Water Supply

PROGRAM DESCRIPTION

Residents of Fairfax County receive public water service from one of five water agencies: Fairfax Water and the City of Fairfax Department of Transit and Utilities own and operate full production and distribution systems. The Falls Church Department of Public Utilities and the Towns of Vienna and Herndon, while operating their own water distribution systems, purchase water from the Washington Aqueduct in the case of Falls Church, from Falls Church in the case of Vienna and from Fairfax Water in the case of Herndon. In terms of meeting water supply needs, Falls Church and the towns are dependent on other water systems. Using recent estimated averages, Fairfax Water serves 79 percent of Fairfax County residents, Falls Church serves 13 percent, the City of Fairfax serves one percent and the remaining seven percent of the residents receive water from their own individual, private wells.

LINK TO THE COMPREHENSIVE PLAN

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

- ✓ Provide the facilities to treat, transmit and distribute a safe and adequate potable water supply.
- ✓ Identify the need for additional water transmission facilities, including the Corbalis to Fox Mill Water Main.
- ✓ Renovate and expand the McLean Pump Station.

Source: 2007 Edition of the Fairfax County Comprehensive Plan, as amended.

CURRENT PROGRAM INITIATIVES

While Fairfax County has neither direct administrative nor budgetary control over water suppliers, the importance of water facilities to County planning is recognized. The Board of Supervisors has entered into an agreement with Fairfax Water which requires Board approval of all capital projects undertaken by Fairfax Water. Fairfax Water projects included in this CIP represent a program guided by the objectives of the Comprehensive Plan and endorsed by the Board of Supervisors. In the interest of providing a broader picture to the citizens of Fairfax County, the independent program for Falls Church is also presented. Inclusion in this document represents neither concurrence nor approval by Fairfax County of the individual projects proposed by Falls Church. It is presented for information purposes only. Additional information can be found in Fairfax Water's 2012 ten year Capital Improvement Program, which is available directly from Fairfax Water.

Fairfax Water

The principal sources of water for Fairfax Water are the Occoquan Reservoir and the Potomac River. The Occoquan Reservoir is impounded by a gravity-type concrete dam across the Occoquan River, a few miles upstream of its confluence with the Potomac River. The dam was constructed in 1957. The drainage area of the Occoquan River above the dam is approximately 595 square miles. The dam impounds about 8.3 billion gallons of water when filled to the crest at elevation 122 feet, mean sea level. The present Occoquan Reservoir supply has a safe yield of about 75 million gallons per day (MGD).

Treatment of water from the Occoquan Reservoir is provided by the 120 MGD Griffith Water Treatment Plant in Laurel Hill, placed in service in 2006. This facility applies various chemicals for coagulation, the control of taste and odors, fluoridation and disinfection. The Griffith Treatment Plant replaced the Lorton and Occoquan Treatment Plants.

Picture of the Occoquan Reservoir, one of Fairfax County's two principal sources of water.

Construction of the intake structure, raw water pumping station and initial phase of the Corbalis Treatment Plant commenced in 1978 and was placed into operation in 1982. During 2008, construction of Stage III was completed, bringing total treatment capacity for the facility to 225 MGD. Facilities are available for applying various chemicals for coagulation, control of taste and odors, fluoridation and disinfection.

Nineteen booster pumping stations are located within the distribution system to provide adequate pressure. A total of 50 million gallons (MG) of distribution system storage is provided at eight locations throughout Fairfax County; an additional 39 MG of treatment plant clearwell storage is also available between the Corbalis and Griffith facilities. There are approximately 3,400 miles of water main up to 54 inches in diameter in the system.

Development of Fairfax Water's supply, treatment, transmission and distribution facilities is conducted in accordance with a ten year Capital Improvement Program. Highlights of the current program include:

- **Rehabilitation of the Occoquan Water Supply:** Rehabilitation of the Occoquan High Dam and Low Dam and associated intakes, and installation of a dissolved oxygen system in the Occoquan Reservoir near the High Dam to improve raw water quality to the Griffith Water Treatment Plant.

- **Distribution System Sustainability:** Increased reinvestment in the distribution system infrastructure to maintain a high level of service to customers.

- **Construction of various Transmission Improvements**: Transmission mains include: Corbalis to Fox Mill Water Main and Fox Mill - Reston Parkway Transmission Main and Tysons East Transmission Main. Additional finished water pumping at the Corbalis and Griffith Water Treatment Plants is also planned.

- **Implementation of a Supervisory Control and Data Acquisition (SCADA) system**: By providing remote monitoring and control capability, SCADA will promote more efficient system performance during both routine and alternative operations.

- **Source Water Protection Activities:** Fairfax Water continues to advocate for source water protection through support of the Occoquan Watershed Monitoring Program, Occoquan Nonpoint Source Program, the Potomac River Basin Drinking Water Source Protection Partnership, study of critical watershed areas, increased involvement in watershed and water quality issues and analysis of ongoing activities in the watershed.

Falls Church Department of Public Utilities

Falls Church buys treated water from the U.S. Corps of Engineers via a 36-inch connection to the Dalecarlia Filter Plant located on MacArthur Boulevard in the District of Columbia. The Corps obtains its raw water from the Potomac River at Great Falls. The Falls Church Water System has a current system capacity of 45 MGD. The Falls Church Water System consists of the main pumping station at Chain Bridge and seven booster pumping stations. The system includes 10 storage facilities with a total capacity of approximately 14.2 MGD. The overall system consists of approximately 495 miles of pipe ranging from 4 inches to 42 inches.

CURRENT PROJECT DESCRIPTIONS

FAIRFAX WATER

1. **General and Administrative.** $154,630,000 for annual expenses associated with administration and overhead. These expenses include materials and supplies; refund of advances; and costs associated with net revenue funded projects, but not attributed to a single project or program.

2. **Subdivision and Other Development Projects.** $14,548,000 for annual expenses associated with the review and approval of plans for water main installation associated with land development activities. This project also includes provisions for Fairfax Water inspection of water mains installed by land development contractors.

3. **Extraordinary Maintenance and Repairs.** $208,157,000 for maintenance and repairs, including $86,860,000 for extraordinary maintenance and major repair of supply, treatment, transmission and general plant facilities associated with a specific project and $121,297,000 to provide a sustainable distribution system through infrastructure reinvestment.

4. **Additions, Extensions and Betterments.** $78,906,000 for improvement and betterment of existing supply, treatment, transmission, distribution and general plant facilities associated with a specific project.

5. **General Studies and Programs.** $19,621,000 for general studies, programs, engineering and research pertaining to water quality, water supply and system development.

6. **Treatment Facilities.** $191,571,000 for design and construction of the Griffith Treatment Facility, which came on line in 2006 and the removal of the former Lorton and River Station treatment plants.

7. **Transmission Facilities.** $17,407,000 for the design and construction of a transmission SCADA system and various pumping station modifications throughout Fairfax County.

8. **General Plant Facilities.** $49,254,000 for annual expenses attributed to administration, overhead and bond financing for projects funded by current bond issue, future bond issue or funds on hand.

9. **Potomac Stage III Transmission Facilities.** $70,825,000 for the design and construction of various transmission facilities primarily associated with development of the Potomac River Water Supply Facilities, including additional finished water pumping facilities at the Corbalis Water Treatment Plant. Water main projects include the Corbalis to Fox Mill Water Main and the Fox Mill - Reston Parkway Transmission Main. Additional storage facilities are also planned at Penderwood.

10. **Potomac Stage III General Plant Facilities.** $55,472,000 for annual expenses attributed to administration, overhead and bond financing associated with development of the Potomac River Water Supply Facilities funded by future bond issue and funds on hand.

11. **Future System Capacity Expansion.** $500,000 for preliminary engineering studies related to development of additional system capacity and related administration, overhead and bond financing expenses.

12. **Potomac Stage IV Transmission Facilities.** $10,000,000 for the design and construction of the Tysons East Transmission Main from the Tysons Corner Pumping Station to the existing 24-inch water main in Magarity Road.

13. **Potomac Stage IV General Plant Facilities.** $3,970,000 for annual expenses attributed to administration, overhead and bond financing associated with development of the future Potomac River Water Supply Facilities funded by future bond issue and funds on hand.

FALLS CHURCH DEPARTMENT OF PUBLIC UTILITIES

14. **Dolley Madison to McLean Pumping Station Water Main.** $1,400,000 to construct a 36-inch water main in Dolley Madison from Old Dominion Drive to the McLean Pumping Station to meet future projected demands.

15. **Water Main Replacement Program.** $10,000,000 over five years as part of a systematic approach to water main replacement throughout the City's water system, which is based on several factors, including main break history, impact to customers and traffic impacts. Each year this list is reevaluated and priority replacement projects are selected for construction.

16. **McLean Pump Station.** $4,200,000 to replace the existing facility.

17. **Kirby Road Water Main (Chain Bridge – Chesterbrook).** $10,200,000 to construct a 36-inch water main from the Chain Bridge Pumping Station to the Chesterbrook Pumping Station. This main is part of an overall project that will provide increased water volume to the Dunn Loring and Tysons Corner areas.

18. **Kirby Road Water Main (Chesterbrook – Westmoreland).** $3,750,000 to construct a 36-inch water main from the Chesterbrook Pumping Station to Westmoreland Street. This main is part of an overall project that will provide increased water volume to the Dunn Loring and Tysons Corner areas.

19. **Tysons Tank No. 2.** $5,500,000 to construct a 3 million gallon storage tank on a property owned by the City on Old Courthouse Road.

20. **Tysons Tank No. 1 to Tysons Tank No. 2 Water Main.** $1,325,000 to construct a 16-inch main between the existing and proposed water storage tanks in the Tysons Corner area.

21. **Chain Bridge Pumping Station to Merchants Lane Water Main.** $1,300,000 to construct 1,700 feet of 48-inch water main.

PROJECT COST SUMMARIES
WATER SUPPLY
($000's)

	Project Title/ Project Number	Source of Funds	Budgeted or Expended Through FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Total FY2013-FY2017	Total FY2018-FY2022	Total Project Estimate
	Fairfax Water										
1	General and Administrative	SR	***C***	***13,510***	***15,220***	***16,070***	***14,940***	***17,180***	76,920	77,710	154,630
2	Subdivision and Other Development Projects	SR	***C***	***1,432***	***1,475***	***1,519***	***1,565***	***1,612***	7,603	6,945	14,548
3	Extraordinary Maintenance and Repairs	SR	***C***	***26,268***	***24,733***	***24,988***	***17,257***	***18,197***	111,443	96,714	208,157
4	Additions, Extensions, and Betterments	SR	***C***	***10,158***	***11,126***	***10,582***	***9,302***	***6,225***	47,393	31,513	78,906
5	General Studies and Programs	SR	***C***	***1,975***	***2,765***	***2,471***	***1,506***	***1,546***	10,263	9,358	19,621
6	Treatment Facilities	SR, B	***188,768***	***2,803***					2,803		191,571
7	Transmission Facilities	SR, B	***11,452***	***100***	***250***	***955***	***1,939***	***1,767***	5,011	944	17,407
8	General Plant Facilities	SR, B	***45,214***	***960***	***90***	***380***	***950***	***1,080***	3,460	580	49,254
9	Potomac Stage III Transmission Facilities	SR, B	***36,822***	***6,888***	***4,910***	***3,302***	***4,613***	***2,272***	21,985	12,018	70,825
10	Potomac Stage III General Plant Facilities	SR, B	***40,762***	***2,280***	***2,100***	***1,590***	***2,270***	***1,380***	9,620	5,090	55,472
11	Future System Capacity Expansion	SR, B	***0***						0	500	500
12	Potomac Stage IV Transmission Facilities	SR, B	***800***	***2,700***	***2,500***	***2,000***	***2,000***		9,200		10,000
13	Potomac Stage IV General Plant Facilities	SR, B	***190***	***890***	***930***	***800***	***980***		3,600	180	3,970
	Subtotal		***324,008***	***69,964***	***66,099***	***64,657***	***57,322***	***51,259***	309,301	241,552	874,861
	Falls Church Department of Public Utilities										
14	Dolley Madison to McLean Pumping Station Water Main	RB	***0***	***200***	***1,200***				1,400		1,400
15	Water Main Replacement Program	RB	***C***	***2,000***	***2,000***	***2,000***	***2,000***	***2,000***	10,000	**10,000**	20,000
16	McLean Pump Station	RB	***3,200***	***900***	***100***				1,000		4,200
17	Kirby Road Water Main (Chain Bridge - Chesterbrook)	RB	***2,600***	***2,500***	***3,000***	***2,100***			7,600		10,200
18	Kirby Road Water Main (Chesterbrook - Westmoreland))	RB	***200***	***200***	***1,950***	***900***	***500***		3,550		3,750
19	Tysons Tank No. 2	RB	***0***		***100***	***400***	***5,000***		5,500		5,500
20	Tysons Tank No 1 to Tysons Tank No 2 Water Main	RB			***150***	***675***	***500***		1,325		1,325
21	Chain Bridge Pumping Station to Merchants Lane Water Main	RB	***0***	***130***	***600***	***570***			1,300		1,300
	Subtotal		***6,000***	5,930	9,100	6,645	8,000	2,000	31,675	10,000	47,675
	GRAND TOTAL		$330,008	$75,894	$75,199	$71,302	$65,322	$53,259	$340,976	$251,552	$922,536

Notes: Numbers in ***bold italics*** represent funded amounts. A "C" in the 'Authorized to be Expended' column denotes a continuing project.
Project cost summaries for Falls Church are estimated based on FY 2012 information, as FY 2013 information was not available at the time of publication.

Key: Source of Funds	
B	Bonds
G	General Fund
X	Other
U	Undetermined
SR	Systems Revenues
RB	Revenue Bonds