District of Columbia Water and Sewer Authority
George S. Hawkins, General Manager

Briefing on:

Implementing Green Infrastructure For DC Water's DC Clean Rivers Project

Briefing for:

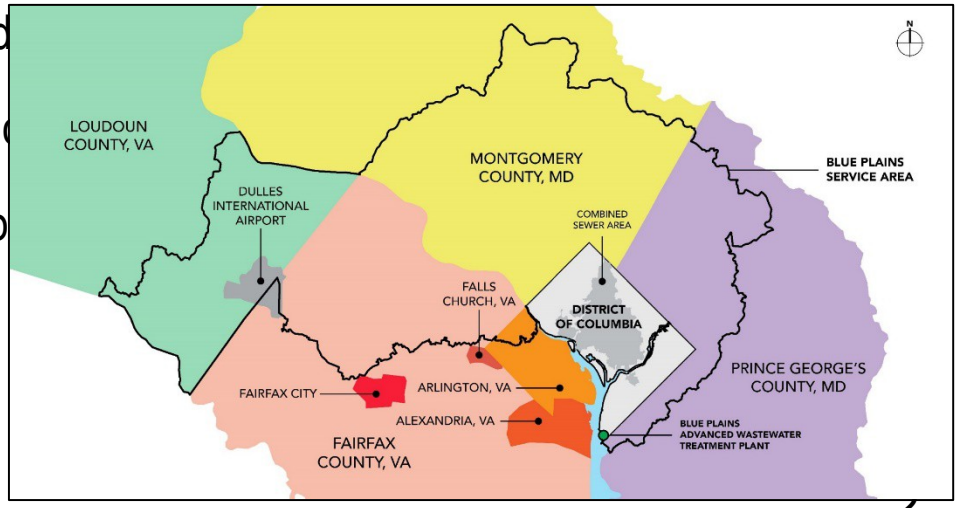
Stony Brook-Millstone Watershed Association's Watershed Stormwater Conference

December 11, 2017

DCWATER.COM

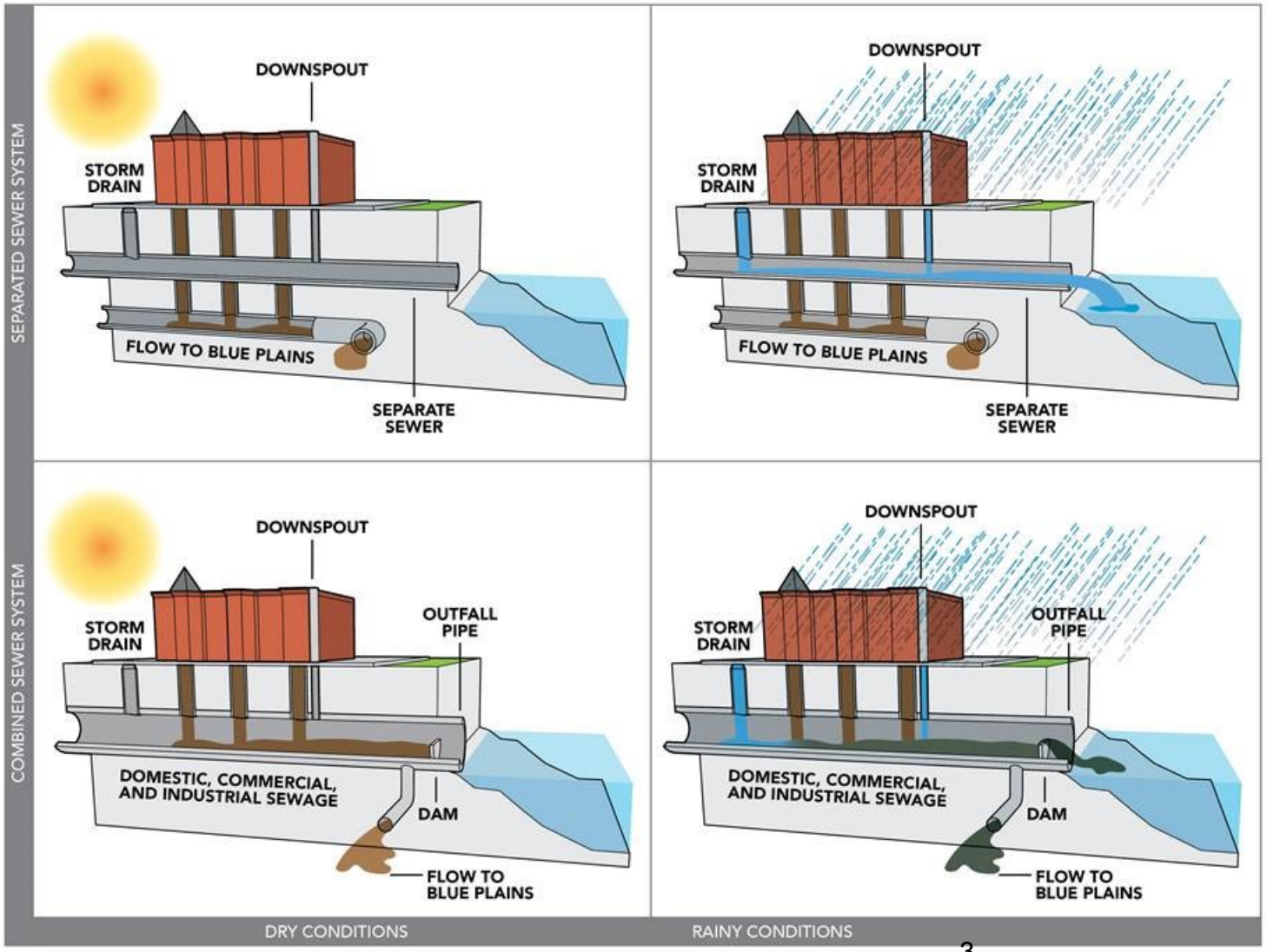
DC Water Overview:
Who We Are

- Serving a regional area of approx. 725 square miles with:
  - Drinking water distribution for the District
  - Wastewater collection and treatment
  - Stormwater collection and conveyance
- Treating wastewater for a population of 2.1 million in:
  - The District; Montgomery & Prince George's Counties, MD; Fairfax & Loudoun Counties, VA
- Operating the world
  - Average daily
  - Peak daily cap



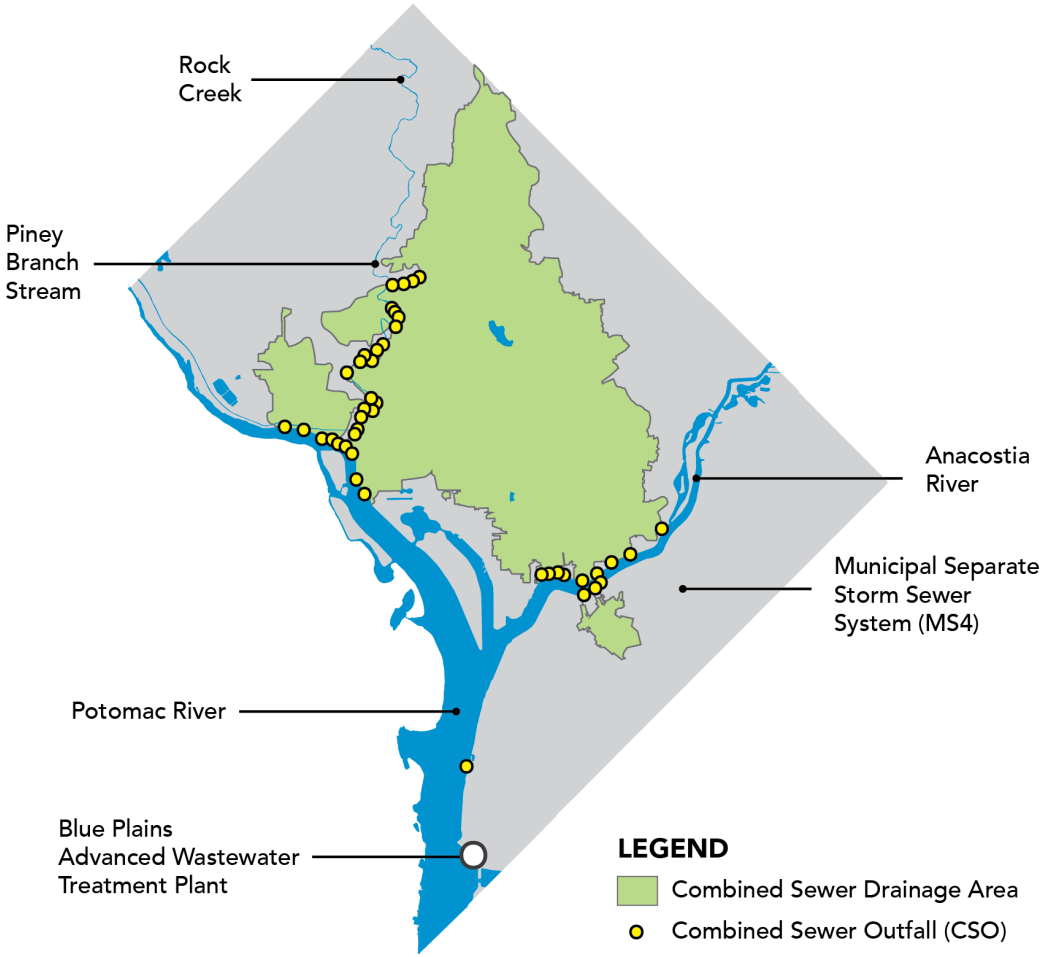
DC Water Service Area

DC Water Overview:
Sewer Systems in DC



*Discharge occurs when pipe's capacity is exceeded

DC Water Overview:
Where is the Combined Sewer System Located?



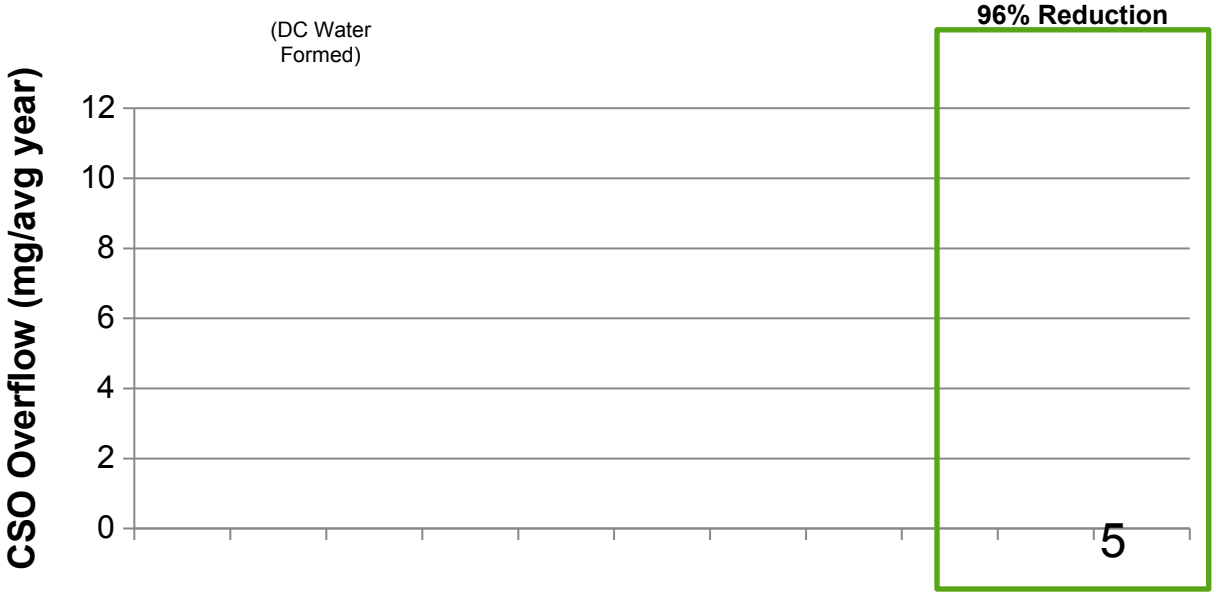
- Combined Sewer System Covers 1/3 of the District (12,478 acres)
- 47 Active CSO outfalls
  - 13 to Anacostia
  - 10 to Potomac
  - 24 to Rock Creek
- Three receiving waters
  - Anacostia River
  - Potomac River
  - Rock Creek

DC Water Overview:
Magnitude of the Problem, DC Water's Solution

CSO 017 Overflowing

Trash in the Anacostia River

CSO 049 Overflowing



Predicted Progress in Controlling CSOs

dc clean RIVERS PROJECT

DC Water Green Infrastructure Overview:

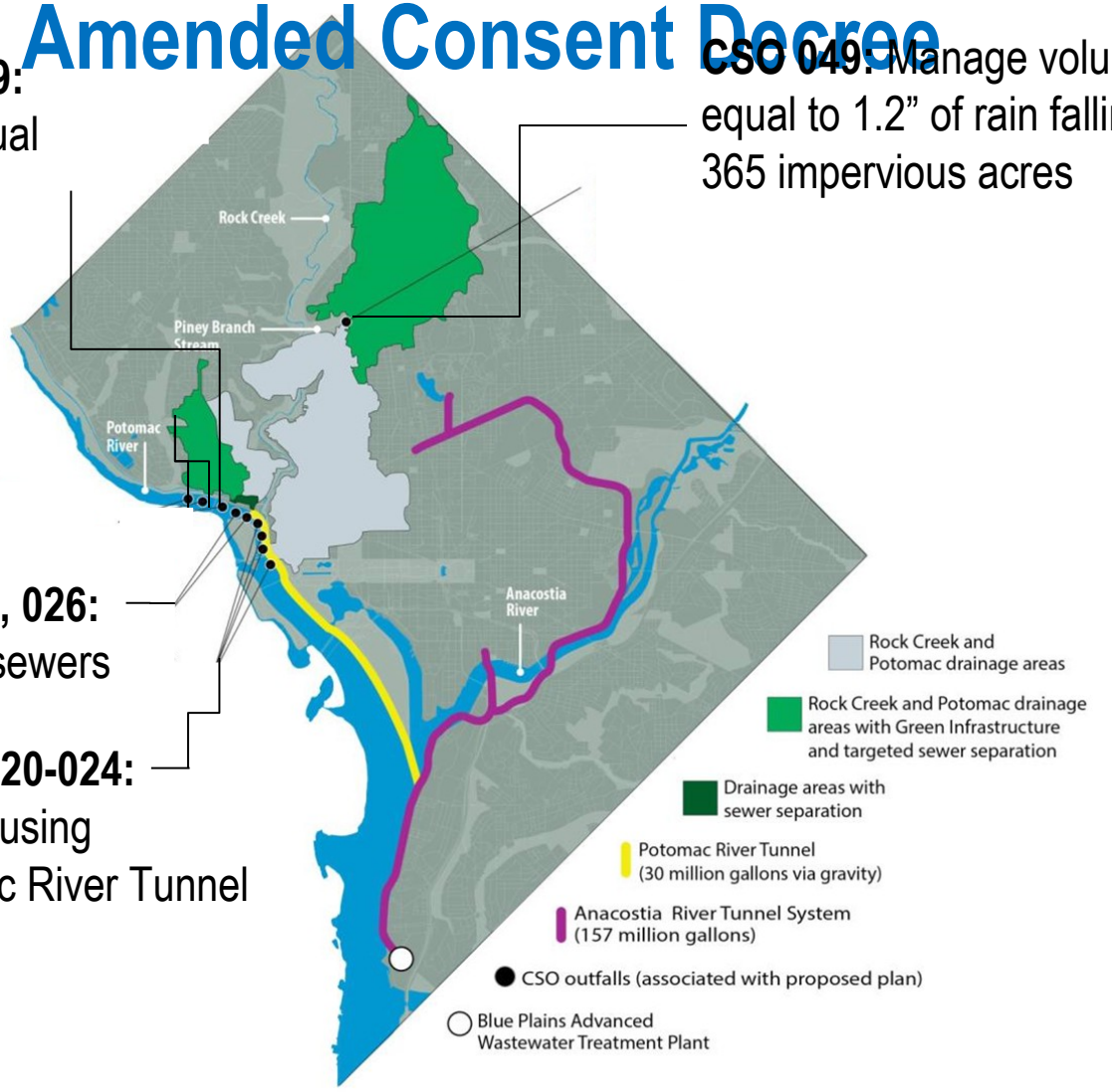
DC Water's Amended Consent Decree

CSOs 027, 028, 029: Manage volume equal to 1.2" of rain falling on 133 impervious acres

CSO 049: Manage volume equal to 1.2" of rain falling on 365 impervious acres

CSOs 025, 026: Separate sewers

CSOs 020-024: Control using Potomac River Tunnel



dc clean RIVERS PROJECT

DC Water Green Infrastructure Overview:
DC Water's Program Drivers

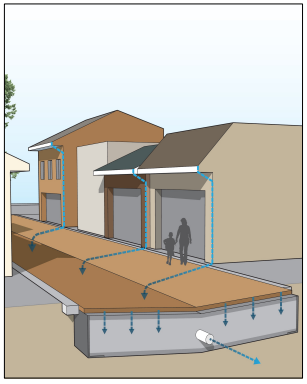
- Volume Management (Gallons)
  - Control Combined Sewer Overflows
- Cost Effectiveness
  - Responsibility to Rate Payers
- Maintenance/Asset Management
  - Safety
  - Aesthetics
  - Performance
- Outreach
  - Coordination with Agencies
  - Build Public Awareness and Stewardship
- Triple Bottom Line Benefits

DC Water's Green Roof on Fort Reno Reservoir

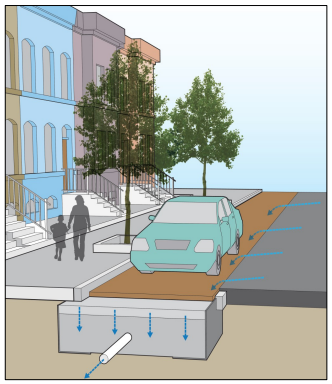
DC Water Green Infrastructure Overview:
DC Water's GI for Right-of-Way

Curb Extension Bioretention

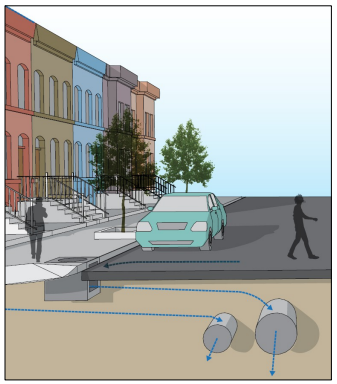
Planter Bioretention



Permeable Alley



Permeable Parking Lane



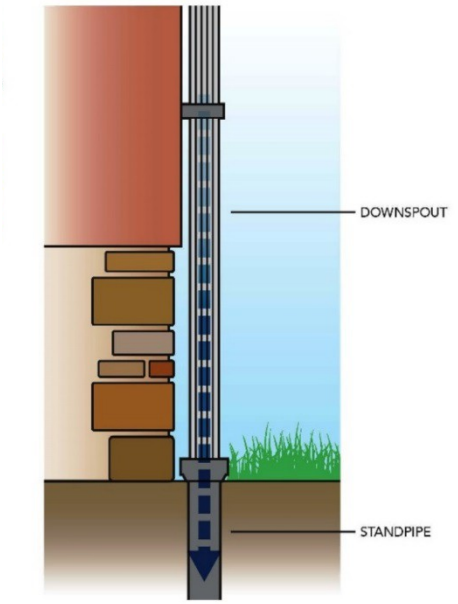
Sewer Separation

In addition to meeting Consent Decree requirements, siting and design goals are:

- Minimize temporary and long-term impacts to community
- Match character and aesthetic of neighborhoods
- Provide infrastructure upgrades by prioritizing areas for implementation
- Provide ancillary benefits to community
- Coordinate work with other entities (DDOT, other utilities, etc.)

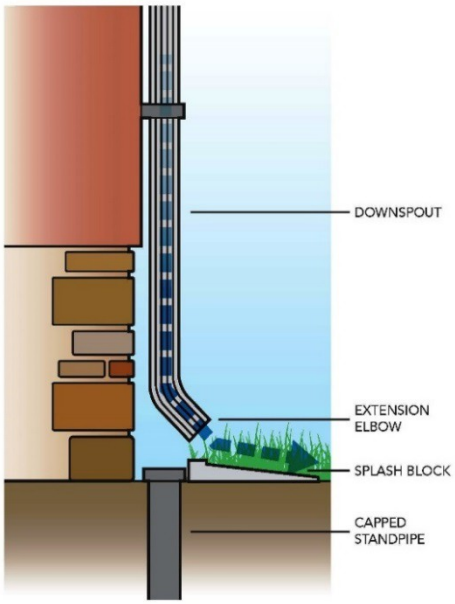
DC Water Green Infrastructure Overview:
DC Water's GI for Private Property

- Voluntary & Free Downspout Disconnection Program with Rain Barrels



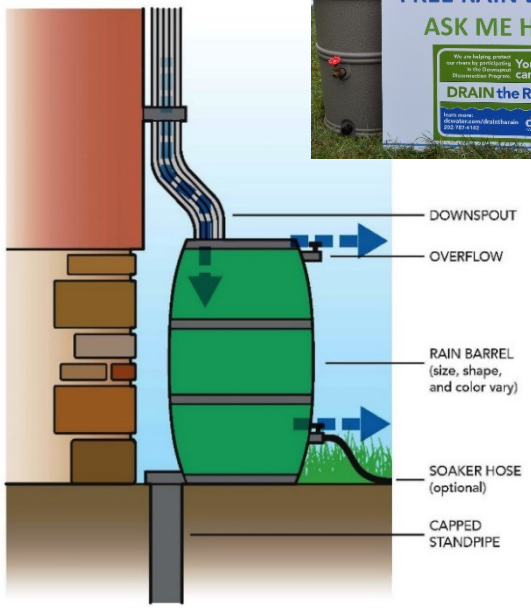
DOWNSPOUT CONNECTED TO SEWER SYSTEM

Downspouts connected directly to the combined sewer system contribute to combined overflows.



DOWNSPOUT DISCONNECTED FROM SEWER SYSTEM

Downspout disconnection process includes cutting the downspouts; attaching elbows, extension, and splash blocks to direct the water to an adjacent pervious area; and capping the standpipe.

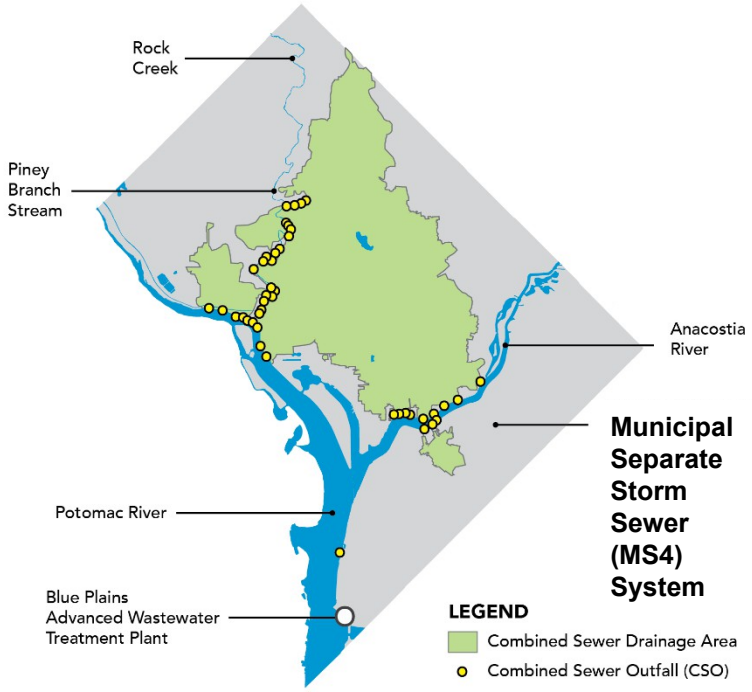


DOWNSPOUT CONNECTED TO RAIN BARREL

Downspouts can be connected to a rain barrel so that stormwater is collected and stored for non-potable uses (i.e., exterior washing, gardening).

Bioretention in Right-of-way

DC's Green Infrastructure Overview:
DC Government Manages the MS4 Area



- DC Water manages stormwater within the combined sewer area
- NPDES/MS4 permit is managed by DC's Department of Energy and Environment (DOEE)
- DOEE created and enforces the 2013 Stormwater Rule
  - Requires Green Infrastructure to manage onsite stormwater for development projects
  - Created the Stormwater Retention Credit Trading for projects that are unable to manage onsite stormwater with GI

DC Water's Funding:
Rate Payer Funded via Impervious Area Charge

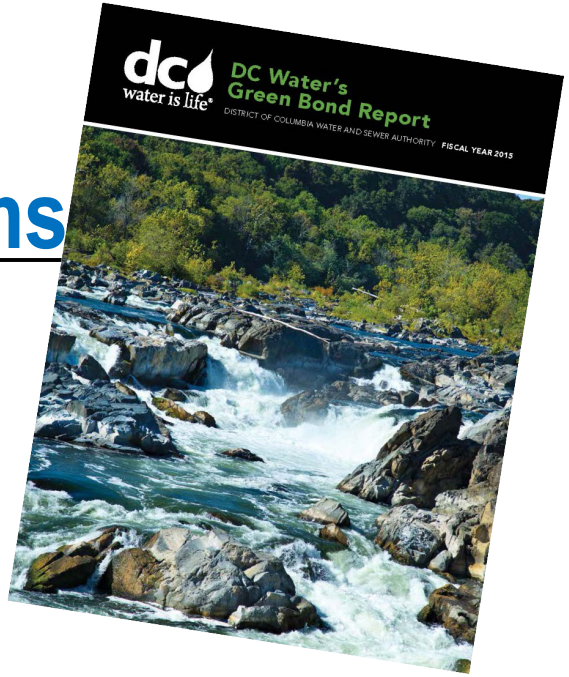
	Units	Current FY 2016	Proposed 4.75% FY 2017	Proposed 5.0% FY 2018
DC Water and Sewer Retail Rates (1)	Ccf	$ 54.56	$ 57.17	$ 60.05
DC Water Clean Rivers IAC	ERU	20.30	22.24	25.18
DC Water Customer Metering Fee	5/8"	3.86	3.86	3.86
DC Water Water System Replacement Fee (3)	5/8"	6.30	6.30	6.30
Subtotal DC Water Rates & Charges		**$ 85.02**	**$ 89.57**	**$ 95.39**
Increase / Decrease		$ 10.97	$ 4.55	$ 5.82
District of Columbia PILOT (1)	Ccf	$ 2.91	$ 2.98	$ 3.04
District of Columbia Right-of-Way Fee (1)	Ccf	1.05	1.05	1.12
District of Columbia Stormwater Fee (2)	ERU	2.67	2.67	2.67
Subtotal District of Columbia Charges		**$ 6.63**	**$ 6.70**	**$ 6.83**
Total Amount Appearing on DC Water Bill		**$ 91.65**	**$ 96.27**	**$ 102.22**
Increase / Decrease Over Prior Year		**$ 11.03**	**$ 4.62**	**$ 5.95**
Percent Increase in Total Bill		**13.7%**	**5.0%**	**6.2%**

(1) Assumes average monthly consumption of 6.20 Ccf, or (4,638 gallons)

(2) District Department of the Environment stormwater fee of $2.67 effective November 1, 2010

(3) DC Water "Water System Replacement Fee" of $6.30 for 5/8" meter size effective October 1, 2015

DC Water's Financing:
Innovative Financing Mechanisms



- Green Bond (2014)
  - First municipal century bond issued by water/wastewater utility in US
  - First 'certified' green bond in US with independent second party sustainability opinion (Vigeo)
- Environmental Impact Bond (September 29, 2016)
  - First Environmental Impact Bond in US
  - Private placement to Goldman Sachs and Calvert Foundation

Performance Tier	Outcome Ranges	Contingent Payment
1	Runoff reduction > 41.3%	DC Water makes Outcome Payment of $3.3 Million
2	18.6% ≤ Runoff reduction ≤ 41.3%	No Contingent Payment
3	Runoff reduction < 18.6%	Investors make Risk Share Payment $3.3

DC Water's Green Infrastructure Implementation: National Green Infrastructure Certification Program

- Initiated under the leadership of DC Water and the Water Environment Federation (WEF), the National Green Infrastructure Certification Program (NGICP):
  - Sets national certification standards for GI <u>construction, inspection, and maintenance</u> workers
  - Designed to meet international best-practice standards, the certification advances the

DC Water's Green Infrastructure Implementation:

It's all about the people!

Rock Creek Project A Kickoff Event – October 23, 2017

Raymond Coates (NGICP Certified, Hired by Anchor Construction)

Thank You

Bethany Bezak, PE, LEED AP

Green Infrastructure Manager

DC Water, DC Clean Rivers Project

Email: Bethany.Bezak@dcwater.com

Phone: 202-787-4466

DC Water's East Side Pumping Station Green Roof