downstream (aggradation). As the development site stabilizes, the receiving stream enters an erosional phase where the overland sediment supply is reduced and geomorphic readjustment takes place (Paul and Meyer 2001). To document stream physical changes during development, DEP conducts annual monitoring of cross-sections, pebble counts for average particle size, stream bed elevation, and measures of sinuosity. Table III.H.8 summarizes sinuosity indices and survey information for the test area (LSLS104) and the control area (LBSB101). Data are shown for the furthest downstream survey area within each reach.

Evaluation of sinuosity over time documents a difference between the test and control stations. Sinuosity is the ratio between the length of the stream and the corresponding length of the stream valley. A ratio of 1:1 would indicate a very straight and channelized stream. From 2003 to 2006 sinuosity ratios went from 1.4 to 1.0. This would be consistent with the increased annual runoff to the test area. After SWM began to be functional in late 2008, the ratio began to increase slightly, and is currently at 1.2. The sinuosity of the control area channel has remained more consistent than in the test area throughout the monitoring period.

The average particle size (D-50) for substrate material in the test area exhibited an increase at the most downstream study area through 2010. In 2011 the average particle size decreased at the test area for the first time since 2004. This corresponds with the beginning of the post-construction period at Clarksburg Village Phase I. The average particle size since 2011 has fluctuated between fine gravel and medium gravel. Increased runoff rates during the construction period may have been flushing the finer particles downstream, while the coarser, parent material aggregates of the stream channel were left in place. Increased impervious may also result in a system which prevents sediment from entering the system naturally. To reach equilibrium, sediment is removed from the stream channel in one location and deposited downstream in another area. Little change in particle size over time would be an indication that the system has reached equilibrium.

Cross sections from the test area illustrate this process on Figure III.H.12. The channel depth and channel width at the downstream study area has increased since construction began, likely in response to changes in hydrology. The cross sections generally show channel aggradation corresponding to the most active years of construction (2004, 2005 and 2006), and then channel degradation and some widening from 2007 to 2011 as the test area neared final elevations and stabilization. In 2012, approximately 1 foot of aggradation was observed. In 2013 and 2014, little change was noted, indicating that the channel may be stabilizing. Changes are most evident in the lower portion of the cross section profiles, at or below frequent storm elevation.

In contrast, representative sections from the control area showed that the channel area at the control station has also increased, but not as rapidly as at the test area. This is consistent with more stable hydrologic pattern and possibly indicative of less sediment moving through the system (Figure III.H.13).

| Table III.H.8. Sinuosity indices and survey information for test area (LSLS104) and control area (LBSB01). Data are shown for furthest downstream survey areas within each reach | | | | | | | | | | | |
|--|---------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|
| Sinuosity Index (SI) | | | | | | | | | | | |
| Year | '03 | '04 | '05 | '06 | '07 | '09 | '10 | '11 | '12 | '13 | '14 |
| LSLS104 A4 | 1.4 | 1.4 | 1.3 | 1.0 | 1.0 | 1.2 | 1.3 | 1.2 | .12 | 1.2 | 1.2 |
| LBSB201 A4 | 1.1 | 1.1 | 1.0 | 1.2 | 1.2 | 1.1 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 |
| Total Longitudinal Slope (%) | | | | | | | | | | | |
| Year | '03 | '04 | '05 | '06 | '07 | '09 | '10 | '11 | '12 | '13 | '14 |
| LSLS104 A4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.4 |
| LBSB201 A4 | 1.1 | 0.9 | 1.5 | 1.4 | 1.4 | 1.5 | 1.2 | 1.3 | 0.9 | 1.1 | 1.2 |
| D50 (mm) | | | | | | | | | | | |
| Year | '03 | '04 | '05 | '06 | '07 | '09 | '10 | '11 | '12 | '13 | '14 |
| LSLS104 A4 | 8.2 | 5.7 | 5.7 | 7.1 | 8.5 | 14 | 20 | 0.062 | 8.9 | 0.062 | 14 |
| LBSB201 A4 | 16 | 0.062 | 8.7 | 14 | 9.2 | 0.062 | 0.062 | 0.062 | 0.062 | 13 | 0.062 |
| D50 (particle) | | | | | | | | | | | |
| Year | '03 | '04 | '05 | '06 | '07 | '09 | '10 | '11 | '12 | '13 | '14 |
| LSLS104 A4 | Med. Gravel | Fine Gravel | Fine Gravel | Fine Gravel | Med. Gravel | Med. Gravel | Coarse Gravel | Fine Gravel | Med. Gravel | Fine Gravel | Med. Gravel |
| LBSB201 A4 | Course Gravel | Silt | Med. Gravel | Med. Gravel | Med. Gravel | Fine Gravel | Fine Gravel | Fine Gravel | Fine Gravel | Med. Gravel | Fine Gravel |

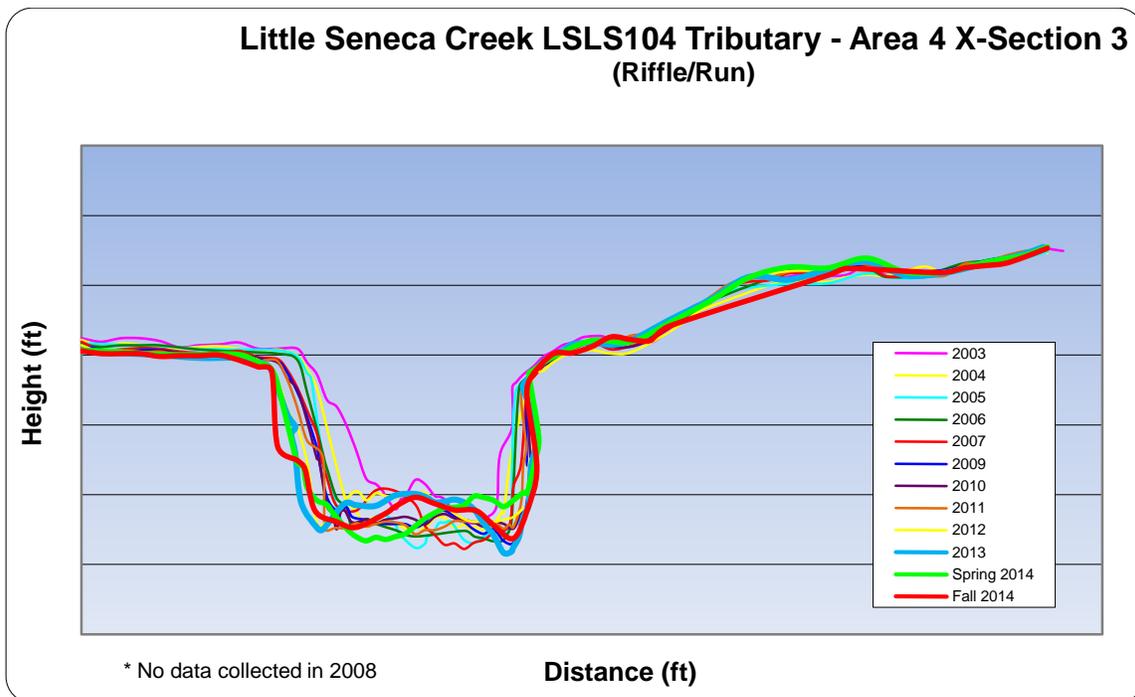
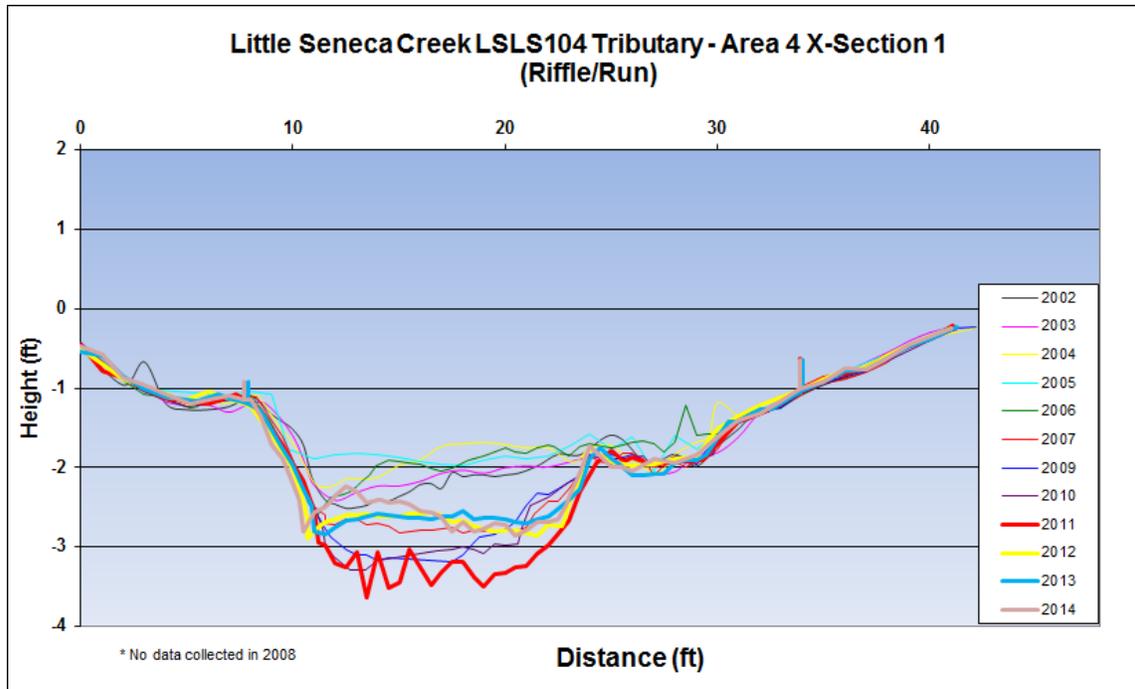


Figure III.H.13. Representative cross sections from the test area (LSLS104), cross section location 4 (most downstream location). Cross sections are both measured in riffle/run features.

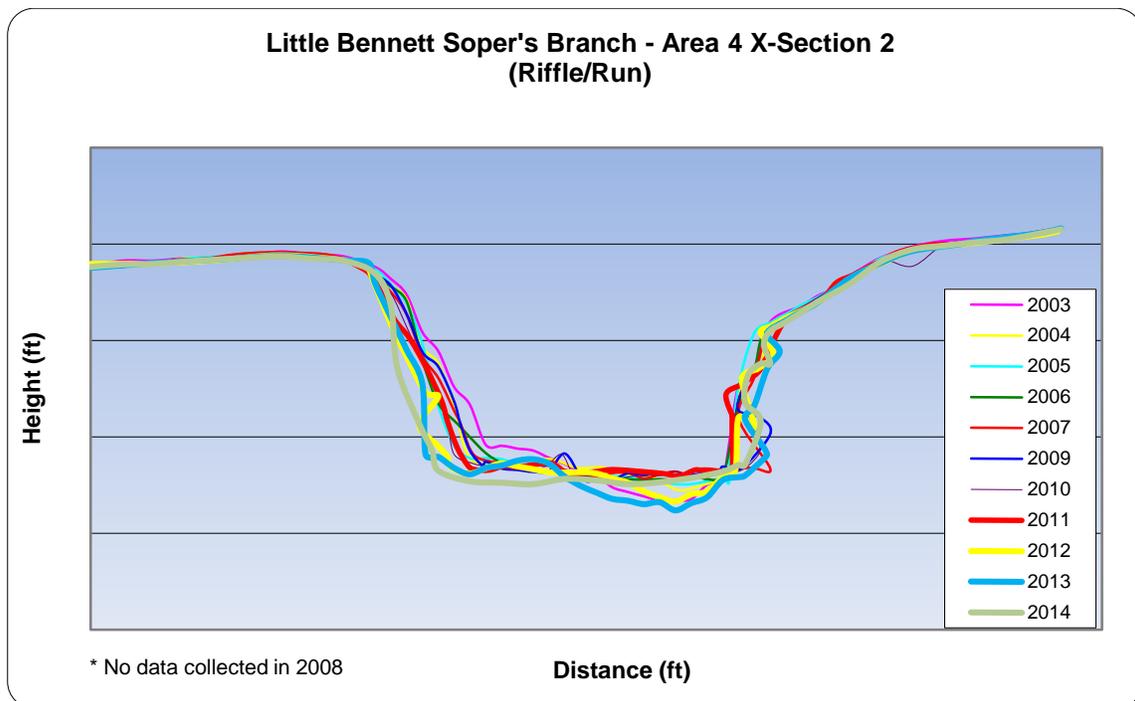
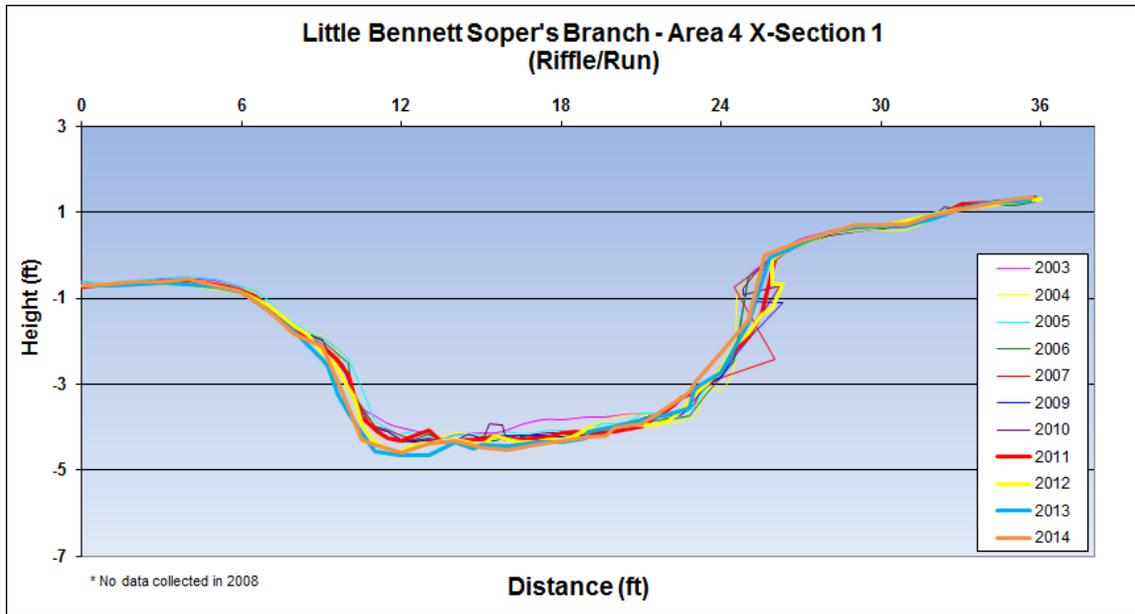


Figure III.H.14. Representative cross sections from the control area, cross section location 4 (most downstream location). Cross sections both measured in riffle/run features.

Figure III.H.14 shows results of longitudinal profiles, looking parallel to the stream channel, for the test area (LSLS104) and for the control area (Sopers Branch), respectively. The stream bed elevation in the test area tributary has shown considerable instability since construction was initiated, and features frequently change as sediment loads move through the system. Whereas, over the same time period greater consistency was observed in stream

bed elevation and feature type at the control station. An examination of the percent of riffle/run to percent pool at the test and the control sites revealed no observable trends. The results indicate the stream channel at the test area may still be in a state of flux as the system responds to the conversion from S&EC to SWM structures. Post-construction monitoring has not yet been completed. However, from the preliminary results it appears that the construction phase of development has impacted the test area channel morphology as evidenced by straightening, down-cutting, and enlargement of the channel.

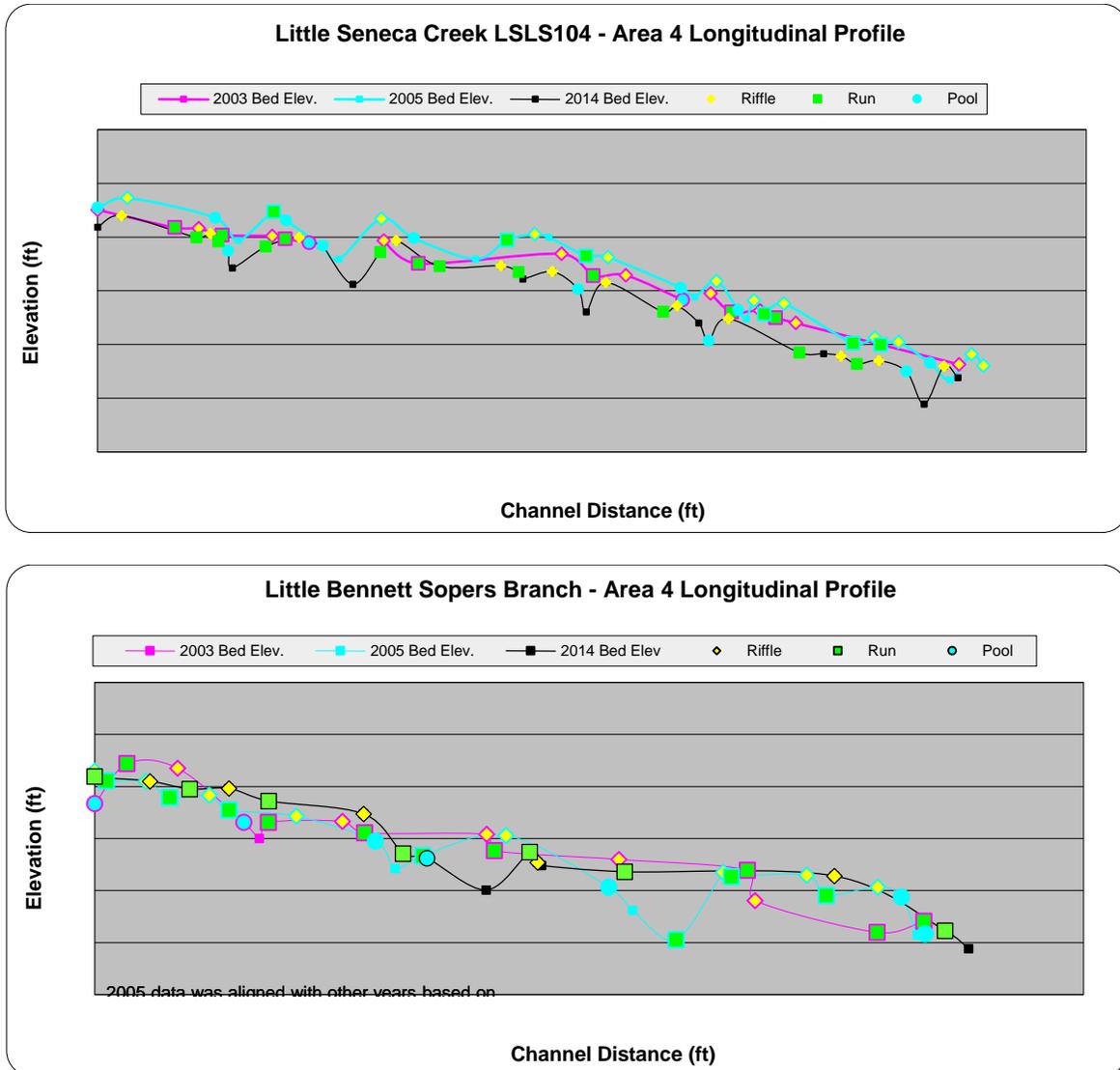


Figure III.H.15. Longitudinal Profiles Test Area (LSLS104) and Sopers Branch Control, Study Area Location 4 (Most Downstream Location).

I. Program Funding

The Permit requires that the County submit annual funding for the capital, operation, and maintenance expenditures in database format specified in Permit Part IV Attachment A. The required database is included in electronic format in Appendix A, MDENPDES15.accdb., Part L. Fiscal Analysis. A discussion of the CIP budget for stormwater management including watershed assessment and restoration is presented in Part III.G Watershed Restoration.

During FY15, the reported total funding associated with Permit requirements was \$53,505,725, an increase of 3 percent over the Permit costs in FY14. For FY13-FY15, DEP is reporting all costs associated with MS4 Program requirements including reporting costs, administrative costs, overhead, and debt service. It does not include operational DOT and DGS costs associated with pollution prevention on County property because these agencies do not have a way to separate out these specific costs from their other operating costs.

| Fiscal Year (FY) | FY0 | FY11 | FY12 | FY13 | FY14 | FY15 |
|-------------------------------|----------|----------|----------|-----------|-----------|---------|
| Total Budgeted | \$27,415 | \$30,097 | \$30,302 | \$44,773* | \$51,728* | 53,506* |
| Increase between fiscal years | | 9.7% | .70% | 48% | 14% | 3% |

*Including personnel, administrative and debt service costs not reported FY10-FY12.

J. TMDLs

The Permit requires the County to develop implementation plans showing how the County will achieve pollutant load reductions to meet WLAs for any EPA approved TMDLs in County watersheds. The WIPs must be developed within one year of the TMDL's approval by EPA. The final revised Strategy includes implementation plans for all those watersheds groupings which had one or more EPA-approved TMDLs prior to June 2009.

A summary of the Strategy's projected progress towards MS4 water quality requirements is presented in Table III.J.1. For TMDL planning purposes, the County is delineated into eight watershed groupings based on the eight-digit USGS hydrologic unit codes (HUCs). Figure III.J.1 shows those watersheds with MDE identified impairments and EPA-approved TMDLs as of January 2014.

**Table III.J.1. Summary of the Strategy’s Progress
Toward MS4 Water Quality Requirements**

| Countywide Watersheds | | | | | | | |
|--|-------|-------|-------|--------|--------|---------------------------------|---------------------------------|
| Summary of Implementation Plan schedule with expected MS4 permit area WLA compliance endpoints | | | | | | | |
| | 2015 | 2017 | 2020 | 2025 | 2030 | Permit/ TMDL Targets 2017 | Permit/ TMDL Targets 2020 |
| Impervious Area Treated (acres) | 4,302 | 6,014 | 7,722 | 10,518 | 11,154 | 6,008 | 7,723 |
| % of Impervious Area Treated by ESD | 18% | 34% | 47% | 60% | 63% | | |
| Impervious Area Treatment Cost (Million \$) | 305 | 622 | 987 | 1,687 | 1,884 | | |
| % of Cost for ESD | 53% | 66% | 70% | 80% | 80% | | |
| Nitrogen (% Reduction) | 18% | 25% | 36% | 46% | 51% | 9% | 20% |
| Phosphorus (% Reduction) | 17% | 23% | 34% | 44% | 46% | 12% | 34% |
| Sediment (% Reduction) | 23% | 34% | 54% | 60% | 62% | 20% | 37% |
| Bacteria (% Reduction) | 11% | 15% | 20% | 28% | 30% | | |
| Trash (% Reduction) | 18% | 26% | 33% | 41% | 42% | | |

Assumptions:
 1. Does not include repeated Outreach and Education costs beyond FY2015
 2. Does not include an inflation multiplier

The MDE approved the Strategy in July 2012. The approval letter can be found in the electronic attachment to this report in Appendix B. The County will continue to work with MDE to address any potential technical issues in the Strategy that are inconsistent with MDE modeling efforts. A final version of the Strategy incorporating MDE and public comments including the Watershed Implementation Plans and supporting documents are publicly available on the DEP website at: <http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/wris.asp#plans>

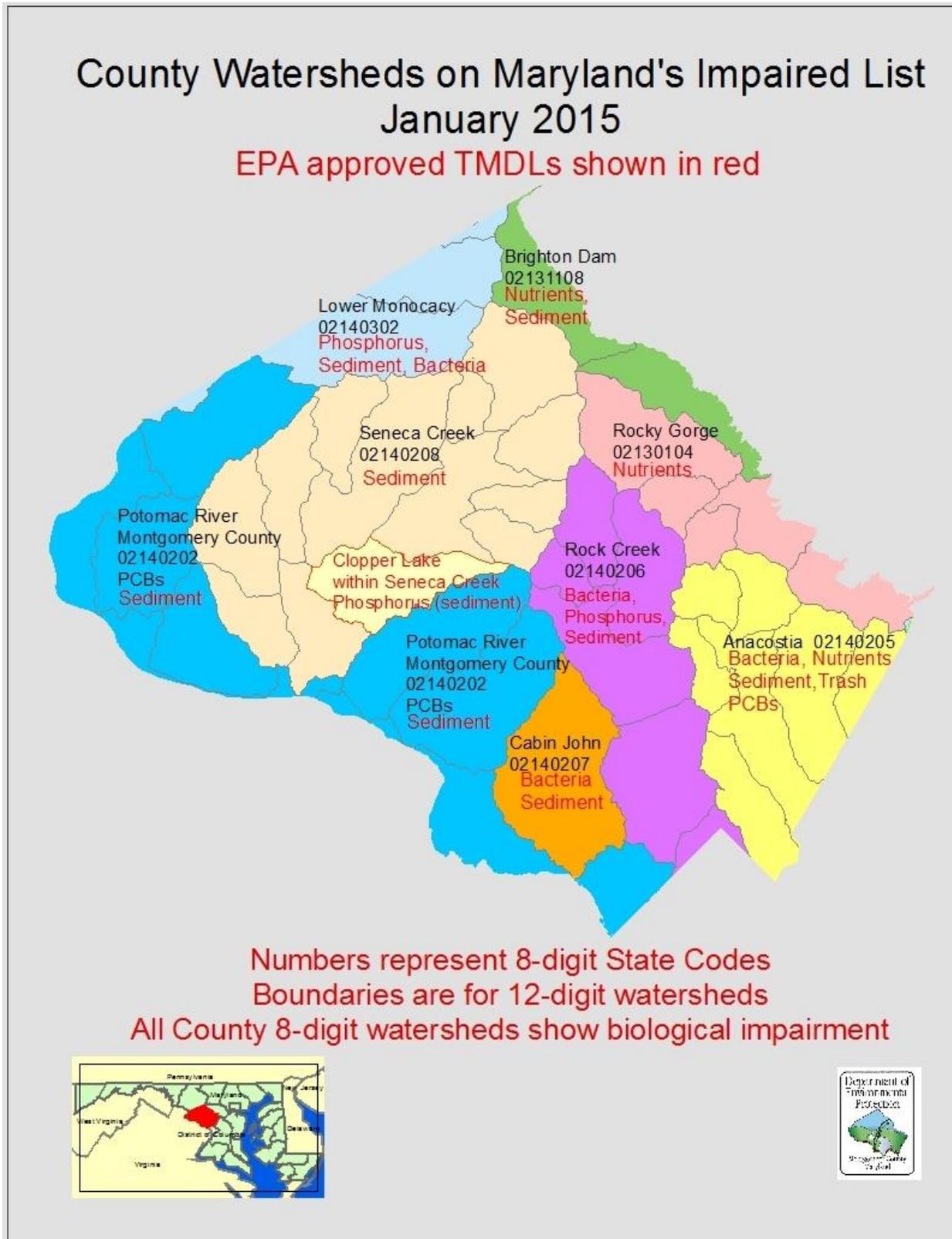


Figure III.J.1. County Watersheds with Impairments and EPA Approved TMDLs

TMDLs Issued Since June 2009

Table III.J.2 shows the TMDLs approved by EPA since the Strategy was developed in 2009.

| Table III.J.2. TMDLs Approved Since 2009 | | |
|--|-------------|---------------------------------------|
| Watershed | TMDL | Status of Implementation Plan |
| Anacostia | PCB | Implementation Plan Submitted in 2013 |
| Cabin John Creek | Sediment | Required Reductions Shown in Strategy |
| Lower Monocacy | Bacteria | Implementation Plan Complete 2014 |
| Lower Monocacy | Phosphorous | Implementation Plan Complete 2014 |
| Potomac River Direct | Sediment | Implementation Plan Complete 2014 |
| Rock Creek | Sediment | Required Reductions Shown in Strategy |
| Rock Creek | Phosphorous | Required Reductions Shown in Strategy |
| Seneca Creek | Sediment | Implementation Plan Complete 2014 |

Cabin John Creek Sediment, Rock Creek Sediment and Rock Creek Phosphorous

Three of the new TMDLs; Cabin John Creek sediment, Rock Creek sediment, and Rock Creek phosphorous, will be met by restoration activities implemented as part of the Strategy.

Table III.J.3 below compares the baseline loads, WLAs and percent reductions specified by the Cabin John sediment, Rock Creek sediment and Rock creek phosphorous TMDLs.

| Table III.J.3. Watershed TMDL Summary | | | | |
|---------------------------------------|--|---------------|----------------------------|-------------|
| Watershed/TMDL | Baseline Load for MC Phase I (tons/yr) | WLA (tons/yr) | Target Reduction (tons/yr) | % Reduction |
| Cabin John/Sediment | 3143.6 | 2430.1 | 713.5 | 22.7% |
| Rock Creek/Sediment | 8666.7 | 5345 | 3322 | 38.3% |
| Rock Creek/ Phosphorous | 12,503 | 8,089 | 4,414 | 35% |

Tables III.J.4 and 5 show the sediment and phosphorous reductions that will be achieved by the Strategy.

| Table III.J.4. Summary of the Implementation Plan Schedule for the Cabin John Creek Watershed with Expected TMDL Compliance Endpoints | | | | | | |
|---|----------|------|------|------|-------|-------|
| Fiscal Year | | 2015 | 2017 | 2020 | 2025 | 2030 |
| Impervious Treated (acres) | | 187 | 380 | 570 | 1,018 | 1,018 |
| ESD (% Impervious) | | 52% | 72% | 78% | 87% | 87% |
| Cost (Million \$) | | 23 | 65 | 114 | 215 | 219 |
| ESD (% Cost) | | 92% | 91% | 86% | 90% | 88% |
| % Reduction from baseline | TN | 21% | 27% | 39% | 55% | 58% |
| | TP | 20% | 26% | 35% | 49% | 51% |
| | TSS | 6% | 17% | 60% | 91% | 100% |
| | Bacteria | 16% | 22% | 27% | 40% | 40% |
| | Trash | 6% | 12% | 19% | 34% | 34% |

| Table III.J.5. Summary of the Implementation Plan Schedule for the Rock Creek Watershed with Expected TMDL Compliance Endpoints | | | | | | |
|---|----------|-------|-------|-------|-------|-------|
| Fiscal Year | | 2015 | 2017 | 2020 | 2025 | 2030 |
| Impervious Treated (acres) | | 1,541 | 1,961 | 2,381 | 3,625 | 3,989 |
| ESD (% Impervious) | | 17% | 28% | 36% | 57% | 61% |
| Cost (Million \$) | | 87 | 172 | 262 | 566 | 658 |
| ESD (% Cost) | | 70% | 79% | 79% | 89% | 90% |
| % Reduction from baseline | TN | 24% | 30% | 38% | 55% | 61% |
| | TP | 25% | 30% | 38% | 54% | 60% |
| | TSS | 38% | 50% | 92% | 100% | 100% |
| | Bacteria | 21% | 27% | 33% | 50% | 55% |
| | Trash | 17% | 24% | 31% | 50% | 55% |

Meeting TMDL WLAs in the Seneca Creek, Lower Monocacy, and Potomac Direct Watersheds

The DEP completed WIPs of the Seneca Creek, Lower Monocacy, and Potomac Direct in FY15. The WIPs show how the County will meet the WLAs of those TMDLs by implementing identified restoration opportunities.

Seneca Creek

Based on the total restoration potential analysis performed using the WTM, it will cost the County approximately \$100.74 Million to meet the sediment TMDL requirements. At the current allocation of funds toward the Seneca Creek watershed, and assuming a 5 percent growth rate, the County will meet the sediment TMDL by the 2025-2029 Permit cycle.

Similarly for the phosphorus TMDL for Clopper Lake, it is anticipated that the County will meet the phosphorus TMDL by the 2035-2039 Permit cycle. The Permit cycles with corresponding pollutant reductions are shown in Table III.J.6, below:

| Table III.J.6. TMDL Reduction by Permit Cycles for the Seneca Creek Watershed | | | | | | |
|---|------------------------|-----------|-----------|-----------|-----------|-----------|
| Impairment | Target Percent Removal | 2015-2019 | 2020-2024 | 2025-2029 | 2030-2034 | 2035-2039 |
| Sediment | 44.6% | 37.2% | 43.7% | 51.7% | 61.7% | 66.6% |
| Nutrients (Clopper Lake) | 45.4% | 31.5% | 33.4% | 38.2% | 44.0% | 45.7% |
| Budget (Watershed Subtotal, \$ M) | | \$25.81 | \$32.92 | \$42.01 | \$53.62 | \$42.05 |

Lower Monocacy Watershed

Based on the total restoration potential analysis performed using the WTM, it will cost the County approximately \$36.1 Million to meet the sediment TMDL requirements. At the current allocation of funds toward the Lower Monocacy watershed, and assuming a 5 percent growth rate, the County will meet the sediment TMDL by the 2035-2039 Permit cycle.

Similarly for the phosphorus TMDL, it is anticipated that the County will meet the phosphorus TMDL by the 2035-2039 Permit cycle.

The WTM modeling of the Lower Monocacy watershed showed that meeting the bacterial reduction required by the TMDL is not achievable by the restoration practices considered, and that the wildlife load within the watershed exceeds the technology available for removal. The complete suite of practices explored would cost \$36.39 Million to implement, which would be exhausted by the 2035-2039 Permit cycle.

The Permit cycles with corresponding pollutant reductions are shown in Table III.J.7, below:

| Table III.J.7. TMDL Reduction by Permit Cycles for the Lower Monocacy Watershed | | | | | | | |
|---|----------------|------------------------|-----------|-----------|-----------|-----------|-----------|
| Impairment | Units | Target Percent Removal | 2015-2019 | 2020-2024 | 2025-2029 | 2030-2034 | 2035-2039 |
| Sediment | tons/yr | 60.8% | 13.9% | 19.9% | 27.0% | 33.8% | 80.9% |
| Bacteria | Billion MPN/yr | 85.4% | 21.7% | 28.0% | 34.8% | 40.0% | 43.0% |
| Nutrients (Phosphorus) | lbs/yr | 30.0% | 9.1% | 13.8% | 19.2% | 23.7% | 37.5% |
| Budget (Watershed Subtotal, \$ M) | | | \$1.39 | \$1.78 | \$2.25 | \$2.89 | \$27.79 |

Potomac Direct

Based on the total restoration potential analysis performed using the WTM, it will cost the County approximately \$41.59 Million to meet the sediment TMDL requirements. At the current allocation of funds toward the Potomac Direct watershed, and assuming a 5 percent growth rate, the County will meet the sediment TMDL by the 2025-2029 Permit cycle.

Table III.J.8 shows the County strategy for meeting the local sediment TMDL for the Potomac Direct watershed.

| Table III.J.8. TMDL Reduction by Permit Cycles for the Potomac Direct Watershed | | | | |
|---|------------------------|-----------|-----------|-----------|
| Impairment | Target Percent Removal | 2015-2019 | 2020-2024 | 2025-2029 |
| Sediment | 36.2% | 28.5% | 35.5% | 43.4% |
| Budget (Watershed Subtotal, \$ M) | | \$25.53 | \$32.59 | \$41.59 |

Chesapeake Bay TMDL

Information on the County’s Phase II WIP submittal for the Chesapeake Bay TMDL is presented below in Part V. Special Programmatic Conditions, A. Tributary Strategy

IV. ANNUAL REPORTING

Annual progress reports are required under 40 CFR 122.42(c). This Permit report fulfills this requirement.

V. SPECIAL PROGRAMMATIC CONDITIONS

A. Tributary Strategy

The DEP continued to serve as the local liaison for activities related to Maryland's WIP process. In July 2014, the MDE published the results of its evaluation of local programs in meeting 2012-2013 Milestones. The County received 'High' ratings for most of these categories including resource enhancements, legal authority, organizational enhancements, and planning/studies. The County's stormwater sector received 'High' ratings in every category. The County received a "Medium" rating in the review category "addresses appropriate sectors (comprehensiveness)" because there were no milestones developed for pollution reduction from the septic sector. The County plans to develop milestones in the septic sector in the future. The complete evaluation is available on the MDE web site:

http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Documents/Milestones/2012-2013/Local/Evaluations/Local_2013_Milestone_Summary_Evaluations.pdf

There were no local meetings held during FY15 related to the WIP efforts. However, the DEP continued to coordinate with the four Phase 2 MS4 Permit localities as MDE moved forward with the next phase in the Maryland WIP process. This included participating in the WIP regional meetings held by MDE in November of 2014 and coordinating submission in January 2016 for Phase 2 milestones and local progress. Implementation remains on track as proposed in the WIP Phase 2 document submitted to MDE in November 2011.

B. Comprehensive Planning

The County agencies are routine participants for review and comment as M-NCPPC Sector Plan and Master Plan documents are being developed.