

WASHINGTON SUBURBAN SANITARY DISTRICT

GREEN BOND FRAMEWORK



August 17, 2020

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1. INTRODUCTION

The Washington Suburban Sanitary Commission (WSSC Water) provides water and sewer services to nearly 1.8 million residents of Maryland’s Montgomery and Prince George’s Counties, which border Washington, D.C. Established by the Maryland General Assembly in 1918 as a regional (bi-county) organization under Article 29 and later recodified into Division II of the Public Utilities Article of the Annotated Code of Maryland, WSSC Water ranks among the largest water and sewer utilities in the country encompassing a service area of nearly 1,000 square miles.

To fulfill its primary mission of providing safe and reliable water and returning clean water to the environment, WSSC Water operates and maintains an extensive array of highly automated facilities. The organization’s two water filtration plants, drawing raw water from the Potomac and Patuxent rivers, are projected to produce an average of 164 million gallons of water per day in FY 2020 and deliver that water through a system of over 5,772 miles of water mains to homes and businesses in Montgomery and Prince George’s Counties, serving over 460,000 customer accounts.



WSSC Water is committed to protecting the natural environment of Prince George’s and Montgomery Counties as it carries out its mandate to provide sanitary sewer and drinking water services. This commitment is reflected in the organization’s core value, environmental stewardship, which serves to guide and incorporate behavior and decision making into the organization’s investments into green buildings, pollution prevention and control, renewable energy, water quality, and climate change adaptation. WSSC Water’s commitment to sustainability is reflected in our energy management program; in our Green House Gas reduction program; and local educational activities. Examples include:

- Purchasing wind power to accommodate up to 30% of our energy needs;
- Using solar power to generate on average 17% of the electricity required to operate the two plants;
- Generating hydropower at two of our Dam facilities;
- Designing and construction of the Piscataway Bio-Energy Plant which will generate 24 million British Thermal Units (MMBTU) per hour of renewable natural gas from wastewater and 3 megawatts (MW) of electricity from clean, natural gas capable of powering the entire plant on a continuous basis;
- Adopting a greenhouse gas (GHG) emission reduction goal. This goal will reduce emissions 10 percent every five years through 2050 for a total reduction of 80 percent (below the baseline year of 2005);
- Partnering with Montgomery County GreenFest, where WSSC Water will teach approximately 500-600 customers how they can reduce their carbon footprint; and

- Teaching 600 fourth graders from Prince George’s and Montgomery counties about the environment at WSSC Water’s Children’s Water Festival. In its 10 years, more than 5,700 children have attended.

In line with these sustainability objectives, WSSC Water is planning to issue Green Bonds related to several selected green projects.

2. FRAMEWORK

In support of the Green Bonds to be issued by WSSC Water, a framework has been created that follows the four pillars of the Green Bond Principles (“GBP”):

- Use of Proceeds;
- Evaluation and Selection Process;
- Management of Proceeds; and
- Reporting.

2.1 Use of Proceeds

Eligibility Criteria

To be eligible for the Green Bond proceeds, the projects to be funded must meet criteria in one or more of the following areas:

1. Green buildings
2. Pollution prevention and control;
3. Renewable energy;
4. Water quality and/or
5. Climate change adaptation.

The context: Working to protect clean water, WSSC Water in 2005 joined then U.S. Representative Chris Van Hollen, Lieutenant Governor Michael S. Steele and representatives from the Anacostia Watershed Society, Natural Resources Defense Council Audubon Naturalist Society, and Friends of Sligo Creek to announce agreement on a multiyear action plan to dramatically minimize and where possible eliminate sanitary sewerage overflows. A sanitary sewer overflow (SSO) is an event where untreated or partially treated wastewater discharge from a sanitary sewer system into the surrounding areas.

Working closely with its partners at the federal, state and local levels, WSSC Water developed a proactive, comprehensive plan that augments existing efforts to maintain, identify and rehabilitate problem areas within its 5,500-mile sewer system. Investment actions by the organization will enhance its ability to meet the public health needs of our customers and protect the environment.

In 2003, WSSC Water also implemented an Energy Performance Program that provides for the planning, design and construction of projects to replace and upgrade energy consuming equipment

and systems at all its facilities. The program's objective is to reduce energy consumption and energy-related costs (electricity, fuel oil, natural gas, or other fuel), as well as WSSC Water's overall carbon footprint.

Use of proceeds: WSSC Water has identified candidate projects aimed at making its infrastructure more green. The projects involve one or more of the following activities:

Green buildings

- Installation of high-efficiency heating, ventilating and air conditioning units;
- Installation of high-efficiency LED lighting fixtures;
- Use of cool roof materials; and
- Installation of high-efficiency water and wastewater processing equipment, pumps, motors, and valves.

Pollution prevention and control

- Lead clean-up and removal;
- Protection of environmentally sensitive areas from sewer overflow;
- Construction of new sewer, storm drain and recycled water supply systems;
- Sewer system rehabilitation to prevent overflow in waterways;
- Sewer line blockage assessments; and
- Enhance nutrient removal (nitrogen and phosphorus) and discharge processes to protect waterways.

Renewable energy

- Installation of new equipment and systems to produce bio-gas and electricity.

Water quality

- Sewer and water line reconstruction for cleaner drinking water;
- Leak detection technologies;
- Advanced mixing systems;
- Installation of technologies to reduce chemical use; and
- Construction of intake channel to reduce drinking water contamination and treatment.

Climate change adaptation

- Address safety standards including the Probable Maximum Flood criteria and maximum credible earthquake loadings;
- Install enhanced power reliability equipment at water resource recovery facilities and wastewater pumping stations to prevent sanitary sewer overflows; and
- Reduce biosolids production to enhance health of Chesapeake Bay and reduce greenhouse gas emissions and other air pollutants.

Projects focused on the activities above are eligible to be funded in whole or in part by an allocation of the Green Bond proceeds. WSSC Water has selected the projects listed in Appendix A for the allocation of proceeds of its initial series of Green Bonds.

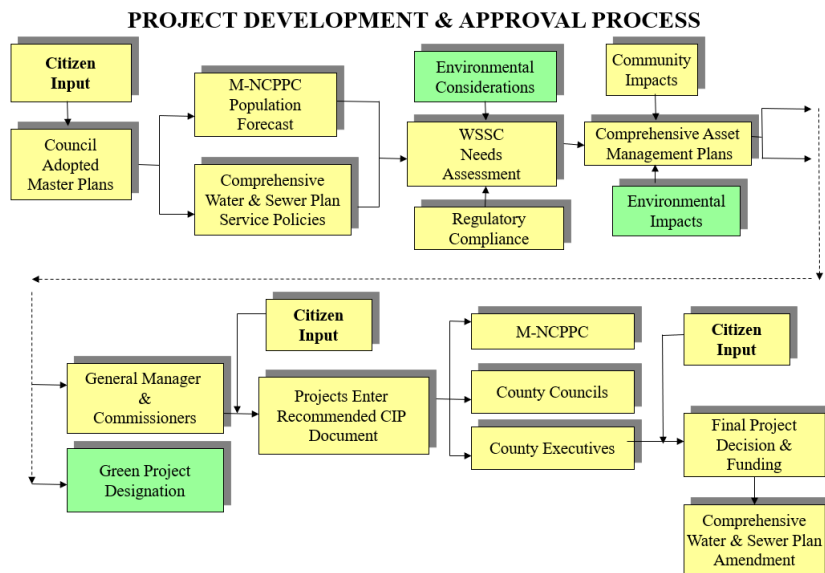
2.2 Project Evaluation and Selection Process

WSSC Water has a rigorous and comprehensive process for the planning and programming of capital projects. Projects financed or refinanced through the Green Bond proceeds are evaluated and selected based on (i) alignment with the 30-year asset management plan (AMP); (ii) business case studies (identify need, options, and preferred solution); and (iii) a thorough vetting process for review and final approval.

Overview of WSSC Water's AMP Process		
Genesis and Validation	Business Case Development	Review and Approval
Asset Management Plans: <ul style="list-style-type: none"> • Establishment of Need • Need Validation • Funding 	Technical Analysis and Documentation: <ul style="list-style-type: none"> • Coordination • Community Outreach • Project Validation • Solution Recommendation 	<ul style="list-style-type: none"> • Project Prioritization • Public Comment • County Governments • WSSC Water's CIP
Project Implementation		

WSSC Water advocates and supports conduct for environmental management that will:

1. Ensure this environmental policy is communicated to WSSC Water staff, its customers, and the community;
2. Ensure compliance with all applicable environmental laws and regulations;
3. Ensure environmental considerations include feasible and cost-effective options for exceeding applicable regulatory requirements;
4. Define and establish environmental objectives, targets, and best management practices and monitor performance;
5. Ensure WSSC Water maintains a Customer Outreach Program to address common environmental issues; and
6. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations through environmental awareness and communication with employees, customers, regulatory agencies, and neighboring communities.



WSSC Water is committed to the spirit and intent of this evaluation and selection process, as well as to the established project development and approval process.

All projects financed with Green Bond proceeds are selected based on their adherence to the conduct stated as part of WSSC Water's environmental management and all applicable laws, rules and regulations. In addition, all selected projects have been reviewed against WSSC Water's Environment

Statement (Appendix F) and a stakeholder consultation process. Looking to the future, WSSC is in the fifth and final year of development of its Climate Change Vulnerability Assessment, Adaption, and

Mitigation Planning (CCVAAMP) Project. Starting in 2016, WSSC undertook an ambitious approach to responding to the threat of climate change and the unique challenges it will present to water and wastewater utilities.

The CCVAAMP project has included climate analysis and projections, a vulnerability assessment of WSSC facilities and resources, an adaptation analysis, and mitigation planning. With 49 facilities located in or near floodplains, WSSC has several current and future challenges associated with climate change. To address this a “Design Guide for Protecting Facilities from Future Climate Extremes” has been drafted and ten facility assessments have been completed. In addition, we are developing a WSSC greenhouse gas inventory as well as planning and implementing strategies to reduce our GHG emissions over the next fifteen years. The facility recommendations of the CCVAAMP will have a significant impact on future capital project planning and development.

2.3 Management of Proceeds

Proceeds from Green Bond issuance will be specifically directed to pay the costs of design, construction, property acquisition, and other related costs necessary for selected projects. Ensuring that the proceeds from a Green Bond issuance are used according to established procedures will be the responsibility of WSSC Water’s Chief Financial Officer and Division Manager of Accounting.

WSSC Water’s Green Bond proceeds will be held in a segregated account and used exclusively to fund a new project or refinance a portion of a prior bond issuance which funded eligible green projects. Green Bond proceeds may also be used to pay the cost of issuance and underwriter’s fees. These costs will be specifically delineated in closing documents.

Any portion of a series bond that is refunded would be determined by reviewing the applicable series’ bond drawdown statements and identifying proceeds that were drawn down for eligible Green Bond Projects.

In the case of refunding, all the funds will be allocated immediately, as no bond proceeds will be used to initiate new projects.

2.4 Reporting

Allocation Reporting

New Projects:

WSSC Water will produce an annual report detailing how the Green Bond proceeds were used to finance the selected projects, a description of the selected projects, and details of the environmental benefits resulting from the project. Such information will be posted to the Electronic Municipal Market Access (EMMA) website of the Municipal Securities Rulemaking Board, accessible at www.emma.msrb.org. This report will be posted along with other WSSC Water filings, which will be made on or before the date eight months after the close of the fiscal year.

Refunded Projects:

In the future, Green Bond proceeds will be used to refund prior debt issuance. The annual report following such future issuance will include the relevant details of the selected projects that were financed by the initial issuance. However, WSSC Water does not plan such a refunding at this time.

Impact Reporting

WSSC Water commits to provide reporting on key performance indicators (KPIs) in the “Sustainability” section of the WSSC Water website.

For an example of this KPI reporting for eligible projects, please see Appendix B.

3. SELECTED PROJECTS

Based on the project criteria and project planning and development articulated above, WSSC Water proposes the following projects to be financed with the proceeds of its second series of Green Bonds in September 2020:

Description: Potomac WFP Consent Decree Program (W-73.33)
Anticipated Environmental Outcomes per International Capital Market Association (ICMA) Green Bond Principles: Pollution Prevention/Control
KPI: Increase in the percent of river solids removed
Estimated Cost: \$16,000,000
Estimated Timeline: July 2020 through September 2021

Description: Potomac WFP Pre-Filter Chlorination & Air Scour Improvements (W-73.22)
Anticipated Environmental Outcomes per International Capital Market Association (ICMA) Green Bond Principles: Sustainable Water Management
KPI: Reduce the amount of water used for filter backwash process
Estimated Cost: \$60,000
Estimated Timeline: July 2020 through September 2021

Description: Large Diameter Water Pipe & Large Valve Rehabilitation Program (W-161.01)
Anticipated Environmental Outcomes per International Capital Market Association (ICMA) Green Bond Principles: Sustainable Water Management
KPI: Miles of large diameter water mains replaced annually
Estimated Cost: \$35,000,000
Estimated Timeline: July 2020 through September 2021

Further detail on these projects can be found on Appendices A, B, and G.

APPENDICES

Appendix A: Eligible Projects

The following table provides a project description, amount, and indicates the ICMA Green Bond Principles 2016 category for each eligible project funded/refunded by the Green Bond. See Appendix G for definitions

Project name	Project description	Amount (USD)	Renewable Energy	Energy Efficiency	Pollution prevention /control	Sustainable management of living natural resources	Terrestrial and aquatic biodiversity conservation	Clean transportation	Sustainable water management	Climate change adaptation	Eco-efficient products, production technologies and processes	Green Building
Potomac WFP Consent Decree Program (W-73.33)	The Potomac WFP Consent Decree Program provides for the planning, design, and construction required for the implementation of Short-Term Operational and Long-Term Capital Improvements at the Potomac Water Filtration Plant (WFP) to allow WSSC Water to meet the new discharge limitations identified in the Consent Decree.	\$16,000,000			✓							
Potomac WFP Pre-Filter Chlorination & Air Scour Improvements (W-73.22)	This project provides for the planning, design, and construction of a pre-filter chlorination system and filter air scour system for the Potomac Water Filtration Plant. The Potomac Water Filtration Plant experienced fourteen separate incidents of catastrophic filter underdrain failure from October 2006 through FY'17, including three filters that failed twice.	\$60,000							✓			

ICMA Green Bond Principles category definitions can be found on Appendix G.

Project name	Project description	Amount (USD)	Renewable Energy	Energy Efficiency	Pollution prevention / control	Sustainable management of living natural resources	Terrestrial and aquatic biodiversity conservation	Clean transportation	Sustainable water management	Climate change adaptation	Eco-efficient products, production technologies and processes	Green Building
Large Diameter Water Pipe & Large Valve Rehabilitation Program (W-161.01)	The purpose of this Program is to plan, inspect, design, and rehabilitate or replace large diameter water transmission mains and large system valves that have reached the end of their useful life. Condition assessment and/or corrosion monitoring is performed on metallic pipelines, including ductile iron, cast iron, and steel, to identify lengths of pipe requiring replacement or rehabilitation and cathodic protection. Rehabilitation or replacement of these mains provides value to the customer by minimizing the risk of failure and ensuring a safe and reliable water supply.	\$35,000,000							✓			

ICMA Green Bond Principles category definitions can be found on Appendix G.

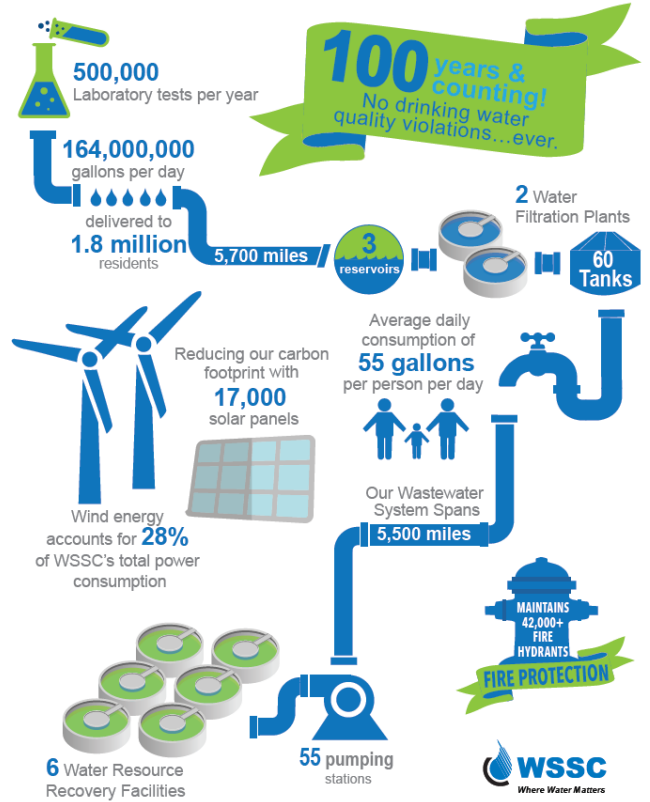
Appendix B: Project KPI Reporting

Project	Category	KPI	Target Result Description	Status
Potomac WFP Consent Decree Program	Solid Discharge Reduction	Increase in the percent of river solids removed	Beginning no later than August 1, 2019, dewater and remove at least 50% of the river intake solids (dry weight equivalent) in addition to the dry weight equivalent of the annual tons of solids resulting from the addition of water treatment chemical due to facility improvements.	Project is proceeding slightly ahead of schedule. Long-term improvements are currently in design. Short-term improvements expected completion later this fall. Solids removal has improved to more than 66%.
Potomac WFP Pre-Filter Chlorination & Air Scour Improvements	Sustainable Infrastructure	Reduce the amount of water used for filter backwash process	Air scour augmentation of the filter backwash process has been shown to significantly improve the efficiency of the backwash process, reduce the amount of water that will need to be used, and improve filter performance.	Project bids came in lower than budgeted, minor Covid-19 related delays slowed project in FY 2020. Once new air scour system is online and configured the backwash process efficiency will improve, reducing the amount of water required.
Large Diameter Water Pipe & Large Valve Rehabilitation Program	Sustainable Infrastructure	Miles of large diameter water mains replaced annually	This program is scheduled to replace a minimum of 4.0 miles of large diameter water mains (16 inches in diameter or greater) in FY 2020. Since FY 2018, WSSC Water has replaced 9.9 miles of large diameter water mains.	Although the Covid-19 pandemic impacted work on the largest diameter pipes, work on 16 to 24-inch pipes surpassed our goals. In FY'20, we completed 4.7 miles of large diameter pipe work.

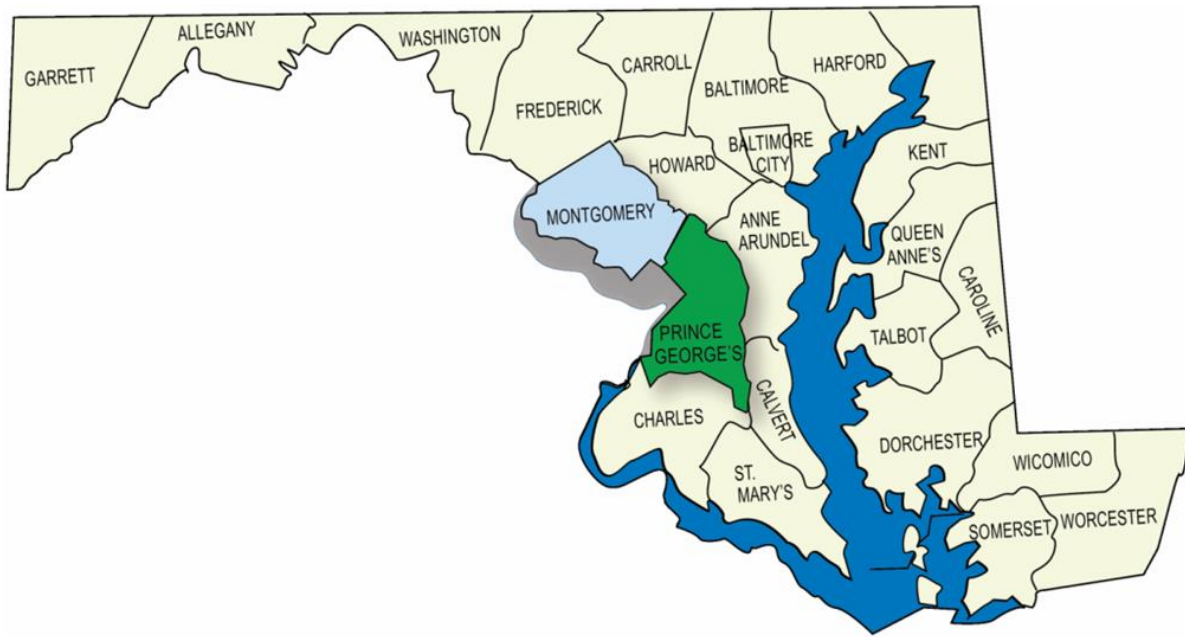
Appendix C: Bi-County Washington Suburban Sanitary District

WSSC WATER At- A Glance

- 2 Water Filtration Plants
- 6 Water Resource Recovery Facilities
- 3 Water Storage Dam/Reservoirs
- 60 Water Storage Tanks
- 55 Wastewater Pumping Stations (WWPS)
- 42,000+ Fire Hydrants
- 17,000 Solar Panels
- 0 Water Quality Violations



MAP



Appendix D: WSSC Water Governance

A six-member commission governs WSSC Water - three members from each County. The Commissioners are appointed to four-year terms by their respective County Executives and confirmed by their County Councils. The Commission's powers and responsibilities are set forth in Division II of the Public Utilities Article of the Annotated Code of Maryland and in any subsequent legislative amendments. The Maryland General Assembly conferred these powers upon the WSSC Water to enable it to fulfill its principal functions:

- To provide for the construction, operation, and maintenance of water supply and sanitary sewerage systems in Montgomery and Prince George's Counties;
- To provide for the construction of water and sewer house connection lines from WSSC Water's mains to abutting property lines;
- To approve the locations of, and issue permits for, utilities installed in public ways; and
- To establish water consumption rates, sewer usage rates, connection charges, front foot benefit charges, and permit fees and, if required, to cause appropriate ad valorem taxes to be levied.

The WSSC Water Strategic Priorities are reviewed and adopted by the Commission, including updates when recommended by management. The Priorities are crucial to not only guiding every decision WSSC Water makes in support of their customers, but in the achievement of their clean water mission.

Appendix D: WSSC Water Governance (Continued)

WSSC Water Commissioners



Howard A. Denis
Chairman
Montgomery County



Keith E. Bell
Vice-Chair
Prince George's County



Fausto R. Bayonet
Commissioner
Montgomery County



Chris Lawson
Commissioner
Prince George's County



T. Eloise Foster
Commissioner
Montgomery County



Sandra L. Thompson
Commissioner
Prince George's County

WSSC Water General Manager/CEO



Carla A. Reid serves as General Manager and Chief Executive Officer (GM/CEO) at WSSC Water (Washington Suburban Sanitary Commission) since 2016. She is the first woman to serve in this capacity. Ms. Reid is a civil engineer and senior executive with more than 30 years of business and leadership experience in the public sector.

Appendix E: WSSC Water Who We Are

OUR MISSION: We are entrusted by our community to provide safe and reliable water, life's most precious resource, and return clean water to our environment, all in an ethical, sustainable, and financially responsible manner.

OUR VISION: To be THE world-class water utility, where excellent products and services are always on tap.

OUR VALUES: Our guides for daily behavior and decision making at every level include:

Accountability: We are responsible employees who act ethically, are accountable, and conduct ourselves with integrity and transparency.

Collaboration: We work as a team across the organization to fulfill the needs of our customers.

Environmental Stewardship: We continuously enhance and protect natural resources and the environment for the health of future generations.

Excellence: We achieve the highest level of quality, safety, productivity, and cost-effectiveness, demonstrating world class service to everyone.

Innovation: We promote creativity to develop new products, streamline processes and enhance services.

OUR STRATEGIC PRIORITIES: Our methods for achieving our Mission and Vision:

Enhance Customer Experience:

- Deliver Safe, Reliable and Consistent Service
- Provide Timely Response to Customer Queries
- Be a Good Citizen Within Our Communities

Optimize Infrastructure:

- Achieve Industry-Leading Reliability and Asset Integrity
- Expand Resilience and Balance Risk

Protect our Resources:

- Resolve and Learn from Past Incidents
- Maintain Best-in-Class Operating Environment Safety for Employees
- Plan Proactively with Community Stakeholders
- Secure WSSC Water's Critical Infrastructure

Spend Customer Dollars Wisely:

- Improve Operational Efficiency
- Improve Fixed Asset Utilization
- Improve Financial Process Efficiency and Fiscal Sustainability

Transform Employee Engagement:

- Acquire the Best People
- Retain Top Performers
- Develop and Grow Talent
- Communicate Effectively

Appendix F: WSSC Water Environmental Statement

WSSC Water is committed to protecting the natural environment of Prince George's and Montgomery Counties as it carries out its mandate to provide sanitary sewer and drinking water services. This commitment focuses on those unique natural and manmade features (waterways, woodlands, and wetlands, as well as parklands, historical sites, and residential areas) that have been indicated by federal, state, and local environmental protection laws and regulations. Specific impact information is included in the evaluation of alternatives during the organization's Asset Management Process, if the environment features will be affected by the proposed construction of a project. Six primary areas are addressed as appropriate:

- Stream Valleys – identify the classification of the stream and, in general terms, the published water quality. From published maps, show the topography including the 100-year floodplain;
- Wetlands (Tidal and Non-tidal) – using published maps, show the locations of these and give their classification;
- Woodlands or Forested Areas – using aerial photographs or published maps, show the location of these and identify their type;
- Parklands – using published maps, show the location of all land holdings of the Maryland-National Capital Park & Planning Commission, the Department of Natural Resources, and the National Park Service;
- Steep Slopes – using published maps, show all slopes greater than 15%; and,
- Historical/Archaeological Sites – the Maryland Geological Survey (State Archaeologist) and Maryland Historical Trust will provide information on sites near the project alternatives. The Maryland-National Capital Park & Planning Commission or county government may provide additional information of local interest.

Appendix G: Green Project Categories (ICMA June 2018)

The eligible Green Project categories, listed in no specific order, include, but are not limited to:

- **Renewable energy** (including production, transmission, appliances and products);
- **Energy efficiency** (such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products);
- **Pollution prevention and control** (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/emission-efficient waste to energy);
- **Environmentally sustainable management of living natural resources and land use** (including environmentally sustainable agriculture; environmentally sustainable animal husbandry; climate smart farm inputs such as biological crop protection or drip-irrigation; environmentally sustainable fishery and aquaculture; environmentally-sustainable forestry, including afforestation or reforestation, and preservation or restoration of natural landscapes);
- **Terrestrial and aquatic biodiversity conservation** (including the protection of coastal, marine and watershed environments);
- **Clean transportation** (such as electric, hybrid, public, rail, non-motorized, multi-modal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions);
- **Sustainable water and wastewater management** (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation);
- **Climate change adaptation** (including information support systems, such as climate observation and early warning systems);
- **Eco-efficient and/or circular economy adapted products, production technologies and processes** (such as development and introduction of environmentally sustainable products, with an eco-label or environmental certification, resource-efficient packaging and distribution);
- **Green buildings** which meet regional, national or internationally recognized standards or certifications.

Appendix G: Selected Green Bond Projects

Potomac WFP Consent Decree Program

A. Identification and Coding Information			PDF Date	October 1, 2019	Pressure Zones	Potomac WFP HGPOWF
Agency Number	Project Number	Update Code	Date Revised		Drainage Basins	
W - 000073.33	173801	Change			Planning Areas	Bi-County

B. Expenditure Schedule (000's)

Cost Elements	Total	Thru FY'19	Estimate FY'20	Total 6 Years	Year 1 FY'21	Year 2 FY'22	Year 3 FY'23	Year 4 FY'24	Year 5 FY'25	Year 6 FY'26	Beyond 6 Years
Planning, Design & Supervision	40,154	6,154	3,500	26,500	4,000	5,000	5,000	4,500	4,000	4,000	4,000
Land	1,000	1,000									
Construction	151,653	1,153	7,000	126,000	6,000	20,000	25,000	25,000	25,000	25,000	17,500
Other	9,225		525	7,625	500	1,250	1,500	1,475	1,450	1,450	1,075
Total	202,032	8,307	11,025	160,125	10,500	26,250	31,500	30,975	30,450	30,450	22,575

C. Funding Schedule (000's)

WSSC Bonds	202,032	8,307	11,025	160,125	10,500	26,250	31,500	30,975	30,450	30,450	22,575
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D. Description & Justification

DESCRIPTION

The Potomac WFP Consent Decree Program provides for the planning, design, and construction required for the implementation of Short-Term Operational and Long-Term Capital Improvements at the Potomac Water Filtration Plant (WFP) to allow the Commission to meet the new discharge limitations identified in the Consent Decree.

JUSTIFICATION

The Consent Decree (CD) was Entered by the U.S. District Court of Maryland on April 15, 2016. Under the terms of the CD the Commission is required to "undertake short-term operational changes and capital improvements at the Potomac WFP that will enable WSSC to reduce significantly the pounds per day of solids discharged to the River" (CD Section II. Paragraph 6.i); and to plan, design, and implement long term "upgrades to the existing Plant or to design and construct a new plant to achieve the effluent limits, conditions, and waste load allocations established by the Maryland Department of the Environment (the Department) and/or in this Consent Decree, and incorporated in a new discharge permit to be issued by the Department" (CD Section II. Paragraph 6.ii). The CD required the Commission to submit a Draft Audit Report and Draft Long-Term Upgrade Plan to the Citizens and the Department by November 15, 2016, and final reports to the Citizens and the Department by January 1, 2017. The Final Audit and Long-Term Upgrade Plan Reports were submitted to the Citizens and the Department on December 29, 2016. The Department reviews the Audit Report and selects recommended improvements in operations, monitoring, and waste tracking, along with select capital projects that can be completed no later than April 1, 2020 and that are necessary to achieve the goals identified in CD Section IV. Paragraph 24. Additionally, the work required to implement the Long-Term Capital Improvements Project(s) shall be fully implemented in accordance with the schedule set forth in the Long-Term Upgrade Plan. The Commission shall be subject to a lump-sum stipulated penalty in accordance with the CD for failure to implement the Long-Term Capital Improvement Project(s) by January 1, 2026.

COST CHANGE

Costs were increased for inflation and are based on recommendations in the approved revised LTUP Report dated September 2018.

OTHER

The project scope has remained the same. Expenditure and schedule projections shown above are Order of Magnitude level estimates. The expenditure and schedule projections shown above also include \$1,000,000 for Supplemental Environmental Projects included under CD Section IX. Paragraph 50. Preliminary planning work began in FY '16 under ESP project W-708.48, Potomac WFP Consent Decree Projects; operational requirements identified in CD Section IV. Interim Performance Measures and Plant Improvements are currently underway under ESP project W-708.47, Potomac WFP Turbidity Monitoring. WSSC Water Green Bonds issued in December 2019 will be utilized to fund a portion of this project. The reduction in suspended solids discharged into the Potomac River will address the following International Capital Market Association (ICMA) Green Bond Principles 2016 categories: Pollution prevention/control; and, Terrestrial and aquatic biodiversity conservation.

COORDINATION

Coordinating Agencies: Maryland Department of the Environment; Montgomery County Government; National Park Service; Prince George's County Government; U.S. Environmental Protection Agency, Region III
Coordinating Projects: W - 000073.30 - Potomac WFP Submerged Channel Intake; W - 000073.32 - Potomac WFP Main Zone Pipeline

E. Annual Operating Budget Impact (000's)		FY of Impact
Staff & Other		
Maintenance		
Debt Service	\$13,142	28
Total Cost	\$13,142	28
Impact on Water and Sewer Rate	\$0.03	28

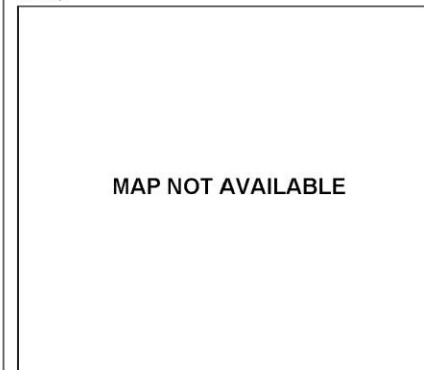
F. Approval and Expenditure Data (000's)

Date First in Program	FY 17
Date First Approved	FY 16
Initial Cost Estimate	27,250
Cost Estimate Last FY	163,823
Present Cost Estimate	202,032
Approved Request Last FY	9,975
Total Expense & Encumbrances	8,307
Approval Request Year 1	10,500

G. Status Information

Land Status	Land Acquired
Project Phase	Design
Percent Complete	0 %
Estimated Completion Date	January 2027
Growth	
System Improvement	
Environmental Regulation	100%
Population Served	
Capacity	

H. Map



Potomac WFP Pre-Filter Chlorination & Air Scour Improvements

A. Identification and Coding Information			PDF Date	October 1, 2019	Pressure Zones	
Agency Number	Project Number	Update Code	Date Revised		Drainage Basins	
W - 000073.22	143803	Change			Planning Areas	Bi-County

B. Expenditure Schedule (000's)

Cost Elements	Total	Thru FY'19	Estimate FY'20	Total 6 Years	Year 1 FY'21	Year 2 FY'22	Year 3 FY'23	Year 4 FY'24	Year 5 FY'25	Year 6 FY'26	Beyond 6 Years
Planning, Design & Supervision	1,749	782	720	247	247						
Land											
Construction	21,591	11,918	7,201	2,472	2,472						
Other	1,064		792	272	272						
Total	24,404	12,700	8,713	2,991	2,991						

C. Funding Schedule (000's)

WSSC Bonds	24,404	12,700	8,713	2,991	2,991						
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D. Description & Justification

DESCRIPTION

This project provides for the planning, design, and construction of a pre-filter chlorination system and filter air scour system for the Potomac Water Filtration Plant. It also includes the replacement of all 32 filter underdrains.

JUSTIFICATION

Due to numerous separate incidents of catastrophic filter underdrain failures since October 2006, an investigation was conducted by WSSC and ITT Leopold, suppliers of the failed underdrain systems. The investigation revealed that the ITT Leopold underdrain system with an Integral Media Support (IMS) cap is not compatible with the biologically active filters at the Potomac WFP. Engineering Standard - I. M. S. Cap Monitoring Operation, and Maintenance Instructions, ITT Water & Wastewater, Leopold, Inc., (April 2009). Memo from John Geibel, P.E., Sr. Product Engineer @ ITT Water & Wastewater, Leopold, Inc. - Potomac Filtration Plant Visit April 2009 - to Joseph Johnson, Potomac Plant Superintendent, (May 2010).

COST CHANGE

Not applicable.

OTHER

The project scope has remained the same. The Potomac Water Filtration Plant experienced fourteen separate incidents of catastrophic filter underdrain failure from October 2006 through FY '17, including three filters that failed twice. The failure rate accelerated with six of the fourteen filter failures taking place during the spring and summer of 2016. The construction for Pre-Filter Chlorination and Underdrain Replacement have been completed. Expenditure and schedule projections shown in Block B above include design level estimates for Air Scour (which may change based on actual bids). The original plan was to design and construct both pre-filter chlorination and air scour systems as one deliverable at the same time. However, due to the more critical need to implement pre-filter chlorination at the Potomac plant, this portion of the project was placed on an accelerated schedule for design and construction, separate from that of the air scour system. WSSC Water Green Bonds issued in December 2019 will be utilized to fund a portion of this project. The elimination of filter underdrain failures will address the following International Capital Market Association (ICMA) Green Bond Principles 2016 category: Sustainable water management.

COORDINATION

Coordinating Agencies: Montgomery County Government; Prince George's County Government
Coordinating Projects: Not Applicable

E. Annual Operating Budget Impact (000's)		FY of Impact
Staff & Other		
Maintenance		
Debt Service	\$1,588	22
Total Cost	\$1,588	22
Impact on Water and Sewer Rate		

F. Approval and Expenditure Data (000's)

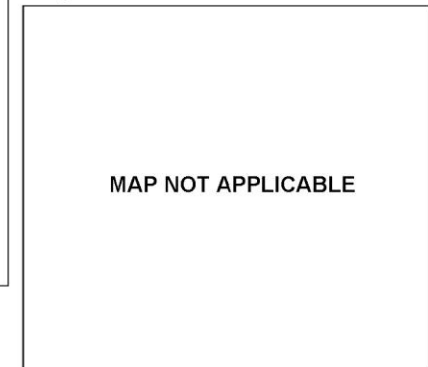
Date First in Program	FY 14
Date First Approved	FY 14
Initial Cost Estimate	5,602
Cost Estimate Last FY	25,275
Present Cost Estimate	24,404
Approved Request Last FY	8,000
Total Expense & Encumbrances	12,700
Approval Request Year 1	2,991

G. Status Information

Land Status	Not Applicable
Project Phase	Design
Percent Complete	100 %
Estimated Completion Date	June 2021

Growth	
System Improvement	100%
Environmental Regulation	
Population Served	
Capacity	

H. Map



Large Diameter Water Pipe & Large Valve Rehabilitation Program

A. Identification and Coding Information			PDF Date	October 1, 2020	Pressure Zones	
Agency Number	Project Number	Update Code	Date Revised	January 15, 2020	Drainage Basins	
W - 000161.01	113803	Change			Planning Areas	Bi-County

B. Expenditure Schedule (000's)

Cost Elements	Total	Thru FY'19	Estimate FY'20	Total 6 Years	Year 1 FY'21	Year 2 FY'22	Year 3 FY'23	Year 4 FY'24	Year 5 FY'25	Year 6 FY'26	Beyond 6 Years
Planning, Design & Supervision	58,925		6,472	52,453	8,301	8,314	8,826	9,154	8,708	9,150	
Land											
Construction	382,269		29,080	353,189	44,552	53,324	60,651	62,773	64,970	66,919	
Other	44,502		3,936	40,566	5,286	6,165	6,949	7,193	7,367	7,606	
Total	485,696		39,488	446,208	58,139	67,803	76,426	79,120	81,045	83,675	

C. Funding Schedule (000's)

WSSC Bonds	485,696		39,488	446,208	58,139	67,803	76,426	79,120	81,045	83,675	
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D. Description & Justification

DESCRIPTION

The purpose of this Program is to plan, inspect, design, and rehabilitate or replace large diameter water transmission mains and large system valves that have reached the end of their useful life. Condition assessment and/or corrosion monitoring is performed on metallic pipelines, including ductile iron, cast iron, and steel, to identify lengths of pipe requiring replacement or rehabilitation and cathodic protection. The PCCP Inspection and Condition Assessment and Monitoring Program identifies individual pipe segments that require repair or replacement to assure the continued safe and reliable operation of the pipeline. The Program also identifies extended lengths of pipe that require the replacement of an increased number of pipe segments in varying stages of deterioration that are most cost effectively accomplished by the replacement or rehabilitation of long segments of the pipeline or the entire pipeline. Rehabilitation or replacement of these mains provides value to the customer by minimizing the risk of failure and ensuring a safe and reliable water supply. The Program includes installation of Acoustic Fiber Optic Monitoring equipment in order to accomplish these goals in PCCP mains.
 *EXPENDITURES FOR LARGE DIAMETER WATER PIPE REHABILITATION ARE EXPECTED TO CONTINUE INDEFINITELY.

JUSTIFICATION

WSSC Water has approximately 1,031 miles of large diameter water main ranging from 16-inch to 96-inch in diameter. This includes 335 miles of cast iron, 326 miles of ductile iron, 35 miles of steel, and 335 miles of PCCP. Internal inspection and condition assessment is performed on PCCP pipelines 36-inch and larger in diameter. Of the 335 miles of PCCP, 140 miles are 36-inch diameter and larger. The inspection program includes internal visual and sounding, sonic/ultrasonic testing, and electromagnetic testing to establish the condition of each pipe section and determine if maintenance repairs, rehabilitation, or replacement are needed.

The planning and design phase evaluates the alignment, hydraulic capacity, and project coordination amongst other factors in an effort to re-engineer these pipelines to meet today's design standards. The design effort includes the preparation of bid ready contract documents including all needed rights-of-way acquisitions and regulatory permits. The constructed system is inspected and an as-built plan is produced to serve as the renewed asset record.

In July 2013, WSSC Water's Acoustic Fiber Optic monitoring system identified breaking wires in a 54-inch diameter PCCP water transmission main in the Forestville area of Prince George's County. Upon attempting to close nearby valves to isolate the failing pipe for repair, WSSC Water crews encountered an inoperable valve with a broken gear, requiring the crew to drop back to the next available valve. This dropping-back to another valve would block one of the major water mains serving Prince George's County, significantly enlarging the shutdown area and reduce our capacity to supply water to over 100,000 residents. In order to minimize the risk associated with inoperable large valves and possible water outages, the large valve inspection and repair program was initiated to systematically inspect, exercise, repair, or replace any of the nearly 1,500 large diameter valves and vaults located throughout the system.

Utility Wide Master Plan (December 2007); 30 Year Infrastructure Plan (2007); FY 2021 Water Network Asset Management Plan (May 2019).

COST CHANGE

Program costs reflect the latest expenditure and schedule estimates based upon the recommendations from the Buried Water Asset Systems Asset Management Plan.

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E. Annual Operating Budget Impact (000's)		FY of Impact
Staff & Other		
Maintenance		
Debt Service	\$31,843	
Total Cost	\$31,843	
Impact on Water and Sewer Rate	\$0.07	

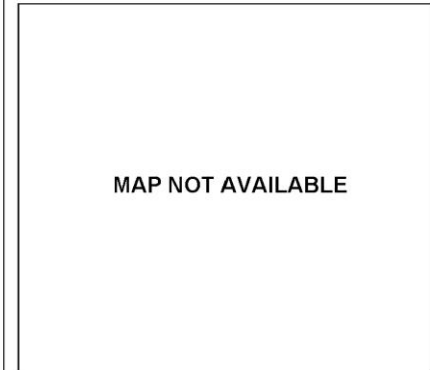
F. Approval and Expenditure Data (000's)

Date First in Program	FY 11
Date First Approved	FY 11
Initial Cost Estimate	
Cost Estimate Last FY	433,058
Present Cost Estimate	485,696
Approved Request Last FY	40,385
Total Expense & Encumbrances	
Approval Request Year 1	58,139

G. Status Information

Land Status	Not Applicable
Project Phase	On-Going
Percent Complete	0 %
Estimated Completion Date	On-Going
Growth	
System Improvement	100%
Environmental Regulation	
Population Served	
Capacity	

H. Map



Continued Project

OTHER

The project scope has remained the same. Expenditure and schedule projections shown in Block B above are Order of Magnitude estimates and are expected to change based upon the results of the ongoing inspections and condition assessments. Additional costs associated with PCCP inspection/condition assessment, large valve inspection/repairs, and emergency repairs are included in the Operating Budget. WSSC Water Green Bonds issued in December 2019 will be utilized to fund a portion of this project. The annual replacement of large diameter water mains will address the following International Capital Market Association (ICMA) Green Bond Principles 2016 category: Sustainable water management.

COORDINATION

Coordinating Agencies: Local Community Civic Associations; Maryland State Highway Administration; Maryland-National Capital Park & Planning Commission; Montgomery County Department of Public Works and Transportation; Montgomery County Government;(including localities where work is to be performed); Prince George's County Government;(including localities where work is to be performed); Prince George's County Department of Permitting Inspection and Enforcement

Coordinating Projects: W - 000001.00 - Water Reconstruction Program; W - 000107.00 - Specialty Valve Vault Rehabilitation Program