

## WATER AND SEWER INFRASTRUCTURE PROGRAMS

### Program Description

These programs construct and maintain the infrastructure, facilities, and equipment which provides safe, reliable, and compliant drinking water, sanitary sewer collection, and wastewater treatment for the County's residents, businesses, and visitors. In addition to the County owned and operated systems and facilities, there are programs for the Washington Aqueduct Division (WAD) which is the potable water treatment plant owned and operated by the Army Corps of Engineers that provides Arlington's drinking water, and for the Blue Plains Wastewater Treatment Plant which treats 5% of Arlington County's wastewater. The County's Water Pollution Control Plant (WPCP) provides wastewater treatment for 95% of the County, and also treats wastewater from portions of Fairfax County, Falls Church City, and Alexandria, collectively known as the Inter-Jurisdictional (IJ) partners. These IJ partners pay a portion of the capital costs for maintenance and upgrades at the Water Pollution Control Plant and for the large transmission sewer mains which convey their wastewater.

### Program Summary

The Capital Improvement Programs for the water distribution and sanitary sewer collection systems are guided by Master Plans adopted by the Board in 2014 for the Water Distribution system and Sanitary Sewer adopted in 2002 (currently being updated). Programs for both systems are bifurcated into Expansion and Non-Expansion programs. The Expansion programs provide additional system capacity to accommodate anticipated growth for the year 2040, while the Non-Expansion programs are focused on asset maintenance, rehabilitation, and replacement.

The Master Plans for both systems identify large infrastructure projects to expand capacity, improve redundancy, and replace or rehabilitate existing infrastructure, as well as identifying key programs based upon core asset management principles. Many of the large infrastructure projects in the Master Plans have already been completed, others are well-underway, and others are programmed in this CIP. Likewise, most of the asset based infrastructure programs are recurring programs which rehabilitate or replace a consistent portion of our infrastructure to ensure that we are maintaining a system which is efficient, reliable, and avoids abrupt funding needs.

Funding is included in this CIP for source water reliability and assurance projects. These include preliminary funding for important Advanced Treatment systems at the Washington Aqueduct, as well as significant funding for source reliability and redundancy at the Washington Aqueduct and/or with neighboring utilities.

The Water Pollution Control Bureau (WPCB) Capital Improvement Program directly supports Arlington's vision for a world class sustainable community as well as the Bureau's mission of safely and cost-effectively protecting public health and the environment. The 10-year program provides for planning to secure a world class wastewater treatment facility that enhances attractive residential neighborhoods, and promotes an environmentally friendly, sustainable community. With the completion of the Master Plan 2001 program which increased capacity to 40 Million Gallons per Day (MGD), no expansion projects are included in this CIP.

The WPCP Non-Expansion program focuses on projects that rehabilitate, replace, and/or upgrade existing WPCP infrastructure, including process control/automation, to ensure that the facility can safely protect the public health and the environment by reliably maintaining continuity of service and simultaneously meeting the permit requirements. Also included in the non-expansion program are annual repairs and replacement of current equipment and infrastructure at the plant and 15 pumping and metering stations. Plant non-expansion capital also funds Arlington's pro-rata share of improvements to DC Water's Blue Plains Advanced Wastewater Treatment Plant and the conveyance infrastructure.

This CIP provides for significant investment in the Solids Handling processes at the Plant. The MP01 Master Plan identified the need to address Solids Handling, but placed a greater priority on the liquid and capacity issues, and thus the Solids Planning was deferred. A Solids Master Planning effort began in 2015 and is being presented to the County Board for adoption concurrent with the FY 2019 - FY 2028 CIP. The Solids Master Planning effort identified core criteria spanning operational, economic, environmental, regulatory, and social considerations. It then evaluated the state of current technology to identify process (es) which best meets the needs of the community. The CIP for the solids projects has been broken into three phases, described below:

- Phase I - Immediate project needs to replace solids handling critical equipment that are failing and costly and labor-intensive to maintain. Several of these projects are being designed and underway.
- Phase II - Projects that need to be completed in advance of Phase III. This may involve additional equipment replacement or demolition of underutilized facilities in preparation for the Phase III construction.
- Phase III - Implementation of state of the art technology to provide long-term sustainability of the WPCP's solids handling processes, deriving benefits of addressing any future regulatory changes while reducing the impacts on the surrounding community and increasing energy efficiency.

WATER AND SEWER INFRASTRUCTURE: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

10 YEAR PROGRAMMED CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Water Distribution	1,500	4,500	2,155	4,890	3,865	6,040	2,915	545	1,415	33,060	60,885
Sanitary Sewer System Improvements	800	1,700	4,840	1,750	1,750	530	530	545	545	560	13,550
WS Maintenance Capital	19,140	18,040	19,315	19,285	18,690	15,470	49,615	16,030	15,710	16,305	207,600
WPCP Non-Expansion	7,475	11,150	16,245	20,230	21,575	33,240	48,970	41,060	14,050	3,145	217,140
<b>Total Recommendation</b>	<b>28,915</b>	<b>35,390</b>	<b>42,555</b>	<b>46,155</b>	<b>45,880</b>	<b>55,280</b>	<b>102,030</b>	<b>58,180</b>	<b>31,720</b>	<b>53,070</b>	<b>499,175</b>

PROGRAM FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	5,000	5,000	5,400	5,420	5,420	5,585	5,835	6,005	6,005	6,170	55,840
New Bond Issue	0	0	8,032	15,239	23,277	28,290	69,550	31,540	9,130	32,500	217,558
PAYG	14,193	16,023	16,424	16,575	14,227	16,058	15,855	13,507	14,229	13,776	150,867
Other Funding	1,248	1,877	2,759	3,430	3,674	5,689	9,200	7,027	2,434	578	37,916
<b>Subtotal New Funding</b>	<b>20,441</b>	<b>22,900</b>	<b>32,615</b>	<b>40,664</b>	<b>46,598</b>	<b>55,622</b>	<b>100,440</b>	<b>58,079</b>	<b>31,798</b>	<b>53,024</b>	<b>462,181</b>
<b>Previously Approved Funding</b>											
Issued but Unspent Bonds	7,473	0	0	0	0	0	0	0	0	0	7,473
Other Previously Approved Funds	29,521	0	0	0	0	0	0	0	0	0	29,521
<b>Subtotal Previously Approved Funding</b>	<b>36,994</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36,994</b>
<b>Total Funding Sources</b>	<b>57,435</b>	<b>22,900</b>	<b>32,615</b>	<b>40,664</b>	<b>46,598</b>	<b>55,622</b>	<b>100,440</b>	<b>58,079</b>	<b>31,798</b>	<b>53,024</b>	<b>499,175</b>

Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Bond Financing Costs	0	0	0	562	1,782	3,783	6,340	11,923	15,620	17,374	57,384

# Arlington County, Virginia

## WATER AND SEWER INFRASTRUCTURE: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

### 10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Improvements for Development	500	500	515	515	515	530	530	545	545	560	5,255
Source Water Reliability & Interconnections	1,000	0	515	1,030	1,030	2,120	2,120	0	0	32,500	40,315
Pump Station Improvements	0	1,000	515	0	0	0	0	0	0	0	1,515
Gravity Transmission Mains - B1	0	3,000	0	0	0	0	0	0	0	0	3,000
Gravity Transmission Mains - B2 & B3	0	0	260	2,985	260	3,390	0	0	0	0	6,895
Edison Street / Carlin Springs Road	0	0	350	360	2,060	0	0	0	870	0	3,640
New River Crossing	0	0	0	0	0	0	265	0	0	0	265
<b>Total Recommendation</b>	<b>1,500</b>	<b>4,500</b>	<b>2,155</b>	<b>4,890</b>	<b>3,865</b>	<b>6,040</b>	<b>2,915</b>	<b>545</b>	<b>1,415</b>	<b>33,060</b>	<b>60,885</b>

### CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	487	500	515	515	515	530	530	545	545	560	5,242
New Bond Issue	0	0	0	4,015	3,090	3,390	0	0	0	32,500	42,995
PAYG	0	429	1,140	360	260	2,120	2,385	0	870	0	7,564
<b>Subtotal New Funding</b>	<b>487</b>	<b>929</b>	<b>1,655</b>	<b>4,890</b>	<b>3,865</b>	<b>6,040</b>	<b>2,915</b>	<b>545</b>	<b>1,415</b>	<b>33,060</b>	<b>55,801</b>
<b>Previously Approved Funding</b>											
Issued but Unspent Bonds	804	0	0	0	0	0	0	0	0	0	804
Other Previously Approved Funds	4,280	0	0	0	0	0	0	0	0	0	4,280
<b>Subtotal Previously Approved Funding</b>	<b>5,084</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,084</b>
<b>Total Funding Sources</b>	<b>5,571</b>	<b>929</b>	<b>1,655</b>	<b>4,890</b>	<b>3,865</b>	<b>6,040</b>	<b>2,915</b>	<b>545</b>	<b>1,415</b>	<b>33,060</b>	<b>60,885</b>

### Projected Additional Operating Costs (in \$1,000s)

Bond Financing Costs	0	0	0	0	281	574	911	996	1,012	985	4,759
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# WATER AND SEWER INFRASTRUCTURE

## WATER DISTRIBUTION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Program Description

The major focus of the Water Distribution System 10-year capital program is implementation of the Water Distribution Master Plan. The Water Distribution Master Plan update was completed and adopted by the County Board in September 2014. Many of the County's water mains were built in the 1930s, 1940s, and 1950s, and are approaching or at the end of their life expectancy. A number of water projects have already been programmed into the CIP to address future growth and increase the rate of water main rehabilitation/replacement to keep up with aging infrastructure. Many of the projects listed here appeared in prior CIPs, because projects are typically in the CIP for a number of years to build up funding for construction.

### Master Plan Impact

These projects are consistent with the plans, policies, and objectives of the Water Distribution Master Plan, originally adopted in 1992, and with an update adopted by the County Board in September 2014.

### Projects

**Improvements for Development:** This funding covers mains necessary for looping or completion of a block where the developer is only responsible for work immediately on the frontage of the site. This may also cover work to abandon existing mains and the completion of loops in prior developments. When modeling indicates a need for larger water mains, but the development requiring the extra flow is by-right, this funding may be used to do entire projects. This program is identified in the Water Distribution Master Plan to respond to opportunities to improve the water distribution system with adjacent developments for water quality, redundancy, and transmission capacity purposes.

**Source Water Reliability & Interconnections:** Source water reliability projects aim to maintain reliability and redundancy for Arlington's water supply. This program covers enhancements to our current water supply system for resiliency as well as interconnections and associated improvements with neighboring jurisdictions to provide backup feed to/ from Arlington in case of emergencies.

**Pump Station Improvements:** Upgrade or replacement of various components at pump stations throughout the County, including motor control center, pumps, and back-up generators. Pump station reliability is essential to providing adequate fire flow and safe drinking water to customers.

**Gravity Transmission Mains - B1:** Provide water mains to back up existing transmission capacity through our Gravity One pressure zone. Originally denoted as Project B in the Water Distribution Master Plan, it has since been broken out into two distinct projects based on the buildable segments, "B1" and "B2 & B3". B1 will provide an additional large diameter supply for the Lee water storage and pumping station. The Water Distribution Master Plan identifies a project to provide a second feed to the Lee Station Water Pumping and Storage Facility to improve resiliency in the Lee Service area which covers portions of the Old Dominion, Langston, Leeway, and Williamsburg areas. This project will also provide redundancy and additional transmission capacity to our pressure zones, serving much of the R-B Corridor.

**Gravity Transmission Mains - B2 & B3:** Provides redundant water mains to back up existing transmission capacity through our Gravity One pressure zone. Originally denoted as Project B in the Water Distribution Master Plan, it has since been broken out into two distinct projects based on the buildable segments, "B1" and "B2 & B3". B2 is the northern segment from Lee water storage to Interstate 66. B3 is the segment south of Interstate 66 to the area of North Pershing Drive. The exact alignment for the B2 and B3 mains are unknown at this time.

**Edison Street / Carlin Springs Road:** Funding for 8,900 feet of 16-inch water main from North Edison and 10th Street to Arlington Boulevard to provide redundancy and improve fire flow. This project impacts various neighborhoods throughout the County.

**New River Crossing:** Additional water main crossing of Potomac River. Initial funding to start a study of the best route to provide a backup water supply to Arlington County. This water main will provide additional capacity to help ensure an adequate water supply if the existing 48-inch main is out of service.

10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Improvements for Development	500	500	515	515	515	530	530	545	545	560	5,255
Spout Run	300	1,200	1,235	1,235	1,235	0	0	0	0	0	5,205
Potomac Interceptor Phase II	0	0	3,090	0	0	0	0	0	0	0	3,090
<b>Total Recommendation</b>	<b>800</b>	<b>1,700</b>	<b>4,840</b>	<b>1,750</b>	<b>1,750</b>	<b>530</b>	<b>530</b>	<b>545</b>	<b>545</b>	<b>560</b>	<b>13,550</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	174	500	515	515	515	530	530	545	545	560	4,929
New Bond Issue	0	0	3,090	0	1,235	0	0	0	0	0	4,325
PAYG	0	0	0	875	0	0	0	0	0	0	875
<b>Subtotal New Funding</b>	<b>174</b>	<b>500</b>	<b>3,605</b>	<b>1,390</b>	<b>1,750</b>	<b>530</b>	<b>530</b>	<b>545</b>	<b>545</b>	<b>560</b>	<b>10,129</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	3,421	0	0	0	0	0	0	0	0	0	3,421
<b>Subtotal Previously Approved Funding</b>	<b>3,421</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,421</b>
<b>Total Funding Sources</b>	<b>3,595</b>	<b>500</b>	<b>3,605</b>	<b>1,390</b>	<b>1,750</b>	<b>530</b>	<b>530</b>	<b>545</b>	<b>545</b>	<b>560</b>	<b>13,550</b>

Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Bond Financing Costs	0	0	0	216	275	393	408	413	402	390	2,498

### Program Description

The Sanitary Sewer System Improvements Program addresses the capacity of the sanitary sewer system. There are 465 miles of sewer mains in the County's system. These projects ensure the sewer system maintains adequate capacity to support residential and commercial growth. Infrastructure availability fees paid by developers and utility user fees fund these projects.

### Master Plan Impact

These projects are consistent with the plans, policies, and objectives of the Sanitary Sewer Collection System Master Plan. The Master Plan was last updated in 2002 and is currently being revised.

### Projects

**Improvements for Development:** This project provides funding for small segments of sewer main installation and other work directly associated with development work. This funding provides for extension of sewer improvements along the remainder of a block where the developer is only responsible for work immediately on the frontage of the site. This may also cover work to abandon existing mains in prior developments. When modeling indicates a need for larger sewer mains, but the development requiring the extra flow is by-right, this funding may be used to complete entire projects.

**Spout Run:** The Spout Run sewer project covers a 3,000 foot section of sewer main which runs under the North Highlands neighborhood and is over 100 feet deep in some areas. This sewer needs to be inspected and alternatives evaluated for rehabilitation, redundancy, and maintenance purposes.

**Potomac Interceptor Phase II:** This project will construct a parallel sanitary sewer to the 54-inch Potomac Interceptor located in S. Joyce Street and Army Navy Drive. The current interceptor is 54 inches in diameter along these streets, carries 40 percent of the County's sewage and has no parallel line. Phase II will provide additional capacity, and system reliability and redundancy. The newly constructed line will operate in parallel with the existing line. Project funding has been reduced from the prior CIP as staff is still determining the best path forward, scope, and appropriate timing for this project based upon the challenging alignment and location.



# Arlington County, Virginia

## WATER AND SEWER INFRASTRUCTURE: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

### 10 YEAR CATEGORY SUMMARY (IN \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Water Main Replacement / Rehabilitation	4,000	4,000	4,120	4,120	4,120	4,240	4,240	4,360	4,360	4,480	42,040
Water Main Cleaning and Lining Program	1,800	1,800	1,855	1,855	1,855	1,910	1,910	1,960	1,960	2,015	18,920
Large Diameter Water Main & Valve Rehabilitation	450	450	465	465	465	475	475	490	490	505	4,730
Small Diameter Valve Rehabilitation & Replacement	250	250	260	260	260	265	265	275	275	280	2,640
Water Tank Rehabilitation	0	100	0	775	0	105	0	110	0	110	1,200
Large Meter Vault Rehabilitation & Replacement	200	200	205	205	205	210	210	220	220	225	2,100
Infiltration and Inflow	3,000	3,000	3,090	3,090	3,090	3,180	3,180	3,270	3,270	3,360	31,530
Large Diameter Sewer Rehabilitation	0	1,505	1,260	0	0	0	3,260	545	545	560	7,675
Sewer Main Replacement Program	850	850	620	620	620	635	635	655	655	670	6,810
Sewer Force Mains	0	150	0	155	0	160	0	165	0	170	800
Water/Sewer Frames/Covers	750	750	775	775	775	795	795	820	820	840	7,895
Manhole Rehabilitation	500	500	515	515	515	530	530	545	545	560	5,255
Trades Center Improvements	575	0	0	0	0	0	0	0	0	0	575
Technology Enhancements	300	50	2,575	2,575	50	55	55	55	55	55	5,825
Utilities Information Billing System	3,570	1,000	0	0	0	0	0	0	0	0	4,570
Washington Aqueduct Capital	2,895	3,435	3,575	3,875	6,735	2,910	34,060	2,560	2,515	2,475	65,035
<b>Total Recommendation</b>	<b>19,140</b>	<b>18,040</b>	<b>19,315<sup>9</sup></b>	<b>19,285</b>	<b>18,690</b>	<b>15,470</b>	<b>49,615</b>	<b>16,030</b>	<b>15,710</b>	<b>16,305</b>	<b>207,600</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	4,339	4,000	4,370	4,390	4,390	4,525	4,775	4,915	4,915	5,050	45,669
New Bond Issue	0	0	0	0	3,980	0	31,370	0	0	0	35,350
PAYG	11,308	11,271	12,119	12,080	10,820	11,184	10,930	10,903	10,745	11,100	112,459
Other Funding	100	100	100	100	100	100	930	100	100	100	1,830
<b>Subtotal New Funding</b>	<b>15,747</b>	<b>15,371</b>	<b>16,589</b>	<b>16,570</b>	<b>19,290</b>	<b>15,809</b>	<b>48,005</b>	<b>15,918</b>	<b>15,760</b>	<b>16,250</b>	<b>195,309</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	12,291	0	0	0	0	0	0	0	0	0	12,291
<b>Subtotal Previously Approved Funding</b>	<b>12,291</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12,291</b>
<b>Total Funding Sources</b>	<b>28,038</b>	<b>15,371</b>	<b>16,589</b>	<b>16,570</b>	<b>19,290</b>	<b>15,809</b>	<b>48,005</b>	<b>15,918</b>	<b>15,760</b>	<b>16,250</b>	<b>207,600</b>

Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bond Financing Costs	0	0	0	0	279	354	2,591	3,177	3,487	9,887

# WATER AND SEWER INFRASTRUCTURE

## WS MAINTENANCE CAPITAL

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Water Main Replacement / Rehabilitation

#### Project Description

This program funds projects that require less engineering and/or timelier implementation than more traditional CIP projects. Projects are established as opportunities or needs are identified in the field. Additionally, this program replaces 4-inch mains where fire flow is an issue, and 2-inch, 1-inch and 1&1/2-inch galvanized "temporary" lines that were installed in the 1920s - 1940s as the County was developing faster than the infrastructure could keep up. These smaller lines are occasional maintenance issues, and provide poor pressure and no fire flow benefit to the system.

#### Project Justification

There are over 250 miles or more than 50% of the County's water system that falls under this category. In conjunction with the water main cleaning and lining program, this project will improve the overall condition of the County's water main assets. This program replaces old cast iron water mains that are more susceptible to breaks with new ductile iron mains. The Water Distribution Master Plan directs that 1% or more of the mains be replaced on an annual basis.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$42,040

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	1,500	1,500	1,720	1,720	1,720	1,840	1,940	2,060	2,060	2,180	18,240
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	2,400	2,400	2,300	2,300	2,300	2,300	2,200	2,200	2,200	2,200	22,800
Other Funding	100	100	100	100	100	100	100	100	100	100	1,000
<b>Subtotal New Funding</b>	<b>4,000</b>	<b>4,000</b>	<b>4,120</b>	<b>4,120</b>	<b>4,120</b>	<b>4,240</b>	<b>4,240</b>	<b>4,360</b>	<b>4,360</b>	<b>4,480</b>	<b>42,040</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>4,000</b>	<b>4,000</b>	<b>4,120</b>	<b>4,120</b>	<b>4,120</b>	<b>4,240</b>	<b>4,240</b>	<b>4,360</b>	<b>4,360</b>	<b>4,480</b>	<b>42,040</b>

#### Notes on Funding Schedule

*A portion of the annual funding will be from infrastructure availability fees (developer contributions). Other funding includes interest income.*

# WATER AND SEWER INFRASTRUCTURE

## WS MAINTENANCE CAPITAL

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Water Main Cleaning and Lining Program

#### Project Description

This program utilizes a trenchless technology to rehabilitate small diameter pre-1960s cast iron water mains. The technology restores flow capacity and improves water quality in structurally sound older mains at a fraction of the cost and disruption of replacement.

#### Project Justification

This program is identified in the Water Distribution Master Plan with a goal to rehabilitate 250 miles of mains by 2040. In conjunction with the water main replacement program, this project will improve the overall condition of the County's water main assets.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$18,920

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	1,800	1,800	1,855	1,855	1,855	1,910	1,910	1,960	1,960	2,015	18,920
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>1,800</b>	<b>1,800</b>	<b>1,855</b>	<b>1,855</b>	<b>1,855</b>	<b>1,910</b>	<b>1,910</b>	<b>1,960</b>	<b>1,960</b>	<b>2,015</b>	<b>18,920</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>1,800</b>	<b>1,800</b>	<b>1,855</b>	<b>1,855</b>	<b>1,855</b>	<b>1,910</b>	<b>1,910</b>	<b>1,960</b>	<b>1,960</b>	<b>2,015</b>	<b>18,920</b>

#### Notes on Funding Schedule

# WATER AND SEWER INFRASTRUCTURE

## WS MAINTENANCE CAPITAL

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Infiltration and Inflow

#### Project Description

This program utilizes Cured-In-Place-Pipe (CIPP) and other innovative technologies to rehabilitate sanitary sewer mains, manholes, and other appurtenances to eliminate the intrusion of ground or surface water into the County's sanitary sewer system.

#### Project Justification

This program funds the rehabilitation of the sanitary sewer system to eliminate infiltration and inflow, the unplanned entrance of rain, ground or surface water into the County's sanitary sewer system. The County's goal is to line 2% of the system annually to reduce wet weather flows at the Water Pollution Control Plant and prevent the costly treatment of rain and ground water.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$31,530

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Developer Contributions	2,239	2,000	2,150	2,050	2,050	2,050	2,200	2,200	2,200	2,200	21,339
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	761	1,000	940	1,040	1,040	1,130	980	1,070	1,070	1,160	10,191
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>3,000</b>	<b>3,000</b>	<b>3,090</b>	<b>3,090</b>	<b>3,090</b>	<b>3,180</b>	<b>3,180</b>	<b>3,270</b>	<b>3,270</b>	<b>3,360</b>	<b>31,530</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>3,000</b>	<b>3,000</b>	<b>3,090</b>	<b>3,090</b>	<b>3,090</b>	<b>3,180</b>	<b>3,180</b>	<b>3,270</b>	<b>3,270</b>	<b>3,360</b>	<b>31,530</b>

#### Notes on Funding Schedule

*A portion of the annual funding will be from infrastructure availability fees (developer contributions).*

# WATER AND SEWER INFRASTRUCTURE

## WS MAINTENANCE CAPITAL

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Washington Aqueduct Capital

#### Project Description

This program provides the County's share of funding for capital improvements to the Washington Aqueduct, the County's wholesale water supplier, which is managed by the U.S. Army Corps of Engineers.

#### Project Justification

A memorandum of understanding between DC Water, Fairfax Water, Arlington County, and the Department of the Army outlines the County's obligations in regard to the Washington Aqueduct. In addition, each customer has a Water Sales Agreement with the Washington Aqueduct. The Washington Aqueduct is currently the County's sole source of drinking water. The County has emergency interconnects with adjacent systems which can sustain portions of the County for emergency purposes, but relies on the Aqueduct for the regular supply of drinking water for County citizens and businesses.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$65,035

Arlington's share is estimated at 16.25% of the Aqueduct's total CIP.

	Funding Schedule (in \$1,000s)										
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	0	0	3,980	0	31,370	0	0	0	35,350
PAYG	2,895	2,896	2,917	2,915	2,755	2,910	2,910	2,560	2,515	2,475	27,748
<b>Subtotal New Funding</b>	<b>2,895</b>	<b>2,896</b>	<b>2,917</b>	<b>2,915</b>	<b>6,735</b>	<b>2,910</b>	<b>34,280</b>	<b>2,560</b>	<b>2,515</b>	<b>2,475</b>	<b>63,098</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	1,937	0	0	0	0	0	0	0	0	0	1,937
<b>Subtotal Previously Approved Funding</b>	<b>1,937</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,937</b>
<b>Total Revenues</b>	<b>4,832</b>	<b>2,896</b>	<b>2,917</b>	<b>2,915</b>	<b>6,735</b>	<b>2,910</b>	<b>34,280</b>	<b>2,560</b>	<b>2,515</b>	<b>2,475</b>	<b>65,035</b>

#### Notes on Funding Schedule

#### Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Bond Financing Costs	0	0	0	0	0	279	354	2,591	3,177	3,487	9,887

### Program Description

The Maintenance Capital program focuses on projects that rehabilitate and replace existing water distribution and sanitary sewer collection infrastructure. This is done for the sanitary system by programs that rehabilitate and replace sewer mains under the infiltration and inflow program, rehabilitate large diameter sewer mains, and replace sewer and sewer force mains. The water distribution system is addressed by programs that clean and line water mains, rehabilitate and replace valves, and rehabilitate water storage tanks. Other categories of maintenance include frames and covers, manhole rehabilitation, and enhance our technological capabilities in our Supervisory Control and Data Acquisition (SCADA) systems and Utility Information Billing System.

### Projects

**Large Diameter Water Main & Valve Rehabilitation:** This program includes the rehabilitation of old (50 - 80 years) large diameter (20 - 36-inch) water mains with internal joint seals, re-linings or other innovative technologies and the rehabilitation or replacement of 16-inch or larger valves and pressure regulating valves. Although not specifically mentioned in the Water Distribution Master Plan, projects within this program meet the "investment loss" criterion established in the Master Plan for new projects.

**Small Diameter Valve Rehabilitation & Replacement:** Program provides for the rehabilitation and/or replacement of small diameter water valves throughout the County, as identified through the Valve Inspection and Exercise Program. This program ensures the County's water distribution system valves are operable to minimize the extent and duration of water service outages during planned or emergency work. Valves are inspected on a four year cycle and replacement or rehabilitation is executed based upon the inspection results.

**Water Tank Rehabilitation:** This project will fund the maintenance and rehabilitation of the water storage tanks at Lee and Fort Barnard.

**Large Diameter Sewer Rehabilitation:** This program funds the rehabilitation of 15 inch and larger sanitary sewer mains and appurtenances to eliminate infiltration and inflow, the unplanned entrance of rain, ground or surface water into the County's sanitary sewer system. Periodic condition inspection and assessments are performed on the large diameter sanitary sewer mains to make recommendations on the type of repair and rehabilitation necessary.

**Large Meter Vault Rehabilitation & Replacement:** Program to fund the rehabilitation and/or replacement of large meter vaults. This program ensures that large commercial meters, which account for approximately 80% of the system revenue, remain in a good state of repair. This program was identified as necessary as a result of the inventory and assessment of the large meters conducted throughout the County by the Large Meter Team.

**Sewer Main Replacement Program:** Replaces smaller diameter sewer mains by cut and cover (digging up ground installing the pipe, then refilling the ground) when lining sewer mains is not possible.

**Sewer Force Mains:** Provide replacement force mains for Donaldson Run, Gulf Run, Windy Run and other sewage lift stations. The FY 2019 - FY 2028 CIP adds periodic funding to address sewer force main rehabilitation and replacement.

**Water/Sewer Frames/Covers:** Replacement of water valve and sanitary sewer manhole covers in conjunction with repaving.

**Manhole Rehabilitation:** Provides for the rehabilitation of manholes through lining and structural rebuilds when necessary. Manhole rehabilitation occurs in conjunction with the Infiltration and Inflow (I&I) Program (sewer main relining).

**Trades Center Improvements:** This funding will be used for rehabilitation of the Water Control Center facility, including roof and HVAC replacement, and restroom facility upgrades, and a redundant emergency roll-up generator connection. For FY 2019, this is a new project in the Water and Sewer Infrastructure Programs. Formerly, this project was part of the Public/ Government Facilities Maintenance Capital program in the FY 2017 - FY 2026 CIP. Moving this project to the Water and Sewer Infrastructure Programs section of the CIP aligns the source of funding with the use of the facility.

**Technology Enhancements:** To upgrade or replace various technology, such as Supervisory Control and Data Acquisition (SCADA), Automated Meter Reading (AMR) and water meters, and other technology software and hardware systems.

**Utilities Information Billing System:** To replace the Utilities Information Billing System (UIBS), which was dates to 1996. This system bills approximately 38,000 accounts for water, sewer, and refuse. The start of this project was delayed from FY 2016 until FY 2017. Implementation began during FY 2018 and will continue for eighteen months, through FY 2020. Cost has increased from the prior CIP; Utility portion of the project is currently \$5.7M.



10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
WPCP Maintenance Capital	2,500	2,600	2,060	2,060	2,060	2,120	2,120	2,180	2,180	2,240	22,120
Blue Plains Capital Improvements	725	700	515	410	410	370	320	325	325	335	4,435
Improvements to Eads St Property	100	1,000	0	10	0	10	0	10	0	10	1,140
Secondary Clarifiers	100	1,000	3,090	8,240	4,840	0	0	0	0	0	17,270
WPCP Technology Enhancements	1,450	1,650	2,625	1,290	515	530	530	545	545	560	10,240
Odor Control	0	300	410	410	720	210	0	0	0	0	2,050
Primary Clarifier Upgrades	100	400	1,545	2,060	1,030	0	0	0	0	0	5,135
Solids Master Plan Phase I - Biosolids Projects	2,500	2,500	3,500	1,500	0	0	0	0	0	0	10,000
Solids Master Plan Phase II	0	0	500	2,500	2,000	0	0	0	0	0	5,000
Solids Master Plan Phase III	0	1,000	2,000	1,750	10,000	30,000	46,000	38,000	11,000	0	139,750
<b>Total Recommendation</b>	<b>7,475</b>	<b>11,150</b>	<b>16,245</b>	<b>20,230</b>	<b>21,575</b>	<b>33,240</b>	<b>48,970</b>	<b>41,060</b>	<b>14,050</b>	<b>3,145</b>	<b>217,140</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	4,940	11,220	14,975	24,900	38,180	31,540	9,130	0	134,885
PAYG	2,885	4,323	3,165	3,260	3,148	2,754	2,540	2,604	2,614	2,676	29,969
Other Funding	1,148	1,777	2,661	3,332	3,572	5,589	8,270	6,927	2,334	478	36,088
<b>Subtotal New Funding</b>	<b>4,033</b>	<b>6,100</b>	<b>10,766</b>	<b>17,812</b>	<b>21,695</b>	<b>33,243</b>	<b>48,990</b>	<b>41,071</b>	<b>14,078</b>	<b>3,154</b>	<b>200,942</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	6,669	0	0	0	0	0	0	0	0	0	6,669
Other Previously Approved Funds	9,529	0	0	0	0	0	0	0	0	0	9,529
<b>Subtotal Previously Approved Funding</b>	<b>16,198</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16,198</b>
<b>Total Funding Sources</b>	<b>20,231</b>	<b>6,100</b>	<b>10,766</b>	<b>17,812</b>	<b>21,695</b>	<b>33,243</b>	<b>48,990</b>	<b>41,071</b>	<b>14,078</b>	<b>3,154</b>	<b>217,140</b>

Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bond Financing Costs	0	0	0	346	1,226	2,537	4,667	7,923	11,030	12,512

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### WPCP Maintenance Capital

#### Project Description

The Water Pollution Control Plant (WPCP) Non-expansion Capital Program provides annually for the repair and replacement of current equipment and infrastructure at the plant and 15 stations (including 11 pumping stations, two ejector stations, and two meter stations). Major components of this program include refurbishing or replacing equipment to prevent premature failure, as well as infrastructure improvements and automating treatment processes to increase efficiency.

#### Project Justification

Maintaining existing plant assets ensures that process equipment will perform and meet or exceed its estimated useful life, and that plant performance will meet regulatory operating limits.

#### Changes from Prior CIP

FY 2019 and FY 2020 includes \$500 thousand in each year for Northside HVAC projects. FY 2020 includes \$100 thousand for energy optimization planning.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$22,120

##### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
PAYG	1,575	1,558	1,710	1,710	1,710	1,760	1,760	1,809	1,809	1,859	17,260
Other Funding	425	442	350	350	350	360	360	371	371	381	3,760
<b>Subtotal New Funding</b>	<b>2,000</b>	<b>2,000</b>	<b>2,060</b>	<b>2,060</b>	<b>2,060</b>	<b>2,120</b>	<b>2,120</b>	<b>2,180</b>	<b>2,180</b>	<b>2,240</b>	<b>21,020</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	1,100	0	0	0	0	0	0	0	0	0	1,100
<b>Subtotal Previously Approved Funding</b>	<b>1,100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,100</b>
<b>Total Revenues</b>	<b>3,100</b>	<b>2,000</b>	<b>2,060</b>	<b>2,060</b>	<b>2,060</b>	<b>2,120</b>	<b>2,120</b>	<b>2,180</b>	<b>2,180</b>	<b>2,240</b>	<b>22,120</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Blue Plains Capital Improvements

#### Project Description

The DC Water's Blue Plains Wastewater Treatment Plant processes a portion of Arlington County's sewage after transmission through Fairfax County mains. The capital program funds Arlington's annual payment through Fairfax County to the Blue Plains Plant for capital improvements. It also funds improvements to the associated sewerage conveyance system.

#### Project Justification

Payment is due under the terms of the October 3, 1994, Sewage Conveyance, Treatment, and Disposal Agreement with Fairfax County.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$4,435

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
PAYG	725	700	515	410	410	370	320	325	325	335	4,435
<b>Subtotal New Funding</b>	<b>725</b>	<b>700</b>	<b>515</b>	<b>410</b>	<b>410</b>	<b>370</b>	<b>320</b>	<b>325</b>	<b>325</b>	<b>335</b>	<b>4,435</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>725</b>	<b>700</b>	<b>515</b>	<b>410</b>	<b>410</b>	<b>370</b>	<b>320</b>	<b>325</b>	<b>325</b>	<b>335</b>	<b>4,435</b>

#### Notes on Funding Schedule

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Improvements to Eads St Property

#### Project Description

Funding for improvements to a property near the Water Pollution Control Plant that the County purchased in March 2010. This facility serves as the plant's off site warehouse, and is used for storage of larger and less frequently used items. Additionally, Arlington Transit (ART) has some offices within the facility. Per a memorandum of understanding dated November 23, 2011, the Transit Bureau contributes toward the cost of the site.

#### Project Justification

Funds are required to properly maintain this facility. Occasional capital improvements will need to be made. Funds programmed for FY 2019 and FY 2020 are for the replacement of the retaining wall at the site. Per the MOU with Transit, they do not contribute towards this project.

#### Changes from Prior CIP

The retaining wall project is planned for FY 2019 - FY 2020. Prior CIPs had funding for this project building up over a number of years to fund construction.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$1,140

\$10,000 every other year is for general maintenance capital starting in FY 2022.

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
PAYG	0	154	0	0	0	0	0	0	0	0	154
Other Funding	17	170	0	3	0	3	0	3	0	3	199
<b>Subtotal New Funding</b>	<b>17</b>	<b>324</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>353</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	787	0	0	0	0	0	0	0	0	0	787
<b>Subtotal Previously Approved Funding</b>	<b>787</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>787</b>
<b>Total Revenues</b>	<b>804</b>	<b>324</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>1,140</b>

#### Notes on Funding Schedule

Both Transit Bureau and IJ Partner contributions are included in 'Other Funding'. The Inter-Jurisdictional (IJ) Partners share in a portion of the capital costs at the facility. The Transit Bureau also contributes 16.8 percent of applicable capital costs at the Eads Street facility during FY 2022 through FY 2028, consistent with its share of the space used there. Per the terms of the MOU with the Transit Bureau, they do not contribute toward the retaining wall project.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Secondary Clarifiers

#### Project Description

Rehabilitation and/ or replacement of secondary clarifiers 1, 2, and 3 is necessary to restore the tanks to full working condition and help assure compliance with the permit.

#### Project Justification

The tanks were originally built in the 1960s and are no longer functioning as designed. A previous preliminary engineering study provided a conceptual design of the tanks for potential future use. FY 2019 engineering work will include evaluating how current clarifier technologies can best be applied to the existing plant infrastructure to meet demand and permit requirements, while staying within or below the prior CIP budget. Once the study is complete, preliminary design will follow and inform the design and construction budget in future CIPs.

#### Changes from Prior CIP

Timing of expenditures has been pushed out two years from the prior CIP.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$17,270

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	2,000	6,560	4,000	0	0	0	0	0	12,558
Other Funding	17	170	510	1,360	797	0	0	0	0	0	2,856
<b>Subtotal New Funding</b>	<b>17</b>	<b>170</b>	<b>2,510</b>	<b>7,920</b>	<b>4,797</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15,414</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	1,856	0	0	0	0	0	0	0	0	0	1,856
<b>Subtotal Previously Approved Funding</b>	<b>1,856</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,856</b>
<b>Total Revenues</b>	<b>1,873</b>	<b>170</b>	<b>2,510</b>	<b>7,920</b>	<b>4,797</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17,270</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity. The County's portion of the project costs will be funded with previously approved PAYG and General Obligation Bonds.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### WPCP Technology Enhancements

#### Project Description

Provides funding to maintain and modernize the Plant's Process Control System (PCS) and other networked cyber/ security related initiatives. Several discrete projects have been identified as part of this program.

#### Project Justification

The highly-automated PCS monitors and regulates the operation of the Plant processes to provide secure, efficient, and reliable treatment with minimal down time. This ensures that permit compliance and other performance goals are met. Technology upgrades are necessary to prevent failures, improve efficiency, and protect the Plant from potential cyber-security threats.

#### Changes from Prior CIP

This is a new program for FY 2019 - FY 2028 CIP. In prior CIPs, this was included in the Maintenance Capital program.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$10,240

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
PAYG	502	500	600	800	430	450	460	470	480	482	5,174
Other Funding	247	281	446	219	88	90	90	93	93	94	1,741
<b>Subtotal New Funding</b>	<b>749</b>	<b>781</b>	<b>1,046</b>	<b>1,019</b>	<b>518</b>	<b>540</b>	<b>550</b>	<b>563</b>	<b>573</b>	<b>576</b>	<b>6,915</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	3,325	0	0	0	0	0	0	0	0	0	3,325
<b>Subtotal Previously Approved Funding</b>	<b>3,325</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,325</b>
<b>Total Revenues</b>	<b>4,074</b>	<b>781</b>	<b>1,046</b>	<b>1,019</b>	<b>518</b>	<b>540</b>	<b>550</b>	<b>563</b>	<b>573</b>	<b>576</b>	<b>10,240</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity. The County's portion of the project costs will be funded with previously approved and new PAYG funding.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Odor Control

#### Project Description

Provides funding to design and construct improvements to the odor control systems throughout the WPCP. Several discrete projects have been identified as part of this program.

#### Project Justification

Due to the location of the WPCP, it is necessary to tightly control odor sources and limit, to the extent possible, the odors leaving the plant site by collecting and treating foul air. Odors generated at process areas can pose a safety risk to WPCP staff if not properly removed from working spaces. Improvements to the foul air collection system and chemical scrubbers for treatment will better control on-site and off-site odor issues.

#### Changes from Prior CIP

New program for FY 2019 - FY 2028 CIP.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$2,050

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
PAYG	0	249	340	340	598	174	0	0	0	0	1,701
Other Funding	0	51	70	70	122	36	0	0	0	0	349
<b>Subtotal New Funding</b>	<b>0</b>	<b>300</b>	<b>410</b>	<b>410</b>	<b>720</b>	<b>210</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,050</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>0</b>	<b>300</b>	<b>410</b>	<b>410</b>	<b>720</b>	<b>210</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,050</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) Partners revenue. Each partner's portion of the cost is based on its reserved capacity.



# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Primary Clarifier Upgrades

#### Project Description

This project will evaluate and rehabilitate/ improve the primary clarifiers to extend the useful life and ensure alignment with industry best practices.

#### Project Justification

The last upgrade to the system was approximately twenty years ago. A holistic assessment of the equipment, facilities, process, and future needs is desirable to determine what improvements are needed to ensure the continued reliability and sustainability of this system.

#### Changes from Prior CIP

This is a new project for the FY 2019 - FY 2028 CIP.

### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$5,135

#### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	1,280	1,710	855	0	0	0	0	0	3,847
PAYG	83	332	0	0	0	0	0	0	0	0	415
Other Funding	17	68	265	350	175	0	0	0	0	0	873
<b>Subtotal New Funding</b>	<b>100</b>	<b>400</b>	<b>1,545</b>	<b>2,060</b>	<b>1,030</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,135</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>100</b>	<b>400</b>	<b>1,545</b>	<b>2,060</b>	<b>1,030</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,135</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ partner's portion of the cost is based on its reserved capacity.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Solids Master Plan Phase I - Biosolids Projects

#### Project Description

The 2001 Master Plan included recommended upgrades to both the liquids and solids handling processes. The solids handling process upgrades were deferred in order to focus resources on the liquid process upgrades which were, at the time, a higher priority. A Solids Master Planning effort was undertaken beginning in 2015 and is being presented to the County Board for adoption concurrent with the FY 2019 - FY 2028 CIP. Phase I entails replacement of equipment that will be needed regardless of the Phase II or III decisions, and there is a critical near term interest for completing these upgrade projects.

#### Project Justification

Solids handling processes were constructed anywhere from the 1950s to the 1990s, and are now well beyond their 20-year equipment life. Many are in need of replacement due to high operation and maintenance costs, sub-optimal performance, or non-operational status. These components are costly and labor-intensive to maintain, and present safety challenges for our operations and maintenance staff. The items included in Phase I are critical to meeting the WPCP's permit, and a failure could lead to violations. Planned Phase I projects include preliminary treatment process replacements (bar screens and scum concentrator), motor control center replacement in the Preliminary Treatment Building, and gravity thickener upgrades. Due to the near-term need for these replacement projects, several are already under design using prior CIP funding. Where possible, these projects will implement more effective technology that will reduce the need for maintenance, be more energy efficient, and reduce safety risks to staff.

#### Changes from Prior CIP

Timing of expenditures has been pushed out one year from the prior CIP. Cost of total project has slightly decreased based on new matrix of proposed projects.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$10,000

##### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Other Funding	425	425	595	255	0	0	0	0	0	0	1,700
<b>Subtotal New Funding</b>	<b>425</b>	<b>425</b>	<b>595</b>	<b>255</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,700</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	6,669	0	0	0	0	0	0	0	0	0	6,669
Other Previously Approved Funds	1,631	0	0	0	0	0	0	0	0	0	1,631
<b>Subtotal Previously Approved Funding</b>	<b>8,300</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,300</b>
<b>Total Revenues</b>	<b>8,725</b>	<b>425</b>	<b>595</b>	<b>255</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10,000</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity. The County's portion of the project costs will be funded with PAYG and previously issued, but unspent General Obligation bonds.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Solids Master Plan Phase II

#### Project Description

The 2001 Master Plan (MP01) included recommended upgrades to both the liquids and solids handling processes. The solids process upgrades were deferred in order to focus resources on the liquid process upgrades which were, at the time, a higher priority. A Solids Master Planning effort was undertaken beginning in 2015 and is being presented to the Board for adoption concurrent with the FY 2019-FY 2028 CIP. The Phase II funding may be used to rehabilitate equipment to extend life while the long-term strategy is under construction. It may also be used for site preparation for the anticipated Phase III projects.

#### Project Justification

Phase II funding is a placeholder that can be used in multiple ways and will come into better focus once the Facility Plan for the Phase III work is completed. It may involve replacement or rehabilitation of solids handling processes that were constructed anywhere from the 1960s to the 1990s, since many processes are now well beyond their 20-year equipment life, which makes them difficult to maintain. It may also involve demolition of underutilized existing facilities in preparation for the Phase III construction, to give designers and builders a better idea of the overall site layout and constraints. If used for equipment rehabilitation or replacement, where possible, these projects will implement more effective technology that will reduce the need for maintenance, be more energy efficient, and reduce safety risks to staff.

#### Changes from Prior CIP

The timing of these projects have been pushed out three years based upon the completion of Phase I projects and the proposed timing of Phase III projects.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$5,000

##### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	0	1,500	1,820	0	0	0	0	0	3,320
Other Funding	0	0	85	425	340	0	0	0	0	0	850
<b>Subtotal New Funding</b>	<b>0</b>	<b>0</b>	<b>85</b>	<b>1,925</b>	<b>2,160</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,170</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	830	0	0	0	0	0	0	0	0	0	830
<b>Subtotal Previously Approved Funding</b>	<b>830</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>830</b>
<b>Total Revenues</b>	<b>830</b>	<b>0</b>	<b>85</b>	<b>1,925</b>	<b>2,160</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,000</b>

#### Notes on Funding Schedule

Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity.

# WATER AND SEWER INFRASTRUCTURE

## WPCP NON-EXPANSION

WATER AND SEWER  
INFRASTRUCTURE  
2019 – 2028 CIP

### Solids Master Plan Phase III

#### Project Description

The 2001 Master Plan (MP01) included recommended upgrades to both the liquids and solids handling processes. The solids process upgrades were deferred in order to focus resources on the liquid process upgrades which were, at the time, a higher priority. A Solids Master Planning effort was undertaken beginning in 2015 and is being presented to the Board for adoption concurrent with the FY19-FY28 CIP. The Master Planning effort identified core criteria spanning Operational, Economic, Environmental, and Social considerations and then evaluated the state of current technology to identify the process(es) which best meets the needs of the community. The recommended technology is Thermal Hydrolysis Pretreatment followed by Anaerobic Digestion (THP/AD), which will recover energy (and potentially nutrient) resources. The Class A biosolids product generated can be effectively land applied in the community and will provide resiliency against potential future regulatory changes. The energy recovered in the form of methane may be utilized to power the ART fleet, reduce the Plant's energy footprint, and/or sold back into the grid. The process will also reduce truck traffic by 50% from current levels. The Master Planning process utilized an External Stakeholder group to inform the process from the establishment of criteria through the identification of the preferred alternative. The Stakeholder group included representatives from key commissions as well as from the surrounding Civic Associations.

#### Project Justification

Solids handling processes were constructed anywhere from the 1950s to the 1990s, and many are now well beyond their 20-year equipment life. New technologies and processes are available which are more efficient, effective, safer, provide greater regulatory resilience, and can recover energy from the wastewater process. The recommended alternative will: replace failing or end of life equipment; mitigate the risk of future regulatory changes; reduce the energy and greenhouse gas footprint of the WPCP; reduce truck traffic to and from the WPCB; and assist in achieving additional County-wide sustainability goals

#### Changes from Prior CIP

The estimated costs of this project have decreased from the prior CIP from \$150 Million to just under \$140 Million.

#### Capital Costs during Ten Year Period (FY 2019 to FY 2028) (in \$1,000s): \$139,750

##### Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
New Bond Issue	0	0	1,660	1,450	8,300	24,900	38,180	31,540	9,130	0	115,162
PAYG	0	830	0	0	0	0	0	0	0	0	830
Other Funding	0	170	340	300	1,700	5,100	7,820	6,460	1,870	0	23,758
<b>Subtotal New Funding</b>	<b>0</b>	<b>1,000</b>	<b>2,000</b>	<b>1,750</b>	<b>10,000</b>	<b>30,000</b>	<b>46,000</b>	<b>38,000</b>	<b>11,000</b>	<b>0</b>	<b>139,750</b>
<b>Previously Approved Funding</b>											
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>0</b>	<b>1,000</b>	<b>2,000</b>	<b>1,750</b>	<b>10,000</b>	<b>30,000</b>	<b>46,000</b>	<b>38,000</b>	<b>11,000</b>	<b>0</b>	<b>139,750</b>

#### Notes on Funding Schedule

*Other funding includes Inter-Jurisdictional (IJ) revenue. Each IJ Partner's portion of the cost is based on its reserved capacity. The County's portion of the project costs will be funded with PAYG and General Obligation Bonds.*

## STORMWATER MANAGEMENT PROGRAMS

### Program Description

The Stormwater Management Capital Program includes two capital program areas: Infrastructure (replacement and repair to address system condition, capacity, and flood risk reduction); and 2) Regulatory (state/federal compliance and environmental quality projects).

The overall goals of the program are: 1) to reduce the potential for stormwater threats to public health, safety, and property; 2) to reduce the impacts of new and existing urban development on Arlington streams, the Potomac River and the Chesapeake Bay; 3) to comply with State and federal stormwater, water quality, and floodplain management regulations; and 4) to manage risk and contribute to community resilience.

### Program Summary

The proposed FY 2019 - FY 2028 CIP reflects stormwater projects currently funded by a Sanitary District tax of \$0.013 per \$100 of assessed real property value. The following bullets provide the financial context and assumptions for this CIP:

-The current annual revenue (\$10.2M) funds both operating expenses and capital.

-Based on the recently approved FY19 operating budget, the projected annual amount available for capital investment is \$2.0M. Any growth in the tax base is assumed to cover normal incremental operating expense increases and not provide any additional capacity for capital.

-The \$13.2M estimated fund balance plus 10 years of revenue at \$2.0 total \$33.2M for the program; significantly less than the adopted FY 17-26 CIP of \$53.7M in funding.

-The approved financial and debt management policy for stormwater requires three months of operating expenses as a baseline fixed reserve (currently set at \$1.5M).

-During the first three years of the CIP, multiple high priority projects in design will move into construction, spending down the remaining fund balance by the end of FY21.

-After the projected fund spend down, the program funding for FY22 through FY28 levels off at the \$2.0M total annual revenue for the infrastructure and regulatory programs (combined).

-A number of supplemental funding options are possible solutions to ensure timely regulatory compliance and sustainable infrastructure repair and replacement beyond 2021:

---Rate increase

---Bonding (applicable to a majority but not all Stormwater Program actions)

---A blended solution (rate increase/bond issue)

---Fee-based or utility-formation alternatives;

each involving distinct levels of public engagement, benefits and liabilities, and government mechanisms

For both the Infrastructure and Regulatory components of the program, the proposed CIP significantly reduces planned projects and programs and introduces risk and multi-faceted consequential impacts, including regulatory compliance, safety, community response, water quality, and infrastructure integrity.

These risks and consequences are discussed under each program component below.

### STORMWATER INFRASTRUCTURE PROGRAM

Proposed CIP funding: \$13.9M

Program Description and Summary: The Stormwater Infrastructure capital program funds re-investment in the County's 400-mile storm drainage network and its tens of thousands of stormwater structures and is comprised of two components: Capital Maintenance of the existing stormwater drainage system and Capital Improvements which increase system capacity and minimize the risk of flooding.

The Capital Maintenance component addresses projects and programs designed to rehabilitate or repair the existing storm drainage system (e.g., outfall repair/replacement, relining

pipes) and to address local drainage issues to resolve complaints. Maintenance of the Four Mile Run Flood Control Project is also part of this program component.

The Capital Improvements component of the CIP was created pursuant to the Stormwater Master Plan (2014) and includes programs and projects that increase system capacity (both pipes and open channels) in order to reduce the risk of residential and commercial flooding. The Stormwater Master Plan (2014) identified initial critical flood risk locations to prioritize system capacity projects (in part based on data from the 2006 Flood Event). There are eight high-priority and more than 50 medium-priority projects. Three high-priority projects have been completed to date.

Since the adoption of the Plan, the Program has focused on delivery of several large capacity projects to reduce flood risk in areas that flooded during the June 2006 storm.

The 2014 Stormwater Master Plan did not undertake a comprehensive asset inventory and assessment and instead defaulted to a baseline approach (not a performance model) that allows for initial repair and replacement of identified failing infrastructure over an introductory period of necessary data gathering. Under this approach, the funding for the capital maintenance program to date (~\$1.0M annually) was established as a prerequisite to the ultimate level of system investment sufficient to fund a responsible and responsive program to manage and abate risk.

FY 2019 Strategies and Actions. In order to provide a more conclusive framework for future investment decision-making, DES will develop a performance-driven risk management and abatement model informed by a full asset inventory and gaps analysis. This approach would provide a more granular assessment of the system. In FY19, the program will initiate this comprehensive system assessment (including location, scale, constructed material, sensitivities with adjacent and/or articulated community elements and infrastructure, and age of all stormwater assets). The assessment will serve as a meaningful decision-support tool for the programmatic, operational, and fiscal needs of the system.

Risks and Consequences of Downscaled Stormwater Infrastructure CIP Program:

- The program will not be sufficiently funded to design or construct any new capacity projects (to mitigate acute flooding risks affecting the safety and property of Arlington residents).
- Upon completion of projects currently in planning/design under the existing fund balance, the program can only run on a reactive basis, without planned repair and replacement.
- Deferred repair and replacement may accelerate or increase system emergency events, resulting in higher costs of reactive rather than proactive response.
- The program will also no longer be able to fund small drainage improvement projects requested by property owners to address localized flooding issues. More than 100 complaints were investigated in FY18 alone, and approximately 80 local drainage projects have been constructed since FY14.

## REGULATORY COMPLIANCE AND ENVIRONMENTAL QUALITY PROGRAM

Proposed CIP \$19.3M

Program Description and Summary: This component of the Stormwater Fund Capital Program funds projects that provide pollutant reductions to respond to the County's MS4 Permit requirements and the Chesapeake Bay Total Maximum Daily Load (TMDL) - a regulatory pollution budget for the Bay.

The projects selected and implemented under this Program provide a suite of other benefits, reflecting the goals and objectives of the adopted Stormwater Master Plan, including local water quality improvements throughout the County, infrastructure protection and integrity, safety, and recreation and habitat improvements. These projects include stream, pond, and wetland restoration projects along with green infrastructure projects.

Many of the infrastructure impacts have created safety issues, including failed slopes, eroded trails, exposed and broken sanitary sewer lines, and collapsed stormwater outfalls.

The MS4 Permit requires the reduction of three specific pollutants-nitrogen, phosphorus, and sediment-in an accelerated approach over three, five-year permit cycles to respond to the aggressive requirements for the cleanup of the Bay. At this time, Virginia DEQ continues to require that the second (2018-2023) and third (2023-2028) permit cycles will achieve a cumulative 40 percent and 100 percent reduction, respectively.

EPA will be evaluating overall Chesapeake Bay restoration progress in 2018, and it is anticipated that there may be changes to the pollutant reduction requirements for local governments across Virginia and the Bay watershed. More sediment and nutrient reductions may be required. It is also possible that EPA's 2025 Bay TMDL target compliance date, rather than Virginia's three permit cycle approach, may be imposed.

Risks and Consequences of Downscaled Regulatory CIP Funding:

The proposed CIP extends projected full compliance with nitrogen removal requirements of the Bay TMDL by more than three decades beyond the 2028 deadline. For the next most

difficult pollutant to address (sediment), the proposed CIP extends compliance by more than a decade. In short, the proposed CIP is insufficient to meet the regulatory compliance requirements of the 2023-2028 permit cycle.

Borrowing nutrient credits from the Water Pollution Control Plant is a temporary strategy that has been planned to provide some additional time to meet the MS4 Permit compliance deadline if necessary, given the steepness of the compliance curve for the 2023-2028 permit cycle. The State recognizes that the Plant credits are a transitional tool to provide compliance as the County develops programs and constructs projects to attain compliance.

The risks and consequences associated with extending compliance this far into the future include:

- The Plant will need its excess credits as it approaches its 40 million gallon per day (MGD) capacity in the future.

- The Plant's current performance well below rated capacity could result in DEQ reducing the Plant's nutrient allocation, given Bay compliance challenges across the State.

- This slow rate of Bay TMDL progress also means a lower rate of overall program implementation to improve damaged stream and wetland resources and infrastructure, resulting in reduced environmental benefits in Arlington, vulnerability to future regulatory requirements for local streams, and inability to respond to significant infrastructure damage along County streams.

- Noncompliance can result in significant enforcement penalties (up to \$50,000 per day).

- Negative impacts to the County's reputation as an 'environmental leader' among the regulatory and advocacy communities in the region and nationally as well as Arlington's residents.

### **Master Plan Impact**

The proposed stormwater management program CIP, due to its limited overall funding after the estimated spend-down of the fund balance by FY22, is significantly less positioned than the previously-adopted CIP to accomplish the goals and implement the strategies of the Stormwater Master Plan, adopted by the County Board in September 2014.

STORMWATER MANAGEMENT: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

10 YEAR PROGRAMMED CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Environmental Quality	7,725	3,098	1,833	611	1,000	1,000	1,000	1,000	1,000	1,000	19,267
Storm Drainage Improvements	70	70	400	400	0	0	0	0	0	0	940
SM Maintenance Capital	1,475	925	3,600	1,000	1,000	1,000	1,000	1,000	1,000	1,000	13,000
<b>Total Recommendation</b>	<b>9,270</b>	<b>4,093</b>	<b>5,833</b>	<b>2,011</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>33,207</b>

PROGRAM FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	500	0	0	0	0	0	0	0	0	500
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	9,270	3,593	5,833	2,011	2,000	2,000	2,000	2,000	2,000	2,000	32,707
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>9,270</b>	<b>4,093</b>	<b>5,833</b>	<b>2,011</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>33,207</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Funding Sources</b>	<b>9,270</b>	<b>4,093</b>	<b>5,833</b>	<b>2,011</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>33,207</b>



10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
01 SW Master Plan watershed retrofit projects	0	0	0	0	500	500	500	500	500	500	3,000
02 Ballston Pond watershed retrofit	2,000	1,900	0	0	0	0	0	0	0	0	3,900
03 SW Master Plan stream restoration/outfall projects	0	0	0	0	500	500	500	500	500	500	3,000
04 Donaldson Run Tributary B stream restoration	2,460	0	0	0	0	0	0	0	0	0	2,460
05 Water quality credits (MS4 Permit)	2,619	873	1,833	611	0	0	0	0	0	0	5,936
06 Gulf Branch stream restoration	100	250	0	0	0	0	0	0	0	0	350
07 S Walter Reed Drive watershed retrofits	75	75	0	0	0	0	0	0	0	0	150
08 N. Kentucky @ 22nd St N watershed retrofit	60	0	0	0	0	0	0	0	0	0	60
09 N. Oakland Street watershed retrofit	96	0	0	0	0	0	0	0	0	0	96
10 Sparrow Pond watershed retrofit	150	0	0	0	0	0	0	0	0	0	150
11 11th Street N (Evergreen) watershed retrofit	165	0	0	0	0	0	0	0	0	0	165
<b>Total Recommendation</b>	<b>7,725</b>	<b>3,098</b>	<b>1,833</b>	<b>611</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>19,267</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	500	0	0	0	0	0	0	0	0	500
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	7,725	2,598	1,833	611	1,000	1,000	1,000	1,000	1,000	1,000	18,767
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>7,725</b>	<b>3,098</b>	<b>1,833</b>	<b>611</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>19,267</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Funding Sources</b>	<b>7,725</b>	<b>3,098</b>	<b>1,833</b>	<b>611</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>19,267</b>

### 01 SW Master Plan watershed retrofit projects

#### Project Description

Watershed retrofit projects add stormwater storage and filtration to the landscape where none currently exists. This category includes retrofits of existing stormwater ponds as well as streetscape bioretention systems to store and filter stormwater runoff from nearby streets and homes. Priority watershed retrofit projects have been identified through the Stormwater Master Plan update.

<b>Associated Master Plan:</b> Storm Water Master Plan, Watershed Management Plan	<b>Advisory Commission:</b> Environment and Energy Conservation Commission
<b>Neighborhood(s):</b> VARIOUS	

#### Project Justification

Cumulatively and over the long-term, these projects will help to improve stormwater quality, protect investments in stream restoration, and contribute towards the County's obligations under its Municipal Separate Storm Sewer System (MS4) Permit and the Chesapeake Bay Total Maximum Daily Load (TMDL) cleanup effort.

## Capital Costs during Ten Year Period (FY19 to FY28) (in \$1,000s): \$3,000

Overall expenditures between stream restoration and watershed retrofit programs may be adjusted between programs depending upon TMDL credits, ease of implementation, and other factors.

Funding Schedule (in \$1,000s)											<b>10 Year Total</b>	<b>Notes on Funding Schedule</b>
<b>FY 2019</b>	<b>FY2020</b>	<b>FY 2021</b>	<b>FY2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>			
<b>New Funding</b>												
Federal Funding	0	0	0	0	0	0	0	0	0	0	0	
State Funding	0	0	0	0	0	0	0	0	0	0	0	
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0	
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0	
PAYG	0	0	0	0	0	0	0	0	0	0	0	
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0	
Sanitary District Tax	0	0	0	0	500	500	500	500	500	500	3,000	
Other Funding	0	0	0	0	0	0	0	0	0	0	0	
<b>Subtotal New Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>3,000</b>	
<b>Previously Approved Funding</b>												
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0	
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0	
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0	
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Total Revenues</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>3,000</b>	

  

Projected Additional Operating Costs (in \$1,000s)											<b>10 Year Total</b>	<b>Notes on Operating Costs</b>
<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>			
Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0	
Non-Personnel (\$)	0	0	0	0	20	40	60	80	100	120	420	
Master Lease Financing Costs	0	0	0	0	0	0	0	0	0	0	0	
Bond Financing Costs	0	0	0	0	0	0	0	0	0	0	0	
<b>Net Operating Cost</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>	<b>420</b>	

  

<b>Total New FTEs (#):</b>	<b>0</b>
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*Operations costs include annual maintenance costs of, on average, approximately \$5,000 per year per project (with significant variability based on project size), based on a comprehensive new maintenance contract. Costs shown below assume 4 new facilities in each of the years shown.*



## Capital Costs during Ten Year Period (FY19 to FY28) (in \$1,000s): \$3,900

Cost estimate to be updated at 100% design completion summer 2018.

### Notes on Funding Schedule

#### Funding Schedule (in \$1,000s)

	FY 2019	FY2020	FY 2021	FY2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	500	0	0	0	0	0	0	0	0	500
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	2,000	1,400	0	0	0	0	0	0	0	0	3,400
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>2,000</b>	<b>1,900</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,900</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>2,000</b>	<b>1,900</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,900</b>

### Notes on Operating Costs

#### Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0
Non-Personnel (\$)	0	0	15	15	15	15	15	10	10	10	105
Master Lease Financing Costs	0	0	0	0	0	0	0	0	0	0	0
Bond Financing Costs	0	0	0	0	0	0	0	0	0	0	0
<b>Net Operating Cost</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>105</b>
<b>Total New FTEs (#):</b>											<b>0</b>

Operations costs reflect annual maintenance costs for invasive plant control and overall plant establishment of approximately \$5,000 per year per project, for a 5-year period. See also impacts described under 'SW Master Plan watershed retrofit projects.' \$10,000 per year placeholder below for annual maintenance, pending completion of project and use of new comprehensive maintenance contract.

**03 SW Master Plan stream restoration/outfall projects**

**Project Description**

The County's stream system has been heavily impacted by legacy land use and drainage decisions. Stream restoration is among the critical tools of the County's long-term watershed management program. The primary stream restoration approach includes energy dissipation with strategic grade controls, re-connection with a floodplain area, and extensive planting for bank/floodplain stability and habitat. Extensive infrastructure repair and protection is also part of most projects. Priority stream restoration projects have been identified through the Stormwater Master Plan update. Several projects have been funded/completed with prior CIP funds.

<p><b>Associated Master Plan:</b> Storm Water Master Plan, Watershed Management Plan</p>	<p><b>Advisory Commission:</b> Environment and Energy Conservation Commission, Park and Recreation Commission, Urban Forestry Commission</p>
<p><b>Neighborhood(s):</b> VARIOUS</p>	

**Project Justification**

The key benefits of stream restoration include: protection of infrastructure: trails, utilities, facilities, private property; improved riparian and aquatic habitat; and, improved aesthetics and recreation. Stream restoration is a central component of the County's watershed management program and is one of the most cost-effective strategies to comply with the pollutant reductions required by the Chesapeake Bay Total Maximum Daily Load (TMDL) cleanup effort, particularly sediment reductions.

**Capital Costs during Ten Year Period (FY19 to FY28) (in \$1,000s): \$3,000**

Overall expenditures between stream restoration and watershed retrofit programs may be adjusted between programs depending upon TMDL credits, ease of implementation, and other factors.

**Funding Schedule (in \$1,000s)**

	FY 2019	FY2020	FY 2021	FY2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	0	0	0	0	0	0	0	0	0	0
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	0	0	0	0	500	500	500	500	500	500	3,000
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>3,000</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>3,000</b>

**Notes on Funding Schedule**

*The funding available can fund one project - but not until the end of the 10-year CIP cycle.*

**Projected Additional Operating Costs (in \$1,000s)**

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0
Non-Personnel (\$)	0	0	0	0	0	0	0	0	5	10	15
Master Lease Financing Costs	0	0	0	0	0	0	0	0	0	0	0
Bond Financing Costs	0	0	0	0	0	0	0	0	0	0	0
<b>Net Operating Cost</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>

**Notes on Operating Costs**

*Operations costs reflect annual maintenance costs for invasive plant control and overall plant establishment of approximately \$5,000 per year per project, for a 5-year period.*

**Total New FTEs (#):** **0**



### 04 Donaldson Run Tributary B stream restoration

#### Project Description

The Donaldson Run Tributary B stream restoration project continues the successful stream restoration partnership with the Donaldson Run Civic Association (DRCA) launched with the Tributary A project completed in 2006. This project will restore 1,400 linear feet of eroded and degraded stream channel and create a new channel with bank stability, reduced velocities, and improved habitat, along with repair and protection of significant stormwater drainage and water supply infrastructure, including a 30" water main that serves 20,000 residents.

<b>Associated Master Plan:</b> Storm Water Master Plan, Watershed Management Plan	<b>Critical Milestones:</b>  <i>Final design</i> 2018 <i>Construction</i> 2019	<b>Advisory Commission:</b> Environment and Energy Conservation Commission, Park and Recreation Commission, Urban Forestry Commission
<b>Neighborhood(s):</b> Donaldson Run		

#### Project Justification

The key benefits of stream restoration include: protection of infrastructure: trails, utilities, facilities, private property; improved riparian and aquatic habitat; and, improved aesthetics and recreation. Stream restoration is a central component of the County's watershed management program and is also one of the most cost-effective strategies to comply with the pollutant reductions required by the Chesapeake Bay Total Maximum Daily Load (TMDL) cleanup effort, particularly sediment reductions.

#### Changes from Prior CIP

Shift in construction schedule to accommodate design of associated storm sewer and other infrastructure work. Increase in cost estimate due to escalation of construction costs and the addition of associated storm sewer and outfall repairs added to project scope.

**Capital Costs during Ten Year Period (FY19 to FY28) (in \$1,000s): \$2,460**

***Notes on Funding Schedule***

Funding Schedule (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	0	0	0	0	0	0	0	0	0	0
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	2,460	0	0	0	0	0	0	0	0	0	2,460
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>2,460</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,460</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>2,460</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,460</b>

Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0
Non-Personnel (\$)	0	5	5	5	5	5	0	0	0	0	25
Master Lease Financing Costs	0	0	0	0	0	0	0	0	0	0	0
Bond Financing Costs	0	0	0	0	0	0	0	0	0	0	0
<b>Net Operating Cost</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>

***Notes on Operating Costs***

*Operations costs reflect annual maintenance costs for invasive plant control and overall plant establishment of approximately \$5,000 per year per project, for a 5-year period.*

**Total New FTEs (#): 0**

# STORMWATER MANAGEMENT

## ENVIRONMENTAL QUALITY

STORMWATER  
MANAGEMENT  
2019 – 2028 CIP

### 05 Water quality credits (MS4 Permit)

#### Project Description

Through a competitively bid contract, the County will purchase nutrient and sediment credits generated by watershed retrofit and stream restoration projects identified, designed, and built by private firms on private property.

<b>Associated Master Plan:</b> Storm Water Master Plan, Watershed Management Plan	<b>Advisory Commission:</b> Environment and Energy Conservation Commission
<b>Neighborhood(s):</b> VARIOUS	

#### Project Justification

The critical path to meet the Chesapeake Bay TMDL requirements requires additional credit delivery beyond what can be obtained through traditional capital improvement. Contract resources targeted at credit delivery supplement but do not replace in-house or contracted capital project efforts to fulfill Chesapeake Bay TMDL requirements. A third party contract was awarded in January 2016, and the contractor proposed a task order for credits achieved through a private project on Washington Golf and Country Club. The task order opportunity provides significant credits at low cost, and are reflected in the project costs below. At the time of publication, the task order is nearing completion but not yet finalized and executed with final terms. Under the terms of the contract, maintenance costs are generally not borne by the County; therefore, no maintenance costs are anticipated in the 10-year period.

## Capital Costs during Ten Year Period (FY19 to FY28) (in \$1,000s): \$5,936

The costs shown below are in the 'construction' category. However, contractually, the County is purchasing credits and not construction services.

### Notes on Funding Schedule

#### Funding Schedule (in \$1,000s)

	FY 2019	FY2020	FY 2021	FY2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	0	0	0	0	0	0	0	0	0	0
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	2,619	873	1,833	611	0	0	0	0	0	0	5,936
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>2,619</b>	<b>873</b>	<b>1,833</b>	<b>611</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,936</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Revenues</b>	<b>2,619</b>	<b>873</b>	<b>1,833</b>	<b>611</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,936</b>

### Notes on Operating Costs

*Under the terms of the contract, all maintenance responsibilities are with the contractor and property owner.*

#### Projected Additional Operating Costs (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0
Non-Personnel (\$)	0	0	0	0	0	0	0	0	0	0	0
Master Lease Financing Costs	0	0	0	0	0	0	0	0	0	0	0
Bond Financing Costs	0	0	0	0	0	0	0	0	0	0	0
<b>Net Operating Cost</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Total New FTEs (#):** **0**

## Program Description

This portion of the Stormwater Management Program CIP includes projects identified and prioritized in the Stormwater Master Plan. Projects include watershed retrofit projects to help reduce the impacts of stormwater runoff on local streams, the Potomac River, and the Chesapeake Bay. This program also includes stream restoration projects to improve stream stability and habitat and protect infrastructure. Both watershed retrofits and stream restoration projects are key parts of the County's strategy to comply with its new Municipal Separate Storm Sewer System (MS4) permit and the nutrient and sediment reductions required by the Chesapeake Bay Total Maximum Daily Load (TMDL)—a pollution budget for the Bay that was established by the U.S. Environmental Protection Agency in 2010.

### **06 Gulf Branch Stream Restoration** Bellevue Forest, Gulf Branch, Old Glebe

This project is the highest priority for stream restoration based upon the County-wide stream assessment for the Stormwater Master Plan and the TMDL credits it will provide. It includes the restoration of approximately 3,800 linear feet of Gulf Branch in the vicinity of the Gulf Branch Nature Center to address severe erosion, protect several exposed sanitary sewer crossings, and stabilize several stormwater outfalls.

### **07 S Walter Reed Drive watershed retrofits** Columbia Heights, Douglas Park

This watershed retrofit project complements phased transportation decal fee-funded improvements to S. Walter Reed Dr. Two bioretention systems will be added to the right-of-way to store and filter stormwater runoff from S. Walter Reed Dr and adjacent roads and rooftops. Phase 1 will add a bioretention at the intersection with 5th Street S. Phase 2 will add bioretention to the intersection with 9th St S.

### **08 N. Kentucky @ 22nd St N watershed retrofit** Leeway Overlee, Tara-Leeway Heights

This watershed retrofit project is coordinated with a Neighborhood Conservation Program streetscape improvement project for the intersection of N. Kentucky with 22nd Street N. Bioretention, which includes engineered soils and specialized plantings to store and filter stormwater runoff from nearby streets and homes, will be incorporated into an intersection "bump out" adjacent to 5809 22nd Street N. Joint implementation of this project with an NC project will result in reduced planning and design time and overall project costs relative to a stand alone project.

### **09 N. Oakland Street watershed retrofit** Ashton Heights

This watershed retrofit project is coordinated with a Neighborhood Conservation Program project that will improve pedestrian circulation on N. Oakland Street. Bioretention, which includes engineered soils and specialized plantings to store and filter stormwater runoff from nearby streets and homes, will be integrated into a mid-block curb extension. The bioretention will replace existing pavement as well as incorporate a portion of the undeveloped right of way associated with the 2nd Street N. paper street. Joint implementation of this project with an NC project will result in reduced planning and design time and overall project costs relative to a stand alone project.

### **10 Sparrow Pond watershed retrofit** Arlington Forest, Barcroft

Sparrow Pond is an existing wet pond with a drainage area of 80 acres. It is the second highest priority pond retrofit after the Ballston Pond project, due to its degraded nature and high TMDL credits. Eroded sediment has filled the pond and maintenance dredging and re-vegetation is needed to restore the pond's function. In lieu of expensive one-time maintenance, this project will retrofit the pond to create a constructed wetland. The project will restore the pond's volume, improve stormwater treatment and will be designed to make subsequent maintenance easier and less costly.

## **11 11th Street N (Evergreen) watershed retrofit** Bluemont, Waycroft-Woodlawn

This watershed retrofit project is coordinated with a Neighborhood Conservation Program project that will improve pedestrian and traffic circulation on N. Evergreen Street and 11th Street N. Bioretention, which includes engineered soils and specialized plantings to store and filter stormwater runoff from nearby streets and homes, will be installed in the right of way. Space for two bioretentions will be created by redesign of the intersections of 11th Street N with N. George Mason Dr. and N. Evergreen Street. Joint implementation of this project with an NC project will result in reduced planning and design time and overall project costs relative to a stand alone project.

MAINTENANCE CAPITAL: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
01 Donaldson Run outfall/channel repair-24th Rd N	600	0	0	0	0	0	0	0	0	0	600
02 Maintenance Capital/Local Drainage	200	200	200	200	0	0	0	0	0	0	800
03 Four Mile Run Flood Control Project Maintenance	275	225	200	100	50	50	50	50	50	50	1,100
04 Maintenance Capital/Outfall Repairs	200	200	200	250	250	250	250	250	250	250	2,350
05 Maintenance Capital/system repair and reinvestment	200	200	300	450	700	700	700	700	700	700	5,350
06 Downstream Dumbarton St. Culvert	0	50	1,350	0	0	0	0	0	0	0	1,400
07 Upstream Dumbarton St. Culvert	0	50	1,350	0	0	0	0	0	0	0	1,400
<b>Total Recommendation</b>	<b>1,475</b>	<b>925</b>	<b>3,600</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>13,000</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	0	0	0	0	0	0	0	0	0	0
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	1,475	925	3,600	1,000	1,000	1,000	1,000	1,000	1,000	1,000	13,000
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>1,475</b>	<b>925</b>	<b>3,600</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>13,000</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Funding Sources</b>	<b>1,475</b>	<b>925</b>	<b>3,600</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>13,000</b>



# STORMWATER MANAGEMENT

## MAINTENANCE CAPITAL

STORMWATER  
MANAGEMENT  
2019 – 2028 CIP

### Program Description

Much of Arlington County's stormwater infrastructure was built during the 1940's and 1950's. It is approaching the end of its useful life and a regular repair and replacement program is necessary to ensure the continued functioning of the storm drainage network during storm events in order to prevent flooding and property damage.

This category of projects provides for the orderly and planned replacement of storm sewer mains, catch basins, and endwalls (with their associated outfalls). Particular attention will be paid to the approximate 11 miles of corrugated metal pipes and plate arch culverts that have deteriorated more quickly than other materials. Associated Master Plans include the Watershed Management Plan and the Stormwater Master Plan.

#### **01 Donaldson Run outfall/channel repair-24th Rd N** Donaldson Run, Old Dominion

To stabilize erosion at the outfall to an inaccessible channel (e.g., due to steep slopes, limited right-of-way, and/or vegetation), and repair/reconfigure storm sewers in the vicinity that will result in a new outfall location farther downstream and a stabilized outfall channel. Includes reconstruction of the failing outfall, replacement of approximately 100 linear feet of 15-inch storm sewer and stabilization of approximately 650 linear feet of channel.

#### **02 Maintenance Capital/Local Drainage**

This program addresses local drainage issues requested by property owners, including discharges from sump pumps in the public right of way and other localized flooding.

#### **03 Four Mile Run Flood Control Project Maintenance**

This program will inspect, repair, remove vegetation, repair wall joints, and dredge channel in the Four Mile Run Flood Control Project. County is responsible to maintain the flood control project per agreements with the US Army Corps of Engineers (USACE).

#### **04 Maintenance Capital/Outfall Repairs**

This category of projects repairs failed storm drain system outfalls and obtain necessary easements. Many of the outfalls for the storm sewer network are in very poor condition: broken pipe, pipe sliding downhill, erosion, broken endwalls. Repairs are necessary to prevent additional deterioration of upstream pipelines, private property and nearby infrastructure. Erosion needs to be stabilized.

#### **05 Maintenance Capital/system repair and reinvestment**

This program is intended to rehabilitate or repair the existing storm drainage system (e.g., outfall repair/replacement, relining pipes) over time. The 2014 Stormwater Master Plan did not undertake a comprehensive asset inventory and assessment and instead defaulted to a baseline approach (not a performance model) that allows for initial repair and replacement of identified failing infrastructure over an introductory period of necessary data gathering. Under this approach, the funding for the capital maintenance program to date (~\$1.0M annually) was established as a prerequisite to the ultimate level of system investment sufficient to fund a responsible and responsive program to manage and abate risk. In order to provide a more conclusive framework for future investment decision-making, DES will develop a performance-driven risk management and abatement model informed by a full asset inventory and gaps analysis. This approach would provide a more granular assessment of the system. In FY19, the program will initiate this comprehensive system assessment (including location, scale, constructed material, sensitivities with adjacent and/or articulated community elements and infrastructure, and age of all stormwater assets. The assessment will serve as a meaningful decision-support tool for the programmatic, operational, and fiscal needs of the system. A proactive program of capital maintenance increases system integrity and reliability, protects public health and safety, reduces impacts on interconnected infrastructure, and increases long-term cost-effectiveness.

## **06 Downstream Dumbarton St. Culvert**

This project will replace the downstream Dumbarton St. culvert, which was damaged in the storm of August 15, 2017. Culvert is under capacity and the road overtops during extreme storm events. This project is technically comprised of two components (upstream and downstream culverts), which can be phased or combined as funding allows. Each component is capable of standing independently as to benefits and outcomes. Assuming available funding, there are certain economies of scale to be realized in constructing both simultaneously.

## **07 Upstream Dumbarton St. Culvert** Rock Spring

This project will replace the existing upstream culvert in Dumbarton St., which was damaged in the storm of August 15, 2017. Culvert is under capacity and the road overtops during extreme storm events. This project is technically comprised of two components (upstream and downstream culverts), which can be phased or combined as funding allows. Each component is capable of standing independently as to benefits and outcomes. Assuming available funding, there are certain economies of scale to be realized in constructing both simultaneously.

STORM DRAINAGE IMPROVEMENTS: PROGRAM FUNDING SUMMARY

CIP  
2019 – 2028

10 YEAR CATEGORY SUMMARY (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
01 Lower Long Branch Flood Risk Reduction Project	40	40	200	200	0	0	0	0	0	0	480
02 Capacity / Flood Risk Reduction Projects	30	30	200	200	0	0	0	0	0	0	460
<b>Total Recommendation</b>	<b>70</b>	<b>70</b>	<b>400</b>	<b>400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>940</b>

CATEGORY FUNDING SOURCES (in \$1,000s)

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	10 Year Total
<b>New Funding</b>											
Federal Funding	0	0	0	0	0	0	0	0	0	0	0
State Funding	0	0	0	0	0	0	0	0	0	0	0
Developer Contributions	0	0	0	0	0	0	0	0	0	0	0
New Bond Issue	0	0	0	0	0	0	0	0	0	0	0
PAYG	0	0	0	0	0	0	0	0	0	0	0
Short Term Finance	0	0	0	0	0	0	0	0	0	0	0
Sanitary District Tax	70	70	400	400	0	0	0	0	0	0	940
Other Funding	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal New Funding</b>	<b>70</b>	<b>70</b>	<b>400</b>	<b>400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>940</b>
<b>Previously Approved Funding</b>											
Authorized but Unissued Bonds	0	0	0	0	0	0	0	0	0	0	0
Issued but Unspent Bonds	0	0	0	0	0	0	0	0	0	0	0
Other Previously Approved Funds	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal Previously Approved Funding</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Funding Sources</b>	<b>70</b>	<b>70</b>	<b>400</b>	<b>400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>940</b>

# STORMWATER MANAGEMENT

## STORM DRAINAGE IMPROVEMENTS

STORMWATER  
MANAGEMENT  
2019 – 2028 CIP

### Program Description

These projects provide additional capacity at locations with limited overland relief. Storm sewer overflows at locations with limited overland relief can result in significant damage to homes. While the County can increase system capacity, some locations will always have some level of vulnerability. The majority of the projects identified in this program address areas that were flooded in the June 2006 storm; the update of the Stormwater Master Plan will be used to refine the designs of these projects.

#### **01 Lower Long Branch Flood Risk Reduction Project** Long Branch Creek

Alternatives are being evaluated to reduce the risk of flooding along Lower Long Branch from South Glebe Road to 26th Street South. Those alternatives include increasing the channel capacity and by providing overflows to a new storm drainage system. The final project will decrease the number of homes in the regulated Federal Emergency Management Agency (FEMA) floodplain.

The recently updated FEMA flood maps based on the most recent topographic information indicate that approximately 138 homes are threatened by the 100-year flood. A flood risk reduction project along Lower Long Branch has the potential to reduce the risk of flooding to these homes significantly, with the added benefit of reducing the need for flood insurance in this neighborhood, resulting in cost savings for property owners.

Due to impacts to the Troy St. Park, concerns raised by neighboring community groups, and the need for a public outreach plan, a feasibility study will develop alternatives and present them to the public before determining final project scope and criteria. Limited overall program funding after FY22 is another key factor. Planning and preliminary design costs only are provided for this project at this time.

#### **02 Capacity / Flood Risk Reduction Projects**

This program implements the capacity and flood risk reduction project priorities identified in the 2014 Stormwater Master Plan. These projects are outlined and prioritized in the 2014 Stormwater Master Plan, and reduce the risk of flooding from systemic capacity limitations of the storm sewer system and from stream channels.