

MASSACHUSETTS WATER RESOURCES AUTHORITY



Fiscal Year 2022 CURRENT EXPENSE BUDGET



GOVERNMENT FINANCE OFFICERS ASSOCIATION

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For the Fiscal Year Beginning

July 01, 2020

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September 2021

Louis M. Taverna, Chairman
MWRA Advisory Board
100 First Avenue
Boston, MA 02129

Dear Chairman Taverna:

This letter transmits to the Advisory Board MWRA's Current Expense Budget (CEB) for Fiscal Year 2022. The CEB was approved by the MWRA's Board of Directors on June 23, 2021.

The Final FY2022 Budget resulted in a combined assessment increase of 2.95%, which is lower than the 3.6% increase projected for FY2022 last year. The FY2022 total expenses are \$813.0 million, of which 61.1% or \$496.5 million is for capital financing costs, \$259.8 million for direct expenses, and \$56.7 million for indirect expenses. The overall expenses increased by \$21.6 million or 2.7% over the FY2021 budget.

When establishing expense projections, the main emphasis was on the FY2022 budget, but with the goal of continuing to utilize MWRA's multi-year rate management strategy to provide sustainable and predictable assessment increases to our member communities for the long term. To achieve this goal again this year, MWRA has continued to employ conservative budgeting and fiscal discipline which includes controlled spending, capital project prioritization, and use of historical variable rate assumptions. The combination of these measures resulted in assessment increase projections no greater than 3.5% for the next three years.

The FY2022 budget continues to address the smoothing of rate revenue changes at the water and sewer utility level.

Additional budget information and a copy of this document are available online at www.mwra.com. Questions or comments on this document may be directed to the MWRA Budget Department at (617) 788-2206. Thank you for your continued support.

Sincerely,

A handwritten signature in blue ink that reads "Fred a Laskey".

Frederick A. Laskey
Executive Director

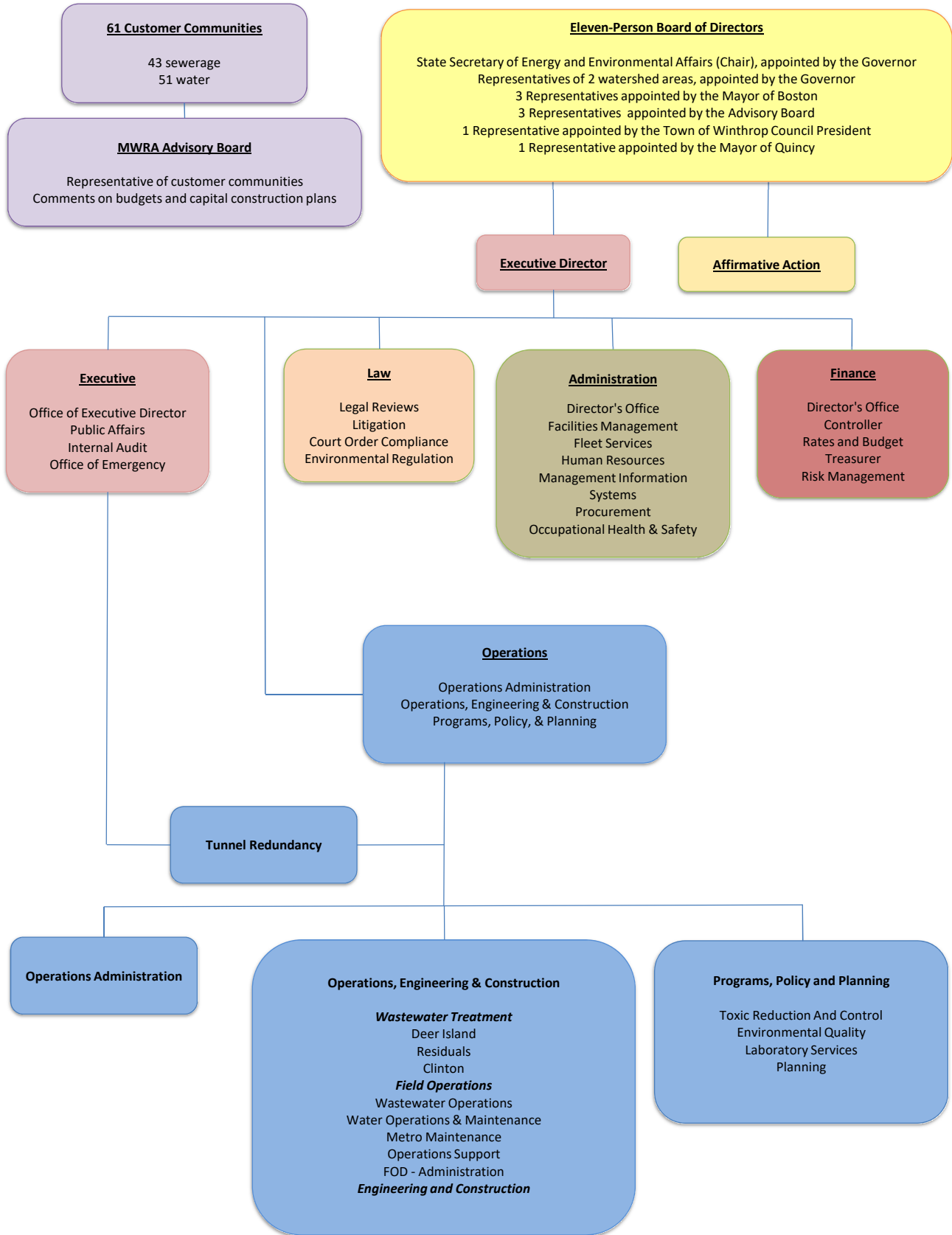


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MWRA AT A GLANCE

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 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*

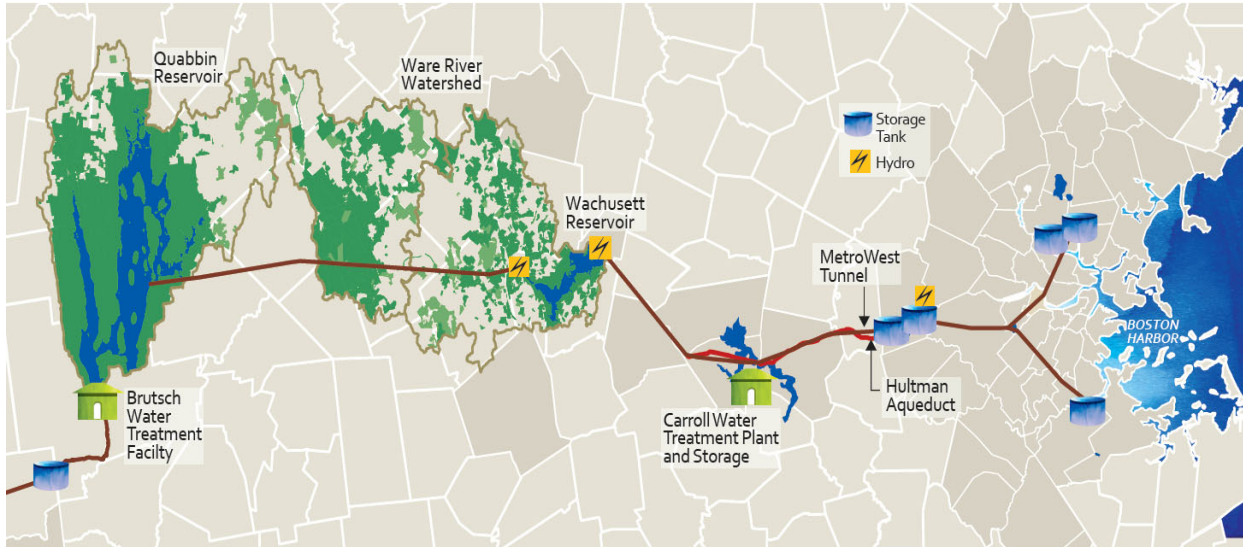
Wastewater System

- 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.

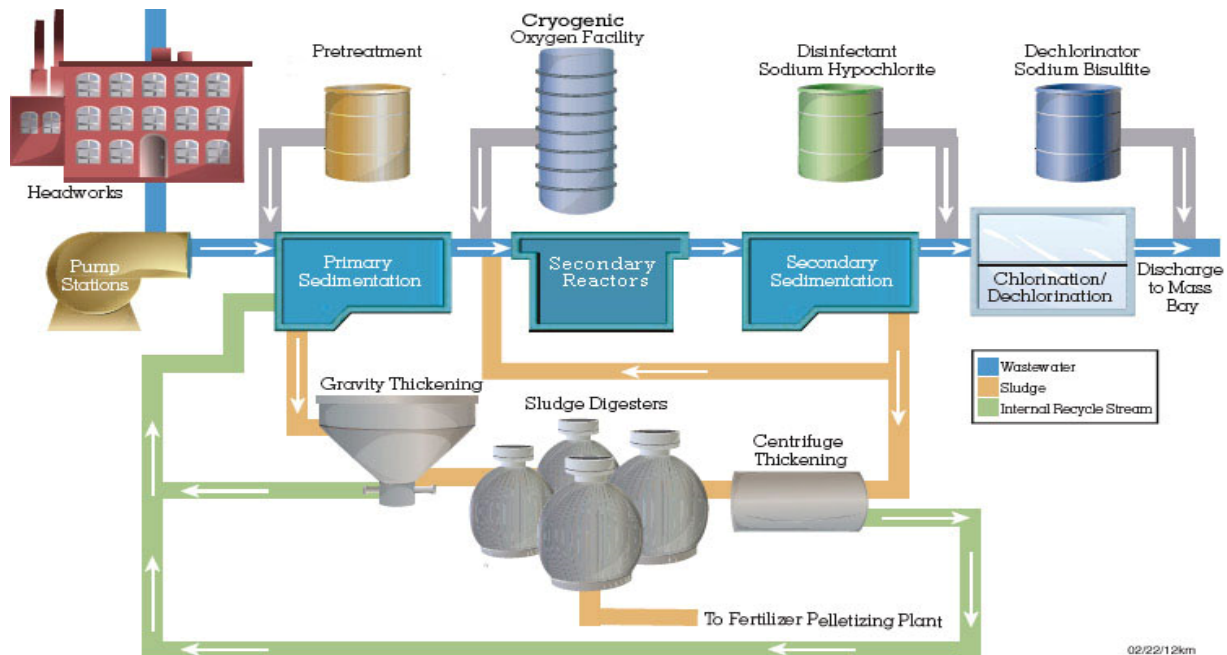
Water for most MWRA communities is treated at the Carroll Water Treatment Plant in Marlborough, Massachusetts. Water from the Quabbin and Wachusett Reservoirs enters the plant through the Cosgrove or Wachusett Aqueduct. The treated water leaves the plant through the MetroWest Water Supply Tunnel and 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 microorganisms. 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.



Executive Summary

Executive Summary

MISSION

The Massachusetts Water Resources Authority (MWRA) is an independent public authority of the Commonwealth of Massachusetts that provides wholesale water and sewer services to its member communities and funds its operations primarily through member community assessments and charges. MWRA's mission is to provide reliable, cost-effective, high-quality water and sewer services that protect public health, promote environmental stewardship, maintain customer confidence, and support a prosperous economy.

HISTORY

Created by the Massachusetts legislature in 1985 (Chapter 372 of the Acts of 1984, "The Enabling Act"), MWRA assumed possession and control of the water and sewer systems, including facilities, properties, and the right to utilize water withdrawn from system reservoirs that had formerly been the Sewerage and Waterworks Divisions of the Commonwealth of Massachusetts Metropolitan District Commission (MDC). The Commonwealth, under the management of the MDC Watershed Management Division (now the Department of Conservation and Recreation – Division of Watershed Management), retained ownership of real property, including the reservoirs and watersheds, the maintenance of which are included in MWRA's operating budget.

In 1985, responsibility for water distribution for 46 municipalities and sewage collection and treatment for 43 municipalities was transferred to the MWRA. In 1987, the legislature also transferred responsibility to operate and maintain the Clinton Wastewater Treatment Plant from the Commonwealth to the MWRA. New communities have the opportunity to join the MWRA water and sewer systems, and, over the years, the number of member communities has increased. Since 1985, the MWRA has invested over \$8.7 billion to modernize and improve the wastewater and waterworks systems serving its 61 member communities. MWRA's facilities span from the Quabbin Reservoir in western Massachusetts to the Deer Island Treatment Plant in Boston Harbor. In Fiscal Year 2021, the system served approximately 3.0 million people and more than 5,500 businesses.

The Enabling Act also established the MWRA Advisory Board to represent the cities and towns in the service area. The Advisory Board appoints three members of the MWRA Board of Directors, approves the extension of water and sewer services to additional communities, and reviews and makes recommendations on MWRA's annual Current Expense Budget and Capital Improvement Program.

MWRA ORGANIZATION

The MWRA has five separate divisions and the Affirmative Action and Compliance Unit Department (AACU). Each division provides operations or support services to carry out MWRA's activities under the direction of the Executive Office. MWRA's organizational structure is included in the document immediately preceding this page.

The **Executive Office** provides centralized MWRA management, direction, and policy development. The budget includes funds for the Office of the Executive Director, the Board of Directors, the Advisory Board, and other advisory committees. It includes the following departments: Office of Emergency Preparedness; Public Affairs; and Internal Audit.

The **Operations Division** operates the water and wastewater treatment systems; the water transmission and distribution system; the wastewater collection, transport, and combined sewer overflow (CSO) systems; and the residuals processing facility. It also provides laboratory and engineering and construction services; enforces sewer use regulations and seeks to limit the discharges of toxic materials; manages environmental studies of Boston Harbor and Massachusetts Bay; monitors water quality; and includes the Planning and Coordination Department.

The **Administration Division** is responsible for managing the support services functions of the Authority. The Administration is comprised of seven departments: Director's Office; Facilities; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Occupational Health and Safety (OHS). The Administration Division performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long-term goals and strategies.

The **Finance Division** is responsible for managing the finance functions of the Authority. Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management. The Finance Division ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

The **Law Division** provides legal counsel to all divisions on compliance with federal and state law, real estate matters, labor and employment law, litigation, and construction issues. Division attorneys provide or supervise through outside counsel the representation of MWRA in all litigation.

The **Affirmative Action and Compliance Unit (AACU) Department** develops, administers and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority/Women Business Enterprises (MBE/WBE) in Authority procurement activities.

GOALS AND PERFORMANCE MEASURES

The MWRA Business Plan was first implemented in 1997 as a strategic road map to present specific steps for the organization to undertake to improve customer service, upgrade operations and maintenance and pursue aggressive rates management. In 2000, MWRA adopted a five-year Strategic Business Plan. Since then, some of the goals have been completed, and new ones have been added. MWRA's current five-year Strategic Business Plan FY2021-2025 was adopted in early 2021 and emphasized improvements in service and systems and included performance targets for operating the water and wastewater systems and maintaining new and existing facilities. The FY2021-2025 Business Plan can be found at <https://www.mwra.com/publications/businessplan/2021-2025mwrabp.pdf>.

MWRA's Water System Master Plan and Wastewater System Master Plan present a long-term vision of the capital development needs of the water and wastewater systems and the actions planned to meet those

needs. The Master Plan can be found at <http://www.mwra.com/02org/html/masterplan.htm>. Both the Master Plan and the Business Plan are integral components to MWRA's goal of carrying out its operating programs and capital projects while providing sustainable, predictable and reasonable assessments to its customer communities. To that end, the MWRA applies a multi-year rates management strategy to provide sustainable and predictable assessment increases to its member communities. The need to achieve and maintain a balance between these two goals is a critical issue in the development of both MWRA's operating and capital budgets.

During the year, MWRA measures actual performance on a monthly basis using various reporting tools. The monthly Financial Staff Summary reports on actual spending versus both the operating and capital budgets and provides summary explanations of the variances at the line item level. At least twice a year staff prepares projections for the fiscal year-end with a similar level of explanations. The performance indicator reports (published by MWRA as the Orange Notebook) captures a variety of parameters regarding performance of each major functional area of the Authority, on a quarterly basis. Please see Appendix I for the most recent detailed report for Q4 of FY2021. Additional reports can be found at <http://www.mwra.com/quarterly/orangenotebook/orangenotebook.htm>.

BUDGET PROCESS OVERVIEW

Each year, MWRA prepares a Current Expense Budget (CEB) that reflects the best available information for anticipated expenditures and revenues. In parallel, MWRA prepares a Capital Improvement Program (CIP) Budget.

The MWRA operates on a fiscal year that runs from July 1 through June 30. The budget process for both budgets begins in the fall with formal kick-off meetings in September where MWRA staff are given guidelines and targets for their budget requests. After review by the Budget Department and MWRA senior staff, a Proposed CIP Budget is typically presented to the Board of Directors in December. The Capital Financing portion of the Current Expense Budget is determined based on existing debt service and projected borrowing needs. Typically in February, after further review with MWRA senior staff, the Budget Department presents the Proposed CEB to the Board of Directors, after which the Proposed CEB is then transmitted to the Advisory Board, with the projected assessment increase Authority-wide and for each customer community. The Advisory Board then has no less than sixty days to review, comment, and provide recommendations on both budgets. MWRA also hosts a public hearing to solicit comments on the budgets and community assessments from citizens in its service area. Typically in May, the Advisory Board transmits its comments to the MWRA to which written responses are provided.

Typically at its May meeting, MWRA's Board of Directors holds hearings on the budget to review recommendations by the Advisory Board and new information available since the budget was developed. Staff incorporates Board decisions from the hearings and presents a final budget and final assessments for approval at the June Board of Directors meeting.

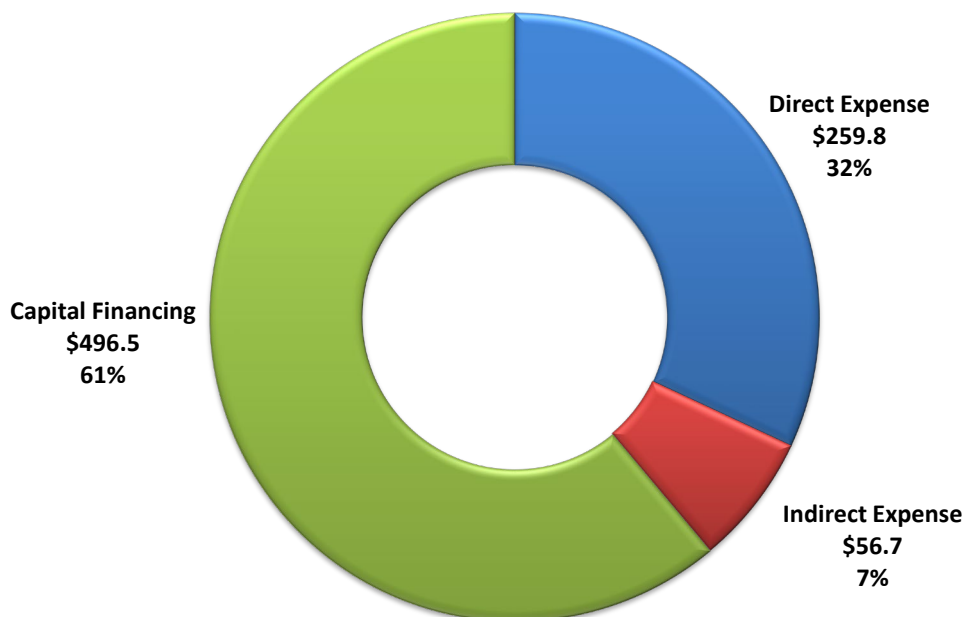
FY22 BUDGET SUMMARY

The Final FY22 Budget projects a combined increase in rates and charges of 2.95% and was approved by the Board of Directors on June 23, 2021. Total expenses are \$813.0 million, an increase of \$21.6 million or 2.7% from the FY21 Budget. Capital Financing costs remain the largest component of the CEB and account for 61.1% of total expenses. The Final FY22 Budget assumes an offset of \$1.3 million for State Debt Service Assistance (DSA) and the use of \$1.3 million in Rate Stabilization that combined to yield the Rate Revenue increase of 2.95%. The Final FY22 Rate Revenue Requirement is \$792.1 million, an increase of \$22.7 million over the FY21 Budget.

Total expenses of \$813.0 million include \$496.5 million for Capital Financing costs and \$316.5 million for operating expenses, of which \$259.8 million is for Direct Expenses and \$56.7 million is for Indirect Expenses. Total expenses increased \$21.6 million due to a \$14.6 million increase in capital financing cost due to the structure of existing debt and projected issuances, higher direct expense of \$7.6 million primarily due to additional Tunnel Redundancy staffing and higher Fringe Benefit expense reflecting higher health insurance expense.

The FY22 Final Budget revenues, excluding rate revenue, totals \$20.9 million, a decrease of \$1.1 million or 4.8% from the FY21 Budget. The FY22 Final Budget non-rate revenue budget includes \$15.7 million in Other User Charges and Other Revenue, \$4.0 million for Investment Income, and \$1.3 million in Rate Stabilization.

FY22 Final Current Expense Budget



MWRA continues to pursue a rate management strategy which promotes sustainable and predictable assessments. The FY22 Final CEB has a combined utilities assessment increase of 2.95% with Rate Revenues totaling \$813.0 million. Rate Revenues account for 97.4% of projected FY22 revenues.

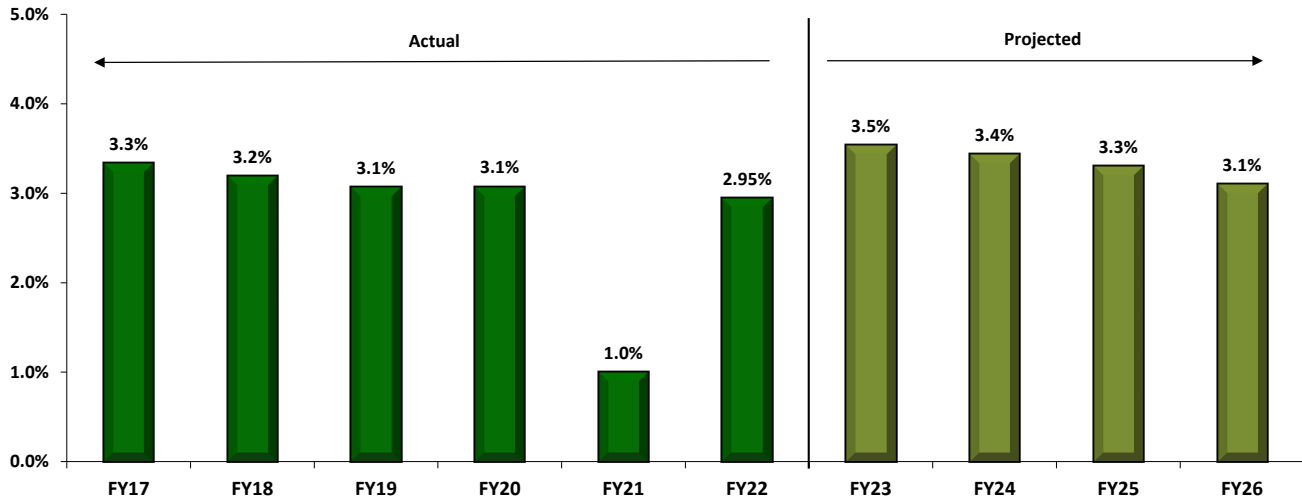
The table below shows MWRA's FY22 Final Budget for revenue and expenses compared with the FY22 Proposed Budget and FY21 Approved Budget. Changes from FY21 to FY22 are described in the Revenue and Expense section of the Executive Summary.

FY22 Final Budget vs. FY21 Approved Budget

TOTAL MWRA	FY21 Approved Budget	FY22 Proposed Budget	FY22 Draft Final Budget	Change FY22 Draft Final Budget vs FY21 Approved Budget	
				\$	%
EXPENSES					
WAGES AND SALARIES	\$ 112,919,297	\$ 117,613,852	\$ 116,680,341	\$ 3,761,044	3.3%
OVERTIME	5,019,296	5,218,335	5,156,681	137,385	2.7%
FRINGE BENEFITS	22,402,224	23,388,645	23,253,137	850,913	3.8%
WORKERS' COMPENSATION	2,476,655	2,242,524	2,614,159	137,504	5.6%
CHEMICALS	12,091,255	12,103,438	12,202,286	111,031	0.9%
ENERGY AND UTILITIES	24,200,846	23,902,322	24,749,865	549,019	2.3%
MAINTENANCE	32,618,569	33,913,280	32,442,381	(176,188)	-0.5%
TRAINING AND MEETINGS	405,264	498,394	473,994	68,730	17.0%
PROFESSIONAL SERVICES	8,377,283	9,019,258	8,773,258	395,975	4.7%
OTHER MATERIALS	6,706,916	6,629,774	8,334,774	1,627,858	24.3%
OTHER SERVICES	24,983,777	25,461,720	25,129,236	145,459	0.6%
TOTAL DIRECT EXPENSES	\$ 252,201,383	\$ 259,991,541	\$ 259,810,111	\$ 7,608,728	3.0%
INSURANCE	\$ 3,059,218	\$ 3,543,600	\$ 3,943,600	\$ 884,382	28.9%
WATERSHED/PILOT/DEBT	26,422,138	27,267,370	\$ 26,731,490	309,352	1.2%
HEEC PAYMENT	7,215,200	6,976,041	\$ 6,991,953	(223,247)	-3.1%
MITIGATION	1,692,344	1,693,359	\$ 1,693,360	1,016	0.1%
ADDITIONS TO RESERVES	1,815,077	1,373,566	\$ 1,412,647	(402,430)	-22.2%
RETIREMENT FUND	11,000,000	11,205,000	\$ 11,205,000	205,000	1.9%
POSTEMPLOYMENT BENEFITS	6,065,490	4,673,624	\$ 4,673,624	(1,391,867)	-22.9%
TOTAL INDIRECT EXPENSES	\$ 57,269,467	\$ 56,732,561	\$ 56,651,673	\$ (617,794)	-1.1%
STATE REVOLVING FUND	\$ 97,811,162	\$ 97,143,496	\$ 95,673,399	\$ (2,137,762)	-2.2%
SENIOR DEBT	258,730,904	246,694,483	244,957,128	(13,773,775)	-5.3%
SUBORDINATE DEBT	96,339,599	125,046,217	125,046,217	28,706,619	29.8%
LOCAL WATER PIPELINE CP	5,686,864	6,120,127	6,120,127	433,263	7.6%
CURRENT REVENUE/CAPITAL	16,200,000	17,200,000	17,200,000	1,000,000	6.2%
CAPITAL LEASE	3,217,060	3,217,060	3,217,060	-	0.0%
DEBT PREPAYMENT	3,900,000	6,215,000	5,609,355	1,709,355	43.8%
DEBT SERVICE ASSISTANCE	-	-	(1,287,870)	(1,287,870)	0.0%
TOTAL DEBT SERVICE	\$ 481,885,588	\$ 501,636,383	\$ 496,535,417	\$ 14,649,829	3.0%
TOTAL EXPENSES	\$ 791,356,438	\$ 818,360,485	\$ 812,997,202	\$ 21,640,764	2.7%
REVENUE & INCOME					
RATE REVENUE	\$ 769,385,000	\$ 796,891,000	\$ 792,084,000	\$ 22,699,000	3.0%
OTHER USER CHARGES	9,208,367	9,249,066	9,222,884	14,517	0.2%
OTHER REVENUE	6,095,403	6,456,202	6,479,202	383,798	6.3%
RATE STABILIZATION	1,500,000	2,000,000	1,250,000	(250,000)	-16.7%
INVESTMENT INCOME	5,167,668	3,764,218	3,961,116	(1,206,552)	-23.3%
TOTAL REVENUE & INCOME	\$ 791,356,438	\$ 818,360,485	\$ 812,997,202	\$ 21,640,764	2.7%

The graph below represents historical and projected assessment changes based on the FY22 Final Budget. The planning estimates project assessment increases at 3.5% in FY23, and then dropping steadily to 3.4% in FY24, 3.3% in FY25, and 3.1% in FY26.

MWRA Combined Utilities
Historical and Projected Rate Revenue Changes



FY22 GOALS AND MAJOR INITIATIVES

Ensuring a safe and reliable source of drinking water to MWRA customers, and wastewater discharges that meet all applicable regulations drives both capital and current expense budget costs. The MWRA has identified Authority-wide major initiatives to support the five strategic priorities integral to MWRA’s mission that were identified for action in MWRA’s Five-Year Strategic Business Plan FY2021-2025 accepted by the Board of Directors in early 2021. The Five-Year Strategic Business Plan FY2021-2025 can be found at <https://www.mwra.com/publications/businessplan/2021-2025mwrabp.pdf>. At the Division and Department-level, additional and more specific goals and initiatives are identified.

FY22 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- ***Compliance with Regulatory Requirements and Public Health Standards:*** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.
- ***Technical Assistance for Water Communities:*** Assist member communities to improve local water distribution systems through ongoing financial, technical and operational support programs to maximize long-term water quality benefits.

II. Wastewater Quality and System Performance

- ***Compliance with Regulatory Requirements:*** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
- ***Regulatory Changes:*** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality. Special initiatives include:

- **Wastewater Infrastructure:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
- **CSO Plan Compliance:** Complete all CSO court-approved control plan milestones by 2021 and demonstrate that the CSO Plan meets its performance objectives.
- **Technical Assistance for Wastewater Communities:** Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.

III. Infrastructure Management and Resilience

- **System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - The FY22 Capital Improvement Program forecasts \$207.8 million in spending in FY22, of which \$109.9 million supports Wastewater System Improvements and \$75.0 million supports Waterworks System Improvements.
 - For FY22, the FY22 Final CIP includes 213 active contracts of which 75 are for design of Wastewater and Waterworks Systems Improvements and 54 are for construction, with projected spending of \$47.1 million for design and \$93.3 million for construction. In addition, there are 84 active other contracts with total spending of \$66.1 million.
- **Emergency Preparedness:** Prepare for catastrophic events and malicious acts that could affect the water and wastewater systems.

IV. Environmental Sustainability

- **Energy Optimization:** Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets.
- **Climate Change Adaptation:** Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure. Initiatives include:
- **Water System Expansion:** Advance reasonable water system expansion.

FY21 Year-End Accomplishments:

I. Drinking Water Quality and System Performance

- Met water quality and treatment standards in the drinking water system during FY21.
- Water Loan Program – Through June 2021, distributed \$30.2 million in Local Water System Assistance Program interest-free loans, plus an additional \$8.4 million under the Lead Service Line Replacement Loan Program in FY21. In total, MWRA has distributed \$491.6 million in loans to fund 481 local projects with participation from 43 of the 47 eligible water communities. Since 1998, MWRA has replaced or cleaned and lined 578 miles of local water main (about 8% of the regional system) via projects funded by MWRA's financial assistance. In addition, MWRA has loaned \$25.1 million via 27 distributions to 13 communities for Lead Water Service Line Replacement projects.

II. Wastewater Quality and System Performance

- Deer Island anticipates receiving the Platinum Peak Performance Award for 2020 from the National Association of Clean Water Agencies (NACWA) for the 14th continuous year (anticipated late 2021). The award recognizes facilities for outstanding compliance of their NPDES permit limits. DITP has had no permit violations for over 14 years.
- Deer Island met secondary permit limits at all times, treating on average 99% of flows with full secondary treatment.
- Processed 95.9 average tons per day of sludge at the Pelletization Plant and disposed of 5,087 tons of grit and screenings through a contracted vendor.
- Met all NPDES reporting requirements including routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order. Missed no reporting deadlines, even with the impacts of COVID-19.
- **Sewer Grant/Loan Program** – Through June 2021, distributed \$37.4 million in grants and interest-free loans to member sewer communities for Infiltration/Inflow reduction and sewer system rehabilitation projects in FY21. In total, MWRA has distributed \$478.3 million in grants and loans to fund 629 local projects with participation from all 43-member sewer communities.

III. Infrastructure Management and Résilience

Maintenance

- For FY21, the Operations Division spent \$25.1 million on maintenance of which \$9.7 million was for materials and \$15.4 million was for services.
- In water system through June 2021, exercised 1,185 and replaced 21 mainline valves; exercised 751 and replaced ten blow-off valves.
- In the wastewater system through June 2021, inspected 23.0 miles and cleaned 30.7 miles of MWRA pipeline. Inspected 1,025 structures and rehabilitated 64 manholes. Also inspected 23 and cleaned six inverted siphon barrels.
- Energy Conservation - Completed the battery storage projects at Brattle Court and Chelsea Maintenance facility.

Capital Improvements

- FY21 spending for FY21 totaled \$148 million broken out by category as follows: \$99 million for Wastewater System projects, \$46 million for Water System projects, and \$4 million for Business and Operations Support projects.

IV. Finance and Management

- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. The credit report from Moody's noted that for the rates management and Compliance and Capital Planning key ratings indicators, MWRA was assigned the highest Aaa rating. These high credit ratings enable MWRA to borrow at very advantageous interest rates minimizing debt service expense.
- Developed the FY22 Budget consistent with the FY21 planning estimates, for both the Current Expense Budget and the Capital Improvement Program.

- Completed a \$160.0 million new money bond transaction on August 20, 2020. All-in True Interest Cost of 2.33% with an average life of 15.6 years. This is the lowest All-in True Interest Cost MWRA has observed.
- Executed a \$16.2 million and a \$26.0 million defeasance of outstanding senior principal in November 2020 and June 2021 respectively. These defeasances reduced the debt service requirement between FY22 and FY26 by a total of \$48.2 million reducing the rate of increase to the Rate Revenue Requirement in those years. The transactions also resulted in \$0.2 million in interest savings by paying bonds on their call dates.
- Completed a \$50.4 million long-term borrowing with the Massachusetts Clean Water Trust in April 2021. The long-term borrowings are for a term of 20 years at a 2.0% interest rate.
- Prepared submission of MWRA's Comprehensive Annual Financial Report (CAFR) to the Government Finance Officers Association
- Implemented pandemic planning protocols to ensure that employees and vendors are paid timely and accurately, without interruption, while teleworking.
- Held Budget Briefings with the MWRA Advisory Board to communicate FY22 departmental budgets and initiatives and how they relate to the MWRA's Master Plan.

VI. Environmental Sustainability

- Received a total of \$754,000 in revenue for energy generated at numerous facilities including hydroelectric from Oakdale Station, Cosgrove Station, and Loring Road; wind from Charlestown Pump Station; and solar from Carroll Water Treatment Plant.
- Continue to leverage MWRA's self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.3 million in revenue year to date in FY21. MWRA also avoided more than \$1.4 million in capacity charges through operation of self-generation assets during peak load events as called by the regional transmission organization (ISO New England).
- Deer Island self-generated 26.8% of the plant's total required power FY21.
- Energy Conservation - Completed the battery storage projects at Brattle Court and Chelsea Maintenance facility.

SOURCES AND USES OF FUNDS

The table to the right shows MWRA's sources and uses of funds for the FY22 Final Budget.

Revenue

MWRA is required by its enabling act to balance its budget each year by establishing user assessments for water and sewer services that provide funds sufficient to, among other things, recover the cost of operations (excluding depreciation), maintenance and improvements, and debt service, as well as meeting required reserve levels.

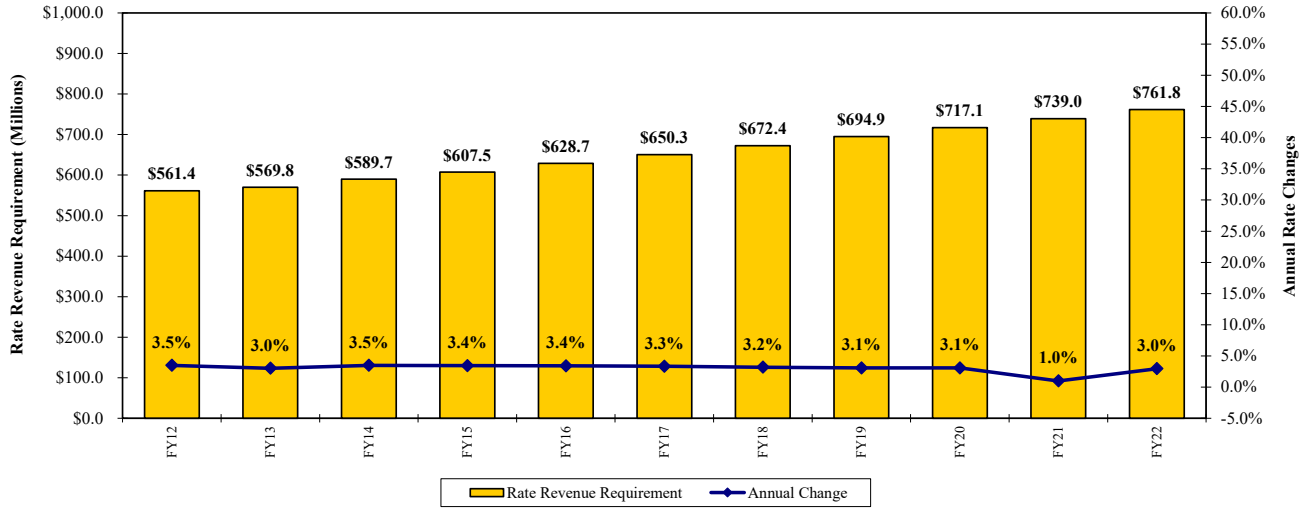
In the FY22 Final Budget, 97.4% of revenue is raised from rate revenue. The remaining 2.6% of revenue will come from interest on investments, Rate Stabilization reserve funds, charges to other water and sewer customers (including Chicopee Valley Aqueduct (CVA) communities), non-recurring revenue, annual charges to sewer system users with permits issued by MWRA's Toxic Reduction and Control Department (TRAC), penalties assessed to holders of sewer use permits, and other miscellaneous sources.

Sources & Uses of Funds*		
\$s in Millions		
<i>Sources of Funds</i>		
Other User Charges	\$9.2	1.1%
Other Revenue	6.5	0.8%
Investment Income	4.0	0.5%
Rate Revenue	792.1	97.4%
Rate Stabilization	1.3	0.2%
Total Revenue	\$813.0	100.0%
<i>Uses of Funds</i>		
Total Debt Expense before Debt		
Service Offsets	\$497.8	61.2%
Less:		
Debt Service Assistance	(1.29)	-0.2%
Bond Redemption	-	
Sub-Total Net Debt Expense	\$496.5	61.1%
Capital Financing	\$496.5	61.1%
Direct Expenses	259.8	32.0%
Indirect Expense	56.7	7.0%
Total Expenses	\$813.0	100.0%
Total Expenses Less Offsets	\$813.0	
<i>*may not add up due to rounding</i>		

Rate Revenue

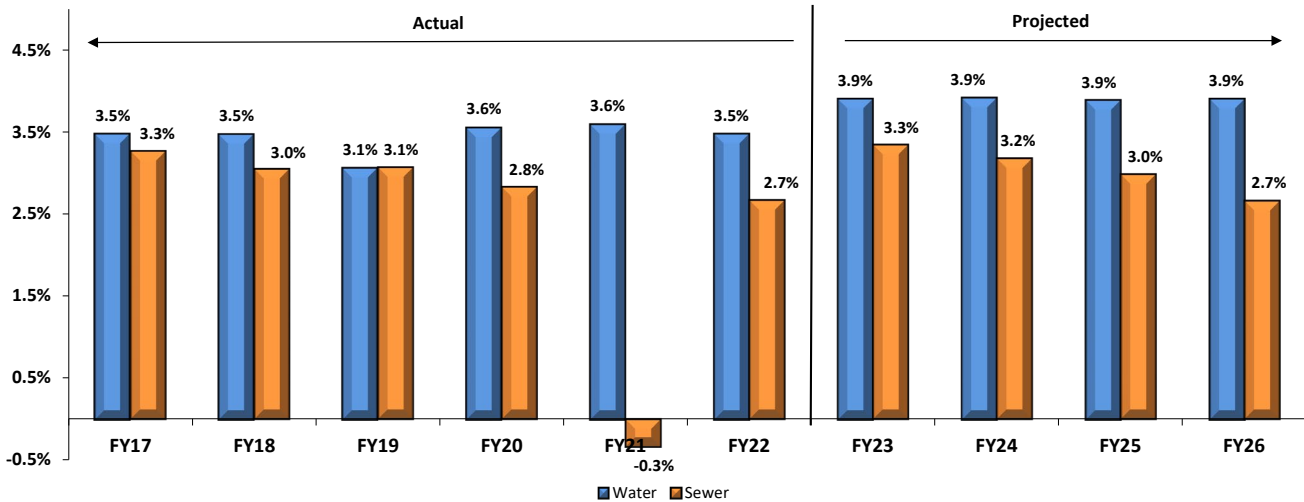
Under the FY22 Final Budget, the MWRA will raise \$792.1 million of its total revenue requirements from water and sewer assessments to member communities. Of the \$792.1 million, \$514.7 million will fund the sewerage system, an increase of 2.7% as compared to FY21; and \$277.4 million will fund the water system, an increase of 3.5% as compared to FY21. The following charts illustrate the historical rate revenue requirements at the combined utility level for the past eleven years.

MWRA: Combined Water & Sewer Assessments



Beginning in FY17, the MWRA successfully implemented a rate projection smoothing methodology that reduces annual volatility at the utility level and is primarily driven by debt service payments for capital projects. The charts below show the historical percent increase for the last six years and the projected increases for the next four years.

MWRA Water & Sewer Utilities
Historical and Projected Rate Revenue Changes



Non-Rate Revenue

FY22 non-rate revenue totals \$20.9 million, which is a decrease of \$1.1 million or 4.8% versus the FY21 Budget.

The FY22 non-rate revenue budget includes:

Other User Charges

Other User Charges include revenues derived from the provision of water and sewer services to communities and other entities under special agreements. Other User Charges in the FY22 Final Budget total \$9.2 million, including \$5.3 million for the Chicopee Valley Aqueduct (CVA) communities, \$2.0 million for Deer Island water usage, \$208,000 for entrance fees from member communities, and \$500,000 for the Commonwealth's partial reimbursement for Clinton Wastewater Treatment Plant expenses. Other User Charges are \$15,000 or 0.2% higher than the FY21 Budget.

Other Revenue

Other Revenue is budgeted at \$6.5 million, an increase of \$384,000 from the FY21 Budget. Other Revenue includes \$2.3 million from the sale of the Authority's Renewable Portfolio Credits, revenue from participating in load response programs, and the sale of generated power to the grid. Energy related revenue decreased \$293,000 reflecting decreased power sales revenue and reduced pricing for Renewable Portfolio Credits. The balance of Other Revenue includes \$2.7 million in permit fees and penalties, an increase of \$259,000 over the FY21 Budget.

Investment Income

MWRA earns interest income by investing funds in both long and short-term investments vehicles governed by Section 522 and 523 of the General Bond Resolution. The FY22 Budget includes \$4.0 million in Investment Income, a decrease of \$1.2 million or 23.3% from the FY21 Budget. The lower budget reflects lower long and short-term interest rate assumptions as a result of market conditions.

Non-Recurring Revenue

Non-Recurring Revenue is one-time revenue used in a given fiscal year to reduce assessments to member communities. In any fiscal year when annual revenues exceed expenses, MWRA may transfer the unexpended amount to the Rate Stabilization Reserve Fund. Within certain limits, MWRA may use this money to reduce the Rate Revenue Requirement in any subsequent year. Consistent with the requirements of its General Bond Resolution, MWRA treats transfers from the Rate Stabilization Reserve as revenue in that fiscal year. For the FY22 Final, \$1.3 million in Rate Stabilization Reserve usage is included as it relates to funds set aside in FY18 to be utilized when the HEEC cable came on line.

The Rate Revenue Requirement for FY22 is \$792.1 million, an increase \$22.7 million or 2.95% over the FY21 Budget. The Rate Revenue Requirement is the difference between total expenses of \$813.0 million, less non-rate revenue of \$20.9 million.

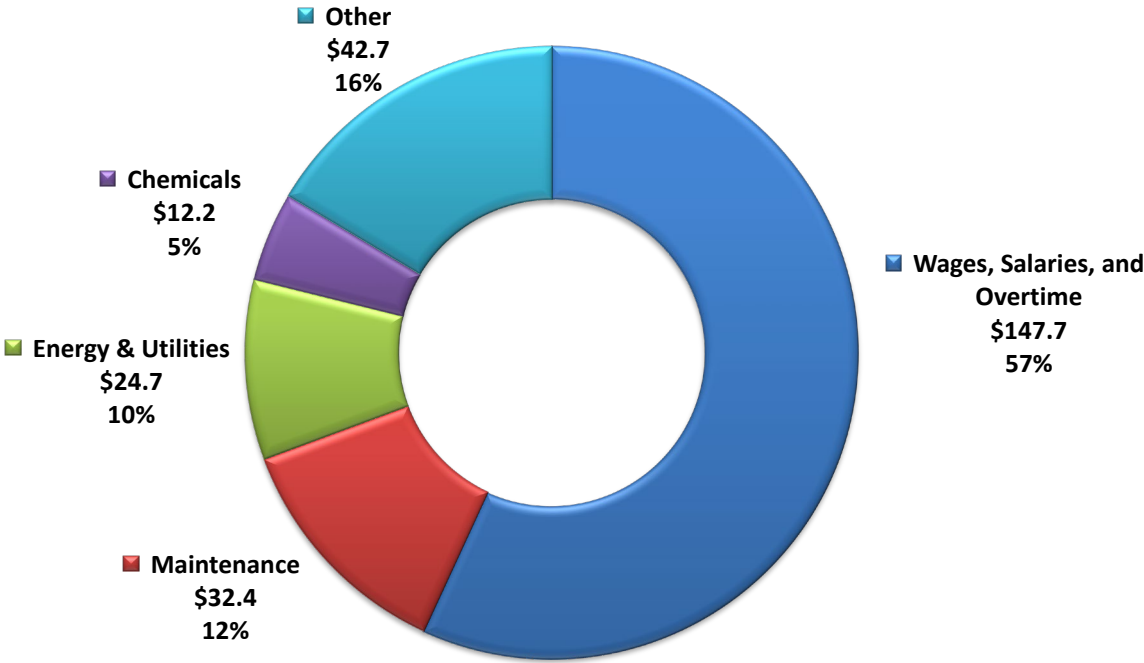
DIRECT EXPENSES

The FY22 Final Direct Expense Budget totals \$259.8 million, an increase of \$7.6 million, or 3.0%, over the FY21 Budget. The primary drivers of the Direct Expenses increases are Wages & Salaries which

includes four additional positions, three of which are within Tunnel Redundancy Department, maintenance, and fringe benefits for projected healthcare cost increases.

The chart below combines related direct expense line items into general cost categories. Personnel costs (wages and salaries, overtime, fringe benefits, and workers' compensation) are the largest component of the direct expense budget at 57%, followed by other expenses (training and meetings, professional services, other materials, and other services) at 16%, maintenance at 12%, energy & utilities at 10%, and chemicals at 5%.

Direct Expenses by Category *(\$s in millions)*



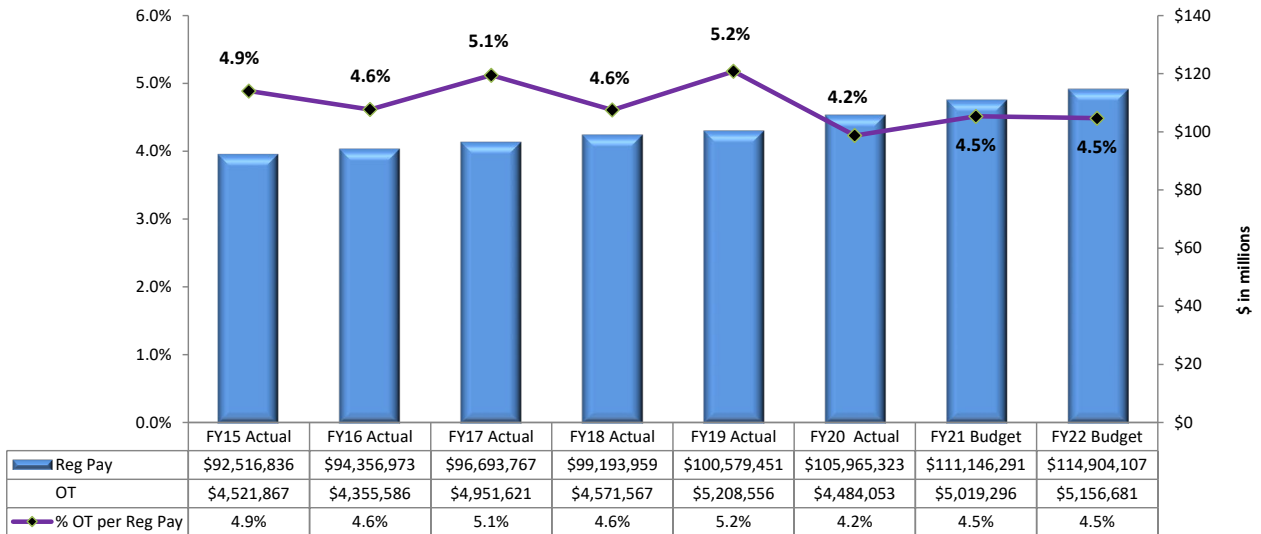
FY22 Final Current Expense Budget MWRA Direct Expenses by Line Item				
LINE ITEM	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 112,919,297	\$ 116,680,341	\$ 3,761,044	3.3%
OVERTIME	5,019,296	5,156,681	137,385	2.7%
FRINGE BENEFITS	22,402,224	23,253,137	850,913	3.8%
WORKERS' COMPENSATION	2,476,655	2,614,159	137,504	5.6%
CHEMICALS	12,091,255	12,202,286	111,031	0.9%
UTILITIES	24,200,846	24,749,865	549,019	2.3%
MAINTENANCE	32,618,569	32,442,380	(176,189)	-0.5%
TRAINING & MEETINGS	405,264	473,994	68,730	17.0%
PROFESSIONAL SERVICES	8,377,283	8,773,258	395,975	4.7%
OTHER MATERIALS	6,706,916	8,334,774	1,627,858	24.3%
OTHER SERVICES	24,983,777	25,129,236	145,459	0.6%
TOTAL	\$ 252,201,383	\$ 259,810,111	\$ 7,608,728	3.0%

Wages and Salaries – The budget includes \$116.7 million for Wages and Salaries as compared to \$112.9 million in the FY21 Budget, an increase of \$3.8 million or 3.3%. Regular Pay which is 98.5% of total Wages and Salaries, increased by \$3.8 million due to bargaining unit step increases, increases to the leave balance accrual and other payroll reserves, and the hiring of additional staff. The FY22 Budget includes 1,167 FTEs, four more than the FY21 Budget. Three of the additional FTEs represent the fourth year of hiring to

Division	FY19	FY20	FY21	FY22
Executive	5.0	5.0	5.0	5.0
Emergency Preparedness	8.0	7.0	4.0	4.0
Affirmative Action	6.0	7.0	7.0	7.0
Internal Audit	6.7	6.7	6.7	6.7
Public Affairs	12.9	11.9	11.9	11.9
Tunnel Redundancy	5.0	8.0	13.0	16.0
Operations	920.3	916.0	918.0	918.0
Law	13.5	13.6	13.6	11.6
Administration	140.6	145.7	146.7	149.7
Finance	37.0	37.0	37.0	37.0
Authority Total	1,155.0	1,158.0	1,163.0	1,167.0

support the Metropolitan Tunnel Redundancy capital project, bringing that staff to a total of 16, and the addition of one position to Occupational Health and Safety. A reduction of 2 FTEs in Law was offset by an increase of 2 FTEs in MIS. As always, new hires and backfilling of vacant positions will be managed at the agency level and addressed on a case-by-case basis by senior management.

MWRA: % Overtime vs. Regular



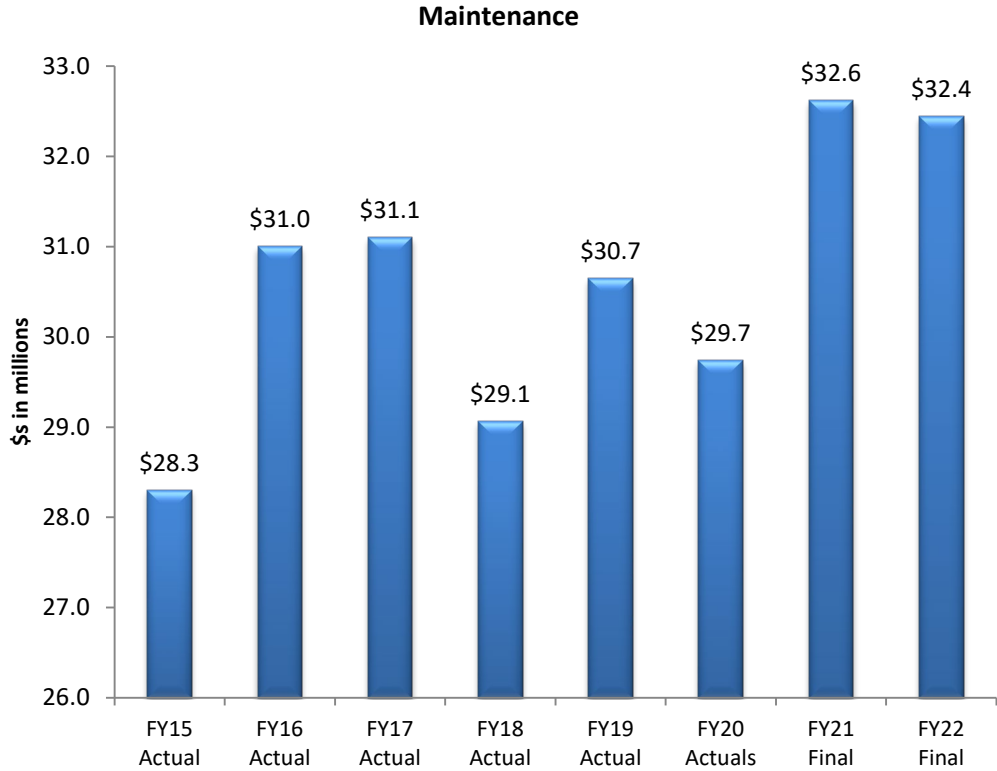
Overtime – The budget includes \$5.2 million for Overtime, an increase of \$137,000 or 2.7% over the FY21 Budget. Overtime was increased to reflect wage increases and recent trends in planned overtime for off-hours maintenance, emergency, and planned projects that include construction.

Fringe Benefits – The budget includes \$23.3 million for Fringe Benefits, an increase of \$851,000 or 3.8% from the FY21 Budget. Health Insurance premiums total \$19.7 million, an increase of \$759,000 or 4.0% from the FY21 Budget largely due to an increase in the health plans rates and utilization.

Fringe Benefits				
Line Item	FY20 Actuals	FY21 Budget	FY22 Budget	Difference
Health Insurance	\$ 17,649,194	\$ 18,987,428	\$ 19,746,494	\$ 759,066
Dental Insurance	1,162,533	1,218,578	1,164,150	(54,428)
Unemployment Insurance	104,034	130,000	130,000	-
PFML	313,620	366,863	448,962	82,099
Medicare	1,459,085	1,533,770	1,589,110	55,340
Overtime Meals	103,545	115,585	119,421	3,836
Tuition Reimbursement	54,334	50,000	55,000	5,000
Total Fringe Benefits	\$20,846,345	\$22,402,224	\$23,253,137	\$ 850,913

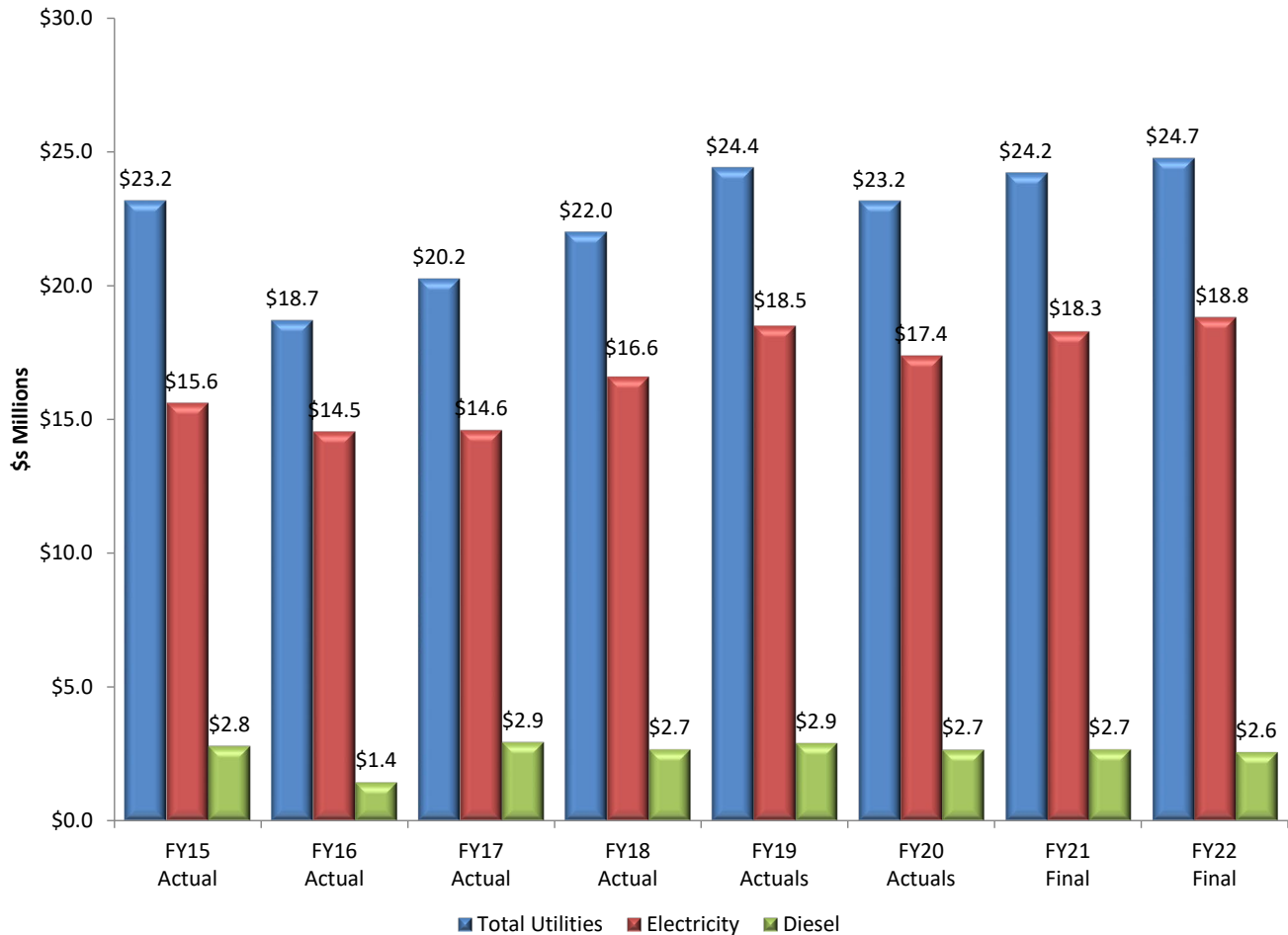
Maintenance – The budget includes \$32.4 million for Maintenance projects, a decrease of \$176,000 or 0.5% from the FY21 Budget. The Operations Division’s budget decrease of \$1.1 million or 3.9% from FY21 is primarily due to a \$1.3 million or 18.9% reduction to Plant and Machinery Services as a result of the early completion of the Deer Island painting and coatings project in the spring of FY21. The decrease is partially offset by increases in Computer Software and License Upgrades in MIS of \$770,000

or 26.7% for Autocad and Windows 10 Enterprise Software Assurance, budgeted at \$360,000 and \$314,000 respectively; Electrical Services of \$291,000 or 20.0% for diesel generator maintenance and rehab at the John Carroll Water Treatment Plant; and Building and Ground Services of \$182,000 or 4.0% primarily for the Shaft 8 Retaining Wall and CVA Intake Building Repointing projects in Water Operations.



Utilities – The budget includes \$24.7 million for Utilities, which is an increase of \$549,000 or 2.3% from the FY21 Budget. The budget funds \$18.8 million for Electricity; \$2.6 million for Diesel Fuel; \$2.6 million for Water; and \$704,000 for Natural Gas. The change to Utilities is driven by Electricity, which has increased by \$529,000 or 2.9% from the FY21 Budget and is driven by updated pricing. The Diesel Fuel budget of \$2.6 million is \$105,000 or 4.0% lower than the FY21 Budget due to the dual fuel heating system installed at the Chelsea Creek Headworks which reduced quantity, partially offset by an increase in price.

Utilities



Chemicals – The budget includes \$12.2 million for Chemicals, an increase of \$111,000 or 0.9% over the FY21 Budget. Higher prices drove the budget increase, partially offset by lower volumes for some chemicals. Carbon Dioxide increased by \$112,000 or 50.1% due to a force majeure surcharge that is due to the uncertainty surrounding the opening of the vendor’s chemical plant. Sodium Hypochlorite increased by \$99,000 or 3.1% due to updated bid price and Soda Ash increased by \$81,000 or 2.4% due to new contract pricing. This is partially offset by Activated Carbon which was reduced by \$87,000 or 17.4% from the FY21 Budget due to lower quantity. The FY22 Budget does not include any funding for the new Deer Island National Pollutant Discharge Elimination System (NPDES) permit, which is projected to have more stringent requirements for enterococcus treatment compliance.

Other Services – The budget includes \$25.1 million for Other Services, an increase of \$145,000 or 0.6% from the FY21 Budget. The budget includes funding of \$14.5 million for Sludge Pelletization, \$4.2 million for Space/Lease Rentals and related lease costs for the Charlestown Navy Yard and Chelsea Facilities, \$1.9 million for Voice and Data costs, \$1.3 million for Grit and Screenings removal, and \$1.2 million for Other Services. The overall increase is driven by Sludge Pelletization of \$82,000 or 0.6% due mainly to the projected cost increase of the NEFCo contract extension, partially offset by reduced sludge quantities

based on historical trends. Also, Health/Safety costs increased by \$60,000 or 38.6% based on departmental needs.

Professional Services – The budget includes \$8.8 million for Professional Services, an increase of \$396,000 or 4.7% over the FY21 Budget. The increase is driven by Lab & Testing Analysis of \$242,000 or 14.6% for the Biobot contract as well as Other Services of \$145,000 or 10.8% for remediation services for underground storage tanks.

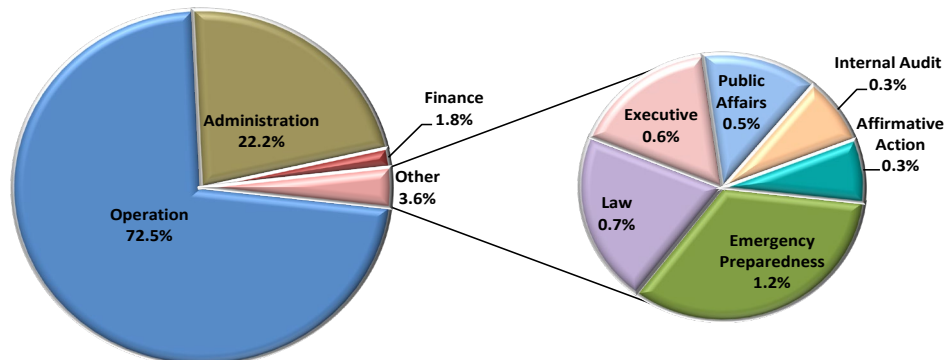
Other Materials – The budget includes \$8.3 million for Other Materials, an increase of \$1.6 million or 24.3% from the FY21 Budget. The increase is largely driven by \$2.1 million in costs associated with the staff relocation from the Charlestown Navy Yard, partially offset by a reduction to Computer Hardware of \$197,000 and Equipment/Furniture of \$141,000, both of which are based on anticipated needs.

Functional Area Budget Summary

The chart below shows the breakdown of the MWRA’s direct expense budget by division.

FY22 Final Current Expense Budget MWRA Direct Expenses by Division						
DIVISION	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
EXECUTIVE	\$ 6,742,750	\$ 6,208,693	\$ 6,954,450	\$ 7,332,671	\$ 378,221	5.4%
ADMINISTRATION	47,123,035	47,424,301	53,222,022	57,563,996	4,341,974	8.2%
FINANCE	3,794,170	3,975,039	4,386,943	4,635,289	248,346	5.7%
LAW	1,792,339	1,706,828	2,209,372	1,927,006	(282,366)	-12.8%
OPERATIONS/PLANNING	174,228,443	176,422,751	185,428,596	188,351,149	2,922,553	1.6%
TOTAL	\$ 233,680,737	\$ 235,737,622	\$ 252,201,383	\$ 259,810,111	\$ 7,608,728	3.0%

MWRA Direct Expense Budget by Division



Detailed summaries for each Division budget are provided following the Executive Summary.

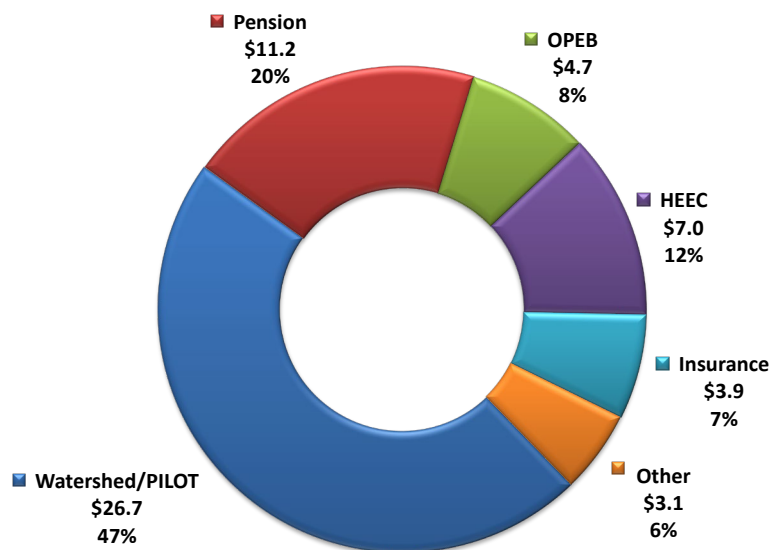
INDIRECT EXPENSES

Indirect Expenses for FY22 total \$56.7 million, a decrease of \$618,000 or 1.1% from the FY21 Budget.

The following graph combines related indirect expense line items into the general cost categories and shows that Water Supply Protection Program expenses are the largest component of the indirect expense budget at 47%, followed by Retirement Fund at 20%, HEEC at 12%, Other Post-Employment Benefits (OPEB) at 8%, Insurance at 7%, and Other (for items such as Mitigation and Additions to Reserves) at 6%.

Indirect Expenses by Category

(\$s in millions)



Insurance

MWRA purchases property and casualty insurance from external insurance carriers with a self-insured retention of \$2.5 million dollars and Worker's Compensation Excess insurance with a self-insured retention of \$500,000 per claim. The budget includes \$3.9 million for Insurance, an increase of \$884,000 or 28.9% from the FY21 Budget. This reflects increased premiums due to insurance market conditions. Claim payments are based on a 5-year average. The budget consists of two components, self-insured claim costs and insurance premiums. Self-insured claim cost are estimated based on actual average spending over the past 5 years (FY16-20). Premium costs are estimated based on current costs adjusted for inflation and potential increases due to insurance market conditions. MWRA mitigates the budgetary risk of self-insurance by maintaining an Insurance Reserve. The reserve, which was established as part of the General Bond Resolution, requires that an independent insurance consultant review the funding level every three years and provide recommendations as to its adequacy.

Watershed Reimbursement/PILOT

The Enabling Act directs MWRA to pay the Commonwealth of Massachusetts for several statutory obligations: Payment in Lieu of Taxes (PILOT) for Commonwealth-owned land in the watersheds and operating expenses of the Division of Water Supply Protection. The budget includes \$26.7 million for the Watershed Management budget, an increase of \$309,000 or 1.2% above the FY21 Budget. The budget includes \$17.9 million for reimbursement of operating expenses net of revenues, and \$8.8 million for Payment in Lieu of Taxes (PILOT). A vacancy adjustment of \$1.5 million has been applied to reflect the actual timing of hiring. The year-over-year increase is primarily due to the PILOT payments increasing by \$305,000 or 3.6% over FY21.

	FY21 Budget	FY22 Budget	FY22 vs. FY21	
			\$	%
Operating Expense	17,819,138	17,513,490	(305,648)	-1.7%
Major Projects	1,313,000	1,433,000	120,000	9.1%
Revenue	(1,210,000)	(1,020,000)	190,000	-15.7%
Net	17,922,138	17,926,490	4,352	0.0%
PILOT	8,500,000	8,805,000	305,000	3.6%
Total	26,422,138	26,731,490	309,352	1.2%

Harbor Electric Energy Company (HEEC)

The budget includes \$7.0 million for the Harbor Electric Energy Company (HEEC), a decrease of \$223,000 or 3.1% from the FY21 Budget. The budget reflects the latest cost estimates, but the final costs will be determined by the Department of Public Utilities (DPU) once it has completed its review of the project. In FY18, \$6.5 million was set aside to mitigate the impact of the HEEC cost, and is projected to be used between FY22-25. In FY22, \$1.3 million of Rate Stabilization/HEEC Reserve will be used.

Mitigation

MWRA disburses mitigation funds to communities affected by MWRA projects or facilities pursuant to MWRA's Statement of Mitigation Principles and/or specific agreements with communities. MWRA mitigation may include relieving the direct impacts of construction, meeting environmental and regulatory requirements, long-term operating agreements, or community compensation for impacts over and above those addressed by other mitigation. In rare situations, where the extent and duration of the impact of a project or facility on a community is such that restoring the area to its pre-project state is insufficient to relieve the stress of MWRA's presence during the project, MWRA funds or contributes to improvements to affected areas. Mitigation expenses are funded in the current expense budget. The budget includes

\$1.7 million for Mitigation payments to the City of Quincy and Town of Winthrop in accordance with mitigation agreements, which expire in FY25.

Operating Reserves

Funding for the Operating Reserve for FY22 is \$1.4 million. The Operating Reserve Fund balance is in compliance with MWRA General Bond Resolution which requires a balance of one-sixth of annual operating expenses. Based on the FY22 Final Budget, the required balance is \$47.3 million versus the \$45.9 million required in FY21.

Retirement System Contribution

The budget includes \$11.2 million for the Retirement Fund which is level to planning estimates, but an increase of \$205,000 or 1.9% over the FY21 budget. The increase reflects the impact of lower than assumed investment returns in 2018 and the reduction of the projected rate of return of the Fund from 7.10% to 6.90%. MWRA's pension fund is at the 88.2% funding level and projected to be fully funded by June 30, 2030. If there is a budgetary surplus based on this lower required amount, it will remain unexpended.

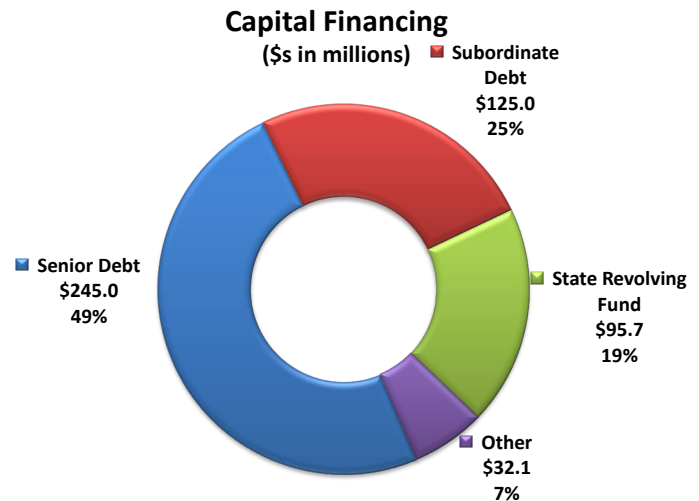
GASB 45 – Accounting and Reporting by Employers for Postemployment Benefits Other than Pensions (OPEB)

In the FY22 Final Budget the Authority funds its OPEB liability at \$4.7 million, continuing the Authority's long-term commitment to address its liabilities. The Authority has complied with the GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other than Pensions (OPEB)*, by disclosing this liability in the year-end Financial Statements. As part of the multi-year strategy to address its unfunded liabilities for OPEB and pension holistically, the Board approved a plan to pay down the pension liability and upon reaching full funding, move to address the OPEB obligation. To maximize the benefits in terms of returns and accounting treatment, an irrevocable OPEB Trust was established with Board approval and funding started on April 23, 2015. The OPEB Trust balance was \$61.8 million as of June 30, 2021. Starting in FY18, GASB 75 is the governing regulation for employee OPEB contributions. The final \$4.7 million budget is based on 50% of the contribution determined in the January 1, 2020 actuarial report.

CAPITAL FINANCING

The FY22 Final Budget capital financing costs total \$496.5 million and remains the largest portion of the MWRA’s budget at 61.1% of the Operating Budget. Capital financing costs increased by \$14.6 million or 3.0% compared to the FY21 Budget. This increase in the MWRA’s debt service is the result of projected FY22 borrowings and the structure of the existing debt, partially offset by the impact of the Spring 2021 defeasance.

The Authority has actively managed its debt structure to take advantage of favorable interest rates. Tools used by MWRA to lower borrowing costs and manage rates include current and advanced refunding of outstanding debt, maximizing the use of the subsidized State Revolving Fund (SRF) debt, issuance of variable rate debt, swap agreements, and the use of surplus revenues to defease debt. MWRA also uses tax exempt commercial paper to minimize the financing cost of construction in process



The FY22 Final Budget includes the benefit of a defeasance of \$30.1 million in June 2021 which will reduce debt service by approximately \$1.3 million in FY22, \$10.3 million in FY23, \$7.8 million in FY24, \$0.8 million in FY25, and \$10.2 million in FY26.

The FY22 Final Budget assumes a 3.50% interest rate for variable rate debt which is the same as the FY21 rate. The Authority’s variable rate debt assumption is comprised of three separate elements: the interest rate for the daily and weekly series; liquidity fees for the Standby Bond Purchase Agreement, Letter of Credit, and Direct Purchase providers; and remarketing fees. While MWRA continues to experience low interest rates, they are not reflective of historical averages and to protect against market uncertainties, MWRA budgets the rate conservatively.

The FY22 capital financing budget includes:

- \$245.0 million in principal and interest payments on MWRA’s senior fixed rate bonds. This amount includes \$7.4 million to support issuances of \$125.0 million in December 2021 and \$3.0 million to support issuances of \$100.0 million of new money in June 2022;
- \$125.0 million in principal and interest payments on subordinate bonds;
- \$95.7 million in principal and interest payments on SRF loans. This amount includes \$5.9 million to support an issuance of \$65.0 million 2022;

- \$17.2 million to fund ongoing capital projects with current revenue and to meet coverage requirements;
- \$5.6 million in debt prepayment;
- \$6.1 million to fund the interest expense related to the Local Water Pipeline Assistance Program;
- \$3.2 million for the Chelsea Lease; and
- \$1.3 million offset to Debt Service for the Debt Service Assistance received in FY21.

Outstanding Debt and Debt Management

The \$8.7 billion spent on MWRA’s modernization efforts since the Authority was established in 1986, has relied heavily on debt financing. Total debt as of June 30, 2021 was \$4.8 billion consisting of senior and subordinated debt, Tax-Exempt Commercial Paper, and a Revolving Loan. The total debt was \$117.6 million lower than the MWRA’s total debt as of June 30, 2020. The MWRA enjoys strong unenhanced senior debt ratings of Aa1, AA+, and AA+ from Moody’s, Standard & Poor, and Fitch, respectively.

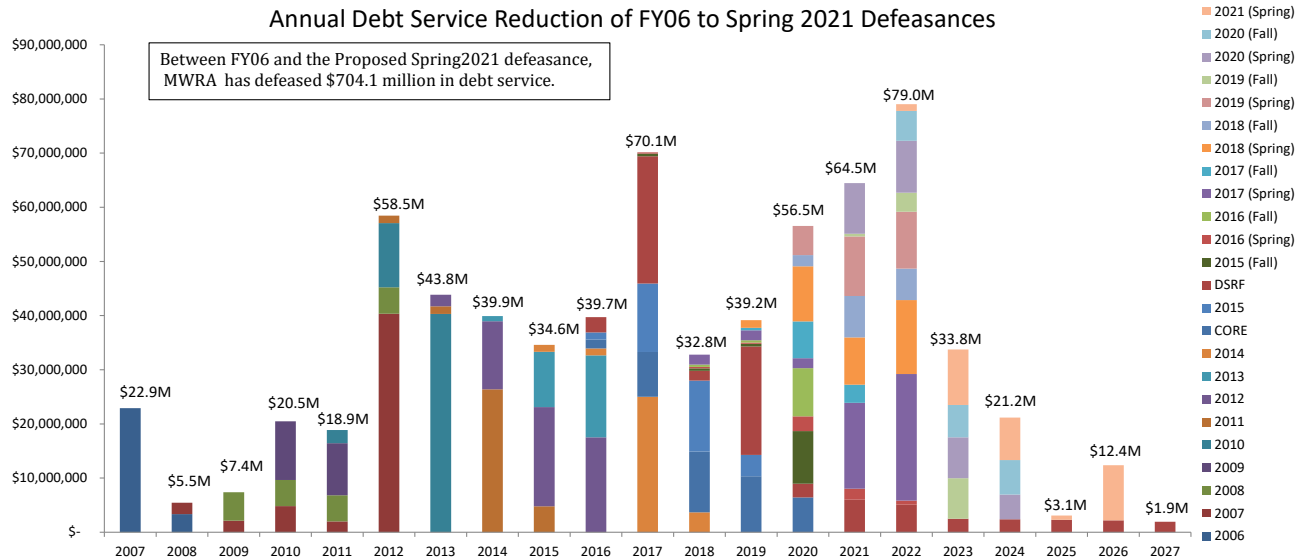
Type	Principal Outstanding June 30, 2021	% of Total
Senior General Revenue Bonds	\$3,134,115,000	65.3%
Massachusetts Clean Water Trust	\$893,937,770	18.6%
Subordnate General Revenue Bonds	\$596,562,500	12.4%
Tax-Exempt Commercial Paper Revolving Loan	\$175,000,000	3.6%
Total	\$4,799,615,270	100.0%

} 83.9% of MWRA debt is fixed

As a result of the Authority’s Capital Improvement Program, capital financing as a percent of total expenses (before offsets) has increased steadily from 36% in 1990 to 61.1% in the FY22 Current Expense Budget. Much of this debt service is for completed projects, primarily the Boston Harbor Project and the Integrated Water Supply Improvement Program. The MWRA’s capital spending, from its inception, had been dominated by projects mandated by court ordered or regulatory requirements, which in total have accounted for ~72% of capital spending to date. Going forward, and as the Combined Sewer Overflow (CSO) projects reached substantial completion in December 2015, the majority of spending will be focused on asset protection and water redundancy initiatives. MWRA anticipates its outstanding debt to continue to decline.

The Authority has actively managed its debt structure to take advantage of favorable interest rates. Tools used by the MWRA to lower borrowing costs and manage rates include current and advanced refunding of outstanding debt, maximizing the use of the subsidized State Revolving Fund (SRF) debt, issuance of variable rate debt, swap agreements, and the use of surplus revenues to defease debt. The MWRA also uses tax exempt commercial paper to minimize the financing cost of construction in process.

The FY22 Final Budget includes the benefit of a \$30.1 million defeasance executed in June 2021 which reduced debt by approximately \$1.3 million in FY22, \$10.3 million in FY23, \$7.8 million in FY24, \$0.8 million in FY25, and \$10.2 million in FY26. Since 2006, MWRA has defeased \$704.1million in debt service. The following table details the impact of defeasances from FY06 to present.



Grant Revenues

In the past, MWRA has been able to finance approximately 20 percent of its capital spending with grant receipts, totaling approximately \$1.1 billion through FY03. However, since FY03, the MWRA has only received \$4.9 million in capital grants. In addition to participating in federal and state grant programs, the MWRA benefitted from the American Recovery and Reinvestment Act of 2009 which forgave approximately \$33.0 million in State Revolving Fund loan principal. The Authority continues to pursue grant funding and take advantage of any possible program available to maximize grant funding opportunities.

MWRA expects to borrow the majority of funds necessary for future capital spending. Borrowing will include the issuance of fixed and variable rate revenue bonds; borrowing from the Massachusetts Clean Water Trust (also known as the State Revolving Loan Fund or SRF), and a Tax-Exempt Commercial Paper program. The table below details the FY21 budget capital financing line item. It also shows how upgrading the sewerage system has dominated the capital program to date. Current and future borrowings increasingly support improvements to the water system. A complete list of the Authority’s indebtedness by series is presented in Appendix E.

TABLE I-3
FY22 Current Expense Budget - Capital Financing Detail (as of 6/30/21)
\$ in Millions

	Amount Outstanding	Total Capital Finance Costs	Sewer	Water
Total SRF ¹ Debt	\$893.9	\$95.7	\$72.7	\$22.9
Total Senior Debt	\$3,134.1	245.0	148.9	96.0
Total Subordinate Debt	\$596.6	125.0	88.6	36.5
Total SRF and Debt Service²	\$4,624.6	\$465.7	\$310.2	\$155.4
Water Pipeline Commercial Paper	175.0	6.1	0.0	6.1
Current Revenue/Capital ³		17.2	16.7	0.5
Capital Lease		3.2	1.9	1.3
Debt Prepayment ⁴		5.6	5.5	0.1
	175.0	\$32.1	\$24.1	\$8.1
Total Capital Financing (before Debt Service Offsets)	4,799.6	\$497.8	\$334.3	\$163.5
Debt Service Offsets:				
Debt Service Assistance		(1.3)	(1.2)	(0.1)
Bond Redemption		0.0	0.0	0.0
Total Capital Financing	4,799.6	\$496.5	\$333.1	\$163.4

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used defeasance of bonds at end of fiscal year.

CIP Impact on Current Expense Budget

In addition to the annual financing costs included in the Current Expense Budget, the Capital Improvement Program affects the annual operating budget when capital facilities come on-line and require adjustments to operating budgets. In prior years, completion of the Deer Island Treatment Plant, the Carroll Water Treatment Plant, and the residuals processing facility in Quincy resulted in significant increases in operating expenses.

The following table summarizes the projected CIP impact on the operating budget by project over the next ten years.

Fiscal Year	CEB Impacts (000)										
	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total
DI Treatment Plant Asset Protection (not including Co-Digestion or Combined Heat and Power Plant)	\$31	(\$11)	(\$33)	(\$22)	\$0	\$0	\$0	(\$51)	(\$65)	(\$67)	(\$218)
DI Treatment Plant Asset Protection - Hydroturbine Replacements	0	0	0	(56)	0	0	0	63	0	0	7
Wastewater Process Optimization	77	0	0	0	0	0	0	0	0	0	77
Unsustained Budget Impacts - Moving Expenses	(464)	(903)	0	0	0	0	0	0	0	0	(1,366)
South Boston CSO Tunnel Inspection/Cleaning and Outfalls Inspection (previously named North Dorchester Bay project)	0	0	0	0	580	(597)	0	0	0	0	(17)
Total Wastewater (inflated)	(\$356)	(\$913)	(\$33)	(\$79)	\$580	(\$597)	\$0	\$13	(\$65)	(\$67)	(\$1,517)
Metro Tunnel Redundancy	\$514	\$422	\$273	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,209
Watershed Div CIP - Quabbin Admin Building Renovations	0	0	109	0	0	(119)	0	0	0	0	(10)
Wachusett Algae Treatment Facility	0	0	0	0	0	0	123	0	0	0	123
Unsustained Budget Impacts - Moving Expenses	(322)	(627)	0	0	0	0	0	0	0	0	(949)
Total Water (inflated)	\$191	(\$205)	\$382	\$0	\$0	(\$119)	\$123	\$0	\$0	\$0	\$372
Total Business and Operations Support (inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL MWRA	(\$164)	(\$1,119)	\$350	(\$79)	\$580	(\$716)	\$123	\$13	(\$65)	(\$67)	(\$1,145)

Operating costs are projected to increase by \$1.2 million for additional Metropolitan Tunnel Redundancy staff from FY23 through FY25. This will be partially offset by Deer Island Treatment Plant Asset Protection initiatives that will reduce operating costs by \$211,000 through FY32.

Following the planned consolidation of facilities in FY22 and FY23, operating costs will decrease by \$2.3 million in FY23 and FY24, resulting in an overall decrease of \$1.2 million over the next 10 years.

RATE ASSESSMENT AND METHODOLOGY

Community Profile and Assessments

MWRA provides wholesale water and sewer services to 61 communities or local bodies. Fifty-four local bodies purchase water supply services, and 43 local bodies purchase wastewater transport and treatment services. Thirty-seven local bodies purchase both. Approximately 3.0 million people, or 44% of the population of Massachusetts, live and work in the communities that purchase water and/or wastewater services from MWRA.

MWRA's largest single customer is the Boston Water and Sewer Commission (BWSC), which provides retail services in the City of Boston. In the FY22, rate revenue from BWSC will account for 31% of MWRA's total rate revenue.

Each year MWRA determines preliminary wholesale water and sewer assessments in February and final assessments in June before the beginning of the new fiscal year. These assessments must satisfy the statutory requirement that MWRA fully recover its budgeted water and sewer costs by apportioning net costs among its wholesale water and sewer customers.

The following table presents the calculation of MWRA's FY22 Rate Revenue Requirement. The table shows that most of MWRA's current expenses are directly attributable to either water or sewer service costs, or to investment in the water or sewer systems. Expenses that support both systems are allocated to water or sewer assessments based on generally accepted cost allocation principles. Investment Income and Other Revenues offset water and sewer expenses. The resulting net cost of water and sewer services is the amount MWRA recovers through water and sewer assessments.

**Calculation of the Final FY22 Rate Revenue Requirement
(000's)**

	Sewer	Water	Total
Allocated Direct Expenses	\$169,080	\$90,731	\$259,810
Allocated Indirect Expenses	\$21,704	\$34,948	\$56,652
PLUS			
Capital Expenses:			
Debt Service	\$310,091	\$155,586	\$465,677
Debt Service Assistance	-\$1,172	-\$116	-\$1,288
Current Revenue for Capital	\$16,684	\$516	\$17,200
Other Capital Expenses	\$7,370	\$7,577	\$14,947
PLUS			
Non-Rate Revenue:			
Investment Income	-\$2,305	-\$1,656	-\$3,961
Fees and Other Revenue	-\$5,532	-\$10,170	-\$15,702
Rate Stabilization	-\$1,250	\$0	-\$1,250
EQUALS			
Rate Revenue Requirement	\$514,669	\$277,415	\$792,084

Wholesale Assessment Methodology

MWRA calculates separate user assessments for water and sewer services. Budgeted water operating and capital costs are allocated based on each community's share of total water use for the most recent calendar year. The sewer assessment methodology allocates budgeted operating and maintenance costs based on share of wastewater flow and strength parameters, and capital costs based on proportion of maximum flow, strength, and population. MWRA uses three-year averaging of wastewater flows to calculate the flow-related components of wholesale sewer assessments. Flow averaging moderates the short-term impact of year-to-year changes in community flow, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.

MWRA Fully Served Water and Sewer Customers	Final FY21 Water Assessment	Final FY22 Water Assessment	Percent Change from FY21	Final FY21 Sewer Assessment	Final FY22 Sewer Assessment	Percent Change from FY21	Final FY21 Combined Assessment	Final FY22 Combined Assessment	Dollar Change from FY21	Percent Change from FY21
ARLINGTON	5,627,090	5,958,052	5.9%	8,872,540	9,124,432	2.8%	\$14,499,630	\$15,082,484	\$582,854	4.0%
BELMONT	3,040,437	3,321,668	9.2%	5,332,639	5,482,714	2.8%	8,373,076	8,804,382	431,306	5.2%
BOSTON (BWSC)	97,981,545	93,962,296	-4.1%	145,976,286	148,872,321	2.0%	243,957,831	242,834,617	(1,123,214)	-0.5%
BROOKLINE	7,543,434	8,011,141	6.2%	13,249,272	13,660,245	3.1%	20,792,706	21,671,386	878,680	4.2%
CHELSEA	5,158,804	5,460,223	5.8%	8,585,318	8,986,504	4.7%	13,744,122	14,446,727	702,605	5.1%
EVERETT	5,958,067	6,272,641	5.3%	9,529,946	9,618,364	0.9%	15,488,013	15,891,005	402,992	2.6%
FRAMINGHAM	8,834,401	9,287,668	5.1%	13,209,393	13,764,605	4.2%	22,043,794	23,052,273	1,008,479	4.6%
LEXINGTON	8,006,399	8,743,912	9.2%	7,922,359	8,177,213	3.2%	15,928,758	16,921,125	992,367	6.2%
MALDEN	7,980,333	8,378,155	5.0%	13,376,032	13,820,322	3.3%	21,356,365	22,198,477	842,112	3.9%
MEDFORD	6,872,249	7,360,071	7.1%	12,312,099	12,538,844	1.8%	19,184,348	19,898,915	714,567	3.7%
MILROSE	3,105,038	3,511,330	13.1%	6,642,072	6,842,727	3.0%	9,747,110	10,354,057	606,947	6.2%
MILTON	3,524,251	3,884,900	10.2%	5,780,577	5,910,238	2.2%	9,304,828	9,795,138	490,310	5.3%
NEWTON	13,532,097	13,717,608	1.4%	21,895,848	22,344,621	2.0%	35,427,945	36,062,229	634,284	1.8%
NORWOOD	4,246,016	4,409,127	3.8%	8,188,530	8,482,434	3.6%	12,434,546	12,891,561	457,015	3.7%
QUINCY	12,401,474	13,440,835	8.4%	20,972,691	21,473,437	2.4%	33,374,165	34,914,272	1,540,107	4.6%
READING	2,399,752	2,831,288	18.0%	5,250,778	5,376,119	2.4%	7,650,530	8,207,407	556,877	7.3%
REVERE	5,591,863	5,756,009	2.9%	10,748,405	11,066,469	3.0%	16,340,268	16,822,478	482,210	3.0%
SOMERVILLE	8,711,112	8,973,256	3.0%	16,822,763	17,020,189	1.2%	25,533,875	25,993,445	459,570	1.8%
STONEHAM	2,870,605	3,561,396	24.1%	4,988,619	5,585,497	12.0%	7,859,224	9,146,893	1,287,669	16.4%
WALTHAM	10,046,663	10,338,346	2.9%	13,972,854	14,299,920	2.3%	24,019,517	24,638,266	618,749	2.6%
WATERTOWN	3,935,832	4,166,126	5.9%	6,648,177	6,806,903	2.4%	10,584,009	10,973,029	389,020	3.7%
WINTHROP	1,958,437	2,074,166	5.9%	3,714,891	3,831,735	3.1%	5,673,328	5,905,901	232,573	4.1%
TOTAL	\$229,325,899	\$233,420,214	1.8%	\$363,992,089	\$373,085,853	2.5%	\$593,317,988	\$606,506,067	\$13,188,079	2.2%

MWRA Sewer and Partial Water Customers	Final FY21 Water Assessment	Final FY22 Water Assessment	Percent Change from FY21	Final FY21 Sewer Assessment	Final FY22 Sewer Assessment	Percent Change from FY21	Final FY21 Combined Assessment	Final FY22 Combined Assessment	Dollar Change from FY21	Percent Change from FY21
CANTON	1,626,637	1,507,385	-7.3%	4,599,635	4,765,395	3.6%	\$6,226,272	\$6,272,780	\$46,508	0.7%
NEEDHAM	1,122,902	1,670,433	48.8%	6,399,895	6,614,690	3.4%	7,522,797	8,285,123	762,326	10.1%
STOUGHTON	141,002	167,480	18.8%	5,226,978	5,434,313	4.0%	5,367,980	5,601,793	233,813	4.4%
WAKEFIELD	2,874,557	2,825,130	-1.7%	6,577,299	6,748,184	2.6%	9,451,856	9,573,314	121,458	1.3%
WELLESLEY	1,835,381	2,301,709	25.4%	5,955,781	6,082,193	2.1%	7,791,162	8,383,902	592,740	7.6%
WILMINGTON	599,456	1,098,672	83.3%	2,953,524	3,013,693	2.0%	3,552,980	4,112,365	559,385	15.7%
WINCHESTER	1,835,487	2,093,282	14.0%	4,440,715	4,535,279	2.1%	6,276,202	6,628,561	352,359	5.6%
WOBURN	4,199,480	4,936,119	17.5%	9,434,265	9,490,135	0.6%	13,633,745	14,426,254	792,509	5.8%
TOTAL	\$14,234,902	\$16,600,210	16.6%	\$45,588,092	46,683,882	2.4%	\$59,822,994	\$63,284,092	\$3,461,098	5.8%

MWRA Sewer-only Customers	Final FY21 Water Assessment	Final FY22 Water Assessment	Percent Change from FY21	Final FY21 Sewer Assessment	Final FY22 Sewer Assessment	Percent Change from FY21	Final FY21 Combined Assessment	Final FY22 Combined Assessment	Dollar Change from FY21	Percent Change from FY21
ASHLAND				2,675,100	2,752,284	2.9%	\$2,675,100	\$2,752,284	\$77,184	2.9%
BEDFORD				3,563,964	3,616,974	1.5%	3,563,964	3,616,974	53,010	1.5%
BRAINTREE				10,046,123	10,463,134	4.2%	10,046,123	10,463,134	417,011	4.2%
BURLINGTON				5,969,600	6,168,357	3.3%	5,969,600	6,168,357	198,757	3.3%
CAMBRIDGE				26,630,300	27,759,220	4.2%	26,630,300	27,759,220	1,128,920	4.2%
DEDHAM				5,877,037	6,076,744	3.4%	5,877,037	6,076,744	199,707	3.4%
HINGHAM SEWER DISTRICT				2,005,219	2,061,694	2.8%	2,005,219	2,061,694	56,475	2.8%
HOLBROOK				1,816,238	1,883,097	3.7%	1,816,238	1,883,097	66,859	3.7%
NATICK				5,916,657	6,126,567	3.5%	5,916,657	6,126,567	209,910	3.5%
RANDOLPH				6,743,289	6,830,622	1.3%	6,743,289	6,830,622	87,333	1.3%
WALPOLE				4,125,676	4,280,744	3.8%	4,125,676	4,280,744	155,068	3.8%
WESTWOOD				3,121,245	3,247,430	4.0%	3,121,245	3,247,430	126,185	4.0%
WEYMOUTH				13,242,974	13,632,330	2.9%	13,242,974	13,632,330	389,356	2.9%
TOTAL				\$91,733,422	\$94,899,197	3.5%	\$91,733,422	\$94,899,197	\$3,165,775	3.5%

MWRA Water-only Customers	Final FY21 Water Assessment	Final FY22 Water Assessment	Percent Change from FY21	Final FY21 Sewer Assessment	Final FY22 Sewer Assessment	Percent Change from FY21	Final FY21 Combined Assessment	Final FY22 Combined Assessment	Dollar Change from FY21	Percent Change from FY21
LYNNFIELD WATER DISTRICT	764,867	861,938	12.7%				\$764,867	\$861,938	\$97,071	12.7%
MARBLEHEAD	2,664,131	3,092,888	16.1%				2,664,131	3,092,888	428,757	16.1%
NAHANT	514,383	533,340	3.7%				514,383	533,340	18,957	3.7%
SAUGUS	4,465,635	4,860,987	8.9%				4,465,635	4,860,987	395,352	8.9%
SOUTHBOROUGH	1,003,016	1,232,930	22.9%				1,003,016	1,232,930	229,914	22.9%
SWAMPSCOTT	2,342,440	2,581,317	10.2%				2,342,440	2,581,317	238,877	10.2%
WESTON	2,395,031	2,837,540	18.5%				2,395,031	2,837,540	442,509	18.5%
TOTAL	\$14,149,503	\$16,000,940	13.1%				\$14,149,503	\$16,000,940	\$1,851,437	13.1%

MWRA Partial Water-only Customers	Final FY21 Water Assessment	Final FY22 Water Assessment	Percent Change from FY21	Final FY21 Sewer Assessment	Final FY22 Sewer Assessment	Percent Change from FY21	Final FY21 Combined Assessment	Final FY22 Combined Assessment	Dollar Change from FY21	Percent Change from FY21
DEDHAM-WESTWOOD WATER DISTRICT	1,037,861.00	620,024.00	-40.3%				\$1,037,861	\$620,024	(\$417,837)	-40.3%
LYNN (LWSC)	396,099	125,688	-68.3%				396,099	125,688	(270,411)	-68.3%
MARLBOROUGH	6,194,747	6,589,994	6.4%				6,194,747	6,589,994	395,247	6.4%
NORTHBOROUGH	1,422,346	1,760,228	23.8%				1,422,346	1,760,228	337,882	23.8%
PEABODY	1,310,040	2,297,770	75.4%				1,310,040	2,297,770	987,730	75.4%
TOTAL	\$10,361,093	\$11,393,704	10.0%				\$10,361,093	\$11,393,704	\$1,032,611	10.0%

SYSTEMS TOTAL	\$268,071,397	\$277,415,068	3.49%	\$501,313,603	\$514,668,932	2.66%	\$769,385,000	\$792,084,000	\$22,699,000	2.95%
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Retail Charges

As noted above, MWRA provides water and sewer services to communities on a wholesale basis. Each community then re-sells services on a retail basis. As a result, household water and sewer charges include each household's share of the community's MWRA water and sewer assessments, plus the community's own charges for the provision of local water and sewer services.

Each community independently establishes retail rates. When establishing local rates, community officials consider issues related to the pricing of services, level of cost recovery, and the local rate structure or methodology. Several factors contribute to a broad range of local rate structures in the MWRA service area:

- Differences in the extent to which water and sewer costs are supported through property taxes and other sources of revenue;
- Differences in the means by which communities finance investments in their own water and sewer systems; and
- Differences in communities' retail rate methodologies.

Some communities have flat unit rates, while others have inclining block rates. Local rates may also provide for differentials among classes of users, such as higher rates for commercial or industrial users, abatements to low-income or elderly residents, and adjusted sewer rates for customers with second meters used for lawn irrigation.

Additional information on rate structure within the member communities is available on the MWRA Advisory Board website as part of its annual retail rate survey.

Revenue and Expenditure Trends

Because MWRA is required by its enabling act to balance its budget and to establish annual assessments to cover all expenses, revenue must change as expenses are changing each year. The Rate Revenue Requirement in any year is the difference between MWRA expenses and other revenue sources, most notably non-rate revenue, investment income, and debt service assistance from the Commonwealth (which directly reduces debt service expense). For FY22, community assessments are projected to represent 97.4% of total revenue.

MWRA's planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. MWRA uses the planning estimates to model and project what future rates and assessments might be based upon these assumptions, as well as to test the impact of changes to assumptions on future rates and assessments. The planning estimates are not predictions of what rates and assessments will be but rather they provide the context and framework for guiding MWRA financial policy and management decision making that ultimately determine the level of actual rate change on an annual basis. Conservative projections of future rates and assessments benefit the MWRA by providing assurance to the rating agencies that MWRA anticipates to raise revenues sufficient to pay for its operations and outstanding debt obligations now and over the long-term. Additionally, conservative forecasts of rates and assessments enable member communities to adequately plan and budget for future payments to MWRA.

MWRA also updates its estimates of anticipated revenues and expenses over a multi-year planning horizon. These estimates provide a context for budget discussions and allow MWRA to consider multiple-year rates management implications and strategies as it evaluates alternative capital and operating budget options, the ultimate goal being sustainable and predictable rate changes.

The table below and Appendix D (in more detail) present the combined estimated future rate revenue requirements for FY23 through FY26.

Rates & Budget Projections						
Final FY22 CEB	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
Total Rate Revenue (\$000)	\$ 769,385	\$ 792,084	\$ 820,128	\$ 848,308	\$ 876,332	\$ 903,530
Rate Revenue Change from Prior Year (\$000)	\$ 7,618	\$ 22,699	\$ 28,044	\$ 28,180	\$ 28,024	\$ 27,198
Rate Revenue Increase	1.0%	2.95%	3.5%	3.4%	3.3%	3.1%
Use of Reserves (\$000)	\$ 1,500	\$ 1,250	\$ 980	\$ 800	\$ 575	\$ 425

Estimated Household Bill

Based on annual water usage of 61,000 gallons	\$1,206	\$1,256	\$1,312	\$1,369	\$1,429	\$1,490
Based on annual water usage of 90,000 gallons	\$1,779	\$1,854	\$1,935	\$2,020	\$2,108	\$2,198

Increasing debt service to pay down and finance the capital improvement program is the most important factor driving estimates of future budget increases. Over the past several years MWRA’s Tax-Exempt Commercial Paper program, debt refinancing, federal grants, SRF loans, and Commonwealth debt service assistance have mitigated the impact on ratepayers of new capital spending. However, new water system improvements, for which there are fewer non-ratepayer sources of funding, and the impact of new financing will increase MWRA capital financing costs over the next several years.

MWRA employs rates management tools where available (e.g. refunding for savings, structured maturities on future borrowings, variable rate debt, and increased use of Tax-Exempt Commercial Paper) to help cushion and smooth the growth in capital financing expenses. Despite these initiatives, the size of the capital program will unavoidably continue to drive increases in community assessments.

The second largest budget factor is the projected growth of base operating costs. The estimated \$29.6 million increase in direct expenses from FY22 to FY26 is primarily the result of an assumed annual inflation rate.

MWRA’s planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. These assumptions include:

- Direct expense inflation rate of 2.7% for salaries and 3.0% for other direct expenses starting in FY23;
- CIP inflation rate of 2.5%;
- Capital spending based on the latest CIP expenditure forecast.
- Long-term fixed rate debt issues with a 25-year term and 5.0% interest rates in FY22, and 30 year terms 5.5% interest rates in FY23, and 6.0% rates from FY24 and beyond;
- Variable rate interest projected at 3.5% in FY22, and 4.0% starting in FY23.

The planning estimates generally use conservative assumptions to help communities plan for future payments to MWRA.

There are several areas where differences from planning estimate assumptions may alter projected increases:

- Changes in anticipated borrowing rates or expected investment income rates;
- The planning estimates do not factor in any positive year-end variances which may be used to defease debt or reserved to offset Rate Revenue Requirements in future years;
- Fewer opportunities for SRF borrowing than expected due to Federal Budget cuts; a dollar borrowed through the SRF at 2% replaces the need to borrow a dollar long-term at an assumed 5% rate;
- Overall inflationary pressures;
- Debt refinancing opportunities;
- Capital spending; and
- Growth in direct expenses, greater than current assumptions.

MWRA Rates Management

Planning estimates for 2022 through 2026 forecast rate revenue requirement increases of 2.95% in FY22, 3.5% in FY23, 3.4% in FY24, 3.3% in FY25, and 3.1% in FY26.

The FY22 Budget:

- Continues to refine planning estimates assumptions to provide greater predictability of future assessments;
- Judiciously uses reserves to lower rate increases, but maintain adequate balances;
- Continues the Authority's multi-year rates management strategy of providing sustainable and predictable assessment increases to our member communities; and
- Continues the smoothing strategy to even out the rate revenue requirement and rate changes caused by fluctuations in debt service at the utility level.

Net Position

The statement of net position (or net assets) provides the information on the assets and liabilities of the Authority, with net position being the difference between total assets and total liabilities. The Authority's net position for FY21 is \$1.5 billion based on the FY21 draft financials. The most recent five fiscal years can be seen in the following table:

\$s in 000

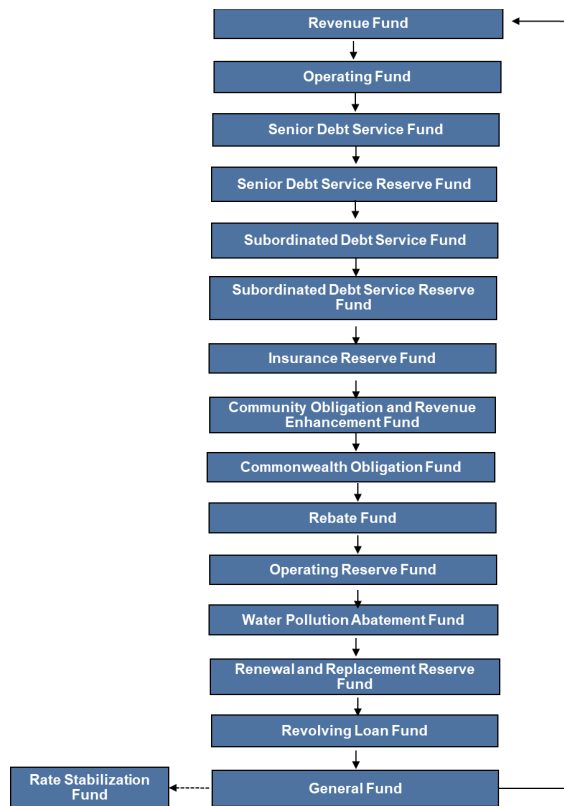
	<u>2021 Draft</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Current Assets	\$ 118,262	\$ 109,747	\$ 100,271	\$ 95,963	\$ 93,210
Capital Assets (Net)	5,658,876	5,755,377	5,840,416	5,948,350	6,023,414
Other Assets	1,523,981	1,413,757	1,614,475	1,529,221	1,683,406
Total Assets	\$7,301,119	\$ 7,278,881	\$ 7,555,162	\$ 7,573,534	\$ 7,800,030
Current Liabilities	482,637	473,853	362,949	350,382	349,139
Non-Current Liabilities	5,332,458	5,279,049	5,626,126	5,617,753	5,784,594
Total Liabilities	\$5,815,095	\$ 5,752,902	\$ 5,989,075	\$ 5,968,135	\$ 6,133,733
Net Position					
Net Investment in Capital Assets	969,652	894,437	827,050	759,757	729,903
Restricted	461,566	420,009	368,532	357,767	339,073
Unrestricted	54,806	211,533	370,505	487,875	597,321
Total Net Position	\$1,486,024	\$ 1,525,979	\$ 1,566,087	\$ 1,605,399	\$ 1,666,297

When both restricted and unrestricted funds are available for use, it is the Authority's policy to use restricted funds first, then unrestricted funds as needed. Restricted funds include construction, debt service, and operating revenue.

General Bond Resolution Funds

The Authority's General Bond Resolution requires that it maintain certain funds related to its operations and as security for its bondholders. The General Bond Resolution establishes the required balances and allocation of all moneys controlled by the Authority. Moneys in the Operating Fund, Debt Service Fund, Subordinated Debt Service Fund and Rate Stabilization maybe utilized as outlined in the Authority's Current Expense Budget. The use of all other Funds is subject to the limitations established in the General Bonds Resolution. The following graphic details the flow of Funds for all moneys under the General Bond Resolution. A copy of the General Bond Resolution can be found at <http://www.mwra.com/finance/documents/general-revenue-bond-resolution/amended-restated-general-resolution-MWRA-04-23-2015.pdf>.

General Bond Resolution Flow of Funds



Fund Balances

Revenue Fund – MWRA shall deposit all income, revenue, receipts, and other moneys derived by the Authority from its operation of the Systems and engaging in other activities authorized by the enabling act into the Revenue Fund. The Revenue Fund is the top in the flow of funds under the General Revenue Bond Resolution. Moneys in the Revenue Fund are transferred on a monthly basis for operating, debt service and other costs of the Authority as required by the General Bond Resolution. As of June 30, 2021, the Revenue Fund had \$50.0 million available.

Operating Fund – All of the Operating Expenses of the Authority as defined in the General Revenue Bond Resolution are paid out of the Operating Fund. The Authority is required to maintain the Operating Fund at a balance equal to the next three months of Operating Expenses. On a monthly basis moneys are moved from the Revenue Fund to the Operating Fund to maintain the required balance. As of June 30, 2021, the Operating Fund had a balance of \$83.0 million.

Debt Service Fund – The principal and interest costs associated with MWRA’s outstanding senior lien debt is paid out of the Debt Service Fund. On a monthly basis funds are transferred from the Revenue Fund to the Debt Service Fund equal to 1/6th of the next interest payment or 1/12th of the next principal payment for each series of bonds. The schedule for principal and interest transfers is such that the payments are funded a month and one day ahead of the next payment date as required by the General

Revenue Bond Resolution. The balance in the Debt Service Fund as of June 30, 2021 was \$183.0 million.

Subordinated Debt Service Fund – The principal and interest associated with MWRA’s outstanding subordinate lien debt. On a monthly basis funds are transferred from the Revenue Fund to the Subordinated Debt Service Fund equal to 1/6th of the next interest payment or 1/12th of the next principal payment for each series of bonds. The schedule for principal and interest transfers is such that the payments are funded a month and one day ahead of the next payment date as required by the General Revenue Bond Resolution. The balance in the Subordinated Debt Service Fund as of June 30, 2021 was \$65.0 million.

Water Pollution Abatement Fund – This fund is used for payments on the debt service due to the Massachusetts Clean Water Trust (formerly the Massachusetts Water Pollution Abatement Trust). The Water Pollution Abatement Fund is funded from the Revenue Fund. The Balance in the Water Pollution Abatement Fund was \$73.0 million on June 30, 2021.

Commonwealth Obligation Fund – This Fund is utilized to pay Commonwealth Obligations as defined under the General Revenue Bond Resolution. Primarily Commonwealth Obligations are amounts payable to the Commonwealth of Massachusetts including Watershed Trust expenses, Payments in Lieu of taxes and other state government charges. The Commonwealth Obligation Fund. The Commonwealth Obligation Fund balance is based of payments due to the Commonwealth and is funded on a regular basis from the Revenue Fund. The balance in the Commonwealth Obligation Fund on June 30, 2021 was \$0.0 million.

Construction Fund – The Construction Fund is primarily funded through the proceeds of debt issuances, and some current revenue. Moneys in the Construction Fund are utilized to pay the cost of the Authority’s capital projects and related costs as defined in the General Revenue Bond Resolution. The Construction Fund had a balance of \$228.0 million on June 30, 2020.

The following table shows a three-year history of fund balances as well as a projection for June 30, 2022 The FY22 year-end projection is based upon General Bond Resolution requirements, projected debt issuances, and projected interest rates. Year-end projected balances for FY22 are subject to change and may vary from the projection.

Fund Balances - \$s in Millions				
Funds	6/30/2019	6/30/2020	6/30/2021	Projected 6/30/2022
Revenue Fund	\$31.0	\$40.0	\$50.0	\$34.0
Operating Fund	\$76.0	\$79.0	\$83.0	\$79.0
Debt Service Fund	\$189.0	\$151.0	\$183.0	\$207.0
Subordinate Debt Service Fund	\$55.0	\$93.0	\$65.0	\$65.0
Water Pollution Abatement Fund	\$68.0	\$71.0	\$73.0	\$74.0
Commonwealth Obligation Fund	\$0.0	\$0.0	\$0.0	\$0.0
Construction Fund	\$189.0	\$141.0	\$228.0	\$126.8
Total	\$608.0	\$575.0	\$682.0	\$585.8

Reserves

Under the terms of its General Bond Resolution, MWRA maintains various reserve funds. Two of MWRA's reserves, Rate Stabilization and Bond Redemption, are used to smooth rate increases. Moneys in the funds are funded from year-end CEB budget surpluses. The amounts in the funds as of June 30, 2021, and the permitted and planned uses are discussed below:

Rate Stabilization - Under the terms of the General Bond Resolution, the annual use of Rate Stabilization monies cannot exceed 10% of the year's senior debt service. Rate stabilization is funded by CEB surpluses and is one of two funds available to smooth rate increases. This reserve balance was \$41.5 million as of 6/30/21. The FY15 through FY20 Final CEB did not include the use of Rate Stabilization Funds. The FY22 CEB includes the use of \$1.3 million in the HEEC reserve and a projected yearend balance of \$40.0 million. Planning estimates based on the FY22 Budget assumes use of \$4.0 million in Rate Stabilization associated with HEEC between FY22 and FY26.

Bond Redemption - Monies in the Bond Redemption Fund can be used only to retire or prepay outstanding debt. Like Rate Stabilization, Bond Redemption is funded by CEB surpluses and is also available to smooth rate increases by reducing debt service. There is no annual limit on the amount of Bond Redemption funds used in a year. However, there are constraints based on bond maturity dates. The FY16, through FY22 CEB assumed no use of Bond Redemption. The balance as of June 30, 2021 was \$26.1 million and is projected to remain unchanged in FY22.

In addition to the Rate Stabilization and Bond Redemption funds, MWRA maintains four funded reserves required by the terms of the General Bond Resolution: Debt Service Reserve, Operating, Insurance, and Renewal and Replacement. The amount in each reserve fund, the basis for determining the funding requirement and when a reserve can be used to reduce rate revenue requirements are discussed below:

Debt Service Reserve - This is MWRA's largest reserve, and is funded from bond proceeds. The funding of this reserve is based on the lesser of four tests, and is currently funded at 50% of the maximum annual debt service. The fund can be used to pay debt service when the amount in the reserve is greater than the remaining debt service. The balance of this reserve fund as of June 30, 2021, was \$156.6 million and projected to remain unchanged in FY22.

Operating Reserve - The required balance is one-sixth of operating expenses for a year, as defined in the Bond Resolution. The balance of this reserve fund as of June 30, 2021, was \$45.9 million and based on FY22 CEB the required balance by the end of FY22 will be \$47.3 million.

Insurance Reserve - MWRA mitigates the budgetary risk of self-insurance by maintaining an insurance reserve. The reserve which was established as part of the Bond Resolution requires that an independent insurance consultant review the adequacy of the funding level every three years. This reserve fund balance as of June 30, 2021, was \$14.0 million and is projected to remain unchanged in FY22. The \$14 million level has been determined to be acceptable and reasonable based on the last review completed in FY20.

Renewal and Replacement Reserve - The required balance is set at \$35 million with the difference between the \$10 million in cash and the required balance based on the triennial recommendation of a consulting engineer being available in short-term borrowing capacity. MWRA's consulting engineer completed its triennial review of this reserve balance in 2020.

The following table shows a three-year history of reserve balances as well as projections for June 30, 2022. The FY22 year-end projections are based upon General Bond Resolution requirements and projected debt issuances. Year-end projected balances for FY22 are subject to change and may vary from the projection.

Reserve Balances - \$s in Millions				
Reserves	6/30/2019	6/30/2020	6/30/2021	6/30/2022 Projection
Rate Stabilization	\$43.0	\$43.0	\$41.5	\$40.0
Bond Redemption	\$26.1	\$26.1	\$26.1	\$26.1
Debt Service Reserve - 50% of max Debt Service	\$156.6	\$156.6	\$156.6	\$156.6
Operating Reserve - 1/6 of annual operating expenses	\$42.0	\$44.0	\$45.9	\$47.3
Insurance Reserve - Est. by independent consultant, as of 2020	\$14.0	\$14.0	\$14.0	\$14.0
Renewal & Replacement Reserve - \$10 million required balance	\$10.0	\$10.0	\$10.0	\$10.0
Total	\$291.7	\$293.7	\$294.1	\$294.0

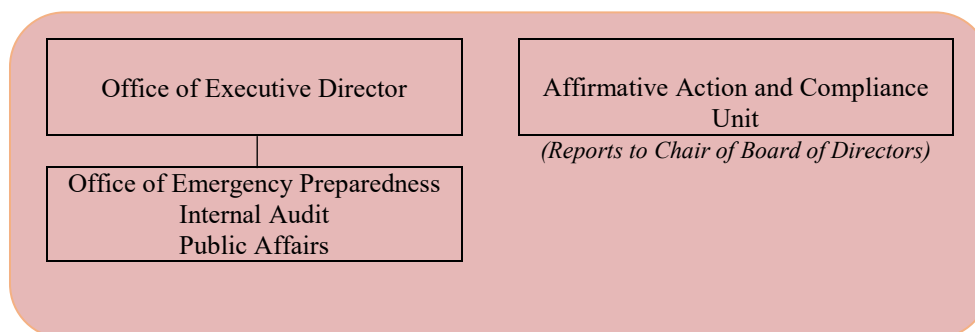
STATEMENT OF FINANCIAL POSITION

In accordance with its enabling act, each year MWRA submits annual reports to the Governor, the President of the State Senate, the House of Representatives, the Advisory Board, and the Chairs of the State Senate and House Committees on Ways and Means containing financial statements relating to its operations maintained in accordance with Generally Accepted Accounting Principles in the United States of America (GAAP) and, commencing with the annual reports for 1986, audited by independent certified public accountants. MWRA's audited financial statements at June 30, 2020 are available online at www.mwra.com.



Executive Office
Budget

EXECUTIVE DIVISION



The **Executive Division** provides executive management and guides the implementation of MWRA policies established by the Board of Directors. It is responsible for developing and implementing specific goals and programs to achieve MWRA's primary mission of providing reliable and efficient water and sewer services, improving water quality, and for creating a framework within which all divisions can operate effectively. The Executive Division also oversees a centralized MWRA-wide security program to preserve and protect MWRA facilities, systems and employees.

The Executive Division includes the Office of Executive Director, Office of Emergency Preparedness, Internal Audit, Public Affairs, and the Affirmative Action and Compliance Unit (AACU). Each of these Departments is accounted for separately in the MWRA budget. In addition, the Director of the Tunnel Redundancy Program reports to the Executive Director. However, the Tunnel Redundancy Program is budgeted under the Operations Division budget.

The **Office of the Executive Director** includes the Board of Directors' cost center as well as the MWRA Advisory Board and Advisory Committees' cost centers. The Board of Directors formulates policies to guide MWRA actions and is responsible for major policy and fiscal decision-making. The MWRA Advisory Board was established by the Enabling Act to serve as "fiscal watchdog" for MWRA's customer communities. The Advisory Board makes recommendations to MWRA on annual expense budgets and capital improvement programs. In addition, the Advisory Board reviews and comments on MWRA reports, holds hearings on related matters, and makes recommendations to the Governor and the Legislature. The other advisory committees supported by this budget are the Water Supply Citizens' Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC). (A description of the Advisory Board,

FY22 Final Current Expense Budget OFFICE OF THE EXECUTIVE DIRECTOR

DEPARTMENT	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
EXECUTIVE OFFICE	\$ 564,015	\$ 603,403	\$ 595,278	\$ 608,129	\$ 12,851	2.2%
BOARD OF DIRECTORS	4,775	3,029	101,948	101,848	(100)	-0.1%
ADVISORY BOARD / OTHER COMMITTEES	750,854	757,419	817,662	830,214	12,552	1.5%
TOTAL	\$ 1,319,644	\$ 1,363,851	\$ 1,514,888	\$ 1,540,191	\$ 25,303	1.7%

WSCAC and WAC is set forth in Appendix E). The Executive Office budget accounts for less than 1% of the MWRA FY22 Direct Expense Budget.

FY22 Goals and Initiatives:

Ensuring a safe and reliable source of drinking water to MWRA customers, and wastewater discharges that meet all applicable regulations drives both capital and current expense budget costs. Five strategic priorities integral to MWRA’s mission were identified for action in MWRA’s FY2016-FY2020 Five-Year Strategic Business Plan.

- I. Drinking Water Quality and System Performance**
- II. Wastewater Management & System Performance**
- III. Infrastructure Management & Resilience**
- IV. Finance & Management**
- V. Environmental Sustainability**

Under each of these priorities, MWRA identified goals and initiatives to guide the Authority’s action. The Executive Department uses the Business Plan to provide the framework for MWRA staff to manage and measure performance. The Office of the Executive Director has also identified core initiatives that support MWRA’s mission and strategic priorities.

- Ensure delivery of reliable and cost-effective water and sewer services to customer communities.
- Ensure that water supply and wastewater collection and treatment preserve public health and protect natural resources.
- Provide overall management of the agency and ensure adherence to all applicable policies and regulations.
- Continue to aggressively pursue renewable and sustainable energy resources to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.
- Manage communication and garner support from key constituents for MWRA programs.

FY22 Final Current Expense Budget OFFICE OF THE EXECUTIVE DIRECTOR							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 561,100	\$ 601,777	\$ 688,490	\$ 701,341	\$ 12,851	1.9%	
OVERTIME	-	-	-	-	-	-	-
TRAINING & MEETINGS	-	-	850	850	-	0.0%	
PROFESSIONAL SERVICES	169,188	169,971	190,662	191,918	1,256	0.7%	
OTHER MATERIALS	3,404	1,391	3,550	3,450	(100)	-2.8%	
OTHER SERVICES	585,951	590,713	631,336	642,632	11,296	1.8%	
TOTAL	\$ 1,319,643	\$ 1,363,852	\$ 1,514,888	\$ 1,540,191	\$ 25,303	1.7%	

Budget Highlights:

The FY22 Budget is \$1.5 million, an increase of \$25,000 or 1.7%, as compared to the FY21 Budget.

- \$701,000 for **Wages and Salaries**, an increase of \$13,000 or 1.9%, as compared to the FY21 Budget. The FY22 Budget includes funding for five FTEs, the same as the FY21 Budget.

OFFICE OF THE EXECUTIVE DIRECTOR	FY21 FTEs	FY22 FTEs
EXECUTIVE OFFICE	5.0	5.0
TOTAL	5.0	5.0

- \$192,000 for **Professional Services**, essentially level funded with FY21 Budget. This budget funds the Water Supply Citizens’ Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC). This budget includes a 6.0% increase in health insurances and a 3% increase in hourly salary and other reimbursable expenses.
- \$643,000 for **Other Services**, an increase of \$11,000 or 1.8%, as compared to the FY21 Budget. The primary component of this line item is MWRA Advisory Board operating expenses, which is increased 2.6% over the FY21 Budget mainly in wages and salaries.



Fells Reservoir

OFFICE OF EMERGENCY PREPAREDNESS

The **Office of Emergency Preparedness (OEP)** was created in November 2005 to consolidate Authority-wide security and emergency response functions. It is responsible for oversight of the MWRA’s security and emergency response plans, policies, and procedures; implementation and training for the Emergency Response Plan; and management, training, and outfitting of the Emergency Service Unit (ESU), which will respond to any intentional or accidental contamination of the water supply. In April 2019, the MWRA bifurcated OEP, creating a separate Security Department. ESU was transferred to the Department of Planning and Sustainability. The Security Division continues to work in close coordination with the Division of Planning and Sustainability to accomplish the overall goals of security and preparedness on behalf of the MWRA and the community it serves.

FY22 Final Current Expense Budget OFFICE OF EMERGENCY PREPAREDNESS

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 722,747	\$ 298,628	\$ 279,313	\$ 478,633	\$ 199,320	71.4%
OVERTIME	467	121	-	-	-	-
MAINTENANCE	494,304	410,910	495,000	520,000	25,000	5.1%
TRAINING & MEETINGS	12,023	673	7,000	7,000	-	0.0%
PROFESSIONAL SERVICES	1,956,706	2,002,305	1,998,700	1,998,700	-	0.0%
OTHER MATERIALS	19,377	19,815	2,350	2,350	-	0.0%
OTHER SERVICES	106,669	4,001	102,151	102,150	(1)	0.0%
TOTAL	\$ 3,312,293	\$ 2,736,453	\$ 2,884,514	\$ 3,108,833	\$ 224,319	7.8%

FY22 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- ***Goal#1 – Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations***
 - Develop and implement policies and programs to provide security, and critical infrastructure protection the MWRA’s water systems.
 - Continue ensuring that new construction and rehabilitation of facilities include an integrated security and surveillance system improvement component. Continue task order security enhancement designs for selected water and wastewater critical sites, fencing and gate installation, guardrails, pipe gates, bollards, barbed wire and other facility hardening initiatives.
 - Establish a backup security monitoring center and communications head end at Norumbega.
 - Complete facility security audits and implement the resulting enhancement and remedial work recommendations.
 - Improve the cyber security of the MWRA’s physical Security System.

II. Wastewater Management & System Performance

- Develop and implement policies and programs to provide security, and critical infrastructure protection, for the MWRA’s wastewater systems. While this initiative is not specifically addressed under the goals of the Wastewater Management & System Performance Strategic Priority, security of the system is a key objective of the Office of Emergency Preparedness. All initiatives set forth in Section I above for MWRA’s water systems apply to MWRA’s wastewater systems as well, unless they address a specific water system location.

III. Infrastructure Management & Resilience

- **Goal #10 – Prepare for catastrophic events or threats that could affect the water and wastewater delivery systems**
 - Manage and direct security guard, security monitoring, and security maintenance contracts.
 - Develop and maintain strong liaison relationships with law enforcement and other external stakeholders to ensure that threat intelligence is received, reviewed, and if appropriate, acted upon.

FY21 Year-End Accomplishments:

- Updating Emergency Response Plans, which is the second phase of America’s Water Infrastructure Act (AWIA).
- Completed more than 86 training events or drills, despite the limitations imposed by the Covid-19 Pandemic.

OEP Training and Drill Events(7/1/2020 - 6/30/21)

Type	Number	Comment
Notification drills	1	Reverse 911 and page groups, GETS/WPS, Satellite phones
Dam EAP Training/Tabletops		Dam EAP tabletop reviews
EAP Group Reviews		Spill EAP reviews,
Tower/Turbine climbing		
Active Shooter Training	11	Run, Hide, Fight
Spill Field Drills and Training	5	DI ERT boom drill, Wachusett car, DCR refreshers, OPA 90, HRD
Evacuation Drills	1	Fire drill Chelsea, muster drill DI, fire drill CNY
Ops Equipment deployment	5	Shutdown of CWTP, DI, MPUs, Spot spill response, power/pump loss/Reading Disinfection
Field Ops Tabletop	3	derailment tabletop, commuter rail safety, cyber TTX, severe WX

Water quality tabletop drills	21	CMP TTX, sampling training, actionable alarm response - CWS
Large tabletop/field drill	1	RR spill, City Tunnel, Lower Mystic
ESU/ DI ERT drills	21	Various
Community ERP trainings	2	ERP training – half day sessions via Webex
Community Sampling training	6	
SPCC Training	3	2.5 Hour class (SPCCE-17, SPCCW-7)
Misc.	6	OSHA Refresher, Everbridge, Wilderness first aid, Section 89, Section 77, Earthquake, DITP Black Start tabletop and CTG Failure
UAS Training/Deployment		
Total	86	

- Completed fencing repairs and upgrade work at 14 sites including, Norumbega Tower, Shaft 9A, Brusch WTF, and .South Boston CSO. Hyde Park Pump Station, Newton Street Pump Station, Ludlow Monitoring Facility, Cottage Farm, Shaft 9, Deer Island, Southboro, CWTP, Nash Hill, and Fell’s Covered Storage.
- Began work on procuring a Visitor Management System (VMS). The VMS is expected to be tested, and implemented during the first Quarter of FY22.
- Complete work on formalizing Security policies and metrics as an outcome of AWIA.

Budget Highlights:

The FY22 Final Budget is \$3.1 million, an increase of \$224,000 or 7.8% as compared to the FY21 Budget.

- \$479,000 for **Wages and Salaries**, an increase of \$199,000 or 71.4% as compared to the FY21 Budget, due to the new Director of Security for \$160k, one position upgrade and salary increases associated with collective bargaining agreements. The FY22 Budget includes funding for four FTEs, matching the FY21 Budget.

OFFICE OF EMERGENCY PREPAREDNESS	FY21 FTEs	FY22 FTEs
EMERGENCY PREPAREDNESS	4.0	4.0
TOTAL	4.0	4.0

- \$520,000 for **Ongoing Maintenance**, an increase of \$25,000 or 5.1% from the FY21 Budget. This budget includes funding of \$150,000 to cover the MWRA-wide security systems preventative maintenance materials and equipment, including cameras, intrusion detection and card readers; \$350,000 for MWRA-wide security systems repair services, and \$20,000 for the intrusion alarm annual and semi-annual monitoring services contracts, which was level funded.

- \$2.0 million for **Professional Services**, matching the FY21 Budget. The budget includes \$1,998,700 for the Security Guard Services contract for all MWRA facilities: Chelsea, Charlestown Navy Yard (CNY), Deer Island Wastewater Treatment Plant (DITP) and Carroll Water Treatment Plant (CWTP). Also included under Professional Services is \$10,000 for maintaining the Dam Emergency Action Plans (EAPs) to keep the contact information current and distributed.
- \$2,000 for **Other Materials**, matching the FY21 Budget.
- \$102,000 for **Other Services**, matching the FY21 Budget.



Nut Island Headworks

AFFIRMATIVE ACTION AND COMPLIANCE UNIT

Under section 7(g) of MWRA’s enabling act, the **Affirmative Action and Compliance Unit (AACU)** is established to “report directly to the chairman of the Authority and provide for the enforcement of affirmative action plans for employment, procurement and contracting activities of the Authority.” The AACU develops, administers, and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Disadvantaged Business Enterprises (DBE) in Authority procurement activities.

FY22 Final Current Expense Budget AFFIRMATIVE ACTION & COMPLIANCE UNIT

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 500,891	\$ 539,193	\$ 694,715	\$ 699,169	\$ 4,454	0.6%
OVERTIME	-	-	-	-	-	-
TRAINING & MEETINGS	5,954	1,166	6,600	6,790	190	2.9%
OTHER MATERIALS	2,406	1,707	1,950	2,100	150	7.7%
OTHER SERVICES	1,666	848	1,636	1,686	50	3.1%
TOTAL	\$ 510,917	\$ 542,914	\$ 704,901	\$ 709,745	\$ 4,844	0.7%

FY22 Goals and Initiatives:

In performing its core goals, the AACU undertakes the following initiatives on an on-going basis:

- Assist divisions and departments in the implementation of MWRA’s affirmative action program and promote MWRA’s policy of non-discrimination for all persons in or recruited into its workforce.
- Maintain adequate internal audit and reporting systems to monitor MWRA’s accomplishments of goal attainment in identified underutilized job groups for female and minority representation.
- Communicate to managers and supervisors MWRA's commitment to its equal opportunity policies and affirmative action programs.
- Assist the Human Resources Department in the coordination and oversight of all external/internal recruitment and selection activities including interviewing, hiring, transfers, and promotions of all candidates, including those who are members of a protected class.
- Provide for the equitable participation of minority/women and disadvantaged-owned businesses in procurement opportunities, ensure that minorities and women are represented in the labor force on construction contracts, and coordinate with other public entities regarding state and federal requirements.
- Assist divisions and departments in the understanding and implementation of MBE/WBE/DBE program policies and practices as well as monitor and report on contractor compliance and expenditures.

FY21 Year-End Accomplishments:

- Provided management assistance to the Human Resources Department in the overall recruitment and selection process for qualified candidates for seventy-two 72 new hires and sixty-five 65 promotions.
- Conducted oversight of 102 construction and professional projects, including monitoring the minority and women workforce as well as MBE/WBE/DBE compliance. There were no FY21 annual site visits due to COVID 19

Budget Highlights:

The FY22 Budget is \$710,000, an increase of \$4,800 or 0.7% over the FY21 Budget.

- \$699,000 for **Wages and Salaries**, an increase of \$4,000 or 0.6% over the FY21 Budget. The increase is primarily for wage increases associated with collective bargaining agreements. The FY22 Proposed Budget includes funding for seven FTEs, matching the FY21 Budget.

AFFIRMATIVE ACTION & COMPLIANCE UNIT	FY21 FTEs	FY22 FTEs
AACU	7.0	7.0
TOTAL	7.0	7.0



Baffle Dams Quabbin Reservoir

INTERNAL AUDIT

The **Internal Audit Department** is prescribed under section 7(h) of the MWRA’s enabling act to “monitor the quality, efficiency and integrity of the Authority’s operating and capital programs and make periodic recommendations and reports to the Executive Director and the Board of Directors.” **The Internal Audit Department** monitors the efficiency and integrity of MWRA operations by auditing financial and program operations; reviewing compliance with accounting and management control systems, laws and regulations, and coordinating the formulation and revisions to MWRA policies and procedures. Internal Audit also monitors MWRA contracts through its contract audit program, including approval of provisional consultant indirect cost rates and subsequent audit of consultant billings, performs construction labor burden reviews, construction change orders and claim audits, and vendor and other contract audits.

FY22 Final Current Expense Budget INTERNAL AUDIT

LINE ITEM	FY19	FY20	FY21	FY22	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY22 to FY21	
WAGES & SALARIES	\$ 648,519	\$ 634,048	\$ 719,837	\$ 739,010	\$ 19,173	2.7%
MAINTENANCE	9	5	-	-	-	-
TRAINING & MEETINGS	3,124	1,376	6,517	6,585	68	1.0%
OTHER MATERIALS	959	1,735	2,168	1,982	(186)	-8.6%
OTHER SERVICES	1,285	1,100	2,100	2,100	-	0.0%
TOTAL	\$ 653,896	\$ 638,264	\$ 730,622	\$ 749,677	\$ 19,055	2.6%

FY22 Goals and Initiatives:

In addition to its statutory core functions, the Department has set the following goals for FY22:

- Encourage more economical and efficient operations, adhere to sound management procedures, and use controls designed to safeguard MWRA assets.
- Assure that automated and supporting manual management information systems provide accurate and useful management information.
- Assure that contractors, consultants and vendors doing business with MWRA have adequate accounting and billing systems to provide current, complete and accurate cost and price information and project invoicing.

FY21 Year-End Accomplishments:

- Identified \$2,325,206 in savings through the fourth quarter related to: internal audits, management advisory services, consultant audits, preliminary consultant reviews, construction labor burden reviews, vendor reviews, facility lease agreements; the HEEC agreement for the new cable, the true-up of the capacity charge and O&M costs for 2019 for the old cable, and on-going savings from the lease of the engine house by the Fore River Railroad Corporation.

- Issued final audit reports on Chelsea and Navy Yard leases. Issued 4 incurred cost audits, 11 preliminary consultant reviews, 5 preliminary labor burden reviews on construction contracts, and 51 cost rate letters to professional service consultants.
- Completed a review of Overhead Crane Inspections to determine if the MWRA is complying with OSHA and industry standards inspection requirements.
- Completed a review of Confined Space Entry (CSE) training to assess whether employees have received training and certain controls and procedures are in place to track and monitor employee training status.
- Provided management advisory analysis services dealing with MWRA overhead rates, unemployment compensation, HEEC tariff filings, and various contract, amendment and change order negotiations.
- Provided support to the Law Division in the matter of HEEC filings of the tariff with the Department of Public Utilities on the proposed new cross-harbor electrical cable and for the existing cable.
- Provided support to staff in ensuring the reopening of offices complies with guidelines issued by the CDC, OSHA, Commonwealth of Massachusetts, City of Boston and industry best practices.
- Reviewed revenues earned by the Operator of the railroad and the share of revenues paid to Fore River Railroad Corporation, as well as verifying maintenance expenses.
- Ten audit recommendations have been closed during the period.

Budget Highlights:

The FY22 Budget is \$750,000, an increase of \$19,000 or 2.6% as compared to the FY21 Budget.

- \$739,000 for **Wages and Salaries**, an increase of \$19,000 or 2.7% as compared to the FY21 Budget, primarily for wage increases associated with collective bargaining agreements. The FY22 Budget includes funding for 6.7 FTEs, the same as the FY21 Budget.

INTERNAL AUDIT DEPARTMENT	FY20 FTEs	FY21 FTEs
INTERNAL AUDIT	6.7	6.7
TOTAL	6.7	6.7



Alewife Brook Wastewater Pump Station

PUBLIC AFFAIRS

The **Public Affairs Department** is the institutional link to the public and government. The Department’s responsibilities are spread over five separate sections.

The **Legislative Section** of the Department works for passage of legislation necessary to carry out MWRA’s mission, monitors legislation, responds to inquiries by elected and appointed officials, and pursues funding from the state legislature for MWRA projects. MWRA’s highest legislative priority continues to focus on the need for a robust “Commonwealth Rate Relief Package” to help offset anticipated rate increases over the next several years.

The **Community Relations Section** deals directly with cities and towns in the MWRA service area, responds to inquiries about MWRA, proactively incorporates community concerns into MWRA project work, coordinates outreach and education initiatives to highlight MWRA programs, and provides technical expertise for specific projects and initiatives. Community Relations staff also work in conjunction with Planning Department staff to ensure compliance with state and local regulations and restrictions.

The **Communications Section** manages media relations, issues press releases and responds to information requests, oversees the design and distribution of MWRA publications, manages the internal and external web sites and social media platforms, and provides design, editorial, and graphics services for other sections of MWRA.

The **Education Section** is responsible for curriculum development, teacher training workshops, as well as providing school education materials on water quality, water conservation, wastewater topics, and environmental issues.

The Communications and Education Sections are led by the Special Assistant to the Executive Director, located in the Executive Office.

FY22 Final Current Expense Budget							
PUBLIC AFFAIRS							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 882,077	\$ 880,448	\$ 1,033,351	\$ 1,137,401	\$ 104,050	10.1%	
OVERTIME	279	1,257	500	500	-	0.0%	
FRINGE BENEFITS	10	6	-	-	-	-	
MAINTENANCE	33	-	-	-	-	-	
TRAINING & MEETINGS	7,491	6,996	8,956	9,061	105	1.2%	
PROFESSIONAL SERVICES	-	-	1,300	1,300	-	0.0%	
OTHER MATERIALS	27,306	16,442	25,896	25,941	45	0.2%	
OTHER SERVICES	28,805	22,061	49,522	50,022	500	1.0%	
TOTAL	\$ 946,001	\$ 927,210	\$ 1,119,525	\$ 1,224,225	\$ 104,700	9.4%	

FY22 Goals and Initiatives:

The core function of the Public Affairs Department is to support the MWRA's achievement of all five key strategic priorities set forth in the FY21-FY25 Five-Year Strategic Business Plan. To that end, the Department has set the following initiatives:

- Work with the Massachusetts Legislature to advocate on behalf of member communities regarding issues that are crucial to the Authority's core mission. The Executive Director and Director of Intergovernmental Affairs routinely meet with House and Senate leaders to discuss issues that are crucial to the Authority and its customers. All newly filed legislation and regulations that could impact the Authority from an operational and administrative perspective are analyzed and monitored, and appropriate responses are formulated in concert with the Office of the Executive Director (OED).
- Enhance overall public understanding of MWRA's mission, goals, and benefits to the public through extensive outreach and effective communication.
 - Develop and implement proactive strategies for educating and informing key MWRA constituencies and the public at large about MWRA's mission, projects and progress, and promote understanding for associated costs.
 - Gain public support for MWRA programs and projects while responding to the needs and concerns of elected, appointed public officials, and the public.
 - Continue to grow the user population of MWRA's Everbridge communication platform in order to reach as many residents as possible, keeping them up to date on meetings, reports, infrastructure projects, and CSO Notifications
 - Continue to expand the presence of MWRA's portable water fountain at public events in service communities, once the COVID-19 pandemic has subsided.
- Maintain and update MWRA's Community Contact Database. This Community Contacts tracking application is used to notify MWRA's communities of any operational issues or emergencies affecting them or surrounding communities.
- Continue to provide accurate and timely information to the public through the MWRA's website and social media accounts, e.g., Twitter, Flickr and Instagram.
- A major initiative for FY22 will be a refresh of the MWRA's website.
- A Five-Year Progress Report will be produced in FY22.
- Continue to respond to media requests in a timely and accurate fashion.
- Continue to develop presentations and graphics for use in a wide range of MWRA programs.
- Communications staff now has responsibility for the MWRA's drone program and will continue to take baseline photos of MWRA facilities and infrastructure, in addition to other requests for drone footage, in compliance with FAA regulations.

- Continue to design and produce Annual Water Quality Report for every household within the MWRA service area.
- Continue to provide educational support through classroom visits, teacher training, educational material development, and facility tours. With classroom visits uncertain for the coming school year, School Program staff will continue to provide remote presentations and additional materials on the website.
- Provide technical support to 14 cities and towns that host MWRA's emergency back-up aqueducts as part of the Public Access Aqueduct Program.
- Continue to work with cities and towns to implement the Public Access Initiative on the Wachusett, Weston, Sudbury, and Cochituate Aqueducts.
- Provide support to MWRA staff to ensure that MWRA projects meet regulatory requirements, and provide input to regulatory agencies in order to ensure MWRA interests are recognized during the development of regulations.

FY21 Year-End Accomplishments:

- Governor Baker's House 1 Budget did not include a statewide appropriation for the Sewer Rate Relief Fund.. However, the House Ways and Means Committee budget included a \$1,500,000 appropriation. Staff will continue to monitor this line-item as the budget process evolves. Historically, MWRA has received approximately 75% of that total appropriation.
- Successfully grew the Everbridge communication platform to over 900 public opt-in subscription in an effort to keep community members informed of construction project updates, service notices, and public meetings. Sent out daily traffic alerts related to Northern Intermediate High and Southern Extra High Construction projects as well as Monthly Water Quality Updates and Board Meeting notifications. Continued efforts will be made to increase public opt-in subscriptions and expand MWRA utilization of this platform, including the newly developed CSO Public Notification effort. Also utilized the Everbridge Employee Notification function to provide important and timely updates to all staff during the COVID-19 pandemic.
- Due to the COVID-19 Pandemic, MWRA has shifted to virtual public meetings and meetings with local officials to keep our communities and their residents updated on upcoming and ongoing infrastructure investments in our local communities.
- Aqueduct Trails: To date, MWRA staff has issued Section 8 (m) Permits to most communities hosting the Wachusett, Wachusett Open Channel, Weston, Sudbury, and Cochituate Aqueducts as part of the Public Access Aqueducts Program. To date, MWRA has authorized approximately 27 miles of Aqueduct Trails, including a small portion in Newton that was opened this year MWRA estimates that approximately 20 miles are currently open including new sections in the Town of Wayland, Northborough and small sections as part of the Bay Circuit Trail in Southborough and Framingham. In the coming year, MWRA expects to add to these trails in Southborough and Marlborough

Wachusett Aqueduct and Open Channel

Northborough: 4.7 miles permitted, of which 4.2 miles opened to the public
Southborough: 2.2 miles opened to the public along the Open Channel

Bay Circuit Trail Connector

Framingham: 0.1 miles open to the public
Southborough: 0.4 miles open to the public

Weston Aqueduct

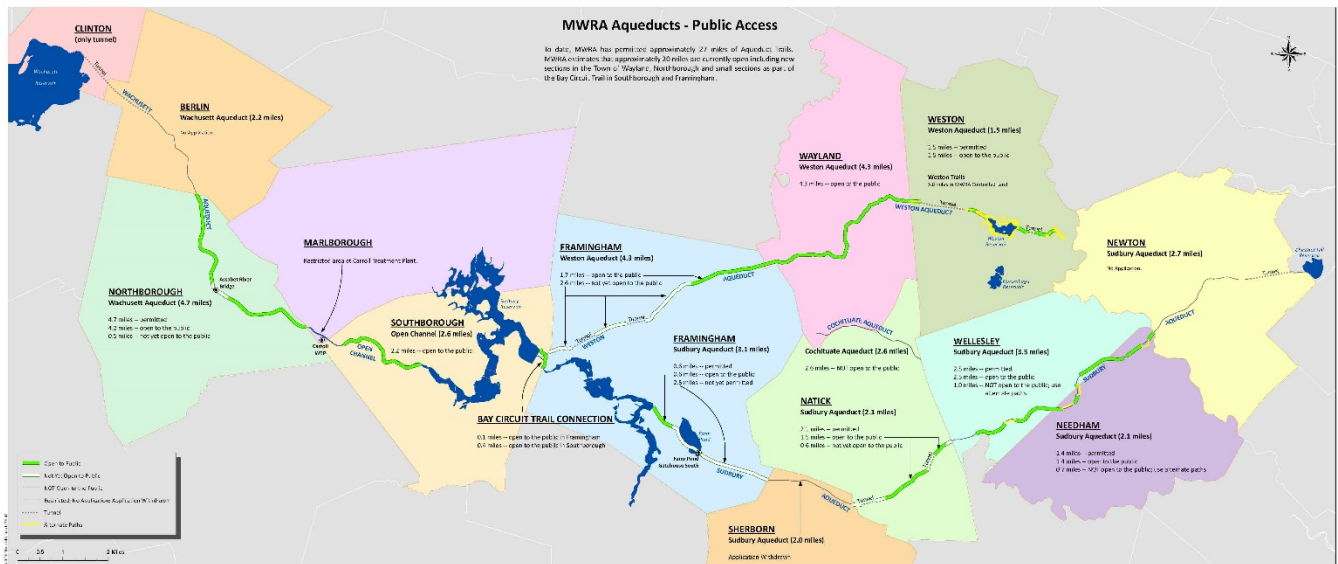
Framingham: 4.3 miles permitted, of which 3.0 miles opened to the public
Weston^[1]: 1.5 miles opened to the public and 500' alternative trail opened on private Pine Brook Country Club property to link public trail
Wayland: 4.3 miles opened to the public

Sudbury Aqueduct

Framingham: .6 miles open to the public
Natick: 2.1 miles permitted, of which 1.5 miles opened to the public
Wellesley: 2.5 miles opened to the public
Needham: 1.4 opened to the public and an additional .5-mile trail opened on private Olin/Babson College property to link public trail
Newton: .3 miles open to the public

Cochituate Aqueduct

Natick: 2.6 miles permitted (0 miles opened to the public)



^[1] Approximately 3.3 miles of additional trails were authorized surrounding the Loring Road Storage Tank and Weston Reservoir as part of previous MWRA commitments included in Memorandum of Agreements with the Town of Weston.

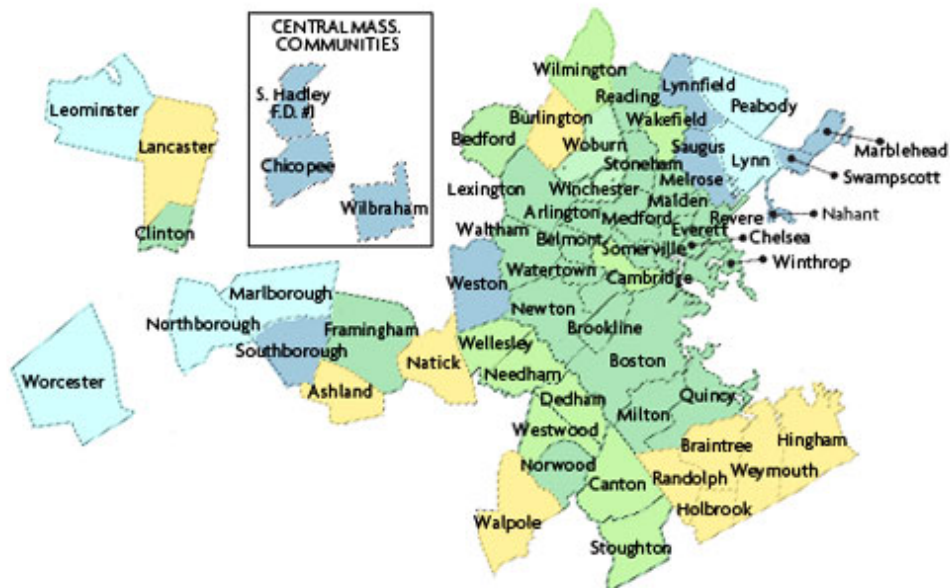
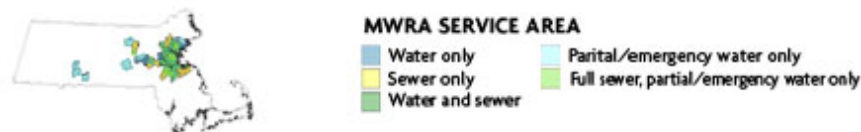
- The Annual Water Quality Report was mailed out to all households in MWRA water service communities in June in accordance with the EPA mandate.
- Staff have continued to provide monthly updates on construction projects on MWRA’s website.
- The School Education staff continues to conduct daily classroom visits within the MWRA service area to educate elementary school children on the importance of water and sewer infrastructure on their daily lives. The theme for the FY2021 annual poster and essay contest is “Water is Essential” and focuses on MWRA’s efforts to provide critical services during the pandemic. This program provides an important opportunity for the students, teachers and parents to learn together about MWRA’s mission.

Budget Highlights:

The FY22 Budget is \$1.2 million, an increase of \$105,000 or 9.4%, as compared to the FY21 Budget.

- \$1.1 million for **Wages and Salaries**, an increase of \$104,000 or 10.1%, as compared to the FY21 Budget primarily for wage increases associated with collective bargaining agreements. The FY22 Proposed Budget includes funding for 11.9 FTEs.

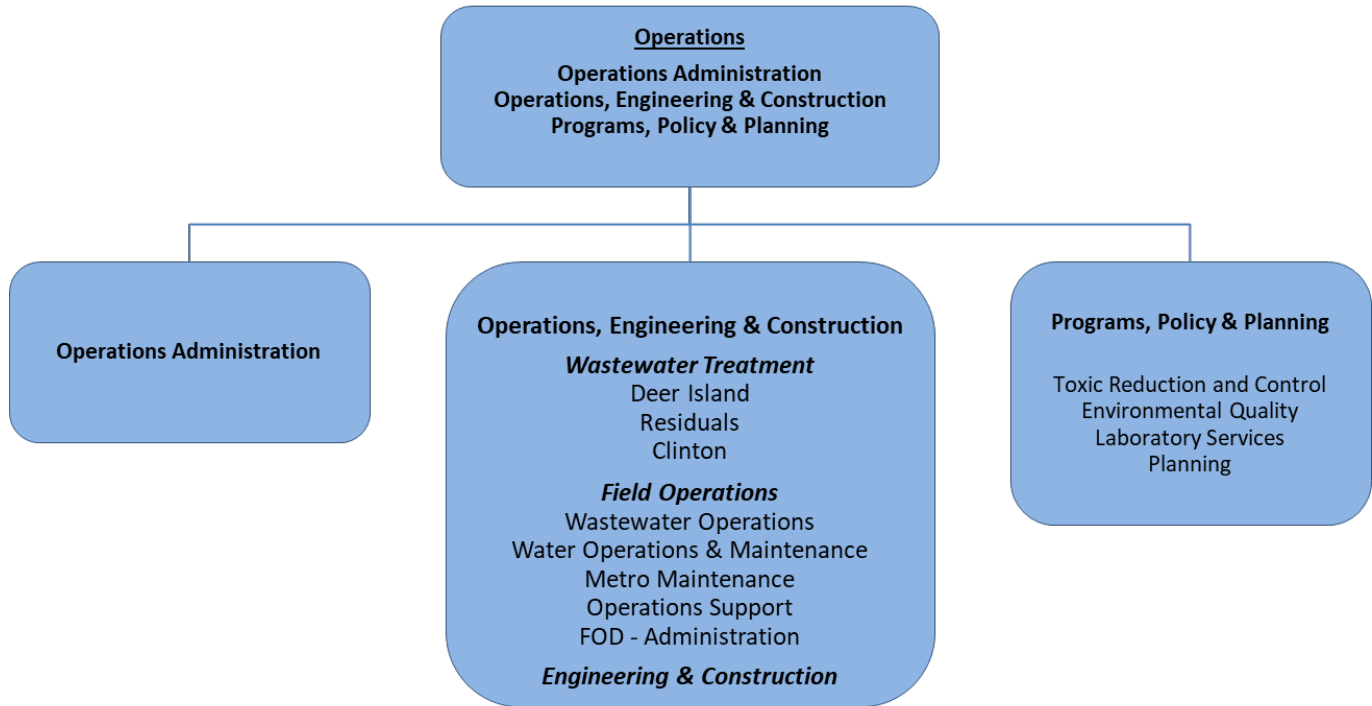
PUBLIC AFFAIRS DEPARTMENT	FY21 FTEs	FY22 FTEs
PUBLIC AFFAIRS	11.9	11.9
TOTAL	11.9	11.9





Operations Division
Budget

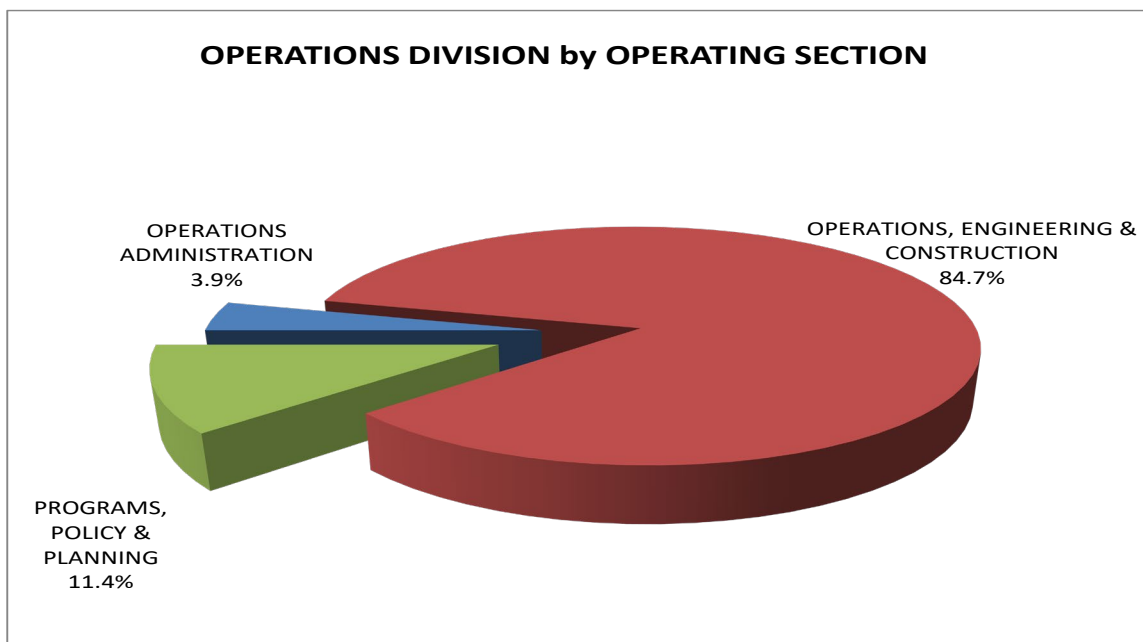
OPERATIONS DIVISION



The **Operations Division** provides MWRA’s wastewater and water system services including operations, maintenance, and treatment; environmental monitoring and laboratory testing and analyses; and engineering, construction, planning, and administration. MWRA’s Chief Operating Officer (COO) leads this division.

FY22 Final Current Expense Budget						
OPERATIONS DIVISION						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 80,832,503	\$ 85,822,647	\$ 88,609,420	\$ 91,719,752	\$ 3,110,332	3.5%
OVERTIME	5,111,941	4,357,092	4,886,114	5,023,499	137,385	2.8%
FRINGE BENEFITS	124,755	101,877	114,560	118,396	3,836	3.3%
CHEMICALS	10,891,948	10,998,339	12,091,255	12,202,286	111,031	0.9%
UTILITIES	24,344,315	23,064,622	24,093,540	24,651,322	557,782	2.3%
MAINTENANCE	25,656,188	24,662,379	27,335,720	26,281,423	(1,054,297)	-3.9%
TRAINING & MEETINGS	325,115	188,787	200,600	200,600	-	0.0%
PROFESSIONAL SERVICES	2,545,665	2,399,789	2,584,683	2,874,935	290,252	11.2%
OTHER MATERIALS	4,628,181	4,367,458	5,095,950	4,826,810	(269,140)	-5.3%
OTHER SERVICES	19,767,832	20,459,761	20,416,753	20,452,126	35,373	0.2%
TOTAL	\$ 174,228,443	\$ 176,422,751	\$ 185,428,595	\$ 188,351,149	\$ 2,922,553	1.6%

The Operations Division is composed of the Operations Administration Department and four operating sections, led by the Deputy Chief Operating Officer (DCOO), Chief Engineer, Director of Wastewater and Director of Water. In addition to managing the operating sections, the managers provide support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting and public constituency matters.



The **Operations Administration Department** provides division-level oversight and general management support in the following areas: administration, personnel, finance, contract administration, comprehensive energy planning and management, regulatory affairs and environmental management, and general management. The Operations Administration Department budget represents 3.9% of the Operations Division budget and includes funds for MWRA vehicle purchases and division-wide professional memberships.

The Department's budget also covers the Tunnel Redundancy Program that oversees and manages the upcoming multi-decade \$1.4 billion water system Tunnel Redundancy Program, expected to be active from FY18 through FY42. Given the complexity of the project, the group is independent of existing engineering and construction departments and reports directly to the Executive Director. However, the department's CEB is included within the Operations Division budget to allow for sufficient administrative support.

The **Programs, Policy & Planning Section** is composed of the Toxic Reduction and Control, Environmental Quality, Laboratory Services, and Planning departments. In total, the budgets for these departments represent 11.4% of the Operations Division's budget. Brief descriptions of the departments in this section are as follows:

- The **Toxic Reduction and Control (TRAC) Department** operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA's Environmental Protection Agency (EPA-approved) Industrial Pretreatment Program and oversees implementation of MWRA's 8-M Permits processes.

- The **Environmental Quality Department (EnQual)** has two units: EnQual-Water and EnQual-Wastewater. EnQual-Water manages compliance with the reporting requirements of the MassDEP Drinking Water Regulations, as well as conducts and oversees the drinking water quality-monitoring program. EnQual-Wastewater manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permits. This unit analyzes environmental data and prepares reports on the quality of sewage influent and effluent and the water quality of Boston Harbor and its tributary rivers and Massachusetts Bay.
- The **Laboratory Services Department** supports various client groups in the Operations Division, the Massachusetts Department of Conservation and Recreation (DCR), and the MWRA member communities; providing field sampling, laboratory testing, and reporting services. Most of the testing is required to meet the strict guidelines of regulatory programs and permits including the Safe Drinking Water Act (SDWA) and MWRA's NPDES permits.
- The **Planning Department** provides planning, advocacy, and decision support services on policy, public health, regulatory, and operations matters regarding MWRA's potable water and wastewater systems.

The **Operations, Engineering & Construction Section** is composed of the Wastewater Treatment, Field Operations, and Engineering & Construction departments. In total, the budgets for these departments represent 84.7% of the Operations Division's budget. Brief descriptions of the departments in this section are as follows:

- The **Wastewater Treatment Department** operates and maintains the Deer Island Treatment Plant (DITP), Clinton Wastewater Treatment Plant, and Residuals Processing Facility (pelletization plant) in Quincy.
- The **Field Operations Department (FOD)** manages the following functions: wastewater pretreatment, wastewater collection and transport, water distribution, and water treatment including the Carroll Water Treatment Plant (CWTP). This department is responsible for operating, maintaining, and metering both the water and wastewater systems.
- The **Engineering and Construction Department** supports the maintenance, repair, and rehabilitation of the wastewater and water systems by providing in-house engineering, drafting, surveying, consultant management, construction management, and other technical assistance. The department is also responsible for implementation and monitoring of the Combined Sewer Overflow (CSO) plan.

FY22 Final Current Expense Budget						
OPERATIONS DIVISION by OPERATING SECTION						
OPERATING SECTION	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
OPERATIONS ADMINISTRATION	\$ 5,759,957	\$ 6,121,047	\$ 6,997,612	\$ 7,370,924	\$ 373,312	5.3%
OPERATIONS, ENGINEERING & CONSTRUCTION	148,586,134	149,421,756	157,621,361	159,458,478	1,837,117	1.2%
PROGRAMS, POLICY & PLANNING	19,882,352	20,879,948	20,809,623	21,521,747	712,124	3.4%
TOTAL	\$ 174,228,443	\$ 176,422,751	\$ 185,428,596	\$ 188,351,149	\$ 2,922,553	1.6%

FY22 Goals and Initiatives:

The Operations Division core function is to plan, develop, implement, and operate efficient, reliable, and economical water treatment/delivery and wastewater transport/treatment systems in an environmentally sound manner. Accordingly, the Division takes the lead on the following MWRA goals included in the FY21-FY25 Five-Year Strategic Business Plan:

I. Drinking Water Quality and System Performance

- **Goal #1- Compliance with Regulatory Requirements and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations. Special initiatives include:
 - Identify and evaluate the impact of different treatment strategies and scenarios on the mitigation of transportation related contaminants into the source water.
 - Evaluate new water quality monitoring equipment and testing techniques to monitor and maintain high quality water all the way to the ends of the community systems.
 - Participate with other nationwide water utilities in Water Research Foundation studies, specifically research opportunities pertaining to algae monitoring and mitigation strategies in source water.
 - Collaborate with CVA communities to modify chlorine-dosing strategy to minimize the formation of disinfection byproducts.
 - Increase water quality monitoring at the Quabbin Reservoir by the installation of a seasonal water quality-profiling buoy. Implement routine and automatic data transfers to ensure data is proactively reviewed and managed.
 - Evaluate data from UCMR4 2018-2020 monitoring and compare against nationwide occurrence data.
 - Advocate for responsible and reasonable new and revised state and federal drinking water regulations, and provide training and technical support to communities for new regulations.

- **Goal #2 – Water Quality Public Communications:** Continue to effectively report and communicate water quality information to our customers and public officials. Special initiatives include:
 - Regulatory communicate routine TCR monitoring data to Water Departments and assist with water quality sampling or training, as needed.
 - Continue to strengthen planning and emergency response documents for Boil Water Order (BWO) events. Work with departments to create, disseminate and train staff on materials that can be used during a BWO event or at a public information call center.

- **Goal #3 – Technical Assistance for Water Communities:** Assist member communities to improve local water distribution systems through ongoing financial, technical and operational support programs to maximize long-term water quality benefits. Special initiatives include:
 - Enhance outreach and technical assistance within the existing Lead Service Line Replacement program to support communities in response to EPA’s revisions to the Lead and Copper Rule.
 - Develop the capability to evaluate potential changes to corrosion control treatment using a pipe loop system constructed using “harvested” lead service lines.

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system. Initiatives include:
 - Continue to carry out the Pretreatment Program to protect receiving water quality, maximize the beneficial reuse of wastewater residuals, and protect workers and MWRA’s wastewater treatment plants and receiving waters.
 - Continue to monitor DITP processes to ensure high quality treated effluent, optimizing plant performance to ensure all applicable NPDES permit limits continue to be attained.
 - Operate the newly installed enhanced phosphorus control systems at the Clinton Wastewater Treatment Plant to ensure compliance with its new NPDES permit.

- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality. Special initiatives include:
 - Develop strategies to address emerging contaminants, such as PFAS, micro plastics, etc. as they are identified, and frame an approach to respond to the public’s concerns about these contaminants.
 - Assess thresholds for annual nitrogen loading, including evaluating the existing thresholds and the environmental impact of nitrogen, as well as whether these thresholds developed over 20 years ago are valid or should be modified.
 - Review new waste treatment technologies as they arise to continuously improve treatment performance and efficiency.
 - Continue to work with researchers investigating the use of wastewater as an indicator of the presence of the Covid-19 virus.

- **Goal #6 – Wastewater Infrastructure:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects. Initiatives include:
 - Continue to design and implement facility rehabilitation projects for various pump stations, headworks, CSO facilities and the Deer Island Treatment Plant.
 - Continue to implement an ongoing program to review, prioritize and accelerate interceptor renewal projects.

- **Goal #7 – CSO Plan Compliance:** Complete all CSO milestones by 2021 and demonstrate that the CSO Plan meets its performance objectives. Special initiatives include:
 - Conduct an evaluation of the CSO treatment processes to determine potential opportunities to better meet permit limits. Confirm or reassess treatment processes as part of CSO facility rehabilitation projects.
 - Implement a subscriber-based CSO Public Notification Program. Provide notification of a CSO overflow within 4 hours of start of the discharge.
 - Implement near real-time SSO reporting system to provide public information and ensure reporting timeframes meet regulatory requirements.

- **Goal #8 – Technical Assistance for Wastewater Communities:** Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs. Initiatives include:

- Provide technical and operational support including TV inspections, fieldwork assistance, or other targeted assistance, as needed.
- Promote and manage MWRA's Inflow/Infiltration Local Financial Assistance Program to facilitate reduced I/I in local community infrastructure.

III. Infrastructure Management and Resilience

- **Goal #9 – System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - The FY22 Capital Improvement Program forecasts \$208 million in spending in FY22, of which \$110 million supports Wastewater System Improvements and \$75 million supports Waterworks System Improvements.
 - For FY22, the FY22Final CIP includes 213 active contracts of which 75 are for design of Wastewater and Waterworks Systems Improvements and 54 are for construction, with projected spending of \$47.1 million for design and \$93.3 million for construction. In addition, there are 84 active other contracts with total spending of \$66.1 million.

Special initiatives include:

- Continue use of Condition Monitoring for all Water and Wastewater sites. Expand Condition Monitoring techniques to provide earlier indication of asset degradation.
 - Conduct an updated benchmarking analysis in order to identify gaps and sustain the goal of maximizing asset protection while potentially identifying new best practices in the industry.
 - Update the wastewater metering system and evaluate new technologies to ensure continued accurate flow accounting and to enhance its usefulness for operational and evaluation purposes by adding additional monitoring locations.
 - Continue to research and develop Key Performance Indicators (KPI) to compare our performance internally and against the industry.
 - Enhance and monitor water pipeline protection to maximize pipeline lifetime.
 - Expand integration between the MWRA's Authority-wide Enterprise Asset Management (EAM) system Maximo with Lawson (Infor), Process Information (PI) and Automated Vehicle Location (AVL) systems to expand the use of Predictive Management (PdM) tasks, increasing functionality, asset tracking and improved workflow to reduce equipment downtime and control budget spikes. Utilize updated MAXIMO to increase opportunities for paperless work.
 - Continue to upgrade and improve upon the Supervisory Control and Data Acquisition (SCADA) and Process Information and Controls System (PICS) hardware and software to meet the current industry standard and to address cyber security concerns.
- **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events and malicious acts that could affect the water and wastewater systems. Operations Division initiatives include:
 - Continue to improve and incorporate redundancy and operational flexibility within the water system to ensure uninterrupted service.
 - Design and implement projects including those that eliminate or mitigate single points of failure within MWRA's water transmission and distribution system.
 - Continue to train staff on various potential emergency scenarios and participate in broader Massachusetts Emergency Management Agency (MEMA) and other training exercises.
 - Complete the Preliminary Design and Environmental Impact Report for the Metropolitan Tunnel Redundancy Program and initiate final design.

- Update MWRA’s earthquake preparedness to bring our facilities up to current standards as they are rehabilitated.
- Move forward with Wastewater Facility Emergency Response Planning to identify potential measures to minimize disruptions from failures of facilities, including development of a comprehensive Emergency Response Plan for each facility.
- Create and implement a predetermined schedule of review for facility risk assessments.
- Participate in Lower Mystic Resiliency Planning as an abutter to the Lower Mystic.

VI. Environmental Sustainability

- **Goal #17 – Energy Optimization:** Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Self-generate ~ 28.4% of the Deer Island Treatment Plant’s (DITP) required power through optimization of power generation assets, including the wind turbines, Steam Turbine Generation (STG) back pressure system, photovoltaic panels, and Combustion Turbine Generators (CTGs).
 - Contribute ~ \$2.3 million in energy revenue to MWRA’s ratepayers through optimization of power generation assets and participation in energy revenue programs such as demand response, energy credits, power sales, and utility rebates. Also, avoid at least \$1.3 million in capacity charges through use of self-generation assets during peak load events.

Special initiatives include:

- Incorporate employee education on energy efficiency in MWRA training outlets, e.g. tool box talks.
 - Design new gas turbine combined heat and power equipment to take advantage of the higher power and thermal efficiencies of new equipment, maximizing the production of additional electric power for on-site use at Deer Island as well as cost savings while reducing maintenance spending on aging equipment.
 - Evaluate and implement where feasible combined heat and power technology in plant operations to improve energy efficiency (e.g. pellet plant, Clinton)
 - Continue to develop the battery storage projects and work with the utility and its contractor to optimize demand savings. Evaluate opportunities for future battery storage projects. Explore community solar opportunities that will stimulate large-scale remote solar installations and save money on our electric bills.
 - Expand our fleet of electric vehicles and charging stations.
 - Explore a new MWRA-wide building/plant information management system that includes a comprehensive energy management system.
- **Goal #18 – Climate Change Adaptation:** Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure. Initiatives include:
 - Continue to incorporate design modifications into facility renovations and maintenance activities to address sea level rise and storm surge.
 - Plan and install flood protection barriers at water and wastewater sites which fall below expected elevations of flood waters under condition of a FEMA 100 year storm plus 2 ½ feet to minimize damage and still provide service.

- **Goal #19 – Water System Expansion:** Advance reasonable water system expansion. Initiatives include:
 - Continue to provide assistance to communities seeking admission to the MWRA’s water system or seeking emergency withdrawals.
 - Work with prospective communities to inform them of the benefits of admission.

The strategic priorities and goals that apply to each department within the Operations Division are presented in departmental budget sections. For more information about MWRA’s Business Plan, please refer to the Business Plan section of the Transparency page on MWRA’s website at mwra.com.

FY21 Year-End Accomplishments:

For more information about this topic, please refer to the Performance Indicator section of the Transparency page on MWRA’s website at mwra.com.

I. Drinking Water Quality and System Performance

- Met water quality and treatment standards in the drinking water system during FY21.
 - MWRA’s algae monitoring season is complete. DCR continued to collect occasional algae samples on Wachusett Reservoir once ice-cover dissipated. Staff performed algal toxin and taste and/or odor compound sampling at treated water taps through November; this sampling coincided with UCMR4 community entry-point cyanotoxin monitoring. Results revealed no cyanotoxin detections during any routine or UCMR4 sampling events.
 - Completed contract with UMass Amherst, under an Interdepartmental Service Agreement, to investigate possible contamination from a railroad contamination event in Wachusett Reservoir.
 - Successfully procured and deployed a new profiling water quality monitoring buoy onto Quabbin Reservoir. Hand-cast and buoy sondes were also procured to provide parameter data throughout the water column. Staff facilitated inclusion of buoy data onto our buoy server and into OMMS and PI Processbook.
- Performed reservoir level management control at all metropolitan reservoirs to maintain normal operating levels.
- The Laboratory Services Department performed 115,000 tests (including data entry of field tests) related to drinking water quality including the annual Lead and Copper Rule testing.
- The Laboratory Services Department performed numerous tests in support of community efforts to identify and reduce lead service lines in schools.
- Water Loan Program – Through June 2021, distributed \$30.2 million in Local Water System Assistance Program interest-free loans, plus an additional \$8.4 million under the Lead Service Line Replacement Loan Program in FY21. In total, MWRA has distributed \$491.6 million in loans to fund 481 local projects with participation from 43 of the 47 eligible water communities. Since 1998, MWRA has replaced or cleaned and lined 578 miles of local water main (about 8% of the regional system) via projects funded by MWRA’s financial assistance. In addition, MWRA has loaned \$25.1 million via 27 distributions to 13 communities for Lead Water Service Line Replacement projects.

II. Wastewater Quality and System Performance

- Deer Island anticipates receiving the Platinum Peak Performance Award for Calendar year 2020 from the National Association of Clean Water Agencies (NACWA) for the 14th continuous year.

The award recognizes facilities for outstanding compliance of their NPDES permit limits. DITP has had no permit violations for over 14 years.

- Deer Island met secondary permit limits at all times, treating on average 99% of flows with full secondary treatment. More detailed information about DITP's NPDES Permit compliance is available on the Transparency/Performance Indicator section of MWRA's website.
- MWRA formally proposed cost-saving reductions in sediment and flounder monitoring to regulatory agencies in November 2020 that regulators approved in January 2021.
- Eversource completed the first annual maintenance on the new 115 kVA cross-harbor marine power cable to Deer Island during October 2020. DITP operated on CTG power-only for 4 days continuously. During this work, DITP experienced an unanticipated power outage when CTG 1A tripped due to a fuel valve failure which resulted in a minor blending event of 0.63 MGal out of a daily flow of 243.4 MGal. All flows received disinfection and met numerical effluent standards.
- Processed 95.9 average tons per day of sludge at the Pelletization Plant and disposed of 5,087 tons of grit and screenings through a contracted vendor.
- Year to date through February, the TRAC Department completed the following Environmental Protection Agency (EPA)-required work for significant industrial users (SIUs): 198 inspections, 166 monitoring events, and 384 sampling of connections. TRAC also issued or renewed 295 permits to SIUs and non-SIUs.
- TRAC issued the first set of annual invoices to approximately 700 permitted dental facilities. March marks the start of the second year of the Dental Discharges permit.
- The Department of Laboratory Services performed 128,000 tests (including data entry of field tests) for wastewater quality including the MA Bay water column testing for the Harbor and Outfall Monitoring program.
- Implemented and improved MWRA's CSO notification web page and database to meet the new rapid CSO notification requirements in the CSO Variances.
- Met all NPDES reporting requirements including routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order. Missed no reporting deadlines, even with the impacts of COVID-19.
- EnQual carried out permit-required environmental monitoring of Boston Harbor and Massachusetts Bay water column, sediments, fish and shellfish and CSO receiving water quality. The department finalized six technical reports, put monitoring results on its website, and sent reports to government regulators, the Outfall Monitoring Science Advisory Panel and interested members of the public.
- **Sewer Grant/Loan Program** – Through June 2021, distributed \$37.4 million in grants and interest-free loans to member sewer communities for Infiltration/Inflow reduction and sewer system rehabilitation projects in FY21. In total, MWRA has distributed \$478.3million in grants and loans to fund 629 local projects with participation from all 43-member sewer communities.

III. Infrastructure Management and Résilience

Maintenance

- For FY21, the Operations Division spent \$25.1 million on maintenance of which \$9.7 million was for materials and \$15.4 million was for services.
- Procured and implemented numerous contracts for maintenance services, including the following:
 - Diver Assisted Suction Harvesting of Invasive Plants at Wachusett Reservoir Lower Basin and CovesCommunity
 - Leak Detection Survey Services
 - Groundskeeping services for Western Operations facilities

- Hydraulic equipment services
 - Crane maintenance services
 - Wachusett Reservoir North and South Dike instrumentation services
 - DITP Thermal and Hydro Plant maintenance
 - Instrumentation maintenance and calibration
- Procured and implemented numerous contracts for maintenance projects including:
 - DITP Gas Protection System Replacement Phase I
 - DITP Tafts and Shirley Intersection Improvements
 - DITP Chemical Tank Relining and Pipe Replacement
- DITP - Completed numerous maintenance projects including the following representative work:
 - Painting and coating contract which painted Digester overflow boxes, all primary scum wells, and six carbon absorbers in our odor control facilities.
 - Fabricated in house and installed two large chutes in stainless steel and all supports. These chutes are on the pug mill process in Residuals.
 - Purchased and installed one 24'' and one 30'' W3 Strainers, which replace existing units which were from start-up of plant.
 - Chiller upgrade work which included high pressure cleaning, replace some fiberglass covers, and seal the sump area which had a major leak.
 - Replaced Digester Mixer which is critical to the proper operation of the Digester. It provides the driving force for mixing the digester's contents and assists in maintaining a uniform temperature within the sludge mass.
- **Clinton Wastewater Treatment Plant** - Completed numerous maintenance projects at the including the following representative work:
 - Maintenance staff rebuilt thickened sludge transfer pumps #1 and #3.
 - Maintenance staff reinstalled the #2 grit screw and installed new safety chain on same grit tank.
 - Maintenance staff replaced doctor blades on belt filter press #1. They also re-piped the polymer system that feeds the belt filter press.
 - Operations staff rebuilt #1 and #2 polymer pumps that feed the disk filters.
 - Completed the paintings and coatings contract.
- **Water System** - Completed numerous maintenance projects including the following representative work:
 - Completed the B-side of the 2020/2021 CWTP half plant maintenance.
 - Operated Lonergan Intake to divert water from Ware River to Quabbin reservoir, transferring 65 million gallons of water in one day.
 - Performed PRV maintenance at Meters 93, 100, 106, 126, 157 & 171, Section 28, Arlington Covered Reservoir, Deer Island Tank and Spot Pond Storage Tank.
 - Performed leak detection performed on 10.5 miles of MWRA water main and community assistance was provided to Arlington, Malden, Medford, Melrose, Newton, Revere, Somerville and Swampscott.
 - In water system through June 2021, exercised 1,185 and replaced 21 mainline valves; exercised 751 and replaced ten blow-off valves.

- **Wastewater System** - Completed numerous maintenance projects including the following representative work:
 - Completed two temporary shutdowns of the odor control system at Nut Island to allow the contractor to tie in new ductwork.
 - Replaced incline gearbox for Channel 2 at Ward Street Headworks.
 - In the wastewater system through June 2021, inspected 23.0 miles and cleaned 30.7 miles of MWRA pipeline. Inspected 1,025 structures and rehabilitated 64 manholes. Also inspected 23 and cleaned six inverted siphon barrels.
- **Energy Conservation** - Completed the battery storage projects at Brattle Court and Chelsea Maintenance facility.

Capital Improvements

- Capital spending for FY21 totaled \$148 million broken out by category as follows: \$99 million for Wastewater System projects, \$46 million for Water System projects, and \$4 million for Business and Operations Support projects.
- Issued Notices to Proceed for numerous contracts including the following:
 - Wastewater System:
 - Dorchester Interceptor Sewer Construction
 - Hayes Pump Station Rehabilitation Design
 - DITP Asset Protection Program including the following:
 - Miscellaneous VFD Replacements
 - East Seawall Design/ESDC/REI
 - South System Pump Station VFD Replacement Design/ESDC/REI
 - MCC & Switchgear Replacement Construction
 - Gas Protection System Replacement Phase 2
 - Water System:
 - Steel Water Tank Painting & Improvements Design/ESDC
 - Weston Aqueduct Sluice Gates Construction
 - Quabbin Maintenance Facility Design/CA/RI
- Substantially completed numerous design and construction phases including the following:
 - Wastewater System:
 - Chelsea Creek Upgrades Construction
 - Charles River Valley Sewer Sections 191 & 192 Rehab Construction
 - Deer Island Radio Repeater System Upgrade Phase 1
 - Gravity Thickener Rehabilitation Construction
 - Winthrop Terminal Facility Variable Frequency Drive Replacement Construction
 - Water System:
 - Northern Intermediate High Section 89 & 29 Redundancy Design CA/RI
 - Technical Assistance Consulting Services John Carroll Water Treatment Plant
 - Cottage Farm & Gillis Flat Roof Replacement Construction

For more information about projects in the Capital Improvement Program, please refer to the Fiscal Year 2022 Capital Improvement Program document located on the Budget page of the MWRA's website at mwra.com.

Emergency Preparedness

- Assisted with implementation of MWRA's Pandemic Emergency Action Plan to meet requirements of America's Water Infrastructure Act (AWIA). Issued regular internal reports on the status and prevailing guidance regarding the COVID19 pandemic in Massachusetts. Also worked with the current vendor, Biobat, to monitor and report the presence of the virus in MWRA's wastewater.
- Completed and certified compliance with the Emergency Response Planning requirements of America's Water Infrastructure Act. Initiated major staff training exercise related to potential railroad spills at Wachusett Reservoir.
- In July and August, staff presented at MWRA's Community Emergency Response Planning Training on building flushing after lengthy shutdowns due to COVID19 and proper coliform sampling technique. Provided a virtual presentation to the Chelsea sampling staff on proper coliform sampling technique and chlorine residual measurement.
- Coordinated the design, procurement and installation training for flood protection equipment to be installed at key MWRA wastewater facilities. Participated in Metro Mayors' Climate Change Coalition Task Force and continued to monitor new research related to the effects of climate change in the service area. Co-chaired and participated in multi-agency Mystic River Regional Infrastructure exercise.

VI. Environmental Sustainability

- Received a total of \$754,000 in revenue for energy generated at numerous facilities including hydroelectric from Oakdale Station and Cosgrove Station; wind from Charlestown Pump Station; and solar from Carroll Water Treatment Plant.
- Continue to leverage MWRA's self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.3 million in revenue year to date in FY21. MWRA also avoided more than \$1.4 million in capacity charges through operation of self-generation assets during peak load events as called by the regional transmission organization (ISO New England).
- Deer Island self-generated 26.8% of the plant's total required power FY21.
- Continued to operate and optimize the phosphorous treatment system and natural gas lines at the Clinton Wastewater Treatment Plant; third full year of operation for both.

Budget Highlights:

The FY22 Budget is \$188.4 million which is \$2.9 million, or 1.6%, more than the FY21 Budget.

- The FY22 Budget of \$91.7 million for **Wages and Salaries** is an increase of \$3.1 million or 3.5% from the FY21 Budget primarily due to wage increases associated with collective bargaining agreements and three additional positions in the Tunnel Redundancy Program. The FY22 Budget funds 934 full-time equivalent positions for the Operations Division departments, including Tunnel Redundancy staffing.

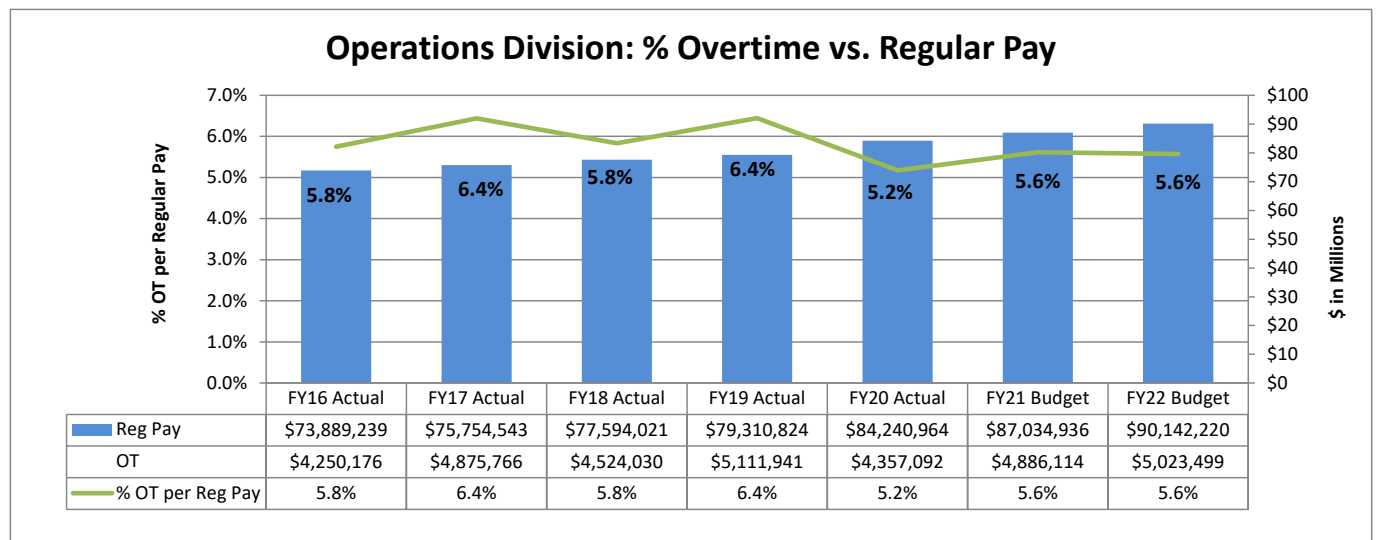
FTEs		
Operations by Department		
DEPARTMENT	FY21 FTEs	FY22 FTEs
OPERATIONS ADMINISTRATION*	41.8	40.6
OPERATIONS, ENGINEERING & CONSTRUCTION PROGRAMS, POLICY & PLANNING	729.1	734.1
TOTAL	930.8	934.0

*includes Tunnel Redundancy

Staffing for the water system Tunnel Redundancy Program increases from 13 positions in the FY21 Budget to 16 in the FY22 Budget. The MWRA currently plans to add FTEs each year over the next few fiscal years to support this project.

The Wages and Salaries line also includes \$831,000 for Stand-by Pay to ensure staffing availability and response during emergencies, \$147,000 for Interns, and \$93,000 for Temporary Employees to assist with lead testing in schools.

- The FY22 Budget of \$5.0 million for **Overtime** is a net increase of \$137,000 or 2.8% from the FY21 Budget primarily due to collective-bargaining wage increases and resizing estimates based on trends. The budget includes \$2.2 million for emergencies and storms; \$1.4 million for planned work primarily required on off-shifts and during periods of lower flows; and \$1.2 million for routine coverage of operations per prevailing collective bargaining agreements.



- The FY22 Budget of \$12.2 million for Chemicals is an increase of \$111,000 or 0.9% over the FY21 Budget, due to the net effect of price and usage adjustments based on recent usage trends, contractual price changes, and market projections. The FY22 Budget includes \$6.3 million for disinfection and treatment in the water system and \$5.9 million for disinfection, treatment, and odor control in the wastewater system. The budget includes \$3.5 million for soda ash, \$3.2 million for sodium hypochlorite,

\$1.9 million for ferric chloride, \$677,000 for hydrogen peroxide, \$410,000 for activated carbon, \$504,000 for polymer, \$464,000 for liquid oxygen, \$335,000 for carbon dioxide, \$330,000 for hydrofluosilicic acid, \$319,000 for sodium bisulfite, \$166,000 for aqua ammonia, and \$139,000 for sodium hydroxide.

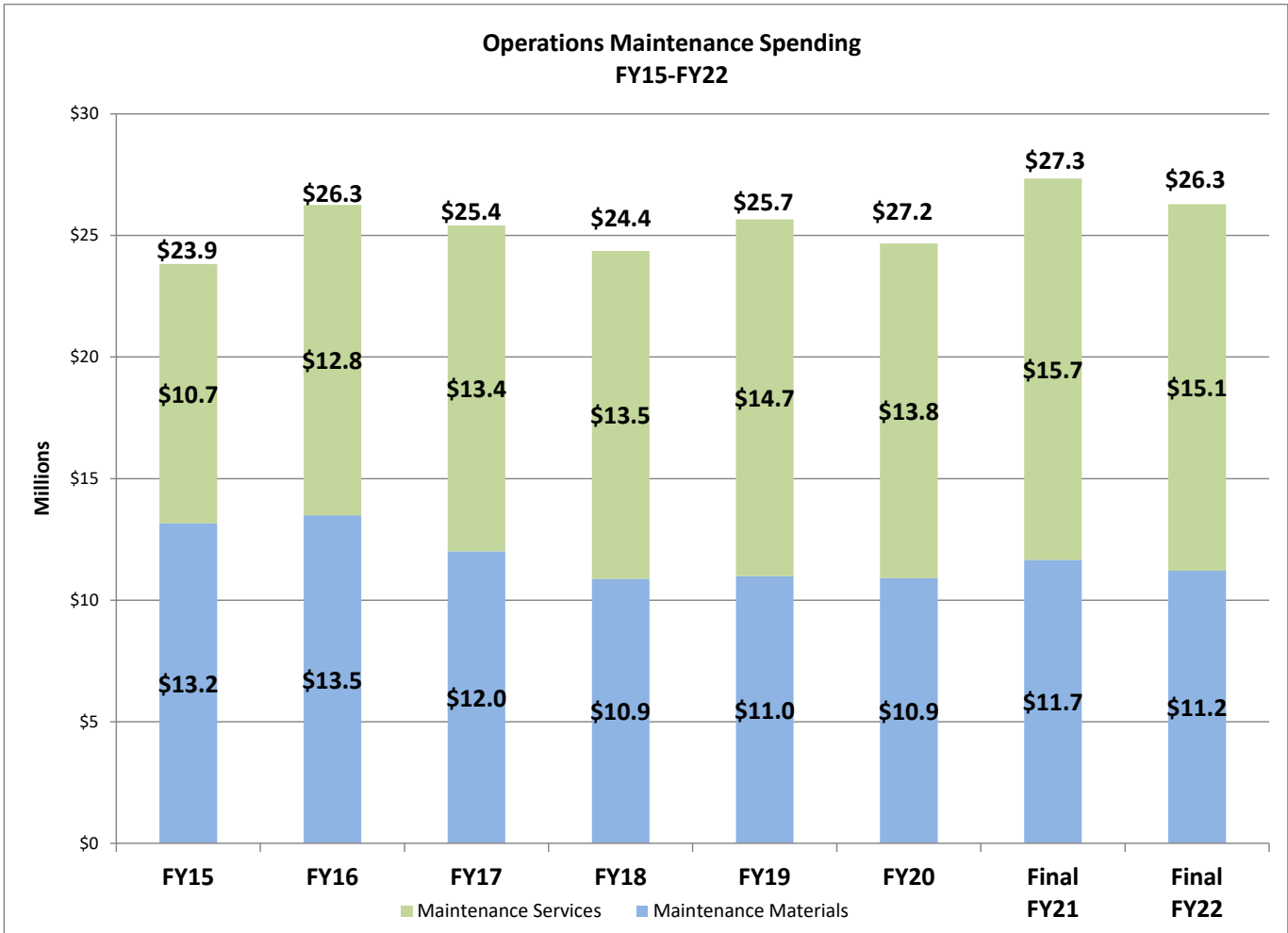
- The FY22 Budget of \$24.7 million for **Utilities** includes \$18.7 million for electricity, \$2.6 million for diesel fuel, \$2.6 million for water, \$704,000 for natural gas, and \$97,000 for propane and other utilities. The utility budget is \$13.8 million for the Deer Island Treatment Plant, \$5.0 million for Wastewater Operations, \$4.9 million for Water Operations, \$515,000 for the Chelsea office and maintenance facilities, and \$311,000 for the Clinton Wastewater Treatment Plant. The utilities budget is \$558,000 or 2.3% more than the FY21 budget, primarily due to electricity price under Deer Island's new electricity contract and higher transmission and distribution charges.



- The FY22 Budget for **Maintenance** is \$26.3 million, a net decrease of \$1.1 million or 3.9% from the FY21 Budget primarily due to changes in project priorities from year to year. The FY22 Budget includes \$15.1 million for services and \$11.2 million for materials. By maintenance area, the largest categories of spending for materials and services include \$10.8 million for plant and machinery; \$5.5 million for building and grounds; \$3.3 million for specialized equipment; \$3.1 million for electrical; \$1.8 million for pipeline; and \$1.3 million for HVAC systems. The budget also funds special initiatives such as energy conservation projects at DITP and in the Field Operations Department facilities; invasive plant control in the water reservoirs; painting and coating upkeep at the wastewater treatment plants; and easement clearing on MWRA's aqueducts. As shown below, the range of maintenance spending has been fairly consistent over the last few fiscal years.



Norumbega Covered Storage Tank and Norumbega Open Reservoir (now a backup supply)

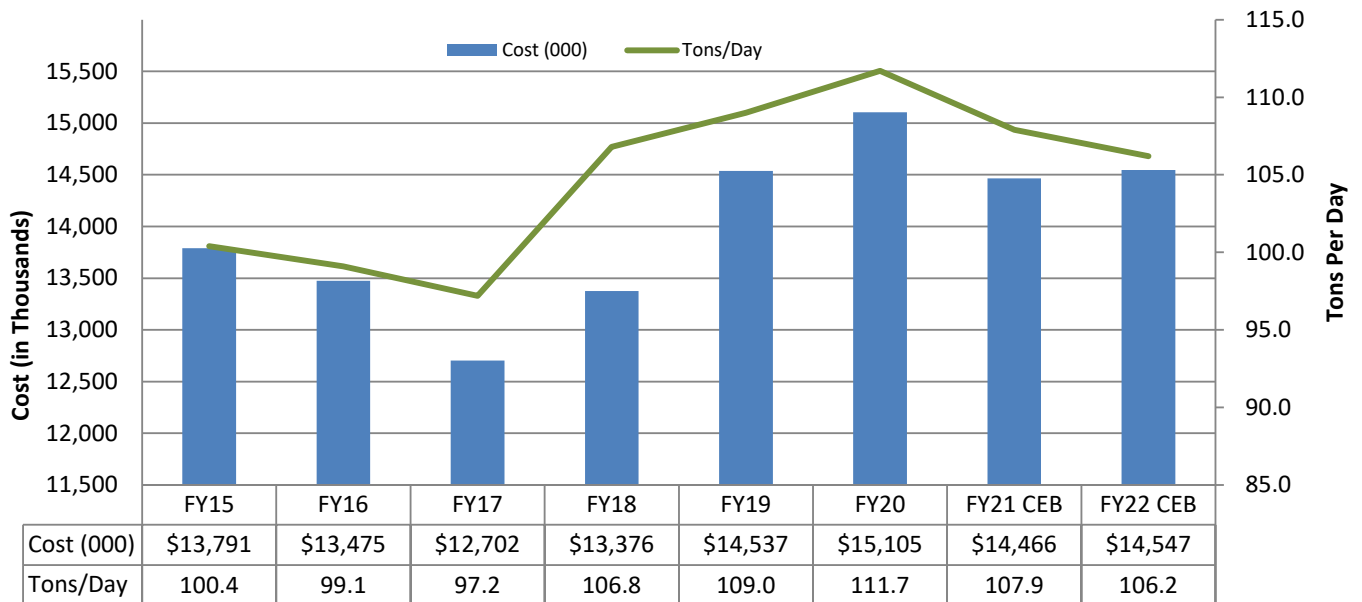


- The FY22 Budget of \$201,000 for **Training and Meetings** covers specialized training, attendance at industry conferences, and site visits as required to vendors and other plants. It specifically funds training for topics such as spill response and boom deployment; spill control and prevention; trenchless technology; cyber security; and electrical voltage. The budget also continues to include funds to support workforce development efforts as part of MWRA’s succession planning initiative. The FY22 Budget is level funded with the FY21 Budget due to the expectation that in-person trainings and travel will continue to be impacted by COVID19 safety protocols.
- The FY22 Budget for **Professional Services** is \$2.9 million, including \$1.9 million for lab and testing services, \$625,000 for engineering services, and \$375,000 for all other services. Major items in the budget include \$1.3 million for Harbor and Outfall Monitoring; \$344,000 for COVID19 testing in wastewater; \$371,000 for as-needed engineering services to support CEB-funded projects; \$199,000 for outsourced testing by the Central Laboratory; \$195,000 for Dam Asset Maintenance Plan development; \$150,000 for site remediation inspection services; \$130,000 for services associated with SCADA system; \$100,000 for continuation of a research study on controlling algae and cyanobacteria at Wachusett and Quabbin reservoirs.; \$86,000 for a comprehensive reservoir-wide plant survey in the water system; and \$55,000 for invasive species control services in the reservoirs. The FY22 Budget is

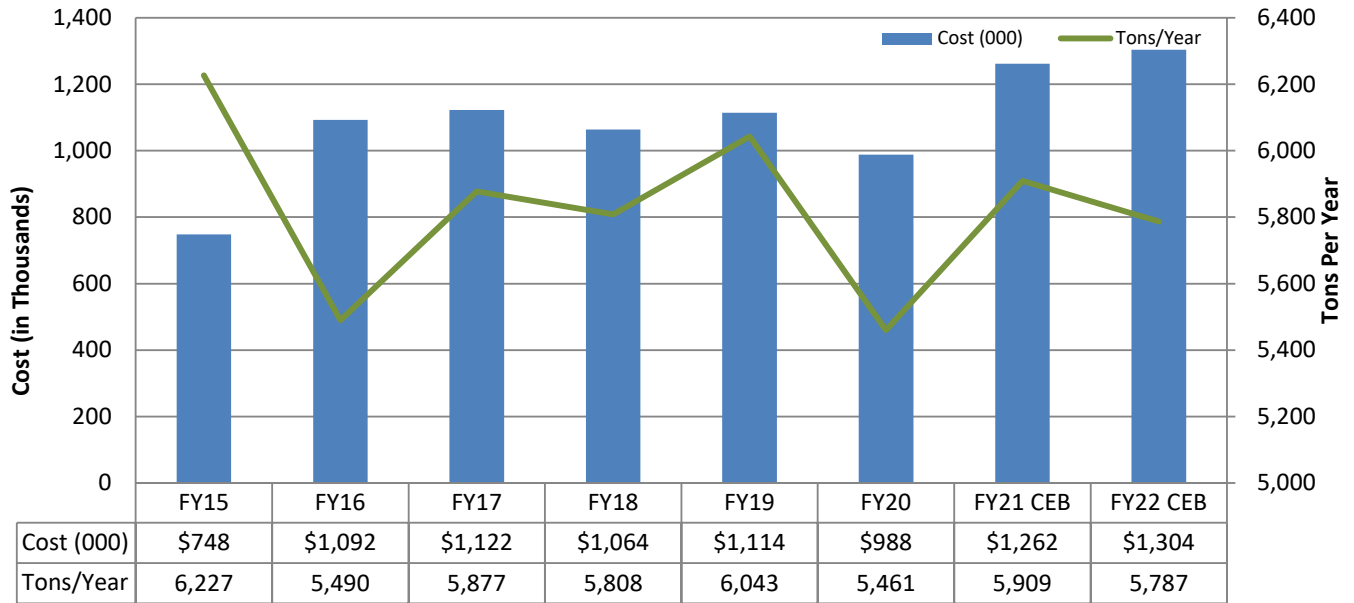
\$290,000 or 11.2% more than the FY21 Budget primarily due to the inclusion of funding for COVID19 testing and the reassessment of needs for various services.

- The FY22 Budget of \$4.8 million for **Other Materials** includes \$1.5 million for Vehicle Replacements; \$1.1 million for Lab and Testing Supplies; \$238,000 for Vehicle Expenses (gas, mileage reimbursement); \$387,000 for Health and Safety Supplies; \$484,000 for Equipment and Furniture; \$427,000 for Work Clothes; and \$239,000 for other materials including gravel for the Clinton landfill. The decrease of \$269,000 or 5.3% from the FY21 Budget is primarily due a \$160,000 decrease for gravel related to the work toward the closure of cell one of the Clinton landfill, which was done during FY21. In addition, there was a \$140,000 decrease for equipment furniture based on anticipated needs for FY22.
- The FY22 Budget for **Other Services** is \$20.5 million, including \$14.5 million for sludge pelletization; \$2.1 million for building space leases and rentals (including the Chelsea office facility); \$1.3 million for grit and screenings removal and disposal; \$671,000 for telecommunications services; \$643,000 for dues, memberships, and subscriptions; \$448,000 for police details; and \$273,000 for other services. The FY22 Budget increase of \$35,000 or 0.2% from the FY21 Budget is primarily due to the net effect of increases in the contractual prices for grit and screenings removal and sludge pelletization contracts, memberships and dues, offset by resizing of budgets for other items based on trends and needs.

Sludge



Grit & Screenings



Alewife Brook Wastewater Pump Station

Operations Administration funds the CEBs for two departments including Operations Administration and Tunnel Redundancy Program Management.

The **Operations Administration Department** includes the Office of the Chief Operating Officer (COO); the Office of the Deputy Chief Operating Officer (DCOO); and division-level support staff. The department’s primary goal is to oversee, manage, and implement MWRA policies and procedures pertaining to the following functions: administration, labor relations, finance, contract administration, comprehensive energy planning and management, regulatory affairs, environmental management, and general management.

The **Tunnel Redundancy Program Management Department** was created by MWRA’s Board of Directors on February 15, 2017 to oversee the planning, design, and construction of a northern and a southern deep rock tunnel that will provide redundancy for the Metropolitan Tunnel system (waterworks). This \$1.4 billion CIP-funded project will take more than a decade to complete. Also, given the complexity of the project, the group is independent of existing engineering and construction departments and reports directly to the Executive Director. However, the department’s CEB is included within the Operations Division budget to allow for sufficient administrative support.

**FY22 Final Current Expense Budget
OPERATIONS ADMINISTRATION**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 3,653,234	\$ 4,042,320	\$ 4,539,750	\$ 4,888,712	\$ 348,962	7.7%
OVERTIME	2,770	6,706	5,000	5,000	-	0.0%
FRINGE BENEFITS	70	0	360	360	-	0.0%
MAINTENANCE	-	66	-	-	-	-
TRAINING & MEETINGS	69,786	49,797	51,000	47,300	(3,700)	-7.3%
PROFESSIONAL SERVICES	-	10,000	1,002	161,002	160,000	15968.1%
OTHER MATERIALS	1,623,392	1,357,886	1,670,000	1,545,000	(125,000)	-7.5%
OTHER SERVICES	410,705	654,272	730,500	723,550	(6,950)	-1.0%
TOTAL	\$ 5,759,957	\$ 6,121,047	\$ 6,997,612	\$ 7,370,924	\$ 373,312	5.3%

**FY22 Final Current Expense Budget
OPERATIONS ADMINISTRATION by Programs**

PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
OPERATIONS ADMINISTRATION	\$ 5,153,428	\$ 5,191,136	\$ 5,529,914	\$ 5,442,999	\$ (86,915)	-1.6%
WATER REDUNDANCY PGR MGMT	606,529	929,911	1,467,698	1,927,925	460,227	31.4%
TOTAL	\$ 5,759,957	\$ 6,121,047	\$ 6,997,612	\$ 7,370,924	\$ 373,312	5.3%

FY22 Goals and Initiatives:

The Operations Administration Department’s purview and function supports all the goals of the Operations Division set forth in the department budgets in the Operations, Engineering & Construction section and the Program, Policy and Planning section.

Key FY22 initiatives include:

- **Tunnel Redundancy Program** – Plans for FY22 include hiring additional staff, raising awareness of the project in the engineering and construction communities, and developing detailed plans for all phases of implementation including procurement, design, engineering, and construction.
- **Energy** – Continue to refine and implement MWRA’s comprehensive energy management strategy, primarily with a focus on expanding solar energy sites and securing grant funding from relevant programs; increasing the use of electric vehicles in MWRA’s fleet; optimizing energy generation assets for ‘behind the meter’ use and revenue from power sales and market-based incentive programs; implementing MOUs with two utility companies for energy conservation projects at numerous facilities; and consolidating energy data management to support decision-making.
- **Regulatory** – Continue to advocate for MWRA during the regulatory review processes for key issues including implementation of the CSO Program assessment phase and development of the requirements for the new NPDES permit for the Deer Island Treatment Plant.
- **Organizational succession** – Continue to develop and implement succession plans to ensure efficient and effective organizational continuity as a significant portion of MWRA’s workforce retires in the next few years. Key aspects of this initiative include documenting institutional policies and practices; identifying and developing employees qualified for promotion into key positions; hiring additional qualified employees to ensure ‘depth of bench’ in staffing in critical functions; and in general, providing programs to the overall MWRA workforce for learning and development.

Budget Highlights:

The FY22 Budget is \$7.4 million, an increase of \$373,000 million or 5.3%, compared to the FY21 Final Budget.

- \$4.9 million for **Wages and Salaries**, an increase of \$349,000 or 7.7%, as compared to the FY21 Final Budget. The FY22 Budget supports 40.6 full-time equivalents (FTEs). That total includes 16 positions from the Tunnel Redundancy Management Unit as the program ramps up. The FY22 Budget also funds wage increases associated with collective bargaining agreements.
- \$47,000 for **Training & Meetings** to fund attendance at conferences for the COO, DCOO, and department staff as well as division-wide attendance at major industry professional conferences held annually. The budget also funds attendance by tunnel redundancy program staff at industry conferences to stay current on relevant technical topics and to educate potential engineering and construction vendors about the upcoming projects.
- \$161,000 for **Professional Services** for inspection of MWRA’s underground storage tanks.
- \$1.5 million for **Other Materials**; \$125,000 less than the FY21 Final Budget. The major item in this budget line is \$1.5 million for vehicle purchases for replacement of vehicles valued at less than \$100,000, MWRA’s minimum threshold for funding from the Capital Improvement Program (CIP). The FY22 Budget supports replacement of up to 35 vehicles or approximately 6% of the active fleet. This line item also includes \$25,000 for purchase of geotech software for the Tunnel Redundancy Program.
- \$724,000 for **Other Services** which includes \$150,000 for fuel tank storage maintenance services and \$537,000 for memberships and dues, primarily in industry associations for MWRA and departmental staff. MWRA continues to fund annual memberships in organizations such as the National Association

of Clean Water Agencies (NACWA), Association of Metropolitan Water Agencies (AMWA), American Water Works Association (AWWA), and Boston NOW (focused on Boston Harbor).



Aerial view of Boston Harbor

Operations, Engineering & Construction

Wastewater Treatment

Deer Island

Residuals

Clinton

Field Operations

Wastewater Operations

Water Operations & Maintenance

Metro Maintenance

Operations Support

FOD - Administration

Engineering & Construction

The work of this section is directed by a team of three senior managers including the Director of Wastewater, Director of Waterworks, and Chief Engineer; each of whom report to the Chief Operating Officer (COO). The purview of this section is as follows:

- operations and maintenance of MWRA's wastewater treatment facilities including Deer Island Wastewater Treatment Plant, Clinton Wastewater Treatment Plant, Residuals Pelletizing Facility, Combined Sewer Overflow facilities, and screenhouses;
- operations and maintenance of MWRA's wastewater distribution system including pipelines, pump stations, and other appurtenances;
- operations and maintenance of MWRA's water treatment facilities including the Carroll Water Treatment Plant serving communities in the Boston metropolitan area and the Brutsch Water Treatment Plant serving communities in the Chicopee Valley Aqueduct (CVA) Water System communities;
- operations and maintenance of the water distribution system including pipelines, pump stations, and valves;
- operations and maintenance of the wastewater and water metering system, Operations Control Centers, and Supervisory Control and Data Acquisition (SCADA) system;
- engineering and construction functions for the Operations Division; and
- energy conservation, capacity, and efficiency maintenance and capital projects.

**FY22 Final Current Expense Budget
OPERATIONS, ENGINEERING & CONSTRUCTION**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 61,859,242	\$ 65,345,744	\$ 67,787,177	\$ 70,091,951	\$ 2,304,774	3.4%
OVERTIME	4,865,030	4,015,408	4,634,640	4,766,520	131,880	2.8%
FRINGE BENEFITS	121,225	96,906	111,051	113,826	2,775	2.5%
CHEMICALS	10,891,947	10,998,338	12,091,255	12,202,286	111,031	0.9%
UTILITIES	24,310,848	23,025,392	24,065,844	24,623,626	557,782	2.3%
MAINTENANCE	25,002,630	24,121,938	26,884,576	25,792,779	(1,091,797)	-4.1%
TRAINING & MEETINGS	196,396	118,953	113,600	115,600	2,000	1.8%
PROFESSIONAL SERVICES	937,472	718,921	878,351	766,354	(111,997)	-12.8%
OTHER MATERIALS	1,372,549	1,539,563	1,714,739	1,598,503	(116,236)	-6.8%
OTHER SERVICES	19,028,795	19,440,593	19,340,128	19,387,033	46,905	0.2%
TOTAL	\$ 148,586,134	\$ 149,421,756	\$ 157,621,361	\$ 159,458,478	\$ 1,837,117	1.2%

The Operations, Engineering & Construction Section is composed of the Wastewater Treatment, Field Operations, and Engineering and Construction departments, which report directly to the Chief Operating Officer. In total, the budgets for these programs represent 84.7% of the Operations Division's FY22 Budget.

**FY22 Final Current Expense Budget
OPERATIONS, ENGINEERING & CONSTRUCTION by Programs**

PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WASTEWATER TREATMENT	\$ 71,318,087	\$ 71,615,005	\$ 73,794,515	\$ 73,297,023	\$ (497,492)	-0.7%
FIELD OPERATIONS	69,190,414	69,394,861	75,036,882	77,111,095	2,074,213	2.8%
ENGINEERING & CONSTRUCTION	8,077,633	8,411,890	8,789,964	9,050,360	260,396	3.0%
TOTAL	\$ 148,586,134	\$ 149,421,756	\$ 157,621,361	\$ 159,458,478	\$ 1,837,117	1.2%

The primary function of the Wastewater Treatment Department is to collect and treat community wastewater so that it can be discharged either into the Massachusetts Bay or the South Nashua River in compliance with federal and state environmental standards. The second function of the Department is to recycle sludge to produce fertilizer and provide for the proper disposal of any materials not suitable for treatment or fertilizer.

FY22 Final Current Expense Budget WASTEWATER TREATMENT						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 20,519,040	\$ 21,366,988	\$ 22,153,202	\$ 23,036,018	\$ 882,816	4.0%
OVERTIME	1,315,157	1,358,131	1,276,302	1,338,054	61,752	4.8%
FRINGE BENEFITS	36,433	36,231	29,480	32,255	2,775	9.4%
CHEMICALS	4,608,156	4,858,710	5,575,169	5,350,423	(224,746)	-4.0%
UTILITIES	13,994,528	13,231,939	13,745,509	14,139,548	394,039	2.9%
MAINTENANCE	14,193,038	13,454,555	14,005,472	12,417,928	(1,587,544)	-11.3%
TRAINING & MEETINGS	19,747	22,038	32,100	32,100	-	0.0%
PROFESSIONAL SERVICES	117,679	44,031	91,501	66,502	(24,999)	-27.3%
OTHER MATERIALS	612,263	877,307	914,010	749,200	(164,810)	-18.0%
OTHER SERVICES	15,902,046	16,365,075	15,971,770	16,134,995	163,225	1.0%
TOTAL	\$ 71,318,087	\$ 71,615,005	\$ 73,794,515	\$ 73,297,023	\$ (497,492)	-0.7%

The **Deer Island Treatment Plant**, the **Residuals Management Program**, and the **Clinton Treatment Plant** comprise the Wastewater Treatment Department. Together, the budgets for these programs represent 39% of the Operations Division’s FY22 Final Budget.

FY22 Final Current Expense Budget WASTEWATER TREATMENT by Program						
PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
DEER ISLAND	\$ 52,898,750	\$ 52,419,229	\$ 55,137,421	\$ 54,843,170	\$ (294,251)	-0.5%
RESIDUALS	15,840,845	16,279,616	15,943,081	16,042,441	99,360	0.6%
CLINTON	2,578,492	2,916,160	2,714,013	2,411,412	(302,601)	-11.1%
TOTAL	\$ 71,318,087	\$ 71,615,005	\$ 73,794,515	\$ 73,297,023	\$ (497,492)	-0.7%

The **Deer Island Wastewater Treatment Plant** (Deer Island or DITP) budget accounts for 29% of the Operations Division’s FY22 Final Budget. DITP has a peak capacity of 1.27 billion gallons per day (bgd) and peak secondary treatment capacity of 700 million gallons per day (mgd).

Wastewater influent from MWRA customer communities arrives at the plant through four underground tunnels. Pumps then lift the influent 80 to 150 feet, depending on the tunnel, to the head of the plant.

North system flows pass through grit channels and bar screens at the headworks that remove grit and screenings for disposal in an off-island landfill. South system flows are pre-treated for grit at Nut Island and the Braintree-Weymouth Intermediate Pump Station. Flow is routed to primary treatment clarifiers,

which remove about half of the pollutants brought to the plant in typical wastewater (removes 50% of total suspended solids and up to 50% of pathogens and toxic contaminants). In the clarifiers, gravity separates sludge and scum from the wastewater.



In secondary treatment, reactors and clarifiers remove non-settleable solids through biological and gravity treatment. The biological process is a pure oxygen-activated sludge system, using aerobic microorganisms to consume organic matter that remain in the primary effluent flow. Secondary treatment raises the level of pollution removal to over 85%. More than 100 tons of pure oxygen is manufactured each day at Deer Island's cryogenic oxygen facility to support the aerobic biological treatment process.

Sludge from primary and scum from both primary and secondary treatment is thickened in gravity thickeners. Sludge from secondary treatment is thickened in centrifuges. Polymer is used in the secondary sludge thickening process to increase its efficiency. Digestion occurs in the egg-shaped anaerobic digesters at the Deer Island Treatment Plant. There are a total of 12 digesters, each 90 feet in diameter at their widest point and approximately 140 feet tall (128 ft. liquid level). Microorganisms naturally present in the sludge work to break sludge and scum down into methane gas, carbon dioxide, solid organic byproducts, and water. Digestion significantly reduces sludge quantity for later recycling. The methane gas produced in the digesters is used in the plant's on-site power generating facility to save operating costs by reducing consumption of fuel oil for heating and purchased electricity. The remaining digested sludge is pumped through pipes embedded in the sidewall of the Nut Island inter-island tunnel and Braintree-Weymouth extension tunnel directly to the MWRA's Pelletizing Facility at Fore River, where it is further processed into a fertilizer product.

**FY22 Final Current Expense Budget
DEER ISLAND TREATMENT PLANT**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 19,479,231	\$ 20,362,682	\$ 21,093,288	\$ 21,925,820	\$ 832,532	3.9%
OVERTIME	1,213,319	1,276,823	1,231,302	1,290,545	59,243	4.8%
FRINGE BENEFITS	33,806	34,473	28,480	31,255	2,775	9.7%
CHEMICALS	4,194,138	4,461,609	5,110,920	4,920,486	(190,434)	-3.7%
UTILITIES	13,677,846	12,986,073	13,419,258	13,828,831	409,573	3.1%
MAINTENANCE	13,580,763	12,479,161	13,446,927	11,993,487	(1,453,440)	-10.8%
TRAINING & MEETINGS	19,747	22,038	28,600	28,600	-	0.0%
PROFESSIONAL SERVICES	84,484	42,531	42,000	42,000	-	0.0%
OTHER MATERIALS	391,764	517,930	536,200	530,700	(5,500)	-1.0%
OTHER SERVICES	223,652	235,909	200,446	251,446	51,000	25.4%
TOTAL	\$ 52,898,750	\$ 52,419,229	\$ 55,137,421	\$ 54,843,170	\$ (294,251)	-0.5%

Organizational Structure:

The Deer Island Treatment Plant has six major functional areas: Operations, Thermal Power Plant, Process Control, Maintenance, Capital Engineering, and Operations and Maintenance (O&M) Support.

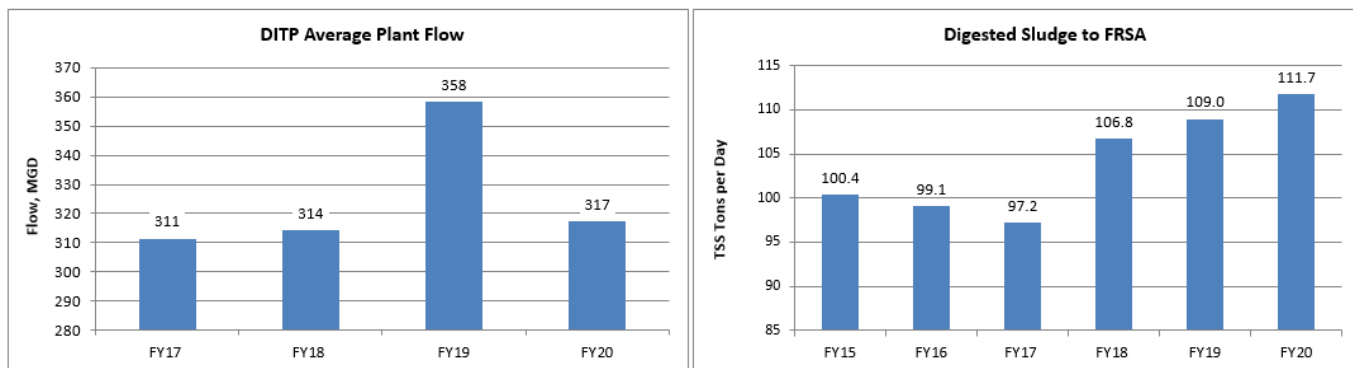
- Operations manages the day-to-day treatment operation of plant processing units, performs minor preventative maintenance activities, and oversees plant functions 24 hours per day, seven days per week.
- Thermal Power Plant manages and operates the Deer Island generation and thermal systems. Power Plant personnel provide 24-hour operation of the high-pressure, high temperature steam power plant. This facility is capable of producing up to 75 megawatts of electrical power including green energy assets with hydro-electric power, wind and solar.
- Process Control manages and maintains the following programs in support of plant operations; real-time process instrumentation and control system (PICS), operational data system (OMS), plant performance monitoring and reporting programs, and regulatory compliance programs including all plant permits, water quality, and air quality. Process Control provides the technical expertise for plant unit operations and routinely performs process optimization studies to help increase performance and reduce operating costs.
- Maintenance performs preventive, predictive, and corrective maintenance repairs on all equipment, utilizing a computerized maintenance management system (CMMS) to coordinate scheduling and document all work completed. Staff has developed the Reliability Centered Maintenance (RCM) program, which has improved plant performance by applying maintenance resources where they are most effective. RCM analyzes the operating systems with the objective of ensuring critical functions perform as required. Implementation of a preventive maintenance program using RCM helps reduce the cost of maintaining the plant and improves the efficiency by anticipating when maintenance will be required. An on-island warehouse, managed by Procurement Department staff, ensures there is adequate stock for maintenance repairs and plant operations.

- Capital Engineering provides technical support services for both Operations and Maintenance. Staff is responsible for all aspects of plant engineering including developing, procuring, and implementing all service contracts, consultant designs, and capital improvement projects at Deer Island. This group also manages the on-island Technical Information Center, which provides services to the DITP community and external clients, and ensures quick access to plant drawings and technical information for operational and maintenance needs.
- O&M Support is responsible for supporting the business needs of the plant. The Administration and Finance Unit provides financial and administrative support to meet daily operational needs of the plant.

The Deer Island Director’s Office provides overall management for the plant plus policy direction and support in the areas of public access and community relations.

Operating Assumptions:

Deer Island’s FY22 Final Budget assumes treatment of an average flow of 325 mgd based on four years (FY17-20) of historical data. The projected quantity of digested sludge to be pumped to FRSA (TSS basis) is 104.0 TPD. This is based on six years of recent operating data for FY15-20, which recently changed from a four year average to six year average of sludge to better attempt to adjust for known recent meter issues that were causing a low bias in the sludge to FRSA numbers.



Deer Island’s FY22 Final Budget accounts for the impact of self-generation of electricity from the steam turbine generators (STG), combustion turbine generators (CTG), hydroelectric generators, wind turbine generators, and photovoltaic panels. These assets will provide approximately 28.4% of the total electricity needs of the plant.

Deer Island continues to comply with the conditions of the National Pollutant Discharge Elimination System (NPDES) Permit issued in 1999, which has been administratively continued since FY05. Given the uncertainty regarding the timing of the permit renewal from the Environmental Protection Agency (EPA), Deer Island’s FY22 Proposed Budget assumes that the plant will continue to operate under the guidelines of the 1999 NPDES permit. When the new permit is issued, it is anticipated that Deer Island’s treatment process will be required to kill enterococcus in addition to fecal coliform to comply with the new regulations at a substantial increase in chemical quantities and cost.

FY22 Goals and Initiatives:

I. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system. Through FY21, Deer Island has met all of its compliance goals.

- **Key Regulatory Performance Measurements:**

Effluent Characteristic	Permit Limits	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Dry Day Flow (mgd)	436	316.4	282.9	317.7	100%
cBOD (mg/L)	25	6.8	6.1	5.7	100%
TSS (mg/L)	45	12.0	10.1	8.6	100%
TCR (ug/L)	631	<40	<40	<40	100%
Fecal Coliform	14,000	7	6	6	100%
pH (S.U.)	6 to 9	6.7	6.7	6.7	100%
Acute Toxicity	Pass	Pass	Pass	Pass	100%
Chronic Toxicity	Pass	Pass	Pass	Pass	100%

- **Goal #6 – Wastewater Infrastructure:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Issue Notice to Proceed for numerous contracts including the following major DITP asset protection projects including:
 - Gas Protect System Replacement Phase 2 (Nov-2021), MCC & Switchgear Replacement Construction (Dec-2021), Odor Control Rehab - Design/ESDC (Dec-2021), Digester & Storage Tank Rehab Design/ESD (Dec-2021), Fire Alarm System Replacement – Construction (Dec-2021), Radio Repeater System Upgrade 2 (Dec-2021), Fire System Replacement – REI (Dec-2021), Cryogenics Plant Equipment Replacement-Design (Dec-2021), DI Dystor Membrane Replacements (Dec-2021), Replacement of Odor Control Dampers (Jan-2022), South System Pump Station VFD Replacement Design/ESDC/REI (Jan-2022), Clarifier Rehab Phase 2 – Construction (Mar-2022), Clarifier Rehab Phase 2 – REI (Mar-2022), DITP Roofing Replacement (Jun-2022), and Combined Heat & Power Des/ESDC/REI (Jun-2022).
 - Make substantial progress according to FY22 CIP schedule for other near-term major DITP projects including:
 - Eastern Seawall and Shoreline Protection Remediation, Digester MCC Switchgear Replacement, Fire Alarm System Replacement; Digester and Storage Tank Rehabilitation Design/ESDC, Odor Control Rehabilitation Design/ESDC, South System Pump Station Variable Frequency Drive Replacement Design/ESDC/REI, Gas Protection System Replacement Phase 2.
 - Substantially complete CIP phases for DITP asset protection including the:
 - Gas Protection System Replacement Phase 1 (Aug-2021), Combined Heat and Power Alternative Study (Sep-2021), Gravity Thickener Rehabilitation Construction (Aug-2021), and Chemical Tank and Digester Pipe (Nov-2021).

II. Infrastructure Management and Resilience

- **Goal #9 – System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support services levels. Through FY21, Deer Island has met all of its goals in this area.

- **Key Maintenance Measurements:**

Indicator	FY19 Actual	FY20 Actual *	FY21 Actual	FY22 Goal
Critical Equipment Availability	100%	99.8%	99.8%	100%
Predictive Maintenance Completion	100%	96%	96%	100%
Predictive Maintenance - % of work orders	23.5%	24%	25%	25%
Maintenance Backlog (hours)	16,480 Standard	17,194 Standard	19,672 Standard	Within industry standard
Preventive Maintenance Completion	100%	92%	94%	100%
Maintenance Kitting - % of work orders	54%	56%	56%	57%

*FY20 actuals were impacted by COVID 19 shutdown during Q4.

V. Environmental Sustainability

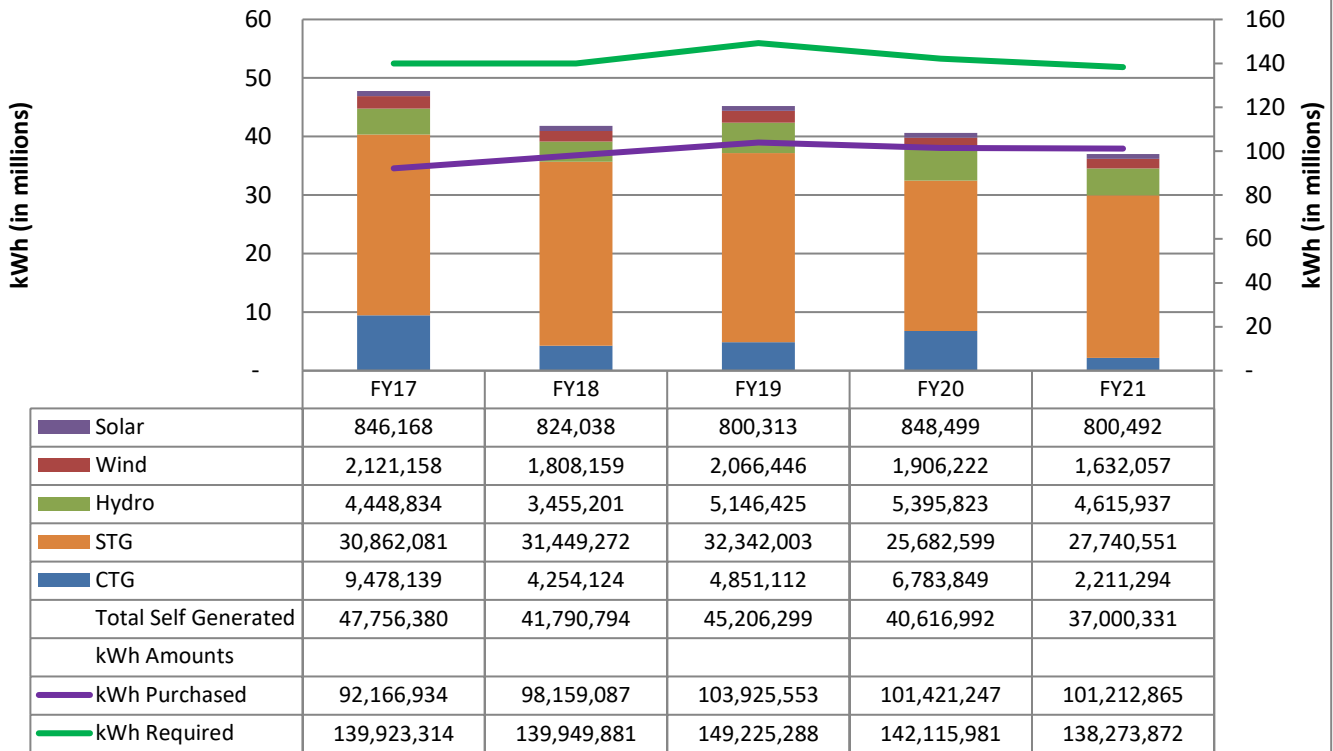
- **Goal #15 – Energy Optimization:** Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.

- **Key Performance Measurements and Accomplishments:**

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
% Required Power Self-Generated - Total	30.3%	28.6%	26.8%	28.4%
% Required Power Self-Generated – Renewables	27.0%	23.8%	25.2%	26.1%
Thermal/Power Plant Digester Gas Utilization	98.2%	98.1%	97.6%	98.1%
Avoided capacity costs	\$867,000	\$714,000	\$1,368,400	\$1,198,867
Generate revenue from energy programs (RPS credits, demand response)	\$1,522,149	\$1,451,000	\$1,894,133	\$1,203,768

- Continue to implement projects to reduce energy use, increase energy revenue, decrease greenhouse gas emissions, and increase self-generation capacity, particularly via renewable energy.

DITP Electricity (Actuals)



FY21 Year-End Accomplishments:

- Deer Island received the Platinum Peak Performance Award for 2020 from the National Association of Clean Water Agencies (NACWA) for the 14th continuous year. The award recognizes facilities for outstanding compliance of their National Pollutant Discharge Elimination System (NPDES) permit limits. DITP has had no permit violations for over 14 years.
- Deer Island met secondary permit limits at all times, treating on average 99% of flows with full secondary treatment. More detailed information about DITP's NPDES Permit compliance is available on the Transparency/Performance Indicator section of MWRA's website.
- Eversource completed the first annual maintenance on the new 115 kVA cross-harbor marine power cable to Deer Island during October 2020. DITP operated on CTG power-only for 4 days continuously. During this work, DITP experienced an unanticipated power outage when CTG 1A tripped due to a fuel valve failure which resulted in a minor blending event of 0.63 MGal out of a daily flow of 243.4 MGal. All flows received disinfection and met numerical effluent standards.
- Completed numerous major maintenance projects including:
 - Painting and coating contract which painted Digester overflow boxes, all primary scum wells, and six carbon absorbers in our odor control facilities.
 - Replace two air handlers in the Hydro Electric Building.

- Fabricated in house and installed two large chutes in stainless steel and all supports. These chutes are on the pug mill process in Residuals.
 - Purchased and installed one 24” and one 30” W3 Strainers, which replace existing units which were from start-up of plant.
 - Changed out two uninterrupted power supplies with batteries at Centrifuge and North Main Pump Station.
 - Chiller upgrade work which included high pressure cleaning, replace some fiberglass covers, and seal the sump area which had a major leak.
 - Replaced Digester Mixer which is critical to the proper operation of the Digester. It provides the driving force for mixing the digester’s contents and assists in maintaining a uniform temperature within the sludge mass.
 - Replaced PLC for North Main Odor Control.
 - Repaired East Odor Control stack.
 - Transitioned Chelsea Creek Headworks lease line communications to a Verizon circuit.
 - Installed new explosion proof grit samplers.
- Issued Notice to Proceeds for Asset Protection Program contracts including the following:
 - Miscellaneous VFD Replacements (Oct-2020)
 - East Seawall Design/ESDC/REI (Oct-2020)
 - Substantially completed projects:
 - Deer Island Radio Repeater System Upgrade Phase 1 (Nov-2020)
 - As-Needed Design 8-3 (Mar-2021)
 - Winthrop Terminal Facility Variable Frequency Drive Replacement Construction (Apr-2021)

Budget Highlights:

The FY22 Final Budget is \$54.8 million, a decrease of \$294,000 or 0.5% compared to the FY21 Budget.

- \$21.9 million for **Wages and Salaries**, an increase of \$833k or 4.0%, compared to the FY21 Budget, primarily due to wage increases associated with reserves for un-awarded collective bargaining agreements (FY21 & FY22). The FY22 Budget also includes \$171,000 for stand-by pay to support operational and maintenance needs primarily during storms and emergencies.
- \$1.3 million for **Overtime**, an increase of \$59,000 or 4.8% compared to the FY21 Budget primarily due to wage increases associated with reserves for un-awarded collective bargaining agreements (FY21 & FY22). The FY22 Budget is based on multi-year historical trends and supports overtime required for operational coverage, critical maintenance projects, and regulatory requirements (i.e. inspections).
- \$4.9 million for **Chemicals**, a decrease of \$190,000 or 3.7% compared to the FY21 Budget. The decrease is due to the net effect of usage and price adjustments. The FY22 Budget, which is based on multi-year historical usage trends and projected market prices, includes \$1.8 million for ferrous/ferric chloride, a decrease of \$66,000 primarily due to price offset by increased quantity; \$1.4 million for sodium hypochlorite, a decrease of \$57,000 primarily due to price and quantity; \$677,000 for hydrogen peroxide, an increase of \$2,000 due to price; \$455,000 for polymer a decrease of \$7,000; \$266,000 for activated carbon; \$118,000 for sodium bisulfite and \$111,000 for sodium hydroxide.

- \$13.8 million for **Utilities**, an increase of \$410,000 due to \$455,000 increase in electricity for higher pricing for transmission and distribution costs and impact of new supply contract that starts November 2021 and increased quantity based on historic average.
- \$12.0 million for **Maintenance**, a decrease of \$1.5 million or 10.8% compared to the FY21 Budget. The FY22 Budget includes \$5.6 million for materials and \$6.4 million for services. Of the total, \$7.0 million or 58% is for plant and machinery materials and services, \$1.6 million is for building and grounds work, and \$1.9 million is for electrical system maintenance. The budget reflects project priorities with a particular emphasis on maintenance of critical equipment.
- \$42,000 for **Professional Services**, level funded from the FY21 Budget. The FY22 Budget includes \$42,000 for as-needed engineering services.
- \$531,000 for **Other Materials**, a decrease of \$6,000 or 1.0% from the FY21 Budget primarily due to decrease in equipment/furniture based on projected needs. The FY22 Budget includes \$166,000 for health and safety materials, \$121,000 for equipment and furniture, \$120,000 for work clothes, \$58,000 for vehicles expenses (bulk fuel and mileage reimbursements), and \$44,000 for office supplies.
- \$251,000 for **Other Services**, an increase of \$51,000 or 25.4%, from the FY21 Budget due to the \$30,000 moved from maintenance to health/safety for cost associated with halon service contract and \$21,000 increase for non-annual permit fees. The FY22 Budget includes \$99,000 for health and safety services, \$55,000 for permit fees, \$37,000 for telephones, \$29,000 for membership dues and subscriptions, \$15,000 for freight charges, and \$5,000 for printing services. The budget is based on historical averages for most items in this category.



Whale breaching in waters off Deer Island Wastewater Treatment Plant

The **Residuals Management Program** manages the processing and disposal of approximately 99-110 dry tons per day (on average per year) total suspended solids (TSS) of sludge from the anaerobic digestion process at the Deer Island Wastewater Treatment Plant, as well as the disposal of grit and screenings from all MWRA facilities. MWRA pumps liquid sludge from Deer Island through the inter-island tunnel to the Fore River Pelletizing Plant where the sludge is dewatered, dried, and shipped by either rail or truck for use as fertilizer or to other appropriate disposal. MWRA is committed to the beneficial use of biosolids to the greatest extent practicable. MWRA seeks to dispose of all sludge and grit and screenings in a reliable, economical, and environmentally sensitive manner.

- MWRA has contracted with the New England Fertilizer Company (NEFCo) since March 1, 2001 to operate the sludge pelletizing plant and to market and distribute biosolids products. The first 15-year contract continued to December 31, 2015. MWRA and NEFCo negotiated a five year contract extension that commenced in January 2016 and ended December 31, 2020. MWRA and NEFCo negotiated another two year extension which commenced January 1, 2021 and is in effect during calendar years 2021 and 2022. The extension includes a third optional year for calendar year 2023.
- The FY22 Budget is based on the assumption of 106.2 average tons per day (TPD; TSS basis), consistent with historical averages from recent years.
- Grit and screenings (minor residuals) from MWRA's headworks and certain pump stations are collected and disposed of in landfills. MWRA contracts with a third party operator for this service. Minor residuals are by-products of wastewater pre-treatment and primary/secondary treatment processes and include grit, screenings, and scum screenings.

FY22 Final Current Expense Budget RESIDUALS MANAGEMENT PROGRAM							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 150,139	\$ 156,456	\$ 156,011	\$ 159,145	\$ 3,134	2.0%	
MAINTENANCE	-	-	-	-	-	-	
TRAINING & MEETINGS	-	-	3,200	3,200	-	0.0%	
PROFESSIONAL SERVICES	19,573	-	25,001	2	(24,999)	-100.0%	
OTHER MATERIALS	15,508	23,995	15,000	20,000	5,000	33.3%	
OTHER SERVICES	15,655,625	16,099,165	15,743,869	15,860,094	116,225	0.7%	
TOTAL	\$ 15,840,845	\$ 16,279,616	\$ 15,943,081	\$ 16,042,441	\$ 99,360	0.6%	

FY22 Goals and Initiatives:

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Continue marketing efforts for Bay State Fertilizer.
 - Maintain beneficial use of MWRA’s processed pellets.
 - **Key Performance Measurements:**

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY21 Goal
Pelletize all sludge received from DITP	100%	100%	100%	100%
Average Tons Per Day Sludge (TSS basis)	109.0	111.7	95.9	106.2
Monthly Ave % Capture – Processed Sludge (goal per contract with NEFCo)	91.1%	91.3%	91.5%	90%
Properly dispose of grit & screenings	100%	100%	100%	100%
Annual grit and screenings tonnage	6,043	5,460	5,087	5,787

- **Goal #6 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Commence work on the following Residuals Asset Protection Program contracts:
 - Residuals Facility Plan/EIR (Jan-2022)
 - Residuals Facility Upgrades/Design (May-2022)

FY21 Year-End Accomplishments:

- Through NEFCo, processed and pelletized 95.9 tons per day of sludge on average from DITP.
- Through contracted operator, collected and properly disposed of 5,087 tons of grit and screenings.
- With support from DITP engineering staff, substantially completed the following Residual Asset Protection Program renovation projects funded in the FY21 Capital Improvement Program:
 - Electrical & Mechanical Improvements, including 3 Drum Dryer Replacements
 - Conveyance Piping Relocation
- For FY21, earned \$19,863 in sales of Bay State Fertilizer, MWRA’s retail product.
- Achieved substantial completion on:
 - Residuals Electrical/Machinery/Drum replacement (Dec-2020)
 - Relocation of Pellet Piping (Dec-2020)

Budget Highlights:

The FY22 Budget is \$16.0 million, which is \$99,000 or 0.6% more than the FY21 Budget.

- \$159,000 for **Wages and Salaries**, an increase of \$3,000 or 2.0%, funds one permanent position and stand-by pay to provide coverage for emergencies during off-shifts. This department also receives on-going management oversight and staff support from other departments of the MWRA including Deer Island, Treasury, and Operations Administration.
- **Professional Services** has a budget of \$2, a decrease of -\$25,000 from FY21 due to the exclusion of funding for bi-annual stack testing required again in FY23. The nominal FY22 budget is a placeholder reminder for future years of this periodic expense.
- **Other Materials** has a budget of \$20,000 to fund plastic bag material for sale of Bay State Fertilizer.
- \$15.9 million for **Other Services**, an increase of \$116,000 or 0.7% from the FY21 Budget primarily due to increases in contractual prices for grit and screenings disposal and sludge pelletization services. The two major items funded in the FY22 Budget include \$1.3 million for grit and screenings disposal

and \$14.5 million for sludge pelletization services, both provided through contracts with private vendors.



MWRA Sludge Pelletizing Facility

The Clinton Wastewater Treatment Plant provides advanced wastewater treatment services to the Town of Clinton and the Lancaster Sewer District. MWRA assumed formal operational responsibility for the Clinton plant in 1987. Since then MWRA has designed and constructed new primary, secondary, and advanced treatment facilities, which incorporated rehabilitated portions of the existing plant with new construction. The new facilities, designed to meet all current and projected National Pollutant Discharge Elimination System (NPDES) discharge standards, were completed in 1992.

A new NPDES permit issued March 1, 2017 imposes additional requirements on phosphorus removal. As such, MWRA commenced operations of a new Phosphorous building as of May 2018 to meet more stringent phosphorus removal requirements and lower discharge limit. The Clinton Plant complies with the new phosphorous limits established under the NPDES permit that took effect as of April 2019.

The plant provides secondary treatment using an activated sludge process in combination with advanced nutrient removal, chlorination and dechlorination. The major facilities include headworks, primary settling tanks, digesters, sludge processes, trickling filters, aeration tanks, secondary tanks, phosphorus removal via filtration and a chemical addition building. The plant discharges its effluent into the South Nashua River in accordance with the discharge limits of the facility's NPDES permit, with a design flow of 3.01 mgd. The plant has a potential peak flow rate of 12 mgd. Residual materials are pressed and transported to an MWRA-owned landfill for final disposal. Staff manage and regularly monitor the landfill site which discharges leachate back to the Clinton Wastewater plant for treatment.

FY22 Final Current Expense Budget CLINTON WASTEWATER TREATMENT PROGRAM							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 889,670	\$ 847,850	\$ 903,903	\$ 951,053	\$ 47,150	5.2%	
OVERTIME	101,838	81,308	45,000	47,509	2,509	5.6%	
FRINGE BENEFITS	2,627	1,758	1,000	1,000	-	0.0%	
CHEMICALS	414,018	397,101	464,249	429,937	(34,312)	-7.4%	
UTILITIES	316,682	245,866	326,251	310,717	(15,534)	-4.8%	
MAINTENANCE	612,275	975,394	558,545	424,441	(134,104)	-24.0%	
TRAINING & MEETINGS	-	-	300	300	-	0.0%	
PROFESSIONAL SERVICES	13,622	1,500	24,500	24,500	-	0.0%	
OTHER MATERIALS	204,991	335,382	362,810	198,500	(164,310)	-45.3%	
OTHER SERVICES	22,769	30,001	27,455	23,455	(4,000)	-14.6%	
TOTAL	\$ 2,578,492	\$ 2,916,160	\$ 2,714,013	\$ 2,411,412	\$ (302,601)	-11.1%	

FY22 Goals and Initiatives:

This department contributes significantly to the following MWRA goals included in the draft FY21-FY25 Five-Year Strategic Business Plan;

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Fully comply with new phosphorous removal requirements.
 - Comply with Department of Environmental Protection (DEP) finding for landfill height levels and sloping that require ongoing remediation efforts.

○ **Key Regulatory Performance Measurements:**

Effluent Characteristic	Permit Limit	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal % compliance
Daily Average Flow (mgd) – 12 month rolling average	3.01 mgd	(#)3.23 mgd	2.38 mgd	2.27 mgd	100%
BOD (mg/L)	20 mg/L	2.80 mg/L	1.95 mg/L	1.79 mg/L	100%
TSS (mg/L)	20 mg/L	5.10 mg/L	2.82 mg/L	2.75 mg/L	100%
TCR (mg/L)	17.6 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	100%
E.coli (cfu/100mL)	126/100mL	16.2/100mL	6.97/100mL	5.23/100mL	100%
pH (S.U.)	6.5-8.3	7.33	7.38	7.39	100%
Acute Toxicity	>100%	>100%	>100%	>100%	100%
Chronic Toxicity	≥62.5%	(*)<62.5%	≥62.5%	(**)<62.5%	100%
Total Phosphorus (mg/L) annual avg	0.15 mg/L Apr-Oct 1.0 mg/L Nov-Mar	0.12 mg/L	0.11 mg/L	0.11 mg/L	100%
Total Ammonia as Nitrogen (mg/L)	2 mg/L Jun-Oct 5 mg/L May 10 mg/L Nov-Apr	0.15 mg/L	0.105 mg/L	0.109 mg/L	100%

(#) This 3.23 mgd level is attributable to unusually high rainfall/wet weather events during the FY19 months of Oct & Nov 2018.

(*) FY19 Chronic Toxicity levels below target due to Q4 Chronic WET Test failure. MWRA addressed the issue.

(**) FY21 Chronic Toxicity levels below target due to Q1. Staff investigated these intermittent instances of apparent toxicity in the plant effluent and found no obvious cause. The next three tests showed no evidence of toxicity (all results were 100%).

- **Goal #6 – Wastewater Infrastructure:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects included in the FY22 CIP.

Issue notice to proceed for:

- Screw Pump Replacement (Sep-2021)
- Digester Cover Replacement (Dec-2021)
- Clinton WWTP Rehab Design/ESDC/RE (Dec-2021)
- Landfill Cell #1 Closure (Dec-2021)
- Clinton Fire Alarm Replacement (Dec-2020)

Reach substantial completion on:

- Valves and Pipe Replacements (Dec-2021)

III. Infrastructure Management and Resilience

- **Goal #9 – System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - Make substantial progress or complete major maintenance projects.
 - Rebuild Hypochlorite Piping
 - Replace Sodium Bisulfite Tank and Pump
 - Install Hot Water Heater in Chemical Building
 - Replace Sodium Hypochlorite Tank
 - Replace Trickling Filter #4

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Continue operations of recently installed natural gas line to replace use of fuel oil in the facility.
 - Continue to evaluate and implement energy audit recommendations.

FY21 Year-End Accomplishments:

- Staff performed process operation and maintenance of the new phosphorus reduction facility (PRF). The PRF was shut down for the winter and restarted in March in order to meet very low NPDES permit limits for phosphorus effective April 1, 2020. During the winter downtime, staff implemented a number of minor system modifications and improvements to improve the reliability of the system including replacement of a few of the filter cartridges and some backwash nozzles. The lower seasonal effluent phosphorus limit of 150 ug/L and 3.8 pounds per day loading limit became effective starting April 1, 2019. The effluent through the end of April 2021 has met these new lower limits.
- Completed numerous maintenance projects including the following:
 - Maintenance staff rebuilt thickened sludge transfer pumps #1 and #3.
 - Maintenance staff reinstalled the #2 grit screw and installed a new safety chain on same grit tank.
 - Maintenance staff replaced doctor blades on belt filter press #1. They also re-piped the polymer system that feeds the belt filter press.
 - Operations staff rebuilt #1 and #2 polymer pumps that feed the disk filters.
- Completed the paintings and coatings contract.

Budget Highlights:

The FY22 Budget for Clinton is \$2.4 million, a decrease of \$303,000 or 11.2% from the FY21 Budget.

- \$951,000 for **Wages and Salaries**, a change of \$47,000 or 5.2%, from the FY21 Budget due to wage increases associated with reserves for un-awarded collective bargaining agreements (FY21 & FY22).
- \$48,000 for **Overtime**, an increase of \$3,000 or 5.6% compared to the FY21 Budget. Overtime is used for critical maintenance work and to meet the 24 hour, 7 days per week emergency coverage requirement. The increase reflects potential impact of un-awarded collective bargaining agreements (FY21 & FY22).
- \$430,000 for **Chemicals**, a decrease of \$34,000 or 7.4% from the FY21 Budget. The FY22 Budget continues the requirements of the new NPDES permit for the entire year. As of April 2020, the new permit requires year around limits for phosphorus discharge, which primarily impacts the use of Ferric Chloride and Polymer. Ferric Chloride and Polymer are used along with a disc filter operation as part of the new phosphorus reduction facility currently in operation.
- \$311,000 for **Utilities**, a decrease of \$16,000 or 4.8% from the FY21 Budget due to the lower usage for electricity, offset by higher pricing. The budget includes \$273,000 for electricity, \$26,000 for natural gas, and \$5,000 for water.

- \$424,000 for **Maintenance**, a decrease of \$134,000 or 24.0% from the FY21 Budget due to project priorities. The decrease is mainly due to the completion of the three year painting and coating project in FY21. This is offset by the new projects for FY22 like tricking filter #4 replacement, sodium bisulfite tank and pump replacement, and sump pump replacements.
- \$25,000 for **Professional Services**, level funded from the FY21 Budget. This funds consultant engineering and resident inspection services to support maintenance projects.
- \$199,000 for **Other Materials**, a decrease of \$164,000, or 45.3% from the FY21 Budget due to the decrease of quantity of gravel related to the work toward the closure of cell one of the landfill which was done during FY21. This line item includes \$187,000 for clean fill for the landfill operation.
- \$23,000 for **Other Services**, a decrease of \$4,000 or 14.6% from the FY21 Budget, for the removal of funding for a construction trailer. This line item includes \$13,000 for permit fees, \$6,000 for telephones, and \$3,300 for railroad easement expenses.



Clinton Wastewater Treatment Plant

The primary function of the **Field Operations Department (FOD)** is to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The Department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Wastewater Treatment Plant.

FY22 Final Current Expense Budget						
FIELD OPERATIONS						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 33,436,688	\$ 35,699,047	\$ 37,059,254	\$ 38,202,739	\$ 1,143,485	3.1%
OVERTIME	3,454,804	2,595,474	3,209,270	3,297,440	88,170	2.7%
FRINGE BENEFITS	84,669	60,520	81,071	81,071	-	0.0%
CHEMICALS	6,283,791	6,139,628	6,516,086	6,851,863	335,777	5.2%
UTILITIES	10,316,320	9,793,453	10,320,335	10,484,078	163,743	1.6%
MAINTENANCE	10,809,501	10,665,002	12,879,104	13,374,851	495,747	3.8%
TRAINING & MEETINGS	136,993	65,904	65,000	67,000	2,000	3.1%
PROFESSIONAL SERVICES	819,793	674,890	786,850	699,852	(86,998)	-11.1%
OTHER MATERIALS	740,307	644,436	777,804	826,378	48,574	6.2%
OTHER SERVICES	3,107,548	3,056,507	3,342,108	3,225,823	(116,285)	-3.5%
TOTAL	\$ 69,190,414	\$ 69,394,861	\$ 75,036,882	\$ 77,111,095	\$ 2,074,213	2.8%

FOD consists of five operating units: Wastewater Operations, Water Operations and Maintenance, Metropolitan Maintenance, Operations Support, and Administration

FY22 Final Current Expense Budget						
FIELD OPERATIONS by Programs						
Program	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WASTEWATER OPERATIONS	\$ 13,113,920	\$ 12,848,013	\$ 12,610,350	\$ 13,008,111	\$ 397,761	3.2%
WATER OPERATIONS & MAINT	30,218,566	29,750,166	32,606,435	33,982,478	1,376,043	4.2%
METRO MAINTENANCE	15,858,382	16,206,724	16,048,785	15,846,598	(202,187)	-1.3%
OPERATIONS SUPPORT	5,336,835	5,299,848	8,840,227	9,536,746	696,519	7.9%
FOD ADMIN	4,662,711	5,290,110	4,931,085	4,737,162	(193,923)	-3.9%
TOTAL	\$ 69,190,414	\$ 69,394,861	\$ 75,036,882	\$ 77,111,095	\$ 2,074,213	2.8%

Wastewater Operations operates MWRA's wastewater transport facilities, including four continuously staffed headworks facilities; twelve fully automated pumping stations; and six Combined Sewer Overflow (CSO) facilities which are similarly unstaffed. The wastewater system is monitored and controlled from the operations control center (OCC) in MWRA's Chelsea facility. Wastewater Operations aims to meet all operational and regulatory performance standards and requirements efficiently and cost-effectively.

**FY22 Final Current Expense Budget
WASTEWATER OPERATIONS**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 5,849,401	\$ 6,483,474	\$ 6,040,852	\$ 6,239,413	\$ 198,561	3.3%
OVERTIME	1,504,067	1,022,829	1,032,270	1,060,657	28,387	2.7%
FRINGE BENEFITS	37,508	24,234	34,140	34,140	-	0.0%
CHEMICALS	628,106	489,521	584,932	578,752	(6,180)	-1.1%
UTILITIES	4,905,744	4,652,312	4,743,720	4,962,520	218,800	4.6%
MAINTENANCE	63,527	44,772	-	-	-	-
PROFESSIONAL SERVICES	-	-	-	-	-	-
OTHER MATERIALS	41,353	50,564	46,995	46,743	(252)	-0.5%
OTHER SERVICES	84,214	80,307	127,441	85,886	(41,555)	-32.6%
TOTAL	\$ 13,113,920	\$ 12,848,013	\$ 12,610,350	\$ 13,008,111	\$ 397,761	3.2%

Water Operations and Maintenance operates and maintains the water supply and treatment facilities to provide an adequate supply of properly treated drinking water to meet all operational and regulatory performance requirements. The Unit is responsible for the treatment and delivery of approximately 200 million gallons per day (average mgd) of water from the Quabbin and Wachusett reservoirs to the community water systems. Water must be supplied to customer



communities at the expected pressure. This unit is also responsible for the maintenance of 300 miles of distribution pipeline and 6,000 valves in a water system that encompasses a service area from Chicopee in the western part of the state to Lynnfield, Wakefield, Marblehead, Norwood and Canton in the metropolitan area. This unit operates twelve pumping stations in the Metropolitan area and operates and maintains MWRA's western waterworks facilities, including the Carroll Water Treatment Plant, the Metro West Tunnel, the Brutsch Water Treatment Plant, the Cosgrove Intake Facility, the Norumbega Reservoir, and the covered storage facilities. There are two operations centers providing monitoring and control of the water system on a 24-hour per day basis. The Metropolitan Operations and Control Center (OCC) is located at MWRA's Chelsea office Facility and the Western Operations Center is located at the Carroll Water Treatment Plant.

**FY22 Final Current Expense Budget
WATER OPERATIONS & MAINTENANCE**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 12,816,830	\$ 13,786,071	\$ 13,977,163	\$ 14,446,474	\$ 469,311	3.4%
OVERTIME	1,154,721	942,710	1,194,557	1,227,405	32,848	2.7%
FRINGE BENEFITS	28,824	22,542	28,557	28,557	-	0.0%
CHEMICALS	5,655,685	5,650,053	5,931,154	6,273,111	341,957	5.8%
UTILITIES	4,821,181	4,615,632	4,996,002	4,948,638	(47,364)	-0.9%
MAINTENANCE	4,487,159	3,851,951	5,280,820	5,929,565	648,745	12.3%
PROFESSIONAL SERVICES	492,698	352,295	489,850	414,851	(74,999)	-15.3%
OTHER MATERIALS	255,767	238,535	255,934	268,475	12,541	4.9%
OTHER SERVICES	505,701	290,377	452,398	445,402	(6,996)	-1.5%
TOTAL	\$ 30,218,566	\$ 29,750,166	\$ 32,606,435	\$ 33,982,478	\$ 1,376,043	4.2%

Metro Maintenance is responsible for the maintenance of MWRA’s wastewater and water facilities within the Route 128 area. Staff maintain interceptors, pumps, facility equipment, and buildings and grounds.

**FY22 Final Current Expense Budget
METRO MAINTENANCE**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 9,578,996	\$ 10,265,012	\$ 9,291,998	\$ 9,483,080	\$ 191,082	2.1%
OVERTIME	677,547	537,069	792,309	814,097	21,788	2.7%
FRINGE BENEFITS	17,055	12,981	16,701	16,701	-	0.0%
CHEMICALS	-	-	-	-	-	-
UTILITIES	51,815	50,294	-	-	-	-
MAINTENANCE	4,847,617	4,602,551	5,440,393	5,023,897	(416,496)	-7.7%
PROFESSIONAL SERVICES	222,739	322,886	150,000	155,000	5,000	3.3%
OTHER MATERIALS	278,409	246,792	246,346	242,678	(3,668)	-1.5%
OTHER SERVICES	184,204	169,139	111,038	111,145	107	0.1%
TOTAL	\$ 15,858,382	\$ 16,206,724	\$ 16,048,785	\$ 15,846,598	\$ (202,187)	-1.3%

Operations Support provides technical support to the FOD in three key areas. Engineering staff coordinate all engineering issues related to the operation of the water and wastewater systems. The SCADA unit is responsible for the maintenance of the water and wastewater Supervisory Control and Data Acquisition (SCADA) systems. Meter Data and Meter Maintenance staff maintain revenue meters and provide flow data. Staff collect meter data for operational and revenue generating purposes from the water and wastewater systems. They maintain 179 revenue water meters, 26 master water meters, 187 revenue wastewater meters and 35 other wastewater-monitoring sites. The data collection and analysis supports Rates and Budget Department’s allocation of MWRA rate revenue requirements.

**FY22 Final Current Expense Budget
OPERATIONS SUPPORT**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 3,699,773	\$ 3,766,162	\$ 6,242,589	\$ 6,615,420	\$ 372,831	6.0%
OVERTIME	73,256	51,093	136,682	140,441	3,759	2.8%
FRINGE BENEFITS	1,255	763	1,644	1,644	-	0.0%
CHEMICALS	-	54	-	-	-	-
UTILITIES	17,041	9,310	55,899	57,753	1,854	3.3%
MAINTENANCE	1,006,207	1,041,069	1,641,874	1,923,082	281,208	17.1%
PROFESSIONAL SERVICES	90,492	10,977	140,000	130,001	(9,999)	-7.1%
OTHER MATERIALS	67,683	47,279	106,536	187,749	81,213	76.2%
OTHER SERVICES	381,128	373,141	515,003	480,656	(34,347)	-6.7%
TOTAL	\$ 5,336,835	\$ 5,299,848	\$ 8,840,227	\$ 9,536,746	\$ 696,519	7.9%

FOD Administration provides financial, administrative, planning, and policy oversight functions for the entire Department.

**FY22 Final Current Expense Budget
FOD ADMIN**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 1,491,688	\$ 1,398,328	\$ 1,506,652	\$ 1,418,352	\$ (88,300)	-5.9%
OVERTIME	45,213	41,773	53,452	54,840	1,388	2.6%
FRINGE BENEFITS	27	-	29	29	-	0.0%
UTILITIES	520,539	465,905	524,714	515,167	(9,547)	-1.8%
MAINTENANCE	404,991	1,124,659	516,017	498,307	(17,710)	-3.4%
TRAINING & MEETINGS	136,993	65,904	65,000	67,000	2,000	3.1%
PROFESSIONAL SERVICES	13,864	(11,268)	7,000	-	(7,000)	-100.0%
OTHER MATERIALS	97,095	61,266	121,993	80,733	(41,260)	-33.8%
OTHER SERVICES	1,952,301	2,143,543	2,136,228	2,102,734	(33,494)	-1.6%
TOTAL	\$ 4,662,711	\$ 5,290,110	\$ 4,931,085	\$ 4,737,162	\$ (193,923)	-3.9%

FY22 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.
 - Optimize operation of water treatment facilities to produce high quality, safe drinking water while maximizing water aesthetics (i.e. taste, clarity and odor).
 - Monitor drinking water quality in collaboration with member communities and the Department of Conservation and Recreation (DCR) in order to verify high quality water and provide guidance for operating decisions.
 - Operate the reservoir system to optimize both quality and quantity of water available for water supply purposes and to meet statutory and regulatory requirements for downstream releases.

- **Key Regulatory Performance Measurements:**

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Turbidity < 5NTU	100%	100%	100%	100%
pH >9.1 & Alkalinity >37 mg/l	100%	100%	100%	100%
Disinfection Effectiveness	100%	100%	100%	100%

- Complete the 2021/2022 Carroll Water Treatment Plant half plant maintenance.
- Inspect, clean, and/or paint water storage tanks according to the prevailing maintenance plan.
- Continue valve replacement and exercising annual goals.

II. Wastewater Management and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.

- **Key Regulatory Performance Measurements:**

Regulatory Compliance and Operational Capacity				
Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Total annual flow (billion gallons based on DITP mgd) – Process all flow at headworks within system parameters	115.5	116.1	107.5	118.7
Minimize choking at headworks (# of hours/highly dependent on weather):				
Nut Island	0	1.5	0	0
Columbus Park	46.6	109.62	39.82	0
Ward Street	26.9	86.76	14.35	0
Chelsea Creek	3.6	3	1.7	0

III. Infrastructure Management and Resilience

- **Goal #9 – System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support service levels.
 - Continue to ensure proper operations and maintenance of the water and wastewater systems and minimize system downtime by performing:
 - Preventative maintenance
 - Predictive maintenance
 - Corrective maintenance on equipment and linear assets
 - Leak surveys of the water system
 - Water system valve inspections and exercise
 - Wastewater pipelines, structures, water storage tanks, and inverted siphons inspections, and cleanings.
 - Inspect, maintain, and improve the dams, dikes, and other facilities constituting the watershed system infrastructure through ongoing maintenance and an adequate multi-year capital improvement program to ensure system reliability and limit potential flood hazards.
 - **Key Maintenance Measurements:**

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
% Total Revenue Calculated Using Meters				
Water	99.17%	99.65%	99.5%	100%
**Wastewater	94.69%	91.7%	95%	95%
Water System:				
Leak Detection – miles surveyed)	144.17	101.71	190.48	140
Main Line Valves – # exercised	1,433	838	1168	1,100
Main Line Valves – # replaced	20	10	21	20
Blow-off Valves – # exercised	938	440	745	600
Blow-off Valves – # maintained	14	4	10	10
Wastewater System:				
Pipeline Inspections – miles	35.04	27.18	230.2	32
Pipeline Cleaning – miles	36.17	28.85	30.72	36
Structure Inspections – # structures	665	747	1025	650
Manhole Rehabilitation – # manholes	109	51	64	105
Inverted Siphon Inspections – # siphons	48	41	23	48
Inverted Siphon Cleaning – # siphons	123	70	7	36
Metro Maintenance – Equipment and Facilities:				
Ops Light Preventive Maint (PM) - % maint hours	14%	11%	14.6%	10%-15%
Preventive Maintenance Completion	100%	100%	100%	100%
*Maint Kitting – % work orders kitted	31%	50%	62.75%	60%
Ops Light Maint % PM Completion	100%	100%	100%	100%
Maintenance Backlog – crew hours	13,275	14,112	18,809	9-13.5k

* Maintenance Kitting: FY18–FY20 based on % of work orders kitted

** For FY20, the value is for July 2019 through March 2020 and June 2020. April & May 2020 were calculated using historical averages due to COVID related data gaps and thus are not considered in the calculation.

VI. Environmental Sustainability

- **Goal #17 – Energy Optimization:** Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Continue to implement projects to reduce energy use, increase energy revenue, decrease greenhouse gas emissions, and increase self-generation capacity, particularly via renewable energy.
 - Continue to conduct energy audits at all facilities as needed.
 - Continue to invest in new stand-alone renewable energy projects at all MWRA facilities.
 - Continue to incorporate cost-effective energy efficiency, non-fossil fuel heating, and renewable energy projects into new construction, rehabilitation projects, and equipment replacement.
 - **Key Performance Measurements:**

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Energy programs - Generate revenue from FOD-managed facilities:				
Power Sales	\$626,631	\$725,273	\$609,132	\$679,010
Demand Response	\$128,825*	\$138,297	\$189,121	\$201,619
Renewable Portfolio Standard Credits	\$220,855	\$320,443	\$321,425	\$172,089

*Including Cosgrove hydro-turbine as of FY19

Indicator	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Energy programs - Generate revenue from FOD-managed facilities:				
Power Sales	\$626,631	\$725,273	\$572,593	\$679,010
Demand Response	\$128,825*	\$138,297	\$163,127	\$201,619
Renewable Portfolio Standard Credits	\$220,855	\$320,443	\$193,605	\$172,089

FY21 Year-End Accomplishments:

Water System

- Completed the B-side of the 2020/2021 CWTP half plant maintenance.
- Operated Lonergan Intake to divert water from Ware River to Quabbin reservoir, transferring 65 million gallons of water in one day.
- Exercised mainline valves in Sections 29, 112 and at Deer Island Treatment Plant.
- Performed PRV maintenance at Meters 93, 100, 106, 126, 157 & 171, Section 28, Arlington Covered Reservoir, Deer Island Tank and Spot Pond Storage Tank.
- Leak detection performed on 10.45 miles of MWRA water main and community assistance was provided to Arlington, Malden, Medford, Melrose, Newton, Revere, Somerville and Swampscott.

Wastewater System

- Completed two temporary shutdowns of the odor control system at Nut Island to allow the contractor to tie in new ductwork.

- Replaced incline gearbox for Channel 2 at Ward Street Headworks.

Energy Conservation

- Completed the battery storage projects at Brattle Court and Chelsea Maintenance facility.

Budget Highlights:

The FY22 Final Budget is \$77.5 million, an increase of \$2 million or 2.8% from the FY21 Budget.

- \$38.2 million for **Wages and Salaries**, an increase of \$1.1 million or 3.1%, from the FY21 Budget, includes two more positions than the FY22 Final Budget and reflects increases to collective bargaining agreements. The FY22 Proposed Budget includes \$475,000 for stand-by pay to ensure support for operational and maintenance needs during wet weather and emergencies and \$21,000 for interns to provide support in several areas including Operations Engineering and SCADA.
- \$3.3 million for **Overtime**, an increase of \$88,000 or 2.7% from the FY21 Budget. The FY22 Proposed Budget for overtime, which incorporates collective bargaining increases, includes \$1.7 million for emergency related overtime; \$891,000 for planned overtime; and \$659,000 for operational coverage needs. Funds for planned overtime associated with the Quench Buggies (MWRA water fountains at public events) remain absent due to the pandemic.
- \$6.85 million for **Chemicals**, an increase of \$336,000 or 5.15% from the FY21 Budget. The FY22 budget includes \$6.26 million for water treatment chemicals and \$579,000 for wastewater treatment chemicals and is based on multi-year historical usage trends and projected market prices. The budget includes \$3.3 million for soda ash, \$1.8 million for sodium hypochlorite, \$464,000 for liquid oxygen, \$335,000 for carbon dioxide, \$330,000 for hydrofluosilic acid, \$144,000 for activated carbon, \$166,000 for aqua ammonia, \$148,000 for other oxidizers, \$162,000 for sodium bisulfite, and \$28,000 for sodium hydroxide, and \$8,500 for other chemicals (sodium thiosulfate,HCl, urea).
- \$10.5 million is included for **Utilities**, an increase of \$164,000 or 1.6% from the FY21 Budget. The FY22 Budget includes \$8 million for electricity, \$1.1 million for diesel fuel, \$678,000 for natural gas, \$552,000 for water and \$63,000 for propane. There is a \$100,000 increase in Electricity due to rate increases by local distribution companies offset by facility net volume increase, a \$102,000 increase in water, and an increase in natural gas of \$72,000. Other changes include a decrease in diesel fuel of -\$99,000, and decrease of -\$12,000 in propane.
- \$13.3 million for **Maintenance**, an increase of \$496,000 or 3.8% from the FY21 Budget due to project priorities and projected needs. The FY22 Proposed Budget includes \$5 million in day-to-day needs, \$4.9 million for services, \$3.2 million in major projects, and \$230,000 for energy initiatives. Some of the major projects included for the FY22 Budget are:

Invasives Control – water reservoirs	\$513,000
Somerville Marginal Tide Gate Replacement	\$294,000
Duct Cleaning for three WW Pump Stations	\$218,000
Manhole Rehabilitation Contract	\$190,000
Nut Island Outfall Inspections	\$183,000

Shaft 8 Retaining Wall Repair

\$150,000

- \$67,000 for **Training and Meetings**, an increase of \$2,000 or 3.1% from the FY21 Budget reflecting continued pandemic travel restrictions . The budget covers training required for work duties, health and safety compliance, job-related licensures and certifications, cyber-security and SCADA technical training.
- \$700,000 for **Professional Services**, a decrease of \$87,000 or 11% from the FY21 Budget primarily due to a decrease in use of engineering services to support several projects. The FY22 Proposed Budget includes \$550,000 for engineering services comprised of \$225,000 for as-needed engineering services to support CEB-funded maintenance projects; \$195,000 for an asset maintenance plan for MWRA dams; and \$130,000 for a consultant to configure SCADA firewalls, software, data modules; Additionally, the professional Services budget includes \$86,000 for an annual Macrophyte (invasive species) survey at the reservoirs; and \$55,000 for quality assurance services for Macrophyte harvesting, \$5k for PCB Abatement Services and \$3,500 for Digsafe Membership.
- \$826,000 for **Other Materials**, an increase of \$49,000 or 6.2% from the FY21 Budget primarily due to the SCADA upgrade project at JCWTP The FY22 Proposed Budget includes \$145,000 for vehicle expenses for gas, mileage reimbursements, and tolls; \$269,000 for work clothes; \$190,000 for health and safety supplies; \$103k for computer software; \$76,000 for equipment and furniture; and \$35,000 for office supplies.
- \$3.2 million for **Other Services**, a decrease of \$116,000 or -3.5%, from the FY21 Budget primarily due due to a decrease in the Howard Street Pump Station rehabilitation costs and in Police Details because the meter replacement police details will be covered through the contract. Note that funding for police details will need to be reinstated in FY23. The FY22 Proposed Budget includes \$2 million for annual lease payments for the Chelsea office building; \$593,000 for telephones, and \$434,000 for police details.



Wachusett Aqueduct Water Pump Station Forebay

The **Engineering and Construction Department (ECD)** manages and coordinates the planning, design, and construction of system improvements that ensure a safe and adequate water supply and reliable wastewater collection and treatment. Staff is organized into three units: Wastewater Engineering, Water Engineering, and Construction.

The Department provides in-house engineering, consultant management (during the facilities planning, environmental review, design, and engineering services during construction stages of capital projects), drafting, surveying, construction management, and other technical assistance. This work supports projects necessary for the maintenance, repair, and rehabilitation of wastewater and waterworks systems. In accordance with the CIP, the Department plans and implements the rehabilitation of existing facilities and construction of new facilities. This includes pipelines, pump stations, storage facilities, and treatment facilities on schedules that allow for sufficient system capacity and performance.

The **Wastewater Engineering Unit** manages all wastewater design and engineering projects including Combined Sewer Overflow (CSO) engineering activities as well as specialized technical services in electrical, structural, mechanical, and civil engineering disciplines.

The **Water Engineering Unit** manages all water design and engineering projects. The unit also maintains the Design Information Services Center (DISC), which provides computer-aided design and drafting (CADD) services.

The **Construction Unit** provides contract management and resident inspection on all MWRA water and wastewater construction and rehabilitation projects, with the exception of Deer Island Treatment Plant.

FY22 Final Current Expense Budget ENGINEERING AND CONSTRUCTION							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 7,903,514	\$ 8,279,709	\$ 8,574,721	\$ 8,853,194	\$ 278,473	3.2%	
OVERTIME	95,069	61,803	149,068	131,026	(18,042)	-12.1%	
FRINGE BENEFITS	123	155	500	500	-	0.0%	
MAINTENANCE	91	2,381	-	-	-	-	
TRAINING & MEETINGS	39,656	31,011	16,500	16,500	-	0.0%	
OTHER MATERIALS	19,979	17,820	22,925	22,925	-	0.0%	
OTHER SERVICES	19,201	19,011	26,250	26,215	(35)	-0.1%	
TOTAL	\$ 8,077,633	\$ 8,411,890	\$ 8,789,964	\$ 9,050,360	\$ 260,396	3.0%	

FY22 Goals and Initiatives:

The Engineering and Construction Department has significant responsibility for the following MWRA goals included in the draft FY21-FY25 Five-Year Strategic Business Plan;

I. Wastewater Quality and System Performance

- **Goal #6 – Wastewater Infrastructure:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects. Initiatives include:
 - Continue to design and implement facility rehabilitation projects for various pump stations, headworks, and CSO facilities.
 - Continue to implement an ongoing program to review, prioritize, and accelerate interceptor renewal projects.
- **Goal #7 – CSO Plan Compliance:** Complete all CSO milestones by 2021 and demonstrate that the CSO Plan meets its performance objectives. Ensure compliance with CSO NPDES permit requirements.
 - Implement CSO performance assessment through ongoing contract with AECOM, which will include a report for submission to DEP/EPA by December 2021, and contains assessing attainment of the performance objectives in the approved CSO Control Plan.
 - Comply with the CSO Variances for the Alewife Brook/Upper Mystic River Basin and Lower Charles River/Charles Basin issued to MWRA and CSO communities for the period Sept 1, 2019 through Aug. 31, 2024.

III. Infrastructure Management and Resilience

- **Goal #9 – System Maintenance and Enhancement:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk consistent with customer, community, and regulatory support levels.
 - Issue Notices to Proceed for numerous contracts in accordance with the FY22 CIP.
 - Substantially complete numerous project phases in accordance with the FY22 CIP.

For more information about Capital Improvement Program projects, please refer to the Fiscal Year 2022 Capital Improvement Program document located on the Budget page of the MWRA's website at mwra.com.

FY21 Year-End Accomplishments:

- Issued Notices to Proceed for numerous contracts including the following:
 - Wastewater System:
 - Ward Street and Columbus Park Headworks Design/CA
 - Dorchester Interceptor Sewer Construction
 - Hayes Pump Station Rehabilitation Design
 - Water System:
 - Northern Intermediate High Section 89 & 29 Replacement Construction
 - Northern Intermediate High Improvements Design/ESDC
 - Steel Water Tank Improvements Design/CA
- Substantially completed numerous design and construction phases including the following:
 - Wastewater System:
 - Chelsea Creek Upgrades Construction
 - Charles River Valley Sewer Sections 191 & 192 Rehab Construction
 - Water System:
 - Southern Extra High Redundancy Pipeline Section 111 Construction 3
 - Northern Intermediate High Section 89 & 29 Redundancy Design CA/RI
 - Technical Assistance Consulting Services John Carroll Water Treatment Plant

Budget Highlights:

The FY22 Budget is \$9.1 million, an increase of \$360,000 or 3%, as compared to the FY21 Budget.

- \$8.9 million for **Wages and Salaries**, an increase of \$278,000 or 3.2% compared to the FY21 Budget primarily for wage increases associated with the addition of one position and collective bargaining agreements. FY22 CEB has 79 approved positions and funds 76 positions net of the vacancy rate. There were 78 approved positions in the FY21 CEB; an increase due to the addition of a construction field position to support western construction projects.
- \$131,000 for **Overtime**, which includes wage increases and additional overtime associated with fourteen construction projects scheduled for FY22. Overtime covers resident inspection at construction sites after regular work hours to ensure monitoring of construction projects. Overtime also covers unplanned design or survey needs, evening attendance at public meetings, and achieving project deadlines.
- \$17,000 for **Training & Meetings** to cover attendance at conferences and technical seminars. This funds staff attendance at conferences as part of MWRA's workforce development and succession planning strategies.
- \$23,000 for **Other Materials** to cover office supplies, work clothes, health and safety supplies, and survey equipment.
- \$26,000 for **Other Services** for printing/duplicating, telephone expenses, memberships and dues, and police details.



Bellevue Storage Tanks

Programs, Policy & Planning

Toxic Reduction and Control
Environmental Quality
Laboratory Services
Planning

The Deputy Chief Operating Officer oversees this section, which focuses on the following:

- Master planning, business planning, and strategic initiatives (such as system expansion);
- Environmental programs and regulatory coordination;
- Water and wastewater quality testing and reporting;
- Divisional budget preparation and monitoring;
- Financial planning and analysis;
- Accounts payable and contract administration;
- Human resources management functions; and
- Energy program planning, evaluation, analysis, reporting and audits.

The Deputy Chief Operating Officer also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting, and public constituency matters.

**FY22 Final Current Expense Budget
PROGRAMS, POLICY & PLANNING**

LINE ITEM	FY19	FY20	FY21	FY22	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY22 to FY21	
WAGES & SALARIES	\$ 15,320,027	\$ 16,434,583	\$ 16,282,494	\$ 16,739,089	\$ 456,595	2.8%
OVERTIME	244,142	334,978	246,474	251,979	5,505	2.2%
FRINGE BENEFITS	3,460	4,971	3,149	4,210	1,061	33.7%
UTILITIES	33,468	39,230	27,695	27,695	-	0.0%
MAINTENANCE	653,556	540,375	451,145	488,645	37,500	8.3%
TRAINING & MEETINGS	58,933	20,039	36,000	37,700	1,700	4.7%
PROFESSIONAL SERVICES	1,608,194	1,670,867	1,705,330	1,947,579	242,249	14.2%
OTHER MATERIALS	1,632,240	1,470,009	1,711,211	1,683,307	(27,904)	-1.6%
OTHER SERVICES	328,332	364,896	346,125	341,543	(4,582)	-1.3%
TOTAL	\$ 19,882,352	\$ 20,879,948	\$ 20,809,623	\$ 21,521,747	\$ 712,124	3.4%

The Programs, Policy & Planning Section is composed of the Toxic Reduction and Control, Environmental Quality (EnQual), Laboratory Services, and Planning departments. The Environmental Quality Department has two units; EnQual-Wastewater and EnQual-Water Quality Assurance. In total, the budgets for these programs represent 11.4% of the Operations Division's FY22 Budget.

**FY22 Final Current Expense Budget
PROGRAMS, POLICY & PLANNING by Program**

PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
TOXIC REDUCTION & CONTROL	\$ 4,765,352	\$ 5,169,831	\$ 5,025,081	\$ 5,199,131	\$ 174,050	3.5%
ENVIRONMENTAL QUALITY	4,968,587	5,263,263	5,453,331	5,469,816	16,485	0.3%
LABORATORY SERVICES	6,863,811	7,077,097	7,440,342	7,957,914	517,572	7.0%
PLANNING	3,284,602	3,369,757	2,890,869	2,894,886	4,017	0.1%
TOTAL	\$ 19,882,352	\$ 20,879,948	\$ 20,809,623	\$ 21,521,747	\$ 712,124	3.4%



Nut Island Headworks

The Toxic Reduction and Control (TRAC) Department operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA’s Environmental Protection Agency (EPA) approved Industrial Pretreatment Program and is responsible for all associated activities which include conducting inspections (approximately 1,250 annually), issuing permits (approximately 300 annually), conducting sampling (more than 2,000 events annually), and carrying out enforcement activities (approximately 300 annually). The program tracks more than 1,900 permitted facilities and 4,000 gas/oil separators. TRAC uses a software application to manage an extensive amount of industrial data on analytical test results, compliance status, and facility sampling and permitting requirements.

FY22 Final Current Expense Budget TOXIC REDUCTION AND CONTROL							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 4,466,790	\$ 4,802,033	\$ 4,720,288	\$ 4,888,998	\$ 168,710	3.6%	
OVERTIME	123,855	198,357	127,474	130,979	3,505	2.7%	
FRINGE BENEFITS	1,849	2,910	1,849	2,910	1,061	57.4%	
MAINTENANCE	2,593	10,404	12,000	12,000	-	0.0%	
TRAINING & MEETINGS	8,060	266	5,300	7,000	1,700	32.1%	
OTHER MATERIALS	139,857	134,326	133,189	131,185	(2,004)	-1.5%	
OTHER SERVICES	22,348	21,535	24,980	26,058	1,078	4.3%	
TOTAL	\$ 4,765,352	\$ 5,169,831	\$ 5,025,081	\$ 5,199,131	\$ 174,050	3.5%	

FY22 Goals and Initiatives:

II. Wastewater Management and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Continue to carry out the Pretreatment Program to protect receiving water quality, maximize the beneficial reuse of wastewater residuals, and protect workers and MWRA’s wastewater treatment plants and receiving waters.
 - Ensure compliance with MWRA and Federal regulations by issuing appropriate enforcement actions as outlined in the Enforcement Response Plan.
 - Staff will continue to transition the 8M permitting process into TRAC’s Pre-treatment Information Management System (PIMS) software.
 - TRAC staff will utilize the PIMS software to schedule and track work and to draft permits and track permit requirements. Sampling required by permits is entered into the PIMS system by permittees’ contract laboratories. This electronic reporting system is subject to EPA’s Cross Media Electronic Reporting Rule (CROMERR) and as such, needs to be upgraded to meet the requirements of the rule. TRAC staff are working with MWRA’s MIS staff to ensure that the PIMS system meets these requirements.

- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - Prepare updated Local Limits Studies for Clinton and Deer Island in accordance with EPA guidelines to confirm appropriate discharge limits from industries.

- Continue to closely follow developing permit issues such as the impact of changes in bacterial and nutrient water quality standards; effluent loading limits; emerging contaminants and PFAS regulations; stormwater permitting; endangered species designations and phosphorus and PFAS in biosolids.

FY21 Year-End Accomplishments:

- TRAC issued the first set of annual invoices to approximately 700 permitted dental facilities. March marks the start of the second year of the Dental Discharges permit.
- TRAC continues to work towards streamlining processes and making more documents and reports available electronically. TRAC has been working with our permitted industries during FY21 to make these changes.
- Key performance indicators includes;

Indicators	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goals
EPA Required SIU Monitoring Events	172	172	166	168
Non-SIU Monitoring Events	83	76	136	77
SIU Connections to be Sampled	398	388	384	392
EPA Required SIU Inspections	201	195	198	180
SIU Permits due to Expire	71	83	52	78
Non-SIU Permits due to Expire	371	242	243	186
Issue Annual Industrial Pretreatment Program Report	Oct 2019	Oct 2020	Oct 2021	Oct 2022

Budget Highlights:

The FY22 Proposed Budget is \$5.2 million, an increase of \$174,000 or 3.5%, from the FY21 Budget.

- \$4.9 million for **Wages & Salaries**, an increase of \$169,000 or 3.6% from the FY21 Budget primarily for wage increases associated with collective bargaining agreements. The budget includes \$82,000 for stand-by pay for wet weather sampling events.
- \$131,000 for **Overtime**, an increase of \$3,500 or 2.7% from the FY21 Budget primarily due to increases associated with collective bargaining agreements. Overtime covers sampling, monitoring, and inspections during off-hours as well as emergencies and wet weather events.
- \$12,000 for **Ongoing Maintenance**, level funded with the FY21 Budget. This funds sampling equipment, materials, and maintenance of equipment used in sampling discharges at permitted industries.
- \$131,000 for **Other Materials**, a decrease of \$2,000 or (1.5%) from the FY21 Budget. Funding in this line item mainly supports lab and testing supplies, health and safety materials, and work clothes.
- \$26,000 for **Other Services**, an increase of \$1,000 or 4.3% from the FY21 Budget. This line item also funds printing costs for regulations, public advertising of industrial users in Significant Noncompliance, and police details for sampling work done in public streets.



Sampling of Clinton Effluent Channel

**FY22 Final Current Expense Budget
ENVIRONMENTAL QUALITY**

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 3,154,668	\$ 3,485,432	\$ 3,647,923	\$ 3,690,499	\$ 42,576	1.2%
OVERTIME	20,454	20,699	20,000	22,000	2,000	10.0%
FRINGE BENEFITS	76	95	200	200	-	0.0%
MAINTENANCE	95,762	116,522	100,520	138,020	37,500	37.3%
TRAINING & MEETINGS	30,330	13,087	17,000	17,000	-	0.0%
PROFESSIONAL SERVICES	1,369,665	1,364,677	1,430,148	1,403,117	(27,031)	-1.9%
OTHER MATERIALS	229,701	187,794	150,000	116,100	(33,900)	-22.6%
OTHER SERVICES	67,931	74,957	87,540	82,880	(4,660)	-5.3%
TOTAL	\$ 4,968,587	\$ 5,263,263	\$ 5,453,331	\$ 5,469,816	\$ 16,485	0.3%

The core functions of the Environmental Quality Department are to monitor and report on the quality of drinking water and to ensure compliance with regulatory reporting requirements governing drinking water; to monitor wastewater and the receiving water environment as laid out in the Ambient Monitoring Plan; and to ensure compliance with regulatory reporting requirements governing wastewater treatment and discharges.

**FY22 Final Current Expense Budget
ENVIRONMENTAL QUALITY by Program**

PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
ENQUAL	\$ 2,883,434	\$ 3,082,629	\$ 3,096,932	\$ 3,110,603	\$ 13,671	0.4%
WATER QUALITY ASSURANCE	2,085,153	2,180,634	2,356,399	2,359,213	2,814	0.1%
TOTAL	\$ 4,968,587	\$ 5,263,263	\$ 5,453,331	\$ 5,469,816	\$ 16,485	0.3%

The **Environmental Quality Department** (EnQual) has two units: EnQual-Water Quality Assurance (EnQual-Water) and EnQual-Wastewater (EnQual-WW). EnQual-Water manages compliance with the reporting requirements of the Massachusetts Department of Environmental Protection (MADEP) Drinking Water Regulations, as well as conducts and oversees the drinking water quality-monitoring program. Activities include maintaining the Contaminant Monitoring System (CMS) and a mobile CMS unit for as-needed sampling including emergency response situations. The group also conducts an algae monitoring program, responds to customer complaints, conducts community sampler training; reviews and reports system water quality while assessing needs for treatment plant chemical dose changes; and conducts community sampler training while assisting water department officials with water quality concerns such as declining chlorine residuals, storage tank management, and regulatory level assessments.

EnQual-WW manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permits. The group must submit permit reports to state and federal regulators, the science advisory panel and its subcommittees, and post many of these reports on its Harbor and Bay web pages. EnQual-WW manages environmental data and monitors and reports on the environmental quality of Massachusetts Bay, sewage influent and effluent, Boston Harbor and its tributary rivers, and Harbor beaches. EnQual-WW uses the monitoring data to demonstrate benefits of CSO control

and support future decision-making. EnQual-WW also keeps current with upcoming and draft regulations, providing comments and evaluating potential impacts on MWRA operations.

The Environmental Quality Department has significant responsibility for the following MWRA goals included in the FY21-FY25 Five-Year Strategic Business Plan:

FY22 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirements and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations and reporting requirements.
 - Under a new an Interdepartmental Service Agreement with UMass Amherst (ISA), we will develop strategies for the control of disinfection by-products (DBPs), and treatment of algae and cyanobacteria in the Wachusett and Quabbin Reservoirs.
 - In coordination with the MA Department of Conservation & Recreation (DCR), continue to develop operational emergency response plans for nuisance and harmful algal blooms, detection of taste and odor compounds, and algal toxins. Communicate goals with MADEP.
 - Continue to monitor algal toxins and taste and odor compounds in source and drinking water and adapt the program to the rapidly changing regulatory landscape of this issue.
 - Continue the process of transitioning water quality reporting to automated platforms from an EnQual-Water database.
 - Continue to respond to MADEP and the U.S. Environmental Protection Agency (EPA) regarding regulatory changes for drinking water quality monitoring.
 - Continue the process of transitioning water quality reporting to automated platforms from an EnQual-Water database.
 - Continue to assess the market for new technologies associated with continuous drinking water monitoring and alarming and determine if wholesale system replacements are warranted.
 - In FY22, work with MIS Dept. to upgrade Aquarius software for drinking water reporting.
- **Goal #2 –Water Quality Public Communications:** Continue to effectively report and communicate water quality information to our customers and public officials.
 - As part of an Authority Consequence Management Plan, operate a comprehensive network of water quality monitoring stations; maintain a mobile water quality trailer to provide field-monitoring capabilities; and oversee a quality-monitoring program for emergency standby reservoirs. Develop and train staff on emergency response procedures and contaminant response procedures for reservoir or distribution system events.



Norumbega Covered Storage Tank and Norumbega Open Reservoir (now a back-up supply)

- Collect samples and evaluate data to develop a program for the emergency standby reservoirs, including management goals to ensure they are ready for use in the event of a drinking water shortage. Continue to annually report on reservoir data.
- Train water department staff from MWRA communities in drinking water sampling and chlorine residual testing, drinking water quality complaints, emergency response, and regulatory compliance assistance. Disseminate quarterly community chlorine residual reports to communities.
- Continue to strengthen planning and emergency response documents for Boil Water Order Events. Work with the Planning Department to create, disseminate and train on materials that can be used at a Public Information Call Center during a Boil Water Order Event.

II. Wastewater Quality and System Performance

- **Goal #4– Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Respond to public interest and improve timeliness of accurate reporting, finish development of systems to more quickly gather and report accurate combined sewer overflow (CSO) and sanitary sewer overflow location and volume data.
 - Continue to implement the water quality modeling requirements of the Deer Island Treatment Plant (DITP) NPDES permit.
 - Continue to develop and manage a monitoring program for Boston Harbor and its tributary rivers, and Massachusetts Bay, reflecting permit and variance requirements, relevant current concerns, and long-term interests of the area.
 - Continue to implement the reporting requirements of DITP and Clinton Treatment Plant NPDES permits. Respond to regulatory changes and program initiatives, including any new permits.
 - Continue to produce scientific reports and manage environmental monitoring data; make data and analysis available in-house, in public presentations, online, and in designed print products; keep up-to-date data available for presentations to regulators and other interested parties.
 - Manage water facility NPDES permits, and provide monthly and quarterly reports to regulators.

- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - Prepare for and meet with regulators regarding the updated NPDES Permit for DITP.
 - Propose permanent modifications to the Ambient Monitoring Plan that have been endorsed by the Outfall Monitoring Science Advisory Panel (OMSAP). Explore additional modifications to better address issues of emerging concern by working with regulators and OMSAP to review the goals and monitoring questions underlying the permit-required Plan.
 - Review draft permits, including general permits that affect MWRA facilities, and regulatory changes, e.g., water quality standards and criteria.
- **Goal #7 – Combined Sewer Overflow Plan Compliance:** Complete all CSO milestones by 2021 and demonstrate that the CSO Plan meets its performance objectives.
 - Provide technical and scientific support for the development of the EPA-required CSO Program performance assessment.
 - Working with staff from Planning, Engineering and Construction, and Operations, continue work on the CSO performance assessment, including ongoing water quality monitoring.
 - Update receiving water models for the Charles and Alewife/Mystic Rivers as part of the four-year performance assessment.
 - To meet future water quality assessments expected in the CSO variance areas of the Mystic and Charles Rivers, intensify data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality.

FY21 Year-End Accomplishments:

III. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:**
 - MWRA and DCR collect algae samples on Wachusett and Quabbin Reservoirs. Staff perform algal toxin and taste and/or odor compound sampling at treated water taps through November, 2020; this sampling coincided with EPA’s UCMR4 community entry-point cyanotoxin monitoring. Results revealed no cyanotoxin detections during any routine or UCMR4 sampling events.
 - Completed contract with UMass Amherst, under an Interdepartmental Service Agreement, to investigate possible contamination from a railroad contamination event in the Wachusett Reservoir.
 - Successfully procured and deployed a new profiling water quality monitoring buoy onto Quabbin Reservoir. Hand-cast and buoy sondes were also procured to provide parameter data throughout the water column. Staff facilitated inclusion of buoy data onto our buoy server and into OMMS and PI Processbook.
 - Sampling staff continued UCMR4 monitoring, including cyanotoxin monitoring every other week for 4 months at 28 fully served, entry-point locations across the service area. Community sampling was completed in 2020.
 - Continued to develop and implement automation of weekly water quality reporting. Worked with MIS Dept. to upgrade Aquarius software to make use of its new and improved capabilities and reporting technology.

- Staff, working in conjunction with Engineering & Construction department, have met to redesign the Route 12 shed sampling intake system through a task order.
 - Throughout the year staff completed the following initiatives:
 - Community assistance sampling events: 11 events
 - Water quality complaint assistance: 6 events
 - Offline pipeline or tank clearance sampling: 17 events
 - Drinking water sampler training: 6 events
 - In March 2021, ENQUAL sampling staff commenced biweekly sampling for the Clinton Water Treatment Plant (CWTP) pipe-loop study. This project involves multiple groups across the agency and its goal is to measure lead in tap water using community lead service lines with various corrosion control treatment.
- ***Goal #2 –Water Quality Public Communications: Continue to effectively report and communicate water quality information to our customers and public officials.***
 - Continued to assess the market for new technologies associated with continuous drinking water monitoring and alarming and determine if wholesale system replacements are warranted.
 - Assisted numerous MWRA communities with sampling or testing needs in FY21. Most assistance was related to storage tank clearance sampling following cleaning events, coliform detection investigations, special Optimal Water Quality Parameter sampling, or testing community samples to help determine if sample is groundwater or a system leak.



Norumbega Covered Storage Tank and Norumbega Open Reservoir (now a back up supply)

- In July, sampling staff worked with the standby reservoir inspection and sampling contractor. Cyanobacteria visual monitoring continued this quarter at all standby and active reservoir locations. Staff continued to use the web-based ESRI application to report field inspection results during the algae season. Data Management staff began annually reporting on reservoir data.
- In July and August, staff presented at MWRA’s Community Emergency Response Planning Training on building flushing after lengthy shutdowns due to COVID19 and proper

- coliform sampling technique. Provided a virtual presentation to the Chelsea sampling staff on proper coliform sampling technique and chlorine residual measurement.
- Staff presented at three training sessions associated with spill identification, monitoring, and response strategies associated with a potential reservoir contamination event.
- Continued to provide monthly virtual drinking water sampler training to newly hired MWRA and community sampling staff.
- Per MA DEP regulation, completed quarterly initial monitoring for perfluorinated compounds (PFAS) at MWRA's finished water taps. MWRA's web page was updated with the data. In June, MA DEP granted MWRA a waiver for the remainder of the initial monitoring period.
- In May, MWRA staff submitted comments to EPA during the public comment period regarding the draft EPA UCMR5 rule. The rule is expected to be finalized in FY22.

EnQual-Wastewater

- ***Goal #4– Compliance with Regulatory Requirements:***

- EnQual-Wastewater published 15 technical reports in FY21.
- Implemented and improved MWRA's CSO notification web page and database to meet the new rapid CSO notification requirements in the CSO Variances.
- Met all NPDES reporting requirements including routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order. Missed no reporting deadlines, even with the impacts of COVID-19.
- Worked with consultants to update the software used to implement the DITP permit's water quality modeling requirements.
- Observing Covid-19 protocols, conducted all ambient monitoring sampling required under the DITP NPDES permit, collecting and analyzing seawater, sediment and flounder samples for evidence of outfall-related environmental degradation (none was observed).

- ***Goal #5 – Regulatory Changes:***

- MWRA formally proposed cost-saving reductions in sediment and flounder monitoring to regulatory agencies in November 2020 that regulators approved in January 2021.
- Reviewed and analyzed impacts on MWRA of several new MADEP and EPA regulations; these include legislation relating to reporting CSO discharges and state water quality standards, such as "alternative Total Maximum Daily Load (TMDL)" for phosphorus in the Mystic River.
- Reviewed and commented on draft permits for Merrimack River wastewater treatment plants and Great Bay NH wastewater treatment plants, on issues that relate to a possible future DITP permit, as well as on the draft industrial stormwater permit that covers MWRA wastewater facilities.

- ***Goal #7 – Combined Sewer Overflow Plan Compliance:***

- Continued monitoring (using Covid-19 safety protocols) and data analyses required by the CSO Variances for the Charles and Alewife/Mystic Rivers and oversaw related work by AECOM on the CSO Water Quality Assessment. Assisted with public briefings for variances. Continued to use the CSO public notification system implemented in July 2020 to make required notifications to regulatory agencies, boards of health, and subscribers. As of

August 2022 notifications are being sent to nearly 100 external subscribers, including the required notifications to regulatory agencies and boards of health.

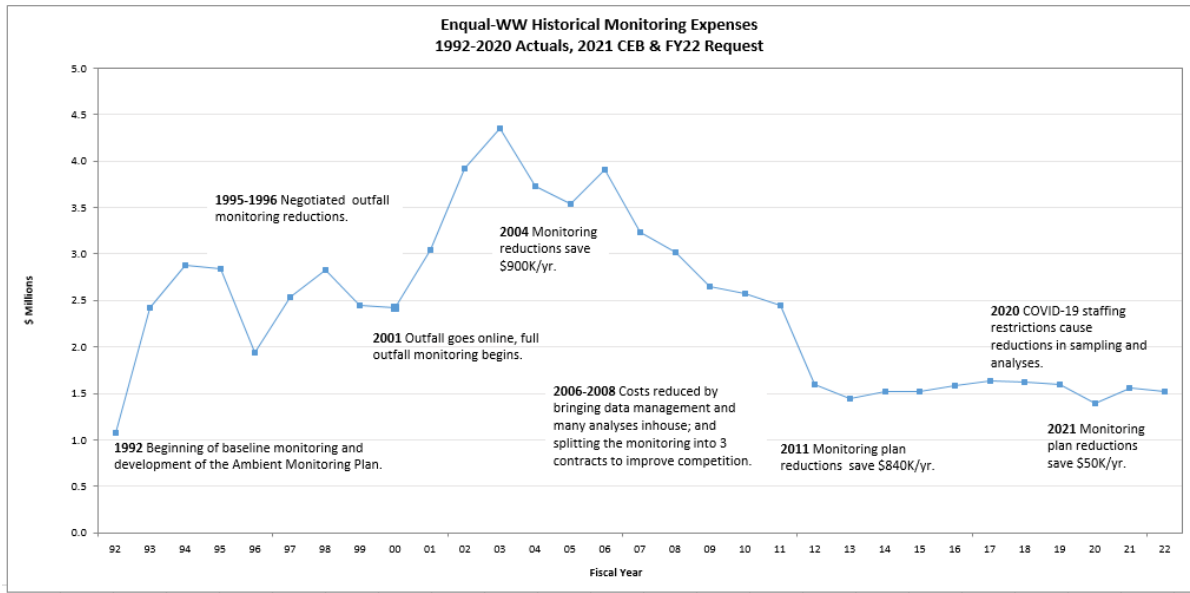
- The new Sewage Notification Law may require modifications to the system during FY22, for example reporting within 2 hours rather than the 4 hours required by the CSO Variances, and addition of SSO reporting. In FY21 Enqual participated in stakeholder meetings convened by DEP to inform the upcoming regulatory implementation of the law.

Budget Highlights:

The FY22 Final Budget is \$5.5 million, essentially level-funded with the FY21 Budget.

- \$3.7 million for **Wages and Salaries**, an increase of \$42,000 or 1.2%, primarily due to wage increases associated with collective bargaining agreements. The budget also includes \$59,000 for interns to assist with data analysis, water quality sampling, and technical support and \$40,000 for stand-by pay associated with wet weather and water quality monitoring programs.
- \$22,000 for **Overtime** to support wet weather and water quality monitoring programs, an increase of \$2,000 or 10% over the FY21 budget based on needs and salary increases.
- \$138,000 for **Maintenance**, an increase of \$37,500 or 37.3% from the FY21 Budget primarily due to inclusion of funds for Contaminant Monitoring System equipment and maintenance of Fluidion water quality monitoring instruments used for the CSO program.
- \$17,000 for **Training and Meetings** to cover staff participation in professional conferences and technical and software training, which is level funded with the FY21 Budget.
- \$1.4 million for **Professional Services**, a decrease of \$27,000 or -1.9% from the FY21 Budget due to ambient monitoring plan reductions to sediment and flounder monitoring. The budget supports laboratory testing for MWRA's Harbor and Outfall Monitoring (HOM) Program, including Cape Cod Bay monitoring and \$322,000 for contracts for the following activities which are co-funded through cost-sharing or cost-reduction agreements:
 - UMass Amherst: a special study to investigate strategies to control algae and cyanobacteria at Wachusett and Quabbin reservoir commenced in FY21.
 - University of Maine's buoy off Cape Ann: instruments measuring algae, chlorophyll and other water-quality indicators.
 - The Center for Coastal Studies: monitors water quality in Cape Cod Bay.

The FY22 Budget reflects approximately \$840,000 in annual savings due to the reduction in scope of HOM monitoring that took place in 2011 through 2013. Additional reductions were implemented starting in FY21, resulting in about \$50,000 in annual savings (see figure below). These changes were based on favorable findings of many years of monitoring data and regulatory approval.



- \$116,000 for **Other Materials** a decrease of \$34,000 or -22.6% from the FY21 Budget, due to the one-time purchase of equipment in FY21. The budget includes \$65,000 for lab and testing supplies for the CMS program and \$38,000 for the replacement of benchtop equipment and field testing kits.
- \$83,000 for **Other Services**, a decrease of \$5,000 or -5.32% from the FY21 Budget, due to the ending of the UCMR4 sampling program. The budget includes charges for Verizon and sample shipping.

The core function of the **Department of Laboratory Services** is to provide high quality and responsive laboratory services to MWRA’s water and wastewater treatment programs, including the Watershed Division of the Department of Conservation and Recreation (DCR) and the MWRA member water and wastewater communities. This involves timely and cost-effective laboratory tests to meet the strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act (SDWA), Clean Water Act, and National Pollutant Discharge Elimination System (NPDES) permits.

The Department supports these functions at five locations: Chelsea, Southborough, Quabbin, the Central Laboratory at Deer Island, and Clinton. Testing supports drinking water transmission and treatment processes, wastewater operations and process control at Deer Island and Clinton, NPDES compliance, Massachusetts Bay outfall monitoring, Toxic Reduction and Control, and wastewater residuals. The Department also conducts the Boston Harbor monitoring program that involves regular sampling for nutrients, bacteria, and water quality parameters throughout Boston Harbor. Laboratory staff track and analyze results for submission to the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

Most MWRA laboratory testing is done in-house. Certain highly specialized or low volume tests are outsourced, such as tests for cryptosporidium, giardia and radioactivity.

FY22 Final Current Expense Budget						
LABORATORY SERVICES						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 4,998,938	\$ 5,238,876	\$ 5,343,214	\$ 5,591,506	\$ 248,292	4.6%
OVERTIME	98,622	115,686	99,000	99,000	-	0.0%
FRINGE BENEFITS	1,505	1,966	1,100	1,100	-	0.0%
UTILITIES	33,468	39,230	27,695	27,695	-	0.0%
MAINTENANCE	314,411	275,679	338,625	338,625	-	0.0%
TRAINING & MEETINGS	2,042	1,695	4,700	4,700	-	0.0%
PROFESSIONAL SERVICES	215,425	293,813	274,181	543,461	269,280	98.2%
OTHER MATERIALS	1,089,619	985,591	1,248,272	1,248,272	-	0.0%
OTHER SERVICES	109,781	124,561	103,555	103,555	-	0.0%
TOTAL	\$ 6,863,811	\$ 7,077,097	\$ 7,440,342	\$ 7,957,914	\$ 517,572	7.0%

FY22 Goals and Initiatives:

The Laboratory Services Department has significant responsibility for the following MWRA goals included in MWRA’s FY21 - FY25 Five-Year Strategic Business Plan:

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.

- **Goal #3 – Technical Assistance for Water Communities:** Assist member communities to improve local water distribution systems through ongoing financial, technical, and operational support programs to maximize long-term water quality benefits.
 - PFAS testing: MWRA is developing the capability to meet the new MassDEP PFAS testing requirements for both fully and partially served communities.

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - CSO Assessment: Continue to perform weekend CSO receiving water sampling during/after significant wet weather events.
 - PFAS testing: MWRA is developing the capability to assess the PFAS inputs into the wastewater system and the subsequent impacts on effluent quality and fertilizer pellet marketability.
 - Decision support: Provide as-needed laboratory services to support assessment of regulatory and operational issues.
- **Goal #5 – Compliance with Regulatory Requirements:** Continue to initiative plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality. Special initiatives include:
 - Continue to work with researchers investigating the use of wastewater as an indicator of the presences of the Covid19 virus.

In addition, the Laboratory Services Department provides support functions for other MWRA Departments. FY22 Major Initiatives in support of those functions include:

- **NPDES Permits** – Provide laboratory data and consulting to wastewater operations and EnQual on Deer Island draft or final NPDES permits.
- **School Lead Testing Initiative** – This special project began in FY16 and is continuing into FY22. MWRA’s lab completed 968 lead and copper tests from 78 schools and childcare facilities in 26 communities during FY21. An additional 104 lead tests were completed in support of DPH investigations of exposed children in FY21. Since 2016, MWRA’s Laboratory has conducted over 38,800 tests from 511 schools and daycares in 44 communities.
- **Ethics Training** – Continue laboratory ethics and data integrity training to meet MassDEP laboratory certification and National Environmental Laboratory Accreditation Program (NELAP) requirements.
- **Laboratory Renovation Projects** – MWRA is planning for eventual replacement of the HVAC system and fume hoods at the Central Lab. Related work will continue in FY22 including restoring cabinetry and lab benches at the Central Lab.
 - **Key Department Performance Measurements and Accomplishments:**

Indicator	FY18 Actual	FY19 Actual	FY20 Actual	FY21 Actual	FY22 Goal
Total # of Tests Performed	265,877	270,194	261,011	268,686	272,000
Percent On-Time Results	94.7%	93.9%	95.5%	95.5%	95%
Average Turnaround Time (days)	5.95	6.19	5.78	5.48	9

Percent Quality Control Within Specifications	97.7%	97.9%	97.7%	97.7%	97%
Special Project: School Lead Project # Samples	1,886	1,498	442	968	As-needed

FY21 Year-End Accomplishments:

- The Department of Laboratory Services (DLS) performed 268,686 tests during FY21 including 128,000 tests for the wastewater system and 115,000 tests for the water system.
- **CSO Assessment:** Performed CSO receiving water sampling in the Charles and Mystic Rivers during/after significant wet weather events to document the recovery of the rivers after rain events. MWRA will use this information as part of the court-ordered CSO Assessment.
- **Pandemic Management:** Assisted with implementation of MWRA’s Pandemic Emergency Action Plan to meet requirements of America’s Water Infrastructure Act (AWIA). Issued regular internal reports on the status and prevailing guidance regarding the COVID19 pandemic in Massachusetts. Also worked with the current vendor, Biobot Analytics, to monitor and report the presence of the virus in MWRA’s wastewater.
- **Decision support:** Provided testing and analytical services to support assessment of numerous issues including School Lead testing, the next DITP NPDES Permit, the new Clinton NPDES Permit, testing for algae blooms in the Emergency Distribution Reservoirs, and red tide testing in Massachusetts Bay.

Budget Highlights:

The FY22 Proposed Budget is \$8.0 million, an increase of \$518,000 or 7% compared to the FY21 Final Budget.

- \$5.6 million for **Wages and Salaries**, an increase of \$248,000 or 4.6% compared to the FY21 Budget primarily due to backfilling of vacant positions and collective bargaining wage increases.
- \$99,000 for **Overtime**, level funded with the FY21 Budget based on recent history, to cover work associated with peak periods, emergencies, and special initiatives.
- \$28,000 for **Utilities**, level funded with the FY21 Budget based on historical spending levels. The budget covers the purchase of gases and cryogenic liquids used for various laboratory instruments.
- \$339,000 for **Ongoing Maintenance**, level funded with the FY21 Budget. This budget includes Lab equipment maintenance, repairs, and calibration for major lab instruments and once a year preventive maintenance for all ovens, water baths, incubators, refrigerators, freezers, chillers, meters, sensors, microscopes, thermometers, and balances. The budget for FY22 is based on historical spending levels.
- \$4,700 for **Training and Meetings** to fund attendance at the Lab Accreditation/National Environmental Monitoring Conference and the Association of Public Health Laboratories (APHL) annual meeting. Also included are several new conferences and seminars to keep staff technically knowledgeable.
- \$543,000 for **Professional Services**, an increase of \$269,000 or 98% compared to the FY21 Budget due to the inclusion of funds for COVID19 testing in MWRA’s wastewater during the continuing pandemic.



Funding in this line item supports laboratory and testing analysis services the department uses to contract out a variety of complex and/or low volume tests. Outside laboratories are used for emergencies, second opinions, capacity constraints, and unavailability of specialized equipment or economic justification.

- \$1.2 million for **Other Materials**, level funded with the FY21 budget. This budget line includes funding for laboratory supplies and laboratory instrument replacements.
- \$104,000 for **Other Services**, level funded compared to the FY21 budget. This covers courier service for shipping samples between laboratories, required permit fees for MassDEP and NELAP certification, removal of hazardous waste, boat dockage for two boats, and boat rental service on an as-needed basis.



Boston Harbor Sampling

The **Planning Department** provides regulatory, public policy, and public health advocacy for MWRA’s drinking water and wastewater programs. It provides decision support on planning, policy and operations matters, using a range of technical and analytical tools. Staff administers financial assistance programs to improve the infrastructure of member communities and to promote water conservation. The Department integrates staff efforts and coordinates MWRA activities related to system and capital planning, infrastructure renewal, and watershed management (in conjunction with the Commonwealth’s Department of Conservation and Recreation; DCR); strategic business planning; agency-wide performance measurement; and industry research.

FY22 Final Current Expense Budget						
PLANNING						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 2,699,631	\$ 2,908,242	\$ 2,571,069	\$ 2,568,086	\$ (2,983)	-0.1%
OVERTIME	1,211	236	-	-	-	-
FRINGE BENEFITS	30	-	-	-	-	-
ONGOING MAINTENANCE	240,790	137,770	-	-	-	-
TRAINING & MEETINGS	18,501	4,991	9,000	9,000	-	0.0%
PROFESSIONAL SERVICES	23,104	12,377	1,000	1,000	-	0.0%
OTHER MATERIALS	173,063	162,298	179,750	187,750	8,000	4.5%
OTHER SERVICES	128,272	143,843	130,050	129,050	(1,000)	-0.8%
TOTAL	\$ 3,284,602	\$ 3,369,757	\$ 2,890,869	\$ 2,894,886	\$ 4,017	0.1%

The department previously had two units, the **Planning Unit** and the **Meter Data Unit**. As of FY21, the Meter Data Unit shifted to the Field Operations/Operations Support Department, so the budget no longer rolls up into the Planning Department.

FY22 Final Current Expense Budget						
PLANNING by Program						
PROGRAM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
PLANNING	\$ 2,252,909	\$ 2,407,463	\$ 2,890,869	\$ 2,894,886	\$ 4,017	0.1%
METER DATA	1,031,693	962,294	-	-	-	-
TOTAL	\$ 3,284,602	\$ 3,369,757	\$ 2,890,869	\$ 2,894,886	\$ 4,017	0.1%

The functions of the **Planning Department** are:

- **Mapping, Modeling, and Data Analysis** – Technical staff develops and maintains the Geographic Information Systems (GIS) for the water and wastewater systems, including integration of field and engineering records into GIS for access by planning, engineering, and operations staff. Provides demand analysis and forecasting of water and wastewater flows for master planning and system operations; models reservoir operations and performs drought forecasting and planning; evaluates system expansion requests; and develops and maintains water and wastewater system models in support of master planning, system operations, and optimization. Staff assists in developing agency wide summaries of energy and greenhouse gas emission efficiency improvements.
- **System Planning and Renewal** – In coordination with colleagues across MWRA, staff with expertise

in engineering and planning are responsible for water and wastewater system master planning, infrastructure needs assessment, and capital project development. Key work includes:

- Reviews water and wastewater system expansion requests, water supply agreements, and emergency water withdrawal requests;
 - Assists with project siting decisions, environmental reviews, and permitting, including assessing impacts on MWRA facilities from other agencies' projects;
 - Develops strategies for reducing long-term emergency risks; and
 - Prepares plans for mitigating the risk of a range of hazards (i.e. climate change and sea level rise) on MWRA facilities and systems.
- **Regulatory and Policy Matters** – Staff work with various regulatory entities to advocate for cost-effective rule setting that protects the environment and promotes public health. Senior staff members also actively work with industry associations and other groups with agendas consistent with MWRA's to advance regulations that make environmental and economic sense. Senior staff conduct strategic policy research on a broad range of topics. Staff also conduct public health research and reports on potable water quality through production of the annual regulatory-required Consumer Confidence Report (CCR). Staff also coordinates with DCR on watershed protection initiatives. In conjunction with the Office of the Executive Director and Public Affairs, this unit serves as the Operations Division's lead on regulatory and policy matters potentially affecting MWRA's water and wastewater systems.
 - **Community Support Program** – This unit oversees and manages MWRA's financial assistance and technical community support programs. Staff are responsible for the development, implementation, and reporting on Inflow/Infiltration (I/I) reduction policy; oversight of and reporting on MWRA leak detection and demand management programs; and reporting on the portions of MWRA's NPDES permit related to demand management and flow limitation activities. Staff administers community assistance programs including sewer Inflow/Infiltration financial and technical assistance, water pipeline rehabilitation financial assistance, lead service line replacement funding, water distribution systems technical assistance, water leak detection technical assistance, and water conservation programs.

FY22 Goals and Initiatives:

- I. **Drinking Water Quality and System Performance** – The Planning Department's purview and function supports all the goals associated with this strategic priority. FY22 priorities include:
 - Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on operational, planning, environmental, and regulatory issues.
 - Continue coordination with member communities for distribution of grants and loans for local sewer, water, and lead service line removal projects.
 - Conduct training and technical assistance to support communities in compliance with the revised Lead and Copper Rule. Continue outreach and coordination to schools and childcare facilities on lead testing and remediation. Work collaboratively with MA Department of Public Health on testing of water in homes with children who have elevated blood lead levels and other priority initiatives.
 - Continue to advocate for responsible and reasonable revised drinking water regulations.
 - Distribute the federally required annual water quality report, the Consumer Confidence Report (CCR), to all households.

- II. Wastewater Quality and System Performance** – The Planning Department’s purview and function supports all the goals associated with this strategic priority. FY22 priorities include:
- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on operational, planning, environmental, and regulatory issues
 - Update selected record plans and real estate records.
 - Comply with I/I mapping and planning requirements in state environmental regulations and NPDES permits; interact with regulators after submitting full I/I control plan for MWRA collection system.
 - Continue coordination with member communities for distribution of grants and loans for local sewer, water, and lead service line removal projects.
- III. Infrastructure Management and Resilience** - Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support service levels. FY22 priorities include:
- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on planning, regulatory, and infrastructure issues.
 - Update the water distribution system model.
- V. Environmental Sustainability** – The Planning Department’s purview and function supports all the goals associated with this strategic priority by directing and managing MWRA’s planning processes including water system expansion planning, and climate change adaptation and mitigation efforts. FY22 priorities include:
- Update reports on greenhouse gas tracking and energy efficiency efforts and develop a sustainability section on MWRA’s web page.
 - Work with state and regional organizations and academic institutions to identify how MWRA can use existing long-term environmental data sets to help assess and project impacts of climate change.
 - Continue to assist communities seeking admission to the MWRA’s water system or approval of emergency withdrawals.

FY21 Year-End Accomplishments:

- Through June 2021, distributed \$30.2 million in Local Water System Assistance Program interest-free loans, plus an additional \$8.4 million under the Lead Service Line Replacement Loan Program in FY21. In total, MWRA has distributed \$491.6 million in loans to fund 481 local projects with participation from 43 of the 47 eligible water communities. Since 1998, MWRA has replaced or cleaned and lined 578 miles of local water main (about 8% of the regional system) via projects funded by MWRA’s financial assistance. In addition, MWRA has loaned \$25.1 million via 27 distributions to 13 communities for Lead Water Service Line Replacement projects.
- **Community Leak Detection** – Through June 2021, assisted six municipalities in the MWRA’s service area with leak detection (via task-order contracts) in their systems in FY21.
- **Lead Reduction Assistance** - Continued outreach to communities on sampling in schools for lead in conjunction with third round of DEP’s Technical Assistance program. Continued laboratory assistance to MDPH for water sampling for schools and day care centers.
- **Regulatory Input** - Planning Department staff have continued to be active in state and federal review of the Lead and Copper Rule as well as other proposed rule changes. Provided community updates on the revised LCR.

- ***Sewer Grant/Loan Program*** – Through June 2021, distributed \$37.4 million in grants and interest-free loans to member sewer communities for Infiltration/Inflow reduction and sewer system rehabilitation projects in FY21. In total, MWRA has distributed \$478.3million in grants and loans to fund 629 local projects with participation from all 43-member sewer communities
- ***Emergency Planning*** - Completed and certified compliance with the Emergency Response Planning requirements of America’s Water Infrastructure Act. Initiated major staff training exercise related to potential railroad spills at Wachusett Reservoir.
- ***Computer Modeling*** - Provided computer modeling support for major capital programs including operational planning for pipeline shutdowns and metro tunnels emergency planning on the water side; and ongoing support for wastewater projects including the CSO evaluation.
- ***Greenhouse Gas Reduction*** - Continued coordination with local and regional climate change adaptation planning efforts.
- ***Climate Change Adaptation*** - Coordinated the design, procurement and installation training for flood protection equipment to be installed at key MWRA wastewater facilities. Participated in Metro Mayors’ Climate Change Coalition Task Force and continued to monitor new research related to the effects of climate change in the service area. Co-chaired and participated in multi-agency Mystic River Regional Infrastructure exercise.
- ***Mystic River*** - Staff continued to represent MWRA on the Mystic River Steering Committee (facilitated by EPA and Mystic River Watershed Association staff). Key objectives are improved water quality and access to the River and improved open space opportunities are key objectives.

Budget Highlights:

- The FY22 Proposed Final Budget is \$2.9 million, an increase of \$4,000 or 0.1% as compared to the FY21 Budget, primarily due to Other Materials increases.
- \$2.6 million for **Wages and Salaries**, a decrease of \$3,000 or 0.1% as compared to the FY21 Budget. The FY22 Budget funds 23 filled positions and also includes \$7,500 for summer interns to assist with analyses in the areas of climate change, benchmarking, public health, and other projects in the spring of 2022.
- **Ongoing Maintenance** is not funded in FY22 due to the transfer of the Meter Data Unit in FY21.
- \$9,000 for **Training and Meetings**, which is level funded with the FY21 Budget. The budget covers participation in training and conferences primarily focused on water quality regulations and geographic information systems.
- \$1,000 for **Professional Services** costs associated with the translation of the CCR.
- \$188,000 for **Other Materials** which includes funding of \$165,000 for postage and mailing of the CCR, \$15,000 for water conservation kits, and \$5,000 for mapping supplies. The increase of \$8,000 is primarily due to expected price increases for distributing the CCR.

- \$129,000 for **Other Services** which includes \$89,000 for printing the CCR; \$20,000 for costs associated with community lead service line reduction initiatives; \$17,500 for printing water conservation and other informational brochures; and \$1,300 for Memberships and Dues for department employees.



Law Division
Budget

LAW DIVISION

Law

Legal Reviews
Litigation
Court Order Compliance
Environmental Regulation

The Law Division provides legal counsel to the Board of Directors, the Executive Director, and staff on compliance with federal and state laws, regulations, court cases, and administrative orders. Staff also handle and provide assistance with respect to litigation matters, real estate matters, labor/employment issues, procurement, and construction issues. The General Counsel interprets the MWRA Enabling Act and provides advice on conflict of interest and Code of Conduct issues. Division attorneys monitor the work of outside counsel when it is necessary to retain such services.

Law Division staff, though usually representing MWRA in a defensive posture, also work with Operations Division staff to effectuate cost recovery claims for design errors and omissions and construction defects. In addition, the Law Division assists in the early resolution of contractor and vendor claims prior to litigation so as to resolve them as favorably and early as possible thereby reducing or eliminating litigation costs and interest payable.

FY22 Final Current Expense Budget							
LAW DIVISION							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 1,654,125	\$ 1,534,345	\$ 1,767,040	\$ 1,533,795	\$ (233,245)	-13.2%	
OVERTIME	-	10	-	-	-	-	
TRAINING & MEETINGS	5,952	670	5,000	4,000	(1,000)	-20.0%	
PROFESSIONAL SERVICES	95,871	138,294	400,000	350,000	(50,000)	-12.5%	
OTHER MATERIALS	4,760	4,090	5,020	3,500	(1,520)	-30.3%	
OTHER SERVICES	31,631	29,419	32,312	35,711	3,399	10.5%	
TOTAL	\$ 1,792,339	\$ 1,706,828	\$ 2,209,372	\$ 1,927,006	\$ (282,366)	-12.8%	

FY22 Goals and Initiatives:

For FY22, the Law Division has identified the following goals and initiatives:

- Provide exemplary legal representation of MWRA.
- Provide timely and cost effective resolution of legal disputes involving MWRA through litigation, administrative proceedings, mediation, arbitration, or other alternative means of dispute resolution.

- Provide high quality legal services to support the business and operational needs of MWRA in several areas of the law including employment, labor, construction, contracts, procurement, environmental, energy, real estate, tort, regulatory compliance and ethics/conflict of interest.
- Provide legal advice on legislation and regulatory issues.

FY21 Year-End Accomplishments:

Negotiated a settlement agreement with the Contractor and Design Engineer to recover costs incurred by MWRA arising out of deficiencies in the installation of a replacement water main under MWRA Contract No. 7222, Watertown Section Rehabilitation.

Negotiated a settlement agreement with the Contractor and Design Engineer to recover costs incurred by MWRA resulting from the failed replacement of an existing water main under MWRA Contract No. 7335, Section 4 Webster Avenue Pipe and Utility Bridge Replacement.

Negotiated settlements to resolve employment and personal injury claims.

Obtained arbitrator's decision that MWRA properly did not increase the pay rate of two employees after the hiring of a third.

Obtained arbitrator's decision that MWRA did not act arbitrary or capricious in its discipline of an employee.

Received a dismissal from the MCAD for lack of probable cause of a charge of discrimination on the basis of age.

Assisted in preparing Financial Assistance Agreement with Boston Water and Sewer Commission for sewer separation and other CSO improvement work.

Worked with Boston Water and Sewer Commission staff in preparation of MOU for cost sharing and reimbursement for health and safety training.

Assisted in preparing Water Supply Contract with the Town of Burlington.

Assisted in preparing Sewer Connection Agreements with Crescent Ridge Dairy and The Rivers School.

Assisted staff in the preparation and filing of court reports in the Boston Harbor case.

Assisted staff in negotiations relating to the Cross Harbor Cable.

Drafted, and prepared for execution, lease agreement for new records center building.

Drafted conveyance agreement for use with City of Quincy for Cleverly Court.

Drafted legislation relative to the release of an access easement by MWRA.

Reviewed and advised staff on laws, orders and guidance related to COVID-19 pandemic. Provided counsel and advice to staff on Massachusetts Paid Family and Medical Leave Law.

Budget Highlights:

The FY22 Proposed Budget is \$1.9 million, a decrease of \$282,000 or 12.8%, as compared to the FY21 Budget. Decreased spending on Wages and Salaries and Professional Services were the principal drivers of the overall budget drop.

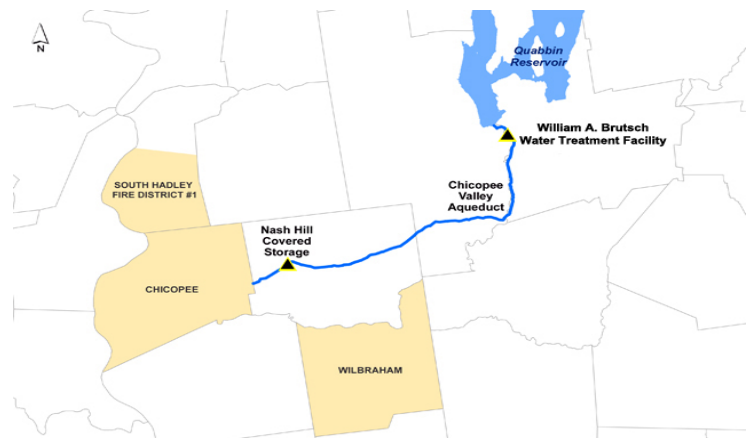
\$1.5 million for **Wages and Salaries**, a decrease of \$233,000 or 13.2%, as compared to the FY21 Budget primarily for reduction in FTEs. The FY22 Final Budget includes funding for 11.6 FTEs, two fewer than FY21 as two retirements will not be backfilled.

LAW DEPARTMENT	FY21 FTEs	FY22 FTEs
LAW	13.6	11.6
TOTAL	13.6	11.6

- \$350,000 for **Professional Services**, a decrease of \$50,000 or 12.5%, as compared to the FY21 Budget, mainly as a result of a revaluation of the cost and potential for additional services required from outside professionals and consultants.



Brutsch Water Treatment Facility



CVA System Map



Administration Division Budget

ADMINISTRATION DIVISION

Administration

Director's Office
 Facilities Management
 Fleet Services
 Human Resources
 Management Information Systems
 Procurement
 Occupational Health and Safety

The **Administration Division** is responsible for managing the support service functions of the Authority. Its departments support daily operations and maintenance and ensure the implementation of the Authority's long-term goals and strategies.

FY22 Final Current Expense Budget						
ADMINISTRATION						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 13,188,405	\$ 13,981,327	\$ 15,387,372	\$ 15,716,211	\$ 328,839	2.1%
OVERTIME	95,868	125,391	132,682	132,682	-	0.0%
FRINGE BENEFITS	19,857,450	20,744,462	22,287,664	23,134,741	847,077	3.8%
WORKERS' COMPENSATION	2,717,568	1,862,942	2,476,655	2,614,159	137,504	5.6%
UTILITIES	101,963	87,090	107,306	98,543	(8,763)	-8.2%
MAINTENANCE	4,500,035	4,664,005	4,787,849	5,640,958	853,109	17.8%
TRAINING & MEETINGS	137,687	87,393	166,742	236,108	69,366	41.6%
PROFESSIONAL SERVICES	994,783	1,397,820	2,575,628	2,697,520	121,892	4.7%
OTHER MATERIALS	2,291,900	1,279,646	1,558,932	3,457,542	1,898,610	121.8%
OTHER SERVICES	3,237,376	3,194,225	3,741,192	3,835,532	94,340	2.5%
TOTAL	\$ 47,123,035	\$ 47,424,301	\$ 53,222,022	\$ 57,563,996	\$ 4,341,974	8.2%

The Administration Division is comprised of seven departments: Director's Office (which includes Real Property); Facilities Management; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Occupational Health and Safety.

FY22 Final Current Expense Budget ADMINISTRATION by Department						
DEPARTMENT	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
ADMIN DIRECTOR'S OFFICE	293,787	386,888	385,353	396,573	11,220	2.9%
HUMAN RESOURCES	24,533,325	24,667,030	27,196,614	28,287,741	1,091,127	4.0%
MIS	12,617,023	12,224,603	14,624,114	15,766,104	1,141,990	7.8%
FACILITIES MANAGEMENT	2,452,708	2,513,349	2,864,731	5,029,596	2,164,865	75.6%
FLEET SERVICES	1,893,234	1,836,318	2,211,736	2,171,963	(39,773)	-1.8%
PROCUREMENT	4,459,912	4,754,986	4,527,386	4,600,226	72,840	1.6%
REAL PROPERTY / ENVIR MGMT	377,369	-	-	-	-	-
OCCUPAT HEALTH AND SAFETY	495,677	1,041,127	1,412,088	1,311,793	(100,295)	-7.1%
TOTAL	\$ 47,123,035	\$ 47,424,301	\$ 53,222,022	\$ 57,563,996	\$ 4,341,974	8.2%

FY22 Goals and Initiatives:

Consistent with MWRA's Board approved FY21 - FY25 Five-Year Strategic Business Plan, the Administration Division's FY22 goals are as follows:

IV. Finance and Management

- **Goal # 12 – Ensure Cost-Effective Operational and Resource Management:**
 - o Long-Term Planning for consolidation of CNY workspace at Chelsea and Deer Island with goal to relocate by May, 2023
 - o Provide Real Estate Support to Tunnel Redundancy Project's property acquisition needs
 - o Assure a safe and well-maintained working environment for all MWRA staff at CNY and appropriate space for staff by coordinating workspace planning, design, and furniture acquisitions.
 - o Maintain and expand MWRA-wide recycling efforts.
 - o Work with staff MWRA-wide to improve specifications development and documentation.
 - o Transition from paper to electronic processes.

- **Goal #13 – Maintain an Excellent Workforce:**
 - o Attract and retain a qualified high-performance workforce, hire and promote qualified minority, female, and veteran employees, and offer a competitive total compensation package (salary and benefits) to all employees.
 - o Continue to expand on MWRA's in-house job shadowing and career development training programs in anticipation of critical retirements over the next several years.
 - o Continue to provide training to ensure employee safety. Continue to transition to virtual trainings to the extent possible.
 - o Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce.

- o Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities and veterans.
- o Negotiate successor collective bargaining agreements with the five unions.
- **Goal #14 – Leverage Information Technology to Improve Organizational Effectiveness:**
 - o Deliver Information Technology (IT) services and solutions efficiently and effectively.
 - o Continue to provide IT resources to support remote work and meetings.
 - o Provide IT solutions to streamline work processes while ensuring the security and integrity of MWRA data by leveraging the use of existing or emerging technologies.
 - o Maintain current technology hardware, software, and network infrastructure.
 - o Maintain a secure technology environment.

V. Environmental Sustainability

- **Goal #15 – Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets:**
 - o Integrate more alternative fueled vehicles into the Authority's fleet. Continue to install idle reduction devices in all Authority vehicles to comply with state and federal regulations and also purchase more fuel efficient vehicles.

FY21 Year-End Accomplishments:

- Long Term Planning to determine viability of MWRA CNY office space consolidation. Met with representative of the Governor's Working Group on the Future of Work. Engaged CDM Smith to perform preliminary concept drawings, which concluded that CNY operations could relocate staff to the Chelsea facility and Deer Island assuming a portion of staff continue to telework.
- Continued to fill positions with qualified applicants using electronic processes and virtual interviews.
- Responded to receipt of option to purchase the Chelsea Facility by reviewing existing lease documents and property information and engaging appraiser to value the property.
- Provide real estate support to the Tunnel Redundancy Project as member of working group attending two weekly meetings (overall project and real estate), conveying preferred methods of acquisition (fee, easement, license) for various project needs, coordinating introductory meetings with sister agencies (DCAMM, MassDOT), engaging appraiser for valuation of six preferred sites, undertaking deed and title research on various parcels and milestone projections.
- Successfully monitored employees impacted by Covid -19 with the goal of preventing greater exposure within the Authority while supporting the needs of employees reporting illness for themselves or their families.
- Spec'd and purchased 3 additional electric vehicles for the Authority and installed electric vehicle charging stations at five locations.
- Installed additional electric vehicle charging stations at Chelsea and Deer Island.
- Electric charging stations installed at CWTP, Southboro, and Clinton Treatment Facility.

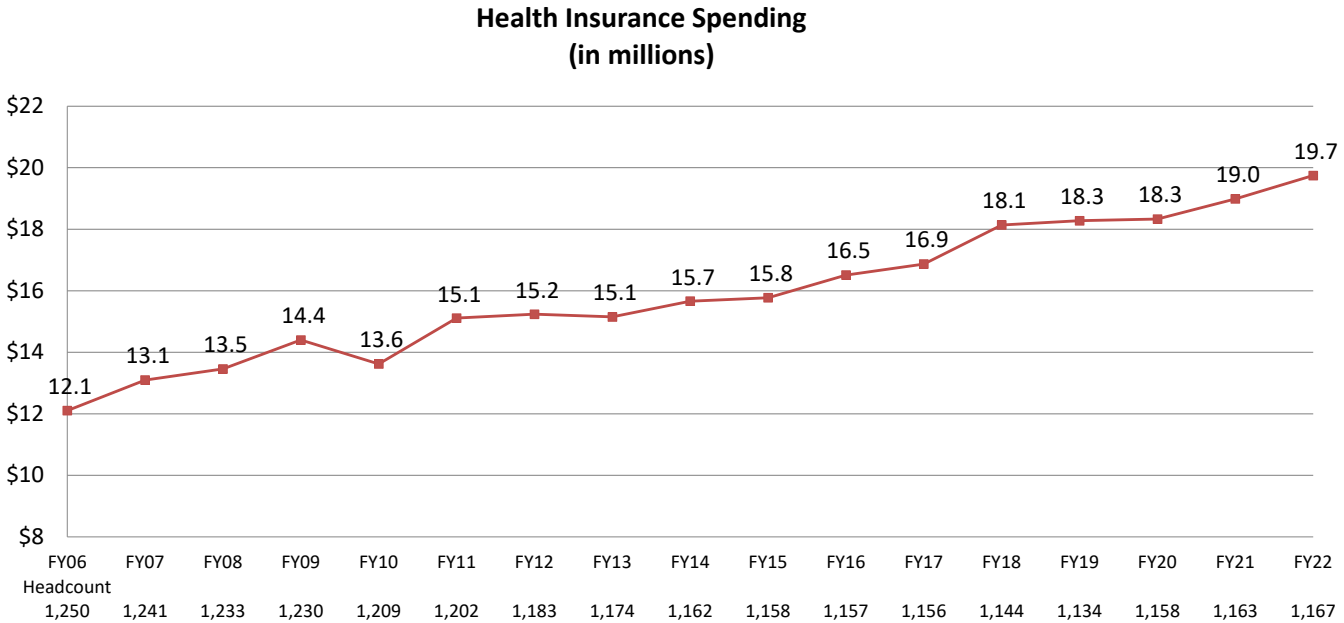
- Recycled 10.23 tons of batteries, 7.42 tons of paper and 213.04 tons of scrap metal, generating \$43,386 in revenue.
- **Fuel Management System:** A new fuel management system was implemented on Deer Island and in Chelsea. Future enhancement may include the implementation of RF ID on vehicles.
- **Multi-Factor Authentication:** Rollout of multi-factor authentication (MFA) to teleworkers was completed.

Budget Highlights:

The FY22 Final Budget is \$57.6 million, an increase of \$4.3 million or 8.2% as compared to the FY21 Budget.

- \$15.7 million for **Wages and Salaries**, an increase of \$329,000 or 2.1% as compared to the FY21 Budget. The increase is primarily due to wage increases associated with collective bargaining agreements plus the addition of an FTE to OH&S. The FY22 Final Budget funds 149.7 FTEs, three more than FY21.
- \$133,000 for **Overtime**, level funded with the FY21 Budget.
- \$23.3 million for **Fringe Benefits**, an increase of \$983,000 or 4.4% as compared to the FY21 Budget, reflecting the continuing rise in health insurance costs.

FTEs		
ADMINISTRATION by Department		
DEPARTMENT	FY21 FTEs	FY22 FTEs
ADMIN DIR OFFICE	3.0	3.0
HUMAN RESOURCES	16.8	16.8
MIS	55.0	57.0
FACILITIES MGMT	7.0	7.0
FLEET SERVICES	12.0	12.0
OH&S	9.0	10.0
PROCUREMENT	43.9	43.9
TOTAL	146.7	149.7



- \$2.6 million for **Workers' Compensation**, \$138,000 above the FY21 Budget or 5.6%. Actual spending for Worker's Compensation can vary. The Workers' Compensation budget is based on the average of the last three years of actual spending, but projections will excludes reserve adjustments.

Worker's Compensation	FY16 Actual	FY17 Actual	FY18 Actual	FY19 Actual	FY20 Actual	FY21 Final	FY22 Final	3 Year Average*
Compensation Payments	1,257,703	1,771,557	1,259,213	1,862,210	1,172,825	1,630,993	1,673,307	1,431,416
Medical Payments	850,170	470,072	718,233	707,099	516,755	631,801	773,523	647,362
Other	242,496	323,706	169,617	148,259	173,362	213,861	167,329	163,746
Total Worker's Comp.	\$2,350,369	\$2,565,335	\$2,147,063	\$2,717,568	\$1,862,942	\$2,476,655	\$2,614,159	\$2,242,524

*Three year average FY18 Actuals, FY19 Actuals, & FY20 Actuals

- \$99,000 for **Utilities**, a decrease of \$9,000 or 8.2%, as compared to the FY21 Budget, to reflect a drop in expected usage for the CNY Headquarters.
- \$5.6 million for **Maintenance**, an increase of \$853,000 or 17.8% as compared to the FY21 Budget, due to number of software licenses coming off multi-year maintenance and support agreements, and equipment on extended service agreements. In FY22, spending on computer licenses totals \$3.7 million, an increase of \$775,000 over FY21 Budget.
- \$236,000 for **Training and Meetings**, a change of \$69,000 or 41.6%% as compared to the FY21 Budget.
- \$2.7 million for **Professional Services**, an increase of \$122,000 or 4.7% as compared to the FY21 Budget. The largest component of this line item is \$1.9 million for computer consultants which increased \$114,000 over the prior year's budget.
- \$3.5 million for **Other Materials**, an increase of \$1.9 million or 121.8% as compared to the FY21 Budget. This includes \$2.1 million in projected relocation and reconfiguration expenses relating to the MWRA leaves its Charlestown space and staff is relocate to other facilities. Partially offset by a drop in computer hardware requirements which dropped \$197,000 after large increase in FY21 to accommodate covid requirements.
- \$3.8 million for **Other Services**, an increase of \$94,000 or 2.5% as compared to the FY21 Budget, primarily due to a \$54,000 increase in Space/Lease Rentals associated lease terms escalations and the new Walpole Record Center which offset Marlborough record center lease which expired in January 2021. Included in the Other Services funding is \$2.1 million for Space/Lease Rentals for the Charlestown Navy Yard Headquarters and new Walpole Record Center, \$1.2 million for Telecommunications expenses for all facilities, and MIS and security data lines.



Fog creeping in over Sudbury Dam

ADMINISTRATION DIVISION DIRECTOR'S OFFICE

The **Administration Division Director's Office** is responsible for the centralized support functions of procurement, human resources, management information systems, fleet services, facilities management, and real property. Additionally, the Director's Office ensures compliance with applicable statutes, regulations, Authority policies and procedures, and contract terms.

FY22 Final Current Expense Budget							
ADMINISTRATION DIVISION DIRECTOR'S OFFICE							
LINE ITEM	FY19	FY20	FY21	FY22	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY22 to FY21		
WAGES & SALARIES	\$ 293,562	\$ 382,118	\$ 375,131	\$ 381,351	\$ 6,220	1.7%	
OVERTIME	-	-	-	-	-	-	
PROFESSIONAL SERVICES	-	4,500	10,000	15,000	5,000	111.1%	
OTHER MATERIALS	-	20	-	-	-	0.0%	
OTHER SERVICES	225	250	222	222	-	0.0%	
TOTAL	\$ 293,787	\$ 386,888	\$ 385,353	\$ 396,573	\$ 11,220	2.9%	

The Administration Director's Office core functions are to:

- Manage and coordinate the Authority's support service functions.
- Guide and coordinate division activities to support MWRA's goals and objectives.
- Continuously improve processes and performance for greater efficiency.

FY22 Goals:

- Long-Term Planning for consolidation of CNY workspace at Chelsea and Deer Island with goal to relocate by May, 2023
- Provide Real Estate Support to Tunnel Redundancy Project's property acquisition needs
- Provide real estate services (appraisal, negotiation, survey review and/or planning) for: Section 50/57 Medford Waterline due to project delays (appraisals); Siphon Structure Rehabilitation (41 siphon structures in need of repair with varying real estate acquisition needs)
- Manage six (7) permit agreements (four at Turkey Hill, two at Walnut Hill, one at Fells Tower).
- Provide real estate support to Operations and Public Affairs for issuance of 8M permits to 1) public and private entities requesting use of MWRA controlled land
- Manage with GIS Department the Real Estate Mapping project

FY21 Year-End Accomplishments:

- Executed lease for new Records Center in Walpole. Part of team that managed procurement and installation of shelving, data wiring, moving, and commencement of building services (janitorial and utility services). Closed out lease at former Marlborough locations requiring removal of shelving and discontinuance of utilities/services.
- Long Term Planning to determine viability of MWRA CNY office space consolidation. Met with representative of the Governor's Working Group on the Future of Work. Engaged CDM Smith to perform preliminary concept drawings, which concluded that CNY operations could relocate staff to the Chelsea facility and Deer Island assuming a portion of staff continue to telework.
- Responded to receipt of option to purchase the Chelsea Facility by reviewing existing lease documents and property information and engaging appraiser to value the property.
- Provide real estate support to the Tunnel Redundancy Project as member of working group attending two weekly meetings (overall project and real estate), conveying preferred methods of acquisition (fee, easement, license) for various project needs, coordinating introductory meetings with sister agencies (DCAMM, MassDOT), engaging appraiser for valuation of six preferred sites, undertaking deed and title research on various parcels and milestone projections.
- Renewed existing Task Order Appraisal Contracts (603TA and 604TA) and procured new Task Order Contracts (607TA and 608TA).
- Provided real estate services (appraisal, negotiation, survey review and/or planning) for: Southern Extra High Service Pipeline, Dedham (easement acquisition from MBTA for land at Dedham Corporate Station); Section 50/57 Medford Waterline (appraisals for 8 properties); New Neponset Valley Sewer, Canton, (support to swap access easement at 777 Dedham Street to enable a redevelopment project); Spot Pond Covered Storage (legislative and survey review to dispose of easements to abutters to clear the title issues)
- Managed six (6) permit agreements (four at Turkey Hill and two at Walnut Hill). MWRA rebid RFP for Fells Tower, Stoneham that required reworking of security requirements. Permit scheduled to be issued by end of FY21. Current revenues (excluding Fells Tower) are \$443,200, half of which goes to the host communities.
- Provided real estate support to Operations and Public Affairs for issuance of 8M permits to 1) private entities requesting use of MWRA controlled land and 2) cities and towns applying to the Aqueduct Trails Program. Annual revenue from long term 8m permit totals \$84,190.
- Managed with GIS Department Real Estate Mapping project to transfer MWRA's real property takings to a user-friendly GIS-map based interface. Continued updating and editing records adding 115 mapped areas to the system.

Budget Highlights:

The FY22 Budget is \$397,000, an increase of \$11,000 or 2.9% as compared to the FY21 Budget.

- \$381,000 for **Wages and Salaries**, an increase of \$6,000 or 1.7% as compared to the FY21 Budget, primarily due to wage increases associated with collective bargaining agreements. The FY22 Budget supports three FTEs, matching the FY21 Budget.



Deer Island Treatment Plant Thermal Power Plant

FACILITIES MANAGEMENT

The **Facilities Management Department** provides a range of support services to MWRA staff located at the MWRA Headquarters in the Charlestown Navy Yard (CNY).

Facilities Management is responsible for coordinating site management activities at CNY. Staff institute maintenance procedures, respond to facilities requests from MWRA staff, coordinate workspace planning, provide office furnishings, and develop and implement appropriate measures to ensure the safety of MWRA staff and protect and preserve MWRA assets.

In addition, staff provides administrative and office support services that facilitate the efficient use of MWRA resources. These responsibilities include providing and managing the motor pools at both the Chelsea Facility and CNY, general office equipment repairs, transportation, mail, and courier services. Staff coordinates MWRA parking programs and corporate Massachusetts Bay Transportation Authority (MBTA) pass programs.

FY22 Final Current Expense Budget							
FACILITIES MANAGEMENT							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 436,852	\$ 471,901	\$ 533,280	\$ 552,918	\$ 19,638	3.7%	
OVERTIME	11,146	6,623	40,000	40,000	-	0.0%	
FRINGE BENEFITS	-	-	-	-	-	-	
UTILITIES	99,161	84,972	104,806	96,043	(8,763)	-8.4%	
MAINTENANCE	7,794	10,996	18,600	18,600	-	0.0%	
PROFESSIONAL SERVICES	-	-	4,000	4,000	-	0.0%	
OTHER MATERIALS	76,290	15,019	67,250	2,167,250	2,100,000	3122.7%	
OTHER SERVICES	1,821,465	1,923,838	2,096,795	2,150,785	53,990	2.6%	
TOTAL	\$ 2,452,708	\$ 2,513,349	\$ 2,864,731	\$ 5,029,596	\$ 2,164,865	75.6%	

FY22 Goals and Initiatives:

IV. Finance and Management

- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - o Assure a safe and well-maintained working environment for all MWRA staff and appropriate space for staff by coordinating workspace planning, design, and furniture acquisitions.
 - o Facilitate relocation of staff from CNY.
 - o Manage the lease for the CNY and Records Center in Walpole.

FY21 Year-End Accomplishments:

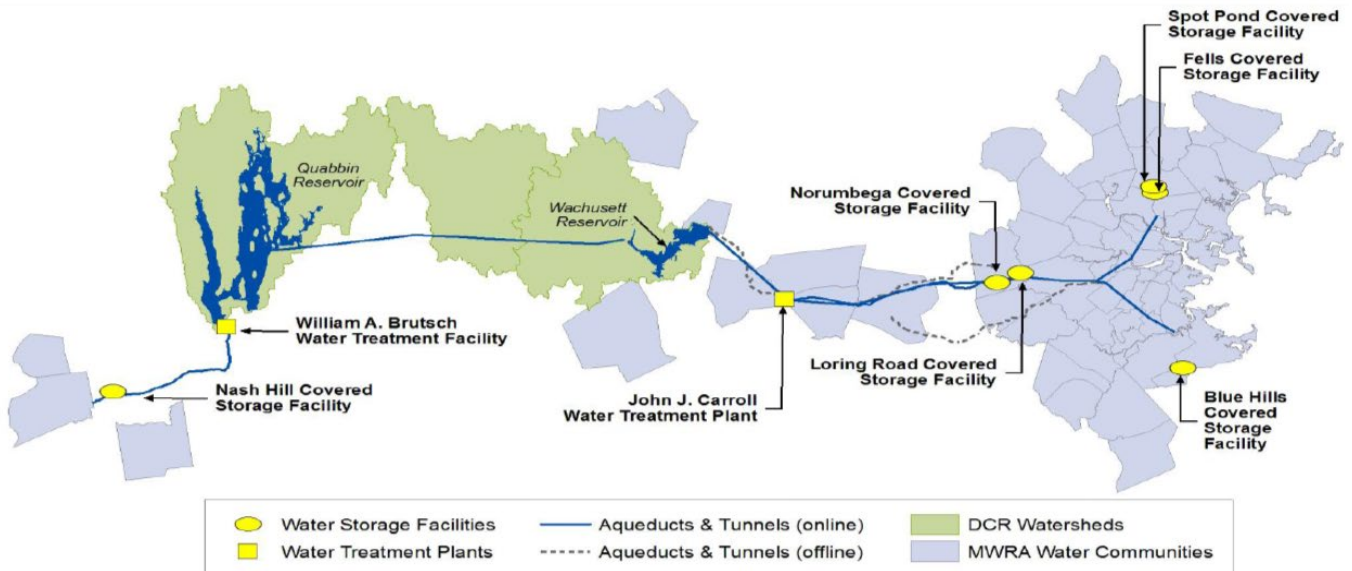
- Implemented facility improvements as provided in our current lease agreement for CNY headquarters.

- In conjunction with MIS, continued to look at ways to maximize efficiency of day-to-day office equipment such as printers, copiers, and facsimile machines.

Budget Highlights:

The FY22 Final Budget is \$5.0 million, an increase of \$2.2 million as compared to the FY21 Budget.

- \$553,000 for **Wages and Salaries**, an increase of \$20,000 or 3.7% as compared to the FY21 Budget, primarily for wage increases associated with collective bargaining agreements, offset by salary savings as a result of staff retiring and positions being filled at a lower salary. The FY22 Budget funds seven FTEs, the same as the FY21 Budget.
- \$96,000 for **Utilities**, \$9,000 below the FY21 Budget.
- \$2.2 million for **Other Materials**, \$2.1 million above the FY21 Budget, this increase reflects projected moving and reconfiguration cost at the Authority leaves its Charlestown space and staff is relocate to other facilities.
- \$2.2 million for **Other Services**, \$54,000 or 2.6% above the FY21 Budget. The main item under this line item is the lease for CNY Headquarters building at \$2.0 million. The lease includes base rent for the facility, real estate taxes, common area maintenance and operating costs. The increase reflects the additional cost for the new Walpole Record Center lease.



FLEET SERVICES

The **Fleet Services Department** manages and maintains MWRA's motor vehicle and equipment fleet. The goal of the Fleet Services Department is to maintain MWRA's vehicle and equipment fleet to minimize downtime and extend the life of the assets. Fleet Services also manages the Chelsea and Deer island fuel facility, the gas card program and the development and processing of specifications for new vehicles and equipment.

FY22 Final Current Expense Budget							
FLEET SERVICES							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 907,069	\$ 915,419	\$ 957,148	\$ 917,375	\$ (39,773)	-4.2%	
OVERTIME	10,212	9,754	11,000	11,000	-	0.0%	
FRINGE BENEFITS	157	143	250	250	-	0.0%	
UTILITIES	2,802	2,117	2,500	2,500	-	0.0%	
MAINTENANCE	460,565	544,426	682,500	682,500	-	0.0%	
TRAINING & MEETINGS	910	-	4,000	4,000	-	0.0%	
OTHER MATERIALS	510,046	363,123	552,924	552,924	-	0.0%	
OTHER SERVICES	1,473	1,336	1,414	1,414	-	0.0%	
TOTAL	\$ 1,893,234	\$ 1,836,318	\$ 2,211,736	\$ 2,171,963	\$ (39,773)	-1.8%	

FY22 Goals and Initiatives:

IV. Finance and Management

- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - Continue to cost effectively maintain the Authority's fleet of vehicles and equipment.
- **Goal #13 – Maintain a Safe Workforce:**
 - Purchase vehicles with additional safety lighting to enhance driver/vehicle visibility and added blue tooth technology to all vehicles.
 - Purchase vehicles with driver safety technology, including collision avoidance and lane departure warning.

V. Environmental Sustainability

- **Goal #15 – Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets:**
 - Integrate more alternative fueled vehicles into the Authority's fleet. Continue to install idle reduction devices in all Authority vehicles to comply with state and federal regulations and also purchase more fuel efficient vehicles.
 - Oversee the installation of additional electric vehicle charging stations at MWRA facilities.

FY21 Year-End Accomplishments:

- Developed specifications for new replacement vehicles and equipment. The majority of the vehicles and equipment will utilize alternative fuel, consistent with the Authority's goal of purchasing environmentally friendly products.
- Completed the fuel management system installation at Chelsea and Deer Island. Continue to work with MIS and Engineering staff on the design, purchase and implementation of a new fuel management system at Southboro headquarters, Loneragan Intake, and the Weston facility.
- Spec'd and purchased 3 additional electric vehicles for the Authority.
- Installed additional electric vehicle charging stations at Chelsea and Deer Island.
- Electric charging stations installed at CWTP, Southboro, and Clinton Treatment Facility.

Budget Highlights:

The FY22 Budget is \$2.2 million, a decrease of \$40,000 or 1.8% as compared to the FY21 Budget.

- \$917,000 for **Wages & Salaries**, a decrease of \$40,000 or 4.2% as compared to the FY21 Budget, primarily for wage increases associated with collective bargaining agreements offset by retirements and backfilling at a lower rate. The FY22 Budget funds 12 FTEs, the same as the FY21 Budget.
- \$683,000 for **Ongoing Maintenance**, level funded with the FY21 Budget.
- \$553,000 for **Other Materials**, level funded with the FY21 Budget reflecting unchanged fuel prices for vehicles. The FY22 Budget funds vehicle/equipment fueling which is based on historical fuel usage and current pricing. Fleet Services procures bulk fuels from state contracts while continuing to meet all governmental alternative fuel directives. It should be noted that the volatility of fuel pricing could impact this line item.



New Chevy Volt at Charging Station

HUMAN RESOURCES

The **Human Resources Department** is responsible for the overall management of MWRA employees. The Department enables employees to contribute successfully to MWRA’s goals and objectives through effective recruitment, labor management, training, and employee benefits management.

FY22 Final Current Expense Budget							
HUMAN RESOURCES							
LINE ITEM	FY19	FY20	FY21	FY22	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY22 to FY21		
WAGES & SALARIES	\$ 1,482,068	\$ 1,586,251	\$ 1,640,896	\$ 1,738,421	\$ 97,525	5.9%	
OVERTIME	-	132	-	-	-	-	
FRINGE BENEFITS	19,856,253	20,742,800	22,286,639	23,133,716	847,077	3.8%	
WORKERS' COMPENSATION	2,717,568	1,862,942	2,476,655	2,614,159	137,504	5.6%	
MAINTENANCE	-	99	-	-	-	-	
TRAINING & MEETINGS	6,093	5,564	3,963	3,963	-	0.0%	
PROFESSIONAL SERVICES	444,604	451,820	738,290	740,790	2,500	0.3%	
OTHER MATERIALS	18,307	6,042	19,550	19,550	-	0.0%	
OTHER SERVICES	8,432	11,380	30,621	37,142	6,521	21.3%	
TOTAL	\$ 24,533,325	\$ 24,667,030	\$ 27,196,614	\$ 28,287,741	\$ 1,091,127	4.0%	

The Human Resources Department is comprised of 3 units:

- The **Employment, Compensation, Benefits and HRIS Unit** coordinates and oversees all external recruitment and selection activities including hiring, lateral transfers, and promotions to meet the business needs of MWRA; develops and coordinates MWRA compensation and benefits strategies and programs; and ensures the proper processing and recording of personnel actions. The compensation unit also ensures that all MWRA employees possess the necessary licenses and certifications required for their positions. This unit is also responsible for managing workers’ compensation claims.
- The **Labor Relations Unit** is responsible for fulfilling MWRA's collective bargaining and contract administration obligations under Massachusetts' public sector collective bargaining law.
- The **Training Unit** develops, coordinates, delivers, and evaluates MWRA technical and professional development training programs and other programs designed to improve employee knowledge, skills, productivity, and the quality of workplace interaction and safety.

In addition, the Human Resources Department includes the Centralized Fringe Benefits cost center, which carries the budget for fringe benefits for all MWRA employees as well as for mandatory payments for unemployment expenses and Medicare.

**FY22 Final Current Expense Budget
HUMAN RESOURCES by Unit**

UNIT	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
EMPLOYEE/COMP/BEN	\$ 968,700	\$ 1,012,272	\$ 1,145,617	\$ 1,187,967	\$ 42,350	3.7%
LABOR RELATIONS	385,200	408,603	505,907	558,451	52,544	10.4%
TRAINING	548,411	596,168	702,296	711,448	9,152	1.3%
CENTRALIZED FRINGE BENEFITS	22,631,014	22,649,987	24,842,794	25,829,875	987,081	4.0%
TOTAL	\$ 24,533,325	\$ 24,667,030	\$ 27,196,614	\$ 28,287,741	\$ 1,091,127	4.0%

FY22 Goals & Initiatives:

IV. Finance & Management

- **Goal #13 - Maintain an Excellent Workforce:**
 - o Attract and retain a qualified high-performance workforce, hire and promote qualified minority, female, and veteran employees, and offer a competitive total compensation package (salary and benefits) to all employees.
 - o Maintain effective relationships with the unions representing the MWRA workforce while protecting and enhancing management flexibility. Ensure that collective bargaining objectives are met, support MWRA initiatives by designing and implementing appropriate labor relations strategies, and create an environment that fosters safety consciousness and productive work.
 - o Provide effective training necessary for employees to obtain and maintain required licenses and certification to ensure a highly skilled workforce.
 - o Continue to expand on MWRA's in-house job shadowing and career development training programs.
 - o Continue to provide training programs with a focus on professional and leadership development as well as diversity, equity and inclusion.
 - o Continue to aggressively manage MWRA Workers' Comp claims to mitigate future exposure.
 - o Engage in Successor Collective Bargaining Negotiations.
 - o Continue to ensure compliance with new state and federal regulations.

FY21 Year-End Accomplishments:

- Successfully monitored employees impacted by COVID-19 with the goal of preventing greater exposure within the Authority while supporting the needs of employees reporting illness for themselves or their families.
- Developed an onsite employee COVID testing program at the Chelsea, Deer Island and Southborough facilities to facilitate clearance of staff following COVID exposure, illness, or out-of-state travel, and for employees who wanted to be voluntarily tested. Implemented a vaccine clinic at the Chelsea facility.
- Working with the Law Division, developed and managed the leaves provided for under the Families First Coronavirus Response Act (federal) and Emergency Paid Sick Leave Law (MA). This program

allowed for up to 10 days of paid time off under certain conditions and expanded the definition of FMLA to include oversight for children whose schools were fully remote.

- Implemented and managed employee leaves for their own illness or birth/adoption under the Massachusetts Paid Family Medical Leave law.
- Continued to fill positions with qualified applicants using electronic processes and virtual interviews.
- Participated in the Diversity, Equity, and Inclusion (DEI) Workgroup to promote diversity and completed the procurement process to provide DEI training to all employees.
- Completed a telework survey of employees. Developed a draft of a new Telework Policy.
- Continued to engage in collective bargaining with all five unions.
- Reviewed employee requests for accommodations for employees at higher risk due to the Coronavirus.
- Continued to support the agency's efforts in implementing succession planning activities due to an increase in retirements anticipated over the next several years.
- Continued to offer supervisory, professional, and career development training programs necessary to support succession planning initiatives.
- Developed additional specialized recruitment sources to attract women, minorities, and veterans for difficult to fill positions including expanding social network recruiting capabilities.
- Reduced future MWRA exposure on Workers' Compensation cases through aggressive claims management.
- Completed procurement process for Employee Assistance Program (EAP), Workers' Compensation legal services, medical services and consulting, MWRA Drug and Alcohol Testing program, and dental insurance.
- Investigated complaints of violations of MWRA policies and Code of Conduct as necessary.
- Successfully maintained harmonious relationships with the unions while negotiating new/revised work rules, benefits and other conditions relating to employment in the wake of the COVID-19 pandemic.
- Offered a variety of professional and technical training to MWRA employees including Confined Space Entry, Hoisting License Mandatory Refresher Training, Wastewater & Water Operator Exam Prep, OSHA 40-Hour Hazardous Waste Operations and Response (HAZWOPER) training, OSHA 10-Hour Construction Safety, OSHA 8-Hour Annual Refresher, created learning paths on LinkedIn Learning specific to MWRA skills needs, Supervisory Development, RCRA/DOT Safety, Work-zone Safety, Lockout/Tagout, Electrical Safety, Electric and Plumbing Code Review classes, Keolis & MBTA Track Safety, and a number of training contact hours (TCH) classes for Water and Wastewater License holders.

- Continued to convert in-person training programs to virtual ones in response to the Coronavirus pandemic. Worked with various vendors to provide virtual training for the Chelsea Creek Headworks Rehabilitation Project and the Commonwealth Ave Pump Station Project. Began work to bring back in-person training to better meet the educational needs of staff, while maintaining applicable safety standards.
- Worked with MIS to begin implementation of a new Learning Management System in conjunction with the MIS department that will provide better tracking ability, course scheduling, and course delivery.
- Distributed Service Award certificates and plaques to employees meeting service milestones via interoffice mail or USPS for teleworkers.
- Completed preliminary review and analysis of compensation for titles in all bargaining units to ensure compliance with the Massachusetts Equal Pay Act.

Budget Highlights:

The FY22 Budget is \$28.3 million, an increase of \$1.1 million or 4.0% as compared to the FY21 Budget.

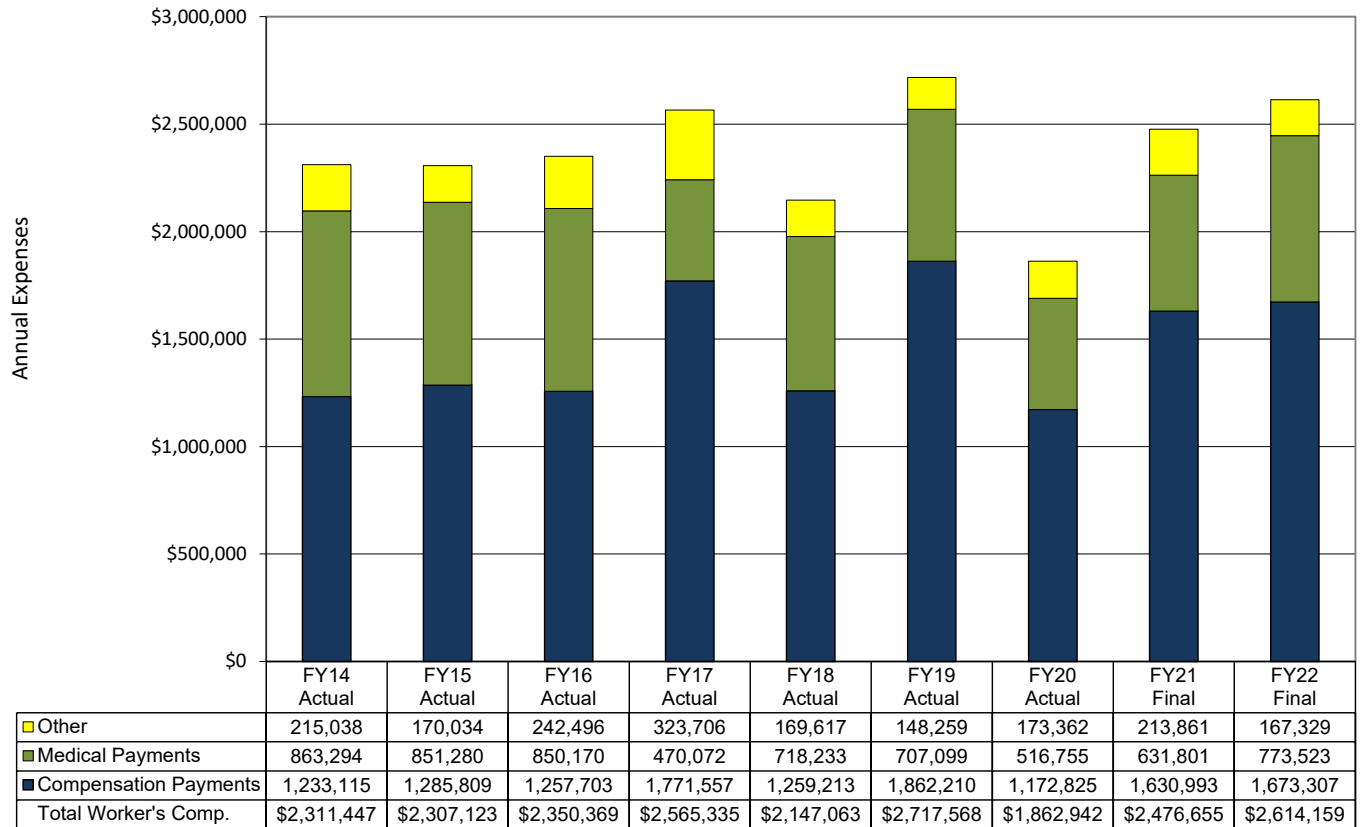
- \$1.7 million for **Wages and Salaries**, an increase of \$98,000 or 5.9%, as compared to the FY21 Budget, the increase reflect the collective bargaining agreements. The FY21 Budget includes funding for 16.8 FTEs, the same as the FY21 Budget.

- \$23.1 million for **Fringe Benefits**, an increase of \$847,000 or 3.8%, as compared to the FY21 Budget mainly for increases in health insurance costs. The FY22 Budget includes \$19.7 million for health insurance, \$1.6 million for Medicare, \$1.2 million for dental insurance, \$449,000 for the Massachusetts Paid Family and Medical Leave (PFML) law, \$130,000 for unemployment insurance, and \$55,000 for tuition reimbursement.

Human Resources Fringe Benefits				
Line Item	FY20 Actuals	FY21 Budget	FY22 Budget	Difference
Health Insurance	\$ 17,649,194	\$ 18,987,428	\$ 19,746,494	\$ 759,066
Dental Insurance	1,162,533	1,218,578	1,164,150	(54,428)
Unemployment Insuranc	104,034	130,000	130,000	-
PFML	313,620	366,863	448,962	82,099
Medicare	1,459,085	1,533,770	1,589,110	55,340
Tuition Reimbursement	54,334	50,000	55,000	5,000
Total Fringe Benefits	\$20,742,800	\$22,286,639	\$23,133,716	\$847,077

- \$2.6 million for **Workers' Compensation**, an increase of \$138,000 or 3.8%, as compared to the FY21 Budget, based on historical spending. The Workers' Compensation expenses can be difficult to predict and the budget is based on an average of the prior three years of expenditures. Below is a graph showing actual expenditures beginning in FY14 and budgets for fiscal years FY21 and FY22. The Human Resources Department is responsible for the management of this program and the coordination with the third-party administrator and legal counsel.

Worker's Compensation Expenses
FY14 - FY20 Actual & FY21 & FY22 CEB



\$741,000 for **Professional Services**, a decrease of \$3,000 or 0.3% as compared to the FY21 Budget. The major budgeted items for FY22 include \$364,000 for Professional Development and Technical Training, \$135,000 for Workers' Compensation Claims Administration and Legal Services, \$100,000 for Pay Equity Consultant, \$47,000 for Arbitrators and Arbitration Expenses, \$35,000 for Medical Evaluation Services, and \$27,000 for the Employee Assistance Program.

MANAGEMENT INFORMATION SYSTEM

The **MIS Department** provides MWRA with the secure information processing services necessary to carry out the Authority’s mission. Applications in use range from financial to operational, and enhance MWRA’s ability to access data and improve internal controls, reporting, and management performance. In addition to computing and telephone systems, the department also provides library and records management services. The MIS department supports all MWRA staff, including those at the Charlestown Navy Yard (CNY), Chelsea Facility, Deer Island Wastewater Treatment Plant, Southborough Facility, Carroll Water Treatment Plant, and other remote sites.

FY22 Final Current Expense Budget MANAGEMENT INFORMATION SYSTEM						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 5,607,115	\$ 5,683,586	\$ 6,603,757	\$ 6,721,617	\$ 117,860	1.8%
OVERTIME	16,283	2,764	12,000	12,000	-	0.0%
FRINGE BENEFITS	178	60	-	-	-	-
MAINTENANCE	3,578,182	3,615,304	4,086,750	4,939,858	853,108	20.9%
TRAINING & MEETINGS	122,350	75,834	146,528	215,894	69,366	47.3%
PROFESSIONAL SERVICES	550,179	941,501	1,823,338	1,937,730	114,392	6.3%
OTHER MATERIALS	1,565,377	757,161	559,183	542,617	(16,566)	-3.0%
OTHER SERVICES	1,177,359	1,148,393	1,392,558	1,396,388	3,830	0.3%
TOTAL	\$ 12,617,023	\$ 12,224,603	\$ 14,624,114	\$ 15,766,104	\$ 1,141,990	7.8%

FY22 Goals and Initiatives:

IV. Finance and Management

- **Goal #14 – Leverage Information Technology to Improve Organizational Effectiveness:**
 - o Deliver Information Technology (IT) services and solutions efficiently and effectively.
 - o Provide IT solutions to streamline work processes by leveraging the use of existing or emerging technologies.
 - o Maintain current technology hardware, software, and network infrastructures.
 - o Maintain a secure technological environment by ensuring the confidentiality, availability, and integrity of MWRA data.

The MIS Department divides the IT services that it provides into 4 programs. A description of each program and the specific initiatives in each are detailed below:

Information Technology Management Program

This program is intended to improve the Information Technology (IT) organization and the oversight processes for selecting, implementing and operating IT solutions throughout the MWRA.

- Complete the transition of application and operational responsibilities to the appropriate teams, matching the new organizational structure for the department.
- ***Project Portfolio Management:*** In order to get a better handle on the number of projects and associated resource loading requirements, MIS is looking at products that will help manage the IT portfolio of projects and possibly integrate it with the ECM Management Dashboard

Application Improvement Program Initiatives

This program, along with associated projects, continue MWRA’s efforts to update and enhance a wide range of applications to improve efficiencies of business processes and effectiveness of the staff while ensuring the availability and integrity of the MWRA’s data resources.

Administration and Finance Initiatives

- ***Electronic Document Management:*** A component of ECM “proof of concept” is ongoing with the Chelsea Creek Headworks Rehabilitation Project for e-Construction. e-Construction is a paperless engineering and construction administration delivery process. This process includes electronic submission of all engineering and construction documentation by all stakeholders, electronic document routing/approvals (e-signature), and digital management of all construction documentation in a secure environment allowing distribution to all project stakeholders through mobile devices. Based on this proof of concept, the MWRA has procured a Content Management System that will support e-Construction processes as well as design (e-Engineering) processes including corresponding Procurement and Contract Management processes (e-Procurement) and corresponding Document and Records Management processes. The identified content management system will improve communication and make design and construction management practices more efficient, replace the legacy document/records management system and provide the infrastructure for expansion and integrations with other systems.
- ***Archiving & Purge and e-Discovery:*** A component of Enterprise Content Management (ECM) initial proof of concept with one solution proved to be unsuccessful. MIS is researching a new solution with our current backup software vendor.
- ***Website Replacement/Upgrade:*** The current website www.mwra.com and Intranet (Pipeline) infrastructure includes nonstandard MWRA IT components impacting support and maintenance. This project will replace the existing websites leveraging current technologies, adoption of standards, and enhance the user/visitor experience.
- ***Enterprise Resource Planning (ERP) System Upgrades:*** The current software version of the ERP system is approaching end of support by the vendor. An independent assessment of the existing ERP system was conducted Q1 FY20 to assist staff in selecting the most cost effective and efficient approach to addressing this. Although the assessment recommended that MWRA upgrade the ERP system to the latest supported on premise version of the software, during the initial RFQ/P process it was identified that the MWRA requirements could only be met with a migration to the Software as a Service option. A new RFP/Q is underway and this initiative will be accomplished over multiple Fiscal Years.

- **Lawson Contracts Management:** All contract types have been tested within the Lawson ERP Contract application. Migration of active and archived contracts from the legacy system to Lawson ERP is ongoing.
- **Miscellaneous Lawson Support:** In response to the COVID-19 pandemic, the Training Department sought a solution to provide training virtually. In FY21 a new Learning Management System was procured and will be integrated with the existing ERP system.
- **Visitor Management:** Staff evaluated applications to track MWRA visitors at security guard managed facilities to support ongoing visitor management. An application was selected and implementation is underway.

Compliance Management Initiatives

- **PIMS/WebSMR CROMERR:** Multiple pilots of this application were launched in FY21. The application is expected to be in production by Q1 of FY22.
- **PIMS PowerBuilder Upgrade:** MWRA started a new initiative in FY21 to upgrade existing PIMS application client layer built based on PowerBuilder technology. The current PIMS client PowerBuilder version is unsupported and does not support Windows 2019. This project is expected to be completed by Q1 of FY22.
- **HOML Upgrade:** Update and re-platform the Harbor Outfall Monitoring and Loading application onto the latest stable version of IBM Websphere running on Windows 2019. The contract has been awarded and work on this initiative has begun.
- **Oracle Discoverer Migration to SAP Business Objects (BO):** Oracle is planning to end support of the Oracle Discoverer product and MIS envisions migrating to SAP BO technology. SAP BO has technical/functional capabilities similar to Oracle Discoverer. There are approximately 600-700 Oracle Discoverer Workbooks. Five of these workbooks were selected for migration to SAP BO for a Proof of Concept. The proof of concept was conducted successfully in FY21. A new scope of work is being finalized for the migration of the remaining workbooks.
- **Laboratory Information Management (LIMS):** Upgrade current Laboratory Information Management system to latest stable version available.

System Integration and Data Warehousing Initiatives

- **ESRI GIS Infrastructure:** Procurement is underway for services to upgrade the existing GIS environment along with implementation of recommended best practices.
- **Enterprise Data Management:** Develop an Authority-wide data architecture that maximizes benefits from data capture and ongoing maintenance. Implement Authority-wide data modeling and management, to standardize data access across multiple systems for a consistent view of the Authority across all business units.

Operations Management Initiatives

- ***Maximo/Lawson Interface Enhancements:*** The MWRA utilizes a custom interface to synchronize the Maximo Enterprise Asset Management (EAM) and Infor/Lawson Enterprise Resource Planning (ERP) systems. The interface has eighteen “touch points” where Infor/Lawson is the system of record for the majority of the data. The Maximo Integration Framework (MIF) is the primary controlling element for data flow between the two systems with supporting functions coded in Infor/Lawson. The objective of this project is to build on the existing interface by streamlining process flows, enhancing functionality, and adding data validation for optimal performance and transaction integrity.
- ***Telog:*** Upgrade the existing Telog environment to support new 4G meters. Additionally, the Enterprise Telog system currently communicates over the internet. The communication infrastructure will be moved to a private wireless network.
- ***WQRS/AQUARIUS:*** WQRS/AQUARIUS application upgrade and enhancements will continue in FY22 and will wrap up by Q3 FY22.
- ***OMMS Application refresh:*** MWRA’s existing OMMS application is built using 20 year old technology. Redesign of the application is underway and completion is anticipated in Q2 FY22.
- ***Upgrade of TISCOR (Inspect ‘N’ Track) application:*** Existing MWRA’s TISCOR (Inspect ‘N’ Track) application is on unsupported hardware and OS. The project is currently underway and is estimated to finish Q2 FY22.

Information Security Program Initiatives

This program focuses on the strength, resiliency, and sustainability of MWRA’s cyber security practices for its data and computing-related assets. The program also monitors for and protects against penetrations, intrusions, and malicious actions from both internal and external threats. The projects associated with this program continue to assess, implement, and improve MWRA’s information security protections, including recommendations to improve each IT system’s security profile. The following are the FY22 projects under this program:

- ***American Water Infrastructure Act (AWIA):*** Congress imposed a new requirements for assessing and responding to water system vulnerabilities in the AWIA. AWIA requires that community drinking water systems develop or update risk assessments and emergency response plans and certify to EPA that they have been completed or updated by specific deadlines. Under AWIA, systems must now recertify that they have reviewed and updated their Risk and Resiliency Assessments (RRA) every five year. The initial assessment was completed in March 2020 and responses to the assessment will continue in FY22.
- ***Managed Security Services Design Service:*** The existing Managed Security Services contract and associated security infrastructure components expires in July of 2022. This initiative is for services to assist with the design and engineering requirements for the next Managed Security Services Contract. This initiative is underway and the design and scope for the MSSP is expected to be completed the end of Q1 FY22.

- **Phase 2 of the Information Security Program Implementation:** Phase 2 of this program focuses on the review and formalization of draft information security policies, standards and procedures into daily operations. Work will continue in FY22 to complete the remaining eleven policies.
- **Web Filter Technology Refresh:** The current appliance (Websense) used for web filtering is reaching End of Life (EOL). A replacement must be procured and implemented to ensure the MWRA has continued protection.
- **Load Balancer Appliance Replacement:** The current appliance (Netscaler) used for load balancing secure access to MWRA network resources is reaching End of Life (EOL). A replacement must be procured and implemented to ensure the MWRA has continued protection.
- **Multi-Factor Authentication:** Multi-factor authentication (MFA) is security enhancement that requires you to present two pieces credentials for authentication. MFA is also a recommended best practice and supports the NIST Cybersecurity framework. MFA was implemented for all remote users in FY21. Implementation of two factor authentication technologies will continue for key IT services.
- **Wireless Network Expansion:** Multi-factor authentication (MFA) is a security enhancement that requires you to present two credentials for authentication. MFA is also a recommended best practice and supports the National Institute of Standards and Technology (NIST) Cybersecurity framework. MFA was implemented for all remote users in FY21. Implementation of two factor authentication technologies will continue for key IT services.
- **Single Sign-on:** Single Sign-on is categorized as Identify and Access Management technologies which are typically implemented for access to on-premise and cloud-based software solutions. This initiative streamlines the authentication process for staff to access these applications and will support upcoming MWRA upgrades and improvements like Webex, the new phone system and Infor CloudSuite.

Technology Infrastructure Improvement Program

The MWRA IT department currently operates 1,377 desktops, 3555 laptops, 385 servers, 195 tablets, 279 iPhones, 19 wide area network circuits and associated ancillary equipment, as well as almost 3.88 petabytes (PB) of data. This program will assess and implement consolidated and optimized versions of these core IT infrastructure elements as utility-like services and commodities. Furthermore, it will look to improve and optimize data management practices including: storage, backup, and archive and purge processes and technologies. The following projects are currently under way:

- **Disaster Recovery:** Build out of a Disaster Recovery site providing the ability to restore business data and applications should the Chelsea Data Center, servers or infrastructure get damaged or destroyed.
- **Telephone System Replacement:** The current telephone system, Mitel PBXs, has exceeded end of life and is unsupported by the vendor. Much of the current hardware cannot be replaced unless using refurbished equipment, as it is no longer being manufactured. MWRA is not able to upgrade the software or purchase new features because the software is no longer supported. Design and configuration of the new telephone system has begun and hardware continues to be received.

- ***Edge & Core Switch Hardware Refresh:*** The current hardware is approaching end of life and will require replacement in order to maintain support. This initiative is being rolled out in multiple phases. Procurement for the initial phase has been awarded; however the processor chip shortage is impacting delivery lead times. Equipment is anticipated in Q2 FY22
- ***Instrumentation and Controls of IT:*** Plan for the implementation of additional tools to monitor and alert on the infrastructure and application health.
- ***Cabling:*** Replacement of older cabling in six facilities to support the telephone system replacement.
- ***Network Convergence:*** Explore new technologies for future implementation considerations including new networking technologies for upcoming network upgrade, web and mobile platforms for business and information services.
- ***Office Automation Refresh Program:*** Flat panels, tablets, smartphones, and printers are targeted for a hardware refresh in FY21.
- ***Future Workplace:*** Explore new technologies and hardware platforms to improve efficiencies in business process supporting the future workplace initiative with the goal of providing a single streamlined user experience regardless of location, support for remote work, shared work, and collaboration spaces.
- ***SAN Storage:*** Implement recommended IT infrastructure changes that include enhancements to capacity and performance of networking and communications, storage, backups, server consolidation, disaster recovery, and integration approach and tools.
- ***Digital Message Boards:*** In response to COVID-19, the MWRA implemented a pilot digital message board in the Chelsea Maintenance facility to support timely and effective communication to all MWRA staff. This initiative will continue at eight additional MWRA facility locations. Procurement for this initiative is underway.
- ***Deer Island Cabling and Switch Replacement:*** In addition to edge switch replacements on Deer Island, network cabling is also in need of an upgrade. Design specifications are being developed.
- ***Conference Room Media Upgrades:*** In support of the MWRA space planning efforts and the use of Webex for video conferences, additional media capabilities will be added to some conference rooms.

FY21 Year-End Accomplishments:

Information Technology Management Program

- ***MIS Reorganization:*** MIS has completed the organizational transformation recommended in the 5-year Strategic Plan. The transition of responsibilities for all applications will continue during FY22.

Application Improvement Program

- ***Electronic Document Management:*** Vendor selected and project began in the spring. Infrastructure is being designed and built out to allow software installation and configuration. Data migration analysis for the unsupported InfoStar records management system is underway as well as the configuration design for selected engineering and design processes.
- ***Telog:*** The Telog Enterprise Application System was successfully upgraded in both the development and production environments. Provided support assistance to metering team on LTE migration.
- ***Fuel Management System:*** A new fuel management system was implemented on Deer Island and in Chelsea. Historical data was migrated from the old Gasboy system to retain history. The new system utilizes employee badges and hardware key fobs for authentication. Future enhancement may include the implementation of RF ID on vehicles.
- ***COVID Self Certification Applications:*** Two applications were implemented to allow staff to self-certify they do not have COVID19 symptoms prior to coming to work. One is a webpage with screening questions and the other is a telephone call in number. Both systems write to the same database for HR and management reporting.
- ***Learning Management System:*** A Learning Management System (LMS) was procured from Infor/Lawson that will be used to manage all training including on-line training developed in house and from 3rd Parties including LinkedIn Learning. Installation and configuration is underway.
- ***Legacy Contract Management System Contracts:*** The remaining contract types in the unsupported custom legacy Contracts Management system have been implemented in the Infor Lawson Contracts Management and Strategic Sourcing systems. The contracts were the smaller or rarer, lower-priority contract types such as. Railroad and Leak Detection contracts.
- ***Website Replacement/Upgrade:*** An SOW has been completed and the procurement process and award is expected to be completed in FY22 Q2
- ***Replacement of Bottomline Check processing application:*** MWRA successfully replaced MWRA's Bottomline check processing application with MHC's Document Express. MWRA is also planning to procure and implement MHC's pdf module for printing, which will be accomplished by the end of FY21.
- ***MSA Gasmonitor Upgrade:*** MWRA upgraded existing unsupported version of gas monitor solution to the latest software version. Upgrade also entailed replacing gas monitor and test stands.

Information Security Program

- ***AWIA Risk and Resiliency Assessment (RRA):*** Remediation work continues to resolve any identified vulnerabilities from the AWIA RRA; to date 65% of the identified tasks were "Completed"; 2% were "In Progress"; and 33% were identified as longer term projects.

- **Security Awareness Training:** Cyber Security Training on a new platform with Proofpoint was started. 95% of the 900+ employees that use a computer on a daily basis has completed their training.
- **Patching:** Security updates on infrastructure components, PCs and mobile devices were installed as required, with special emphasis on the Microsoft Exchange vulnerability first exploited by the Chinese state-sponsored hacking group Hafnium.
- **Email Security:** DMARC, DKIM and SPK have been implemented prevent email spoofing with external parties that also have this technology implemented.
- **Multi-Factor Authentication:** Rollout of multi-factor authentication (MFA) to teleworkers was completed.
- **Password Manager:** Security improvements for passwords was completed; a new document “Tips For Choosing A Long, Strong Passphrase As Your Password” has been published to PipeLine.

Technology Infrastructure Improvement Program

During FY21, several upgrades were completed and or started in order to keep the aging infrastructure up to date. One of the biggest efforts is to continue to provide socially distant support from our Desktop support staff where possible while continuing to supply hardware, software and mobile devices to teleworkers.

- The Chelsea Environmental Controls Monitoring System upgrade was completed.
- SQL Cluster Hardware Upgrade: Hardware was procured and migration of databases is in progress.
- The Nut Island, Weston, and Southborough MPLS and Chelsea internet data circuits were upgraded to improved network response in support of increased network traffic resulting from Webex meetings and online training.
- Delauri Pump Station was converted from a DSL connection to MPLS.
- Oracle Database Appliance: Operating system was upgraded. Database upgrades are in progress.

Other FY21 infrastructure projects included:

- **Audio Visual Upgrades:** The Audio Visual equipment upgrade was completed in ten locations.
- **Enterprise Data Management:** A committee has been formed comprised of a number of MWRA data users and appropriate IT staff to explore MWRA needs and goals. The committee is soliciting options and feedback form Gartner Inc. analysts and peer agency Water and Wastewater CIOs.
- **MWRA Records Center Relocation:** The Records Center move started in December and finished early in Q3. A scanning paper documents pilot and analysis for building consolidations are underway.

- **Wireless Network:** Upgraded Aruba ClearPass to latest version and migrated physical appliance to VM. The wireless network was expanded to all of Chelsea, Charlestown, and Southborough.
- **Digital Signage:** As one of the CoVid response initiatives, a pilot implementation of this solution was implemented in the Chelsea Maintenance building to improve communications with staff.

Budget Highlights:

The FY22 Budget is \$15.8 million, an increase of \$1.1 million or 7.8% as compared to the FY21 Budget.

- \$6.7 million for Wages and Salaries, an increase of \$118,000 or 1.8% as compared to the FY21 Budget. The rise in Wages and Salaries reflects wage increases associated with collective bargaining agreements in addition to salary adjustments associated with position changes/upgrades within the department. The FY22 Budget includes funding for 57 FTEs.
- \$4.9 million for **Ongoing Maintenance**, an increase of \$853,000 or 20.9%, as compared to the FY21 Budget. The increase reflects regular annual increases, the \$350,000 annual cost for the new Cisco UC phone system and the \$360,000 cost to upgrade AutoCAD licenses.
- \$1.9 million for **Professional Services**, an increase of \$114,000 or 6.3% as compared to the FY21 Budget. Professional services to augment MIS staff are needed for upgrades that include Peopleclick, MHC, Ivanti, Forcepoint, Maximo, Citrix, and Aruba wireless. Custom Development projects include Complaints Database, Management Consoles of IT systems, technical reference model, cloud security, and cyber security assessments. There is a \$300,000 cost increase for 24x7 monitoring of cyber security breaches to the MWRA's network.
- \$543,000 for **Other Materials**, a decrease of \$17,000 or 3.0%, as compared to the FY21 Budget. The majority of these fund are to replace aging servers, printers, plotters and mobile devices. Equipment to enhance wireless connectivity at various MWRA sites will also be purchased.
- \$1.4 million for **Other Services**, an increase of \$4,000 or 0.3%, as compared to the FY21 Budget. Funding of \$1.4 million is for facility and security data lines, and network upgrades. Remaining funds are for the lease of Automated Vehicle Location (AVL) services.

PROCUREMENT

The **Procurement Department** provides timely and high quality services to all MWRA Divisions to enable MWRA programs to meet their public, production and schedule responsibilities. The Procurement Department is responsible for procuring materials, equipment, supplies, construction, professional, and non-professional services in a timely, efficient, and openly competitive process in accordance with MWRA applicable law and policies and procedures, including those related to meeting affirmative action goals. The Department also maintains a centralized, efficient, and cost-effective management of spare parts and operating supplies inventory.

FY22 Final Current Expense Budget						
PROCUREMENT						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 3,801,122	\$ 4,058,008	\$ 4,276,449	\$ 4,349,288	\$ 72,839	1.7%
OVERTIME	22,707	20,058	23,471	23,471	-	0.0%
FRINGE BENEFITS	451	519	300	300	-	0.0%
MAINTENANCE	453,494	491,411	-	-	-	-
TRAINING & MEETINGS	6,029	5,850	10,750	10,751	1	0.0%
OTHER MATERIALS	120,143	116,803	144,000	144,000	-	0.0%
OTHER SERVICES	55,966	62,337	72,416	72,416	-	0.0%
TOTAL	\$ 4,459,912	\$ 4,754,986	\$ 4,527,386	\$ 4,600,226	\$ 72,840	1.6%

The **Procurement Department** includes three operational units. The **Purchasing Unit** operates a competitive purchasing system for the procurement of materials, goods, and non-professional services in accordance with MWRA policies and procedures. The **Contract Management Unit** reviews, drafts, and negotiates contracts, amendments, and change orders for all professional, non-professional, and construction services contracts. Staff directs the bid, review, and selection process, and maintains a contracts database. The **Materials Management Unit** manages an Authority-wide inventory control and management system for better control, storage, distribution, and accounting of MWRA's inventory. The unit manages three regional warehouses/distribution centers that support all MWRA activities.

FY22 Goals & Initiatives:

IV. Finance & Management

- **Goal #11 - Ensure Financial Sustainability, Integrity, and Transparency:**
 - o Continue to conduct strategic energy procurements for both the purchase of energy and sale of energy credits generated from MWRA energy production.
- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - o Maintain a recycling program in order to contain MWRA operating costs by removing recyclable materials from the waste stream.
 - o Review and update policies and procedures for procurement of professional services, non-professional services and goods and materials.
 - o Provide training to MWRA staff on various procurement policies and procedures including purchasing of goods and materials and consultant selection committee service.

- o Update construction contract documents.

FY21 Year-End Accomplishments:

- Awarded the following Major Capital Improvement Program Contracts and Other Contracts necessary for Operations and Maintenance through Q4, FY21:
 - OVERHEAD DOOR MAINTENANCE, DITP
 - COMBUSTION TURBINE GENERATOR MAINTENANCE
 - VALVE AND PIPE REPLACEMENT CLINTON WTP
 - CWTP SODIUM HYPOCHLORITE SYSTEM MODIFICATIONS
 - TOP OF SHAFTS 6, 8 & 9A INTERIM IMPROVEMENTS
 - REHAB. OF WASM 3 SECTIONS W11/W12/W16/51
 - QUABBIN PK CEMETERY BLDGS. DEMO. & HAZ. MAT. ABAT.
 - THERMAL AND HYDRO POWER PLANT MAINTENANCE
 - PERMANENT METERING SYSTEM REPLACEMENT
 - WESTON AQUEDUCT STOP PLANK GATES
 - HYDRAULIC EQUIPMENT SERVICE
 - FUEL STORAGE TANK MAINTENANCE SERVICE
 - WACHUSETT RESERVOIR N. & S. DIKE INSTRUMENTATION
 - RIVER ROAD REHABILITATION, CLINTON, MA
 - WACHUSETT DAM LOWER GATEHOUSE BRIDGE CRANE DEMO
 - PUMP STATION DUCT CLNG & REP QUINCY & HINGHAM, MA
 - TAFTS & SHIRLEY INTERSECTION IMPROV., WINTHOP, MA
 - METROPOLITAN OPERATIONS PAVING
 - MWRA BOAT STORAGE AND COSGROVE INTAKE IMPROVMENTS
 - CRANE MAINTENANCE SERVICE
 - MISCELLANEOUS FENCING INSTALLATIONS AND REPAIRS
 - PHASE 10 SEWER MANHOLE REHABILITATION
 - QUABBIN AQUEDUCT SHAFT 2 REPAIRS
 - FORE RIVER RAILROAD MAIN LINE ADJUSTMENT
 - MONITORING AND MAINTENANCE OF INTRUSION ALARM SYST
- 7,600 purchase orders in FY21 for a total of \$37,324,201.52
- Online vehicle and equipment auctions resulted in revenue of \$242,447
- Recycled 10.23 tons of batteries, 7.42 tons of paper and 213.04 tons of scrap metal, generating \$43,386 in revenue.

Budget Highlights:

The FY22 Budget is \$4.6 million, an increase of \$73,000 or 1.6% as compared to the FY21 Budget.

- \$4.3 million for **Wages and Salaries**, an increase of \$73,000 or 1.7% as compared to the FY21 Budget, including wage increases associated with collective bargaining agreements. The FY22 Budget funds 43.9 FTEs, matching the FY21 Budget.

OCCUPATIONAL HEALTH AND SAFETY

The **Occupational Health and Safety** Department manages MWRA's compliance with Massachusetts Department of Labor Standards (state) and federal rules and regulations and provides programs, guidance and recommendations in areas of employee safety and health. The department oversees a program for regulatory compliance with state standards and works closely with other authority safety and health staff to communicate, implement, monitor and track safety and health regulatory compliance. OHS leads the agency's activities in a proactive way to minimize health issues and prevent situations that could create workers' compensation cases.

FY22 Final Current Expense Budget OCCUPATIONAL HEALTH AND SAFETY							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 456,988	\$ 884,044	\$ 1,000,712	\$ 1,055,242	\$ 54,530		5.4%
OVERTIME	35,520	86,060	46,210	46,210	-		0.0%
FRINGE BENEFITS	405	940	475	475	-		0.0%
CHEMICALS	-	-	-	-	-		-
UTILITIES	-	-	-	-	-		-
MAINTENANCE	-	1,770	-	-	-		-
TRAINING & MEETINGS	-	145	1,500	1,500	-		0.0%
PROFESSIONAL SERVICES	-	-	-	-	-		-
OTHER MATERIALS	1,131	21,478	216,025	31,200	(184,825)		-85.6%
OTHER SERVICES	1,633	46,690	147,166	177,166	30,000		20.4%
TOTAL	\$ 495,677	\$ 1,041,127	\$ 1,412,088	\$ 1,311,793	\$ (100,295)		-7.1%

FY22 Goals and Initiatives:

IV. Finance and Management

- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - o Continue to cost effectively maintain the Authority's safety equipment.
 - o Works closely with other authority safety staff to establish and/or update operating procedures including the MWRA Online Safety & Health Manual and ensure the appropriate communication to employees is delivered in order to ensure employee compliance with safety and health requirements.
 - o Ensures that any required DLS postings are prominently displayed at authority worksites in order to inform employees of their rights and responsibilities.
- **Goal #13 – Maintain a Safe Workforce:**
 - o Conducts multi-facility (30+) worksite safety assessments and inspections (i.e., self-audits) to determine risks to employee safety and health and ensure that the workplace conditions conform to DLS standards.
 - o Evaluates risks and hazard control measures.
 - o Review training needs to assure the proper training is available to all employees while the content of current training is appropriate.

FY21 Year-End Accomplishments:

- Reorganized the Occupational Health and Safety department by adding 2 additional positions and amending 2 positions to meet MWRA needs.
- Assessed potential hazards and controls.
- Investigated incidents involving the safety and health of employees, visitors, vendors and contractors.
- Maintained and evaluated injury and illness records in accordance with OSHA standards.
- Assisted with the development and deployment of emergency response plans.
- Purchased safety audit software to assist in performing safety inspection at MWRA facilities.

Budget Highlights:

The FY22 Budget is \$1.3 million which is \$100,000 or 7.1% below the FY21 Budget. The Occupational Health and Safety department was established in FY20 when it was spun out of Operations.

- \$1.1 million for **Wages & Salaries**, an increase of \$55,000 or 5.4% over FY21 primarily due to wage increases associated with collective bargaining agreements and net impact of two additional safety techs and the removal of one vacancy from OEPs FY21 Budget for a net addition of one FTE. OHS is staffed by 10 FTE's in FY22, one more than FY21's level.
- \$46,000 for **Overtime**, to respond to as need incidents.
- \$31,000 for **Other Materials**, a decrease of \$185,000 from the prior year when additional computer hardware for industrial gas monitors was purchased.
- \$177,000 for **Other Services**, an increase of \$30,000 for services to maintain Authority wide safety equipment like winches, fire extinguishers, respirators, AEDs, and first aid cabinets.



Finance Division
Budget

FINANCE DIVISION

Finance

Director's Office
Rates and Budget
Treasury
Controller
Risk Management

The **Finance Division** is responsible for managing the finance functions of the Authority. It performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies. The Finance Division also ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

FY22 Final Current Expense Budget						
FINANCE DIVISION						
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 3,341,537	\$ 3,483,848	\$ 3,739,759	\$ 3,955,030	\$ 215,271	5.8%
OVERTIME	-	183	-	-	-	-
TRAINING & MEETINGS	2,489	984	3,000	3,000	-	0.0%
PROFESSIONAL SERVICES	432,489	480,441	626,310	658,885	32,575	5.2%
OTHER MATERIALS	9,561	5,341	11,100	11,100	-	0.0%
OTHER SERVICES	8,094	4,242	6,774	7,274	500	7.4%
TOTAL	\$ 3,794,170	\$ 3,975,039	\$ 4,386,943	\$ 4,635,289	\$ 248,346	5.7%

The Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management.

FY22 Final Current Expense Budget						
FINANCE by Department						
DEPARTMENT	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
DIR OFFICE (FINANCE)	\$ 252,903	\$ 257,190	\$ 264,689	\$ 273,406	\$ 8,717	3.3%
CONTROLLER	1,376,686	1,514,349	1,531,663	1,680,141	148,478	9.7%
RATES AND BUDGET	801,628	688,915	934,150	953,408	19,258	2.1%
TREASURY	893,567	948,030	1,119,957	1,163,742	43,785	3.9%
RISK MANAGEMENT	469,386	566,555	536,484	564,592	28,108	5.2%
TOTAL	\$ 3,794,170	\$ 3,975,039	\$ 4,386,943	\$ 4,635,289	\$ 248,346	5.7%

FY22 Goals & Initiatives:

The Finance Division supports the fourth key strategic priority set forth in the Authority's FY21 - FY25 Strategic Business Plan.

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Develop and implement long-term strategies to ensure assessment increases to MWRA's Continue assessment and evaluation of sustainable cost savings opportunities throughout the organization.
 - Continue to implement MWRA's approach to sustainable rate increases while accounting for the pandemic's effects on its communities' revenue.
 - Manage debt and investment portfolios to maximize prudent savings/returns in compliance with all applicable rules and regulations.
 - Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.
 - Maintain a system of internal controls to best protect the organization's resources.
 - Continue to employ budget and expense control practices to manage expenses.
 - Identify and pursue optimization in all aspects of MWRA financial operations.
 - Continue to conduct strategic energy procurements.
 - Continue to fund the pension fund at the annual required contribution level and to fund Other Post-Employment Benefits at a level that has a meaningful impact on the unfunded liability while being sustainable.

FY21 Year-End Accomplishments:

- Developed the FY22 Budget consistent with the FY21 planning estimates, for both the Current Expense Budget and the Capital Improvement Program.
- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates helping to minimize debt service expenses.
- Prepared submission of MWRA's Comprehensive Annual Financial Report (CAFR) to the Government Finance Officers Association
- Implemented pandemic planning protocols to ensure that employees and vendors are paid timely and accurately, without interruption, while teleworking.
- Held Budget Briefings with the MWRA Advisory Board to communicate FY22 departmental budgets and initiatives and how they relate to the MWRA's Master Plan.

Budget Highlights:

The FY22 Budget for the Finance Division is \$4.7 million, an increase of \$248,000 or 5.7% as compared to the FY21 Budget.

- \$4.0 million for **Wages and Salaries**, an increase of \$215,000 or 5.8% as compared to the FY21 Budget, the increase reflects filling vacant positions, upgrades, and wage increases associated with collective bargaining agreements. The FY22 Budget funds 37 FTEs, the same as the FY21 Budget.

FTEs FINANCE by Department		
DEPARTMENT	FY21 FTEs	FY22 FTEs
DIR OFFICE (FINANCE)	2.0	2.0
CONTROLLER	16.0	16.0
RATES AND BUDGET	8.0	8.0
TREASURY	7.0	7.0
RISK MANAGEMENT	4.0	4.0
TOTAL	37.0	37.0

FINANCE DIVISION DIRECTOR'S OFFICE

The **Finance Division Director's Office** oversees a multitude of functions that support the daily operations and ensure the implementation of the Authority's long-term goals and strategies.

The Director's Office is responsible for the centralized financial functions of rates development, revenue collection, budgeting, capital financing, debt and investment management, accounting, payroll and accounts payable processing, and risk management. Additionally, the Director's Office ensures that transactions comply with all rules, regulations, Authority policies and procedures, and contract terms. The Director's Office manages the development and implementation of policies to uphold the efficient utilization of resources and control of all monies. The Director's Office provides advice and analysis to the Executive Director and the Board of Directors on all financial issues.

The Division's continuing challenge in FY22 will be maintaining an agency-wide focus on balancing competing needs to minimize assessment increases while ensuring the provision of critical MWRA services.

FY22 Final Current Expense Budget							
FINANCE DIVISION DIRECTOR'S OFFICE							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 240,667	\$ 250,054	\$ 249,837	\$ 258,554	\$ 8,717	3.5%	
OVERTIME	-	-	-	-	-	-	
TRAINING & MEETINGS	2,455	984	3,000	3,000	-	0.0%	
OTHER MATERIALS	7,547	4,574	10,100	10,100	-	0.0%	
OTHER SERVICES	2,234	1,578	1,752	1,752	-	0.0%	
TOTAL	\$ 252,903	\$ 257,190	\$ 264,689	\$ 273,406	\$ 8,717	3.3%	

FY22 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Manage and coordinate the Authority's finance functions.
 - Identify and pursue optimization in all aspects of MWRA's financial operations.
 - Continue to fund the Pension Fund at the annual required contribution level and to fund Other Post-Employment Benefits at a level that has a meaningful impact on the unfunded liability while being sustainable.
 - Guide and coordinate division activities to support MWRA's goals and objectives.
 - Continuously improve processes and performance for greater efficiency.
 - Develop and implement long-term strategies to ensure sustainable and predictable assessments and charges to our communities at both the water and wastewater utility level.

Budget Highlights:

The FY22 Budget is \$273,000, in increase of \$9,000 or 3.3% as compared to the FY21 Budget.

- \$259,000 for **Wages and Salaries**, an increase of \$9,000 or 3.5% as compared to the FY21 Budget, reflecting collective bargaining agreements. The FY22 Final Budget funds two FTEs, the same as in FY21.

RATES & BUDGET

The **Rates & Budget Department** provides the financial analysis that allows MWRA to translate its goals, and legal and financial commitments into cost-effective annual and multi-year programs and budgets. Department staff works closely with divisional staff to coordinate development of the long-term Capital Improvement Program (CIP) and monitor the progress of capital projects compared to projected schedules and budgeted spending. Staff also coordinates the development of MWRA’s annual Current Expense Budget (CEB) and monitors spending compared to the budget throughout the year. The Budget Department also manages the annual process of establishing water and sewer assessments to be paid by MWRA’s member communities and develops planning estimates of rate projections.

FY22 Final Current Expense Budget							
RATES AND BUDGET							
LINE ITEM	FY19	FY20	FY21	FY22	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY22 to FY21		
WAGES & SALARIES	\$ 799,506	\$ 688,388	\$ 933,113	\$ 952,371	\$ 19,258	2.1%	
TRAINING & MEETINGS	34	-	-	-	-	-	
OTHER MATERIALS	1,016	263	500	500	-	0.0%	
OTHER SERVICES	1,072	264	537	537	-	0.0%	
TOTAL	\$ 801,628	\$ 688,915	\$ 934,150	\$ 953,408	\$ 19,258	2.1%	

FY22 Goals and Initiatives:

IV. Finance & Management

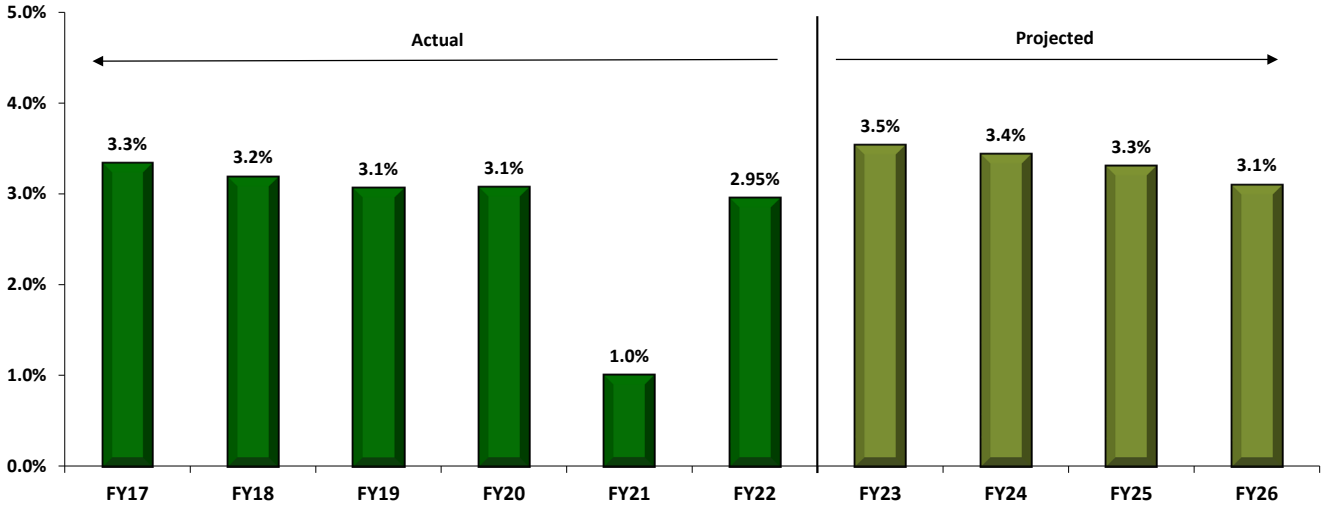
- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Continue long-term strategic budgeting practices to ensure predictable and sustainable sewer and water assessments and charges to our member communities at both the combined and the water and wastewater utility level.
 - Continue to employ budget and expense control practices to manage expenses.
 - Continue to enhance processes and the management of resources to deliver the final CIP and CEB timely and accurately.
 - Adhere to all MWRA policies, procedures, and administrative practices as well as all relevant statutory and regulatory authority, accounting, and budgeting principles.
 - Provide financial analysis as required, including system expansion opportunities.
 - Start the process of evaluating and selecting software applications to replace the CEB and CIP programs.
 - Improve the quality and presentation of budget documents and regularly required reports while working to develop new reports that will aid the Authority’s Board of Directors, Management, and the MWRA Advisory Board.

FY21 Year-End Accomplishments:

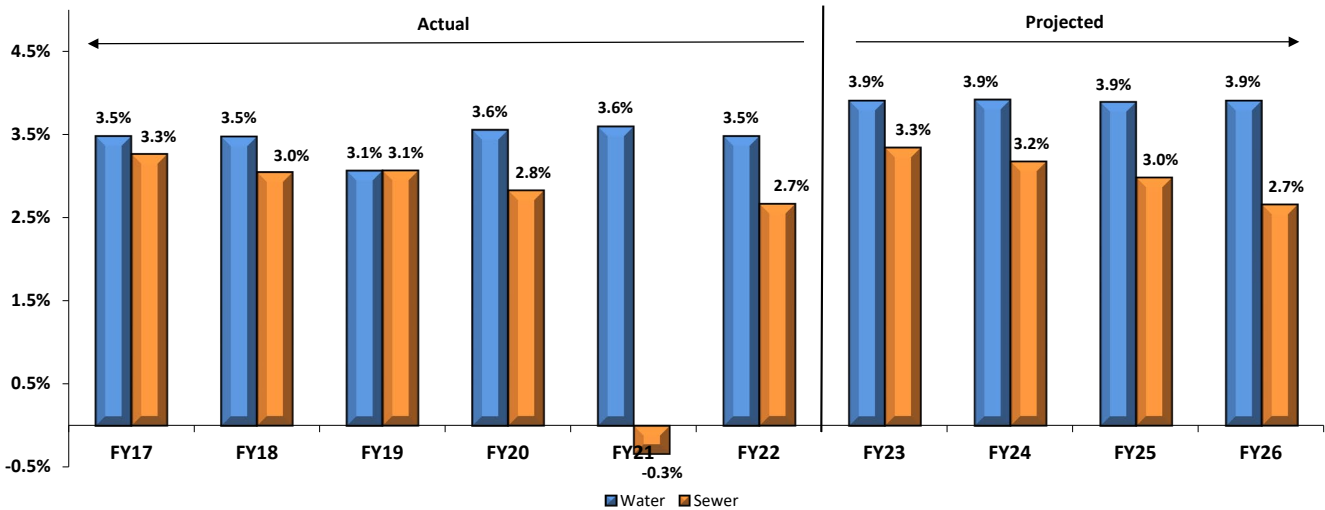
- Developed the FY22 Current Expense Budget below the FY21 planning estimates for combined water and sewer assessment increases.

- Developed the FY22 Capital Improvement Budget to fit within the five-year spending cap for the FY19-23 period.
- Communicated Final FY22 Assessments to the service area communities, staying within the 2.95% projected assessment changes that are in the MWRA’s multi-year planning model.
- Held Budget Briefings with the MWRA Advisory Board to communicate FY22 departmental budgets and initiatives and how they relate to the MWRA’s Master Plan.

**MWRA Combined Utilities
Historical and Projected Rate Revenue Changes**



**MWRA Water & Sewer Utilities
Historical and Projected Rate Revenue Changes**



Budget Highlights:

The FY22 Budget is \$953,000, an increase of \$19,000 or 2.1% as compared to the FY21 Budget.

- \$952,000 for **Wages and Salaries**, an increase of \$19,000 or 2.1% as compared to the FY21 Budget, the increase reflects the wage increases associated with collective bargaining agreements. The FY22 Budget funds eight FTEs, the same as in the FY21 Budget.

TREASURY

The **Treasury Department** secures funds for ongoing operations and capital programs in addition to processing cash disbursements. Department staff collects revenue, disburses funds, and manages grant and loan programs in addition to debt issuance and investments.

FY22 Final Current Expense Budget							
TREASURY							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 614,458	\$ 666,094	\$ 694,535	\$ 725,245	\$ 30,710	4.4%	
TRAINING & MEETINGS	-	-	-	-	-	-	
PROFESSIONAL SERVICES	276,440	279,912	423,810	436,385	12,575	3.0%	
OTHER MATERIALS	771	277	300	300	-	0.0%	
OTHER SERVICES	1,898	1,747	1,312	1,812	500	38.1%	
TOTAL	\$ 893,567	\$ 948,030	\$ 1,119,957	\$ 1,163,742	\$ 43,785	3.9%	

FY22 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Manage debt and investment portfolio to maximize savings/returns in compliance with all applicable rules and regulations while maintaining compliance with the General Revenue Bond Resolution requirements regarding security and liquidity and contributing to the achievement of sustainable and predictable assessment increases.
 - Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.

FY21 Year-End Accomplishments:

- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. The credit report from Moody's noted that for the rates management and Compliance and Capital Planning key ratings indicators, MWRA was assigned the highest Aaa rating. These high credit ratings enable MWRA to borrow at very advantageous interest rates minimizing debt service expense.
- Completed a \$160.0 million new money bond transaction on August 20, 2020. All-in True Interest Cost of 2.33% with an average life of 15.6 years. This is the lowest All-in True Interest Cost MWRA has observed.
- Executed a \$16.2 million and a \$26.0 million defeasance of outstanding senior principal in November 2020 and June 2021 respectively. These defeasances reduced the debt service requirement between FY22 and FY26 by a total of \$48.2 million reducing the rate of increase to the Rate Revenue Requirement in those years. The transactions also resulted in \$0.2 million in interest savings by paying bonds on their call dates.

- Completed a \$50.4 million long-term borrowing with the Massachusetts Clean Water Trust in April 2021. The long-term borrowings are for a term of 20 years at a 2.0% interest rate.

Budget Highlights:

The FY22 Final Budget is \$1.2 million, an increase of \$44,000 or 3.9% as compared to the FY21 Budget.

- \$725,000 for **Wages and Salaries**, an increase of \$31,000 or 4.4% as compared to the FY21 Budget, this increase is driven by to collective bargaining agreements and position upgrades. The FY22 Budget includes funding for seven FTEs, the same as the FY21 Budget.
- \$436,000 for **Professional Services**, \$13,000 or 3.0% above FY21 Budget. These funds are used for banking, financial advisory, bond and disclosure council services.

CONTROLLER

The **Controller Department** consists of the Accounting, Accounts Payable, Accounts Receivable, and Payroll units. The department has the responsibility for ensuring integrity within the financial accounting system and integration among the four functions. The department is also responsible for the appropriate treatment, classification, and reporting of the MWRA's assets, liabilities, revenues and expenditures in accordance with accounting principles generally accepted in the United States of America.

FY22 Final Current Expense Budget CONTROLLER

LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21	
WAGES & SALARIES	\$ 1,261,245	\$ 1,378,361	\$ 1,365,790	\$ 1,514,268	\$ 148,478	10.9%
OVERTIME	-	183	-	-	-	-
TRAINING & MEETINGS	-	-	-	-	-	-
PROFESSIONAL SERVICES	113,804	135,240	162,500	162,500	-	0.0%
OTHER MATERIALS	82	26	200	200	-	0.0%
OTHER SERVICES	1,555	539	3,173	3,173	-	0.0%
TOTAL	\$ 1,376,686	\$ 1,514,349	\$ 1,531,663	\$ 1,680,141	\$ 148,478	9.7%

FY22 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Implement process efficiencies in all department units.
 - Enhance controls to safeguard Authority assets and ensure accurate and timely reporting.
 - Continue to support management initiatives with underlying documentation and detail.
 - Implement any new or changed GASB standards as appropriate.
 - Manage the certification of Financial Statements by Independent Auditors.

FY21 Year-End Accomplishments:

- Successfully completed certified financial statement audit with no audit findings.
- Awarded the Certificate of Achievement for Excellence in Financial Reporting by the Government Finance Officers Association (GFOA) for the MWRA's FY20 Comprehensive Annual Financial Report. The FY21 Comprehensive Annual Financial Report will be submitted to the GFOA for review.
- Reviewed over one dozen contractor financial statements to support Procurement Department analysis of contractor's financial capacity to successfully perform under the terms of the MWRA contract.
- Implemented pandemic planning protocols to ensure that employees and vendors are paid timely and accurately, without interruption, while teleworking.

Budget Highlights:

The FY22 Budget is \$1.7 million, an increase \$148,000 or 9.7% as compared to the FY21 Budget.

- \$1.5 million for **Wages and Salaries**, an increase of \$148,000 or 10.9%, as compared to the FY21 Budget, the increase reflects the filling of vacant positions, upgrades, and wage increases associated with collective bargaining agreements. The FY22 Budget funds 16 FTEs, the same as the FY21 Budget.

RISK MANAGEMENT

The **Risk Management Department** is responsible for all MWRA insurance programs and risk management functions. Department staff manages all administrative functions relating to the initial reporting, processing, and resolution of construction contract claims and self-insured auto, general liability, and property damage claims. Department staff members are responsible for the annual procurement, renewals, and maintenance of all Authority-wide insurance policies and programs and for managing all aspects of MWRA’s contractor/vendor insurance certificate program. Department staff serves as liaisons to insurance industry participants including brokers, insurers, insurance consultants, and attorneys as well as providing support to all MWRA departments.

FY22 Final Current Expense Budget							
RISK MANAGEMENT							
LINE ITEM	FY19 Actuals	FY20 Actuals	FY21 Final Budget	FY22 Final Budget	Change FY22 to FY21		
WAGES & SALARIES	\$ 425,661	\$ 500,950	\$ 496,484	\$ 504,592	\$ 8,108	1.6%	
PROFESSIONAL SERVICES	42,245	65,290	40,000	60,000	20,000	50.0%	
OTHER MATERIALS	145	201	-	-	-	-	
OTHER SERVICES	1,335	114	-	-	-	-	
TOTAL	\$ 469,386	\$ 566,555	\$ 536,484	\$ 564,592	\$ 28,108	5.2%	

FY22 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Secure the timely, cost effective renewal of Authority-wide insurance policies and contracts.
 - Minimize MWRA’s exposure to financial loss stemming from contractor and vendor activities by reviewing risk exposures and establishing contract insurance requirements and monitoring contractors/vendors for compliance.
 - Process self-insured automobile, general liability, property damage, and construction contract claims in an efficient and timely manner.
 - Provide support to all MWRA Departments on all insurance, claims, litigation and risk management issues.

FY21 Year-End Accomplishments:

- Successfully procured MWRA’s Insurance Program through a competitive bid process for all lines of coverage.
- Staff renewed MWRA’s license to operate as a self-insured entity for workers’ compensation claims by completing the annual application process with the Division of Insurance.
- Received, investigated and processed 62 self-insured Automobile (40), General Liability (13) and Property Damage (9) claims.
- Performed 103 Project/Contract Insurance Reviews and 82 Risk Assessments in support of construction, professional services and purchase order contracts.

- Provided timely support to MWRA managers on all insurance, claims, litigation and risk management issues.

Budget Highlights:

The FY22 Final Budget is \$565,000, an increase \$28,000 or 5.2% as compared to the FY21 Budget.

- \$505,000 for **Wages & Salaries**, an increase of \$8,000 or 1.6% as compared to the FY21 Budget, due to wage increases associated with collective bargaining agreements. The FY22 Proposed Budget funds four FTEs, the same as the FY21 Budget.



Quabbin Reservoir



Appendices

APPENDIX A

DIRECT EXPENSES BUDGET LINE ITEM DESCRIPTIONS

MWRA's direct expenses budget funds the annual expenses of its operating and support divisions. Though the direct expenses budget is approximately 31% of MWRA's total budget, it is these expenses which directly support the provision of water and sewer services to MWRA's customers. The direct expense budget includes the annual costs of operating the water and sewer systems, and funds the policy direction, administrative, financial, and legal support services for MWRA's ongoing operations. The direct expenses budget also includes the personnel costs for management and oversight of MWRA's extensive capital programs.

There are 11 line items in the division budgets. The line items are:

Wages and Salaries - This line item includes funds for regular pay, shift differential, holiday pay, and standby pay for MWRA staff, as well as funds for interns and temporary staff.

Overtime - This line item includes funds for overtime related to operations, maintenance, emergencies, and training.

Fringe Benefits - This line item includes funds for health and dental insurance, unemployment compensation, Medicare, overtime meals, and tuition reimbursement.

Workers' Compensation - This line item includes funds for compensation payments, medical payments, and settlements of compensation claims.

Chemicals - This line item includes funds for the chemicals used in water and wastewater treatment, such as sodium hypochlorite, soda ash, sodium bisulfite, and hydrofluosilicic acid.

Utilities - This line item includes funds for electricity, diesel fuel, natural gas and other utilities such as water and sewer services paid by MWRA to the towns in which it operates facilities.

Maintenance - This line item includes funds to purchase materials and services for the maintenance of MWRA's plants and machinery, water and sewer pipelines, grounds, and buildings.

Training and Meetings - This line item covers the costs of staff training, meetings, and professional seminars.

Professional Services - This line item funds outside consultants supporting MWRA activities, including engineering and construction services, laboratory and testing contracts, computer system consultants, and legal and audit services.

Other Materials - This line item includes funds for office materials, equipment, postage, laboratory supplies, MWRA vehicles, work clothes, and computer hardware and software.

Other Services - This line item includes funds for space leasing, health and safety initiatives, removal of grit and screenings from the sewerage system, and the contracted operation of MWRA's residuals processing plant.

FY21 Final Current Expense Budget						
MWRA Direct Expenses by Line Item						
LINE ITEM	FY18 Actuals	FY19 Actuals	FY20 Final Budget	FY21 Final Budget	Change FY21 to FY20	
WAGES & SALARIES	\$ 100,875,415	\$ 102,331,904	\$ 109,953,488	\$ 112,919,297	\$ 2,965,809	2.6%
OVERTIME	4,571,567	5,208,556	4,898,965	5,019,296	120,331	2.4%
FRINGE BENEFITS	20,068,927	19,982,221	21,717,533	22,402,224	684,691	3.1%
WORKERS' COMPENSATION	2,147,063	2,717,568	2,354,256	2,476,655	122,399	4.9%
CHEMICALS	9,659,734	10,891,948	11,811,221	12,091,255	280,034	2.3%
UTILITIES	21,997,423	24,446,278	24,454,796	24,200,846	(253,950)	-1.0%
MAINTENANCE	29,067,175	30,650,570	32,726,954	32,618,569	(108,385)	-0.3%
TRAINING & MEETINGS	314,745	499,836	504,394	405,264	(99,130)	-24.5%
PROFESSIONAL SERVICES	6,955,638	6,194,703	8,295,315	8,377,283	81,968	1.0%
OTHER MATERIALS	6,293,935	6,987,854	6,867,239	6,706,916	(160,323)	-2.4%
OTHER SERVICES	22,794,735	23,769,299	24,683,370	24,983,777	300,407	1.2%
TOTAL	\$ 224,746,357	\$ 233,680,737	\$ 248,267,531	\$ 252,201,382	\$ 3,933,851	1.6%

FY21 Final Current Expense Budget						
MWRA Direct Expenses by Division						
DIVISION	FY18 Actuals	FY19 Actuals	FY20 Final Budget	FY21 Final Budget	Change FY21 to FY20	
EXECUTIVE	\$ 1,315,341	\$ 1,319,644	\$ 1,440,611	\$ 1,514,614	\$ 74,003	4.9%
EMERGENCY PREPAREDNESS	3,673,985	3,312,285	3,618,929	2,886,776	(732,153)	-25.4%
ADMINISTRATION	45,760,274	47,123,032	52,222,114	53,221,569	999,455	1.9%
FINANCE	3,971,553	3,794,170	4,420,980	4,385,292	(35,688)	-0.8%
LAW	2,055,302	1,792,339	2,083,232	2,209,094	125,862	5.7%
AFFIRMATIVE ACTION	511,201	510,917	683,060	704,828	21,768	3.1%
INTERNAL AUDIT	659,333	653,896	715,847	730,565	14,718	2.0%
PUBLIC AFFAIRS	1,117,372	946,001	1,144,317	1,119,621	(24,696)	-2.2%
OPERATIONS/PLANNING	165,681,999	174,228,443	181,938,441	185,429,023	3,490,582	1.9%
TOTAL	\$ 224,746,357	\$ 233,680,737	\$ 248,267,531	\$ 252,201,382	\$ 3,933,851	1.6%

Performance measures for all MWRA Divisions and Departments are published monthly in the MWRA “Yellow Notebook” and quarterly in the MWRA “Orange Notebook.” In addition, monthly financial staff summaries are presented to the Board of Directors reviewing monthly budget performance and explaining variances. All documents are available on-line at mwra.com.

**APPENDIX B
BUDGET PROCESS AND TIMETABLE**

MWRA operates on a fiscal year that starts July 1. The budget development process begins in August and, as described below, continues through a series of interactive reviews and revisions until June, when the Board of Directors approves the final budget. Throughout the formal budget process, MWRA staff maintains an ongoing dialogue with the Board of Directors and Advisory Board to discuss issues, the status of budget development, and other concerns.

	Current Expense Budget (CEB)	Capital Improvement Program (CIP)
Date	Activity	Activity
8/14/20	Prepare budget guidelines and materials	Update database with current awards, change orders, and annual estimated inflation factor
9/14/20		Kick-off meeting
9/25/20	Kick-off meeting - Release database files to all departments	
10/27/20		Project Managers update project schedules and costs
10/30/20		Proposed CIP finalized
11/6/20	Budget staff prepare capital financing requirements and indirect expenses	Review of Proposed CIP with senior management
11/13/20	Update CEB impacts from CIP	
11/20/20		Proposed CIP Staff Summary and Board of Directors presentation
12/1/20	Proposed CEB, Rate Revenue Requirement and planning projections	
12/15/20	Review of Proposed CEB with Senior Management	
12/20/20		Present Proposed CIP at Board Of Directors Meeting
12/21/20		Advisory Board Review and Comments begins
1/15/21	Proposed CEB Staff Summary and Board of Directors presentation	
2/21/21	Present Proposed CEB at Board of Directors Meeting	
2/22/21	Advisory Board Review and Comments begins	
3/15/21	Spring Revisit - Distribute Proposed FY19 database files to all departments	
4/9/21	Update Proposed CEB	Update Proposed CIP
4/15/21	Public hearings	Public hearings
4/27/21	Receive Advisory Board Comments	Receive Advisory Board Comments
5/18/21	Prepare MWRA's response to Advisory Board Comments	Prepare MWRA's response to Advisory Board Comments
5/18/21	Prepare Draft Final CEB presentation for Board of Directors	Prepare Draft Final CIP presentation for Board of Directors
5/30/21	Presentation - Draft Final CEB to Board of Directors	Presentation - Draft Final CIP to Board of Directors
6/15/21	Draft Final CEB Staff Summary	Draft Final CIP Staff Summary
6/20/21	Board of Directors Meeting - Vote on Final CEB	Board of Directors Meeting - Vote on Final CIP

APPENDIX C

MASSACHUSETTS WATER RESOURCES AUTHORITY BUDGET AND ASSESSMENT POLICIES AND PROCEDURES

**(Revised August 2003 to incorporate changes to capital budget section of Management
Policies adopted by the Board of Directors June 11, 2003)**

These policies and procedures govern certain budget, assessment, and rates management practices at the Massachusetts Water Resources Authority (MWRA). Policies and procedures may be amended from time to time, provided that changes in provisions governing reporting to or approvals by the Board of Directors or the Advisory Board must be approved by the Board of Directors. If any sections of these policies and procedures are at variance with requirements of MWRA's financing agreements, the latter shall govern.

ASSESSMENT POLICIES AND PROCEDURES

Basis of MWRA Assessments

MWRA is required by its Enabling Act to establish assessments which, with other revenues, provide sufficient funds each year to pay all current expenses, debt service, and obligations to the Commonwealth; to pay all costs of maintenance, replacement, improvements, extension, and enlargement of the sewer and waterworks systems; to create and maintain reserve funds; and to provide amounts required by financing agreements. These assessments are adopted by MWRA based on the rate revenue requirements set forth in the Current Expense Budget.

Costs Recovered

MWRA capitalizes certain of its asset costs in accordance with its capitalization policy. Capital expenditures are planned as set forth in the Capital Improvement Program and are recovered through assessments in accordance with MWRA financing agreements. The Current Expense Budget provides detailed information on capital and debt costs, additions to reserves, and all operations and maintenance costs to be recovered with current revenue.

Sources of Current Revenue

MWRA recovers most of its current expenses from users of the services it provides. In addition to rate revenue requirements, budgeted current revenue includes anticipated fines, fees, investment income on certain fund balances, and payments for contracted services. MWRA is committed to seeking additional sources of current revenue.

Coverage Requirements

MWRA's financing agreements include coverage requirements which provide that each year revenue less operating expenses (net revenue) must be more than the amount required for debt

service payments on outstanding bonds. The primary bond coverage requirement is that net revenue must be 120 percent of required debt service fund deposits for bonds outstanding excluding subordinated bonds. The secondary coverage requirement is that net revenue must be 110 percent of required debt service fund deposits for all bonds outstanding, including subordinated bonds. Revenue must be raised annually to meet the primary and secondary bond coverage requirements and may be used for additions to reserves or for payment of obligations to the Commonwealth. Amounts remaining after these uses are used to pay capital costs in order to reduce the need for future borrowing or to reduce current debt service costs. In addition, MWRA has a supplemental bond coverage requirement that amounts contained in its Community Obligation and Revenue Enhancement (CORE) Fund shall equal 10 percent of required debt service fund deposits for bonds outstanding, excluding subordinated bonds. Amounts required to be on deposit in the CORE Fund are recovered through assessments as necessary.

Basis of Budgeting

The Authority is required by the Enabling Act to establish user rates for its water and sewer services which provide sufficient funds to recover the costs of operations (excluding depreciation), debt service, maintenance, replacements, improvements to its facilities, and appropriate reserves. MWRA budgets on the accrual basis, its financial statements are reported on the accrual basis of accounting and the economic measurement focus as specified by the Governmental Accounting Standards Board's (GASB) requirements for an enterprise fund.

The MWRA distinguishes operating revenues and expenses from nonoperation items. Operating revenues and expenses generally result from providing water and sewer services to its member communities. All revenues and expenses not meeting this definition are reported as nonoperating revenues and expenses. All operating revenues are pledged for repayment of outstanding debt service.

In addition, MWRA applies the provisions of GASB Statement No. 62, Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements, to provide a better matching of revenues and expenses. The effect of this policy has been to defer certain outflows of resources, which will be recovered through future revenues in accordance with MWRA's rate model, and to record deferred inflows of resources for revenue collected through current rates for costs expected to be incurred in the future.

Budget Surpluses

In any year in which current revenue exceeds both current expenses on a budget basis and amounts required to meet bond coverage tests, the amount of over-recovery is deposited first to reserve funds, if any, which are below the level specified in any financing agreements, and second into MWRA's rate stabilization fund or bond redemption fund. Amounts deposited in these funds are used to offset rate requirements in subsequent years and such, to provide rate relief for our communities. With Board approval, surplus funds can also be used for targeted defeasance in future years and/or to reduce future liabilities, as part of a multi-year rate strategy. MWRA consults with the Advisory Board regarding the yearly use of these funds.

Budgeting and Assessment Objectives

MWRA follows conservative budgeting practices, and has the following objectives in developing budgets and community assessments:

1. To minimize total costs, consistent with MWRA's statutory responsibilities to provide effective, environmentally sound wholesale water delivery and wastewater collection and treatment services;
2. To minimize the cost of debt;
3. To avoid single year assessment spikes by prudent management of cost and assessment increases, and
4. To support inter-generational equity by avoiding unfair assessment burdens on either current or future ratepayers.

Allocation of Costs and Revenue to Systems

Most of MWRA's current expenses are directly attributable to either water or sewerage service costs or to investment in either the water or sewerage systems. Expenses which support both systems (indirect system costs) are allocated to the water or sewer system based on generally accepted cost allocation principles. Investment, contract, and other income offsets water and sewerage expenses on either a direct or allocated, indirect basis. The resulting net cost of water and sewerage services is the amount to be recovered through water and sewer assessments.

Allocation of Rate Revenue Requirements to User Assessments

Users of MWRA wholesale water and sewerage services are assessed for those services according to MWRA's water and sewer assessment methodologies. Assessments for water services are computed by MWRA based on metered water use for the preceding calendar year. The total assessment is allocated based on each community's share of water delivered in the immediately preceding calendar year.

Assessments for sewer services are computed on the basis of a combination of metered wastewater flow and loads, and population.

- Operations and Maintenance (O&M) costs are allocated based on total annual metered wastewater flow, and total annual average strength, septage, and high strength flow loads.
- Capital (or debt service) costs are allocated based on a combination of metered wastewater flow and loads, and population. One-quarter of capital costs are allocated based on maximum month flow, and total annual average strength, septage, and high strength flow loads. The

remaining three-quarters of capital costs are allocated based on population. Half of the population allocation is based on census population and half is based on contributing population.

Schedule and Procedure for Adoption of Assessments

During the preparation of the proposed Current Expense Budget, required water and sewer rate revenue is determined, and a preliminary calculation of the allocation of costs to user-specific assessments is made. This information is provided to MWRA customers to assist them in their own fiscal planning. As provided in the Enabling Act, the proposed Current Expense Budget and preliminary assessments undergo statutory review, including public hearings and review by MWRA's Advisory Board. Further refinements of projected expenses and revenues also occur during this period. If review and analysis of the proposed Current Expense Budget results in lower projected expenses or higher projected revenue, some or all of such savings from preliminary estimates of assessments can be included in the adopted budget as additions to the rate stabilization fund and used to reduce rate revenue requirements in subsequent years. Alternatively, some or all of such savings can be used to reduce final assessments to customers below preliminary estimates.

The Current Expense Budget and final water and sewer assessments are adopted in June for the fiscal year beginning in July. The budget adopted in June may differ from the proposed budget as a result of review and further refinement of the proposed budget, although final assessments adopted by MWRA must be sufficient to recover water and sewer rate revenue requirements specified in the adopted budget. Final water and sewer rate requirements and their allocation to users may thus change from preliminary estimates. In addition, any individual community's final assessment may be higher or lower than the preliminary estimate, both because of changes in the factors which affect the allocation of assessments among wholesale customers, and because of differences between MWRA's proposed and final budgets as approved by the Board of Directors.

Review and Dispute Resolution Process

MWRA annually determines preliminary and final assessments for water and sewer services in February and June prior to the beginning of the new fiscal year. These assessments must satisfy the requirement that MWRA fully recover its water and sewer costs by apportioning total costs as assessments among its wholesale water and sewer customers pursuant to its water and sewer rate methodologies and to certain specified data including:

- Calendar year metered water volume and metered wastewater flow obtained from MWRA's water and wastewater metering systems;
- Federal and state community census statistics, and sewer population estimates and other information supplied on Customer Service Update forms and Municipal Discharge Permits; and
- High strength user monitoring data and estimates of community septage volumes as obtained by MWRA's Toxic Reduction and Control Department.

The review and dispute resolution process provides MWRA's wholesale customers with the opportunity to review and comment on the reasonableness of the data used to calculate preliminary water and sewer assessments. During the year, MWRA provides its customers with monthly summaries of water and wastewater flow data distributed, at a minimum, on a bimonthly basis. Because annual metered water and wastewater flows are major components for establishing water and sewer charges for each community, customers are strongly encouraged to review this data closely upon receipt and raise questions with MWRA staff concerning the data. MWRA expects that prompt customer review and comment on meter data will result in the resolution of most water and wastewater metering questions and assure the most consistency between preliminary assessments in February and final assessments announced in June. Community contributions of high strength flow and septage, and population data are made available with the release of preliminary assessments in February.

If after an initial review a community believes that specific data used to calculate assessments should be reevaluated, a community may submit a written objection to the Executive Director with a copy to the Rates Manager or their designee. The objection must be signed by the local official on record with MWRA as responsible for water or sewer services in the city, town, or district. The objection should state the community's concern with the data used to calculate community assessments, and should also include information and technical data to support the community's objection.

In order for any data adjustments to be incorporated into the allocation of final fiscal year assessments, all objections to data used to calculate preliminary assessments must be received no later than the date of the final public hearing on the proposed budget and preliminary assessments, held pursuant to Section 10 of the MWRA Enabling Act. MWRA staff will review and evaluate the merits of all written objections. Customers are notified in writing of the results of this review prior to the release of final assessments.

Adjustments to preliminary data, if any, are not retroactive beyond the applicable calendar year for proposed assessments. Final fiscal year assessments are calculated incorporating adjustments, if any, resulting from the review and objection process, and final rate revenue requirements as adopted by the Board of Directors.

Written objection(s) may also be submitted following the adoption of final fiscal year assessments, but no later than the end of the fiscal year for which the assessments are applicable. Objections submitted in this manner must also be directed to the Executive Director with a copy to the Rates Manager or their designee.

Following MWRA staff review, adjustments to assessments resulting from the challenge of rate basis data that are submitted following the adoption of final fiscal year assessments will be applied to the subsequent year's assessments. Customers are notified in writing of the results of this review and any assessment adjustments prior to the release of the subsequent year's assessments.

Water and Sewer Assessment Payment Schedule

MWRA adopts a schedule of assessments and a schedule of payments annually. Any adjustments for prior years resulting from the review and objection process are apportioned to each of the scheduled payment amounts. No interest is paid or billed by MWRA for previous year's adjustments.

Assessments are payable to MWRA in ten equal installments due on the first day of August, September, October, November, December, February, March, April, May, and June.

Interest Charge on Delinquent Payments

For payments received after a payment due date MWRA levies an interest charge of one percent per month or 0.033 percent per day. Interest charges do not accrue until 30 days after the bills are mailed to MWRA's customer communities. Interest charges are added to subsequent regular billings.

Retail Rates

MWRA assessments are for MWRA's provision of wholesale services. Local bodies which receive wholesale services in turn provide retail services to their users at the local level.

MWRA encourages its customers to establish retail rates which:

1. Recover the full cost of providing local water and/or sewerage services, including both direct costs and an allocation or estimate of indirect costs,
2. Charge users of local water and/or sewerage services in a manner which demonstrates to customers that increased use of services results in increased user costs,
3. Comply with MWRA policies directed to conservation of water; elimination of infiltration and inflow of surface water and ground water into the sewage collection, treatment, and disposal system; and removal or pretreatment of industrial wastes, and
4. To the extent consistent with #1 and #2, provide assistance to low income users through lifeline rates.

CAPITALIZATION POLICY

It is the policy of the MWRA that capitalization of expenditures conforms to generally accepted accounting principles. Under such guidelines, MWRA has adopted the provisions of the Financial Accounting Standards Board's Statement No. 71, "Accounting for the Effects of Certain Types of Regulation," which is intended to assure that utility revenues are appropriately matched with incurred costs. Capital expenditures create assets or extend their useful lives. Assets are valued at their cost and provide benefits over an extended period of time. Sources of funds for capital expenditures include grants, proceeds of MWRA borrowing, loans, and current revenue.

Asset value created by MWRA is of two kinds. One is the value of tangible assets either created or increased through MWRA capital investments. Such assets include land, buildings, plant, equipment, and the system infrastructure for water and wastewater. The cost of such fixed asset investment includes not only purchase, rehabilitation, and construction cost, but also ancillary expenses necessary to make productive use of the asset. Ancillary costs can include, but are not limited to, costs for planning studies, professional fees, transportation charges, site preparation expenditures, and legal fees and claims directly attributable to the asset.

The second kind of asset value created by MWRA investment is the value of intangible assets. While such investment does not result in tangible MWRA assets, it does create a benefit to MWRA and its users over several years. Such assets include the cost of MWRA efforts to establish baseline leak detection information for the water systems of MWRA customers. The cost of providing water consumption-limiting devices to households is another example.

Expenditures for tangible assets are included in the Capital Improvement Program and Budget if the expected cost of the individual asset or capital project is \$100,000 or more and if the expected useful life is more than one year. Expenditures for intangible assets are capitalized if the expected cost is \$100,000 or more and if the expected benefit period is three years or more. Annually recurring costs and expenditures for maintenance of assets are not capitalized, even though their cost may exceed \$100,000. Examples of such maintenance expenditures include replacement of vehicles or computers, replacement of inoperable valves or other equipment before the anticipated useful life has been reached, and pipeline or interceptor repairs that do not add significant life to the underlying asset.

RESERVES FUNDED FROM CURRENT REVENUE

Operating Reserve

The Operating Reserve has been established to provide a source of funds to be used to pay operating expenses of the sewer or water systems should there not be sufficient funds otherwise available for that purpose. Bond agreements specify that the fund level shall not be less than one-sixth of MWRA's annual operating expenses.

Insurance Reserve

The Insurance Reserve has been established to provide funds to restore, replace, or reconstruct lost or damaged property or facilities of the water or sewer system. It provides funds reserved against risks for which MWRA does not currently maintain insurance. This self-insurance reduces the cost MWRA might otherwise incur for purchased insurance policies. MWRA periodically evaluates the level of its insurance reserve and every three years a consulting engineer or an insurance consultant recommends an appropriate insurance reserve fund requirement. The current funding level of \$14.0 million has been determined to be adequate based on a FY17 Insurance Reserve Fund review performed by an outside insurance consultant who estimated an acceptable fund level in the range of \$12 to \$16 million. The next Insurance Reserve Fund review is expected in February 2020.

Renewal and Replacement Reserve

The Renewal and Replacement Reserve has been established to pay the costs of emergency repairs or capital improvements to the system when funds are not available in either the Construction Fund or the Operating Fund. Amounts may not be withdrawn until MWRA has specified the project to which the amount will be applied, its estimated cost, and estimated completion date. It must also certify that such expenditures are reasonably required for the continued operation of the systems, or for maintenance of revenues, or that other provisions have not been made for funding such expenditures. The requirement of the Bond Resolution, every three years, MWRA receives recommendations from a Consulting Engineer as to the adequacy of the renewal and replacement reserve fund requirement. The Renewal and Replacement Reserve Fund requirement is presently established at \$35 million. The adequacy of the funding requirements for the Operating Reserve Fund and the Replacement Reserve Fund have been confirmed by the Consulting Engineer in its most recent triennial report dated October 2014, prepared and delivered in accordance with the General Resolution. The next Triennial Report is scheduled for October 2017. The Consulting Engineer also provides an opinion as to the adequacy of the Authority rates, rentals, and other charges.

CURRENT EXPENSE BUDGET MANAGEMENT POLICIES AND PROCEDURES

A. Budget Allocations

Budget Contingency Holdbacks

After the Board of Directors adopts the Current Expense Budget each year, the Executive Director, the Chief Operating Officer, or a division director may reserve between two percent and four percent of a division's approved budget as a budget contingency to be expended only upon approval of the Executive Director. The contingency holdback may be from any line item or cost center or combinations thereof, and any amount reserved as a budget contingency is not to be included in the monthly budget allocation process described below. The Administration, Finance, and Audit Committee will be notified of all budget contingency holdback amounts.

Monthly Allocation of the Annual Current Expense Budget

Initial monthly allocations are made for purposes of adopting and filing an operating budget in accordance with MWRA's financing agreements. Before the end of the first reporting period of the fiscal year, divisions, with the assistance of the Rates and Budget Department, allocate the approved budget, less any holdbacks, by month. The allocations set forth planned expenditures and accruals for each of the 12 months of the year to be compared to actual expenditures and accruals as reported in MWRA's monthly variance reports.

B. Budget Variance Monitoring and Analysis

At the close of each monthly accounting period, the Controller Department prepares MWRA financial statements. The Rates and Budget Department then prepares monthly variance reports that compare budgeted to actual revenues and expenses.

Variance Analysis

Division directors and staff review variance reports and explain variances between budgeted and actual expenditures as requested by the Rates and Budget Department. Variance explanations are prepared as needed, usually at the first quarter of the year, and following monthly for the rest of the year. At least twice each year MWRA staff prepares forecasts of year-end expenditures and revenue. Barring extraordinary circumstances, division directors are responsible for controlling spending within the overall division budget. The Rates and Budget Department reviews all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA's budget.

Variance explanations are submitted to the Rates and Budget Department in accordance with the schedule developed by the Rates and Budget Department. Each month the Rates and Budget Department prepares a summary of budget variances for inclusion in the Management Indicators Report (Yellow Notebook). The Rates and Budget Department also prepares a monthly staff summary (except for July and August) to the Board of Directors describing major budget variances and a quarterly budget variance report for inclusion in the Board of Directors Report on Key

Indicators of MWRA Performance (Orange Notebook). At least twice a year, the Rates and Budget Department prepares a staff summary to the Board of Directors on year-end projections of revenue and expenses.

C. Budget Amendments

An amendment to an MWRA Current Expense Budget is defined as follows:

A proposed change in an adopted budget or a proposed budget transmitted to the MWRA Advisory Board in accordance with Section 8(b) of Chapter 372 of the Acts of 1984 which meets any of the following criteria:

1. Any increase in total current expenses.
2. An increase of five percent or more in total division expenses.
3. An increase in any expense line item (subsidiary account) of 15 percent or more if that line item is at least 2.5 percent of total current expenses.
4. An addition or deletion of a specific new program or initiative, the cost of which is greater than one percent of total current expenses, unless the addition or deletion has been specifically recommended by the Advisory Board.

The Executive Director, with the concurrence of the Chairman of the Board of Directors and the Chairman of the Administration, Finance, & Audit Committee of the Board of Directors, submits proposed amendments to the Advisory Board for comment and recommendation. At the end of the Advisory Board 30-day review period, the Board of Directors may take action on the amendment.

CAPITAL BUDGET MANAGEMENT POLICIES AND PROCEDURES

General Guidelines

The Authority shall periodically adopt and revise capital facility programs for the Waterworks and Sewer Systems and capital budgets based on these programs. The Authority shall consult in the preparation of its capital facility programs for the Sewer and Waterworks Systems with the Authority's Advisory Board and the Executive Office of Environmental Affairs, and may consult with other agencies of federal, state and local government concerned with the programs of the Authority. Proposed capital facility programs and capital expenditure budgets for said systems shall be submitted to the Advisory Board for such consultation no less than sixty days prior to adoption or revision by the Authority. The Authority shall prepare a written response to reports submitted to it by the Advisory Board, which response shall state the basis for any substantial divergence between the actions of the Authority and the recommendations contained in such reports of the Advisory Board. The Authority shall capitalize expenditures in accordance with generally accepted accounting principles. Capital expenditures will be planned in accordance with Authority financing agreements and policies for amortization of capital costs.

Capital Budget Contingency

A contingency for each fiscal year is incorporated into the Capital Improvement Program for the purpose of providing for unanticipated or unpredictable expenditures under the CIP spending cap.

Capital Budget Monitoring and Reporting

The Authority continually monitors the progress of capital projects for purposes of managerial control and decision-making and for financial planning and management. Two capital budget variance analysis reports are provided to the Board of Directors, one for the first six months of a year and one at year-end. The reports include a comparison between planned project schedules to actual performance. The reports highlight any major changes, either in scope or budget, of any project. Based on these reports, staff may recommend to the Board of Directors revisions, if appropriate, to the annual and five-year caps based upon said changes. In addition, capital budget progress reports are provided to the Board of Directors on a regular basis, both as project specific updates and in Quarterly Orange Notebook reports that shall include discussions of project progress compared to schedules. Monthly Financial Summary reports shall include discussions of capital expenditures compared to budget.

Capital Budget Spending Cap

Beginning in June 2003, the Board of Directors established a five-year Capital Budget Spending cap and annual caps for each year within the cap period. Spending for any year in the cap period may vary within plus or minus 20% of the annual cap, as long as total spending for the five-year period does not exceed the five-year cap. Before the end of each five-year cap period, the Board will adopt a cap for the next five-year period and annual caps for each year in the period. The Board established the third five-year cap for the FY14-18 period at its June 2013 meeting.

Expenditures in Excess of the Spending Cap

In the event of unanticipated spending requirements, the Executive Director may recommend to the Board of Directors that annual expenditures exceed an annual cap by more than 20% or that five-year expenditures exceed the current five-year CIP spending cap. In such an event, a proposed plan to adjust the five-year cap or any of the annual caps will be presented to the Board. Any such proposed plan will be submitted to the MWRA Advisory Board for review and comment for a period of thirty days. At the end of the thirty-day period, the Board of Directors may take action on the proposed plan.

Debt Limit

The Authority's statutory debt limit is \$6,450,000,000. The current debt is well below the debt limit. The Authority's debt limit was most recently amended by Chapter 312 of the Acts of 2008 of the Commonwealth of Massachusetts.

APPENDIX D

MWRA Planning Estimates FY2021 to FY2030										
COMBINED UTILITIES	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
EXPENSES										
Direct Expenses	\$259,810	\$266,997	\$273,432	\$281,514	\$289,398	\$298,164	\$305,883	\$314,659	\$323,574	\$332,665
Indirect Expenses	56,652	59,500	61,730	64,526	67,293	70,562	73,806	77,694	81,494	86,174
Capital Financing (before offsets)	497,823	514,497	535,012	552,710	569,958	586,809	603,551	616,385	626,736	663,997
Sub-Total Expenses	\$814,285	\$840,993	\$870,173	\$898,750	\$926,648	\$955,534	\$983,239	\$1,008,738	\$1,031,805	\$1,052,835
Debt Service Assistance	(1,288)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	0	0	0	0	0
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Expenses	\$812,997	\$840,993	\$870,173	\$898,750	\$926,648	\$955,534	\$983,239	\$1,008,738	\$1,031,805	\$1,052,835
REVENUE & INCOME										
Non-Member and Other Revenue	\$15,702	\$16,148	\$16,767	\$17,181	\$17,609	\$18,031	\$18,450	\$18,876	\$19,127	\$19,389
Interest Income	3,961	3,737	4,298	4,662	5,084	5,511	5,881	6,160	6,375	6,538
Rate Stabilization	1,250	980	800	575	425	350	300	200	140	12
Total Other Revenue	\$20,913	\$20,865	\$21,865	\$22,418	\$23,118	\$23,891	\$24,631	\$25,236	\$25,642	\$25,940
Total Rate Revenue	\$792,084	\$820,128	\$848,308	\$876,332	\$903,530	\$931,643	\$958,608	\$983,502	\$1,006,163	\$1,026,895
Rate Revenue Increase	3.0%	3.5%	3.4%	3.3%	3.1%	3.1%	2.9%	2.6%	2.3%	2.1%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$1,256	\$1,312	\$1,369	\$1,429	\$1,490	\$1,554	\$1,620	\$1,687	\$1,756	\$1,826
Based on water use of 90k gpy (weighted)	\$1,854	\$1,935	\$2,020	\$2,108	\$2,198	\$2,293	\$2,390	\$2,489	\$2,591	\$2,695
WASTEWATER UTILITY	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031
EXPENSES										
Direct Expenses	\$169,080	\$173,526	\$177,557	\$182,562	\$187,664	\$193,553	\$198,462	\$204,093	\$209,897	\$215,789
Indirect Expenses	21,704	22,664	23,451	24,549	25,684	27,152	28,505	30,310	32,045	15,221
Capital Financing (before offsets)	334,145	344,471	356,792	367,170	376,204	384,672	392,513	396,483	397,542	414,623
Sub-Total Wastewater Expenses	\$524,928	\$540,662	\$557,801	\$574,280	\$589,551	\$605,377	\$619,481	\$630,887	\$639,484	\$645,633
Debt Service Assistance	(1,172)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	0	0	0	0	0
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Wastewater Expenses	\$523,756	\$540,662	\$557,801	\$574,280	\$589,551	\$605,377	\$619,481	\$630,887	\$639,484	\$645,633
REVENUE & INCOME										
Non-Member and Other Revenue	\$5,532	\$5,727	\$5,870	\$6,017	\$6,169	\$6,328	\$6,492	\$6,660	\$6,832	\$7,010
Interest Income	2,305	2,094	2,399	2,603	2,850	3,096	3,283	3,385	3,444	3,482
Rate Stabilization	1,250	980	800	575	425	350	300	200	140	12
Prior Year Utility Surplus/Deficit Transfer	0	0	0	0	0	0	0	0	0	0
Total Other Revenue	\$9,087	\$8,801	\$9,069	\$9,195	\$9,444	\$9,773	\$10,074	\$10,244	\$10,416	\$10,504
Wastewater Rate Revenue	\$514,669	\$531,861	\$548,732	\$565,085	\$580,107	\$595,604	\$609,406	\$620,642	\$629,068	\$635,129
Rate Revenue Increase	2.7%	3.3%	3.2%	3.0%	2.7%	2.7%	2.3%	1.8%	1.4%	1.0%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$757	\$791	\$825	\$860	\$897	\$934	\$973	\$1,011	\$1,050	\$1,090
Based on water use of 90k gpy (weighted)	\$1,117	\$1,166	\$1,217	\$1,270	\$1,323	\$1,379	\$1,435	\$1,492	\$1,550	\$1,608
WATER UTILITY	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031
EXPENSES										
Direct Expenses	\$90,731	\$93,471	\$95,874	\$98,952	\$101,734	\$104,610	\$107,420	\$110,566	\$113,678	\$116,875
Indirect Expenses	34,948	36,836	38,279	39,977	41,609	43,410	45,300	47,384	49,449	40,953
Capital Financing (before offsets)	163,678	170,025	178,219	185,540	193,754	202,137	211,037	219,901	229,194	249,374
Sub-Total Water Expenses	\$289,357	\$300,332	\$312,373	\$324,470	\$337,097	\$350,157	\$363,758	\$377,852	\$392,320	\$407,202
Debt Service Assistance	(116)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	0	0	0	0	0
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Water Expenses	\$289,241	\$300,332	\$312,373	\$324,470	\$337,097	\$350,157	\$363,758	\$377,852	\$392,320	\$407,202
REVENUE & INCOME										
Non-Member and Other Revenue	\$10,170	\$10,421	\$10,898	\$11,164	\$11,440	\$11,703	\$11,958	\$12,216	\$12,294	\$12,379
Interest Income	1,656	1,643	1,899	2,059	2,234	2,415	2,598	2,775	2,932	3,056
Rate Stabilization	0	0	0	0	0	0	0	0	0	0
Prior Year Utility Surplus/Deficit Transfer	0	0	0	0	0	0	0	0	0	0
Total Other Revenue	\$11,826	\$12,064	\$12,797	\$13,223	\$13,674	\$14,118	\$14,557	\$14,992	\$15,226	\$15,436
Water Rate Revenue	\$277,415	\$288,267	\$299,576	\$311,247	\$323,423	\$336,039	\$349,202	\$362,860	\$377,094	\$391,767
Rate Revenue Increase	3.5%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$499	\$521	\$544	\$568	\$593	\$620	\$647	\$676	\$706	\$737
Based on water use of 90k gpy (weighted)	\$737	\$769	\$803	\$838	\$875	\$914	\$955	\$997	\$1,041	\$1,087

** Annual household charges are estimated for communities that receive full water and wastewater services from MWRA weighted by the number of households in each of these core communities. Based on community responses to the 2020 MWRA Advisory Board's Annual Water and Sewer Retail Rate Survey.

APPENDIX E
FY22 Current Expense Budget - Capital Financing Detail (as of 6/30/21)

	Outstanding as of 6/30/21	Total	Sewer	Water
SRF ¹				
1999E Sewer		214,420	214,420	-
1999E Water	4,392,752	-	-	-
1999F	124,940,000	24,091,057	24,091,057	-
2000E Sewer		3,105,361	3,105,361	-
2000E Water	35,758,571	-	-	-
2001C Water	27,043	-	-	-
2001D Sewer		22,094	22,094	-
2001D Water	418,944	-	-	-
2002H Sewer		3,154,403	3,154,403	-
2002H Water	52,250,000	1,536,330	-	1,536,330
2002I Sewer		103,768	103,768	-
2002I Water	1,246,429	-	-	-
2003A	199,956	71,345	-	71,345
2003C Sewer		1,342,427	1,342,427	-
2003C Water	22,066,533	966,287	-	966,287
2004C Sewer		530,847	530,847	-
2004C Water	6,187,618	40,379	-	40,379
2004D Sewer		2,672,891	2,672,891	-
2004D Water	37,200,000	697,147	-	697,147
2005C Sewer		409,732	409,732	-
2005C Water	3,706,804	68,085	-	68,085
2005D Sewer		3,032,698	3,032,698	-
2005D Water	41,354,745	796,127	-	796,127
2005E Sewer		24,961	24,961	-
2005E Water	143,478	5,479	-	5,479
2006C Sewer		478,806	478,806	-
2006D Sewer		2,796,867	2,796,867	-
2006D Water	45,644,001	1,596,519	-	1,596,519
2006E Sewer		22,883	22,883	-
2006E Water	185,766	10,281	-	10,281
2007C Sewer		221,985	221,985	-
2007C Water	2,308,236	166,934	-	166,934
2007D Sewer		1,143,592	1,143,592	-
2007E Sewer		2,730,609	2,730,609	-
2007E Water	44,458,727	1,253,034	-	1,253,034
2008G Sewer		381,436	381,436	-
2008G Water	2,516,549	81,666	-	81,666
2009C Sewer		3,774,990	3,774,990	-
2009C Water	60,754,064	1,875,320	-	1,875,320
2009D Sewer		638,974	638,974	-
2009D Water	6,754,568	85,161	-	85,161
2010 D Sewer		1,417,367	1,417,367	-
2010 D Water	30,428,793	1,429,616	-	1,429,616
2011A Sewer		306,456	306,456	-
2011A Water	5,907,263	362,086	-	362,086
2012C Sewer		515,794	515,794	-
2012C Water	6,878,723	254,976	-	254,976
2012D Sewer		2,850,739	2,850,739	-
2012D Water	33,854,942	532,879	-	532,879
2013B Sewer		2,216,554	2,216,554	-
2013B Water	24,811,574	534,179	-	534,179
2014C Sewer		283,635	283,635	-
2014C Water	7,458,147	385,462	-	385,462
2015A Sewer		2,648,798	2,648,798	-
2015A Water	50,293,266	980,307	-	980,307
2015B Sewer		212,687	212,687	-
2015B Water	3,699,426	151,726	-	151,726
2016A Sewer		2,130,433	2,130,433	-
2016A Water	44,011,787	848,478	-	848,478
2017A Sewer		542,016	542,016	-
2017A Water	27,949,433	1,538,511	-	1,538,511
2018E Sewer		1,077,579	1,077,579	-
2018E Water	45,910,941	2,021,463	-	2,021,463
2019D Sewer		2,030,805	2,030,805	-
2019D Water	\$ 50,366,860	1,222,057	-	1,222,057
2021A Sewer		1,558,101	1,558,101	-

APPENDIX E
FY22 Current Expense Budget - Capital Financing Detail (as of 6/30/21)

	Outstanding as of 6/30/21	Total	Sewer	Water
2021A Water	\$ 50,438,634	1,566,901	-	1,566,901
Pool 24 Sewer		4,042,000	4,042,000	-
Pool 24 Water		1,866,901	-	1,866,901
Total SRF Debt	\$ 893,937,770	\$ 95,673,399	\$ 72,727,765	\$ 22,945,634
MWRA Senior Debt				
2002J Refunding	73,205,000	23,626,725	21,264,053	2,362,673
2007B Refunding	647,950,000	34,017,375	28,574,595	5,442,780
2011B New	3,030,000	-	-	-
2012A New	3,505,000	3,680,250	1,840,125	1,840,125
2013A Refunding	94,015,000	25,114,400	14,064,064	11,050,336
2014D New	55,340,000	2,694,250	1,832,090	862,160
2014F Refunding	138,755,000	5,068,950	1,571,375	3,497,576
2016B New	60,770,000	2,994,450	1,497,225	1,497,225
2016C Refunding	672,445,000	38,167,300	19,465,323	18,701,977
2016D Refunding	103,425,000	4,482,250	2,913,463	1,568,788
2017B New	60,470,000	3,023,500	1,511,750	1,511,750
2017C Refunding	220,120,000	31,500,750	14,175,338	17,325,413
2018B New	99,705,000	4,985,250	2,991,150	1,994,100
2018C Refunding	17,500,000	875,000	656,250	218,750
2019B New	121,265,000	6,063,250	4,225,750	1,837,500
2019C Refunding	19,190,000	8,011,500	5,768,280	2,243,220
2019E New	50,000,000	1,407,472	703,736	703,736
2019F Refunding	537,250,000	29,891,461	11,956,584	17,934,876
2020B New Money	156,175,000	8,953,750	6,556,250	2,397,500
FY20 New Money		7,399,245	5,549,434	1,849,811
FY 21 New Money		3,000,000	1,800,000	1,200,000
Defeasance Assumption		-	-	-
Total Senior	\$ 3,134,115,000	244,957,128	\$ 148,916,833	\$ 96,040,295
Subordinate Debt				
1999B	\$ 42,100,000	\$ 6,025,917	\$ 3,615,550	\$ 2,410,367
2008A Refunding	160,150,000	42,205,992	\$ 37,141,273	\$ 5,064,719
2008C Refunding	44,120,000	7,013,688	\$ 6,733,140	\$ 280,548
2008E Refunding	107,140,000	37,231,129	\$ 34,252,639	\$ 2,978,490
2012E Refunding	55,237,500	4,476,420	\$ 940,048	\$ 3,536,372
2012G Refunding	8,780,000	3,651,378	\$ 3,505,323	\$ 146,055
2014A Refunding	50,000,000	7,385,000	\$ 664,650	\$ 6,720,350
2014B Refunding	31,505,000	13,643,144	\$ 1,227,883	\$ 12,415,261
2018A Refunding	47,530,000	1,663,550	\$ 349,346	\$ 1,314,205
2018D Refunding	50,000,000	1,750,000	\$ 157,500	\$ 1,592,500
Total Subordinate Debt	\$ 596,562,500	125,046,217	\$ 88,587,352	\$ 36,458,866
Total SRF & MWRA Debt Service²	\$ 4,624,615,270	465,676,745	\$ 310,231,950	\$ 155,444,795
Other Capital				
Water Pipeline Commercial Paper	\$ 175,000,000	\$ 6,120,127	-	6,120,127
Current Revenue/Capital ³		\$ 17,200,000	16,684,000	516,000
Capital Lease		\$ 3,217,060	1,906,995	1,310,065
Debt Prepayment ⁴		\$ 5,609,355	5,462,670	146,685
Total Other Capital	\$ 175,000,000	\$ 32,146,542.20	\$ 24,053,665	\$ 8,092,877
Total Capital Financing (before Debt Service Offsets)	\$ 4,799,615,270	497,823,286.70	\$ 334,285,615	\$ 163,537,671
Debt Service Offsets				
Debt Service Assistance		(1,287,870)	\$ (1,171,962)	\$ (115,908)
Bond Redemption				
Total Debt Service Offsets		(1,287,870)	\$ (1,171,962)	\$ (115,908)
Total Capital Financing	\$ 4,799,615,270	496,535,417	\$ 333,113,653	\$ 163,421,763

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used defeasance of bonds at end of fiscal year.

APPENDIX F

Advisory Boards and Committees

The Advisory Board

The Advisory Board is established by section 23 of the MWRA Enabling Act. The Advisory Board's primary purposes are as follows:

1. To appoints 3 members of the Board of Directors, with staggered 6-year terms.
2. To review and comment on the current expense and capital improvement budgets.
3. To approve expansion of the MWRA's service area, whether permanent or temporary.
4. To make recommendations to the governor and the legislature with respect to matters that affect the Authority.

The Authority's proposed annual current expenses budget and its capital improvement program budget must be submitted to the Advisory Board at least sixty days prior to the adoption of each budget by the Board of Directors. Amendments to the current expenses budget must be submitted to the Advisory Board at least thirty days prior to adoption, except in the event of emergencies. The Authority is required to provide a written response to any reports of the Advisory Board regarding its finances. The Advisory Board has provided the Authority with written comments to both the current expenses and the capital improvement budgets. The Advisory Board's budget for personnel and expenses is included in the Executive Division's budget.

Water Supply Citizens Advisory Committee to MWRA (WSCAC)

Originally formed in 1977 to review a proposed diversion of the Connecticut River for water supply to the metropolitan Boston area, WSCAC represents an unusual approach for engaging citizen participation in water resource policy decisions.

WSCAC advises the MWRA and the Department of Conservation and Recreation on water conservation and watershed protection strategies. The MWRA has implemented leak repair and demand management programs, avoiding the need for river diversion.

WSCAC's current focus is water quality - source protection and management of the watersheds, reservoirs and distribution system.

WSCAC worked with the New England Safe Drinking Water Task Force on the Safe Drinking Water Act reauthorization. WSCAC helped secure passage of state legislation - the Interbasin Transfer Act of 1983, the Water Management Act of 1985, and the Watershed Protection Act of 1992. State officials have tapped WSCAC for other statewide advisory groups.

The Wastewater Advisory Committee (WAC)

The MWRA Board of Directors created WAC in 1990 to offer independent recommendations on wastewater policies and programs. WAC's mission is to be an independent public forum for holistic discussion of wastewater issues. Membership is designed to reflect the knowledge and interest of major affected constituencies: engineering and construction, environmental advocacy, planning, academic research, and business.

WAC's contractual duties are as follows:

1. Provide independent advice to the MWRA Board and staff on wastewater programs and policies directly related to the MWRA
2. Review and comment to the Authority on wastewater reports and proposed documents; offer independent advice on current and proposed wastewater program and policy directions to further MWRA objectives
3. Reflect the knowledge and interest of major affected constituencies, including
 - a. Engineering
 - b. Construction
 - c. Business/industry
 - d. Planning
 - e. Academic research
 - f. Environmental advocacy
4. Advise MWRA on wastewater planning
5. Increase citizen participation and education by providing MWRA with assistance in outreach. Review programs and explain plans & policies to citizens
6. Attend Authority working groups related to wastewater programs and policy, including the Advisory Board and WSCAC
7. Propose to the Authority ways to continue effective and efficient long-term public involvement in wastewater programs.

WAC's focus for 2017-2018 includes:

- Protecting the ratepayer's massive investment in clean water remains one of WAC's primary interests, and it will continue to monitor maintenance as well as progress on the CSO project.
- WAC is interested in the possibilities of further energy efficiency and renewable energy production at all MWRA facilities.
- Other areas of interest:
 - Co-digestion as it expands across New England
 - Marketability of Bay State Fertilizer
 - Climate Change impacts
 - Regulatory changes that might affect MWRA

APPENDIX G

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.

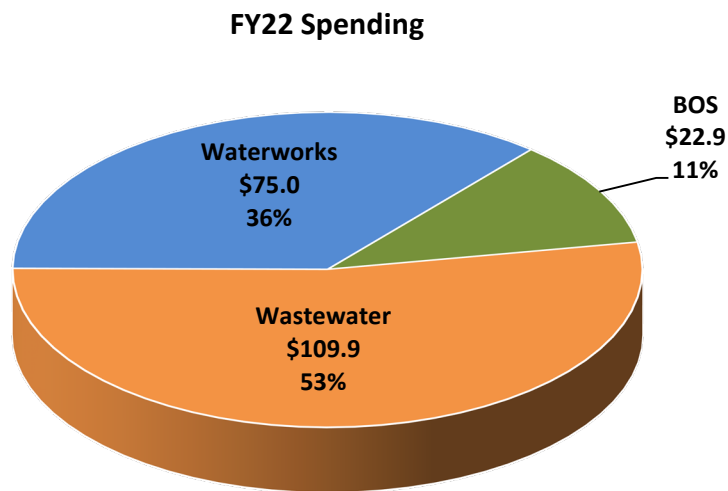
The MWRA's credit ratings of Aa1 from Moody's, AA+ from S&P, and AA+ from Fitch, reflect strong management of financial performance, application of operating surpluses to early debt defeasance, satisfactory debt service coverage ratios, well maintained facilities, comprehensive long-term planning of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

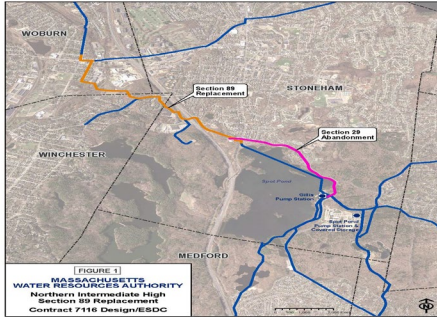
Project	Subphase	FY22 \$s in Millions
Corrosion & Odor Control	Nut Island Odor Control HVAC Improvement Construction Phase 2	\$22.9
Facility Asset Protection	Prison Point Rehabilitation - Construction	10.0
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	8.2
Metro Tunnel Redundancy	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



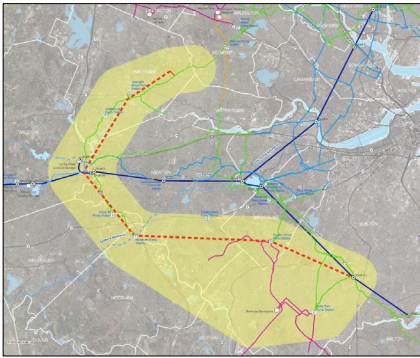
Nut Island Odor Control and HVAC Improvements - Construction Phase 2 - \$22.9 million (\$58.9 million total construction cost). Improvements to the Nut Island Headworks odor control, HVAC and energy management systems. These are the long-term improvement projects that arose following the January 2016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



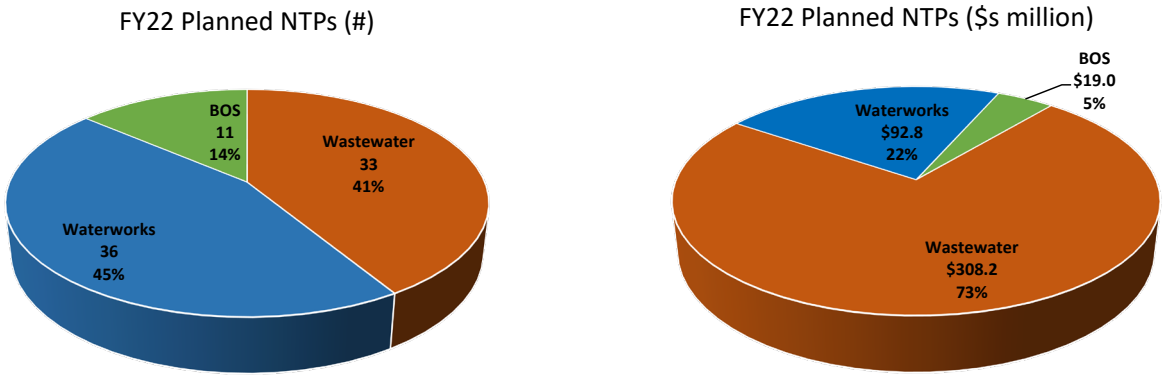
Carroll Water Treatment SCADA Upgrade Construction - \$2.8 million (\$14.0 million total construction cost). This project includes the replacement of PLC's nearing their end of life with an updated PLC platform. New PLC's will provide enhanced security capabilities, continued vendors support and future 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 \$ 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

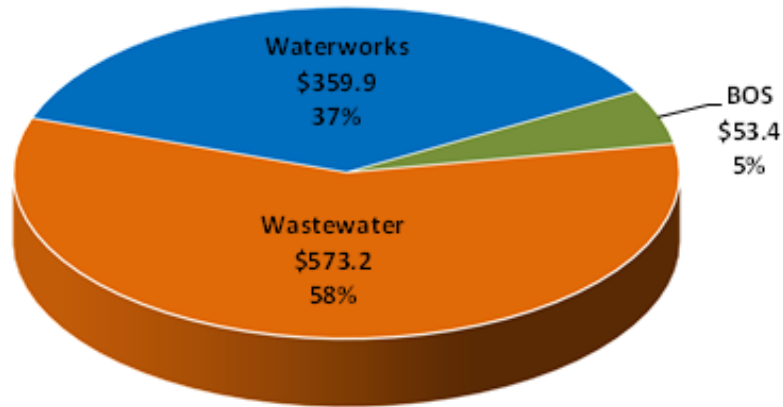
Of the 80 planned contract awards for FY22, 36 are for Waterworks, 33 Wastewater and 11 Business and Operation Services with associated dollar awards of \$92.8 million, \$308.2 million, and \$19.0 million, respectively. Deer Island’s Clarifier Rehabilitation Phase 2 Construction is the largest planned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



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.

FY19-23 Spending



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

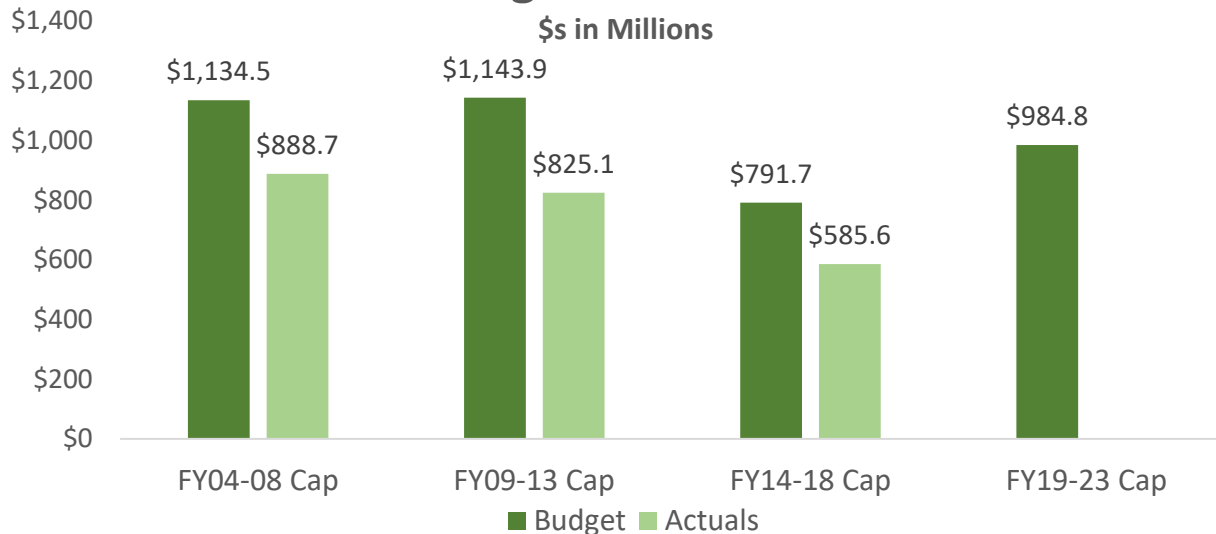
	FY19	FY20	FY21	FY22	FY23	Total FY19-23
Wastewater System Improvements	\$74.8	\$97.2	\$110.5	\$109.9	\$180.7	\$573.2
Waterworks System Improvements	\$65.6	\$58.1	\$54.8	\$75.0	\$106.4	\$359.9
Business & Operations Support	\$2.4	\$3.7	\$7.6	\$22.9	\$16.8	\$53.4
Total MWRA	\$142.9	\$159.0	\$172.9	\$207.8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

Cap Spending Budget and Actual



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:

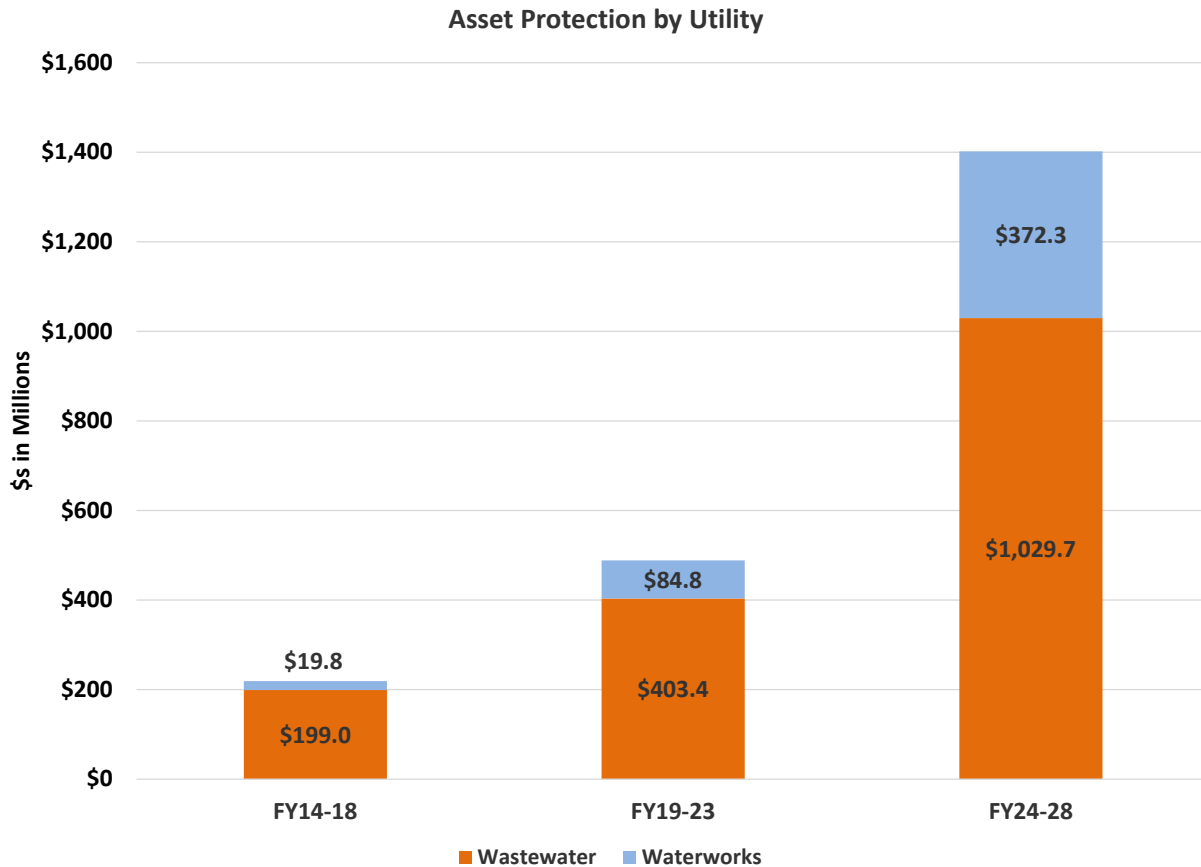
Project	Subphase	FY19-23 Spending \$s in Millions
Corrosion & Odor Control	Nut Island Odor Control HVAC Improvement Construction Phase 2	\$58.9
Facility Asset Protection	Chelsea Creek Upgrades - Construction	53.2
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	42.8
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.

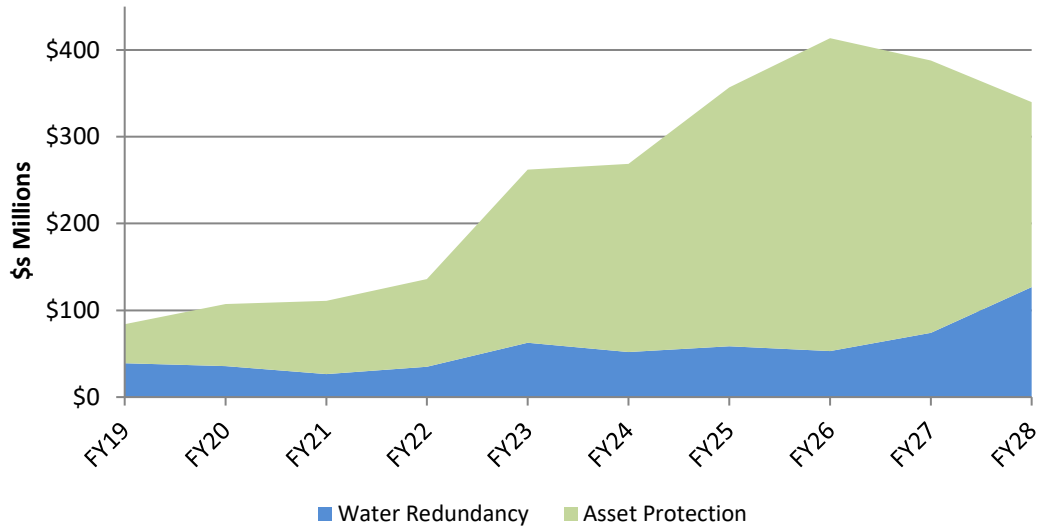
Changing nature of the CIP by Category

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

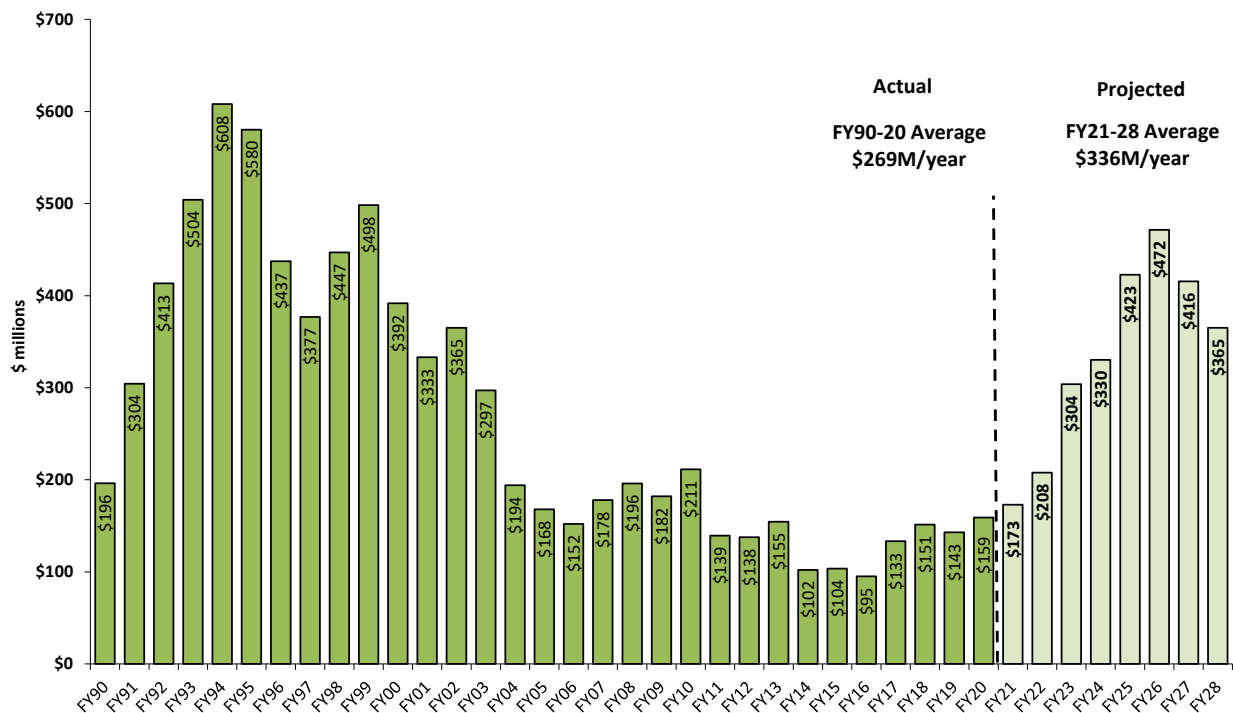
Spending for the FY19-23 period totals \$986.5 million with Wastewater projects accounting for \$573.2 million of total period spending or 58% and Waterworks planned spending following at \$359.9 million or 37%. Spending beyond FY23 totals \$3.4 billion, including \$1.3 billion for Wastewater projects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

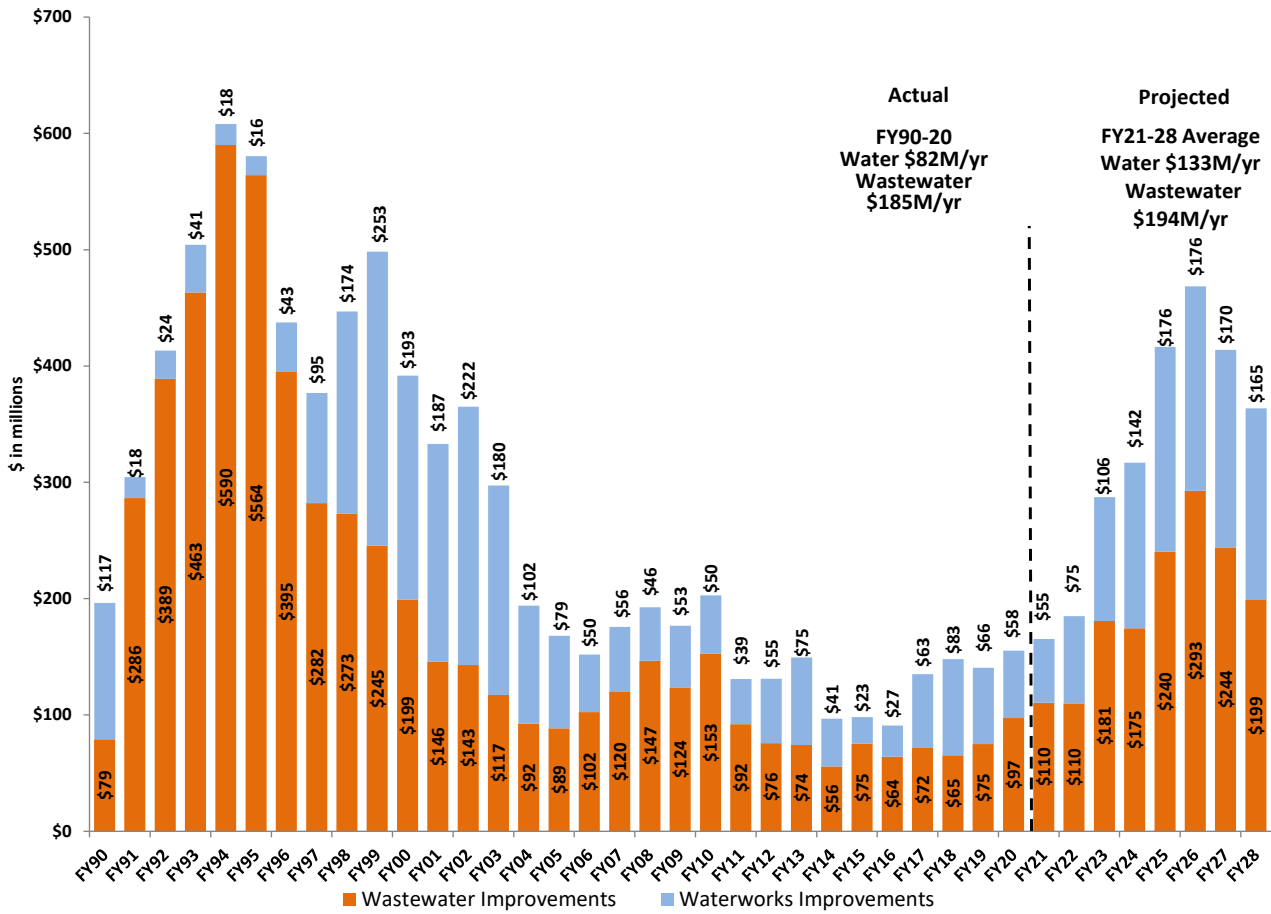
The following two charts below capture the historical CIP spending through FY20 and projects spending through FY28 based on the FY22 CIP both overall at the MWRA level and by utility. Average total annual CIP spending through FY19 was \$273 million. Average annual CIP spending through FY20 was \$269 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

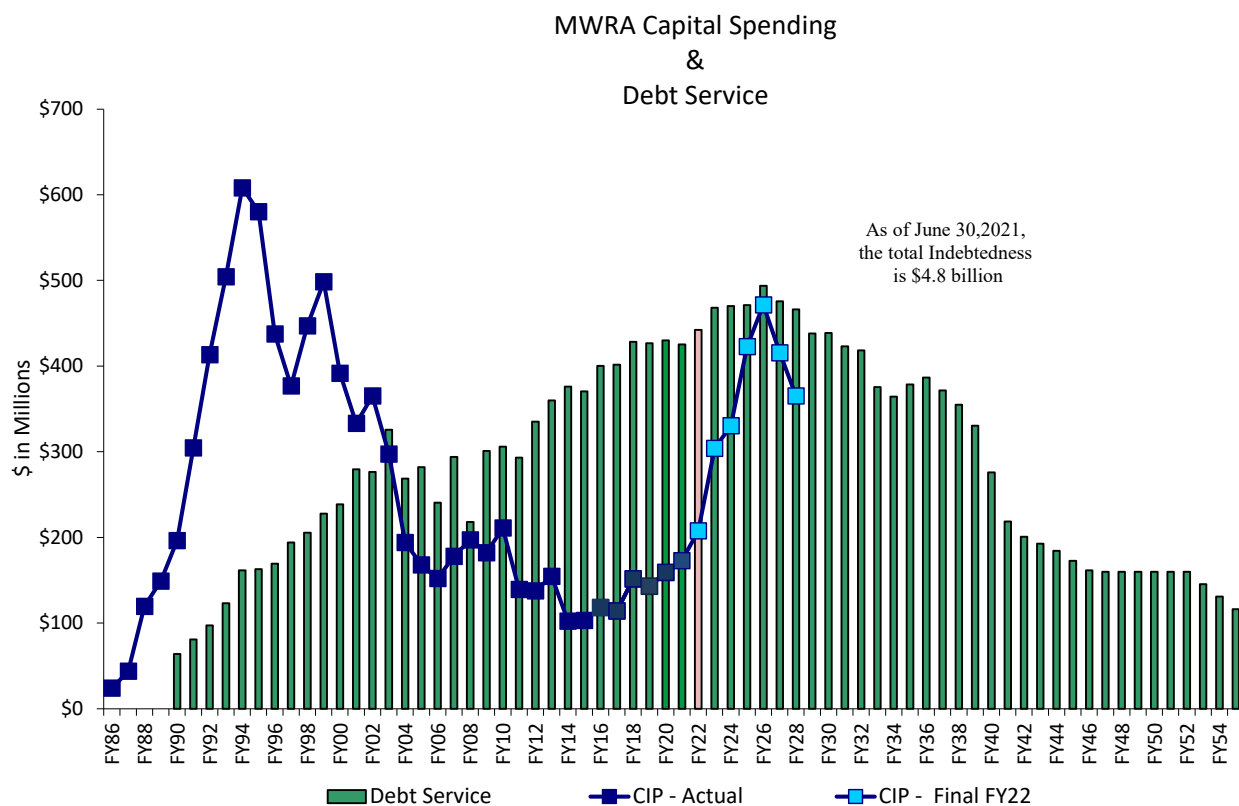
The MWRA offers its water and wastewater communities loan and grant opportunities for infrastructure preservation. Community loans are interest-free and repaid to MWRA over a 5-year or a 10-year period. On the water side, the program's goal is to improve local water system pipeline conditions to help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

APPENDIX H

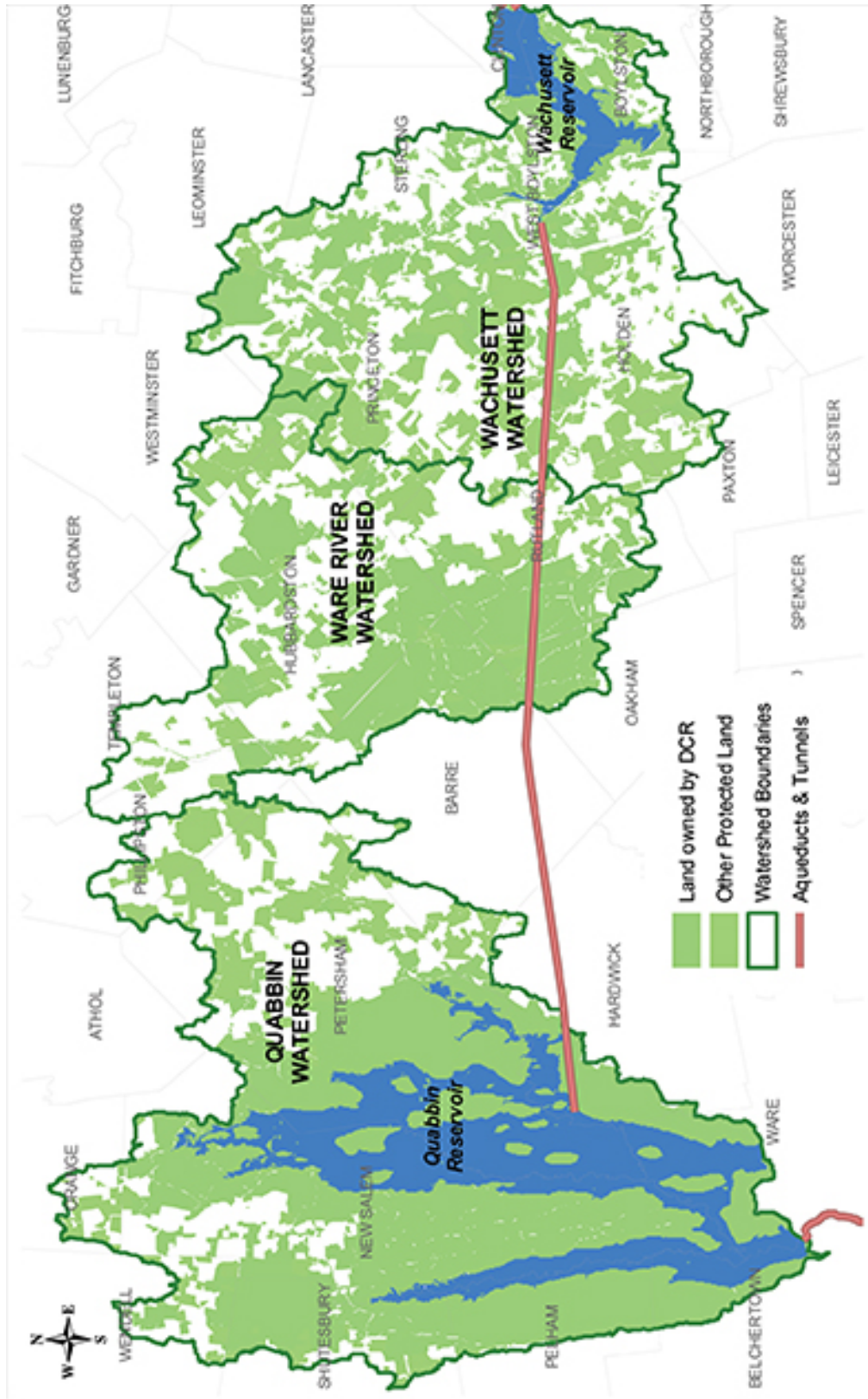
Water Supply Protection Trust

Code	Line Item	FY21 Final	FY22 Final	Change	% Change
AA	Personnel	\$ 10,776,725	\$ 10,588,163	\$ (188,562)	-1.7%
BB	Employee Expenses	\$ 20,000	\$ 20,000	\$ -	0.0%
CC	Contracted Services	\$ 50,000	\$ 35,000	\$ (15,000)	-30.0%
DD	Pensions/Insurance	\$ 4,152,413	\$ 4,199,327	\$ 46,914	1.1%
EE	Admin Expenses	\$ 130,000	\$ 110,000	\$ (20,000)	-15.4%
FF	Facility Operational Supplies	\$ 225,000	\$ 260,000	\$ 35,000	15.6%
GG	Energy Costs	\$ 325,000	\$ 335,000	\$ 10,000	3.1%
HH	Consultant Contracts	\$ 400,000	\$ 231,000	\$ (169,000)	-42.3%
JJ	Operational Services	\$ 35,000	\$ 60,000	\$ 25,000	71.4%
KK	Equipment	\$ 1,010,000	\$ 970,000	\$ (40,000)	-4.0%
LL	Leases, Rentals	\$ 250,000	\$ 160,000	\$ (90,000)	-36.0%
NN	Construction Improvements	\$ 1,313,000	\$ 1,433,000	\$ 120,000	9.1%
PP	Grants to Public Entities	\$ 100,000	\$ 100,000	\$ -	100.0%
TT	Specials Payments	\$ 130,000	\$ 140,000	\$ 10,000	7.7%
UU	IT Expenses	\$ 215,000	\$ 305,000	\$ 90,000	41.9%
	Total Expenses	\$ 19,132,138	\$ 18,946,490	\$ (185,648)	-1.0%

6995	Hydro + Transmission	\$ 450,000	\$ 350,000	\$ (100,000)	-22.2%
4500	Forestry	\$ 500,000	\$ 500,000	\$ -	0.0%
3148	Fishing & Recreation	\$ 210,000	\$ 150,000	\$ (60,000)	-28.6%
6900	Miscellaneous	\$ 50,000	\$ 20,000	\$ (30,000)	-60.0%
	Total Revenue	\$ 1,210,000	\$ 1,020,000	\$ (190,000)	-15.7%

	Total Net Operating Budget	\$ 17,922,138	\$ 17,926,490	\$ 4,352	0.0%
	PILOT net of Fay School and Southboro rec use fee	\$ 8,500,000	\$ 8,805,000	\$ 305,000	3.6%
	Grand Total to Budget in Indirect Expense Section	\$ 26,422,138	\$ 26,731,490	\$ 309,352	1.2%

APPENDIX H



Appendix I

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

Fourth Quarter FY2021

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 15, 2021

Board of Directors Report on Key Indicators of MWRA Performance

Fourth Quarter FY21

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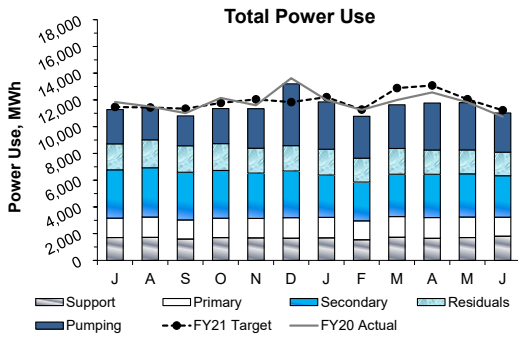
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for internal management use and is subject to correction and clarification.

Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
September 15, 2021

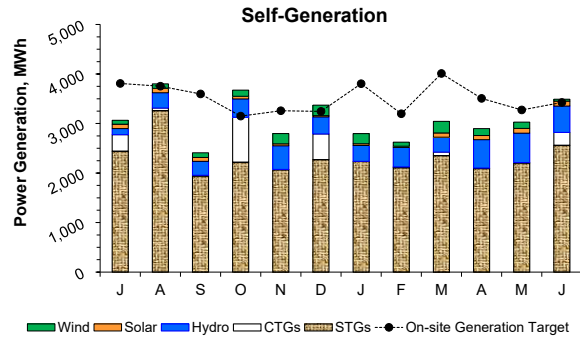
OPERATIONS AND MAINTENANCE

Deer Island Operations

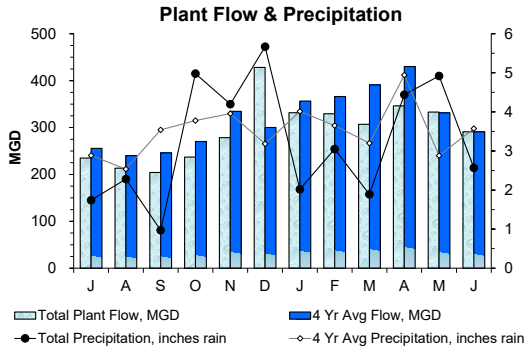
4th Quarter - FY21



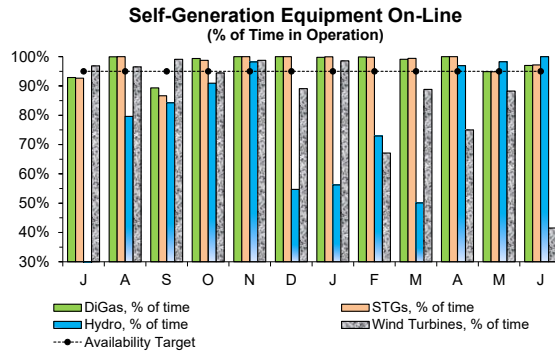
Total power usage in the 4th Quarter was 4.9% below target as plant flow for this period was 7.8% below target with historical data (4 year average) used to generate the electricity model. Power usage was below target for all plant processes, including power usage for raw wastewater pumping which was 8.1% below target due to the lower-than-expected flows. **Overall, total power usage in FY21 was 3.1% below target as total plant flow was 7.3% below the 4 year average plant flow target.**



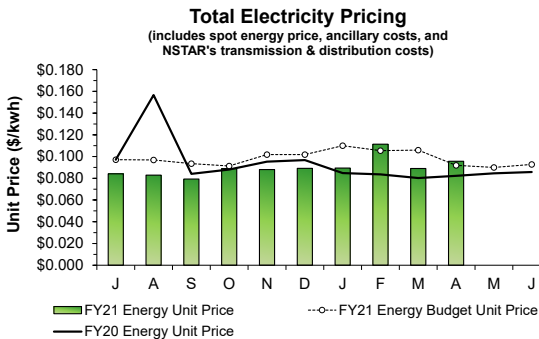
Power generated on-site during the 4th Quarter was 7.7% below target. CTG generation was below target by 57.4% as the units were only operated briefly for checkout purposes in April and May. In June, the CTGs were operated on six (6) days during peak system demand to avoid the capacity charge on DITPs electricity bills, and concurrently on two (2) days for Eversource Demand Response. STGs generation was 12.8% below target as the turbines were offline for several days due to an unanticipated power-related issue on May 22 and to a planned outage for the annual dump condenser cleaning on May 24. Additionally, digester gas production was 12.4% below target which also results in reduced generation. Hydro Turbine generation was 71.6% above target even though Turbine #2 has been offline pending repair of the runner blade assembly due to a budget estimate that was biased low. Wind Turbine generation was 27.6% below target due to mechanical and electrical issues with both turbines this quarter. Generation from the Solar Panels was 1.4% below target. **Overall, power generation was 12.0% below target for FY21.**



Total Plant Flow for the 4th Quarter was 7.8% below target with the budgeted 4 year average plant flow (323.4 MGD actual vs. 350.8 MGD expected) even though precipitation was 5.0% above target (11.93 inches actual vs. 11.40 inches expected). The region had been experiencing drought conditions throughout the spring and only recently began to see the return of significant rainfall and thus more typical plant flows. **Total Plant Flow in FY21 was 7.3% below target as precipitation was on 8.1% below target.**

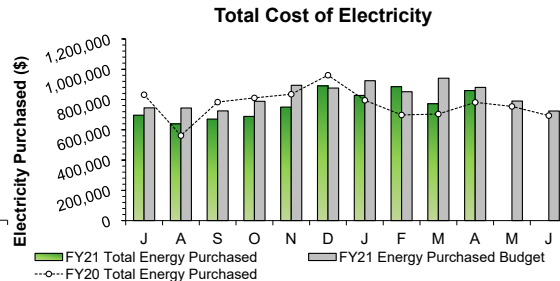


The availability of the DiGas system, STGs, and Hydro Turbine all met their 95% availability target during the 4th Quarter, while Wind Turbine availability fell below target. Wind Turbine availability was 68.3% due to electrical and mechanical issues with both turbines. Turbine #2 has been out of service since May 29 awaiting the arrival of OEM replacement parts from overseas.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in April (the most current invoice available) was 4.1% above target with budgetary estimates. The actual total energy unit price in May and June are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by two (2) months due to the timing of invoice receipt and review.

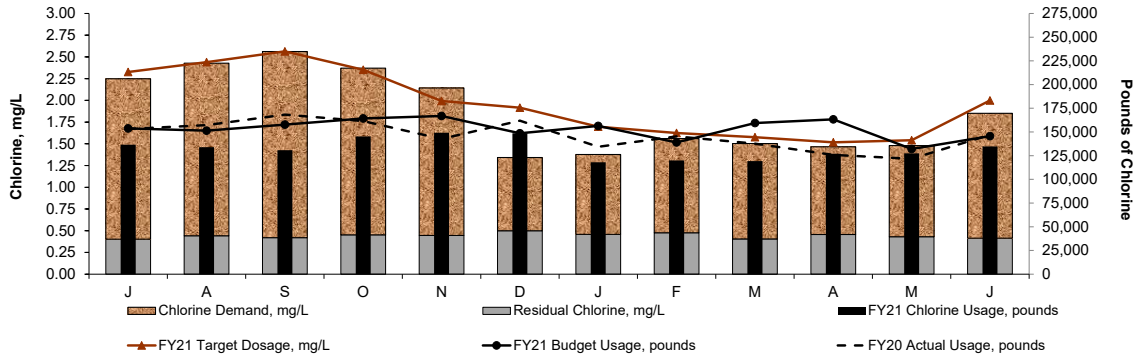


The Electricity cost data for Electricity Purchased in May and June are not yet available. Year-to-date Total Cost of Electricity is \$688,393 (8.2%) lower than budgeted through April as the Total Energy Unit Price was 9.9% lower than target while the Total Electricity Purchased was only 1.8% above target.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by two (2) months due to the timing of invoice receipt and review.

Deer Island Operations
4th Quarter - FY21

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 4th Quarter was 5.0% below target with budgetary estimates. Actual sodium hypochlorite usage in pounds of chlorine was 11.7% lower than expected as the 4 year average plant flow used for estimating the hypochlorite usage target was 7.8% lower-than-expected. DITP maintained an average disinfection chlorine residual of 0.43 mg/L this quarter with an average dosing rate of 1.60 mg/L (as chlorine demand was 1.16 mg/L). **Overall in FY21, disinfection dosing was 5.0% below target and sodium hypochlorite usage in pounds of chlorine was 13.5% below target.**

The overall disinfection dosing rate (target and actual) is dependent on plant flow, target effluent total chlorine residual levels, effluent quality and

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	0	0	0	100.0%	0.00
A	1	1	0	99.97%	1.17
S	0	0	0	100.0%	0.00
O	2	1	1	99.9%	2.62
N	3	3	0	99.0%	13.63
D	3	3	0	97.4%	41.94
J	1	1	0	99.8%	4.62
F	0	0	0	100.0%	0.00
M	0	0	0	100.0%	0.00
A	2	2	0	99.8%	10.40
M	1	1	0	99.5%	8.40
J	1	1	0	99.84%	3.80
Total	14	13	1	99.49%	86.58

99.7% of all flows were treated at full secondary during the 4th Quarter. There were four (4) secondary blending events due to high plant flows from heavy rain. These blending events resulted in 22.60 hours of blending and 101.10 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD. Secondary permit limits were met at all times during the 4th Quarter of FY21.

Overall in FY21, 99.5% of all flows were treated at full secondary. There were a total of 14 separate secondary blending events; all but one (1) were due to high plant flows resulting from heavy rain (sometimes in combination with snowmelt). A brief 13 minute dry weather secondary blending event occurred on October 19 during the process of recovering from an unanticipated plant-wide power loss event. These secondary blending events combined produced a total of 86.58 hours of blending and 558.26 MGal of flow blended with secondary effluent.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 953.3 MGD in the 4th Quarter during the early morning of May 29. This peak flow occurred during a storm event that brought 2.2 inches of precipitation to the metropolitan Boston area. Overall, Total Plant Flow in the 4th Quarter was 7.3% below target with the 4 year average plant flow estimate for the quarter.

Work on the Winthrop Terminal Facility (WTF) VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in 2018 and entails the demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). These pumps were powered by 600 volts service which were changed to 4,160 volts service as part of this project to make them consistent with the other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). The contractor completed the upgrade of WTF Pump #1 in April and the 30 day performance test was successfully completed on May 9. As a result, the upgrade has now been completed on all six (6) pumps and this contract was declared substantially complete.

Secondary Treatment:

Annual turnaround maintenance on Train #2 at the Cryogenic Oxygen Facility began during the last week of April and continued through the first week of May. This turnaround maintenance is performed on roughly half of the components and systems in the Cryogenic Oxygen Facility and is a two (2) week process. Train #1 was in operation while Train #2 was offline during this maintenance. The same turnaround maintenance will be performed on Train #1 in the fall.

Disinfection:

The West Disinfection Basin (Basin #2) was taken offline for 1.8 days, during dry weather/low plant flow conditions, from April 13 to April 15 to allow staff to replace the faulty gearbox and mixer for one (1) of the two (2) chlorine flash mixers located at the head end of the disinfection basin. The target chlorine residual (prior to dechlorination) was increased during operation of the single disinfection basin (Basin #1) to compensate for the reduced chlorine contact time thus ensuring fecal coliform inactivation below effluent permit limits. Additionally, the sodium bisulfite feed was also increased to ensure sufficient dechlorination at these higher residual chlorine levels to meet effluent total chlorine residual permit limits. The DEP and EPA were provided with a courtesy notification in advance of this maintenance activity.

Deer Island Operations & Maintenance Report (continued)

Odor Control Treatment:

In May, carbon adsorber (CAD) units #2 in the East Odor Control (EOC) Facility, #4 in the West Odor Control (WOC) Facility, and #4 in the Residual Odor Control (ROC) Facility were emptied and refilled with new activated carbon media as part of routine maintenance to replace spent activated carbon.

Residuals Treatment:

The rehabilitation of Gravity Thickener #5 under the major Gravity Thickener Rehabilitation project was completed in May. As a result, the rehabilitation has now been completed on all six (6) gravity thickeners. These gravity thickeners are used to concentrate sludge that is generated from the primary treatment process, and scum that is generated from all treatment processes. The sludge and scum thickening equipment and five (5) of the six (6) Fiberglass-Reinforced Plastic (FRP) domed covers had reached the end of their useful lives and were in need of replacement. This rehabilitation project upgraded all six (6) gravity thickeners including the complete replacement of each tank's sludge and scum thickening equipment as well as replacement of five (5) of the six (6) FRP dome covers (the FRP domed cover for Gravity Thickener #2 has already been replaced). Additionally, critical components which were previously fabricated from carbon steel, including the center columns and center cages, are now fabricated from type 316 stainless steel in order to provide superior protection against hydrogen sulfide gas which is present in high concentrations in this highly corrosive environment.

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 27.2% of Deer Island's total power use for the 4th Quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 26.4% of Deer Island's total electrical power use for the quarter.

The boilers in the Thermal Power Plant were taken offline starting in the late evening of May 23 to allow the contractor and DITP Maintenance staff to complete the annual dump condenser cleaning on May 24 prior to placing the steam system in summer operating mode. Boiler 201 was returned to operation later that evening, following the dump condenser work, to restore steam production and steam turbine power generation. The Thermal Power Plant began operating the steam system in summer mode starting on May 27 to maximize the energy generation from the steam turbines while minimizing additional fuel oil usage during the seasonally lower plant heat demand period.

CTG-2B was operated for 3.7 hours on June 8 for an ISO-New England declared Demand Response summer audit event and concurrently during peak system demand to avoid the capacity charge. The CTGs were operated a total of six (6) days in June during peak system demand.

Regulatory:

Emissions compliance testing on the Secondary Odor Control (SOC) treatment system on DITP was conducted by consultants from June 23 to June 24. The SOC treatment system treats combined process air from the secondary batteries and the reactors. The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the outlet of the odor control system over a 24-hour period for TRS and NMHC at the outlet (stack) of the odor control system. Even though it is not required by the operating permit, the inlet was also sampled for target Volatile Organic Compounds (VOCs). All the preliminary test results show that DITP was in compliance. The draft report summarizing the test results is currently being prepared by the consultants.

Public Access:

MWRA, state and local officials, and fishing advocates cut the ribbon on the new Deer Island Recreational Fishing Pier on June 24 for its official grand opening. Energy and Environmental Affairs (EEA) Secretary Kathleen Theoharides joined MWRA, state and local officials, fishing advocates, and youth anglers for the ribbon cutting ceremony. The fishing pier was constructed by the Department of Fish and Game's (DFG) Division of Marine Fisheries (DMF), in cooperation with DFG's Office of Fishing and Boating Access, the MWRA, and the City of Boston. The \$2.4 million project was paid for mostly with funds from the sale of Massachusetts recreational saltwater fishing permit, with additional assistance from the MWRA. The unofficial opening of the fishing pier took place on November 25, 2020 when the public was able to begin using the pier.

Clinton Operations & Maintenance Report

Dewatering Building

Operation's staff washed down gravity thickener # 1. They also unplugged and pumped down GT scum well. Maintenance cleaned out grit, rags, and debris out of # 3 sludge thickened transfer pumps suction header.

Chemical Building

Maintenance completed the cleaning and rebuilding of # 1 soda ash pump. Staff also disassembled and cleaned # 2 soda ash pump. Operations staff cleaned calibration columns on both polymer pumps. Maintenance installed a new # 1 RAS pump. Staff Jetted clean soda ash feed line "A". Maintenance repaired leak on hypochlorite pump chemical feed system piping. They also installed a new # 2 hypochlorite pump.

Aeration Basins

Operations staff cleaned pH and DO probes. Maintenance staff replaced drive motor on Aerzen 6B blower. They also completed oil changes on #4 and #6 Aerzen blowers. Maintenance staff with help from contractor replaced and calibrated three pH probes. Deer Island staff replaced control transformer on 6A aeration blower.

Phosphorus Building

Maintenance staff acid washed all three disk filters, cleaned troughs, and inspected all nozzles. Operation staff cleaned both CL17 chlorine analyzers.

Headworks

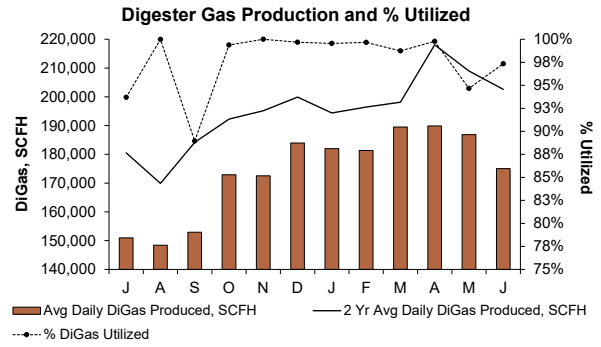
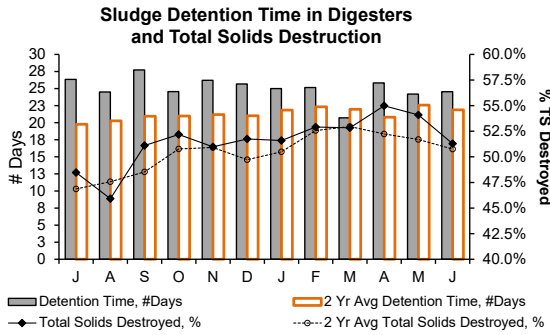
Maintenance staff continues to work on # 1 bucket elevator system. Contractor replaced leaking boiler condensate piping and installed new fill valve. Maintenance installed sparge air system arm and diffusers on #1 aerated grit tank piping. Staff cleaned mechanical bar rack and filled gear box with 220 meropa oil. Contractor completed welding # 2 classifier belly pan.

Digester Building

Maintenance staff checked all equipment for proper operation. Operations staff cleaned the foam on the floating cover. Contractor installed new ultrasonic sensor on floating cover. Maintenance staff greased Ovivo mixer on floating cover.

Deer Island Operations and Residuals

4th Quarter - FY21



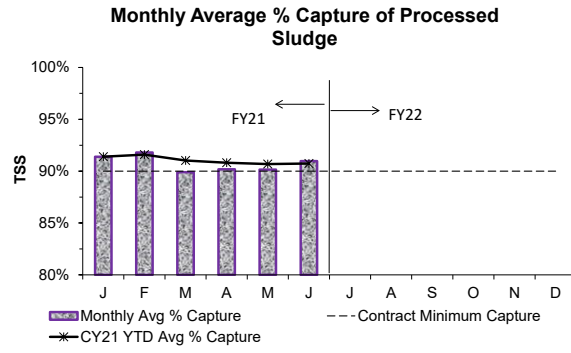
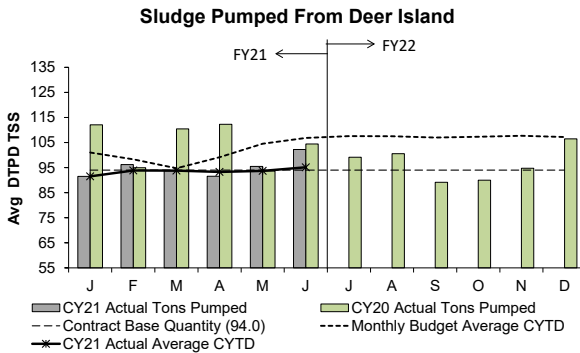
Total solids (TS) destruction following anaerobic sludge digestion averaged 53.5% during the 4th Quarter, 3.7% above target with the 2 year average of 51.6%. Sludge detention time in the digesters was 24.9 days, 14.2% above target, as DI operated with an average of 8.0 digesters. **Overall in FY21, TS destruction averaged 51.5%, 2.2% higher than the 2 year average of 50.4%. Sludge detention time was 25.0 days, 17.5% higher than the 2 year average of 21.3 days.**

The Avg Daily DiGas Production in the 4th Quarter was 12.4% below target with the 2 Year Avg Daily DiGas Production due to much lower-than-expected primary sludge production which breaks down more readily during anaerobic sludge digestion. On average, 97.3% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP). **Overall in FY21, the Avg Daily DiGas Production was 10.9% below target, with an average of 97.6% utilization of DiGas at the TPP.**

Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting around of sludge.

Residuals Pellet Plant

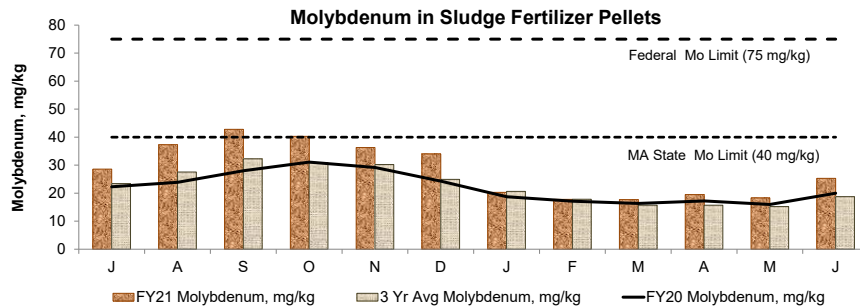
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 94.0 DTPD/TSS as an annual average (for the extended contract period of January 1, 2021 through December 31, 2022). The monthly invoice is based on 94.0 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. On average, MWRA processes more than 94.0 DTPD/TSS each year (FY21's budget is 107.9 DTPD/TSS and FY22's budget is 106.2 DTPD/TSS).



The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 4th Quarter was 96.4 TSS Dry Tons Per Day (DTPD) - 18.9% below target with the FY21 budget of 119.0 TSS DTPD for the same period.

The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 4th Quarter was 90.43% and the CY21-to-date average capture was 90.73%.

The CY21 average quantity of sludge pumped through June is 95.1 DTPD - 11.0% below target compared with the CY21-to-date average budget of 106.8 DTPD during the same time period.



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. In 2016, Massachusetts Type I biosolids standard for molybdenum was changed to 40 mg/kg from the previous standard of 25 mg/kg. This has allowed MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms since NEFCO does not distribute product that does not meet the suitability standards.

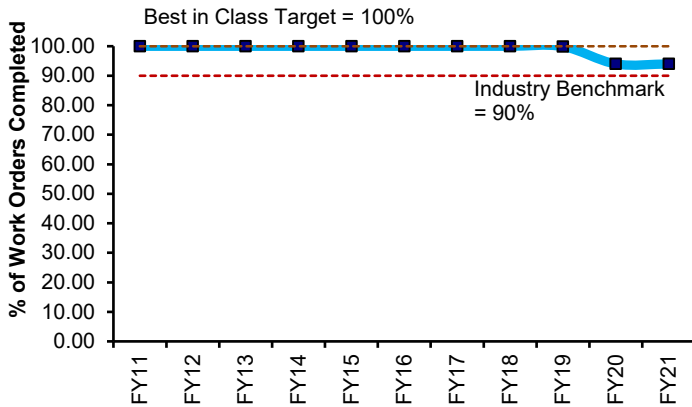
Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 4th Quarter averaged 16.6 mg/kg, 27.0% above the 3 year average, 47% below the MA State Limit, and 72% below the Federal Limit.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY21

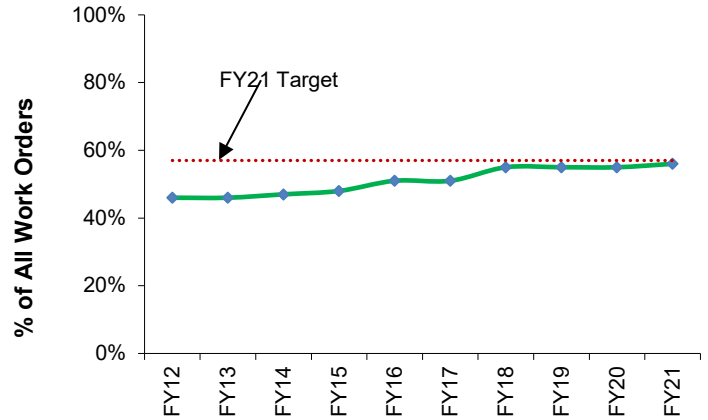
Proactive and Productivity Measures

Preventive Maintenance



The industry benchmark is 90% for Preventive Maintenance (PM) completion. Upon reaching the 90% goal in FY05, the target goal was increased to the "Best in Class" Target of 100% PM completion. Reliability-Centered Maintenance (RCM) and PM optimization efforts have continued since FY01. PM completion rate was 94% in FY21. We managed to meet the Industry Benchmark, but the slight decrease was caused by vacancies and COVID-19 staff absences due to quarantining.

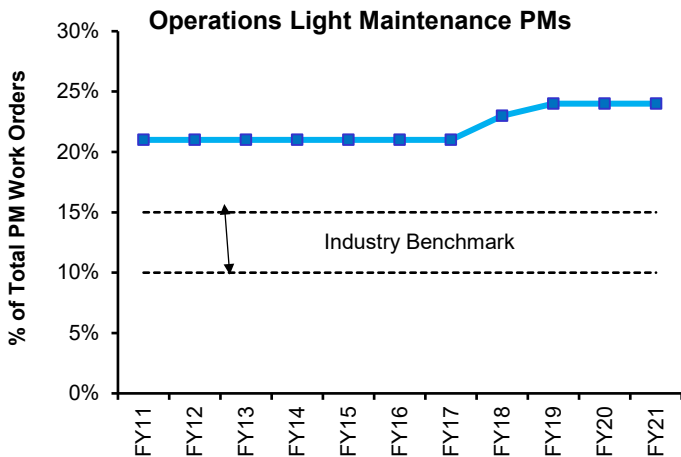
Maintenance Kitting



Preventive Maintenance (PM) inventory items were loaded into Maximo to assign spare parts for equipment to PM work orders. DITP reached the PM kitting goal of 100%. In FY12 a new graph (above) was developed to track kitting of all maintenance work orders in an effort to increase wrench time. Staff continues to fine-tune the process to "kit" all maintenance work orders. Kitting is considered a best practice by maintenance and reliability professionals. It entails staging parts necessary to complete maintenance work.

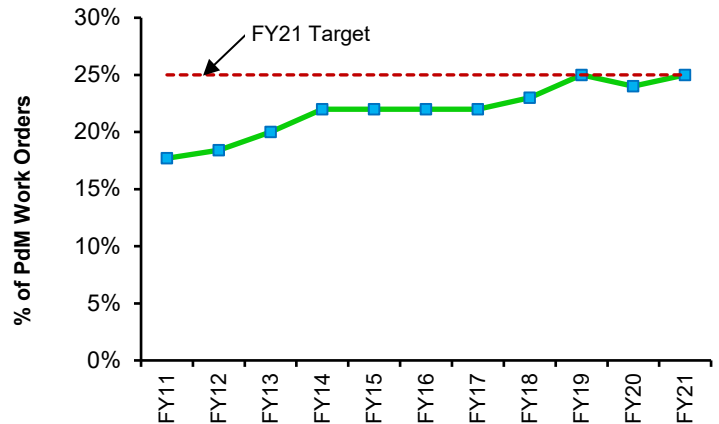
Kitting allows maintenance staff to spend more time "turning the wrench" and less time waiting for parts at the stockroom window. Kitting for FY21 was 56%, just below DITP's goal of 57%, kits were prepared, but some had to be put on hold because of vacancies and COVID-19 staff absences due to quarantining.

Operations Light Maintenance PMs



The percentage of preventive maintenance work order hours completed by Operations staff (non maintenance staff) increased from less than 1% in January 2002 to the current level of 24% in FY21. DITP reached the industry benchmark range of 15% in April 2003 and has exceeded the goal through FY21. Operations completes approximately 664 PM work orders per month. Operations work percentage stayed on track as operations was fully staffed through COVID-19.

Predictive Maintenance

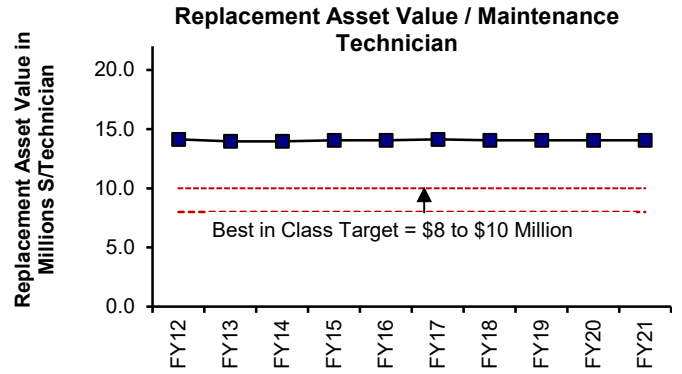
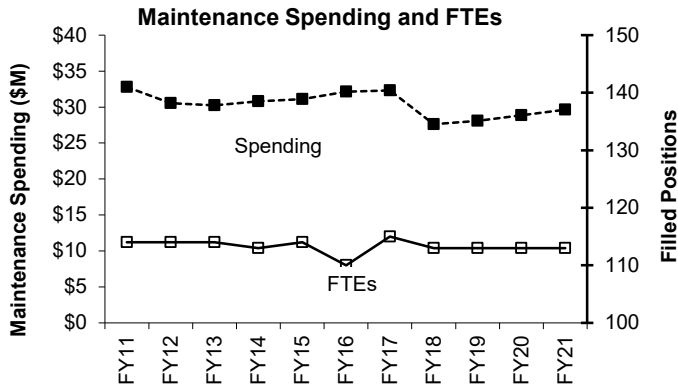


Predictive maintenance has steadily increased from 2% in FY03 to 25% in FY21, DITP's met the FY21 goal of 25%. This percentage in predictive maintenance was achieved through the expanded use of lubrication, vibration, thermography, and acoustic ultrasonic testing techniques. The Condition Monitoring Group continually reviews and investigates new opportunities and initiatives to expand condition monitoring testing and analysis. The slight increase of Predictive Maintenance work orders, is due to less total work orders being generated because of vacancies and COVID-19 staff absences for quarantining.

Deer Island Yearly Maintenance Metrics

4th Quarter - FY21

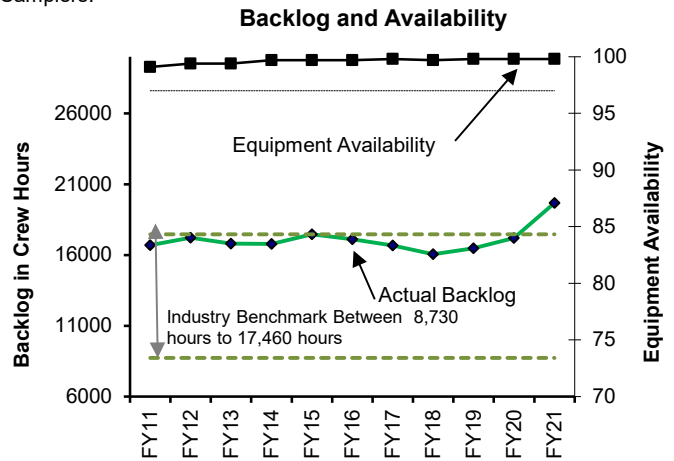
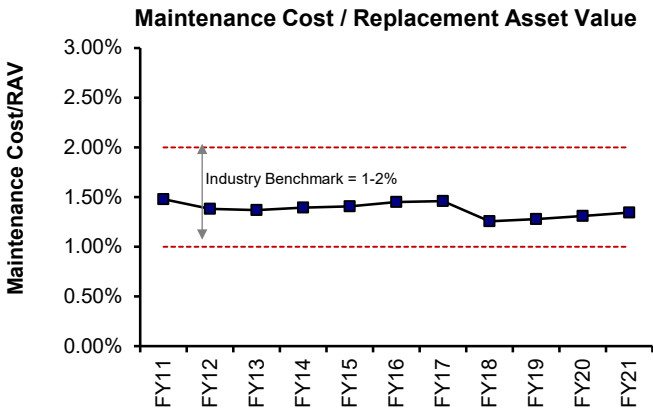
Overall Maintenance Program Measures



DITP's Maintenance staff is currently at 113 FTE's. Maintenance staff levels ended at 113, but for the majority of the year we had limited staff due to COVID-19, retirement and hiring challenges. Maintenance has worked to meet our goals through implementation of numerous maintenance efficiencies including: Operations performing light maintenance, cross-functional training and flexibility, and Reliable-Centered Maintenance. This year's Maintenance spending increased for materials and services, but not all parts were installed.

DITP adopted a "best in class" target of \$8-\$10 Million/Technician for maintenance staffing. DITP remains above this Best in Class. However, as the plant ages and additional equipment replacements are expected, DITP management will reassess staffing as needed.

The Maintenance Spending graph shows actual annual maintenance spending and significant CIP asset replacements (equipment costs only). Maintenance budgeting continues to evaluate plant assets and requirements for replacement of obsolete equipment to ensure the plant operates at maximum efficiency. In FY21, overall spending increased slightly from FY20 due to some large Maintenance Projects; Winthrop Motors and VFD Replacements, Gravity Thickener Rehabilitation, Gravity Thickener Overflow Piping Replacement, Gas Protection System Replacements, Coating Contract (Digesters, Overflow Boxes, Primary Scum Wells and Carbon Absorbers), two Hydro Plant Electrical Building Air Handler Replacements, Installation of two W3 Strainers, and the installation of New Explosion Proof Grit Samplers.



The industry benchmark for annual maintenance spending is between 1% to 2% of replacement asset value, currently DITP is at 1.32%. The plant's replacement asset value is calculated at approximately \$2.6 billion dollars. DITP's current maintenance spending is within the industry benchmark. Maintenance spending has increased since last year. DITP Maintenance CEB spending is \$23.7 million coupled with CIP spending of \$5.9 million (equipment costs only), totaling \$29.6 million.

Industry benchmark for Equipment Availability is 97%. Deer Island has exceeded this benchmark over for the last ten years. In FY21 the availability was 99.8%. The high percentage in Equipment Availability during FY21 is due to redundancy of equipment and effective/efficient maintenance practices.

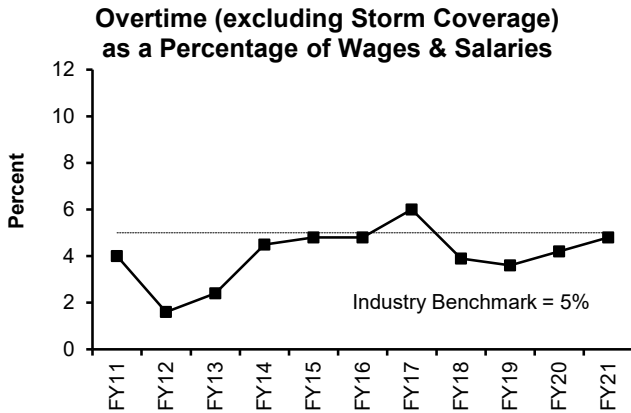
Industry Benchmark for Backlog is between 8,730 to 17,460 hours for maintenance based on current staffing, the total average backlog for FY21 was 19,672 hours, which exceeds industry benchmark, due to vacancies and COVID-19 staff absences due to quarantining.

Non-Critical work orders were deferred for critical work orders, to ensure Deer Island Plant would operate at maximum capacity.

Deer Island Yearly Maintenance Metrics

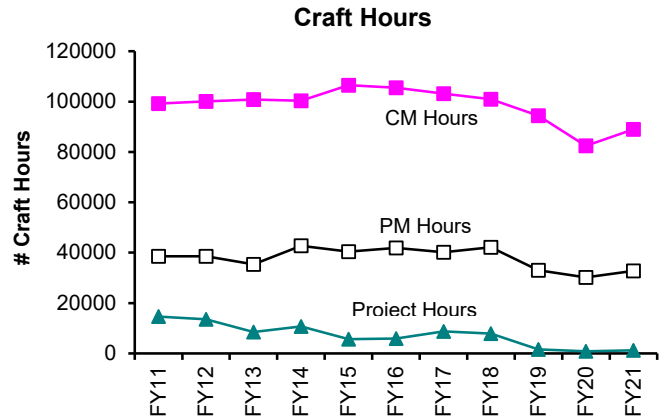
4th Quarter - FY21

Overall Maintenance Program Measures (cont.)



Management continues its effort to keep overtime below the industry benchmark. DITP maintenance overtime was 4.8% for FY21. Management has taken steps to reduce overtime spending by limiting overtime to repair critical equipment and systems only. DITP has been under the Industry Benchmark every year except FY17, due to the increase in overtime for the Eversource Cable Outage.

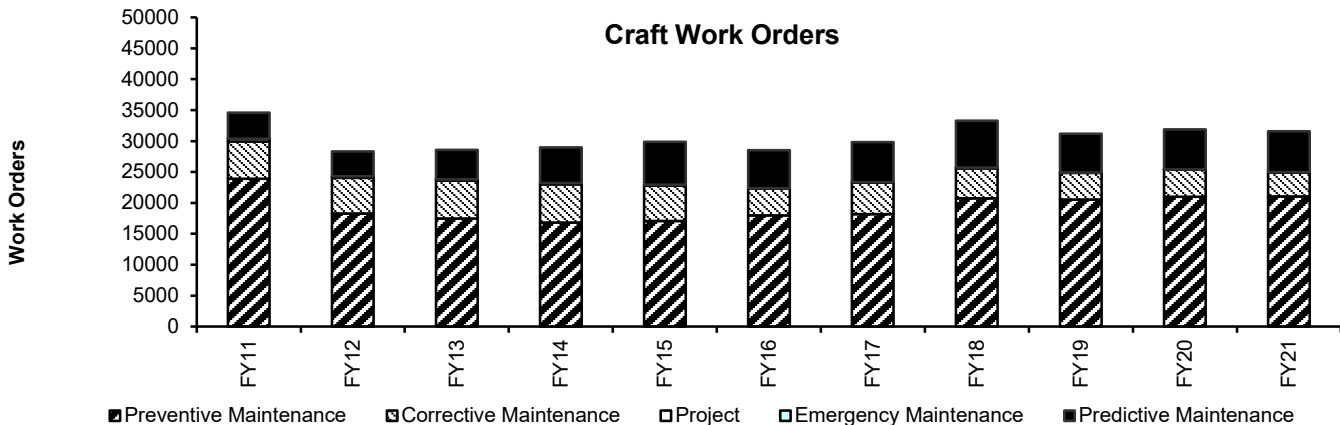
The slight increase in overtime from last year was because of vacancies and staff absences due to quarantining.



Continued optimization of the Preventive Maintenance (PM) program through the transfer of some light maintenance tasks from Maintenance to Operations staff (24% of PM work orders in FY21), elimination of duplicate work orders, combining some PM's, increasing PM frequency due to equipment history. This process was delayed because of vacancies and staff absences due to quarantining.

This years significant increase in Corrective Maintenance (CM) hours was due to staff focused on (CM) work orders to ensure all critical equipment was on-line. Project work was put on hold.

Maintenance did complete some significant maintenance work in FY21: Overhauled Centrifuges #11 and #12, Primary AHU Coil Replacement BD:SA.AHU-2, Residuals Air Coil Replacement, Grit Screw Replacement AD:GR.CLSF-16, Fabrication of Grit Screws, Replacement Heating Actuator Valve for FA:SA.AHU-5, and Replacement of Secondary Air Condensing Unit Electrical Building #9.



During FY21, the overall number of work orders decreased by 56 from the previous year. The decrease in work orders was because of vacancies and staff absences due to quarantining.

The Planning department is continuously modifying PM, PdM, and CM Job Plans to ensure maintenance is being performed efficiently and effectively, while ensuring reliability and availability of DITP's Assets.

Water Distribution System Valves

4th Quarter FY21

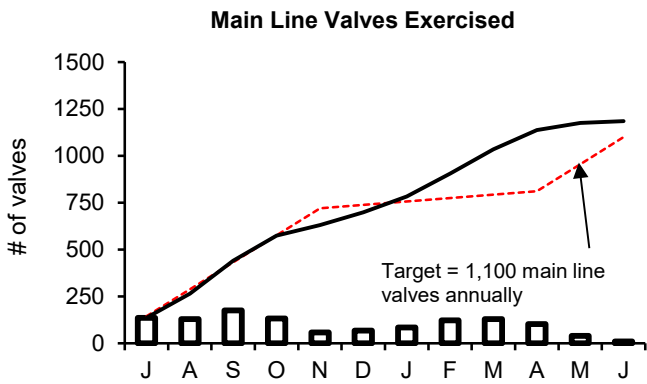
Background

Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but is often displaced during the construction season. This is due to the fact that a large number of construction contracts involving rehabilitation, replacement, or new installation of water lines, requires valve staff to operate valves and assist with disinfection, dechlorination, pressure-testing, and final acceptance. Valve exercising can also be impacted due to limited redundancy in the water system; valve exercising cannot be performed in areas where there is only one source of water to the community meters or flow disruptions will occur.

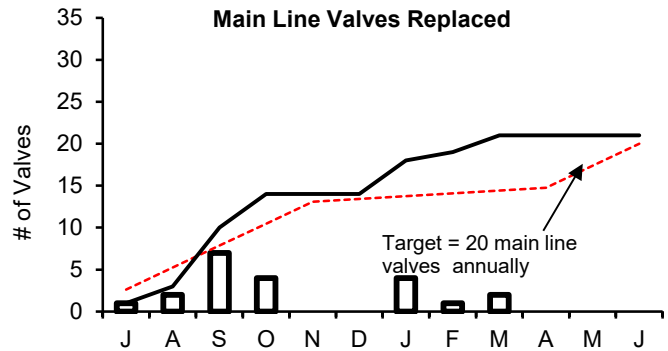
Type of Valve	Inventory #	Operable Percentage	
		FY21 to Date	FY21 Targets
Main Line Valves	2,159	96.9%	95%
Blow-Off Valves	1,317	98.5%	95%
Air Release Valves	1,380	95.5%	95%
Control Valves	49	100.0%	95%

Key to Symbols:

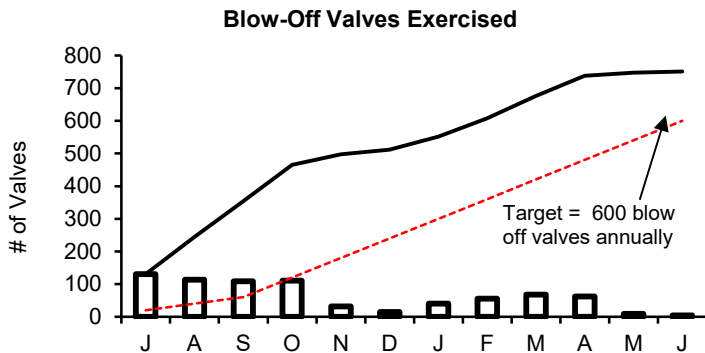
- FY21 Monthly Total
- FY21 Cumulative Total
- FY21 Target



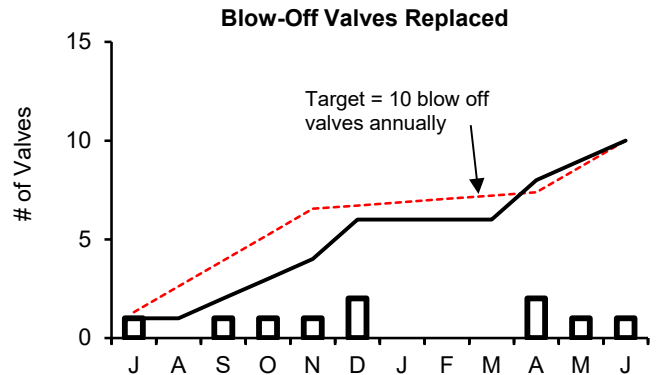
During the 4th Quarter FY21, 151 main line valves were exercised. The total exercised for the fiscal year to date is 1,185.



During the 4th Quarter FY21, there were no main line valves replaced. The total replaced for the fiscal year to date is 21.



During the 4th Quarter FY21, 75 blow off valves were exercised. The total exercised for the fiscal year to date is 751.



During the 4th Quarter FY21, there were 4 blow off valves replaced. The total replaced for the fiscal year to date is 10.

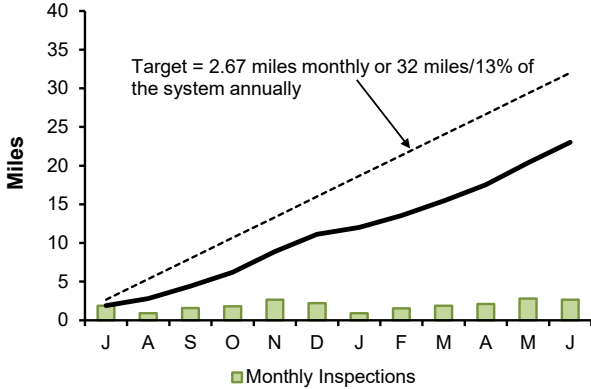
Wastewater Pipeline and Structure Inspections and Maintenance

4th Quarter 2021 - FY21

Wastewater Pipeline and Structure Inspection and Maintenance performances measures have seen improved progress toward FY21 targets, but have fallen short of expected targets. This was primarily due to key staff vacancies and some Covid -19 exposures.

Inspections

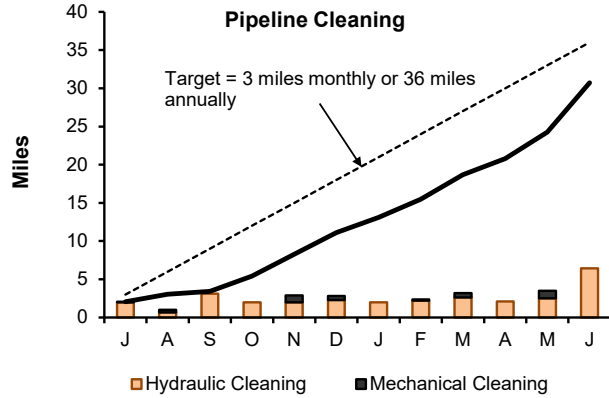
Pipeline Inspections



Staff internally inspected 7.58 miles of MWRA sewer pipe during this quarter. The year to date total is 23.02 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result of staffing availability, and equipment issues.

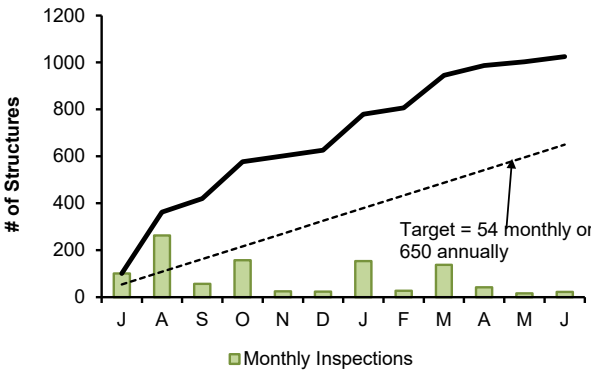
Maintenance

Pipeline Cleaning



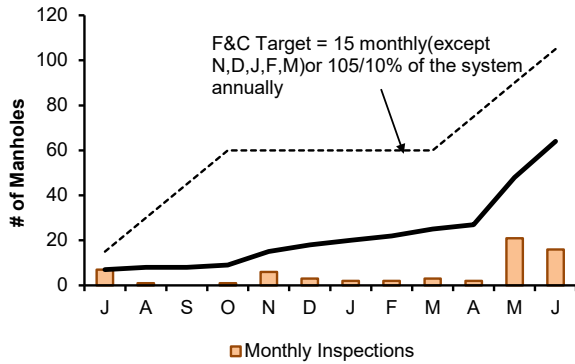
Staff cleaned 11.04 miles of MWRA sewer pipe, and removed 49 yards of grit. The year to date total is 30.72 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result of staffing availability.

Structure Inspections



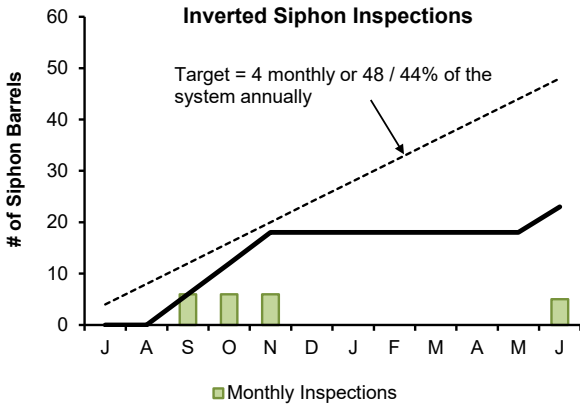
Staff inspected the 36 CSO structures and performed 90 other additional manhole/structure inspections during this quarter. The year to date total is 1025 inspections.

Manhole Rehabilitation



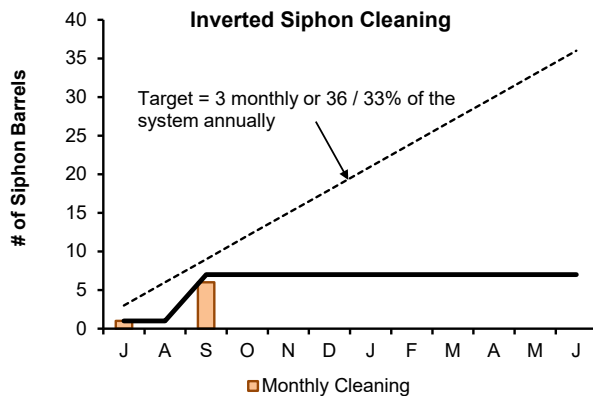
Staff replaced 39 frame and cover replacement this quarter. The year to date total is 64. Shortcomings for the quarter were a direct results of staffing availability.

Inverted Siphon Inspections



Staff inspected 5 siphon barrel this quarter. The year total is 23 inspections. Shortcomings for the quarter were a direct result of staffing availability, and equipment issues.

Inverted Siphon Cleaning

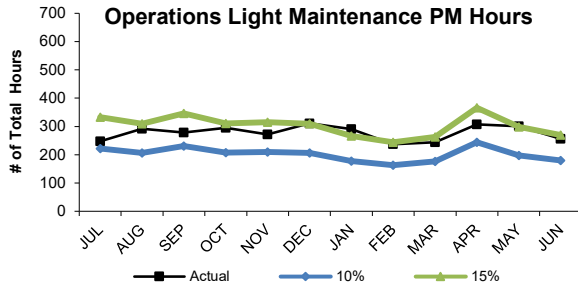


Staff did not clean any siphon barrel this quarter. Shortcomings for the quarter were a direct results of staffing availability.

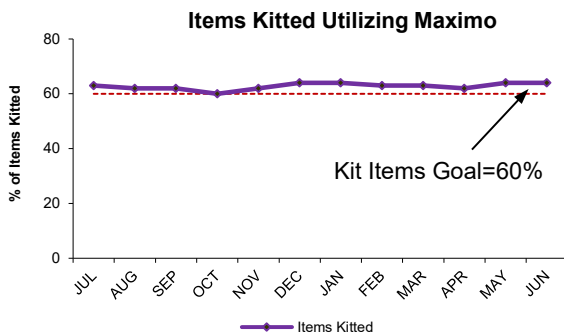
Field Operations' Metropolitan Equipment & Facility Maintenance

4th Quarter - FY21

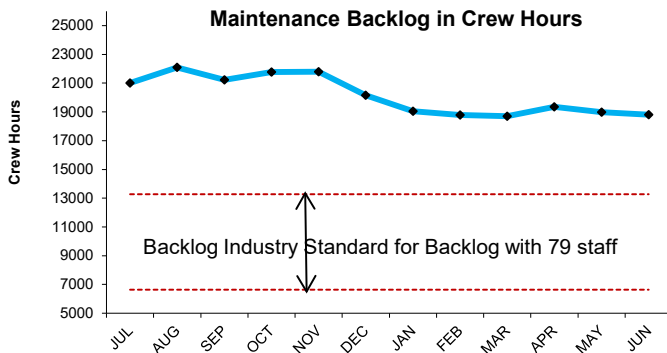
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance initiatives.



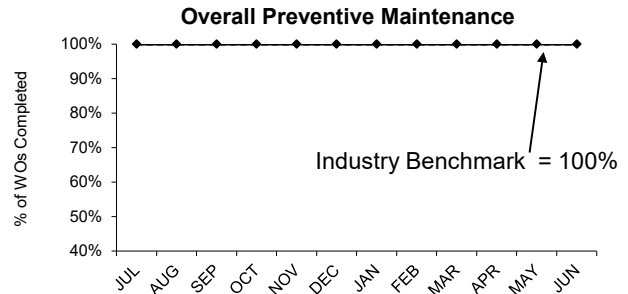
Operations staff averaged 288 hours per month of preventive maintenance during the 4th Quarter of FY21, an average of 14% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.



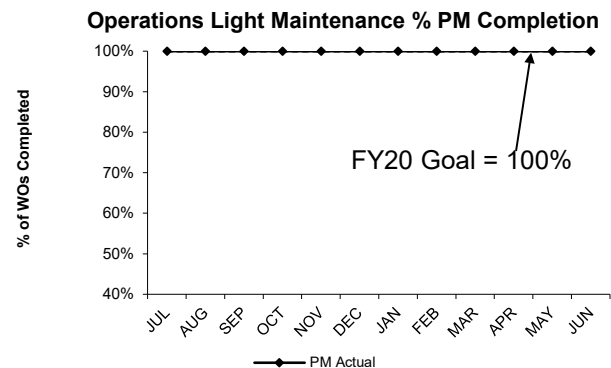
Operations' FY21 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 4th Quarter of FY21, 63% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



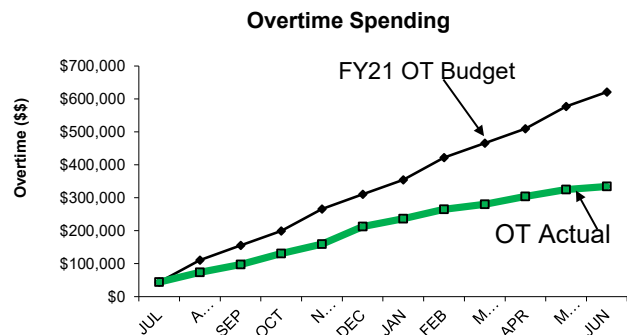
The 4th Quarter of FY21 backlog average is 19,050 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to the previous reduction in staffing levels due to COVID19.



The Field Operations Department (FOD) preventive maintenance goal for FY21 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 4th Quarter of FY21.



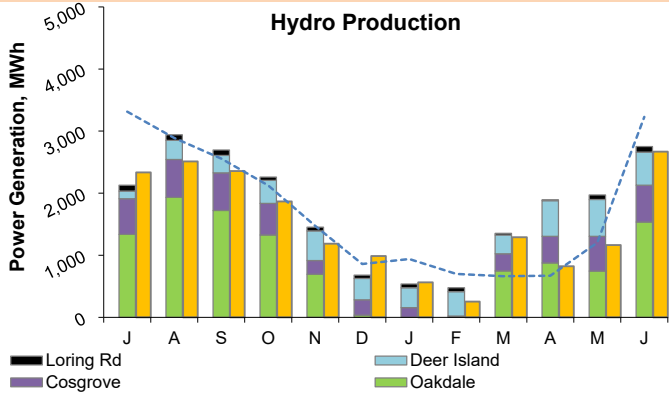
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY21 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 4th Quarter of FY21.



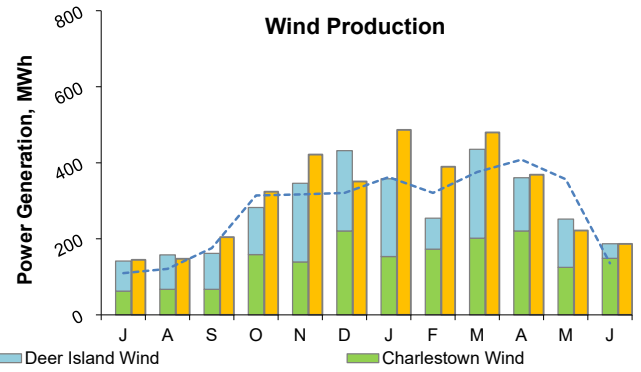
Maintenance overtime was \$33,630 under budget on average, per month, for the 4th Quarter of FY21. Overtime was used for critical maintenance repairs and wet weather events. The overtime budget for FY21 was \$621,114 and we were \$287,756 under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

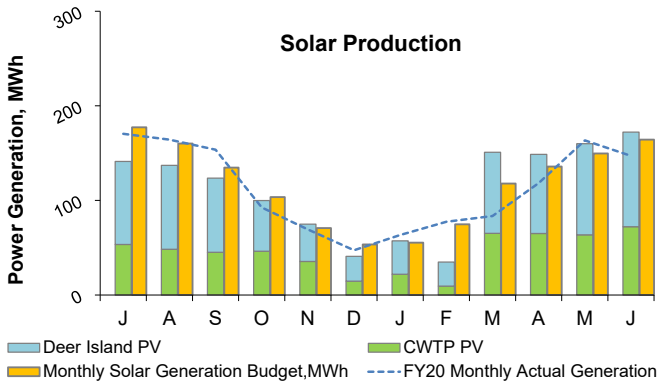
4th Quarter - FY21



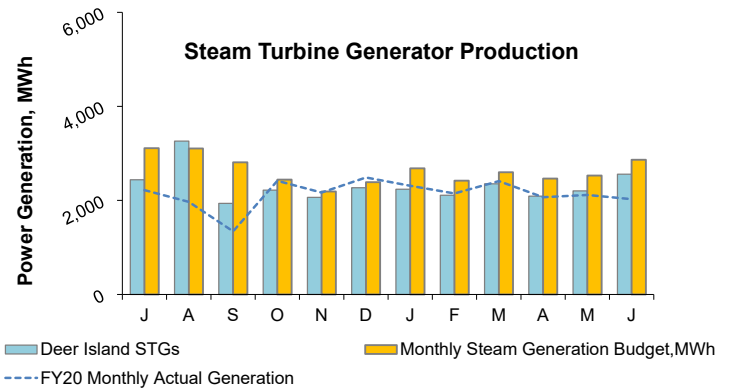
In Quarter 4 of FY21, the renewable energy produced from all hydro turbines totaled 6,734 MWh; 45% above budget³. The total savings and revenue² to date in FY21 (actuals through April¹) is \$650,407 ; 2% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



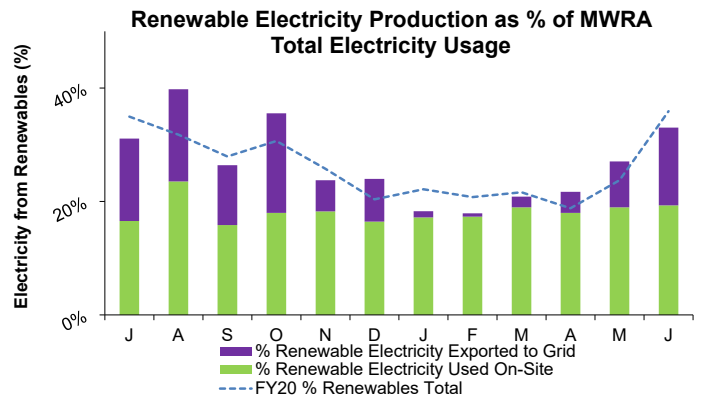
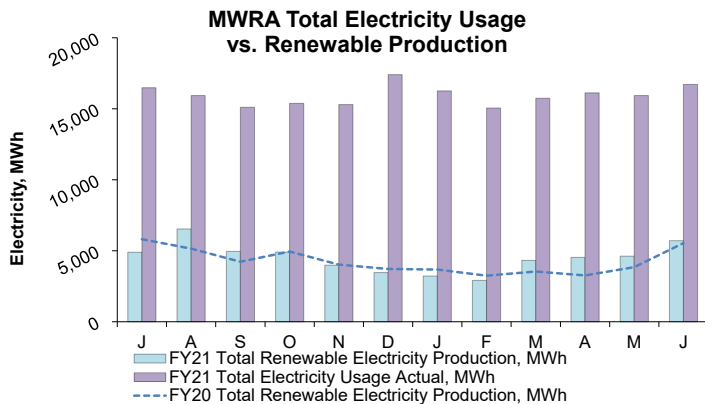
In Quarter 4 of FY21, the renewable energy produced from all wind turbines totaled 800 MWh; 3% above budget³. The total savings and revenue² to date in FY21 (actuals through April¹) is \$426,882, 13% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In Quarter 4 of FY21, the renewable energy produced from all solar PV systems totaled 481 MWh; 7% above budget³. The total savings and revenue² to date in FY21 (actuals through April¹) is \$126,821 10% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In Quarter 4 of FY21, the renewable energy produced from all steam turbine generators totaled 6,852 MWh; 13% below budget³. The total savings and revenue² to date in FY21 (actuals through April¹) is \$2,055,103, 21% below budget³. The savings and revenue value does not include RPS REC revenue (see next page).

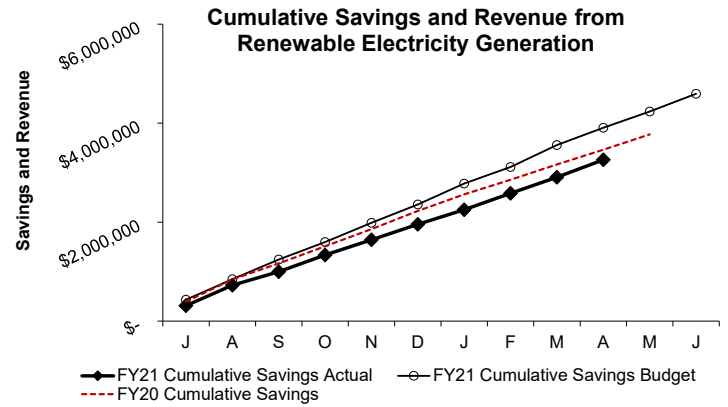
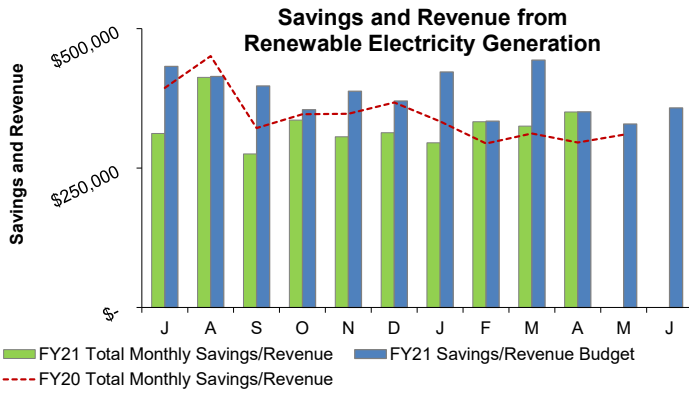


In Quarter 4 of FY 21, MWRA's electricity generation by renewable resources totaled 14,866 MWh, 8% above budget. MWRA's total electricity usage was approximately 48,773 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 2 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.

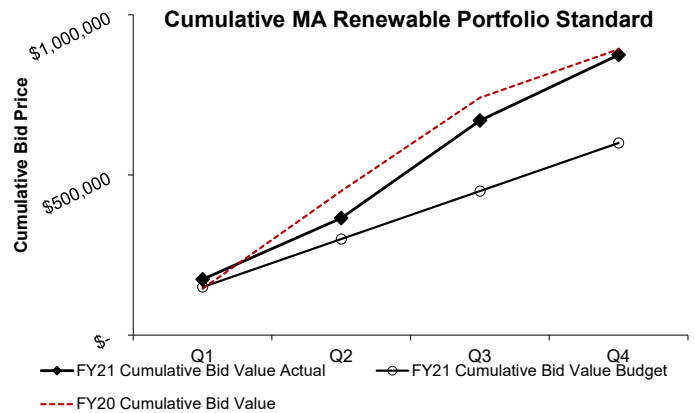
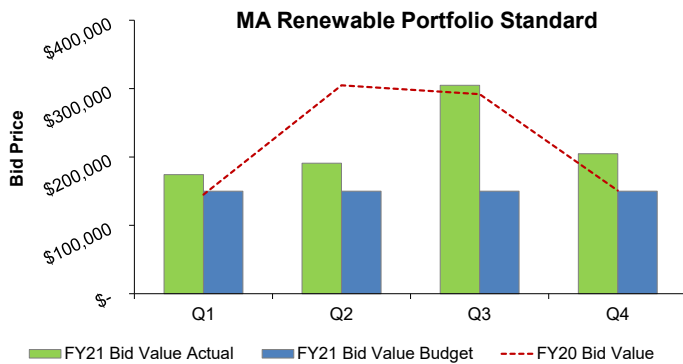
Renewable Electricity Generation: Savings and Revenue

4th Quarter - FY21

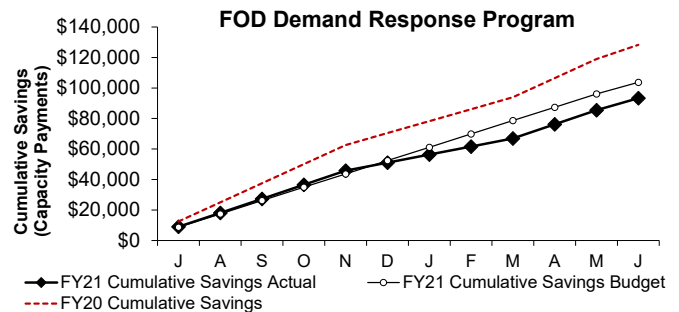
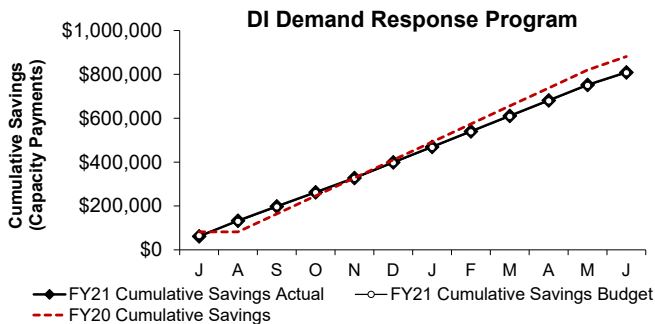


Savings and revenue from MWRA renewable electricity generation in the first 10 months of FY21 (actuals only through April) is \$3,258,213 which is 17% below the budget³.

Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 4th Quarter¹ from MWRA's renewable energy assets; 3,512 Q4 CY2020 Class I Renewable Energy Certificates (RECs), 1,850 Class II RECs, and 39 Q4 CY2020 Solar RECs were sold for a total value of \$204,771 RPS revenue; which is 37% above budget³ for the Quarter. REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

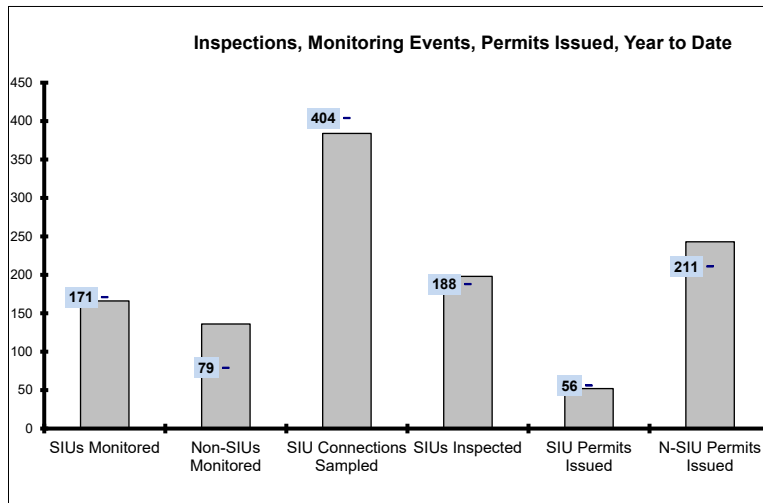


Currently Deer Island, JCWTP, Loring Rd, and Brusch participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY21 Cumulative savings (Capacity Payments only) through June¹ total \$809,267 for DI and \$93,324 for FOD through June¹.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 2 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.
 4. Chelsea Creek, Columbus Park, Ward St., and Nut Island participated in the ISO Demand Response Program through May 2016, until an emissions related EPA regulatory change resulted in the disqualification of these emergency generators, beginning June 2016. MWRA is investigating the cost-benefit of emissions upgrades for future possible participation.

Toxic Reduction and Control

4th Quarter - FY21



EPA Required SIU Monitoring Events for FY20: 171
YTD : **166**

Required Non-SIU Monitoring Events for FY20: 79
YTD : **136**

SIU Connections to be Sampled For FY20: 404
YTD: **384**

EPA Required SIU Inspections for FY20: 188
YTD: **198**

SIU Permits due to Expire In FY20: 56
YTD: **52**

Non-SIU Permits due to Expire for FY20: 211
YTD: **243**

Significant Industrial Users (SIUs) are MWRA's highest priority industries due to their flow, type of industry, and/or their potential to violate limits. SIUs are defined by EPA and require a greater amount of oversight. EPA requires that all SIUs *with flow* be monitored at least once during the fiscal year.

The "SIU Monitored" data above, reflects the number of industries monitored; however, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

Throughout FY21, TRAC continued to see impacts to our permitted universe due to the COVID pandemic. Impacts included industry closures and changes to business practices that directly impact the industrial discharge.

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs. Monitoring of SIUs and Non-SIUs is dynamic for several reasons, including: newly permitted facilities; sample site changes within the year requiring a permit change; changes in operations necessitating a change in SIU designation; non-discharging industries; a partial sample event is counted as an event even though not enough sample was taken due to the discharge rate at the time; and also, increased/decreased inspections leading to permit category changes requiring additional monitoring events.

	Number of Days to Issue a Permit						Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU		
Jul	1	4	0	4	0	3	1	11
Aug	2	15	0	1	0	1	2	17
Sep	1	20	0	3	0	1	1	24
Oct	2	15	0	1	0	2	2	18
Nov	2	17	0	1	0	1	2	19
Dec	3	9	0	0	0	1	3	10
Jan	5	12	1	2	0	1	6	15
Feb	0	11	1	1	0	0	1	12
Mar	5	15	0	2	0	3	5	20
Apr	0	6	0	3	0	0	0	9
May	4	18	0	2	0	2	4	22
Jun	24	54	1	4	0	8	25	66

TRAC did not complete the monitoring goal because three industries did not discharge during the year and three industries went out of business before TRAC could sample their discharge. The remainder of TRAC's goals were completed.

% YTD	94%	81%	6%	10%	0%	9%	52	243
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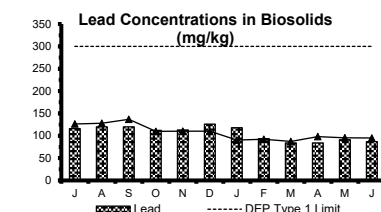
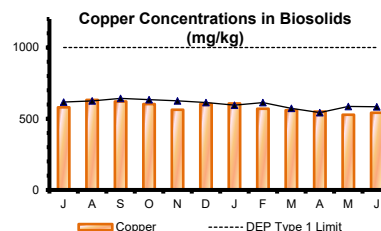
EPA requires MWRA to issue or renew 90 percent of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10 percent of SIU permits to be issued within 180 days. This month brings to an end the MWRA fiscal year, FY21.

In the fourth quarter, 126 permits were issued, 29 of which were SIUs. Twenty-eight of the SIU permits were issued within the 120-day timeframe. There were 97 non-SIU permits issued. Of the 97 Non-SIU permits issued in the quarter, 19 were issued late.

The reasons for late issuances include: waiting for critical data needed for permit processing; project delays and/or COVID related delays mainly in hotel operations, new start-ups, septage hauling and construction dewatering. Some of these translated to late payment of the relevant permit charges and hence, permits issued late.

For the Clinton Sewer Service area, three SIU permits were issued in the fourth quarter of the fiscal year.

During FY21, nine SIUs changed status from SIU to Non-SIU or went out of business. As a result, the universe of SIU permits available for issuance during FY21 was smaller than initially projected (less than 50 SIU permits were available for renewal).



Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer.

Overall, copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years.

A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion.

These two pages provide a partial snapshot of activities in the water and wastewater field operations.

Western Water Operations and Maintenance

- Wachusett Aqueduct Pump Station Testing: Staff activated the Wachusett Aqueduct to send water to WAPS for testing over four days in May. Six of seven pumps were tested successfully sending water out the surge relief tower and into the forebay. Electrical repairs have been made to the seventh pump and now all 7 pumps are available for service if needed, providing redundancy to the Cosgrove tunnel.
- Brusch Water Treatment Facility: SCADA was completed in June. Operations, maintenance, and valve crew support were needed to complete the upgrade, which was performed due to pending obsolescence. It allowed for implementing updated control system standards, ensuring future reliability, improving cyber security measures, and enhanced maintenance features.
- Norumbega Covered Storage Tank Cell 2: Staff successfully isolated cell 2 at Norumbega in May and performed a test of the dewatering system, to finalize the project requirements to completely dewater the cell and clean the tank floor. Cell 2 tank cleaning is expected to take place in 2022.

Metro Water Operations and Maintenance

- Water Pipeline Program: Staff completed four Blow-Off Retrofit projects during the quarter. One on Section 78 in Brookline, one on Section 70 in Melrose and two on Section 95 in Brookline. Work continued on repairing the Watertown Section in Waltham, a 24-inch high-density polyethylene (HDPE) pipe. Three sites were excavated allowing work on three mechanical couplings and a fourth allowing work at a transition coupling. Additional work during the month included excavating and shoring to support a valve repair on Section 70, and preparing Lee Street in Brookline for final paving after a major water main break. Leak detection was performed on over 51 miles of MWRA water main and assistance was provided to eight customer communities.

Operations Engineering

- Staff continued providing management and coordinating with Arcadis to support design and bidding efforts on the Carroll Water Treatment Plant control system upgrade.

Staff continued community assistance as needed:

- Newton System, installed pressure recorders and reviewed data to determine possible closed valve(s)
- Staff supported the planning for possible Wayland and Natick emergency connections to MWRA due to local PFAS contamination, and developed operational plans for the isolation and dewater of the Hultman for the installation of a valve at the Rte30 Hultman connection.
- Staff continued to manage the lead loop study at CWTP
- Staff assisted in several wet weather storm events, compiled and finalized storm reports, monitored and reported on CSO activation durations and volumes and provided follow up on operational and SCADA issues.

Wastewater Operations & Maintenance

- Remote Headworks Upgrades: Wastewater Operations staff continued to work with Engineering & Construction staff and the contractor on the Remote Headworks Upgrades Project. All channels are in service. Operations staff continued to attend training on the new systems.
- Nut Island Headworks Odor Control & HVAC Improvements: The contractor continued to perform work on the facility odor control system, replacement of the facility's four (4) emergency spillway gates and replacement of the facility boilers. Operations staff assisted with shutdowns of the odor control system on 6/8/21 and 6/10/21.
- Union Park CSO Facility Operation & Maintenance: Operations, Process Control and Procurement staff have begun the process of going out to bid and hiring a contractor for the Management, Operation and Maintenance of the Union Park CSO Facility.
- Prison Point – Planned Utility Power Outage: Eversource informed the MWRA that they had to perform maintenance to their electrical distribution system which would impact the Prison Point CSO Facility. This resulted in a five (5) day utility power outage to Prison Point, April 18 to 22. Eversource supplied a portable generator to the MWRA and the facility was powered by this portable generator for the duration of the outage. The portable generator was staffed 24/7 and fueled by the generator contractor. The work was completed with no operational impact.

Metro Equipment and Facility Maintenance

- Belmont Pump Station: MWRA electricians change out the Variable Frequency Drive for pump #3.
- Commonwealth Ave Pump Station: The motor for the #1 pump failed. MWRA electricians and mechanics changed out the motor. The existing motor will be repaired and become the stations spare motor.
- Chelsea Maintenance Facility: HVAC technician's replace the Unit Heater in the electrical shop.
- Hayes Pump Station: Pump #1 was not pumping to capacity. MWRA mechanics removed the rotating assembly and replaced with a new assembly. The older assembly will be re-built and become the station spare.
- Nut Island Headworks: MWRA mechanics repaired the motor mounting bolts on #1 vortex.
- Commonwealth Ave. Pump Station: MWRA mechanics replaced the bearings for #3 pumping unit.
- Wastewater Facilities: MWRA electricians assisted construction with the final testing of the Towable Generator Project at Nut Island Headworks, Quincy Pump Station and Braintree/Weymouth Pump Station.
- Alewife Pump Station: MWRA electricians working with electrical vendor Infra-Red repaired the stations emergency generation switch gear.
- Chestnut Hill Underground Pump Station: A security audit was conducted at the facility. The lighting in the rear stair well was found to be deficient. MWRA electricians installed new light fixtures.
- IPS: MWRA mechanics completed an over haul of the #1 screening conveyor.
- Chelsea Maintenance Facility: MWRA HVAC Specialist working with Facilities and an outside rigging company replaced two Roof Top Units (RTU's) for the Maintenance Building.

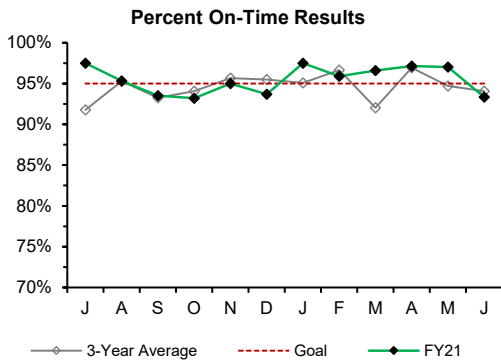
Environmental Quality-Wastewater

- Ambient Monitoring: Monitoring consultants successfully conducted the April, May, and June water column surveys

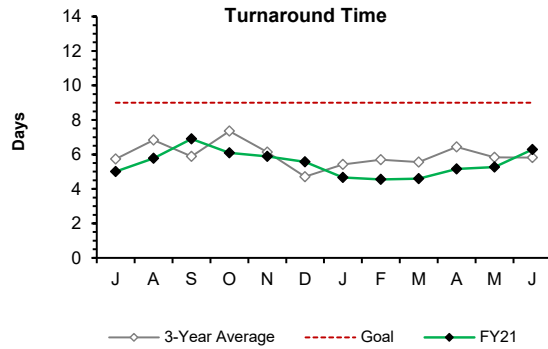
of the 2021 field season, and the annual flounder survey, under modifications imposed by COVID-19 Health and Safety guidelines. Results from the June water column survey triggered a Contingency Plan caution threshold because of high abundance at stations near the outfall of the algae responsible for red tide in New England waters. Completed reports on bay and harbor benthos, flounder, and the Massachusetts Bay model. Presentations on an upgraded water quality model made to a meeting of expert reviewers and to the May 11 OMSAP meeting led to consensus that the updated model can be used for permit-required modeling. MWRA summarized the 2020 monitoring findings available to date at the May 11 OMSAP meeting. OMSAP, regulators, and representatives of the public present commended MWRA and its consultants for successfully continuing the monitoring and data analyses despite the challenges imposed by the COVID-19 pandemic.

- Harbor/CSO Receiving Water Monitoring: Biweekly harbor wide and CSO receiving water monitoring continued with appropriate COVID-19 safety protocols.
- Permitting and Compliance Reporting: Staff submitted monthly and quarterly discharge monitoring reports and as-needed reports of blending and essential maintenance. Staff gathered information for upcoming NPDES permit applications.
- Coordination with other MWRA Departments: Staff continued to work with Engineering & Construction and the DCOO on the receiving water quality analysis portion of the CSO Post-Construction Monitoring & Performance Assessment project. Staff participated in interdepartmental Data Users/Data Quality Team. Staff coordinated installation of CSO Variance required informational signs along Alewife Brook and Mystic River.
- Cooperation with other agencies: Staff participated in Massachusetts Bays Partnership meetings (Management Committee, Science/Technical Advisory subcommittee, Boston Harbor Ecosystem Network). Staff participated in stakeholder meetings held by MassDEP to provide input for regulations implementing CSO notification law. Staff met with Charles and Mystic River watershed associations to discuss CSO program.

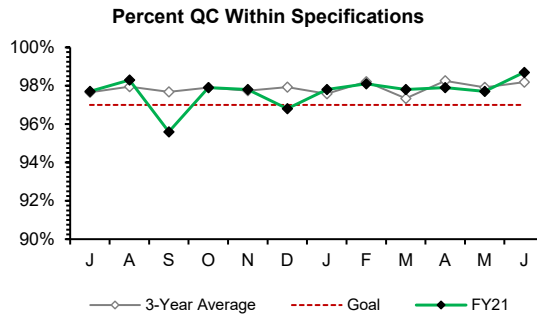
Laboratory Services 4th Quarter - FY21



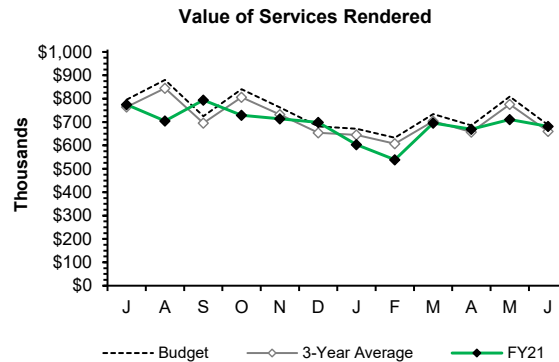
The Percent On-Time measurement met the 95% goal for FY21.



Turnaround Time met the 9-day goal.



Percent of QC tests meeting specifications met the 97% goal for FY21.



Value of Services Rendered finished FY21 slightly below the annual budget projection.

Highlights:

Performance: FY21 average Turnaround Time, Percent on time and Percent QC within Specification all met targets. Value of Services Rendered fell slightly below the three year average.

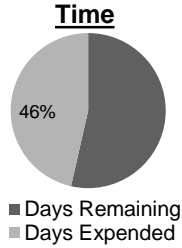
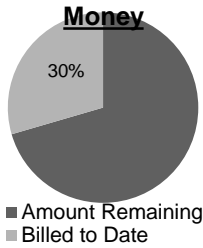
School Lead Program: MWRA’s lab completed 968 lead and copper tests from 78 schools and childcare facilities in 26 communities during FY21. An additional 104 lead tests were completed in support of DPH investigations of exposed children in FY21. Since 2016, MWRA’s Laboratory has conducted over 38,800 tests from 511 schools and daycares in 44 communities.

COVID-19 Testing: The wastewater pilot project continued throughout FY21. Sample results are posted on MWRA.com as they are received.

CONSTRUCTION PROGRAMS

Projects In Construction

4th Quarter – FY21



Permanent Metering Replacement and Installation

Project Summary: This project consists of the replacement of new installation of 174 flow meters in sewer manholes located throughout the MWRA service district.

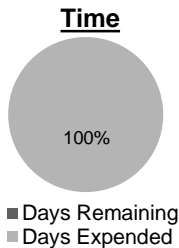
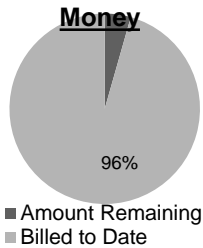
Contract Amount: \$3,286,114

Contract Duration: 450 Days

Notice to Proceed: 3-Dec-20

Contract Completion: 26-Feb-22

Status and Issues: As of June, the Contractor has installed 59 meters. The meter confirmations are up to date.



Chelsea Creek Headworks Upgrade

Project Summary: This project involves a major upgrade to the entire facility including: automation of screening collection & solids conveyance, replacement of the odor control, HVAC and electrical systems.

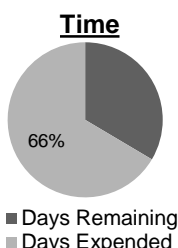
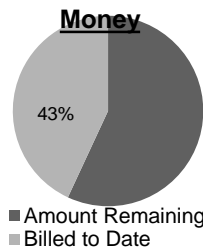
Contract Amount: \$85,153,789.06

Contract Duration: 1,594 Days

Notice to Proceed: 22-Nov-16

Contract Completion: 4-Apr-21

Status and Issues: As of June, the Contractor installed firestopping throughout the Headworks, worked on caulking interior walls, they installed caulking at the Channel 1 influent shaft covers in the Lounge and worked on caulking external doors, windows and louvers. In addition, they continued modernization of the freight elevator and worked on painting the elevator car support beams.



Dorchester Interceptor Sewer

Project Summary: MWRA's Dorchester Interceptor conveys flows to MWRA's Columbus Park Connection and Headworks in South Boston

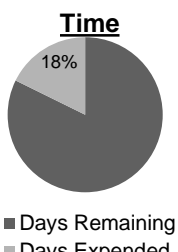
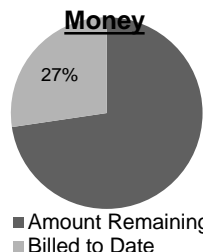
Contract Amount: \$4,707,485

Contract Duration: 540 Days

Notice to Proceed: 6-Jul-20

Contract Completion: 29-Dec-21

Status and Issues: As of June, the Contractor completed water cured inversion No. 5 between SMH 172+90 and SMH 167+81; No. 4 between 172+90 to 179+72; No. 15 across Granite Ave SMH 130+93 to SMH 128+18. In addition, a 2 man, manhole rehabilitation crew was mobilized to repair leaks and epoxy coat SMH's through the DCR property on Adams Street.



Rehabilitation of WASM 3

Project Summary: This project consists of the rehabilitation of 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford.

Contract Amount: \$19,537,850.00

Contract Duration: 1,383 Days

Notice to Proceed: 28-Oct-20

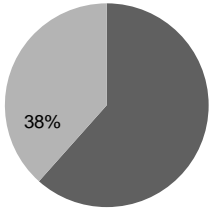
Contract Completion: 11-Aug-24

Status and Issues: As of June, the Contractor set up an irrigation system to water the DCR property, after which they will continue to irrigate the hydroseed on the DCR property.

Projects In Construction

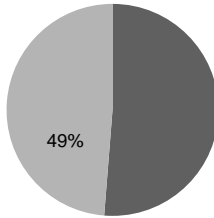
4th Quarter – FY21

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

Nut Island Odor Control and HVAC

Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment.

Contract Amount: \$58,115,295.10

Contract Duration: 1,034 Days

Notice to Proceed: 12-Feb-20

Contract Completion: 12-Dec-22

Status and Issues: As of June, the Contractor backfilled and compacted chemical feed pipes to chemical fill station. Formed, installed rebar, and placed concrete for equipment pad for new chemical fill station. Backfilled and compacted equipment pad and reset fence and fence posts plumb and level.

Chemical Tank Relining & Pipe Replacement

Project Summary: This project involves replacing the chlorobutyl rubber linings in 3 sodium hypochlorite and 2 sodium bisulfite storage tanks and assorted gravity thickener overflow piping at Deer Island.

Contract Amount: \$8,680,743

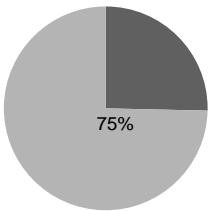
Contract Duration: 850 Days

Notice to Proceed: 13-Aug-19

Contract Completion: 10-Dec-21

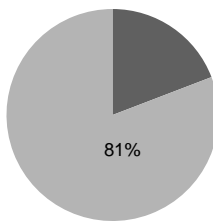
Status and Issues: During June, the Contractor completed weld repairs of Sodium Hypochlorite Tank No. 2; inspected Sodium Bisulfite Tank No. 2 after lining removal. They performed nozzle and weld repairs and completed the installation of overflow pipe for Gravity Thickener No. 2.

Money



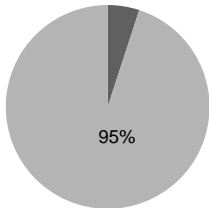
- Amount Remaining
- Billed to Date

Time



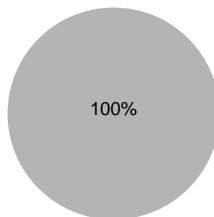
- Days Remaining
- Days Expended

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

Winthrop Terminal VFD and Motor

Project Summary: This project involves the replacement of 6, 600-HP motors, VFDs and associated electrical components in the Winthrop Terminal Facility.

Contract Amount: \$11,950,754

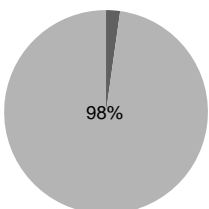
Contract Duration: 1,549 Days

Notice to Proceed: 16-Jun-16

Contract Completion: 12-Sep-20

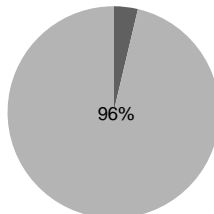
Status and Issues: As of June, the Contractor achieved substantial completion and began working on punchlist items.

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

Gravity Thickener Rehabilitation

Project Summary: This project involves the upgrade of all six gravity thickeners, including the complete replacement of each tank's sludge and scum thickening equipment and 5 of the 6 FRP dome covers.

Contract Amount: \$19,979,541.22

Contract Duration: 1,190 Days

Notice to Proceed: 11-May-18

Contract Completion: 13-Aug-21

Status and Issues: As of June, the Contractor completed valve replacements in Gallery A5, below the DiStor and on top of the DiStor. The nitrogen purge and leaking coupling repair of DiStor 1 is on hold due to a 24" dewatering line in need of repair. DiStor 1 is full of water and needs to be drained through the 24" dewatering line.

CSO CONTROL PROGRAM

4th Quarter – FY21

All 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015 in compliance with milestones in the Federal District Court Order. MWRA is conducting a multi-year CSO post-construction monitoring program and performance assessment that will culminate in a report to EPA and DEP in December 2021 verifying whether the court-ordered LTCP levels of CSO control are attained. Of the \$912.5 million budget in the FY21 CIP for the CSO Control Program, **approximately \$5.8 million remain to be spent**, as described below.

Project/Item	Status as of June 30, 2021
BWSC Dorchester Interceptor Inflow Removal	This agreement with BWSC provided up to \$3.76 million in MWRA financial assistance for reimbursement of the eligible costs of construction to remove inflow from the BWSC's Dorchester Interceptor system. BWSC awarded one construction contract for inflow removal in the amount of \$1.58 million. BWSC completed the contract work on June 30, 2021, when the financial assistance agreement ended. \$2.18 million of remaining funds in the Dorchester agreement has been transferred into a new agreement by which BWSC will construct sewer separation and other CSO improvements in East Boston (see below).
BWSC East Boston Sewer Separation and other CSO Improvements	On April 14, 2021, the MWRA Board of Directors authorized the East Boston CSO financial assistance agreement in the amount of \$2.18 million for a term of two years, from July 1, 2021 through June 30, 2023. BWSC and MWRA executed the agreement on June 10, 2021. BWSC has awarded East Boston Sewer Separation Contract 3 and is finalizing design of an upgraded connection to the MWRA system to lower CSO discharges at Outfall BOS014.
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last MWRA CSO plan project in December 2015 in compliance with Schedule Seven. The \$100.2 million MOU/FAA by which MWRA funded the eligible costs of the Cambridge-implemented CSO projects ended on June 30, 2018. MWRA recently completed final eligibility review of the Cambridge construction contracts and expects to issue a final eligibility certification this summer .
City of Somerville Financial Assistance Agreement	By this agreement, MWRA will provide up to \$1.4 million upon construction award of City of Somerville's repair of its combined sewer trunk line upstream of the Somerville Marginal CSO Facility. Pursuant to the agreement, the repair work is intended to maintain the full in-system storage capacity of the trunk sewer to support CSO control. Somerville is finalizing design and expects to award the construction contract in the fall of 2021.
MWRA CSO Performance Assessment – Contract 7572	<p>MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and DEP in December 2021 verifying whether the LTCP goals are attained. The current contract amount is \$5.28 million of which approximately \$4.5 million has been spent.</p> <p>On August 30, 2019, DEP issued five-year CSO variances to water quality standards for the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River effective through August 31, 2024. The variance conditions include receiving water quality modeling and CSO and stormwater sampling; the evaluation of certain additional CSO controls; other requirements intended to minimize CSO discharges, their impacts and public health risk; and preparation of updated CSO control plans for these waters. In compliance with the CSO variances, MWRA has implemented a subscriber-based system to notify the public of CSO discharges at its permitted outfalls within four hours of the start of discharge at each location, using meter readings. MWRA also reports estimated discharge volumes on its CSO notification web page. Cambridge and Somerville are also parties to the variances and have implemented notification systems for their own outfalls.</p> <ul style="list-style-type: none"> • AECOM continues to make progress with CSO variance-required project evaluations and other site-specific investigations to mitigate CSO discharges at locations where LTCP goals are not yet attained. In these efforts, MWRA is maintaining close coordination with the CSO communities. CSO mitigation implemented in late 2020/early 2021 included: BWSC completed its East Boston sewer separation Contract 1, Chelsea raised the overflow weir at Outfall CHE004, Cambridge removed heavy sediments in the Outfall CAM401A system, and MWRA is designing a replacement for the interceptor connection at Outfall CHE008 - all expected to bring associated outfalls into attainment with LTCP discharge goals. In addition, Cambridge completed the partial sewer separation improvements that have reduced discharges from the Cottage Farm facility. More recent work includes MWRA's ongoing design of a new interceptor connection at Chelsea's Outfall CHE008, replacement of a faulty tide gate in the Somerville Marginal Facility outfall, evaluations supporting a new interceptor connection upstream of the Somerville Marginal Facility, and evaluations to improve flow conveyance at Outfall BOS017 in Charlestown. BWSC continues with construction of East Boston sewer separation Contract 2, has awarded Contract 3, and also has commenced construction of South Boston sewer separation Contract 1 that will lower CSO discharges to Fort Point Channel. • AECOM updated the MWRA hydraulic model to Q1-2021 system conditions in part to produce an updated Typical Year CSO performance assessment relative to the LTCP activation and volume goals. The updated assessment shows attainment of the goals at 70 of 86 discharge locations active in the late 1980's, including outfalls that have been closed. MWRA forecasts attainment at an additional six outfalls with scheduled completion after 2021 of recently recommended MWRA and community CSO improvements (many are mentioned above). At 10 discharge locations, MWRA and the CSO communities continue to identify and evaluate alternatives to further reduce discharges. • Utilizing receiving water quality models of the Lower Charles River and the Alewife Brook/Upper Mystic River AECOM completed and calibrated last fall, it performed water quality assessments of current river conditions and the impacts of remaining CSO and non-CSO (dry weather and stormwater) pollution sources. MWRA distributed a draft Water Quality Assessment Report to EPA, DEP, the CSO communities, Charles River Watershed Association, and Mystic River Watershed Association and is addressing comments received.

CIP Expenditures

4th Quarter – FY21

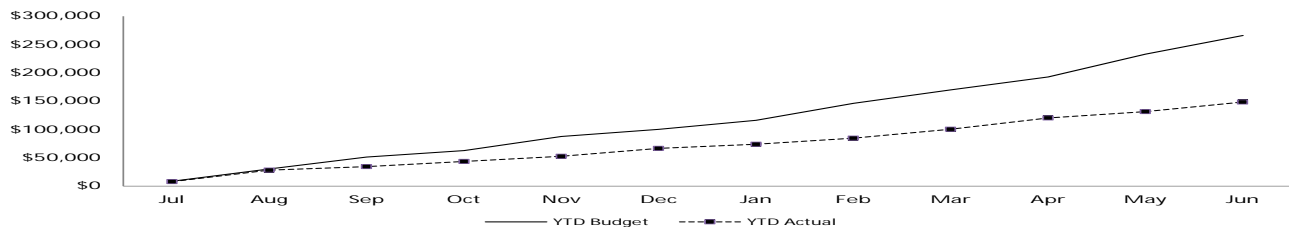
FY21 Capital Improvement Program Expenditure Variances through June by Program (\$ in thousands)				
Program	FY21 Budget Through June	FY21 Actual Through June	Variance Amount	Variance Percent
Wastewater	\$153,470	\$98,560	(\$54,910)	-36%
Waterworks	\$90,301	\$45,592	(\$44,709)	-50%
Business and Operations Support	\$22,003	\$4,211	(\$17,792)	-81%
Total	\$265,774	\$148,363	(\$117,411)	-44%

Project underspending within Wastewater was due to updated schedules for the Prison Point CSO Rehabilitation, DI Primary & Secondary Clarifier Rehab, DI Motor Control Center and Switchgear Replacement Construction, and Remote Access Shaft Improvements, delay in award and software training for the Wastewater Metering contract, work was delayed, and time extension for the Chelsea Creek Headworks Upgrades, delays in equipment delivery, and Covid-19 shutdown for Nut Island Odor Control & HVAC Construction, updated final cost for Dorchester I/I Removal work, delay in award for Ward Street and Columbus Park Headworks Upgrades Design/CA, work anticipated in FY21 that was completed in FY20 for the Pellet Pipe Relocation and the Residuals Mechanical/Electrical/Dryer Drum Replacements, start-up delay for the Dorchester Interceptor Sewer, and timing of community repayments due to less than anticipated communities deferring their loan repayments for the I/I Local Financial Assistance program. This underspending was partially offset by contractor progress for the Winthrop Terminal Facility (WTF) VFD Replacement, and DI Gravity Thickener Rehab contracts. Project underspending in Waterworks was due to timing of community repayments due to less than anticipated communities deferring their loan repayments for the Water Loan program, updated schedules for Section 89 & 29 Replacement, CP-3 Sections 23, 24, and 47 Rehab, and CWTP SCADA Upgrades, timing of consultant work for the Tunnel Preliminary Design & MEPA Review, timing of final work and balancing credit change order for SEH Section 111 Construction 3, and delay in award and repair clamps issue for CP-1 Shafts 6, 8, and 9A. This underspending was partially offset by contractor progress for WASM 3 CP-1, Commonwealth Avenue Pumping Station Rehab, SEH Section 111 Construction 2, and consultant progress for Section 56 Repl./Saugus River Design/CA.

Budget vs. Actual CIP Expenditures

(\$ in thousands)

Total FY21 CIP Budget of \$265,774



Construction Fund Management

All payments to support the capital program are made from the Construction Fund. Sources of fund in-flows include bond proceeds, commercial paper, SRF reimbursements, loan repayments by municipalities, and current revenue. Accurate estimates of cash withdrawals and grant payments (both of which are derived from CIP spending projections) facilitate planning for future borrowings and maintaining an appropriate construction fund balance.

Cash Balance as of 6/30/21	\$228.0 million
Unused capacity under the debt cap:	\$1.65 billion
Estimated date for exhausting construction fund without new borrowing:	Apr-22
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$128 million
Commercial paper capacity / Revolving Loan	\$350 million
Budgeted FY21 Cash Flow Expectancy*:	\$203 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

4th Quarter – FY21

Source Water – Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal tract of mammals. They act as indicators of possible fecal contamination. The Surface Water Treatment Rule for unfiltered water supplies allows for no more than 10% of source water samples prior to disinfection over any six-month period to have more than 20 fecal coliforms per 100mL.

Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the William A. Brutsch Water Treatment Facility raw water tap before being treated and entering the CVA system.

All samples collected during the quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL.**

Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled at the CWTP raw water tap in Marlborough before being treated and entering the MetroWest/Metropolitan Boston systems.

In the wintertime when smaller water bodies near Wachusett Reservoir freeze up, many waterfowl will roost in the main body of the reservoir - which freezes later. This increased bird activity tends to increase fecal coliform counts. DCR has an active bird harassment program to move the birds away from the intake area.

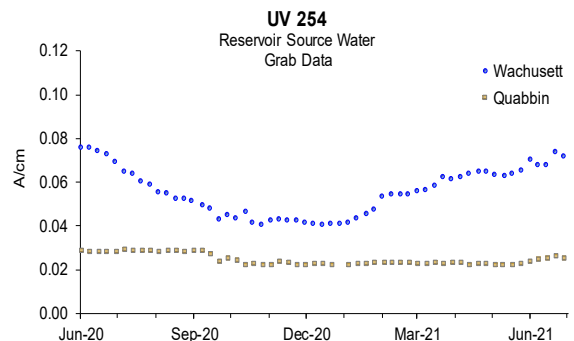
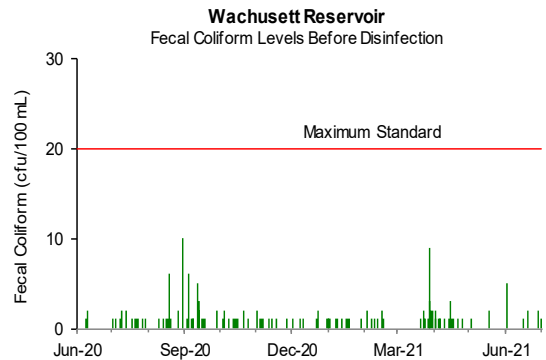
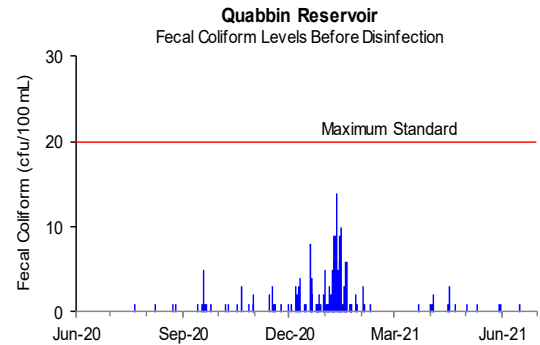
All samples collected during the 4th Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

Source Water – UV Absorbance

UV Absorbance at 254nm wavelength (UV-254), is a measure of the amount and reactivity of natural organic material in source water. Higher UV-254 levels cause increased ozone and chlorine demand resulting in the need for higher ozone and chlorine doses, and can increase the level of disinfection by-products. UV-254 is impacted by tributary flows, water age, sunlight and other factors.

Quabbin Reservoir UV-254 levels averaged 0.023 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.066 A/cm for the quarter.



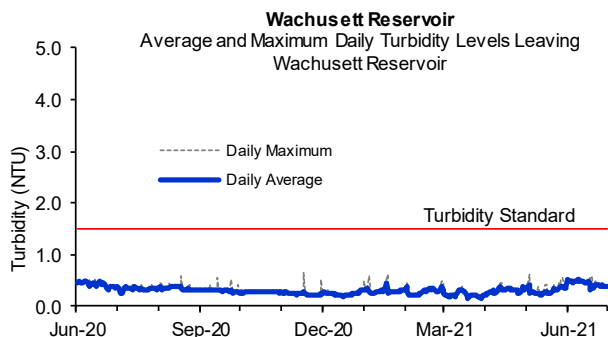
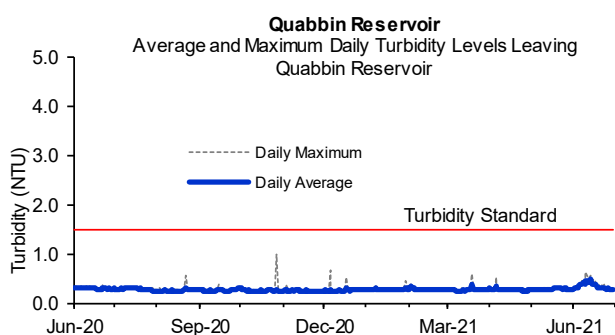
Source Water – Turbidity

4th Quarter – FY21

Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may protect bacteria from disinfection effects, thereby interfering with the disinfectant residual throughout the distribution system.

There are two standards for turbidity: all water must be below five NTU (Nephelometric Turbidity Units), and water only can be above one NTU if it does not interfere with effective disinfection.

Turbidity of Quabbin Reservoir water is monitored continuously at the Brutsch Water Treatment Facility (BWTF) before UV and chlorine disinfection. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation and UV disinfection. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

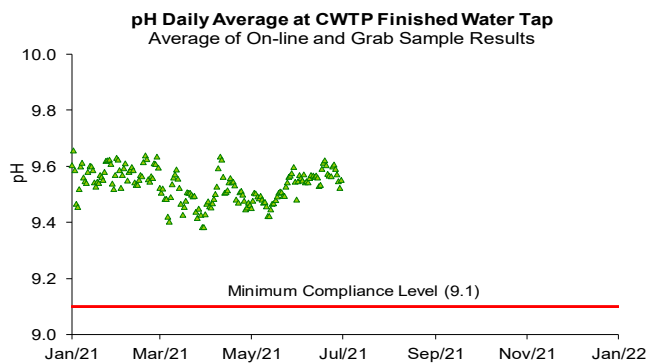
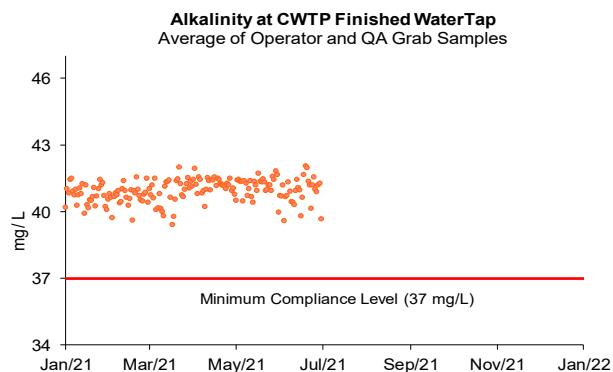


Treated Water – pH and Alkalinity Compliance

MWRA adjusts the alkalinity and pH of Wachusett water at CWTP to reduce its corrosivity, which minimizes the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA tests finished water pH and alkalinity daily at the CWTP's Fin B sampling tap. MWRA's target for distribution system pH is 9.3; the target for alkalinity is 40 mg/l. Per DEP requirements, CWTP finished water samples have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system locations have a minimum compliance level of 9.0 for pH and 37 mg/L for alkalinity. Results must not be below these levels for more than nine days in a six month period. Distribution system samples are collected in March, June, September, and December.

Each CVA community provides its own corrosion control treatment. See the CVA report: www.mwra.com/water/html/awqr.htm.

Quarterly distribution system samples were collected over a course of two weeks in June. Distribution system sample pH ranged from 9.5 to 9.6 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

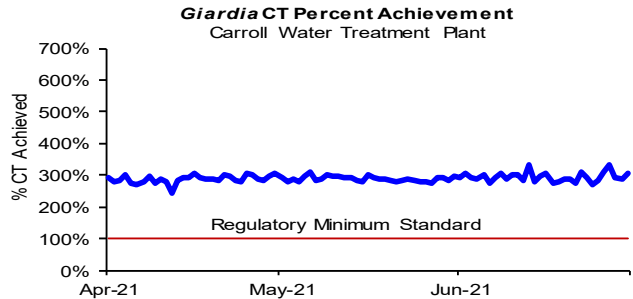
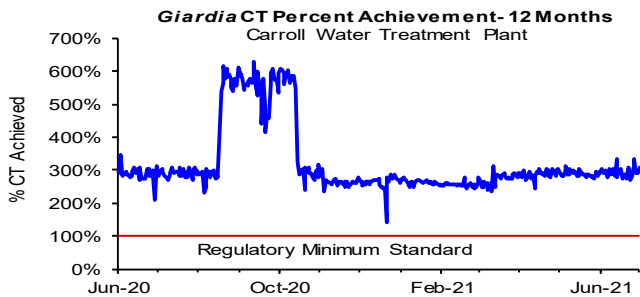
4th Quarter – FY21

At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA calculates inactivation rates hourly and reports *Giardia* inactivation at maximum flow and *Cryptosporidium* inactivation at minimum UV dose. MWRA must meet 100% of required CT and IT.

CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. For *Cryptosporidium*, there is also an "off-spec" requirement. Off-spec water is water that has not reached the full required UV dose or if the UV reactor is operated outside its validated ranges. No more than 5% off-spec water is allowed in a month.

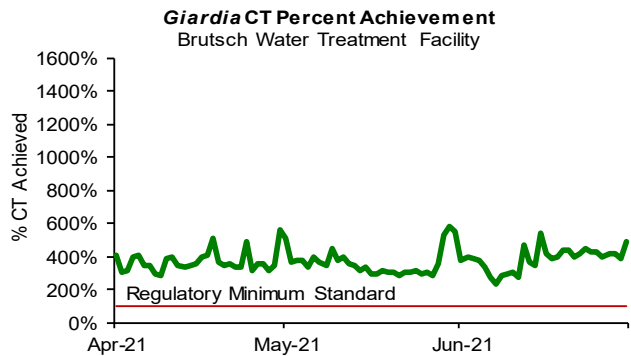
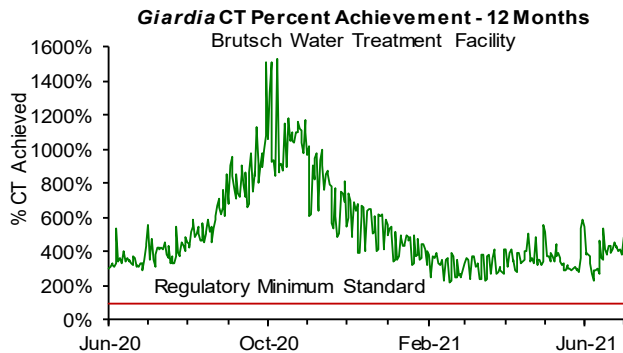
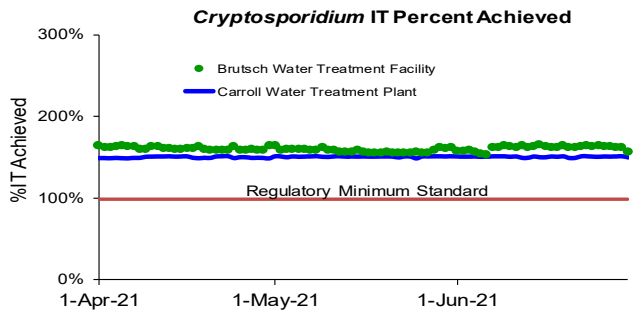
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- Ozone dose at the CWTP varied between 1.9 to 2.8 mg/L for the quarter.
- Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.
- The ozone dose was proactively raised in 2020 from mid August to mid October in response to elevated reservoir total coliform levels. This is visible in the top left graph.
- The slight dip in *Giardia* CT Achievement on December 21, 2020 was due to Train B returning to service after undergoing winter maintenance. *Giardia* CT Achievement was met this day. This is visible in the top left graph.



Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of 0.75 - 0.85 mg/L (November 1 – May 31) and 0.85 - 1.05 mg/L (June 1 – October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.2 to 1.8 mg/L for the quarter.
- Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.



Source Water - Algae

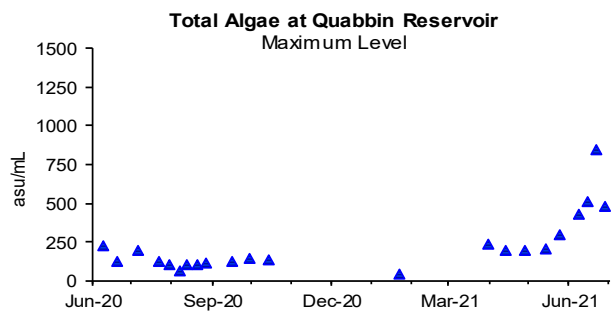
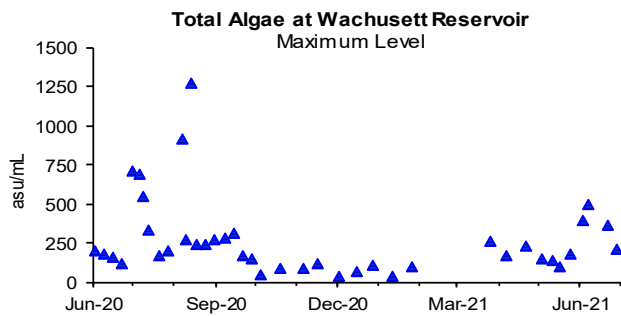
4th Quarter – FY21

Algae levels in the Wachusett and Quabbin Reservoir are monitored by DCR and MWRA. These results, along with taste and odor complaints, are used to make decisions on source water treatment for algae control.

Taste and odor complaints at the tap may be due to algae, which originate in source reservoirs, typically in trace amounts. Occasionally, a particular species grows rapidly, increasing its concentration in water. When *Synura*, *Anabaena*, or other nuisance algae bloom, MWRA may treat the reservoirs with copper sulfate, an algaecide. During the winter and spring, diatom numbers may increase. While not a taste and odor concern, consumers that use filters may notice a more frequent need to change their filters.

In the 4th quarter, there were seven taste and odor complaints which may be related to algae reported from the local water departments.

In June, *Chrysophaerella*, a taste and odor causing algae species, bloom occurred the Quabbin Reservoir. See the MWRA Press Release: <https://www.mwra.com/01news/2021/061421-quabbinalgae.html>.

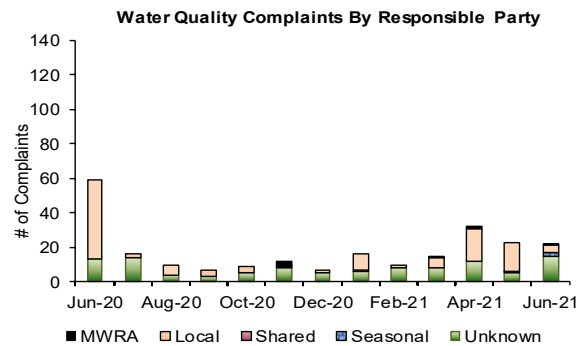
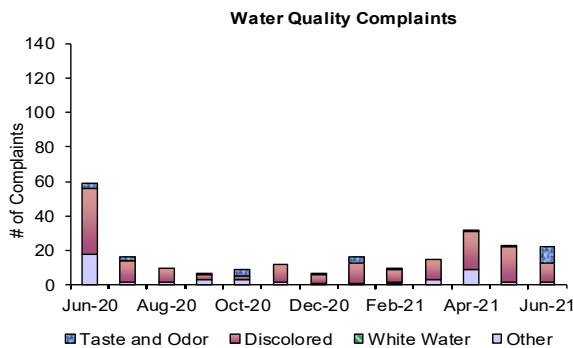


Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

MWRA collects information on water quality complaints that typically fall into four categories: 1) discoloration due to MWRA or local pipeline work; 2) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3) white water caused by changes in pressure or temperature that traps air bubbles in the water; or 4) "other" complaints including no water, clogged filters or other issues.

MWRA routinely contacts communities to classify and tabulate water complaints from customers. This count, reflecting only telephone calls to towns, probably captures only a fraction of the total number of customer complaints. Field Operations staff have improved data collection and reporting by keeping track of more kinds of complaints, tracking complaints to street addresses and circulating results internally on a daily basis.

Communities reported 77 complaints during the quarter compared to 85 complaints from 4th Quarter of FY20. Of these complaints, 53 were for "discolored water", 11 were for "taste and odor", and 13 were for "other". Of these complaints, 40 were local community issues, 2 were MWRA related, 1 was a shared MWRA/community issue, 2 were seasonal in nature, and 33 were unknown in origin.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program 4th Quarter – FY21

While all communities collect bacteria samples and chlorine residual data for the Total Coliform Rule (TCR), data from the 44 systems that use MWRA's Laboratory are reported below.

The MWRA TCR program has 141 sampling locations. These locations include sites along MWRA's transmission system, water storage tanks and pumping stations, as well as a subset of the community TCR locations.

Samples are tested for total coliform and *Escherichia coli* (*E.coli*). *E.coli* is a specific coliform species whose presence likely indicates potential contamination of fecal origin.

If *E.coli* are detected in a drinking water sample, this is considered evidence of a potential public health concern. Public notification is required if repeat tests confirm the presence of *E.coli* or total coliform.

Total coliform provide a general indication of the sanitary condition of a water supply. If total coliform are detected in more than 5% of samples in a month (or if more than one sample is positive when less than 40 samples are collected), the water system is required to investigate the possible source/cause with a Level 1 or 2 Assessment, and fix any identified problems.

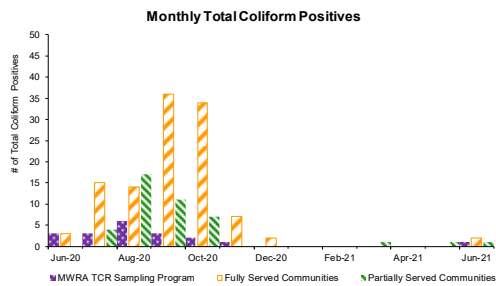
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 4th Quarter, four of the 6,529 samples (0.06% system-wide) submitted to MWRA labs for analysis tested positive (South Hadley – May, Boston, Framingham, Peabody - June). One of the 1954 MWRA locations or Community/MWRA Shared samples (0.05%) tested positive for total coliform. No samples tested positive for *E.coli*. Only 0.1% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

NOTES:

- MWRA total coliform and chlorine residual results include data from community locations. In most cases these community results are indicative of MWRA water as it enters the community system; however, some are strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.
- The number of samples collected depends on the population served and the number of repeat samples required.
- These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
- Part of the Chicopee Valley Aqueduct System. Free chlorine system.
- Burlington sampling started June 2021.



	Total Coliform		E.coli Positive	# Assessment Required
	# Samples (b)	# (%) Positive		
MWRA	MWRA Locations	399	1 (0.25%)	0
	Shared Community/MWRA sites	1555	0 (0%)	0
	Total: MWRA	1954	1 (0.05%)	0 No
Fully Served	ARLINGTON	169	0 (0%)	0
	BELMONT	104	0 (0%)	0
	BOSTON	783	1 (0.13%)	0
	BROOKLINE	223	0 (0%)	0
	CHELSEA	169	0 (0%)	0
	DEER ISLAND	52	0 (0%)	0
	EVERETT	169	0 (0%)	0
	FRAMINGHAM	240	1 (0.42%)	0
	LEXINGTON	118	0 (0%)	0
	LYNNFIELD	18	0 (0%)	0
	MALDEN	234	0 (0%)	0
	MARBLEHEAD	72	0 (0%)	0
	MARLBOROUGH	126	0 (0%)	0
	MEDFORD	192	0 (0%)	0
	MELROSE	117	0 (0%)	0
	MILTON	102	0 (0%)	0
	NAHANT	30	0 (0%)	0
	NEWTON	276	0 (0%)	0
	NORTHBOROUGH	48	0 (0%)	0
	NORWOOD	99	0 (0%)	0
	QUINCY	338	0 (0%)	0
	READING	130	0 (0%)	0
	REVERE	195	0 (0%)	0
	SAUGUS	104	0 (0%)	0
	SOMERVILLE	252	0 (0%)	0
	SOUTHBOROUGH	30	0 (0%)	0
STONEHAM	91	0 (0%)	0	
SWAMPSCOTT	57	0 (0%)	0	
WALTHAM	216	0 (0%)	0	
WATERTOWN	130	0 (0%)	0	
WESTON	45	0 (0%)	0	
WINTHROP	72	0 (0%)	0	
	Total: Fully Served	5001	2 (0.04%)	
Partially Served	BEDFORD	57	0 (0%)	0
	BURLINGTON	24	0 (0%)	0
	CANTON	90	0 (0%)	0
	NEEDHAM	123	0 (0%)	0
	PEABODY	209	1 (0.48%)	0
	WAKEFIELD	140	0 (0%)	0
	WELLESLEY	114	0 (0%)	0
	WILMINGTON	87	0 (0%)	0
	WINCHESTER	91	0 (0%)	0
	WOBBURN	195	0 (0%)	0
	Total: Partially Served	1130	1 (0.09%)	
CVA	MWRA CVA Locations	104	0 (0%)	0
	CHICOPEE	186	0 (0%)	0
	SOUTH HADLEY FD1	63	1 (1.59%)	0
	WILBRAHAM	45	0 (0%)	0
	Total: CVA	398	1 (0.25%)	
	Total: Community Samples	6529	4 (0.06%)	

Chlorine Residuals in Fully Served Communities

	2020							2021					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% <0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1
% <0.2	0.4	0.5	0.4	1.0	1.1	1.4	0.4	0.2	0.1	0.0	0.0	0.0	0.2
% <0.5	1.5	2.2	2.9	4.1	5.1	3.7	2.5	1.9	0.8	0.2	0.3	0.2	0.6
% <1.0	4.3	6.5	8.4	10.7	12.2	9.3	5.3	3.6	2.5	1.5	2.0	1.0	2.1
% ≥1.0	95.7	93.6	91.6	89.4	87.8	90.7	94.7	96.5	97.6	98.5	98.0	99.0	97.9

Treated Water Quality: Disinfection By-Product (DBP) Levels in Communities

4th Quarter – FY21

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA’s locational running annual average (LRAA) standard is 80 µg/L for TTHMs and 60 µg/L for HAA5s.

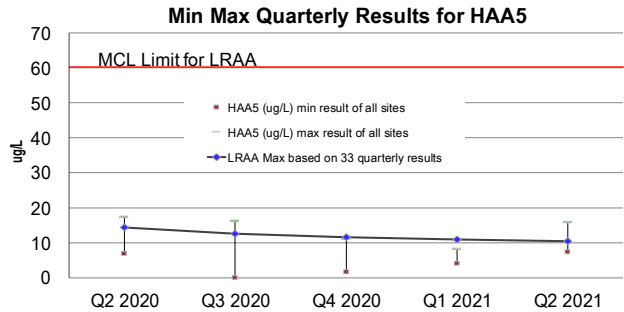
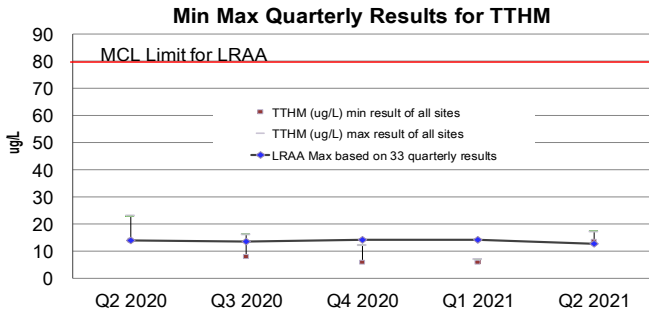
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines data for all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1). Each community is regulated individually.

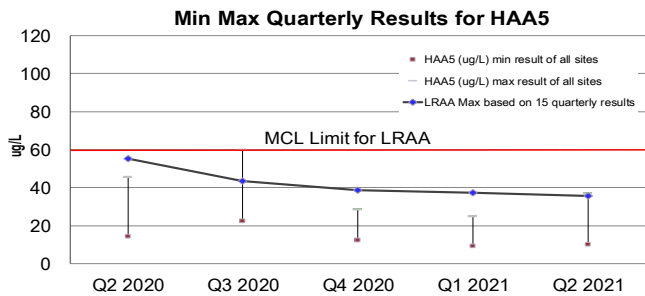
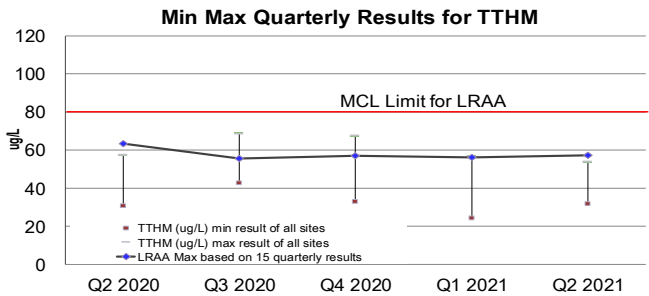
Bromate is tested monthly as required for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA’s RAA MCL standard for bromate is 10 µg/L.

The LRAA for TTHMs and HAA5s for MWRA’s Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 14.7 µg/L; HAA5s = 10.5 µg/L. The current RAA for Bromate = 0.0 µg/L. No LRAA exceedances or violations occurred this quarter for MetroBoston and any of the CVA communities. MWRA and the CVA communities continue to closely monitor and manage the disinfection process to minimize DBP production.

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results)



Water Supply and Source Water Management

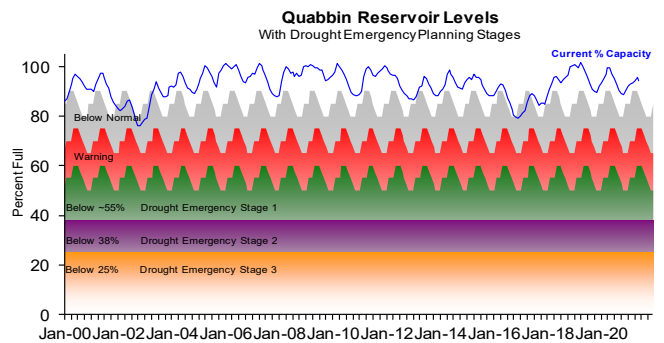
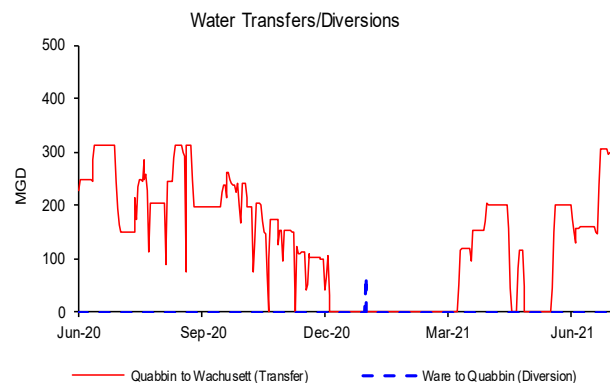
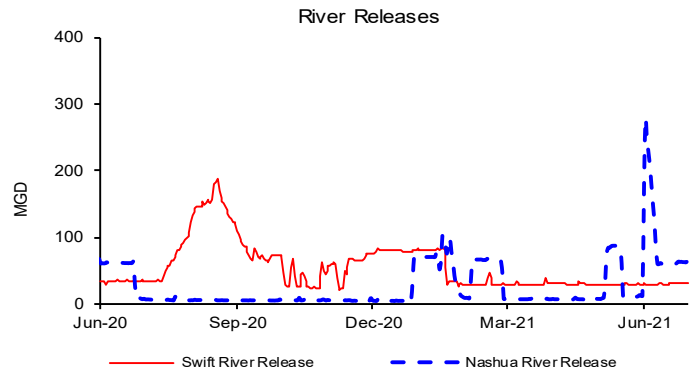
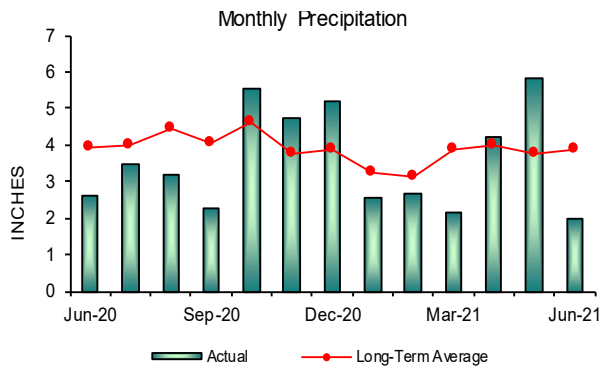
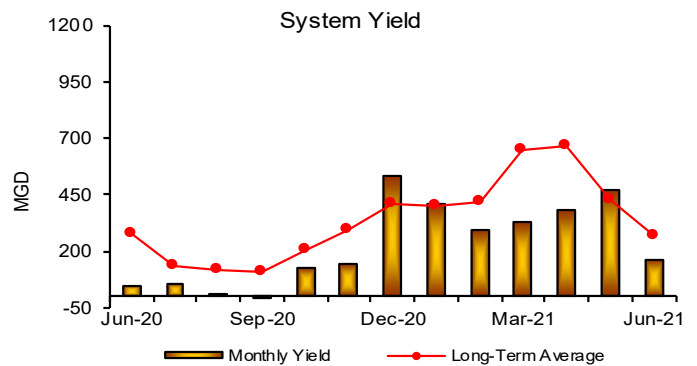
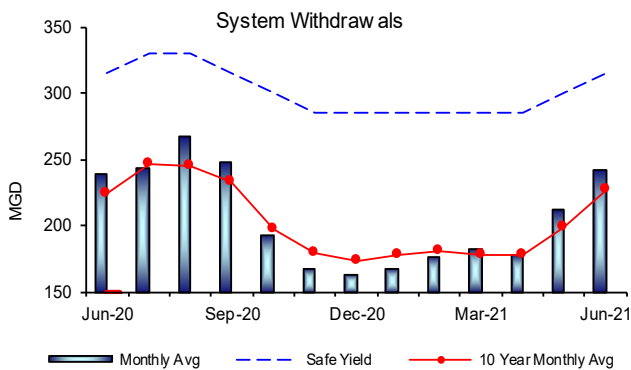
4th Quarter – FY21

Background

A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir was designed to effectively supply water to the service areas under a range of climatic conditions and has the ability to endure a range of fluctuations. Wachusett Reservoir serves as a terminal reservoir to meet the daily demands of the Greater Boston area. A key component to this reservoir's operation is the seasonal transfer of Quabbin Reservoir water to enhance water quality during high demand periods. On an annual basis, Quabbin Reservoir accounts for nearly 50% of the water supplied to Greater Boston. The water quality of both reservoirs (as well as the Ware River, which is also part of the System Safe Yield) depend upon implementation of DCR's DEP-approved Watershed Protection Plans. System Yield is defined as the water produced by its sources, and is reported as the net change in water available for water supply and operating requirements.

Outcome

The volume of the Quabbin Reservoir was at 94.1% as of June 30, 2021; a 0.70 % increase for the quarter, which represents a gain of more than 2.7 billion gallons of storage and an increase in elevation of 0.37'. System withdrawal and precipitation for the quarter were above their long term averages. Yield for the quarter was below its long term quarterly average. Quabbin is in Normal Operating Range for this time of year.



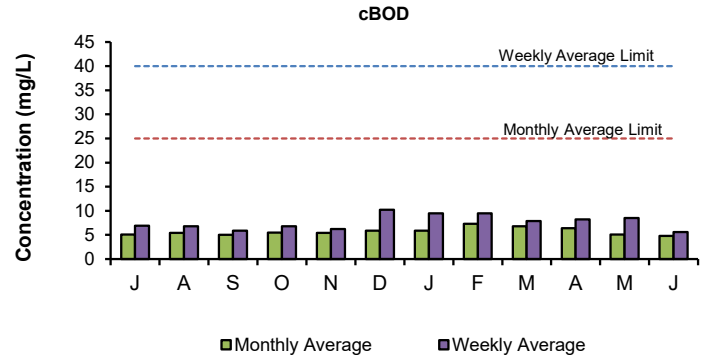
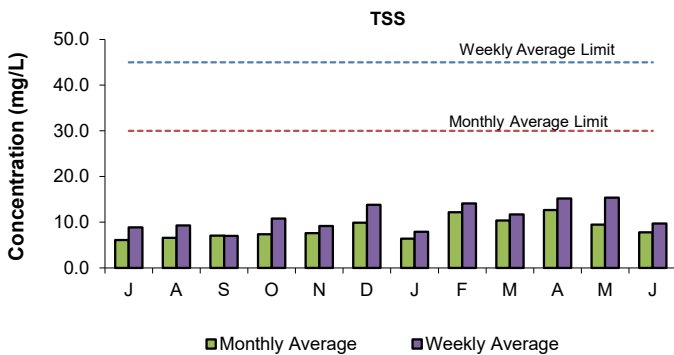
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 4th Quarter - FY21

NPDES Permit Limits

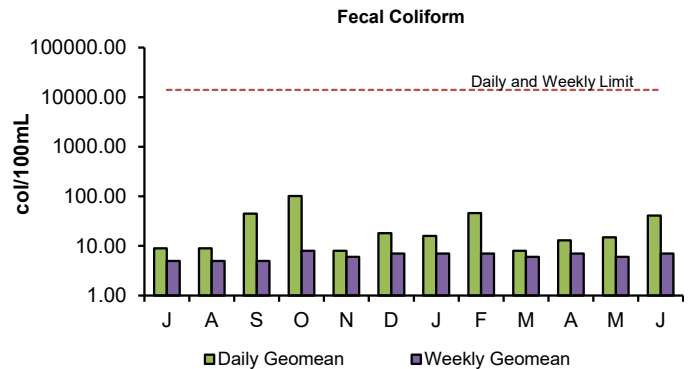
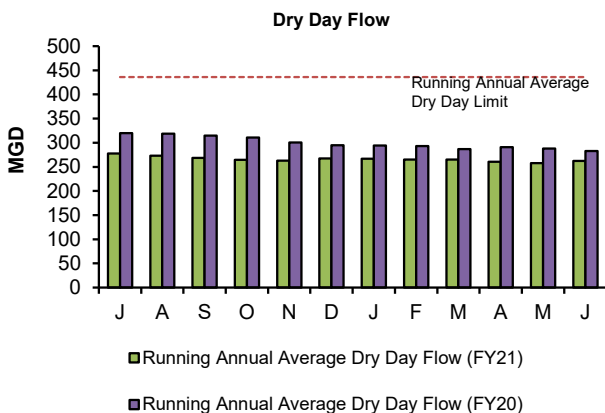
Effluent Characteristics		Units	Limits	April	May	June	4th Quarter Violations	FY21 YTD Violations
Dry Day Flow (365 Day Average):		mgd	436	260.4	257.8	262.0	0	0
cBOD:	Monthly Average	mg/L	25	6.4	5.1	4.8	0	0
	Weekly Average	mg/L	40	8.2	8.5	5.6	0	0
TSS:	Monthly Average	mg/L	30	12.7	9.5	7.8	0	0
	Weekly Average	mg/L	45	15.2	15.4	9.7	0	0
TCR:	Monthly Average	ug/L	456	0.0	0.0	0.0	0	0
	Daily Maximum	ug/L	631	0.0	0.0	0.0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	13.0	15.0	41.0	0	0
	Weekly Geometric Mean	col/100mL	14000	7.0	6.0	7.0	0	0
	% of Samples >14000	%	10	0.0	0.0	0.0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.4-6.9	6.5-7.0	6.5-7	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	100	100	100	0	0

There have been no permit violations in FY21 to date at the Deer Island Treatment Plant (DITP).



Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 4th Quarter were within permit limits.

Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 4th Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 4th Quarter was well below the permit limit of 436 MGD.

Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 4th Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant
4th Quarter - FY21

NPDES Permit Limits

Effluent Characteristics		Units	Limits	April	May	June	4th Quarter Violations	FY21 YTD Violations
Flow:	12-month Rolling Average:	mgd	3.01	2.22	2.21	2.27	0	0
BOD:	Monthly Average:	mg/L	20	0.70	0.80	0.90	0	0
	Weekly Average:	mg/L	20	0.90	1.50	1.40	0	0
TSS:	Monthly Average:	mg/L	20	1.70	1.70	1.80	0	0
	Weekly Average:	mg/L	20	2.30	2.30	2.30	0	0
pH:		SU	6.5-8.3	7-7.6	7.1-7.7	7-7.6	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	9.40	9.00	8.60	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	6	0	0
	Daily Geometric Mean:	cfu/100mL	409	5	9	13	0	0
TCR:	Monthly Average:	ug/L	17.6	0.13	0.00	0.00	0	0
	Daily Maximum:	ug/L	30.4	4.00	0.00	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	8.94	8.57	7.66	0	0
	Daily Maximum:	ug/L	14.0	8.94	8.57	9.00	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.00	0.00	0.02	0	0
	Daily Maximum:	mg/L	35.2	0.00	0.00	0.10	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	ug/L	1000	49	40	48	0	0
	Daily Maximum:	ug/L	RPT	106	59	72	0	0
Acute Toxicity*:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity*:	Daily Minimum:	%	≥62.5	N/A	N/A	100	0	1

There has been one permit violation in FY21 at the Clinton Treatment Plant.

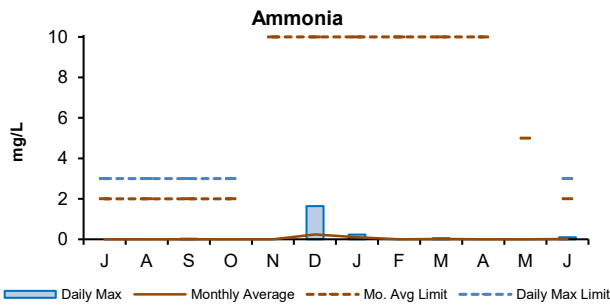
1st Quarter: There was one permit violation in the first quarter. The quarterly chronic toxicity result of 25% was below the minimum permit limit of 62.5%.

2nd Quarter: There were no permit violations in the 2nd Quarter.

3rd Quarter: There were no permit violations in the 3rd Quarter.

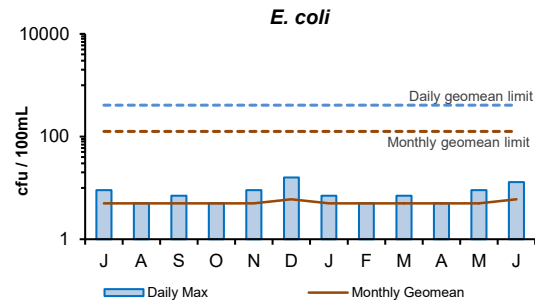
4th Quarter: There were no permit violations in the 4th Quarter.

+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



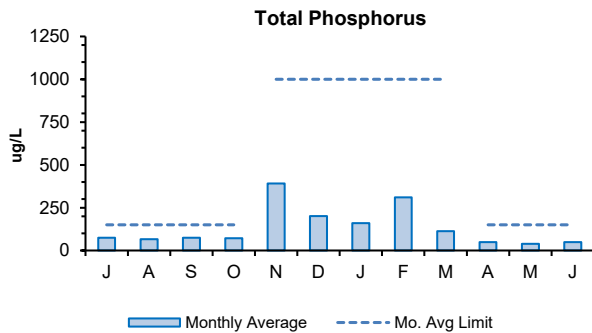
Legend: Daily Max (blue bar), Monthly Average (orange line), Mo. Avg Limit (dashed orange line), Daily Max Limit (dashed blue line)

The 4th Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 4th Quarter are 2.0 and 3.0 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



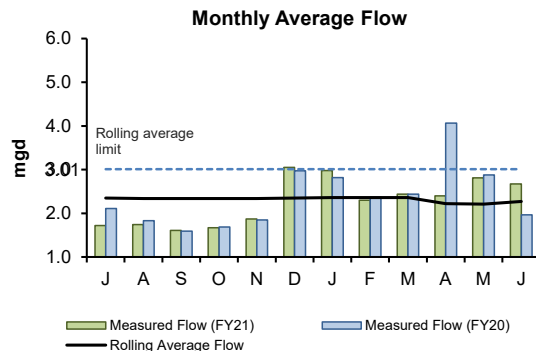
Legend: Daily Max (blue bar), Monthly Geomean (orange line)

E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 4th Quarter. The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



Legend: Monthly Average (blue bar), Mo. Avg Limit (dashed blue line)

Total phosphorus limits are most stringent during the growing season from April to October. The 4th Quarter's monthly average concentrations for total phosphorus were below permit limits.

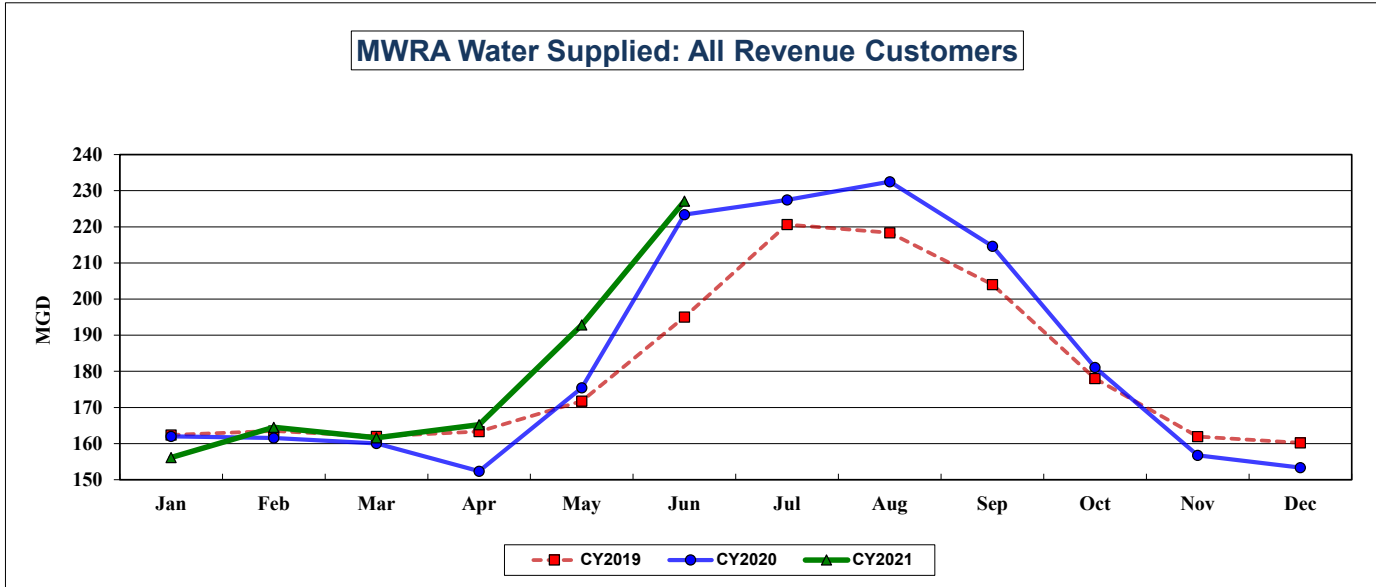


Legend: Measured Flow (FY21) (green bar), Measured Flow (FY20) (blue bar), Rolling Average Flow (black line)

The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 4th Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use 4th Quarter - FY21



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2019	162.367	163.492	161.984	163.350	171.773	195.025	220.621	218.376	203.996	177.998	161.941	160.207	169.662	180.220
CY2020	162.016	161.551	160.018	152.368	175.435	223.405	227.454	232.496	214.617	181.110	156.727	153.367	172.416	183.462
CY2021	156.148	164.513	161.615	165.219	192.854	227.139	0.000	0.000	0.000	0.000	0.000	0.000	177.935	177.935

The June 2021 Community Water Use Report was recently distributed to communities served by the MWRA Metropolitan and Chicopee Valley waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2021 water use will be used to allocate the FY2023 water utility rate revenue requirement.

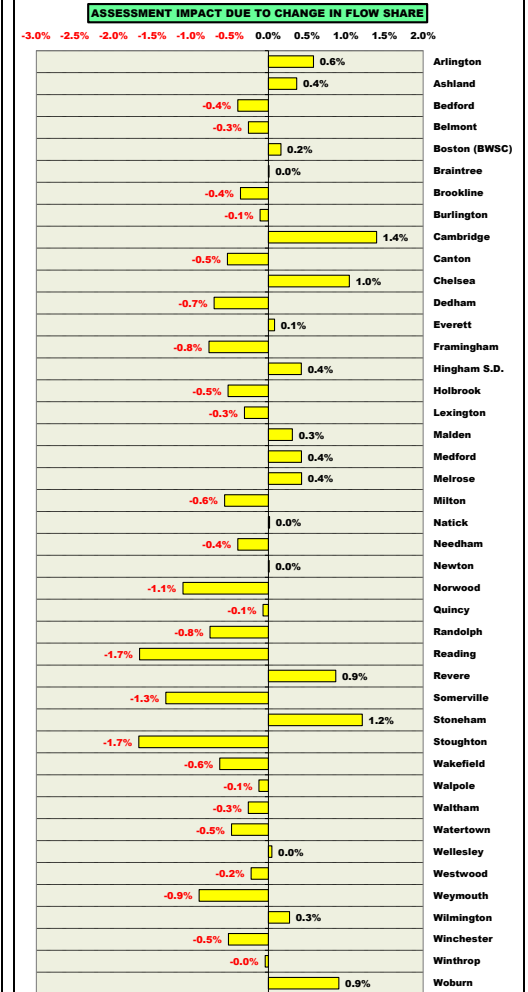
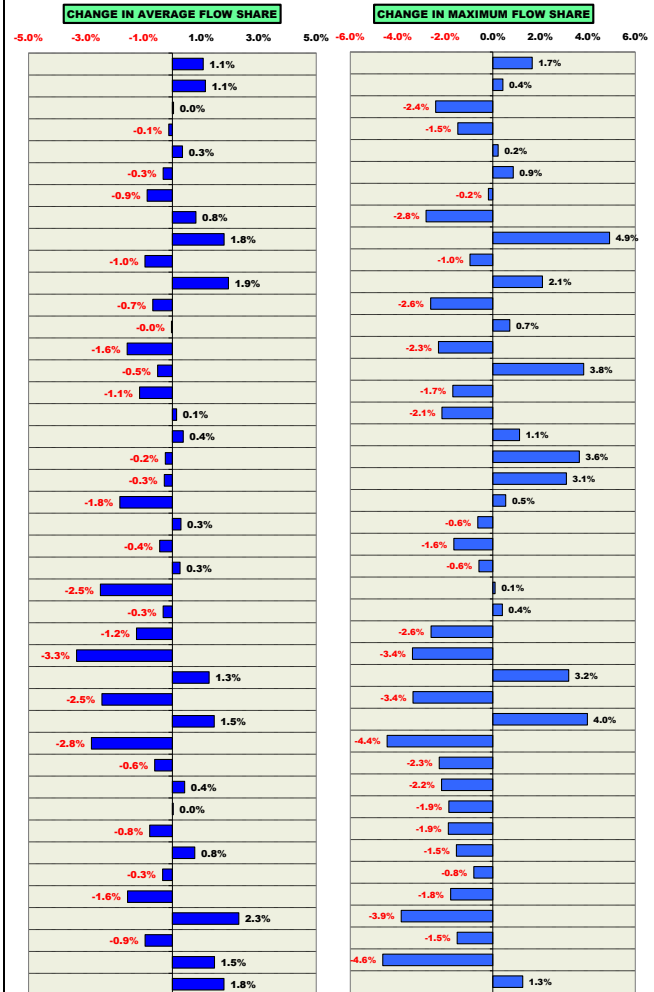
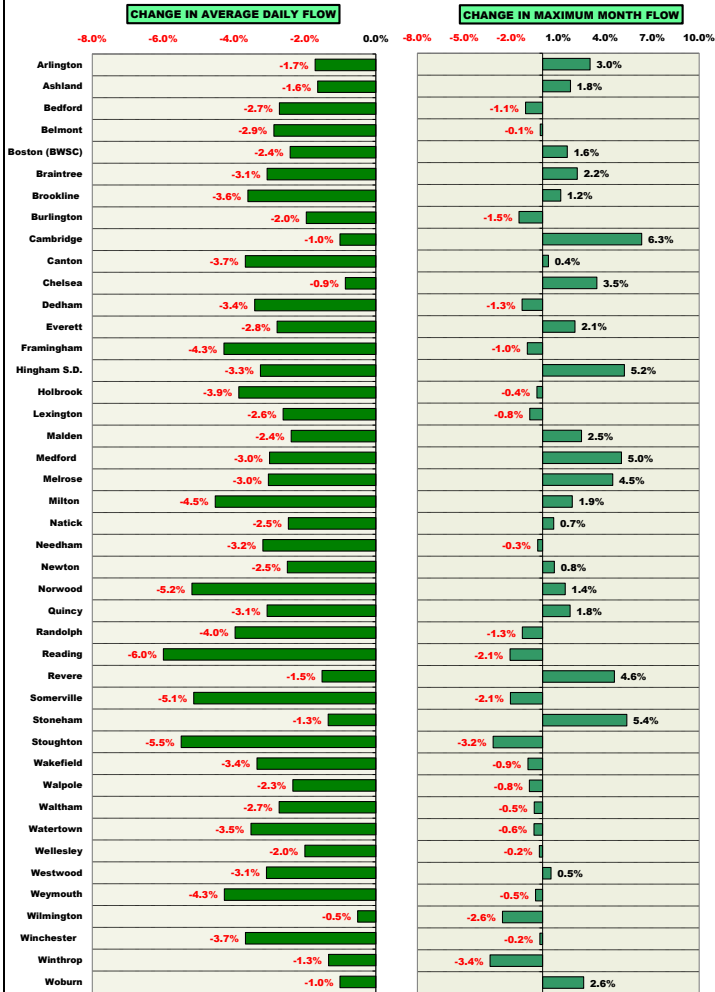
MWRA customers used an average of 195.1 mgd in the 4th quarter (Apr-Jun 2021) of FY2021. This is an increase of 11.3 mgd or 6.2% compared to the 4th quarter of FY2020.

How CY2019-21 Community Wastewater Flows Could Effect FY2023 Sewer Assessments

The flow components of FY2023 sewer assessments will be calculated using a 3-year average of CY2019 to CY2021 wastewater flows compared to FY2022 assessments that will use a 3-year average of CY2018 to CY2020 wastewater flows.

But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the **RELATIVE** change in CY2019 to CY2021 flow share compared to CY2018 to CY2020 flow share, compared to all other communities in the system.

The chart below illustrates the change in the **TOTAL BASE** assessment due to **FLOW SHARE CHANGES**.⁴



¹ MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smoothes the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.
² Based on actual flows for 2018 and 2019, and January to March, and June to December 2020. April & May 2020 based on the average of three prior years, adjusted for 2020 water use. January to December 2021 estimate based on the average of the three prior years.
³ Flow data is preliminary and subject to change pending additional MWRA and community review.
⁴ Represents **ONLY** the impact on the total BASE assessment resulting from the changes in average and maximum wastewater **FLOW SHARES**.

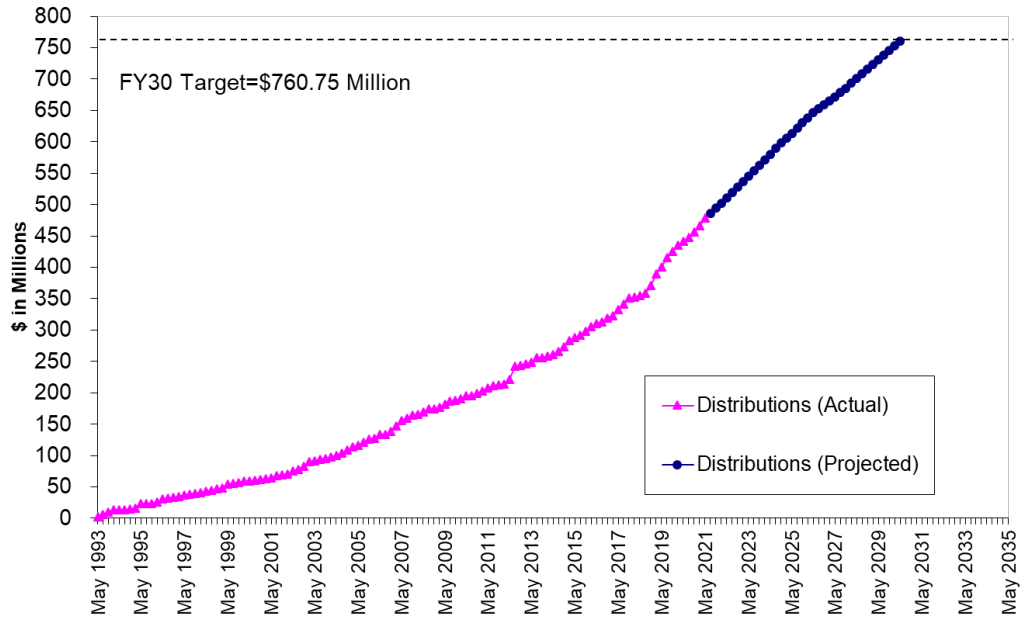
Community Support Programs

4th Quarter – FY21

Infiltration/Inflow Local Financial Assistance Program

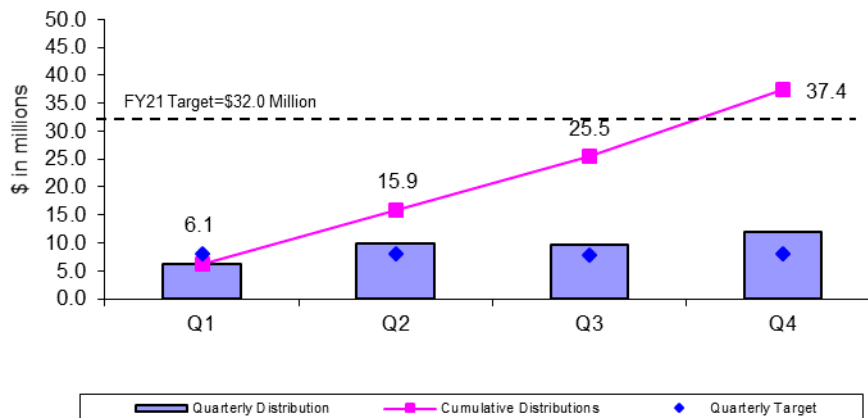
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$760.75 million in grants and interest-free loans (average of about \$20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total \$300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total \$360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. Phase 13 provides an additional \$100 million in ten-year loan-only funds.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 4th Quarter of FY21, \$11.9 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Boston, Malden, Quincy and Watertown. Total grant/loan distribution for FY21 is \$37.4 million. From FY93 through the 4th Quarter of FY21, all 43 member sewer communities have participated in the program and \$478 million has been distributed to fund 629 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY21 Quarterly Distributions of Sewer Grant/Loans

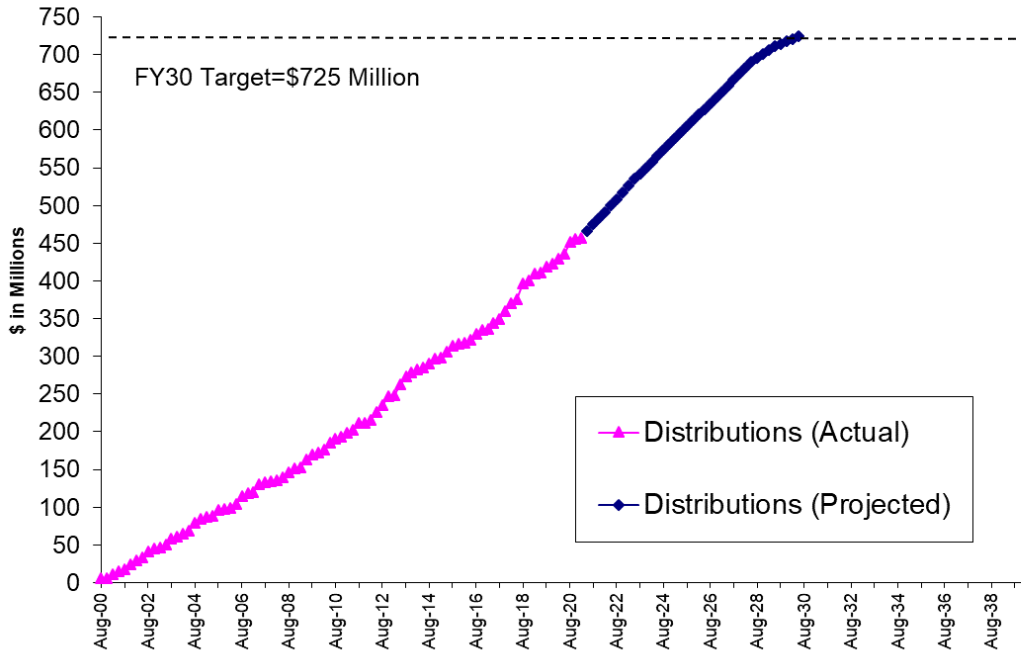


Community Support Programs 4th Quarter – FY21

Local Water System Assistance Program

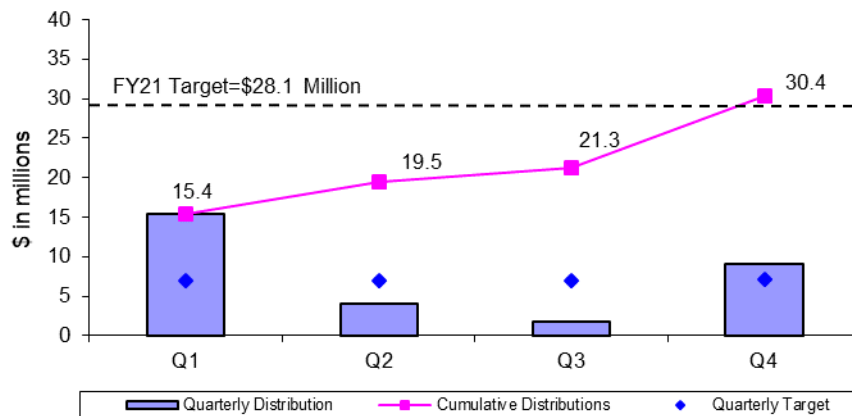
MWRA's Local Water System Assistance Programs (LWSAP) provides \$725 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at \$222 Million, Phase 2 at \$210 Million, and Phase 3 at \$293 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with \$222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 4th Quarter of FY21, \$9.1 million in interest-free loans was distributed to fund local water projects in Arlington, Boston, Dedham Westwood Water District, Marblehead, Revere, and Watertown. Total loan distribution for FY21 is \$30.4 million. From FY01 through the 4th Quarter of FY21, \$467 million has been distributed to fund 486 local water system rehabilitation projects in 43 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY21 Quarterly Distributions of Water Loans



Community Support Programs 4th Quarter – FY21

Lead Service Line Replacement Loan Program

By its vote on March 16, 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to \$100 million in 10-year zero-interest loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is also referenced as the Lead Loan Program or LLP. Each community can develop its own program, tailored to their local circumstances. MWRA's goal in providing financial assistance to member communities is to improve local water systems so that the high quality water MWRA delivers can make it all the way to the consumer's tap. The presence of a lead service line connecting a home to the main in the street can lead to elevated lead levels in tap water, especially if that water sits stagnant for an extended period. MWRA's stable water quality and effective corrosion control treatment reduce the risk that a lead service line will cause elevated lead levels, and measured lead levels in high risk homes have decreased by 90 percent since corrosion control was brought on-line in 1996. However, the risk of elevated levels remains as long as lead service lines are in use.

FY17 was the first year of the Lead Service Line Replacement Loan Program – MWRA made three Lead Loans.

FY18 was the second year of the Lead Loan Program - MWRA made five Lead Loans.

FY19 was the third year of the Lead Loan Program - MWRA made four Lead Loans.

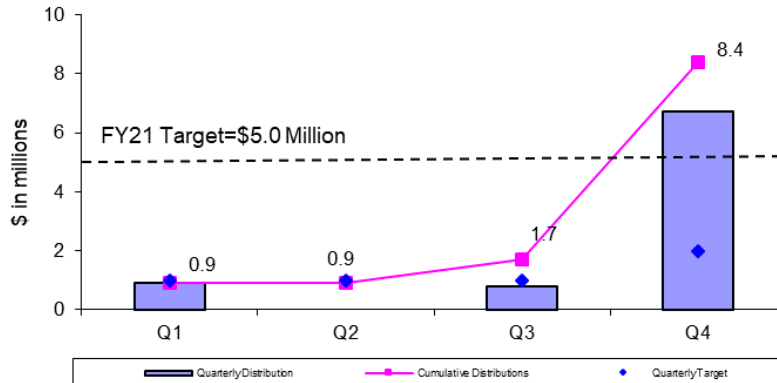
FY20 was the fourth year of the Lead Loan Program - MWRA made eight Lead Loans.

FY21 is the fifth year of the Lead Loan Program – MWRA made seven Lead Loans.

Summary of Lead Loans:

Watertown in FY21	\$0.6 Million
Marlborough in FY21	\$2.0 Million
Everett in FY21	\$1.5 Million
Boston in FY21	\$2.6 Million
Winthrop in FY21	\$0.8 Million
Chelsea in FY21	\$0.3 Million
Winchester in FY21	\$0.6 Million
Everett in FY20	\$0.5 Million
Marlborough in FY20	\$1.0 Million
Winchester in FY20	\$0.6 Million
Winthrop in FY20	\$0.7 Million
Weston in FY20	\$0.2 Million
Everett in FY20	\$1.0 Million
Somerville in FY20	\$0.9 Million
Chelsea in FY20	\$0.3 Million
Marlborough in FY19	\$1.0 Million
Winthrop in FY19	\$0.5 Million
Chelsea in FY19	\$0.1 Million
Everett in FY19	\$1.0 Million
Needham in FY18	\$1.0 Million
Winchester in FY18	\$0.5 Million
Revere in FY18	\$0.2 Million
Winthrop in FY18	\$0.3 Million
Marlborough in FY18	\$1.0 Million
Newton in FY17	\$4.0 Million
Quincy in FY17	\$1.5 Million
Winchester in FY17	\$0.5 Million
TOTAL	\$25.2 Million

FY21 Quarterly Distributions of Lead Service Line Replacement Loans

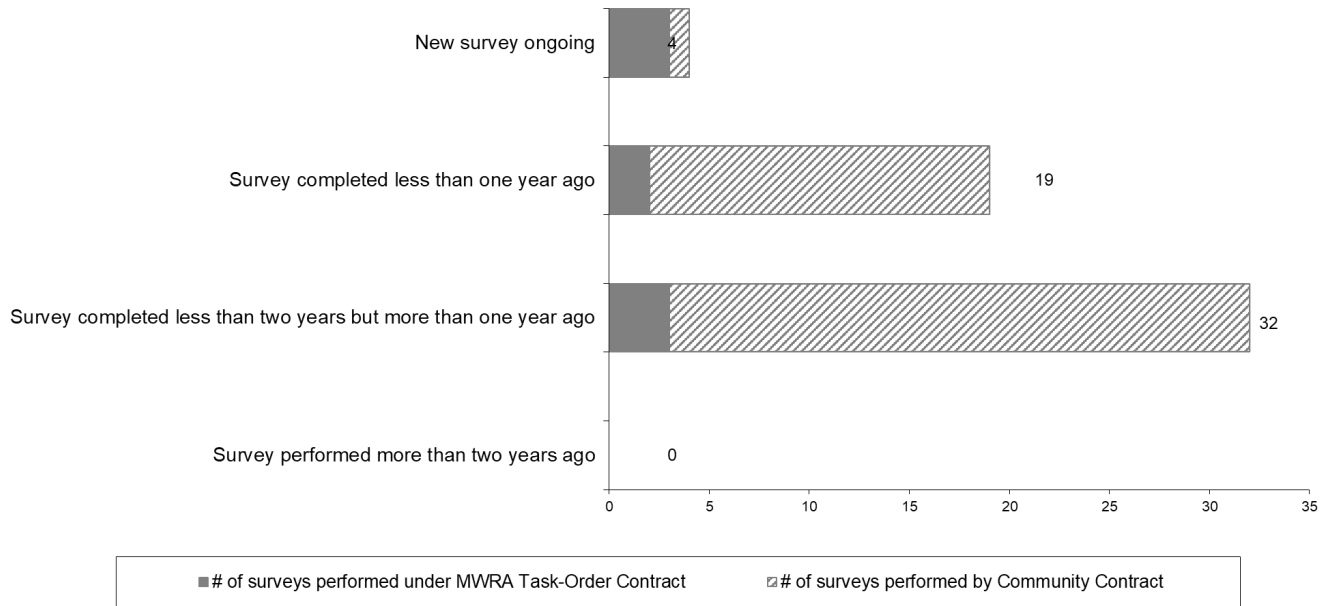


Community Support Programs

4th Quarter – FY21

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA’s task order leak detection contract. MWRA’s task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 4th Quarter of FY21, all member water communities were in compliance with MWRA’s Leak Detection Regulation.



Community Water Conservation Outreach

MWRA’s Community Water Conservation Program helps to maintain average water demand below the regional water system’s safe yield of 300 mgd. Current 5-year average water demand is less than 200 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor - outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program’s annual budget is \$25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	360	10,753	61,917	10,204	83,234
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	880	1,635	3,042	1,157	6,714
Toilet Leak Detection Dye Tablets	_____	293	352	5,008	285	5,938

BUSINESS SERVICES

Procurement: Purchasing and Contracts

4th Quarter - FY21

Background: Goal is to process 85% of Purchase Orders and 80% of Contracts within Target timeframes.

Outcome: Processed 95% of purchase orders within target; Average Processing Time was 4.41 days vs. 4.57 days in Qtr 4 of FY20. Processed 76% (13 of 17) of contracts within target timeframes; Average Processing Time was 138 days vs. 193 days in Qtr 4 of FY20.

Purchasing



	No.	TARGET	PERCENT IN TARGET
\$0 - \$500	573	3 DAYS	92.8%
\$500 - \$2K	584	7 DAYS	95.1%
\$2K - \$5K	417	10 DAYS	96.8%
\$5K - \$10K	37	25 DAYS	91.8%
\$10K - \$25K	43	30 DAYS	88.3%
\$25K - \$50K	14	60 DAYS	85.7%
Over \$50K	35	90 DAYS	91.4%

The Purchasing Unit processed 1703 purchase orders, 355 more than the 1348 processed in Qtr 4 of FY20 for a total value of \$11,880,029 versus a dollar value of \$10,674,862 in Qtr 4 of FY20.

Contracts, Change Orders and Amendments

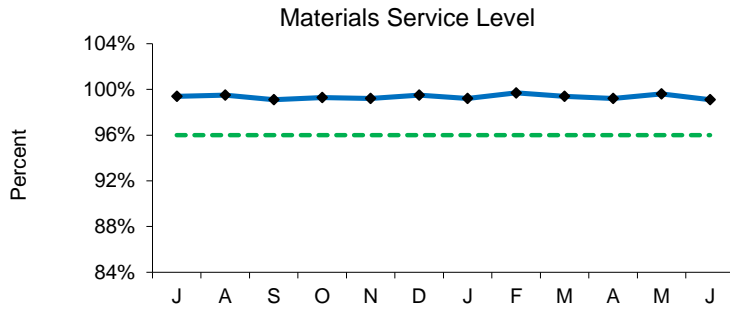
Procurement processed seventeen contracts with a value of \$7,712,896 and six amendments with a value of \$1,490,534. Eighteen change orders were executed during the period. The dollar value of all non-credit change orders during Q4 FY21 was \$883,104 and the value of credit change orders was (\$1,286,604).

Four contracts were not processed within the target timeframes. The first contract was delayed due to delays by the contractor obtaining the required signatures to execute the contract based on the signatory's remote work situation and availability. Another contract was delayed due to the extension of the proposal due date to accommodate the bid document release schedule of the associated construction project (7117). A third contract was delayed due to changes to the RFQ/P requirements, timeline and costs in addition to delays in receiving insurance certificates and a MA Foreign Corp Certificate due to COVID-19 circumstances. The final contract was delayed due to administrative delays during the contract execution due to COVID-19 circumstances.

Staff reviewed 29 proposed change orders and 29 draft change orders.

Materials Management

4th Quarter - FY21



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,612 (99.3%) of the 7,665 items requested in Q4 from the inventory locations for a total dollar value of \$464,652.

Inventory Value - All Sites

Inventory goals focus on:

- Maintaining optimum levels of consumables and spare parts inventory
- Adding new items to inventory to meet changing business needs
- Reviewing consumables and spare parts for obsolescence
- Managing and controlling valuable equipment and tools via the Property Pass Program

The FY21 goal is to reduce consumable inventory from the July '20 base level (\$8.8 million) by 2.0% (approximately \$176,369), to \$8.6 million by June 30, 2021 (see chart below). This goal has been achieved. Consumable inventory reduction amounted to \$230,553, a value of \$54,184 over the goal.

Items added to inventory this quarter include:

- Deer Island – gauges, pressure transmitters, controllers, interface communication, actuators, temperature sensor assembly, and temperature metering pump and temperature modules for I&C; level transmitter for Residuals; pump for Power & Pump; safety harnesses, weed killer, eyewash station, lamps, filters and flush valves for entire plant.
- Chelsea – filters, hoses and sample probes for Safety; snow plow modules and harnesses, fuses, filters, fittings, brake pads and rotors and ignition coils for Fleet Service; conveyors, motor controllers and recorders for Work Coordination; bends for Pipeline; frames and covers for Water Operations & Maintenance; syringe filters for TRAC; padlock keys for FOD.
- Southboro – no items were added this quarter for Southboro.

Property Pass Program:

- Eleven audits were conducted during Q4.
- Scrap revenue received for Q4 amounted to \$25,476. Year to date revenue received amounted to \$64,958.
- Revenue received from online auctions held during Q4 amounted to \$42,024. Year to date revenue received amounted to \$284,470.

Items	Base Value July-20	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,818,459	8,587,906	-230,553
Spare Parts	8,797,946	9,160,439	362,493
Total	17,616,405	17,748,345	131,940

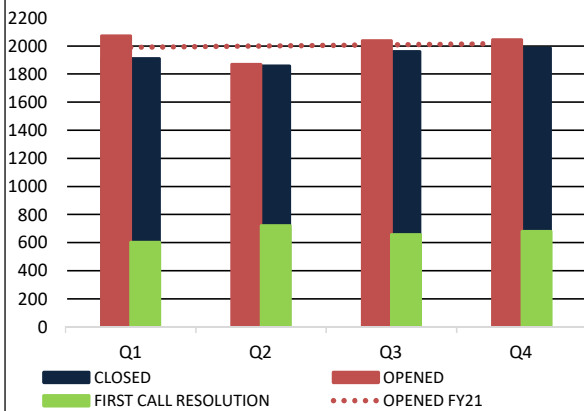
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

MIS Program

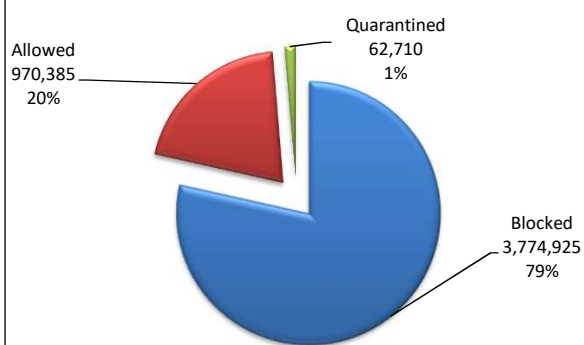
Fourth Quarter – FY21

Numbers & Statistics

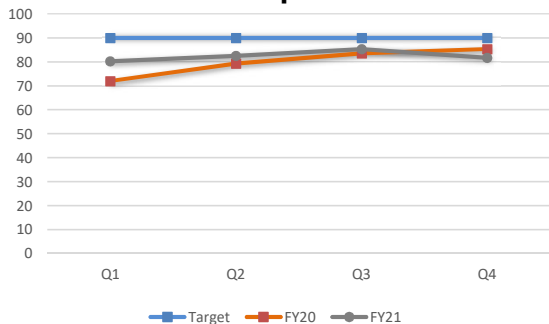
Monthly Call Volume



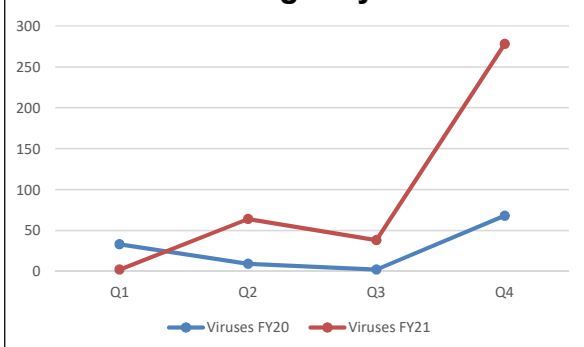
Emails Received: 4,808,020



PC Compliance



Viruses Caught by McAfee



Project Updates

Infrastructure & Security

AWIA Risk and Resiliency Assessment: Remediation work to resolve vulnerabilities continued. At the end of the quarter, 64% of the identified tasks were “Completed”; 3% were “In Progress”; and 33% were identified as longer term projects.

Cyber Security Awareness Training: 99% of the assigned 889 employees have completed their assignments. 46% of the additional 270 Water and Wastewater staff that do not use computers regularly have completed their training.

PBX (Telephone System) Upgrade: Bid was awarded to ePlus; Planning for the installation, configuration, and roll-out of the new phones began. Cabling and other required infrastructure upgrades continued through Q4 and will complete in Q1 FY22.

Aquarius: Application has been upgraded to NG (newest version) on a new SQL Server.

New SQL Server: Multiple new 2019 servers that support Tiscor, Lobby TRAC, Telog, and PI installed this quarter.

Deer Island: Upgraded internet circuit from an outdated T1 to a 50 MB.

Digital Signage: Pilot in Chelsea Maintenance building completed successfully. Staff scoping requirements for 7 new locations

Other Software & Custom Applications

COVID Self-Certification: Went live with web app and phone app that allows employees to self-certify they are COVID symptom-free prior to entering the workplace.

ECM/Electronic Document Management: Internal and vendor team kick off meetings held. Started looking at data migration requirements, finalized controlled vocabulary, and had multiple meetings with vendor on infrastructure, records management, and departmental files structures. Exploring standardization of documentation processes and folder hierarchies across Engineering, Construction, DI-TIC and DISC.

MWRA Website Replacement: Preliminary meetings with Procurement for project to upgrade the platform and modernize both the external website and Pipeline.

Learning Management System: Internal staff training complete. Began migration of existing course content into the LMS. Several course catalogs/learning paths (grouping of courses) along with outside license records have been added. Integration with LinkedIn established. Employee and historical data migration continues to be explored.

Visitor Management: Added an additional visitor group to account for unannounced visitors / deliveries. Received go-ahead from business sponsor to begin User Acceptance Testing after successful demo completed. UAT scripts and Job Aids completed.

PIMS Apeon PowerBuilder Upgrade: Installed new PIMS client on updated servers. User Acceptance Testing completed.

Library, Record Center, & Training

Library: Undertook 23 research requests (69 YTD), supplied 21 books for circulation (83 YTD), provided 19 articles (62 YTD), and 12 (145 YTD) standards. The MWRA Library Portal supported 704 end-user searches (2,686 YTD). Research topics include historic drawings of Marlborough, historic drawings of Farm Pond Gatehouse, Schenk’s Dam Toe, EPA-Sen. Grassley letters.

Record Center (RC): The Record Center added 288 (745 YTD) new boxes, handled 584 (1,185 YTD) total boxes, and shredded 10 (42 YTD) 65 gallon bins of confidential documentation on-site. Analysis of scope for document scanning due to building consolidation underway. The RC manager attended 3 (9 YTD) RCB virtual meetings. The RC did 57 (72 YTD) physical box searches for requested information. Requested searches included Tunnel Redundancy information, Litigation, construction projects, HR related items, Walnut Hill and Metro West information.

Training: In Q4, 73 online IT lessons were taken (139 YTD), by 11 employees (33 YTD), spanning 152 hours (244 YTD).

Legal Matters

4th Quarter - FY21

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed seventy-eight (78) 8(m) permits. Finalized Fens Gatehouse Direct Connect Permit 20 09 186DC – MWRA's Boston Marginal Conduit.
- **Real Property:** Reviewed property rights, title documents and outlined processes for acquisition of property interests to support MWRA's Tunnel Redundancy Department with the Metropolitan Water Tunnel Program. Reviewed CNY lease with respect to responsibility for damage related to water damage that occurred in Building 39 as a result a failed water tank on January 4, 2021 and drafted response to landlord. Drafted license related to Dorchester Interceptor Rehabilitation Contract 7279. Reviewed Chelsea Lease relative to option to purchase 2 Griffin Way property in Chelsea and reviewed property rights through chain of title documents and title certification for the 2 Griffin Way property. Reviewed requirements for deed restriction at MWRA's Chelsea Headworks. Reviewed MWRA's property rights in the area of 69 Clinton Road in Brookline and in the area of the former Green property, which is adjacent to DITP. Researched Payment in Lieu of Taxes and Applicability to Non-Watershed Property for MWRA. Researched eminent domain taking powers for MWRA and MBTA. Reviewed Wachusett Watershed Fee Acquisition, W-001229 for approximately 36.08 acres in Leominster and Sterling. Reviewed proposed realignment of water easement for MWRA's Northern Intermediate High Section 89 water main located in the area of 2 Hill Street, Woburn as it relates to housing development and MWRA Contract 7117 - Northern Intermediate High Section 89 Replacement Pipeline. Reviewed Sudbury Aqueduct property rights in area of 1058 and 1062 Beacon Street in Newton, MWRA's property rights in area of Norumbega covered storage property, MWRA's property rights in area of Cosgrove intake in Clinton, and easement rights related to proposed traffic lights near Griffin Way in Chelsea. Finalized license related to Dorchester Interceptor Rehabilitation Contract 7279. Reviewed property rights in area of 16 Courtney Road in West Roxbury related to complaint to quiet title, where MWRA is a named party, to determine the origin of a drainage easement. Researched MWRA's property rights in the areas of I90/I95; and reviewed title documents in Waltham, outlined acquisition process for property interest to support MWRA's Metropolitan Water Tunnel Program. Reviewed Chelsea lease and amendments; edited and finalized estoppel certificate. Drafted memorandum of understanding for Section 89 Waterline Replacement Project for MWRA Contract 7117. Reviewed property rights for 2 Hill Street, Woburn and MWRA's easement. Reviewed property rights along Eastern Avenue and Griffin Way, Chelsea for anticipated traffic light signal project. Researched and advised on eminent domain taking powers for MWRA. Drafted conveyance agreement for property disposition to City of Quincy for 2 Cleverly Court. Reviewed property rights for Nash Hill Telecommunication Tower. Reviewed House Bill 3770 and case law on project labor agreements.
- **Public Records Requests:** During the months of April, May and June, MWRA received and responded to one hundred eighty three (183) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

Four demands for arbitration were filed.

A charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of national origin, race, and color, following his non-selection for a promotion.

Matters Concluded

Received an arbitrator's decision in favor of the MWRA following a hearing on a grievance alleging that it violated a collective bargaining agreement when grievant was suspended and demoted for safety violations and making misleading statements.

LITIGATION/CLAIMS

New lawsuits/claims: In re Mercedes-Benz Emissions Litigation,

United States District Court for the District of New Jersey;
16-cv-881 (KM) (ESK)

Law Division has been notified of a class action lawsuit that relates to "Bought or Leased Mercedes-Benz or Sprinter Blue TEC II Diesel Vehicles" that may be eligible for certain cash payments and/or an extended warranty. Six MWRA fleet vehicles qualify for inclusion in the settlement.

DiGregorio, et al. v. Griffin Way, LLC v. MWRA,
C.A. No. 2084-CV-02429-K

On May 18, 2021, MWRA was served with a Third Party Complaint in a personal injury action against Griffin Way, LLC, by a former employee of the MWRA Retirement Board arising out of a slip and fall in the lobby of MWRA's Chelsea facility in September 2019. Plaintiff alleges Griffin Way, as owner of the property, was negligent in failing to keep the property in a safe condition. The Third Party Complaint, in turn, seeks indemnity from MWRA as the tenant of the building. Plaintiff seeks medical and other expenses, as well as a loss of consortium claim by her husband.

Kilgannon v. Boston Water Sewer Commission, et als.,
21 MISC 000240 (MDV)

Plaintiff filed a Quiet Title Action in the Land Court against various parties seeking a declaration that a drainage easement referenced on a 1924 plan of real property owned by him at 16 Courtney Road in West Roxbury has been abandoned and, therefore, extinguished. Staff confirmed that MWRA maintains no assets or infrastructure in or around the location of the property. A Case Management Conference was held on June 4, 2021. All defendants, including MWRA, BWSC and DCR, either assented or did not object to judgment in Plaintiff's favor. The court ordered Plaintiff to file certain motions for appropriate disposition of the case by July 2, 2021.

Closed Cases:

(Former employee) v. MWRA, C.A. No.19-CV-01847

A Stipulation of Dismissal was filed with the court on May 28, 2021. The matter is now closed.

MWRA v. NEL Corp., Dewberry, et al., Suffolk Superior Court C.A. No. 18-CV 01156-BLS1

A Stipulation of Dismissal was filed with the court on June 16, 2021. The matter is now closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of June 2021	As of Mar 2021	As of Dec 2021
Construction/Contract/Bid Protest (other than BHP)	0	1	1
Tort/Labor/Employment	3	4	3
Environmental/Regulatory/Other	3	2	2
Eminent Domain/Real Estate	1	0	0
Total	7	7	6
Other Litigation matters (restraining orders, etc.)	2	2	2
TOTAL – all pending lawsuits	9	9	8
Claims not in suit:	1	1	0
1. Granados MVA Claim			
Bankruptcy	1	1	1
Wage Garnishment	2	2	2
TRAC/Adjudicatory Appeals	0	0	0
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	13	13	11

**Significant
Developments**

There are no new Significant Developments to report.
Closed Claims: There are no closed claims to report.

Subpoenas Wage

During the Fourth Quarter of FY 2021, no subpoenas were received and no subpoenas were pending at the end of the Fourth Quarter FY 2021.

Garnishments

There are two wage garnishment matters that are active and monitored by Law Division.

TRAC/MISC.

New Appeals:

There are no new appeals in the 4th Quarter FY 2021.

**Settlement by
Agreement of
Parties**

There are no Settlements by Agreement of Parties in the 4th Quarter FY 2021.

**Stipulation of
Dismissal**

No Joint Stipulation of Dismissals filed.

**Notice of Dismissal
Fine paid in full**

No Notices of Dismissal, Fine Paid in Full.

**Tentative Decision
Final Decisions**

There are no Tentative Decisions issued in the 4th Quarter FY 2021.
There are no Final Decisions issued in the 4th Quarter FY 2021.

**INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
4th Quarter FY21**

Highlights

During the 4th quarter FY21, Internal Audit (IA) completed a review of Compliance Status of Employees' Mandatory Confined Space Entry Training. IA noted several employees who require confined space entry training are overdue. IA provided several recommendations relating to identifying, tracking and reporting those employees who need required training. Support to staff on Return to Work Guidance continued through May as the Authority prepared for a hybrid work in office/work from home model. An internal review of water and wastewater licenses and certifications is progressing.

In addition, IA completed a true-up of 2020 operating expenses for the HEEC cable, reviewed the Fore River Railroad 2020 tax return, and completed preliminary reviews of 3 professional service contracts while 3 others are in process. IA issued 51 indirect cost rate letters to professional service consultants. Management advisory services included support on the MWRA's leases and recovery of overcharged office supplies is progressing.

Status of Recommendations

During FY21, 10 recommendations were closed.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 36 months, the appropriateness of the recommendation is re-evaluated.

All Open Recommendations Pending Implementation – Aging Between 0 and 36 Months

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Fuel Use & Mileage Tracking (12/31/18)	3	5	8
Asset Tracking – Fleet Data Verification (8/21/19)	1	15	16
Fleet Services Non-Plated Equipment Inspections (3/30/20)	9	6	15
Overhead Crane Inspections (4/28/21)	11	0	11
Compliance Status of Employees' Mandatory Confined Space Entry Training (6/30/21)	8	0	8
Total Recommendations	32	26	58

Cost Savings

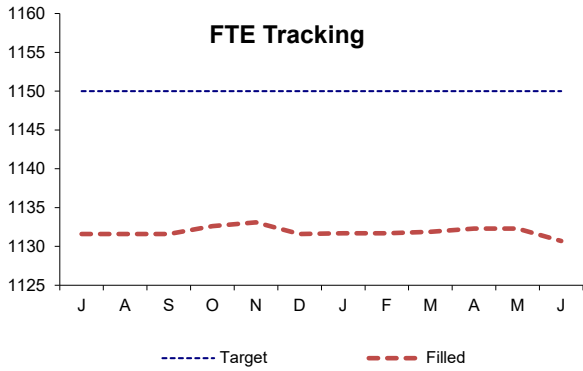
IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY17	FY18	FY19	FY20	FY21 Q4	TOTALS
Consultants	\$272,431	\$118,782	\$262,384	\$643,845	\$563,525	\$1,860,967
Contractors & Vendors	\$3,037,712	\$1,323,156	\$3,152,884	\$2,097,729	\$1,547,223	\$11,158,704
Internal Audits	\$224,178	\$204,202	\$210,063	\$212,517	\$214,458	\$1,065,418
Total	\$3,534,321	\$1,646,140	\$3,625,331	\$2,954,091	\$2,325,206	\$14,085,089

OTHER MANAGEMENT

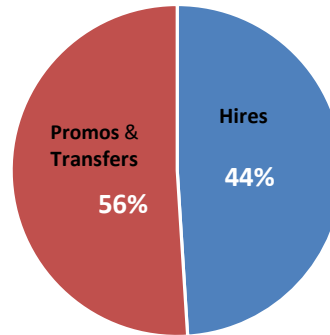
Workforce Management

4th Quarter - FY21

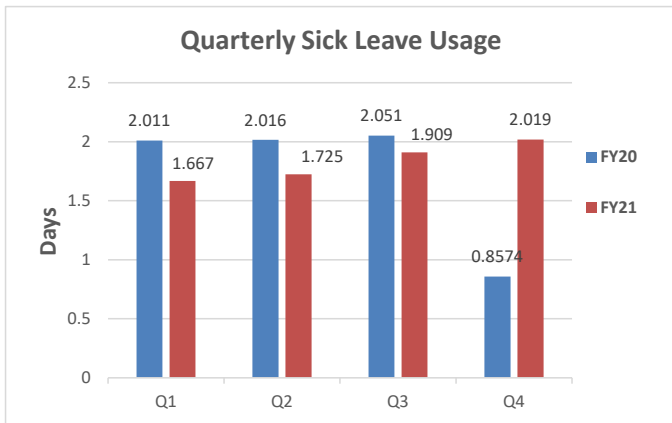


FY21 Target for FTE's = 1150
 FTE's as of June 2021 = 1130.7
 Tunnel Redundancy as of June 2021 = 10.0

Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY19	112 (60%)	76 (40%)	188
FY20	84 (59%)	58 (41%)	142
FY21	81 (56%)	64 (44%)	145

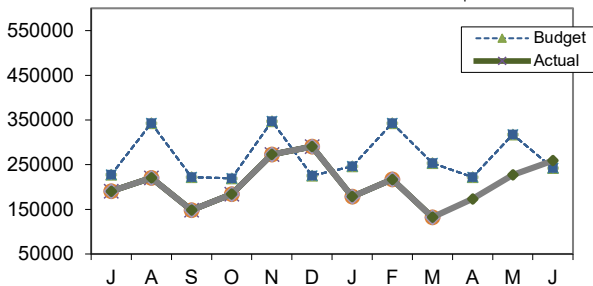


Sick leave usage in 4th Quarter of FY21 is higher than usage in the 4th Quarter of FY20.

	Number of Employees	YTD (usage to date)	Annualized Total	Annual FMLA %	FY20
Admin	141	5.87	5.87	15.6%	6.48
Aff. Action	7	3.60	3.60	0.0%	6.42
Executive	4	4.17	4.17	0.0%	1.81
Finance	35	3.14	3.14	0.0%	4.09
Internal Audit	6	0.90	0.90	0.0%	5.08
Law	12	5.83	5.83	8.9%	6.71
OEP	5	1.33	1.33	0.0%	1.00
Operations	920	7.95	7.95	19.5%	7.27
Tunnel Redundancy	10	1.63	1.63	17.8%	4.93
Public Affairs	11	1.13	1.13	0.0%	7.96
MWRA Avg	1151	7.32	7.32	18.6%	6.94

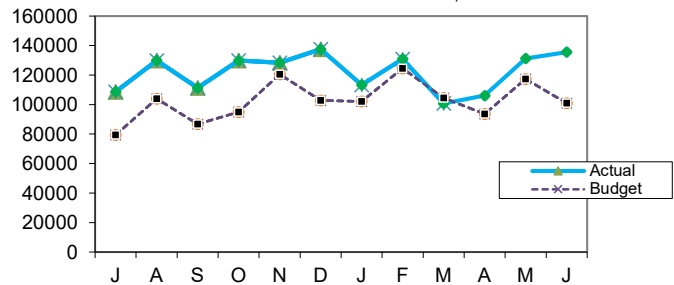
Percent of sick leave usage for FY21 attributable to Family and Medical Leave Act (FMLA) is 18.6%

Field Operations Current Month Overtime \$



Total Overtime for Field Operations for the fourth quarter of FY21 was \$660k which is (\$123k) under budget. Emergency overtime was \$328k, which is (\$77k) under budget. Rain Events totaled \$232k and Emergency Maintenance was \$46k and Emergency Operations was \$2k. Coverage overtime was \$214k which is \$43k over budget, reflecting the quarter's shift coverage requirements. Planned overtime was \$118k, which is (\$86k) under budget with combined spending of \$61k for all Maintenance, \$26k for Planned Operations and \$11k for Training.

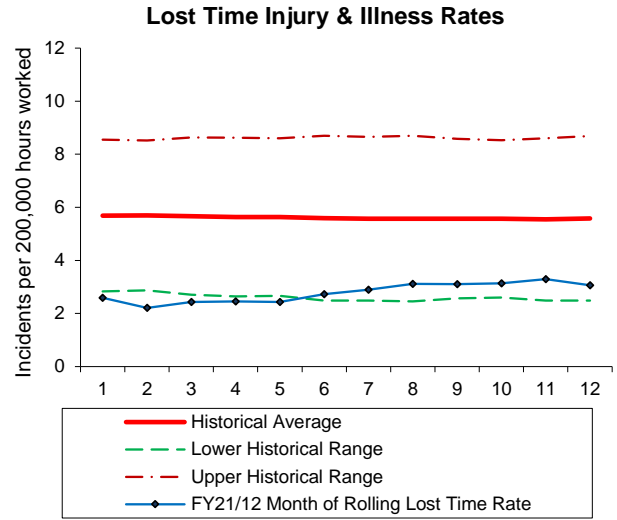
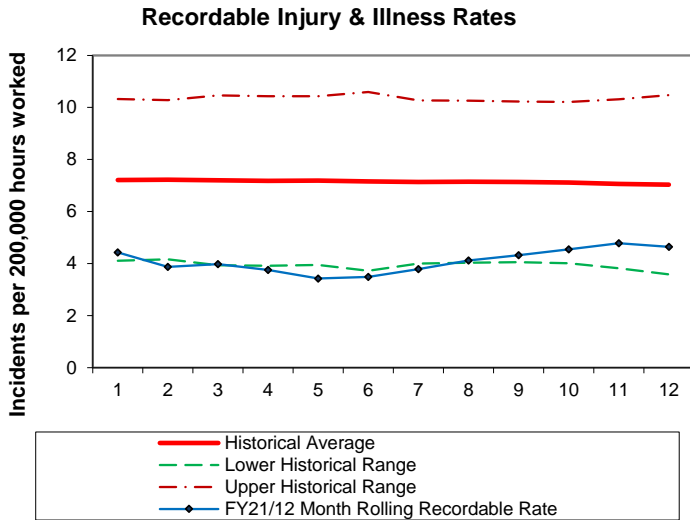
Deer Island Treatment Plant Current Month Overtime \$



Deer Island's total overtime expenditure for the fourth quarter was \$373K, which was \$61K or 19.6% over budget. In the fourth quarter, Deer Island experienced higher than anticipated shift coverage of \$60K and planned/unplanned of \$24K. This was offset by lower than anticipated storm coverage of (\$23K). YTD Deer Island's overtime spending is \$1.3M, which is \$198K or 17.5% over budget due to higher than anticipated shift coverage of \$195K; and planned/unplanned overtime of \$12K. This is offset by lower storm coverage of \$9K. During October, Eversource conducted 4 days of annual maintenance on the HEEC cable which accounted for \$27K of the overspending for the year. COVID-19 related OT has accounted for \$74K of the overspending for the fiscal year.

Workplace Safety

4th Quarter - FY21



- 1 "Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid. Each month this rate is calculated using the previous 12 months of injury data.
- 2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness. Each month this rate is calculated using the previous 12 months of injury data.
- 3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY21. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.
- 4 With Changes in state law, in February 1, 2019, MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses. This increase is causing both the Recordable injury and illness Rate and the Lost Time Injury and Illness rate to trend higher than in past years but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an increase in the OSHA rate while the Workers' Compensation claims are decreasing. Over time, the rise on the charts should stabilize as new data replaces the older data..

WORKERS COMPENSATION HIGHLIGHTS

	4th Quarter Information		Open Claims
	New	Closed	
Lost Time	7	12	59
Medical Only	12	16	19
Report Only	3	3	
	QYTD		FYTD
Regular Duty Returns	7		17
Light Duty Returns	0		0
Indemnity payments as of June 30 2021 included in open claims listed			19

COMMENTS:

Regular Duty Returns

Apr 0 Employees returned to full duty/no restrictions
May 3 Employees returned to full duty/no restrictions
June 4 Employees returned to full duty/no restrictions

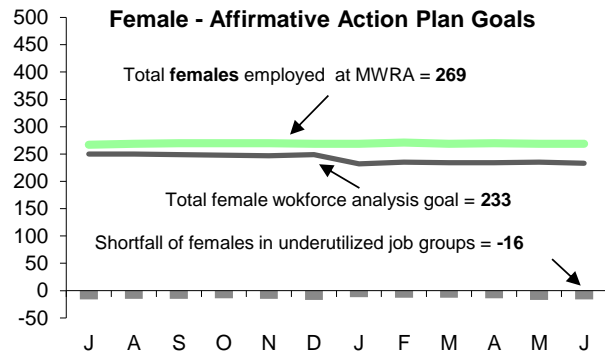
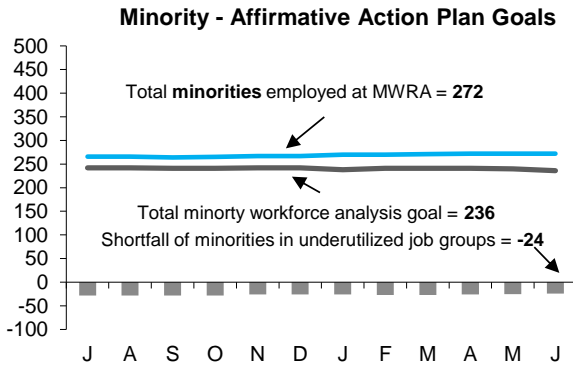
Light Duty Returns

Apr N/A
May N/A
June N/A

Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would only count the claim as opened but not as a new claim. *Report only claims are closed the month they are filed.

MWRA Job Group Representation

4th Quarter - FY21



Highlights:

At the end of Q4 FY21, 5 job groups or a total of 24 positions are underutilized by minorities as compared to 5 job groups for a total of 29 positions at the end of Q4 FY20; for females 5 job groups or a total of 16 positions are underutilized by females as compared to 8 job groups or a total of 17 positions at the end of Q4 FY21. During Q4, 4 minorities and 4 females were hired. During this same period 1 minority and 2 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees	Minorities	Achievement	Minority	Females	Achievement	Female
	as of 6/30/2021	as of 6/30/2021	Level	Over or Under Underutilized	As of 6/30/2021	Level	Over or Under Underutilized
Administrator A	24	3	1	2	12	6	6
Administrator B	24	1	7	-6	7	5	2
Clerical A	30	10	6	4	27	23	4
Clerical B	23	8	6	2	3	7	-4
Engineer A	82	25	18	7	18	20	-2
Engineer B	60	20	16	4	13	9	4
Craft A	115	15	21	-6	0	4	-4
Craft B	139	21	19	2	3	3	0
Laborer	71	22	16	6	5	3	2
Management A	92	22	28	-6	34	19	15
Management B	43	11	9	2	9	10	-1
Operator A	67	5	9	-4	3	2	1
Operator B	68	21	9	12	3	1	2
Professional A	27	4	6	-2	17	12	5
Professional B	174	51	41	10	85	74	11
Para Professional	49	15	10	5	22	22	0
Technical A	57	16	13	3	7	12	-5
Technical B	6	2	1	1	1	1	0
Total	1151	272	236	60/-24	269	233	52/-16

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Administrative B	Director, SCADA, Metering & Monitoring	1	Int./Ext.	1	0	Promo = WM
Administrative B	Director, Western Operations & Maint.	1	Int.	1	0	Promo = WM
Craft A	Sewer Maintenance Supervisor	1	Int.	1	0	Promo = WM
Craft A	M&O Specialist	1	Int./Ext.	1	0	Transfer = WM
Craft A	Specialty Valve Foreman	1	Int.	1	0	Promo = WM
Craft A	Unit Supervisor	1	Int.	1	0	Promo = WM
Craft A	WSS Foreman	1	Int.	1	0	Transfer = WM
Engineer A	Program Manager	1	Int./Ext.	1	0	Promo = WF
Engineer A	Program Manager, Electrical (Chelsea)	1	Int.	1	0	Promo = M
Engineer A	Program Manager, SCADA (Tech)	1	Int./Ext.	1	0	Promo = AM
Engineer A	Senior Engineer	1	Int./Ext.	0	0	NH = WM
Engineer A	Senior Engineer	1	Int./Ext.	1	0	Promo = WF
Management A	Manager, Operations (Wastewater)	1	Int./Ext.	0	0	NH = WM
Operators A	Director, Environmental & Reg Affairs	1	Int.	1	0	Promo = WF

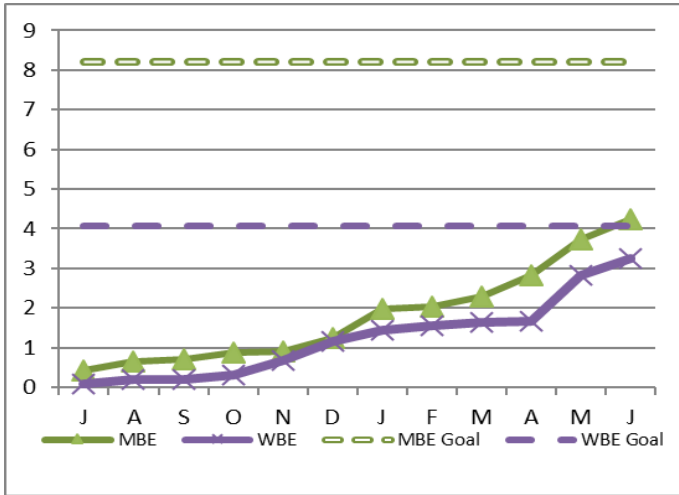
MBE/WBE Expenditures

4th Quarter - FY21

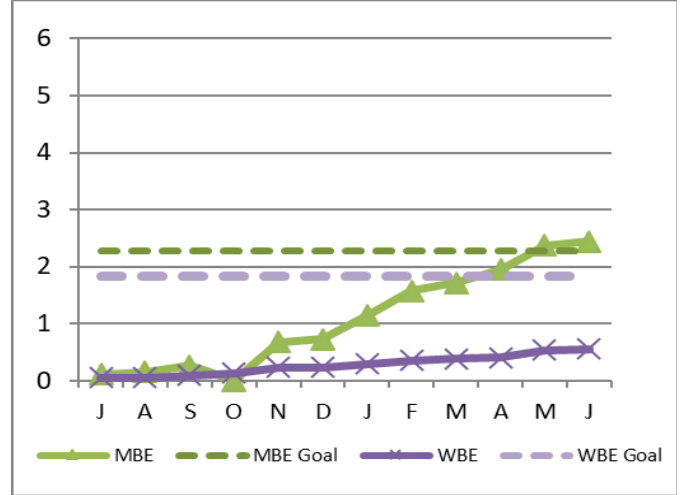
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY21 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

MBE/WBE percentages are the results from a 2002 Availability Analysis, and MassDEP's Availability Analysis. As a result of the Availability Analyses, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through June.

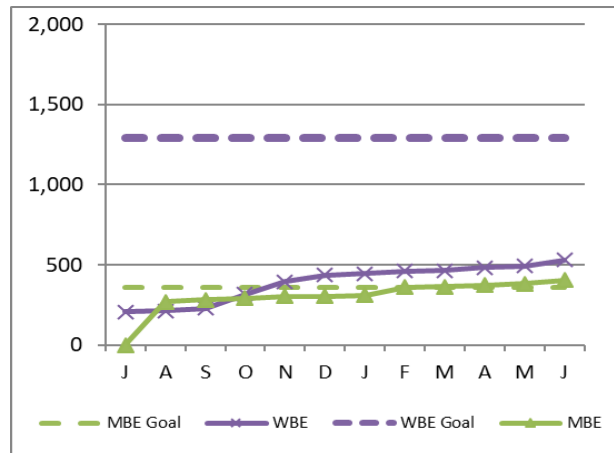
Construction



Professional Services



Goods/Services



FY21 spending and percentage of goals achieved, as well as FY20 performance are as follows:

MBE			
FY21 YTD		FY20	
Amount	Percent	Amount	Percent
4,234,355	51.6%	3,641,145	45.6%
2,439,855	107.0%	2,322,007	111.9%
403,728	113.2%	340,656	94.1%
7,077,938	65.3%	6,303,808	60.5%

WBE			
FY21 YTD		FY20	
Amount	Percent	Amount	Percent
3,238,772	79.3%	2,446,388	61.7%
554,298	30.3%	942,850	56.6%
528,645	40.9%	993,375	81.3%
4,321,715	60.0%	4,382,613	63.9%

Construction
Prof Svcs
Goods/Svcs
Totals

FY21 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY21 CEB Expenses 4th Quarter – FY21

As of June 2021, total expenses are \$778.4 million, \$13.0 million or 1.6% lower than budget, and total revenue is \$793.1 million, \$1.8 million or 0.1% over budget, for a net variance of \$14.7 million.

Direct Expenses are \$239.5 million, \$12.7 million or 5.0% under budget.

- 1
- **Wages & Salaries** are under budget by \$3.1 million or 2.7%. Regular pay is \$3.0 million under budget, due to lower head count, and timing of backfilling positions. YTD through June, the average Full Time Equivalent (FTE) positions was 1,140, twenty-three fewer than the 1,163 FTE's budgeted.
 - **Utilities** are \$2.3 million under budget or 9.6%, driven by Diesel Fuel, which is \$1.3 million under budget, as Deer Island has not yet topped off its tanks. In addition, under spending for Electricity of \$987k of which \$664k is from Deer Island and \$105k is from Water Operations, both due to favorable pricing and lower demand. Lower flows at Deer Island (7.2% under budget) contributed to lower electricity demand. Water Operations is under budget primarily due to lower rates and quantity.
 - **Maintenance** expenses are \$2.0 million under budget or 6.0%, primarily due to the timing of projects.
 - **Other Services** are \$1.3 million under budget or 5.3%, primarily due to under spending for Sludge Pelletization of \$1.1 million due to lower YTD quantities, Grit Screen Removal of \$149k also due to lower YTD quantities, partially offset by higher spending of \$175k for Other Services.
 - **Professional Services** are \$1.0 million under budget or 11.9%, primarily due to under spending for Computer Systems Consultants of \$1.0 million due to timing of several MIS projects and Engineering Services of \$453k, partially offset by overspending on Lab Testing and Analysis of \$439k, which is driven by the Biobot engagement.
 - **Fringe Benefits** are \$708k under budget or 3.2%, primarily due to Health Insurance of \$589k due to lower headcount.
 - **Worker's Compensation** expenses are \$634k under budget or 25.6%, primarily due to Compensation payments reflecting fewer accidents and reduced severity of those accidents.
 - **Overtime** expenses are \$604k under budget or 12.0%, primarily due to reduced need for emergency and planned overtime for maintenance in Field Operations, partially offset by higher spending on DI for shift coverage including Covid-19 coverage and unplanned maintenance including HEEC maintenance.

• **Indirect Expenses** are \$58.9 million, \$1.7 million over budget or 2.9%. The HEEC cable costs totaled \$10.2 million through June, \$3.0 million above budget as revised costs for the new HEEC Cable. Watershed Reimbursements were \$577k under budget reflecting lower operating costs and combined with Pension Expense which was \$1.0 million below budget combined to partially offset HEEC overspending. The pension contribution requirement was revised in response to the most recent actuarial valuation report's funding schedule which reduced pension expense by \$1.0 million for FY21.

Capital Finance Expenses totaled \$480.0 million and was \$1.9 million or 0.4% below budget after the impact of the spring defeasance. Surplus was a result of lower than budget variable interest expense of \$9.9 million due to lower interest rates combined with lower SRF spending of \$9.2 million due to bond issue timing, lower Water Pipeline CP of \$5.1 million due to lower than budgeted interest rates, offset by higher Senior Debt of \$22.3 million, as a result of defeasance expenditures of \$25.6 million.

Revenue and Income –

Total Revenue and Income is \$793.1 million, \$1.8 million over budget. Other Revenue of \$8.6 million was over budget by \$2.5 million, reflecting receipt of \$1.3 million from the Commonwealth for Debt Service Assistance. Also, higher energy revenue of \$505k, income from the disposal of equipment of \$317k, and miscellaneous revenue of \$231k. This revenue gain was reduced by lower investment income. Investment income totaled \$4.2 million, \$926k million under budget due to lower than budgeted interest rates (0.47% vs 0.68%) slightly offset by higher than budgeted average balances.

	Jun 2021 Year-to-Date			
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	\$ 112,919,298	\$ 109,857,067	\$ (3,062,231)	-2.7%
OVERTIME	5,019,295	4,415,142	(604,153)	-12.0%
FRINGE BENEFITS	22,402,224	21,694,636	(707,588)	-3.2%
WORKERS' COMPENSATION	2,476,655	1,842,853	(633,802)	-25.6%
CHEMICALS	12,091,255	11,652,051	(439,204)	-3.6%
ENERGY AND UTILITIES	24,200,847	21,887,023	(2,313,824)	-9.6%
MAINTENANCE	32,618,569	30,660,795	(1,957,774)	-6.0%
TRAINING AND MEETINGS	405,264	150,787	(254,477)	-62.8%
PROFESSIONAL SERVICES	8,377,283	7,377,648	(999,635)	-11.9%
OTHER MATERIALS	6,706,916	6,272,620	(434,296)	-6.5%
OTHER SERVICES	24,983,777	23,656,946	(1,326,831)	-5.3%
TOTAL DIRECT EXPENSES	\$ 252,201,383	\$ 239,467,568	\$ (12,733,817)	-5.0%
INSURANCE	\$ 3,059,218	\$ 3,361,487	\$ 302,269	9.9%
WATERSHED/PILOT	26,422,138	25,844,695	(577,443)	-2.2%
HEEC PAYMENT	7,215,200	10,189,727	2,974,527	41.2%
MITIGATION	1,692,344	1,652,058	(40,286)	-2.4%
ADDITIONS TO RESERVES	1,815,077	1,815,077	-	0.0%
RETIREMENT FUND	11,000,000	10,000,000	(1,000,000)	-9.1%
POST EMPLOYEE BENEFITS	6,065,490	6,065,490	-	0.0%
TOTAL INDIRECT EXPENSES	\$ 57,269,467	\$ 58,928,534	\$ 1,659,067	2.9%
STATE REVOLVING FUND	\$ 97,811,162	\$ 88,657,488	\$ (9,153,674)	-9.4%
SENIOR DEBT	258,730,904	281,064,031	22,333,127	8.6%
DEBT SERVICE ASSISTANCE	-	-	-	---
CURRENT REVENUE/CAPITAL	16,200,000	16,200,000	-	0.0%
SUBORDINATE MWRA DEBT	96,339,598	96,339,598	-	0.0%
LOCAL WATER PIPELINE CP	5,686,864	545,023	(5,141,841)	-90.4%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%
VARIABLE DEBT	-	(9,915,154)	(9,915,154)	---
DEFEASANCE ACCOUNT	-	-	-	---
DEBT PREPAYMENT	3,900,000	3,900,000	-	0.0%
TOTAL CAPITAL FINANCE EXPENSE	\$ 481,885,588	\$ 480,008,046	\$ (1,877,542)	-0.4%
TOTAL EXPENSES	\$ 791,356,438	\$ 778,404,148	\$ (12,952,292)	-1.6%
REVENUE & INCOME				
RATE REVENUE	\$ 769,385,000	\$ 769,385,000	\$ -	0.0%
OTHER USER CHARGES	9,208,367	9,443,294	234,927	2.6%
OTHER REVENUE	6,095,403	8,578,511	2,483,108	40.7%
RATE STABILIZATION	1,500,000	1,500,000	-	0.0%
INVESTMENT INCOME	5,167,668	4,242,037	(925,631)	-17.9%
TOTAL REVENUE & INCOME	\$ 791,356,438	\$ 793,148,842	\$ 1,792,404	0.1%

Cost of Debt

4th Quarter – FY21

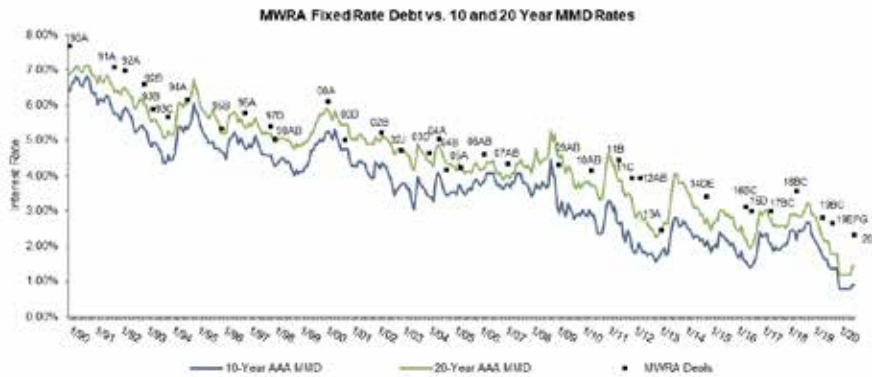
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt (\$3.40 billion)	3.39%
Variable Debt (\$330.7million)	0.49%
SRF Debt (\$894.1 million)	1.60%
Weighted Average Debt Cost (\$4.63 billion)	2.84%

Most Recent Senior Fixed Debt Issue August 2020

2020 Series B (\$160.0 million) 2.33 %

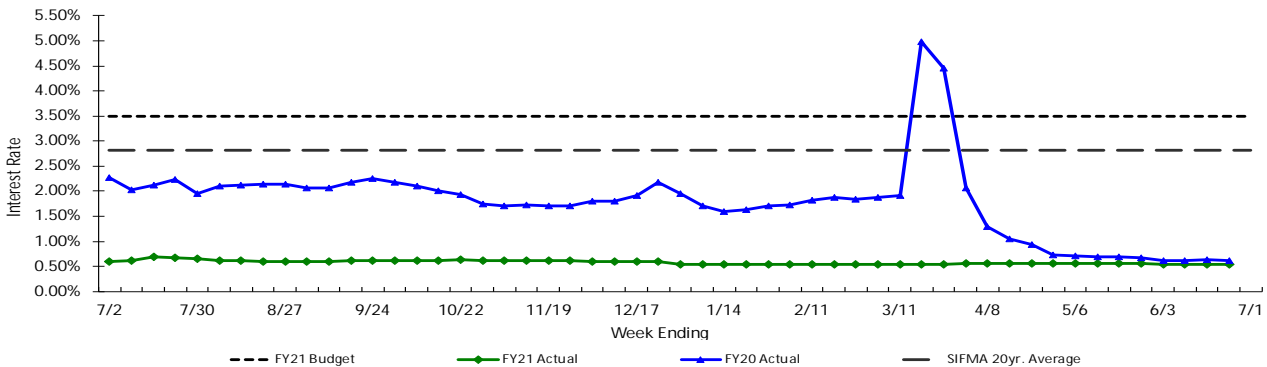


Bond Deal	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB
Rate	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%
Avg Life	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs

Bond Deal	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B
Rate	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%	2.82%	2.66%	2.33%
Avg Life	15.4 yrs	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs	11.7yrs	11.9yrs	9.73 yrs.	15.6 yrs

Weekly Average Variable Interest Rates vs. Budget

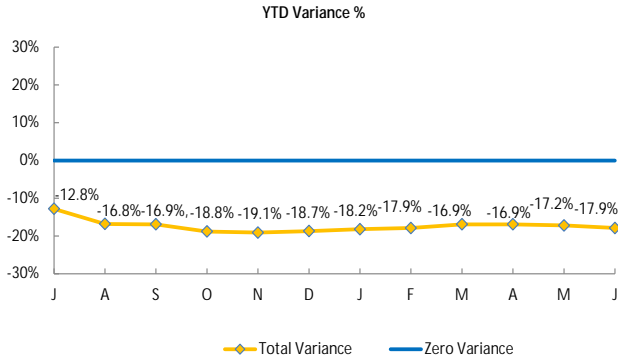
MWRA currently has ten variable rate debt issues with \$596.6 million outstanding, excluding commercial paper. Of the ten outstanding series, four have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In June, the SIFMA rate was 0.03% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



Investment Income

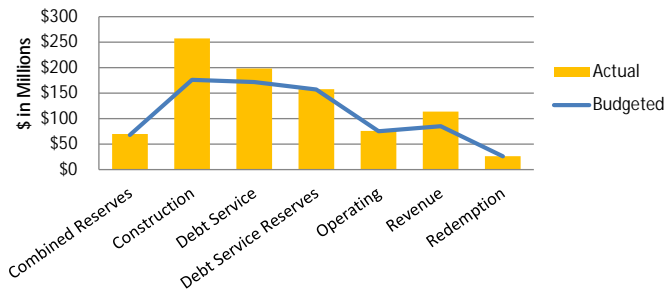
4th Quarter – FY21

Year To Date

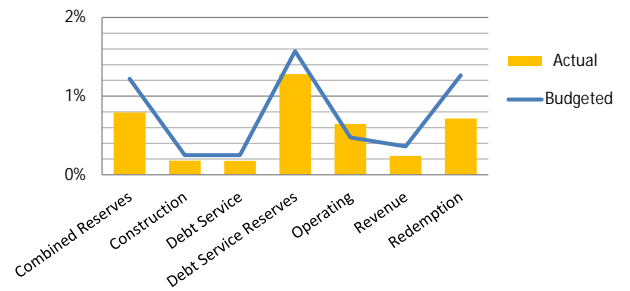


	YTD BUDGET VARIANCE			
	(\$000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	\$24	(\$301)	(277)	-33.3%
Construction	\$203	(\$183)	19	4.4%
Debt Service	\$67	(\$144)	(78)	-18.1%
Debt Service Reserves	\$7	(\$458)	(451)	-18.3%
Operating	\$3	\$37	40	11.3%
Revenue	\$104	(\$139)	(35)	-11.4%
Redemption	\$1	(\$145)	(145)	-43.4%
Total Variance	\$407	(\$1,333)	(\$926)	-17.9%

YTD Average Balances Budgeted vs. Actual



YTD Average Interest Rate Budgeted vs. Actual

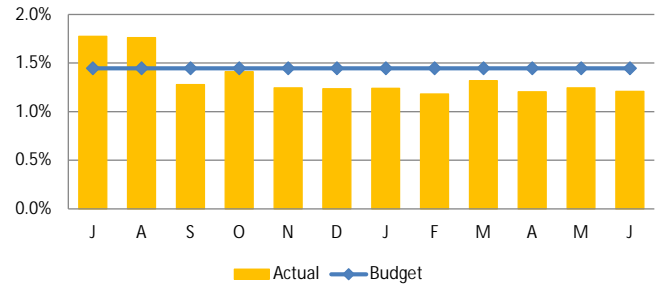


Monthly

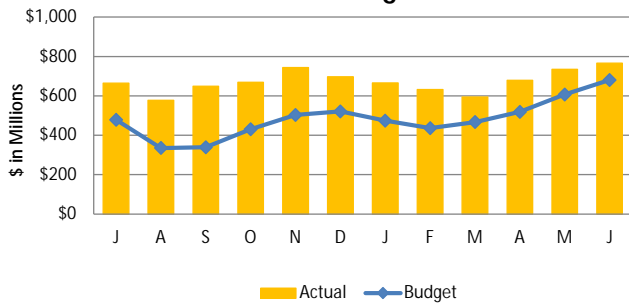
Short -Term Interest Rates



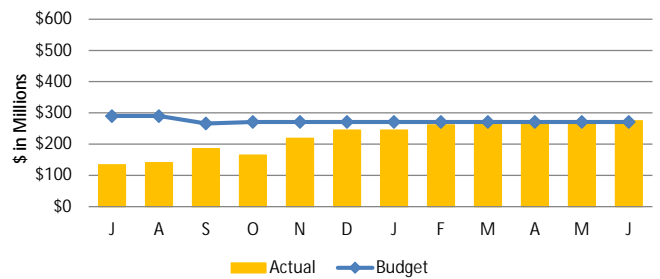
Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances



APPENDIX J

GLOSSARY OF FINANCIAL AND OPERATING TERMS

8M permit: Permission granted by MWRA to persons who wish to construct property improvements on land either adjoining or overlapping MWRA property interests. Permission may be conditioned on various operational and/or engineering concerns.

Accrued Costs: Adjustments to paid expenditures to account for materials or services received but for which payment has not yet been made.

Activated Sludge: The sludge that results when primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment.

Advanced Waste Treatment: Wastewater treatment beyond the secondary or biological stage that includes the removal of nutrients such as phosphorus and nitrogen and the removal of a higher percentage of suspended solids and organic matter than primary treatment.

Advisory Board: The agency that represents the interests of MWRA's 61 user communities to the Board of Directors in an advisory capacity in accordance with the provisions of MWRA's Enabling Act. The Advisory Board elects three members of the Board of Directors, reviews and comments on MWRA's CIP and CEB, and approves the addition of new communities to the wastewater and water systems.

Aerobic: In the presence of free oxygen.

Anaerobic: Life or processes such as bacteria that digest sludge that require, or are not destroyed by, the absence of free oxygen.

AOC: Assimilable Organic Carbon - One measure of the "food" available to bacteria within a water system. More complex carbon compounds can become assimilable when oxidized by strong disinfectants.

ARRA: American Recovery and Reinvestment Act of 2009 – principal forgiveness loans distributed based on the Department of Environmental Protection's Intended Use Plan.

Ash: The inert material remaining after the combustion of wastewater sludge. Ash is either wet or dry depending on combustion system design.

Audit: An independent examination of the financial books and records of the organization. Typically, audit refers to the year-end examination and preparation of audited financial statements performed by an outside accounting firm hired under contract.

Bacteria: One-celled microscopic organisms commonly found in the environment. Bacteria can be harmful, such as pathogens, or helpful and perform a variety of biological treatment processes.

BDOC: Biologically Degradable Organic Carbon - Another, more precise, measure of the “food” available to bacteria within a water system.

BGD: Billion gallons per day.

Biofilm: Growth of various bacteria within a water distribution system on the pipe walls. Biofilm growth can contribute to iron corrosion, colored water, poor taste, excessive chlorine demand, and complications with coliform testing.

Blow-off valves: Valves operated during pipeline repair to de-water (drain) a portion of a pipeline.

BOD: Biochemical Oxygen Demand - An indicator of the amount of biodegradable contaminants in wastewater.

Board of Directors: The 11-member governing board of MWRA.

Bond: A general debt obligation. Typically, bonds are issued as a series of bonds of different amounts and interest rates maturing in different years.

Bond Resolution: A document adopted by the Board of Directors that governs MWRA's issuance of revenue bonds and sets forth its obligations to bondholders.

Boston Harbor Project: An extensive plan of activities which MWRA developed and implemented to construct new wastewater treatment facilities in response to a federal court order to comply with the provisions of the U.S. Clean Water Act.

Business Systems Plan (BSP): The strategic planning framework for MWRA’s management information systems. The BSP is updated annually to reflect ongoing business requirements, new opportunities identified by ongoing MWRA strategic planning efforts, technology changes, and user requests.

BWSC: Boston Water and Sewer Commission - The agency responsible for providing water and sewer services to the City of Boston, MWRA’s largest customer.

BWTF: William A. Brutsch Water Treatment Facility – Water treatment plant for the Chicopee Valley Aqueduct communities of Chicopee, South Hadley Fire District #1, and Wilbraham. The facility has a capacity of 24 mgd, and disinfects the water using a combination of UV light and chlorine.

CADD: Computer aided drafting and design.

Capital Improvement Program (CIP): A plan which identifies and estimates the nature, schedule, cost, and financing of long-term assets that MWRA intends to build or acquire during a specific period.

Capital Investment: Development of a facility or other asset that adds to the long-term value of an organization.

Carroll Water Treatment Plant (CWTP): Water treatment facility for waters from Quabbin and Wachusett Reservoirs with capacity of 405 mgd using ozonation as a primary disinfectant and UV as a secondary disinfectant beginning in February 2014.

CCR: Consumer Confidence Report – The 1996 Amendments to the Safe Drinking Water Act required public water suppliers to provide all consumers with an annual Consumer Confidence Report by July 1, 2005. The report includes water quality information and education for the consumer about their publicly supplied drinking water.

CDF: Cosgrove Disinfection Facility

Cathodic Protection: A form of corrosion protection that is particularly effective against galvanic corrosion. Galvanic corrosion occurs when pipe metal is in the presence of other metals while immersed in water. The interaction of these elements causes an electric current to flow away from the pipe, taking electrons with it and pitting the pipe as a result. Cathodic protection reverses the current, thereby stopping the corrosion.

Centrifuge: A machine that uses centrifugal force to separate substances of different densities and remove moisture. MWRA uses centrifuges at the Deer Island Wastewater Treatment Plant to de-water sludge.

CFM: Cubic Feet per Minute - A measure of the quantity of a material flowing through a pipe.

Chloramination: The process of adding chloramine to drinking water. Chloramine, a form of chlorine and ammonia, is used as a residual disinfectant because it lasts longer in the water distribution system than primary disinfectants.

Chloramine: A long lasting residual disinfectant created by combining measured amounts of chlorine and ammonia. Chloramine forms fewer disinfection by-products than chlorine.

Chlorination: The process of adding chlorine to drinking water to inactivate pathogens.

Chlorine: A relatively strong primary disinfectant, effective against bacteria, *giardia*, and viruses, but not *cryptosporidium*. Concerns exist about the health effects of its by-products, some of which are or will be regulated.

Clarifiers: Settling tanks or basins in which wastewater is held for a period of time, during which heavier solids settle to the bottom and lighter materials float to the surface.

Clean Water Act: A law passed by Congress in 1972, and subsequently amended, which sets national standards for pollution reduction, permits discharges from wastewater treatment plants, and promotes achievement of the national goal that all surface waters be "fishable and swimmable."

Cleaning and Lining: Cleaning and cement lining of unlined cast iron water mains to improve hydraulic capacity and extend useful life.

CMMS (Computerized Maintenance Management System): *Maximo* is the computerized maintenance management system which is an essential component of successful asset management. This system is an important tool used in refining the long-term maintenance strategy to ensure proper maintenance and replacement of plant assets.

Co-Digestion Process: Introduction of non-wastewater derived organic waste material into the wastewater anaerobic digestion process. Co-digestion could potentially increase digester gas production which would be utilized for heating and electricity generation at Deer Island.

Coliform bacteria: A group of lactose fermenting bacteria, which while not of direct health concern, are used as a first line indicator of potential problems. See fecal coliform and *E.coli*.

Combined Sewer and Combined Sewer Overflow: While modern systems transport rainwater and sewage from homes and businesses through separate pipes, some older systems like Boston's have "combined" sewers that carry both flows together. During normal conditions flows are delivered to treatment plants. During very heavy rains, these systems become overloaded. Built-in overflows (called combined sewer overflows or "CSOs") must then act as relief points by releasing excess flows into the nearest body of water. This prevents sewage backups into homes and onto area streets, but the discharges can impact water quality.

Comminutor - A machine or process that pulverizes and reduces solids to minute particles.

Commonwealth Debt Service Assistance (DSA): Funds appropriated by the Commonwealth to offset MWRA capital financing expenses.

Community Obligation and Revenue Enhancement (CORE) Fund: A fund established by MWRA's bond resolution that is used to provide insurance against delays by communities in paying charges due to MWRA.

Composting: The process of converting wastewater treatment residuals to a soil-like humus material often used in the horticultural industry. The process involves the aerobic breakdown of the residuals and the addition of sawdust or wood chips.

Corrosion Control: Adjustments to the chemistry of treated water to reduce its ability to dissolve lead, copper, other metals, or form hydrogen sulfide. Corrosion control can include adjustments to pH and alkalinity, as well as the addition of corrosion inhibitors such as phosphates or oxidizers.

Coverage Requirement: Requirement of MWRA's bond resolution which provides that each year, revenue less operating expenses (net revenue) must be more than the amount required for debt service payments on outstanding bonds.

CP (Construction Package): Major construction projects such as the Carroll Water Treatment Plant or the North Dorchester Bay CSO project will group areas of work into individual construction contracts.

Cross-Connection: A point at which potable water piping is connected to a non-potable water source creating an opportunity for the introduction of pollutants into the potable water.

Cryogenic oxygen plant: MWRA operates a cryogenic oxygen-based facility as part of its secondary wastewater treatment program at Deer Island.

Cryptosporidium: A protozoan parasite that can cause severe gastrointestinal disease in healthy individuals, and may be fatal to people with compromised immune systems. Cryptosporidia exist in the environment as hard walled oocysts that are very resistant to chlorination, but can be inactivated by disinfection with ozone or ultraviolet light.

CSO: Combined Sewer Overflow – An overflow point and the discharged flow from a combined sewer system intended to provide hydraulic relief to avoid system flooding and backups during large wet weather events. During large rainstorms, systems can become overloaded, with the excess discharged directly into surface waters. The discharged flow and the discharge location are called CSOs. In the metropolitan Boston area there are approximately 46 active, permitted CSOs that currently discharge into rivers or Boston Harbor.

CSO Facilities: MWRA has six facilities that intercept the flow from CSO pipes. Four of these facilities provide treatment and two provide storage prior to discharge. The CSO facilities have some capacity to store flow and pump it to the Deer Island plant after rainstorms end.

CT: Concentration x Contact Time - A measure of disinfection effectiveness established under the Surface Water Treatment Rule. CT is the product of the concentration of disinfectant [C] and the time it has been in contact with the water [T]. Required CT varies by type of disinfectant, organism, temperature, and pH.

CTG (Combustion Turbine Generator): CTGs are used to generate electricity during planned cable outages, wet weather operations and for participation in price response events.

Current Expense Budget: A financial plan that estimates the revenues and expenses associated with MWRA's operations for a fiscal year.

C-Value: The carrying capacity of a water main for a specified length and pressure drop that is determined by its diameter and resistance to flow. The friction coefficient "C" of the main is often used as a measure of flow resistance. C-values for new pipe are about 120 for water mains that are 6 to 16-inches in diameter, and 130 and 140 for larger diameter mains.

DAF: Dissolved Air Flotation - A process of adding super saturated air into water to cause coagulated solids to rise to the top to be skimmed off. DAF replaces conventional gravity sedimentation (clarification) and is particularly cost-effective for low turbidity waters subject to periodic algae blooms.

DBP: Disinfection By-products - Complex compounds formed by the use of oxidizing agents such as chlorine or ozone in waters containing organic matter.

D/DBP Stage 1: Disinfectants/Disinfection By-products, Stage 1 Rule - Promulgated 11/1998, and effective 1/2002, this rule set DBP limits at 80 parts per billion for Trihalomethanes and 60 parts per billion for Haloacetic Acids, averaging all samples over four quarters.

D/DBP Stage 2: Disinfectants/Disinfection By-products Stage 2 Rule - The rule further regulates the amount of DBPs allowed in water. The 80/60 values set in Stage 1 will now apply to each individual sample location in a "Locational Running Annual Average".

Debt Service: In a given fiscal year, the amount of money necessary to pay interest and principal on outstanding notes and revenue bonds.

Defeasance: The setting aside of cash or securities sufficient to make debt service payments allowing the reduction of the debt amount to the liabilities of a balance sheet and the reduction of the debt service amount to the Current Expense Budget.

DEP: Department of Environmental Protection - The Massachusetts agency that regulates water pollution control, water supplies, and waterways and dispenses federal and state grant funds to support these activities.

Department: A sub-unit of an MWRA division.

Department of Conservation and Recreation (DCR): Created in 2003 through the merger of the Metropolitan District Commission and the Department of Environmental Management, DCR manages the Commonwealth's diverse parks system and protects and enhances natural resources and outdoor recreational opportunities throughout Massachusetts.

De-watering: The process of removing water from wastewater treatment residuals. De-watered sludge has the appearance of mud or wet soil material.

Diffusers: A system of shafts, rising from the end of MWRA's effluent outfall tunnel to the seabed, which disperses treated wastewater over a large area. Technically, the diffusers are the "sprinkler heads" mounted on top of the riser shafts that lead from the outfall tunnel and disperse wastewater into Massachusetts Bay.

Digesters: Tanks for the storage and anaerobic or aerobic decomposition of organic matter present in sludge.

Direct Program Expenses: Costs directly associated with providing services or performing activities.

Disinfection, Primary: The inactivation (killing) of pathogenic organisms in a water system by the use of chemical or other disinfection agents.

Disinfection, Residual: The presence of a measurable residual of disinfectant within a water distribution system to help control bacterial re-growth and guard against contamination.

Dissolved Oxygen (DO): A measure of the amount of oxygen in a given amount of water. Adequate levels of DO are needed to support aquatic life. Low dissolved oxygen concentrations can result from inadequate wastewater treatment.

Division: A major organizational unit within MWRA, encompassing the activities and resources for providing a major service or function.

DLS (Department of Laboratory Services): Laboratory Services is a full service analytical testing and consulting group within the MWRA that primarily serves client groups primarily within the Operations Division. The analytical services that Laboratory Services provides include wet chemistry, metals, organics, and microbiology testing. Related services include field sampling, technical consultation, and contract laboratory management.

DMR (Discharge Monitoring Report): Monthly reports that are submitted to federal and state regulators. MWRA monitors the effluent (treated sewage) that is discharged into Massachusetts Bay, to ensure that it meets the standards set out in the NPDES permit. Analytical support to the effluent monitoring program is provided by the Department of Laboratory Services.

E.coli: A normal inhabitant of the digestive tract of mammals. The presence of *E.coli* indicates probable contamination by fecal matter.

Effluent: Treated wastewater discharged from a treatment plant.

EIR: Environmental Impact Report – A document prepared in adherence with the Massachusetts Environmental Policy Act (MEPA) to review the environmental impact of projects and ensure opportunities for public review and comment.

EIS: Environmental Impact Statement – A document prepared in adherence with the National Environmental Policy Act to review the environmental impact of projects and ensure opportunities for public review and comment.

Enabling Act: Legislation (Chapter 372 of the Acts of 1984) that established MWRA and define its purpose and authority as of January 1, 1985.

ENF: Environmental Notification Form - The first step in the MEPA process.

EOEEA: Executive Office of Energy and Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EOC: Emergency Operations Center

EOEA: Executive Office of Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EPA: Environmental Protection Agency - The federal government agency responsible for environmental enforcement and investigation.

ESWTR: Enhanced Surface Water Treatment Rule - A federal rule that is promulgated in three stages:

1) Interim Enhanced Surface Water Treatment Rule (IESWTR): The IESWTR was promulgated in 1998 and tightened the requirements for the operation of water filtration plants in large systems to take a first step toward controlling *cryptosporidium* in source waters. IESWTR also added *cryptosporidium* to the list of issues considered within watershed protection plans for unfiltered systems.

2) LT1ESWTR primarily extends the IESWTR to smaller systems

3) LT2ESWTR: further tightens the standards for the operation of filtration plants and adds requirements for 99% inactivation of *cryptosporidium* and the use of two primary disinfectants for unfiltered systems. The concept of proportional treatment, with less treatment required for cleaner sources, was implemented as part of the rule.

Enterococcus: A pathogen indicator, similar to fecal coliform, that is used in the Massachusetts Water Quality Standards for marine waters, consistent with the Federal Clean Water Act requirements, which indicates potential contamination from human or animal waste.

Enterprise Fund: A governmental accounting and budgeting Fund that is designed to be self-supporting with revenues equal to expenditures.

Eutrophication: Nutrient enrichment of a lake or other water body typically characterized by increased growth of planktonic algae and rooted plants. Eutrophication can be accelerated by wastewater discharges and polluted runoff.

Eversource: Formerly NStar, formerly Boston Edison Company, is a publicly traded, Fortune 500 energy company headquartered in Hartford, Connecticut and Boston, Massachusetts, with several regulated subsidiaries offering retail electricity and natural gas service to more than 3.6 million customers in Connecticut, Massachusetts and New Hampshire.

Expenditures: Payments for goods and services received.

Expenses: Costs associated with the operating activities of a period, including expenditures and accrued costs.

Facility Information System (FIS): The management information system at the Deer Island Treatment Plant.

Fecal coliform bacteria: A group of bacteria used as a primary indicator organism for potential contamination from human or animal waste. Also called thermo-tolerant bacteria. Specific organisms in the group may or may not be of health concern (see *E.coli*).

Filtration: A water treatment process involving the removal of suspended particulate matter by passing the water through a porous medium such as sand or carbon.

Fiscal Year: The 12-month financial period used by MWRA that begins July 1 and ends June 30 of the following calendar year. MWRA's fiscal year is numbered according to the calendar year in which it ends.

Flash coat: A light coat of shotcrete used to cover minor blemishes on a concrete surface.

FOD (Field Operations Department): Department within the Operations Division created to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Treatment Plant.

Force Main: A pressure pipe joining the pump discharge at a water or wastewater pumping station with a point of gravity flow.

FRSA (Fore River Staging Area): The site of the Sludge Pelletization Plant.

FTE (Full Time Equivalent): An FTE is the hours worked by one employee on a full-time basis. The concept is used to convert the hours worked by several part-time employees into the hours worked by full-time employees.

Fund: A separate accounting entity for a particular purpose facilitating the accounting of assets, liabilities, and net assets.

Giardia: A protozoan parasite that can cause severe gastrointestinal disease, although there is medical treatment available. *Giardia* exist in the environment as hard-walled cysts, and are moderately resistant to chlorine disinfection.

Geographic Information System (GIS) -- A geographic information system is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

Green Energy: Energy that comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they're naturally replenished.

Goal: A statement in general terms of a desired condition, state of affairs, or situation. Goals, which are long-term in nature and not usually directly measurable, provide general direction for the activities of operating units.

Global Positioning System (GPS): Also known as an Automatic Vehicle Location system (GPS/AVL), this tool provides real-time transmission alerts utilizing a cell phone/satellite communication system and a web-based mapping system to track vehicles and operator-driven mobile equipment in MWRA's service area. The system allows MWRA to respond more quickly to emergencies, enhance driver and vehicle safety, reduce fuel costs, track mileage electronically, monitor unauthorized vehicle usage, and improve efficiency.

Graphitization: A corrosion mechanism that alters the molecular structure of the carbon/iron matrix of cast iron pipe. During the process, iron atoms are forced away from the metal leaving behind an unstable carbon matrix. The result is a weakened pipe, easily susceptible to ruptures. High frequency in the number of breaks causes leakage to be a major problem of graphitized pipe.

Grit: Sand-like materials that quickly settle out of wastewater.

Groundwater: A body of water beneath the surface of the ground. Groundwater is made up primarily of water that has seeped down from the surface.

HAA: Haloacetic Acids - A class of disinfection by-products related to chlorine disinfection. HAAs are regulated under D/DBP Stage 1 and 2 Rules at 60 ppb.

Harbor Electric Energy Company (HEEC): A subsidiary of Eversource which installed a cross harbor power cable and built a sub-station to provide power for construction and operation of the Deer Island Wastewater Treatment Plant.

Head House: A structure containing the control gates to a conduit such as a sewer pipeline.

Headworks: A preliminary treatment structure or device, usually including a screening and de-gritting operation, that removes large or heavy materials such as logs and sand from wastewater prior to primary treatment.

Heavy Metals: Metals such as lead, silver, gold, mercury, bismuth, and copper that can be precipitated by hydrogen sulfide in an acid solution.

HOM (Harbor and Outfall Monitoring): A comprehensive program to provide environmental data that helps to predict and measure the effect of Deer Island outfall discharge on the marine ecosystem.

Incentives and Other Charges: A fee system designed to help recover permitting, inspecting, and monitoring costs incurred by MWRA's TRAC Program and provide incentives to permitted users to reduce discharges.

Indirect Expenses: Costs not directly associated with providing services or performing activities.

Infiltration/Inflow (I/I): The problem of clean water flows entering sewers resulting in diminished pipe capacity for sanitary flows and in costly pumping and treatment of unnecessarily large wastewater volumes. Infiltration is groundwater that leaks into the sewerage system through pipe joints and defects. Inflow, primarily a wet-weather phenomenon, refers to water that enters sewers from improperly connected catch basins, sump pumps, land and basement drains, and defective manholes. Inflow also enters through improperly closed or defective tidegates during high tides.

Influent: The flow of water that enters the wastewater treatment process.

Insurance Reserve: A fund established to adequately reserve against risks for which MWRA does not currently maintain insurance.

Interceptors: The large pipes that convey wastewater from collection systems to treatment plants.

Investment Income: Income derived by investing certain operating and reserve fund balances in interest-yielding securities in accordance with the provisions of MWRA's bond resolution.

ISO - NE (Independent System Operator of New England): Non-profit wholesale operator of the regional grid system. The MWRA receives payment from ISO-NE when Deer Island, Carroll Water Treatment Plant, and the four Remote Headworks remove themselves from the grid. All six facilities participate in load response programs offered by ISO-NE which pays larger commercial and industrial electricity consumers to “shed load” during grid peaks. There are several programs available such as price, demand response and load response. MWRA constantly evaluates the options and participates in the most advantageous program.

Labor Costs: Direct costs of employing permanent and temporary personnel, including wages, salaries, overtime pay, fringe benefits, and workers' compensation.

Land Application: The use of wastewater treatment residuals on land for agricultural benefits.

Landfilling: The disposal of residuals by burial. Modern landfills have double liners, leachate collection systems, and other design features to protect against groundwater contamination.

LCR: Lead and Copper Rule – A federal rule that set an action level for lead and copper at “worst case” consumer taps. Optimized corrosion control, notification, education, and lead service replacements are all components of compliance plans.

Leachate: Water that drains from a landfill after having been in contact with, and potentially contaminated by, buried residuals. Modern landfills are designed to collect leachate for subsequent treatment.

Limnology: The scientific study of physical, chemical, meteorological, and biological conditions in fresh waters.

LIMS: Laboratory Information and Management System – An automated database system used to transfer information between MWRA’s Central Laboratory to its client groups and to process information obtained by the Central Laboratory to monitor substances that enter and leave the MWRA wastewater system. Use of LIMS removes the potential for human error in the sampling process by bar coding samples, eliminating the need to transcribe sample data, producing pre-printed project-specific sample check-off forms for field crews, and automating testing through pre-set test codes and project-specific parameters.

LOX (Liquid Oxygen): Liquid oxygen is used together with electrical energy to generate ozone at the Carroll Water Treatment Plant.

Mapping Protocols: Sets of specifications defining the content and format of data to be collected.

MCL: Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available control technology.

MCLG: Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Massachusetts Environmental Policy Act (MEPA) Unit: A unit of the Commonwealth’s Executive Office of Environmental Affairs responsible for implementation of the state environmental review process.

Methane: A colorless, nonpoisonous, flammable gas produced as a by-product of anaerobic sludge processing. At Deer Island, MWRA uses methane as fuel to provide heat and hot water and to generate electricity.

MGD: Million gallons per day.

MIS: Management Information Systems

Mission: A description of the fundamental purposes and major activities of an operating unit or program.

Mitigation: Financial remuneration or non-financial considerations that MWRA provides to communities to alleviate the negative effects of major construction projects.

Molybdenum (Mo): A metallic element that resembles chromium and tungsten in many properties, and is used in strengthening and hardening steel. Mo is a trace element in plant and animal metabolism. The concentration of molybdenum in sludge products is strictly regulated.

NACWA (Nation Association of Clean Water Agencies): NACWA represents the interests of publicly owned wastewater treatment plants. NACWA is involved in all areas of water quality protection including the development of environmental legislation and assisting federal regulatory agencies in the implementation of environmental programs.

NEFCo: New England Fertilizer Company - The contractor responsible for the operation of processing sludge into fertilizer pellets at MWRA's residuals processing plant located in Quincy. NEFCo is also responsible for marketing and distributing the pellets and disposing of any product that is not marketable.

National Pollutant Discharge Elimination System (NPDES) Permit: A permit issued by EPA in conjunction with DEP that governs wastewater discharges into surface waters.

NHS (Northern High Service): Project that involves a series of water system pipeline improvements in the MWRA's Northern High Service Area.

Nitrification: An aerobic process in which bacteria changes the ammonia and organic nitrogen in wastewater into oxidized nitrogen (usually nitrate). Second-stage BOD is sometimes referred to as the nitrification stage (first-stage BOD is called the carbonaceous stage). Also, a similar process in the water distribution system, where ammonia from chloramine can be used by nitrifying bacteria, resulting in a reduced chlorine residual, and the potential for additional bacteria growth.

OCC: Metropolitan Operations Control Center, located at MWRA's Chelsea Facility.

OEP (Office of Emergency Preparedness): The Office of Emergency Preparedness has oversight over security, exercises, emergency operations, planning, the Emergency Services Unit and critical infrastructure protection.

OMS (Operations Management Systems): OMS correlates PICS data with laboratory analysis to track and analyze DITP's process performance with regard to the plant's discharge permit from EPA and DEP and with respect to cost effective operation.

Operating Reserve: A fund established to adequately reserve for operating contingencies, required by MWRA's bond resolution to be not less than one-sixth of its annual operating expenses.

Organic Matter: Material containing carbon, the cornerstone of plant and animal life. It originates from domestic and industrial sources.

Other User Charges: Revenue received per agreements MWRA has for provision of water, sewer, and other services to entities other than communities which are charged assessments.

Outfall: The pipe or structure where effluent is discharged into receiving waters.

Ozonation: The application of ozone to water, wastewater, or air, generally for the purposes of disinfection or odor control. The Carroll Water Treatment Plant (CWTP) employs the ozonation process to inactivate pathogens, including *cryptosporidium*, with lower levels of DBPs.

Ozone: A strong disinfectant made from oxygen and electrical energy. Ozone is effective against *cryptosporidium*.

Pathogens: Harmful organisms, often called germs that can cause disease. Waterborne pathogens (or the diseases they cause) include *giardia*, *cryptosporidium*, cholera, typhoid, *E.coli*, Hepatitis A, *legionella*, and MAC.

Payments in Lieu of Taxes (PILOT): Amounts which MWRA pays each fiscal year to cities and towns for land owned by the Commonwealth in the Quabbin, Ware River, Wachusett, and Sudbury watersheds. Consistent with the provisions of MWRA's Enabling Act, these payments are based on the past commitments of the Commonwealth of Massachusetts.

Penalty Revenue: Revenue derived from penalties assessed by MWRA to violators of its sewer use regulations.

Performance Measure: An indicator of the work and/or service provided, defined by output, work or service quality, efficiency, effectiveness, or productivity.

Performance Objective: A statement of proposed accomplishments or attainments that is short-term in nature and measurable.

PICS (Process Instrumentation and Control System): PICS provides real-time operations data from systems throughout Deer Island (including system status, flow, etc.).

PILOT (Payment in Lieu of Taxes): The Watershed PILOT program is the method that DCR compensates communities which contain the state owned land bought to protect one of the nation's largest unfiltered water supply systems. The law that defines this PILOT program, MGL c. 59 s.5G, guarantees regular and stable payment to 29 Massachusetts communities.

Plume: The rising discharge of treated wastewater effluent from a treatment plant outfall pipe.

Preliminary Treatment: The process of removing large solid objects, sticks, gravel, and grit from wastewater.

Pretreatment: The reduction or elimination of pollutant properties in wastewater prior to discharge into a sewer system.

Primacy: Primary enforcement authority for Federal Safe Drinking Water Act regulations delegated to a state by the Environmental Protection Agency (EPA).

Primary Treatment: A wastewater treatment process that takes place in a rectangular or circular tank and allows substances in wastewater that readily settle or float to be separated from the water being treated. Primary treatment results in 50-60% removal of suspended solids and 30-34% removal of BOD.

Program: An organized group of activities and the resources to carry them out aimed at achieving one or more related objectives.

Rate Revenue: Revenue received from annual assessments of communities within MWRA's service area for water and sewer services.

Rate Stabilization Reserve: A fund established by the Board of Directors that is used to reduce rate revenue requirements. MWRA finances this reserve with unexpended or surplus funds available from the Current Expense Budget at the end of each fiscal year.

RCM (Reliability Centered Maintenance): A maintenance strategy adopted at Deer Island in FY00 for critical systems. RCM is a failure modes and effects process that involves maintenance, operations and engineering staff in the development of preventative maintenance and operation plans for plant systems.

Relief Sewer: A sewer built to carry flows in excess of the capacity of an existing sewer.

Renewable Energy: Energy from a source that is not depleted when used, such as wind or solar power

RGGI: The Regional Greenhouse Gas Initiative is a mandatory, market-based program in the United States to reduce greenhouse gas emissions. The program involves selling emission allowances through auctions and investing the proceeds in demand-side management and clean energy technology projects.

Remote Headworks: The initial structures and devices of a treatment plant set apart by some distance from the plant site.

Renewal and Replacement Reserve: A fund established to adequately reserve for the cost of capital improvements not provided for by funds available through the Capital Improvement Program or the Current Expense Budget.

Residuals: The by-products of the wastewater treatment process, including scum (floatables), grit and screenings, primary sludge, and secondary sludge.

Revenue Bonds: Bonds payable from a specific source of revenue and which do not pledge the full faith and credit of the issuer.

RPS (Renewable Portfolio Standards): State policies which mandate a state to generate a percent of its electricity from renewable resources. Qualified renewable generation facilities for the MWRA include: the Steam Turbine Generator (STG) and a variety of Hydroelectric, Wind and Solar units. The MWRA is issued electronic certificates for each megawatt hour of electricity produced from the digester gas, which is considered renewable energy. RPS credits are a source of revenue for the MWRA.

Safe Yield Model: The equation used to determine the maximum dependable draft that can be made continuously on a water supply source during a period of years during which the probable driest period or period of greatest deficiency in water supply is likely to occur.

SAMS: Sewerage Analysis and Management System – A database which contains specifications of the location, size, and condition of MWRA wastewater interceptors and appurtenances and which produces maps for use by MWRA and outside parties. Now referred to as Wastewater GIS.

Sanitary Sewers: In a separate system, pipes that carry only domestic wastewater.

SCADA: Supervisory Control and Data Acquisition - Equipment for monitoring and controlling water or wastewater facilities remotely.

SCBA: Self-contained breathing apparatus.

Screenings: Large items such as wood and rags that are collected from wastewater in coarse screens prior to primary treatment.

Scum: Floatable materials such as grease, oil, and plastics that are skimmed from the surface of wastewater as it flows through large settling tanks.

SDWA: Safe Drinking Water Act - A Federal law enacted in 1986 and amended in 1996 that requires EPA to establish national primary drinking water regulations for water suppliers which consist of MCLs or treatment techniques.

Secondary Treatment: Usually following primary treatment, secondary treatment employs microorganisms to reduce the level of BOD and suspended solids in wastewater.

Sedimentation Tanks: Settling tanks where solids are removed from sewage. Wastewater is pumped to the tanks where the solids settle to the bottom or float on the top as scum. The scum is skimmed off the top, and solids on the bottom are pumped out for further treatment and/or final disposal.

Seeding: The initial filling of sludge into digesters.

Sensitive user: A member of a group within the general population likely to be at greater risk than the general population of adverse health effects due to exposure to contaminants in drinking water. Sensitive users include infants, children, pregnant women, the elderly, and individuals with histories of serious illness.

Septic Tanks: Tanks used for domestic wastes when a sewer line is not available to carry them to a treatment plant. Periodically, the septage is pumped out of the tanks, usually by commercial firms, and released into a wastewater treatment system.

Shotcrete: Mortar or concrete conveyed through a hose and projected at high velocity onto a surface; also known as air-blown mortar, pneumatically applied sprayed mortar, or gunned concrete.

Siphon: A closed conduit, a portion of which lies above the hydraulic grade line, resulting in a pressure less than atmospheric and requiring a vacuum within the conduit to start flow. A siphon utilizes atmospheric pressure to effect or increase the flow of water through the conduit.

Slip Lining: Insertion by pushing or pulling of lines fabricated of plastic, concrete cylinder pipe, reinforced concrete, or steel through existing conduits from access pits.

Sludge: Material removed by sedimentation during primary and secondary treatment. Sludge includes both settled particulate matter and microorganisms and is the single largest component of wastewater residuals. At the time sludge is removed during the treatment process, it contains only 0.5% to 5% solid content by weight. It has the appearance of muddy water.

Sodium Hypochlorite (NaOCl): A liquid form of chlorine that MWRA uses in the disinfection and/or odor processes at the Deer Island Treatment Plant, various other Wastewater facilities, and the Carroll Water Treatment Plant (CWTP).

Storm Sewers: Separate systems of pipes that carry only water runoffs from roofs, streets, and parking lots during storms.

Surcharging: Loads on a system beyond those normally anticipated; also, the height of wastewater in a sewer manhole above the crown of the sewer when the sewer is flowing completely full.

Suspended Solids: The particulate matter contained in wastewater.

SWTR: Surface Water Treatment Rule – A Federal rule promulgated in 1989 that affects all utilities using surface waters or waters under the influence of surface waters. SWTR requires filtration unless certain criteria on source water quality, watershed control, and disinfection effectiveness can be met (see also ESWTR).

Telemetry: Remote measuring or monitoring devices connected to a central monitoring station via telephone lines.

TCR: Total Coliform Rule – A federal rule that requires monitoring of water distribution systems for coliform bacteria and chlorine residual. No more than 5% of the coliform samples in a month can be positive.

TOC: Total Organic Carbon - A measure of the amount of organic material in water. Often used as a surrogate for disinfectant demand or DBP precursors.

Transition: A short section of conduit used as a conversion section to unite two conduits having different hydraulic elements.

TTHM: Total Trihalomethanes - A class of disinfection by-products, related to primarily chlorine disinfection (see D/DBP Rule).

TRAC: Toxic Reduction and Control – The department responsible for MWRA’s industrial pretreatment program.

TSS (Total Suspended Solids): A measure of the settleable solids and non-settleable solids in wastewater. During the primary treatment process, flows are routed to primary treatment clarifiers that remove about half of the pollutants brought to the plant in typical wastewater (50-60% of total suspended solids and up to 50% of pathogens and toxic contaminants are removed).

Ultraviolet (UV) Treatment: Ultraviolet light is an effective method of disinfection in drinking and wastewater applications. UV light damages the DNA of microbes, and is particularly effective against cryptosporidium. Federal regulations require two primary disinfectants for unfiltered water systems. The Carroll Water Treatment Plant added UV as a second disinfectant (in addition to ozonation) in February 2014 and the Quabbin Disinfection Facility (now named the William A. Brusch Water Treatment Facility) in Ware added UV (as a second disinfection in addition to chlorine) in October 2014.

United States Geological Survey (USGS): The federal agency that collects Geographic Information System (GIS) data for developing mapping protocols.

Vector Jet Truck: A vehicle used to clean and/or remove blockages from sewer lines by pushing and/or pulling fluids in the sewer.

VMM: Vehicle Management and Maintenance – The program responsible for management and maintenance of MWRA’s vehicles and heavy equipment.

WASM (Weston Aqueduct Supply Mains): Project involving the rehabilitation of the four Weston Aqueduct Supply Mains that carry potable water to MWRA’s service area. When complete, they will transmit about one-third of the water to MWRA’s service area and the City tunnel will carry the remaining two-thirds.

Wastewater: The water carried by sewers serving residences and businesses that enters wastewater facilities for treatment. Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, and/or agricultural and can encompass a wide range of potential contaminants and concentrations.

Wastewater Treatment Plant (WTP): A facility containing a series of tanks, screens, filters, and other equipment and processes for removing pollutants from wastewater.

Water Supply Trust: The legislature further enhanced the ability of the Department of Conservation and Recreation (DCR) Office of Watershed Management to protect the source waters of the MWRA drinking water supply by establishing a Water Supply Protection Trust in 2004. The

trust provides a more efficient mechanism for MWRA's direct funding of the Office of Watershed Management. The Water Supply Protection Trust has a five person board of trustees responsible for approving the Annual Work Plan and Budget each spring for the following fiscal year.

Watershed Reimbursement: An amount that MWRA pays to the Department of Conservation and Recreation (DCR) each fiscal year for maintaining and managing the primary sources of MWRA's water supply (watersheds) in accordance with the laws of the Commonwealth of Massachusetts. The amount of the reimbursement is determined by prevailing legislation.

Wholesale Water and Sewer Services: Potable water and wastewater collection, transport, delivery, and treatment services that MWRA provides to communities. Communities provide the same services directly to retail customers or end users.

WOCC: Western Operations Control Center, located at the Carroll Water Treatment Plant.

