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1 STORMWATER FEE OPTIONS EVALUATION

Section 2.2.3 of the District of Columbia's Municipal Separate Storm Sewer System (MS4) permit requires the District to complete an evaluation of the adequacy of the District's Stormwater Fee for achieving the water quality goals of the permit. This evaluation must also include an assessment of how the Stormwater Fee works in tandem with other financing options.

Stormwater Fee Background

The District of Columbia charges a Stormwater Fee to support the implementation of the District's MS4 permit. Revenue generated by the fee helps address the costs of permit compliance, by implementing programmatic measures and Best Management Practices to reduce and control stormwater pollution. These include a number of programs to promote voluntary installation of green infrastructure, as well as efforts to retrofit the District's stormwater infrastructure and overall urban landscape with stormwater BMPs.

The Stormwater Fee currently generates approximately \$13.5 million each year in revenue. The Fee is charged based on a property's amount of impervious surfaces and appears on a property's DC Water bill. DC Water bills and collects the Fee on behalf of the District Department of Energy and the Environment (DOEE). The current monthly rate is \$2.67 per 1,000 square feet (Equivalent Residential Unit, or ERU) of impervious surface. Commercial properties are billed based on individual assessments of impervious surface, while residential properties are billed according to a tiered structure.

The amount of revenue generated by the Stormwater Fee has remained flat since 2010. The monthly charge per ERU has also not changed since 2010, when the tiered structure for residential billing was introduced.

Evaluation of the Fee's Adequacy for Achieving Water Quality Goals

The District's MS4 permit incorporates numerous numeric and programmatic requirements intended to manage and reduce stormwater pollution and to improve water quality in the District. The permit's numeric performance requirements are based on modeling and forecasting conducted to support development of the DOEE's *Consolidated Total Maximum Daily Load (TMDL) Implementation Plan*, which was finalized in 2016. This plan evaluated pollutant load reductions and water quality improvements that would be realized by the District's current level of funding, investment and implementation of green infrastructure, and forecast a schedule for achieving TMDL Waste Load Allocations (WLAs).

As a result, the current level of funding provided by the Stormwater Fee is adequate to achieve the permit's water quality goals. DOEE has periodically evaluated the potential for increasing the Stormwater Fee, as this would allow the District to accelerate the pace of stormwater retrofits and green infrastructure implementation in the MS4 area of the city. Currently, increasing the Stormwater Fee is infeasible due to the ongoing economic impact of the COVID-19 pandemic. The COVID-19 pandemic has led to economic insecurity for many District ratepayers, at a time when water and sewer rates are already beyond affordability for

many, due to the ongoing costs of the District's Clean Rivers Project to address combined sewer overflows.

The Stormwater Fee and other Financing Mechanisms

The Stormwater Fee provides DOEE a stable source of funds for stormwater management programs and projects. DOEE is also able to leverage the funding provided by the Fee in a variety of ways to increase its effectiveness. Several examples are detailed below:

Clean Water SRF Match – DOEE receives annual grant funds from EPA's Clean Water State Revolving Fund. These grants require the District to provide a 45 percent local match. Revenue from the Districts' Stormwater Fee is a major source of matching funds for these grants. Having this source of match has made it possible for the District to receive and spend an average of \$6,500,000 in EPA Clean Water SRF funds annually. These funds have further supported projects to implement green infrastructure and improve water quality in the District.

Cost-Share Incentive Programs – The Stormwater Fee supports DOEE's RiverSmart programs. The RiverSmart Homes program provides both direct funding and rebates for installation of residential scale stormwater BMPs such as rain barrels, rain gardens, trees, and/or permeable pavers. Similarly, the RiverSmart Rooftops program provides rebates for properties that install green roofs. Each of these programs requires a cost-share from the property owner, so the funding from the Stormwater Fee is being leveraged to promote voluntary implementation and private investment in green infrastructure.

Market-based Incentive Programs – DOEE's Stormwater Retention Credit (SRC) Trading Program helps to leverage private investment for green infrastructure practices that restore the District's streams and rivers. Properties can generate SRCs by voluntarily installing green infrastructure or by removing impervious surfaces. The owner of a regulated development or redevelopment site may achieve a portion of their regulatory requirement to reduce stormwater runoff by purchasing SRCs from another site, generating SRCs elsewhere at another site they own, or paying an In-Lieu Fee (ILF) to the District government. This provides flexibility to developers and incentivizes voluntary green infrastructure projects in the District.

DOEE has made a significant investment to accelerate green infrastructure retrofits in the MS4 by establishing the SRC Price Lock Program. To date, projects participating in the SRC Price Lock Program have achieved a combined retrofit of over 18.7 acres of new area in the MS4.

To participate in the SRC Price Lock Program, SRC generators must build new, voluntary green infrastructure in the MS4. Participants have the option to sell their SRCs to DOEE at fixed prices for the first 12 years of SRC certification. This program offers certainty about the revenue from selling SRCs. All SRCs purchased through this program are retired and removed from the market, meaning they cannot be resold. DOEE has made \$11.5 million of stormwater fee funds available solely for SRC purchases.

Potential for Future Stormwater Fee Increases

The District of Columbia engaged Public Financial Management (PFM), a public finance advisory firm which focuses on asset management and consulting services for municipalities, cities, schools, hospitals, and other public entities to conduct a review of its fees. DOEE's Stormwater Fee was included in this effort (see attached). PFM began initial development of a proposal to update the Stormwater Fee to adjust for inflation since 2010. This would allow DOEE to provide additional support for the development of green jobs and to accelerate the pace of green infrastructure implementation to meet permit requirements.

As noted above, the economic impact of the COVID-19 pandemic currently precludes increasing the District's Stormwater Fee. DOEE will continue to evaluate the potential for such an increase on an ongoing basis, in the hopes of enacting such an increase once the District's economy has recovered from COVID-related impacts.

2 Analysis of Updating Stormwater Regulations

In the 2018 Municipal Separate Storm Sewer System (MS4) Permit (NPDES Permit No. DC0000221) issued to the District of Columbia (“District”), the U.S. Environmental Protection Agency (“EPA”) required the District to evaluate several options for how to improve stormwater management in the District through regulation changes. The suggestions included in the permit for consideration are:

1. Increasing the on-site stormwater retention standard to 2 inches;
2. Applying a different retention standard to priority watersheds;
3. Lowering the threshold for regulated projects or eliminating exemptions for unregulated projects; and
4. Revising standards in stormwater management, taking into account factors such as sea level rise, extreme weather, and changing precipitation patterns.

After evaluating the four areas identified by EPA, the District’s Department of Energy and Environment (“DOEE”) has determined that there are two options that represent cost-effective opportunities for enhancing stormwater management:

- Lowering the threshold of regulated projects through the adoption of small area regulations; and
- Revising the peak discharge requirements to better prepare for the increased frequency of relatively large storms due to climate change.

A description of DOEE’s evaluation of each of the four EPA-identified areas follows.

In addition, this report provides a description of two stormwater management rulemakings that DOEE has already proposed during the permit term, one of which has been enacted. These rulemaking initiatives will change the off-site compliance provisions in the current stormwater regulations in order to increase green infrastructure (GI) retrofits in the MS4. Finally, this report provides an update on Stormwater Retention Credit Price Lock programmatic changes that are helping to drive additional GI retrofits in the MS4.

1. Increasing the On-Site Stormwater Retention Standard to 2 Inches

DOEE determined that the cost for increasing the on-site stormwater retention standard to 2 inches would be very high relative to the environmental benefit. A best management practice (BMP) retaining a 1.2-inch storm already manages 94% of the annual volume that would be achieved by a BMP retaining 1.7 inches with the same contributing drainage area. Moreover, based on feedback from the project development community, many regulated projects in the District already struggle to meet the current retention standard. Approximately 13% of regulated projects choose to comply partially off-site which is often due to challenges in meeting the 1.2-inch on-site requirement.

In addition, the District’s current regulations are among the strongest retention requirements of any U.S. city. There are a few cities that have a higher retention requirement, such as Philadelphia, PA and Gresham, OR; however, these cities typically include a feasibility or

practicability process, meaning the requirement is not necessarily fully achieved. By contrast, in the District, aside from public-right-of-way projects, the requirement is absolute, meaning that any required retention volume that isn't met with on-site GI must be met with retention achieved by GI installed elsewhere in the District.

2. Applying a Different Retention Standard to Priority Watersheds

The District's stormwater management performance requirements generally do not vary across the District based on the watershed in which a project is located. However, there is some variability in the requirements between the MS4 area and the Combined Sewer System (CSS) area. Generally, more stringent and protective requirements apply to the MS4.

Waterbody impairments are widespread throughout the MS4, so the District's stormwater management regulations generally do not distinguish among watersheds within the MS4. In other words, the entire MS4 is a high priority. Setting a higher retention standard for the MS4 is not practicable for the same reasons it is not practicable to increase the retention requirement District-wide. However, the District has additional regulatory and programmatic efforts underway to drive more GI retrofits in the MS4, which are described in greater detail in the following sections.

3. Eliminating Exemptions for Unregulated Projects or Lowering the Threshold for Regulated Projects

The District's regulations currently have very few exemptions to the stormwater retention requirements. The exemptions include new, voluntary GI projects undertaken for the purpose of generating Stormwater Retention Credits (SRCs); utility work, sidewalk and ramp replacements; permeable athletic playing fields; and emergency work. These exemptions are in place for good reason, and it is not practicable to remove them. Very few projects get exemptions, and these exemptions are in place to avoid having these types of projects experience disproportionate costs. The impacts of projects that qualify for exemptions are minor. Eliminating these exemptions would result in only a modest increase in the volume of stormwater retained while adding disproportionate burden to certain types of construction activities.

To research the possibility of lowering the threshold for regulated projects, DOEE interviewed twelve jurisdictions across the country that have some variation of stormwater regulations that apply to sites with a lower threshold of land disturbance than the District's current stormwater regulations.

Regulatory triggers in these jurisdictions varied among:

- The construction of new and replacement of existing impervious areas;
- Only the construction of new impervious areas; and
- Land disturbance, with thresholds ranging from 200 to 2,500 square feet.

Across these varied regulatory frameworks, standard designs are often provided, and BMP maintenance was almost always the responsibility of the property owner.

Lowering the threshold for regulated projects appears to be both feasible and warranted, and DOEE has started researching and developing new regulations. There are many smaller projects

done in the District that do not trigger the current regulations that could reasonably be asked to build GI, such as small residential and commercial construction and renovation projects. However, DOEE has determined that the relatively low cost of these projects compared to projects that trigger the current regulations merits a different approach to retention standards and design than for the larger, higher budget projects that trigger the current regulations. The trigger of these potential new regulations would likely be the new construction or substantial improvement of single- and two-family homes (which do not require a Certificate of Occupancy in the District) and any structure that requires a Certificate of Occupancy. There would not be specific retention requirements similar to the current stormwater regulations for these sites, but rather, the retention and BMP installation requirements would be based on opportunity and practicability.

Using data from the Department of Consumer and Regulatory Affairs from 2016-2019, the total acreage in the MS4 was calculated for projects that would be regulated based on potential new regulations. These calculations indicated that new regulations have the potential to add approximately 18 acres of additional MS4 retrofit area each year.

4. Accounting for Climate Change

Based on the District's 2015 Climate Projections and Scenario Development report¹, the 90th percentile storm is not expected to drastically increase in the coming decades. As shown in Figure 1, the 90th percentile storm is projected at 1.24" through 2034 and between 1.24" and 1.39" in the 2080s.

By contrast, the 15-year storm is expected to significantly increase (see Fig. 1). The District's sewer conveyance system is generally sized to convey the 15-year storm, meaning that generally the system can convey the 15-year storm with minimal street flooding. DOEE expects that the projected increase in the size of the 15-year, 24-hour storm from 5.5" to 8" will result in a significant increase in street flooding.

DOEE is currently exploring changes to the peak discharge requirement for the 15-year storm in its stormwater management regulations based on the projected increase in the size of that storm. However, there are technical challenges in establishing new requirements that stem from the fact that peak discharge requirements are typically based on the preceding thirty years of rainfall data. These datasets show the intensity and duration of a given design storm, such as the 15-year storm, and make it possible for regulators and designers to know how much stormwater storage capacity needs to be provided in order to avoid exceeding the required discharge rate. Since the District is trying to prepare for a storm that will occur in the 2080s, the rainfall record for the preceding 30 years does not exist. Various jurisdictions nationwide are grappling with this, and DOEE currently has staff serving on the Chesapeake Bay Program's Urban Stormwater Workgroup with an objective of determining new Intensity-Duration-Frequency curves for the Chesapeake Bay Watershed.

¹ This report can be found at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/150828_AREA_Research_Report_Small.pdf.

Figure 1. Table of precipitation indicators (from the District’s 2015 Climate Projections and Scenario Development report).

Precipitation Indicator	Baseline 1981-2000	2015-2034 (2020’s)	2045-2064 (2050’s)	2080’s
90 th Percentile storm (in.)	1.14	1.24 (0.1)	1.24 - 1.34 (0.1 - 0.2)	1.24 - 1.39 (0.1 - 0.25)
15-yr., 24-hr. storm (in.)	5.5	6.8 (6.0 - 7.3)	7.1 (6.7 - 7.6)	8 (4 - 9)

Recently Initiated Stormwater Management Regulatory Changes to Increase GI Retrofits in the MS4

In addition to researching and developing new regulations to lower the threshold for regulated projects, the District amended its stormwater regulations on January 31, 2020 and proposed additional regulatory updates on September 18, 2020. The January amendments include, among other regulations, three key changes that should increase the installation of new, voluntary GI retrofit projects in the MS4. First, for projects in the CSS that drain to storage tunnels designed to prevent combined sewage overflows (CSOs), DOEE will waive the 50% minimum on-site retention requirement if the project commits to use SRCs from the MS4 to achieve their off-site retention. Second, the regulatory amendments now require projects in the MS4 to purchase SRCs from the MS4 to meet off-site retention requirements. Last, DOEE has changed the SRC generating eligibility cutoff date. Previously, any project installed after May 1, 2009 could generate SRCs assuming that all other eligibility criteria were met. Now, only projects installed after July 1, 2013 are eligible and must submit their first SRC certification application within 3 years of the project completion. This means that a GI project that was installed more than 3 years ago and has never applied for SRCs will lose its SRC eligibility, thereby reducing the potential supply of SRCs and improving the financial incentives for installation of new GI retrofits in the MS4.

The regulatory amendments that DOEE proposed in September 2020 would further prioritize SRCs from new, voluntary GI retrofit projects in the MS4, which DOEE refers to as High-Impact SRCs. New regulated projects with off-site retention requirements will be required to purchase these SRCs before any others. The proposed amendments also include removing the 2-year peak discharge requirements for projects in the area of the CSS that will drain to CSO storage tunnels if the project commits to complying off-site with at least 50% High-Impact SRCs. These proposed amendments should continue to incentivize GI installation in the MS4.

New Subsidy in SRC Price Lock Program Supports Additional GI Retrofits in the MS4

The SRC Price Lock Program provides SRC sellers the option to sell SRCs to DOEE in order to guarantee a return on investment. In January 2020, DOEE launched an optional subsidy for High-Impact SRC sales by SRC Price Lock Program participants. An important objective of

the program was to make High-Impact SRCs, those from new, voluntary GI retrofit projects in the MS4, more competitive with SRCs generated from regulatory over-compliance or from GI built prior to 2013. Projects generating SRCs from over-compliance or GI built before 2013 did not invest in their GI for the sole purpose of generating SRCs, and any revenue from SRC sales is an unplanned financial benefit. When these SRCs are sold at below-market rates, that absorbs SRC demand and drives down SRC prices, which undermines the financial incentive to invest in new, voluntary GI.

The SRC Price Lock subsidy addresses the problem of below-market SRCs by providing High-Impact SRC sellers in the SRC Price Lock Program with a small payment from DOEE for each High-Impact SRC sale, which enables these SRC sellers to set a more competitive SRC market price and increase their chances of selling their SRCs on the market. When an SRC Price Lock Program participant sells on the market, that means DOEE funds that would have otherwise been used to purchase those SRCs are freed up to be used by other projects, helping to drive the installation of additional GI retrofits in the MS4. To date, this subsidy has increased High-Impact SRC sales to developers from 27% to 74% and freed up \$193,280 to be reinvested in the SRC Price Lock Program.

Ultimately, the regulatory changes to prioritize the use of High-Impact SRCs (described above) are the key to addressing the problem of below-market SRCs. However, the addition of the subsidy to the SRC Price Lock Program is addressing the problem in the short term and freeing up DOEE funds to support additional voluntary GI retrofits in the MS4.

3 SNOW AND ICE REMOVAL PLAN

During the 2019 and 2020 reporting years, DOEE designed a pilot test to evaluate different strategies to reduce road salt use in the management of snow and ice within the District. DOEE coordinated with the District of Columbia Department of Public Works (DPW) to test alternative treatment scenarios that could be incorporated into standard snow removal practices within the District. While the pilot project was anticipated to run during the 2019-2020 winter season, the District of Columbia only received 0.6 inches of snow during that entire time period and therefore was unable to deploy the pilot testing treatments. DOEE anticipates running the pilot project during the 2020-2021 winter season if weather conditions allow. After successful completion of the pilot testing, DOEE will develop an evaluation of treatment scenarios tested and provide recommendations on how the District could incorporate these activities into the snow and ice removal plan. The following page provides a brief overview of the road salt reduction pilot.

District of Columbia Deicing Alternatives Pilot Overview “Road Salt Reduction Pilot”

Background: The 2018 District of Columbia Government Municipal Separate Stormwater Sewer System (MS4) Permit requires the District to pilot salt alternatives and incorporate its findings into the District’s snow removal strategy. This Road Salt Reduction Pilot will be implemented during the FY21 Snow Season, provided favorable weather conditions occur.

Goal: DOEE will compare the effectiveness of alternative deicing practices including the use of a salt alternative, Calcium Magnesium Acetate (CMA) and the use of a pre-wetting technology that allows brine to wet road salt as it is being applied, with existing deicing practice of dry road salt application (control scenario).

Selection of Alternatives: The deicing alternatives that were selected for this study represent treatment options that have shown success at reducing salt use in other jurisdictions. Calcium Magnesium Acetate (CMA) has been shown to be an environmentally friendly alternative to road salt, while still protecting public safety in deicing operations. The use of saddle tanks loaded with brine to prewet road salt has also shown the ability to reduce the use of salt in deicing operations. By prewetting road salt with brine, the salt granules are less likely to bounce off of the road. In addition, prewetting allows the salt to melt ice faster than non-prewetted salt.

Qualifying Events: To best target the effectiveness of each deicing treatment scenario, the pilot will only be deployed during events where plowing will not be needed. The qualifying weather conditions are listed below:

- Ice, freezing rain, slush, and winter mix
- Trace to 2 inches of snow

Test Design: DOEE and DPW have identified 6 snow plow routes to execute the pilot testing during snowfall events. The three treatment scenarios (Control, Pre-wetting, and CMA) will be run in duplicate for each snow event. It is anticipated that this pilot test will be deployed on the identified routes during as many qualifying events as feasible during the 2020-2021 snow season. It is the goal of this project to deploy and evaluate the treatment scenarios described in this pilot plan during at least 3 events beyond the initial “test” event. Limitations such as quantity of deicing chemicals and qualifying events will ultimately determine the total number of events captured by this pilot.

Evaluation of Alternatives: DOEE anticipates using a variety of data points collected during the pilot test to evaluate the effectiveness of each treatment alternative including:

- Cost of treatment
- Weather and road conditions before and after application
- District Snow Team - Road Conditions Rating after application
- Feedback on implementation procedures and product effectiveness from snow plow drivers, QA personnel, and the public

4 MODIFICATIONS TO THE DISTRICT'S STORMWATER MANAGEMENT GUIDEBOOK

On January 31, 2020, the Department of Energy and Environment (DOEE) adopted a revised Stormwater Management Guidebook (SWMG). DOEE proposed a draft of the SWMG for public comment between February 15, 2019 and April 1, 2019. DOEE updated and expanded the SWMG to be consistent with recent regulatory amendments, [found at https://doee.dc.gov/swregs](https://doee.dc.gov/swregs). DOEE has also updated and expanded the SWMG to incorporate technical changes to stormwater best management practice (BMP) design standards and to clarify existing guidelines and processes. These updates also include changes that DOEE published as Errata and Clarifications in 2014 and 2017, found at <https://doee.dc.gov/proposedstormwaterrule>. Finally, DOEE made changes related to feedback received during the public comment period.

1. Errata and Clarifications

DOEE has previously published Errata and Clarifications in 2014 and 2017. These have been incorporated into the SWMG, and are not considered changes. These changes may be found at <https://doee.dc.gov/proposedstormwaterrule>. The Errata and Clarifications are primarily found within:

- a. Chapter 2, "Minimum Control Requirements"
- b. Chapter 3.2, "Green Roofs"
- c. Chapter 3.6, "Bioretention"
- d. Figure 5.4, "Declaration of Covenants template"
- e. Appendix O, "Geotechnical Information Requirements for Underground BMPs"

2. Proposed Regulatory Amendments

DOEE has updated and expanded the SWMG to be consistent with the final regulatory amendments. The updates to the SWMG that are related to the regulatory amendments are primarily found within:

- a. Chapter 2, "Minimum Control Requirements"
- b. Chapter 6, "Use of Off-Site Retention by Regulated Sites"
- c. Appendix A.3, "Design Examples"
- d. Appendix E, "Relief from Extraordinarily Difficult Site Conditions"
- e. Appendix W, "Definitions"

3. Clarifications of Existing Processes and Rules

DOEE has updated and expanded the SWMG to provide clarity regarding existing processes and rules. These changes to the SWMG do not reflect new review requirements. These clarifications are primarily found within:

- a. Chapter 5, "Administration of Stormwater Management Rules"

- b. Chapter 6, “Use of Off-Site Retention by Regulated Sites”
- c. Chapter 7, “Generation, Certification, Trading, and Retirement of Stormwater Retention Credits”
- d. Appendix A, “Compliance Calculations and Design Examples”
- e. Appendix U, “Site Drainage Area and BMP Design Diagrams”

4. Changes to BMP Design Specifications

DOEE proposes to change the calculations in Chapter 3 of the SWMG that are used to determine infiltration rates, storage volumes, and retention volumes. These changes are proposed based on stakeholder feedback and the best available science to ensure BMPs function effectively and are receiving appropriate retention credit. In particular, changes have been proposed to:

- a. Throughout: Clarification that the K_{sat} value is DOEE standard for calculating the drawdown period of infiltrating BMPs.
- b. Section 3.2.4, “Green Roof Design Criteria”:
 - i. Introduced new paragraphs on rock wool and contributing drainage area.
 - ii. Modified default water retention values for green roof soil media and retention/drainage layers.
 - iii. Modified solar panel spacing requirements from the version published in the 2017 Errata.
- c. Section 3.2.8, “Green Roof Stormwater Compliance Calculations”: irrigated green roofs are an accepted Total Suspended Solids treatment practice.
- d. Section 3.4.8, “Impervious Surface Disconnection Stormwater Compliance Calculations”: Increased retention value for practices which discharge to pervious areas with soils of hydraulic soil group A or B.
- e. Section 3.5.8, “Permeable Pavement Stormwater Compliance Calculations”: increased retention value of standard permeable pavement from 4.5 cubic feet per 100 square feet of practice to 5 cubic feet per 100 square feet of practice.
- f. Section 3.6.5, “Bioretention Design Criteria”: Noted that the mulch layer can be included with the filter media depth, and the choker stone layer can be included with the gravel depth when calculating the storage volume in Equation 3.5.
- g. Section 3.14, “Tree Planting and Preservation”:
 - i. Added new BMP categories for small tree plantings and preservation as well as Special and Heritage Tree preservation.
 - ii. Expanded the list of landscape professionals which can conduct a tree inventory.
 - iii. Updated matured spread requirement to 40 feet to match GAR requirements.

5. Changes to Appendix M

Appendix M governs rainwater harvesting treatment requirements. Previously, Appendix M was titled, “Tiered Risk Assessment Management: Water Quality End Use Standards”. It has been overhauled and is now titled, “Rainwater Harvesting Treatment and Management Requirements”. The new appendix discusses treatment requirements in terms of a risk-based framework and streamlines the guidance for meeting those requirements. The appendix also discusses submission guidelines for the accompanying design report and provides design examples. Guidance closely matches a large, recently-released report that is generally considered in-line with current best practices in rainwater harvesting treatment.

6. Changes resulting from feedback during the public comment period

DOEE incorporated both internal and external feedback into several sections of the SWMG. These changes are discussed in DOEE’s response to public comments document, which can be found at <https://doee.dc.gov/swguidebook>. DOEE also provided a copy of the SWMG that shows changes made between the draft 2019 version issued for public comment and the final 2020 version, which can be found at <https://doee.dc.gov/proposedstormwaterrule>. Most notably, changes were made in the following sections:

- a. Section 2.2, “Regulated Site Definition and Examples”
- b. Section 2.11, “Additional Stormwater Management Requirements”
- c. Section 2.12, “Exemptions”
- d. New Section 2.13, “Practicable Process”
- e. Section 3.2.1, “Green Roof Feasibility Criteria”,
 - i. Roof Access
 - ii. Contributing Drainage Area
- f. Section 3.2.4, “Green Roof Design Criteria”
 - i. Structural Capacity of the Roof
 - ii. Leak Detection System
 - iii. Green Roof Sizing
 - iv. Irrigation and Storage Volume
- g. Section 3.14, “Tree Planting and Preservation”
 - i. Guidance for when a tree preservation plan must be prepared
 - ii. Inclusion of deer protection fencing
- h. Section 6.3, “Off-Site Retention via Stormwater Retention Credits”
- i. Section 7.2, “Eligibility Requirements”
- j. New Appendix C, “Practicable Process”
- k. Appendix I, “Acceptable Hydrologic Methods and Models”
- l. New Appendix V, “Examples of Regulated Activities”
- m. Appendix Y, “Definitions”:
 - i. Critical Root Zone
 - ii. Drought Condition

- iii. Land-disturbing activity
- n. Throughout:
 - i. Allowable level of fines in reservoir gravel for BMPs
 - ii. Storage and drawdown equations no longer divide the K_{sat} value by two
 - iii. Appendix names, figure numbers, and equation numbers are reassigned their letters and numbers.

5 EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM

The District's MS4 Annual Report, Section 4.6, requires a data synthesis of programmatic and watershed indicators.

4.6.1 Programmatic Indicators

The Permittee shall evaluate the effectiveness of the SWMP using multiple programmatic indicators linked to the requirements in Part 3 of this permit. The Annual Reporting Template in Appendix A of this permit identifies the programmatic indicators used to evaluate the success of implementing stormwater control measures.

As required by Section 4.6.1, the effectiveness of the Stormwater Management Program is evaluated using the programmatic indicators found in Part 3 of the MS4 Permit. The Annual Report describes implementation of these programs in this reporting year. In interest of doing a complete synthesis, indicators are being reviewed over the life of multiple permit terms. As seen in the text and figures below, major program indicators have seen a steady progression in implementation.

Catch Basin Cleaning Activities (Section 3.3.4)

Through the development of the DC Water Catch Basin Cleaning App, DOEE has increased the resolution at which it can report catch basin cleaning within the District. In previous permit terms DOEE was limited to reporting the number of catch basins cleaned over the entire jurisdiction. Now DOEE is able to report the number of catch basins that were cleaned specifically within the area of the city serviced by the MS4. Using data from the DC Water Catch Basin Cleaning App, DOEE has determined that there are 14,807 catch basins within the MS4 area of the District. The number of catch basins cleaned in the MS4 area of DC was 13,182 in reporting year 2019 and 12,473 in reporting year 2020. These values represent the number of unique catch basins that were cleaned, not the number of cleaning events. It should be noted that some catch basins were cleaned more than once during the reporting year, which is not reflected in the numbers reported. The reduction in the number of catch basins cleaned in reporting year 2020 is due to a temporary pause in cleanings due to coronavirus.

Construction Activities (Section 3.5)

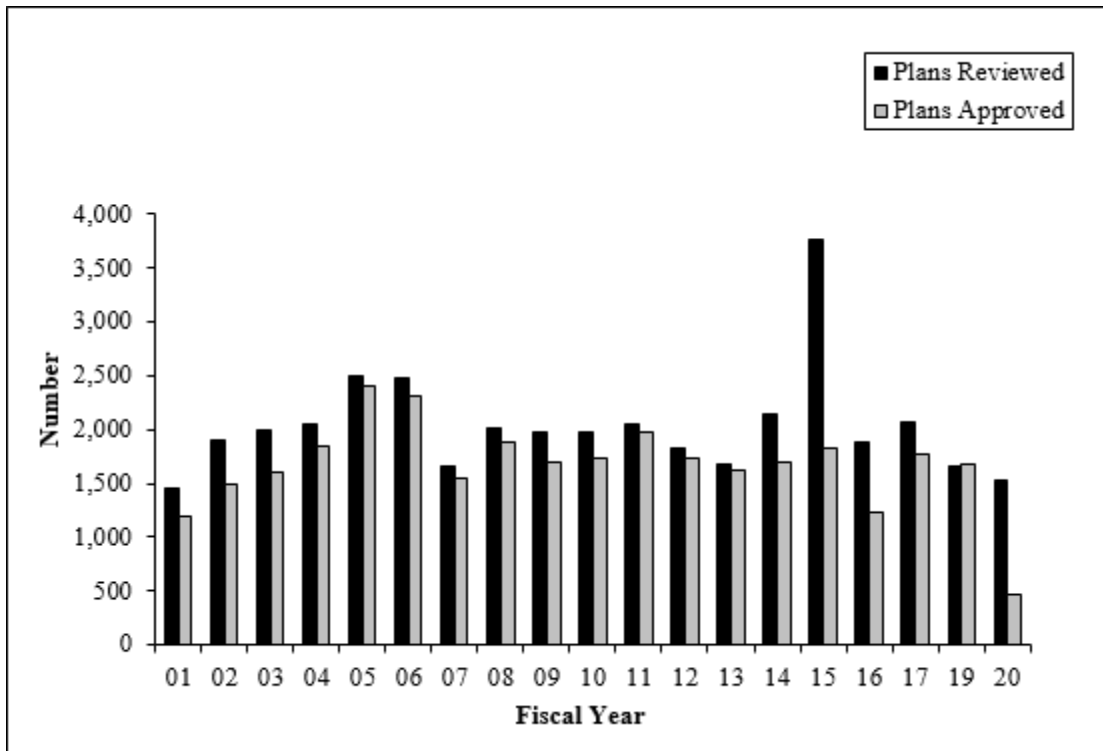


Figure 1 Total Number of Stormwater Management and Erosion and Sediment Control Plans Reviewed and Total Number of Plans Approved Over Time

Targeted Trash and Litter Pollutant Controls (Section 3.7)

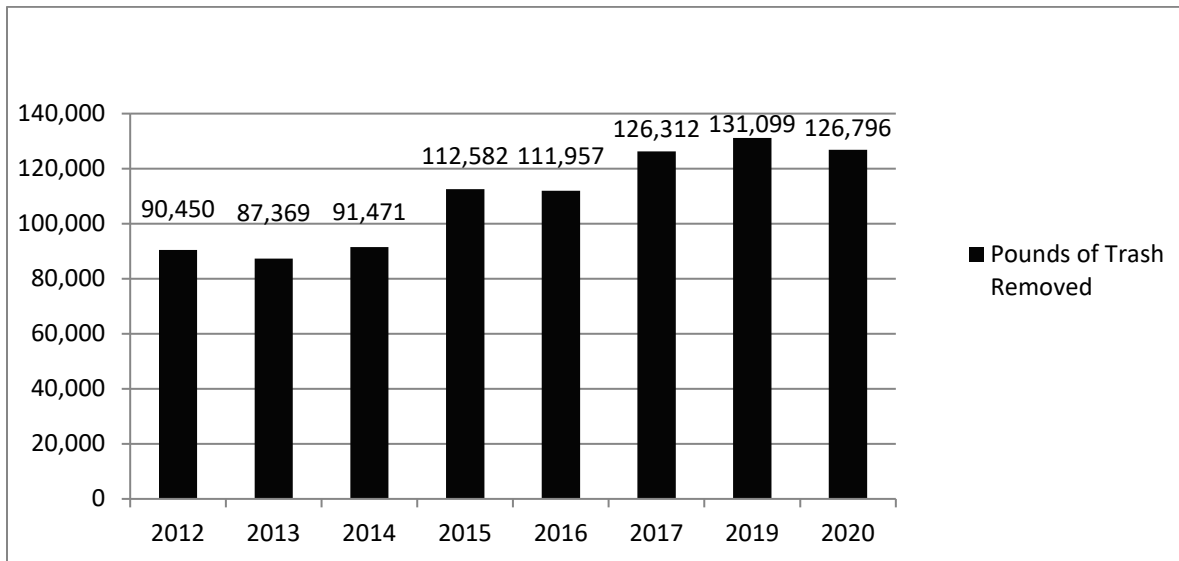


Figure 2 Annual Pounds of Trash Removed Over Time

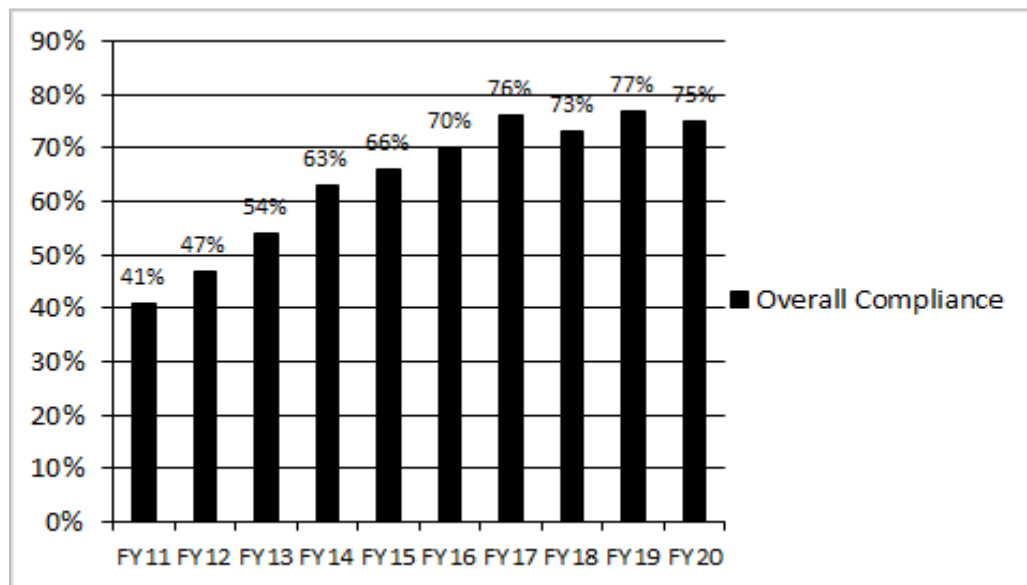


Figure 3 Bag Law Compliance Rates Over Time

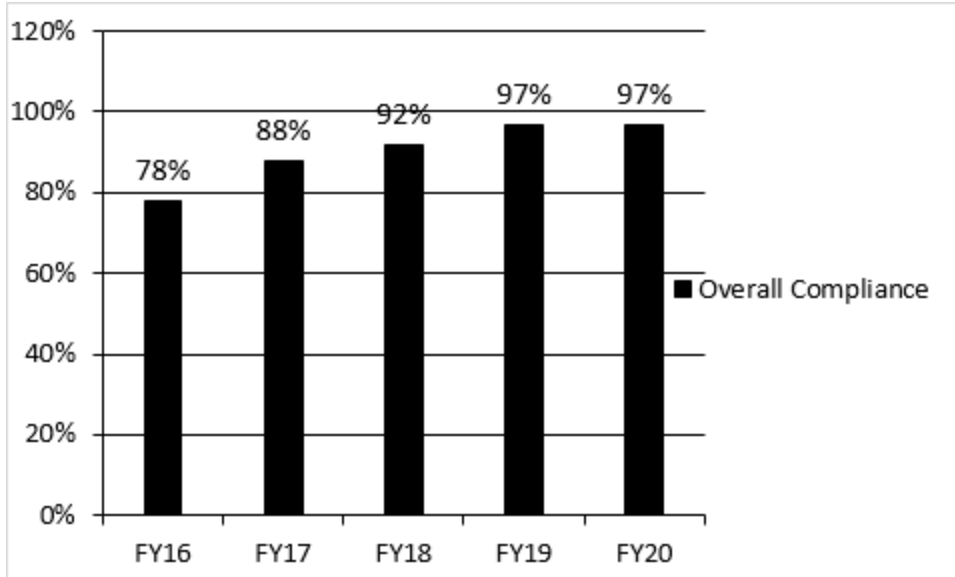


Figure 4 Foam Ban Compliance Rates

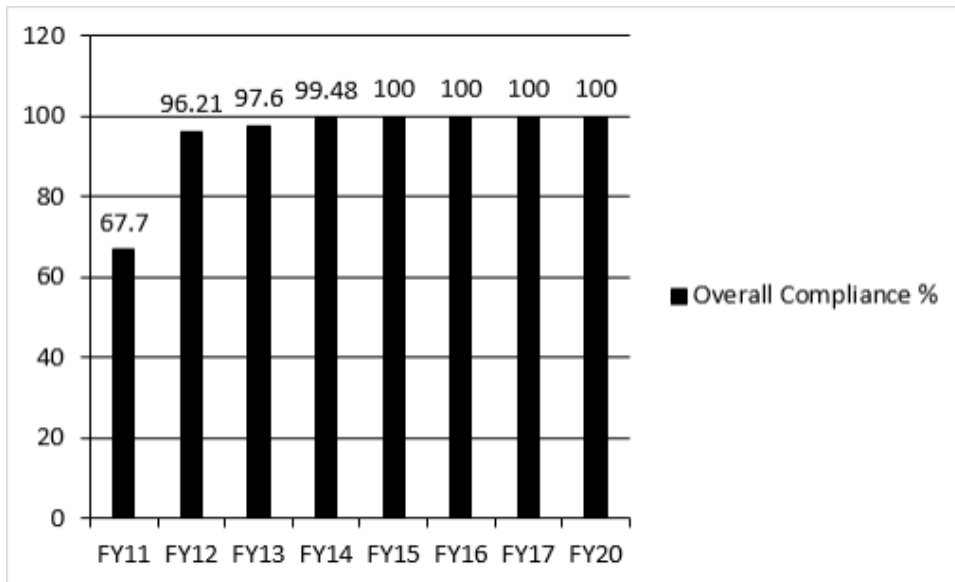


Figure 5 Coal Tar Pavement Sealant Ban Compliance Rates

Table 1 Coal Tar Pavement Sealant Ban Inspections and Compliance Rates

Fiscal Year	Inspections	Positive CT Field Tests	Overall Compliance (%)
FY11	36	13	66.7
FY12	79	2	96.21
FY13	163	6	97.6
FY14	190	9	99.48
FY15	83	1	100
FY16	60	0	100
FY17	64	4*	100
FY18	60	6*	100
FY19	63	1	100
FY20	63	0	100
TOTALS:	737	32	

4.6.2 Watershed Indicators

The Permittee shall also evaluate the effectiveness of the SWMP using multiple watershed indicators linked mostly to the assessment requirements of Part 4 of this permit, and the synthesis of those data through analysis and modeling.

In the 2020 reporting year, DOEE continued implementing the Receiving Waters Assessment Program as required in Section 4.3 of the District’s MS4 Permit. As part of this program, DOEE has developed a Rapid Stream Assessment. The intent of the Rapid Stream Assessment (RSA) is to collect information to provide a high-level overview of the entire wadeable stream network within the District. This information can help identify potential issues as well as locations that may warrant follow-up inspections or more in-depth evaluations. The information from the RSA can also serve as a baseline with which to compare information from these assessments in the future. All data collected as part of this program is housed in ArcGIS.

In the first season of implementation, DOEE assessed 58.784 miles of streams, approximately 13 miles were assessed in reporting year 2019 and approximately 45 miles in reporting year 2020. This translates to approximately 47.8 percent of the wadeable streams in the District, Figure 6. The first field season focused on implementation and protocol QA/QC. Health and safety concerns related to coronavirus prevented DOEE staff from conducting the Rapid Stream Assessment program during the 2020 field season. DOEE will complete an assessment of the remaining 52.2 percent of wadeable streams in the next sampling season. From then on, DOEE will aim to re-assess approximately 20 percent of wadeable streams each year, allowing for trend analysis of RSA results in future reporting years.

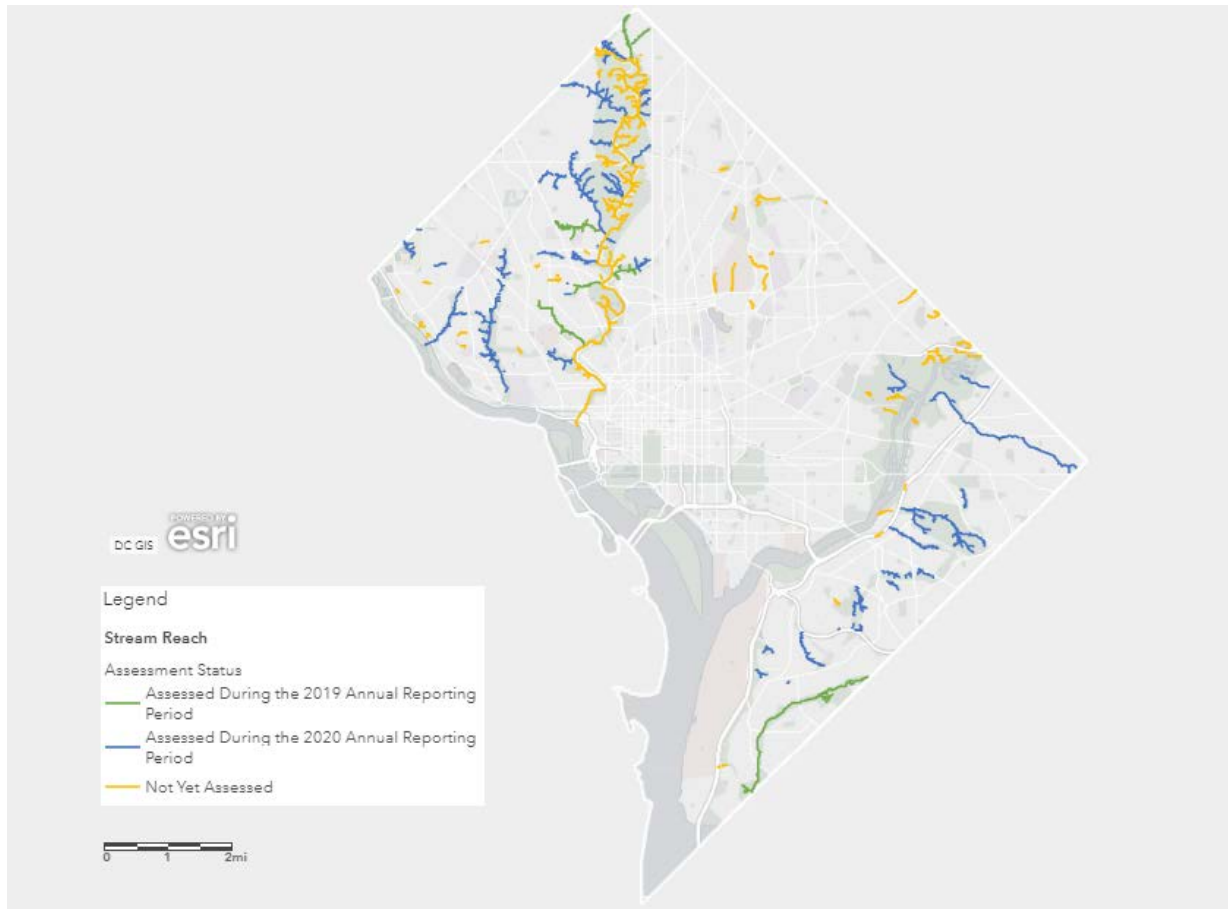


Figure 6 Rapid Stream Assessment Achievements

4.6.2.1 Estimate Annual Cumulative Pollutant Loadings

The Permittee shall estimate annual cumulative pollutant loadings for all pollutants listed in Table 7 of this permit.

DOEE continues to implement a wet weather monitoring program at representative outfalls, Table 2. The wet weather sampling summary data for the required monitoring parameters is detailed in Table 3, Table 4, and Table 5. The geometric mean for each parameter was calculated to represent the event mean concentration (EMC).

Table 2 Monitoring Site Information

Site	Outfall	Watershed
SW1	Outfall 999 - Gallatin	Anacostia
SW2	Outfall 123 - Oxon Run	Potomac
SW3	Outfall 851 - Soapstone Creek	Rock Creek
SW4	Outfall 1035 - Kenilworth and Douglas	Anacostia
SW5	Outfall 260 - 53 rd and Dix Street	Anacostia
SW6	Outfall 950 - Potomac Tributary	Potomac

SW7	Outfall 103 - Oxon Run	Potomac
SW8	Outfall 825 - Tilden and Reno	Rock Creek
SW9	Outfall 901 - Tributary to Pinehurst Br.	Rock Creek

Table 3 Potomac Watershed Wet Weather Sampling Data 2019-2020, geometric mean

Potomac River Watershed				
Parameter	Unit	SW2	SW6	SW7
E. Coli	MPN/100ml	1287.42	1120.8157	1663.5674
Cadmium	mg/L	0.000060	0.0000599	0.0000599
Copper	mg/L	0.0114	0.0168863	0.0186224
Lead	mg/L	0.0008	0.004595	0.0039684
Zinc	mg/L	0.0368	0.0564547	0.0908298
Total Suspended Solids	mg/L	8.28	22.138248	40.475817
Phosphorus, Total	mg/L	0.12	0.3009783	0.4445914
Nitrogen, Total	mg/L	4.72	3.7849609	4.4199805

n=3

Note: where value is < (less than) or non-detect, the Detection Limit (DL) value is used

Table 4 Anacostia Watershed Wet Weather Sampling Data 2019-2020, geometric mean

Anacostia River Watershed				
Parameter	Unit	SW1	SW4	SW5
E. Coli	MPN/100ml	1821.4913	1663.5674	1531.6855
Cadmium	mg/L	0.0000599	0.0000599	0.0000599
Copper	mg/L	0.0127842	0.0134549	0.007476
Lead	mg/L	0.0036036	0.0047392	0.002487
Zinc	mg/L	0.0772072	0.065249	0.0397245
Total Suspended Solids	mg/L	18.247917	10.459367	8.2577787
Phosphorus, Total	mg/L	0.3181269	0.2054984	0.2576726
Nitrogen, Total	mg/L	4.583869	3.5563109	3.4303141

n=3

Note: where value is < (less than) or non-detect, the Detection Limit (DL) value is used

Table 5 Rock Creek Watershed Wet Weather Sampling Data 2019-2020, geometric mean

Rock Creek Watershed				
Parameter	Unit	SW3	SW8	SW9
E. Coli	MPN/100ml	1600	1836.6163	1367.9808
Cadmium	mg/L	0.000279	0.0001094	0.0000599
Copper	mg/L	0.0113	0.0171658	0.0117047
Lead	mg/L	0.0023	0.0030617	0.0010174
Zinc	mg/L	0.0409	0.0662145	0.0227095
Total Suspended Solids	mg/L	15	23.76011	6.9437672
Phosphorus, Total	mg/L	0.45	0.3026433	0.2603152
Nitrogen, Total	mg/L	4.57	3.9068846	3.4968985

n=3 except SW3, which is n=1

Note: where value is < (less than) or non-detect, the Detection Limit (DL) value is used

Table 6 provides the annual cumulative pollutant load occurring in the three main watersheds within the District.

Table 6 Annual Cumulative Pollutant Load in Each Watershed

	Rock Creek	Anacostia River	Potomac River	Total	Units
Total Suspended Solids	660,000	326,000	1.058E+6	2.046E+6	Pounds
Total Nitrogen	142,134	82,875	195,520	420,529	Pounds/yr
Total Phosphorous	10,544	5,353	12,905	28,802	Pounds/yr
Copper	765	763	902	2,430	Pounds/yr
Lead	170	69	62	301	Pounds/yr
Zinc	1,913	1,089	2,077	5,079	Pounds/yr
Cadmium	13	9	9	30	Pounds/yr
E. coli	2.86E+14	3.00E+14	1.90E+14	7.76E+14	MPN/100ml

DOEE calculated the potential pollutant load and volume reductions achieved through the annual BMP implementation, Table 7. The load and volume reduction estimates were developed using the District’s Implementation Plan Modeling Tool (IPMT). With the permit’s green roof installation requirement being met this reporting period, DOEE has also included the square footage of green roofs installed in each watershed to date, Table 8.

Table 7 Pollutant Load Reductions, 07/01/2019 - 06/30/2020

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	E. coli (Billion MPN)	Copper (lbs)	Lead (lbs)	Cadmium¹ (lbs)	Zinc (lbs)
Anacostia	43,638,465	1,327	167	34,786	11,305	23.28	7.36	7.25	54.55
Rock Creek	23,211,857	695	82	11,491	5,401	11.33	3.53	3.70	22.05
Potomac River	18,629,747	624	92	45,327	4,693	9.92	3.22	3.10	19.64
Total	85,480,069	2,646	340	91,603	21,398	44.53	14.11	14.05	96.24

1 An EPA report (402-R-99-004B- linked below) that reviewed several studies with varied site conditions has documented mean partition coefficients for metals. DOEE 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. DOEE will continue to use this methodology to estimate the pollutant load reduction for cadmium in Annual Reports.

EPA Report: <http://www.epa.gov/sites/production/files/2015-05/documents/402-r-99-004b.pdf>

2. Note that summations include MS4, Direct Drainage, and CSS areas.

Table 8 Square Feet of Green Roofs Installed in Each Watershed

	2018-2019	2019-2020	Total
Anacostia	89,378	214,551	303,929
Rock Creek	15,895	217	16,112
Potomac	62,912	60,754	123,666
Total	168,185	275,522	443,707

As required, DOEE has attached all WLA benchmarks to this annual report, Table 11. This table provides a watershed scale summary that includes load reductions MS4 and direct drainage area for each non-CSS watersheds. The color coding indicates whether the Wasteload Allocation (WLA) has been achieved for that waterbody/pollutant combination, Table 10.

Table 9 Table Key

Green cells indicate that the WLA has already been achieved for that waterbody and pollutant combination.
Blue cells indicate that the benchmark load reduction was achieved or exceeded for that waterbody and pollutant combination.
Orange cells indicate that the benchmark load reduction was not achieved for that waterbody and pollutant combination.
Grey cells indicate that there is no MS4 WLA for that waterbody and pollutant combination, and therefore no benchmark has been established. Load reductions are provided for informational purposes only.

Table 10 Overall Summary of WLA Benchmark Achievements, 07/01/2019 - 06/30/2020

WLA Achieved	32
Benchmark Achieved	31
Benchmark Not Achieved	144
No WLA or benchmark	849

Table 11 Pollutant Load Reductions from BMP Implementation with WLA Benchmarks, 07/01/2019 to 06/30/2020

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium' (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH 1 (lbs)	PAH 2 (lbs)	PAH 3 (lbs)	TPCB (lbs)	E. coli (Billion MPN)
Anacostia	26,264,663	764.14	99.94	21,185.3	17,002	7,896	1,026.7	4.0E-01	1.4E+01	4.5E+00	4.1E+00	5.0E-02	3.3E+01	2.3E-03	8.0E-04	3.7E-03	9.3E-03	6.4E-05	2.1E-04	1.5E-01	1.0E+00	7.7E-01	2.1E-02	6,898.7
Anacostia Lower	7,539,854	220.76	27.33	5,885.9	4,749	2,261	235.5	1.1E-01	4.0E+00	1.2E+00	1.1E+00	1.4E-02	9.3E+00	6.5E-04	2.3E-04	1.0E-03	2.6E-03	1.8E-05	6.0E-05	4.2E-02	2.9E-01	2.1E-01	5.9E-03	1,928.1
Anacostia Upper	18,724,808	543.38	72.60	#####	12,254	5,634	791.3	2.9E-01	1.0E+01	3.2E+00	3.0E+00	3.6E-02	2.4E+01	1.6E-03	5.8E-04	2.6E-03	6.7E-03	4.5E-05	1.5E-04	1.0E-01	7.3E-01	5.5E-01	1.5E-02	4,970.6
ANATF_DC	24,951,869	462.44	63.60	#####	11,079	4,679	613.3	2.6E-01	9.1E+00	2.9E+00	2.5E+00	3.2E-02	2.1E+01	1.4E-03	5.2E-04	2.4E-03	6.1E-03	3.8E-05	1.3E-04	8.8E-02	6.3E-01	5.1E-01	1.4E-02	4,517.7
ANATF_MD	4,233,457	97.91	14.55	3,335.3	2,528	827	224.5	5.6E-02	2.0E+00	6.8E-01	5.5E-01	6.9E-03	4.9E+00	2.7E-04	1.2E-04	5.5E-04	1.4E-03	6.7E-06	2.2E-05	1.5E-02	1.3E-01	1.2E-01	3.0E-03	1,033.5
Battery Kemble Creek	537,821	14.91	1.71	190.3	280	126	15.0	6.9E-03	2.4E-01	7.2E-02	7.8E-02	8.6E-04	4.6E-01	4.4E-05	1.4E-05	6.0E-05	1.5E-04	1.3E-06	4.3E-06	3.0E-03	1.9E-02	1.2E-02	3.6E-04	112.2

Broad Branch	721,119	21.46	2.83	524.5	503	2	14	25.0	1.2E-02	4.1E-01	1.3E-01	1.1E-01	1.4E-03	8.3E-01	6.4E-05	2.4E-05	1.1E-04	2.7E-04	1.7E-06	5.8E-06	4.0E-03	2.9E-02	2.3E-02	6.1E-04	197.6
C&O Canal	1,017,180	29.31	3.41	389.7	559		238	28.4	1.4E-02	4.7E-01	1.5E-01	1.6E-01	1.7E-03	9.1E-01	8.4E-05	2.7E-05	1.2E-04	3.1E-04	2.5E-06	8.1E-06	5.6E-03	3.6E-02	2.5E-02	7.1E-04	223.0
Dalecarlia Tributary	575,898	57.58	21.12	#####	360	5	13	16.1	8.4E-03	3.0E-01	9.6E-02	8.4E-02	1.0E-03	5.9E-01	4.9E-05	1.7E-05	7.8E-05	2.0E-04	1.4E-06	4.6E-06	3.2E-03	2.1E-02	1.7E-02	4.5E-04	137.5
Dumbarton Oaks	4,758	0.13	0.02	2.4	2	1		0.2	6.1E-05	2.1E-03	6.3E-04	6.9E-04	7.5E-06	4.0E-03	3.9E-07	1.2E-07	5.3E-07	1.4E-06	1.2E-08	3.8E-08	2.6E-05	1.7E-04	1.1E-04	3.2E-06	1.0
Fenwick Branch	108,857	3.08	0.38	65.7	65		22	3.8	1.6E-03	5.5E-02	1.7E-02	1.6E-02	1.9E-04	1.1E-01	9.3E-06	3.1E-06	1.4E-05	3.6E-05	2.6E-07	8.7E-07	6.0E-04	4.0E-03	2.9E-03	8.2E-05	25.9
Fort Chaplin Tributary	155,415	4.75	0.72	180.1			47	4.7	3.1E-03	1.1E-01	3.7E-02	2.3E-02	3.8E-04	2.7E-01	1.5E-05	6.3E-06	3.0E-05	7.5E-05	3.8E-07	1.2E-06	8.7E-04	7.1E-03	6.5E-03	1.6E-04	56.6
Fort Davis Tributary	68,192	2.26	0.35	92.1	69		20	2.1	1.5E-03	5.5E-02	1.9E-02	9.9E-03	1.9E-04	1.3E-01	7.0E-06	3.1E-06	1.5E-05	3.7E-05	1.7E-07	5.5E-07	3.9E-04	3.4E-03	3.3E-03	8.0E-05	28.6
Fort Dupont Tributary	1,267,118	37.77	4.52	943.7	768		380	39.6	1.8E-02	6.4E-01	2.0E-01	2.0E-01	2.3E-03	1.5E+00	1.1E-04	3.7E-05	1.7E-04	4.2E-04	3.1E-06	1.0E-05	7.0E-03	4.7E-02	3.4E-02	9.7E-04	310.2
Fort Stanton Tributary	30,131	0.68	0.13	27.4	22	9		0.9	5.0E-04	1.8E-02	5.7E-03	4.4E-03	6.2E-05	4.2E-02	2.7E-06	1.0E-06	4.7E-06	1.2E-05	7.3E-08	2.4E-07	1.7E-04	1.2E-03	9.9E-04	2.6E-05	8.8
Foundry Branch	261,122	7.90	0.94	110.6	154	1	6	7.9	3.7E-03	1.3E-01	4.1E-02	4.2E-02	4.5E-04	2.5E-01	2.2E-05	7.3E-06	3.3E-05	8.4E-05	6.3E-07	2.1E-06	1.4E-03	9.5E-03	7.0E-03	1.9E-04	61.1
Hickey Run	2,964,141	85.64	10.47	2,209.6	1,797		889	94.0	4.3E-02	1.5E+00	4.7E-01	4.4E-01	5.3E-03	3.5E+00	2.5E-04	8.6E-05	3.9E-04	9.9E-04	7.2E-06	2.4E-05	1.6E-02	1.1E-01	8.0E-02	2.3E-03	728.5
Kingman Lake	3,880,291	115.17	14.36	2,897.6	2,359		1,164	193.4	5.6E-02	2.0E+00	6.2E-01	6.2E-01	7.0E-03	4.6E+00	3.3E-04	1.1E-04	5.1E-04	1.3E-03	9.4E-06	3.1E-05	2.1E-02	1.5E-01	1.1E-01	3.0E-03	951.7
Klinge Valley Run	1,022,276	43.95	5.17	930.6	857		202	35.4	1.9E-02	6.9E-01	2.3E-01	2.5E-01	2.4E-03	1.4E+00	9.6E-05	4.0E-05	1.9E-04	4.7E-04	2.5E-06	8.2E-06	5.7E-03	4.4E-02	4.1E-02	1.0E-03	343.7
Lower Beaverdam Creek	-	0.06	0.02	8.5	6		-	-	1.1E-04	4.2E-03	1.6E-03	0.0E+00	1.3E-05	1.1E-02	2.4E-07	2.4E-07	1.3E-06	3.0E-06	2.0E-10	8.8E-11	1.7E-06	1.7E-04	3.0E-04	5.8E-06	2.4
Luzon Branch	1,193,656	33.78	4.43	777.1	762		236	41.4	1.8E-02	6.3E-01	2.0E-01	1.8E-01	2.2E-03	1.2E+00	1.0E-04	3.6E-05	1.7E-04	4.2E-04	2.9E-06	9.5E-06	6.6E-03	4.5E-02	3.5E-02	9.5E-04	301.0
Melvin Hazen Valley Branch	33,798	0.96	0.12	20.3	20	7		1.2	4.8E-04	1.7E-02	5.3E-03	4.9E-03	6.0E-05	3.3E-02	2.9E-06	9.6E-07	4.4E-06	1.1E-05	8.2E-08	2.7E-07	1.9E-04	1.2E-03	9.1E-04	2.5E-05	8.0
Nash Run	508,649	15.51	2.14	513.0	397		153	15.5	9.1E-03	3.2E-01	1.1E-01	7.4E-02	1.1E-03	7.7E-01	4.7E-05	1.9E-05	8.7E-05	2.2E-04	1.2E-06	4.1E-06	2.8E-03	2.2E-02	1.8E-02	4.8E-04	163.4
Normanstone Creek	148,834	4.22	0.52	88.0	88		29	5.2	2.1E-03	7.4E-02	2.3E-02	2.2E-02	2.6E-04	1.4E-01	1.3E-05	4.2E-06	1.9E-05	4.8E-05	3.6E-07	1.2E-06	8.2E-04	5.5E-03	3.9E-03	1.1E-04	35.0
Northwest Branch	3,705,167	112.91	14.79	3,305.7	2,608		1,111	112.9	6.1E-02	2.1E+00	6.9E-01	5.9E-01	7.5E-03	5.1E+00	3.3E-04	1.2E-04	5.7E-04	1.4E-03	9.0E-06	3.0E-05	2.1E-02	1.5E-01	1.2E-01	3.2E-03	1,062.6
Oxon Run	6,980,199	207.66	26.31	3,232.8	4,395		1,687	195.2	1.0E-01	3.6E+00	1.2E+00	1.1E+00	1.3E-02	7.1E+00	6.0E-04	2.1E-04	9.6E-04	2.4E-03	1.7E-05	5.6E-05	3.9E-02	2.6E-01	2.0E-01	5.4E-03	1,703.0
Pinehurst Branch	323,569	9.39	1.16	197.6	196		64	11.9	4.7E-03	1.6E-01	5.2E-02	4.9E-02	5.8E-04	3.2E-01	2.8E-05	9.3E-06	4.2E-05	1.1E-04	7.8E-07	2.6E-06	1.8E-03	1.2E-02	8.8E-03	2.5E-04	77.9
Piney Branch	9,515	0.28	0.04	7.2	7	2		0.3	1.6E-04	5.6E-03	1.8E-03	1.4E-03	1.9E-05	1.1E-02	8.5E-07	3.2E-07	1.5E-06	3.7E-06	2.3E-08	7.6E-08	5.3E-05	3.8E-04	3.2E-04	8.3E-06	2.7
Pope Branch	163,936	4.67	0.70	164.6	128		49	5.0	2.9E-03	1.0E-01	3.4E-02	2.4E-02	3.6E-04	2.5E-01	1.5E-05	5.9E-06	2.8E-05	7.0E-05	4.0E-07	1.3E-06	9.1E-04	7.0E-03	5.9E-03	1.5E-04	52.4

Portal Branch	9,515	0.36	0.07	17.0	15	2	0.3	3.0E-04	1.1E-02	4.1E-03	1.4E-03	3.6E-05	2.4E-02	1.1E-06	6.4E-07	3.2E-06	7.8E-06	2.3E-08	7.6E-08	5.5E-05	5.9E-04	7.4E-04	1.6E-05	5.5
Potomac Lower	7,067,422	218.14	28.09	3,560.5	4,736	1,744	197.6	1.1E-01	3.9E+00	1.3E+00	1.2E+00	1.3E-02	7.7E+00	6.1E-04	2.2E-04	1.0E-03	2.6E-03	1.7E-05	5.6E-05	3.9E-02	2.7E-01	2.2E-01	5.8E-03	1,820.0
Potomac Middle	4,454,496	136.06	17.46	2,185.6	2,931	1,067	173.9	6.8E-02	2.4E+00	7.8E-01	7.1E-01	8.4E-03	4.8E+00	3.8E-04	1.4E-04	6.4E-04	1.6E-03	1.1E-05	3.6E-05	2.5E-02	1.7E-01	1.4E-01	3.6E-03	1,124.4
Potomac Upper	4,238,785	166.09	33.83	#####	2,442	994	119.1	5.9E-02	2.0E+00	6.4E-01	6.6E-01	7.2E-03	4.0E+00	3.6E-04	1.2E-04	5.3E-04	1.3E-03	1.0E-05	3.4E-05	2.3E-02	1.5E-01	1.1E-01	3.1E-03	966.1
POTTF_DC	23,107,041	561.48	69.92	#####	11,781	4,007	566.9	2.7E-01	9.7E+00	3.1E+00	3.0E+00	3.4E-02	1.9E+01	1.6E-03	5.5E-04	2.6E-03	6.4E-03	4.4E-05	1.4E-04	1.0E-01	6.9E-01	5.4E-01	1.5E-02	4,449.7
POTTF_MD	627,146	7.35	1.09	156.2	196	56	6.7	4.3E-03	1.6E-01	5.4E-02	3.5E-02	5.3E-04	3.2E-01	2.2E-05	8.9E-06	4.3E-05	1.1E-04	5.8E-07	1.9E-06	1.3E-03	1.0E-02	9.6E-03	2.3E-04	70.5
Rock Creek Lower	3,121,798	111.62	13.21	2,296.9	2,195	61	108.1	5.1E-02	1.8E+00	5.9E-01	6.2E-01	6.2E-03	3.6E+00	2.8E-04	1.0E-04	4.8E-04	1.2E-03	7.6E-06	2.5E-05	1.7E-02	1.2E-01	1.0E-01	2.7E-03	878.5
Rock Creek Upper	7,772,349	222.12	26.90	4,496.9	4,520	1,536	269.9	1.1E-01	3.8E+00	1.2E+00	1.2E+00	1.3E-02	7.4E+00	6.6E-04	2.2E-04	9.8E-04	2.5E-03	1.9E-05	6.2E-05	4.3E-02	2.8E-01	2.0E-01	5.7E-03	1,799.7
Soapstone Creek	477,624	15.44	1.92	342.0	329	94	16.5	7.6E-03	2.7E-01	8.8E-02	8.2E-02	9.4E-04	5.4E-01	4.2E-05	1.5E-05	7.1E-05	1.8E-04	1.2E-06	3.8E-06	2.6E-03	1.9E-02	1.5E-02	4.0E-04	130.4
Texas Avenue Tributary	43,380	1.36	0.22	51.4	39	3	1.3	8.7E-04	3.1E-02	1.1E-02	6.3E-03	1.1E-04	7.6E-02	4.3E-06	1.8E-06	8.5E-06	2.1E-05	1.1E-07	3.5E-07	2.4E-04	2.0E-03	1.8E-03	4.6E-05	16.1
Tidal Basin	69,955	2.82	0.54	95.9	108	6	2.4	2.1E-03	8.1E-02	3.1E-02	1.0E-02	2.6E-04	1.7E-01	7.9E-06	4.7E-06	2.4E-05	5.8E-05	1.7E-07	5.6E-07	4.0E-04	4.1E-03	5.8E-03	1.1E-04	35.1
Washington Ship Channel	2,850,708	86.31	11.06	1,358.6	1,837	668	128.6	4.3E-02	1.5E+00	4.9E-01	4.5E-01	5.3E-03	3.0E+00	2.4E-04	8.6E-05	4.0E-04	1.0E-03	6.9E-06	2.3E-05	1.6E-02	1.1E-01	8.5E-02	2.3E-03	707.4
Watts Branch	2,341,655	47.50	6.95	978.9	910	702	71.3	2.4E-02	8.1E-01	2.2E-01	3.5E-01	3.0E-03	1.8E+00	1.8E-04	4.6E-05	1.9E-04	5.1E-04	5.7E-06	1.9E-05	1.3E-02	7.2E-02	3.7E-02	1.3E-03	356.1
Watts Branch - Lower	345,693	10.89	1.64	411.4	312	10	10.5	6.9E-03	2.5E-01	8.4E-02	5.2E-02	8.6E-04	6.1E-01	3.4E-05	1.4E-05	6.8E-05	1.7E-04	8.4E-07	2.8E-06	1.9E-03	1.6E-02	1.5E-02	3.7E-04	128.8
Watts Branch - Upper	1,995,962	36.61	5.32	567.5	599	599	60.8	1.7E-02	5.6E-01	1.4E-01	2.9E-01	2.2E-03	1.2E+00	1.5E-04	3.1E-05	1.2E-04	3.4E-04	4.8E-06	1.6E-05	1.1E-02	5.6E-02	2.2E-02	9.0E-04	227.3
CSS - Anacostia	17,373,802	562.74	67.40	#####	10,978	5,267	831.4	2.6E-01	9.1E+00	2.9E+00	3.2E+00	3.2E-02	2.1E+01	1.5E-03	5.2E-04	2.4E-03	6.0E-03	4.2E-05	1.4E-04	9.6E-02	6.7E-01	4.9E-01	1.4E-02	4,405.8
CSS - Potomac	2,869,044	104.21	12.13	2,087.0	1,949	567	99.4	4.5E-02	1.6E+00	5.3E-01	5.8E-01	5.5E-03	3.2E+00	2.5E-04	9.1E-05	4.3E-04	1.1E-03	6.9E-06	2.3E-05	1.6E-02	1.1E-01	9.2E-02	2.4E-03	782.2
CSS - Rock Creek	12,317,710	360.86	41.52	4,696.8	6,784	2,897	354.1	1.7E-01	5.7E+00	1.8E+00	1.9E+00	2.0E-02	1.1E+01	1.0E-03	3.3E-04	1.5E-03	3.7E-03	3.0E-05	9.8E-05	6.8E-02	4.4E-01	3.0E-01	8.7E-03	2,722.6

Note that summations include MS4 and Direct Drainage areas. There is no distinction between runoff draining into a water body and runoff that is conveyed in collection system within the three CSS segments.

"-" indicates no reductions resulted from BMP implementation.

1. An EPA report (402-R-99-004B- linked below) that reviewed several studies with varied site conditions has documented mean partition coefficients for metals. DOEE 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. DOEE will continue to use this methodology to estimate the pollutant load reduction for cadmium in Annual Reports. <http://www.epa.gov/sites/production/files/2015-05/documents/402-r-99-004b.pdf>.

Upon further review of the 2019 DC MS4 report, DOEE noticed errors in the Overview Summary Table of WLA Benchmark Achievements for the period of 7/1/2018 – 6/30/2019 and 10/1/2017 – 6/30/2018. DOEE has provided the corrected data in Tables 12 and 13 below, respectively.

Table 12 Overview Summary Table of WLA Benchmark Achievements, 7/1/2018-6/30/2019

WLA Achieved	32
Benchmark Achieved	27
Benchmark Not Achieved	148
No WLA or benchmark	849

Table 12 Overview Summary Table of WLA Benchmark Achievements, 10/01/2017 - 06/30/2018

WLA Achieved	32
Benchmark Achieved	28
Benchmark Not Achieved	147
No WLA or benchmark	849

4.6.2.2 Estimate Progress Towards all Numeric Limits

The Permittee shall estimate annual progress towards all numeric limits in Subsection 1.5.3.1 of this permit for acres managed and pounds of trash in the Anacostia River.

The District continues to implement and enforce its Stormwater Management Program in accordance with the MS4 Permit and the Revised Stormwater Management Plan. This reporting year, the District has made progress towards achieving the numeric limits of section 1.5.3.1 of the District’s MS4 Permit, Table 13. Based on current implementation rates, DOEE expects to achieve or surpass the requirements by the end of this permit term.

Table 13 Annual Progress Towards Numeric Limits of the MS4 Permit for Trees Planted, Green Roofs Installed, and Trash Removed

Numeric Requirement	Achievement During Reporting Year	Percent Complete	Achievement During Permit Term
Achieve a minimum net increase of 33,525 trees in the MS4 Permit Area	8,918 trees	55.09%	18,468* trees
Install 350,000 square feet of green roofs within the MS4 Permit area	275,522 square feet	126.77%	443,707** square feet
Remove 108,347 pounds of trash annually from the Anacostia River	126,796 lbs	NA	Meeting annual trash reduction goal

*DOEE revised its 2019 tree total from 9,073 to 9,550 with updated information collected after submitting the 2019 annual report.

**DOEE also revised its 2019 green roof square footage from 139,165 to 168,185 with updated information collected after submitting the 2019 annual report.

DOEE has made progress towards the Acres Managed requirements of Section 1.5. The progress achieved during this reporting period is outlined in Table 14 Annual Progress Towards Numeric Limits of the MS4 Permit for Acres Managed, 07/01/2019 - 06/30/2020

Major Drainage Basin	Sewer shed	Regulated PROW (square feet)	Regulated Parcels (square feet)	Voluntary Retrofits (square feet)	Total (square feet)	Total (acres)	TMD L IP Target (acres)	Difference Between Actual and Target (acres)
Anacostia	MS4	171,686	2,903,904	913,491	3,989,082	92	110	(19)
	CSS	725,178	2,426,676	400,750	3,552,604	82	-	
	MS4 + CSS	896,864	5,330,580	1,314,241	7,541,685	173	-	
Rock Creek	MS4	2,833,729	241,283	1,119,212	4,194,224	96	30	66
	CSS	471,870	965,469	253,881	1,691,220	39	-	-
	MS4 + CSS	3,305,600	1,206,752	1,373,093	5,885,444	135	-	-
Potomac	MS4	510,019	1,297,351	328,299	2,135,669	49	67	(18)
	CSS	146,836	244,624	27,129	418,589	10	-	-
	MS4 + CSS	656,855	1,541,975	355,428	2,554,258	59	-	-
TOTAL	MS4	3,515,435	4,442,538	2,361,002	10,318,974	237	208	29
	CSS	1,343,884	3,636,768	681,760	5,662,412	130	-	
	MS4 + CSS	4,859,319	8,079,306	3,042,762	15,981,387	367	-	-

. During this reporting period, DOEE achieved their TMDL Implementation Plan targets for the Rock Creek watershed.

Table 14 Annual Progress Towards Numeric Limits of the MS4 Permit for Acres Managed, 07/01/2019 - 06/30/2020

Major Drainage Basin	Sewer shed	Regulated PROW (square feet)	Regulated Parcels (square feet)	Voluntary Retrofits (square feet)	Total (square feet)	Total (acres)	TMD L IP Target (acres)	Difference Between Actual and Target (acres)
Anacostia	MS4	171,686	2,903,904	913,491	3,989,082	92	110	(19)
	CSS	725,178	2,426,676	400,750	3,552,604	82	-	
	MS4 + CSS	896,864	5,330,580	1,314,241	7,541,685	173	-	
Rock Creek	MS4	2,833,729	241,283	1,119,212	4,194,224	96	30	66
	CSS	471,870	965,469	253,881	1,691,220	39	-	-

	MS4 + CSS	3,305,600	1,206,752	1,373,093	5,885,444	135	-	-
Potomac	MS4	510,019	1,297,351	328,299	2,135,669	49	67	(18)
	CSS	146,836	244,624	27,129	418,589	10	-	-
	MS4 + CSS	656,855	1,541,975	355,428	2,554,258	59	-	-
TOTAL	MS4	3,515,435	4,442,538	2,361,002	10,318,974	237	208	29
	CSS	1,343,884	3,636,768	681,760	5,662,412	130	-	-
	MS4 + CSS	4,859,319	8,079,306	3,042,762	15,981,387	367	-	-

4.6.2.3 Multi-faceted Suite of Indicators

Using all other data and information collected per the water quality assessment requirements of Part 4 of this permit, the Permittee shall establish a multi-faceted suite of indicators to be reported over multiple permit terms. These indicators shall address discharge quality as well as receiving water quality. These indicators shall balance current status with long-term trends in order to determine elements of the program that are effective and those needing additional improvement. This suite of indicators shall be developed in consultation with EPA and other stakeholders and finalized with submittal of the updated SWMP submitted to EPA as part of the application package for permit renewal per Section 2.10 of this permit. These indicators shall be established as long-term metrics for the SWMP and may be included as requirements in future permits.

DOEE is on track to meet this permit requirement and will be working with EPA and stakeholders to develop a multi-faceted suite of indicators that address discharge and receiving water quality.

4.6.3 Synthesis of Strengths and Weaknesses

In each annual report the Permittee shall provide a short synthesis of areas of the program deemed effective with ongoing effort, and areas where additional strategies are needed to effectively address certain pollutants or sources, supported by interpretation of both programmatic and watershed indicators. Conclusions shall be based on interpretations of the indicators.

Strengths

DOEE has had continued success implementing many stormwater management programs. Notable achievements include:

- Since the expiration of the last permit and through the end of this reporting period, the District has retrofitted 237 acres in the MS4 Permit area.
- The District has installed 275,552 square feet of green roof this reporting year.
 - Installed a sum total of ~4.8 million square feet of green roof throughout the District.
- Planted 8,918 net trees in MS4 area (accounting for mortality).
 - The Districtwide total of 13,653 trees planted this reporting year exceeds the annual tree planting rate (10,648 trees) needed to achieve the District's 40% tree canopy goal.
- Installed 18.7 acres of green infrastructure through the Stormwater Retention Credit (SRC) Price Lock Program, with another 5.3 acres in design, permitting, and/or construction.
- Continued the targeted trash and litter source control programs that include any food service product designed for single use, which includes foam and straws.
- Steady increase in compliance rates for bag law, foam ban, and coal tar ban inspections.

Weaknesses

DOEE has identified several program areas that could be improved: interagency coordination, pollution prevention, and fertilizer law enforcement.

1. The District has a number of mechanisms in place to ensure that coordination across all agencies with responsibilities to implement Permit provisions occurs. However, with the increasing complexity of the Stormwater Management Program DOEE has identified a need for increased sister agency coordination. Previous coordination activities included monthly Technical Working Group meetings and yearly Director level Stormwater Advisory Panel meetings. To improve, DOEE has elevated interagency coordination to include the following:
 - Working with the City Administrator, Deputy Mayor for Operations and Infrastructure (DMOI), and Executive Office of the Mayor to leverage funding, support, and set priorities.
 - Holding regular BMP maintenance meetings between DOEE, DDOT, and DPW staff.
 - Increasing sister agency coordination for pollution prevention measures and compliance at District facilities.
2. Since the last permit, DOEE has made large strides in District Pollution Prevention implementation. All District critical source facilities now have an approved SWPPP.

However, this is an area that is still in need of strengthening. Strategies that DOEE is using to improve this program are: increased interagency coordination, targeted Stormwater Pollution Prevention Plan development efforts, and increased municipal staff training.

3. The District has been implementing the outreach components of the Anacostia River Clean Up and Protection Fertilizer Act of 2012. DOEE created a website and outreach materials for retailers, distributors, and lawn care professionals. DOEE is currently updating delegations of authority that will assign the inspection and compliance component internally.

6 EPA CONSENT AGREEMENT REPORTING

As required, DOEE is posting the Consent Order Status Report concurrently with the MS4 Annual Report. This report will be posted to DOEE's website on December 23, 2020 and will be found at: <https://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports>.