

UOSA Capital Improvements Program

2026-2035



Upper Occoquan Service Authority Capital Improvement Plan

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Capital Improvement Plan

The Capital Improvement Plan (CIP) is the Upper Occoquan Service Authority's primary framework for planning and budgeting the upgrade, replacement, and maintenance of capital assets and infrastructure. Built on a 10-year planning horizon, the CIP is refreshed annually, with projects added, updated, or retired as needs evolve.

Because wastewater treatment is operationally complex, project cost, scope, and schedule shape every capital decision. The Capital Improvement team updates scope and cost estimates with each annual CIP cycle to keep the plan grounded in reliable data for financial planning.



Introduction

In the 1960s, rapid growth across the Occoquan Watershed degraded water quality in the eleven-billion-gallon Occoquan Reservoir, a principal drinking water source for Northern Virginia. In response, the Virginia Water Control Board, with the Virginia Department of Health, adopted the landmark Occoquan Policy in 1971, establishing the Upper Occoquan Service Authority (UOSA) to provide state-of-the-art treatment for all wastewater generated in the watershed, and the Occoquan Watershed Monitoring Laboratory (OWML) for ongoing monitoring and reservoir protection guidance. UOSA's Regional Water Recycling Plant came online in 1978 on 470 acres in western Fairfax County, replacing eleven small secondary treatment plants and serving Fairfax County, Prince William County, Manassas, and Manassas Park.

Original capacity of ten million gallons per day (mgd) grew through a series of expansions to 54 mgd in 2005. Forty-eight years on, UOSA reclaimed water plays a growing role in the Washington metropolitan area's drinking water supply.

UOSA's reclaimed water has improved the water quality and expanded the reservoir's safe yield.



BEFORE

1973 Occoquan Reservoir



AFTER

2016 Occoquan Reservoir

Mission, Vision, & Values

The Upper Occoquan Service Authority's commitment to protecting public health and the environment through exceptional water recycling, fuels the UOSA Strategic Plan. The Capital Improvement Program is a significant planning tool to help UOSA achieve its strategic goals through innovation, collaboration, and leadership.

CORE VALUES

Safety

Safety is everyone's responsibility.

Integrity

We act with integrity in every decision we make.

Innovation

We challenge the status quo.

Community

We value collaboration and partnerships.

Accountability

We take responsibility for our decisions, actions, and outcomes.

MISSION We are a regional water recycling facility that protects public health and the environment as trusted stewards of our most precious resource—WATER.

VISION To be globally recognized for protecting our region's water resources.
2050

CIP Major Initiatives

Nutrient Cap Projects

The Nutrient Cap Projects address regulatory requirements to reduce the nutrients entering the Chesapeake Bay. UOSA's nitrogen removal systems are designed to supply oxidized nitrogen to the Occoquan Reservoir, which protects the reservoir's water quality. These projects follow a phased approach, developed at the Board's direction to defer work into later years where practical. The capital improvement plan aligns the timing of each modification to come online just as rising nutrient loads make it necessary.

Plant Expansion Projects

The 2020 Master Plan projected that the UOSA Plant will reach its treatment capacity in 2030. That projection is based on recent flow data showing that, while wastewater flows are expected to grow at a slower rate going forward, treatment loads will continue to rise as those flows become more highly concentrated.

CIP Major Initiatives

Delivery System Projects

UOSA's original delivery system was designed in the 1970s under EPA guidelines that capped sizing to a 20-year planning horizon. Most of the larger delivery system projects have since been completed, and the remaining work identified in this CIP update consists primarily of smaller expansion projects. Delivery system planned work in the later years of the CIP reflects the need for critical buried pressure pipeline assets whose remaining useful life is limited, requiring significant planned investment in pipe replacements.

Reserve Maintenance (RM) Projects

Reserve Maintenance Projects are programmed to address assets that are now 25 to 30 years old. More recent CIP updates increasingly reflect the looming cost of rehabilitating and refurbishing the remaining assets installed during the last major plant expansion. Those assets are now more than 20 years old, and with each passing year, more of them reach their expected useful life within the CIP's planning horizon.

Major CIP 2026 Budget Increases

Project	Increase Amount <i>(compared to 2025 CIP)</i>
Building U Systems Rehabilitation	\$22.8 million
HVAC & Building Envelope Projects	\$5.2 million
Rerating Enhancement Projects	\$3.0 million
Building P Electrical R&R Project	\$1.7 million
Building L/2 Roof Replacement	\$1.4 million
Site, Site Piping, Electrical and Paving projects	\$1.2 million
P2NR+ Project	\$1.0 million

CIP Project List 2026-2035

Project Name	Project Description	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget ('000s)
P2NR+ (Phase 2 Nutrient Removal and other Improvements)	Hydrocyclones, Primary and Secondary Clarifier Improvements, PELS/Selector, and R&R Improvements	430	45,580	10,860	56,440
Comprehensive Facilities Plan	Comprehensive updates to the 2020 Master Plan and provisions for modernizing the CIP methodology	1,000	2,000	0	2,000
Alkalinity Feed System	Infrastructure to add alkalinity to Secondary Bioreactors	0	2820	0	2,820
Cub run Gravity Delivery System Phase II	Replacement of upper areas of delivery system due to capacity and condition needs	0	4890	0	4,890
Flat Lick Interceptor Size Increase	Upsizing of existing Interceptor for projected increases in flow	0	1,960	16,840	18,800
Yorkshire Park Interceptor	Upsizing of existing Interceptor for projected increases in flow	2,450	12,260	0	12,260
Old Centreville Interceptor	Upsizing of existing Interceptor for projected increases in flow	0	5,350	0	5,350
Other Interceptor Work	Upgrade of existing sections of Flat Branch delivery system	0	2,920	0	2,920
Rerating Enhancement Projects	Increase Equalization capacity, Emergency Storage and return upgrades, and Sludge storage tank.	300	41,520	71,500	113,020
AWT Physical – Building P Phase 1 R&R Improvements	Renewal of 25+ year old electrical infrastructure at Building P/1 and Pump Station 28/1	1,980	1,980	0	1,980
AWT Physical Phase 2 Improvements	Priority replacements of the aging Physical assets	160	1,260	0	1,260
Filter Press Chemical System R&R Improvements in H/1 building	R&R for sludge pumps, filter press platforms, Ferric Chloride system, and building ventilation	990	1,980	0	1,980

CIP Project List 2026-2035

Project Name	Project Description	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget ('000s)
L/2 Roof Replacement	Roofing Replacement Building L/2	1,840	1,840	0	1,840
Building U Centrifuge Replacement Contract U2	Replacement of a Centrifuge	320	320	0	320
Septage Receiving Facility Improvements	SRF improvements for additional volume, redundancy, operation and maintenance	490	2,230	0	2,230
L/2 Nozzle Rebuild, Carbon Replacement & Carbon Transfer System Improvements	R&R for Hydraulic Capacity, COD removal, carbon transfer, and PFAS removal	540	5,380	0	5,380
HVAC Systems & Building Envelope R&R Improvements	HVAC repair and upgrades, and building envelope improvements	2,410	7,230	0	7,230
Chemical Storage Tank R&R Improvements	R&R of Fiberglass chemical storage tanks approaching end of life	0.00	1,060	0	1,060
Facility Electric R&R V/1 Transformers, Z/1 MCC	Replacement of electrical equipment and ancillary infrastructure	1,150	1,150	0	1,150
Building DD/1 Plant Waste Pump Station R&R Improvements	Plant waste system upgrades for aging infrastructure	0.00	4,350	0	4,350
Building M & Building Q Electrical R&R Improvements	Improvements to aging infrastructure in Load Center and Auxiliary Power	0.00	980	0	980
Site, Site Piping, Electrical, and Paving R&R Improvements	Improvements to UOSA site piping, electrical, and paving	490	1,960	0	1,960

CIP Project List 2026-2035

Project Name	Project Description	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget ('000s)
Building LB Improvements	Full Renovation of the Laboratory	9,400	9,400	0	9,400
Solids Building U – Phase 1, Berlie Dryer and associated systems rehabilitation	Rehabilitation of the Berlie RDS and other ancillary systems	1,710	16,820	0	16,820
Solids Building U – Phase 2, Centrifuge Systems Replacement	Replacement of remaining Alfa Laval Centrifuges	0	2,900	20,150	23,050
Solids Building U – Phase 3, Remaining U Systems Replacement	Replacement of remaining systems at their end of useful life	0	0	10,700	10,700
Solids Building U Roof Replacement	Replacement of remaining sections of U-Building roof	1,620	1,620	0	1,620
Emergency Generators Improvements	Upgrades to existing emergency power generation	0	3,880	31,050	34,930
Building CC Load Center improvements	Electrical system Upgrades	0	2,360	0	2,360
Headworks Odor Control Improvements	Odor Control Improvements at Plant Headwork facility	0	4,240	5,950	10,190

CIP Project List 2026-2035

Project Name	Project Description	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget ('000s)
Phase 3 C54 AWT Physical R&R Improvements	Age related AWT system upgrades	0	6,930	48,180	55,110
Building L/1 Filter & GAC Improvements R&R Improvements	Improvements to multimedia filters and carbon contactors	0	10,180	0	10,180
Final Treatment R&R Improvements	Improvements to final treatment facilities	0	0	18,240	18,240
Primary Treatment Improvements	Improvements to primary treatment facilities	0	0	8,800	8,800
Secondary Process Improvements	Improvements to secondary treatment facilities	0	0	34,040	34,040
Buildings C Annex & D/2 Improvements	Improvements to digestion and sludge blending facilities	0	0	39,490	39,490
West Chemical AWT Improvements	Improvements to advanced water treatment facilities	0	0	37,610	37,610
Building H/1 Slakers Improvements	H/1 Slaker system improvements	0	0	1,910	1,910
Manassas Park PS R&R Improvements	R&R Upgrades to the Manassas Park Pump Station	0	0	990	990
Manassas Park Force Main R&R	Improvements to the Manassas Park Force Main	0	6,510	9,050	15,560
Cub Run PS R&R Improvements	R&R and upgrades to the Cub Run pump station equipment	0	0	4,670	4,670

CIP Project List 2026-2035

Project Name	Project Description	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget ('000s)
Flat Branch FM#1 R&R Improvements	R&R improvements to Flat Branch FM that carry pumped sewage from FBPS to headworks	0	2,450	27,590	30,040
Cockrell Branch FM R&R Improvements	R&R Improvements to Force Main that carries pumped sewage to Winters Branch Interceptor	0	1,370	1,920	3,290
Russia Branch FM#1 R&R Improvements	R&R Improvements to Force Main that carries pumped sewage to Liberia Interceptor	0	9,710	0	9,710
Winters Branch FM#1 R&R Improvements	R&R Improvements to Force Main that carries pumped sewage to Flat Branch Interceptor	0	1,470	16,560	18,030
CIP Budget Total		\$27,290	\$230,860	\$416,100	\$646,960

CIP Project Categories 2026-2035

Project Category	Funding Source	2026 CIP Budget ('000s)	2026-2030 CIP Budget ('000s)	2031-2035 CIP Budget ('000s)	Ten-Year CIP Budget 2026-2035 ('000s)
Nutrient Cap Total	Nutrient Cap	430	45,540	10,850	56,390
Reserved for Plant Expansion	Master Planning	1,000	4,820	0	4,820
Cub Run DS Total	Cub Run Delivery System	0	6,860	16,840	23,700
Flat Branch DS Total	Flat Branch Delivery System	2,460	20,470	0	20,470
Replacements & Improvements (Plant)	Reserve Maintenance	23,400	131,670	327,620	459,420
Replacements & Improvements (Delivery Systems)	Reserve Maintenance	0	21,500	60,790	82,290
CIP Budget Total		\$27,290	\$230,860	\$416,100	\$646,960

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