Municipal Separate Storm Sewer System

NPDES Permit No. DC0000221

2017
MS4 Annual Report

Nash Run Stream Restoration and Trash Trap
Photo by Josh Burch, DOEE

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DEPARTMENT OF ENERGY & ENVIRONMENT
GOVERNMENT OF THE DISTRICT OF COLUMBIA

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List of Acronyms and Abbreviations

AFF	Alice Ferguson Foundation
AWS	Anacostia Watershed Society
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSS	Combined Sewer System
CWC	Clean Water Construction Program
CWSRF	Clean Water State Revolving Fund
CWP	Center for Watershed Protection
DCMR	District of Columbia Municipal Regulations
DCPS	District of Columbia Public Schools
DCRA	Department of Consumer and Regulatory Affairs
DDOE	District Department of the Environment
DOEE	Department of Energy and Environment
DDOT	District Department of Transportation
DGS	Department of General Services
DPR	Department of Parks and Recreation
DPW	Department of Public Works
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FY	Fiscal Year (October–September)
GAR	Green Area Ratio
GIS	Geographic Information System
ILF	In-Lieu Fee
IPM	Integrated Pest Management
IPMT	Implementation Modeling Tool
LID	Low Impact Development
MWEE	Meaningful Watershed Education Experience
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NOI	Notice of Infraction

NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
Offv	Off-Site Volume
O&M	Operation and Maintenance
P2	Pollution Prevention
Permit	National Pollutant Discharge Elimination System Permit
PROW	Public Right-of-Way
QAPP	Quality Assurance Program Plans
RCRA	Resource Conservation and Recovery Act
SOP	Standard Operating Procedure
SRC	Stormwater Retention Credit
SWAP	Stormwater Advisory Panel
SWEEP	Solid Waste Education and Enforcement Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRv	Stormwater Retention Volume
TMDL	Total Maximum Daily Load
TWG	Technical Working Group
WLA	Wasteload Allocation

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DISTRICT OF COLUMBIA

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT ANNUAL REPORT

1 INTRODUCTION

1.1 Background

The Government of the District of Columbia (the District) submits this Annual Report on stormwater pollution control for fiscal year (FY) 2017 (October 1, 2016 through September 30, 2017). This report documents activities required to fulfill the requirements of the District of Columbia's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. DC0000221 (Permit), reissued on October 7, 2011, modified on November 9, 2012, and administratively extended on October 7, 2016, as well as additional activities undertaken by the District to reduce pollutant loadings from the MS4 to the Potomac and Anacostia Rivers and their tributaries. The activities described in the Annual Report meet the reporting requirements of the Permit and serve as a review of program implementation and compliance. This report also contains the Discharge Monitoring Report (DMR) forms for interim monitoring, Attachment K. The District Department of Energy and the Environment (DOEE)[1] compiled this report with assistance and input from the District agencies responsible for MS4 Permit compliance, Table 4.

1.2 Authorized Discharges

Stormwater discharges from the MS4 to Rock Creek, the Potomac and Anacostia Rivers and their tributaries are allowed if they comply with the requirements of the District's MS4 Permit.

1.3 Limitations of Coverage

The District continues to prohibit, through the implementation of the MS4 Program described in this report, non-stormwater discharges into the MS4, except to the extent such discharges are regulated by the Permit. The District has removed the "waivers and exemption" provision that previously existed in its regulations at 21 DCMR § 528.

1 Mayor's Order 2015-191, dated July 23, 2015 changes the Agency's name from District Department of the Environment (DDOE) to Department of Energy and Environment (DOEE).

1.4 Discharge Limitations

The District continues to manage, implement, and enforce a stormwater management program in accordance with all federal and local laws and regulations.

The District is in compliance with all the performance standards, provisions, and schedules found in the MS4 Permit. This demonstrates adequate progress towards compliance with District of Columbia Water Quality Standards and WLAs, as stated in Section 1.4.1 of the District's MS4 Permit.

2 LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINISTRATION

2.1 Legal Authority

As required by Section 2 of the MS4 Permit the District maintains the legal authority to control stormwater pollution within the MS4 drainage area.

The legal authority is established by the following laws and regulations:

MS4 Program Activities:

- The Comprehensive Stormwater Management Enhancement Amendment Act of 2008, effective July 1, 2009 (D.C. Official Code § 8-151.51 *et seq*.)
- The District Department of the Environment Establishment Act of 2005, effective February 15, 2006 (D.C. Law 16-51, as amended; D.C. Official Code §§ 8-151.01 *et seq*.)
- The Water Pollution Control Act of 1984, effective March 16, 1985 (D.C. Law 5-188; D.C. Official Code §§ 8-103.01 *et seq*.), as amended

Soil and Sediment Control:

- The Water Pollution Control Act of 1984, effective March 16, 1985 (D.C. Law 5-188; D.C. Official Code 8-103.07 *et seq*.)
- The Soil Erosion and Sedimentation Control Act of 1977, effective Sept. 28, 1977 (21 DCMR §§ 500-507; 21 DCMR §§ 40-48)
- The Soil Erosion and Sedimentation Control Act of 1977, effective September 28, 1977 (D.C. Law 2-; 24 DCR 792), as amended by the Soil Erosion and Sedimentation Control Amendment Act of 1994, effective August 26, 1994, (D.C. Law 10-166; 41 DCR 4892; 21 DCMR §§ 500-15)

Illicit Discharge and Dumping:

- The Water Pollution Control Act of 1984, effective March 16, 1985 (D.C. Law 5-188; D.C. Official Code 8-103.07 *et seq*.)
- The illegal Dumping Enforcement Act of 1994, effective May 20, 1994 (DC Law 10-117; D.C. Official Code Sec. 8-901 *et seq*.), as amended

Plastic Bag Fee and Enforcement:

- The Anacostia River Clean Up and Protection Act of 2009, effective September 23, 2009 (D.C. Law 18-55; D.C. Official Code § 2-1226.51 *et seq*.)

Coal Tar-Based Pavement Product Ban:

- Comprehensive Stormwater Management Enhancement Amendment Act of 2008, effective July 1, 2009 (D.C. Official Code § 8-151.81)

Pesticide and Fertilizer Control:

- Section 12(a) of the Pesticide Operations Act of 1977, effective April 18, 1978 (D.C. Law 2-70; D.C. Official Code § 8-411(a) (2001))
- The Pesticide Education and Control Amendment Act of 2012, effective on October 23, 2012 (D.C. Official Code § 8-431 *et seq*)
- Section 103(b)(1)(B)(ii)(II) of the District Department of the Environment Establishment Act of 2005, effective February 15, 2006 (D.C. Law 16-51; D.C. Official Code § 8-151.03(b)(1)(B)(ii)(II))

Polystyrene Ban:

- The Sustainable DC Omnibus Amendment Act of 2014, effective January 1, 2016 (D.C. Act 20-385)

DC Solid Waste Management and Recycling:

- Title 21 DCMR, Chapter 7, Chapter 8 and Chapter 20

Further authority is established by the following regulations:

As required by Section 2.1.2 of the District's MS4 Permit, the District finalized the 2013 Stormwater Management Soil Erosion and Sediment Control (2013 Stormwater Rule) on Friday, July 19, 2013. The 2013 Stormwater Rule amended Chapter 5 (Water Quality) of Title 21 (Water and Sanitation) § 500 to 545 and 599, and §§ 546, 547, and 552 of the District of Columbia Municipal Regulations (DCMR). The 2013 Stormwater Rule requires sites that disturb 5,000 square feet (SF) or more of land to retain the stormwater from a 1.2 inch storm. The Rule also requires a lesser retention standard for substantial improvement projects and has provisions for regulated sites to satisfy these standards offsite.

As required by Section 2.1.4 of the MS4 Permit, the District has drafted and amended environmental legislation and regulations to remove barriers to implementing the 2013 Stormwater Rule and other Permit required performance standards.

Additional legal authorities are discussed throughout the report where the activities are addressed.

2.2 Fiscal Resources

The District's Stormwater Permit Compliance Amendment Act of 2000 requires each agency to budget and fund costs for stormwater management activities that they were required to carry out prior to April 20, 2000. Those agencies continue to budget and fund the stormwater management activities listed in Table 2. Additionally, the District coordinates internally to spend special purpose revenue funds and to set the budget. The revenue target set in 2010, at the beginning of the Permit term, is still adequate to meet Permit requirements.

The Enterprise Fund

As required by Section 2.2 of the MS4 Permit the District has a dedicated funding source for MS4 Permit implementation. The District's Stormwater Permit Compliance Amendment Act of 2000 also established a Stormwater Permit Compliance Enterprise Fund (Enterprise Fund) to provide revenue to implement and administer activities directly required by the MS4 Permit. The Enterprise Fund generates approximately $13,000,000 per year that is utilized to substantively fulfill the requirements of the MS4 Permit. DOEE will continue current activities to manage stormwater pollution and encourage improved stormwater management techniques. This law also requires District agencies to maintain budget allocations that support baseline levels of effort for activities that control pollution from stormwater discharges from the MS4. This funding is derived from each agency's general obligation budget.

The Anacostia River Clean Up and Protection Fund

The Anacostia River Clean Up and Protection Act (Bag Law) requires all District businesses selling food or alcohol to charge $.05 for each disposable paper and plastic carryout bag. The law allows businesses to keep $.01 (or $.02 if it offers a rebate when customers bring their own bag), and the remaining $.03 or $.04 is deposited in to the Anacostia River Clean Up and Protection Fund. This fund generates approximately $2,000,000 per year and is used to implement watershed education programs, stream restoration, trash retention projects, and to purchase and distribute reusable bags to District residents. Many of these activities also support the District's compliance with the MS4 Permit.

Clean Water Construction Program

The Clean Water Construction (CWC) Program, managed by DOEE Water Quality Division, directs funding to projects that have the potential to achieve the highest return in terms of attainment of water quality standards in the District. Annually, DOEE solicits new project applications; evaluates them for their contribution to protecting and enhancing water quality; and sorts them in rank order on one of three project priority lists, Stormwater Grey Infrastructure, Stormwater Green Infrastructure, and Sewage Infrastructure. DOEE then applies to the EPA Clean Water State Revolving Fund (CWSRF) Program with a work plan to complete as many of the highest priority projects as can be executed with the District's CWSRF allotment for that fiscal year.

Examples of funded projects are the construction of stormwater bioretention facilities in the public right-of-way, green roofs installations on schools and public safety buildings, stream restorations, and an enhanced nutrient reduction facility at DC Water's Blue Plains Wastewater Treatment Plant. While planning and design work are eligible for funding, each project must include a construction phase since an applied benefit to District waters is required.

Projects funded through the CWC program receive CWSRF funding for 55% of the total project cost. An applicant must identify a local funding source for at least 45% of a project's funding, thus leveraging DOEE's EPA's funding. The CWC program is currently directing over 25.5 million dollars to stormwater mitigation projects in the MS4 area of the district, Table 1.

Table 1 Breakdown of Open CWC Grants in the MS4 Portion of the District

Grant Fiscal Year[2]	Funded Projects[3]	Federal Grant Amount	Local Matching Contribution	Total
2013	4	$3,159,011.21	$2,584,645.18	$5,743,656.39
2014	5	$2,750,818.43	$2,250,668.71	$5,001,487.14
2015	4	$2,470,296.55	$2,021,151.72	$4,491,448.27
2016	5	$2,688,349.00	$1,711,834.50	$4,400,183.50
2017	3	$3,159,439.25	$2,584,995.75	$5,744,435.00
TOTAL	**21**	**$14,227,914.44**	**$11,153,295.86**	**$25,381,210.30**

MS4 Program Budget and Expenditures

The District expends Enterprise Funds, Anacostia River Clean Up and Protection Funds, and general obligation funds to fulfill its obligations, Table 3. DOEE budgets Enterprise Funds solely for activities that are specific to the MS4 Permit compliance. DOEE and other District agencies also allocate additional funds to complete baseline municipal activities that are necessary to control pollution in MS4 discharges. The current level of funding is sufficient to fully comply with the Permit requirements. The Enterprise Fund budget for FY 2017 provides for capital construction costs, operation and maintenance (O&M) of structural controls, and programmatic activities. Table 2 provides a summary of the budget for FY 2017 MS4 Permit-required programs. Table 3 provides a summary of the Enterprise Fund expenditures for FY 2017 for Permit required deliverables. It is important to note that the budget includes capital funds that are often expended over multiple years. Further, DOEE establishes stormwater related budgets and track expenditures in a manner consistent with District practices and agency structure, which do not reflect the organization of the MS4 Permit.

2 Reported funding excludes subprojects constructed in the CSS portion of the District including tree plantings and retrofits in the public right-of-way, parks, and schools.

3 When distinct phases of a large project are funded through different grant awards, each of those phases is counted as one project. Additionally, a large project that includes multiple subproject sites and is funded through one grant award is counted as one project. In both cases, a project is defined by the scope of work awarded funding through a unique grant.

Table 2 FY 2018 Budget

Permit Section	Topic	FY 2018 Budget
	General MS4 Permit Management	$3,691,000
4.1	Standard for Long-Term Stormwater Management	$250,000
4.1	Impervious Surface Retrofits: bioretention, green roofs, outfall repairs, tree canopy and other capital investments	$5,000,000
4.1	Green Landscape Incentives / RiverSmart Programs	$2,050,000
4.2	Operation and Maintenance of Stormwater Capture Practices	$500,000
4.3	Management of District Government Areas	$300,000
4.3	Enhanced Street Sweeping	$750,000
4.4	Management of Commercial Institutional Areas	$230,000
4.5	Management of Industrial Facilities and Spill Response	$140,000
4.6	Stormwater Management for Construction Sites	$0
4.7	Illicit Discharges and Improper Disposal	$230,000
4.8	Flood Control Practices	$0
4.9	Public Education and Public Participation	$500,000
4.10	TMDL Wasteload Allocation Planning and Implementation	$2,700,000
4.10	Trash TMDL Implementation	$1,000,000
5.1	Revised Monitoring Program	$500,000
5.2	Interim Monitoring	$600,000
Total FY 2017 Budget		**$18,441,000**

Table 3 FY 2017 MS4 Program Expenditures by Program

Activity	Fund Source	Total
MS4 Monitoring, TMDL Development, and IDDE	Stormwater Enterprise Fund	$1,725,619
Construction Plan Review, Construction and Maintenance Inspection, and Restoration Project Management	Stormwater Enterprise Fund	$167,666
Pubic Space Green Infrastructure Programs and Trees	Stormwater Enterprise Fund	$2,191,049
Green Infrastructure Retrofits (non-public space) and Education	Stormwater Enterprise Fund	$12,850,660[4]
MS4 Program Administration and Program Implementation, Regulatory Development, and Fee Collection	Stormwater Enterprise Fund	$3,083,155
Enhance Street Sweeping, Hazardous Waste Collection, and Outreach	Stormwater Enterprise Fund	$748,676
Contracts - TMDL Implementation Planning, Revised Monitoring Planning, Catch Basin Optimization and Cleaning, and Outfall Survey	Stormwater Enterprise Fund	$1,734,571
Other Related Expenses (legal and office expenses)	Stormwater Enterprise Fund	$232,667
Stream Restoration and Design	Bag Law Fund	$1,408,681
Trash Reduction, Green Infrastructure, and Education	Bag Law Fund	$2,076,144
Total FY17 Expenditures		**$26,218,888**

2.3 Stormwater Management Program Administration and Permitee Responsibility

DOEE was designated by the District Department of the Environment Establishment Act of 2005, D.C. Official Code 8-151.01 *et seq*, as the MS4 Permit Administrator and assumed this responsibility in February of 2007. The current MS4 Permit was issued on October 12, 2011, and became effective on January 22, 2012. On November 9, 2012, EPA finalized limited modifications to the MS4 Permit to (1) provide additional public notice and input on the permittee's development of the Consolidated Total Maximum Daily Load (TMDL) Implementation Plan; (2) clarify and provide accountability for specific water quality-related outcomes, specifically on the content and timelines for the Consolidated TMDL Implementation Plan; (3) clarify that the District is the sole permittee; and (4) clarify that the District needs to notify the public of a sanitary sewer system overflow.

On April 6, 2016, the District submitted to the United States Environmental Protection Agency (EPA) Region III an application for renewal of its MS4 Permit. A draft of the District's next MS4 Permit was issued on November 17, 2016. EPA Region III issued a second draft of the

4 DOEE has awarded $11.5 million to the Stormwater Retention Credit (SRC) Price Lock Program to incentivize voluntary green infrastructure. This money will be spent in future years. Section 4.1.3 of this report provides detailed information about the SRC Price Lock Program. For more information see https://doee.dc.gov/service/src-price-lock-program.

District's next MS4 Permit on August 25, 2017. On October 7, 2016, the 2011 MS4 Permit was administratively extended until the new permit becomes effective.

Read more about DOEE's stormwater permit at the following links:

- MS4 Permit Administration http://doee.dc.gov/service/separate-storm-sewer-system-ms4-permit
- MS4 Permit http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/FinalPermit2011/DCMS4permit2011.pdf
- Final Signed Limited Modification to the DC MS4 Permit http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/MS4FinalLimitedModDocument/FinalSignedDCMS4LimitedMod%2011_9_12.pdf

DOEE partners with sister agencies to implement Permit activities. An overview of District agency responsibilities for MS4 permit compliance is shown in Table 4. This table summarizes the Matrix of Responsibilities from the Memorandum of Understanding (MOU) executed on December 14, 2000, and updated in 2008, which assigned responsibilities to District agencies for compliance with the Permit.

As required by Section 2.3.2 of the MS4 Permit, the District has a number of mechanisms in place to ensure that coordination across all agencies with responsibilities to implement Permit provisions occurs. Specifically, DOEE coordinates the District's MS4 Technical Workgroup (TWG) and the cabinet-level Storm Water Advisory Panel (SWAP). DOEE also executed independent MS4 MOUs with sister agencies which specified activities to be implemented in FY 2017 as required under the Permit and specified reimbursement amounts for implementation of these activities. Copies of the FY 2017 MOUs are included in Attachment A of this report.

Every year during the MOU and budget process the District assesses the need to add new agencies and groups to the TWG and SWAP. In FY 2017 no new critical partners were identified. Additionally, DOEE continues to hold quarterly meetings with non-governmental organizations (NGOs) to discuss partnership opportunities.

Table 4 Agencies Responsible for District MS4 Permit Compliance

Responsible Agency	Compliance Activity
DOEE	MS4 program administration Source identification Pollution Prevention Wet/dry weather monitoring program Wet weather screening program Flood control projects review Construction management and plan review Pollutant control from hazardous waste sites Pesticide, herbicide, and fertilizer application Promoting LID practices Illicit discharge detection Sediment erosion control Inspection/enforcement
DC Water	Floatables reduction program Pollution prevention Operation and maintenance of sewer infrastructure Catch basin cleaning Illicit discharge detection
DPW	Street sweeping Seasonal leaf and holiday tree collection program Pollution prevention Household hazardous waste collection De-icing and snow removal Stormwater management at municipal waste transfer stations
DDOT	Pollutant reduction from vehicles and roadways Pollution prevention LID practices in public right-of-way
DGS	LID practices on District-owned properties Pollution prevention
OP	Planning for neighborhoods, public facilities, parks and open spaces, etc. Urban design and land use review

3 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

The District continues to implement, assess, and upgrade all the controls and management practices described in the MS4 Permit and Revised Stormwater Management Plan (SWMP). The Revised SWMP was published on January 21, 2016 and can be found at http://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports.

The Consolidated TMDL Implementation Plan drives the District's determination of any future implementation needs that may need to be addressed in the SWMP, a requirement of Section 6.2.1.h of the MS4 Permit. This plan also establishes the framework for tracking the effects of stormwater management in the District, a requirement of Section 6.2.l.j of the MS4 Permit. The Consolidated TMDL Implementation Plan can be found at http://dcstormwaterplan.org/documents-and-deliverables.

Section 6.2.1.c of the MS4 Permit requires an assessment of the effectiveness of controls established by the SWMP. This requirement is fulfilled by Table 16 which details pollutant load and stormwater volume reductions.

The District is required by Section 6.2.1.a and Section 3 of the MS4 Permit to comply with all schedules of compliance. Table 5 includes program elements and strategies the District is required to submit to the EPA for review and approval.

Table 5 Stormwater Management Program Submittal Dates

Element	Required Submittal Date	Actual Submittal Date
Anacostia River Watershed Trash Reduction Calculation Methodology	01/22/2013	01/22/2013
Tree Canopy Strategy	01/22/2013	01/22/2013
Catch Basin Operation and Maintenance Plan	07/22/2013	07/05/2013
Outfall Repair Schedule	07/22/2013	07/05/2013
Updated Stormwater Regulations	07/22/2013	07/19/13
Stormwater Retention Standards for Substantial Improvement Projects	07/22/2013	07/19/13
Off-Site Mitigation/ Fee-in-Lieu Program	07/22/2013	07/19/13
Stormwater Management Guidebook	07/22/2013	07/19/13
Retrofit Program	01/22/2014	01/22/2014
Revised Monitoring Program	05/09/2015	5/8/2015
Consolidated TMDL Implementation Plan	05/09/2015	5/15/2015*
Revised Stormwater Management Program Plan for Public Comment	1/22/2015	2/20/2015*
Final Revised Stormwater Management Program Plan	01/22/2016	1/22/2016
MS4 Permit Reapplication	04/07/2016	04/06/2016

*extension granted by EPA Region III

4 IMPLEMENTATION OF STORMWATER CONTROL MEASURES

4.1 Standard for Long-Term Stormwater Management

The District continues to implement and enforce its Stormwater Management Program in accordance with the MS4 Permit and the Revised SWMP. The program uses retention practices to reduce stormwater runoff by mimicking natural landscapes through green roofs, bioretention, pervious pavers and other stormwater runoff reducing green infrastructure. The implementation of these activities, policies, and incentive programs is described throughout this report.

Table 6 Numeric Performance Standards and Compliance

Numeric Requirement	Time Period	FY 2017 Achievement	Achievement During Permit Term
Retrofit 18,000,000 square feet of impervious surfaces	Permit term	6,542,725 square feet	23,150,171 square feet[5,6]
Retrofit 1,500,000 square feet of impervious surfaces in the transportation right-of-way	Permit term	214,700 square feet	2,894,818 square feet
Plant 4,150 trees within the MS4 area (net increase)	Annually	7,794 trees	42,167 trees
Install 350,000 square feet of green roofs on District properties	Permit term	336,355 square feet	1,646,505 square feet
Remove 103,188 pounds of trash annually from the Anacostia River	By the fifth year of the permit	126,312 lbs.	Not Applicable

4.1.1 Standards for Stormwater Discharges from Development

DOEE finalized the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control (2013 Stormwater Rule) on Friday, July 19, 2013.

5 Discussion on District retrofit program and retrofit calculation is found in Section 4.1.5.4 of this report.
6 DOEE updates data in the Stormwater Database as historical data is validated or Stormwater Management Plans are revised. The information reported in this table will be updated in future annual reports as the Stormwater Database is updated.

The 2013 Stormwater Rule satisfies the requirements of Section 4.1.1 of the MS4 Permit, which requires the District to implement a 1.2-inch stormwater retention standard for land-disturbing activities, a lesser retention standard for substantial improvement projects, and provisions for regulated sites to satisfy these standards offsite. The 2013 Stormwater Rule also includes the Stormwater Retention Credit (SRC) trading program, which allows property owners to generate and sell SRCs by installing green infrastructure that has the capacity to retain stormwater and thereby reduce the runoff that harms District streams and rivers. More information on the SRC trading program can be found in Sections 4.1.2 and 4.1.3 of this report.

DOEE continues to hold training sessions for the public and District agency staff. FY 2017 accomplishments can be found in Table 7.

Table 7 FY 2017 District Stormwater Training Accomplishments

Training Date	Training Topic	Details and intended audience	Number of Attendees
10/18/2016	BMP Construction & Inspection	Public	6
11/15/2016	BMP Construction & Inspection	Public	1
3/30/2017	BMP Construction & Inspection	Public	8
11/2/2016	General Compliance	Public	9
1/10/2017	General Compliance	Public	26
3/1/2017	General Compliance	Public	18
6/7/2017	General Compliance	Public	4
8/2/2017	General Compliance	Public	16
1/25/2017	Green Area Ratio	Public	18
3/22/2017	Green Area Ratio	Public	9
5/17/2017	Green Area Ratio	Public	6
7/12/2017	Green Area Ratio	Public	12
11/16/2016	Office Hours	Public	NR
12/15/2016	Office Hours	Public	NR
1/11/2017	Office Hours	Public	NR
2/16/2017	Office Hours	Public	2
10/6/2016	SRC and RiverSmart Rewards	Public	5
11/1/2016	SRC and RiverSmart Rewards	Public	7
12/15/2016	SRC and RiverSmart Rewards	Public	2
1/19/2017	SRC and RiverSmart Rewards	Public	6
3/23/2017	SRC and RiverSmart Rewards	Public	5
4/25/2017	SRC and RiverSmart	Public	NR

Training Date	Training Topic	Details and intended audience	Number of Attendees
	Rewards		
6/12/2017	SRC and RiverSmart Rewards	Public	4
7/20/2017	SRC and RiverSmart Rewards	Public	6
8/23/2017	SRC and RiverSmart Rewards	Public	3
10/25/2016	Stormwater Database	Public	14
11/30/2016	Stormwater Database	Public	3
1/17/2017	Stormwater Database	Public	12
2/14/2017	Stormwater Database	Public	3
3/21/2017	Stormwater Database	Public	3
3/6/2017	Stormwater Database	DOEE Staff	NR
3/7/2017	Stormwater Database	DDOT Reviewers	NR
6/1/2017	Stormwater Database	Public	5
4/20/2017	Stormwater Database	Public	NR
7/13/2017	Stormwater Database	Public	3
8/22/2017	Stormwater Database	Public	6
9/21/2017	Stormwater Database	Public	7

NR: no attendance record

To view the 2013 Stormwater Rule and the 2013 Stormwater Management Guidebook (2013 SWMG): http://doee.dc.gov/swregs

FY 2018 Goals: Additional trainings for District staff and the public will continue to be held throughout FY 2017.

4.1.2 Code and Policy Consistency, Site Plan Review, Verification and Tracking

As required by Section 4.1.2 of the MS4 Permit, the District has drafted and amended environmental legislation and regulations to remove barriers to the implementation of the retention performance standards. DOEE has also designed the 2013 Stormwater Rule to work in concert with other sustainability initiatives in the District, including Green Area Ratio (GAR) requirements under the zoning code. To read more information about these initiatives:

- Sustainable DC http://www.sustainabledc.org
- The Green Area Ratio (GAR) http://doee.dc.gov/GAR
- The Green Building Act https://doee.dc.gov/publication/green-building-act-2006
- Green Infrastructure Design Standards www.ddot.dc.gov/greeninfrastructure

Along with code and policy revisions, the District maintains an erosion control plan review program for new construction coupled with a field inspection program to ensure compliance with District erosion control and stormwater management regulations.

In FY 2015, DOEE launched the Stormwater Database to manage submission, review, and inspection of Stormwater Management Plans, Erosion and Sediment Control Plans, and Green Area Ratio Plans. The database is also used to calculate and track discounts in the RiverSmart Rewards program and to calculate eligibility for and track the Stormwater Retention Credit Program. As required by Section 4.1.2 of the MS4 Permit, the database tracks each site's regulatory obligations and compliance, including off-site retention achieved with SRCs or payment of the in-lieu fee (ILF). The public uses the database to:

- Submit compliance calculations and other information to support an application for DOEE approval of a Stormwater Management Plan, Erosion and Sediment Control Plan, or Green Area Ratio Plan.
- Comply with an off-site retention obligation by applying to use SRCs or notifying DOEE of an in-lieu fee payment.
- Apply to certify, transfer, or retire SRCs.
- View the SRC registry.
- Apply for a RiverSmart Rewards discount on the District's impervious surface-based fees.

After completing applications, public users submit them electronically and the database notifies DOEE of these new applications. Staff review and make a decision to approve or disapprove each application and the database notifies public users of DOEE's decision.

In FY 2016, DOEE continued to expand the uses of the Stormwater Database across all programs. General enhancements to the database have included streamlining database workflows, automating email notifications regarding application approval and inspection, and providing greater access to program information. Notably, DOEE is now publishing Best Management Practice (BMP) data from the Stormwater Database in a GIS layer that can be publicly downloaded from http://opendata.dc.gov/.

DOEE also increased its ability to use the Stormwater Database for its inspection and enforcement programs by developing new database features. DOEE's inspectors now use the Stormwater Database in the field with tablets, which allows them to record inspection events and enforcement actions on-site. Detailed inspection data is stored in the database, signed, formatted into PDF documents, and automatically sent to the site owner and the site owner's agent, if applicable.

DOEE also developed expanded reporting options for the Stormwater Database to enhance the ability of program administrators to track program implementation. Custom dashboards and queries allow program administrators to view and export data in real time. This allows DOEE to identify process bottlenecks and to assess overall program implementation across the District.

In FY 2017, DOEE added several new Stormwater Database features:

- An electronic plan approval stamp allows DOEE permit reviewers to stamp SWMPs as PDFs rather than requiring physical plans. This helps to streamline DOEE's review process and improve electronic recordkeeping of SWMP approvals.
- DOEE began tracking the RiverSmart Homes program through the Stormwater Database. This module syncs with an ArcGIS collector app that RiverSmart Homes staff use in the field to make BMP recommendations.
- DOEE implemented a Stormwater Database feature to streamline the process for inspectors to upload photo evidence from their inspections.

DOEE also continued to migrate additional BMP data sources. In FY 2017, DOEE migrated its list of voluntary green roof projects into the Stormwater Database. DOEE continued to validate BMP data from historical SWMPs.

As previously stated, DOEE will coordinate with EPA staff to identify the data fields related to the MS4 Permit performance metrics and provide the relevant data upon request.

More information about the Stormwater Database can be found at: http://doee.dc.gov/swdb.

FY 2018 Goals: DOEE will continue to migrate historic data into the database and validate historical records. DOEE will expand the database to include new features, to track additional information for DOEE's programs, and to incorporate new programs within the Stormwater Database. Updates about the operation and implementation of the BMP tracking database will be included in future Annual Reports.

4.1.3 Off-Site Mitigation and/or Fee-in-Lieu

The 2013 Stormwater Rule provides regulated sites with flexible options for meeting regulatory requirements. Under the rule, each major regulated project must meet a stormwater retention volume (SWRv) based on either the 0.8 or 1.2 inch storm. A regulated site may meet a portion of its SWRv through Stormwater Retention Credits (SRCs) that are purchased in a private market or through payment of ILF to the District government. Program details are contained in Section 527 and Sections 530 through 534 of the 2013 Stormwater Rule and Chapters 6 and 7 of the 2013 Stormwater Management Guidebook. The regulations and trading program meet the requirements of Section 4.1.3 of the MS4 Permit. For full program information and to view the SRC Registry, visit http://doee.dc.gov/src.

SRC Price Lock Program

In FY 2017, DOEE made a significant investment to accelerate GI retrofits in MS4 areas by continuing to develop and establish three new programs: the SRC Price Lock Program, the SRC

Aggregator Startup Grant Program, and the SRC Site Evaluation Program (the FY 2016 annual report described a grant that DOEE issued to the Center for Watershed Protection (CWP) to assist in the development of these programs). Participation in each of these programs is restricted to new, voluntarily-installed green infrastructure in the MS4.

Through the SRC Price Lock Program, participants have the option to sell their SRCs to DOEE at fixed prices, effectively creating a price floor in the SRC market. This provides investors with the confidence necessary to commit funding to SRC-generating projects in the MS4. The initial terms offered by DOEE allow for projects to sell their SRCs to DOEE for the first 12 years of SRC certification. All SRCs purchased through this program will be retired and removed from the market so that they cannot be resold and cannot be used to meet a regulatory obligation. DOEE has made $11.5 million available solely for SRC purchases. DOEE began accepting applications to participate in the SRC Price Lock Program in early FY 2018.

Projects will apply for the SRC Price Lock Program in the early stages of design. Participants will receive an SRC Purchase Agreement that includes the terms by which the project can sell SRCs to DOEE. After the participating project is built and SRCs are generated (which requires a maintenance inspection and a maintenance contract or plan), the owner of the SRCs will have the option to either sell the SRCs on the market or execute the SRC Purchase Agreement with DOEE. When regulated construction projects purchase SRCs on the market from SRC Price Lock projects, this shifts investment in green infrastructure to areas that drain directly to the District's waterbodies without treatment, maximizing water quality benefits. This also makes DOEE's SRC Price Lock funding available to support additional projects. DOEE expects that the SRC Price Lock Program will help to accelerate the restoration of the District's waterbodies while providing developers with a supply of affordable SRCs from the MS4 that they can use to comply with regulatory obligations.

DOEE is offering prices for the first 6 years of SRC certification that are expected to help recoup project costs. Green infrastructure provides a larger water quality benefit when it is located in areas that drain to small streams and tributaries (which DOEE refers to as the non-tidal MS4). For that reason, DOEE is offering a higher price to projects in the non-tidal MS4 than to projects in areas that drain directly to the main stem of the tidal Anacostia and Potomac Rivers. DOEE is offering a price for years 7 through 12 that is expected to cover the cost of BMP maintenance. Since projects can expect to receive enough revenue to cover maintenance costs, this helps to ensure that the green infrastructure installed through this program is maintained long-term.

DOEE will purchase SRCs according to the terms listed in Table 8.

Table 8 SRC Purchase Terms

Project Location	Price for years 1 through 6	Price for years 7 through 12
Non-Tidal MS4	$1.95	$0.40
Tidal MS4	$1.70	$0.40
CSS	N/A	N/A

In addition to the $11.5 million that will be available for SRC purchases, DOEE also prepared two programs to support the design of SRC-generating BMPs for participation in the SRC Price Lock Program. SRC aggregating businesses that want to design and install green infrastructure to generate SRCs from multiple projects can apply for an SRC Aggregator Startup Grant of up to $75,000. These grants support technical and outreach work to identify green infrastructure opportunities on properties whose owners are interested in a green infrastructure project. Property owners who want direct assistance from DOEE can apply for an SRC Site Evaluation.

SRC Market Activity

The SRC market and Offv programs grew substantially in FY 2017. The SRC market experienced 12 trades for a total of 74,505 SRCs selling at an average price of $2.07. The total trading activity in FY 2017 exceeded that of all prior FYs combined, both in terms of the number of individual transactions and the total number of SRCs sold.

In FY 2017, DOEE approved 8 applications to certify Stormwater Retention Credits accounting for 1,897,877 SRCs, of which 96,020 SRCs represent new supply in the SRC market. The other 1,801,857 SRCs were generated by SRC owners who have informed DOEE there are no plans to sell the SRCs. The SRCs are being banked with the intention of meeting the SRC owners' Offv obligations on future projects if they arise. As a result, these SRCs do not represent supply on the SRC market and are not expected to impact market equilibrium.

Among the SRCs certified in FY 2017, DOEE approved the first SRCs for a green infrastructure project that was motivated primarily by the opportunity to generate and sell SRCs. The bioretention project was installed by an SRC-aggregating business on a property owners by a religiously-affiliated non-profit in located in Ward 7. DOEE certified 33,495 SRCs for the project in May, 2017 and posted a case study on its website at http://doee.dc.gov/src.

Of the SRCs approved in FY 2017, 96.9% represent green infrastructure located in the Anacostia River watershed. 2.7% represent green infrastructure located in the Potomac River watershed. 0.4% represent green infrastructure located in the Rock Creek watershed. 99.4% of SRCs represent green infrastructure located in the MS4 and 0.6% represent green infrastructure located in the CSS.

The 12 SRC trades in FY 2017 were driven primarily by projects with Offv obligations that were nearing the end of construction along with two project purchasing SRCS to use for a subsequent year of Offv compliance. DOEE received three ILF payment in FY 2017, totaling $7,996.26. One project that paid $780.44 subsequently applied to use SRCs. As a result, DOEE pro-rated the ILF payment and reimbursed the project $675.67. Projects may use SRCs or pay ILF to achieve Offv compliance in a later fiscal years, which means that some of these trades and payments will achieve Offv compliance in FY 2018.

In FY 2017, DOEE approved 16 permit applications for sites with Offv, bringing the total number of sites with Offv to 47 (these values exclude any site that was originally approved with an Offv but has subsequently been approved for a revision to eliminate the Offv). The increase in the number of plans with Offv is expected to stimulate trades in the market into the future. 16

projects with Offv finished construction in FY 2017, representing new demand for SRCs (or new ILF payments).The increase in the number of approved plans with Offv and the increase in the overall Offv approved is expected to stimulate trades in the market into the future.

In FY 2017, DOEE also updated the publicly-available information about the SRC program in the SRC and Offv Registry, which is available via the Stormwater Database. These updates are intended to increase program transparency and provide more information about program activity. Due to increased trading activity, DOEE began publishing yearly average prices, as well as averages for the most recent 12-month period (which updates daily). This makes it easier for participants to find typical trading prices. Additionally, DOEE updated its lists of "Expected SRCs" and "Expected Offv" to more clearly show the current and future SRC supply and demand. The SRC and Offv Registry is available at http://doee.dc.gov/src.

Information about SRC and Offv program activity in FY 2017 is summarized in the below charts and tables.

SRCs Certified

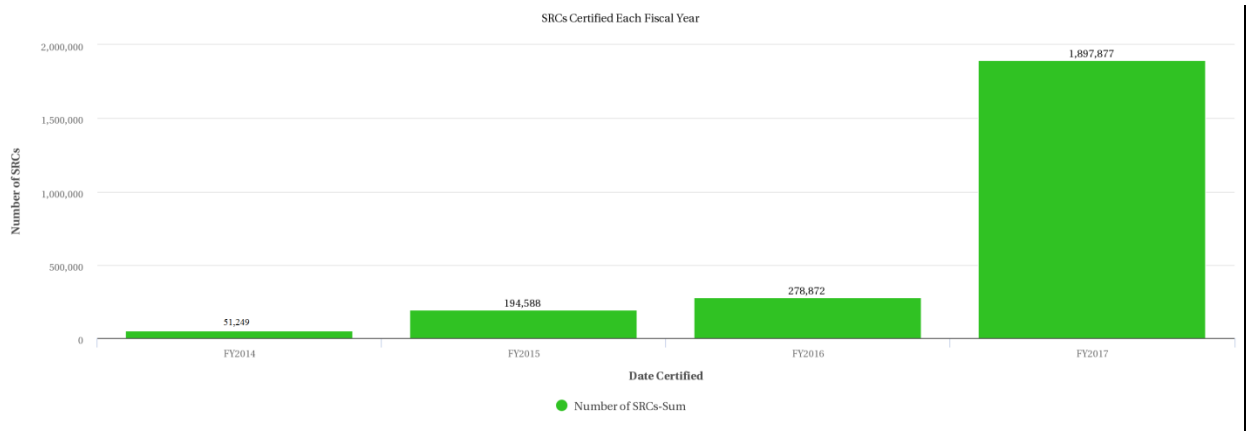

Figure 1 SRCs Certified per Fiscal Year

The SRC program has continued to grow from year to year. Figure 1 shows the SRCs certified in each fiscal year, with 1,897,877 SRCs certified in FY 2017. DOEE certifies up to 3 years' worth of SRCs on one application, so each fiscal year shown in Figure 1 represents up to 3 years' worth of SRCs. Some SRC owners generate SRCs to bank for Offv compliance for future projects, if these obligations arise. Table 9 shows how many SRCs certified each year represent supply in the SRC market. This is based on information provided to DOEE by applicants along with decisions by applicants to not list SRCs for sale.

Table 9: SRCs Certified Each Fiscal Year

Fiscal Year	SRCs approved - SRC Sellers	SRCs Approved - Projects Generating but not Selling SRCs	Total
FY 2014	51,249	0	51,249
FY 2015	71,588	123,000	194,588
FY 2016	125,917	152,955	278,872
FY 2017	96,020	1,801,857	1,897,877
Total	**344,774**	**2,077,812**	**2,422,586**

Each SRC has a vintage year that represents the year during which SRCs achieve retention. A vintage year is based on the date DOEE receives a complete application and each anniversary thereafter, for up to 3 years of certification. More information about SRC certification is available in Table 10, including the certification and vintage year for each SRC.

Each application may result in SRC certification for up to 3 years, which is shown in the Vintage Year columns. In most instances, the vintage occurs partially in two fiscal years. For simplicity, this table reports the fiscal year during which the SRC begins to achieve retention. For example, an SRC with a vintage from 5/10/2017 through 5/9/2018 would achieve retention during both FY2017 and FY2018, but would be reported only in the FY2017 column.

DOEE may receive an SRC certification application in one fiscal year and approve it in the next fiscal year. The vintage date for each SRC is based on the date DOEE receives a complete SRC certification application, rather than the date DOEE makes an approval of that application. For this reason, two projects were approved in FY 2017 with a vintage date in FY 2016.

Due to space limitations, this table includes information about all SRCs with vintage years since FY 2016. Information about SRCs with vintage years prior to FY 2016 can be found in prior annual reports.

Table 10 SRCs Certified With Vintages Since FY2016

SRC Certification Date	Watershed	Sewershed	Total SRCs (Vintages since FY 2016)	Vintage Year			
				FY2016	FY2017	FY2018	FY2019
8/15/2017	Rock Creek	CSS	2334		778	778	778
5/10/2017	Anacostia	MS4	33495		11,165	11,165	11,165
5/3/2017	Anacostia	MS4	672		224	224	224
4/21/2017	Potomac	MS4	51249		17,083	17,083	17,083
12/15/2016	Rock Creek	CSS	5891		2,373	1,759	1,759
11/21/2016	Anacostia	MS4	1738665	579,555	579,555	579,555	
11/16/2016	Anacostia	CSS	3051		1,017	1,017	1,017
10/5/2016	Anacostia	MS4	62520	20,840	20,840	20,840	
9/28/2016	Anacostia	MS4	41334	13,778	13,778	13,778	
9/2/2016	Anacostia	MS4	111621	37,207	37,207	37,207	
3/7/2016	Anacostia	MS4	38826	19,413	19,413		
2/19/2016	Anacostia	CSS	12203		12,203		
2/17/2016	Anacostia	CSS	12203	12,203			
10/30/2015	Potomac	CSS	62685	20,895	20,895	20,895	
9/24/2015	Potomac	MS4	82000	41,000	41,000		
7/2/2015	Anacostia	CSS	4366	4,366			
6/12/2015	Potomac	MS4	20330	10,165	10,165		
1/29/2015	Rock Creek	CSS	8632	4,316	4,316		
4/29/2014	Potomac	MS4	17083	17,083			
TOTAL			**2,309,160**	**780,821**	**792,012**	**704,301**	**32,026**

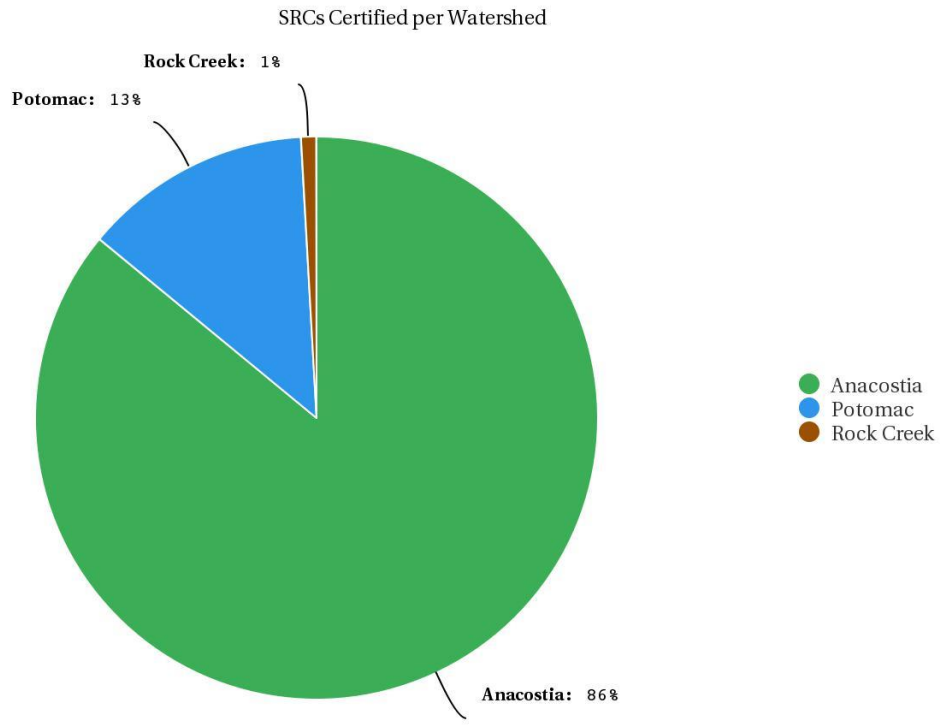

Figure 2 SRCs Certified per Watershed (All SRCs Certified FY2014-FY2017)

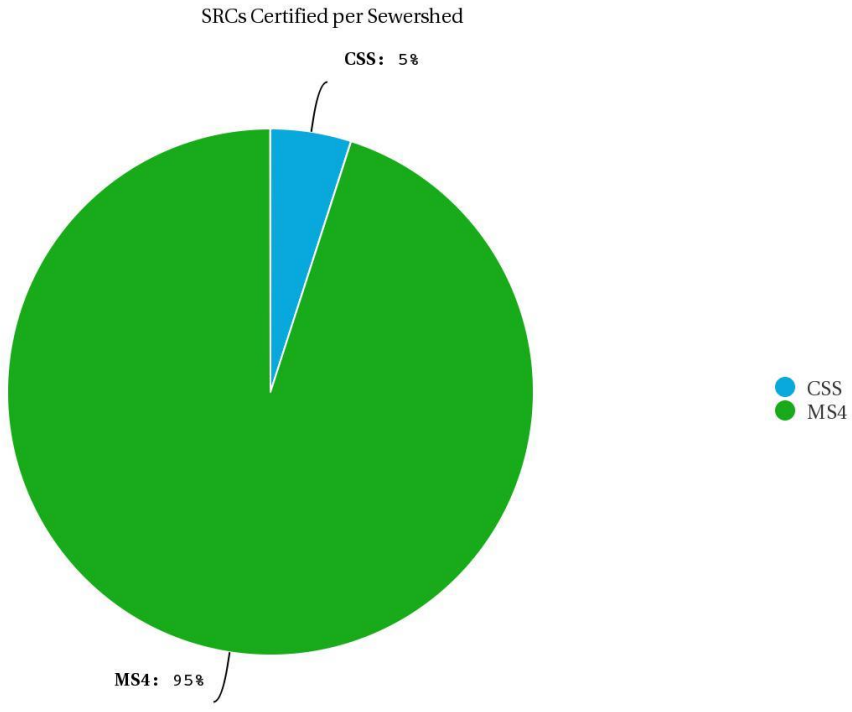

Figure 3 SRCs Certified per Sewershed (All SRCs Certified FY2014-FY2017)

Off-Site Retention Volume

In FY 2017, DOEE approved 16 projects with Offv. Figure 4 shows the number of projects approved with Offv each fiscal year (these values exclude any site that was originally approved with an Offv but has subsequently been approved for a revision to eliminate the Offv). More projects with Offv translate to increased potential demand in the SRC market. This creates additional incentive for more voluntary green infrastructure projects to meet that demand.

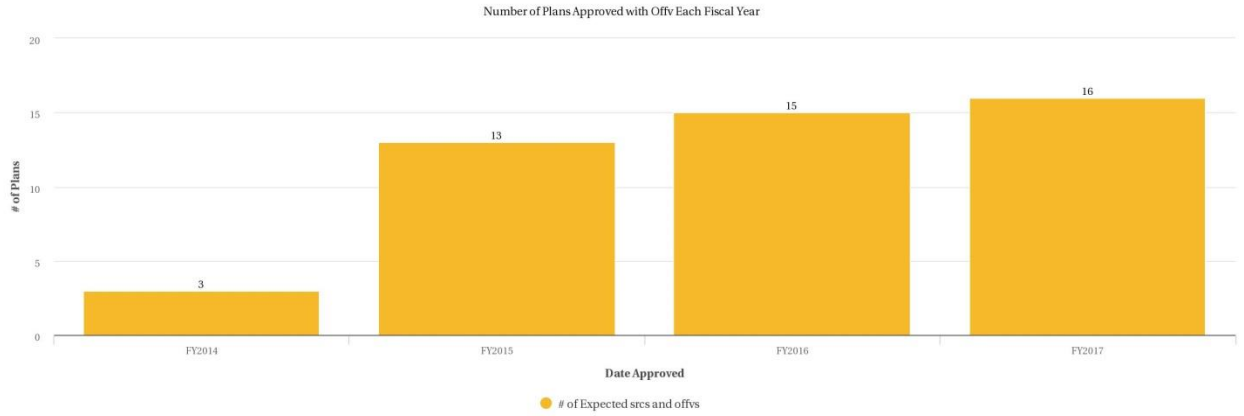

Figure 4 Number of Plans Approved with Offv

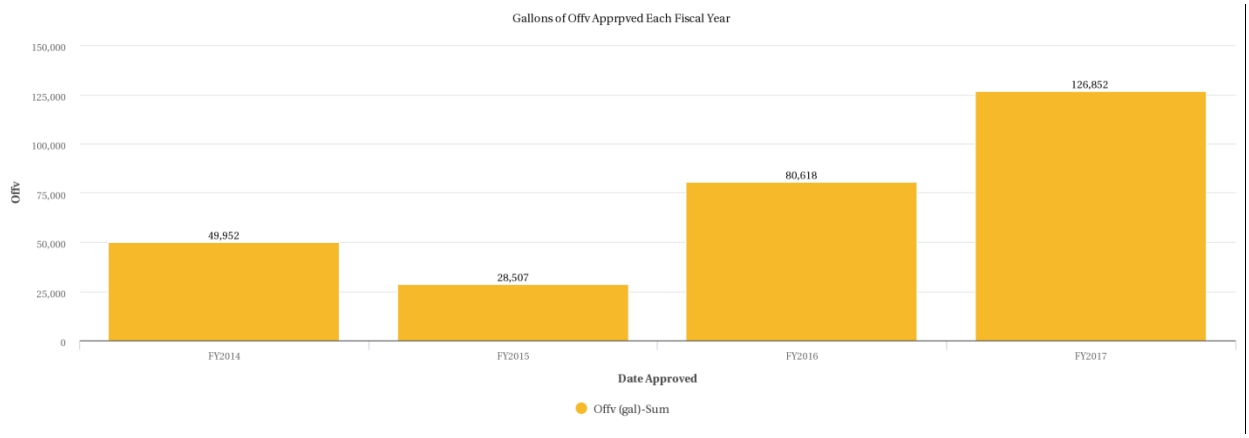

Figure 5 Gallons of Offv Approved Per Year

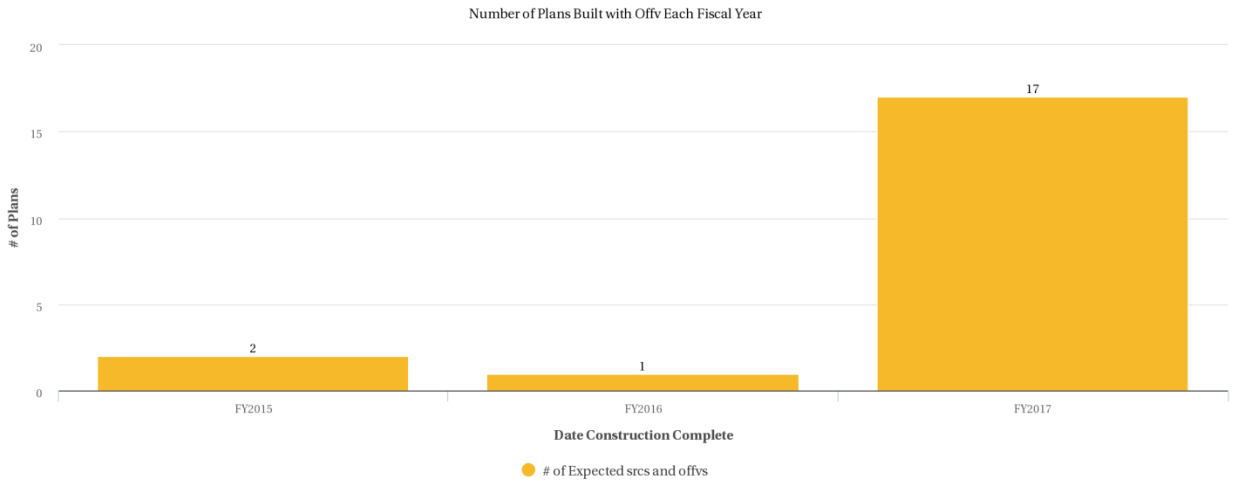

Figure 6 Number of Plans Built with Offv Per Year

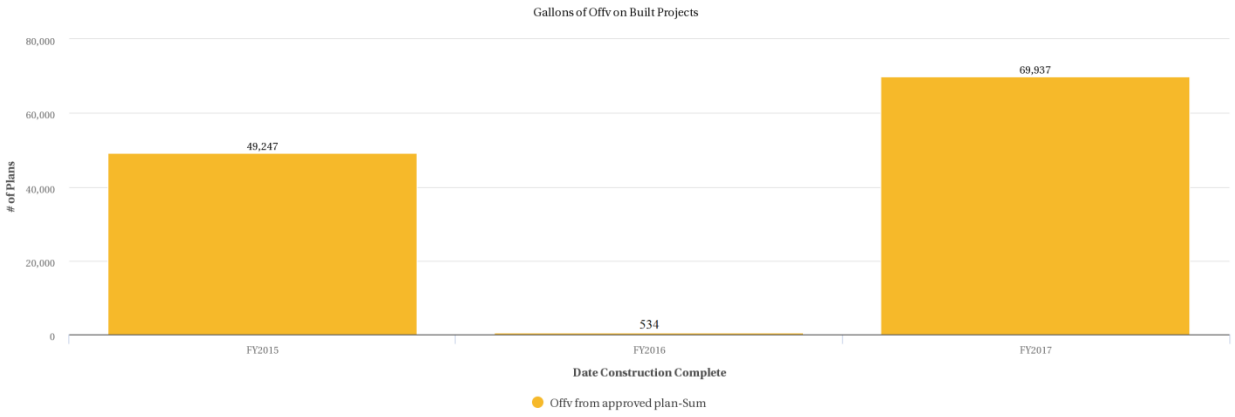

Figure 7 Gallons of Offv on Built Projects Per Year

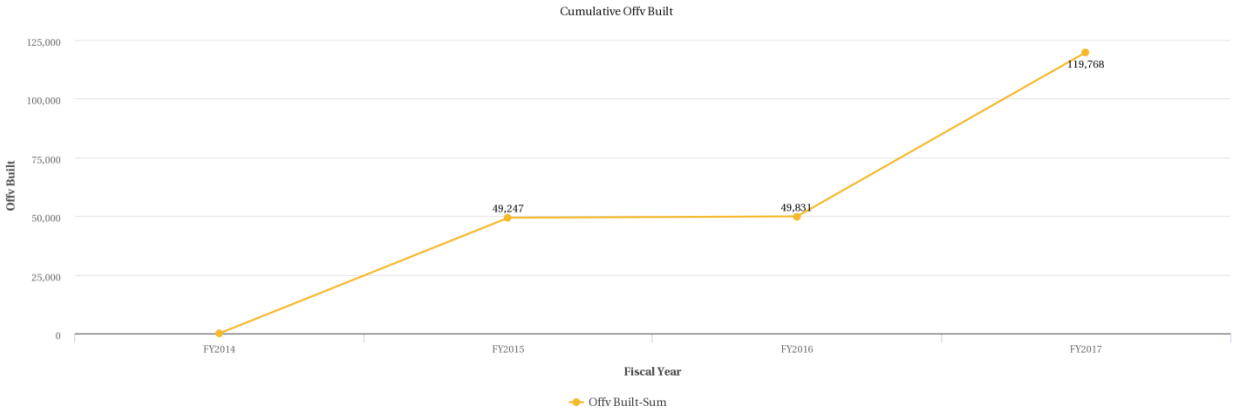

Figure 8 Gallons of Offv on Built Projects (Cumulative)

SRC Trades

The number of SRC trades increased substantially in FY 2017, particularly during the second half of the fiscal year. All trades were driven by projects that were nearing the end of construction or their next Offv compliance date. Table 11 lists the price for each trade, and as each trade represents a different number of SRCs, a weighted average price for all trades is included.

Table 11 FY2017 SRC Trades

Date	Number of SRCs	Purchase Price	Value of Trade
9/20/2017	1,455	$1.90	$2,764.50
8/30/2017	903	$2.00	$1,806
7/28/2017	584	$2.00	$1,168
7/19/2017	4,950	$2.00	$9,900
6/13/2017	621	$1.80	$1,117.80
6/12/2017	6,403	$2.50	$16,007.50
6/9/2017	1,500	$2.00	$3,000
5/25/2017	24,505	$2.00	$49,010
5/10/2017	669	$1.85	$1,237.65
4/5/2017	12,671	$2.35	$29,776.85
3/9/2017	9,231	$1.90	$17,538.90
10/13/2016	11,013	$1.90	$20,924.70
TOTAL/AVERAGE	**74,505**	**$2.07**	**$154,252**

Offv Compliance

A regulated site must begin to comply with its Offv as of the date of its Final Construction Inspection and every year thereafter. Projects with Offv must use SRCs and/or pay ILF for each year of Offv compliance. Table 12 shows periods of Offv compliance that began in FY 2017, regardless of when ILF payment was received or when SRCs were certified and traded.

Table 12 Offv Compliance in FY2017

Offv Compliance Start Date	Offv (gallons)	SRCs Used	ILF Payment	Notes
10/4/2016	1622		$5,806.76	End of Construction
10/8/2016	38234	38324		Renewed Offv Compliance
10/14/2016	534	534		End of Construction
10/31/2016	11013	11013		Renewed Offv Compliance
11/21/2016	705	705		End of Construction
1/9/2017	380		$1,360.40	End of Construction
2/10/2017	4177	4177		End of Construction
3/17/2017	29*		$104.77*	End of Construction
3/22/2017	3077	3077		End of Construction
4/4/2017	24505	24505		End of Construction
4/11/2017	8229	8229		End of Construction
5/5/2017	218*	218*		Renewed Offv Compliance
6/5/2017	12671	12671		End of Construction
6/15/2017	6403	6403		End of Construction
6/27/2017	651	651		End of Construction
7/11/2017	2142	2142		End of Construction
7/25/2017	223	223		End of Construction
8/11/2017	2324	2324		End of Construction
8/24/2017	584	584		Renewed Offv Compliance
9/7/2017	1455	1455		End of Construction
9/21/2017	621	621		End of Construction
TOTAL	**119,797**	**117,856**	**$7,947.60**	

*This project made a $780.44 In-Lieu Fee payment to satisfy its Offv obligation effective 3/17/2017. It subsequently applied to use 218 SRCs and started a new, full year of Offv compliance effective 5/5/2017. DOEE pro-rated and reimbursed $675.67 of the ILF payment. For this reason, 29 gallons of Offv were satisfied by ILF payment prior to 218 gallons of Offv satisfied with SRC use. The also accounts for a total Offv achieved of 119,797 instead of 119,768.

SRCs Used in FY 2017 – Spatial Distribution

An SRC certified in one location in the District can be used to comply with an Offv requirement in another sewershed or watershed. As shown in Figure 9, 49.66% of the SRCs that were used in FY 2017 were generated by green infrastructure practices located in the MS4 and were used by projects to comply with Offv requirements in the CSS. 33.58% of the SRCs that were used in FY 2017 were both generated and used in the MS4. 16.76% of the SRCs used in FY 2017 were both generated and used in the CSS.

45% of the SRCs that were used in FY2017 were generated by GI located in the Potomac River watershed and were used in the Anacostia River watershed. 26% of SRCs used in FY 2017 were generated in the Anacostia River watershed and used in the Potomac River watershed. 11% of SRCs used in FY 2017 were both generated and used within the Anacostia River watershed. 11% of SRCs used in FY 2017 were both generated and used within the Potomac River watershed. 6% of SRCs used in FY 2017 were generated in the Rock Creek watershed and used in the Anacostia River watershed. 1% of SRCs used in FY 2017 were generated in the Potomac River watershed and used in the Rock Creek watershed.

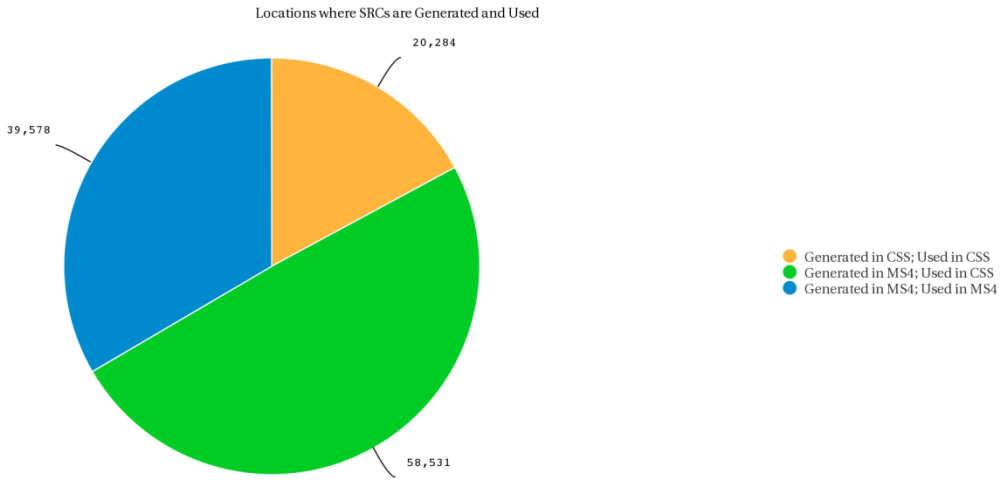

Figure 9 SRCs Used in FY2017 - Spatial Distribution by Sewershed

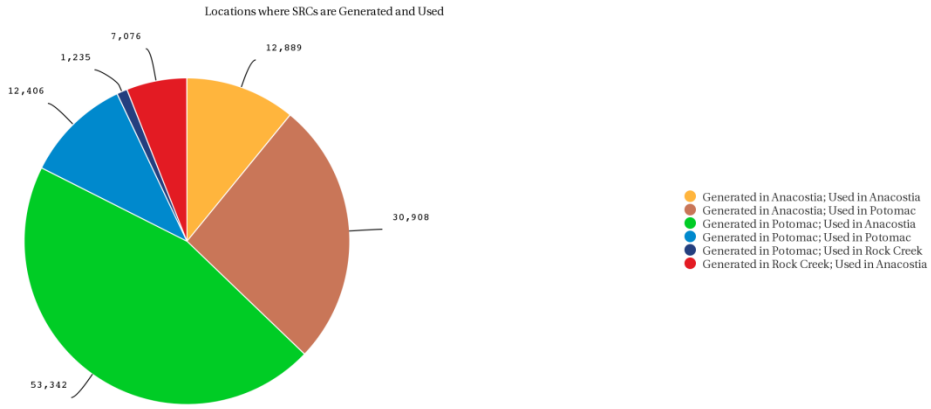

Figure 10 SRCs Used in FY2017 - Spatial Distribution by Watershed

SRCs Used in FY 2017 – Temporal Distribution

DOEE certifies up to three years' worth of SRCs at a time and SRCs may be banked indefinitely. DOEE tracks SRC vintage, which is the year for which an SRC represents a gallon of retention. The first SRC vintage year begins the date DOEE receives a complete SRC Certification application. Subsequent years of vintage begin on the anniversary of this date.

Offv compliance is also tracked on an annual basis. A regulated site with an Offv must begin to comply with its Offv as of the date of its final construction inspections.

Figure 11 Temporal Distribution of SRCs Used in FY2017Figure 11 through Figure 14 report on, for SRCs used in FY 2017, the extent to which the SRC vintage year overlaps with the regulated sites' Offv compliance. The SRC vintage year in green and the Offv compliance in blue. The number of SRCs represented by each pair of bars is shown on the left size of the vertical axis. For example, the chart shows that 38,234 SRCs had a vintage from 9/24/2016 through 9/23/2017 and were used for Offv from 10/8/2016 through 10/7/2017.

Figure 14 summarizes this information and shows that 56.6% of the SRCs used in FY 2017 had a vintage year that overlaps with the Offv for which the SRCs were used. 42.6% of the SRCs used in FY 2017 had a vintage year that did not overlap with the Offv for which they were used, but were within one year of overlapping. 0.8% of the SRCs used in in FY 2017 had a vintage year that was within two years of overlapping the Offv compliance period. It is worth noting that the vintage year for these SRCs occurred before the year of Offv compliance for which they were used, meaning that the environmental performance of the green infrastructure represented by these SRCs occurred in full prior to beginning the period for which it was needed.

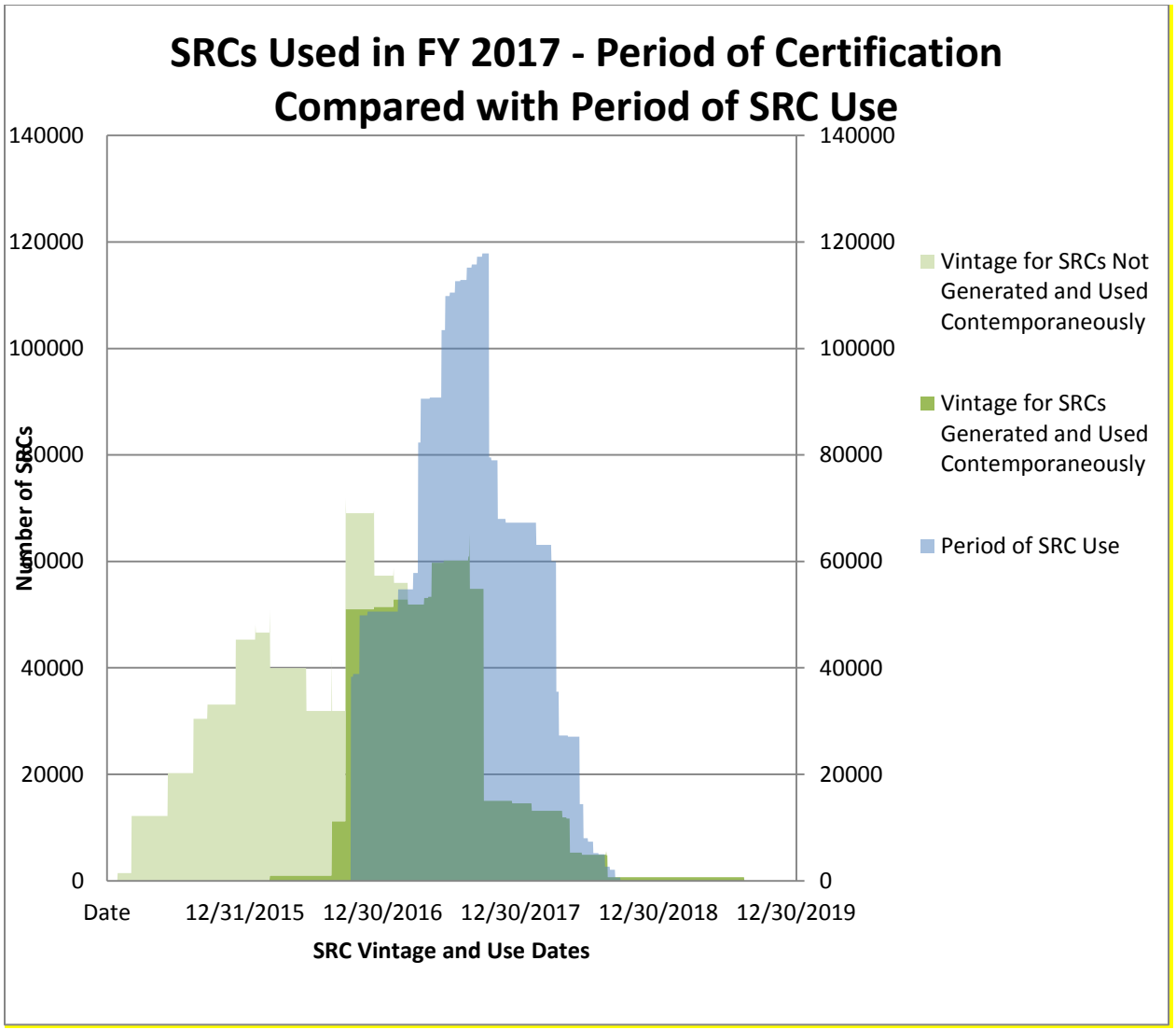

Figure 11 Temporal Distribution of SRCs Used in FY2017

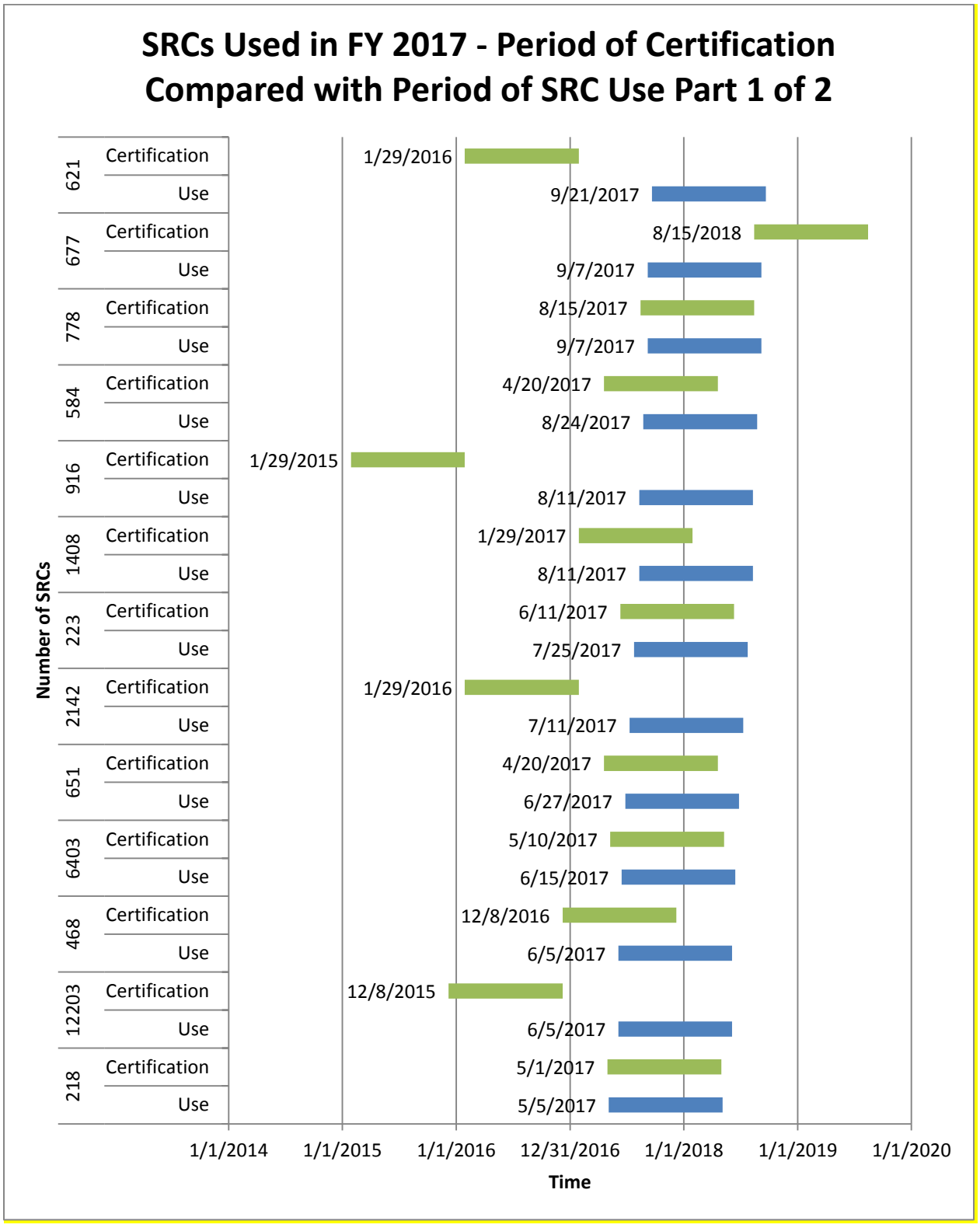

Figure 12 Temporal Distribution of SRCs Used in FY2017

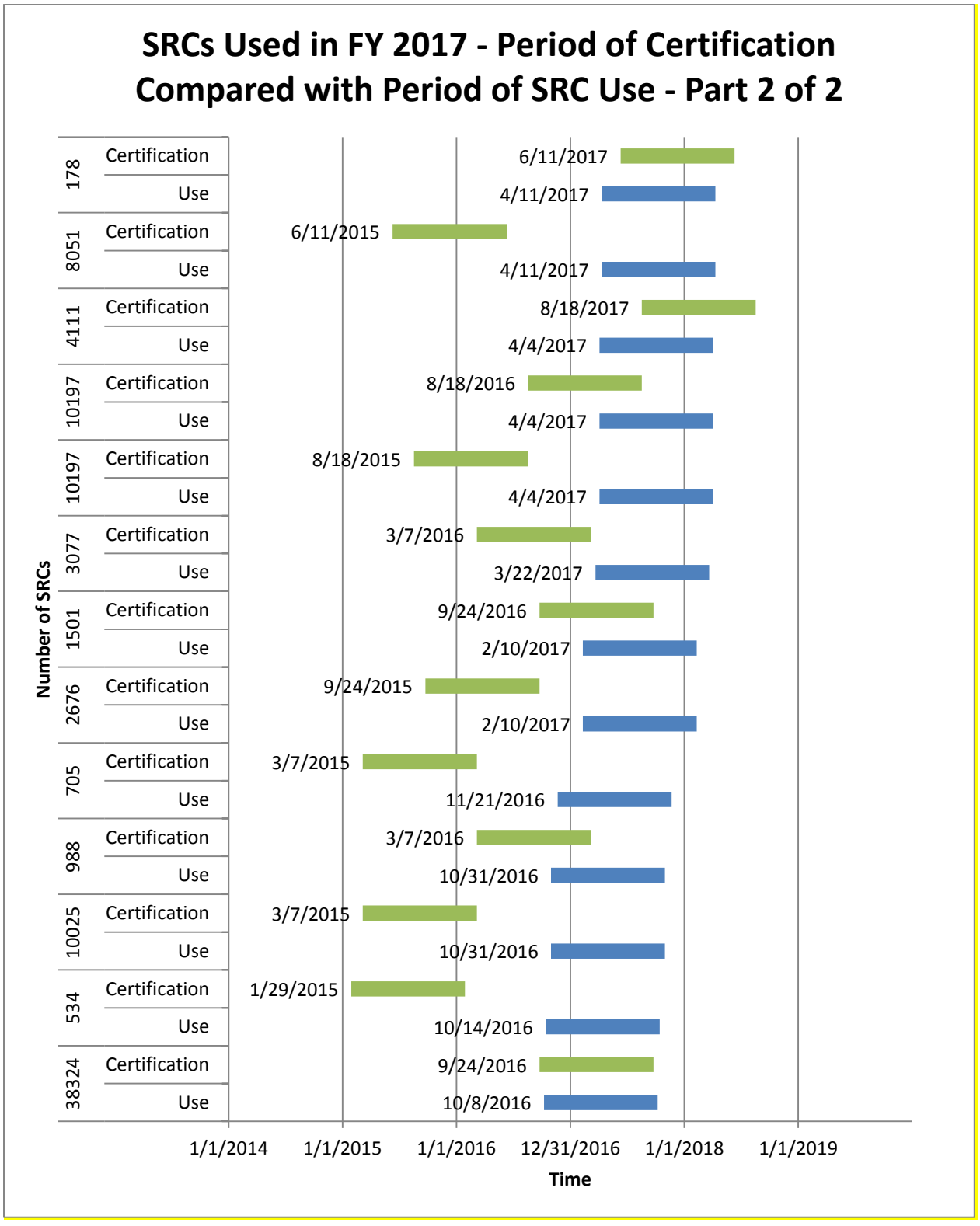

Figure 13 Temporal Distribution of SRCs Used in FY2017

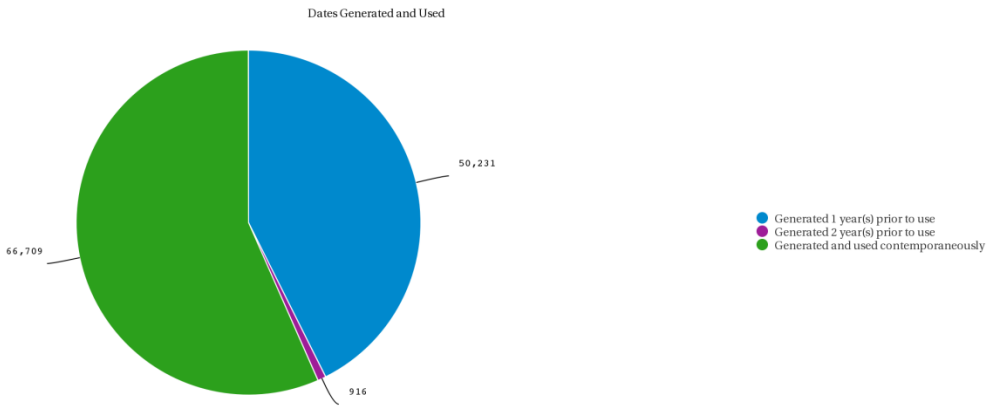

Figure 14 Summary of Temporal Distribution of SRCs Used in FY2017

To provide further information, the Table 13 also includes the sewershed and watershed where the SRCs were certified and the sewershed and watershed where the SRCs were used.

Table 13 SRCs Used in FY 2017

Number of SRCs	Vintage Date	Certification Watershed	Certification Sewershed	Use Date	Use Watershed	Use Sewershed
38,324	9/24/2016	Potomac	MS4	10/8/2016	Anacostia	CSS
534	1/29/2015	Rock Creek	CSS	10/14/2016	Anacostia	CSS
10,025	3/7/2015	Potomac	MS4	10/31/2016	Anacostia	CSS
988	3/7/2016	Potomac	MS4	10/31/2016	Anacostia	CSS
705	3/7/2015	Potomac	MS4	11/21/2016	Anacostia	CSS
2,676	9/24/2015	Potomac	MS4	2/10/2017	Potomac	CSS
1,501	9/24/2016	Potomac	MS4	2/10/2017	Potomac	CSS
3,077	3/7/2016	Potomac	MS4	3/22/2017	Anacostia	CSS
10,197	8/18/2015	Anacostia	MS4	4/4/2017	Potomac	MS4
10,197	8/18/2016	Anacostia	MS4	4/4/2017	Potomac	MS4
4,111	8/18/2017	Anacostia	MS4	4/4/2017	Potomac	MS4
8,051	6/11/2015	Potomac	MS4	4/11/2017	Potomac	MS4
178	6/11/2017	Potomac	MS4	4/11/2017	Potomac	MS4
218	5/1/2017	Anacostia	CSS	5/5/2017	Anacostia	MS4
12,203	12/8/2015	Anacostia	CSS	6/5/2017	Anacostia	CSS
468	12/8/2016	Anacostia	CSS	6/5/2017	Anacostia	CSS
6,403	5/10/2017	Anacostia	MS4	6/15/2017	Potomac	MS4
651	4/20/2017	Potomac	MS4	6/27/2017	Rock Creek	CSS
2,142	1/29/2016	Rock Creek	CSS	7/11/2017	Anacostia	CSS

Number of SRCs	Vintage Date	Certification Watershed	Certification Sewershed	Use Date	Use Watershed	Use Sewershed
223	6/11/2017	Potomac	MS4	7/25/2017	Anacostia	MS4
1,408	1/29/2017	Rock Creek	CSS	8/11/2017	Anacostia	CSS
916	1/29/2015	Rock Creek	CSS	8/11/2017	Anacostia	CSS
584	4/20/2017	Potomac	MS4	8/24/2017	Rock Creek	CSS
778	8/15/2017	Rock Creek	CSS	9/7/2017	Anacostia	CSS
677	8/15/2018	Rock Creek	CSS	9/7/2017	Anacostia	CSS
621	1/29/2016	Rock Creek	CSS	9/21/2017	Anacostia	CSS

FY 2018 Goals: DOEE expects SRC trades to increase throughout FY2018, as regulated demand increases, both from regulated sites with an approved Offv that reach the end of construction and from new regulated sites going through the permitting process. In addition, as SRC purchase agreements become available to SRC generators, DOEE expects a significant increase in the generation of SRCs in the MS4. DOEE also plans to continue providing trainings and undertaking other efforts to assist program participants.

4.1.4 Green Landscaping Incentives Program

The District is using a series of stormwater incentive programs to help single-family residents and commercial properties, multi-family residences, schools, and churches plan and implement stormwater retrofit projects and increase planted areas. The Green Area Ratio and DOEE's RiverSmart programs fulfill the requirements of Section 4.1.4 of the MS4 Permit. Additional information about DOEE's incentive programs can be found at: http://doee.dc.gov/riversmart.

District green landscaping incentive programs are:

- Green Area Ratio
- RiverSmart Homes
- RiverSmart Schools
- RiverSmart Communities
- RiverSmart Rooftops
- RiverSmart Rebates
- Stormwater Retention Credit Trading
- RiverSmart Rewards
- RiverSmart Innovation Grant

Green Area Ratio

The Green Area Ratio (GAR) is a zoning regulation that integrates sustainable landscape elements into parcel site design to promote greater livability, ecological function, and climate adaptation in the urban environment. The GAR sets minimum lot coverage standards for landscaping and site design features in site construction. The GAR assigns a weighted score to a

building site based on the types of landscape and site design features that are implemented and the amount of area the features cover. The minimum GAR score needed to reach compliance is determined based on the zoning district of the site. With limited exceptions, sites that require a Certificate of Occupancy must submit a GAR plan as part of the building permit application. These sites include new building construction, additions and interior renovations where the cost of work exceeds 100 percent of the assessed land value. The Green Area Ratio became effective on October 1, 2013. In FY 2017 DOEE held four training sessions, reviewed 219 plans, and approved 114 plans for the GAR. On November 17, 2017, DOEE published the updated Green Area Ratio Guidebook, which modernizes the 2015 GAR Guidebook to conform to the 2016 Zoning Regulations.

Specific information about the GAR, including the updated GAR Guidebook, regulations, and score forms are available at http://doee.dc.gov/GAR.

RiverSmart Homes

The District recognizes the importance of targeting homeowners for pollution reduction measures because residential property is the largest single land use type in the city and is the slowest of all construction areas to be redeveloped. Since 2008, DOEE has been implementing the RiverSmart Homes program, which provides technical and financial assistance to single-family residential properties seeking to install green infrastructure. The program started with eight demonstration sites—one in each of the eight wards. It then expanded to a pilot program in the Pope Branch watershed. The program is now mature and has been operating citywide since the summer of 2009. In FY 2017, the program focused outreach efforts in targeted watersheds to increase RiverSmart Homes participation in the neighborhoods adjacent to stream projects. To view information on the RiverSmart Homes program, visit https://doee.dc.gov/service/riversmart-homes-overview.

FY 2017 RiverSmart Homes accomplishments include the following:

- 930 stormwater audits
- 559 rain barrels installed
- 596 shade trees planted
- 122 rain gardens installed
- 250 BayScaping installations
- 1 pervious pavers installed

RiverSmart Schools

DOEE's RiverSmart Schools program works with schools to install green infrastructure. These practices are specially designed to be functional as well as educational in order to fit with the school environment. Additionally, schools that take part in the program receive teacher training on how to use the sites to teach to curriculum standards and how to properly maintain the sites. To view information on the RiverSmart Schools program, visit https://doee.dc.gov/service/riversmart-schools.

In FY 2017, DOEE completed the construction of four RiverSmart Schools projects. Listed below are project sites and accomplishments:

1. Hart Elementary School

This project is a voluntary RiverSmart School Improvement Project to install 1,113 SF of BMPs and an outdoor classroom on asphalt to ecosystem land area.

- Installed two rain gardens
- Total BMP area is 1,113 square feet
- On-site retention achieved is 8,004 gallons
- Retention volume achieved is 1,070 cubic feet
- Total drainage area is 3,220 square feet

2. Seaton Elementary School

This project is a voluntary unregulated RiverSmart School Improvement Project to remove existing asphalt school yard and playground area to install bioretention areas, plant education plantings, and outdoor education areas.

- Installed 1,200 square feet bioretention
- On-site retention achieved is 5,556 gallons
- Total retention volume achieved is 743 cubic feet
- Total drainage area is 24,873 square feet

3. Payne Elementary School

This site was a large landscaping conservation garden and outdoor classroom.

- Total project area is 1,675 square feet

4. Mundo Verde Public Charter School

This site was a landscape conservation garden and outdoor classroom installation.

- Total project area is 700 square feet

RiverSmart Communities

In FY 2017, the RiverSmart Communities program offered technical and financial assistance to condominiums, co-ops, apartments, locally-owned businesses, and houses of worship interested in installing rain gardens, BayScaping, pervious pavement, and rainwater harvesting practices.

There are two options for RiverSmart Communities projects:

1. Offered city-wide - rebates of up to 80% of the project cost of eligible green infrastructure
2. Offered in Oxon Run and Watts Branch - 100% funding for design/build of green infrastructure

In FY 2017, the RiverSmart Communities completed projects on 5 properties, Table.

View information about RiverSmart Communities, included application forms, FAQs, and design guidance at http://doee.dc.gov/service/riversmart-communities.

Table 14 FY 2017 RiverSmart Communities Project Information

Project Address	Subwatershed	Storm Sewer System	LID Type	LID Surface Area (sq. ft.)	Treatment Area (sq.ft.)	Rebate or Design / Build
3001 Veazey Terrace NW	Soapstone	MS4	Rain garden	NR	7,345.00	Rebate
3204 Brothers Pl SE	Potomac	MS4	Permeable pavement	NR	9,500.00	Rebate
607 Division Ave NE 20019	Watts Branch	MS4	Permeable pavement	1,959 sf	11,817.70	Design -Build
Galen Terrace Apartments	Anacostia	MS4	Stormwater planter	193 sf	1,628.00	Design -Build
Morning Star Baptist Church	Oxon Run	MS4	Tree trench and impervious removal	450 sf	NR	Design -Build

NR: Not reported

RiverSmart Rooftops

The District offers rebates for new green roofs on existing buildings and new construction projects that add a green roof that exceeds their requirements for a stormwater management permit. The FY 2017, DOEE offers a rebate of $10 – $15 per square foot for voluntary installations of green roofs around the District. The specific rebate amount depends on whether the proposed green roof is located within the combined sewer system ($10/sq.ft.) or the municipal storm sewer system ($15/sq.ft.). To view more information about the RiverSmart Rooftop rebate program visit https://doee.dc.gov/greenroofs.

In FY 2017, DOEE awarded 4 rebates. These rebates equate to a total of 22,877 square feet of green roof.

RiverSmart Rebates

DOEE offers rebates to single-family and multi-family properties owners with less than four units who implement their own green infrastructure projects. The following rebates are available:

1. Rain Barrel Rebates

- $2 per gallon rebate, with maximum of $1,000 total per property or cost of rebate
- 50 gallon minimum capacity to qualify
- Up to two rebates per property
- Open to single-family homes and multi-family properties with less than four units

In FY 2017, DOEE awarded 99 rain barrel rebates. To view information on rain barrel rebates, visit www.doee.dc.gov/service/riversmart-homes-rain-barrels.

2. Shade Tree Rebates

- $50 rebate per tree for small and medium canopy trees
- $100 per tree for select species large canopy trees

In FY 2017, DOEE awarded 514 trees rebates. To view information on the shade tree rebate, visit https://doee.dc.gov/riversmartrebates.

3. Landscaping Rebates

- Rain gardens:
  - $3 per square foot of treatment area
  - 400 square foot minimum
- Replacement of impervious surface with vegetation:
  - $5 per square foot of project area
  - 200 square foot minimum
- Replacement of impervious surface with permeable pavers:
  - $10 per square foot of project area
  - 100 square foot minimum

In FY 2017, 39 properties received landscaping rebates.
- 3 rain garden rebates
- 18 impervious surface removal rebates
- 32 permeable paver rebates

Stormwater Retention Credit Trading

The Stormwater Retention Credit (SRC) Trading Program is an innovative market-based program for managing stormwater in the District of Columbia. The program allows property owners to generate and sell SRCs by installing green infrastructure that has the capacity to retain stormwater and thereby reduce the runoff that harms District streams and rivers. An SRC is worth one gallon of retention for one year, and regulated development sites buy and use SRCs to meet their regulatory requirements for retaining stormwater runoff. Additional information on the FY 2017 implementation of the program can be found in Section 4.1.3 of this report.

To view information on the Stormwater Retention Credit Trading Program, visit http://doee.dc.gov/src.

RiverSmart Rewards

RiverSmart Rewards is DOEE's stormwater fee discount program. The program began July 19, 2013 upon promulgation of regulations (21 DCMR Chapter, Sections 557-563, 599) establishing the program. In FY16, DOEE revised these regulations to align the program with the existing billing practices of DC Water by changing when the discount calculated by DOEE is applied to the customer's account, authorizing a greater discount for green infrastructure that receives runoff from compacted cover, and allowing greater flexibility in calculating discounts for rainwater harvesting practices.

RiverSmart Rewards offers a discount of up to 55% off the DOEE Stormwater Fee charged on a property's water and sewer utility bill. In order to be eligible for a discount, a property must install and maintain green infrastructure practices that function to retain stormwater runoff. Eligible green infrastructure practices include bioretention, rainwater harvesting, permeable

pavement systems, green roofs, and newly planted or preserved trees. All stormwater management practices assigned a retention value in DOEE's 2013 Stormwater Management Guidebook qualify for a discount. Discounts are available for three-year periods and are renewable.

DOEE calculates discounts based on the volume of stormwater retained by eligible green infrastructure practices. The maximum discount of 55% is provided when a property manages the 1.2" storm event, and the discount is scaled back proportionately for properties that manage less stormwater. DOEE offers two types of RiverSmart Rewards applications, a simple application for properties that manage less than 2,000 square feet of impervious surface and a standard application for properties that manage more than 2,000 square feet of impervious surface.

In FY17, DOEE began renewing applications for participants whose three-year discount period was scheduled to expire. DOEE renewed 17 RiverSmart Rewards applications and auto-enrolled 332 RiverSmart Homes participants.

DOEE approved a total of 417 discount applications, 19 standard applications, 49 simple applications, 332 RiverSmart Homes auto-enroll applications, and 17 renewal applications.

The table below summarizes FY 2017 RiverSmart Rewards accomplishments.

Table 15 RiverSmart Rewards Accomplishments

Major Drainage Basin	Number of RiverSmart Rewards Applications Approved	Total Value of Monthly Discounts	Number of BMPs on approved applications	Total Contributing Drainage Area (sf)	Volume Eligible for RiverSmart Rewards Discount (gal)
Anacostia	219	$63,946.36	450	4,533,041	837,746
Potomac	63	$15,524.28	135	257,034	149,998
Rock Creek	135	$5,538.24	240	138,012	78,489
Total	**417**	**$85,008.88**	**825**	**4,928,087**	**1,066,233**

For additional information on RiverSmart Rewards go to http://doee.dc.gov/riversmartrewards.

Community Stormwater Solutions Grants

In FY 2017, DOEE awarded 11 Community Stormwater Solutions Grants totaling $208,812. The program provides start-up funding for community-oriented projects that raise awareness and lead to behavior change around watershed and stormwater-related issues. Another purpose is to build capacity among community-based organizations and small businesses. DOEE prioritized projects located in the MS4 sewershed and Anacostia Watershed by assigning 5 and 10 points, respectively, for each category.

The projects focus on one or more of the following project areas:

- Remove impervious surfaces, install stormwater runoff-reducing green infrastructure, or plant trees
- Create/promote jobs focused on stormwater solutions
- Restore native habitat
- Clean up an area affected by high volumes of litter
- Prevent litter
- Raise awareness about the impacts of stormwater runoff on District water bodies

In addition, DOEE closed out the nine Community Stormwater Solutions Grants in awarded in FY16. These projects totaled $156,500.

For more information, visit https://doee.dc.gov/service/community-stormwater-solutions-grants.

FY 2018 Goals: The District will continue to implement green landscaping incentive programs.

4.1.5 Retrofit Program for Existing Discharges

4.1.5.1 Retrofit Plan

DOEE submitted the District's Retrofit Plan to EPA Region III on January 22, 2014. To view the District's Stormwater Retrofit Plan and calculator utilized to determine retrofit credit: http://doee.dc.gov/stormwaterretrofitplan.

4.1.5.2 Federal Facilities

During FY 2017, DOEE staff continued to participate in quarterly meetings with the Chesapeake Bay Program's DC Federal Stormwater MOU Workgroup. These efforts have resulted in improved communication and data sharing between DOEE and the Federal agencies in the District, and aided in resolving issues associated with property ownership, stormwater fee applicability, and the confirmation that Federal agencies must comply with the District's 2013 Stormwater Rule. Staff also participated in monthly conference calls with the Federal Facilities Workgroup. The workgroup documented a protocol for Setting Targets, Planning BMPs and Reporting Progress for Federal Facilities and Lands, inventoried Federal Facilities requiring targets, and then published nitrogen, phosphorus, and sediment targets for applicable facilities.

4.1.5.3 Volume and Pollutant Reductions

DOEE calculated the potential pollutant load and volume reductions achieved through the District Retrofit Program. See Table 16 below.

DOEE developed runoff and load reduction estimates using the District's Implementation Plan Modeling Tool (IPMT), which was used to develop the District's Consolidated TMDL Implementation Plan. Load reductions for trash are based on the trash loading coefficients developed for the Anacostia Trash TMDL.

Table 16 Pollutant Load and Volume Reduction from Retrofit Projects

Watershed	Runoff Retained (gallons)	TN (lbs.)	TP (lbs.)	TSS (lbs.)	Fecal Coliform (billion MPN)	Copper (lbs.)	Lead (lbs.)	Cadmium[7] (lbs.)	Zinc (lbs.)	Trash (lbs.)
Anacostia	30,141,388	991	122	24,778	19,838	16.45	5.23	5.73	38.67	1,808.99
Rock Creek	6,028,940	180	21	3,093	3,429	2.89	0.90	0.98	5.61	1,575.09
Potomac River	7,629,852	257	32	3,813	5,041	4.15	1.35	1.47	8.20	780.81
Total	**43,800,180**	**1,428**	**175**	**31,684**	**28,308**	**23**	**7.48**	**8.19**	**52**	**4,164.90**

*Summations include MS4, Direct Drainage, and CSS areas.

4.1.5.4 Numeric Performance Requirement for Retrofits

In FY 2016, the District made adjustments in how retrofit projects are accounted for to better reflect their true environmental impact. The first of these changes was to consider compacted cover and impervious cover as equivalent. The Retrofit Calculator considers land cover in its calculations, and assigns runoff coefficients to each land cover type (0.25 for compacted cover and 0.95 for impervious cover). The majority of retrofit projects in the District are from regulated redevelopment of existing sites, which are frequently mischaracterized as compacted cover. The runoff coefficient assigned to compacted cover substantially underestimates the extent of impervious surface that is likely present on these sites prior to redevelopment. In terms of generating stormwater runoff, these sites behave more like fully impervious cover than compacted cover. To reflect this, in compiling retrofit data for this Annual Report DOEE considered compacted and impervious cover as equivalent.

The second change is to credit all projects constructed and projects currently under construction, and expected to be completed in FY 2018. This change is a result of DOEE utilizing data from the new Stormwater Database, which compiles and tracks more accurate data on BMP type, size, and performance, as well as overall project status. The Stormwater Database collects and tracks expected completion dates, as provided during the permitting process. The Stormwater Database also tracks projects for which DOEE has inspected and observed the initial phases of stormwater BMP construction. Therefore, DOEE can accurately track and sort projects expected to be completed with the next year. The Stormwater Database can credit projects meeting those criteria towards meeting our numeric performance standard.

7 An EPA report (402-R-99-004B- linked below) that reviewed several studies with varied site conditions has documented mean partition coefficients for metals. DDOE used these metal-specific partition coefficients (Kd) and associated particle associated fraction (fp) values to model pollutant reduction for these metals through BMP implementation. Since many of the relevant low impact development (LID) practices have similar removal rates for lead and cadmium, the relationship between these two metals, their fp values, and the areas retrofitted were used to estimate cadmium reductions achieved through the Retrofit Program. DDOE will use this methodology to estimate the pollutant load reduction for cadmium in future Annual Reports. http://www.epa.gov/sites/production/files/2015-05/documents/402-r-99-004b.pdf.

Using those assumptions the District has retrofitted 6,543,725 square feet of impervious surface in FY 2017, Table 17. Since the start of the Permit Term in 2012 the District has retrofitted a total of 23,150,171 square feet of impervious surface, Table 17.

Table 17 FY 2017 Retrofit Projects and Total Retrofit Projects To-Date

Projects	Impervious Surface Retrofitted between FY 2012 and FY 2016 (sq. ft.)	Impervious Surface Retrofitted in FY 2017 (sq. ft.)	Total Retrofitted During Permit Term (sq. ft.)
DOEE Stormwater Database Projects - Installed[8]	12,032,068	3,595,333	15,627,401
DOEE Stormwater Database Projects – Under Construction	3,283,637	2,668,613	5,952,250
Incentive Programs[9]	1,291,741	278,779	1,570,520
Total PROW Projects-Installed	**2,680,118**	**214,700**	**2,894,818**
Total Projects Installed	**16,607,446**	**6,542,725**	**23,150,171**

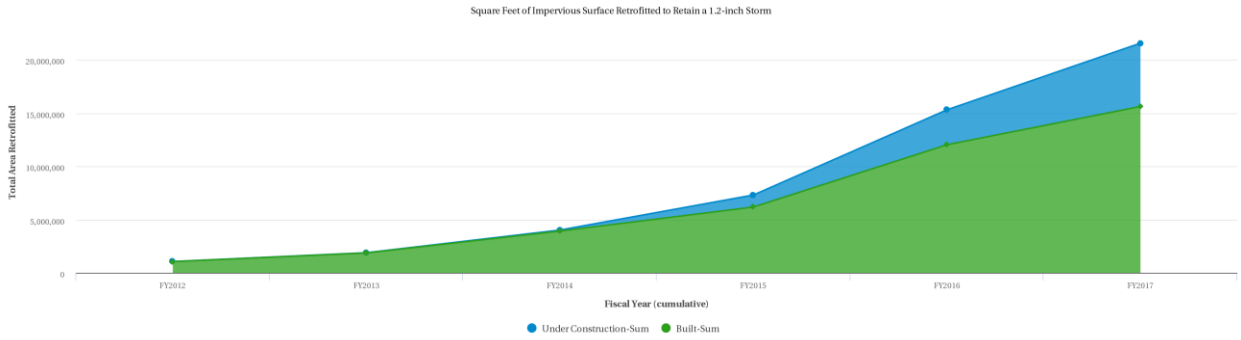

Figure 15 Square Feet of Impervious Surface Retrofitted to Retain a 1.2 Inch Storm

8 DOEE updates data in the Stormwater Database as historical data is validated. The information reported in this table will be updated in future annual reports as the Stormwater Database is updated.
9 Incentive program projects include rain barrels, bioretention, BayScaping, permeable pavers, cisterns, and impervious surface removal implemented through RiverSmart Homes, RiverSmart Communities, RiverSmart Schools, and RiverSmart Rebates.

The District is approximately 44.29% impervious, Table 18. In FY 2017, the District's retrofit program reduced the impervious surface by approximately 0.87%.

Table 18 Total District Land Area by Watershed

Watershed	Land Area (sq. ft.)[10]	Impervious Surface (sq. ft.)	Percent Impervious Surface
Anacostia River	800,385,149	376,376,540	47.02%
Potomac River	450,489,770	190,165,697	42.21%
Rock Creek	457,023,015	189,834,967	41.54%
Total	**1,707,897,934**	**756,377,204**	**44.29%**

4.1.5.5 Substantial Improvement Projects

As part of the 2013 Stormwater Rule, finalized on July 19, 2013, the District created the regulatory mechanism that will implement a stormwater retention performance standard for substantial improvement projects. The stormwater retention performance standards are triggered by two different categories of projects:

1. Major Land-Disturbing Activities: Sites that disturb 5,000 square feet more of land are required to retain the stormwater from a 1.2 inch storm, either on-site or through a combination of on-site and off-site retention. The disturbance of 5,000 square feet of land has been the regulatory trigger since the establishment of the District's first stormwater management regulations in 1988.
2. Major Substantial Improvement Projects: Sites that undergo renovations of existing structures that have a combined building and associated land disturbance of 5,000 square feet or more and for which the project cost exceeds 50% of the pre-project value of the structure are required to retain the volume from a 0.8 inch storm.

More information about the 2013 Stormwater Rule can be found at http://doee.dc.gov/swregs.

4.1.5.6 District-Owned Properties

As required under Section 4.1.5.6 of the MS4 Permit, DOEE continues to work with the District's Department of General Services' (DGS) Office of Sustainability and Energy Management to identify retrofit project opportunities, as well as to incorporate green

10 Data is based on the most recent impervious surface data and is subject to change as data is validated and GIS layers are updated.

infrastructure into new construction. DGS staff participates in monthly MS4 Technical Working Group (TWG) meetings, and the Director of DGS is a member of the Stormwater Advisory Panel (SWAP). DOEE leads both meetings.

FY 2018 Goals: DOEE will continue to fund and install retrofit projects throughout the District through various programs. Additionally, the District will track and report retrofit installations and progress towards meeting the District's performance goal of retrofitting 18,000,000 square feet of impervious surface.

4.1.6 Tree Canopy

4.1.6.1 Tree Canopy Plan

The District developed a draft Urban Tree Canopy Plan that provides details on the tree canopy goal and the actions the District and its partners can take to achieve the canopy goal. To view the draft Urban Tree Canopy Plan: http://doee.dc.gov/treecanopyplan.

4.1.6.2 Tree Planting in the District

The District is assuming a five percent tree mortality rate. Using this assumption, the District has achieved a net increase of 7,794 trees in the MS4 in FY 2017, Table 19. DOEE and DDOT Urban Forestry Administration (UFA) are currently building capacity to track tree mortality and replacement tree survival. This will help the District meet tree planting goals.

4.1.6.3 Tree Goals

The District continues to track tree plantings to document progress towards meeting the Sustainable DC goal to cover 40% of the District with a healthy tree canopy by 2032. The District's tree canopy is evaluated using high resolution aerial imagery. As of 2016, the District has achieved 38.7% average tree canopy cover. This aerial canopy assessment has been independently verified by Casey Trees, as documented by Casey Trees' 2016 Tree Report Card.[11]

To view information about the District programs to achieve the tree canopy goal:

- DDOT's Tree Planting Program see https://ddot.dc.gov/page/tree-planting-ddot-trees
- DOEE's Tree Program see http://doee.dc.gov/trees

11 The 2016 Tree Report Card can be found at https://caseytrees.org/resources-list/the-tree-report-card/.

Table 19 FY 2017 Tree Plantings in the District of Columbia

Program	Trees Planted Districtwide	Trees Planted in MS4 Area
RiverSmart Homes Tree Planting	596	391
Casey Trees Tree Planting	2,202	1,453
Washington Parks and People	103	103
UFA Districtwide Tree Planting	8,644	5,484
Tree Rebates	514	391
Stream Restoration Tree Planting	382	382
National Park Service Tree Planting	NR	NR
Pepco Tree Program	NR	NR
Total Trees Planted	**12,441**	**8,204**
Net Trees Planted	**11,819**	**7,794**
Estimated Stormwater Volume Reduced (gallons)	**12,668,786.10**	**8,354,388.60**

FY 2018 Goals: The District will continue inter agency coordination on tree planting activities to meet the tree canopy goal.

4.1.7 Green Roof Projects

4.1.7.1 Structural Assessment

On October 8, 2013, DGS published the Smart Roof Final Report. For this report over 12.5 million square feet of roof area was evaluated to determine if they can be retrofitted with cool, green, or solar roofs. In 2015, DGS finished a Smart Roof Cost-Benefit Report that estimate of the costs and benefits of applying cool, green, and solar roof technologies on District owned buildings.

4.1.7.2 Green Roof Installations

The District continues incentive programs the installation of green roofs on private property. Since the start of the Permit term, 1,646,505 square feet of green roofs have been installed. In FY 2017, the District installed a total of 336,355 square feet of green roof which retained 1,401,735 gallons of stormwater, Table and Table 21. A complete inventory of green roofs installed in the District is found at https://doee.dc.gov/publication/inventory-green-roofs.

Table 20 Green Roof Installation Over Permit Term[12,13]

Fiscal Year	Total Installed Districtwide (sq. ft.)	Total Installed in MS4 (sq. ft.)	Total Installed through Green Roof Rebate Program (sq. ft.)
2017	336,355	80,440	22,877
2016	414,977	147,190	22,137
2015	143,160	53,695	29,876
2014	148,908	18,089	60,222
2013	523,968	416,674	27,656
2012	79,137	45,825	26,287
Totals	**1,646,505**	**761,913**	**189,055**

Table 21 Runoff Retained by Green Roofs (by major watershed)

Watershed	Annual Runoff Retained (gallons)
Anacostia	728,528
Rock Creek	525,342
Potomac	147,865
Total	**1,401,735**

4.1.7.3 Green Roof Tracking

DOEE continues to track green roof projects using the Stormwater Database. DOEE is regularly updating the database as plans for additional green roofs are approved and verified through our inspection program.

FY 2018 Goals: DOEE will continue tracking, inspecting, and funding green roof installations throughout the District of Columbia.

12 As of the time of this report approximately 30 stormwater plans are under revision. When the revisions are complete these numbers may change slightly.
13 Green roof data is taken from DOEE's Stormwater Database (SWDB). As DOEE updates historical data in the SWDB, the information here may be updated.

4.2 Operation and Maintenance of Stormwater Capture Practices

4.2.1 District Owned and Operated Practices

As required by Section 4.2.1 of the MS4 Permit, the District included operation and maintenance requirements for retention and non-retention BMPs in the updated 2013 Stormwater Management Guidebook (2013 SWMG), which was finalized in July 2013. The 2013 SWMG is available at http://doee.dc.gov/swguidebook.

The District has expanded educational training for District agency employees, particularly with regard to stormwater pollution prevention techniques and 'good housekeeping' training. Additional information regarding District trainings can be found in Section 4.3.10 of this report.

DOEE launched a database to manage submission, review, and inspection of Stormwater Management Plans, Erosion and Sediment Control Plans, and Green Area Ratio Plans. Additional information about the stormwater database can be found in Section 4.1.2 of this report.

FY 2018 Goals: DOEE has scheduled additional training for District staff. These include training on BMP design, one-on-one "office hours" with DOEE staff for engineers who are developing Stormwater Management Plans, and training on the use of DOEE's Stormwater Management Database.

4.2.2 Non-District Owned and Operated Practices

As stated in Section 4.2.1 of this report, DOEE included operation and maintenance protocols in Chapter 5 of the 2013 SWMG, see http://doee.dc.gov/swguidebook.

The new Stormwater Database is how the District will continue to track non-district owned practices. All non-District properties are subject to inspection through DOEE's inspection and enforcement program. More information about DOEE's inspection and enforcement program can be found in Section 4.6 of this report.

FY 2018 Goals: DOEE will continue to update and maintain the Stormwater Database.

4.2.3 Stormwater Management Guidebook and Training

On July 19, 2013, DOEE released the 2013 Stormwater Management Guidebook (2013 SWMG), which provides technical guidance on complying with the 2013 Stormwater Rule, as required by Section 4.2.3.1 of the MS4 Permit. The SWMG is available at https://doee.dc.gov/swregs. The webpage also contains a link to downloadable versions of several spreadsheets developed to assist with determining project compliance, and calculating the SRCs that a project can earn. The available spreadsheets include the "General Retention Compliance Calculator" tool, a series of worksheets for the application and review of the proposed Maximum Extent Practicable (MEP) for the reconstruction of existing PROW, and an SRC Calculator to be used by SRC trading program participants. On November 28, 2017, DOEE published an update to the Errata for the 2013 SWMG. DOEE expects to republish the entire SWMG in the near future and will notify the public when there is an opportunity to provide public comment.

As required by Section 4.2.3.2 of the MS4 Permit, DOEE holds training sessions for the public and District staff. DOEE also sends out updates to the stormwater stakeholder list of over 900 engineers, nonprofits, utilities, and government agencies. Information and schedules for upcoming Stormwater Management Guidebook training: http://doee.dc.gov/swtraining.

FY 2018 Goals: DOEE has committed to ensuring that interested stakeholders have the opportunity to participate in training sessions and will continue to add trainings based on stakeholder and public interest. A list of upcoming trainings can be found at http://doee.dc.gov/swtraining.

4.3 Management of District Government Areas

4.3.1 Sanitary Sewage System Maintenance Overflow and Spill Prevention Response

As required by Section 4.3.1 of the MS4 Permit, DC Water continues to implement an effective response protocol for overflow events.

This protocol includes:

- Investigating complaints received within 24 hours of the incident report as outlined in the DC Water Emergency Command Center procedures and required by the DC Water All-Hazard Initial Response Actions Plan (2010).
- Responding within two hours to overflows for containment. Instructions on overflow response is located in the DC Water Sewer Emergency Containment Plan (2013) and DC Water All-Hazard Initial Response Actions Plan (2010).
- Notifying appropriate sewer and public health agencies within 24 hours when the sanitary sewer overflows to the MS4. Agencies are notified within 24 hours (per permit requirements) as identified in the DC Water Sewer Emergency Containment Plan (2013), DC Water Crisis Communication Plan, and the DC Water All-Hazard Initial Response Actions Plan (2010).
- Notifying the public in a timely and effective manner in the event of a discharge into the MS4 that may adversely affect public health. The procedures for notification are contained in the DC Water Crisis Communication Plan.

Due to confidentiality restrictions, the District cannot submit DC Water's All-Hazard Response Action Plan and Crisis Communication Plan at this time. However, these documents will be made available for review during the next EPA inspection and audit.

FY 2018 Goals: The District and DC Water will continue to coordinate to implement the provisions of Section 4.3.1 of the MS4 Permit. DC Water will continue to maintain a response and notification protocol.

4.3.2 Public Construction Activities Management

The District continues to comply with the construction and development requirements outlined in Section 4.3.2 of the MS4 Permit. Details of the construction management program are found in Section 4.6 of this report.

4.3.3 Vehicle Maintenance / Material Storage Facilities / Municipal Operations

DOEE provides trainings to inform District agencies on how to better manage their facilities to reduce and mitigate pollutants in stormwater runoff. These trainings typically last one and a half to two hours, and include a participant survey to measure understanding and adoption of practices and principles. Take-home materials are provided to better enable personnel to adopt long-term 'good housekeeping' and BMPs.

All personnel who are responsible for 1) the design, installation, maintenance, and repair of stormwater controls; 2) storage and handling of materials exposed to stormwater; and 3) monitoring, inspecting, and documenting corrective actions are required to be trained at least once a year. In FY 2017, DOEE hosted 21 official trainings that reached 409 District employees.

Trainings included the following:

- SWPPP and BMP training for District employees
- Vehicle wash solutions for District facilities
- Pollution prevention training for snow plow operators

FY 2018 Goals: DOEE will establish a schedule to inspect municipal vehicle maintenance, material storage, and operations facilities. DOEE will continue trainings employees. DOEE will work with District agencies to finalize or update SWPPPs. DPW will continue to maintain and purchase additional AFVs as needed.

4.3.4 Landscape and Recreation Facilities Management, Pesticide, Herbicide, Fertilizer and Landscape Irrigation

4.3.4.1 Integrated Pest Management

DOEE has an Integrated Pest Management (IPM) strategy to better inform the public about the proper use and disposal of pesticides, and safer alternatives to pesticides. These programs encourage IPM at all project sites. The program provides citizen education and outreach to help residents adopt environmentally sound practices for pesticides use in yards and gardens, including the use of "good" garden pests.

DOEE's Pesticide Management Program trains commercial applicators in the legal and safe application of pesticides and herbicides. Commercial applicators must receive a certification through the program to legally apply pesticides and herbicides in the District. DOEE is responsible for developing, updating, and administering examinations to qualified applicants for certification as pesticide applicators in the District. There are currently 400 certified applicators working in the District.

District waters are tested regularly for the presence of pesticides, herbicides, and fertilizers. Pesticides are monitored as part of DOEE's overall wet and dry weather stormwater sampling and analysis program. In previous years, pesticides have been detected in some of the samples

collected from outfalls. When pesticides are found in monitoring samples, the Illicit Discharge Detection and Elimination (IDDE) Program is notified and an inspection is conducted.

Another aspect of IPM is native plants and native gardens due to their natural ability to ward off local pests. Native plants are naturally adapted to the local climate, weather, and soil conditions. Once established, native plants do not need pesticides or fertilizers and require minimal watering, which reduces water consumption and stormwater run-off. The District continues to incentivize native plants and native gardening.

The following list provides additional details into DOEE's IPM and Pesticide Programs:

- IPM Program, including how to submit an IPM plan: https://doee.dc.gov/service/integrated-pest-management
- Native plants and pollinator gardens: https://doee.dc.gov/service/vegetation-trees-flowers-plants
- Pesticide Program: https://doee.dc.gov/service/pesticides
- Pesticide Products Registration: https://doee.dc.gov/service/pesticide-products-registration
- Pesticide Permitting and Licensing: https://doee.dc.gov/service/environmental-applications-licenses-and-permits

4.3.4.2 District Coordination

District agency staff coordinate on the use of pesticides. DGS maintains a plan to incorporate IPM on school properties. The Healthy Schools Act of 2010 requires the establishment of IPM in the DC Public Schools, under Title V, Sec. 501 (a) (1)(D). Implementation of this law requires coordination between DGS, DC Public Schools (DCPS), and pest control specialists.

4.3.4.3 Partnership

The District regularly partners with outside organizations and jurisdictions to ensure pesticide and fertilizer use does not impact water quality. DOEE's RiverSmart Homes Program is a public-private partnership that provide financial assistance to help District property owners install green infrastructure. RiverSmart Homes encourages native plants and minimizing the use of herbicides, pesticides, and fertilizers that are typical in conventional landscaping. RiverSmart Homes has created a factsheet that describes the impact of fertilizer use on water quality and provides alternative options for home owners. This factsheet can be found at http://doee.dc.gov/publication/riversmart-homes-bayscaping-flyer.

Additionally, through the Metropolitan Washington Council of Governments and the Chesapeake Bay Program's Urban Stormwater Workgroup, the District collaborates with other organizations in the region to discuss programs and measures employed to effectively limit the use of pesticides and fertilizers.

4.3.4.4 Fertilizer Program

The Anacostia River Clean Up and Protection Fertilizer Act of 2012 went into effect on April 20, 2013. The District's Fertilizer Law outlines requirements for lawn care professionals on how, when, and where to apply fertilizer and the types of fertilizer they can use. The legislation requires the development of a public education program that shall include the dissemination of information regarding nutrient pollution, soil testing, proper interpretation of fertilizer label instructions, the proper use of fertilizer application equipment, best management practices for fertilizer use in the urban landscape, the requirements of the legislation, and the effects of fertilizers on the Chesapeake Bay and its tributaries.

In FY 2017, DOEE developed a guidance document for residents and a series of webpages on fertilizer use. DOEE also developed signs to educate retailers and lawn care professionals.

The following list shows DOEE documents pertaining to integrated pest management:

- Fertilizer Law: https://doee.dc.gov/fertilizer
- Environmental Impacts: https://doee.dc.gov/node/1178311
- Fertilizer Best Practices: https://doee.dc.gov/node/1178325
- Guidance Document: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/Fertilizer%20Sign.pdf

4.3.4.5 Priority Areas

The District's existing geographic information system (GIS) layers contain data that can be used to identify and prioritize potential target areas for addressing pesticide and fertilizer use. These areas include District parks, institutional areas (such as college and university campuses), and transportation corridors (such as railroads). DOEE has included a number of activities in the Revised SWMP that will address pesticide and fertilizer application in priority areas, including public property and child-occupied areas. These activities will help the District meet the requirements of local pesticide laws and Section 4.3.4.5 of the MS4 Permit.

4.3.4.6 Program Implementation

The above detailed implementation activities summarize and explain how the District is meeting the requirements of Section 4.3.4 of the Permit.

FY 2018 Goals: DOEE will work with relevant sister agencies to include IPM as part of their overall SWPPPs.

4.3.5 Storm Drain System Operation and Management and Solids and Floatables Reduction

As required by Section 4.3.5 of the MS4 Permit, the District continues to conduct routine catch basin cleaning and repair activities and floatables removal.

Catch Basin Cleaning

DC Water conducts the operation and maintenance of pipes and conduits carrying stormwater flow, (not differentiating between the two systems for maintenance purposes) and works to keep all catch basins clean. To view the Optimal Catch Basin Cleaning, Inspection, and Repair report go to http://doee.dc.gov/draftcatchbasinreport.

FY 2017 catch basin cleaning and repair activities include the following:

- 29,316 catch basins cleaned across the District; 14,124 cleaned in the MS4.
- 186 catch basins repaired across the District; 83 repaired in the MS4.

Figure 16 shows the fourteen-year trend for the cleaning and repair of the District catch basins. The number of catch basins cleaned and repaired has remained relatively constant since FY 2003.

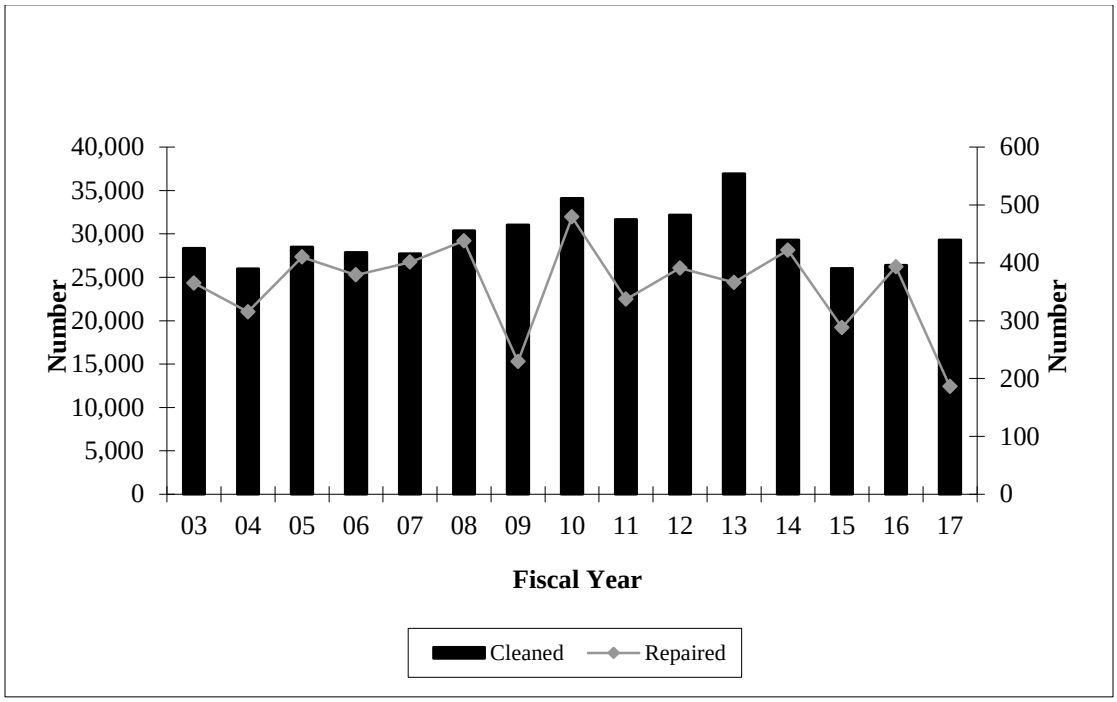

Figure 16 Number of Catch Basins Cleaned and Repaired in the District

Outfall Repair

The District's Outfall Repair Schedule identified 101 outfalls in need of repair due to their potential impact on water quality. During the current permit term, DOEE repaired 51 outfalls while implementing stream restoration projects, Table 22.

Many of the MS4 outfalls are located on land managed by third parties, principally National Park Service (NPS). Federal permitting requirements have can add significant delays before a project can be scheduled for construction. DOEE and DC Water continue to coordinate with the National Park Service to plan to repair a number of outfalls are on National Park Service land.

Table 22 Outfalls Repaired Through District Stream Restoration Projects

Stream Restoration Project	Number of Outfalls Repaired
Watts Branch	23
Milkhouse Ford	3
Park Drive	1
Soapstone Creek	1
Pope Branch	5
Alger Park	5
Nash Run	2
Springhouse Run	1
Linnean	1
Klingle Valley	9
Total	**51**

To view the Draft Outfall Repair Schedule report: http://doee.dc.gov/draftoutfallreport.

Floatables Reduction

DC Water continues to conduct the floatables reduction program utilizing skimmer boats on the Potomac and Anacostia Rivers. Activities to remove floatable debris and trash from the rivers as well as accumulated trash on river banks continue five days a week using skimmer boats and support boats. In FY 2017, DC Water removed 520 tons of debris. Since 2000, DC Water's skimmer boats have removed a total of 9,643 tons of debris from the Anacostia River, Figure 17.

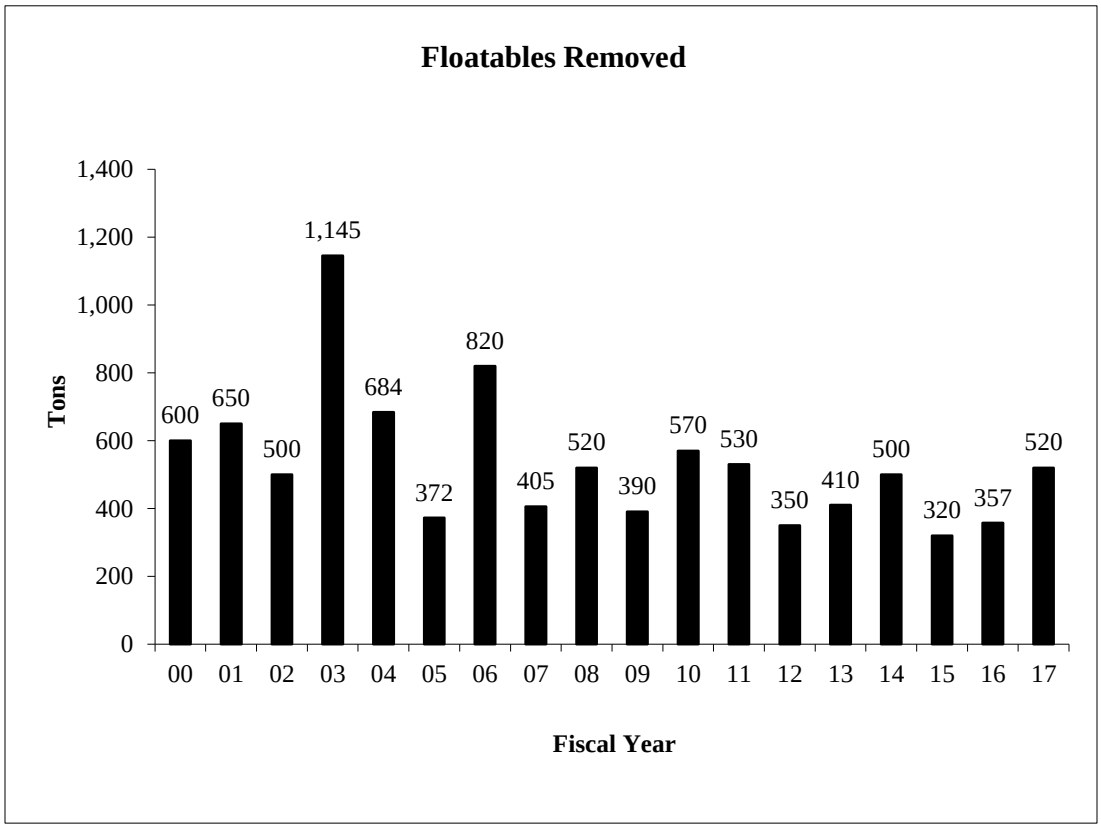

Figure 17 Floatables Removed from the Anacostia River

Trash TMDL Compliance

As required in Section 4.3.5.4 of the MS4 Permit, the District continues to comply with the Anacostia River Trash TMDL. Implementation activities can be found in Section 4.10.1 of this report.

FY 2018 Goals: DC Water will continue to conduct the floatables reduction program on the Potomac and Anacostia River. Catch basin cleaning and outfall repair activities will also continue.

4.3.6 Streets, Alleys, and Roadways

Street Sweeping

DPW is responsible for street sweeping activities in the District. DPW uses two basic methods to clean and sweep streets: mechanical street sweeping and litter vacuum personnel. These activities are complimented by truck crews that clean streets where the density of parked cars prohibits the effectiveness of mechanical cleaning.

Street sweepers are deployed to residential, industrial, and environmental hotspot areas, as well as the Central Business district and arterial/highway routes at or above the frequencies indicated in Table 3 of the MS4 Permit. Table 23 contains DPWs historical street sweeping and debris collection record.
FY 2017 street sweeping accomplishments are as follows:

- 22,114 miles[14] of night sweeping on designated routes
- 10,112 miles of highway miles swept
- 7,602 miles of ward miles swept
- 1,074 miles of inbound/outbound miles swept
- 16,962 miles of signed sweeping miles swept
- 57,864 total miles swept
- 4,361 tons removed through street sweeping

To view information about DPW's Street Sweeping Program: http://dpw.dc.gov/page/street-and-alley-cleaning.

14 DPW tracks and reports street sweeping efforts in curb miles. The Chesapeake Bay Program estimates that 1 curb mile of street sweeping is equivalent to 1 acre of impervious surface.

Table 23 DPW Street Sweeping and Debris Collection Activities

Fiscal Year	Streets Swept (miles)	Alley Segments Swept	Number of Litter Receptacles Cleaned	Litter and Debris Collected (tons)
2001	34,000	8,751	4,000	3,400
2002	74,490	16,400	4,000	8,920
2003	102,181	41,238	4,050	9,516
2004	103,163	13,354	4,050	9,346
2005	91,649	20,897	4,050	7,755
2006	72,468	3,781	4,200	6,632
2007	68,189	5,944	4,324	6,388
2008	64,955	4,181	4,445	7,411
2009	62,972	3,550	4,445	7,883
2010	87,837	2,397	4,445	7,834
2011	80,489	2,842	4,600	7,872
2012	82,240	3,647	4,600	6,851
2013	88,705	5,543	5,000	6,509
2014	69,076	5,694	5,000	7,225
2015*	41,615	NR	8,110	4.471
2016*	52,742	NR	NR	4,020
2017*	57,864	NR	NR	4,361

*DPW has updated how street sweeping is tracked and recorded. Street sweeping routes and frequency have not changed and the difference in sweeping mileage is due to tracking improvements.

Snow and Ice Removal

The District implements a snow removal and deicing program to ensure safe passage on its roadways. As required by the MS4 Permit, the District uses deicing materials that cause the minimum impact practicable to the District's water bodies from snow and ice melt (stormwater runoff) that enters the MS4. The District's Snow Team has invested in new equipment to expand anti-icing operations and is working on expanding capacity to create, store, and apply anti-icing liquids. A combination of brine and hot mix (a mixture of brine and beet juice) will be used in FY 2018. For the FY 2018 snow season, the District is prepared with 19 liquid dispensing trucks and 10 new liquid dispensing club cars with plows and spreaders to clear and treat sidewalks and bike paths. For more information about the 2017-2018 Snow Team go to https://mocrs.dc.gov/release/dc-snow-team-kicks-snow-season-dry-run-practice-and-citywide-exercise.

As required by Section 4.3.6.4 of the MS4 Permit, the District continues to maintain a program that prevents excessive quantities of snow and ice from entering District water bodies.

FY 2017 accomplishments include the following:

- DPW snow plows will calibrate all salt applicators. Application rates will be adjusted by Snow Command based on the type and amount of precipitation the city receives. This will help reduce salt usage during the FY2018 snow season.
- DPW began a pilot program to retrofit brine saddle tanks to 10 snow plows that will be able to pre-wet solid rock salt as it is being applied. This increases the salt's melting efficiency and helps prevent it from bouncing and being blown off the road, allowing the salt to stay where it is applied and reduce the need for additional product to be applied.
- DOEE developed a Snow Plan to clearly articulate DOEE's role in snow and ice removal operations and emergency response management during winter weather events. DOEE also helped a District salt dome devise a temporary vehicle wash station to divert wash water away from a sand filter into the sanitary sewer.
- DOEE conducted five onsite visits to provide compliance assistance to snow operations (three salt domes and two vehicle washing operations).
- DOEE worked with DPW to identify nine snow disposal sites that could be used to store snow in case of a large event, such as a blizzard. The nine sites totaled 43.8 acres and could store roughly 1,106,400 cubic yards of compacted snow. Environmental controls at each site will be set up and maintained in the event that snow disposal operations were activated. Environmental site plans and a self-inspection checklist were created for each site.
- DOEE conducted site visits at three active salt domes to ensure salt, brine, beet juice, and magnesium were being stored properly. The fourth (and final) dome was under construction in FY 2017. Salt dome information can be found in Table 24.
- In the summer of FY 2017, DOEE began working with DPW to identify snow disposal sites for the FY 2018 snow season.
- DOEE revised website content for how to be environmentally friendly during the winter with tips for the public. This website outlined DOEE's efforts in order to make the agency's role during winter weather events more transparent. https://doee.dc.gov/service/protecting-environment-winter-weather-what-you-can-do
- DOEE taught a module at seven of the District's annual snow plow trainings reaching 261 District employees, contractors, and representatives from the downtown Business Improvement District (BID). These 10-20 minute presentations taught District light and heavy plow operators and manual street and bridge teams about stormwater permitting; how to minimize stormwater pollution from snow and ice removal operations; good housekeeping practices; and how to respond to spills, leaks, and drips.

Table 24 Salt Storage Facilities

Salt Dome Locations	Sewershed	Salt Capacity	Alternative De-Icer Capacity
2750 South Capitol Street	CSS	7,500 tons	20,000 gallons (brine)
Brentwood Road NE	CSS	12,000 tons	36,100 gallons (brine)
3890 Fort Reno Drive, NW	MS4	4,500 tons	4,200 gallon (brine)
401 Farragut Street, NE	MS4	18,000 tons	30, 000 gallons (brine)
			12,500 gallons (beet juice)

The District has studied the use of pervious surfaces that require less use of deicing materials. There are many studies that have examined the performance of permeable pavement compared with conventional pavement in cold climates. The general consensus is that pervious materials show less buildup of ice and snow because of their ability to infiltrate precipitation that falls on it. The District used this research in its decision to implement the use of permeable pavement in the RiverSmart Programs.

FY 2018 Goals: DOEE will continue to provide recommendations for District snow and ice removal operations, and incorporate presentations on stormwater pollution prevention into yearly, mandatory training of light and heavy plow operators held by DPW and DDOT. The District will begin implementation of DGS Stormwater Application to better track stormwater BMP management and implementation and ensure facility employees are trained on how to use it. Additionally, the District will continue to report on the implementation of permeable materials in future Annual Reports.

4.3.7 Infrastructure Maintenance / Pollution Source Control Maintenance

Operations and Maintenance

DOEE developed a two-year Operation and Maintenance Plan (O&M Plan) to provide guidance and a regulatory framework for each District government-operated facility within the MS4 Permit area. This plan details how the District will develop mechanisms to ensure the

maintenance of stormwater controls at District-operated facilities. It also includes a long-term strategy to record and track operation and maintenance of pollution prevention control measures.

Any District-operated facility covered by this plan will develop and implement stormwater pollution prevention control measures and inspection protocols to ensure compliance with the District's MS4 Permit. The District will apply different practices, schedules, and procedures to different facility types. The variation recognizes that different types of facilities pose different risks to water quality. For instance, a maintenance garage is less likely to pollute than a waste transfer station. Main elements of the O&M Plan include:

- An inventory of District facilities that identifies current operations, potential pollutants, contacts for responsible employees, and prioritizes facilities into two tiers based on potential risk for the discharge of pollution through stormwater.
- Guidance on the regular maintenance of a structural stormwater BMP at a municipal facility within the MS4 Permit area that was installed to comply with post-construction stormwater management regulations and requirements to regularly inspect the BMP through a combination of regulatory and self-inspections.
- Assistance for each District industrial and Critical Source facility with the review, update, and development of SWPPPs to guide BMP implementation and self-inspection;
- A strategy for SWPPP implementation, including:
    - The Pollution Prevention Database, an online recordkeeping and management program to assist with SWPPP development and implementation, and to provide maintenance and self-inspection reminders, capture information for recordkeeping, and assist with reporting requirements.
    - Employee training to ensure that District employees and contractors understand how to implement their facility's SWPPP and utilize the Pollution Prevention Database.
    - Inspections of facility compliance with stormwater regulations, both regulatory inspections by DOEE inspectors and self-inspections.
    - Clear expectations and procedures for taking corrective action.
- Establish District agency roles and responsibilities that will enhance collaboration and clarify expectations among Pollution Prevention Program participants.
- Schedule for implementation.

Inspection Program

DOEE maintains a database of industrial, commercial, institutional, municipal, and federal facilities within the MS4 area. DOEE conducts a minimum of two inspections of each municipal facility within the MS4 permit term to ensure compliance with maintenance standards, best management practices, the facility SWPPP and self-inspection and monitoring requirements, and proper record keeping. At each site, DOEE inspects control strategies for protecting water quality, including 'good housekeeping' practices, containment structures, pretreatment devices, sediment and erosion control devices, and other BMPs. Inspectors evaluate the effectiveness of

the control strategies and document deficiencies for follow-up using standard forms based on facility type.

Record Keeping

DOEE is working with DGS to create a Pollution Prevention Database to better manage a regulatory compliance program that will reduce pollutant discharges from industrial, automotive, and other types of District facilities to receiving waters. The Pollution Prevention Database will use cost-effective cloud computing; will synchronize with DGS's Salesforce Database and DOEE's Stormwater Database; and will assist in the development, implementation, and revision of facility stormwater pollution prevention plans. This will result in a customizable web-enabled application of site-specific information on the design, location, and maintenance of structural stormwater BMPs and non-structural, "good housekeeping" compliance BMPs. This database will assist facilities with the regulatory requirements for tracking and reporting that all involved stakeholders can access, edit, and communicate using a desktop computer or mobile device. This will strengthen cooperation and communication among relevant District agencies (such as DOEE, DDOT, and DPW) for stormwater management-related activities.

4.3.8 Public Industrial Activities Management / Municipal and Hazardous Facilities

Individual Permits

There is one District-owned facility with an individual NPDES permit. However, there are several non-District owned facilities within the District that have individual permits, Table 25.

Table 25 Facilities with Individual Permits

NPDES ID	Facility Name	Street Address
DCR053022	Aircraft Service International, Inc.	Base 537
DCR053021	American Airlines	Ronald Reagan National Airport
DCR053030	Amtrak Ivy City Yard	1401 W Street, NE
DCR053037	Benning Yard	225 33rd Street SE
DCR053008	Bladensburg Bus Facility	2250 And 2251 26th Street NE
DCR053010	District Yacht Club	1409 Water Street
DCR053042	East Potomac Maintenance Facility	1000 Ohio Drive SW
DCR053015	Fedex WASA	1501 Eckington Place, NE
DCR053043	First Vehicle Services	2175 West Virginia Avenue NE
DCR053011	Joint Base Anacostia-Bolling	20 Macdill Blvd
DCR053025	National Museum of African American History & Culture	1400 Constitution Avenue
DCR053019	Recycled Aggregates - Dc Rock Plant	1721 South Capitol Street SW
DCR050001	Rock Creek Park - Maintenance Yard	5000 Glover Road NW

NPDES ID	Facility Name	Street Address
DCR053031	Ronald Reagan National Airport	Ronald Reagan National Airport Terminal B
DCR053014	Ronald Reagan Washington National Airport	1 Aviation Circle
DCR053020	Ronald Reagan Washington National Airport	11 Air Cargo Road
DCR053023	Ronald Reagan Washington National Airport	1 General Aviation Terminal Hanger 7
DCR053040	Ronald Reagan Washington National Airport	1 Aviation Circle
DCR053007	Shepherd Parkway Bus Division	2 DC Village Lane SW
DCR053013	Southwest Airlines Co.	1 Aviation Circle, Terminal A
DCR053016	Super Salvage, Inc.	1711 1st Street SW
DCR053024	Superior Concrete Materials Inc.	1601 South Capitol Street SW
DCR053012	Swissport USA	1 Aviation Circle Air Canada Terminal 1
DCR053041	The Washington Marina Co.	1300 Maine Ave SW
DCR053035	United Airlines, Inc. DCA	Ronald Reagan National Airport
DCR053018	Virginia Concrete - SWDC	2 S Street SW
DCR053009	Western Bus Division	5230 Wisconsin Avenue NW

Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity

In FY 2017, two District facilities have successfully obtained coverage under the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP):

- MPD's maintenance facility called First Vehicle Services
- DPW's fueling facility called the 7th District Fueling Site

In FY 2017, six District facilities have taken the first step in obtaining MSGP coverage, by submitted the required worksheets. Many of the remaining District facilities needing MSGP coverage are currently preparing to submit.

DOEE conducted six in-person meetings with sister agencies to assist and encourage them to apply for MSGP coverage, and conducted annual SWPPP trainings for staff at 11 facilities that need MSGP coverage. To assist the facility with MSGP compliance, DOEE created facility and agency-specific handouts that outlined employee expectations, penalties for non-compliance, and a summary of the facility's most recent inspection report with photos. DOEE created a two-year plan to bring District facilities into compliance with the MSGP.

FY 2018 Goals:

- Ensure District facilities are in compliance with the new 2015 MSGP. This includes ensuring facilities understand and meet monitoring, recordkeeping, and other ongoing requirements of the MSGP.
- DOEE will support DGS in creating a Pollution Prevention Database to assist District employees in capturing and tracking pollution prevention activities.
- DOEE will host employee training of relevant personnel at District facilities that need coverage under the MSGP. These trainings will review the impact of stormwater runoff and pollution, facility SWPPPs, and location and maintenance of on-site controls.
- DOEE will continue to facilitate interagency collaboration and knowledge-building to ensure District facilities have access to and information on stormwater BMPs.

4.3.9 Emergency Procedures

The District did not conduct repairs of public service systems or infrastructure as part of any emergency circumstance that caused an upset of District Water Quality Standards. In FY 2017 there were no emergencies as defined by 40 C.F.R. 122.41(n). However, the District did respond to several IDDE emergencies as reported in Section 4.7 of this report.

FY 2018 Goals: The District will continue meet the requirements of Section 4.3.9 of the MS4 Permit.

4.3.10 Municipal Official Training

The District continues to implement a training program for District staff. Individuals who manage, investigate or work on stormwater practices regularly attend relevant trainings. Specifically, the District has taken significant steps to enhance its pollution prevention program since the current Permit was issued and has offered numerous targeted training sessions for municipal facility staff.

FY 2017 municipal official training accomplishments include:

- 2 trainings on the SW Database
- 21 trainings on pollution prevention

FY 2018 Goals: DOEE will continue to hold trainings for District employees on a variety of training topics.

4.4 Management of Commercial and Institutional Areas

As required by Section 4.4 of the MS4 Permit, the District's inspection and enforcement program utilizes established policies and procedures to effectively limit and reduce the discharge of pollutants in stormwater from all industrial, commercial, institutional, municipal, and federal facilities within the MS4 area. These facilities are inspected a minimum of twice each permit term under DOEE's inspection and enforcement program and tracked via the Stormwater

Database. The inspections of all MS4 facilities are conducted by trained DOEE staff. Control measures identified at these facilities are documented by inspectors and include: 'good housekeeping' practices, containment structures, pre-treatment devices, sediment and erosion control devices, and other large best management practices. During these inspections, the condition and effectiveness of the control measures are documented. If an inspection of an MS4 facility identifies an ineffective control measure or an imminent threat to water quality, DOEE inspectors require immediate corrective action through varying approaches: compliance assistance, site directive, notice of violation (NOV), and possibly notice of infraction (NOI).

Additionally, the District's Stormwater Management Guidebook provides the procedures for managing stormwater and can be found at http://doee.dc.gov/swguidebook.

4.4.1 Inventory of Critical Sources and Source Controls

DOEE continues to maintain a database of critical sources of stormwater pollution within the MS4 area including industrial, commercial, institutional, municipal, and federal facilities. Commercial and institutional facilities identified within this database include automotive repair facilities, automotive fueling stations, automotive wash facilities, dry cleaners, and other facilities deemed as sources of stormwater pollution. DOEE WQD identified 334 critical sources of stormwater pollution during FY 2017. Included in this critical source inventory are 11 individual NPDES permit holders and 28 municipal facilities.

4.4.2 Inspection of Critical Sources

DOEE maintains an inspection and enforcement program to address sources of stormwater pollution within the MS4 area of the District. In FY 2017, DOEE inspected a total of 122 critical sources, including 7 individually permitted NPDES facilities and 12 MSGP facilities. DOEE inspected one municipal MSGP facility in FY 2017.

These inspections are documented with facility specific inspections forms and recorded in the MS4 Inspection Tracking Database. DOEE took appropriate enforcement actions to ensure compliance with the District's MS4 Permit. The list of critical sources inspections is included in Attachment B.

All facilities on the critical source inventory are inspected at a minimum of twice per Permit term. During the inspections, control strategies for protecting water quality, including 'good housekeeping' practices, containment structures, pre-treatment devices, sediment and erosion control devices, and other BMPs are inspected and documented. The effectiveness of the control strategies is evaluated and deficiencies are documented for follow-up.

4.4.3 Compliance Assurance

DOEE inspects each facility identified on the critical source inventory at a minimum of twice each during the permit term. Inspectors document control measures identified at these facilities, including 'good housekeeping' practices, containment structures, pretreatment devices, sediment and erosion control devices, and other large BMPs. Inspectors also document the condition and effectiveness of these control measures.

FY 2018 Goals: The District will continue to inspect, track, and report on critical sources as required by the MS4 Permit.

4.5 Management of Industrial Facilities and Spill Prevention

4.5.1 Industrial Facilities Program

The District continues to implement a program to monitor and control pollutants from industrial facilities within the MS4.

4.5.2 Industrial Facilities Database

DOEE maintains a database of industrial, commercial, institutional, municipal, and federal facilities within the MS4 area. The industrial facilities identified by the database covered under NPDES individual and general permits are inspected as part of DOEE's NPDES Inspection and Enforcement Program.

As part of the Inspection and Enforcement program DOEE conducted Compliance Evaluation Inspections (CEI) of all individual NPDES permitted facilities within the District. A CEI is conducted to verify permittee compliance with regulations, permit conditions, applicable permit self-monitoring requirements, effluent limits, compliance schedules, and the current SWPPP. Additionally, the program reviews facility DMR's for compliance with established effluent limits and the District Water Quality Standards.

Industrial facilities identified by the MS4 facilities database and not covered under NPDES are inspected as part of the MS4 Inspection and Enforcement program. These facilities include, but are not limited to, industrial facilities subject to Superfund Amendments and Reauthorization Act (SARA) and Resource Conservation and Recovery Act (RCRA) requirements.

DOEE continues to conduct inspections to determine compliance with hazardous waste regulations. DOEE conducted inspections at RCRA Large Quantity Generators (LQG); Small Quantity Generators (SQG); Treatment, Storage and Disposal (TSD) facilities; and Conditionally Exempt Small Quantity Generators (CESQG).

In FY 2017, DOEE inspected:

- 1 TSD facility
- 28 LQGs
- 34 SQGs
- 125 CESQGs

4.5.3 On-Site Assistance

As required by Section 4.5.3 of the MS4 Permit, the District continues to provide on-site assistance and inspections focused on the development of pollution prevention plans and permit compliance.

FY 2017 on-site assistance accomplishments include:

- Held 35 meetings with sister agencies to provide stormwater pollution prevention assistance.
- Assisted three facilities in developing SWPPPs.
- Worked with two agencies to revise 43 facility SWPPPs to ensure they addressed MSGP requirements.
- Held 23 trainings on pollution prevention, which reached 464 people.
- Reached 409 District staff on how to implement facility SWPPPs.
- Created six facility-specific flyers were developed to accompany trainings that outline employee expectations, permitting requirements, and inspection report summaries.

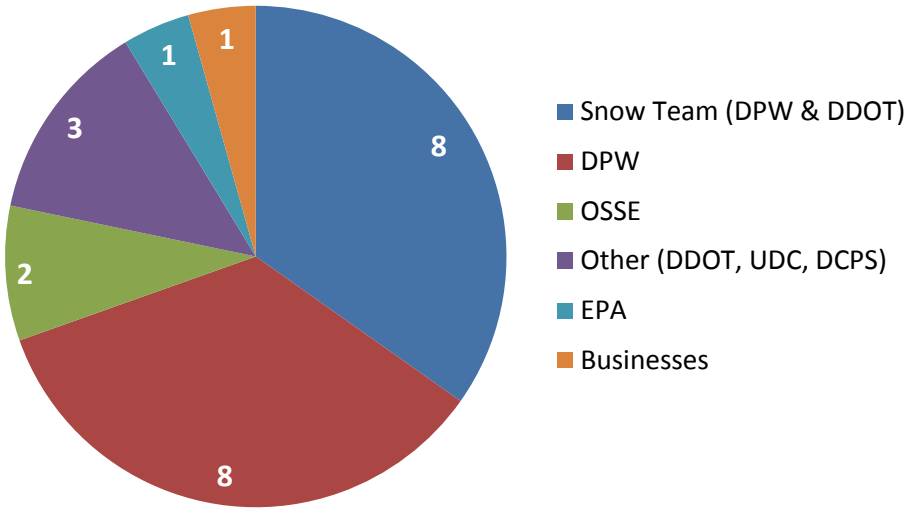

Figure 18 FY 2017 Pollution Prevention Training Summary

4.5.4 Illicit Discharge and Spill Prevention

Information regarding the District's Illicit Discharge and Improper Disposal Program implementation is found in Section 4.7 of this report.

4.5.5 Program Progress

The program implementation activities in Sections 4.5 of this report address the District's requirements of Section 4.5.6 of the MS4 Permit.

FY 2018 Goals: The District will continue to implement the provisions of Section 4.5 of the MS4 Permit. Additionally, in FY 2017 SWPPPs will be updated or completed for applicable facilities.

4.6 Management of Construction Activities

4.6.1 Program Implementation

DOEE maintains a plan review and erosion control program for new construction, which coupled with a field inspection program, ensures compliance with the District erosion control regulations.

4.6.2 Review and Approval Process for Sediment and Erosion Control Plans

DOEE reviews construction and grading plans for stormwater management, erosion and sediment control, and flood plain management considerations. Figure 19 details the 17-year trend in plan review and approval.

In FY 2017, DOEE accomplished the following:

- 219 GAR plans reviewed and 114 plans approved
- 1,557 Erosion and Sediment Control Plans reviewed and 1,323 approved
- 234 Stormwater Management Plans reviewed and 207 approved

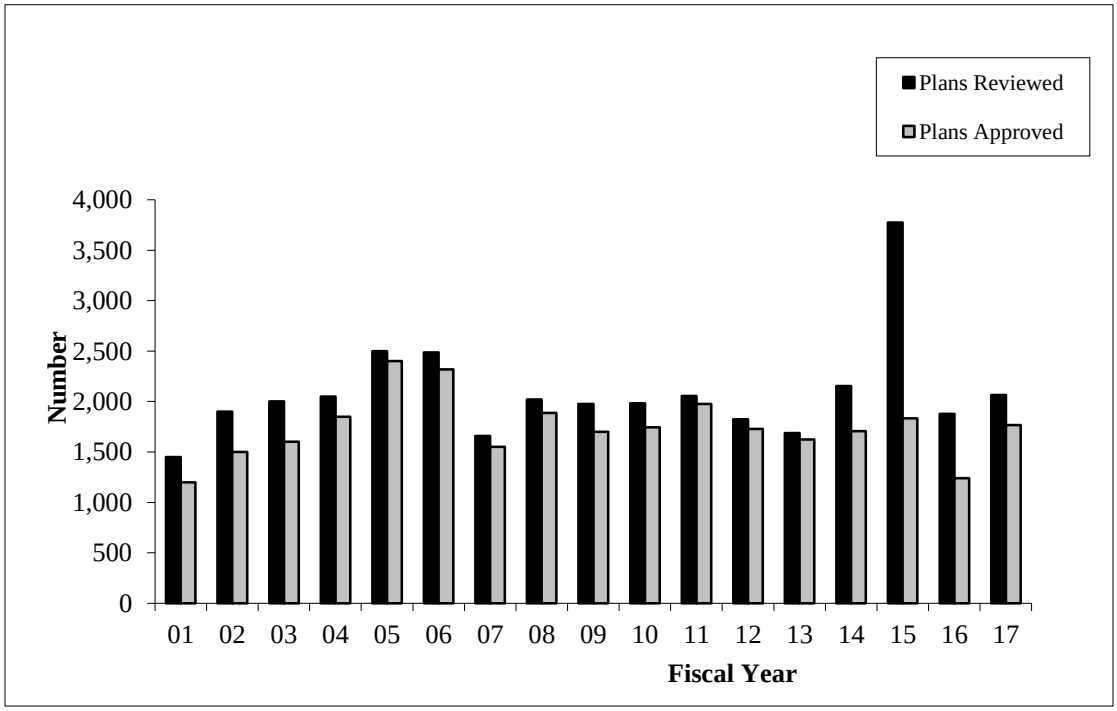

Figure 19 Total Number of Plans Reviewed and Total Number of Plans Approved

4.6.3 Inspection and Enforcement Procedures

The District continues to implement existing inspection and enforcement procedures. The District's procedures for erosion and sediment control inspections have been previously submitted to the EPA and can be found in Attachment H of the 2014 Annual Report.

All District erosion and sediment control inspectors have been trained on the updated procedures and fines, as well as received training on other current topics and best practices regarding soil erosion and sediment control.

DOEE's construction site inspection program meets the required inspection frequency specified in Sections 4.6.3.1-3 of the MS4 Permit. DOEE inspectors are authorized to conduct on-site inspections for all stormwater management facility construction in the District. The building permit holder is required to contact DOEE 24 hours before beginning construction of the stormwater management facility. The first step in all stormwater management facility construction inspections is a preconstruction meeting, where inspectors are required to review the SWMP with the owner/agent of the stormwater management facility. Inspections are performed at different stages of construction as outlined in the stormwater narrative of the approved SWMP and as specified in the specific Stormwater Management Facility Construction Report. A final inspection is performed upon completion of the stormwater management facility. The report indicates the due date of the As-Built plan of the completed stormwater management facility. A Final Approval Notice is issued to the owner/ agent after receipt and approval of the As-built.

4.6.4 Erosion and Sediment Control Enforcement

As required by Section 4.6.4 of the MS4 Permit, the District is providing a listing of all violations and enforcement actions, see Attachment C.

In FY 2017, the District accomplished the following:

- 1,114 BMP construction inspections
- 3,328 erosion and sediment control inspections
- 1,197 maintenance inspections
- 83 Notices of Violation
- 11 Administrative Orders
- 60 Maintenance Notices
- 38 Notices of Infraction

The District has a new BMP tracking database that addresses the recordkeeping, paperwork, and data management requirement of the MS4 Permit. This database tracks compliance with the District's updated stormwater management regulations, including the construction and ongoing maintenance of BMPs.

4.6.5 Education and Outreach for Construction Site Operators

Educational training and compliance assistance for construction site operators is conducted during the site inspection process, as required by Section 4.6.5 of the MS4 Permit. This training includes distribution of the District's 2013 Stormwater Management Guidebooks and addresses particular needs and questions of the operators.

4.6.6 Progress in the Construction Program

The accomplishments of the Inspection and Enforcement Program demonstrate the effectiveness of the Program and meet the requirements of Section 4.6.6 of the MS4 Permit. The District is performing multiple rounds of inspections, identifying violations, following up with sites as appropriate to ensure violations are addressed, and imposing penalties as appropriate. Since 1988, the District has required and enforced stringent erosion and sediment control measures for projects that disturb more than 50 square feet of earth, which significantly exceeds the Permit requirement to enforce controls on projects greater than 5,000 square feet. Regulation of construction sites prevents the acceleration of soil erosion and sedimentation, which reduces total suspended solids (TSS) and turbidity in District waters and reduces the amount of pollutants that adhere to the soil entering the waters. Dewatering practices at construction sites prevent additional pollutants, including toxics, from entering the District's waters. As required by EPA, regulated projects in the District must have SWPPPs that "identify all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site." SWPPPs and 'good housekeeping' practices at construction sites further reduce the amount of pollutants that may be discharged to District waters. Additionally, the

District has removed the "waivers and exemption" provision that previously existed in its regulations at 21 DCMR § 528.

FY 2018 Goals: The District will continue to review and approve SWM plans and to provide staff refresher training to continually improve efficiency for review and provision of technical assistance. The District will continue to provide educational materials to construction site operators and to enforce the inspection procedure guidelines.

The District will continue inspections of commercial, residential, and road construction projects for the maintenance and implementation of erosion control devices and stormwater retention BMPs. DOEE will continue to track SWM facilities inspected in the Stormwater Database system.

4.7 Management of Illicit Discharges and Improper Disposal

4.7.1 Illicit Discharges Detection and Elimination Program

As required by Section 4.7.1 a-i of the MS4 Permit, the District maintains an Illicit Discharge Detection and Elimination Program (IDDE) designed to detect and eliminate illicit discharges within the District. DOEE, with the support of DC Water and DPW, investigates and conducts enforcement actions in accordance with the District's MS4 permit, the District's Water Pollution Control Act and District Surface Water Quality Standards 21 DCMR § 1100 *et seq.*

The program also provides assistance to first responders, including DC Fire and Emergency Medical Service Department (DC FEMS), Metropolitan Police Department (MPD), Homeland Security and Emergency Management Agency (HSEMA), and the US Coast Guard in environmental emergencies. Reports or notifications from these agencies are routed to the DOEE Chief of Emergency Operations. Incidents potentially affecting the MS4 or District water quality are then referred to DOEE inspectors for assistance. Those incidents referred to the DOEE Emergency Operations are considered "emergency responses" and are designated and recorded as such.

In FY 2017, DOEE investigated 71 reports associated with a discharge, spill, or release of pollutants to the MS4 or District waters. To ensure case closure, a total of 133 follow-up inspections were conducted. In FY 2017 a total of 17 enforcement actions were taken. A listing of DOEE IDDE investigations is included in Attachment D.

DOEE's enforcement procedures are addressed in *The Environmental Enforcement Guidelines*. This document details how enforcement actions, such as notices of violation (NOV), notices of infraction (NOI), and stop work orders are issued and adjudicated. The strategies outlined in the manual provide the standard operating procedures (SOPs) for inspection and enforcement efforts within the District.

Another aspect of water quality protection measures, the District performs dry and wet weather monitoring to help determine the source of pollution. DOEE conducts dry weather surveys through visual observations of outfalls to identify non-stormwater flows. Because illicit discharges are often intermittent, DOEE inspectors check for discharges multiple times in a

given location, particularly in priority locations. DOEE reviews the collected data to discern any spatial or temporal patterns that may assist the program in prioritizing sewersheds for additional regulatory, educational, or structural pollution controls. Illicit discharges are also identified through routine facility inspections.

The District provides personnel with training on spill prevention and response as part of the larger Pollution Prevention Program, as well as during compliance assistance provided by the IDDE inspection staff.

Outfall Inventory

DOEE continues to refine an inventory of outfalls within the District, Table 26.

Table 26 MS4 Outfalls Identified by Watershed

Watershed	Number of Outfalls
Anacostia River	191
Potomac River	209
Rock Creek	170
Total	**570**

4.7.2 Soils and Floatables Program

As required by Section 4.7.2 and 4.3.5 of the MS4 Permit, the District maintains a solids and floatables program. Information about the District's floatables program is found in Section 4.3.5 of this report.

4.7.3 Proper Disposal of Household Waste

As required by Section 4.7.3 of the MS4 Permit, the District prohibits the disposal of used motor fluids, household hazardous waste, leaf and grass clippings, and animal waste into the storm sewer. Each of these programs are readily available and information can be found on the DPW and DOEE websites.

- Household hazardous waste: http://dpw.dc.gov/service/household-hazardous-waste-e-cycling-document-shredding
- Paint Care: https://doee.dc.gov/paint
- Leaf Collection: http://dpw.dc.gov/service/leaf-and-holiday-tree-collection
- Pet Waste: http://doee.dc.gov/petwaste
- Auto Service Workshops: https://doeeautoworkshop.splashthat.com/
- Littering: http://mpdc.dc.gov/page/littering-enforcement-help-keep-dc-clean

Paint Stewardship

The Paint Stewardship Act of 2014 requires paint manufacturers to collect and reuse, recycle, or safely dispose of excess paint. Manufacturers, or representative organizations of manufacturers, are required to register with DOEE, pay a registration fee, submit a paint recycling and management plan, and annually report on collection and recycling activities. Paint stewardship in the District of Columbia is achieved through the PaintCare program which increased opportunities for the public to recycle their leftover paint with the addition of retail drop-off sites, paint collection events, and other services. The PaintCare program launched on November 1, 2016. In the first year of this program over 21,000 gallons of water-based paint was processed, Table 27.

Table 27 PaintCare Collection between November 2016 and October 2017[15]

Paint Type	Collected	Processed
Water-Based Paint	21,952 gallons	21,297 gallons recycled
Oil-Based Paint	6,379 gallons	6,379 gallons used as alternative fuel

Motor Vehicle Fluids and Auto Body Repair

DOEE hosted the Auto Services Workshop on June 8, 2017. DOEE staff presented on the topics of compliance assistance and best practices. The program also received a two-year grant to further provide assistance to District automotive repair shops, a critical source of stormwater pollution. The funding will be used to provide a unified, clear message on how to reduce pollution through source reduction. Businesses will be encouraged to develop and adopt source reduction plans for their businesses that will reduce their negative impact on the environment, save them money, and help keep their employees safe and healthy. The program includes four main elements: 1) onsite technical assistance visits; 2) twice-yearly newsletters; 3) twice-yearly workshops; and 4) a certification program. Over the next two years 43 automotive repair shops in the District will receive onsite technical assistance and 90 people will attend automotive workshops.

Pet Waste

In FY 2017, DOEE provided a community partner with 9,600 dog waste bags for three bag dispensers in Edgewood, which is within the combined sewer system (CSS). This total number of bags, once used, would remove an estimated 3,600 pounds of pet waste from the environment. This program is serving as a demonstration project that may be expanded to other neighborhoods.

15 The final PaintCare Collection Report for FY 2017 will be published in April 2018. The numbers reported here are subject to change as the PaintCare report is finalized.

In FY 2017, 183 signs were posted throughout the District. These signs advertise the fines associated with not picking up after dogs and the environmental impacts of abandoned pet waste.

DOEE implemented a new system for tracking pet waste complaints and calls. During FY 2017 DOEE received 388 pet waste complaints, estimated 160 complaints taken over the phone and 228 from DOEE's online form.

DOEE created a new pet waste flyer. Roughly 300 flyers were disseminated in Ward 8 to a community group and given out at the Advisory Neighborhood Committee (ANC) 8C meeting in September.

DOEE organized an inter-agency meeting to discuss the future direction of the District's Pet Waste Program. During this meeting, a new process for routing complaints was devised to ensure enforcement agencies were able to access and respond to complaints. Another meeting outcome was an agreement to conduct outreach and enforcement blitzes in areas that have received many complaints. Three agencies, DOEE, DOH Animal Control, and DPW SWEEP program, were identified to participate in the enforcement blitz. These agencies will conduct outreach to pet owners and issue citations if residents are caught not cleaning up after their pet. In preparation, DOEE created a heat map of pet waste complaints in the District and identified two main locations within which increased enforcement and education will be targeted, Rosedale / Carver-Langston and Mount Pleasant/Columbia Heights. A list of outreach targets, including parks, pet stores, community and recreation centers, and other outreach locations, were identified within each hotspot for distributing flyers and reaching pet owners about picking up after their pets.

Household Hazardous Waste

DPW continues to provide household hazardous waste (HHW) collection. During FY 2017, DPW operated monthly HHW drop-off sites at the Ft. Totten Transfer Station. Residents are able to bring their HHW materials and unwanted electronics for proper disposal. Details of the FY 2017 HHW Collections can be found in Attachment E.[16]

FY 2017 DPW HHW collection accomplishments included:

- 17,435 total gallons of HHW
- 17,173 linear feet of HHW
- 208 cubic yards of HHW

Leaf Collection

In FY 2017, DPW continued with seasonal leaf and holiday tree collection. During leaf collection season DPW collects leaves at least twice from each residential neighborhood by

16 In FY 2017, the DPW contract for HHW collection expired. A new contract was issued halfway through the year which resulted in a tracking and reporting change for the months of March and April.

"vacuuming" loose leaves residents rake into curbside tree boxes. Loose leaves are sent for composting. Figure 20 shows the historical record of leaf collection data.

FY 2017 leaf and tree collection accomplishments include:

- 277 tons of holiday trees
- 7,363 tons of leaves

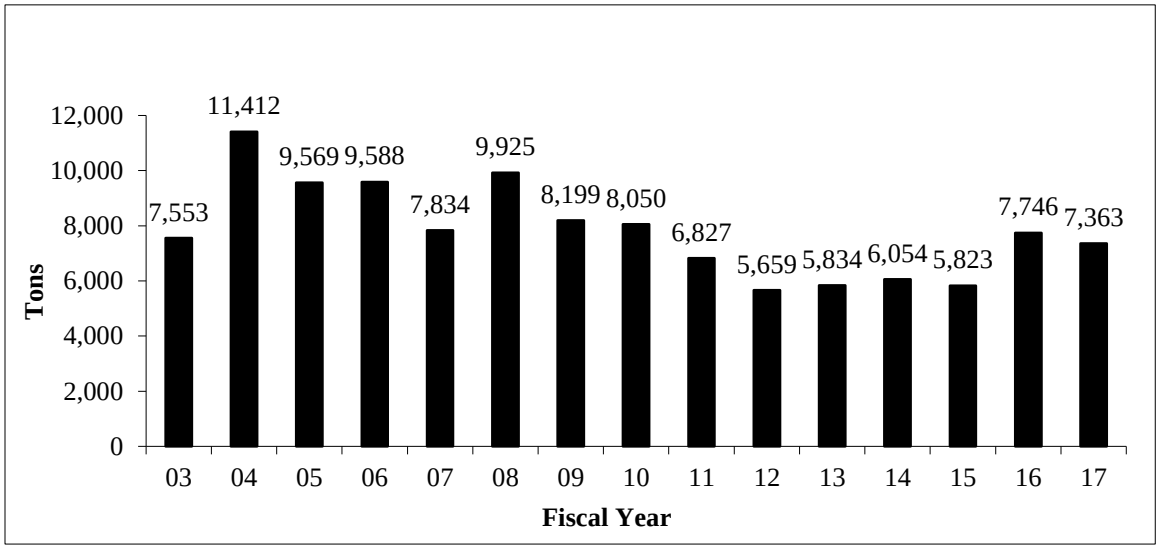

Figure 20 Leaf Collection Trend

Littering and Illegal Dumping Enforcement

The District continued to enforce the District's anti-littering laws as well as issue traffic tickets for littering from an automobile. DPW continued the Solid Waste Education and Enforcement Program (SWEEP) to maintain clean private and public spaces by investigating illegal dumping complaints, overgrown lots, trash can litter and overflow, and other sanitation violations. DOEE, in collaboration with MPD, DPW, DDOT, Chessie Seaboard Xpress (CSX) Transportation Company, and the National Park Service (NPS), continued to implement the illegal dumping enforcement program, *DumpBusters* program.

FY 2017 Littering and Illegal Dumping achievements include:

- 5,934 requests for action for illegal dumping
- 7 arrests for illegal dumping through the *Dumpbusters* program
- 53 Notices of Violation for littering[17]
- 30 traffic tickets for littering from a vehicle

17 Data comes from the 2016 Metropolitan Police Department Annual Report, issued December 29, 2017. At the time of this report, this data is the most current. https://mpdc.dc.gov/publication/mpd-annual-report-2016.

The following list provides additional details into the District's littering and illegal dumping programs:

- MPD's littering enforcement program: http://mpdc.dc.gov/page/littering-enforcement-help-keep-dc-clean.
- DPW SWEEP program: http://dpw.dc.gov/service/solid-waste-education-and-enforcement-sweep.

4.7.4 Coal Tar Ban Enforcement

As required by Section 4.7.5 of the MS4 Permit, the District continues to enforce its prohibition on the sale, use, and permitting of coal tar based pavement products. The coal tar ban helps to protect human health and the environment by reducing the amount of toxic polycyclic aromatic hydrocarbons (PAHs) in our communities and environment. Rainwater washes PAH-containing sealant particles and dust down storm drains and into our local streams and rivers, threatening aquatic life in the Anacostia and Potomac Rivers and the Chesapeake Bay.

FY 2017 Coal Tar Program accomplishments include:

- 64 inspections

DOEE continues to maintain an online tip line for citizens to report properties they suspect are in violation of the District's ban of coal tar pavement product. In addition, DOEE staff uses GIS and remote sensing technology to identify dark-color paved areas for inspections. To view information on the District's coal tar ban: http://doee.dc.gov/coaltar.

4.7.5 Anacostia Clean Up and Protection Act Enforcement

The District continues to implement the Anacostia Clean Up and Protection Act of 2009 (Bag Law). In FY 2017, DOEE updated regulations to reflect the current statute and to tie the schedule of fines to the Civil Infractions Act.

The Bag Law is working to keep trash out of District water bodies by incentivizing residents to use reusable bags and reduce consumption of disposable bags. Funds from the disposable bag fee are funding water quality protection projects, including maintenance of trash traps, stream restoration, reusable bag distribution, and environmental education.

FY 2017 Bag Law accomplishments include:

- 552 total inspections performed
- 83 NOVs issued
- 51 NOIs issued
- 22,090 reusable bags distributed

DOEE continues to solicit tips from the public about potential Bag Law violations. Beginning in FY 2015, residents were able to report Bag Law violations through the citywide 311 website and smartphone application. DOEE received two tips via 311 in FY 2017.

To view information about the Bag Law: https://doee.dc.gov/bags.

4.7.6 Foam Ban

The Sustainable DC Omnibus Amendment Act of 2014 bans the use of food service products made of expanded polystyrene, commonly known as Styrofoam™. The foam ban began on January 1, 2016 and applies to all District businesses and organizations that serve food. The law also requires these regulated food entities to switch to recyclable and compostable food service ware products beginning January 1, 2017.

In FY 2017, DOEE launched the door-to-door "street team" outreach campaign to educate the regulated community about the food service ware recyclable and compostable requirements (regulations from the Sustainable DC Omnibus Amendment Act of 2014). The street team campaign involves extensive cooperation from community representatives (main streets, BIDs, Mayor's Office of Community Relations, ANC commissioners, and DPW) and reaches commercial corridors in all eight wards. DOEE worked closely with DPW to streamline messaging on recycling initiatives from both agencies, providing for a cohesive and simplified campaign for District businesses and residents. A website dedicated to the compostable and recyclable food service ware requirements was created, visit https://doee.dc.gov/foodserviceware.

FY 2017 Foam Ban Program accomplishments include:

- 309 total inspections performed
- 29 NOVs issued
- 8 NOIs issued
- 6,506 mailers sent to the regulated community
- 116 businesses reached through door-to-door street team outreach

DOEE started soliciting tips from the public about potential Foam Ban violations. Beginning in FY 2017, residents were able to report Foam Ban violations through the citywide 311 website and smartphone application. DOEE received 21 tips via the District's 311reporting system in FY 2017.

FY 2018 Goals:

- The District will continue to investigate illegal dumping complaints, overgrown lots, trash can litter, and other sanitation violations.
- The District will continue the program to detect illicit discharges, and to prevent improper disposal into the storm sewer system. DOEE personnel will continue to investigate potential illicit discharges in response to reports by citizens or government personnel.
- DOEE will purchase and install additional pet waste street signs.
- DOEE will continue coal tar and foam bans and bag law enforcement efforts.
- The District will strive to increase the number of citizens participating in the HHW and leaf collection programs through public education and the continuation of HHW collection at a transfer station on a monthly basis.

4.8 Flood Control Projects

The District adopted the Flood Insurance Rate Maps (FIRM), issued by the Federal Emergency Management Agency (FEMA), on September 27, 2010. There have been no major changes in floodplains areas since adopting the 2010 FIRM. After a major FIRM revision, DOEE will update the impervious surface analysis of floodplains in the District, a requirement of Section 4.8.1 of the MS4 Permit.

District's Flood Hazard Rules Compliance Reviews:

FY 2017 Flood zone accomplishments include:

- DOEE review engineers co-located at the satellite office in the Department of Consumer and Regulatory Affairs (DCRA) processed 174 flood zone determinations for various development projects as part of the permitting process.
- Reviewed 32 and approved 5 Environmental Impact Screening Forms for compliance with the District's Flood Hazard Rules (20 DCMR, Chapter 31) and the District's Environmental Policy Act (DC Law 8-36).
- Reviewed and approved 4,061 Erosion & Sediment Control (ESC), Stormwater Management (SWM), and Floodplain Management (FPM) Plans for compliance with the District's Flood Hazard Rules (20 DCMR, Chapter 31).

DC Flood Risk Management

DC Silver Jackets is an interagency team that leverages resources to identify and implement comprehensive, resilient, and sustainable solutions to reduce flood risk around the District and to assist local communities.

Twelve federal and District agencies formalized the DC Silver Jackets in 2014 through an interagency Memorandum of Understanding (MOU). DC Silver Jackets first began meeting in April of 2012 as the Potomac River Flood Coordination Group. DOEE is the lead agency for the District. The U.S. Army Corps of Engineers, Baltimore District, and the National Park Service jointly lead the federal agencies.

DC Silver Jackets has established multiple task groups: Development of Flood Inundation Mapping/Stream Gauges; Flood Emergency Planning; Interior Flooding; Levee Certification and Accreditation; Flood Risk Communication; Flood Tours, and Watts Branch Study. Each task group has respective responsibilities that will aid in fulfilling the team's mission and goals. For more information about DC Silver Jackets: http://silverjackets.nfrmp.us/State-Teams/Washington-DC.

In FY 2017 the DC Silver Jacket accomplished the following:

- On October 25, 2016, the Office of Planning (OP) hosed the DC Silver Jackets Team meeting. OP presented its integration of resilience into the Comprehensive Plan update. The Team shared feedback and comments on goals achievements and lessons learned from the 2016 Flood Summit that was held in September 2016.
- On January 31, 2017, the Georgetown Climate Center (GCC) hosted the District Silver Jackets Team meeting. GCC presented its adaptation clearinghouse 2.0 that is a comprehensive database providing tools in climate adaptation. The DC Silver Jackets leaders shared the 2016 DC Silver Jackets Annual Report that captures accomplishments in 2016 and lists planned activities in 2017.
- On May 11, 2017, DOEE hosted the DC Silver Jackets Team meeting. DOEE presented its roles on flood risk management and ongoing/upcoming flood risk management projects in the District, including an overview of the DC Flood Risk Governance Review and Recommendations. The DC Silver Jackets leaders shared a potential interagency project in FY 2017.
- On August 15, 2017, The Smithsonian Institute's (SI) National Museum of African American History and Culture hosted the DC Silver Jackets team meeting. SI presented its climate mitigation plan that is a plan to address climate impact to the SI buildings and assets. The DC Silver Jackets leaders shared the FY 2017 interagency proposals to address flood risks in Federal Triangle and Watts Branch.
- On September 27, 2017, members of the DC Silver Jackets Team attended a meeting with officials from the City of Rotterdam at the Embassy of the Netherlands. The purpose of the meeting is to share knowledge on urban flood resilience and best practices in flood risk management.

FY 2018 Goals: The DOEE flood control program will continue to review and track compliance with the District's Flood Hazard Rules. The program will also continue to participate in the DC Silver Jackets Team.

4.9 Public Education and Participation

The District continues to implement a targeted education and outreach program that strives to reduce or eliminate behaviors that cause adverse stormwater impacts.

4.9.1 Education and Outreach

The District conducts public education activities related to stormwater pollution. These activities target:

- Teachers and students (RiverSmart Schools, DC Environmental Literacy Plan, District of Columbia Environmental Education Consortium, The Anacostia River Environmental Education Fair, Meaningful Watershed Education Experiences, boat tours).
- Businesses (Bag Law, Coal Tar, Illicit Discharge Detection and Elimination (IDDE), Foam Ban, Pollution Prevention).
- District employees (2013 Stormwater Rule, Pollution Prevention, Stormwater Guidebook, IDDE).
- Homeowners and property managers (RiverSmart Homes, RiverSmart Communities, RiverSmart Washington, IDDE).
- Developers and engineers (2013 Stormwater Rule, Stormwater Guidebook, SRC).
- General public (RiverSmart, Storm drain markers, House Hold Hazardous Waste (HHW), motor oil, boat tours).

More information about each of these programs is presented in Section 4.9.4 of this report.

4.9.2 Measurement of Impacts

The Alice Ferguson Foundation (AFF) monitored the effectiveness of their anti-littering education and outreach campaign, discussed in Section 4.10.1 of this report. From monitoring conducted between 2013 and 2015, AFF observed a 31% decrease in the number of litterers at these monitoring sites.

4.9.3 Recordkeeping

DOEE continues to track and record stormwater related public education and outreach activities.

4.9.4 Public Involvement and Participation

The District continues to provide the opportunity for direct public involvement through a variety of programs.

Storm Drain Marking

In FY 2017, DOEE's Watershed Protection Division installed 790 storm drain markers. DOEE worked with eight different volunteer groups, including: the Green Zone Environmental Program (GZEP); an elementary school; an afterschool program; a summer camp; and two universities.

Stream and Neighborhood Cleanup Events

The District hosts volunteer stream clean ups throughout the year. More information about volunteer stream cleanups can be found in Section 4.10.1 of this report.

DC Environmental Literacy Plan

In FY 2017, DOEE continued to collaborate with stakeholders to implement the District Environmental Literacy Plan (ELP). The DC Council passed the Sustainable DC Omnibus Amendment Act of 2014, which included the "Environmental Literacy Plan Adoption" Act, which created a new program and staff within the Office of the State Superintendent of Education (OSSE) to further develop and implement the Environmental Literacy Plan. In September 2017, OSSE released the first updated DC Environmental Literacy Plan, https://osse.dc.gov/node/1113326.

In partnership with nonprofit organizations, DOEE began implementation of the Environmental Literacy Framework for District schools, a grade-by-grade approach for integrating environmental education into the curriculum. Teachers from Sustainable DC Model Schools, which are exemplary schools that already include environmental programming, helped develop and pilot the framework. Four of the eight model schools had already participated in DOEE's RiverSmart Schools program. This framework helps to identify where and how DOEE programming can be integrated into school activities and curriculum. This project will also coordinate Green Career Expos for high school students to learn about green jobs and summer internships. DOEE continues to work with OSSE to implement the ELP.

- DOEE's Environmental Literacy Program: https://doee.dc.gov/service/dc-environmental-literacy-plan.
- OSSE's Environmental Literacy Program: https://osse.dc.gov/node/1113341.

RiverSmart Schools

RiverSmart Schools works with applicant schools to install Low Impact Development (LID) practices to control stormwater. These practices are designed to be functional as well as educational. Additionally, schools that take part in the RiverSmart Schools program receive teacher training on how to use the sites to teach to curriculum standards and how to properly maintain the sites.

In FY 2017 DOEE RiverSmart Schools Program accomplished the following:

- Provided 37 teachers with a four-day workshop on RiverSmart schools site usage and programming.
- Conducted 14 classroom visits and provided six boat trips to support integration of watershed lessons for the RiverSmart Schools project at each participating school.
- Engaged approximately 200 students, teachers, and volunteers from three schools in eight community work days to construct and maintain designed schoolyard conservation sites.
- Completed the construction of four RiverSmart Schools LID projects.

District of Columbia Environmental Education Consortium (DCEEC)

DOEE helps to organize a network of environmental educators throughout the District so that ideas and resources can be shared among them. The DC Environmental Education Consortium (DCEEC) provides opportunities for networking, event coordination, and program partnering among its members. The members provide environmental expertise, professional development opportunities, curricula and resources, and hands-on classroom and field studies to District schools.

In FY 2017 DOEE and DCEEC hosted their 11th annual DC Teacher's Night at the U.S. Botanic Garden. Over 200 teachers registered and those in attendance and learned about environmental programming from approximately 30 exhibitors representing local environmental and science education organizations. The teachers met with local environmental educators for connection with environmental education opportunities both inside and outside the classroom. Participants also took part in hands-on experiments and left with lesson plans for their classrooms.

The District held its sixth annual Growing Healthy Schools Month, which is the fusion of DC School Garden Week and DC Farm to School Week. Growing Healthy Schools Week highlights the interrelated goals of these two former weeks and reflects the components of the recent Healthy Schools Act, which encourages linkages between farm-to-school and school garden programs.

DOEE assisted the consortium with an initiative on Nature Near School mapping. The goal is to identify public parks within 0.25 miles (5-minute walk) of all District schools.

The Anacostia Environmental Youth Summit

The Anacostia Environmental Youth Summit (AEYS) is a District-wide showcase that spotlights youth voice, demonstrates environmental literacy, and encourages stewardship for the Anacostia and Potomac rivers and the Chesapeake Bay. In FY 2017, the AEYS hosted nine schools, 447 student, 30 teachers, 21 exhibitors, 13 volunteers, seven judges.

Meaningful Watershed Educational Experiences (MWEEs)

DOEE funded nonprofit partners implement MWEEs for District youth. DOEE's current MWEE initiatives are the following:

- Trash-Focused Meaningful Watershed Educational Experiences
- Overnight Meaningful Watershed Educational Experiences (OMWEE)

In FY 2017, the trash-focused MWEE grant program reached 340 students, focusing on schools in Wards 7 and 8.

During FY 2017, the Overnight Meaningful Watershed Educational Experiences provided two-day, three-night experiences to 1603 fifth grade students at DC Public School and DC Public Charter School. More information about OMWEEs can be found at: http://doee.dc.gov/service/overnight-meaningful-watershed-educational-experience.

Teacher Training Workshops

DOEE provides teachers and informal educators with environmental curricula that support the District teaching and learning standards and provide students with meaningful environmental education experiences using outdoor activities and events. Aquatic WILD, Project WILD, and Project Learning Tree are internationally recognized conservation education programs currently being offered to District educators. More information on teacher trainings and workshops can be found at: https://doee.dc.gov/service/environmental-education-workshops-and-training#Aquatic%20WILD.

In FY 2017 these workshops included:

- Two Project Learning Tree K-8 curriculum workshops for 45 teachers and informal educators.
- One combo PLT and Aquatic WILD workshop for 32 teachers and informal educators.

Watershed Stewards Academy

Watershed Stewards Academy (WSA) equips and supports community leaders to recognize and address local pollution problems in their nearby streams and rivers. The program provides WSA participants with the tools and resources they need to bring solutions to these problems, restoring their local waterways and the communities they affect. In FY17, 12 stewards completed the coursework, and 8 of these have completed a capstone project.

Anacostia River Explorers Educational Boat Tours

Anacostia River Explorers RiverSmart Educational Boat Tours (Anacostia River Explorers) educate the public about the Anacostia River. This includes its human and natural history, the threats it faces, and what solutions are being undertaken to help the River realize its full potential as an invaluable asset for the District and its residents. Boat tours are free, guided motorboat and canoe tours conducted by nonprofit partners and funded by the Anacostia River Clean Up and Protection Fund.

In FY 2017, the Anacostia River Explorers conducted 197 boat tours of the Anacostia River.

Bag Law

In FY 2017, DOEE continued outreach to residents and businesses about the District's Bag Law.

FY 2017 Bag Law Program accomplishments include:

- Distributed 22,090 reusable bags to District residents
- Tabled at local community events

Foam Ban

Launched a door-to-door "street team" outreach campaign to educate the regulated community about food service ware recyclable and compostable requirements (regulations from the Sustainable DC Omnibus Amendment Act of 2014). The street team campaign involved extensive cooperation from community representatives and reached commercial corridors in all 8 wards. Among those involved include Main Street organizations, business improvement districts (BIDs), the Mayor's Office of Community Relations, Advisory Neighborhood Commission (ANC) commissioners, and Department of Public Works (DPW). DOEE worked closely with DPW to streamline messaging on recycling initiatives from both agencies, providing for a cohesive and simplified campaign for District businesses and residents.

FY 2017 Foam Ban Program accomplishments include:

- Sent 6,506 mailers to the regulated community
- Tabled at local community events
- Reached 116 businesses through the door-to-door street team outreach

Integrated Pest Management/Nutrient Management

The Anacostia River Clean Up and Protection Fertilizer Act of 2012 went into effect on April 20, 2013. The District's Fertilizer Law outlines requirements for lawn care professionals on how, when, and where to apply fertilizer and the types of fertilizer they can use. In FY 2017, DOEE created web resources to educate residents and businesses about the fertilizer law. This information can be found at http://doee.dc.gov/fertilizer.

Clean Marina

DOEE and National Park Service of the National Capital Region partner with marinas in the District to educate the public on environmentally responsible boating practices. The Clean Marina Program encourages marina, boatyard, and boat club operators, as well as the boating public, to reduce pollution through their daily operations and through encouraging boaters to do the same. To view more information on DOEE's Clean Marina Program: http://doee.dc.gov/service/dc-clean-marina-partnership

Trash and Litter

A major component of DOEE's public education activities in FY 2017 related to anti-littering and trash prevention efforts. Trash education and outreach activities are detailed in Section 4.10.1 of this report.

4.9.4.1 Stormwater Management Plan

On January 21, 2016 the Final Revised Stormwater Management Plan was submitted to EPA Region III and posted to the DOEE website, https://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports.

Routine Communication

DOEE holds quarterly meetings with environmental non-profits regarding partnership opportunities and available grants. These meetings are held by the DOEE director and involve all DOEE programing.

4.9.4.2 MS4 Permit Deliverables

All MS4 Permit deliverables are made available for public comment and posted to the DOEE website.

- DOEE Annual Reports and Discharge Monitoring Reports are found at: http://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports
- The Draft Stormwater Retrofit Plan can be found at: http://doee.dc.gov/stormwaterretrofitplan
- The Draft Tree Canopy Plan can be found at: http://doee.dc.gov/sites/default/files/dc/sites/DOEE/page_content/attachments/Draft_Urban_Tree_Canopy_Plan_Final.pdf
- The Draft MS4 Catch Basin Maintenance Optimization Plan can be found at: http://doee.dc.gov/draftcatchbasinreport
- The Draft MS4 Outfall Repair Schedule can be found at: http://doee.dc.gov/draftoutfallreport
- The 2013 Stormwater Guidebook and 2013 Stormwater Rule can be found at: http://doee.dc.gov/swregs
- Revised Monitoring Program can be found at: http://dcstormwaterplan.org/documents-and-deliverables/
- Consolidated TMDL Implementation Plan can be found at: http://dcstormwaterplan.org/documents-and-deliverables/

4.9.4.3 Public Education Materials

As required by Section 4.9.4.4 of the MS4 Permit, public education materials are routinely developed or updated.

4.9.4.4 DOEE Website

As required by Section 4.9.4.5 of the MS4 Permit, DOEE websites are regularly updated, at a minimum annually.

DOEE websites and social media sites include:

- www.doee.dc.gov
- https://twitter.com/DOEE_DC
- https://www.facebook.com/DDOE.DC/ http://www.youtube.com/user/DOEEPublicInfo
- https://www.instagram.com/doee_dc/

FY 2018 Goals: The District periodically evaluates existing public education materials and revises or develops additional materials as necessary. DOEE will continue to update, add to, and refine the website and social media outreach to display all relevant information including reports, accomplishments, and outreach materials.

4.10 Total Maximum Daily Load Wasteload Allocation Planning and Implementation

4.10.1 Anacostia River Watershed Trash TMDL Implementation

The District met the October 7, 2016, deadline for removing 103,188 pounds of trash annually from the Anacostia River, Table 28.

To accomplish the trash requirement the District is using the following tools:

- In-stream and end-of-pipe BMPs (e.g. trash traps)
- Stream clean-up activities
- Street sweeping environmental hotspots
- Education and outreach
- Regulatory approaches (e.g. Bag Fee)

Below is a description of the progress made to date with each of the practice categories.

In-Stream and End-of-Pipe Best Management Practices

To date, the District has installed eight trash traps in the Anacostia River watershed. The construction of the Gallatin Trash Trap has been delayed due to needed outfall repair issues. Trap installation is estimated to be completed by summer 2018.

Stream Clean-Up Activities

The District sponsors several annual stream clean-up events throughout the Anacostia watershed. Examples include the Alice Ferguson Foundation's (AFF) Potomac Trash clean-up and the Anacostia Watershed Society's (AWS) Anacostia River Earth Day clean-up. Trash cleanup data is collected from a variety of sources, including; the AFF Trash Potomac Network, AWS, non-profit partners, District agencies, and directly by DOEE. The total amount of trash collected at each cleanup event in the District can be found in Attachment F. The portion of those efforts that the District is counting towards meeting its TMDL goal is outlined in Table 28.

Street Sweeping Environmental Hotspots

DPW continued to implement the enhanced street sweeping program in 2016. In 2011, DOEE funded DPW to develop an enhanced street sweeping program for the District. The purpose of this project was to make street sweeping more efficient by creating extra time per month to sweep streets identified as environmental hotspots by DOEE.

This past year, DOEE discovered its calculations were over-estimating trash reductions resulting from street sweeping of environmental hotspots. DOEE revised the calculations, which estimate loads based on area swept, frequency of sweeping, whether parking restrictions exist in swept areas, per acre loading rates. DOEE uses coefficients and discount rates developed by the Chesapeake Bay Program. The total area of roadways within the environmental hotspots (e.g. blocks found to contain high trash amounts during a 2008 survey) was calculated using GIS.

The revised calculations significantly reduce the total amount of trash removed by this BMP for 2017. DOEE also reevaluated its calculation methodology for the Department of Small and Local Business Development (DSLBD) Clean Teams Program to ensure the full amount of trash removed by these two programs is calculated but not double counted. A summary of the program is below and the updated calculations for both street sweeping and the clean teams are provided in Table 28.

Department of Small and Local Business Development Clean Teams Program

In 2015, DOEE worked with the Department of Small and Local Business Development (DSLBD) to capture data on trash collected by their commercial corridor Clean Teams program. In FY 2017, DSLBD provided over $2.9 million per year in grant funding to groups throughout the District to conduct the following activities in commercial areas:

- Litter and graffiti removal
- Removal of trash and recycling of materials collected from sidewalks, tree boxes, and gutters
- Maintenance of street trees and other planters
- Tracking and reporting public space defects

Currently, there are 21 Clean Teams operating throughout the District. Since FY 2014, DSLBD has been collecting litter data. The Clean Teams transport the trash they collect to the District's Fort Totten Trash Transfer Station and weigh it. That data is then entered into a Quickbase database managed by DSLBD. Over 9 million lbs. of material was removed city-wide by Clean Teams in FY17.

In 2017, DSLBD established four new Clean Teams in the District. Two of these teams work within the Anacostia River watershed, along Alabama Ave SE and Benning Rd NE. The area maintained by these two teams overlaps with trash hotspots identified in the 2009 Anacostia Watershed Trash Reduction Plan.[18]

18 *The Anacostia Watershed Trash Reduction Plan.* Technical paper. December 2008. https://doee.dc.gov/Anacostia%20River%20Trash%20Reduction%20Plan.

As mentioned above, DOEE reevaluated the methodology for estimating trash removed by the Clean Teams program in the Anacostia River watershed in 2017.

DOEE now credits the total amount of trash captured by Clean Teams both within and outside environmental sweeping hotspots towards the annual load reduction. These teams were established after the trash TMDL was finalized in 2010 making them new BMPs which are leading to significant trash reductions in the Anacostia and its watershed. In order to avoid double-counting load reductions from street sweeping, the total street sweeping load reduction is subtracted from the Clean Teams load reduction.

Using this new method DOEE estimates that 100,314 lbs. of trash was removed from the Anacostia River watershed in FY 2017.

DSLBD Clean Teams: https://dslbd.dc.gov/service/clean-teams.

Education and Outreach

In 2017, DOEE issued a new grant to the Alice Ferguson Foundation to implement their Potomac River anti-littering campaign in the District. This work builds upon previous work by AFF to implement a comprehensive anti-littering campaign throughout the District. AFF is working on developing a citizen science component focused on volunteer trash monitoring. DOEE expects a pilot of that program to be implemented in 2018

Regulatory and Enforcement Approaches

The District continued to implement *DumpBusters*, its illegal dumping enforcement program. *DumpBusters* has identified 10 illegal dumping areas, called hotspots, hosted hotspot cleanups, and installed enforcement cameras and no dumping signs. Illegal dumping in the District carries civil and criminal penalties including monetary fines and jail time. The Metropolitan Police Department (MPD) 6th District, where the program is currently piloting, has a full-time environmental crimes unit, which has a zero tolerance policy when it comes to illegal dumping.

Over the course of the program's first year, MPD has arrested 30 people for illegal dumping and DPW has issued thousands of dollars in fines. There has been a significant reduction in dumping at most of the hotspots. The District has committed to identifying seven additional hotspots for enforcement over the next year.

Summary of 2017 Trash Load Reductions

Table 28 below displays how the District met the MS4 Permit trash TMDL requirement.

Table 28 Annual Trash Load Reductions by Program

Activity Category	Activity	Amount of Trash Removed (pounds)	Annual Load Reduction (pounds)	Calculation Methodology
Trash Traps	Marvin Gaye Park Bandalong	1,092	22	Annual average value taken from empirical data collected between Jan 2012 & November 2017. The average amount of trash collected during this time period is multiplied by 2% since that is the approximate proportion of the Watts Branch watershed which lies within District and drains to the trash trap.
	River Terrace Trash Trap	627	627	Annual average of trash collected from 2014 to 2017. Reduction factors are not applied since the drainage area lies entirely within the District MS4 and all bottles and cans are emptied of water before weighing.
	Kenilworth Bandalong	2,885	2,885	Annual average taken from empirical data collected between March 2011 and November 2017. No reduction factors are being applied since the entire drainage area above this trap lies within the District.
Trash Traps	Nash Run Trash Trap	2,205	1,654	Annual average taken from empirical data collected between 2009 and 2016. The total amount collected is then multiplied by 75% since that is the approximate proportion of the Nash Run watershed that lies within the District and drains to the trash trap.

Activity Category	Activity	Amount of Trash Removed (pounds)	Annual Load Reduction (pounds)	Calculation Methodology
	Nash Run Bandalong	1,647	1,235	Total trash collected by the trap in 2016. The total amount collected is then multiplied by 75% since that is the approximate proportion of the Nash Run watershed that lies within the District and drains to the trash trap.
	Hickey Run BMP	1,802	1,802	DOEE issued a new contract in 2017 for maintenance of the Hickey Run BMP. The new contractor now collects trash, drains water from all bottles, and stores collected trash in a dumpster. That dumpster is weighed multiple times per year to give total annual trash removed. The number reported is the total annual trash removed from the Hickey Run BMP.
	James Creek Bandalong	90	90	Annual average taken from empirical data collected between January 2012 and November 2015. No reduction factors have been applied since the entire drainage area for this practice lies within the District.
	Diamond Teague Trash Booms (formerly Earth Conservation Corps Trash Booms)	1,372	115	Amount collected from trap in 2014. Annual average not taken for 2013 and 2014 data since only four months of data was collected in 2013. Reduction factors are applied since a portion of the trash collected is coming from the mainstem of the river. A reduction factor of 16.5% is applied since this the proportion of the Anacostia watershed which lies within the District. A second reduction factor of 50.8 % is applied to account for the District's portion of the Anacostia served by the MS4.
Sweeping Environmental	Sweeping Environmental	9,048	4,524	***Efficiency Calculation Updated in 2017*** - The total

Activity Category	Activity	Amount of Trash Removed (pounds)	Annual Load Reduction (pounds)	Calculation Methodology
Hotspots	Hotspots			area of roadways within the environmental hotspots (e.g. blocks found to contain high trash amounts) was calculated using GIS. That area was then multiplied by 50% because roughly half of the roadway (the middle of the road) is swept in these areas because they are unsigned and parking may occur along the side of the street.
Clean-Up Activities	Clean-Up Events	58,916	3,951	Based on empirical data collected during cleanup events within the District's portion of the Anacostia watershed. If a site is located along the mainstem of the river, a reduction factor of 16.5% is applied since this the proportion of the Anacostia watershed which lies within the District. A second reduction factor of 50.8 % is applied to account for the District's portion of the Anacostia served by the MS4. A third reduction factor of 80% is applied to account for the fact that not all plastic and glass bottles collected may have been emptied of water before bagged.
Clean-Up Activities	Skimmer Boats	1,052,400	8,821	Based on the annual average of material collected by DC Water skimmer boats between 2003 and 2017. The average amount is first multiplied by 16.5 %, which represents the proportion of the watershed that lies within the District. A second reduction factor of 50.8 % was applied to account for the area of the District's portion of the watershed served by the MS4.

Activity Category	Activity	Amount of Trash Removed (pounds)	Annual Load Reduction (pounds)	Calculation Methodology
				A third reduction factor of 50 % was applied since not all material collected by the skimmer boats may have been trash. Finally, a fourth reduction factor of 80 percent was applied since not all plastic and glass bottles collected were emptied of water.
	Clean Teams Program	136,126	100,314	***Efficiency Calculation Updated in 2017*** - The total weight of trash collected by each Clean Team is collected 4X per year. The annual average from those samples is then computed. That average is then multiplied by the number of days each teams operates, and is then multiplied by 52 weeks per year. The total annual estimate is then reduced by 50% to assume that 50% of the weight captured consists of organic debris. We further reduce the total captured by 80% (i.e. the number is multiplied by 20%) to adjust for the weight being impacted by beverage containers full of liquid. Next, using GIS we compute the percentage of the Clean Team route found in the MS4 area and Anacostia River Watershed. That percentage is then multiplied by the weight of trash remaining after previous reduction factors. In order to avoid double counting the total weight of trash removed by street sweeping is then subtracted from the total removed by Clean Team activities.

Activity Category	Activity	Amount of Trash Removed (pounds)	Annual Load Reduction (pounds)	Calculation Methodology
Education and Outreach	Watershed Wide Anacostia Campaign	NA	NA	DOEE is currently collaborating with the Metropolitan Washington Council of Governments, Prince Georges County and Montgomery County to establish an efficiency for education and outreach.
Regulatory Approaches	Bag Law	1,072	272	DOEE currently estimates (based on data collected for the development of the Anacostia Watershed Trash Reduction Plan) that there are 82,431 bags in the river and tributaries. This amount is first multiplied by 50.8%, since this is the proportion of the Anacostia River served by the MS4. The amount is then reduced by 50% because according to a recent survey report, 50% of businesses in the District report a 50% reduction in bag purchases. Finally, the total number of bags is then multiplied by 0.013 lbs., which is the standard weight for a plastic bag.
	Total (pounds)	**1,269,282**	**126,312**	

FY 2018 Goals:

- DOEE will continue to implement all of the BMPs noted in Table 28 above.
- The Gallatin Trash Trap construction will start in FY 2018.
- DOEE will continue to work with the Metropolitan Washington Council of Governments and the other Anacostia River Watershed jurisdictions to ensure that BMP efficiency calculations are consistent across jurisdictional lines.

4.10.2 Hickey Run TMDL Implementation

The Hickey Run watershed has been targeted for restoration based on historic commercial and residential pollution impacting stream water quality. During this five-year Permit term, the District accomplished the following:

- Targeted Hickey Run as a priority watershed for restoration efforts.
- Created Hickey Run Hero's to install green infrastructure throughout the neighborhood through the RiverSmart Homes program.
- Installed a Terre Kleen BMP to capture oil, grease, and sediment.
- Installed a stream gage downstream of the Terre Kleen BMP.
- Completed the Springhouse Run stream restoration project.

Additionally, DOEE continues the strategic investigation and enforcement efforts in the Hickey Run sewershed. Targeted inspections and investigations were conducted of high priority facilities, focusing on the improper and illegal handling and disposal of oil and other hazardous materials. Follow-up inspections are being conducted on facilities with potential illicit connections to the MS4. DOEE's ongoing efforts have identified a number of potential responsible parties of illicit discharges and illegal disposals. Enforcement actions have been initiated against these facilities. DOEE also continues to work with larger industrial facilities in the sewershed to ensure continued compliance with industrial stormwater permits and District regulations. If these larger facilities fail to comply, DOEE is prepared to initiate enforcement actions to compel compliance. A new comprehensive work plan has been approved for further investigation of the sewershed, including additional closed-circuit television (CCTV) video inspections, storm sewer sample collection, and strategic illicit sewer connection investigations. This work plan will be executed in FY 2018.

To view work DOEE has done in the Hickey Run watershed go to: http://doee.dc.gov/service/hickeyrun.

FY 2018 Goals: DOEE will continue to incentivize RiverSmart projects on residential properties within the Hickey Run watershed and will continue progress towards the Spring House Run restoration.

4.10.3 Consolidated TMDL Implementation Plan

DOEE submitted an updated draft of its Consolidated TMDL Implementation Plan in August of 2016. A draft of the Consolidated TMDL IP was originally published for public comment and submitted to EPA in May of 2015. DOEE received detailed comments from several stakeholders and from EPA. The August 2016 updated draft was intended to address these comments.

The core of these updates to the TMDL IP were a series of new, programmatic milestones the District has committed to in the interest of accelerating the pace of stormwater management implementation.

These programmatic milestones include:

- Committing $12.75 million to establish a Stormwater Retention Credit Purchase Agreement program.
- Developing a list of targeted watersheds and targeted implementation approaches.
- Evaluating options for increasing the District's stormwater fee.
- Working to revise and update District TMDLs, including:
    - Identifying priority TMDLs in need of revision.
    - Developing a monitoring work plan to support TMDL revisions.
    - Conducting intensive monitoring to support TMDL revisions.
    - Completing the first round of priority TMDL revisions.
- Conducting an analysis of potential changes to existing stormwater management regulations.
- Updating the Implementation Plan Modeling Tool and the TMDL IP.

DOEE expects that these programmatic milestones, as well as the numeric milestones from the original draft of the Consolidated TMDL IP, will be incorporated into the District's next MS4 Permit

FY 2018 Goals: DOEE will continue to implement stormwater management activities to make progress toward the numeric and programmatic milestones from the Consolidated TMDL IP.

5 MONITORING AND ASSESSMENT CONTROLS

5.1 Revised Monitoring Program Development Status

In FY 2017, DOEE developed an Integrated Monitoring Strategy. This strategy builds upon the Revised Monitoring Plan that was developed in FY 2015.

The Integrated Monitoring Strategy documents the overarching monitoring requirements of the entire Natural Resources Administration, including:

- Regulatory drivers
- Monitoring objectives
- Data management objectives
- Analysis, assessment, and reporting methods
- Programmatic evaluation
- General support and infrastructure planning needs

The Integrated Monitoring Strategy is supported by both quality assurance program plans (QAPPs) and standard operating procedures (SOPs). The design of the Integrated Monitoring Strategy includes a tiered approach to implementation of monitoring activities consisting of:

- rapid assessments
- core monitoring that includes both probability-based and targeted monitoring
- supplemental monitoring for special studies

The Revised Monitoring Plan was released for a 90-day public comment period on May 8, 2015 and can be found at http://dcstormwaterplan.org/documents-and-deliverables/.

FY 2018 Goals: DOEE anticipates implementing the Integrated Monitoring Strategy in the next approved permit period.

5.2 Interim Monitoring

Sampling proceeded under the interim sampling provisions in FY 2017. The District provided a summary of monitoring data, trends in pollutant loading, monitoring station locations, and storm information as required by Section 6.2.1.b of the MS4 Permit.

5.2.1 Wet Weather Discharge Monitoring

Water quality monitoring for chemical constituents took place at six monitoring stations throughout the District during the FY 2017 monitoring period, Table 29 and Figure 21. Detailed maps of each of the monitoring stations can be found in Attachment G.

Table 29 Monitoring Stations and Dates

Watershed	Site	Location	Drainage Area (Acres)	Dates of Wet Weather Sampling	Dates of Dry Weather Sampling
Anacostia River	A1	Anacostia High School (Corner of 17th St and Minnesota Ave, SE)	252	11/29/16 2/28/17 5/5/17	6/4/17 7/13/17
	A2	Gallatin & 14th St NE (Across from the intersection of 14th St and Gallatin St, NE)	662	11/29/16 2/9/17 3/18/17	6/4/17 7/13/17
Rock Creek	B1	Walter Reed (Fort Stevens Drive NW)	23	12/29/16 2/28/17 5/5/17	5/10/17 7/27/17
	B2	Soapstone Creek (Connecticut Avenue and Albemarle Street, NW)	320	12/29/16 5/5/17 6/16/17	5/10/17 7/13/17
Potomac River	C1	Battery Kemble Creek (49th and Hawthorne Streets, NW)	11	12/29/16 5/5/17 6/16/17	NDF
	C2	Oxon Run (Mississippi Avenue and 15th Street, SE)	43	2/9/17 3/18/17 5/5/17	5/10/17 7/13/17

* No dry weather flow

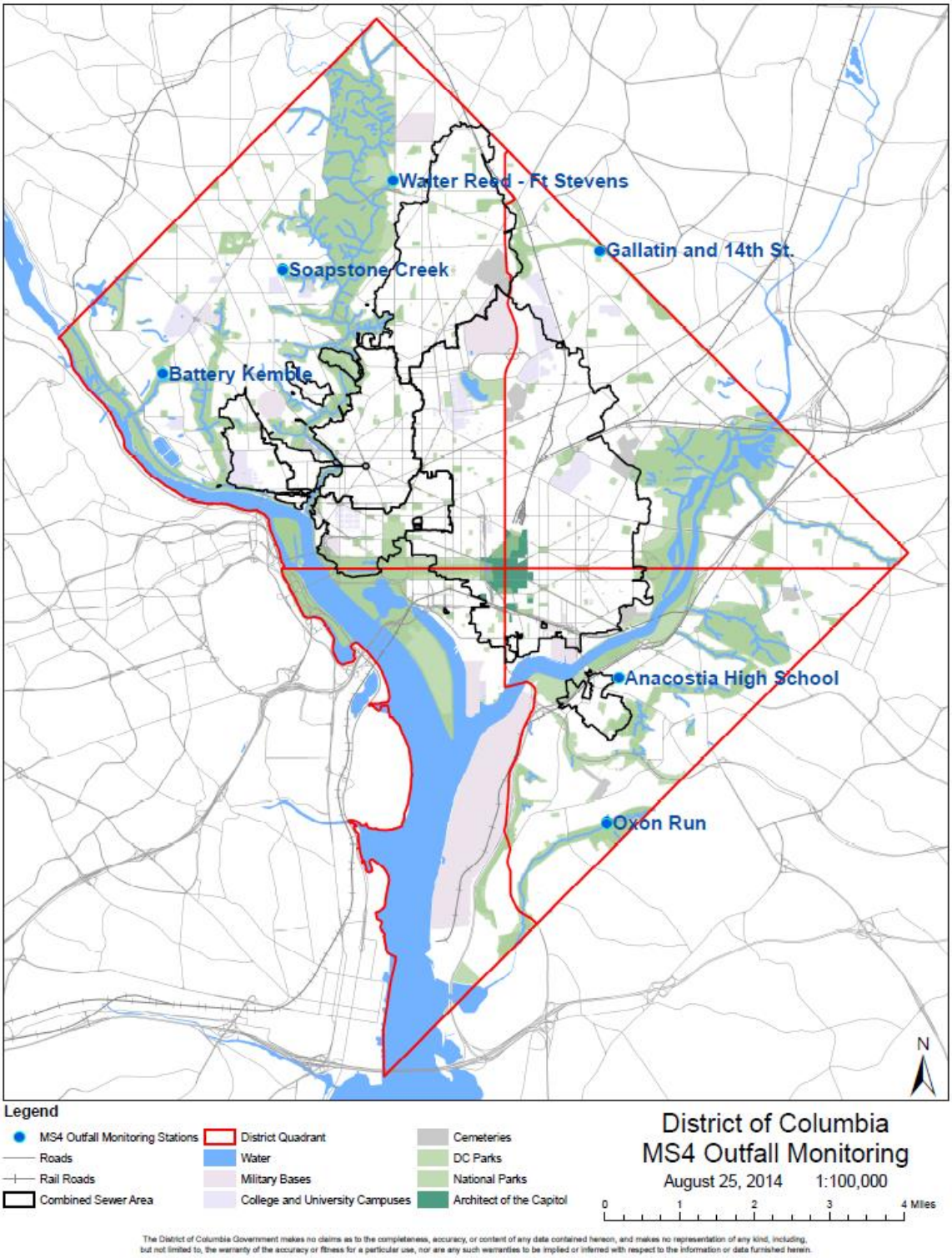

Figure 21 District MS4 Monitoring Stations

Table 30 details the water quality results for wet weather sampling. Table 31 details the wet weather sampling summary data for the required monitoring parameters. The geometric mean for each parameter was calculated to represent the event mean concentration (EMC). Attachment H includes detailed wet weather sampling data for each monitoring site.

Table 30 Ambient Water Quality Data for Wet Weather Sampling

Site	Location	Date	Water Temp (°F)	pH	DO* (mg/L)	Estimated Flow (gpm)
A1	Anacostia High School	11/29/16	54.05	7.46	9.84	1047.27
		02/28/17	57.56	7.02	10.89	1496.00
		05/05/17	58.82	7.50	10.70	673.25
A2	Gallatin and 14th St. NE	11/29/16	55.12	7.32	10.16	2103.89
		02/09/17	51.62	7.43	13.05	1496.10
		03/18/17	42.8	7.61	11.8	1496.10
B1	Walter Reed	12/29/16	36.9	7.7	10.97	56.10
		02/28/17	58.46	7.6	11.03	70.1
		05/05/17	59.00	7.90	9.20	4.68
B2	Soapstone Creek	12/29/16	40.67	6.97	8.59	2057.14
		05/05/17	61.88	7.14	10.40	1851.43
		06/16/17	66.24	7.61	7.11	374.03
C1	Battery Kemble Creek	12/29/16	39.07	7.97	10.52	23.38
		05/05/17	50.00	7.30	10.02	0.39
		06/16/17	66.07	7.57	6.20	0.39
C2	Oxon Run	02/09/17	49.28	7.49	12.24	233.77
		03/18/17	46.51	6.98	12.4	701.3
		05/05/17	62.24	8.80	10.23	224.42

* Field measurements were taken as % saturation

Table 31 Summary of Wet Weather Monitoring Results (Geometric Mean)

Site	TN (mg/L)	TP (mg/L)	TSS (mg/L)	E. Coli (MPN/100mls)	Cd (mg/L)	Cu (mg/L)	Pb (mg/L)	Zn (mg/L)
A1	4.81 (n=3)	0.49 (n=3)	27.66 (n=3)	492 (n=3)	0.0002 (n=1)	0.0296 (n=3)	0.0064 (n=3)	0.0948 (n=3)
A2	3.11 (n=3)	0.18 (n=3)	15.79 (n=3)	312 (n=3)	0.0002 (n=1)	0.0149 (n=3)	0.0014 (n=2)	0.0567 (n=3)
B1	3.49 (n=3)	0.31 (n=3)	13.68 (n=3)	575 (n=3)	ND (n=3)	0.0270 (n=3)	0.0030 (n=2)	0.0767 (n=3)
B2	4.04 (n=3)	0.41 (n=3)	11.04 (n=3)	1330 (n=3)	0.0001 (n=1)	0.0196 (n=3)	0.0005 (n=1)	0.0370 (n=3)
C1	3.41 (n=3)	0.30 (n=3)	22.28 (n=3)	73 (n=3)	ND (n=3)	0.0816 (n=3)	0.0063 (n=3)	0.0187 (n=3)
C2	4.54 (n=3)	0.24 (n=3)	15.58 (n=3)	69 (n=3)	ND (n=3)	0.0219 (n=3)	0.0029 (n=2)	0.1283 (n=3)

ND- Not detected at or above the reporting limit

5.2.1.1 Estimates of Cumulative Pollutant Loading

The Simple Method is used to estimate stormwater runoff pollutant loads for urban areas. The Simple Method estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentrations, Equation 1. The geometric mean of the measured event mean concentration (EMCs) were calculated for each monitoring station, Equation 2.

Equation 1 Simple Method

$$L = \sum_{i=1}^{\text{No. of landuse types}} \left(\frac{P}{12} \times CF \times Rv_i \times C_i \times A_i \times 2.72 \right)$$

Where:

L = Pollutant loading (lb./year for chemical constituents, MPN/yr. for bacteria)
P = Average annual rainfall (inches)
CF = Correction factor (0.9) to adjust for storms where no runoff occurs (dimensionless) (EPA 1992)
Rv_i = Runoff coefficient for the land use type (dimensionless)
C_i = Average event mean concentration (EMC) (mg/L for chemical constituents)
A_i = Land use area (acres)
2.72 = Unit conversion factor for chemical constituents in concentration units of mg/L;
12,334,885 for bacteria in units of MPN/100 mL.

Equation 2 Event Mean Concentration

$$\text{Geomean of EMCs} = \left[\prod_{j=1}^{m} \text{EMC}_j\right]^{\frac{1}{m}}$$

Where:

EMC_j = Event Mean Concentration of storm

m =Number of storms at monitoring location

The total cumulative pollutant load for each of the three watersheds was calculated using the data from each monitoring site in a watershed. This calculation assumes that the two sampling stations are representative of the respective Potomac River, Anacostia River and Rock Creek watersheds. Given this assumption, a simple ratio is used to cover a cumulative load for each watershed, Equation 3. The annual pollutant loads for the selected pollutants is detailed in Table 32.

Equation 3 Cumulative Pollutant Load

$$L_A = \left(\frac{\sum L_i}{\sum A_i}\right)(A_t)$$

L_A = Estimated subwatershed cumulative pollutant load (lb./year)
A_t = Subwatershed total area (acres)
L_i = Pollutant loading for each monitoring site (lb./year)
A_i = Size of each monitoring site (acres)

Table 32 Annual Pollutant Loading

Station	TN (lb./yr.)	TP (lb./yr.)	TSS (lb./yr.)	E. Coli (MPN/100ml)	Cd (lb./yr.)	Cu (lb./yr.)	Pb (lb./yr.)	Zn (lb./yr.)
Anacostia High School	46	5	35,416	2.86E+12	0.26	37.90	8.19	121.38
Gallatin & 14th St. NE	11,445	662	58,108	5.21E+12	0.74	54.83	5.15	208.66
Water Reed	489	43	1,915	3.65E+11	0.00	3.78	0.42	10.74
Soapstone Creek	6,549	665	17,898	9.778E+12	0.16	317.75	0.81	59.98
Battery Kemble Creek	1,915	134	16,959	4.00E+11	0.00	44.25	5.72	1.46
Oxon Run	7,231	272	9,712	2.26E+12	0.00	61.11	10.89	252.02
Load Estimates Anacostia Watershed	11,491	667	93,524	8.06E+12	0.99	92.73	13.35	330.04
Load Estimates Potomac Watershed	835,058	37,122	2,435,234	2.43E+14	0.00	9,620.58	1,516.86	23,144.61
Load Estimates Rock Creek Watershed	10,376	6,404	437,008	2.53E+13	0.00	612.88	131.11	1,393.33
Total Load Estimates	856,925	44,193	2,965,766	2.77E+14	1	10,326	1,661	24,868

5.2.1.2 Water Quality Trend Analysis

Table 33, Table 34, and Table 35 present the historic range of concentrations (minimum and maximum) for each watershed.

Table 33 Summary of Selected Parameters in the Potomac River Watershed

Parameters	2005-2011*		2013-2017**	
	Concentration (mg/L)		Concentration (mg/L)	
	Low	High	Low	High
Cadmium, Total	0.00022	0.016	ND	0.0085
Copper, Total	0.00320	0.650	0.0100	0.2500
Lead, Total	0.00360	0.380	0.0019	0.0220
Zinc, Total	0.00950	0.980	0.0160	0.3200
Total suspended solids	5.20000	558.000	3.0000	120.0000
Total Phosphorous	0.03900	2.600	0.0230	0.7600
Total Nitrogen	1.00000	9.200	1.2000	7.1300

*Samples were collected from seven (7) stations for a total of 33 sampling events from 2005 thru 2011
** Samples were collected from two (2) stations for a total of 33 sampling events

Table 34 Summary of Selected Parameters in the Anacostia River Watershed

Parameters	2001-2012*		2013-2016**	
	Concentration (mg/L)		Concentration (mg/L)	
	Low	High	Low	High
Cadmium, Total	0.0003	0.012	ND	0.0037
Copper, Total	0.0060	0.450	0.0088	0.9170
Lead, Total	0.0014	0.100	ND	0.0140
Zinc, Total	0.0200	0.890	0.0055	0.2700
Total Suspended Solids	6.0000	1400.000	4.0000	75.0000
Total Phosphorous	0.0170	1.500	0.1000	0.7600
Total Nitrogen	0.9000	13.000	1.7000	6.8200

*Samples were collected from nine (9) stations for a total of 99 sampling events from 2001 thru 2012
** Samples were collected from two (2) stations for a total of 33 sampling events

Table 35 Summary of Selected Parameters in Rock Creek Watershed

Parameters	2003-2011*		2013-2016**	
	Concentration (mg/L)		Concentration (mg/L)	
	Low	High	Low	High
Cadmium, Total	0.0005	0.031	ND	0.00077
Copper, Total	0.0028	0.360	0.010	0.12000
Lead, Total	0.0030	0.280	ND	0.02600
Zinc, Total	0.0170	0.344	0.024	0.11500
Total Suspended Solids	5.0000	2,600.000	1.000	110.00000
Total Phosphorous	0.0760	13.000	0.130	0.87000

*Samples were collected from six (6) - 10 stations for a total of 47 sampling events from 2003 thru 2011
** Samples were collected from two (2) stations for a total of 33 sampling events

5.2.2 Storm Event Data

The National Oceanic and Atmospheric Administration (NOAA) rain gauge located at Ronald Reagan Washington National Airport is used to track rain conditions for the District and surrounding jurisdictions, Table 36. Annual precipitation within the District of Columbia for the 2017 monitoring period totaled 36.47 inches. Table 37 details the measurements of storms sampled during the 2017 monitoring period. This information includes, as required by the MS4 Permit, the date, duration, and size of storm events, and time to previous sampled storm. The required flow measurements can be found in Section 5.5 of this report.

Table 36 Precipitation Record for the District of Columbia

Year	Month	Rainfall (inches)*	Number of Days in Month with Storms >0.10 inches	Monthly Average (inches)
2016	November	0.76	3	2.74
	December	2.61	7	3.11
2017	January	2.75	6	3.10
	February	0.68	3	2.81
	March	3.19	6	3.54
	April	2.62	6	3.14
	May	5.55	9	3.73
	June	1.13	3	3.83
	July	9.15	8	4.19
	August	4.58	6	4.05
	September	1.43	2	3.56
	October	2.02	2	3.08
Total		**36.47**		**40.87**

* Rain gauge reading at Ronald Reagan Washington National Airport.

Table 37 Sampled Storm Characteristics

Date	Precipitation (inches)	Duration (hours)	Time to Previous Measurable Rainfall (approx. days)	Sites Sampled
11/29/16	0.12	12	20	A1, A2
12/29/16	0.24	6	4	B1, B2, C1
2/9/17	0.12	6	16	A2, C2
2/28/17	0.34	5	3	A1, B1
3/18/17	0.37	14	4	A2, C2
5/5/17	0.13	5	9	A1, B1, B2, C1, C2
6/16/17	0.36	3	16	B2, C1

5.2.3 Sample type, Collection, and Analysis

The District conducted the water quality sampling and analysis in accordance with the requirements specified in the MS4 Permit, SWMP, and EPA regulations. Table 38 details the water quality sampling and laboratory requirements.

Table 38 Sample Analysis Requirements

Bottle Type	Sample Type	Parameter	Method	Units	Monitoring Detection Limit
1000 mL Plastic, Sterile	Grab	E. coli	SM9221F	MPN/ 100 mL	200
500 mL Plastic H_2SO_4	Composite	Total Nitrogen	Calculation	mg/L	1.0
500 mL Plastic H_2SO_4	Composite	Phosphorus, Total	SM4500-P B, E	mg/L	0.010
1-L Plastic Unpreserved	Composite	Total Suspended Solids	SM2540D	mg/L	1.0
1000 mL Plastic HNO_3	Composite	Cadmium, Total	EPA 200.8	mg/L	0.00050
1000 mL Plastic HNO_3	Composite	Copper, Total	EPA 200.8	mg/L	0.0010
1000 mL Plastic HNO_3	Composite	Lead, Total	EPA 200.8	mg/L	0.0010
1000 mL Plastic HNO_3	Composite	Zinc, Total	EPA 200.8	mg/L	0.0050

5.2.4 Sampling Waiver

In FY 2017, the District collected all required monitoring samples for the chemical and physical constituents listed in Table 4 of the MS4 Permit.

5.2.5 Trash Monitoring

In FY 2016, DOEE awarded the Metropolitan Washington Council of Governments (MWCOG) a grant to conduct an in-stream trash monitoring program across the District.

DOEE and MWCOG identified 13 stream sites that were appropriate for administering the monitoring protocols developed for this program. The 13 streams are identified in Table 39 and Figure 22. MWCOG staff conducted count surveys at all 13 sites, twice per sampling year. The first survey was conducted mid-summer and the second survey was conducted in early fall before first leaf fall. These surveys required walking the 500-foot length of the stream in order to count and identify every piece of trash – according to the trash categories identified in the TMDL – within the banks full width. In addition, the six Anacostia watershed sites underwent trash pick surveys, where MWCOG staff collected every piece of trash from the upstream 250 feet of the designated 500-foot length. Each trash item was sorted by category, and an aggregate weight for each category was determined. The final report, including data, for the 2017 trash monitoring program is found in Appendix I.

Table 39 Location of In-Stream Trash Monitoring Sites

Watershed	Stream Name	Site ID
Rock Creek	Blagden Run	BGD-001
Rock Creek	Broad Branch	BRB-001
Rock Creek	Luzon Branch	LZD-001
Rock Creek	Piney Branch	PNB-001
Rock Creek	Soapstone Creek	STC-001
Potomac	Battery Kemble	BKG-001
Potomac	Foundry Branch	FDB-001
Anacostia	Watts Branch Upper	WBU-oo2
Anacostia	Fort Davis	FDV-001
Anacostia	Fort Dupont	FDT-001
Anacostia	Fort Chaplin	FTC-001
Anacostia	Watts Branch Lower	WBL-001
Anacostia	Kingman Lake	KNG-001

Figure 22 Stream Name and Site ID for the In-Stream Trash Monitoring Program

5.3 Dry Weather Monitoring

5.3.1 Dry Weather Screening Program

In FY 2017, the District completed the dry weather screening program as described in the SWMP. Dry weather sampling commenced on scheduled days following periods of dry weather defined as72 hours of no precipitation. Table 40 details the ambient water quality results from dry weather sampling.

Table 40 Quality Data from Dry Weather Sampling

Site	Location	Date	Water Temp (°F)	pH	DO *(mg/L)	Estimated Flow (gpm)
A1	Anacostia High School	06/04/17	69.98	7.75	5.20	336.62
		07/13/17	74.30	7.78	5.51	252.47
A2	Gallatin and 14th St. NE	06/04/17	68.18	7.90	6.96	897.66
		07/13/17	75.38	7.69	6.19	1346.50
B1	Walter Reed	05/10/17	58.93	7.80	11.81	1.56
		07/27/17	67.42	7.36	10.4	0.58
B2	Soapstone Creek	05/10/17	59.90	7.73	11.23	97.42
		07/13/17	73.99	7.22	7.60	56.10
C1	Battery Kemble Creek	NDF	--	--	--	--
		NDF	--	--	--	--
C2	Oxon Run	05/11/17	59.83	6.55	10.92	5.84
		07/13/17	77.00	6.85	7.45	70.13

NDF – No Dry Weather Flow
* Field measurements were taken as % saturation

The water quality monitoring data for dry weather sampling is found in Table 41. The geometric mean for each parameter was calculated to represent the event mean concentration (EMC). The analysis for dry weather monitoring included additional parameters of concern. The full dry weather monitoring results are included in Attachment J.

Table 41 Summary of Dry Weather Monitoring (Geometric Mean)

Site	TN (mg/L)	TP (mg/L)	TSS (mg/L)	E. Coli (MPN/100mL)	Cd (mg/L)	Cu (mg/L)	Pb (mg/L)	Zn (mg/L)
A1	3.56 (n=2)	0.371 (n=2)	3.80 (n=2)	1600 (n=2)	ND (n=2)	0.0125 (n=2)	0.0005 (n=1)	0.0209 (n=2)
A2	4.68 (n=2)	0.297 (n=2)	8.00 (n=2)	395 (n=2)	ND (n=2)	0.0043 (n=2)	ND (n=2)	0.0166 (n=2)
B1	5.07 (n=2)	0.053 (n=2)	25.00 (n=2)	280 (n=2)	0.0004 (n=2)	0.0023 (n=2)	0.0002 (n=1)	0.0686 (n=2)
B2	4.68 (n=2)	0.238 (n=2)	1.99 (n=2)	1600 (n=2)	0.0001 (n=1)	0.0084 (n=2)	ND (n=2)	0.0313 (n=2)
C1**	(n=0)	(n=0)	(n=0)	(n=0)	(n=0)	(n=0)	(n=0)	(n=0)
C2	4.00 (n=2	0.003 (n=1)	1.00 (n=2)	200 (n=2)	ND (n=2)	0.0023 (n=2)	0.0005 (n=1)	0.0131 (n=2)

** no dry weather flow was observed at this site
ND- Analyte not detected at or above the reporting limit

5.3.2 Screening Procedures

Details on screening procedures can be found in Section 4.7 of this report.

5.3.3 Follow-up on Dry Weather Screening Results

The District continued to implement an IDDE program for locating and eliminating all suspected sources of illicit connections and improper disposals identified during dry weather screening. The District's IDDE program description and implementation activities can be found in Section 4.7 of this report.

5.4 Area and Source Identification Program

The District is highly urbanized, with little available land for further development. The MS4 drainage area contains approximately 26,500 acres, which is two-thirds of the District. The Combined Sewer System (CSS) drainage area encompasses approximately 12,640 acres, which is one-third of the District. All new development and redevelopment of existing areas is subject to the District's stormwater management regulations with a review by DOEE. The land use and impervious area must be indicated on all stormwater management plans submitted to DOEE for review and inspection. No single development plan reviewed to date has sufficient land area to make a significant impact to the MS4 system. The cumulative impacts of the proposed and new developments have not resulted in a significant change for the existing land use activities in the

portion of the District served by the MS4. Table 42 provides the existing land use by planning area in the District (MS4 and CSS).

Table 42 Acres of Existing Land and Water Use by Planning Area

	Planning Area											
Land Use Type	Capitol Hill	Central Washington	Far northeast & southeast	Far southeast & southwest	Lower Anacostia waterfront/near southwest	Mid city	Near northwest	Rock creek east	Rock creek west	Upper northeast	Citywide	Percent (%)
Public Rights-of-Way	759	899	1,338	906	477	628	716	1,311	1,760	1,223	10,018	25
Single Family Detached Homes	6	0	775	164	7	15	84	919	2,324	641	4,936	13
Single Family Attached Homes/ Row Homes	520	10	641	328	30	497	340	606	290	611	3,874	10
Low-Rise Apts.	43	10	436	555	106	136	110	85	185	189	1,856	5
High-Rise Apts.	4	26	20	44	26	59	65	25	109	25	402	1
Commercial	97	448	129	63	122	144	220	106	170	296	1,795	5
Industrial	5	16	12	5	42	21	6	16	0	295	418	1
Local Public Facilities	72	47	154	441	47	54	75	131	67	102	1,110	3
Federal Facilities (excl. parks)	47	481	4	1,067	409	1	1	412	283	76	2,781	7
Institutional	42	67	71	117	22	142	249	163	659	730	2,262	6
Permanent Open Space	296	678	1,321	729	533	141	354	878	2,011	1,038	7,980	20
Rail, Utilities Communication,	1	36	223	74	11	97	6	83	4	321	857	2
Vacant	66	58	179	188	51	36	33	22	111	99	843	2
Total Land	**1,958**	**2,776**	**5,305**	**4,687**	**1,884**	**1,971**	**2,259**	**4,757**	**7,982**	**5,645**	**39,225**	**100**
Water	117	509	135	1,791	1,295	46	239	19	313	89	4,554	
Total Land and Water	**2,075**	**3,284**	**5,440**	**6,474**	**3,179**	**2,017**	**2,498**	**4,776**	**8,288**	**5,735**	**43,766**	

5.5 Flow Measurements

Wet weather sampling measurements for flow are found in Table 43. Dry weather sampling measurements for flow are found in Table 44.

Table 43 Flow Measurements for Wet Weather Sampling

Site	Location	Date	Estimated Flow (gpm)
A1	Anacostia High School	11/29/16	1047.27
		02/28/17	1496.00
		05/05/17	673.25
A2	Gallatin and 14th St. NE	11/29/16	2103.89
		02/09/17	1496.10
		03/18/17	1496.10
B1	Walter Reed	12/29/16	56.10
		02/28/17	70.1
		05/05/17	4.68
B2	Soapstone Creek	12/29/16	2057.14
		05/05/17	1851.43
		06/16/17	374.03
C1	Battery Kemble Creek	12/29/16	23.38
		05/05/17	0.39
		06/16/17	0.39
C2	Oxon Run	02/09/17	233.77
		03/18/17	701.3
		05/05/17	224.42

Table 44 Dry Weather Measurements for Flow

Site	Location	Date	Estimated Flow (gpm)
A1	Anacostia High School	06/04/17	336.62
		07/13/17	252.47
A2	Gallatin and 14th St. NE	06/04/17	897.66
		07/13/17	1346.50
B1	Walter Reed	05/10/17	1.56
		07/27/17	0.58
B2	Soapstone Creek	05/10/17	97.42
		07/13/17	56.10
C1	Battery Kemble Creek	NDF	NDF
		NDF	NDF
C2	Oxon Run	05/11/17	5.84
		07/13/17	70.13

NDF- No Detectable Flow

5.6 Monitoring and Analysis Procedures

The District's monitoring is conducted using the procedures approved in 40 C.F.R Part 136, http://www.epa.gov/region9/qa/pdfs/40cfr136_03.pdf.

Detection limits for the District's water quality monitoring can be found in Table 38.

5.7 Reporting of Monitoring Results

All monitoring results are also summarized and reported in the MS4 Annual Report. One copy of the Annual Report is sent to both EPA Region III and the National Marine Fisheries Service Greater Atlantic Region Fisheries Office each year.

This year, due to an unresolved issue with NetDMR, DMR data is being submitted via paper DMR forms, Attachment K. DOEE received permission from EPA staff to submit the FY 2017 DMR via alternative method in December 2017.

5.8 Additional Monitoring

The District did not monitor any pollutant more frequently than required by the MS4 Permit.

5.9 Retention of Monitoring Information

The District continues to retain all monitoring records in electronic and hard copy files as required by the MS4 Permit.

5.10 Record Content

DOEE maintains a record of rainfall event, sampling, and analysis data.

This data includes:

- Description of Sampling, including;
    - Sampling protocols
    - Location/Collection time
    - Sample collection procedures
    - Field notes
    - Sampling personnel
- Storm Event Data, including;
    - Date and duration of storm events sampled
    - Rainfall measurements
    - Duration between storm event sampled and the end of the previous measurable storm event
    - Estimate of the total volume of the discharge sampled
- Storm Water Analysis Data, including;
    - Field test results
    - Laboratory results

6 REPORTING REQUIREMENTS

The District continues to comply with the reporting requirements and deliverable dates of the MS4 Permit.

6.1 Discharge Monitoring Report

As required in Section 5.7 of the MS4 Permit, monitoring results are to be submitted to EPA via NetDMR. If NetDMR is not available then the original DMR will be submitted to EPA at the provided address. Due to an unresolved NetDMR issue DOEE has not been able to enter DMR data into NetDMR. Once the issues with NetDMR have been resolved the DMR data can be electronically submitted. DOEE received permission from EPA staff in December 2017 to submit DMR data via an alternative method. For the 2017 monitoring year, DOEE will be submitting the DMR via paper forms that are found in Attachment K.

A summary of monitoring results can be found in Section 5.2 of this report.

6.2 Annual Reporting

The District continues to submit the Annual Report to EPA Region III and publish the reports to the DOEE website, located at http://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports.

6.2.1 Annual Report

The 2017 Annual Report follows the format of the MS4 Permit and addresses each Permit requirement. The required Permit elements of Section 6.2., a-p, are addressed throughout this report. The activities described as "FY 2018 Goals" in each section of the Annual Report fulfill the MS4 Permit Section 6.2.1.l requirement to provide a summary of commitments for the next year.

6.2.2 Annual Report Meeting

DOEE fulfilled the requirements of this Permit section on February 21, 2013 upon completion of the 1st Annual Report meeting with EPA Region III staff.

7 MODELING

The District's TMDL Implementation Plan Modeling Tool (IPMT) was developed in 2014 to estimate stormwater runoff, conduct an initial baseline analysis of pollutant loading, evaluate progress made toward WLA attainment (using BMP implementation to-date), and to forecast pollutant reductions associated with implementation of the new stormwater regulations. The IPMT also includes a comprehensive TMDL inventory that provides users with access to details for each waterbody, pollutant, TMDL document, decision rationale document, and numeric waste load allocation.

DOEE updates the IPMT at the end of each annual reporting cycle with the specifications of BMPs that have been implemented in that time frame. These data are then used to model pollution reductions made toward implementation milestones and, if necessary, guide adaptive management strategies.

In FY17 the model continued to be refined in response to comments received on the Consolidated TMDL Implementation Plan, wherein the model was modified to evaluate alternative BMP implementation scenarios. Other key enhancements during this period include improved numeric (tabular) and graphic reports for tracking progress towards annual benchmarks and five-year milestones, the inclusion of updated documentation, including a new IPMT user manual, and additional BMP data that supports enhanced (District-wide) mapping functionality. The volume of stormwater removed from the MS4 as a result of implementing stormwater controls for FY 2017 is provided in Section 4.1.5.3 of this Annual report.

The implementation activities of this section fulfil the reporting requirements of Section 6.2.1.g and Section 7 of the MS4 Annual Report.

8 ATTACHMENTS

A. Memorandum of Understanding (43 pages)
B. Critical Sources (6 pages)
C. List of FY 2017 Erosion and Sediment Control Enforcement Actions (6 pages)
D. FY 2017 IDDE Investigations (2 pages)
E. FY 2017 Household Hazardous Waste Collection (3 pages)
F. FY 2017 Trash Cleanup Event Data (4 pages)
G. Monitoring Location Maps (9 pages)
H. Wet Weather Monitoring Data (1 page)
I. Monitoring for Trash in District Waters 2017 Annual Progress Report (14 pages)
J. Dry Weather Monitoring Data (1 page)
K. Discharge Monitoring Report Forms (12 Pages)