

Executive Summary

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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 January 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

FY22 Operating Budget (\$ in millions)

| | |
|------------------------|----------------|
| Direct Expenses | \$259.8 |
| Indirect Expenses | \$56.7 |
| <u>Capital Finance</u> | <u>\$496.5</u> |
| Total Operating Budget | \$813.0 |
| Revenues* | \$813.0 |

*97.4% 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: \$8.8 billion since 1984
- Total Current Indebtedness: \$4.8 billion
- FY22 CIP Budget: \$207.8 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*

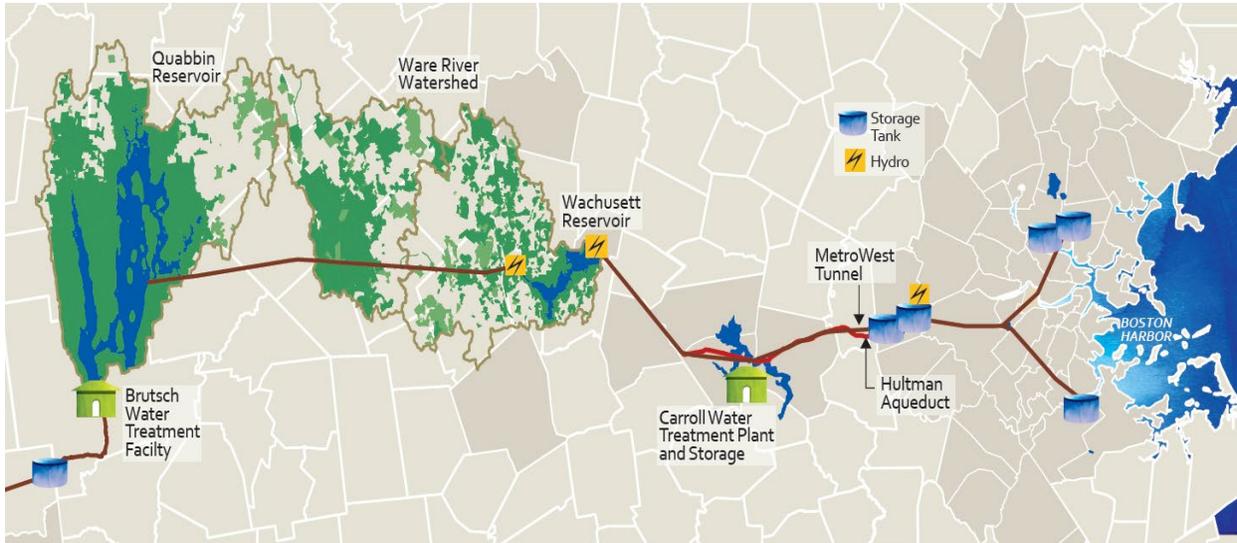
Wastewater System

- 240 miles of sewer pipelines and cross-harbor tunnels
- 13 pump stations
- 1 screening facility
- 1 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: 307 mgd
- Peak wet weather capacity: 1,270 mgd

Renewable Energy

Approximately 27% of MWRA's energy requirement was self-generated from renewable sources (biomass, hydro, wind, & solar assets) in FY21.

MWRA AT A GLANCE



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.

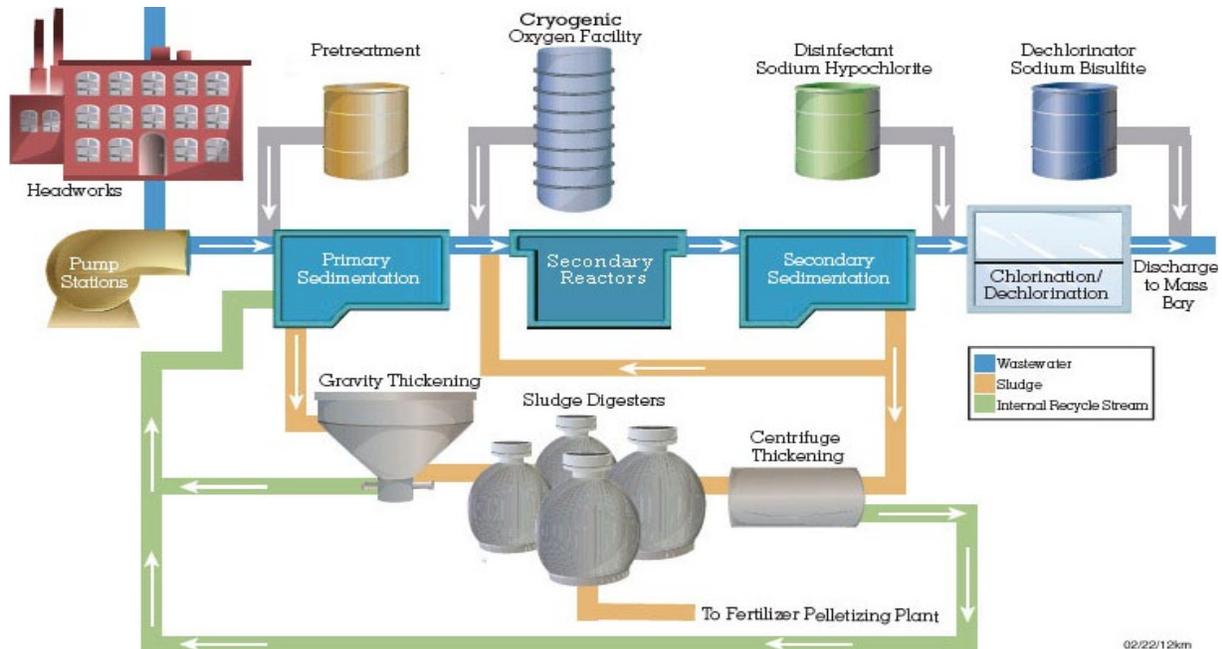
Water for most MWRA communities is treated at the Carroll Water Treatment Plant in Marlborough, Massachusetts. Water from the Quabbin and Wachusett Reservoirs enters the plant through the Cosgrove or Wachusett Aqueduct. The treated water leaves the plant through the MetroWest Water Supply Tunnel and 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 \$8.8 billion to improve the wastewater and waterworks systems serving its 61 customer communities with projected future spending of \$4.0 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 420 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 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.

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 - \$907 million
- MetroWest Tunnel - \$697 million
- Carroll Water Treatment Plant - \$426 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 building facilities. 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 the largest single future CIP initiative with estimated spending in excess of \$1.5 billion over 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 FY22 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, 2021, MWRA's total debt was \$4.8 billion. The Authority's capital finance (including debt service) obligation as a percent of total expenses has increased from 36% in 1990 to 61.1% in the Final FY22 Current Expense Budget.

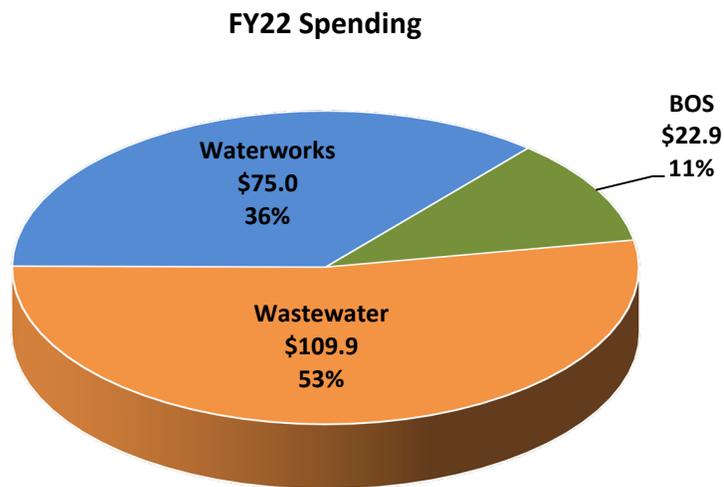
The MWRA's credit ratings of Aa1 from Moody's, AA+ from S&P, and AA+ from Fitch, reflect strong management of financial performance, application of operating surpluses to early debt defeasance, satisfactory debt service coverage ratios, well maintained facilities, comprehensive long-term planning of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

To arrive at the FY22 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 FY22 CIP represents an update to the FY21 CIP approved by the MWRA Board in June 2020. 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.

FY22 Capital Spending

The FY22 Capital Improvement Program projects \$207.8 million spending for FY22, of which \$109.9 million supports Wastewater System Improvements, \$75.0 million supports Waterworks System Improvements, and \$22.9 million is for Business and Operations Support. Capital spending continues to target asset protection to preserve the integrity of the Authorities operating assets and the initial funding in preparation for the next major redundancy initiative.



The FY22 CIP includes \$43.0 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of \$25.1 million for the local Infiltration/Inflow Program and net expenditures of \$17.9 million for the Local Water Pipeline Program. In response to the COVID-19 pandemic and in an effort to ease financial hardship, member communities are able to defer loan repayments due in FY21 and FY22 which provided some cash flow relief and improved financial flexibility.

The table below lists project contracts with spending greater than approximately \$2.5 million in FY22, excluding local community assistance programs, totaling \$75.8 million and accounting for 36.5% of the total annual spending.

| Project | Subphase | FY22 \$s in Millions |
|---|---|----------------------|
| Corrosion & Odor Control | Nut Island Odor Control HVAC Improvement Construction Phase 2 | \$22.9 |
| Facility Asset Protection | Prison Point Rehabilitation - Construction | 10.0 |
| NIH Redundancy & Storage | Section 89 & 29 Replacement - Construction | 8.2 |
| Metro Tunnel Redundancy | Preliminary Design & Massachusetts Environmental Policy Act (MEPA) Review | 6.2 |
| Metro Redundancy Interim Improvements | WASM 3 CP-1 | 5.2 |
| Deer Island Treatment Plant Asset Protection | Motor Control Center & Switchgear Replacement Construction | 4.5 |
| Facility Asset Protection | Ward St & Columbus Park Headworks Design/Construction Admin | 4.3 |
| Deer Island Treatment Plant Asset Protection | Clarifier Rehabilitation Phase 2 - Construction | 3.8 |
| Central Monitoring System | Carroll Water Treatment Plant SCADA Upgrade Construction | 2.8 |
| Deer Island Treatment Plant Asset Protection | Fire Alarm System Replacement - Construction | 2.8 |
| IT Infrastructure Program | Cabling | 2.7 |
| Braintree-Weymouth Relief | B/W Improvements - Construction | 2.5 |
| Total Contracts > \$2.5 million (excl. Loan Programs) | | \$75.8 |
| % of FY22 Spending | | 36.5% |
| Other Project Spending | | \$132.0 |
| Total FY22 Spending | | \$207.8 |



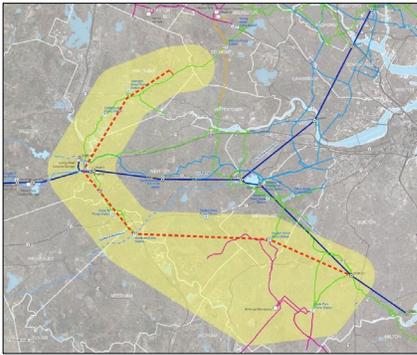
Nut Island Odor Control and HVAC Improvements - Construction Phase 2 - \$22.9 million (\$58.9 million total construction cost). Improvements to the Nut Island Headworks odor control, HVAC and energy management systems. These are the long-term improvement projects that arose following the January 2016 fire and the odor control, HVAC and energy management systems evaluation contract completed in February 2017.



Prison Point Rehabilitation Construction - \$10.0 million (\$42.5 million total construction cost). This rehabilitation will include upgrades to the facility including replacement of diesel pump engines, dry weather screens, wet weather screens, sluice gates, chemical tanks, updating of other facility equipment including electrical distribution and chemical disinfection systems, and repair/replacement of miscellaneous equipment. Improvement/installation of systems as appropriate for energy efficiencies, security, and fire alarm will also be included.



NIH Redundancy & Storage Section 89 & 29 Construction - \$8.2 million (\$32.6 million total construction cost). This contract will include replacement of a 10,500-foot portion of PCCP with class IV reinforcing wire, replacement of line valves and appurtenances on the existing ductile iron portion of Section 89, and abandonment of the 118-year old, 24-inch diameter cast iron Section 29 pipeline.



Metro Tunnel Redundancy, Preliminary Design and Massachusetts Environmental Policy Act (MEPA) Review - \$6.2 million (\$15.7 million total construction cost). The Preliminary Design Engineering contract includes the preliminary geotechnical investigation (deep rock borings), evaluation of preliminary tunnel alignment and shaft site alternatives, preliminary design, preliminary contract packaging, preparation of the required MEPA filings and development of a comprehensive list of the environmental permits needed.



Metro Redundancy Interim Improvements, WASM 3 CP-1 - \$5.2 million (\$19.5 million total construction cost). This first construction contract includes rehabilitation of approximately 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford. The rehabilitation will consist of cleaning and internal cement mortar lining the pipe and adding valves for better operational flexibility. In addition, two old 36-inch valves are being removed to eliminate reduced sections of pipe.

Motor Control Center & Switchgear Replacement Construction - \$4.5 million (\$11.2 million total construction cost). On-going program to replace obsolete Motor Control Centers and electrical switchgear. The design scope was revised to include replacement of switchgear in the Admin/Lab building. Construction is scheduled for FY21-FY24.

Ward St & Columbus Park Headworks Design/Construction Admin - \$4.3 million (\$29.0 million total contract cost). This contract provides design and engineering services during construction for the upgrade of the Ward Street and Columbus Park Headworks. The upgrade will include replacement and automation of all solids handling equipment, including screens, grit collection systems, and solids conveyance systems; replacement of all influent and effluent gates and stop planks; odor control and HVAC systems; instrumentation and control systems; and repair of the concrete surfaces of the headworks channels, settling basins, and influent and effluent shafts.



Clarifier Rehabilitation Phase 2 Construction - \$3.8 million (\$149.0 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.

Fire Alarm System Replacement - \$2.8 million (\$28.8 million total construction cost) Project will replace obsolete fire alarm monitoring & control systems. Design awarded October 2015; construction phase to commence in FY21 and approximately every 20 years thereafter.



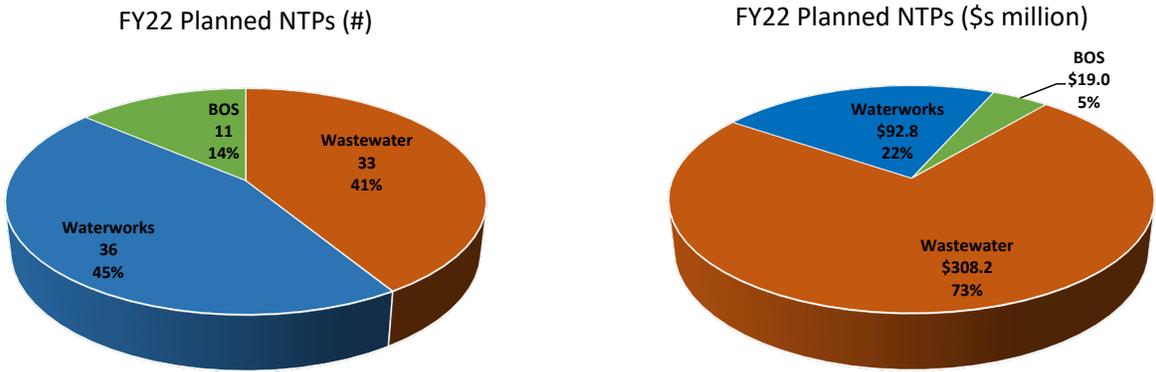
Carroll Water Treatment SCADA Upgrade Construction - \$2.8 million (\$14.0 million total construction cost). This project includes the replacement of PLC's nearing their end of life with an updated PLC platform. New PLC's will provide enhanced security capabilities, continued vendors support and future reliability. Project will also include standardizing PLC logic and HMI graphics, and upgrading aging field instrumentation.

Major Planned Contract Awards for FY22:

In Fiscal Year 2022, 80 contracts totaling \$420.0 million are projected to be awarded. The largest ten projected contract awards total \$298.5 million and account for 71.1% of expected awards and are presented in the following table.

| Project | Subphase | Notice to Proceed | Total Contract Amount \$s in Millions |
|--|--|-------------------|---------------------------------------|
| Deer Island Treatment Plant Asset Protection | Clarifier Rehab Phase 2 - Construction | Mar-22 | \$149.0 |
| Facility Asset Protection | Prison Point Rehab - Construction | Jul-21 | 42.5 |
| Deer Island Treatment Plant Asset Protection | Fire Alarm System Replacement - Construction | Oct-21 | 28.8 |
| New Connect Mains-Shaft 7 | CP3-Sect 23,24,47, Rehabilitation | Feb-22 | 14.7 |
| Central Monitoring System | Carroll Water Treatment Plant SCADA Upgrade Construction | Sep-21 | 14.0 |
| Metro Redundancy Interim Improvement | Waltham Water Pipeline Construction | Feb-22 | 13.8 |
| Deer Island Treatment Plant Asset Protection | Motor Control Center & Switchgear Replacement Construction | Aug-21 | 11.2 |
| Braintree-Weymouth Relief | Braintree/Weymouth Improvements - Construction | Sep-21 | 8.8 |
| Siphon Structure Rehabilitation | Construction | May-22 | 8.3 |
| Application Improvement Program | Lawson Upgrade | Oct-21 | 7.6 |
| Top Ten Contracts | | | \$298.5 |
| % of Total Planned Awards | | | 71.1% |
| 80 Contract Awards Planned | | | \$420.0 |

Of the 80 planned contract awards for FY22, 36 are for Waterworks, 33 Wastewater and 11 Business and Operation Services with associated dollar awards of \$92.8 million, \$308.2 million, and \$19.0 million, respectively. Deer Island’s Clarifier Rehabilitation Phase 2 Construction is the largest planned award at \$149.0 million.



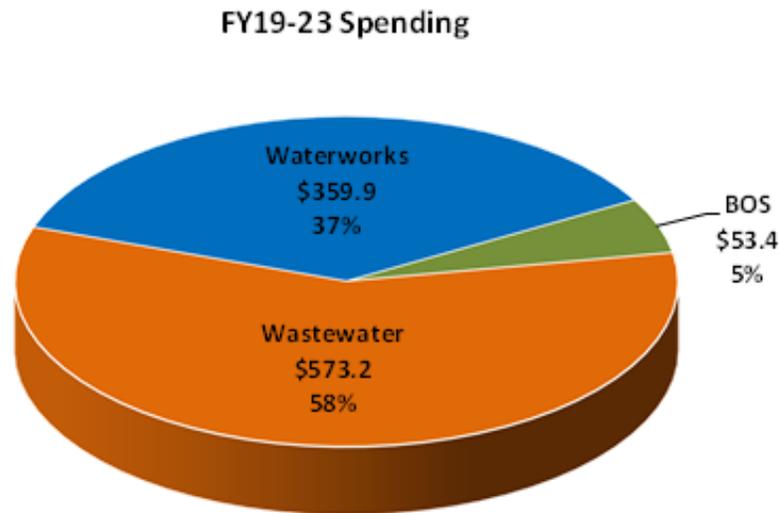
New Projects

The FY22 CIP added four projects for \$3.8 million with the largest being East Boston Sewer Separation BOS-014 at \$2.2 million. The remaining three projects include Chelsea 008 Connection Relief (\$0.6 million), Marlborough Emergency Water Connection (\$0.5 million), and IT Future Workplace (\$0.5 million).

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

FY19-23 Expenditures & Five-Year Spending Cap

Spending during the FY19-23 timeframe is planned to be \$986.5 million, including local community spending of \$158.4 million for the I/I loan and grant program and \$55.1 million for the water pipeline loan program.



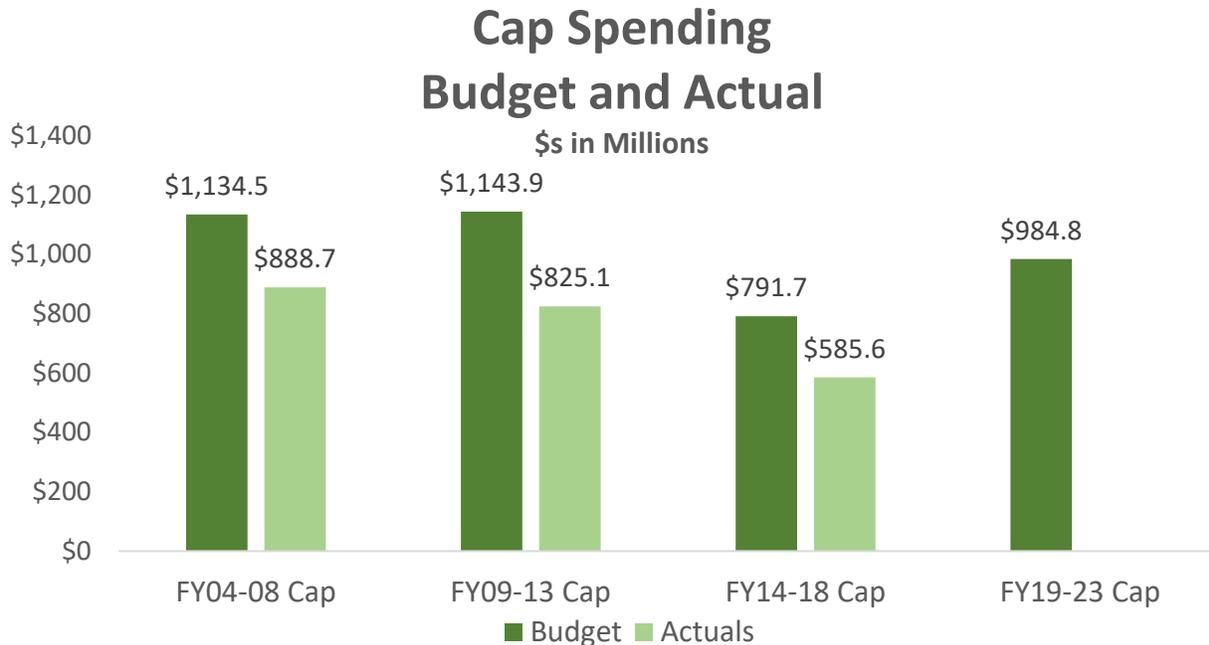
Yearly projected expenditures for the FY19-23 Cap period by Division are shown below in millions:

| | FY19 | FY20 | FY21 | FY22 | FY23 | Total FY19-23 |
|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Wastewater System Improvements | \$74.8 | \$97.2 | \$110.5 | \$109.9 | \$180.7 | \$573.2 |
| Waterworks System Improvements | \$65.6 | \$58.1 | \$54.8 | \$75.0 | \$106.4 | \$359.9 |
| Business & Operations Support | \$2.4 | \$3.7 | \$7.6 | \$22.9 | \$16.8 | \$53.4 |
| Total MWRA | \$142.9 | \$159.0 | \$172.9 | \$207.8 | \$303.9 | \$986.5 |

FY19-23 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 Cap represents targeted spending levels to ensure adequate capital program funding and to serve as a guide for long-term planning estimates and community assessments. The graph below describes the history of the past three five-year caps and the Final FY19-23 Cap, both in terms of the Cap budget levels and actual spending.

The most recent Cap (FY19-23) of \$984.8 million is significantly higher than the prior Cap (FY14-18) of \$791.7 million for a variety of reasons including increased spending on asset protection and the initial phases of the long-term redundancy program.



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 FY19-23 cap period.

The format of the Cap table has changed to account separately for MWRA spending, which excludes the local I/I grant and loan program and the local water pipeline loan spending which are both outside of MWRA’s control. 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. Finally, the Cap excludes Chicopee Valley Aqueduct system projects.

It is important to note that the spending on capital programs is largely determined by the nature, magnitude, and number of upcoming projects. In the prior five-year Caps, specifically FY04-08 and FY09-13, the majority of spending was driven by court-mandated projects and building new facilities. During the FY14-18 Cap, the Authority reached substantial completion on its court-mandated CSO Control Plan at an approximate total cost of \$913.1 million. The Authority’s main focus going forward is asset protection and water system redundancy. The FY22 Final CIP includes

approximately \$2.0 billion in future expenditures for asset protection and continues to fund the critical redundancy for the Metropolitan Tunnels System at approximately \$1.5 billion over a seventeen-year period. However, the FY19-23 period includes only \$22.9 million related to that tunnel project.

The FY19-23 cap cash flow totals \$809.8 million, \$175.0 million below the approved Cap of \$984.8 million and \$78.2 million under the FY22 Proposed CAP calculation. Annual cash flows for the Cap period are shown below in millions:

| FY22 Final | | FY19 | FY20 | FY21 | FY22 | FY23 | Total FY19-23 |
|-------------------------------------|------------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| | Projected Expenditures | \$142.9 | \$159.0 | \$172.9 | \$207.8 | \$303.9 | \$986.5 |
| I/I Program | (39.6) | (35.2) | (34.8) | (25.1) | (23.6) | (158.4) | |
| Water Loan Program | (13.8) | (11.4) | (16.4) | (17.9) | 4.4 | (55.1) | |
| MWRA Spending | \$89.4 | \$112.3 | \$121.7 | \$164.7 | \$284.8 | \$773.0 | |
| Contingency | 0.0 | 0.0 | 0.0 | 9.7 | 18.7 | 28.5 | |
| Inflation on Unawarded Construction | 0.0 | 0.0 | 0.0 | 1.2 | 7.2 | 8.4 | |
| Chicopee Valley Aqueduct Projects | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| FY22 Final FY19-23 Spending | \$89.4 | \$112.3 | \$121.7 | \$175.7 | \$310.7 | \$809.8 | |

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 FY19-23 timeframe. Project contracts with expenditures greater than \$10 million for the FY19-23 timeframe total \$377.3 million, which excludes local community assistance programs, and accounts for slightly over 38% of total spending. Large initiatives include Nut Island Odor Control HVAC Improvement at \$58.9 million (\$58.9 million total cost), Chelsea Creek Upgrades at \$53.2 million (\$84.8 million total cost), Clarifier Rehab at Deer Island \$42.8 million (\$149.0 million total cost), and Prison Point Rehabilitation at \$38.0 million (\$42.5 million total cost).

The following table highlights major project spending in the FY19-23 timeframe:

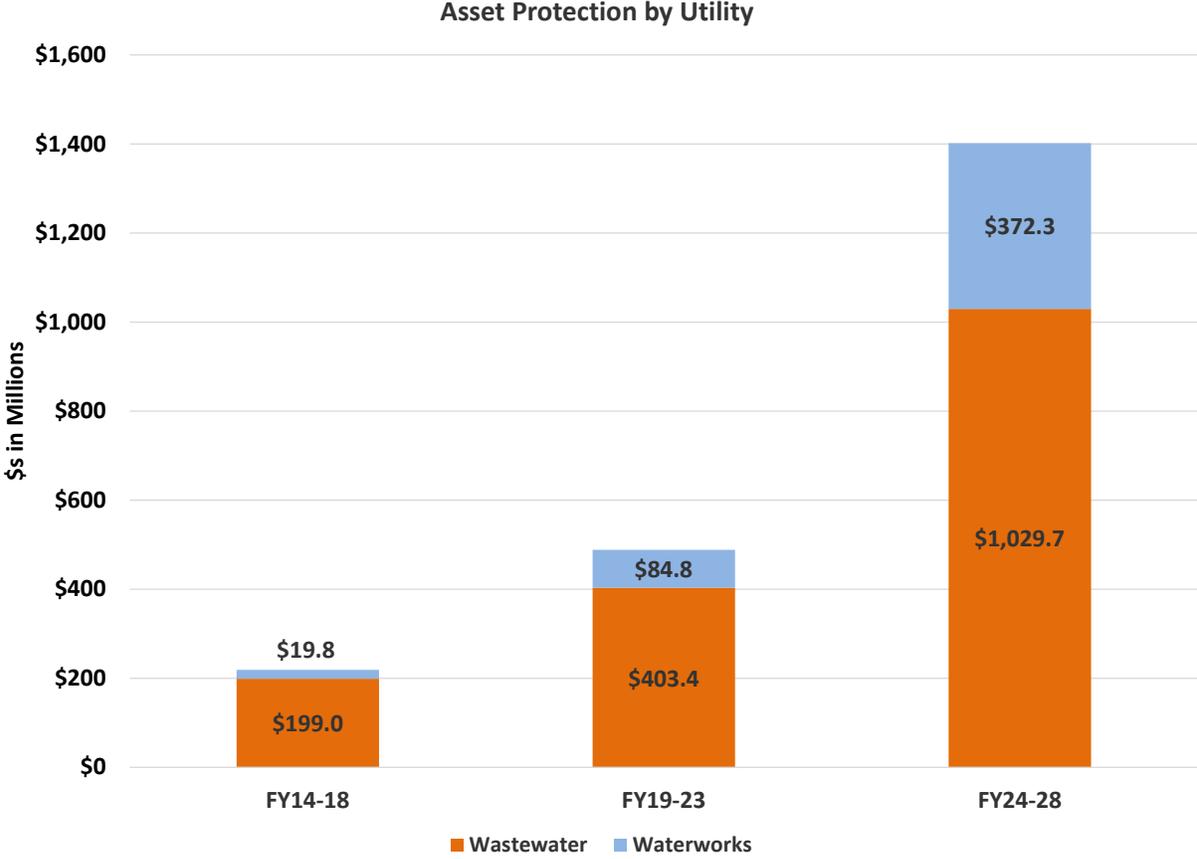
| Project | Subphase | FY19-23 Spending \$s in Millions |
|--|---|----------------------------------|
| Corrosion & Odor Control | Nut Island Odor Control HVAC Improvement Construction Phase 2 | \$58.9 |
| Facility Asset Protection | Chelsea Creek Upgrades - Construction | 53.2 |
| Deer Island Treatment Plant Asset Protection | Clarifier Rehab Phase 2 - Construction | 42.8 |
| Facility Asset Protection | Prison Point Rehabilitation - Construction | 38.0 |
| SEH Redundancy & Storage | Redundancy Pipeline Section 111 - Construction 3 | 20.2 |
| Deer Island Treatment Plant Asset Protection | Gravity Thickener Rehabilitation | 19.8 |
| NIH Redundancy & Storage | Section 89 & 29 Redundancy Construction Phase 2 | 19.8 |
| NIH Redundancy & Storage | Section 89 & 29 Replacement - Construction | 16.3 |
| Metro Redundancy Interim Improvement | WASM 3 CP-1 | 15.7 |
| Metro Tunnel Redundancy | Preliminary Design & Massachusetts Environmental Policy Act (MEPA) Review | 14.4 |
| SEH Redundancy & Storage | Redundancy Pipeline Sect 111 - Construction 2 | 13.9 |
| Facility Asset Protection | Ward St & Columbus Park Headworks Design/Construction Admin | 11.5 |
| Metro Redundancy Interim Improvement | WASM/Spot Pond Supply Mains West Pressure Reducing Valve Construction | 11.2 |
| Residuals Asset Protection | Residual Electric Machine Drum Replacement | 10.6 |
| Deer Island Treatment Plant Asset Protection | Fire Alarm System Replacement - Construction | 10.6 |
| Central Monitoring System | Carroll Water Treatment Plant SCADA Upgrade Construction | 10.3 |
| Metro Redundancy Interim Improvement | Waltham Water Pipeline Construction | 10.2 |
| | Top Spending Subphase FY19-23 (excl. Loan Programs) | \$377.3 |
| | % of 19-23 Spending | 38.2% |
| | Remaining FY19-23 Spending | \$609.2 |
| | Total Projected FY19-23 Spending | \$986.5 |

Asset Protection accounts for the largest share of capital expenditures for the FY19-23 period. The FY22 Final CIP includes \$501.8 million for asset protection initiatives, representing nearly 51% of total MWRA spending. Wastewater and Waterworks Asset Protection are \$403.4 million and \$84.8 million, respectively. Deer Island Treatment Plant Asset Protection alone accounts for \$145.5 million of Asset Protection spending. Spending for water system redundancy projects total \$198.6 million in the same FY19-23 period, accounting for 20% of total spending.

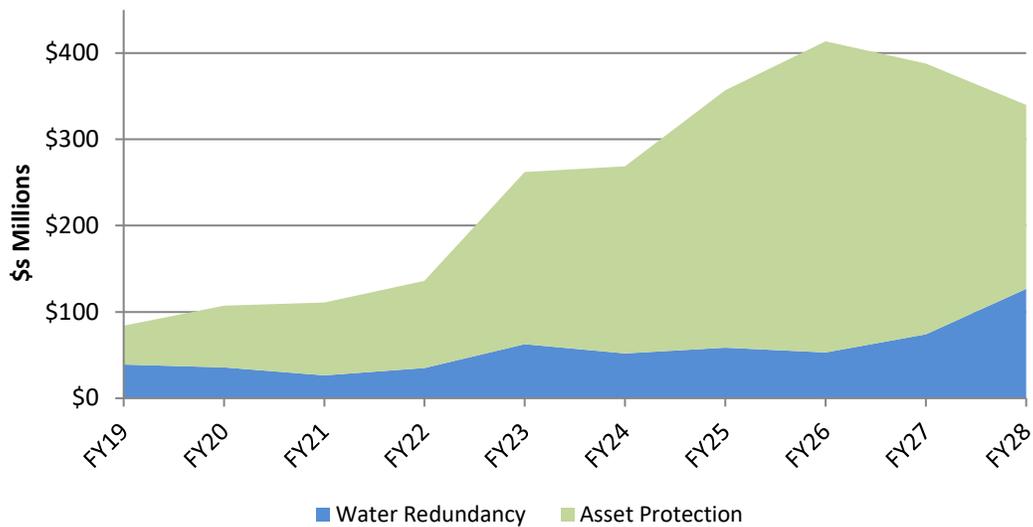
Changing nature of the CIP by Category

| Project Category | Total Contract | FY14-18 | FY19-23 | FY24-28 |
|-------------------------|------------------|----------------|----------------|------------------|
| Asset Protection | \$3,192.0 | \$222.8 | \$501.8 | \$1,402.4 |
| Water Redundancy | \$3,064.8 | \$174.6 | \$198.6 | \$364.6 |
| CSO | \$888.5 | \$64.7 | \$10.6 | \$0.1 |
| Other | \$1,477.7 | \$123.5 | \$275.6 | \$238.0 |
| Total | \$8,622.9 | \$585.6 | \$986.5 | \$2,005.2 |
| Asset Protection | 37.0% | 38.0% | 50.9% | 69.9% |
| Water Redundancy | 35.5% | 29.8% | 20.1% | 18.2% |
| CSO | 10.3% | 11.0% | 1.1% | 0.0% |
| Other | 17.1% | 21.1% | 27.9% | 11.9% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |

In terms of utility spending, wastewater asset protection accounts for nearly 41% of the FY19-23 projected spending at \$403.4 million of which \$145.5 million is designated for the Deer Island Wastewater Treatment Plant and \$257.9 million for headworks, pump stations, residuals facility, and pipelines. The \$84.8 million targeted for waterworks asset protection includes \$38.1 million for water pipelines.



As illustrated in the following graph, the next two waves of spending over the FY19-23 period and the FY24-28 period 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. Total asset protection spending for FY19-23 is projected at \$501.8 million or 50.9% of projected spending. Similarly, water redundancy spending for FY19-23 is projected at \$198.6 million or 20.1% of projected FY19-23 spending. For the FY24-28 spending window, total asset protection is projected at \$1.4 billion or 69.9% of projected spending. Similarly, water redundancy spending for FY24-28 is projected at \$364.6 million or 18.2% of projected FY24-28 spending.



FY22 CIP Future Expenditures

The FY22 Final CIP contains future spending (beyond FY20) estimated at \$4.0 billion. The spending projections include updates to FY22 Proposed CIP with the latest cost estimates, revised schedules, and new projects.

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

| | Future Spending Beyond FY20 | FY19 | FY20 | FY21 | FY22 | FY23 | Total FY19-23 | Beyond 23 |
|--|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Wastewater System Improvements | \$1,715.5 | \$74.8 | \$97.2 | \$110.5 | \$109.9 | \$180.7 | \$573.2 | \$1,314.4 |
| Interception & Pumping | 595.4 | 23.1 | 33.1 | 53.1 | 52.4 | 71.8 | 233.6 | 418.1 |
| Treatment | 892.8 | 10.0 | 14.2 | 18.0 | 28.0 | 83.8 | 154.0 | 763.1 |
| Residuals | 91.3 | 0.8 | 13.4 | 1.6 | 0.1 | 0.7 | 16.6 | 88.8 |
| CSO | 8.3 | 1.2 | 1.3 | 2.9 | 4.3 | 0.9 | 10.6 | 0.1 |
| Other Wastewater | 127.7 | 39.6 | 35.2 | 34.8 | 25.1 | 23.6 | 158.4 | 44.2 |
| Waterworks System Improvements | \$2,258.6 | \$65.6 | \$58.1 | \$54.8 | \$75.0 | \$106.4 | \$359.9 | \$2,022.3 |
| Drinking Water Quality Improvements | 56.9 | 0.8 | 1.5 | 2.2 | 3.2 | 5.8 | 13.5 | 45.7 |
| Transmission | 1,714.8 | 9.9 | 12.8 | 21.4 | 29.2 | 55.5 | 128.9 | 1,608.6 |
| Distribution & Pumping | 525.6 | 36.6 | 26.6 | 13.3 | 19.1 | 34.6 | 130.3 | 458.5 |
| Other Waterworks | (38.7) | 18.4 | 17.0 | 17.9 | 23.5 | 10.5 | 87.2 | (90.5) |
| Business & Operations Support | \$73.1 | \$2.4 | \$3.7 | \$7.6 | \$22.9 | \$16.8 | \$53.4 | \$25.9 |
| Total MWRA | \$4,047.2 | \$142.9 | \$159.0 | \$172.9 | \$207.8 | \$303.9 | \$986.5 | \$3,362.6 |

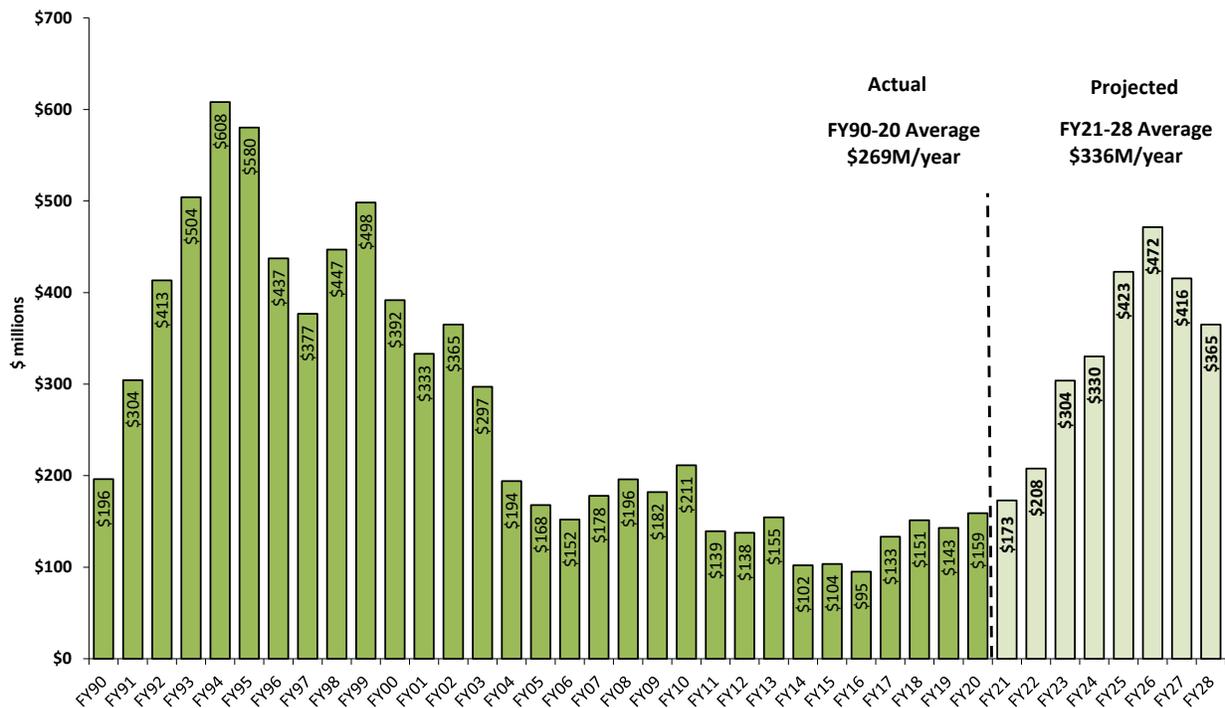
Spending for the FY19-23 period totals \$986.5 million with Wastewater projects accounting for \$573.2 million of total period spending or 58% and Waterworks planned spending following at \$359.9 million or 37%. Spending beyond FY23 totals \$3.4 billion, including \$1.3 billion for

Wastewater projects and \$2.0 billion for Waterworks projects. Beyond FY23 spending is evenly split between Redundancy and Asset Protection initiatives with projected spending of \$1.7 billion each. Beyond FY23 spending for the Metro Tunnel Redundancy project is estimated at \$1.5 billion. Redundancy project spending accelerates in the FY24-28 window.

Historical and Projected Spending

The following two charts below capture the historical CIP spending through FY20 and projects spending through FY28 based on the FY22 CIP both overall at the MWRA level and by utility. Average total annual CIP spending through FY19 was \$273 million. Average annual CIP spending through FY20 was \$269 million. Average annual CIP spending for the FY21-28 period is projected to be \$336 million.

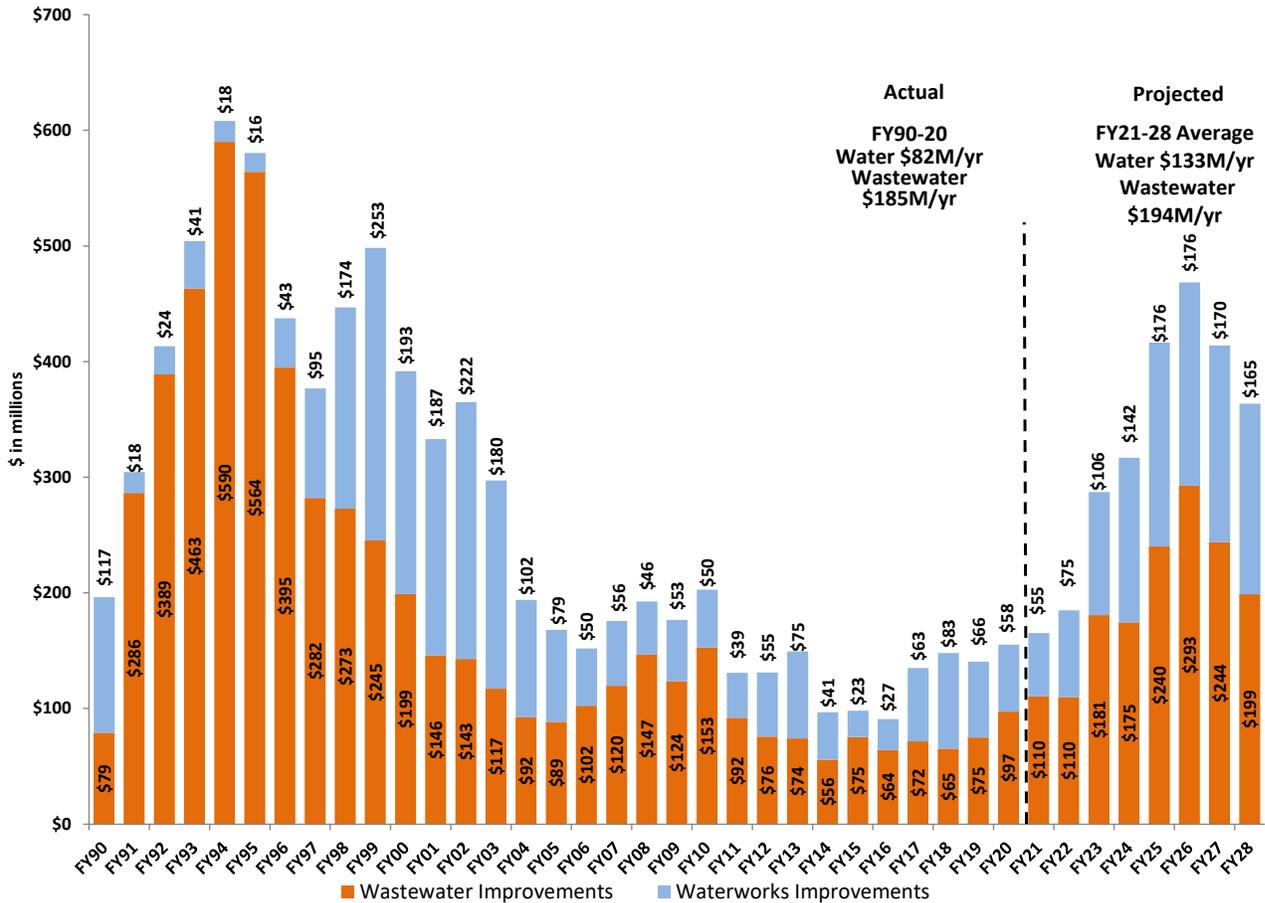
Annual CIP Spending



The following chart shows the historical CIP spending from FY90 through FY20 by utility, with projections through FY28. Average annual CIP spending through FY20 was \$82 million for

Waterworks and \$185 million for Wastewater. Average annual CIP spending for the FY21-28 period is projected to be \$133 million for Waterworks and \$194 million for Wastewater.

Annual CIP Spending by Utility



Community Loan Programs

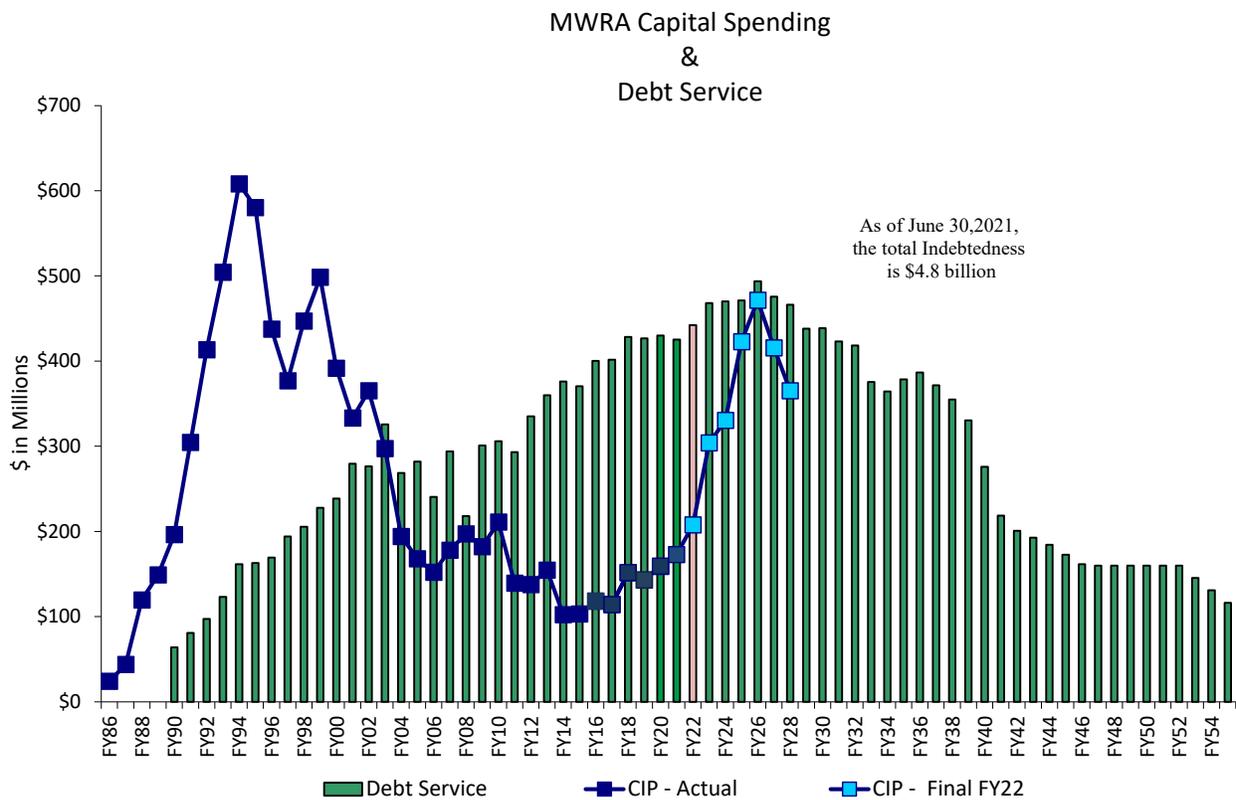
The MWRA offers its water and wastewater communities loan and grant opportunities for infrastructure preservation. Community loans are interest-free and repaid to MWRA over a 5-year or a 10-year period. On the water side, the program's goal is to improve local water system pipeline conditions to help 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 546 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 2025. Unlike the water loan program, the I/I program is a partial grant program.

Over the FY19-23 timeframe, \$158.4 million in funding is projected to be distributed to MWRA wastewater communities and \$55.1 million is projected to be distributed to MWRA water communities for a total of \$213.5 million in community support.

| \$s in Millions | FY19 | FY20 | FY21 | FY22 | FY23 | FY19-23 |
|---|--------|--------|--------|--------|---------|---------|
| I/I Financial Assistance (Net of repayments) | \$39.6 | \$35.2 | \$34.8 | \$25.1 | \$23.6 | \$158.4 |
| Local Water System Assistance (Net of Repayments) | \$13.8 | \$11.4 | \$16.4 | \$17.9 | (\$4.4) | \$55.1 |
| Total Community Loan Programs | \$53.5 | \$46.7 | \$51.2 | \$43.0 | \$19.1 | \$213.5 |

MWRA Capital Improvement Spending and Debt Service

As of June 30, 2021, MWRA’s total debt is \$4.8 billion, which is \$117.8 million less than the MWRA’s total debt as of June 30, 2020. 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.