MASSACHUSETTS WATER RESOURCES AUTHORITY
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October 16, 2023

John Sanchez, Chairman
MWRA Advisory Board
2 Griffin Way
Chelsea, MA 02150

Dear Chairman Sanchez:

This letter transmits to the Advisory Board the MWRA's Capital Improvement Program (CIP) for Fiscal Year 2024. The MWRA Board of Directors approved the FY24 CIP at its June 21, 2023 meeting. The FY24 CIP represents an update to the FY23 CIP approved by the Board in June 2022 and includes the latest cost estimates, revised schedules, and new projects. The Board also established the FY24-28 spending Cap at $1.4 billion. The new cap for the first time includes a 25% discount to account for future expected underspending. This rate is based on historical spending patterns.

The FY24 Capital Improvement Program projects $302.6 million in spending for FY24, of which $137.6 million supports Wastewater System Improvements, $141.7 million supports Waterworks System Improvements, and $23.2 million is for Business and Operations Support. The projects with significant spending in FY24 include Deer Island Clarifier Rehabilitation Phase 2 Construction, Wachusett Lower Gate House Pipe & Boiler Replacement, Waltham Water Pipeline Construction, and NIH Redundancy & Storage - Section 89 & 29 Replacement Construction.

FY24-28 spending is projected at $1.8 billion with Asset Protection accounting for the largest share of capital spending. The FY24 CIP includes $1.2 billion for Asset Protection initiatives, representing 63.9% of projected total MWRA spending in this timeframe. Water System Redundancy project spending totals $365.8 million in the same FY24-28 period, accounting for 20.0% of total spending.

The FY24 Capital Program reaffirms MWRA's commitment to the community financing assistance programs on both the water and wastewater sides.

A copy of the CIP document is available on-line at www.mwra.com. Questions or comments on this document can be directed to the MWRA Budget Department at (617) 788-2206. Thank you for your continued support.

Sincerely,

Frederick A. Laskey
Executive Director

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MWRA AT A GLANCE

Purpose

Provide wholesale water and sewer services to customer communities, funded primarily through rates and charges

Legal Status

Massachusetts public authority established by an enabling act in 1984 – Chapter 372 of the Acts of 1984 as most recently amended November 2019

Management

- 11-member Board of Directors (3 Governor appointees, 3 Mayor of Boston appointees, 1 City of Quincy appointee, 1 Town of Winthrop appointee, and 3 Advisory Board appointees)
- 1 Executive Director (5 divisions: Office of the Executive Director, Operations, Finance, Administration, Law)

Advisory Board

Established by the enabling act to make recommendations to the MWRA on the MWRA budget and programs and to serve as liaison to the customer communities

Service Area

- 61 customer communities (43 sewerage, 54 water)
- 3.0 million people (44% of MA population)
- 5,500 businesses

FY24 Operating Budget ($ in millions)

Direct Expenses	$316.0
Indirect Expenses	$70.4
Capital Finance	$487.8
Total Operating Budget	$874.2
Revenues*	$874.2

**95.4% of Revenues raised from rate assessments*

Bond Ratings - General Revenue Bonds (senior/subordinate)

Moody's -	Aa1/Aa2
S&P -	AA+/AA
Fitch -	AA+/AA

Capital Improvement Program

- Total CIP spending: $9.1 billion since 1984
- Total Current Indebtedness: $4.4 billion
- FY24 CIP Planned Spending: $302.6 million

Water System

- 2 protected reservoirs
  - Quabbin
  - Wachusett
- 2 water treatment facilities
  - John J. Carroll
  - William A. Brutsch
- 350 miles of distribution infrastructure including aqueducts, deep rock tunnels, and pipeline
- 14 active storage reservoirs and standpipes
- 11 active pumping stations
- Average Daily flow: 200 mgd
- Safe yield: 300 mgd
- Treatment Capacity: 405 mgd
- Percentage of capacity utilized: 67%*
  **based on safe yield*

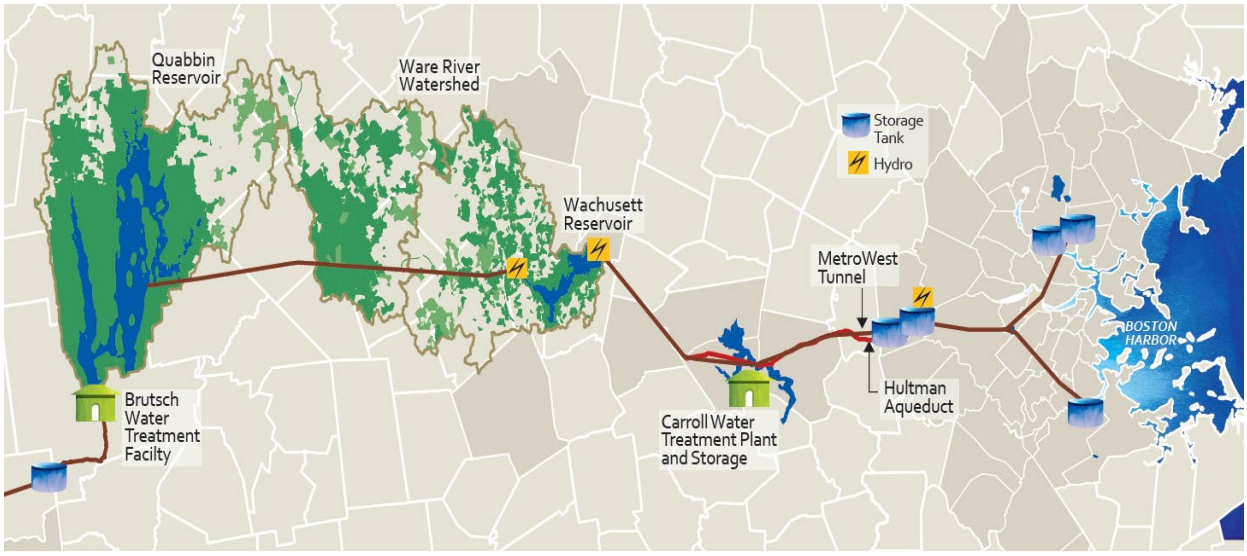
Wastewater System

- 240 miles of sewer pipelines and cross-harbor tunnels
- 13 pump stations
- 1 screening facility/gate house
- 6 CSO treatment/storage facilities
- 2 wastewater treatment plants
  - Deer Island Treatment Plant
  - Clinton Wastewater Treatment Plant
- 4 remote headworks
- 1 Pellet Plant for residuals processing
- Average daily flow: 360 mgd
- Peak wet weather capacity: 1,270 mgd

Renewable Energy

Approximately 30% of MWRA's energy requirement is self-generated from renewable sources (biomass, hydro, wind, & solar assets).

MWRA is voluntarily purchasing New England sourced renewable energy certificates to meet 100% of its purchased electricity needs.



MWRA's water comes from the Quabbin Reservoir, 65 miles west of Boston, and the Wachusett Reservoir, 35 miles west of Boston. The Quabbin alone holds a 4-year supply of water.

The reservoirs are filled naturally. Rain and snow fall onto watersheds (protected land around the reservoirs) and eventually turn into streams that flow into the reservoirs. This water comes into contact with soil, rock, plants and other material as it follows its path. This process helps to clean the water.

The Quabbin and Wachusett Reservoirs are protected. Over 85% of the watershed lands that surround the reservoirs are covered in forest and wetlands. About 75% of the total watershed land cannot be built on. The natural undeveloped watersheds help to keep MWRA water clean and clear. Because they are well-protected, the water in the Quabbin and Wachusett Reservoirs is of very high quality. The MWRA has won numerous awards for quality, taste, and sustainability.

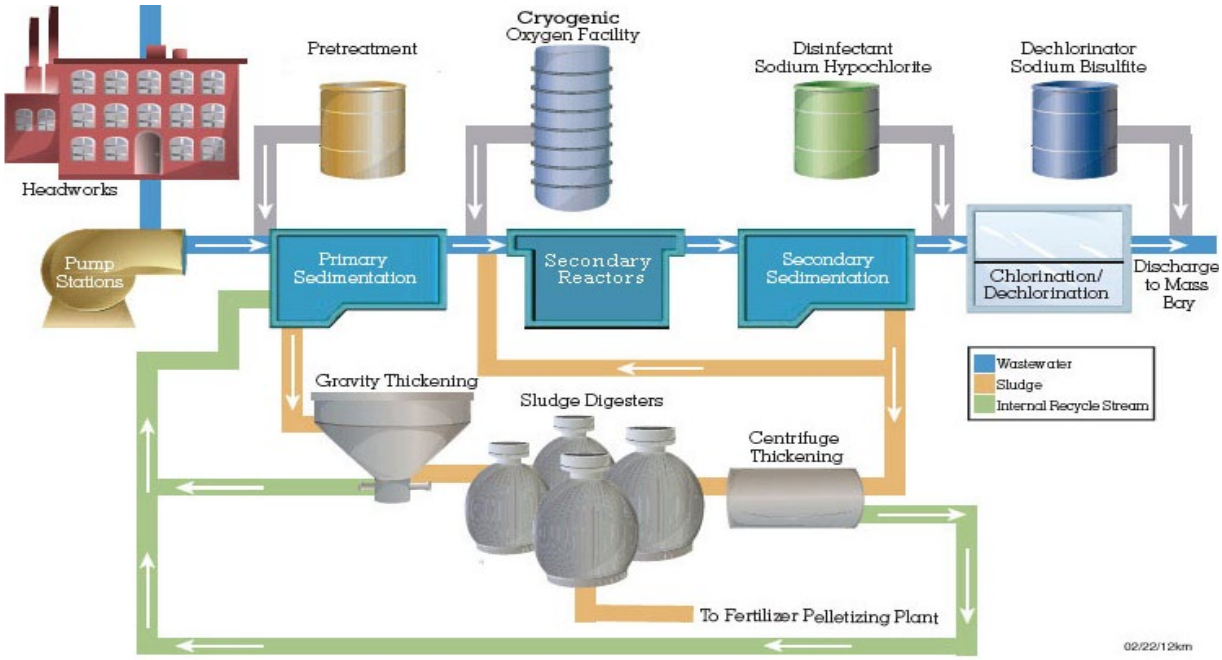
Water for most MWRA communities is treated at the Carroll Water Treatment Plant in Marlborough, Massachusetts. Water from the Quabbin and Wachusett Reservoirs enters the plant through the Cosgrove or Wachusett Aqueduct. The treated water leaves the plant through the MetroWest Water Supply Tunnel and the Hultman Aqueduct. Water from the Quabbin Reservoir for Chicopee, South Hadley Fire District #1 and Wilbraham is treated at the Brutsch Water Treatment Facility in Ware, Massachusetts, and leaves the plant through the Chicopee Valley Aqueduct.

For MetroWest and Metro Boston communities**,** treated water is sent through the MetroWest Water Supply Tunnel and the Hultman Aqueduct and is stored in covered tanks. From there it is drawn into distribution mains and many smaller community pipes. For Chicopee Valley Area Communities, treated water is sent through the Chicopee Valley Aqueduct to the local distribution mains and smaller community pipes. Water meters log the water entering each community.

Local pipes serve each street in the customer communities and eventually carry water into buildings. Meters installed by the local communities measure the amount of water delivered to each home or business.

To maintain and measure water quality, MWRA tests over 1,600 water samples per month, from the reservoirs all the way to household taps.

MWRA AT A GLANCE – Wastewater System



Water is flushed through a building's pipes into customer community sewers. These 5,100 miles of local sewers transport the wastewater into 227 miles of MWRA interceptor sewers. The interceptor sewers, ranging from 8 inches to 11 feet in diameter, carry the region's wastewater to two MWRA treatment plants. Most communities' wastewater flows to the Deer Island Treatment Plant with the Clinton Wastewater Treatment Plant serving the town of Clinton and the Lancaster Sewer District.

The following describes the Deer Island treatment process:

Collection and Pumping: Sewage is piped to headworks where bricks, logs and other large objects are screened out. Pumps draw the screened sewage through deep-rock tunnels under Boston Harbor to Deer Island.

Preliminary Treatment: Mud and sand settle in a tank called a grit chamber. This material, known as grit and screenings, is taken to a landfill for environmentally safe disposal.

Primary Treatment**:** The sewage then flows to primary settling tanks where up to 60% of the solids in the waste stream settle out as a mixture of sludge and water.

Secondary Treatment: Plant oxygen is added to the wastewater to speed up the growth of micro-organisms. These microbes then consume the wastes and settle to the bottom of the secondary settling tanks. After secondary treatment, 80-90% of human waste and other solids have been removed.

The treated wastewater is disinfected before it is discharged to the Massachusetts Bay. The treated wastewater, known as effluent, travels through a 9.5-mile Outfall Tunnel bored through solid rock more than 250 feet below the ocean floor. The tunnel's last mile and a quarter include 55 separate release points known as "diffusers." With water depths up to 120 feet, this outfall provides a much higher rate of mixing and/or dilution than possible with discharges into the shallow waters of Boston Harbor.

Sludge from primary and secondary treatment is processed further in sludge digesters, where it is mixed and heated to reduce its volume and kill disease-causing bacteria. It is then transported through the Inter-Island Tunnel to the pelletizing plant in Quincy, Massachusetts where it is dewatered, heat-dried and converted to a pellet fertilizer for use in agriculture, forestry and land reclamation.

MWRA Capital Improvement Program Overview

In 1984, legislation was enacted to create the Massachusetts Water Resources Authority, an independent agency with the ability to raise its revenues from ratepayers, bond sales and grants. The primary mission was to modernize the area's water and sewer systems and clean up Boston Harbor. Since its establishment, the MWRA has invested over $9.1 billion to improve the wastewater and waterworks systems serving its 61 customer communities with projected future spending of $5.3 billion. The system serves 3.0 million people and more than 5,500 businesses.

Since 1985, MWRA has been subject to a Clean Water Act enforcement action to end years of wastewater pollution of Boston Harbor and its tributaries from the old Deer Island and Nut Island treatment plants and combined sewer overflows (CSOs). The enforcement case was initiated by the Conservation Law Foundation in 1983 and taken up by the U.S. Environmental Protection Agency in 1985. The Commonwealth of Massachusetts, the Boston Water and Sewer Commission, the City of Quincy and the Town of Winthrop are also parties to the case.

The Orders of the Court set forth the schedules of activities to be undertaken to achieve compliance with the law. Since 1985, MWRA has complied with 422 milestones which include the completion of extensive new wastewater treatment facilities at Deer Island in Boston and Nut Island in Quincy, a residuals facility in Quincy, and 35 CSO control projects in Boston, Cambridge, Chelsea, Brookline, and Somerville which comprise the long-term CSO control plan, the last of which were completed in December 2015.

As part of compliance with the Court's Orders, MWRA was required to file monthly compliance and progress reports on its ongoing activities through December 15, 2000 and quarterly compliance and progress reports through December 2016. MWRA was required to submit bi-annual compliance and progress reports through December 2020. Bi-annual reports were also submitted in 2021 prior to the approval of a 3-year extension to the court ordered Long Term Control Plan (December 2024). Under this extension period, annual updates will be submitted to the court.

During the same time, MWRA complied with regulatory mandates to improve waterworks facilities. The mandated waterworks projects included the MetroWest Water Supply Tunnel, the Carroll Water Treatment Plant, and several covered water storage facilities.

The mandated projects account for most of the Capital Improvement Program (CIP) spending. The five initiatives below account for over $6.0 billion or nearly 70% of life spending to date:

- Boston Harbor Project - $3.8 billion
- Combined Sewer Overflow - $915 million
- MetroWest Tunnel - $697 million
- Carroll Water Treatment Plant - $429 million
- Covered Storage Facilities - $239 million

As the MWRA reaches maturity as an agency, the infrastructure modernization and new facilities construction phase is nearing completion, and, barring new mandates, most of the Authority's future capital budget will be designated for Asset Protection, Water System Redundancy, Pipeline Replacement and Rehabilitation, and Business System Support.

Asset Protection focuses on the preservation of the Authority's operating facilities. Currently over $2.3 billion in future spending is targeted for asset protection initiatives. Water System Redundancy aims to reduce the risks of service interruption and facilitate planned maintenance where major sections of the water delivery system assets can be taken off-line. Long-term water redundancy will be a critical future CIP initiative with estimated spending in excess of $2.0 billion over the next 17 years. Pipeline Replacement and Rehabilitation focuses on the maintenance and replacement of water and sewer pipelines. Business System Support provides for the continuing improvement and modernization of technology and security systems.

The FY24 CIP Budget reaffirms MWRA's commitment to the community financial assistance programs on both the water and wastewater side.

Capital initiatives to date have been primarily funded through long-term borrowings, and the debt service on these outstanding bonds represents a significant and growing portion of the Authority's operating budget. As of June 30, 2023, MWRA's total debt was $4.4 billion. The Authority's capital finance (including debt service) obligation as a percent of total expenses has increased from 36% in 1990 to 55.8% in the Final FY24 Current Expense Budget.

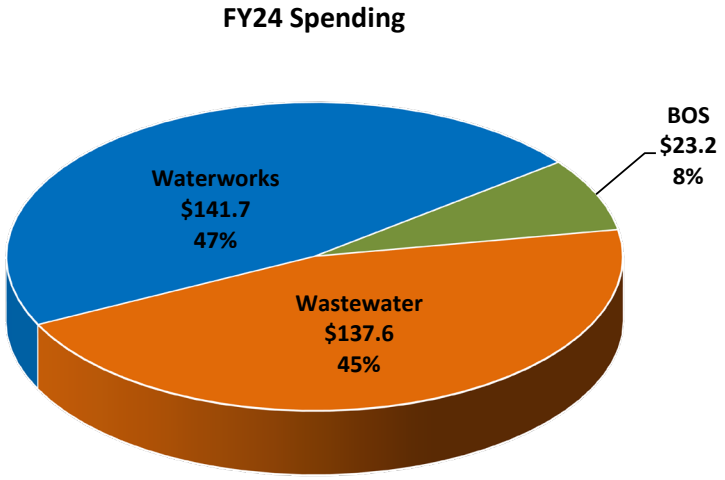
The MWRA's credit ratings of Aa1 from Moody's, AA+ from S&P, and AA+ from Fitch, reflect strong management of financial performance, application of operating surpluses to early debt defeasance, satisfactory debt service coverage ratios, well maintained facilities, comprehensive long-term planning of both operating and capital needs, and the strong credit quality of its member service communities.

To arrive at the FY24 CIP, the Authority identified the needs of the capital programs taking into account the recommendations of the Master Plan. The long-term strategy for capital work is identified in the Authority's Master Plan which was published in 2006 and updated in 2013 as well as 2018. The Master Plan serves as a road map for inclusion of projects in the CIP in every budget cycle. Additionally, the Authority's 5-Year Strategic Plan for FY21-FY25 was released in early 2021.

The FY24 CIP represents an update to the FY23 CIP and was approved by the MWRA Board in June 2023. The spending projections are the result of prioritizing the projects, establishing realistic estimates based on the latest information, striking a balance between maintenance and infrastructure improvements, and ensuring that there is adequate support for MWRA's core operations to meet all regulatory operating permit requirements.

FY24 Capital Spending

The FY24 Final Capital Improvement Program projects $302.6 million in spending for FY24, of which $137.6 million supports Wastewater System Improvements, $141.7 million supports Waterworks System Improvements, and $23.2 million is for Business and Operations Support.



The FY24 Final CIP includes $57.0 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of $42.9 million for the local Infiltration/Inflow program and net expenditures of $14.1 million for the local water pipeline program.

The Fiscal Year 2024 Capital Improvement Program (CIP) represents an update to the FY23 CIP Program approved by the Board in June 2022 for Fiscal Year 2023. The FY24 Final CIP includes the latest cost estimates, revised schedules, and new projects, and reaffirms MWRA's commitment to the community financing assistance programs on both the water and wastewater sides. The FY24 Final CIP projects $302.6 million spending for FY24, of which $137.6 million supports Wastewater System Improvements, $141.7 million supports Waterworks System Improvements, and $23.2 million is for Business and Operations Support. The projects with significant spending in FY24 include Deer Island Clarifier Rehabilitation Phase 2 Construction ($24.8 million), Wachusett Lower Gate House Pipe & Boiler Replacement ($13.6 million), Waltham Water Pipeline Construction ($13.5 million), and NIH Redundancy & Storage - Section 89 & 29 Replacement Construction ($10.8 million).

The $302.6 million in projected spending is driven by 40 active wastewater and water projects. Of this $302.6 million in spending, project contracts with spending greater than $5.0 million in FY24, excluding local community assistance programs, total $114.5 million and account for 37.8% of the total annual spending. These projects are presented in the following table:

Project	Subphase	FY24 $s in Millions	% of Total
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	$24.8	8.2%
Quabbin Transmission System	Wachusett Lower Gate House Pipe & Boiler Replacement Constr.	$13.6	4.5%
Metro Redundancy Interim Improvements	Waltham Water Pipeline Construction	$13.5	4.5%
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	$10.8	3.6%
Braintree-Weymouth Relief	B/W Improvements - Construction	$9.7	3.2%
New Connecting Mains-Shaft 7 to WASM 3	CP3-Sect 23,24,47, Rehabilitation	$9.5	3.1%
New Connecting Mains-Shaft 7 to WASM 3	Sect 25 & 24 - Construction CP-2	$9.0	3.0%
DI Treatment Plant Asset Protection	MCC & Switchgear Replacement Construction	$6.0	2.0%
New Connecting Mains-Shaft 7 to WASM 3	Section 75 Extension - Construction CP-1	$6.0	2.0%
Metro Tunnel Redundancy	Geotechnical Support Services	$6.0	2.0%
Metro Redundancy Interim Improvements	CP3 Shafts 7, 7B, 7C, 7D	$5.7	1.9%
	Total Contracts > $5 million (excl. Loan Programs)	**$114.5**	**37.8%**
	Other Project Spending	**$188.2**	**62.2%**
	Total FY24 Spending	**$302.6**	**100.0%**

Clarifier Rehabilitation Phase 2 Construction - $24.8 million ($289.4 million total construction cost). This project will rehabilitate the sludge removal system in the primary tanks and the aeration/recirculation systems in the secondary tanks. The influent gates, effluent launders and aeration systems, and concrete corrosion in primary clarifiers will also be addressed and repaired.

Wachusett Lower Gatehouse Pipe & Boiler Replacement Construction - $13.6 million ($19.0 million total construction cost). Replace the oldest piping in the Lower Gatehouse. Provide CFRP lining of the pipes between the dam and the Lower Gatehouse. Replace the existing propane fueled boilers and radiators.

Waltham Water Pipeline Construction - $13.5 million ($27.6 million total construction cost). This contract will include installation of approximately 8,920 linear feet of new 36-inch diameter water main along Lexington Street in Waltham, from Meter 182 to a new meter near Totten Pond Road, including installation of valves, meters and other appurtenances, by-pass pumping, replacement of certain utilities, pavement restoration, traffic and environmental controls.

Northern Intermediate High Redundancy Section 89 and 29 Replacement Construction - $10.8 million ($33.7 million total construction cost). This is a redundancy project for MWRA's Northern Intermediate High service area. Section 89 will be replaced now that the redundant pipeline is completed. This contract was awarded in May 2021.

Braintree-Weymouth Improvements Construction - $9.7 million ($13.5 million total construction cost). Modifications needed to improve facility safety, reliability and performance. Construction improvements are required to address deficiencies in odor control, monitoring/instrumentation systems, solids screenings/handling and pumping operations.

CP3 Sections 23, 24 and 47 Rehabilitation - $9.5 million ($24.6 million total construction cost). This contract includes cleaning and cement mortar lining approximately 4,500 linear feet of Section 23, which is a 36-inch diameter cast iron water main, 10,800 feet of 20-inch Section 24 and Section 47 cast iron water mains, and 500 feet of 20-inch steel water main along Section 24. The construction work will also include installing, by open-cut, 3,600 feet of 36-inch ductile iron Section 23 water main, 6,400 feet of 24-inch ductile iron Section 24 water main, and new valves

and appurtenances, and replacing the check valve assembly at Boston Meter 120. Additionally, the construction contract will include replacing approximately 2,400 linear feet of City of Newton 20-inch diameter, 140 year old cast iron water main on Ward Street between Manet Road and Waverly Avenue. This contract was awarded in October 2021.

Sections 24 & 25 – Construction CP-2 - $9.0 million ($21.4 million total construction cost). Replacement of the existing Watertown 4,900ft Section 25, a 16-in CI pipe, with 5,900ft of 20-in DI pipe and valves. Relocation/replacement of Watertown revenue Meter 2 and replacement of Watertown Meter 40 and new PRV for interconnection of the intermediate high to southern high systems. Cleaning and lining 3,300ft of Section 24, a 20-inch CI pipe, including valve replacements. Work in Newton includes the cleaning and lining of the southern crossing of the Charles River (part of Section 24) and valve replacements.

Motor Control Center & Switchgear Replacement Construction - $6.0 million ($23.5 million total construction cost). Project includes the replacement of Motor Control Center equipment that has become obsolete and unreliable at Deer Island Treatment Plant.

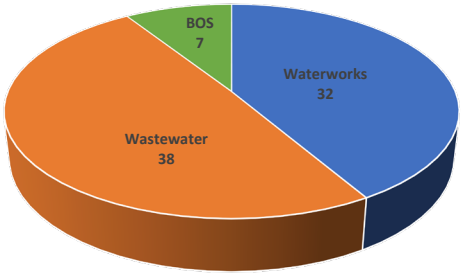
Major Planned Contract Awards for FY24:

In Fiscal Year 2024, 77 contracts totaling $371.2 million are projected to be awarded. The largest ten projected contract awards total $183.5 million and account for 49.4% of expected awards. Those planned awards are presented in the following table.

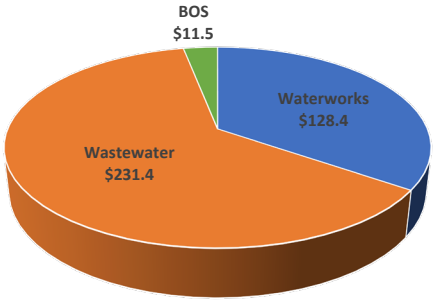
Project	Subphase	Notice to Proceed	Total Contract Amount $s in Millions
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	Dec-23	$35.0
DI Treatment Plant Asset Protection	MCC & Switchgear Replacement Construction	Dec-23	$23.5
DI Treatment Plant Asset Protection	HVAC Control System Replacement	Jun-24	$22.0
Northern Extra High Service New Pipelines	CP-2 NEH Improvements	Dec-23	$20.7
Facility Asset Protection	Hayes Pump Station Rehab Construction	Dec-23	$19.5
DI Treatment Plant Asset Protection	CHP Des/ESDC/REI	Sep-23	$14.5
New Connect Mains-Shaft 7 to WASM 3	Section 75 Extension - Construction CP-1	Oct-23	$14.0
Metro Redundancy Interim Improvements	WASM 3 Rehab CP-2	Mar-24	$13.7
Waterworks Facility Asset Protection	Steel Tank/Improvement Construction	Sep-23	$11.5
DI Treatment Plant Asset Protection	DITP Roofing Replacement	Aug-23	$9.0
Top 10 Planned Contract Awards			**$183.5**
% of Planned Awards			**49.4%**
77 Planned Contract Awards			**$371.2**

Of the 77 planned contract awards for FY24, 38 are for Wastewater, 32 are for Waterworks, and 7 for Business and Operation Services with associated dollar awards of $231.4 million, $128.4 million, and $11.5 million, respectively. Deer Island's Fire Alarm Replacement Construction is the largest planned award at $35.0 million with a targeted notice to proceed of December 2023.

FY24 Planned NTPs (#)



FY24 Planned NTPs ($s in millions)



New Projects

The FY24 CIP adds 10 new projects at a total cost of $245.7 million with projected spending of $81.2 million over the FY24-28 period. There are 8 wastewater projects totaling $232.5 million and 2 waterworks projects at $13.2 million. The largest new project is the Rehabilitation of the Braintree-Weymouth Intermediate Pump Station at $46.5 million. Other new wastewater projects include rehab of four pump stations: Squantum PS, Quincy PS, Framingham, and New Neponset PS at $24 million each. The largest water project is the Butterfly Valve Replacement project at the Carroll Water Treatment Plant for $12.5 million. Another phase of I/I assistance was also added in the FY24 Budget cycle at $75 million. A complete listing of projects is included as Attachment C.

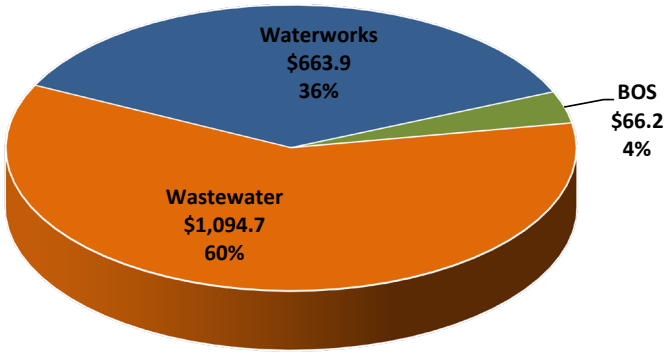
Project	Total Contract Amount	FY24-28 Spending
I/I Local Financial Assistance - Phase XIV	$75.0	$55.8
Intermediate Pump Station Rehabilitation	46.5	0.0
New Neponset Pump Station Rehabilitation	24.0	0.0
Framingham Pump Station Rehabilitation	24.0	0.0
Quincy Pump Station Rehabilitation	24.0	0.0
Squantum Pump Station Rehabilitation	24.0	0.0
Fort Point Channel & Mystic/Chelsea Confluence	10.0	9.4
CSO Updated Control Plan Design	5.0	2.8
Total Wastewater #8	**$232.5**	**$68.0**
Carroll Water Treatment Plant Butterfly Valve 4	12.5	12.5
Brutsch Treatment Plant Sodium Hypo Upgrade	0.7	0.7
Total Waterworks #2	$13.2	$13.2
10 New Projects	**$245.7**	**$81.2**

Additional details on these new projects with cash flows and descriptions can be found in Appendix 3.

FY24-28 Expenditures & Five-Year Spending Cap

Spending during the FY24-28 timeframe is planned to be $1.8 billion, including local community spending of $174.5 million for the I/I loan and grant program and $24.0 million for the water pipeline loan program. The $1.8 billion includes $1.1 billion for Wastewater spending, $663.9 million for Waterworks, and $66.2 million for Business & Operations Support. Yearly projected expenditures for the FY24-28 Cap period by Division are shown below in millions:

FY24-28 Spending

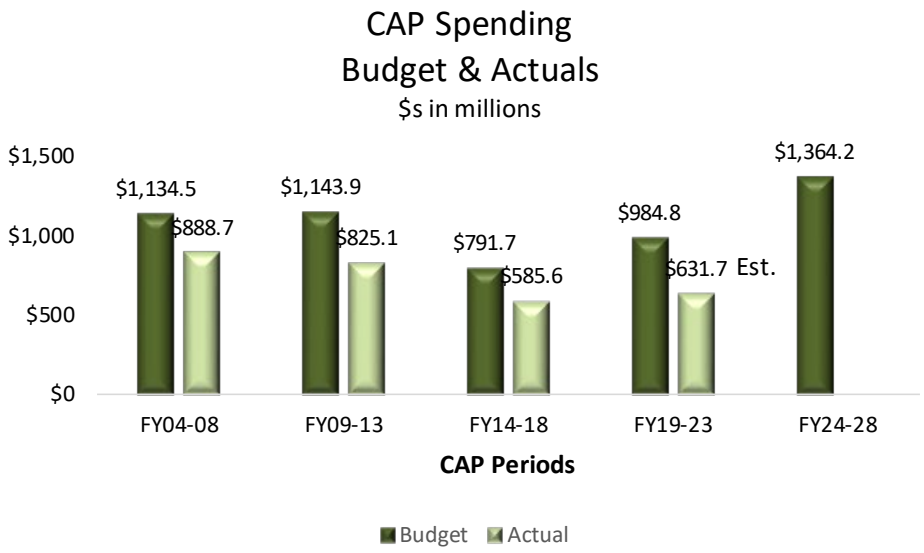


	FY24	FY25	FY26	FY27	FY28	Total FY24-28
Wastewater System Improvements	$137.6	$199.6	$195.6	$253.3	$308.7	$1,094.7
Waterworks System Improvements	$141.7	$162.4	$131.3	$114.3	$114.1	$663.9
Business & Operations Suppport	$23.2	$21.2	$10.6	$6.2	$4.9	$66.2
Total MWRA	$302.6	$383.2	$337.4	$373.8	$427.8	$1,824.8

FY24-28 Five-Year Spending Cap

The concept of a five-year spending Cap was first introduced at the Advisory Board's recommendation in 2003 for the FY04-08 period. The FY24-28 Cap will be the fifth cap established by the Authority. The Cap represents a targeted maximum spending limit to ensure adequate capital program funding and to serve as a guide for long-term planning estimates and community assessments. The FY24-28 Cap of $1,346.2 million is significantly higher than the prior FY19-23 Cap of $984.8 million for a variety of reasons including updated project schedules, inflation, increased spending on asset protection and the funding of initial phases of the long-term redundancy program.

The following graph illustrates the history of the past four five-year Caps and the Final FY24-28 Cap, both in terms of the Cap levels and actual spending:



MWRA project spending (excluding water and wastewater loan programs) has been 25% under plan levels on average since FY04. Underspending for the past two Cap periods, FY14-18 and projected FY19-23, were 26% and 36%, respectively. To try to better predict future spending, the Authority proposes to discount projected Cap spending by applying a Spend Rate Adjustment of 25%. This will be a better reflection of likely spending targets without removing future projects from plan. The Final FY24-28 Cap cash flows total $1.8 billion and net to $1.4 billion after applying the 25% Spend Rate Adjustment. Annual cash flows for the Cap period are shown in the following table (in millions):

		FY24	FY25	FY26	FY27	FY28	FY24-28
FY24 Final	Projected Expenditures excl. Metro Tunnel	$288.2	$357.9	$313.5	$349.8	$349.1	$1,658.5
	Metropolitan Tunnel	$14.4	$25.2	$23.9	$23.9	$78.6	$166.2
	I/I Program	(42.9)	(41.5)	(27.5)	(28.4)	(34.2)	(174.5)
	Water Loan Program	(14.1)	(10.9)	(5.0)	(2.6)	8.6	(24.0)
	MWRA Spending	**$245.6**	**$330.8**	**$304.9**	**$342.8**	**$402.2**	**$1,626.3**
	Contingency	15.2	21.8	20.7	23.6	31.7	113.0
	Inflation on Unawarded Construction	1.9	8.1	12.2	22.1	36.1	80.4
	Chicopee Valley Aqueduct Projects	(0.3)	(0.5)	0.0	0.0	0.0	(0.8)
	Projected Spending before Adjustment	**$262.4**	**$360.2**	**$337.8**	**$388.5**	**$469.9**	**$1,818.9**
	Spend Rate Adjustment (25%)*	(65.6)	(90.1)	(84.5)	(97.1)	(117.5)	(454.7)
	FY24 Draft Final FY24-28 Spending	**$196.8**	**$270.2**	**$253.4**	**$291.4**	**$352.5**	**$1,364.2**

*Based on historical underspending FY04-FY22 excluding community loan programs

In addition to the Spend Rate Adjustment, the format of the Cap table is adjusted to account separately for MWRA and Metropolitan Tunnel spending, and excludes the local I/I grant and loan program and the local water pipeline loan spending which are both outside of MWRA's control. The Cap also excludes Chicopee Valley Aqueduct system projects. As in past Caps, contingency for each fiscal year is incorporated into the CIP to fund the uncertainties inherent to construction. The contingency budget is calculated as a percentage of budgeted expenditure outlays.

Specifically, contingency is 7% for non-tunnel projects and 15% for tunnel projects. Inflation is added for unawarded construction contracts.

The Capital Improvement Program includes on-going Combined Sewer Overflow improvements in Boston, Chelsea and Somerville, rehabilitation of MWRA's Somerville Marginal, Prison Point and Cottage Farm CSO treatment facilities, and a new placeholder at the end of the cap period for design of any projects that come out of the Variance Water updated CSO Long-Term Control Plan process. MWRA continues to evaluate the needs of the program and will refine cost projections as more information becomes available.

The Capital Improvement Program continues to address critical redundancy improvements most notably the Metropolitan Water Tunnel Program. When this program was initially added to the CIP in FY17, estimated program costs totaled $1.47 billion, since that time some actual contracts have been awarded and costs are known and additional inflation has been applied. The FY24 CIP includes approximately $1.79 billion in projected project spending, an increase of $324.3 million due primarily to inflation. As the design of the tunnel progresses, the associated costs will continue to be refined. The initial contract for Program Support Services was awarded in March 2019 with a budget of $17.5 million and spanning over a nine-year period. The second contract, Preliminary Design & MEPA Review (Massachusetts Environmental Policy Act), for $15.7 million was awarded in May 2020 with projected spending through FY24. The third contract, Metropolitan Water Tunnel Program Geotechnical Support Services, for $12.8 million and a term of 36 months was awarded in December 2022. This contract is critical to identifying geological conditions and selecting the optimal tunnel route.

Today, the Authority is well positioned to reinvest in rehabilitation and replacement of aging facilities as result of conservative fiscal management, which includes judicious control of expenses, and the fact that MWRA has implemented the practice of utilizing available funds for defeasances resulting in the reduction of debt service expense and lowering the rate of increase to assessments. MWRA projects an overall reduction in outstanding indebtedness during the FY24-28 period.

Today, the Authority is better positioned to reinvest in rehabilitation and replacement of aging facilities as result of conservative fiscal management which includes judicious control of expenses, and the fact that MWRA has implemented the practice of utilizing available funds resulting from positive current expense budget variances for defeasances resulting in the reduction of future fiscal years debt service expense. MWRA projects an overall reduction in outstanding principal of debt during the FY24-28 cap period.

FY24-28 Expenditures

Yearly projected expenditures for the Proposed FY24-28 period by program are shown below in millions:

	Future Spending Beyond FY22	FY24	FY25	FY26	FY27	FY28	Total FY24-28
Wastewater System Improvements	**$2,420.6**	**$137.6**	**$199.6**	**$195.6**	**$253.3**	**$308.7**	**$1,094.7**
Interception & Pumping	883.3	31.0	40.8	34.6	82.8	110.4	299.5
Treatment	1,277.8	56.2	109.5	132.1	138.1	159.8	595.8
Residuals	90.6	0.0	0.8	0.8	3.5	3.5	8.6
CSO	21.3	7.5	7.1	0.5	0.5	0.8	16.4
Other Wastewater	147.5	42.9	41.5	27.5	28.4	34.2	174.5
Waterworks System Improvements	**$2,736.0**	**$141.7**	**$162.4**	**$131.3**	**$114.3**	**$114.1**	**$663.9**
Drinking Water Quality Improvements	72.5	4.0	5.7	5.3	3.7	7.8	26.6
Transmission	2,080.9	66.2	60.5	36.2	39.6	91.4	293.9
Distribution & Pumping	626.7	47.1	68.8	65.0	52.7	14.5	248.1
Other Waterworks	(44.0)	24.5	27.3	24.7	18.3	0.4	95.2
Business & Operations Suppport	**$96.2**	**$23.2**	**$21.2**	**$10.6**	**$6.2**	**$4.9**	**$66.2**
Total MWRA	**$5,252.9**	**$302.6**	**$383.2**	**$337.4**	**$373.8**	**$427.8**	**$1,824.8**

It is important to emphasize that the majority of spending within the Wastewater and Waterworks programs is concentrated in several larger projects with significant spending in the FY24-28 timeframe. Project contracts with expenditures greater than $21 million for the FY24-28 period total $766.7 million, which excludes local community assistance programs. These 15 projects account for 42.0% of total period spending. Largest construction initiatives in terms of FY24-28 spending include the Clarifier Rehabilitation at Deer Island of $224.8 million (total cost $289.4 million), Ward Street Headworks of $61.3 million (total cost $142.8 million), CP-1 Section 53 Construction total cost of $51.5 million, Tunnel Construction of $50.0 million (total cost $1.3 billion), Tunnel Final Design $45.8 million (total cost $114.4 million), South System PS VFD Replacement of $45.5 million (total cost $80.5 million), and Combined Heat and Power Construction $44.3 million (total cost $114.0 million).

The table below highlights major project spending in the FY24-28 timeframe:

Project	Subphase	FY24-FY28 $s in Millions
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	$224.8
Facility Asset Protection	Ward St Headworks Construction	$61.3
NHS - Revere & Malden Pipelines	CP-1 Section 53 Conn-Construction	$51.5
Metro Tunnel Redundancy	Tunnel Construction	$50.0
Metro Tunnel Redundancy	Final Design/ESDC	$45.8
DI Treatment Plant Asset Protection	SSPS VFD Replace Construction	$45.5
DI Treatment Plant Asset Protection	Combined Heat & Power - Construction	$44.3
Facility Asset Protection	Columbus Park HW Construction	$43.8
Metro Tunnel Redundancy	Admin Legal & Public Outreach	$37.1
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	$35.0
NIH Redundancy & Storage	NIH Storage - Construction	$33.0
Facility Asset Protection	Prison Point Rehabilitation	$28.7
DI Treatment Plant Asset Protection	MCC & Switchgear Replace Construcion	$23.5
New Connecting Mains-Shaft 7 to WASM 3	Sect 25 & 24 - Construction CP-2	$21.4
Metro Redundancy Interim Improvements	Waltham Water Pipeline Construction	$21.2
Top 15 Subphase Spending (excl. Loan Programs)		**$766.7**
% of FY24-28 Spending		**42.0%**
FY24-28 Spending		**$1,824.8**

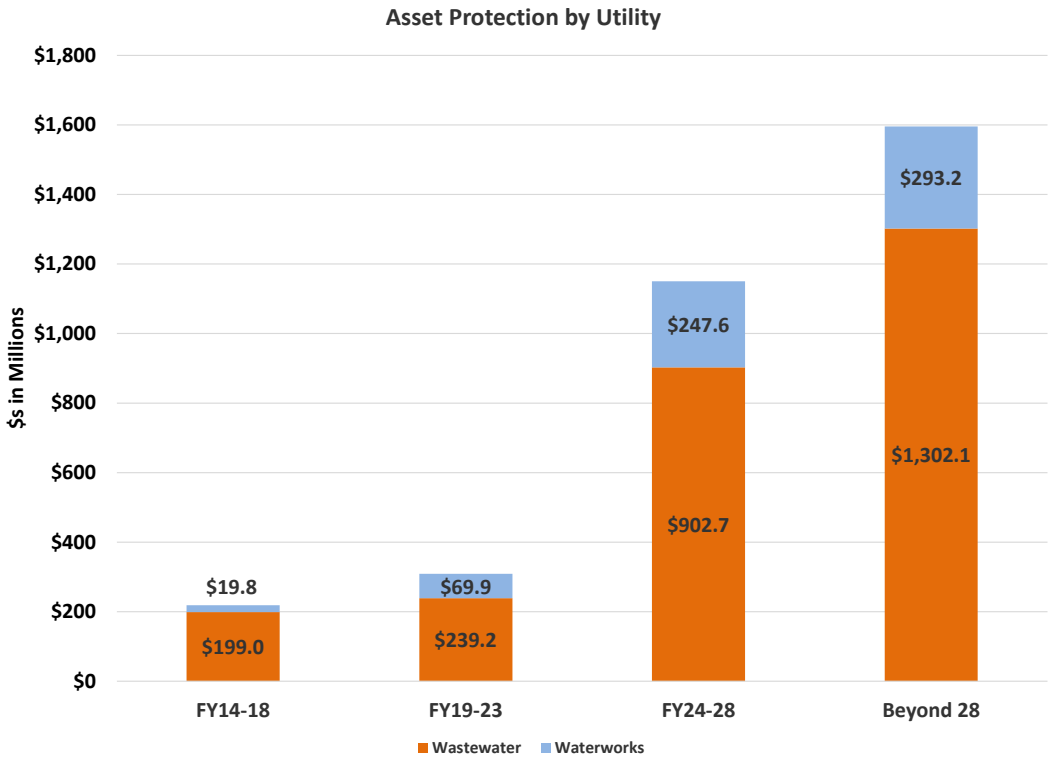
Asset Protection accounts for the largest share of capital expenditures for the FY24-28 period. The FY24 Final CIP includes $1.2 billion for asset protection initiatives, representing 63.9% of total MWRA spending in this timeframe. Asset protection spending by program is as follows: Wastewater ($902.7 million), Waterworks ($247.6 million), and Business and Operations Support ($15.4 million). Spending for Water Redundancy projects totals $365.8 million in the same FY24-28 period, accounting for 20.0% of total spending.

Changing nature of the CIP by Category
($s in millions)

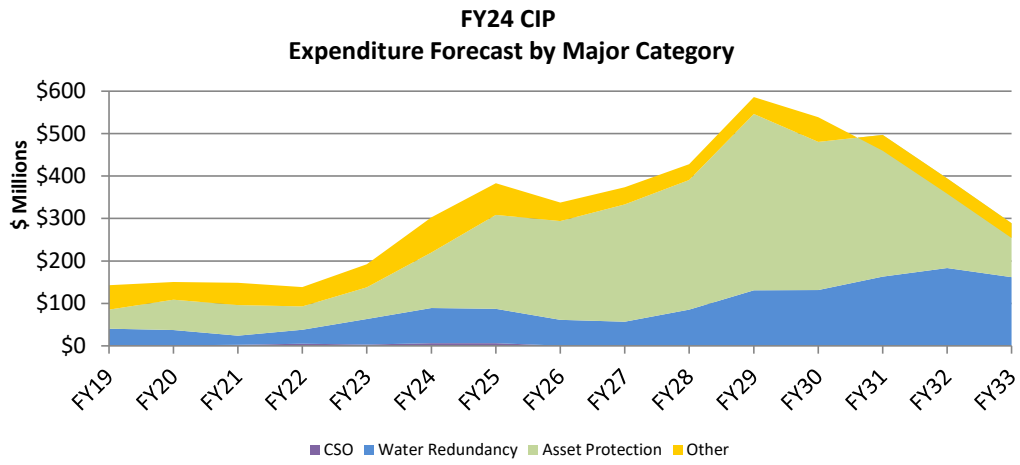
Project Category	FY14-18	FY19-23	FY24-28	Beyond 28
Asset Protection	$222.8	$318.3	$1,165.7	$1,596.8
Water Redundancy	$174.6	$189.7	$365.8	$1,813.1
CSO	$64.7	$12.3	$14.2	$2.2
Other	$123.5	$251.6	$279.0	-$175.9
Total	**$585.6**	**$771.9**	**$1,824.8**	**$3,236.3**
Asset Protection	**38.0%**	**41.2%**	**63.9%**	**49.3%**
Water Redundancy	**29.8%**	**24.6%**	**20.0%**	**56.0%**
CSO	11.0%	1.6%	0.8%	0.1%
Other	21.1%	32.6%	15.3%	-5.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

In terms of utility spending, Wastewater Asset Protection accounts for 77.4% of the FY24-28 projected Asset Projection spending at $902.7 million of which $581.4 million is designated for the Deer Island Wastewater Treatment Plant and $321.3 million for headworks and pipelines.

The $247.6 million targeted for Waterworks Asset Protection includes $142.3 million for water pipeline projects.



As illustrated by the following graph, the next two waves of spending over the FY24-28 and the FY29-33 periods will be for asset protection and water redundancy. This reflects MWRA's commitment to maintaining its physical plant and addressing the need for water system redundancy in some critical service areas. This reflects MWRA's commitment to maintaining its physical plant and addressing the need for water system redundancy in some critical service areas. Total asset protection spending for FY24-28 is projected at $1.2 billion or 63.9% of projected spending. Similarly, water redundancy spending for FY24-28 is projected at $365.8 million or 20.0% of projected FY24-28 spending. For the FY29-33 spending window, total asset protection is projected at $1.4 billion or 65.4% of projected spending. Similarly, water redundancy spending for FY29-33 is projected at $769.9 million or 35.0% of projected spending.



FY24 CIP Future Expenditures

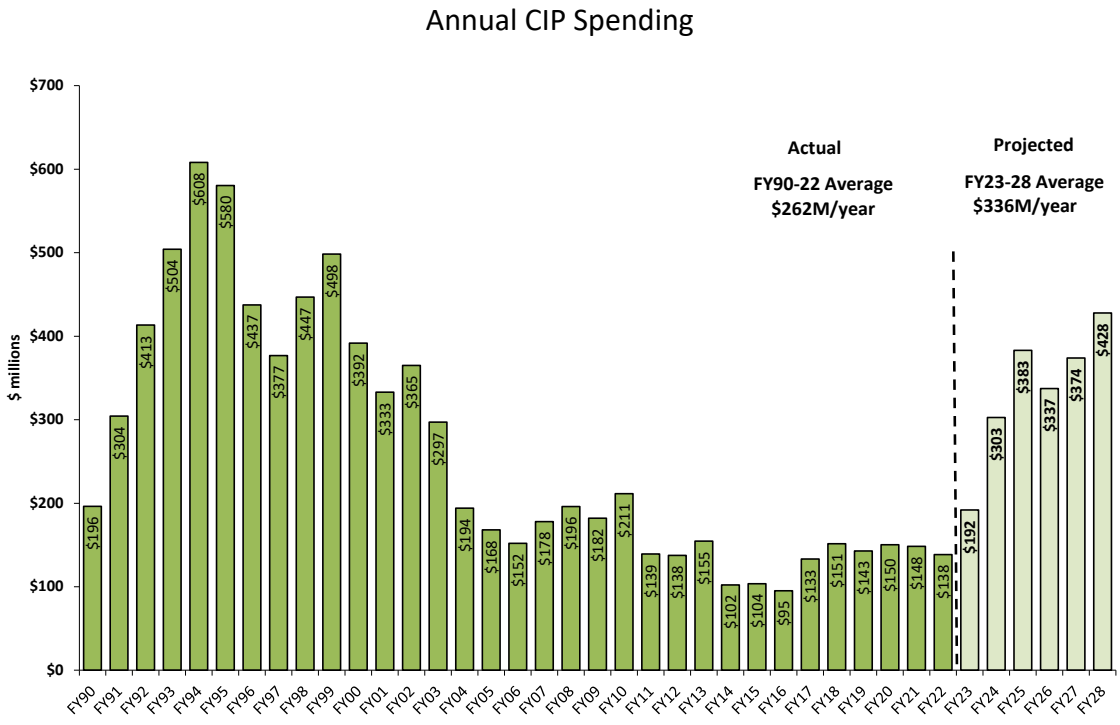
The FY24 CIP contains future spending (beyond FY22) estimated at $5.3 billion, including $2.4 billion for Wastewater (primarily Asset Protection of $2.2 billion) and $2.7 billion for Waterworks (primarily Redundancy projects of $2.2 billion). Wastewater Asset Protection includes $1.3 billion for Deer Island and $985.2 million for Wastewater Facility Asset Protection (primarily pump station rehabilitation). Redundancy projects include the Metro Tunnel Redundancy and Metro Redundancy Interim Improvement projects with future spending of $1.8 billion and $167.0 million, respectively. FY24-FY28 spending is projected at $1.8 billion or 34.7% of future spending.

The table below represents the projected spending by the major project categories:

	Future Spending Beyond FY22	FY23	Total FY24-28	Beyond 28
Wastewater System Improvements	**$2,420.6**	**$61.6**	**$1,094.7**	**$1,264.3**
Interception & Pumping	883.3	29.5	299.5	554.3
Treatment	1,277.8	9.9	595.8	672.2
Residuals	90.6	0.0	8.6	82.0
CSO	21.3	2.8	16.4	2.2
Other Wastewater	147.5	19.4	174.5	-46.4
Waterworks System Improvements	**$2,736.0**	**$101.8**	**$663.9**	**$1,970.4**
Drinking Water Quality Improvements	72.5	4.3	26.6	41.6
Transmission	2,080.9	42.0	293.9	1,744.9
Distribution & Pumping	626.7	39.4	248.1	339.2
Other Waterworks	(44.0)	16.1	95.2	-155.3
Business & Operations Suppport	**$96.2**	**$28.5**	**$66.2**	**$1.6**
Total MWRA	**$5,252.9**	**$191.9**	**$1,824.8**	**$3,236.3**

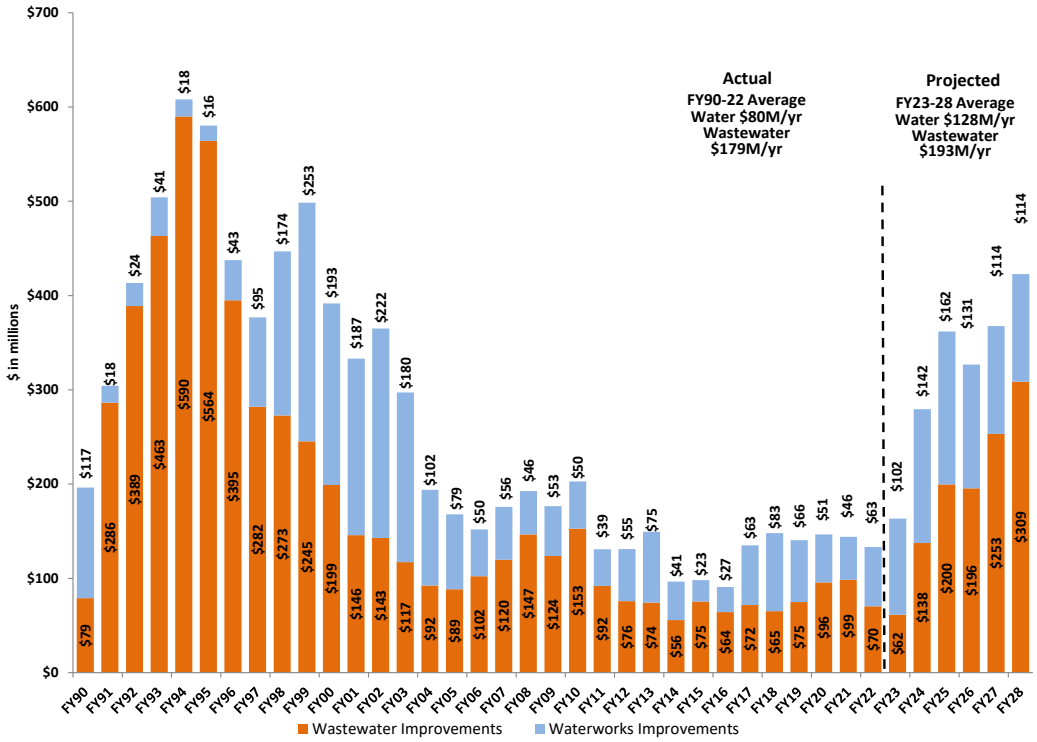
Historical & Projected Spending

The following chart captures the historical CIP spending through FY22 and projects spending through FY28 based on the FY24 Proposed CIP. Average annual CIP spending through FY22 was $262 million. Average annual CIP spending for the FY23-28 period is projected to be $336 million.



The following chart shows the historical CIP spending from FY90 through FY22 by utility with projections through FY28. Average annual CIP spending through FY22 was $80 million for Waterworks and $179 million for Wastewater. Average annual CIP spending for FY23-28 is projected to be $128 million for Waterworks and $193 million for Wastewater.

Annual CIP Spending by Utility



Community Loan Programs

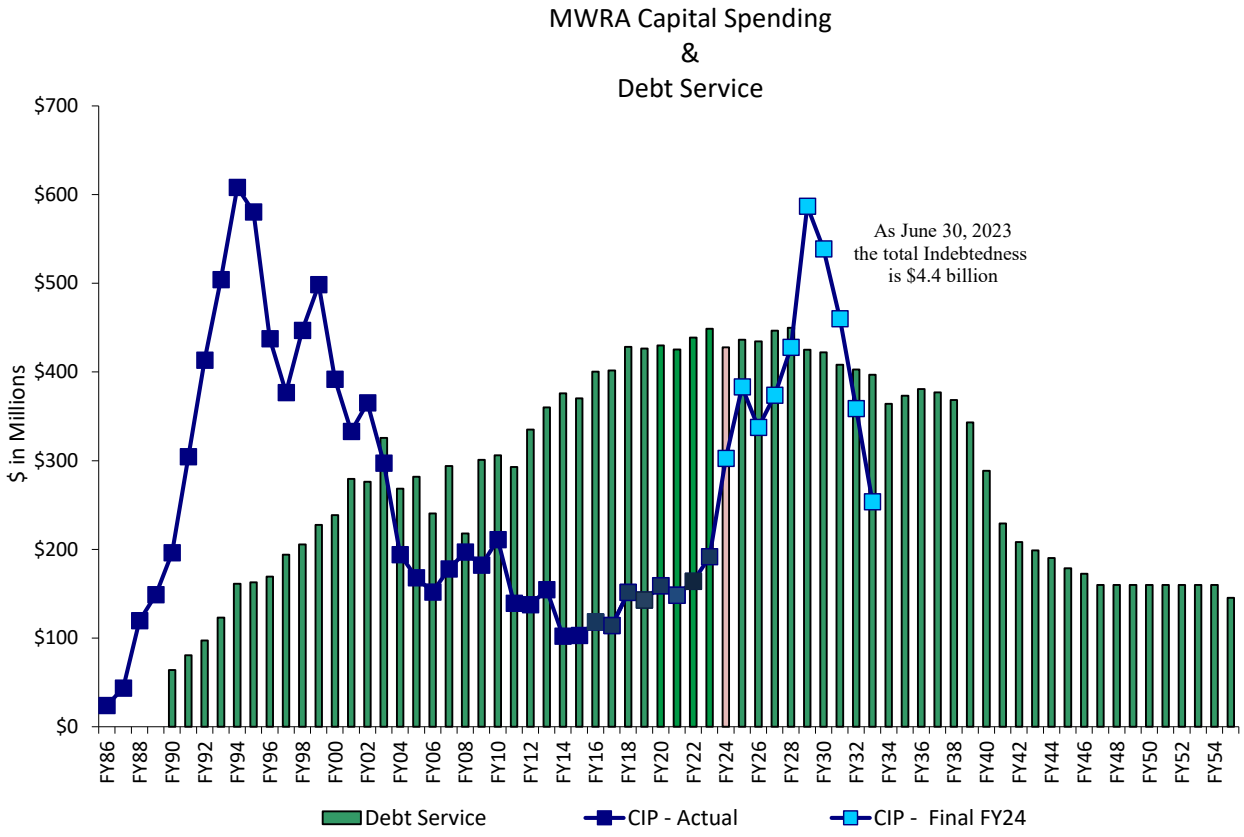
The MWRA offers its water and wastewater communities loan and grant opportunities for infrastructure preservation. Community loans are interest-free and repaid to MWRA over a 5-year or a 10-year period. On the water side, the program's goal is to improve local water system pipeline conditions to help maintain high water quality distribution from MWRA's treatment plant through local pipelines to customers' taps. The water loan program was established in 1998 and over 603 miles of pipeline have been improved. Similarly, on the wastewater side, the local financial assistance program provides MWRA sewer communities funding to perform local infiltration and inflow "I/I" reduction and sewer rehabilitation. The I/I program was established in 1993 and funds are currently approved for distribution through Fiscal Year 2030. Unlike the water loan program, the I/I program is a partial grant program.

Over the FY24-28 timeframe, $174.5 million in funding is projected to be distributed to MWRA wastewater communities and $24.0 million is projected to be distributed to MWRA water communities for a total of $198.5 million in community support.

$s in Millions	FY24	FY25	FY26	FY27	FY28	FY24-28
I/I Financial Assistance (Net of repayments)	$42.9	$41.5	$27.5	$28.4	$34.2	$174.5
Local Water System Assistance (Net of Repayments)	$14.1	$10.9	$5.0	$2.6	-$8.6	$24.0
Total Community Loan Programs	$57.0	$52.4	$32.5	$31.0	$25.6	$198.5

MWRA Capital Improvement Spending and Debt Service

As of June 30, 2023, MWRA's total debt is $4.4 billion, which is $169.8 million less than the MWRA's total debt as of June 30, 2022. While total outstanding debt is decreasing, debt service obligations continue to rise and are projected to increase in coming years.



Project Level Budget Summaries and Detail of Changes

Information on individual project budgets and detail of changes is provided in the supplemental appendices attached to this document.