

# Sanitary Sewers

## PROGRAM DESCRIPTION

Fairfax County provides sewer service to its residents and businesses through a system of approximately 3,247 miles of sewer lines, 63 pumping stations, 57 metering stations and one treatment plant owned and operated by the County. Additional treatment plant capacity is provided by contractual agreements with the District of Columbia Water (DC Water), Alexandria Renew Enterprises (AlexRenew), Arlington County, Upper Occoquan Service Authority (UOSA), Loudoun Water, Prince William County Service Authority and Colchester Utilities.

### LINK TO THE COMPREHENSIVE PLAN

The Policy Plan for Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Emphasize the need to maintain a system of conveyance and treatment facilities that is responsive and compatible with the development and environmental goals of the County, and provide necessary renovations and improvements that will permit the entire system to function at a high level of efficiency.
- ✓ Provide public sewer in accordance with the Board of Supervisor's approved sewer service area in support of the County's land use objectives.

Source: 2017 Edition of the Comprehensive Plan, as amended

## PROGRAM INITIATIVES

The current capital program generally supports the following County initiatives:

- Providing sufficient treatment plant capacity to ensure that projected residential and nonresidential growth can be accommodated over the planning period.
- Improving the effluent quality of County-owned and treatment by contract wastewater treatment facilities to comply with increasingly stringent discharge limitations, such as those mandated by the Chesapeake Bay Program.
- Ensuring a sufficient capital re-investment rate for the rehabilitation and replacement of existing County assets to ensure cost effective long-term operations and provision of adequate service levels.

Financing of the capital program for the sanitary sewer system has historically been derived from three sources: system revenues, the sale of revenue bonds and grant funding. The County has generally used system revenues on a "pay as you go" basis to fund the majority of capital improvements. This has particularly been true for "recurring" capital projects, such as capital replacement and rehabilitation projects, extension and improvement (E&I) projects and general system improvements. For major capital initiatives, such as system expansion and regulatory compliance projects, the County has funded the projects through the use of sewer revenue bonds, payable solely from the revenues of the Integrated Sewer System and hence not general obligations of Fairfax County. The County actively manages its outstanding debt, refinancing to take advantage of lower interest rates or retiring debt to manage its debt coverage. While federal and state grants were extensively utilized to fund the construction programs of the 1970's and 1980's, the financial burden of current programs fall heavily on the County due to scarcity of federal and

state grant funds. The County has received limited state grant funding to help offset the cost of compliance with the Chesapeake Bay Program.

Approximately 95 percent of the System's revenues are derived from charges to new and existing customers through availability charges, base charges and sewer service charges. New customers to the System are charged a one-time availability charge per new connection for access to the System. Existing customers pay sewer service charges, which are based upon the actual water consumption during the winter quarter, and base charges, which are assessed quarterly and provide for a more equitable rate structure by recovering a portion of the program's costs. Availability charges, base charges and sewer service charges are established by the Fairfax County Board of Supervisors. Since 1979, the Board has used the five-year financial projection of system expenses, revenues and available cash balances to determine the appropriate level of availability charges and sewer service charges. The available cash balance reflects the projected sources and uses of funds by new and existing customers. The system allocates operating revenues and expenses, debt service and capital outlay between existing users and new users of the System. The remaining 5 percent of system revenues are derived primarily from sale of service to wholesale users such as Arlington County, Loudoun Water, the Cities of Fairfax and Falls Church, the Towns of Herndon and Vienna and Ft. Belvoir.

The FY 2020 proposed increases to both the Sewer Service Charge and Base Charge will change the annual average customer bill from \$625.52 in FY 2019 to \$655.80, a cost increase of \$30.28 per year, \$2.52 per month, or 4.8 percent. The Sewer Service Charge will increase from \$7.00 to \$7.28 per 1,000 gallons of water consumed, based on Fairfax County's residential winter quarter average consumption of 18,000 gallons. The Base Charge will increase from \$30.38 per quarter to \$32.91 per quarter.

The County has issued sewer revenue bonds to provide funds for expanding treatment facility capacity at both County-owned and County-contracted facilities. Specifically, the County issued revenue bond debt for the following treatment plant expansions and upgrades:

- In June 2001 and June 2002, a total of \$90 million in State Revolving Fund/Virginia Resources Authority debt to support the County's share of plant upgrades at the Alexandria Renew Enterprises treatment plant.
- In July 2009, \$152.3 million in revenue bond debt to support the County's share of the plant upgrades at DC Water, Arlington County, Alexandria Renew Enterprise as well as the County owned treatment plant to comply with the nitrogen discharge limits as defined in the Chesapeake Bay Program.
- In August 2012, \$100.7 million in revenue bond debt to support the County's share of the plant upgrades at DC Water, Alexandria Renew Enterprises as well as the County owned treatment plant to comply with the enhanced nutrient discharge limits as defined in the Chesapeake Bay Program.
- In April 2014, the remaining \$64.9 million of the 2004 Sewer Refunded Bonds were refunded in order to take advantage of the lower interest rates.
- In June 2017, \$85.8 million in revenue bond debt to provide funds for additions, extensions and improvements to the Fairfax County's sewage collection, and treatment systems including the County's Noman M. Cole, Jr. Pollution Control Plant, paying capital improvement costs allocable to the County at other regional treatment facilities that provide service to the County and, if necessary purchasing additional capacity.

In addition to this County-issued debt, as of June 30, 2018, the County is responsible for \$231.8 million in debt to support the expansion and upgrade of the UOSA treatment plant. A regional facility, UOSA issues its own bonds that are used to finance the expansion and upgrade projects. The participating members of UOSA, (Fairfax County, Prince William County Service Authority, City of Manassas, and Manassas Park) are responsible for the debt service on the UOSA bonds based on capacity owned at the facility.

Looking to the future, a balance must be found between the following three major issues facing the integrated sewer system: (1) the necessity of maintaining high levels of water quality (including meeting more stringent nutrient limits); (2) maintaining capacity to accommodate growth within the County, and (3) achieving these two goals within financial resources. To a similar end, consideration must be given to inspecting, repairing and maintaining the system at acceptable service levels. In most instances, annual expenditures for system upkeep will enable the County to avoid costly, major rehabilitation in the future.

## **SUMMARY OF TREATMENT CAPACITY STATUS AND SUFFICIENCY**

Fairfax County's current treatment capacity is projected to be sufficient through 2045. The following summarizes the status of the County's treatment capacity.

### **Noman M. Cole, Jr. Pollution Control Plant**

The Noman M. Cole, Jr., Pollution Control Plant (NCPCP) serves the Accotink, Pohick, Long Branch, Little Hunting and Dogue Creek drainage basins. In addition to flows originating within the County, the plant also treats sewage from the City of Fairfax, Fort Belvoir and part of the Town of Vienna. The NCPCP was put on line in 1970 with an initial design capacity of 18 million gallons daily (MGD), which was subsequently increased to a rating of 36 MGD of advanced treatment in 1978, 54 MGD in 1995 and again increased to a rating of 67 MGD in 2005. The Chesapeake Bay water quality program requires reductions in the amount of nutrient pollutants discharged from wastewater treatment facilities. In December 2004, the state notified the County that the renewal of County's Virginia Pollutant Discharge Elimination System (VPDES) permit includes a requirement that nutrient removal be performed using "State of the Art" technology and meet a waste load allocation (cap) for the nitrogen and phosphorus nutrients. A phased approach was used to renovate and upgrade current plant facilities to accommodate these more stringent nutrient discharge requirements.

### **Blue Plains**

With a current capacity of 370 MGD, the District of Columbia Water (DC Water) treatment plant at Blue Plains is the largest plant in the area. In addition to the District of Columbia, it treats flows from Maryland, Virginia and several federal installations. Wastewater flows originating in the Sugarland Run, Horsepen Creek, Difficult Run, Scotts Run, Dead Run, Turkey Run and Pimmit Run watersheds are treated at Blue Plains. Fairfax County is presently allocated 31 MGD at the plant. Blue Plains has gone through a major renovation of the chemical addition, nitrogen removal and sludge disposal systems over the past several years. The County's flows to Blue Plains will be continually monitored to see if any additional capacity will be required at Blue Plains or from Loudoun Water; or if the diverting of flow from the Blue Plains service area with the Difficult Run Pump Station to the NCPCP service area will be sufficient to stay within the County's allocation of 31 MGD.

### **Alexandria Renew Enterprises (AlexRenew)**

The Cameron Run and Belle Haven watersheds and a portion of the City of Falls Church are served by the Alexandria treatment plant. The Alexandria plant is owned and operated by Alexandria Renew Enterprises. Fairfax County is allotted 32.4 MGD of total capacity of 54 MGD. By activating the Braddock Road and Keene Mill Road pumping stations, the County has the capability to divert flow from the Accotink watershed (currently served by the Noman Cole Plant) to AlexRenew. These diversions will increase the County's wastewater management alternatives in the entire eastern portion of the County by off-loading flows from the NCPCP and Blue Plains Treatment Plant to the AlexRenew plant. As with other treatment plants in the area, additional facilities have been constructed at AlexRenew to enhance the removal of nitrogen using "State of the Art" technology. AlexRenew will be constructing new facilities to process wet weather flows during heavy storms to avoid sanitary sewer overflows. Fairfax County will be responsible for its pro rata share of these costs.

### **Arlington County Pollution Control Plant**

The Arlington County pollution control plant serves the portion of Fairfax County within the Four Mile Run watershed. The plant has been upgraded to comply with the water quality standards for nitrogen removal, and expanded to 40 MGD. The Arlington plant currently receives approximately 2.0 MGD of flow from Fairfax County. The County's contractual capacity is 3.0 MGD.

### **Upper Occoquan Service Authority**

The southwestern part of Fairfax County is served by a regional plant owned and operated by the Upper Occoquan Service Authority (UOSA). This plant became operational in 1978 and replaced five small treatment plants in Fairfax County (Greenbriar, Big Rocky Run, Flatlick Run, Upper Cub Run and Middle Cub Run) and six in Prince William County. This plant was originally certified to operate at 15 MGD. Fairfax County's initial 30.83 percent share of the plant was increased to 36.33 percent in 1978 with the purchase of additional capacity from Manassas Park. When the plant expanded to 54 MGD, the County's share increased to 51.1 percent. However, the County has sold some of its capacity to other UOSA users and decreased its share to 41.8 percent. The following summarizes the County's capacity in the plant:

- Original plant capacity of 15 MGD- County capacity of 5.45 MGD.
- Plant capacity expansion to 27 MGD- County capacity of 9.915 MGD.
- Additional plant capacity expansion to 54 MGD- County capacity of 27.6 MGD.
- The County sold 3.0 MGD of capacity to other UOSA users in January 2008, which reduced County capacity to 24.6 MGD.
- The County sold 2.0 MGD of capacity to other UOSA users in January 2010, which reduced County capacity to 22.6 MGD.

Even with the sale of County capacity, the UOSA Plant is capable of handling anticipated flows from its contributory sheds through 2045.

### **Loudoun Water**

The northwestern part of Fairfax County is currently served by Blue Plains and NCPWP. To provide sufficient capacity for the anticipated growth in this area, the County purchased 1.0 MGD of capacity from the Loudoun Water in March of 2011. The flows in Blue Plains will be continually monitored to see if any additional capacity will be required from Loudoun Water in the planning period. Currently, the County is not utilizing its capacity at Loudoun Water. However, the use of this capacity is anticipated in the future as the County's flows approach its allocation at Blue Plains.

## **CURRENT PROJECT DESCRIPTIONS**

1. **Alexandria Renew Enterprises (AlexRenew) Treatment Plant Improvements** (Countywide): \$139,740,000 is estimated for the County's share of improvements at the AlexRenew treatment plant through FY 2029. This project includes the replacement and rehabilitation of existing treatment process facilities and facilities to handle wet weather flows in order to avoid sanitary sewer overflows.
2. **Arlington Wastewater Treatment Plant Upgrade** (Countywide): \$16,097,000 is estimated for the County's share of the plant upgrade costs through FY 2029. Funding will provide for Fairfax's portion for non-expansion capital improvements, technology enhancements, clarifier upgrades, a Bio-solids Master Plan, and the relining of a large diameter sewer line for the Four Mile Run interceptor which runs from Fairfax County to the Arlington plant.
3. **DC Water Blue Plains Treatment Plant Improvements** (Countywide): \$129,886,000 is estimated for the County's share of upgrading the 370 MGD of capacity at the Blue Plains treatment plant through FY 2029. This upgrade includes major plant renovations, including the chemical addition, flow control tunnels, and sludge disposal systems to meet the enhanced total nitrogen standards.
4. **Extension and Improvements Projects** (Countywide): \$1,000,000 is estimated to be required in FY 2020 for the extension of sanitary sewer to homes with failing septic systems located within the approved sewer service area. Failing septic systems can be a health hazard and to mitigate this hazard, the County extends sanitary sewer to these homes. It is anticipated that \$2,000,000 will be required annually in the future.

5. **Gravity Sewer Capacity Improvements** (Countywide): \$51,500,000 is estimated to be required through FY 2029 for increasing the size of existing sewer lines and the installing new sewer lines to serve development within the County. This is a proactive program to manage the strain placed on the current sewer system due to additional load as areas develop.
6. **Noman M. Cole, Jr. Pollution Control Plant Rehabilitation and Replacement** (Mt. Vernon District): \$729,816,000 is estimated to be required to continue the rehabilitation and replacement of the plant's assets through FY 2029. Projects proposed to improve the plant's assets include the following: replacement of and improvements to the existing biosolid facilities; replacement and upgrades to the facility's electrical system including the motor control centers and electrical distribution centers; rehabilitation and upgrades to disinfection facilities; HVAC upgrades to the laboratory and administration buildings; rehabilitation and replacement of miscellaneous pumps, gates, and valves; rehabilitation of the various facilities; facility pilots, improvements, and additions to improve processes and facilities aimed at improving environmental compliance optimization and reliability, facility safety and security, operations and maintenance costs, and sustainability of the facility; fFacility storm water improvements; and other rehabilitation and replacement projects related to the maintenance of the wastewater treatment facility assets.
7. **Noman M. Cole, Jr. Pollution Control Plant Upgrades** (Mt. Vernon District): \$6,297,000 is required to replace and rehabilitate existing treatment process facilities through FY 2029. This project will include filtration facilities, equalization basin improvements, solid thickening facilities, and various other facilities at the wastewater treatment facility.
8. **Pumping Station Improvements** (Countywide): \$147,950,000 is estimated for the continual replacement, rehabilitation and upgrade of the System's pumping stations through FY 2029. These improvements do not increase capacity of the stations but are related to addressing system upkeep or improving the stations to address service issues such as odor control.
9. **Sanitary Sewer Replacement, Rehabilitation and Reinvestment Program** (Countywide): \$245,229,000 is estimated to be required for the continual replacement, rehabilitation and reinvestment of sewer lines through FY 2029. A continued increased effort to address large diameter sewer lines continues in order to prevent future pipe failures.
10. **Sewer Metering Projects** (Countywide): \$1,100,000 to install and rehabilitate sewer meters. These meters support billing for actual flows, help identify excessive Inflow and Infiltration (I/I) and provide data required for billing other jurisdictions.
11. **Sewer System Capital Renewal** (Countywide): \$1,900,000 is required for renovation and improvements to the Robert P. McMath facility through FY 2029. This facility houses the Sewer collection system maintenance staff and equipment. Improvements include reconfiguring office space, HVAC maintenance and miscellaneous facility rehabilitation. Other improvements will include the Supervisory Control and Data Acquisition (SCADA) Backup System, various safety improvements at all collection facilities and smaller miscellaneous improvements.
12. **Upper Occoquan Service Authority Treatment Plant Upgrade** (Countywide): \$68,322,000 is estimated for the County's share of the plant upgrade costs through FY 2029. This upgrade includes plant renovations, specifically the nutrient cap project, filter press replacement, and re-carbonation clarifier improvements.

**PROJECT COST SUMMARIES  
SANITARY SEWERS  
(\$000's)**

Project Title Project Number			Source of Funds	Budgeted or Expended Through FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total FY2020- FY2024	Total FY2025- FY2029	Total Project Estimate
1	Alexandria Renew Enterprises (AlexRenew) Treatment Plant Improvements WW-000021	SR, B	C	\$19,680	\$20,220	\$27,270	\$18,660	\$15,000		\$100,830	\$38,910	\$139,740
2	Arlington Wastewater Treatment Plant Upgrade WW-000020	SR, B	C	\$784	\$1,180	\$1,487	\$1,587	\$2,465		\$7,503	\$8,594	\$16,097
3	DC Water Blue Plains Treatment Plant Improvements WW-000022	SR, B	C	\$9,957	\$12,543	\$14,936	\$12,358	\$8,869		\$58,663	\$71,223	\$129,886
4	Extension & Improvement Projects WW-000006	SR	C	\$1,000	\$2,000	\$2,000	\$2,000	\$2,000		\$9,000	\$10,000	\$19,000
5	Gravity Sewer Capacity Improvements WW-000032	SR	C		\$2,250	\$3,750	\$6,500	\$6,500		\$19,000	\$32,500	\$51,500
6	Noman M. Cole, Jr. Pollution Control Plant Rehabilitation and Replacement WW-000009, WW-000017	SR, B	C	\$78,760	\$91,463	\$84,103	\$90,505	\$90,275		\$435,106	\$294,710	\$729,816
7	Noman M. Cole, Jr. Pollution Control Plant Upgrades WW-000016	SR, B, F, S	C	\$4,197	\$2,100					\$6,297		\$6,297
8	Pumping Station Improvements WW-000001	SR	C	\$8,020	\$12,280	\$20,150	\$18,500	\$14,000		\$72,950	\$75,000	\$147,950
9	Sanitary Sewer Replacement, Rehabilitation and Reinvestment Program WW-000007, WW-000008, WW-000024, WW-000026, WW-000028	SR	C	\$15,899	\$23,980	\$30,850	\$24,500	\$25,000		\$120,229	\$125,000	\$245,229
10	Sewer Metering Projects WW-000005	SR	C		\$500	\$300	\$300			\$1,100		\$1,100
11	Sewer System Capital Renewal WW-000004	SR	C	\$400	\$500	\$500	\$500			\$1,900		\$1,900
12	Upper Occoquan Service Authority Treatment Plant Upgrade WW-000025	SR, X	C	\$13,471	\$14,669	\$9,628	\$9,153	\$2,348		\$49,269	\$19,053	\$68,322
TOTAL				\$0	\$152,168	\$183,685	\$194,974	\$184,563	\$166,457	\$881,847	\$674,990	\$1,556,837

Notes: Numbers in ***bold italics*** represent funded amounts. A "C" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Source of Funds  
 B Bonds  
 G General Fund  
 S State  
 F Federal  
 X Other  
 U Undetermined  
 SR Sewer Revenues

# SANITARY SEWERS PROJECT LOCATIONS

