

MASSACHUSETTS WATER RESOURCES AUTHORITY



Fiscal Year 2020 PROPOSED CURRENT EXPENSE BUDGET



**The Government Finance Officers Association
of the United States and Canada**

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CERTIFICATE OF RECOGNITION FOR BUDGET PREPARATION

to

Thomas Durkin

Massachusetts Water Resources Authority, Massachusetts



The Certificate of Recognition for Budget Preparation is presented by the Government Finance Officers Association to those individuals who have been instrumental in their government unit achieving a Distinguished Budget Presentation Award. The Distinguished Budget Presentation Award, which is the highest award in governmental budgeting, is presented to those government units whose budgets are judged to adhere to program standards.

Executive Director

Christopher P. Morill

Date

March 11, 2019

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

April 2019

Dear Chairman Taverna:

At its February 20, 2019 meeting, the MWRA Board of Directors voted to transmit the FY20 Proposed Current Expense Budget to the Advisory Board for its review and comment.

The FY20 Proposed Budget recommends a combined assessment increase of 3.74% in-line with the Advisory Board's challenge to keep the assessment increases below 4%. MWRA was able to meet this challenge due to our continuing practice of targeted debt defeasance for the most challenging out-years and managing both direct and indirect expenses. The FY20 Proposed Budget reflects the benefits of a planned \$15.0 million defeasance in FY19 with targeted savings primarily during FY21-23. Besides the planned defeasances, the Authority is continuing to address the significant Pension and Other Post-Employment Benefits (OPEB) obligations.

Total expenses are \$797.0 million, a \$29.1 million or 3.8% increase over the FY19 Budget. Capital financing costs, at \$497.6 million, remain the largest portion of the budget, representing 63% of the total expenses. Operating expenses are \$299.5 million, of which \$248.8 million is for direct expenses and \$50.7 million is for indirect expenses.

MWRA continues to employ a multi-year rates management strategy to promote sustainable and predictable assessment increases. As such, the assessment increases for FY21-24 are also estimated to be below 4%, despite the increased cost of the new cross-harbor cable for Deer Island.

To ensure that the MWRA's long-term goals will continue to be met in future years, it is imperative to continue the conservative fiscally responsible budgeting practices while addressing all outstanding long-term liabilities.

Additional budget information and a copy of this document are available online at www.mwra.com. Questions or comments on this document should be directed to the MWRA Budget Department. We look forward to working with Advisory Board members and staff during your review of the FY20 Proposed Current Expense Budget. Thank you for your continued support and recommendations.

Sincerely,

Frederick A. Laskey
Executive Director

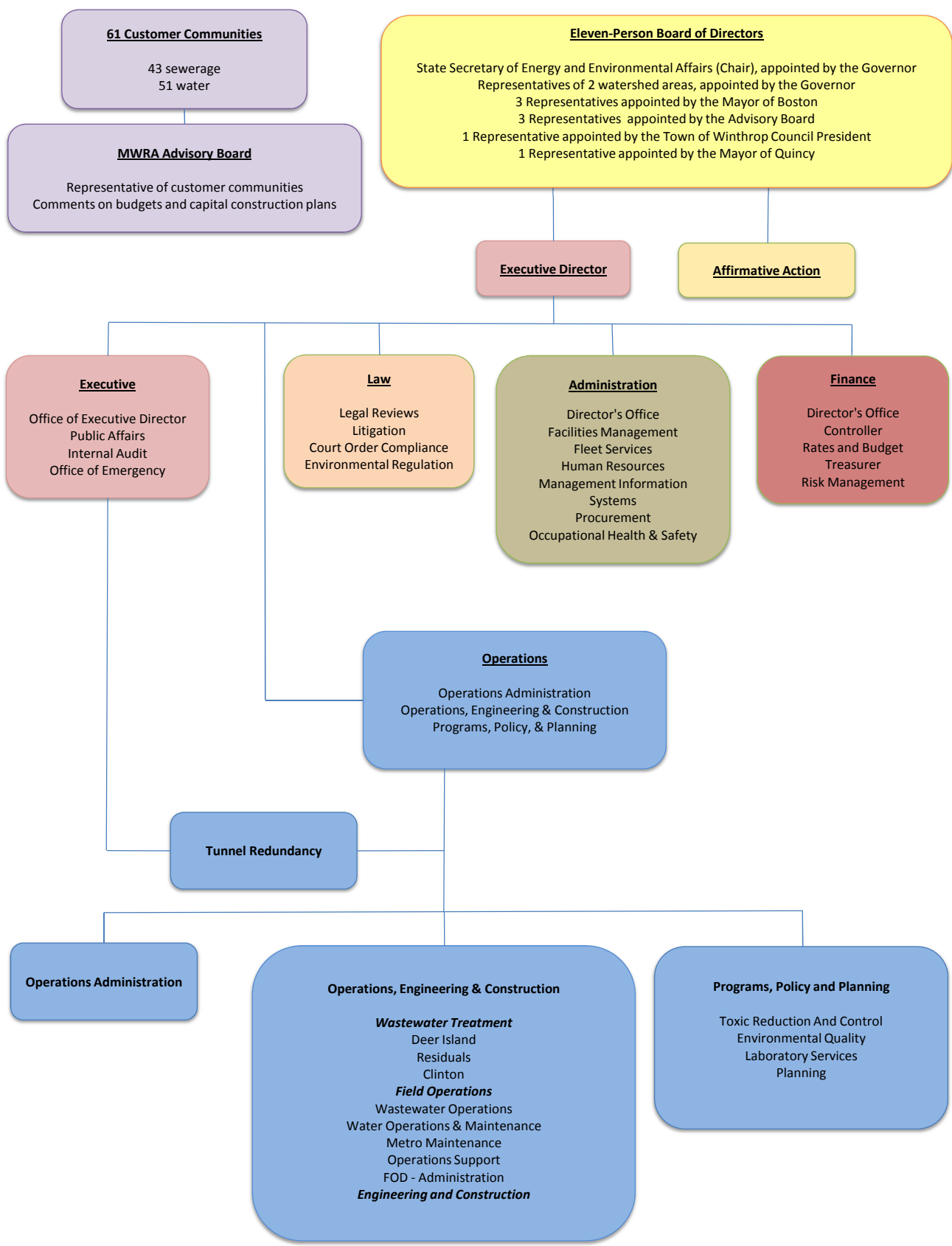


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MWRA AT A GLANCE

Purpose

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

Legal Status

Massachusetts public authority established by an enabling act in 1984 – Chapter 372 of the Acts of 1984 as most recently amended 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, 51 water)
- 3.0 million people (44% of MA population)
- 5,500 businesses

FY19 Operating Budget (\$ in millions)

| | |
|------------------------|----------------|
| Direct Expenses | \$239.6 |
| Indirect Expenses | \$46.0 |
| <u>Capital Finance</u> | <u>\$482.4</u> |
| Total Operating Budget | \$767.9 |
| Revenues* | \$767.9 |

*96.2% 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: \$8.4 billion since 1984
- Total Current Indebtedness \$4.9 billion
- FY19 CIP Budget: \$179.2 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
- 12 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*

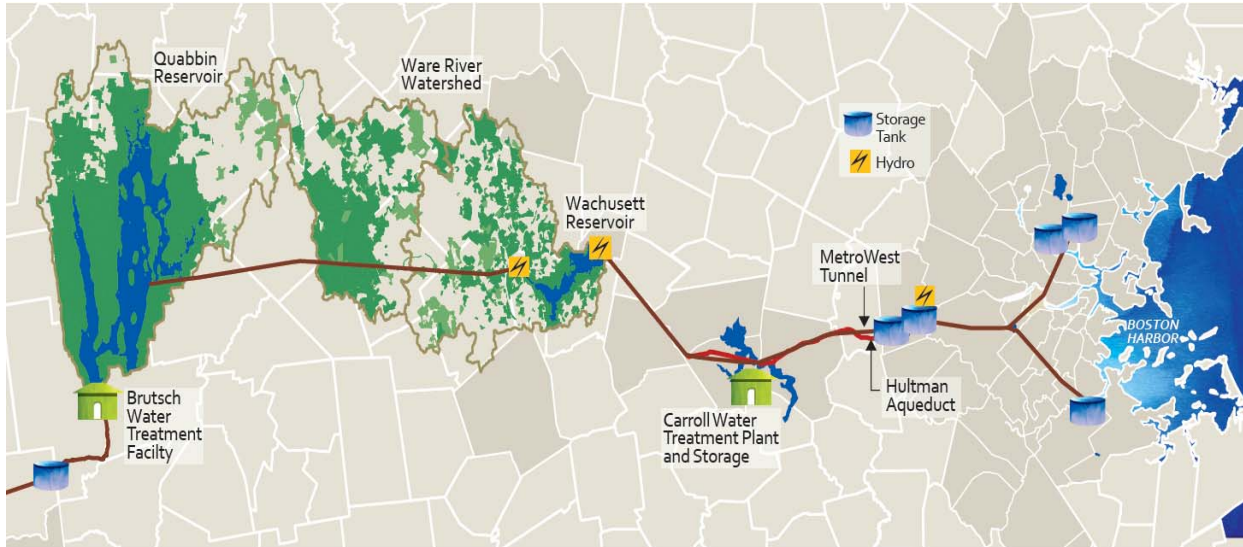
Wastewater System

- 240 miles of sewer pipelines and cross-harbor tunnels
- 11 pump stations
- 1 screening facility
- 4 CSO treatment/storage facilities
- 2 wastewater treatment plants
 - Deer Island Treatment Plant
 - Clinton Advanced Wastewater Treatment Plant
- 5 remote headworks
- 1 Pellet Plant for residuals processing
- Average daily flow: 365 mgd
- Peak wet weather capacity: 1,270 mgd
- Percentage of capacity utilized on average: 30%

Renewable Energy

27% of MWRA's energy requirement was self-generated from renewable sources (biomass, hydro, wind, & solar assets) in FY18.

MWRA AT A GLANCE



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

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

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

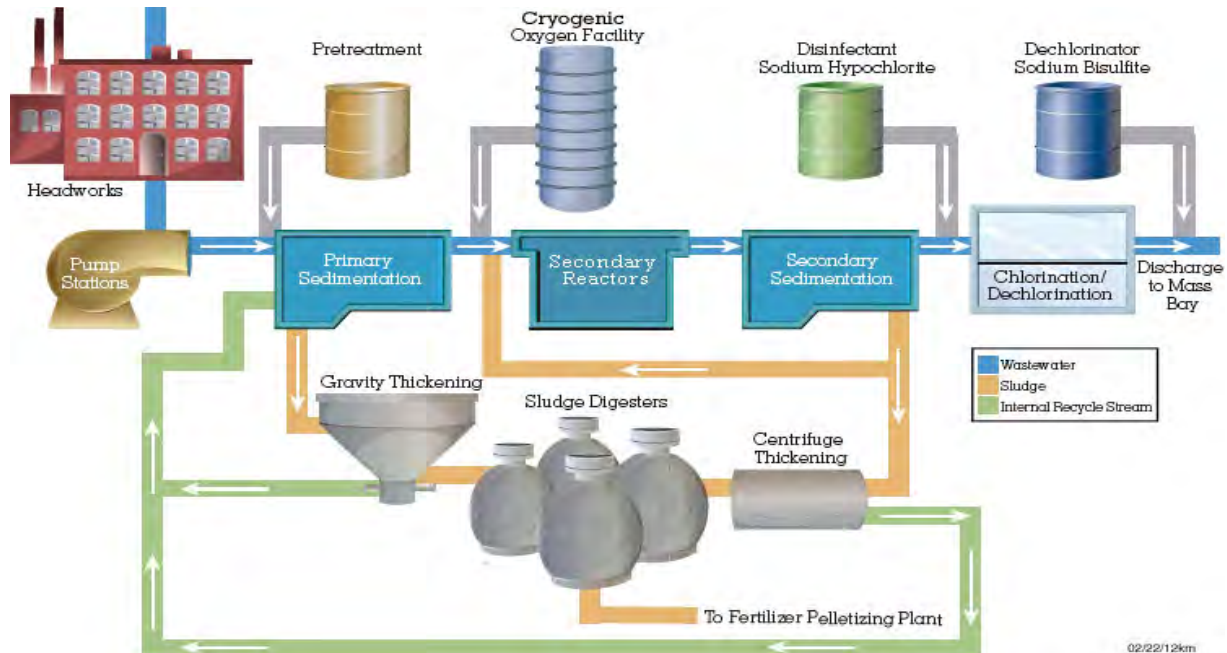
Water for most MWRA communities is treated at the Carroll Water Treatment Plant in Marlborough, Massachusetts. Water from the Quabbin and Wachusett Reservoirs enters the plant through the Cosgrove or Wachusett Aqueduct. The treated water leaves the plant through the MetroWest Water Supply Tunnel and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

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

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

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

MWRA AT A GLANCE – Wastewater System



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

The following describes the Deer Island treatment process:

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

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

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

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

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

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

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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), 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 \$8.4 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 2019, the system serves approximately 3.1 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. 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 **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/Real Property; Facilities; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Occupational Health and Safety. 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 five-year Strategic Business Plan FY2016-2020 emphasizes improvements in service and systems and includes performance targets for operating the water and wastewater systems and maintaining new and existing facilities. MWRA's Water System Master Plan and Wastewater System Master Plan present to long-term vision of the capital development needs of the water and wastewater systems and the actions planned to meet those needs. Parallel to MWRA's goal of carrying out its operating programs and capital projects is its goal of 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 and Yellow Notebooks) capture a variety of parameters regarding performance of each major functional area of the Authority, on a monthly and quarterly basis.

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 presented to the Board of Directors in December. The Capital Financing portion of the Current Expense Budget is determined based on the CIP Budget. 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 anticipated assessment increase Authority-wide and for each customer community. The Advisory Board then has 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. In May, the Advisory Board transmits its comments to the MWRA to which written response are provided.

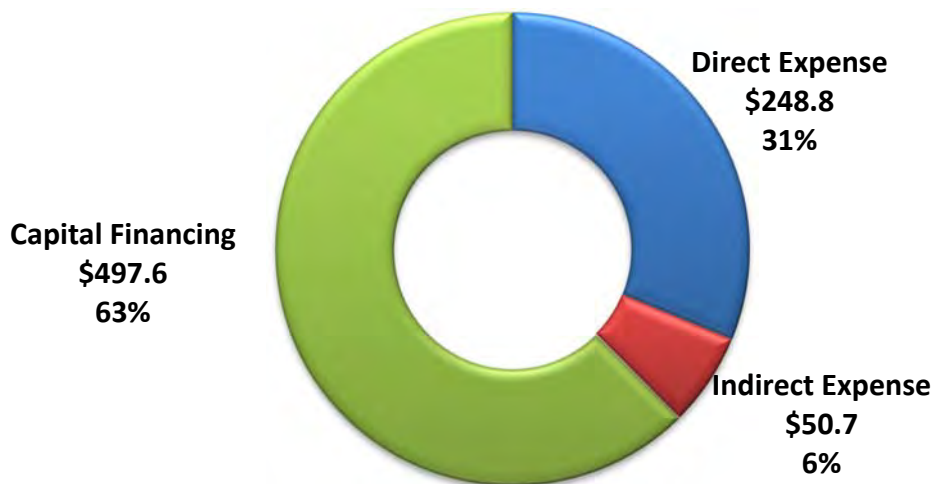
At its May meeting, MWRA's Board of Directors holds hearings on the budget to review recommendations by the Advisory Board and new information available since the budget was developed. Staff incorporates Board decisions from the hearings and presents a final budget and final assessments for approval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

PROPOSED FY20 BUDGET SUMMARY

Total Expenses in the Proposed FY20 Current Expense Budget (Budget) are \$797.0 million, an increase of \$29.1 million or 3.8% over the FY19 Budget. There are no offsets from Debt Service Assistance (DSA) assumed for FY20 or in any future years.

Total expenses include \$497.6 million for Capital Financing costs and \$299.5 million for operating expenses, of which \$248.8 million is for Direct Expenses and \$50.7 million is for Indirect Expenses. Total expenses increased mainly due to higher Capital Financing costs of \$15.2 million and higher Direct Expenses of \$9.1 million. The increases in Direct Expenses are mainly due to Wages & Salaries, which include five additional positions for the Tunnel Redundancy Program, Chemicals due to price and quantity increases in Sodium Hypochlorite, Ferric Chloride, and Activated Carbon prices and Utilities due to increased Electricity costs due to new contracts, which have increased rates. Indirect Expenses increased by \$4.8 million due to the start of payments for the new cross-harbor electrical cable (HEEC), increased pension and OPEB contributions, increased Watershed Management operating expenses, and higher additions to reserves.

FY20 Proposed Current Expense Budget



MWRA continues to pursue a rate management strategy, which promotes sustainable and predictable assessments. The Proposed FY20 Budget has a combined utilities assessment increase of 3.74% with Rate Revenues totaling \$766.7 million. Rate Revenues account for 96.2% of projected FY20 revenues.

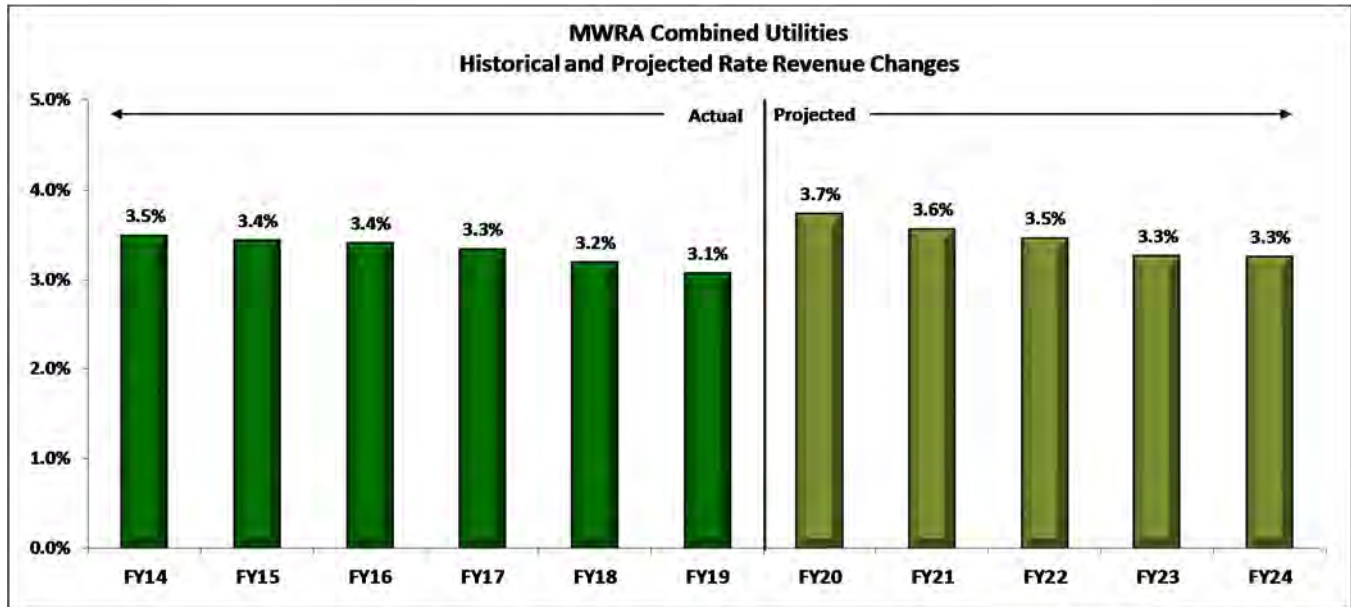
Measures taken by the Authority to achieve the 3.74% rate increase include:

- Continued practice of targeted defeasances
- Budgeted 1,155 Full-Time Equivalent (FTE's) positions, plus 5 FTE's for supporting the water redundancy program, for a total of 1,160 FTE's in FY20
- Budgeted a \$4.9 million Debt Prepayment
- Direct Expenses increased 3.8% versus FY19 budget
- Capital Financing increased 10.4% versus FY19 budget

The table below shows MWRA's Proposed FY20 Budget for revenue and expenses compared with the FY19 Budget and FY18 Actuals. Changes from FY19 to FY20 are described in the Revenue and Expense section of the Executive Summary.

| TOTAL MWRA | FY18 Actuals | FY19 Approved Budget | FY20 Proposed Budget | Change FY20 Proposed Budget vs FY19 Approved Budget | |
|-----------------------------------|-----------------------|-----------------------|-----------------------|---|--------------|
| | | | | \$ | % |
| EXPENSES | | | | | |
| WAGES AND SALARIES | \$ 100,875,415 | \$ 107,032,021 | \$ 110,520,570 | \$ 3,488,549 | 3.3% |
| OVERTIME | 4,571,567 | 4,447,554 | 4,898,965 | 451,411 | 10.1% |
| FRINGE BENEFITS | 20,068,927 | 21,173,571 | 21,965,210 | 791,639 | 3.7% |
| WORKERS' COMPENSATION | 2,147,063 | 2,422,609 | 2,354,256 | (68,353) | -2.8% |
| CHEMICALS | 9,659,734 | 10,830,452 | 12,087,530 | 1,257,078 | 11.6% |
| ENERGY AND UTILITIES | 21,997,423 | 22,868,633 | 24,199,103 | 1,330,470 | 5.8% |
| MAINTENANCE | 29,067,175 | 32,258,727 | 32,784,793 | 526,066 | 1.6% |
| TRAINING AND MEETINGS | 314,745 | 455,770 | 504,394 | 48,624 | 10.7% |
| PROFESSIONAL SERVICES | 6,955,638 | 7,675,976 | 8,324,491 | 648,515 | 8.4% |
| OTHER MATERIALS | 6,293,935 | 7,381,098 | 7,186,700 | (194,398) | -2.6% |
| OTHER SERVICES | 22,794,735 | 23,065,411 | 23,925,385 | 859,975 | 3.7% |
| TOTAL DIRECT EXPENSES | \$ 224,746,357 | \$ 239,611,821 | \$ 248,751,395 | \$ 9,139,574 | 3.8% |
| INSURANCE | \$ 3,231,510 | \$ 2,099,064 | \$ 2,081,406 | (17,658) | -0.8% |
| WATERSHED/PILOT | 23,756,756 | 26,406,427 | 27,194,708 | 788,281 | 3.0% |
| HEEC PAYMENT | 782,135 | 1,386,832 | 4,429,316 | 3,042,484 | 219.4% |
| MITIGATION | 1,574,890 | 1,614,262 | 1,654,618 | 40,356 | 2.5% |
| ADDITIONS TO RESERVES | 821,116 | 1,881,798 | 2,086,626 | 204,828 | 10.9% |
| RETIREMENT FUND | 3,277,369 | 7,000,000 | 7,315,000 | 315,000 | 4.5% |
| POST EMPLOYMENT BENEFITS | 5,035,422 | 5,574,152 | 5,962,457 | 388,306 | 7.0% |
| TOTAL INDIRECT EXPENSES | \$ 38,479,198 | \$ 45,962,534 | \$ 50,724,131 | \$ 4,761,597 | 10.4% |
| STATE REVOLVING FUND | \$ 80,637,870 | \$ 89,380,358 | \$ 93,138,692 | 3,758,334 | 4.2% |
| SENIOR DEBT | 281,126,707 | 272,633,979 | 204,715,571 | (67,918,409) | -24.9% |
| SUBORDINATE DEBT | 85,443,447 | 92,032,294 | 170,587,702 | 78,555,408 | 85.4% |
| LOCAL WATER PIPELINE CP | 1,482,833 | 4,750,393 | 5,846,823 | 1,096,430 | 23.1% |
| CURRENT REVENUE/CAPITAL | 13,200,000 | 14,200,000 | 15,200,000 | 1,000,000 | 7.0% |
| CAPITAL LEASE | 3,217,060 | 3,217,060 | 3,217,060 | - | 0.0% |
| DEBT PREPAYMENT | 10,900,000 | 7,100,000 | 4,850,000 | (2,250,000) | -31.7% |
| BOND REDEMPTION | - | - | - | - | - |
| VARIABLE RATE SAVINGS | (7,595,896) | - | - | - | - |
| DEBT SERVICE ASSISTANCE | (1,336,306) | (944,726) | - | 944,726 | -100.0% |
| HEEC CABLE CAPACITY RESERVE FUND | 6,532,146 | - | - | - | - |
| TOTAL CAPITAL FINANCING | \$ 473,607,861 | \$ 482,369,358 | \$ 497,555,847 | \$ 15,186,489 | 3.1% |
| TOTAL EXPENSES | \$ 736,833,416 | \$ 767,943,713 | \$ 797,031,374 | \$ 29,087,661 | 3.8% |
| REVENUE & INCOME | | | | | |
| RATE REVENUE | \$ 717,054,000 | \$ 739,042,200 | \$ 766,657,500 | 27,615,300 | 3.74% |
| OTHER USER CHARGES | 9,019,144 | 9,328,768 | 9,239,263 | (89,505) | -1.0% |
| OTHER REVENUE | 12,230,488 | 6,013,635 | 5,630,638 | (382,997) | -6.4% |
| RATE STABILIZATION | - | - | - | - | - |
| INVESTMENT INCOME | 12,755,559 | 13,559,110 | 15,503,973 | 1,944,863 | 14.3% |
| TOTAL REVENUE & INCOME | \$ 751,059,191 | \$ 767,943,713 | \$ 797,031,374 | \$ 29,087,661 | 3.8% |

The graph below represents historical and projected assessment changes based on the Proposed FY20 Budget. The planning estimates project assessment increases at 3.7% in FY20, 3.6% in FY21, 3.5% in FY22, and 3.3% in FY23 and FY24. Rates at the combined utilities level are projected to increase at a slower pace beginning in FY25.



The Proposed FY20 Budget revenues, excluding rate revenue, total \$30.4 million, an increase of \$1.5 million or 5.1% above the FY19 budget. The Proposed FY20 Budget non-rate revenue budget includes \$14.9 million in Other User Charges and Other Revenue and \$15.5 million for Investment Income.

FY20 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 FY2016-2020. At the Division and Department-level, additional and more specific goals and initiatives are identified.

I. Drinking Water Quality and System Performance

- Begin Metro Tunnels Redundancy project to ensure delivery of reliable and cost-effective water services to customer communities.
- Continue to support core operations to ensure compliance with regulatory requirements.

II. Wastewater Management and System Performance

- Implement new National Pollutant Discharge Elimination System (NPDES) Permits for the Clinton Wastewater Treatment Plant.

- Continue to meet or surpass environmental compliance standards for the Deer Island Treatment Plant as required by the National Pollutant Discharge Elimination System (NPDES) permit and air quality permits.

III. Infrastructure Management and Resilience

- Continue to invest in asset protection to ensure adequate availability of equipment and facilities to support core operations.
- Continue to prepare for severe weather and other critical events that could affect the water and wastewater delivery systems.

IV. Finance and Management

- Continue to plan and develop long-term strategies to ensure sustainable and predictable assessments to MWRA communities at the combined and the utility level.
- Secure favorable financing terms to support both the capital and current expense budgets and preserve the Authority's credit rating.
- Invest in cyber security protection.
- Continue to focus on succession planning with emphasis on training for current employees.

V. Environmental Sustainability

- 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.
- Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA's system.
- Enter into a new Memorandum of Understanding with Eversource for payment of energy reduction incentives.
- Pursue grant-funding and cost-sharing arrangements to defray costs of implementing new energy reduction and energy self-generation projects.
- Continue to monitor climate change, research and move forward with plans to reduce impacts of sea level rise and storm surge events on MWRA infrastructure.

FY19 MID-YEAR ACCOMPLISHMENTS

I. Drinking Water Quality and System Performance

- Identified and repaired over 25 leaks, many while the pipelines remained in service.
- Performed reservoir level management control at all Metropolitan reservoirs to maintain normal operating levels.
- Overall valve operability is 96.5% as result of continued valve exercising, repair, and replacement.
- Replaced 13 main line valves and retrofitted 15 blow off valve sites during the fiscal year.
- Assisted many of the customer communities with both routine and emergency assistance.
- Provided leak detection assistance to Arlington, Boston, Canton, Chelsea, Deer Island, Framingham, Ludlow, Lynn, Malden, Marlborough, Mass DOT in the Ted Williams Tunnel,

Medford, Milton, Newton, Northborough, Reading, Revere, Saugus, Somerville, Stoneham, Swampscott, Wakefield, Watertown, Waltham, Wellesley, and Winthrop.

II. Wastewater Management and System Performance

- Deer Island anticipates receiving the Platinum Peak Performance Award for 2018 from the National Association of Clean Water Agencies (NACWA) for the 12th 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 12 years.
- Deer Island received a Utility of the Future Today award from the Water Environment Federation (WEF) and its collaborators on this initiative. The selection committee for this award, consisting of six peer utility general managers/executives, determined the application met the award criteria in the Activity Area of Energy Generation & Recovery.
- Deer Island met secondary permit limits at all times, treating on average 99% of flows with full secondary treatment.

III. Infrastructure Management and Resilience

- Substantially completed numerous design and construction phases including the following (contract value => \$3 million):
 - Cosgrove Tunnel Redundancy – Wachusett Aqueduct Pump Station Construction
 - Northern Intermediate High Redundancy & Storage – Section 89 & 29 Redundancy Phase 1C Construction
 - Facility Asset Protection Alewife Brook Pump Station Rehab – Construction
 - Southern Extra High Redundancy and Storage – Pipeline Section III Ph 1 – Construction
 - Waterworks Facility Asset Protection – Paint Bellevue II TH Tanks

IV. Finance and Management

- Developed the FY20 Capital Improvement Budget to fit within the five-year spending cap for the FY19-23 period
- Completed the Massachusetts Clean Water Trust (MCWT) Pool 21 borrowing in September 2018. This \$50.0 million transaction was made at subsidized interest rate contributing to a lower overall cost of debt for the Authority.
- Completed a zero percent interim loan with the MCW in January 2019. This \$52.5 million borrowing will be permanently finance by MCWT Pool 22 transaction.
- Executed a \$13.9 million of outstanding senior principal in September 2018. This defeasance decreased the debt service requirement between FY20 and FY22 by a total of \$15.5 million reducing the Rate Revenue Requirement in those years.

V. Environmental Sustainability

- In October 2018, TRAC Staff sent letters to its Significant Industrial Users (SIUs) to transmit their FY17 compliance status and preliminary annual charges. The letters provide an opportunity for each SIU to review the data upon which the charges are based and submit any changes. They also inform the SIUs if they are in Significant Noncompliance with MWRA/EPA standards or requirements.
- TRAC drafted revisions to the three regulations (360 CMR 1.00: Adjudicatory Proceedings, 360 CMR 2.00: Enforcement and Administrative Penalties, and 360 CMR 10.000: Sewer Use) that are utilized to implement MWRA's Industrial Pretreatment Program. The draft revisions for all three regulations will be available for public comment in April 2019.

SOURCES AND USES OF FUNDS

Funds supporting the Current Expense Budget are not subject to appropriation with the exception of State debt service assistance. The table to the right shows MWRA's sources and uses of funds for the Proposed FY20 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 recover the cost of operations (excluding depreciation), maintenance and improvements, and debt service, as well as meeting required reserve levels.

In the Proposed FY20 Budget, 96.2% of revenue is raised from rate revenue. The remaining 3.8% of revenue will come from interest on investments, 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.

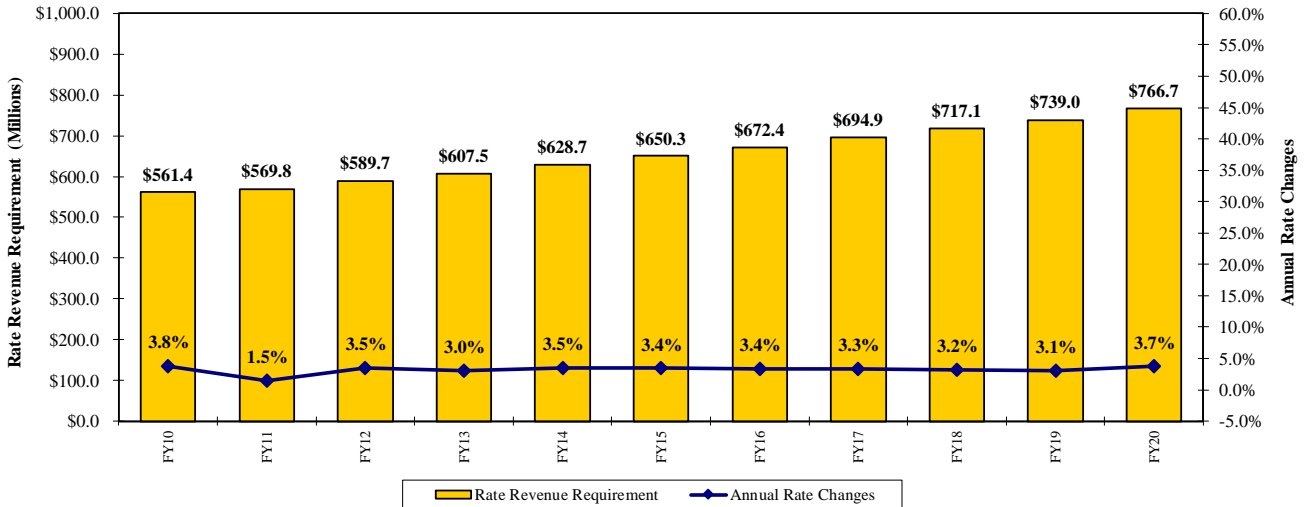
| SOURCES & USES OF FUNDS* | | |
|--|----------------|---------------|
| \$s in Millions | | |
| <i>Sources of Funds</i> | | |
| Other User Charges | \$9.2 | 1.2% |
| Other Revenue | 5.6 | 0.7% |
| Investment Income | 15.5 | 1.9% |
| Rate Revenue | 766.7 | 96.2% |
| Rate Stabilization | 0 | 0.0% |
| TOTAL REVENUE | \$797.0 | 100.0% |
| <i>Uses of Funds</i> | | |
| Total Expenses before Debt | | |
| Service Offsets | \$497.6 | |
| Less: | | |
| Debt Service Assistance | - | |
| Bond Redemption | - | |
| Sub-Total Net Expenses | \$497.6 | |
| Capital Financing | \$497.6 | 62.4% |
| Direct Expenses | 248.8 | 31.2% |
| Indirect Expenses | 50.7 | 6.4% |
| TOTAL EXPENSES | \$797.0 | 100.0% |
| TOTAL EXPENSES Less Offsets | \$797.0 | |
| <i>*may not add up due to rounding</i> | | |

Rate Revenue

Under the Proposed FY20 Budget, the MWRA will raise \$766.7 million of its total revenue requirements from water and sewer assessments to member communities. Of the \$766.7 million, \$507.5 million will

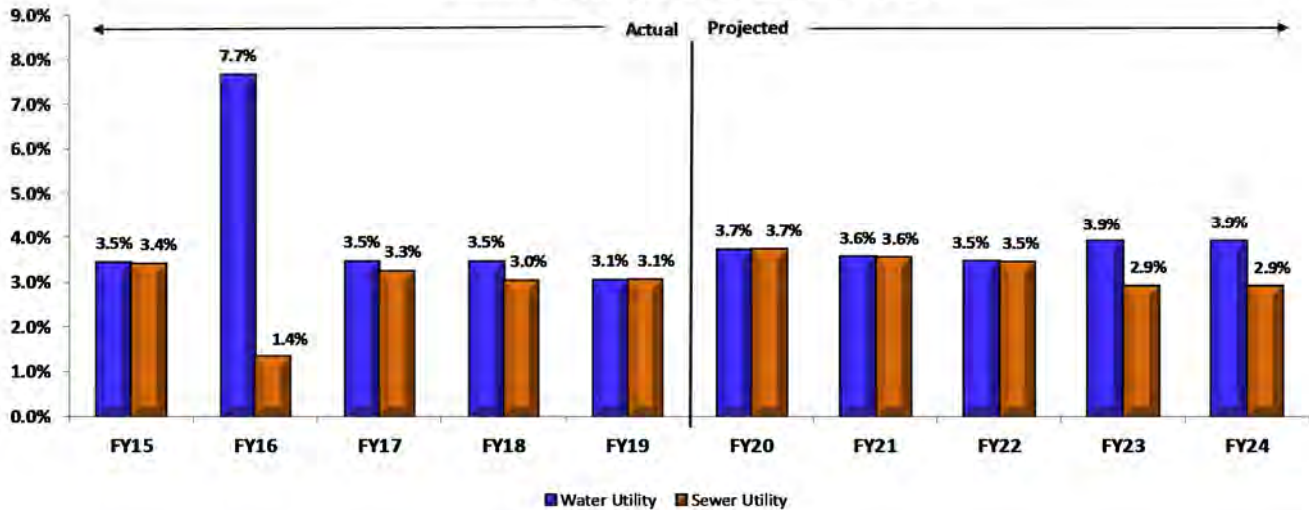
fund the sewerage system, an increase of 3.74% as compared to FY18; and \$259.2 million will fund the water system, an increase of 3.74% as compared to FY19. The charts below show the historical rate revenue requirements at the combined utility level for the past ten years.

MWRA: Combined Water & Sewer Assessments



Beginning in FY17, the MWRA successfully implemented a rate increase smoothing mechanism that allows the rate revenue requirement to be smoothed between utilities eliminating annual volatility mostly driven by debt service payments for capital projects. The charts below show the historical percent increase for the last five years and the projected increases for the next five years.

MWRA Water & Sewer Utilities
Historical and Projected Rate Revenue Changes



Non-Rate Revenue

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 Proposed FY20 Budget total \$9.2 million, a decrease of 1.0% from the FY19 budget and includes \$5.2 million for the Chicopee Valley Aqueduct (CVA) communities, \$1.8 million for Deer Island water usage, \$615,000 for entrance fees from member communities, and \$500,000 for the Commonwealth's partial reimbursement for Clinton Wastewater Treatment Plant expenses.

Other Revenue

Other Revenue is budgeted at \$5.6 million, a decrease of \$383,000 from the FY19 Budget. Other Revenue includes \$2.1 million from the sale of the Authority's Renewable Portfolio Credits, revenue from participating in load response program and sale of generated power to the grid, a decrease of \$581,000 attributable to a decrease in the price for demand response and for Renewable Portfolio Credits. The balance of Other Revenue includes \$2.4 million in permit fees and penalties, an increase of \$191,000 over the FY19 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 FY20 Budget includes \$15.5 million in investment income, an increase of \$1.9 million or 14.3% over the FY19 budget reflecting higher interest rate assumptions. The short-term interest rate assumption is at 2.25% for FY19, 50 basis points above the FY19 Budget level.

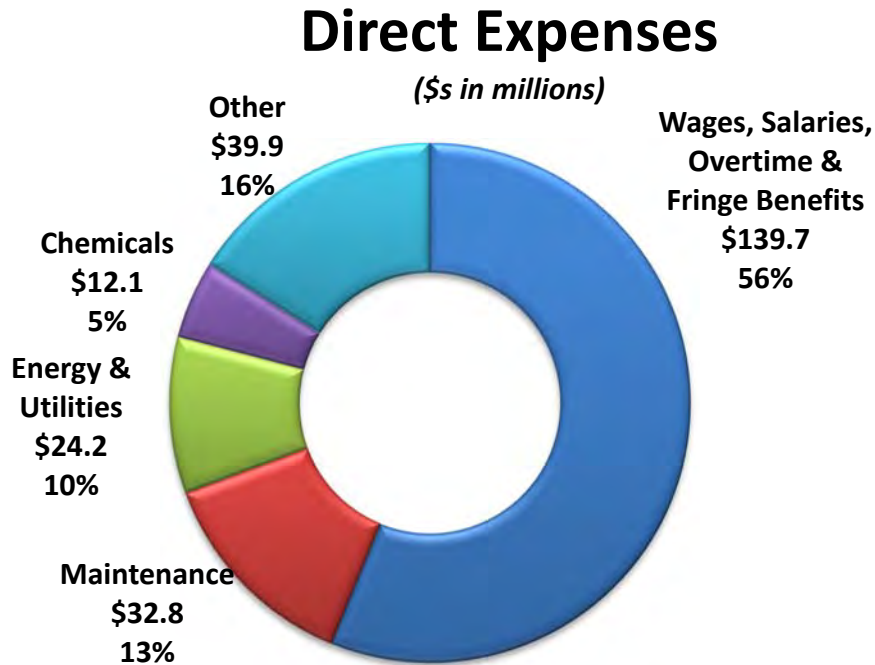
Non-Recurring Revenue

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. Within certain limits, MWRA may use this money to reduce the Rate Revenue Requirement in any subsequent year. Consistent with the requirements of its enabling act and its general bond resolution, MWRA treats transfers from the rate stabilization reserve as revenue in that fiscal year. For the Proposed FY20 Budget, no Rate Stabilization fund usage is projected.

DIRECT EXPENSES

The Proposed FY20 Direct Expense Budget totals \$248.8 million, an increase of \$9.1 million, or 3.8%, over the FY19 Budget. The primary drivers of the Direct Expenses increases are Wages & Salary increases associated with collective bargaining contracts and cost of living adjustments (COLAs) and includes five additional positions for the Tunnel Redundancy Department, fringe benefits for projected healthcare cost increases, Chemicals due to increases in Sodium Hypochlorite, Ferric Chloride, and Activated Carbon prices within Wastewater Operations, and Utilities due to increased Electricity costs at Deer Island.

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 components of the direct expense budget accounting for 56%, followed by other expenses (professional services, other materials, and other services) at 16%, maintenance at 13%, energy & utilities at 10%, and chemicals at 5%.



Wages and Salaries – The budget includes \$110.5 million for Wages and Salaries as compared to \$107.0 million in the FY19 Budget, an increase of \$3.5 million or 3.3%. Regular Pay which is 98.0% of total Wages and Salaries, increased \$3.5 million primarily for COLA increases and additional staff. The FY20 Proposed Budget includes 1,160 FTEs, five more than the FY19 Budget. The five additional FTEs represent the second year of the hiring to support the Metropolitan Tunnel Redundancy capital project.

| Division | FY18 | FY19 | FY20 |
|------------------------|----------------|----------------|----------------|
| Executive | 5.0 | 5.0 | 5.0 |
| Emergency Preparedness | 7.8 | 8.0 | 8.0 |
| Affirmative Action | 6.0 | 6.0 | 6.0 |
| Internal Audit | 6.8 | 6.7 | 6.7 |
| Public Affairs | 13.0 | 12.9 | 12.9 |
| Operations | 918.8 | 924.3 | 932.3 |
| Law | 15.5 | 13.5 | 13.5 |
| Administration | 142.0 | 142.6 | 139.6 |
| Finance | 35.5 | 36.0 | 36.0 |
| Authority Total | 1,150.0 | 1,155.0 | 1,160.0 |

Overtime – The overtime line item is comprised of both emergency overtime and budgeted overtime for maintenance and capital projects. The budget includes \$4.9 million for Overtime, an increase of \$451,000 or 10.15% from the FY19 Budget mostly for COLA increases. Overtime has increased in the Field Operations Department in the Operations Division to reflect recent trends in planned overtime for off-hours maintenance.

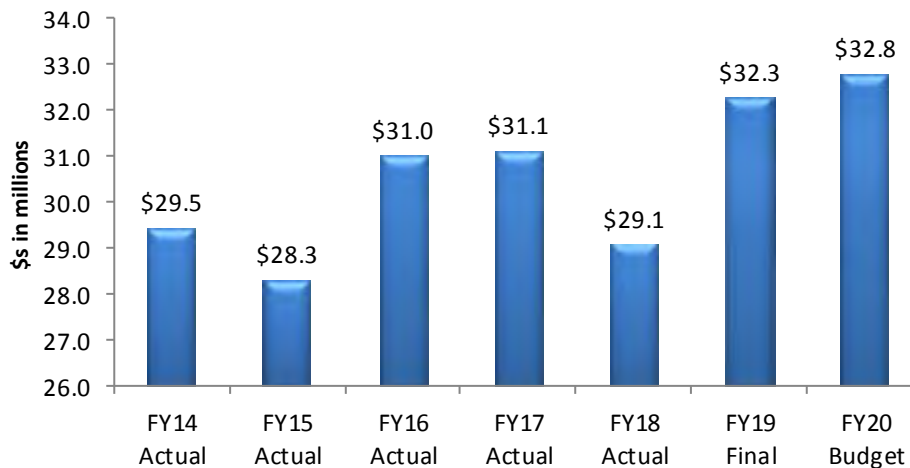
Fringe Benefits – The budget includes \$22.0 million for Fringe Benefits, an increase of \$792,000 or 3.7% from the FY19 Budget. Health Insurance premiums total \$19.0 million, an increase of \$698,000 or 3.8% from the FY19 Budget largely due to an anticipated 6% increase in rate structure offset by a change to the number and mix of plans based on FY19 enrollment changes.

Fringe Benefits

| Line Item | FY18 Actual | FY19 Budget | FY20 Budget |
|------------------------------|----------------------|----------------------|----------------------|
| Overtime Meals | \$ 109,914 | \$ 90,147 | \$ 115,361 |
| Health Insurance | 17,315,432 | 18,278,017 | 18,975,763 |
| Dental Insurance | 1,105,881 | 1,160,145 | 1,202,354 |
| Unemployment Insurance | 121,693 | 150,000 | 150,000 |
| Medicare | 1,374,311 | 1,425,262 | 1,471,732 |
| Tuition Reimbursement | 41,696 | 70,000 | 50,000 |
| Total Fringe Benefits | \$ 20,068,927 | \$ 21,173,571 | \$ 21,965,210 |

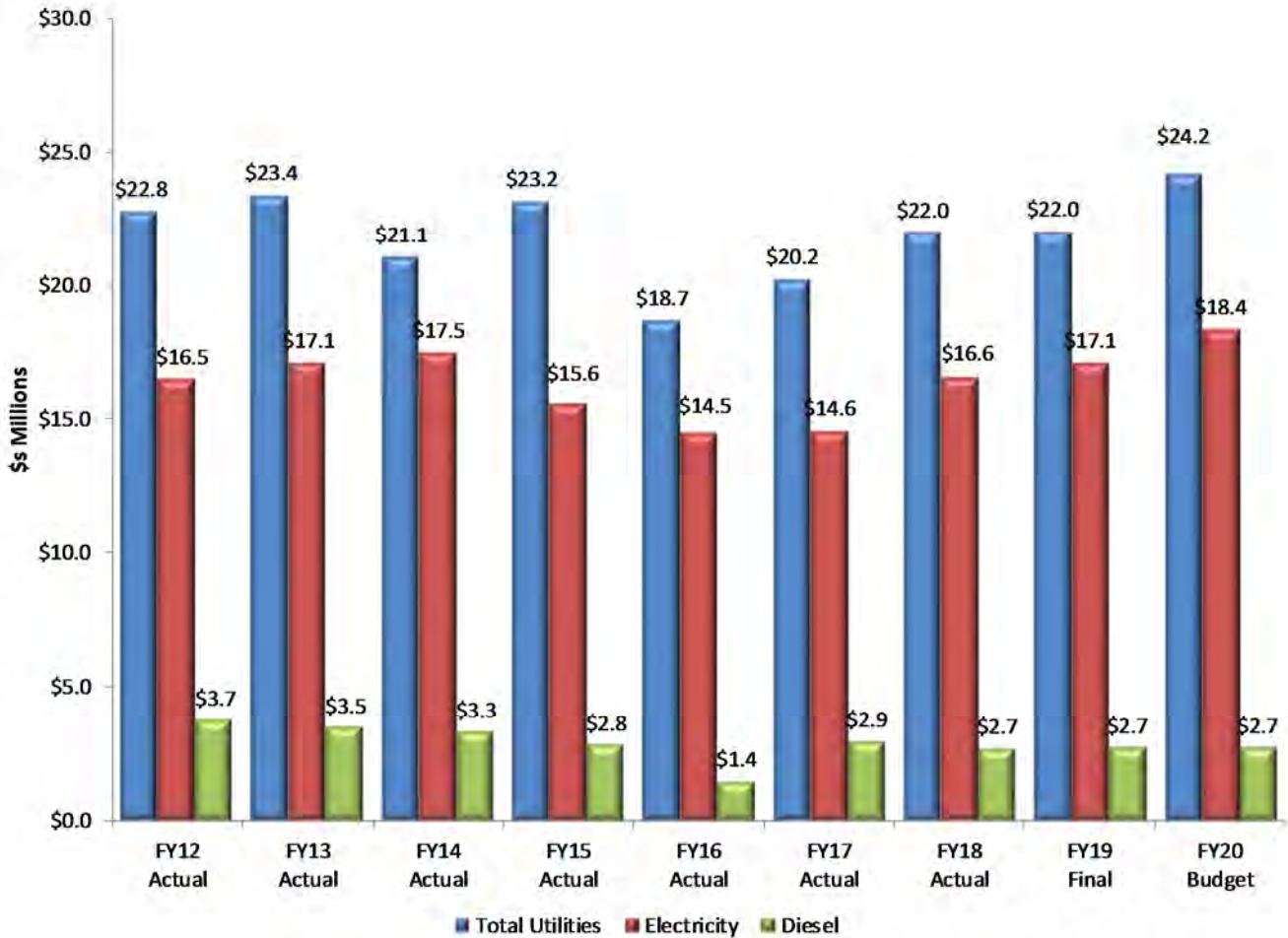
Maintenance – The budget includes \$32.8 million for Maintenance projects, an increase of \$526,000 or 1.6% from the FY19 budget. The Operations Division had an increase of \$130,000 or 0.5% in FY20. The overall \$526,000 increase in the budget is driven by software maintenance in MIS, which is comprised of a two-year extension to the Managed Security Service Provider (MSSP) contract for \$392,000 and for Management Consoles (infrastructure monitoring) in MIS for \$148,000.

Maintenance



Utilities – The budget includes \$24.2 million for Utilities, which is an increase of \$1.3 million or 5.8% over the FY19 Budget. The budget funds \$18.4 million for Electricity, an increase of \$1.2 million or 7.2% over the FY19 budget. \$1.1 million of the increase is related to the Deer Island Treatment Plant, which saw an increase in usage by 1.3 million kWh and in pricing by \$0.01/kWh (per a new contract with Eversource effective 10/2018). The major utilities that the budget funds are \$18.4 million for Electricity, \$2.7 million for Diesel Fuel, \$2.1 million for Water, and \$590,000 for Natural Gas.

Utilities



Chemicals – The budget includes \$12.1 million for Chemicals, an increase of \$1.3 million or 11.6% from the FY19 Budget. Sodium Hypochlorite has increased by \$561,000 or 21.1% over FY19 Budget due to price increases, impacting the Deer Island Treatment Plant and Wastewater Operations (which increased by \$284,000 and \$180,000 respectively). Activated Carbon increased by \$326,000 or 95.7% over the FY19 Budget due to a change from using Sodium Hydroxide within Wastewater Operations. The FY20 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 \$23.9 million for Other Services, an increase of \$860,000 or 3.7% from the FY19 Budget. The primary increase in the budget reflects an increase in the base cost of the sludge pelletization contract, which is budgeted at \$13.9 million for FY20 versus \$13.3 million for FY19

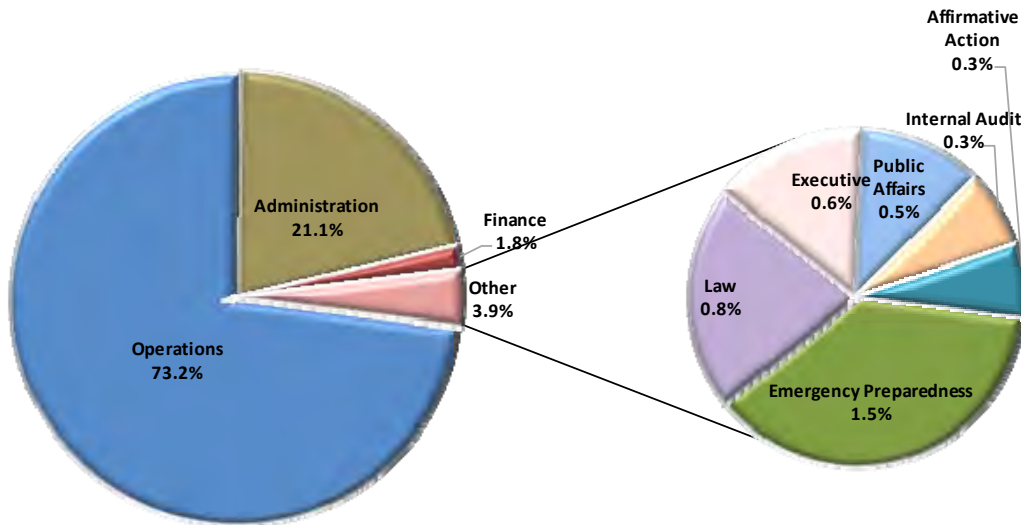
(due to an increase to two tons/day). In addition, there was an increase to Space/Lease Rentals of \$256,000 driven by increases to rent and common area maintenance at Charlestown Navy Yard and Marlboro Records Center and Warehouse.

Functional Area Budget Summary

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

| FY20 Proposed Current Expense Budget MWRA Direct Expenses by Division | | | | | | |
|--|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| DIVISION | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| EXECUTIVE | \$ 6,706,256 | \$ 7,277,161 | \$ 7,590,300 | \$ 7,612,061 | \$ 21,761 | 0.3% |
| OPERATIONS | 162,910,116 | 165,681,994 | 176,153,629 | 182,255,966 | 6,102,337 | 3.3% |
| LAW | 2,285,192 | 2,055,302 | 2,059,794 | 2,087,231 | 27,437 | 1.3% |
| ADMINISTRATION | 44,967,225 | 45,760,258 | 49,486,446 | 52,366,079 | 2,879,633 | 5.5% |
| FINANCE | 3,853,122 | 3,971,552 | 4,321,656 | 4,430,058 | 108,402 | 2.4% |
| TOTAL | \$ 220,721,911 | \$ 224,746,267 | \$ 239,611,821 | \$ 248,751,395 | \$ 9,139,574 | 3.8% |

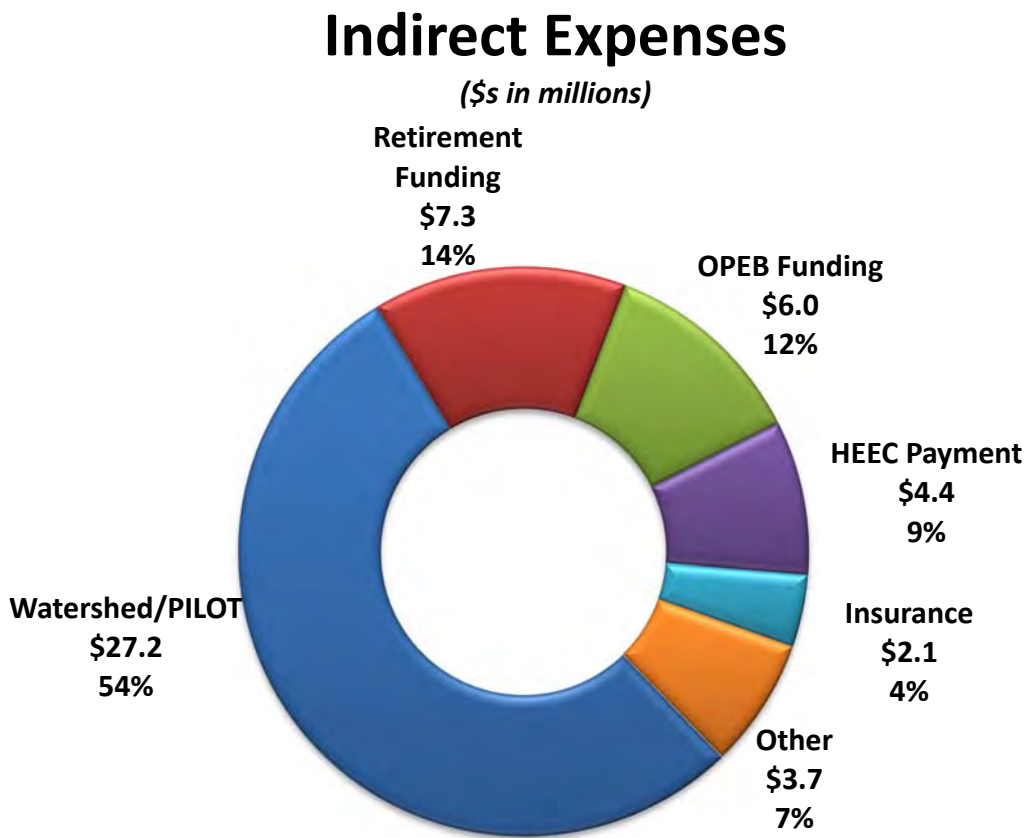
**MWRA Direct Expense Budget
By Division**



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

INDIRECT EXPENSES

The FY20 Indirect Expense Budget is \$50.7 million, an increase of \$4.8 million or 10.4% over the FY19 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 54% followed by Retirement Fund at 26%, Other (for items such as HEEC, Mitigation, and Addition to Reserves) at 16%, and Insurance at 4%.



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 \$2.1 million for Insurance, level funded with the FY19 Budget, and consist of Premium Costs and Self-insured Claim Costs. Premium Costs are estimated based on current costs adjusted for inflation and potential increases due to insurance market conditions. Self-insured Cost are estimated based on actual average spending over the past 5 years (FY14-18). 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 funding level every three years and provide recommendations as to its adequacy. The Insurance Reserve Fund is currently funded at \$14.0 million which was within the acceptable range as identified in the triennial insurance consultant review as of February 2017.

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 \$27.2 million for the Watershed Management budget, an increase of \$908,000 or 3.4% over the FY19 Budget. The budget includes \$18.4 million for reimbursement of operating expenses net of revenues, and \$8.8 million for Payment in Lieu of Taxes (PILOT). The PILOT payments increased by \$255,000 from the FY19 budget based on actual assessments in FY19.

Watershed Management

| | FY19 Budget | FY20 Proposed | FY20 Proposed vs. FY19 | % |
|--------------------|-------------|---------------|------------------------|-------|
| Operating Expenses | 17,321,420 | 17,939,708 | 618,288 | 3.6% |
| Major Projects | 1,600,000 | 1,575,000 | (25,000) | -1.6% |
| Revenue | 1,014,993 | 1,075,000 | 60,007 | 5.9% |
| Net | 17,906,427 | 18,439,708 | 533,281 | 3.0% |
| Pilot | 8,500,000 | 8,755,000 | 255,000 | 3.0% |
| Total | 26,406,427 | 27,194,708 | 788,281 | 3.0% |

Harbor Electric Energy Company (HEEC)

The budget includes \$4.4 million for the Harbor Energy Electric Company (HEEC), an increase of \$3.0 million or 219.4% over the FY19 Budget due to the new cross-harbor cable projected to be placed into service in December 2019. The budget reflects updated calculations for the Operations and Maintenance component of the HEEC payment obligations and capital improvements to the electrical substations providing electricity to the Deer Island Wastewater Treatment Plant. The \$6.5 million reserve is projected to be used to reduce HEEC payments between FY21-25.

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 capital budget and in the current expense budget. The FY20 Final Budget includes funding of \$1.7 million in community compensation for the City of Quincy and the Town of Winthrop. Both mitigation agreements expire in FY25.

Operating Reserves

Funding for the Operating Reserve for \$2.1 million. The Operating Reserve balance complies with the MWRA General Bond Resolution that requires a balance of one-sixth of annual operating expenses. Based on the FY20 Proposed Budget, the required balance is \$43.9 million versus the \$41.8 million required in FY19.

Retirement System Contribution

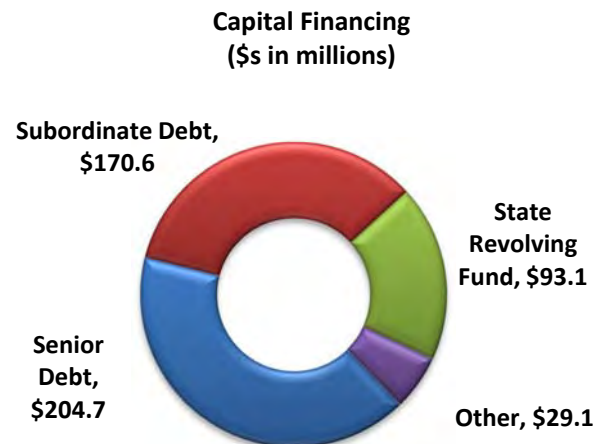
The budget includes \$7.3 million for the Retirement Fund, an increase of \$315,000 from FY19. Based on the January 1, 2018 actuarial report, the minimum required contribution for FY19 was \$8.0 million. Because pension investment returns were favorable in CY17, the Authority obtained a preliminary interim actuarial valuation, which resulted in a lower minimum required contribution of \$7.1 million. Based on the latest actuarial evaluation, MWRA's pension fund is at a 95.0% funding level.

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

In the Proposed FY20 Budget, the Authority funds its OPEB liability at \$6.0 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. Based on the latest actuarial evaluation, MWRA's pension fund is at a 95.0% funding level. To maximize the benefits in terms of returns and accounting treatment, an irrevocable OPEB Trust was established after Board approval and funding started on April 23rd, 2015. The current Trust balance is \$28.7 million which represents approximately an 18% funding level. The proposed \$6.0 million budget is based on 50% of the contribution determined in the January 1, 2018 actuarial report.

CAPITAL FINANCING

The FY20 Proposed capital financing costs total \$497.6 million and remains the largest portion of the MWRA's budget. The FY20 Proposed Budget capital financing costs increased by \$15.2 million or 3.2% compared to the FY19 Budget. This increase is primarily the result of projected FY19 and FY20 borrowings and the structure of the existing debt, and increased current revenue for capital partially offset by the impact of the defeasance



The FY20 Capital Financing budget includes:

- \$204.7 million in principal and interest payments on MWRA's senior fixed rate bonds. This amount includes \$8.5 million to support issuances of \$125 million in May 2019 and \$5.1 million to support issuances of \$125 million of new money in May 2020;
- \$170.6 million in principal and interest payments on subordinate bonds;
- \$93.1 million in principal and interest payments on SRF loans. This amount includes \$8.6 million to support issuances of \$55 million of loans during 2019 and \$55 million 2020;
- \$15.2 million to fund ongoing capital projects with current revenue and to meet coverage requirements;
- \$4.9 million in debt prepayment;
- \$5.8 million to fund the interest expense related to the Local Water Pipeline Assistance Program;
- \$3.2 million for the Chelsea Lease;

Outstanding Debt and Debt Management

The \$8.4 billion spent on MWRA's modernization efforts since the Authority was established in 1986, has relied heavily on debt financing. Total debt as of December 31, 2018 was \$4.9 billion consisting of senior and subordinated debt, Tax-Exempt Commercial Paper, and Revolving Loan. The total debt was \$113 million less than the MWRA's total debt as of December 31, 2017. The MWRA enjoys strong unenhanced senior debt ratings of Aa1, AA+, and AA+ from Moody's, Standard & Poor, and Fitch, respectively.

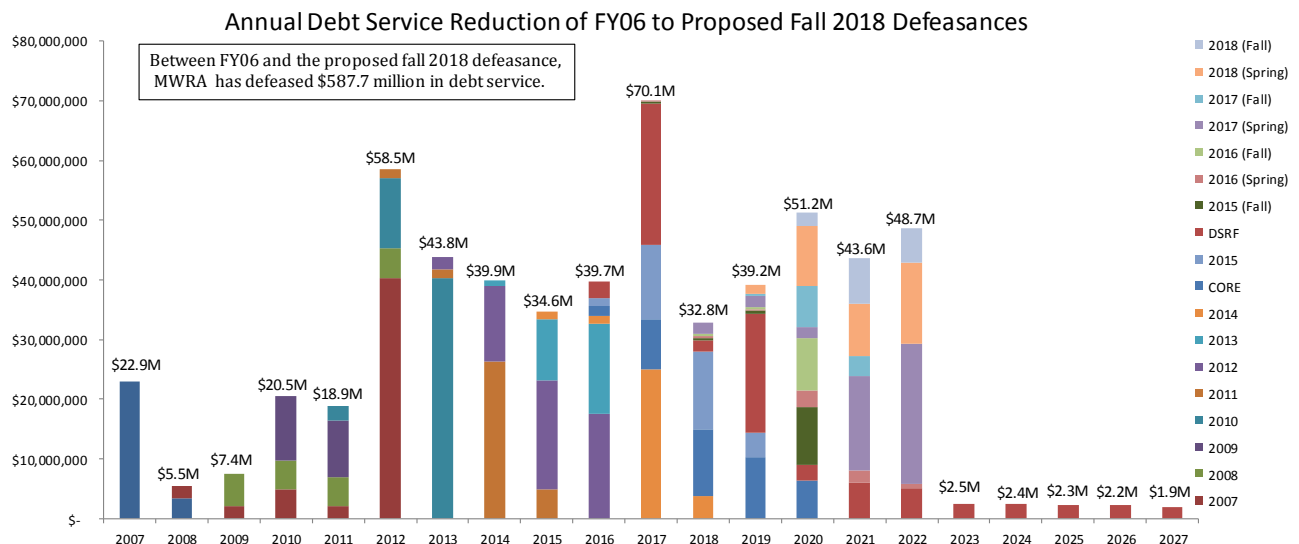
| Type | Principal Outstanding December 31, 2018 | % of Total |
|-----------------------------------|--|------------|
| Senior General Revenue Bonds | \$ 3,037,250,000 | 61.6% |
| Massachusetts Clean Water Trust | \$ 935,747,230 | 19.0% |
| Subordinate General Revenue Bonds | \$ 782,225,000 | 15.9% |
| Tax Exempt Commercial Paper | \$ 175,000,000 | 3.6% |
| Total | \$ 4,930,222,230 | |

← 80.6% of MWRA's
Debt is Fixed Rate

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 62.4% in the FY20 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 ~80% 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. The projected capital spending scheduled for FY19 is less than scheduled principal payments which will contribute to decrease MWRA's outstanding indebtedness.

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 FY20 Proposed Budget includes a planned defeasance of \$15.0 million which will reduce debt service by approximately \$5.2 million in FY20, \$478,000 in FY21, \$4.5 million in FY22, and \$5.8 million in FY23.



The FY20 Budget assumes a 3.75% interest rate for variable rate debt which is 0.25% higher than the rate in FY19. 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 there are projected increases in the future.

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 FY19 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.

| | Amount Outstanding | Total FY20 Capital Costs | Sewer | Water |
|--|-----------------------|-----------------------------|----------------|----------------|
| Total SRF ¹ Debt | \$935.7 | \$93.1 | \$70.8 | \$22.4 |
| Total Senior Debt | \$3,037.3 | 204.7 | 134.1 | 70.6 |
| Total Subordinate Debt | \$782.2 | 170.6 | 114.7 | 55.8 |
| Total SRF and Debt Service² | \$4,755.2 | \$468.4 | \$319.6 | \$148.8 |
| Water Pipeline Commercial Paper | 175.0 | 5.8 | 0.0 | 5.8 |
| Current Revenue/Capital ³ | | 15.2 | 14.4 | 0.8 |
| Capital Lease | | 3.2 | 1.9 | 1.3 |
| Debt Prepayment ⁴ | | 4.9 | 3.6 | 1.3 |
| | 175.0 | \$29.1 | \$19.9 | \$9.2 |
| Total Capital Financing (before Debt Service Offsets) | 4,930.2 | \$497.6 | \$339.6 | \$158.0 |
| Debt Service Offsets: | | | | |
| Debt Service Assistance | | 0.0 | 0.0 | 0.0 |
| Bond Redemption | | 0.0 | 0.0 | 0.0 |
| Total Capital Financing | 4,930.2 | \$497.6 | \$339.6 | \$158.0 |

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 South Boston CSO Tunnel inspection will be performed by in-house staff resulting in a reduction of operating costs of \$424,000 in FY22. This is the first year of a tunnel inspection program that will be conducted every five years.

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

| Fiscal Year | CEB Impacts (000) | | | | | | | | | | |
|---|-------------------|----------------|------------|---------------|----------------|---------------|--------------|----------------|--------------|------------|----------------|
| | FY21 | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | Total |
| DI Treatment Plant Asset Protection (not including Co-Digestion or Combined Heat and Power Plant) | (\$31) | | | (\$56) | (\$174) | (\$72) | | | | | (\$333) |
| DI Treatment Plant Asset Protection - Hydroturbine Replacements | | | | | | | (\$123) | | | | (\$123) |
| South Boston CSO Tunnel Inspection/Cleaning and Outfalls Inspection (previously named North Dorchester Bay project) | \$52 | (\$424) | | | | | \$922 | (\$950) | | | (\$401) |
| Total Wastewater (inflated) | \$21 | (\$424) | \$0 | (\$56) | (\$174) | (\$72) | \$799 | (\$950) | \$0 | \$0 | (\$856) |
| Metro Tunnel Redundancy | \$1,028 | | | | | | | | | | \$1,028 |
| Wachusett Algae Treatment Facility | | | | | | | | | \$130 | | \$130 |
| Total Water (inflated) | \$1,028 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$130 | \$0 | \$1,158 |
| Total Business and Operations Support (inflated) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL MWRA | \$1,048 | (\$424) | \$0 | (\$56) | (\$174) | (\$72) | \$799 | (\$950) | \$130 | \$0 | \$302 |

Operating costs are projected to increase in FY21 by \$1.0 million primarily due additional staff for the Metropolitan Tunnel Redundancy project. This will be offset by Deer Island Treatment Plant Asset Protection initiatives resulting in a reduction of operating costs of \$456,000 through FY30.

The next South Boston CSO Tunnel inspection will be in FY27 and result in an increase to operating costs of approximately \$922,000.

Other increases to operating costs over the next ten years include charges to the Wachusett Algae Treatment Facility for \$130,000 in utilities in FY29.

RATE ASSESSMENT AND METHODOLOGY

Community Profile and Assessments

MWRA provides wholesale water and sewer services to 61 communities or local bodies. Fifty-one local bodies purchase water supply services, and 45 local bodies purchase wastewater transport and treatment services. Thirty-five 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 Proposed FY20 Budget, rate revenue from BWSC will account for 31% of MWRA's total rate revenue. The table on page I-24, lists MWRA communities, the services received, and the proposed MWRA assessments for FY20.

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 FY20 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 Preliminary FY20 Rate Revenue Requirement
(000's)**

| | Sewer | Water | Total |
|-----------------------------|-----------|-----------|-----------|
| Allocated Direct Expenses | \$164,145 | \$84,607 | \$248,751 |
| Allocated Indirect Expenses | \$17,339 | \$33,385 | \$50,724 |
| PLUS | | | |
| Capital Expenses: | | | |
| Debt Service (less offsets) | \$319,677 | \$148,765 | \$468,442 |
| Current Revenue for Capital | \$14,440 | \$760 | \$15,200 |
| Other Capital Expenses | \$6,346 | \$7,568 | \$13,914 |
| PLUS | | | |
| Non-Rate Revenue: | | | |
| Investment Income | -\$9,623 | -\$5,881 | -\$15,504 |
| Fees and Other Revenue | -\$4,857 | -\$10,013 | -\$14,870 |
| Rate Stabilization | \$0 | \$0 | \$0 |
| EQUALS | | | |
| Rate Revenue Requirement | \$507,468 | \$259,190 | \$766,657 |

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 FY19 Water Assessment | Preliminary FY20 Water Assessment | Percent Change from FY19 | Final FY19 Sewer Assessment | Preliminary FY20 Sewer Assessment | Percent Change from FY19 | Final FY19 Combined Assessment | Preliminary FY20 Combined Assessment | Dollar Change from FY19 | Percent Change from FY19 |
|---|-----------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------------|
| ARLINGTON | 5,207,787 | 5,429,333 | 4.3% | 8,649,531 | 9,011,108 | 4.2% | \$13,857,318 | \$14,440,441 | \$583,123 | 4.2% |
| BELMONT | 2,845,415 | 3,002,417 | 5.5% | 5,092,015 | 5,374,220 | 5.5% | 7,937,430 | 8,376,637 | 439,207 | 5.5% |
| BOSTON (BWSC) | 90,752,551 | 93,429,979 | 3.0% | 141,531,379 | 147,214,547 | 4.0% | 232,283,930 | 240,644,526 | 8,360,596 | 3.6% |
| BROOKLINE | 7,037,965 | 7,301,894 | 3.8% | 12,898,264 | 13,324,237 | 3.3% | 19,936,229 | 20,626,131 | 689,902 | 3.5% |
| CHELSEA | 4,830,322 | 4,940,301 | 2.3% | 8,305,015 | 8,705,517 | 4.8% | 13,135,337 | 13,645,818 | 510,481 | 3.9% |
| EVERETT | 5,466,023 | 5,544,645 | 1.4% | 8,876,844 | 9,313,471 | 4.9% | 14,342,867 | 14,858,116 | 515,249 | 3.6% |
| FRAMINGHAM | 8,205,353 | 8,449,638 | 3.0% | 13,423,226 | 13,704,216 | 2.1% | 21,628,579 | 22,153,854 | 525,275 | 2.4% |
| LEXINGTON | 7,128,006 | 7,414,724 | 4.0% | 7,572,486 | 7,923,398 | 4.6% | 14,700,492 | 15,338,122 | 637,630 | 4.3% |
| MALDEN | 7,119,028 | 7,554,262 | 6.1% | 13,514,306 | 13,822,520 | 2.3% | 20,633,334 | 21,376,782 | 743,448 | 3.6% |
| MEDFORD | 6,462,326 | 6,543,875 | 1.3% | 12,356,732 | 12,611,566 | 2.1% | 18,819,058 | 19,155,441 | 336,383 | 1.8% |
| MELROSE | 2,897,122 | 2,977,605 | 2.8% | 6,520,195 | 6,785,330 | 4.1% | 9,417,317 | 9,762,935 | 345,618 | 3.7% |
| MILTON | 3,463,069 | 3,509,377 | 1.3% | 5,556,575 | 5,792,015 | 4.2% | 9,019,644 | 9,301,392 | 281,748 | 3.1% |
| NEWTON | 12,080,214 | 12,724,326 | 5.3% | 22,348,192 | 22,639,537 | 1.3% | 34,428,406 | 35,363,863 | 935,457 | 2.7% |
| NORWOOD | 4,064,489 | 3,964,362 | -2.5% | 7,628,062 | 8,245,988 | 8.1% | 11,692,551 | 12,210,350 | 517,799 | 4.4% |
| QUINCY | 11,998,387 | 11,716,127 | -2.4% | 20,708,161 | 21,281,625 | 2.8% | 32,706,548 | 32,997,752 | 291,204 | 0.9% |
| READING | 2,296,922 | 2,371,066 | 3.2% | 5,090,525 | 5,430,596 | 6.7% | 7,387,447 | 7,801,662 | 414,215 | 5.6% |
| REVERE | 5,185,345 | 5,263,284 | 1.5% | 10,761,283 | 10,994,231 | 2.2% | 15,946,628 | 16,257,515 | 310,887 | 1.9% |
| SOMERVILLE | 8,055,307 | 8,433,001 | 4.7% | 17,094,747 | 17,654,452 | 3.3% | 25,150,054 | 26,087,453 | 937,399 | 3.7% |
| STONEHAM | 3,105,808 | 3,019,723 | -2.8% | 4,616,825 | 4,860,101 | 5.3% | 7,722,633 | 7,879,824 | 157,191 | 2.0% |
| WALTHAM | 9,311,252 | 9,623,699 | 3.4% | 13,800,824 | 14,087,691 | 2.1% | 23,112,076 | 23,711,390 | 599,314 | 2.6% |
| WATERTOWN | 3,696,371 | 3,899,172 | 5.5% | 6,357,733 | 6,735,163 | 5.9% | 10,054,104 | 10,634,335 | 580,231 | 5.8% |
| WINTHROP | 1,698,840 | 1,848,725 | 8.8% | 3,565,533 | 3,754,400 | 5.3% | 5,264,373 | 5,603,125 | 338,752 | 6.4% |
| TOTAL | \$212,907,902 | \$218,961,535 | 2.8% | \$356,268,453 | \$369,265,929 | 3.6% | \$569,176,355 | \$588,227,464 | \$19,051,109 | 3.3% |

| MWRA Sewer and Partial Water Customers | Final FY19 Water Assessment | Preliminary FY20 Water Assessment | Percent Change from FY19 | Final FY19 Sewer Assessment | Preliminary FY20 Sewer Assessment | Percent Change from FY19 | Final FY19 Combined Assessment | Preliminary FY20 Combined Assessment | Dollar Change from FY19 | Percent Change from FY19 |
|--|-----------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------------|
| CANTON | 1,874,192 | 2,137,222 | 14.0% | 4,383,915 | 4,661,549 | 6.3% | \$6,258,107 | \$6,798,771 | \$540,664 | 8.6% |
| NEEDHAM | 856,049 | 1,413,150 | 65.1% | 6,173,219 | 6,460,637 | 4.7% | 7,029,268 | 7,873,787 | 844,519 | 12.0% |
| STOUGHTON | 161,431 | 146,715 | -9.1% | 5,072,227 | 5,289,740 | 4.3% | 5,233,658 | 5,436,455 | 202,797 | 3.9% |
| WAKEFIELD | 2,133,553 | 2,581,683 | 21.0% | 6,290,285 | 6,644,649 | 5.6% | 8,423,838 | 9,226,332 | 802,494 | 9.5% |
| WELLESLEY | 1,485,700 | 1,477,073 | -0.6% | 5,745,909 | 5,992,162 | 4.3% | 7,231,609 | 7,469,235 | 237,626 | 3.3% |
| WILMINGTON | 503,145 | 732,349 | 45.6% | 2,913,415 | 3,010,395 | 3.3% | 3,416,560 | 3,742,744 | 326,184 | 9.5% |
| WINCHESTER | 1,840,674 | 1,732,537 | -5.9% | 4,319,099 | 4,503,768 | 4.3% | 6,159,773 | 6,236,305 | 76,532 | 1.2% |
| WOBBURN | 3,177,148 | 4,120,146 | 29.7% | 9,474,524 | 9,556,907 | 0.9% | 12,651,672 | 13,677,053 | 1,025,381 | 8.1% |
| TOTAL | \$12,031,892 | \$14,340,875 | 19.2% | \$44,372,593 | 46,119,807 | 3.9% | \$56,404,485 | \$60,460,682 | \$4,056,197 | 7.2% |

| MWRA Sewer-only Customers | Final FY19 Water Assessment | Preliminary FY20 Water Assessment | Percent Change from FY19 | Final FY19 Sewer Assessment | Preliminary FY20 Sewer Assessment | Percent Change from FY19 | Final FY19 Combined Assessment | Preliminary FY20 Combined Assessment | Dollar Change from FY19 | Percent Change from FY19 |
|---------------------------|-----------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------------|
| ASHLAND | | | | 2,693,503 | 2,776,819 | 3.1% | \$2,693,503 | \$2,776,819 | \$83,316 | 3.1% |
| BEDFORD | | | | 3,655,178 | 3,661,257 | 0.2% | 3,655,178 | 3,661,257 | 6,079 | 0.2% |
| BRAINTREE | | | | 9,758,859 | 9,978,997 | 2.3% | 9,758,859 | 9,978,997 | 220,138 | 2.3% |
| BURLINGTON | | | | 5,530,776 | 5,869,990 | 6.1% | 5,530,776 | 5,869,990 | 339,214 | 6.1% |
| CAMBRIDGE | | | | 25,518,527 | 26,636,146 | 4.4% | 25,518,527 | 26,636,146 | 1,117,619 | 4.4% |
| DEDHAM | | | | 5,597,434 | 5,913,520 | 5.6% | 5,597,434 | 5,913,520 | 316,086 | 5.6% |
| HINGHAM SEWER DISTRICT | | | | 1,902,184 | 1,953,706 | 2.7% | 1,902,184 | 1,953,706 | 51,522 | 2.7% |
| HOLBROOK | | | | 1,824,554 | 1,876,569 | 2.9% | 1,824,554 | 1,876,569 | 52,015 | 2.9% |
| NATICK | | | | 5,972,626 | 6,108,225 | 2.3% | 5,972,626 | 6,108,225 | 135,599 | 2.3% |
| RANDOLPH | | | | 6,530,979 | 6,814,617 | 4.3% | 6,530,979 | 6,814,617 | 283,638 | 4.3% |
| WALPOLE | | | | 3,988,527 | 4,127,058 | 3.5% | 3,988,527 | 4,127,058 | 138,531 | 3.5% |
| WESTWOOD | | | | 2,988,061 | 3,163,487 | 5.9% | 2,988,061 | 3,163,487 | 175,426 | 5.9% |
| WEYMOUTH | | | | 12,584,755 | 13,201,449 | 4.9% | 12,584,755 | 13,201,449 | 616,694 | 4.9% |
| TOTAL | | | | \$88,545,963 | \$92,081,840 | 4.0% | \$88,545,963 | \$92,081,840 | \$3,535,877 | 4.0% |

| MWRA Water-only Customers | Final FY19 Water Assessment | Preliminary FY20 Water Assessment | Percent Change from FY19 | Final FY19 Sewer Assessment | Preliminary FY20 Sewer Assessment | Percent Change from FY19 | Final FY19 Combined Assessment | Preliminary FY20 Combined Assessment | Dollar Change from FY19 | Percent Change from FY19 |
|---------------------------|-----------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------------|
| LYNNFIELD WATER DISTRICT | 759,983 | 801,392 | 5.4% | | | | \$759,983 | \$801,392 | \$41,409 | 5.4% |
| MARBLEHEAD | 2,531,598 | 2,576,899 | 1.8% | | | | 2,531,598 | 2,576,899 | 45,301 | 1.8% |
| NAHANT | 496,315 | 457,376 | -7.8% | | | | 496,315 | 457,376 | (38,939) | -7.8% |
| SAUGUS | 4,016,971 | 4,222,326 | 5.1% | | | | 4,016,971 | 4,222,326 | 205,355 | 5.1% |
| SOUTHBOROUGH | 866,571 | 927,840 | 7.1% | | | | 866,571 | 927,840 | 61,269 | 7.1% |
| SWAMPSCOTT | 2,021,785 | 2,162,229 | 6.9% | | | | 2,021,785 | 2,162,229 | 140,444 | 6.9% |
| WESTON | 2,493,163 | 2,414,331 | -3.2% | | | | 2,493,163 | 2,414,331 | (78,832) | -3.2% |
| TOTAL | \$13,186,386 | \$13,562,393 | 2.9% | | | | \$13,186,386 | \$13,562,393 | \$376,007 | 2.9% |

| MWRA Partial Water-only Customers | Final FY19 Water Assessment | Preliminary FY20 Water Assessment | Percent Change from FY19 | Final FY19 Sewer Assessment | Preliminary FY20 Sewer Assessment | Percent Change from FY19 | Final FY19 Combined Assessment | Preliminary FY20 Combined Assessment | Dollar Change from FY19 | Percent Change from FY19 |
|-----------------------------------|-----------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------------|
| DEDHAM-WESTWOOD WATER DISTRICT | 154,204.00 | 181,986.00 | 18.0% | | | | \$154,204 | \$181,986 | \$27,782 | 18.0% |
| LYNN (LWSC) | 320,031 | 592,299 | 85.1% | | | | 320,031 | 592,299 | 272,268 | 85.1% |
| MARLBOROUGH | 5,820,947 | 5,876,246 | 1.0% | | | | 5,820,947 | 5,876,246 | 55,299 | 1.0% |
| NORTHBOROUGH | 1,271,058 | 1,312,949 | 3.3% | | | | 1,271,058 | 1,312,949 | 41,891 | 3.3% |
| PEABODY | 4,162,771 | 4,361,641 | 4.8% | | | | 4,162,771 | 4,361,641 | 198,870 | 4.8% |
| TOTAL | \$11,729,011 | \$12,325,121 | 5.1% | | | | \$11,729,011 | \$12,325,121 | \$596,110 | 5.1% |
| SYSTEMS TOTAL | \$249,855,191 | \$259,189,924 | 3.74% | \$489,187,009 | \$507,467,576 | 3.74% | \$739,042,200 | \$766,657,500 | \$27,615,300 | 3.74% |

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 FY20, community assessments are projected to represent 96.2% 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 rate increases might be based upon these assumptions, as well as to test the impact of changes to assumptions on future rate increases. The planning estimates are not predictions of what rate increases 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 increases on an annual basis. Conservative projections of future rate increases 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 rate revenue increases 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 assessment increases.

The table below and Appendix D (in more detail) present the combined estimated future rate revenue requirements for FY20 through FY24. The planning estimates assume no Debt Service Assistance and use of Rate Stabilization and Bond Redemption reserves through FY2024 to manage the rate increases. These projections also include the release of cash and debt service reserves starting in FY16 as a result of Bond Indenture changes.

| Rates & Budget Projections | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| Proposed FY20 CEB | FY2019 | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 |
| Total Rate Revenue (\$000) | \$ 739,042 | \$ 766,657 | \$ 793,957 | \$ 821,419 | \$ 848,185 | \$ 875,791 |
| Rate Revenue Change from Prior Year (\$000) | \$ 21,988 | \$ 27,615 | \$ 27,299 | \$ 27,463 | \$ 26,766 | \$ 27,606 |
| Rate Revenue Increase | 3.1% | 3.7% | 3.6% | 3.5% | 3.3% | 3.3% |
| Use of Reserves (\$000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |

Estimated Household Bill

| | | | | | | |
|---|---------|---------|---------|---------|---------|---------|
| Based on annual water usage of 61,000 gallons | \$1,157 | \$1,208 | \$1,261 | \$1,316 | \$1,372 | \$1,431 |
| Based on annual water usage of 90,000 gallons | \$1,707 | \$1,783 | \$1,861 | \$1,942 | \$2,025 | \$2,112 |

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, extended 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 projected growth of base operating costs. The estimated \$30.0 million increase in direct expenses from FY20 to FY24 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. The assumptions include:

- Direct expense inflation rate of 2.7% for salaries and 3.0% for other direct expenses starting in FY21;
- 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 5.25% interest rates in FY20, and 30 year terms 5.5% interest rates in FY21, 5.75% rates in FY22, and 6.0% rates from FY23 and beyond;
- Variable rate interest projected at 3.75% in FY20, and 4.0% starting in FY21.

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 2020 through 2029 forecast rate revenue requirement increases of 3.7% in FY20, 3.6% in FY21, 3.5% in FY22, and 3.3% in FY23 and FY24.

The FY20 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
- For the second year, continues the smoothing strategy to even out the rate revenue requirement and rate changes caused by fluctuations in debt service at the utility level.

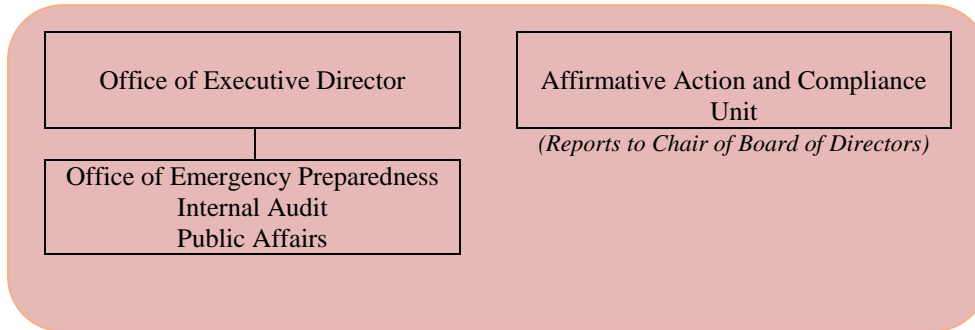
STATEMENT OF FINANCIAL POSITION

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, 2018 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, WSCAC and WAC is set forth in Appendix E). The Executive Office budget accounts for less than 1% of the MWRA FY20 Direct Expense Budget.

FY20 Proposed Current Expense Budget OFFICE OF THE EXECUTIVE DIRECTOR

| DEPARTMENT | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| EXECUTIVE OFFICE | \$ 525,060 | \$ 542,631 | \$ 549,534 | \$ 571,894 | \$ 22,360 | 4.1% |
| BOARD OF DIRECTORS | 77,673 | 61,964 | 84,579 | 82,635 | (1,944) | -2.3% |
| ADVISORY BOARD / OTHER COMMITTEES | 702,640 | 710,746 | 785,174 | 787,046 | 1,872 | 0.2% |
| TOTAL | \$ 1,305,373 | \$ 1,315,341 | \$ 1,419,287 | \$ 1,441,575 | \$ 22,288 | 1.6% |

FY20 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.

| FY20 Proposed Current Expense Budget | | | | | | | |
|---|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|--|
| OFFICE OF THE EXECUTIVE DIRECTOR | | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 595,819 | \$ 598,671 | \$ 627,522 | \$ 646,853 | \$ 19,331 | 3.1% | |
| OVERTIME | - | - | - | - | - | - | |
| TRAINING & MEETINGS | - | - | 850 | 850 | - | 0.0% | |
| PROFESSIONAL SERVICES | 166,289 | 165,905 | 180,674 | 185,046 | 4,372 | 2.4% | |
| OTHER MATERIALS | 3,377 | 2,594 | 2,505 | 3,200 | 695 | 27.7% | |
| OTHER SERVICES | 539,888 | 548,171 | 607,736 | 605,626 | (2,110) | -0.3% | |
| TOTAL | \$ 1,305,373 | \$ 1,315,341 | \$ 1,419,287 | \$ 1,441,575 | \$ 22,288 | 1.6% | |

Budget Highlights:

The FY20 Proposed Budget is \$1.4 million, an increase of \$22,000 or 1.6%, as compared to the FY19 Budget.

- \$647,000 for **Wages and Salaries**, an increase of \$19,000 or 3.1%, as compared to the FY19 Budget. The FY20 Proposed Budget includes funding for five FTEs, the same as the FY19 Budget.

| OFFICE OF THE EXECUTIVE DIRECTOR | FY19 FTEs | FY20 FTEs |
|----------------------------------|------------|------------|
| EXECUTIVE OFFICE | 5.0 | 5.0 |
| TOTAL | 5.0 | 5.0 |

- \$185,000 for **Professional Services**, an increase of \$4,400 or 2.4%, as compared to the FY19 Budget, mainly due to increases in the Advisory Committees’ operating expenses. This budget funds the Water Supply Citizens’ Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC) budgets and includes a 3.0% increase in salaries, level funding of miscellaneous operating expenses and a 3.0% increase in health insurances.
- \$606,000 for **Other Services**, a decrease of \$2,000 or 0.3%, as compared to the FY19 Budget. The primary component of this line item is MWRA Advisory Board operating expenses is reduced from the FY19 Budget, mainly from eliminating the rental cost, offset by increases in wages and salaries following two staff upgrades.



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.

FY20 Proposed Current Expense Budget OFFICE OF EMERGENCY PREPAREDNESS

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|
| WAGES & SALARIES | \$ 650,894 | \$ 839,048 | \$ 913,777 | \$ 811,472 | \$ (102,305) | -11.2% |
| OVERTIME | 167 | 128 | - | - | - | - |
| MAINTENANCE | 493,085 | 638,663 | 654,900 | 659,900 | 5,000 | 0.8% |
| TRAINING & MEETINGS | 10,934 | 9,890 | 14,500 | 14,500 | - | 0.0% |
| PROFESSIONAL SERVICES | 1,849,903 | 2,023,845 | 1,918,440 | 2,008,700 | 90,260 | 4.7% |
| OTHER MATERIALS | 24,050 | 53,604 | 18,042 | 18,042 | - | 0.0% |
| OTHER SERVICES | 109,920 | 108,807 | 115,272 | 109,272 | (6,000) | -5.2% |
| TOTAL | \$ 3,138,953 | \$ 3,673,985 | \$ 3,634,931 | \$ 3,621,886 | \$ (13,045) | -0.4% |

FY20 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, critical infrastructure protection, and emergency planning for the MWRA’s water systems.
 - Continue to enhance Emergency Response Plans for all water and wastewater facilities. Update Emergency Action Plans (EAPs) as needed, including the Western Section Dam EAPs and spill control EAPs.
 - 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 installation, 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, critical infrastructure protection, and emergency planning 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 that could affect the water and wastewater delivery systems***
 - Expand, equip, train, and lead the Emergency Service Unit (ESU).
 - Develop and exercise emergency plans and procedures.
 - Manage and direct security guard, security monitoring, and security maintenance contracts.
 - Hold a major Inter-Agency Consequence Management drill.

V. Environmental Sustainability

- ***Goal #16 – 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***
 - 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.

FY19 Mid-Year Accomplishments:

- Purchased additional flood stop-planks for facility protection.
- Held a cyber-security tabletop drill for technical staff.
- Executed a new three-year Security Guard Services contract.
- Performed a Consequence-Driven Cyber-Informed Engineering review of critical operation processes.
- Integrated the Wachusett Aqueduct Pump Station and the new Marlboro Maintenance Building into the MWRA's security system.
- Completed a total of 72 training events or drills through February 2019.
- Continued to provide an emergency response training program and a tabletop exercise series for MWRA staff and community water system staff. Held four Community ERP classes in the fall with good community operator and MWRA staff turnout. Held two severe-weather table top drills for managers and supervisors.
- Continued the use of drones for documenting asset condition.

- Arranged for the DHS, MITRE, FBI and Idaho National Lab speakers for the 4th semi-annual Water Sector OT/IT Cyber Security Meeting.
- Participated in the State Threat and Hazard Identification and Risk Assessment process.
- Began work to understand and meet the requirements of America’s Water Infrastructure.

Budget Highlights:

The FY20 Proposed Budget is \$3.6 million, a decrease of \$13,000 or 0.4%, as compared to the FY19 Budget.

- \$811,000 for **Wages and Salaries**, a decrease of \$102,000 or 11.2% as compared to the FY19 Budget, mainly due to transfer of a staff to the OH & Safety unit. The FY20 Proposed Budget includes funding for seven FTEs, one less than the FY19 Budget.

| OFFICE OF EMERGENCY PREPAREDNESS | FY19 FTEs | FY20 FTEs |
|----------------------------------|------------|------------|
| EMERGENCY PREPAREDNESS | 8.0 | 7.0 |
| TOTAL | 8.0 | 7.0 |

- \$660,000 for **Ongoing Maintenance**, an increase of \$5,000 or 0.8%, slightly higher than the FY19 Budget. This budget includes funding of \$515,000 to cover the MWRA-wide security systems preventative maintenance and repair service, \$125,000 an increase of \$15,000 for MWRA-wide security systems maintenance materials and equipment, including cameras, intrusion detection, card readers; and \$20,000 for the intrusion alarm annual and semi-annual monitoring services contracts, which was decreased by \$10,000 to reflect a shrinking facility count.
- \$2.0 million for **Professional Services**, an increase of \$90,300 or 4.7% as compared to the FY19 Budget. The increase is primarily due to new vehicle expenses, increased rates and some additional hours to facilitate shift-change pass down. 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), 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.
- \$18,000 for **Other Materials**, which is level funded from the FY19 Budget. This line item mainly funds purchase of Health and Safety materials for the ESU Team.
- \$109,000 for **Other Services**, a decrease of \$6,000 or 5.2% from the FY19 Budget. This budget includes funding for licensing cost for two-way radios with Department of Conservation and Recreation (DCR) and for mandatory monthly testing and inspection of the Self-Contained Breathing Apparatus (SCBA).



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.

| FY20 Proposed Current Expense Budget AFFIRMATIVE ACTION & COMPLIANCE UNIT | | | | | | | |
|--|-------------------|-------------------|----------------------|----------------------------|------------------------|--------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 457,840 | \$ 502,922 | \$ 559,777 | \$ 675,238 | \$ 115,461 | 20.6% | |
| OVERTIME | - | - | - | - | - | - | |
| TRAINING & MEETINGS | 4,617 | 4,830 | 7,560 | 6,600 | (960) | -12.7% | |
| OTHER MATERIALS | 1,632 | 2,643 | 1,950 | 1,950 | - | 0.0% | |
| OTHER SERVICES | 386 | 806 | 912 | 1,012 | 100 | 11.0% | |
| TOTAL | \$ 464,475 | \$ 511,201 | \$ 570,199 | \$ 684,800 | \$ 114,601 | 20.1% | |

FY20 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.

FY19 Mid-Year Accomplishments:

- Provided management assistance to the Human Resources Department in the overall recruitment and selection process for qualified candidates for eighty-four (84) new hires and ninety-nine (99) promotions.
- Conducted oversight of 116 construction and professional projects, including 16 site visits monitoring the minority and women workforce as well as MBE/WBE/DBE compliance. With the exception of WBE Construction, the other procurement targets remain.

Budget Highlights:

The FY20 Proposed Budget is \$684,800 an increase of \$114,601 or 20.1% over the FY19 Budget.

- \$675,238 for **Wages and Salaries**, an increase of \$115,461 or 20.6% over the FY19 Budget. The increase is primarily for wage increases associated with proposed new positions of an Associate Special Assistant and Monitoring and Compliance Administrator and collective bargaining agreements. The FY20 Proposed Budget includes funding for seven FTEs, an increase from six FTEs in the FY19 Budget.

| AFFIRMATIVE ACTION & COMPLIANCE UNIT | FY19 FTEs | FY20 FTEs |
|--------------------------------------|------------|------------|
| AACU | 6.0 | 7.0 |
| TOTAL | 6.0 | 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.

| FY20 Proposed Current Expense Budget | | | | | | | |
|--------------------------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------|--|
| INTERNAL AUDIT | | | | | | | |
| LINE ITEM | FY17 | FY18 | FY19 | FY20 | Change | | |
| | Actuals | Actuals | Final Budget | Proposed Budget | FY20 to FY19 | | |
| WAGES & SALARIES | \$ 616,599 | \$ 652,002 | \$ 686,402 | \$ 706,483 | \$ 20,081 | 2.9% | |
| MAINTENANCE | 15 | 11 | - | - | - | - | |
| TRAINING & MEETINGS | 4,211 | 4,120 | 6,683 | 6,517 | (166) | -2.5% | |
| OTHER MATERIALS | 1,613 | 1,159 | 2,159 | 2,168 | 9 | 0.4% | |
| OTHER SERVICES | 1,376 | 2,041 | 1,800 | 2,100 | 300 | 16.7% | |
| TOTAL | \$ 623,814 | \$ 659,333 | \$ 697,044 | \$ 717,268 | \$ 20,224 | 2.9% | |

FY20 Goals and Initiatives:

In addition to its statutory core functions, the Department has set the following goals for FY20:

- 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 have secure data control environments and 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.

FY19 Mid-Year Accomplishments:

- Identified \$2,785,478 in savings through the second 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 and on-going savings from the lease of the engine house by the Fore River Railroad Corporation.

- Issued final audit reports on Chelsea lease and Cambridge financial assistance agreements. Issued two incurred cost audits, four preliminary consultant and five preliminary construction reviews.
- Provided management advisory analysis services dealing with MWRA overhead rates, unemployment compensation, HEEC tariff filings, sole source award analysis and comparison of estimates with bids for construction and professional service contracts, and various contract and amendment 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.
- Seven audit recommendations have been closed during the period.

Budget Highlights:

The FY20 Proposed Budget is \$717,000, an increase of \$20,000 or 2.9% as compared to the FY19 Budget.

- \$706,000 for **Wages and Salaries**, an increase of \$20,000 or 2.9% as compared to the FY19 Budget, primarily for wage increases associated with collective bargaining agreements. The FY20 Proposed Budget includes funding for 6.7 FTEs, reflecting an adjustment to the number of hours of a part-time employee.

| INTERNAL AUDIT DEPARTMENT | FY19 FTEs | FY20 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.

FY20 Proposed Current Expense Budget PUBLIC AFFAIRS

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|
| WAGES & SALARIES | \$ 1,114,692 | \$ 1,060,989 | \$ 1,187,041 | \$ 1,065,429 | \$ (121,612) | -10.2% |
| OVERTIME | 14 | - | 500 | 500 | - | 0.0% |
| TRAINING & MEETINGS | 3,065 | 5,230 | 4,586 | 4,586 | - | 0.0% |
| PROFESSIONAL SERVICES | 0 | 0 | 1,300 | 1,300 | - | 0.0% |
| OTHER MATERIALS | 20,854 | 21,548 | 26,596 | 25,896 | (700) | -2.6% |
| OTHER SERVICES | 35,016 | 29,534 | 48,816 | 48,821 | 5 | 0.0% |
| TOTAL | \$ 1,173,641 | \$ 1,117,301 | \$ 1,268,839 | \$ 1,146,532 | \$ (122,307) | -9.6% |

FY20 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 FY16-FY20 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, and infrastructure projects.
 - Continue expand the presence of MWRA's portable water fountain at public events in service communities.
- 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 FY20 will be a refresh of the MWRA's website.
- 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.
- 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.
- 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.

- Continue to implement the recently awarded Recreational Trails Grant from MassDCR in order to improve maintenance and wayfinding across the Aqueduct Trails Network.
- 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.

FY19 Mid-Year Accomplishments:

- Successfully advocated for the funding of the Sewer Rate Relief Fund. Governor Baker’s House 1 Budget included a statewide appropriation of \$1,100,000. MWRA has historically received approximately 75% of the total appropriation.
- Successfully grew the Everbridge communication platform to over 500 public opt-in subscription in an effort 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.
- Conducted several public meetings to update public officials and residents of MWRA’s upcoming and ongoing infrastructure investments and their potential impacts on local communities. These included, among others, several meetings with Stoneham residents and the Board of Selectman regarding the Northern Intermediate High Water Transmission Redundancy and Storage Project as well as meeting with Dedham officials and residents regarding the Southern Extra High Redundancy.
- 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. 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.

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:
Weston^[1]:

4.3 miles permitted, of which 3.0 miles opened to the public
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

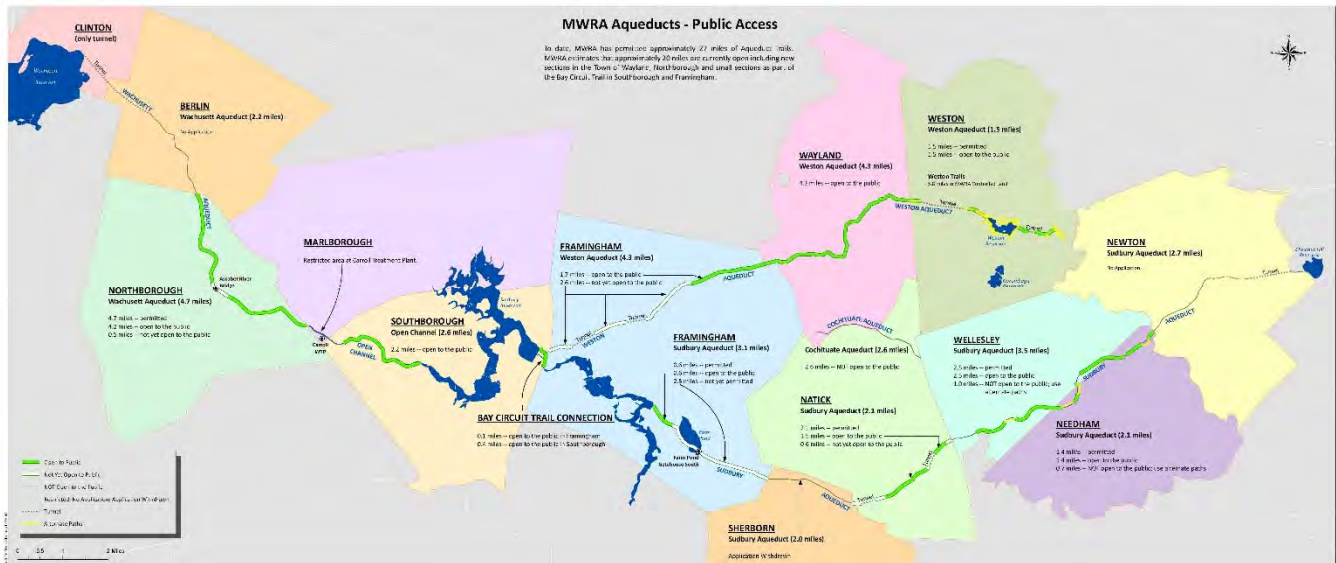
Framingham:
Natick:
Wellesley:
Needham:

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

Cochituate Aqueduct

Natick:

2.6 miles permitted (0 miles opened to the public)



- Continued to grow partnerships and expand public outreach in member communities at over 70 public events across the service area by providing educational materials as well as access to free drinking water with MWRA's Water Fountain.
- In FY2019, work continued on construction photo books to document projects that have been completed by the MWRA over the past 30 years to provide a physical record for the projects to compliment the digital photo collection. A book on the MetroWest Water Supply Tunnel and Hultman Aqueduct Rehabilitation was completed in the fall, bringing the total to six.

[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.



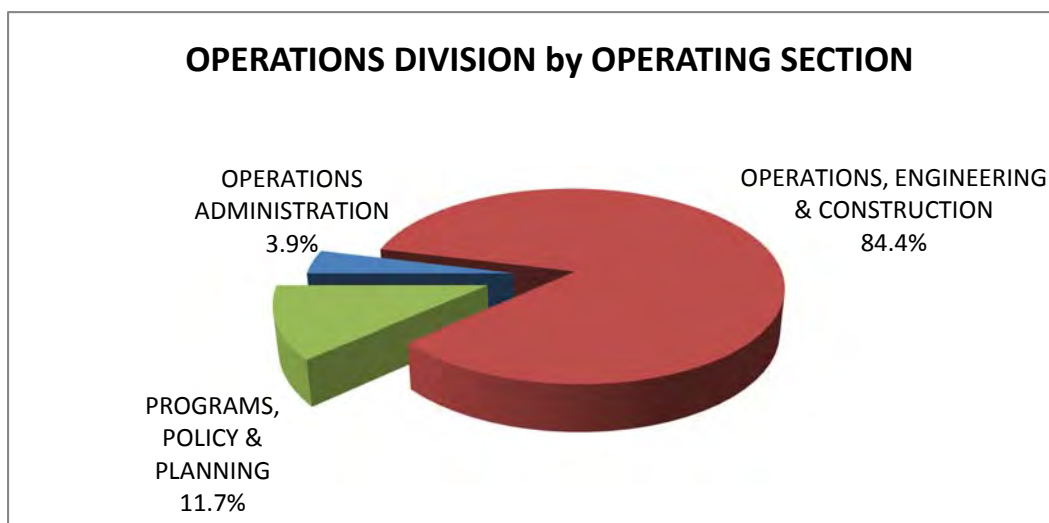
Operations Division Budget



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.

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| OPERATIONS DIVISION | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 77,413,245 | \$ 79,087,126 | \$ 83,817,645 | \$ 85,779,996 | \$ 1,962,351 | 2.3% |
| OVERTIME | 4,875,767 | 4,524,031 | 4,366,583 | 4,811,993 | 445,410 | 10.2% |
| FRINGE BENEFITS | 106,053 | 109,288 | 89,597 | 114,451 | 24,854 | 27.7% |
| CHEMICALS | 9,262,849 | 9,659,735 | 10,830,452 | 12,087,530 | 1,257,078 | 11.6% |
| UTILITIES | 20,137,269 | 21,894,329 | 22,760,516 | 24,087,993 | 1,327,477 | 5.8% |
| ONGOING MAINTENANCE | 25,405,009 | 24,363,901 | 27,141,796 | 27,271,844 | 130,048 | 0.5% |
| TRAINING & MEETINGS | 182,597 | 142,101 | 245,600 | 297,600 | 52,000 | 21.2% |
| PROFESSIONAL SERVICES | 2,583,297 | 2,451,457 | 3,092,472 | 2,678,151 | (414,321) | -13.4% |
| OTHER MATERIALS | 5,049,295 | 4,792,529 | 5,084,607 | 5,161,061 | 76,454 | 1.5% |
| OTHER SERVICES | 17,894,735 | 18,657,497 | 18,724,361 | 19,634,983 | 910,622 | 4.9% |
| TOTAL | \$ 162,910,116 | \$ 165,681,994 | \$ 176,153,629 | \$ 181,925,602 | \$ 5,771,973 | 3.3% |

The Operations Division is composed of the Operations Administration Department and four operating sections, led by 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 new Tunnel Redundancy Program that will oversee and manage 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 11.7% 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 also 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 84.4% 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 wastewater pretreatment, water treatment, wastewater collection and water distribution functions, 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 the implementation and monitoring of the Combined Sewer Overflow (CSO) plan.

| FY20 Proposed Current Expense Budget | | | | | | |
|---|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| OPERATIONS DIVISION by OPERATING SECTION | | | | | | |
| OPERATING SECTION | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| OPERATIONS ADMINISTRATION | \$ 4,829,601 | \$ 4,902,826 | \$ 5,406,992 | \$ 7,092,485 | \$ 1,685,493 | 31.2% |
| OPERATIONS, ENGINEERING & CONSTRUCTION | 139,091,187 | 141,081,379 | 149,553,191 | 153,619,605 | 4,066,414 | 2.7% |
| PROGRAMS, POLICY & PLANNING | 18,989,328 | 19,697,789 | 21,193,446 | 21,213,512 | 20,066 | 0.1% |
| TOTAL | \$ 162,910,116 | \$ 165,681,994 | \$ 176,153,629 | \$ 181,925,602 | \$ 5,771,973 | 3.3% |

FY20 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 Board-approved FY16 - FY20 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. Continue to optimize ultraviolet disinfection treatment process for MWRA's potable water system at the Carroll Water Treatment Plant and Brutsch Treatment Facility while meeting or exceeding all water quality standards.
 - Continue to develop and implement contaminant monitoring plans in the water system.
 - Conduct invasive species removal and monitoring at water reservoirs.
- **Goal #2 – Water Quality Public Communications:** Continue to effectively report and communicate water quality information to our customers and public officials.
- **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.
 - Continue to distribute interest-free loans to member water communities including under the Lead Service Line Replacement Loan Program.
 - Continue to provide technical assistance and laboratory analysis to help communities identify and reduce lead service lines, primarily in schools.

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.
 - Meet all NPDES and other regulatory effluent quality, treatment, monitoring, and pre-treatment requirements.
 - Successfully use new phosphorous treatment system and natural gas lines at the Clinton Wastewater Treatment Plant.
 - Implement new NPDES permit requirements for Clinton Wastewater Treatment Plant (permit issued March 2017).
 - Continue work on harbor and outfall monitoring initiatives including: calculating revised thresholds, continuing work with Department of Conservation and Recreation implementation of appropriate beach management practices in South Boston, and improving instrumentation on National Oceanic and Atmospheric Administration's (NOAA's) weather buoy.
 - Comply with I/I mapping and planning requirements in state environmental regulations and NPDES permits.
- **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.
 - Plan for implementation of requirements of the new National Pollutant Discharge Elimination System (NPDES) Permits for DITP (assume will be issued after FY19).
 - Plan for the new round of NPDES-required Local Limit testing in TRAC to reassess industrial discharge limits and commence the work after the Environmental Protection Agency (EPA) issues the new NPDES permits.

- **Goal #6 – CSO Plan Compliance:** Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives at all outfalls. Ensure compliance with CSO NPDES permit requirements.
 - Develop an intensified level of data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality to meet future water quality assessments expected in the CSO variance areas of the Mystic and Charles Rivers.
- **Goal #7 – Technical Assistance for Wastewater Communities:** Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.
 - Continue distribution of interest-free loans and grants to member sewer communities.

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** 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.
 - Optimize staff resources, overtime, service contracts, and as-needed design contracts to complete routine and major maintenance projects.
 - Work on numerous projects in Field Operations including meter inspection and repairs; manhole rehabilitation; pipeline repair and replacement; invasives control in the water reservoirs; dam inspections and tree clearing; and water tank inspections and cleaning.
 - Commence and complete periodic facility painting and coating projects at Deer Island and Clinton.
 - Continue work on numerous major projects at Deer Island including facility repainting and coating repairs; Zurn boiler maintenance and repairs; electrical system maintenance; motor overhauls; HVAC unit replacement; PLC replacements; and critical equipment maintenance.
- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - The FY20 Capital Improvement Program forecasts \$249.8 million in spending in FY20, of which \$169.7 million supports Wastewater System Improvements and \$65.4 million supports Waterworks System Improvements.
 - There are 197 active contracts in FY20 of which 63 are for design of Wastewater and Waterworks Systems Improvements and 47 are for construction, with projected spending of \$33.9 million for design and \$163.8 million for construction. In addition, there are 87 active other contracts with total spending of \$52.1 million.
- **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events that could affect the water and wastewater delivery systems.

IV. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA’s facilities through grant-funding and cost-sharing if available.

- Self-generate ~ 30% 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 ~ \$2.2 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 ~ \$600,000 in capacity charges through use of self-generation assets during peak load events.
- Implement multi-year Memorandums of Understanding with Eversource and NGrid including lists of eligible projects and rebates for energy savings.



- **Goal #16 – Climate Change Adaptation:** Continue to monitor climate change research and progress with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure.
- **Goal #17 – Water System Expansion:** Advance reasonable water system expansion.

The strategic priorities and goals that apply to each department within the Operations Division are presented in each department's budget section.

FY19 Mid-Year Accomplishments:

I. Drinking Water Quality and System Performance

- Met water quality and treatment standards in the drinking water system during the first six months of FY19.
- Developed and trained community staff in preparation for EPA's Unregulated Contaminant Monitoring Rule 4 program which commenced in 2018 and continues into 2020. Also continued to participate in the Unregulated Contaminant Rule 4 sampling program.
- Continued to develop and refine equipment maintenance plans and life cycle projection for newly expanded monitoring equipment inventory with a total estimated value of over \$2 million.
- Performed reservoir level management control at all metropolitan reservoirs to maintain normal operating levels.
- The Laboratory Services Department performed 68,008 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 3,985 tests in support of community efforts to identify and reduce lead service lines in schools.
- Distributed \$24.7 million in interest-free loans to member water communities plus an additional \$1.1 million for lead service line replacement.

II. Wastewater Quality and System Performance

- Deer Island anticipates receiving the Platinum Peak Performance Award for 2018 from the National Association of Clean Water Agencies (NACWA) for the 12th 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 12 years.

- DITP met secondary permit limits at all times, treating on average more than 99% of flows with full secondary treatment.
- Processed 112 average tons per day of sludge at the Pelletization Plant and disposed of 3,062 tons of grit and screenings through a contracted vendor.
- The TRAC Department completed the following Environmental Protection Agency (EPA)-required work for significant industrial users: 101 inspections, 130 monitoring events, and 273 sampling of connections. This department also issued or renewed 245 permits to Significant Industrial Users (SIUs) and non-SIUs.
- The Department of Laboratory Services performed 140,923 tests (including data entry of field tests) including the Massachusetts Bay water column testing for the Harbor and Outfall Monitoring program.
- 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 five technical reports, made monitoring results available on its website, and sent reports to government regulators, the Outfall Monitoring Science Advisory Panel and interested members of the public.
- Distributed \$16.3 million in grants and interest-free loans to member sewer communities to rehabilitate their collection systems with the goal of structurally reducing infiltration and inflow.

III. Infrastructure Management and Résilience

Maintenance

- The Operations Division spent \$12.4 million on maintenance of which \$5.1 million was for materials and \$7.3 million was for services.
- Procured and implemented numerous contracts for maintenance services, including the following:
 - Crane maintenance services
 - Instrumentation system services
 - Hydraulic equipment services
 - Invasives plant control services
 - Lab equipment maintenance services
 - Thermal and hydro plant maintenance services
- Procured and implemented numerous contracts for maintenance projects including:
 - Loring Road pipe insulation
 - Installation of energy efficient LED interior and site lighting at Union Park Detention and Treatment Facility
 - Union Park Pump Station Fuel Storage Upgrade
 - Clinton painting and coating project
 - Purchase of flood protection stop plank barriers for numerous wastewater transport facilities
- Completed numerous maintenance projects including the following representative work:
 - **DITP:** Completed annual maintenance at the Thermal Power Plant began in December. Work on the Steam Turbine Generators (STGs) and the two (2) Zurn boilers included maintenance on various pumps, valves, and instruments throughout the power plant.
 - **Clinton Wastewater Treatment Plant:** Monthly maintenance including washing down effluent weirs in final clarifiers, washing down all mixing tanks and rain effluent channel in

- Phosphorous Reduction Facility, greasing drive motors on final clarifiers, and cleaning and calibrating pH meters.
- **Wastewater Operations:** Operations Supervisors inspected all unstaffed wastewater facilities during December 2018. Audits included inspection of pumps, screens, engines, wastewater-related equipment, recommendations for maintenance items and the overall cleanliness of facilities.
 - **Metro Equipment and Facility Maintenance:** Water Pipeline staff removed the cover on the Section 57 river crossing shaft structure to support the design efforts for the rehabilitation of the pipeline. Replaced the existing bolts and gasket replaced to facilitate the interior inspection. Also repaired a leak was repaired on Section 50 in Medford.
 - **SCADA and Process Control:** Continued support of Chelsea Headwork Rehabilitation Project, Caruso Pump Station Improvements Project, Nut Island Odor Control Improvements Project, and Prison Point Rehabilitation Project. Also continued work on installation of SCADA wireless communication and work on Active Directory implementation.
 - **Carroll Water Treatment Plant:** Staff coordinated the annual half plant shutdown of the treatment process on the A side annual maintenance. Annual tank cleaning resumed along with half plant shutdown tasks including replacing chemical feed check valves, inspecting hatches and UV Reactor maintenance.
 - **Aqueducts:** Grounds and Aqueduct Maintenance Staff completed the annual cutting of the aqueducts in the Massachusetts Endangered Species Act Exclusion Zones (MESA). These areas of the aqueduct that have been designated for limited grounds maintenance until after December 1st of each year.
 - **Dam Safety:** Staff kicked off River Road Landslide Assessment Scope of Work including field site visits with geotechnical engineers. Also, continued with task order work associated with Ware Diversion Dam Drainage Assessment.
- In water system, exercised 820 and replaced one mainline valves; exercised 561 and replaced 10 blow-off valves.
 - In the wastewater system, inspected 15 miles and cleaned 18 miles of MWRA pipeline. Inspected 387 structures and rehabilitated 75 manholes. Also inspected 12 and cleaned 37 inverted siphon barrels.

Capital Improvements

- FY19 mid-year spending totaled \$75.5 million broken out by category as follows: \$41 million for Water System projects, \$33 million for Wastewater System projects, and \$1.4 million for Business and Operations Support projects.
- Major contracts awarded by MWRA during the first six months of FY19 include:
 - Intermediate High Pipeline Improvements Design/Engineering Services During Construction - \$6.5 million
 - Carroll Water Treatment Plant SCADA Upgrade Design Program/Resident Engineering - \$4.7 million
 - Bellevue II and Turkey Hill Tank Painting - \$4.0 million
 - Weston Aqueduct Supply Mains/Spot Pond Supply Mains Pressure reducing Valves Design/Engineering Services During Construction - \$2.8 million
 - Braintree-Weymouth Pump Station Improvements Design/Engineering Services During Construction - \$2.1 million

- Section 56 Pipe Demolition Construction - \$1.9 million
- Remote Headworks and Deer Island Shaft Study - \$1.4 million
- Projects that were completed or reached substantial completion during the first half of FY19 include:
 - Wastewater Interceptor Renewal No. 1 Reading Extension Sewer - Project cost = \$2.0 million, Completed December 2018
 - Clinton Treatment Plant Phosphorus Reduction - Project Cost = \$7.5 million, Completed September 2018
 - Residuals Sludge Tank and Silo Coating - Project Cost = \$0.7 million, Completed Sept 2018
 - Marlborough Maintenance Facility - Project Cost = \$3.7 million, Completed July 2018
 - Northern Intermediate High Sections 89 & 29 Construction 1 C - Project Cost = \$18.3 million, Completed September 2018
 - Southern Extra High Section 111 Construction 1 - Project Cost = \$12.5 million, Completed September 2018

For an in-depth update of the progress of projects in the Capital Improvement Program, please refer to the Fiscal Year Proposed 2020 Capital Improvement Program Spending Report located on the Budget page of the MWRA's website at mwra.com.

Emergency Preparedness

- Managers and staff participated in an emergency response training program and a tabletop exercise series held for MWRA employees and community water system staff. Operations Division employees participated in four community emergency response program classes in the fall and two severe-weather table top drills.

V. Environmental Sustainability

- Received a total of \$497,000 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 \$860,000 in revenue for the first six months of FY19. MWRA also avoided approximately \$300,000 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 also self-generated 31% of the plant's total required power during that time period.
- Continued to operate phosphorous treatment system and natural gas lines at the Clinton Wastewater Treatment Plant; both are in first full year of operation.

Budget Highlights:

The FY20 Proposed Budget is \$181.9 million, which is \$5.8 million or 3.3%, more than the FY19 Budget.

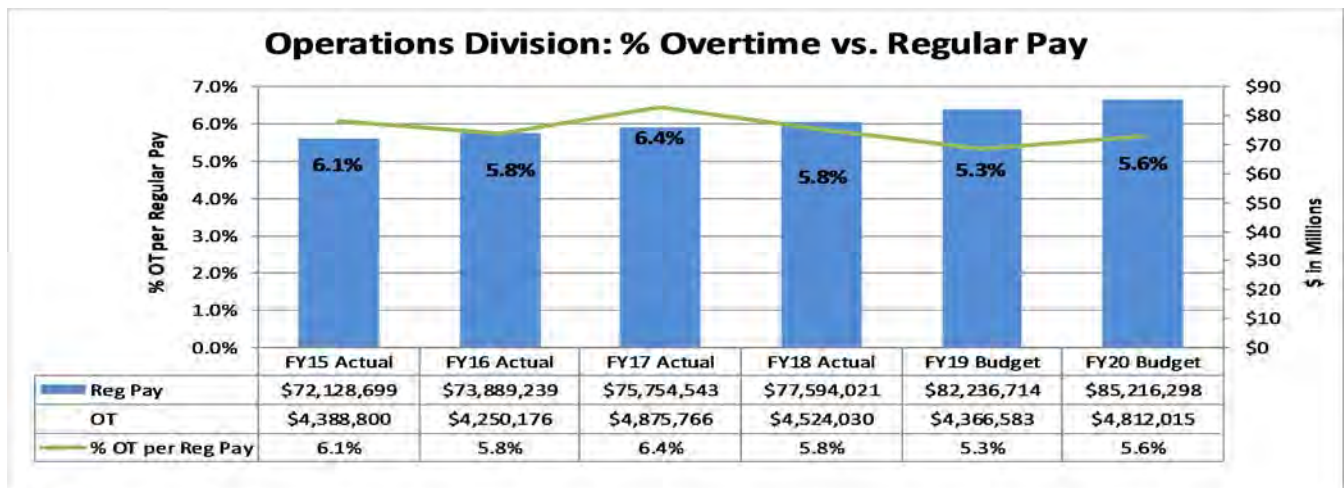
- The FY20 Proposed Budget of \$85.8 million for **Wages and Salaries** is an increase of \$2 million or 2.3% from the FY19 Budget primarily due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds 927 full-time equivalent positions; two more than funded in FY19 primarily due to increases to the Tunnel Redundancy Program staffing levels and the net effect of position transfers. Specifically, seven health and safety positions from the Operations Division have transferred into a new centralized unit in the Administration Division. These transfers out have been offset by the transfer in of three environmental management positions from the Administration Division into the regulatory unit of the Operations Division Administration Department.

| FTEs Operations by Department | | |
|--|--------------|--------------|
| DEPARTMENT | FY19 FTEs | FY20 FTEs |
| OPERATIONS ADMINISTRATION | 28.6 | 28.6 |
| OPERATIONS, ENGINEERING & CONSTRUCTION PROGRAMS, POLICY & PLANNING | 731.2 | 731.2 |
| TOTAL | 924.3 | 925.3 |

Also, staffing for the water system Tunnel Redundancy Program increases from five positions in the FY19 Budget to 11 in the FY20 Proposed Budget. The MWRA currently envisions that FTEs will be added each year over the next three fiscal years to support this project, eventually resulting in a staffing level of 15 to 20 positions.

The Wages and Salaries line also includes \$777,000 for Stand-by Pay to ensure staffing availability and response during emergencies, \$251,000 for Interns, and \$62,000 for Temporary Employees to assist lead testing in schools.

- The FY20 Proposed Budget of \$4.8 million for **Overtime** is a net increase of \$445,000 or 10.2% from the FY19 Budget, of which approximately \$100,000 is for wage increases. The remaining increase of \$345,000 is primarily due to additional funding based on recent trends and project priorities for planned maintenance work required on off-shifts and emergency overtime associated with major storms. The budget includes \$2.1 million for emergencies and storms; \$1.5 million for planned work primarily required on off-shifts and during periods of lower flows; \$1.1 million for routine coverage of operations per prevailing collective bargaining agreements; and \$21,000 for training.



- The FY20 Proposed Budget of \$12.1 million for Chemicals, is an increase of \$1.3 million or 11.6% over the FY19 Budget, due to the net effect of price and usage adjustments based on recent usage trends, contractual price changes, and market projections. Approximately \$930,000 of the increase is due to price increases primarily for sodium hypochlorite (wastewater and water facilities) and ferric chloride at DITP. The remaining \$325,000 of the change from FY19 to FY20 is primarily due to expected purchases of activated carbon for odor control use at several wastewater facilities including the DeLauri Pump Station and the Nut Island Headworks. This increase reflects MWRA’s reassessment of odor control strategies after the Nut Island Headworks fire several years ago.

The FY20 Proposed Budget includes \$6.0 million for disinfection and treatment in the water system and \$6.1 million for disinfection, treatment, and odor control in the wastewater system. The budget includes \$3.6 million for soda ash, \$3.2 million for sodium hypochlorite, \$1.7 million for ferric chloride, \$667,000 for activated carbon, \$664,000 for hydrogen peroxide, \$448,000 for polymer, \$370,000 for liquid oxygen, \$307,000 for carbon dioxide, \$275,000 for hydrofluosilicic acid, \$255,000 for sodium bisulfite, \$190,000 for sodium hydroxide, and \$171,000 for aqua ammonia.

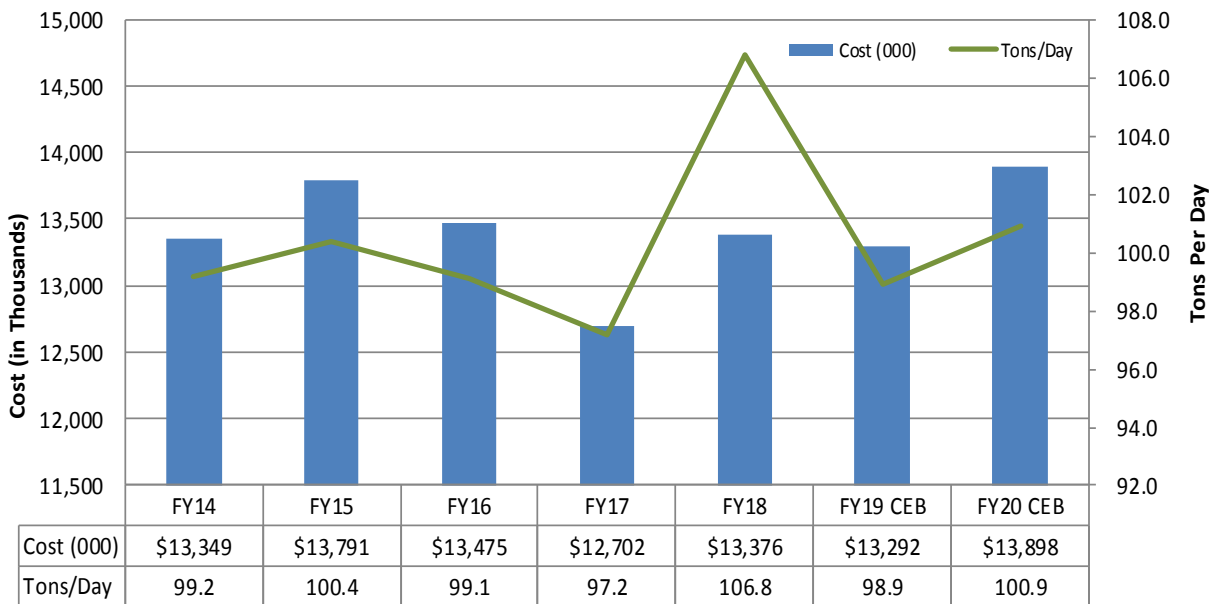
- The FY20 Proposed Budget of \$24.1 million for **Utilities** includes \$18.2 million for electricity, \$2.7 million for diesel fuel, \$2.4 million for water, \$630,000 for natural gas, and \$141,000 for propane and other utilities. The utility budget is \$13.7 million for the Deer Island Treatment Plant, \$4.8 million for Wastewater Operations, \$4.6 million for Water Operations, \$520,000 for the Chelsea office and maintenance facilities, and \$410,000 for the Clinton Wastewater Treatment Plant. The utilities budget is \$1.3 million or 5.8% more than the FY19 budget, primarily due to price increases for DITP electricity based on a recent contract award.



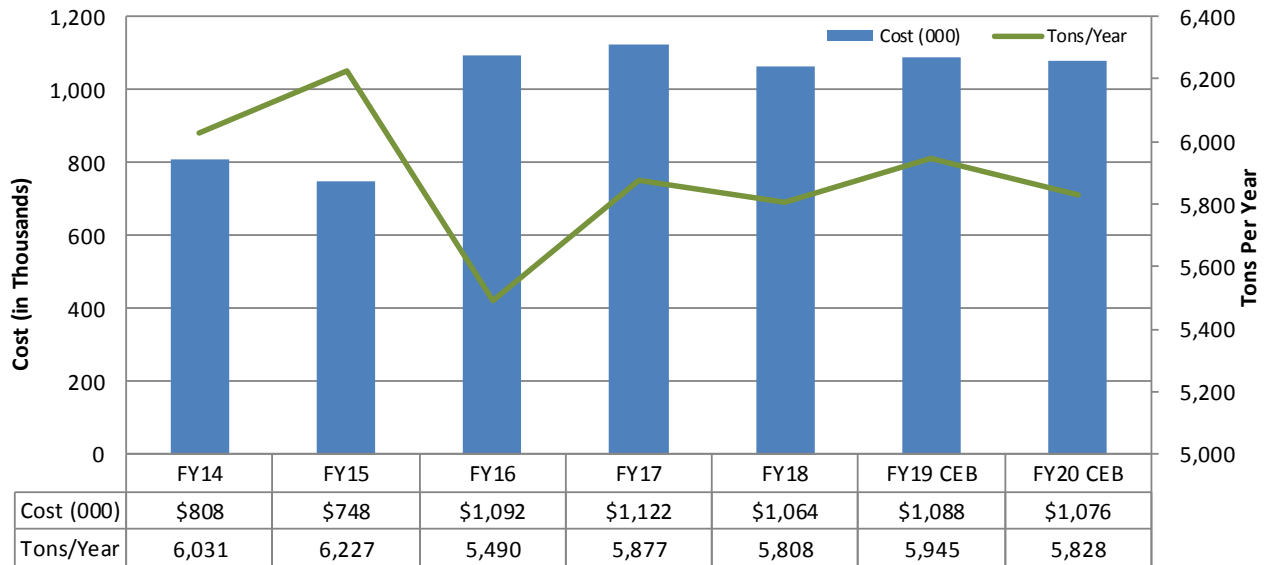
- The FY20 Proposed Budget of \$298,000 for **Training and Meetings** covers specialized training, attendance at industry conferences, and site visits as required to vendors and other plants. It specifically funds training for topics such as spill response and boom deployment; spill control and prevention; 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 FY20 Proposed Budget is \$52,000 or 21% more than the FY19 Budget primarily due to additional funding for the Tunnel Redundancy Program for attendance at conferences to promote the program to potential vendors and to stay current on trends relevant to this complicated set of projects.
- The FY20 Proposed Budget of \$5.2 million for **Other Materials** includes \$1.9 million for Vehicle Replacements; \$1 million for Lab and Testing Supplies; \$229,000 for Vehicle Expenses (gas, mileage reimbursement); \$405,000 for Health and Safety Supplies; \$562,000 for Equipment and Furniture; and \$443,000 for Work Clothes. The increase of \$76,000 or 1.5% from the FY19 Budget is primarily due the inclusion of funds for purchase of geotechnical software for the Tunnel Redundancy Program and increased funding for testing supplies for the Laboratory Services Department based on current pricing.

- The FY20 Proposed Budget for **Professional Services** is \$2.7 million, including \$1.6 million for lab and testing services, \$754,000 for engineering services, and \$274,000 for other services. Major items in the budget include \$1.3 million for Harbor and Outfall Monitoring; \$275,000 for as-needed engineering services to support CEB-funded projects; \$271,000 for outsourced testing by the Central Laboratory; \$225,000 for Dam Asset Maintenance Plan development; \$140,000 for hardware and software security services to protect MWRA’s SCADA system; \$100,000 for a new study to provide research on MWRA pellets as they related to biosolids exemptions in MA regulations; \$78,000 for a comprehensive reservoir-wide plant survey in the water system; \$67,000 for invasive species control services in the reservoirs; and \$50,000 to commence development of the multi-year Emergency Reservoir Management Plan. The FY20 Proposed Budget is -\$414,000 or -13% less than the FY19 Budget primarily due to the exclusion of funding for the SCADA firewall configuration project (completed in FY19), the bi-annual emissions testing of the sludge dryers at the Pelletization Plant (next due in FY21), and energy advisory services and the Mystic River Modeling project based on a reassessment of needs.
- The FY20 Proposed Budget for **Other Services** is \$19.6 million, including \$13.9 million for sludge pelletization; \$2 million for building space leases and rentals (including the Chelsea office facility); \$1.1 million for grit and screenings removal and disposal; \$703,000 for telecommunications services; \$505,000 for dues, memberships, and subscriptions; \$461,000 for police details; and \$455,000 for other services. The FY20 Proposed Budget increases by \$911,000 from the FY19 Budget is primarily attributable to sludge pelletization services increases of \$606,000 due to contractual inflation and additional tonnage based on trends (+ 2 tons per day). Also, \$217,000 in funding for the fuel storage tank maintenance contract is shifting from the Administration Division to the Operations Division due to the transfer of environmental management staff into the Operations Administration Department’s regulatory unit.

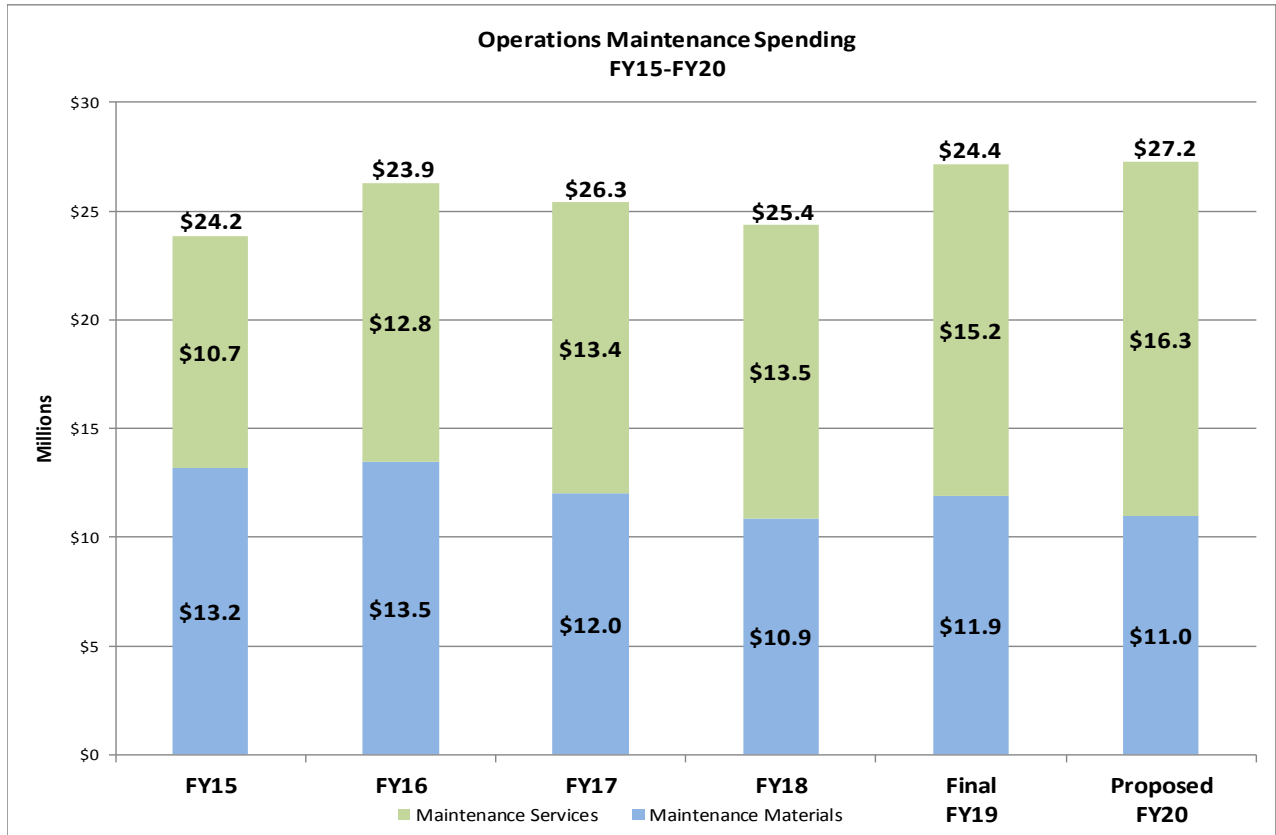
Sludge



Grit & Screenings



- The FY20 Proposed Budget for **Maintenance** is \$27.3 million, a net increase of \$130,000 or .5% from the FY19 Budget primarily due to changes in project priorities from year to year. The FY20 Proposed Budget includes \$16.3 million for services and \$11 million for materials. By maintenance area, the largest categories of spending for materials and services include \$12.7 million for plant and machinery; \$4.7 million for building and grounds; \$3.3 million for specialized equipment; \$2.9 million for electrical; \$1.8 million for pipeline; and \$1.2 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 DITP and the Clinton Wastewater Treatment Plant; easement clearing on MWRA’s aqueducts; periodic STG overhaul at DITP; and inspection and cleaning of MWRA’s South Boston CSO outfall. As shown below, maintenance spending has been fairly consistent over the last few fiscal years.



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. During FY20, MWRA will continue to develop the capacity and roles of the Energy and Regulatory Affairs units. MWRA formed both of these units in FY18 to provide comprehensive and more effective management of those functions. The units include a combination of new positions, existing positions transferred into the groups, and functional support from positions in other departments.

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.

| FY20 Proposed Current Expense Budget OPERATIONS ADMINISTRATION | | | | | | | |
|---|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 2,407,327 | \$ 2,648,192 | \$ 2,984,667 | \$ 4,331,380 | \$ 1,346,713 | 45.1% | |
| OVERTIME | 1,188 | 1,150 | - | 5,000 | 5,000 | - | |
| TRAINING & MEETINGS | 41,669 | 38,764 | 38,000 | 90,000 | 52,000 | 136.8% | |
| PROFESSIONAL SERVICES | 65,300 | 12,500 | 40,000 | 1,002 | (38,998) | -97.5% | |
| OTHER MATERIALS | 1,977,472 | 1,795,675 | 1,934,050 | 1,995,000 | 60,950 | 3.2% | |
| OTHER SERVICES | 336,645 | 406,545 | 410,275 | 670,103 | 259,828 | 63.3% | |
| TOTAL | \$ 4,829,601 | \$ 4,902,826 | \$ 5,406,992 | \$ 7,092,485 | \$ 1,685,493 | 31.2% | |

| FY20 Proposed Current Expense Budget OPERATIONS ADMINISTRATION by Programs | | | | | | | |
|---|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|--|
| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| OPERATIONS ADMINISTRATION | \$ 4,829,601 | \$ 4,887,023 | \$ 4,949,909 | \$ 6,018,063 | \$ 1,068,154 | 21.6% | |
| WATER REDUNDANCY PGR MGMT | - | 15,803 | 457,083 | 1,074,782 | 617,699 | 135.1% | |
| TOTAL | \$ 4,829,601 | \$ 4,902,826 | \$ 5,406,992 | \$ 7,092,845 | \$ 1,685,853 | 31.2% | |

FY20 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 FY20 initiatives include:

- **Tunnel Redundancy Program** – Plans for FY20 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 FY20 Proposed Budget is \$7.1 million, an increase of \$1.7 million or 31%, compared to the FY19 Budget.

- \$4.3 million for **Wages and Salaries**, an increase of \$1.3 million or 45%, as compared to the FY19 Budget. The FY20 Proposed Budget supports 39 full-time equivalents (FTEs), an increase of 10.4 FTEs as compared to 28.6 FTEs in the FY19 Budget. The increase is due to the addition of three positions for the new Tunnel Redundancy Management Program, the transfer in of four environmental management positions from other departments, and two additional positions to support the environmental regulatory function. These additions are offset by the transfer of two safety positions to a centralized safety unit in the Administration Division. The FY20 Proposed Budget also funds the backfilling of several vacant positions and wage increases associated with collective bargaining agreements.
- \$90,000 for **Training & Meetings**, an increase of \$52,000 or 137%. This line item funds attendance at conferences for the COO, DCOO, departmental staff as well as division-wide attendance at major industry professional conferences held annually. The budget includes an increase of \$47,000 for meeting travel, conference attendance, and training for the tunnel redundancy program. Staff in this program plan to attend many industry conferences to stay current on relevant technical topics and to also educate potential engineering and construction vendors about the upcoming projects. The remaining increase in

the budget is due to funding for conferences and meetings for additional staff in the regulatory and environmental management function.

- \$1,000 for **Professional Services**, a decrease of \$39,000 or 97.5% as compared to the FY19 Budget. The decrease is due to substantially reduced funding for the Mystic River Modeling Project/USGS program and Energy Advisory Services based on a reassessment of expected spending after FY19.
- \$2 million for **Other Materials**, which is \$61,000 more than the FY19 Budget. The major item in this budget line is \$1.9 million for fleet vehicle replacements. Each of these vehicles are valued at less than \$100,000, the minimum value to be included in the Capital Improvement Program (CIP). At an average cost of \$30k to \$35k per vehicle, the FY 19 budget supports replacement of 54-63 vehicles which is approximately 11%-12% of the active fleet. This line item also includes \$50,000 for purchase of geotech software for the Tunnel Redundancy Program and \$30,000 for division-wide funding for safety glasses and rain gear.
- \$670,000 for **Other Services**, an increase of \$260,000 or 63% as compared to FY19 Budget. The change is primarily due to the shift of funding for the fuel storage tank maintenance contract from the Administration Division to the Operations Division in conjunction with the transfer of responsibility for the environmental management function. Remaining increases are due to changes in annual membership costs for industry organizations and the inclusion of additional funds for professional memberships for new staff in the tunnel redundancy and regulatory oversight programs. This department's budget 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



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.

**FY20 Proposed Current Expense Budget
OPERATIONS, ENGINEERING & CONSTRUCTION**

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 60,488,144 | \$ 61,438,861 | \$ 64,824,294 | \$ 65,127,933 | \$ 303,639 | 0.5% |
| OVERTIME | 4,707,839 | 4,324,056 | 4,156,368 | 4,567,325 | 410,957 | 9.9% |
| FRINGE BENEFITS | 104,115 | 106,664 | 87,047 | 111,351 | 24,304 | 27.9% |
| CHEMICALS | 9,262,849 | 9,659,735 | 10,830,452 | 12,087,530 | 1,257,078 | 11.6% |
| UTILITIES | 20,105,722 | 21,889,565 | 22,730,516 | 24,060,298 | 1,329,782 | 5.9% |
| ONGOING MAINTENANCE | 24,739,756 | 23,852,448 | 26,265,391 | 26,565,318 | 299,927 | 1.1% |
| TRAINING & MEETINGS | 121,575 | 85,676 | 163,100 | 163,100 | - | 0.0% |
| PROFESSIONAL SERVICES | 850,247 | 717,254 | 1,200,760 | 929,252 | (271,508) | -22.6% |
| OTHER MATERIALS | 1,555,390 | 1,198,580 | 1,484,570 | 1,528,298 | 43,728 | 2.9% |
| OTHER SERVICES | 17,155,550 | 17,808,540 | 17,810,693 | 18,479,200 | 668,507 | 3.8% |
| TOTAL | \$ 139,091,187 | \$ 141,081,379 | \$ 149,553,191 | \$ 153,619,605 | \$ 4,066,414 | 2.7% |

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% of the Operations Division's FY20 Proposed Budget.

**FY20 Proposed Current Expense Budget
OPERATIONS, ENGINEERING & CONSTRUCTION by Programs**

| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|----------------------------|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| WASTEWATER TREATMENT | \$ 63,506,598 | \$ 65,819,757 | \$ 69,139,371 | \$ 72,286,155 | \$ 3,146,784 | 4.6% |
| FIELD OPERATIONS | 67,931,138 | 67,275,901 | 72,024,450 | 72,820,757 | 796,307 | 1.1% |
| ENGINEERING & CONSTRUCTION | 7,653,451 | 7,985,721 | 8,389,370 | 8,512,693 | 123,323 | 1.5% |
| TOTAL | \$ 139,091,187 | \$ 141,081,379 | \$ 149,553,191 | \$ 153,619,605 | \$ 4,066,414 | 2.7% |



Cosgrove Intake

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.

| FY20 Proposed Current Expense Budget WASTEWATER TREATMENT | | | | | | |
|--|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 19,690,098 | \$ 20,349,177 | \$ 21,048,871 | \$ 21,393,852 | \$ 344,981 | 1.6% |
| OVERTIME | 1,471,218 | 1,220,100 | 1,194,034 | 1,275,033 | 80,999 | 6.8% |
| FRINGE BENEFITS | 34,719 | 33,305 | 27,636 | 29,830 | 2,194 | 7.9% |
| CHEMICALS | 3,425,381 | 4,002,527 | 4,544,879 | 5,226,444 | 681,565 | 15.0% |
| UTILITIES | 11,167,904 | 12,447,962 | 12,816,526 | 14,130,009 | 1,313,483 | 10.2% |
| ONGOING MAINTENANCE | 12,930,197 | 12,503,632 | 13,877,784 | 14,044,471 | 166,687 | 1.2% |
| TRAINING & MEETINGS | 19,109 | 14,741 | 46,100 | 46,100 | - | 0.0% |
| PROFESSIONAL SERVICES | 78,466 | 47,416 | 260,401 | 183,702 | (76,699) | -29.5% |
| OTHER MATERIALS | 600,133 | 524,613 | 723,125 | 757,215 | 34,090 | 4.7% |
| OTHER SERVICES | 14,089,373 | 14,676,284 | 14,600,015 | 15,199,499 | 599,484 | 4.1% |
| TOTAL | \$ 63,506,598 | \$ 65,819,757 | \$ 69,139,371 | \$ 72,286,155 | \$ 3,146,784 | 4.6% |

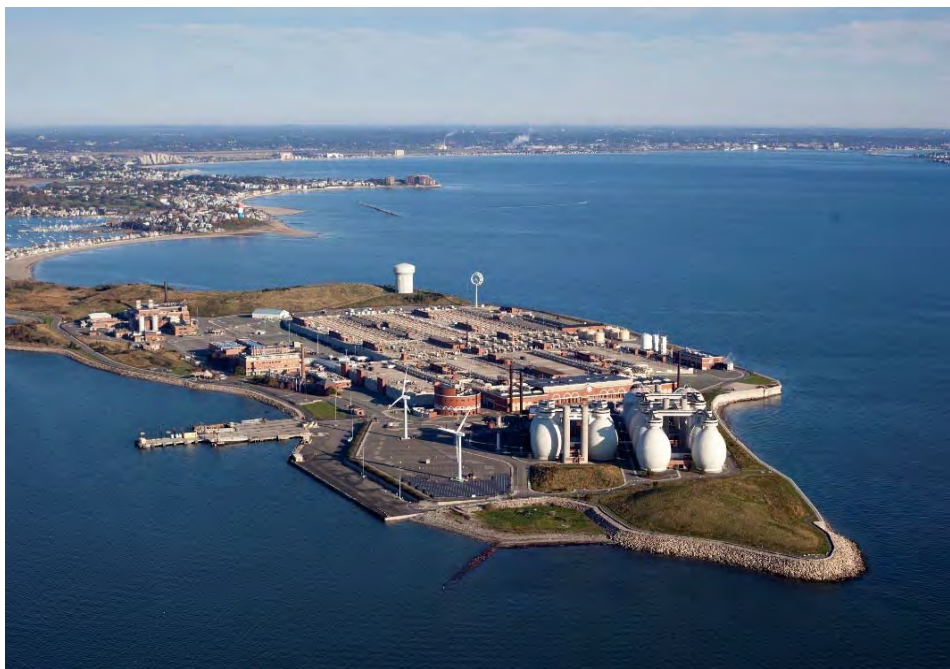
The **Deer Island Treatment Plant**, the **Residuals Management Program**, and the **Clinton Treatment Plant** comprise the Wastewater Treatment Department. Together, the budgets for these programs represent 40% of the Operations Division's FY20 Proposed Budget.

| FY20 Proposed Current Expense Budget WASTEWATER TREATMENT by Program | | | | | | |
|---|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| DEER ISLAND | \$ 47,789,762 | \$ 49,146,133 | \$ 52,147,052 | \$ 54,340,875 | \$ 2,193,823 | 4.2% |
| RESIDUALS | 14,021,203 | 14,611,983 | 14,609,710 | 15,317,227 | 707,517 | 4.8% |
| CLINTON | 1,695,633 | 2,061,641 | 2,382,609 | 2,628,053 | 245,444 | 10.3% |
| TOTAL | \$ 63,506,598 | \$ 65,819,757 | \$ 69,139,371 | \$ 72,286,155 | \$ 3,146,784 | 4.6% |

The **Deer Island Wastewater Treatment Plant** (Deer Island or DITP) budget accounts for 29.9% of the Operations Division's FY20 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 side wall 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.

**FY20 Proposed Current Expense Budget
DEER ISLAND TREATMENT PLANT**

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 18,871,339 | \$ 19,344,679 | \$ 20,025,785 | \$ 20,356,627 | \$ 330,842 | 1.7% |
| OVERTIME | 1,433,754 | 1,184,091 | 1,174,034 | 1,245,033 | 70,999 | 6.0% |
| FRINGE BENEFITS | 34,063 | 32,430 | 27,036 | 28,830 | 1,794 | 6.6% |
| CHEMICALS | 3,188,443 | 3,671,736 | 4,133,970 | 4,754,446 | 620,476 | 15.0% |
| UTILITIES | 10,977,595 | 12,209,993 | 12,490,357 | 13,720,038 | 1,229,681 | 9.8% |
| ONGOING MAINTENANCE | 12,575,450 | 12,089,259 | 13,339,665 | 13,330,016 | (9,649) | -0.1% |
| TRAINING & MEETINGS | 18,518 | 14,741 | 42,600 | 42,600 | - | 0.0% |
| PROFESSIONAL SERVICES | 15,169 | 38,006 | 180,000 | 142,000 | (38,000) | -21.1% |
| OTHER MATERIALS | 443,326 | 358,700 | 548,000 | 545,200 | (2,800) | -0.5% |
| OTHER SERVICES | 232,105 | 202,498 | 185,605 | 176,085 | (9,520) | -5.1% |
| TOTAL | \$ 47,789,762 | \$ 49,146,133 | \$ 52,147,052 | \$ 54,340,875 | \$ 2,193,823 | 4.2% |

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 FY20 Proposed Budget assumes treatment of an average flow of 329 mgd based on ten years of historical data. The projected quantity of digested sludge to be pumped to FRSA (TSS basis) is 100.9 TPD. This is based on 4-years of recent operating data.

Deer Island's FY20 Proposed 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% of the total energy 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 FY20 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.

FY20 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 YTD February 2019, Deer Island has met all of its compliance goals.

- **Key Regulatory Performance Measurements:**

| NPDES Permit Compliance | | | | | |
|-------------------------|---------------|-------------|-------------|-------------------------------|-----------|
| Effluent Characteristic | Permit Limits | FY17 Actual | FY18 Actual | FY19 Actual (year to date) | FY20 Goal |
| Dry Day Flow (mgd) | 436 | 270.6 | 272.7 | 309.5 | 100% |
| cBOD (mg/L) | 25 | 6.3 | 6.5 | 6.7 | 100% |
| TSS (mg/L) | 45 | 13.4 | 11.3 | 11.5 | 100% |
| TCR (ug/L) | 631 | <40 | <40 | <40 | 100% |
| Fecal Coliform | 14,000 | 6 | 6 | 7 | 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% |

II. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** 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 YTD February 2019, Deer Island has met all of its compliance goals.

- **Key Maintenance Measurements:**

| Indicator | FY17 Actual | FY18 Actual | FY19 Goal | FY20 Goal |
|---|-----------------|-----------------|--------------------------|--------------------------|
| Critical Equipment Availability | 99.8% | 99.7% | 100% | 100% |
| Predictive Maintenance Completion | 99.9% | 99.9% | 100% | 100% |
| Predictive Maintenance - % of work orders | 22% | 25% | 24% | 24% |
| Maintenance Backlog | 16,666 Standard | 16,052 Standard | Within industry standard | Within industry standard |
| Preventive Maintenance Completion | 99.9% | 99.9% | 100% | 100% |
| Maintenance Kitting - % of work orders | 51% | 55% | 55% | 55% |

- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects. Through YTD February 2019, Deer Island has met all of its compliance goals.
 - Issue Notice to Proceed for numerous contracts including the following major asset protection projects:
 - Combined Heat & Power Study (Contract No. 6963A) – Awarded/NTP pending
 - Clinton Wastewater Treatment Plant Roofing Replacement (Contract No. 7450)
 - Capital Improvements at Biosolids Processing Facility (Contract No. 7153) – Awarded/NTP pending
 - Substantially complete CIP construction phases for asset protection including the following:
 - Biosolids Processing Facility Tank and Silos Coating (Contract No. 7151)
 - Biosolids Processing Facility Expedited Mechanical Improvements – Conveyors (Contract No. 7153A)
- Make substantial progress according to FY19 CIP schedule for other near-term major projects
 - Gravity Thickener Rehabilitation Construction (Contract No. 7428)
 - MCC and Switchgear Replacement Construction (Contract No. 7149)
 - Winthrop Terminal VFD & Motor Replacements (Contract No. 6875)
 - Chemical Tank Relining and Pipe Replacement (Contract No 7373)
 - Clinton WWTP, Replacement of Existing Pumps at Influent Lift Station (Contract No. 7173)

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. Through YTD February 2019, Deer Island has met all its compliance goals.
 - **Key Performance Measurements and Accomplishments:**

| Indicator | FY17 Actual | FY18 Actual | FY19 Actual (year to date) | FY20 Goal |
|---|------------------------|------------------------|---|----------------------|
| % Required Power Self-Generated - Total | 34.1% | 29.1% | 30.4% | 28.2% |
| % Required Power Self-Generated - Renewables | 27.3% | 26.1% | 27.3% | 26.2% |
| Thermal/Power Plant Digester Gas Utilization | 97.5% | 98.7% | 98.9% | 98.0% |
| Avoided capacity costs | \$872,500 | \$2,000,000 | \$1,300,000 | \$867,000 |
| Generate revenue from energy programs (RPS credits, demand response)* | \$1,763,606 | \$2,938,776 | \$1,840,550 | \$1,200,010 |

*The decrease of \$1.1 million in FY19 is attributable to a decrease in the price for demand response and for Renewable Portfolio Credits which continues into FY20.

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

FY 19 Mid-Year Accomplishments:

- Deer Island anticipates receiving the Platinum Peak Performance Award for 2018 from the National Association of Clean Water Agencies (NACWA) for the 12th 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 12 years.
- Deer Island received a Utility of the Future Today award from the Water Environment Federation (WEF) and its collaborators on this initiative. The selection committee for this award, consisting of six peer utility general managers/executives, determined the application met the award criteria in the Activity Area of Energy Generation & Recovery,
- 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.
- A sole source contract to Emerson Process Management Power & Water Solutions, Inc. was awarded for DITP PICS anti-virus conversion. The DITP PICS system was converted from a Kaspersky Anti-Virus environment to a standardized McAfee Anti-Virus platform. This conversion was completed in September. There were concerns with security risks utilizing the Kaspersky Anti-Virus software.
- A sole source contract to Emerson Process Management Power & Water Solutions, Inc. has been awarded to upgrade the DITP PICS Human Machine Interface (HMI) which was originally purchased from Emerson in 2011. The Notice to Proceed was issued in November with a 40 week contract completion date of August 2019.
- Completed numerous major maintenance projects including Repaired influent gate on Battery C, replaced broken mixer on module #2 in digester #4, and completed electrical and hydraulic repairs on wind turbine #2.
- Issued Notice to Proceeds for three Asset Protection Program contracts with a total value of \$10.5 million, including the following:
 - Combined Heat & Power Study (Contract No. 6963A) – Awarded/NTP pending
 - Clinton Wastewater Treatment Plant Roofing Replacement (Contract No. 7450)
 - Capital Improvements at Biosolids Processing Facility (Contract No. 7153) – Awarded/NTP pending

- Substantially complete CIP construction phases for asset protection including the following:
 - Biosolids Processing Facility Tank and Silos Coating (Contract No. 7151)
 - Biosolids Processing Facility Expedited Mechanical Improvements – Conveyors (Contract No. 7153A)

Budget Highlights:

The FY20 Proposed Budget is \$52.1 million, an increase of \$2.1 million or 4.3% compared to the FY19 Budget.

- \$20.4 million for **Wages and Salaries**, an increase of \$331,000 or 1.7%, compared to the FY19 Budget, primarily due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget also includes \$185,000 for stand-by pay to support operational and maintenance needs primarily during storms and emergencies.
- \$1.2 million for **Overtime**, which is virtually level funded with the FY19 Budget. The FY20 Proposed Budget is based on multi-year historical trends and supports overtime required for operational coverage, critical maintenance projects, and regulatory requirements (i.e. inspections).
- \$4.8 million for **Chemicals**, an increase of \$620,000 or 15.0% compared to the FY19 Budget. The increase is due to the net effect of usage and price adjustments. The FY20 Proposed Budget, which is based on multi-year historical usage trends and projected market prices, includes \$1.6 million for ferrous/ferric chloride, an increase of \$303,000 primarily due to an increase in price, \$1.4 million for sodium hypochlorite, an increase of \$284,000 primarily due an increase in price, \$91,207 for sodium bisulfite, \$657,000 for hydrogen peroxide, a decrease of \$48,000 due to a decrease in price, \$387,000 for polymer, \$339,000 for activated carbon, and \$153,000 for sodium hydroxide.
- \$13.7 million for **Utilities**, an increase of \$1.2 million primarily due to a \$1.1 million increase in electricity due to higher pricing for new supplier contract, \$60,000 increase in diesel fuel due to higher price and an increase in water of \$28,000 resulting from higher water rate.
- \$13.3 million for **Maintenance**, which is virtually level funded with the FY19 Budget. The FY20 Proposed Budget includes \$4.9 million for materials and \$8.4 million for services. Of the total, \$8.7 million or 65% is for plant and machinery services and materials, \$2.1 million is for electrical system maintenance, and \$1.4 million is for building and grounds work. The budget reflects project priorities with a particular emphasis on maintenance of critical equipment.
- \$142,000 for **Professional Services**, an decrease of \$38,000 over the FY19 Budget. The FY20 Proposed Budget includes \$117,000 for as-needed engineering services, an decrease of \$38,000 from FY19, funds a research study of land applications of bio-solids due to phosphorous runoff, and \$25,000 for environmental testing required as part of MWRA's air quality permit.
- \$545,000 for **Other Materials**, an decrease of \$3,000 or 0.5% from the FY19 Budget primarily due to decrease in health and safety materials and other materials. The FY20 Proposed Budget includes \$159,000 for health and safety materials, \$141,000 for equipment and furniture, \$111,000 for work clothes, \$58,000 for vehicles expenses (bulk fuel and mileage), and \$42,000 for office supplies.

- \$176,000 for **Other Services**, a decrease of \$10,000 or 5.13%, from the FY19 Budget. The FY20 Proposed Budget includes \$54,000 for health and safety services, \$38,000 for telephones, \$29,000 for membership dues and subscriptions, \$27,000 for permit fees, \$15,000 for freight charges, and \$2,000 for printing services. The budget is based on historical averages for most items in this category.



Whale breaching in waters off of 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 contracts with the New England Fertilizer Company (NEFCo) to operate the sludge pelletizing plant, and to market and distribute biosolids products. A 15-year contract with NEFCo became effective March 1, 2001 and continued to December 31, 2015. After negotiations with NEFCo, MWRA approved a revised, five-year contract extension that commenced in January 2016 ending December 31, 2020.
- The FY20 Proposed Budget is based on the assumption of 100.89 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.

| FY20 Proposed Current Expense Budget RESIDUALS MANAGEMENT PROGRAM | | | | | | | |
|--|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 142,831 | \$ 146,844 | \$ 148,729 | \$ 152,941 | \$ 4,212 | 2.8% | |
| ONGOING MAINTENANCE | 4,000 | - | - | 150,000 | 150,000 | - | |
| TRAINING & MEETINGS | 591 | - | 3,200 | 3,200 | - | 0.0% | |
| PROFESSIONAL SERVICES | 26,181 | (1,462) | 38,701 | 2 | (38,699) | -100.0% | |
| OTHER MATERIALS | 15,203 | 18,761 | 30,125 | 15,125 | (15,000) | -49.8% | |
| OTHER SERVICES | 13,832,397 | 14,447,840 | 14,388,955 | 14,995,959 | 607,004 | 4.2% | |
| TOTAL | \$ 14,021,203 | \$ 14,611,983 | \$ 14,609,710 | \$ 15,317,227 | \$ 707,517 | 4.8% | |

FY20 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 and expand local (within Massachusetts) beneficial use of MWRA’s processed pellets.

- **Key Performance Measurements:**

| Indicator | FY17 Actual | FY18 Actual | FY19 Goal | FY20 Goal |
|--|------------------------|------------------------|----------------------|----------------------|
| Pelletize all sludge received from DITP | 100% | 100% | 100% | 100% |
| Average Tons Per Day Sludge (TSS basis) | 97.2 | 106.8 | 98.9 | 100.89 |
| Monthly Ave % Capture – Processed Sludge (goal per contract with NEFCo) | 92% | 91.3% | 90% | 90% |
| Properly dispose of grit & screenings | 100% | 100% | 100% | 100% |
| Annual grit and screenings tonnage | 5,877 | 5,808 | 5,964 | 5,828 |

III. Infrastructure Management and Resilience

- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Continue work on the following Residuals Asset Protection Program contracts planned for FY20:
 - Electrical Improvements
 - Mechanical Improvements
 - Dryer Drum Replacement

FY19 Mid-Year Accomplishments:

- Through NEFCo, processed and pelletized 109 tons per day of sludge on average from DITP.
- Through contracted operator, collected and properly disposed of 3,971 tons of grit and screenings.
- With support from DITP engineering staff, commenced procurement process for several Residual Asset Protection Program renovation projects in the FY19 Capital Improvement Program.
- Substantially completed work for Sludge Tank and Silo Coating capital project.
- Bay State Fertilizer sales expanded at record pace.

Budget Highlights:

The FY20 Proposed Budget is \$15.3 million, an increase of \$708,000 or 4.8%, from the FY19 Budget.

- \$153,000 for **Wages and Salaries**, an increase of \$4,000 or 2.8%, 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.
- \$150,000 for **Maintenance** to fund incremental costs incurred by NEFCo due to operational limitations associated with changes on the physical property.
- **Professional Services** funding decreased (\$39,000) from FY19 to FY20 due to the exclusion of funding for bi-annual stack testing completed in FY19, which will be required again in FY21 per regulation.
- \$15 million for **Other Services**, an increase of \$607,000 or 4.2% from the FY19 Budget primarily due to inflation rates for components of the sludge processing contract based on market indices and the addition of two tons per day on average for sludge processing based on recent trends. The two major

items funded in the FY20 Proposed Budget include \$1.1 million for grit and screenings disposal and \$13.9 million for sludge pelletization services, both provided through contracts with private vendors. Projected FY20 budget quantities, which are based on multi-year historical averages, include sludge tonnage of 100.89 average tons per day (TPD) and 5,828 tons for grit and screenings.



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 limits. At the time of this reporting, the Clinton Plant is in compliance with the new phosphorous limits established under the NPDES permit prior to the target date of April 2019.

The plant provides secondary treatment using an activated sludge process in combination with advanced nutrient removal and dechlorination. The major facilities include headworks, primary settling tanks, digesters, sludge processes, trickling filters, aeration tanks, secondary tanks, 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 which limits effluent flow to 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 disposal. Staff also performs regular monitoring of the landfill site.

| FY20 Proposed Current Expense Budget | | | | | | | |
|---|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|--|
| CLINTON WASTEWATER TREATMENT PROGRAM | | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 675,928 | \$ 857,654 | \$ 874,357 | \$ 884,284 | \$ 9,927 | 1.1% | |
| OVERTIME | 37,464 | 36,009 | 20,000 | 30,000 | 10,000 | 50.0% | |
| FRINGE BENEFITS | 656 | 875 | 600 | 1,000 | 400 | 66.7% | |
| CHEMICALS | 236,938 | 330,791 | 410,909 | 471,998 | 61,089 | 14.9% | |
| UTILITIES | 190,309 | 237,969 | 326,169 | 409,971 | 83,802 | 25.7% | |
| ONGOING MAINTENANCE | 350,747 | 414,373 | 538,119 | 564,455 | 26,336 | 4.9% | |
| TRAINING & MEETINGS | - | - | 300 | 300 | - | 0.0% | |
| PROFESSIONAL SERVICES | 37,116 | 10,872 | 41,700 | 41,700 | - | 0.0% | |
| OTHER MATERIALS | 141,604 | 147,152 | 145,000 | 196,890 | 51,890 | 35.8% | |
| OTHER SERVICES | 24,871 | 25,946 | 25,455 | 27,455 | 2,000 | 7.9% | |
| TOTAL | \$ 1,695,633 | \$ 2,061,641 | \$ 2,382,609 | \$ 2,628,053 | \$ 245,444 | 10.3% | |

FY20 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.
 - Fully comply with new phosphorous removal requirements by April 2019.
 - Clinton is on track to meet the April 2019 NPDES permit requirements.
 - Comply with Department of Environmental Protection (DEP) finding for landfill height levels requiring ongoing remediation efforts.
 - **Key Regulatory Performance Measurements:**

| Effluent Characteristic | Permit Limit | FY17 Actual | FY18 Actual | FY19 (8 mo.) Actual | FY20 Goal (% compliance) |
|---|------------------------|-------------|-------------|---------------------|-----------------------------|
| Dry Day Flow (mgd) | 3.01 mgd | 2.38 mgd | 2.50 mgd | # 3.30 mgd | 100% |
| cBOD (mg/L) | 20 mg/L | 3.39 mg/l | 3.39 mg/l | 2.14 mg/l | 100% |
| TSS (mg/L) | 20 mg/L | 4.29 mg/l | 4.29 mg/l | 4.97 mg/l | 100% |
| TCR (mg/L) | 17.6 mg/L | <0.02 | <0.02 | <0.02 | 100% |
| Fecal Coliform (#/100mL) *E.Coli 3/1/ 17 | 126/100mL | *5.96/10ml | *5.65/100mL | *21.11/100ml | 100% |
| pH (S.U.) | 6.5-8.3 | 7.32 | 7.37 | 7.26 | 100% |
| Acute Toxicity | >100% | >100% | >100% | >100% | 100% |
| Chronic Toxicity | >62.5% | (++) 25% | >62.5% | >64.3% | 100% |
| Phosphorus (mg/L) | 150 ug/L 1,000 ug/L | 0.29 | 0.33 | 0.28 | 100% |
| Nitrogen (mg/L) | 10 mg/L | 0.663 | 0.101 | 0.099 | 100% |

(#) This 3.30 mgd level is attributable to unusually high rainfall/wet weather events during the FY19 months of Oct & Nov 2018.

(*) New NPDES Permit went into effect switching measurement from Fecal Coliform to E. Coli on (3/1/17). Exceedance year-to-date (3/1/19) of 21.11/100ml is due to one-day aberration on 2/15/19 @ 666.55/100ml exceedance. As of 3/20/19 daily average is running approximately 7.02/100ml. The aberration was due to a broken return activated sludge pump valve which was not allowing treatment of sludge, raising the E. Coli levels to such a high level. The valve is now fixed and is fully operational.

(++) FY17 Chronic Toxicity levels below target due to persistent problem with balancing the proper ferric chloride levels.

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** 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 including:
 - Phase 1 of paintings and coatings was completed on February 8, 2019.

- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Issue Notices to Proceed for two CIP contracts:
 - Valves and Screw Pumps Replacement – estimated NTP is 10/2019.
 - Roofing Rehabilitation – estimated NTP is 8/2018.

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine 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.

FY19 Mid-Year Accomplishments:

- Completed numerous projects which include the following:
 - Rebuild of the trickling filter distributor column.
 - Painted the column and distributor arms.
 - Rebuild of the isolation gates.
 - Replaced wear strips and shoes on primary clarifier.
 - Replaced broken skimmer and structural support in gravity thickener.
 - Replaced support brackets for skimmer box and replaced a section of weir overflow baffle on final clarifier.
 - Installed a new final effluent sampling shed and samplers.
- Substantially completed Digester Cleaning and Rehabilitation project.
- Remediated DEP’s Landfill finding to resurface landfill gravel to be compliant with height limits.
- Replaced aeration tank effluent weirs with stainless steel hardware.

Budget Highlights:

The FY20 Budget for Clinton is \$2.6 million, an increase of \$245,000 or 10.3% from the FY19 Budget.

- \$884,000 for **Wages and Salaries**, a change of \$10,000 or 1.1%, from the FY19 Budget due to wage increases associated with collective bargaining agreements, partially offset by a vacancy rate reduction to reflect timing of backfilling positions.
- \$30,000 for **Overtime**, an increase of \$10,000 or 50% compared to the FY19 Budget. Overtime is used for critical maintenance work and to meet the 24 hour, 7 days per week emergency coverage requirement. The increase reflects expected needs based on overtime trends for wet weather events, critical operational issues, and support for capital project work.
- \$472,000 for **Chemicals**, an increase of \$61,000 or 14.9% from the FY19 Budget. The FY20 Proposed Budget assumes the requirements of the new NPDES permit will be in effect for the entire year. The new permit requires year around limits for phosphorus discharge, which primarily impacts the use of Ferric Chloride and Polymer. Ferric Chloride and Polymer will be utilized along with a disc filter operation as part of the new phosphorus reduction facility currently in operation.

- \$410,000 for **Utilities**, a change of \$84,000 or 25.7% from the FY19 Budget due to the increased market price for electricity and additional usage required for the phosphorous removal process. The budget includes \$384,000 for electricity, \$34,000 for natural gas, and \$6,000 for water. The budget assumes



the plant will continue to phase in use of the new natural gas line and phase out fuel use for the boilers.

- \$564,000 for **Maintenance**, an increase of \$26,000 or 4.9% from the FY19 Budget due to project priorities. The increase is mainly due to the level of planned work in FY20 for the three year painting and coating project.

- \$42,000 for **Professional Services**, level funded with the FY19 Budget. This funds consultant engineering and resident inspection services to support maintenance projects.



- \$197,000 for **Other Materials**, an increase of \$52,000, or 38% from the FY19 Budget due to the market price increase for gravel. This line item includes \$187,000 for clean fill for the landfill operation.

- \$27,000 for **Other Services**, an increase of \$2,000 or 8% from the FY19 Budget, which includes \$13,000 for permit fees, \$6,000 for telephones, and \$3,300 for railroad easement expenses.

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.

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| FIELD OPERATIONS | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 33,297,171 | \$ 33,265,932 | \$ 35,520,754 | \$ 35,386,813 | \$ (133,941) | -0.4% |
| OVERTIME | 3,166,726 | 3,008,252 | 2,894,384 | 3,195,342 | 300,958 | 10.4% |
| FRINGE BENEFITS | 69,216 | 72,828 | 59,161 | 81,021 | 21,860 | 37.0% |
| CHEMICALS | 5,837,468 | 5,657,208 | 6,285,573 | 6,861,086 | 575,513 | 9.2% |
| UTILITIES | 8,937,818 | 9,441,603 | 9,913,990 | 9,930,289 | 16,299 | 0.2% |
| ONGOING MAINTENANCE | 11,809,324 | 11,348,146 | 12,387,607 | 12,520,847 | 133,240 | 1.1% |
| TRAINING & MEETINGS | 85,048 | 63,715 | 104,000 | 104,000 | - | 0.0% |
| PROFESSIONAL SERVICES | 771,781 | 669,838 | 940,359 | 745,550 | (194,809) | -20.7% |
| OTHER MATERIALS | 919,150 | 643,472 | 735,510 | 744,658 | 9,148 | 1.2% |
| OTHER SERVICES | 3,037,436 | 3,104,907 | 3,183,112 | 3,251,151 | 68,039 | 2.1% |
| TOTAL | \$ 67,931,138 | \$ 67,275,901 | \$ 72,024,450 | \$ 72,820,757 | \$ 796,307 | 1.1% |

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

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| FIELD OPERATIONS by Programs | | | | | | |
| Program | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WASTEWATER OPERATIONS | \$ 11,950,273 | \$ 11,813,537 | \$ 12,527,015 | \$ 12,859,208 | \$ 332,193 | 2.7% |
| WATER OPERATIONS & MAINT | 29,310,282 | 28,513,261 | 30,672,133 | 31,429,704 | 757,571 | 2.5% |
| METRO MAINTENANCE | 16,714,930 | 17,075,418 | 17,209,115 | 17,605,014 | 395,899 | 2.3% |
| OPERATIONS SUPPORT | 4,902,944 | 4,888,107 | 5,753,477 | 5,745,372 | (8,105) | -0.1% |
| FOD ADMIN | 5,052,709 | 4,985,578 | 5,862,710 | 5,181,459 | (681,251) | -11.6% |
| TOTAL | \$ 67,931,138 | \$ 67,275,901 | \$ 72,024,450 | \$ 72,820,757 | \$ 796,307 | 1.1% |

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.

**FY20 Proposed Current Expense Budget
WASTEWATER OPERATIONS**

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 5,974,824 | \$ 5,896,213 | \$ 6,325,814 | \$ 5,995,143 | \$ (330,671) | -5.2% |
| OVERTIME | 1,064,762 | 943,073 | 924,482 | 1,012,030 | 87,548 | 9.5% |
| FRINGE BENEFITS | 23,196 | 22,179 | 16,847 | 27,249 | 10,402 | 61.7% |
| CHEMICALS | 255,031 | 273,209 | 319,657 | 867,812 | 548,155 | 171.5% |
| UTILITIES | 4,209,927 | 4,398,716 | 4,755,758 | 4,779,214 | 23,456 | 0.5% |
| ONGOING MAINTENANCE | 250,595 | 110,212 | - | - | - | - |
| PROFESSIONAL SERVICES | - | - | - | - | - | - |
| OTHER MATERIALS | 42,412 | 40,633 | 53,499 | 46,390 | (7,109) | -13.3% |
| OTHER SERVICES | 129,526 | 129,302 | 130,958 | 131,370 | 412 | 0.3% |
| TOTAL | \$ 11,950,273 | \$ 11,813,537 | \$ 12,527,015 | \$ 12,859,208 | \$ 332,193 | 2.7% |

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 193 million gallons per day (FY16-FY18 three-year 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. The water system 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 and maintains MWRA’s western waterworks facilities, including the Carroll Water Treatment Plant, the Metro West Tunnel, the Brusch Water Treatment Plant, the Cosgrove Intake Facility, the Norumbega Reservoir, and the covered storage facilities. There are two operations centers that provide for 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.

| FY20 Proposed Current Expense Budget WATER OPERATIONS & MAINTENANCE | | | | | | |
|--|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 12,700,855 | \$ 12,511,933 | \$ 13,276,650 | \$ 13,612,558 | \$ 335,908 | 2.5% |
| OVERTIME | 1,137,233 | 1,214,230 | 1,068,605 | 1,220,132 | 151,527 | 14.2% |
| FRINGE BENEFITS | 25,256 | 31,713 | 24,521 | 31,939 | 7,418 | 30.3% |
| CHEMICALS | 5,581,956 | 5,380,399 | 5,965,916 | 5,993,274 | 27,358 | 0.5% |
| UTILITIES | 4,191,782 | 4,468,887 | 4,609,945 | 4,578,817 | (31,128) | -0.7% |
| ONGOING MAINTENANCE | 4,574,417 | 4,048,930 | 4,689,090 | 4,886,241 | 197,151 | 4.2% |
| PROFESSIONAL SERVICES | 384,279 | 258,781 | 413,359 | 448,550 | 35,191 | 8.5% |
| OTHER MATERIALS | 229,030 | 231,071 | 209,877 | 239,554 | 29,677 | 14.1% |
| OTHER SERVICES | 485,474 | 367,317 | 414,170 | 418,639 | 4,469 | 1.1% |
| TOTAL | \$ 29,310,282 | \$ 28,513,261 | \$ 30,672,133 | \$ 31,429,704 | \$ 757,571 | 2.5% |

Metro Maintenance is responsible for the maintenance of MWRA’s wastewater facilities within the Route 128 area. Staff maintains pipelines, valves, interceptors, pumps, facility equipment, buildings, and grounds, as well as meters, and monitoring sites.

| FY20 Proposed Current Expense Budget METRO MAINTENANCE | | | | | | |
|---|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 9,329,839 | \$ 9,442,970 | \$ 10,090,544 | \$ 10,289,938 | \$ 199,394 | 2.0% |
| OVERTIME | 821,477 | 743,245 | 766,472 | 822,602 | 56,130 | 7.3% |
| FRINGE BENEFITS | 19,408 | 17,864 | 16,717 | 20,362 | 3,645 | 21.8% |
| CHEMICALS | (3) | 3,600 | - | - | - | - |
| UTILITIES | 39,769 | 43,511 | 38,503 | 43,446 | 4,943 | 12.8% |
| ONGOING MAINTENANCE | 5,724,884 | 6,158,677 | 5,633,068 | 5,765,687 | 132,619 | 2.4% |
| PROFESSIONAL SERVICES | 239,401 | 225,182 | 150,000 | 150,000 | - | 0.0% |
| OTHER MATERIALS | 322,870 | 256,359 | 288,938 | 309,565 | 20,627 | 7.1% |
| OTHER SERVICES | 217,285 | 184,010 | 224,873 | 203,414 | (21,459) | -9.5% |
| TOTAL | \$ 16,714,930 | \$ 17,075,418 | \$ 17,209,115 | \$ 17,605,014 | \$ 395,899 | 2.3% |

Operations Support provides technical support to the FOD in two 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.

**FY20 Proposed Current Expense Budget
OPERATIONS SUPPORT**

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|
| WAGES & SALARIES | \$ 3,559,816 | \$ 3,498,290 | \$ 3,848,522 | \$ 3,982,136 | \$ 133,614 | 3.5% |
| OVERTIME | 79,161 | 63,163 | 86,448 | 88,174 | 1,726 | 2.0% |
| FRINGE BENEFITS | 1,282 | 1,012 | 1,076 | 1,147 | 71 | 6.6% |
| CHEMICALS | 484 | - | - | - | - | - |
| UTILITIES | 9,252 | 9,154 | 10,281 | 9,056 | (1,225) | -11.9% |
| ONGOING MAINTENANCE | 608,250 | 722,981 | 931,330 | 1,024,800 | 93,470 | 10.0% |
| PROFESSIONAL SERVICES | 148,101 | 160,282 | 354,000 | 140,000 | (214,000) | -60.5% |
| OTHER MATERIALS | 107,457 | 60,213 | 108,060 | 92,291 | (15,769) | -14.6% |
| OTHER SERVICES | 389,141 | 373,012 | 413,760 | 407,768 | (5,992) | -1.4% |
| TOTAL | \$ 4,902,944 | \$ 4,888,107 | \$ 5,753,477 | \$ 5,745,372 | \$ (8,105) | -0.1% |

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

**FY20 Proposed Current Expense Budget
FOD ADMIN**

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|---------------|
| WAGES & SALARIES | \$ 1,731,837 | \$ 1,916,526 | \$ 1,979,224 | \$ 1,507,038 | \$ (472,186) | -23.9% |
| OVERTIME | 64,093 | 44,541 | 48,377 | 52,404 | 4,027 | 8.3% |
| FRINGE BENEFITS | 74 | 60 | - | 324 | 324 | - |
| UTILITIES | 487,088 | 521,335 | 499,503 | 519,756 | 20,253 | 4.1% |
| ONGOING MAINTENANCE | 651,178 | 307,346 | 1,134,119 | 844,119 | (290,000) | -25.6% |
| TRAINING & MEETINGS | 85,048 | 63,715 | 104,000 | 104,000 | - | 0.0% |
| PROFESSIONAL SERVICES | - | 25,593 | 23,000 | 7,000 | (16,000) | -69.6% |
| OTHER MATERIALS | 217,381 | 55,196 | 75,136 | 56,858 | (18,278) | -24.3% |
| OTHER SERVICES | 1,816,010 | 2,051,266 | 1,999,351 | 2,089,960 | 90,609 | 4.5% |
| TOTAL | \$ 5,052,709 | \$ 4,985,578 | \$ 5,862,710 | \$ 5,181,459 | \$ (681,251) | -11.6% |

FY20 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.
 - Operate and maintain the water supply and treatment facilities to provide an adequate supply of properly treated drinking water to meet all operational and regulatory performance requirements.

- Supply water to customer communities at the expected pressure.
- **Key Regulatory Performance Measurements:**

| Compliance with Source and Treated Water Parameters | | | | |
|--|--------------------|--------------------|--------------------|------------------|
| Indicator | FY17 Actual | FY18 Actual | FY19 Actual | FY20 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 cleaning of Norumbega Covered Storage Tank cells 1 and 2.
- Complete the 2019/2020 Carroll Water Treatment Plant half plant maintenance.
- Prepare for the inspection and cleaning of Nash Hill tanks.
- Inspect Arlington Covered Reservoir, Bear Hill, Blue Hills, Fells, and Loring Road water storage tanks.
- Support design and painting contract for Bellevue 1, Park Circle, and Walnut Hill water storage tanks.
- Continue valve replacement and exercising annual goals.

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.

- **Key Regulatory Performance Measurements:**

| Regulatory Compliance and Operational Capacity | | | | |
|--|--------------------|--------------------|--------------------|------------------|
| Indicator | FY17 Actual | FY18 Actual | FY19 Actual | FY20 Goal |
| Total annual flow (billion gallons based on DITP mgd) – Process all flow at headworks within system parameters | 116,681 | 114.66k | 78.41k | 122.5k |
| Minimize choking at headworks (# of hours/highly dependent on weather): | | | | |
| Nut Island | 0 | 0 | 0 | 0 |
| Columbus Park | 28.3 | 60.61 | 46.6 | 0 |
| Ward Street | 17 | 37.11 | 26.9 | 0 |
| Chelsea Creek | 12.9 | 10.53 | 3.6 | 0 |

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** 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.
 - Complete numerous major maintenance projects including:
 - Duct Cleaning at South System Pump Stations
 - South Boston CSO inspection
 - Replace Sewerage Ejector system at Gillis PS
 - Re-pipe chemical feed line at Columbus and Ward Street headworks odor control

- Replace Rooftop ACU at Framingham Chemical Room
- Replace 2 RWW pumps at Hough’s neck
- Replace AC units at Brattle Court and Spring Street

○ **Key Maintenance Measurements:**

| Indicator | FY17 Actual | FY18 Actual | FY19 Actual | FY20 Goal |
|--|----------------|----------------|----------------|-------------|
| % Total Revenue Calculated Using Meters | | | | |
| Water | 97.87 | 100% | | |
| Wastewater | 98.73 | 95% | | |
| Water System: | | | | |
| Leak Detection – miles surveyed) | 140 | 126 | 77.88 | 140 |
| Main Line Valves – # exercised | 811 | 844 | 820 | 1100 |
| Main Line Valves – # replaced | 17 | 7 | 5 | 20 |
| Blow-off Valves – # exercised | 473 | 511 | 561 | 500 |
| Blow-off Valves – # maintained | 7 | 12 | 10 | 10 |
| Wastewater System: | | | | |
| Pipeline Inspections – miles | 33 | 32.81 | 19.97 | 32 |
| Pipeline Cleaning – miles | 36 | 36.35 | 20.76 | 36 |
| Structure Inspections – # structures | 719 | 750 | 419 | 650 |
| Manhole Rehabilitation – # manholes | 115 | 175 | 86 | 105 |
| Inverted Siphon Inspections – # siphons | 49 | 50 | 16 | 48 |
| Inverted Siphon Cleaning – # siphons | 81 | 72 | 49 | 36 |
| Metro Maintenance – Equipment and Facilities: | | | | |
| Ops Light Preventive Maint (PM) - % maint hours | 15% | 14 | 14 | 10%-15% |
| Preventive Maintenance Completion | 100% | 100% | 100% | 100% |
| Maint Kitting – % work orders kitted | 267 | 24 | 31% | 30% |
| Ops Light Maint % PM Completion | 100% | 100% | 100% | 100% |
| Maintenance Backlog – crew hours | 10,815 | 12,586 | 13,275 | 9000-13,500 |

*Maint Kitting: FY16–17 based on items kitted, FY18–FY19 based on % of work orders kitted

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine 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.
 - A review of previously audited facilities will also be undertaken to identify potential energy efficiency projects.

○ **Key Performance Measurements:**

| Indicator | FY17 Actual | FY18 Actual | FY19 Goal | FY20 Goal |
|---|------------------------|------------------------|----------------------|----------------------|
| Energy programs - Generate revenue from FOD-managed facilities: | | | | |
| Power Sales | \$254,000 | \$557,000 | \$626,631 | \$572,593 |
| Demand Response | \$46,000 | \$34,216 | \$128,825* | 163,127* |
| Renewable Portfolio Standard Credits | \$263,000 | \$155,997 | \$220,855 | \$193,605 |

*Including Cosgrove as of FY19

FY19 Mid-Year Accomplishments:

Water System

- Wachusett Aqueduct Pump Station (WAPS) testing was completed; substantial completion granted on February 2, 2019.
- The Weston Aqueduct flow control valve in Southborough was replaced.
- Application of the Action Spectra Correction Factor (ASCF) at the Carroll Water Treatment Plant (CWTP) and the Brutsch Water Treatment Facility (BWTF) was implemented to ensure proper UV disinfection for regulatory requirements.
- Completed the 2018/2019 CWTP half plant maintenance.
- Wachusett Lower Gatehouse Phase 1 pipe replacement (fountain feed) is in progress.
- The contract to clean Norumbega Covered Storage Tank cell 2 is in place for Spring, 2019.
- Replacement of Generator 1 at CWTP is underway.
- Identified and repaired over 25 leaks, many while the pipelines remained in service.
- Performed reservoir level management control at all Metropolitan reservoirs to maintain normal operating levels.
- Overall valve operability is 96.5% as result of continued valve exercising, repair, and replacement.
- Replaced 13 main line valves and retrofitted 15 blow off valve sites during the fiscal year.
- Assisted many of the customer communities with both routine and emergency assistance.
- Provided leak detection assistance to Arlington, Boston, Canton, Chelsea, Deer Island, Framingham, Ludlow, Lynn, Malden, Marlborough, Mass DOT in the Ted Williams Tunnel, Medford, Milton, Newton, Northborough, Reading, Revere, Saugus, Somerville, Stoneham, Swampscott, Wakefield, Watertown, Waltham, Wellesley, and Winthrop.
- Continued the rehabilitation of the impressed current cathodic protection system on Section 57 in Everett and Chelsea.
- Successfully operated the Chestnut Hill Emergency pump station during scheduled testing.
- Repaired two leaking couplings on the Watertown Section pipeline in Waltham.
- Supported painting of Bellevue 2, Deer Island, and Turkey Hill storage tank painting contracts. Operated Bellevue 1 tank in Southern Extra High service area, and Park Circle tank in Northern Extra High Service area during the painting of Bellevue 2 and Turkey Hill.

Wastewater Facilities

- Install Air Release Valves @ Quincy, Raw WW Pump Vents
- Replace Rooftop ACU at Framingham Chemical Room
- Air handling unit at IPS and Chelsea
- Replaced #3 VFD at IPS.
- Replaced #2 RWW pump motor at New Neponset
- Replaced Pump # 2 at Wiggins Terminal.

CSO

- Replace 3 Chromlux explosion proof heaters @ Somerville
- Replaced Head Shaft Screen # 2 Somerville CSO.
- Repaired Sodium Bisulfite line # 2 at Cottage Farm CSO.
- Cleared Sodium Bisulfite line at Somerville CSO.

Headworks

- Replace Floor Drain in Truck Bay @ Nut Island
- Replaced wet well dewatering pump at Nut Island.
- Replaced grit belt at Nut Island

Water Facilities

- Installed generator at Turkey Hill Water Tank.
- Replaced and repaired the VFD's for Pumps 2 & 3 at Spring Street Pump Station.
- Tested chemical piping for leaks and successfully test chemical pumps at Chestnut Hill Underground Pump Station.
- Posted signs at Chestnut Hill Reservoir.

Grounds/Facilities

- Facilities Staff replaced over 140 manhole frames and covers in FY18.
- Facilities staff repointed the Hingham Pump Station exterior brick work.
- Paint Staff painted interior of Spring Street, Belmont Pump Stations.

Energy Conservation

- Completed energy efficient LED lighting replacement and installation of VFDs on the hot water heating system at Union Park Treatment & Detention Facility, as well as installation of insulation on the incoming water pipes at Loring Road Underground Vault for a total savings of approximately 181,058 kWh annually.

Budget Highlights:

The FY20 Budget is \$72.8 million, an increase of \$796,000 or 1.1% from the FY19 Budget.

- \$35.3 million for **Wages and Salaries**, a slight decrease of of (\$134,000) million or 0.38%, from the FY19 Budget, mainly due to sizing of the vacancy rate. The FY20 Proposed Budget also includes \$445,000 for stand-by pay to ensure support for operational and maintenance needs during wet weather and emergencies and \$44,000 for interns to provide support in several areas including Operations Engineering and SCADA.
- \$3.2 million for **Overtime**, an increase of \$301,000 or 10.40% from the FY19 Budget. The FY20 Budget for overtime, which incorporates collective bargaining increases, includes \$1.6 million for emergency related overtime; \$899,000 for planned overtime; and \$629,000 for operational coverage needs. The budget for emergency overtime is increasing to reflect an increased mobilization for wet weather, and a significant increase in water line repair work.
- The FY20 Budget includes \$6.8 million for **Chemicals**, an increase of \$576,000 or 9.16% from the FY19 Budget. The budget includes \$6.0 million for water treatment chemicals and \$868,000 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, \$370,000 for liquid oxygen, \$328,000 for activated carbon, \$307,000 for carbon dioxide, \$275,000 for hydrofluosilicic acid, \$171,000 for aqua ammonia, \$124,000 for sodium bisulfite, \$125,000 for other oxidizers, and \$37,000 for sodium hydroxide.
- \$9.9 million is included for **Utilities**, which is \$16,000 or 0.16% higher than the FY19 Budget. The FY20 Budget includes \$7.5 million for electricity, \$1.25 million for diesel fuel, \$596,000 for natural gas, \$526,000 for water and \$66,000 for propane. The largest changes are a \$70,000 decrease in diesel fuel due to lower volume at various facilities and an increase of \$45,000 in natural gas due to a \$0.10 per therm rise in the cost assumptions. Water increases by \$32,000 primarily due to the addition of a new water service at the rehabilitated Chelsea Creek Headworks.
- \$12.5 million for **Maintenance**, an increase of \$133,000 or 1.08% from the FY19 Budget due to project priorities and projected needs. The FY20 Proposed Budget includes \$5.1 million in day-to-day needs, \$4.4 million for services, \$2.7 million in major projects, and \$350,000 for energy initiatives. Some of the major projects included for the FY20 Proposed Budget are:

| | |
|--|-----------|
| MIS Data Center HVAC Project | \$400,000 |
| Duct Cleaning at South System Pump Stations | \$375,000 |
| South Boston CSO Outfall Inspection and cleaning | \$350,000 |
| Manhole Rehabilitation Contract | \$328,585 |
| Annual tank cleaning | \$150,000 |
| Invasives Control - Wachusett Reservoir | \$119,000 |

- \$104,000 for **Training and Meetings**, level funded from the FY19 Budget. The budget covers training required for work duties, health and safety compliance, job-related licensures and certifications, cyber-

security and SCADA technical training. A significant portion of training is attributable to the evolving realm of cyber security and the need for SCADA staff to maintain current skill sets.

- \$746,000 for **Professional Services**, a decrease of \$195,000 or 20.72% from the FY19 Budget primarily due to lower use of consultant services for the unit. The FY20 Proposed Budget includes \$597,000 for engineering services, which is made up of \$225,000 for as-needed engineering services to support CEB-funded maintenance projects; \$225,000 for an asset maintenance plan for MWRA dams; \$140,000 for a consultant to configure SCADA firewalls, software, data modules; and \$7,000 for evaluation of spill prevention, control and countermeasure plans. Additionally, the professional Services budget includes \$78,000 for an annual Macrophyte survey at the reservoirs; and \$67,000 for quality assurance services for Macrophyte harvesting.
- \$745,000 for **Other Materials**, an increase of \$9,000 or 1.24% from the FY19 Budget primarily due to Costs for vehicle expenses in western operations. The FY20 Proposed Budget includes \$137,000 for vehicle expenses for gas, mileage reimbursements, and tolls; \$268,000 for work clothes; and \$218,000 for health and safety supplies.
- \$3.3 million for **Other Services**, an increase of \$68,000 or 2.14%, from the FY19 Budget primarily due to an increase of \$74,000 to the Chelsea office building. The FY20 Budget includes \$2.0 million for annual lease payments for the Chelsea office building; \$582,000 for telephones, and \$447,000 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.

| FY20 Proposed Current Expense Budget ENGINEERING AND CONSTRUCTION | | | | | | | |
|--|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 7,500,875 | \$ 7,823,752 | \$ 8,254,669 | \$ 8,347,268 | \$ 92,599 | 1.1% | |
| OVERTIME | 69,895 | 95,704 | 67,950 | 96,950 | 29,000 | 42.7% | |
| FRINGE BENEFITS | 180 | 531 | 250 | 500 | 250 | 100.0% | |
| ONGOING MAINTENANCE | 235 | 670 | - | - | - | - | |
| TRAINING & MEETINGS | 17,418 | 7,220 | 13,000 | 13,000 | - | 0.0% | |
| OTHER MATERIALS | 36,107 | 30,495 | 25,935 | 26,425 | 490 | 1.9% | |
| OTHER SERVICES | 28,741 | 27,349 | 27,566 | 28,550 | 984 | 3.6% | |
| TOTAL | \$ 7,653,451 | \$ 7,985,721 | \$ 8,389,370 | \$ 8,512,693 | \$ 123,323 | 1.5% | |

FY20 Goals and Initiatives:

The Engineering and Construction Department has significant responsibility for the following MWRA goals included in the Board-approved FY16 - FY20 Five-Year Strategic Business Plan.

I. Wastewater Quality and System Performance

- **Goal #6 – CSO Plan Compliance:**
 - Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives. Ensure compliance with CSO NPDES permit requirements.
 - Finalize scope, procure consultant contract and issue notice to proceed for court-ordered CSO post-construction monitoring and performance assessment (January 2018 and December 2020 milestones).

III. Infrastructure Management and Resilience

- **Goal #9 – Capital Improvements:** Move forward with design and construction of major water and wastewater infrastructure rehabilitation and renewal projects.
 - Issue Notices to Proceed for numerous contracts including the following major projects (contract value => \$3 million):
 - Interception & Pumping Facility Asset Protection:
 - Prison Point Rehabilitation Construction
 - Ward Street & Columbus Park Headworks Design/CA
 - DITP Asset Protection:
 - Digester and Storage Tank Rehabilitation Design/ESDC
 - Dystor Membrane Replacements
 - Fire Alarm System Replacement - Construction
 - Metropolitan Redundancy Interim Improvements:
 - Section 101/Waltham Design/CA
 - WASM 3 CP-1
 - Northern Intermediate High Redundancy and Storage: Section 89 & 29 Replacement – Construction
 - Wastewater Meter System – Equipment purchase
 - Watershed Division Capital Improvements: Maintenance Garage/Wash Bay/Storage Building Design
 - Dorchester Bay Sewer Separation/Commercial Point: Dorchester Interceptor Inflow Removal Construction
 - **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events that could affect the water and wastewater delivery systems.
 - Continue to improve and incorporate redundancy in the water system to ensure uninterrupted service by developing and implementing plans to eliminate or mitigate single points of failure within MWRA’s water transmission and distribution system, including the Northern Intermediate High and the Southern Extra High System.
 - Substantially complete work on the Southern Extra High Section 111 Boston pipeline Construction 2 project.

FY19 Mid-Year Accomplishments

- Issued Notices to Proceed for numerous contracts including the following major contracts (contract value => \$3 million):
 - Metropolitan Redundancy Interim Improvements
 - Comm Ave Pumping Station Improvements Construction
 - Chestnut Hill Emergency Pumping Station Design
 - New Connecting Mains – Shaft 7 to WASM 3: Replace Sect 25, 75, 59, & 60 Design/CA
 - Central Monitoring System – CWTP SCADA Upgrade Design Prog RE
 - Waterworks Facility Asset Protection
 - Painting DI Water Tank
 - Paint Bellevue II and Turkey Hill Tanks
- Substantially completed numerous design and construction phases including the following (contract value => \$3 million):
 - Cosgrove Tunnel Redundancy – Wachusett Aqueduct Pump Station Construction
 - Northern Intermediate High Redundancy & Storage – Section 89 & 29 Redundancy Phase 1C Construction
 - Facility Asset Protection Alewife Brook Pump Station Rehab – Construction
 - Southern Extra High Redundancy and Storage – Pipeline Section III Ph 1 – Construction
 - Waterworks Facility Asset Protection – Paint Bellevue II TH Tanks

For an in-depth update of the progress of projects in the Capital Improvement Program, please refer to the Fiscal Year Proposed 2020 Capital Improvement Program Spending Report located on the Budget page of the MWRA's website at mwra.com.

Budget Highlights:

The FY20 Proposed Budget is \$8.5 million, an increase of \$123,000 or 1.54%, as compared to the FY19 Budget.

- \$8.3 million for **Wages and Salaries**, an increase of \$92,000 or 1.1% compared to the FY19 Budget primarily for wage increases associated with collective bargaining agreements. The Proposed FY20 CEB funds 77 positions versus 78 in the FY19 CEB; a reduction due to the transfer of one position to the Regulatory Unit in the Operations Administration Department.
- \$97,000 for **Overtime**, which includes wage increases and additional overtime associated with four construction projects scheduled for FY20. Overtime covers resident inspection at construction sites after regular work hours to ensure monitoring of construction projects. Overtime is also used for unplanned design or survey needs, evening attendance at public meetings, and achieving project deadlines.
- \$13,000 for **Training & Meetings** to cover attendance at conferences and technical seminars. This is level-funded from the FY19 CEB.

- \$26,000 for **Other Materials**, which is level-funded from the FY19 CEB. The FY20 Proposed Budget is based on historical spending and it covers office supplies, work clothes, health and safety supplies, and survey equipment.
- \$29,000 for **Other Services**, an increase of \$1,000 from the FY19 Budget based on historical spending. The budget supports 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 also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting, and public constituency matters.

| FY20 Proposed Current Expense Budget PROGRAMS, POLICY & PLANNING | | | | | | | |
|---|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 14,517,774 | \$ 15,000,073 | \$ 16,008,684 | \$ 16,320,683 | \$ 311,999 | 1.9% | |
| OVERTIME | 166,740 | 198,825 | 210,215 | 239,668 | 29,453 | 14.0% | |
| FRINGE BENEFITS | 1,938 | 2,624 | 2,550 | 3,100 | 550 | 21.6% | |
| UTILITIES | 31,547 | 4,764 | 30,000 | 27,695 | (2,305) | -7.7% | |
| ONGOING MAINTENANCE | 665,253 | 511,453 | 876,405 | 706,526 | (169,879) | -19.4% | |
| TRAINING & MEETINGS | 19,353 | 17,661 | 44,500 | 44,500 | - | 0.0% | |
| PROFESSIONAL SERVICES | 1,667,750 | 1,721,703 | 1,851,712 | 1,747,897 | (103,815) | -5.6% | |
| OTHER MATERIALS | 1,516,433 | 1,798,274 | 1,665,987 | 1,637,763 | (28,224) | -1.7% | |
| OTHER SERVICES | 402,540 | 442,412 | 503,393 | 485,680 | (17,713) | -3.5% | |
| TOTAL | \$ 18,989,328 | \$ 19,697,789 | \$ 21,193,446 | \$ 21,213,512 | \$ 20,066 | 0.1% | |

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. The Planning Department also has two units; Planning and Meter Data. In total, the budgets for these programs represent 12% of the Operations Division’s FY20 Proposed Budget.

**FY20 Proposed Current Expense Budget
PROGRAMS, POLICY & PLANNING by Program**

| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|---------------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| TOXIC REDUCTION & CONTROL | \$ 4,082,703 | \$ 4,459,614 | \$ 4,681,407 | \$ 4,865,475 | \$ 184,068 | 3.9% |
| ENVIRONMENTAL QUALITY | 4,985,183 | 5,140,680 | 5,546,892 | 5,535,422 | (11,470) | -0.2% |
| LABORATORY SERVICES | 6,386,857 | 6,568,164 | 6,966,910 | 7,091,036 | 124,126 | 1.8% |
| PLANNING | 3,534,585 | 3,529,331 | 3,998,237 | 3,721,579 | (276,658) | -6.9% |
| TOTAL | \$ 18,989,328 | \$ 19,697,789 | \$ 21,193,446 | \$ 21,213,512 | \$ 20,066 | 0.1% |



Nut Island Headworks

TOXIC REDUCTION AND CONTROL

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 1,250 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.

FY20 Proposed Current Expense Budget TOXIC REDUCTION AND CONTROL

| LINE ITEM | FY17 | FY18 | FY19 | FY20 | Change | |
|---------------------|---------------------|---------------------|---------------------|---------------------|-------------------|-------------|
| | Actuals | Actuals | Final Budget | Proposed Budget | FY20 to FY19 | |
| WAGES & SALARIES | \$ 3,873,404 | \$ 4,198,577 | \$ 4,462,714 | \$ 4,577,891 | \$ 115,177 | 2.6% |
| OVERTIME | 57,646 | 103,223 | 75,015 | 124,668 | 49,653 | 66.2% |
| FRINGE BENEFITS | 914 | 1,748 | 1,200 | 1,750 | 550 | 45.8% |
| ONGOING MAINTENANCE | 9,899 | 13,853 | 12,000 | 12,000 | - | 0.0% |
| TRAINING & MEETINGS | 600 | 1,610 | 1,500 | 1,500 | - | 0.0% |
| OTHER MATERIALS | 126,000 | 124,711 | 115,978 | 128,059 | 12,081 | 10.4% |
| OTHER SERVICES | 14,240 | 15,892 | 13,000 | 19,607 | 6,607 | 50.8% |
| TOTAL | \$ 4,082,703 | \$ 4,459,614 | \$ 4,681,407 | \$ 4,865,475 | \$ 184,068 | 3.9% |

FY20 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 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.
 - Ensure compliance with MWRA and Federal regulations by issuing appropriate enforcement actions as outlined in the Enforcement Response Plan.
 - Comply with EPA’s new Dental Effluent Guidelines (40 CFR 441) by developing and implementing a new Dental Discharges permit program for dental facilities in MWRA’s service area. This new program will permit approximately 1,000 dental facilities.
 - Staff will continue to transition the 8M permitting process into TRAC’s Pre-treatment Information Management System (PIMS) software.
 - TRAC staff will utilize the Pre-treatment Information Management System (PIMS) software to schedule and track work, as well as 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. TRAC and MIS are on schedule to complete this requirement during FY20.

- **Goal #5 – Regulatory Changes:** Continue to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - **Revise Sewer Use Regulations:**
 - TRAC staff will revise the Sewer Use regulations (360 CMR 10.000) to incorporate the new local limits for the Clinton Wastewater Treatment Plant and the new federal dental effluent regulations, among other changes. The local limits changes for the Clinton Wastewater Treatment Plant were public noticed and then approved by EPA in September 2018. Proposed changes to the Sewer Use regulations have been approved by EPA and should be available for public comment at the end of April 2019.
 - **Local Limits:**
 - Revise industrial permits in the Clinton service area to include new local limits, as incorporated in the revised Sewer Use regulations.
 - Continue to collect samples for use in update of DITP local limits when new DITP NPDES permit is issued in future.

FY19 Mid-Year Accomplishments:

- MWRA submitted the Annual Industrial Waste report detailing its pretreatment program activities to US EPA and Mass DEP as required by our NPDES Permits for the Clinton and Deer Island Wastewater Treatment Plants by its October 31, 2018 due date.
- In October 2018, TRAC Staff sent letters to its Significant Industrial Users (SIUs) to transmit their FY17 compliance status and preliminary annual charges. The letters provide an opportunity for each SIU to review the data upon which the charges are based and submit any changes. They also inform the SIUs if they are in Significant Noncompliance with MWRA/EPA standards or requirements.
- TRAC drafted revisions to the three regulations (360 CMR 1.00: Adjudicatory Proceedings, 360 CMR 2.00: Enforcement and Administrative Penalties, and 360 CMR 10.000: Sewer Use) that are utilized to implement MWRA’s Industrial Pretreatment Program. The draft revisions for all three regulations will be available for public comment in April 2019.

| Indicators | FY17 Actual | FY18 Actual | FY19 Actual | FY20 Goal |
|---|----------------|----------------|----------------|--------------|
| EPA Required SIU Monitoring Events | 181 | 176 | 152 | 174 |
| Non-SIU Monitoring Events | 96 | 114 | 22 | 101 |
| SIU Connections to be Sampled | 403 | 415 | 340 | 403 |
| EPA Required SIU Inspections | 202 | 204 | 141 | 190 |
| SIU Permits due to Expire | 56 | 88 | 30 | 89 |
| Non-SIU Permits due to Expire | 231 | 257 | 269 | 177 |
| Issue Annual Industrial Pretreatment Program Report | Oct 2017 | Oct 2018 | Oct 2019 | Oct 2020 |

Budget Highlights:

The FY20 Budget is \$4.9 million, an increase of \$184,000 or 4.13%, from the FY19 Budget.

- \$4.6 million for **Wages & Salaries**, an increase of \$115,000 or 2.58% from the FY19 Budget primarily for wage increases associated with collective bargaining agreements. The budget also includes \$54,000 for stand-by pay for wet weather sampling events.
- \$125,000 for **Overtime**, an increase of \$50,000 or 66.19% from the FY19 Budget primarily for wage increases associated with collective bargaining agreements. Overtime covers sampling and monitoring during off-hours, emergencies, and wet weather events.
- \$12,000 for **Ongoing Maintenance**, level funded with the FY19 Budget. This funds sampling equipment, materials, and maintenance of equipment used in sampling industrial discharges at permitted industries.
- \$128,000 for **Other Materials**, level funded with the FY19 Budget. Funding in this line item mainly supports lab and testing supplies, health and safety materials, and work clothes.
- \$20,000 for **Other Services**, level funded with the FY19 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.



Samplng of Clinton Effluent Channel

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.

| FY20 Proposed Current Expense Budget ENVIRONMENTAL QUALITY | | | | | | | |
|---|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|--|
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 3,007,637 | \$ 3,191,952 | \$ 3,407,141 | \$ 3,548,044 | \$ 140,903 | 4.1% | |
| OVERTIME | 16,938 | 15,467 | 16,000 | 16,000 | - | 0.0% | |
| FRINGE BENEFITS | 120 | 121 | 200 | 200 | - | 0.0% | |
| ONGOING MAINTENANCE | 170,133 | 90,629 | 142,200 | 142,200 | - | 0.0% | |
| TRAINING & MEETINGS | 6,464 | 8,451 | 22,000 | 22,000 | - | 0.0% | |
| PROFESSIONAL SERVICES | 1,509,226 | 1,515,785 | 1,545,727 | 1,476,084 | (69,643) | -4.5% | |
| OTHER MATERIALS | 155,409 | 162,573 | 290,550 | 179,800 | (110,750) | -38.1% | |
| OTHER SERVICES | 119,256 | 155,702 | 123,074 | 151,094 | 28,020 | 22.8% | |
| TOTAL | \$ 4,985,183 | \$ 5,140,680 | \$ 5,546,892 | \$ 5,535,422 | \$ (11,470) | -0.2% | |

The **Environmental Quality Department** (EnQual) has two units: EnQual-Water and EnQual-Wastewater. EnQual-Water manages compliance with the reporting requirements of the Massachusetts Department of Environmental Protection 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 (S::CAN) unit for as-needed sampling and monitoring in customer communities and quick deployment where needed to obtain real-time water quality data, including emergency response situations. The group also conducts an algae monitoring program, responds to customer complaints, conducts community sampler training, and reviews system water quality data. EnQual-Wastewater 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-Wastewater manages environmental data and monitors and reports on the quality of sewage influent and effluent; Boston Harbor and its tributary rivers, and Massachusetts Bay. EnQual-Wastewater also keeps current with upcoming and draft regulations, providing comments and evaluating potential impacts on MWRA operations.

| FY20 Proposed Current Expense Budget ENVIRONMENTAL QUALITY by Program | | | | | | | |
|--|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|--|
| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| ENQUAL | \$ 2,918,267 | \$ 2,999,239 | \$ 3,053,612 | \$ 3,027,838 | \$ (25,774) | -0.8% | |
| WATER QUALITY ASSURANCE | 2,066,916 | 2,141,441 | 2,493,280 | 2,507,584 | 14,304 | 0.6% | |
| TOTAL | \$ 4,985,183 | \$ 5,140,680 | \$ 5,546,892 | \$ 5,535,422 | \$ (11,470) | -0.2% | |

The Environmental Quality Department has significant responsibility for the following MWRA goals included in the Board-approved FY16-FY20 Five-Year Strategic Business Plan.

FY20 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.
- **Goal #2 –Effective Public Communications:** Continue to report on and communicate water quality information to our customers and public officials.
 - As part of an Authority Consequence Management Plan, operate a comprehensive CMS, a 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, including a plan to ensure readiness of emergency supplies.
 - Develop and train staff on emergency response procedures and contaminant response procedures for reservoir or distribution system events. Also train staff in Incident Command System protocols, procedures, and practices in the case of an emergency event.
 - Collect samples and evaluate data to develop a program for the emergency standby reservoirs, including management goals to ensure these are ready, from a water quality perspective, in the event of an emergency.
 - Respond to the Massachusetts Department of Environmental Protection (MADEP) and the U.S. Environmental Protection Agency (EPA) regarding regulatory changes for drinking water quality monitoring.
 - Monitor algal toxins in drinking water and adapt the program to the rapidly changing regulatory landscape of this issue.
 - Train community staff that sample in 2020 for EPA’s Unregulated Contaminant Monitoring Rule 4 (UCMR4) program. Continue to work with UMass Amherst, under an Interdepartmental Service Agreement, to assess potential impacts from a chemical spill, and how treatment can mitigate those effects.
 - Provide outreach training to communities for drinking water sampling and chlorine residual testing, drinking water quality complaints, emergency response, and regulatory compliance assistance

II. Wastewater Quality and System Performance

- **Goal #3 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - In FY20, EnQual-Wastewater will procure services for the next three years of permit-required Massachusetts Bay environmental monitoring, and oversee the development of a replacement to the permit-required Bays Eutrophication Model.
 - To respond to public interest and improve timeliness of accurate reporting, finish development of a system to more quickly gather accurate sanitary sewer overflow location and volume data.
 - Continue to implement the reporting requirements of DITP and Clinton NPDES permits. Respond to EPA and MADEP NPDES regulatory changes and program initiatives, including electronic reporting requirements and 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, environmental groups and other interested parties.

- **Goal #4 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - Prepare materials and meet with EPA and MADEP staff regarding an updated DITP NPDES Permit.
 - Report against the new, stricter limits in the 2017 Clinton NPDES Permit.
 - Explore modification of the Ambient Monitoring Plan to better address issues of emerging concern involving potential impacts of the outfall. This involves working with regulators and the Outfall Monitoring Science Advisory Panel (OMSAP) to review the goals and monitoring questions underlying the Ambient Monitoring Plan, which is required by DITP’s 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.
 - Provide on-call staffing for off-hour required regulatory notifications and public right-to-know reporting on sanitary sewer overflows and Combined Sewer Overflow (CSO) facility activations.
- **Goal #5 – Combined Sewer Overflow Plan Compliance:** Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives at all outfalls. Ensure compliance with CSO NPDES permit requirements.
 - 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. This is the next phase of the Long-Term CSO Control Plan, which calls for three years of assessment before 2020 to ensure that the goals of the plan are met.
 - To meet future water quality assessments expected in the CSO variance areas of the Mystic and Charles Rivers, develop an intensified level of data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality.

EnQual Water / Wastewater FY20 Initiatives

EnQual-Water

- Implement radiological monitoring.
- Commence ESRI-application based cyanobacteria inspections at active and standby reservoirs.
- Continue to develop an improved database for monitoring CMS maintenance activities.
- Continue to more fully utilize Maximo and complete individual component tracking.

EnQual-Wastewater

- Continued support for CSO Assessment project, working with consultant to analyze water quality data.
- Continue to review regulatory changes e.g. water quality standards and criteria. Work will continue with senior management, regulators, and other stakeholders to review and revise permit-required Ambient Monitoring.
- Implement the next permit-required modeling contract.

- Produce another pamphlet on one of several important topics including but not limited to DITP plant performance, nutrients in MWRA effluent and Massachusetts Bay.

FY19 Mid-Year Accomplishments:

EnQual-Water

- Developed and trained community staff in preparation for EPA's Unregulated Contaminant Monitoring Rule 4 program which commenced in 2018 and continues into 2020. Continued to upgrade and expand contaminant monitoring and detection capabilities to provide both routine water quality information and contaminant detection.
- Continued to participate in the Unregulated Contaminant Rule 4 sampling program. This three-year program will continue into FY20.
- Continued to develop and refine equipment maintenance plans and life cycle projection for newly expanded monitoring equipment inventory with a total estimated value of over \$2 million.
- Completed all MADEP-required drinking water sampling and reporting Assistance Events:
 - Community Support: 21
 - In-House Support: 23
 - Complaint Investigations: 5
- Coordinated with Reservoir Operations group regarding actions to control cyanobacteria growth in Chestnut Hill Reservoir. SOLitude performed two low dose alum treatments in May and June.

EnQual-Wastewater

EnQual-Wastewater published 5 technical reports during the first half of FY19.

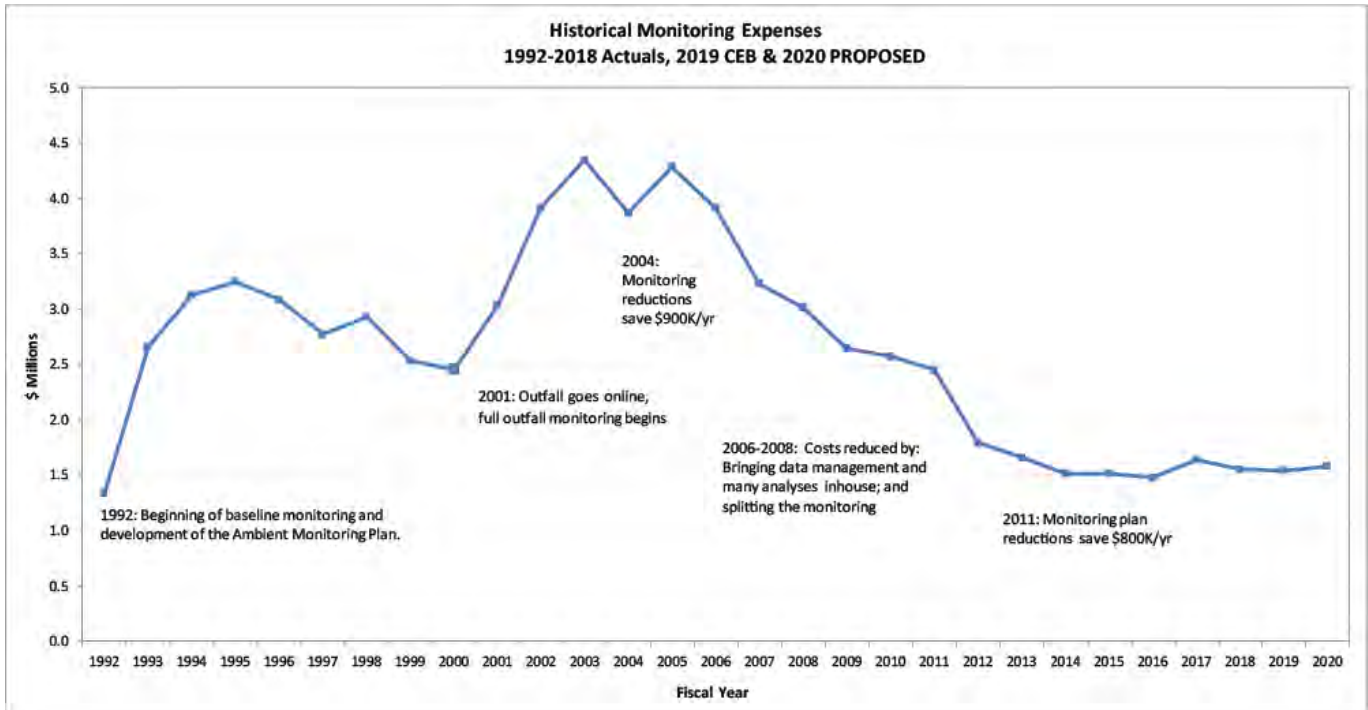
- Met all NPDES reporting requirements including routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order.
- Conducted all ambient monitoring sampling required under the DITP NPDES permit, collecting and analyzing seawater, sediment and flounder samples and analyzing them for evidence of outfall-related environmental degradation (no degradation was observed).
- Reviewed and analyzed impacts on MWRA of several new DEP and EPA regulations; these included legislation relating to reporting CSO discharges and regulations relating to the definition of Waters of the United States, water quality criteria for aluminum, and proposed label changes for copper algaecide. Reviewed and commented on Springfield draft permit, on issues that relate to possible future Deer Island permit.
- Began working with AECOM on the CSO Water Quality Assessment under Contract 7572. Also met with DEP to discuss the general plan for the assessment.

Budget Highlights:

The FY20 Budget is \$5.5 million, essentially level-funded with the FY19 Budget.

- \$3.5 million for **Wages and Salaries**, an increase of \$141,000 or 4.1%, due to wage increases associated with collective bargaining agreements and the addition of one more FTE than in FY19, from 33.8 to 34.9 FTEs. The budget will fund a Water Quality Technician who will focus on DEP Required sampling, algae sampling and testing, including cyanotoxins, as well as support increasing needs of emergency and active reservoir monitoring. The budget also includes \$63,000 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.
- \$16,000 for **Overtime** to support wet weather and water quality monitoring programs, level-funded with FY19.
- \$142,200 for **Maintenance**, level funded with the FY19 Budget primarily for maintaining equipment at MWRA's reservoirs for water quality contamination monitoring. MWRA is establishing maintenance schedules for this relatively new equipment inventory valued at over \$2 million. This is higher than the FY18 actual of \$91K and will be resized as the needs of the program stabilize.
- \$22,000 for **Training and Meetings** to cover staff participation in professional conferences and technical and software training, which is level funded with the FY18 Budget.
- \$1.5 million for **Professional Services**, a decrease of \$70,000 or -4.5% from the FY19 Budget. The budget supports laboratory testing for MWRA's Harbor and Outfall Monitoring (HOM) Program, including Cape Cod Bay monitoring and \$300,000 for contracts for the following activities which are co-funded through cost-sharing or cost-reduction agreements:
 - o UMass Amherst special study on railroad contaminants in the Wachusett Reservoir;
 - o University of Maine's buoy off Cape Ann; instruments measuring algae, chlorophyll and other water-quality indicators;
 - o The Center for Coastal Studies monitoring water quality in Cape Cod Bay.
The new Bays Eutrophication Model contract has been moved to the capital budget resulting in a decrease in the FY20 proposed budget.

The FY20 Budget continues to reflect approximately \$840,000 in annual savings due to the reduction in scope of HOM monitoring that took place in 2011 through 2013 based on favorable findings of many years of monitoring data and regulatory approval (see figure below).



\$179,800 for **Other Materials** which is a -\$111,000 or 38% decrease from the FY19 Budget primarily to support the Contaminant Monitoring System and reservoir monitoring. The budget includes \$55,000 for lab and testing supplies for reservoir water quality monitoring. It also includes \$113,000 for equipment to continue funding parts and replacements for the drinking water CMS and S::CAN drinking water analysis equipment. The equipment budget also funds a Telog system as backup to the CMS system (\$10,000).

- \$151,000 for **Other Services**, an increase of \$28,000 or 23% from the FY19 Budget. There was an increase of \$18,000 for shipping UCMR4 samples, based on actual expenditures; and Verizon fees increased \$10,000 associated with operating the Contaminant Management System.



Norumbega Covered Storage Tank

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 the 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.

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| LABORATORY SERVICES | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 4,648,580 | \$ 4,760,710 | \$ 4,964,816 | \$ 5,102,094 | \$ 137,278 | 2.8% |
| OVERTIME | 92,156 | 80,135 | 119,200 | 99,000 | (20,200) | -16.9% |
| FRINGE BENEFITS | 904 | 755 | 1,100 | 1,100 | - | 0.0% |
| UTILITIES | 31,547 | 4,764 | 30,000 | 27,695 | (2,305) | -7.7% |
| ONGOING MAINTENANCE | 295,010 | 232,644 | 349,005 | 329,125 | (19,880) | -5.7% |
| TRAINING & MEETINGS | 2,835 | 1,255 | 7,000 | 7,000 | - | 0.0% |
| PROFESSIONAL SERVICES | 156,424 | 196,984 | 305,185 | 271,013 | (34,172) | -11.2% |
| OTHER MATERIALS | 1,075,985 | 1,211,007 | 1,096,209 | 1,162,454 | 66,245 | 6.0% |
| OTHER SERVICES | 83,416 | 79,910 | 94,395 | 91,555 | (2,840) | -3.0% |
| TOTAL | \$ 6,386,857 | \$ 6,568,164 | \$ 6,966,910 | \$ 7,091,036 | \$ 124,126 | 1.8% |

FY20 Goals and Initiatives:

The Laboratory Services Department has significant responsibility for the following MWRA goals included in the Board-approved FY16 - FY20 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.

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.
 - UCMR4: Provide EPA-required testing and analysis via contract laboratories to comply with the Unregulated Contaminant Monitoring Rule 4 (UCMR4).
 - Decision support: Provide as-needed laboratory services to support assessment of regulatory and operational issues.

In addition, the Laboratory Services Department provides support functions for other MWRA Departments. FY20 Major Initiatives in support of those functions include:

- **Ethics Training** – Continue laboratory ethics and data integrity training to meet MassDEP laboratory certification and National Environmental Laboratory Accreditation Program (NELAP) requirements.
- **NPDES Permits** – Provide laboratory data and consulting to wastewater operations and EnQual on Deer Island draft or final NPDES permits.
- **Electronic Laboratory Notebook (ELN)** – Implement ELN software on wireless tablet computers at three of the water quality laboratory locations.
- **Laboratory Renovation Projects** – Replacement of the HVAC system and fume hoods at the Central Lab has been delayed, but may still start in FY20. Related work will continue in FY20 including restoring cabinetry and lab benches at the Central Lab.
- **School Lead Testing Initiative** – This special project began in FY16 and is continuing into FY20. MWRA staff have tested thousands of samples.

- **Key Department Performance Measurements and Accomplishments:**

| Indicator | FY16 Actual | FY17 Actual | FY18 Actual | FY19 Goal | FY20 Goal |
|--|------------------------|------------------------|------------------------|----------------------|----------------------|
| Total # of Tests Performed | 265,346 | 314,270 | 265,877 | 270,000 | 270,000 |
| Percent On-Time Results | 97.0 | 91.3 | 94.7% | 95% | 95% |
| Average Turnaround Time (days) | 5.72 | 6.58 | 5.95 | 9 | 9 |
| Percent Quality Control Within Specifications | 98.2 | 97.6 | 97.7% | 97% | 97% |
| Special Project: School Lead Project # Samples | N/A | 12,390 | 3,219 | As-needed | As-needed |

FY19 Mid-Year Accomplishments:

- **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.
- **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 an algae bloom in the Chestnut Hills Emergency Distribution Reservoir, and red tide testing in Massachusetts Bay.
- DLS continued to provide high-quality, responsive, timely, and cost-effective laboratory services to our clients in compliance with strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act and NPDES permits. DLS's performance versus key goals in FY19 year-to-date were as follows:
 - 93.8% of lab results were completed on time versus goal of > 95%.
 - Turnaround time averaged 6.5 days versus goal of < 9 days
 - 97.6% of quality control tests were within specifications versus goal > 97%
 - Lead Testing Initiatives – Staff completed 1,118 samples in the 1st half of FY19, down from a peak of 13,203 in FY17.

Budget Highlights:

The FY19 Proposed Budget is \$7.1 million, an increase of \$124,000 or 1.8% compared to the FY19 Budget.

- \$5.1 million for **Wages and Salaries**, an increase of \$137,000 or 2.8% compared to the FY19 Budget primarily for wage increases associated with collective bargaining agreements.
- \$99,000 for **Overtime**, a decrease of \$20,000 based on recent history, to cover work associated with peak periods, emergencies, and special initiatives.
- \$28,000 for **Utilities**, a decrease of \$2,000 or 7.7% based on historical spending levels. The budget covers the purchase of gases and cryogenic liquids used for various laboratory instruments.
- \$329,000 for **Ongoing Maintenance**, a decrease of \$20,000 or 5.7% from the FY19 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 FY20 is based on historical spending levels.
- \$7,000 for **Training and Meetings**, level funded with the FY19 Budget. This line funds attendance at the EPA Environmental Laboratory Advisory Board (ELAB) Forum on 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.

- \$271,000 for **Professional Services**, a decrease of \$34,000 or 11.2% compared to the FY19 Budget. The decrease is because a portion of the UCMR4 water quality project was deferred from FY19 to FY21. The cost of UCMR4 is based on actual contract lab bid prices. 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.
- \$1.1 million for **Other Materials**, an increase of \$66,000 or 6.0% compared to the FY19 budget. This budget line includes funding for laboratory supplies and laboratory instrument replacements. The increase reflects recent historical spending.
- \$92,000 for **Other Services**, a decrease of \$3,000 or 3.0% compared to FY19. 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. The decrease reflects recent historical spending.



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, and manages the wholesale meter data necessary for water and sewer billing. 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.

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|
| PLANNING | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 2,988,153 | \$ 2,848,834 | \$ 3,174,013 | \$ 3,092,654 | \$ (81,359) | -2.6% |
| OVERTIME | - | - | - | - | - | - |
| FRINGE BENEFITS | - | - | 50 | 50 | - | 0.0% |
| ONGOING MAINTENANCE | 190,211 | 174,327 | 373,200 | 223,201 | (149,999) | -40.2% |
| TRAINING & MEETINGS | 9,454 | 6,345 | 14,000 | 14,000 | - | 0.0% |
| PROFESSIONAL SERVICES | 2,100 | 8,934 | 800 | 800 | - | 0.0% |
| OTHER MATERIALS | 159,039 | 299,983 | 163,250 | 167,450 | 4,200 | 2.6% |
| OTHER SERVICES | 185,628 | 190,908 | 272,924 | 223,424 | (49,500) | -18.1% |
| TOTAL | \$ 3,534,585 | \$ 3,529,331 | \$ 3,998,237 | \$ 3,721,579 | \$ (276,658) | -6.9% |

The Department has two units, the **Planning Unit** and the **Meter Data Unit**.

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|--------------|
| PLANNING by Program | | | | | | |
| PROGRAM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| PLANNING | \$ 2,495,290 | \$ 2,610,443 | \$ 2,737,887 | \$ 2,584,484 | \$ (153,403) | -5.6% |
| METER DATA | 1,039,295 | 918,888 | 1,260,350 | 1,137,095 | (123,255) | -9.8% |
| TOTAL | \$ 3,534,585 | \$ 3,529,331 | \$ 3,998,237 | \$ 3,721,579 | \$ (276,658) | -6.9% |

The functions of the **Planning Unit** 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** – Staff with expertise in engineering and planning are responsible for water and wastewater system master planning, infrastructure needs assessment, and capital project development. This work is done in coordination with staff across MWRA. 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. The functions of the **Meter Data Unit** are:
- Meter Data** – This unit collects meter data for operational and revenue generating purposes from the water and wastewater systems. Staff maintains 179 revenue water meters, 26 master water meters, 187 revenue wastewater meters and 35 other



wastewater monitoring sites. The water metering data collection and analysis supports Rates and Budget Department's allocation of MWRA rate revenue requirements.

FY20 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. FY20 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.
- Continue outreach and coordination to schools and child care facilities on lead testing and remediation. Evaluate and revise as necessary the joint MWRA/MDPH lead testing project for homes with children with elevated blood lead levels.
- 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. FY19 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
- Oversee implementation of the wastewater meter upgrade project.
- Update the MWRA wastewater maps, and produce an updated atlas. Participate in efforts to update selected water 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 by 3/1/19.
- 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. FY20 priorities include:
 - 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.
 - Complete the update of the Water and Wastewater Master Plan with extensive coordination across all MWRA Departments. Present to advisory committees and the Board of Directors.
 - Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on planning, regulatory, and infrastructure issues.

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. FY20 priorities include:

- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on sustainability issues.
- Update reports on greenhouse gas tracking and energy efficiency efforts and maintain a sustainability section on MWRA's web page.
- Work with state and regional organizations and academic institutions to identify how MWRA's existing long-term environmental data sets can be used to help assess and project impacts of climate change.
- Continue to provide assistance to communities seeking admission to the MWRA's water system or seeking emergency withdrawals.

FY19 Mid-Year Accomplishments:

- Distributed \$24.7 million in Local Water System Assistance Program interest-free loans, plus an additional \$1.1 million under the Lead Service Line Replacement Loan Program. In total, MWRA has distributed \$400.2 million in loans to fund 421 local projects with participation from 42 of the 45 eligible water communities. Since 1998, 544 miles of local water main have been replaced or cleaned and lined (about 8% of the regional system) via projects funded by MWRA's financial assistance. In addition, \$10.1 million has been loaned to nine communities for Lead Line Replacement projects.
- Assisted four municipalities in the MWRA's service area with leak detection (via task-order contracts) in their systems in FY19.
- Conducted additional outreach to communities on sampling in schools for lead in conjunction with second round of DEP's Technical Assistance program. Continued laboratory assistance to MDPH for water sampling for families with children with elevated blood lead levels.
- 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.
- Distributed \$16.3 million in grants and interest-free loans to member sewer communities for Infiltration/Inflow reduction and sewer system rehabilitation projects. In total, MWRA has distributed a total of \$370 million in grants and loans to fund 556 local projects with participation from all 43-member sewer communities.
- Provided computer modeling support for major capital programs including WASM3 rehabilitation and multiple pipelines, operational planning for pipeline shutdowns, and metro tunnels emergency planning on the water side; and ongoing support for wastewater projects including the CSO evaluation.
- Updated MWRA's Greenhouse Gas Inventory, and initiated tracking of vehicle greenhouse gas production. Continued coordination with local and regional climate change adaptation planning efforts.
- Staff continued to represent MWRA on the Mystic River Steering Committee (facilitated by EPA and Mystic River Watershed Association staff). This group brings together representatives from many varied interests including regulators, state and regional government entities, academics, local environmental and planning organizations, municipalities, businesses, environmental justice advocates and others to share information and to help facilitate communication and project coordination on

watershed wide concerns. Improved water quality and access to the River and improved open space opportunities are key objectives.

- Staff participated in the Technical Advisory Committee for the Mystic River Watershed TMDL alternative which hopes to develop strategies to mitigate phosphorous loadings in the Mystic River.
- Presented the Water and Wastewater 2018 Master Plans to the MWRA Board, Advisory Board and WAC/WSCAC. Responding to comments prior to posting to MWRA Website.
- Provided information regarding the Water System Admission process to four communities. Of this group, two communities are working with the MWRA to move forward in the process.
- Commenced and made progress on the Wastewater Meter Upgrade project. Performed field investigations and temporary flow monitoring for unmetered areas. Reviewed current permanent metering locations, and began evaluation of the art of metering and data collection and communications systems.

Budget Highlights:

- The FY20 Proposed Budget is \$3.7 million, a decrease of \$277,000 or 6.9% as compared to the FY19 Budget.
- \$3.1 million for **Wages and Salaries**, a decrease of \$81,000 or 2.6% as compared to the FY19 Budget due to departmental re-assessment of position requirements as staff retire. The FY20 Budget also includes \$22,500 for summer interns to assist with analyses in the areas of climate change, benchmarking, and other projects.
- \$223,000 for **Ongoing Maintenance**, a decrease of \$150,000 or 40.2% from the FY19 Budget. The reduction is due to the completion of meter modems procured in FY19.
- \$14,000 for **Training and Meetings**, which is level funded with the FY19 Budget. The budget covers participation in training and conferences primarily focused on water quality regulations and geographic information systems.
- \$800 for **Professional Services** costs associated with the translation of the Consumer Confidence Report (CCR) and also programming of the GIS user interface. This is level funded with the FY19 Budget.
- \$167,000 for **Other Materials** which includes funding of \$144,000, a 3% increase for postage and mailing of the CCR, \$15,000 for water conservation kits, \$5,000 for mapping supplies, \$2,000 for office supplies, \$750 for vehicle expenses, and \$500 for work clothes for employees in the Meter Data section.
- \$223,000 for **Other Services**, a decrease of \$50,000 or 22% as compared to the FY19 Budget. This reduction is primarily due to expected level of spending for lead removal technical assistance in FY20. Other Services also includes \$103,000 for printing of the CCR, \$10,000 for printing water conservation and other informational brochures, and \$1,000 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.

| FY20 Proposed Current Expense Budget | | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|--|
| LAW DIVISION | | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | | |
| WAGES & SALARIES | \$ 1,605,405 | \$ 1,661,759 | \$ 1,612,751 | \$ 1,687,899 | \$ 75,148 | 4.7% | |
| OVERTIME | 381 | 105 | - | - | - | - | |
| TRAINING & MEETINGS | 1,360 | 2,795 | 4,000 | 4,000 | - | 0.0% | |
| PROFESSIONAL SERVICES | 647,904 | 344,853 | 408,000 | 358,000 | (50,000) | -12.3% | |
| OTHER MATERIALS | 3,402 | 3,791 | 5,984 | 5,020 | (964) | -16.1% | |
| OTHER SERVICES | 26,740 | 41,999 | 29,059 | 32,312 | 3,253 | 11.2% | |
| TOTAL | \$ 2,285,192 | \$ 2,055,302 | \$ 2,059,794 | \$ 2,087,231 | \$ 27,437 | 1.3% | |

FY20 Goals and Initiatives:

The Law Division supports the MWRA's achievement of all five key strategic priorities set forth in the FY16-FY20 Five-Year Strategic Business Plan. For FY20, the 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, arbitration, administrative proceedings or 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 real estate, conflict of interest, tort, labor and employment, regulatory compliance, construction, procurement, environmental and business law.
- Provide legal advice on legislation and regulatory issues.

FY19 Mid-Year Accomplishments:

- Assisted Engineering staff in successfully securing a variance from the Division of Professional Licensure, Board of State Examiners of Plumbers and Gas Fitters, for relief from applicable regulations governing plumbing and gas fitting work, which would otherwise require restroom facilities at the chemical building for the Prison Point CSO facility, thereby reducing design and construction costs.
- Drafted legislation authorizing release of certain easements.
- Drafted: Memorandum of Understanding concerning mutual future release of certain easements; Second Amended Memorandum of Understanding relating to fishing pier project at Deer Island; and Memorandum of Agreement with municipality for cost reimbursement relating to certain work performed as part of MWRA Contract 6392.
- Negotiated and drafted terms of letter agreement with Harbor Electric Energy Co. concerning pre-payment of certain project costs associated with the new cross harbor electric cable to Deer Island, thereby reducing total project costs.

Budget Highlights:

The FY20 Final Budget is \$2.1 million, an increase of \$27,437 or 1.3%, as compared to the F9Y8 Budget. An increase in Wages and Salaries is offset, in part, by a decrease in Professional Services, as follows:

- \$1.7 million for **Wages and Salaries**, an increase of \$75,148 or 4.7%, as compared to the FY19 Budget, including wage increases associated with collective bargaining agreements. The FY20 Final Budget includes funding for 13.5 FTEs.

| LAW DEPARTMENT | FY19 FTEs | FY20 FTEs |
|----------------|-------------|-------------|
| LAW | 13.5 | 13.5 |
| TOTAL | 13.5 | 13.5 |

- \$358,000 for **Professional Services**, a decrease of \$50,000 or 12.3%, as compared to the FY19 Budget, mainly as a result of a revaluation of the cost and likelihood of services associated with potential NPDES permit issues.



Brutsch Water Treatment Facility



CVA System Map



Administration Division Budget

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.

| FY20 Proposed Current Expense Budget | | | | | | |
|---|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| ADMINISTRATION | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 12,683,592 | \$ 13,089,315 | \$ 13,940,989 | \$ 15,044,988 | \$ 1,103,999 | 7.9% |
| OVERTIME | 75,293 | 47,289 | 80,471 | 86,471 | 6,000 | 7.5% |
| FRINGE BENEFITS | 19,517,582 | 19,959,627 | 21,083,974 | 21,850,399 | 766,425 | 3.6% |
| WORKERS' COMPENSATION | 2,565,336 | 2,147,063 | 2,422,609 | 2,354,256 | (68,353) | -2.8% |
| UTILITIES | 112,324 | 103,094 | 108,116 | 111,109 | 2,993 | 2.8% |
| ONGOING MAINTENANCE | 4,900,600 | 4,064,522 | 4,462,032 | 4,853,048 | 391,016 | 8.8% |
| TRAINING & MEETINGS | 151,419 | 144,128 | 168,991 | 166,741 | (2,250) | -1.3% |
| PROFESSIONAL SERVICES | 965,687 | 1,394,705 | 1,459,827 | 2,456,530 | 996,703 | 68.3% |
| OTHER MATERIALS | 742,493 | 1,410,130 | 2,228,156 | 1,958,263 | (269,893) | -12.1% |
| OTHER SERVICES | 3,252,899 | 3,400,385 | 3,531,281 | 3,484,274 | (47,007) | -1.3% |
| TOTAL | \$ 44,967,225 | \$ 45,760,258 | \$ 49,486,446 | \$ 52,366,079 | \$ 2,879,633 | 5.8% |

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

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| ADMINISTRATION by Department | | | | | | |
| DEPARTMENT | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| ADMIN DIRECTOR'S OFFICE | 221,367 | 235,858 | 241,967 | 367,752 | 125,785 | 52.0% |
| HUMAN RESOURCES | 24,193,801 | 24,331,372 | 25,985,443 | 26,728,091 | 742,648 | 2.9% |
| MIS | 11,991,006 | 11,785,088 | 13,539,737 | 14,834,233 | 1,294,496 | 9.6% |
| FACILITIES MANAGEMENT | 2,254,448 | 2,464,285 | 2,505,444 | 2,727,461 | 222,017 | 8.9% |
| FLEET SERVICES | 1,623,340 | 1,934,980 | 2,195,133 | 2,235,222 | 40,089 | 1.8% |
| PROCUREMENT | 4,066,779 | 4,304,750 | 4,267,877 | 4,517,145 | 249,268 | 5.8% |
| REAL PROPERTY / ENVIR MGMT | 616,484 | 703,925 | 750,845 | - | (750,845) | -100.0% |
| OCCUPAT HEALTH AND SAFETY | - | - | - | 956,175 | 956,175 | - |
| TOTAL | \$ 44,967,225 | \$ 45,760,258 | \$ 49,486,446 | \$ 52,366,079 | \$ 2,879,633 | 5.8% |

FY20 Goals and Initiatives:

Consistent with MWRA's Board approved FY16-FY20 Five-Year Strategic Business Plan, the Administration Division's FY19 goals are as follows:

IV. Finance and Management

- **Goal #13 – Maintain an Excellent Workforce:**
 - 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.
 - Continue to provide programs and procedures to ensure employee safety.
 - Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce.
 - Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities and veterans.
- **Goal #14 – Leverage Information Technology to Improve Organizational Effectiveness:**
 - Deliver Information Technology (IT) services and solutions efficiently and effectively.
 - 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.
 - Maintain current technology hardware, software, and network infrastructure.
 - Maintain a secure technology environment.
- **Goal # 12 – Ensure Cost-Effective Operational and Resource Management:**
 - Maintain and expand MWRA-wide recycling efforts.
 - Work with staff MWRA-wide to improve specifications development and documentation.

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:**
 - Look for opportunities to incorporate energy efficiency measures into specifications for new construction, rehabilitation, and equipment replacement.

FY19 Mid-Year Accomplishments:

- **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 FY20.
- Investigated incidents involving the safety and health of employees, visitors, vendors and contractors.
- Developed additional specialized recruitment sources to attract women, minorities, and veterans for difficult to fill positions including expanding social network recruiting capabilities.
- Continued to work with Deer Island Treatment Plant (DITP), Field Operations (FOD), and utility companies to establish energy conservation programs at DITP and FOD facilities utilizing various programs including the Green Communities Act. Continued to dispose of surplus scrap metal materials in an environmentally responsible manner.
- Recycled 8.69 tons of batteries, 35.90 tons of paper, 157.54 tons of scrap metal, and 1,440 pounds of stainless steel, aluminum, brass, and copper, generating \$30,987 in revenue

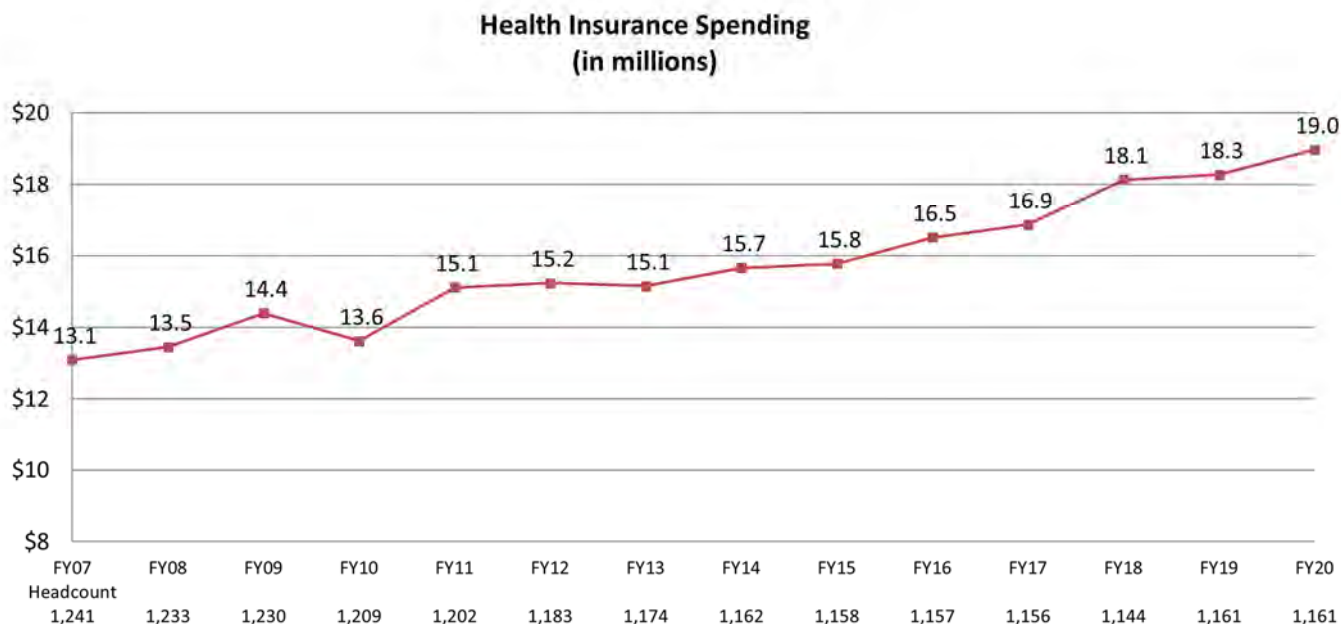
Budget Highlights:

The FY20 Proposed Budget is \$52.3 million, an increase of \$2.9 million or 5.8% as compared to the FY18 Budget.

- \$15.0 million for **Wages and Salaries**, an increase of \$1.1 million or 7.9% as compared to the FY19 Budget. The increase is primarily due to the transfer of the Occupational Health and Safety staff to Administration as well as wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds 140.6 FTEs, 1.4 FTEs less than the FY18 Budget. The net decrease of 1.4 FTEs is the result of 2.4 positions in MIS not being funded in FY19, offset by funding one additional position in Procurement.
- \$86,000 for **Overtime**, an increase of \$6,000 or 7.5% as compared to the FY19 Budget. The increase is in MIS based on recent actual overtime costs.

| FTEs | | |
|------------------------------|--------------|--------------|
| ADMINISTRATION by Department | | |
| DEPARTMENT | FY18 FTEs | FY19 FTEs |
| ADMIN DIR OFFICE | 2 | 2 |
| HUMAN RESOURCES | 16.9 | 16.9 |
| MIS | 57.4 | 55 |
| FACILITIES MGMT | 7 | 7 |
| FLEET SERVICES | 12 | 12 |
| PROCUREMENT | 42.8 | 43.8 |
| REAL PROP/ENVIR MGMT | 4 | 4 |
| TOTAL | 142.0 | 140.6 |

- \$21.8 million for **Fringe Benefits**, an increase of \$766,000 or 3.6% as compared to the FY19 Budget, reflecting the continuing rise in health insurance costs.



- \$2.4 million for **Workers' Compensation**, \$68,000 lower than the FY19 Budget. 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.

| | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 | 3 Year |
|------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Worker's Compensation | Actuals | Actuals | Actuals | Actuals | Actuals | Actuals | Actual | Budget | Average * |
| Compensation Payments | 1,547,206 | 730,690 | 1,075,548 | 1,233,115 | 1,285,809 | 1,257,703 | 1,771,557 | 1,258,876 | 1,438,356 |
| Medical Payments | 605,252 | 787,449 | 940,096 | 863,294 | 851,280 | 850,170 | 470,072 | 854,915 | 723,841 |
| Other | 75,717 | 82,587 | 99,058 | 215,038 | 170,034 | 242,496 | 323,706 | 209,189 | 245,412 |
| Total Worker's Comp. | 2,228,175 | 1,600,726 | 2,114,702 | 2,311,447 | 2,307,123 | 2,350,369 | 2,565,335 | 2,322,980 | 2,407,609 |

* Three year average of FY15 Actuals, FY16 Actuals, FY17 Actuals

- \$111,000 for **Utilities**, an increase of \$3,000 or 2.8%, as compared to the FY19 Budget, to reflect an anticipated rate increase for the CNY Headquarters.
- \$4.9 million for **Maintenance**, an increase of \$391,000 or 8.8% as compared to the FY19 Budget, due to number of software licenses coming off multi-year maintenance and support agreements, and equipment on extended service agreements. In FY20, the MSSP/Information Security Protection

contract will require the advance payment of 2 years of maintenance resulting in an increase of \$191,000. Also planned is a monitoring and alerting system at an estimated cost of \$148,000.

- \$167,000 for **Training and Meetings**, a decrease of \$2,000 or -1.3% as compared to the FY19 Budget.
- \$2.5 million for **Professional Services**, an increase of \$997,000 or 68.3% as compared to the FY19 Budget. The largest component of this increase is the 2 year MSSP monitoring cost of \$684,000, which must be paid in advance.
- \$2.0 million for **Other Materials**, a decrease of \$270,000 or -12.1% as compared to the FY19 Budget. The decrease is due to the completion of the PC replacement project in FY19.
- \$3.5 million for **Other Services**, a decrease of \$47,000 or -1.3% as compared to the FY19 Budget. Included in the Other Services funding is \$1.9 million for Space/Lease Rentals for the Charlestown Navy Yard Headquarters and Marlborough warehouse, \$1.2 million for Telecommunications expenses for all facilities, and MIS and security data lines.

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.

FY20 Proposed Current Expense Budget ADMINISTRATION DIVISION DIRECTOR'S OFFICE

| LINE ITEM | FY17 | FY18 | FY19 | FY20 | Change | |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|
| | Actuals | Actuals | Final Budget | Proposed Budget | FY20 to FY19 | |
| WAGES & SALARIES | \$ 221,053 | \$ 235,360 | \$ 241,643 | \$ 357,530 | \$ 115,887 | 48.0% |
| OVERTIME | - | 244 | - | - | - | 0.0% |
| PROFESSIONAL SERVICES | - | - | - | 10,000 | 10,000 | - |
| OTHER MATERIALS | 28 | - | - | - | - | - |
| OTHER SERVICES | 286 | 254 | 324 | 222 | (102) | -31.5% |
| TOTAL | \$ 221,367 | \$ 235,858 | \$ 241,967 | \$ 367,752 | \$ 125,785 | 52.0% |

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.

For FY20, Real Property has been consolidated into the Administration Director's Office. This results in an additional FTE under the Director's Office, but an overall reduction if FTE under Administration. The remaining Environmental Management FTE's have been transferred into Operations.

FY19 Mid-Year Accomplishments

- Renewed Records Center Lease in Marlborough through January 31, 2020. RFP for new lease scheduled in FY20.
- Provided real estate services (appraisal, negotiation, survey review and/or planning) for: Dorchester Interceptor Sewer (easements from three private entities and permits from two entities); Southern Extra High Service Pipeline, Dedham (executed construction license with MBTA for land at Dedham Corporate Station); General Edwards Bridge Waterline Removal, Lynn and Revere (construction permitting assistance); Section 65 waterline, Medford/Somerville (support to MBTA request to swap for the Greenline Extension); New Neponset Valley Sewer, Canton, (support to swap access easement at 777 Dedham Street to enable a redevelopment project).
- Managed six (6) permit agreements (four at Turkey Hill and two at Walnut Hill). FCC permitting completed allowing award of a seventh cell contract to T-Mobile at the Fells Tower in Stoneham with

FY19 revenues of \$418,000, half of which goes to the host communities. Coordinated with Operations to remove and relocate all privately and publicly owned cellular equipment from the tank and to temporary scaffolding and successfully recovered \$200,000 of the cost of scaffolding from the private cellular vendors.

- 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 \$80,320.
- Managed with GIS a pilot project to convert 215 of MWRA's real property takings to a user friendly GIS-map based interface. Worked with consultant and in process of integrating data into MWRA system in preparation for a second phase. Continued updating and editing records.

Budget Highlights:

The FY20 Proposed Budget is \$368,000, an increase of \$126,000 or 52.0% as compared to the FY19 Budget.

- \$358,000 for **Wages and Salaries**, an increase of \$116,000 or 48.0% as compared to the FY19 Budget, primarily for the transfer of one employee from Real Property to the Administration Division Director's Office, as well as wage increases associated with collective bargaining agreements. The FY20 Proposed Budget supports three FTEs, one more than the FY18 Budget.

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.

FY20 Proposed Current Expense Budget FACILITIES MANAGEMENT

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 443,092 | \$ 425,281 | \$ 465,710 | \$ 503,583 | \$ 37,873 | 8.1% |
| OVERTIME | 26,136 | 9,740 | 40,000 | 40,000 | - | 0.0% |
| FRINGE BENEFITS | - | - | - | - | - | - |
| UTILITIES | 110,684 | 99,616 | 105,616 | 108,609 | 2,993 | 2.8% |
| ONGOING MAINTENANCE | 9,513 | 9,367 | 18,600 | 18,600 | - | 0.0% |
| PROFESSIONAL SERVICES | - | - | 4,000 | 4,000 | - | 0.0% |
| OTHER MATERIALS | 4,064 | 73,854 | 67,250 | 67,250 | - | 0.0% |
| OTHER SERVICES | 1,660,959 | 1,846,427 | 1,804,268 | 1,985,419 | 181,151 | 10.0% |
| TOTAL | \$ 2,254,448 | \$ 2,464,285 | \$ 2,505,444 | \$ 2,727,461 | \$ 222,017 | 8.9% |

FY20 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 at CNY and appropriate space for staff by coordinating workspace planning, design, and furniture acquisitions.
 - o Continue to coordinate with the CNY landlord on building improvements.

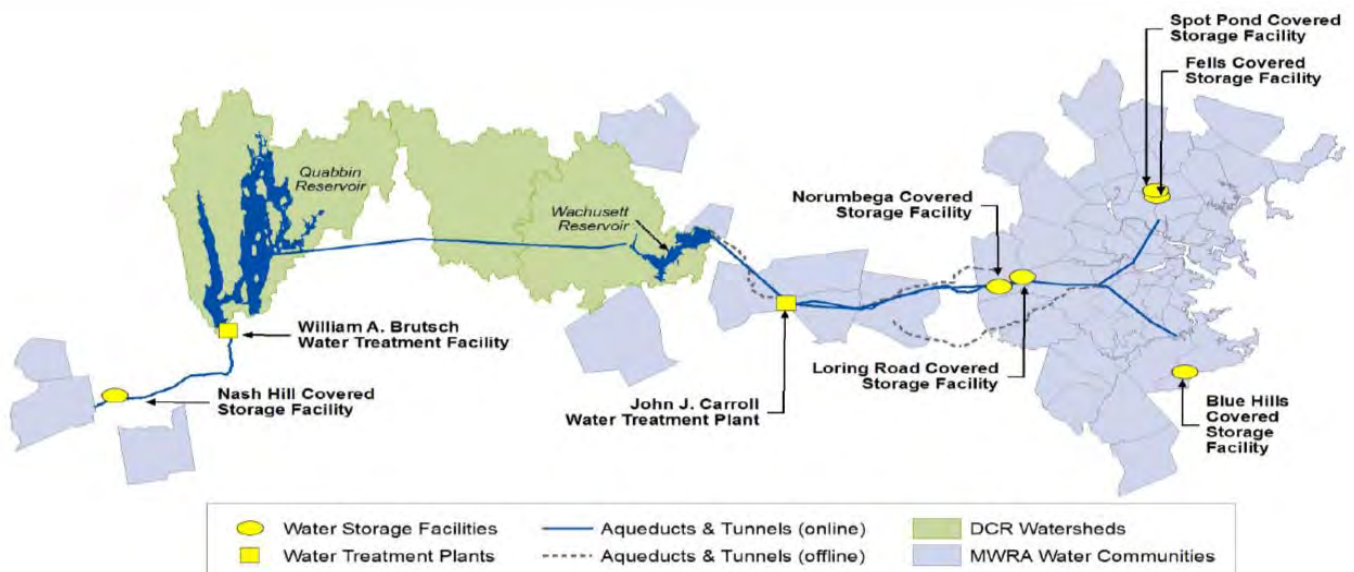
FY19 Mid-Year Accomplishments:

- Implemented facility improvements as provided in our lease agreement for CNY headquarters, including the upgrade of the two main elevators.
- 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 FY20 Proposed Budget is \$2.7 million, an increase of \$222,000 or 8.9% as compared to the FY19 Budget.

- \$504,000 for **Wages and Salaries**, an increase of \$38,000 or 8.1% as compared to the FY19 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 FY20 Proposed Budget funds seven FTEs, the same as the FY19 Budget.
- \$109,000 for **Utilities**, an increase of \$3,000 or 2.8% as compared to the FY19 Budget. This is due to rate increases for the CNY electricity.
- \$2.0 million for **Other Services**, an increase of \$181,000 or 10.0% as compared to the FY19 Budget. The main item under this line item is the lease for CNY Headquarters building. The lease includes base rent for the facility, real estate taxes, common area maintenance and operating costs.



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 fuel facility, the gas card program and the development and processing of specifications for new vehicles and equipment.

FY20 Proposed Current Expense Budget FLEET SERVICES

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|---------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 816,824 | \$ 910,912 | \$ 931,797 | \$ 947,121 | \$ 15,324 | 1.6% |
| OVERTIME | 8,294 | 9,238 | 11,000 | 11,000 | - | 0.0% |
| FRINGE BENEFITS | 158 | 172 | 250 | 250 | - | 0.0% |
| UTILITIES | 1,640 | 3,478 | 2,500 | 2,500 | - | 0.0% |
| ONGOING MAINTENANCE | 509,727 | 517,781 | 682,500 | 682,499 | (1) | 0.0% |
| TRAINING & MEETINGS | 670 | 782 | - | 4,000 | 4,000 | - |
| OTHER MATERIALS | 284,519 | 491,597 | 565,402 | 586,438 | 21,036 | 3.7% |
| OTHER SERVICES | 1,508 | 1,020 | 1,684 | 1,414 | (270) | -16.0% |
| TOTAL | \$ 1,623,340 | \$ 1,934,980 | \$ 2,195,133 | \$ 2,235,222 | \$ 40,089 | 1.8% |

FY20 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.

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.

FY19 Mid-Year 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.
- Continued to work with MIS on the purchase and implementation of the new Fuel management system
- Spec'd and purchase 3 additional electric vehicles for the Authority.

- Installed electric vehicle charging stations at the Chelsea facility.

Budget Highlights:

The FY20 Proposed Budget is \$2.2 million, an increase of \$40,000 or 1.8% as compared to the FY19 Budget.

- \$947,000 for **Wages & Salaries**, an increase of \$15,000 or 1.6% as compared to the FY19 Budget, primarily for wage increases associated with collective bargaining agreements. The FY20 Budget funds 12 FTEs, the same as the FY19 Budget.
- \$682,000 for **Ongoing Maintenance**, level funded from the FY19 Budget.
- \$586,000 for **Other Materials**, an increase of \$21,000 or 3.7% as compared to the FY19 Budget, for vehicle fuel. The FY20 Budget includes funds for 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.



Gillis Water Pump 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.

FY20 Proposed Current Expense Budget HUMAN RESOURCES

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 1,575,520 | \$ 1,536,643 | \$ 1,694,512 | \$ 1,726,530 | \$ 32,018 | 1.9% |
| OVERTIME | - | 21 | - | - | - | - |
| FRINGE BENEFITS | 19,516,579 | 19,959,013 | 21,083,424 | 21,849,849 | 766,425 | 3.6% |
| WORKERS' COMPENSATION | 2,565,336 | 2,147,063 | 2,422,609 | 2,354,256 | (68,353) | -2.8% |
| TRAINING & MEETINGS | 7,723 | 4,243 | 3,713 | 3,963 | 250 | 6.7% |
| PROFESSIONAL SERVICES | 502,008 | 661,805 | 745,827 | 756,590 | 10,763 | 1.4% |
| OTHER MATERIALS | 17,846 | 10,089 | 24,225 | 19,550 | (4,675) | -19.3% |
| OTHER SERVICES | 8,789 | 12,495 | 11,133 | 17,353 | 6,220 | 55.9% |
| TOTAL | \$ 24,193,801 | \$ 24,331,372 | \$ 25,985,443 | \$ 26,728,091 | \$ 742,648 | 2.9% |

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.
- The **Labor Relations Unit** is responsible for fulfilling MWRA's collective bargaining and contract administration obligations under Massachusetts' public sector collective bargaining law, and its workers' compensation responsibilities.
- 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.

**FY20 Proposed Current Expense Budget
HUMAN RESOURCES by Unit**

| UNIT | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| EMPLOYEE/COMP/BEN | \$ 774,787 | \$ 956,007 | \$ 1,173,811 | \$ 1,191,956 | \$ 18,145 | 1.5% |
| LABOR RELATIONS | 646,701 | 433,582 | 538,169 | 548,773 | 10,604 | 2.0% |
| TRAINING | 641,053 | 775,287 | 712,430 | 704,557 | (7,873) | -1.1% |
| CENTRALIZED FRINGE BENEFITS | 22,131,260 | 22,166,496 | 23,561,033 | 24,282,805 | 721,772 | 3.1% |
| TOTAL | \$ 24,193,801 | \$ 24,331,372 | \$ 25,985,443 | \$ 26,728,091 | \$ 742,648 | 2.9% |

FY20 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.
 - o Continue to aggressively manage MWRA Workers Comp claims to mitigate future exposure.
 - o Engage in Successor Collective Bargaining Negotiations.

FY19 Mid-Year Accomplishments:

- Continue to support the agency's efforts in implementing succession planning activities due to an increase in retirements anticipated over the next several years.
- Continue to offer supervisory, professional, and career development training programs necessary to support succession planning initiatives.
- Continue to offer Leadership Development Programs.
- 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 by 450,000 through aggressive claims management.
- Workers Compensation Program reporting has been revised to ensure consistency with OSHA standards.
- Completed procurement process of Third Party Administrator contract for a three (3) year term.
- Investigated complaints of violations of MWRA policies and Code of Conduct as necessary.
- Completed a variety of professional and technical training to MWRA employees including Confined Space Entry, Hoisting License Mandatory Refresher Training, Wastewater & Water Operator Exam Prep, Wastewater OJT, OSHA 40-Hour Hazardous Waste Site, OSHA 10-Hour Construction Safety, OSHA 8-Hour Annual Refresher, Leadership Development, Supervisory Development, RCRA/DOT Safety, Hot Work Safety, Vehicle Maintenance, Work-zone Safety, Lockout/Tagout, Electrical Safety, CPR First Aid, Advance First Aid, Underground Storage Tanks, Chemistry for Water & Wastewater, Harassment Prevention, Keolis & MBTA Track Safety, O&M Wastewater Collection Systems, Prevailing Wage Law, The Art of Negotiation, and a number of TCH classes.
- Worked with a Union / Management team on Extra-Ordinary Service award nominations, review and presentation at the February 20, 2019 Board of Directors meeting.
- Completed a review of non-union compensation to ensure compliance with the Massachusetts Equal Pay.

Budget Highlights:

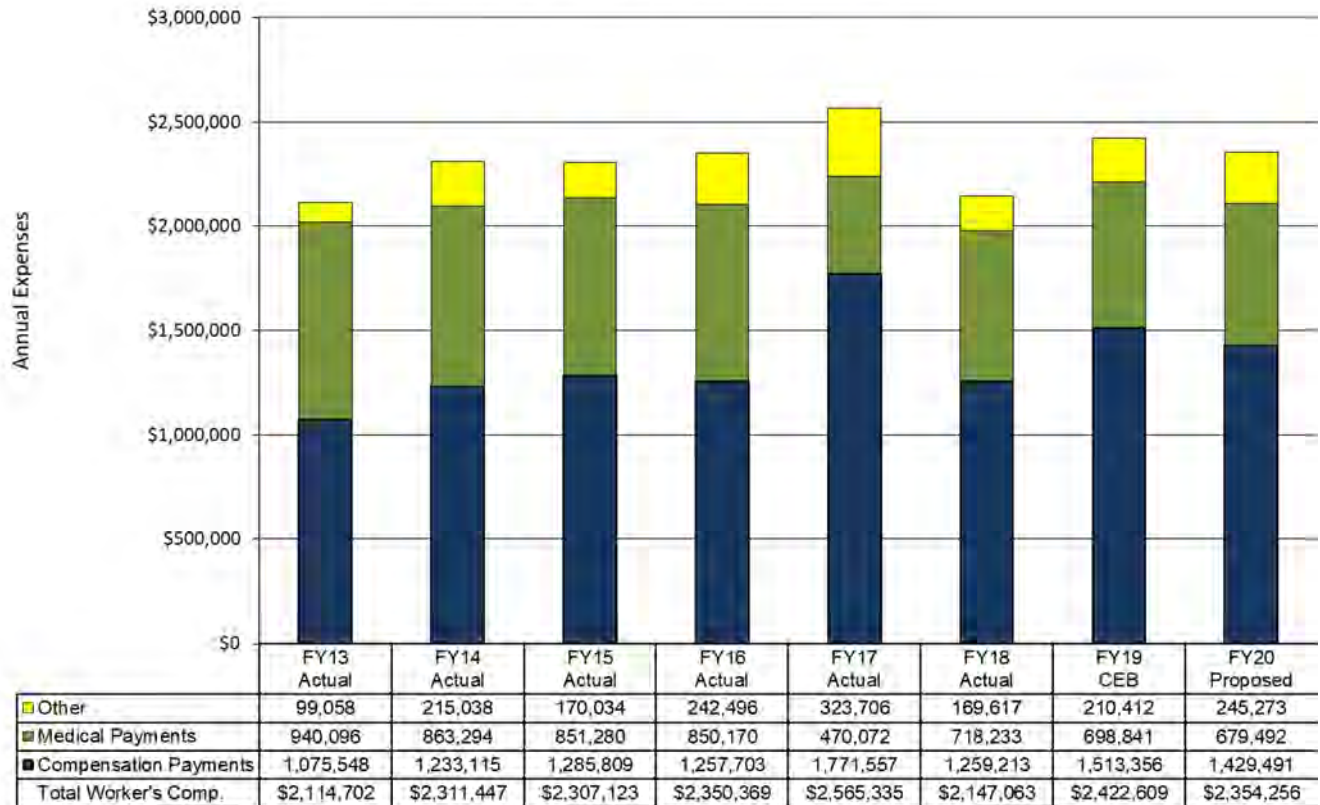
The FY20 Proposed Budget is \$27.0 million, an increase of \$743,000 or 2.9% as compared to the FY19 Budget.

- \$1.7 million for **Wages and Salaries**, an increase of \$32,000 or 1.9%, as compared to the FY19 Budget, primarily for wage increases associated with collective bargaining agreements. The FY20 Budget includes funding for 17 FTEs, the same as the FY19 Budget.
- \$21.8 million for **Fringe Benefits**, an increase of \$766,000 or 3.6%, as compared to the FY19 Budget, mainly for increases in health insurance costs. The FY20 Proposed Budget includes \$19.0 million for health insurance, \$1.5 million for Medicare, \$1.2 million for dental insurance, \$150,000 for unemployment insurance, and \$50,000 for tuition reimbursement.

| MWRA Fringe Benefits | | | |
|------------------------------|----------------------|----------------------|-------------------|
| Line Item | FY19 Budget | FY20 Budget | Difference |
| Health Insurance | 18,278,017 | 18,975,764 | 697,747 |
| Dental Insurance | 1,160,145 | 1,202,354 | 42,209 |
| Unemployment Insurance | 150,000 | 150,000 | - |
| Medicare | 1,425,262 | 1,471,731 | 46,469 |
| Tuition Reimbursement | 70,000 | 50,000 | (20,000) |
| Total Fringe Benefits | \$ 21,083,424 | \$ 21,849,849 | \$ 766,425 |

- \$2.4 million for **Workers' Compensation**, a decrease of \$68,000 or 2.8%, as compared to the FY19 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 FY13 and budgeted amount FY20. 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
FY13 - FY18 Actual, FY19 CEB & FY20 Proposed CEB



- \$757,000 for **Professional Services**, an increase of \$11,000 or 1.4% as compared to the FY19 Budget. The major budgeted items for FY20 include \$364,000 for Professional Development and Technical Training, \$145,000 for Workers' Compensation Claims Administration and Legal Services, \$56,000 for Arbitrators and Arbitration Expenses, \$35,000 for Medical Evaluation Services, and \$24,000 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 the 1,155 MWRA users, 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.

FY20 Proposed Current Expense Budget MANAGEMENT INFORMATION SYSTEM

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|----------------------|----------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 5,603,390 | \$ 5,633,993 | \$ 6,079,985 | \$ 6,290,253 | \$ 210,268 | 3.5% |
| OVERTIME | 20,371 | 11,235 | 6,000 | 12,000 | 6,000 | 100.0% |
| FRINGE BENEFITS | 344 | 125 | - | - | - | - |
| ONGOING MAINTENANCE | 4,087,070 | 3,276,360 | 3,760,932 | 4,151,949 | 391,017 | 10.4% |
| TRAINING & MEETINGS | 132,826 | 130,806 | 146,528 | 146,528 | - | 0.0% |
| PROFESSIONAL SERVICES | 463,713 | 729,675 | 700,000 | 1,685,940 | 985,940 | 140.8% |
| OTHER MATERIALS | 299,222 | 697,384 | 1,431,154 | 1,140,425 | (290,729) | -20.3% |
| OTHER SERVICES | 1,384,070 | 1,305,510 | 1,415,138 | 1,407,138 | (8,000) | -0.6% |
| TOTAL | \$ 11,991,006 | \$ 11,785,088 | \$ 13,539,737 | \$ 14,834,233 | \$ 1,294,496 | 9.6% |

FY20 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 responsibilities to the appropriate team, which matches 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 with a "proof of concept" being conducted 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 is pursuing the identification of 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. The current list of 47 use cases and 86 workflows is 83% complete. To date, 21 related databases have been identified 91% have been documented.
- **e-Discovery:** A component of Enterprise Content Management (ECM) is underway with the pilot design and implementation of both the Enterprise Vault system archiving application and the Clearwell identification and collection electronic discovery application. The Enterprise Vault system was being evaluated for archiving and related deduplication processes allowing for more efficient data storage and backups. Several configurations were evaluated and the software was pilot tested with unacceptable results. MIS is researching a new solution with our current backup software vendor. The Clearwell application is being evaluated for supporting public records requests and litigation document/discovery for documents across the Authority. This evaluation is underway and will be completed in FY20.
- **Enterprise Resource Planning (ERP) System Upgrades:** Upgrades are scheduled for the e-procurement applications infrastructure, Mobile Supply Chain Management (MSCM), and the Business Software, Inc. Tax Factory application. In addition, a comprehensive ERP version upgrade will be undertaken. Upgrades include selecting new Time Entry system, planning and replacement of the existing hardware platform to support future upgrade of ERP version, and choosing a replacement for the Budgeting Application to ensure vendor support. These upgrades will be accomplished over multiple Fiscal Years.

Compliance Management Initiatives

- ***LIMS/Electronic Laboratory Notebook (ELN) PhaseII:*** Complete any remaining tasks for the ELN – Phase I Improvement Project and then begin ELN - Phase II Wastewater. Phase II will replace paper logbooks used by Department of Lab Services Wastewater Labs. Phase II is a significantly larger project than Phase I. This project will begin in FY20 and span multiple years.
- ***PIMS/Dental Discharge Permit:*** The US EPA promulgated regulations requiring MWRA to regulate the dental industry. TRAC is developing a permit program for dental discharges that will include the submittal of a biennial certification to the MWRA by year 2020. This project will automate the submission of new permit requests and biennial certification through the use of the Permit Application module in PIMS.
- ***HOML Upgrade:*** Re-platform the Harbor Outfall Monitoring and Loading application will be ported onto a windows 2016 server and hosted on latest stable version of Weblogic Application Server. The existing HOML infrastructure is hosted on windows 2003 OS based physical server and Oracle Application Server which are both unsupported.
- ***Oracle Discoverer Migration to SAP Business Objects (BO):*** Oracle is planning to end support of the Oracle Discoverer product and MWRA wants to switch to SAP BO technology. SAP BO has technical/functional capabilities similar to Oracle Discoverer. There are approximately 500-600 Oracle Discoverer Workbooks that need to be migrated to SAP BO.

System Integration and Data Warehousing Initiatives

- ***ESRI GIS Infrastructure:*** MIS will invite ESRI for a study of the existing GIS environment to get recommendations on best practices. This study will include establishment of the Development, Test and Production environments not limited to ArcServer and Portal components of GIS application system.
- ***Enterprise Application Integration (EAI):*** Establish a dynamically scaling Enterprise Service Bus (ESB) technology product, implemented as an Integration Platform for select MWRA applications. This will standardize data flow/data exchange format and integrate disparate MWRA applications to the ESB and hence to the Central Data Repository

Operations Management Initiatives

- ***Telog:*** The Enterprise Telog system currently communicates over the internet. The communication infrastructure will be moved to a private wireless network.
- ***Gasboy Replacement:*** MWRA will be looking to replace the existing Fuel Management System, Gasboy, and replace it with a modern Fuel management solution that meets all user expectations and authority's future fuel management technology needs.
- ***WQRS/AQUARIUS:*** WQRS/AQUARIUS application improvements and enhancements will continue in FY20 and will wrap up by Q4 FY20

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 FY20 projects under this program:

- ***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 FY20 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.
- ***Email Filter Technology Refresh:*** The current appliance (ForcePoint) used for email 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.
- ***2 Factor Authentication:*** Implementation of 2 factor authentication technologies for key IT services.

Technology Infrastructure Improvement Program

The MWRA currently owns and operates 1,411 desktops, 143 laptops, 112 servers, 163 tablets and 239 iPhones. 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 the Disaster Recovery site enabling the ability to restore business data and applications there should the Chelsea data center, servers or infrastructure get damaged or destroyed.
- ***Network Storage Improvements:*** Plan for the migration and implementation for consolidation of new storage requirements for archiving, and implement e-discovery services.
- ***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. A Telephone System Replacement should be implemented for continued and reliable service.

- **Exchange Upgrade:** The current version of Exchange is approaching end of life and will need to be replaced to maintain support.
- **Edge Switch Hardware Refresh:** The current hardware is approaching end of life and will require replacement in order to maintain support.
- **Instrumentation and Controls of IT:** Plan for the implementation of 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.
- **Server Hardware Refresh:** Replacement of end of life servers
- **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, laptops, tablets, and printers are targeted for a hardware refresh in FY20.
- **Workforce Mobilization:** Continue to explore new technologies and hardware platforms to improve efficiencies in business process.

FY19 Mid-Year 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 FY20.

Application Improvement Program

- **Miscellaneous Lawson Support:** In FY19 MWRA upgraded PORTIA to v12.4.3. This upgrade was needed because the current version of Portia is not compatible with the Windows 10 Operating System. In addition new functionality, calculations and reporting features will be incorporated into our current implementation based on consultant's recommendations.
- **Computerized Maintenance Management System (CMMS) Enhancements:** The (ICD) service portion has been implemented and completed in FY19 Q2 and is being used authority wide.. Clinton Site was configured in Maximo and the site is likely to go live Q4 FY19

- **LIMS/Electronic Laboratory Notebook (ELN):** Completed remaining tasks for the ELN –Phase 1 Improvement Project.
- **LIMS /Analysts Exception Certification:** An exception report was developed that will display currently certified Analysts for a variety of analyses for which each Analyst holds an active Certification.
- **LIMS/Corrective Action Request:** 3 new fields were added to the INVESTIGATION Table and corresponding Corrective Action Request (CAR) template for managing follow up activities on C.A.R. investigations. CAR is required when a sample needs modifications.
- **LIMS / Control Chart Part II:** DLS Control Chart utility will allow Lab users of LIMS application to systematically manage a vast number of Spec Limit Records in a standardized systematic approach based on a unique set of specifications. The utility is going through lab user acceptance test. Most likely to be deployed to production in Q4 FY19.
- **PIMS CROMERR Compliance:** CROMERR provides the legal framework for electronic reporting under EPA’s regulatory programs. MWRA must modify its Pretreatment Information Management System (PIMS) to transition to electronic reporting. In FY19 the application was developed and deployed as a pilot program with two Laboratories. Modifications based on this pilot will be wrapped by Q4 FY19.
- **PIMS:** Installation of PIMS build 12.0.0 from IPS with fixes for 9 bugs and enhancements.
- **Oracle Discoverer Migration to SAP Business Objects (BO):** SAP BO environment build, upgrade of Crystal server version and porting of previous reports is in progress. Scheduled to complete by Q4 FY19.
- **Geographic Information System (GIS) Integration:** In GIS Oracle database (GISMAPPD), replaced the existing Rutland-Holden sewer data layers SEWER.RutlandholdenPipe_Arc and SEWER.RutlandholdenStruct_pt with a newer version of each layer. Add a new layer called Member Community to the GIS Oracle database (GISMAPPD). Updated GIS Sampling Station Layer with six new fields. By adding the six new field to the layer, the Planning Dept. will be able to capture Pressure Zone information related to each sample location. Update GIS Viewer Water Quality configuration Basemap. By changing the basemap and turning off the WS Communities layer, the web map will be easier to read. Upgraded GIS Portal and ArcServer to version 10.6.
- **Telog:** The Telog Enterprise Application System was successfully upgraded in both the development and production environments in FY18. The new application system resides in virtual environment with latest version of software Components.
- **Sewer Inspection TV truck software Upgrade from GraniteXP to GraniteNet:** The Upgrade of TV truck software Upgrade from GraniteXP to GraniteNet has been completed and is in use. GraniteNet is Windows 10 complaint.

- **Water Quality Reporting System (WQRS)/AQUARIUS Upgrade:** WQRS/AQUARIUS application was successfully upgraded to v3.10 in FY18. In FY19 WQRS/AQUARIUS application improvements have begun and are scheduled for completion Q4 FY20.
- **Computerized Maintenance Management System (CMMS) Enhancements:** The Maximo/ICD upgrade project came to closure which completed the effort to have all assets in one system being managed in a standard way across all departments.
- **Custom Development:** The Water Conservation Fixture Ordering Application and the OMMS DCR Data Portal are both internet facing application, which modernized the way business is conducted.

Information Security Program

- **Branch Office VPN Replacement:** The hardware appliance providing network connectivity from the smaller branch offices is approaching end of support and product life. This initiative will explore VPN technologies to replace the existing solution. Design work is complete for this project. Hardware has not been received yet. This work was completed during FY19.
- **External Email Banner:** In an effort to improve staff awareness of potential phishing emails, an “External” banner was added to all emails coming from outside of the MWRA.
- **Managed Security Services Contract:** A two-year extension to the Managed Security Services Contract was approved by the Board, which coincides with the Cyber Security infrastructure refresh timeline.
- **Cyber Security Incidence Response Plan:** Developed the Cyber Security Incidence Response Plan, trained staff and conducted a table top exercise against the plan.

Technology Infrastructure Improvement Program

During FY19, several upgrades were completed and or started in order to keep the aging infrastructure up to date.

One of the biggest efforts started in January and scheduled to complete in mid-June is the Window 10 PC upgrade and Refresh. Nine hundred fifty four desktops are being replaced due to their age (4-5 years). All PC are also being upgraded from Windows 7 to Windows 10.

Other FY19 infrastructure projects included:

- The server infrastructure in Charlestown was upgraded to a virtualized environment providing additional storage capacity, hardware resilience and redundancy.
- Obsolete, end of life hardware supporting network connectivity to remote branch offices was upgrade.
- End of life hardware supporting the management of the VMWare environment was upgraded.

- AutoCAD licenses and server to support concurrent users was upgraded
- All leased Multi-Function Devices were replaced.
- The Deer Island Circuit Upgraded to improve network response from the island and to support the backup replication requirements within the established maintenance window.
- All network switch were upgraded to latest recommended version.
- Audio Visual upgrades were installed in the Chelsea Muster Room and Charlestown Board Room to replace end of life equipment.

Budget Highlights:

The FY20 Proposed Budget is \$14.8 million, an increase of \$1.3 million or 9.6% as compared to the FY19 Budget.

- \$6.3 million for Wages and Salaries, an increase of \$210,000 or 3.5% as compared to the FY19 Budget. The FY20 Budget includes funding for 55 FTEs, as well as wage increases associated with collective bargaining agreements.
- \$4.2 million for **Ongoing Maintenance**, an increase of \$391,000 or 10.4%, as compared to the FY19 Budget, due to number of software licenses coming off multi-year maintenance and support agreements, and equipment on extended service agreements. In FY20, the MSSP/Information Security Protection contract will require the advance payment of 2 years of maintenance resulting in an increase of \$191,000. Also planned is a monitoring and alerting system at an estimated cost of \$148,000.
- \$1.7 million for **Professional Services**, an increase of \$985,000 or 140.8% as compared to the FY19 Budget. The largest component of this increase is the 2 year MSSP monitoring cost of \$684,000, which must be paid in advance. Professional services to augment MIS staff are needed for the following planned software and hardware upgrades: Fuel Management System, Peopleclick, Portia, Bartender, Ivanti, Tiscor, PGP server, Websense appliances, Ironport appliances, Aruba wireless equipment, and AV equipment in meeting rooms, training rooms, and other locations.
- \$1.1 million for **Other Materials**, a decrease of \$291,000 or 20.3%, as compared to the FY19 Budget. The decrease is due to the completion of the PC replacement project in FY19 but is offset by the purchase of equipment for the conference room upgrades estimated at \$372,000.
- \$1.4 million for **Other Services**, a decrease of \$8,000 or 0.6%, as compared to the FY19 Budget. Funding of \$1.2 million is for facility and security data lines and network upgrades. Remaining funds are for the lease of Automated Vehicle Location (AVL) services.



Fog creeping in over Sudbury Dam

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.

FY20 Proposed Current Expense Budget PROCUREMENT

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|---------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 3,556,164 | \$ 3,828,459 | \$ 4,026,095 | \$ 4,266,208 | \$ 240,113 | 6.0% |
| OVERTIME | 20,492 | 16,811 | 23,471 | 23,471 | - | 0.0% |
| FRINGE BENEFITS | 501 | 317 | 300 | 300 | - | 0.0% |
| ONGOING MAINTENANCE | 294,290 | 261,014 | - | - | - | - |
| TRAINING & MEETINGS | 4,502 | 4,391 | 10,750 | 10,750 | - | 0.0% |
| OTHER MATERIALS | 136,628 | 136,869 | 139,475 | 144,000 | 4,525 | 3.2% |
| OTHER SERVICES | 54,202 | 56,889 | 67,786 | 72,416 | 4,630 | 6.8% |
| TOTAL | \$ 4,066,779 | \$ 4,304,750 | \$ 4,267,877 | \$ 4,517,145 | \$ 249,268 | 5.8% |

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.

FY20 Goals & Initiatives:

IV. Finance & Management

- **Goal #11 - Ensure Financial Sustainability, Integrity, and Transparency:**
 - 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:**
 - Maintain a recycling program in order to contain MWRA operating costs by removing recyclable materials from the waste stream.
 - Continue implementing electronic procurement for contract bids, with a focus on electronic bidding for professional services contracts.

- 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.

FY19 Mid-Year Accomplishments:

- Awarded the following Major Capital Improvement Program Contracts and Other Contracts necessary for Operations and Maintenance through Q3, FY19:
 - o CWTP SCADA System Improvements
 - o Braintree Weymouth Pump Station Improvements
 - o Cathodic Protection Replacement Shafts E and L
 - o Metropolitan Tunnel Redundancy Program Support Services
 - o Intermediate High Pipeline Improvements
 - o Fore River RR Main Line Adjustment
 - o Bellevue 2/Turkey Hill Water Tank Painting Project
 - o Roof Replacement Clinton
 - o General Edwards Bridge – Demo of Section 56 Water Main
 - o Cosgrove Intake and Power Station Upgrades
 - o Deer Island Steel Water Tank Painting Project
 - o Biosolids Processing Facility Capital Improvements
 - o Thermal & Hydro Power Plant Maintenance
 - o Centrifuge Services
 - o Security Guard Services
 - o Supply and Delivery of Sodium Hypochlorite, DITP
 - o Insurance Consultant Services
 - o Supply and Delivery of Ferrous Chloride, DITP
 - o Financial & Swap Advisory Services
 - o Dental Insurance
 - o Interval Accounts
 - o HVAC Systems Maintenance, Western Ops
 - o Supply and Delivery of Soda Ash, JJCWTP
 - o Community Leak Detection Survey Services
 - o Workers Compensation Legal Services
 - o Grounds keeping Services, Metro Boston
 - o 69Kv Electrical System Maintenance
 - o Insurance Program Renewal
 - o Technical Assistance Consulting Services – Hazardous Materials
 - o Renewable and Alternative Energy Portfolio Services
 - o Supply and Delivery of Sodium Hypochlorite, JJCWTP

- Continued to work with Deer Island Treatment Plant (DITP), Field Operations (FOD), and utility companies to establish energy conservation programs at DITP and FOD facilities utilizing various programs including the Green Communities Act. Continued to dispose of surplus scrap metal materials in an environmentally responsible manner.
- Work on improvements to the electronic procurement bidding process.
- Processed 5,602 purchase orders in through Q3, FY19 for a total of \$43,170,222.
- Online vehicle and equipment auction process resulted in revenue of \$357,261.
- Recycled 8.69 tons of batteries, 35.90 tons of paper, 157.54 tons of scrap metal, and 1,440 pounds of stainless steel, aluminum, brass, and copper, generating \$30,987 in revenue.

Budget Highlights:

The FY20 Proposed Budget is \$4.5 million, an increase of \$249,000 or 5.8% as compared to the FY19 Budget.

- \$4.3 million for **Wages and Salaries**, an increase of \$240,000 or 6.0% as compared to the FY19 Budget, including wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds 43.8 FTEs, which is the same as the FY19 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.

FY20 Proposed Current Expense Budget OCCUPATIONAL HEALTH AND SAFETY

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 |
|-----------------------|-----------------|-----------------|----------------------|----------------------------|------------------------|
| WAGES & SALARIES | \$ - | \$ - | \$ - | \$ 953,763 | \$ 953,763 - |
| TRAINING & MEETINGS | - | - | - | 1,500 | 1,500 - |
| PROFESSIONAL SERVICES | - | - | - | - | - - |
| OTHER MATERIALS | - | - | - | 600 | 600 - |
| OTHER SERVICES | - | - | - | 312 | 312 - |
| TOTAL | \$ - | \$ - | \$ - | \$ 956,175 | \$ 956,175 - |

FY20 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.

FY19 Mid-Year Accomplishments:

- Created the Occupational Health and Safety Department by moving salaried staff currently in safety roles into the department to better support regulatory 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.

Budget Highlights:

The FY20 Proposed Budget is \$956,000, which is new under Administration and Finance as of FY20. The previous Occupational Health and Safety Budget was in Operations.

- \$954,000 for **Wages & Salaries**, which funds 9 FTE's in FY20.
- \$1,500 for **Trainings and Meetings**, for safety conferences.



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).

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| FINANCE DIVISION | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 3,356,207 | \$ 3,383,581 | \$ 3,686,118 | \$ 3,772,210 | \$ 86,092 | 2.3% |
| TRAINING & MEETINGS | 1,912 | 1,651 | 3,000 | 3,000 | - | 0.0% |
| PROFESSIONAL SERVICES | 485,783 | 574,889 | 615,263 | 636,763 | 21,500 | 3.5% |
| OTHER MATERIALS | 4,734 | 5,937 | 11,100 | 11,100 | - | 0.0% |
| OTHER SERVICES | 4,486 | 5,494 | 6,175 | 6,985 | 810 | 13.1% |
| TOTAL | \$ 3,853,122 | \$ 3,971,552 | \$ 4,321,656 | \$ 4,430,058 | \$ 108,402 | 2.5% |

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

| FY20 Proposed Current Expense Budget | | | | | | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| FINANCE by Department | | | | | | |
| DEPARTMENT | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| DIR OFFICE (FINANCE) | \$ 226,092 | \$ 250,519 | \$ 246,709 | \$ 254,818 | \$ 8,109 | 3.3% |
| CONTROLLER | 1,411,844 | 1,401,701 | 1,590,063 | 1,632,257 | 42,194 | 2.7% |
| RATES AND BUDGET | 875,443 | 915,851 | 929,944 | 949,919 | 19,975 | 2.1% |
| TREASURY | 835,584 | 946,571 | 1,053,039 | 1,063,412 | 10,373 | 1.0% |
| RISK MANAGEMENT | 504,159 | 456,910 | 501,901 | 529,652 | 27,751 | 5.5% |
| TOTAL | \$ 3,853,122 | \$ 3,971,552 | \$ 4,321,656 | \$ 4,430,058 | \$ 108,402 | 2.5% |

FY20 Goals & Initiatives:

The Finance Division supports the fourth key strategic priority set forth in the Authority’s FY 2016-2020 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 communities are sustainable and predictable, both at the combined and at the water and wastewater utility level.
 - Continue to fund the pension at appropriate levels and address the Other Post-Employment Benefits.
 - Manage MWRA’s debt portfolio to contribute to the achievement of sustainable and predictable utility assessment increases.
 - Manage diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.
 - Continue assessment and evaluation of sustainable cost savings opportunities throughout the organization.

FY19 Mid-Year Accomplishments:

- Developed the FY20 Proposed Budget consistent with the FY19 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 first submission of MWRA’s Comprehensive Annual Financial Report (CAFR) to the Government Finance Officers Association

Budget Highlights:

The FY20 Proposed Budget for the Finance Division is \$4.4 million, an increase of \$108,000 or 2.5% as compared to the FY19 Budget.

- \$3.8 million for **Wages and Salaries**, an increase of \$86,000 or 2.3% as compared to the FY19 Budget, mainly due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds 37 FTEs, the same as the FY19 Budget.

| FTEs | | |
|-----------------------|--------------|--------------|
| FINANCE by Department | | |
| DEPARTMENT | FY19 FTEs | FY20 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 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 FY20 will be maintaining an agency-wide focus on balancing competing needs to minimize assessment increases while ensuring the provision of critical MWRA services.

FY20 Proposed Current Expense Budget FINANCE DIVISION DIRECTOR'S OFFICE

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|---------------------|-------------------|-------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 219,632 | \$ 244,492 | \$ 231,857 | \$ 239,966 | \$ 8,109 | 3.5% |
| TRAINING & MEETINGS | 1,852 | 1,651 | 3,000 | 3,000 | - | 0.0% |
| OTHER MATERIALS | 3,622 | 3,467 | 10,100 | 10,100 | - | 0.0% |
| OTHER SERVICES | 986 | 892 | 1,752 | 1,752 | - | 0.0% |
| TOTAL | \$ 226,092 | \$ 250,502 | \$ 246,709 | \$ 254,818 | \$ 8,109 | 3.3% |

FY20 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 develop strategies to address the growing Other Post-Employment Benefits.
 - 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 FY20 Proposed Budget is \$255,000, in increase of \$8,000 or 3.3% as compared to the FY19 Budget.

- \$240,000 for **Wages and Salaries**, an increase of \$8,000 or 3.5% as compared to the FY19 Budget, reflecting collective bargaining agreements. The FY20 Proposed Budget funds two FTEs, the same as in FY19.

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.

FY20 Proposed Current Expense Budget RATES AND BUDGET

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|---------------------|-------------------|-------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 874,207 | \$ 913,211 | \$ 928,595 | \$ 948,660 | \$ 20,065 | 2.2% |
| TRAINING & MEETINGS | 60 | - | - | - | - | - |
| OTHER MATERIALS | 447 | 984 | 500 | 500 | - | 0.0% |
| OTHER SERVICES | 728 | 1,655 | 849 | 759 | (90) | -10.6% |
| TOTAL | \$ 875,442 | \$ 915,850 | \$ 929,944 | \$ 949,919 | \$ 19,975 | 2.1% |

FY20 Goals and Initiatives:

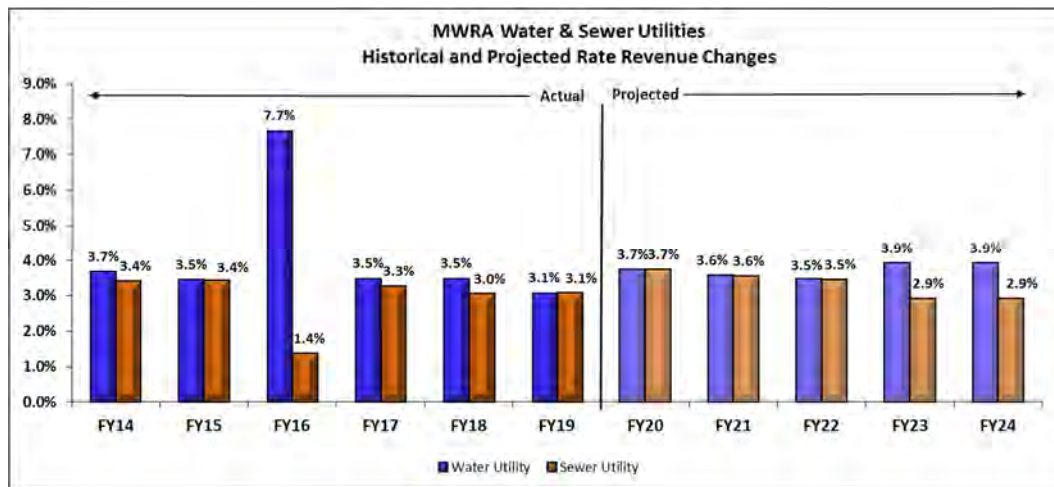
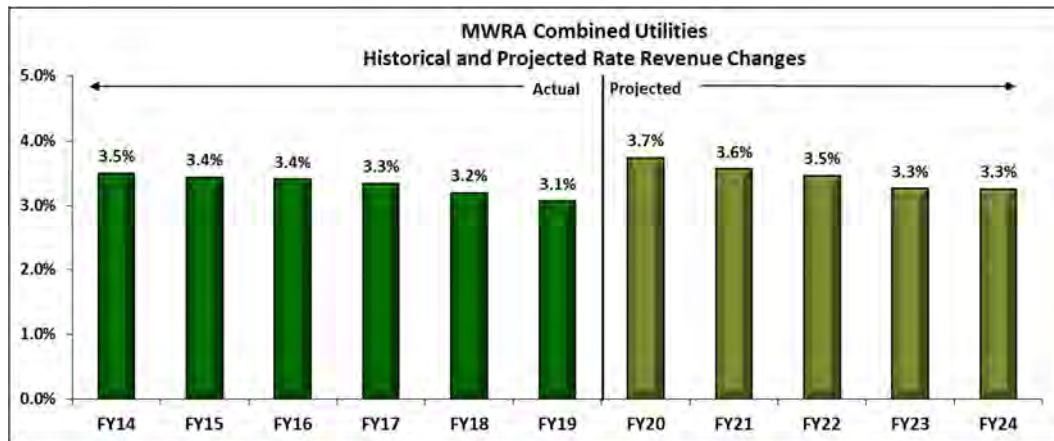
I. Finance & Management

- **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 CIP program.
 - 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.

FY19 Mid-Year Accomplishments:

- Developed the FY20 Current Expense Budget below the FY19 planning estimates for combined water and sewer assessment increases.

- Developed the FY20 Capital Improvement Budget to fit within the five-year spending cap for the FY19-23 period.
- Communicated preliminary FY20 Assessments to the service area communities, staying within the 3.7% projected assessment changes that are in the MWRA’s multi-year planning model.
- Held Budget Briefings with the MWRA Advisory Board to communicate FY20 departmental budgets and initiatives and how they relate to the MWRA’s Master Plan.



Budget Highlights:

The FY20 Proposed Budget is \$949,000, an increase of \$20,000 or 2.1% as compared to the FY19 Budget.

- \$949,000 for **Wages and Salaries**, an increase of \$20,000 or 2.2% as compared to the FY19 Budget, for wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds eight FTEs, the same as in the FY19 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.

FY20 Proposed Current Expense Budget

TREASURY

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|-------------------|-------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 553,610 | \$ 539,449 | \$ 632,164 | \$ 642,537 | \$ 10,373 | 1.6% |
| TRAINING & MEETINGS | - | - | - | - | - | - |
| PROFESSIONAL SERVICES | 280,437 | 404,867 | 419,263 | 419,263 | - | 0.0% |
| OTHER MATERIALS | 324 | 1,155 | 300 | 300 | - | 0.0% |
| OTHER SERVICES | 1,214 | 1,100 | 1,312 | 1,312 | - | 0.0% |
| TOTAL | \$ 835,585 | \$ 946,571 | \$ 1,053,039 | \$ 1,063,412 | \$ 10,373 | 1.0% |

FY19 Goals and Initiatives:

IV. Finance & Management

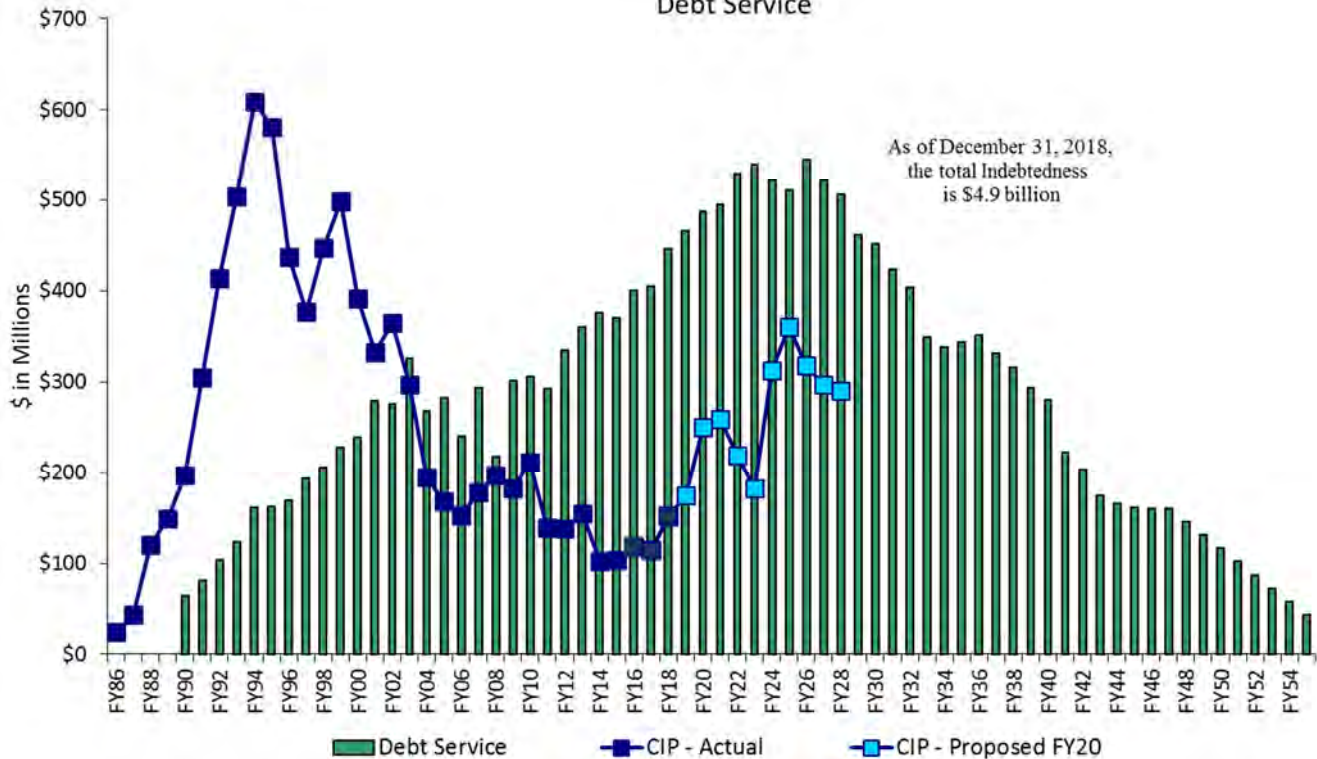
- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**

- 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.

FY19 Mid-Year Accomplishments:

- Completed the Massachusetts Clean Water Trust (MCWT) Pool 21 borrowing in September 2018. This \$50.0 million transaction was made at subsidized interest rate contributing to a lower overall cost of debt for the Authority.
- Completed a zero percent interim loan with the MCW in January 2019. This \$52.5 million borrowing will be permanently finance by MCWT Pool 22 transaction.
- Executed a \$13.9 million of outstanding senior principal in September 2018. This defeasance decreased the debt service requirement between FY20 and FY22 by a total of \$15.5 million reducing the Rate Revenue Requirement in those years.
- 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 which helps minimize debt service expenses.

MWRA Capital Spending & Debt Service



Budget Highlights:

The FY20 Proposed Budget is \$1.1 million, an increase of \$10,000 or 1.0% as compared to the FY19 Budget.

- \$643,000 for **Wages and Salaries**, an increase of \$10,000 or 1.6% as compared to the FY19 Budget, due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget includes funding for seven FTEs, the same as the FY19 Budget.
- \$419,000 for **Professional Services**, level funded as compared to the FY19 Budget. These funds are used for financial and bond 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.

FY20 Proposed Current Expense Budget

CONTROLLER

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|---------------------|---------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 1,274,415 | \$ 1,277,174 | \$ 1,431,601 | \$ 1,471,395 | \$ 39,794 | 2.8% |
| PROFESSIONAL SERVICES | 135,881 | 123,307 | 156,000 | 157,500 | 1,500 | 1.0% |
| OTHER MATERIALS | 338 | 299 | 200 | 200 | - | 0.0% |
| OTHER SERVICES | 1,210 | 922 | 2,262 | 3,162 | 900 | 39.8% |
| TOTAL | \$ 1,411,844 | \$ 1,401,702 | \$ 1,590,063 | \$ 1,632,257 | \$ 42,194 | 2.7% |

FY20 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.
 - Implement new cash management tool for recording cash transactions to General Ledger.
 - 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.

FY19 Mid-Year Accomplishments:

- Successfully completed certified financial statement audit with no audit findings.
- Prepared first submission of MWRA's Comprehensive Annual Financial Report (CAFR) to the Government Finance Officers Association.
- 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.

Budget Highlights:

The FY20 Proposed Budget is \$1.6 million, an increase \$40,000 or 2.8% as compared to the FY19 Budget.

- \$1.5 million for **Wages and Salaries**, an increase of \$39,000 or 2.8%, as compared to the FY19 Budget, due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds 16 FTEs, the same as the FY19 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.

FY20 Proposed Current Expense Budget RISK MANAGEMENT

| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
|-----------------------|-------------------|-------------------|----------------------|----------------------------|------------------------|-------------|
| WAGES & SALARIES | \$ 434,343 | \$ 409,254 | \$ 461,901 | \$ 469,652 | \$ 7,751 | 1.7% |
| PROFESSIONAL SERVICES | 69,466 | 46,700 | 40,000 | 60,000 | 20,000 | 50.0% |
| OTHER MATERIALS | 3 | 32 | - | - | - | - |
| OTHER SERVICES | 347 | 925 | - | - | - | - |
| TOTAL | \$ 504,159 | \$ 456,911 | \$ 501,901 | \$ 529,652 | \$ 27,751 | 5.5% |

FY20 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.

FY19 Mid-Year Accomplishments:

- Successfully procured MWRA’s FY19 Insurance Program through a competitive bid process for all lines of coverage at a 6.0% increase in program cost compared to the FY18 program.
- 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 more than 56 self-insured Automobile, General Liability and Property damage claims.

- Provided timely support to MWRA managers on all insurance, claims, litigation and risk management issues.
- Performed over 100 Insurance reviews and Project/Contract risk assessments in support of construction, professional services and purchase order contracts.

Budget Highlights:

The FY20 Proposed Budget is \$530,000, an increase \$28,000 or 5.5% as compared to the FY19 Budget.

- \$470,000 for **Wages & Salaries**, an increase of \$8,000 or 1.7% as compared to the FY19 Budget, due to wage increases associated with collective bargaining agreements. The FY20 Proposed Budget funds four FTEs, the same as the FY19 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.

| FY20 Proposed Current Expense Budget | | | | | | |
|---|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| MWRA Direct Expenses by Line Item | | | | | | |
| LINE ITEM | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| WAGES & SALARIES | \$ 98,494,293 | \$ 100,875,413 | \$ 107,032,022 | \$ 110,520,570 | \$ 3,488,548 | 3.2% |
| OVERTIME | 4,951,622 | 4,571,553 | 4,447,554 | 4,898,965 | 451,411 | 9.2% |
| FRINGE BENEFITS | 19,623,635 | 20,068,915 | 21,173,571 | 21,965,210 | 791,639 | 3.6% |
| WORKERS' COMPENSATION | 2,565,336 | 2,147,063 | 2,422,609 | 2,354,256 | (68,353) | -2.9% |
| CHEMICALS | 9,262,849 | 9,659,735 | 10,830,452 | 12,087,530 | 1,257,078 | 10.4% |
| UTILITIES | 20,249,593 | 21,997,423 | 22,868,632 | 24,199,103 | 1,330,471 | 5.5% |
| ONGOING MAINTENANCE | 30,798,709 | 29,067,097 | 32,258,728 | 32,784,792 | 526,064 | 1.6% |
| TRAINING & MEETINGS | 360,115 | 314,745 | 455,770 | 504,394 | 48,624 | 9.6% |
| PROFESSIONAL SERVICES | 6,698,863 | 6,955,654 | 7,675,976 | 8,324,490 | 648,514 | 7.8% |
| OTHER MATERIALS | 5,851,450 | 6,293,935 | 7,381,099 | 7,186,700 | (194,399) | -2.7% |
| OTHER SERVICES | 21,865,446 | 22,794,734 | 23,065,412 | 23,925,385 | 859,973 | 3.6% |
| TOTAL | \$ 220,721,911 | \$ 224,746,267 | \$ 239,611,825 | \$ 248,751,395 | \$ 9,139,570 | 3.8% |

| FY20 Proposed Current Expense Budget | | | | | | |
|---|-----------------------|-----------------------|-----------------------|----------------------------|------------------------|-------------|
| MWRA Direct Expenses by Division | | | | | | |
| DIVISION | FY17 Actuals | FY18 Actuals | FY19 Final Budget | FY20 Proposed Budget | Change FY20 to FY19 | |
| EXECUTIVE | \$ 6,706,256 | \$ 7,277,161 | \$ 7,590,300 | \$ 7,612,061 | \$ 21,761 | 0.3% |
| OPERATIONS | 162,910,116 | 165,681,994 | 176,153,629 | 182,255,966 | 6,102,337 | 3.3% |
| LAW | 2,285,192 | 2,055,302 | 2,059,794 | 2,087,231 | 27,437 | 1.3% |
| ADMINISTRATION | 44,967,225 | 45,760,258 | 49,486,446 | 52,366,079 | 2,879,633 | 5.5% |
| FINANCE | 3,853,122 | 3,971,552 | 4,321,656 | 4,430,058 | 108,402 | 2.4% |
| TOTAL | \$ 220,721,911 | \$ 224,746,267 | \$ 239,611,825 | \$ 248,751,395 | \$ 9,139,570 | 3.8% |

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 |
| 8/14/18 | Prepare budget guidelines and materials | Update database with annual estimated inflation factor |
| 9/14/18 | | Kick-off meeting |
| 9/25/18 | Kick-off meeting - Release database files to all departments | |
| 10/27/18 | | Project Managers update project schedules and costs |
| 10/30/18 | | Proposed CIP finalized |
| 11/6/18 | Budget staff prepare capital financing requirements and indirect expenses | Review of Proposed CIP with senior management |
| 11/13/18 | Update CEB impacts from CIP | |
| 11/20/18 | | Proposed CIP Staff Summary and Board of Directors presentation |
| 12/1/18 | Proposed CEB, Rate Revenue Requirement and planning projections | |
| 12/15/18 | Review of Proposed CEB with Senior Management | |
| 12/20/18 | | Present Proposed CIP at Board Of Directors Meeting |
| 12/21/18 | | Advisory Board Review and Comments begins |
| 1/15/19 | Proposed CEB Staff Summary and Board of Directors presentation | |
| 2/21/19 | Present Proposed CEB at Board of Directors Meeting | |
| 2/22/19 | Advisory Board Review and Comments begins | |
| 3/15/19 | Spring Revisit - Distribute Proposed FY19 database files to all departments | |
| 4/9/19 | Update Proposed CEB | Update Proposed CIP |
| 4/15/19 | Public hearings | Public hearings |
| 4/27/19 | Receive Advisory Board Comments | Receive Advisory Board Comments |
| 5/18/19 | Prepare MWRA's response to Advisory Board Comments | Prepare MWRA's response to Advisory Board Comments |
| 5/18/19 | Prepare Draft Final CEB presentation for Board of Directors | Prepare Draft Final CIP presentation for Board of Directors |
| 5/30/19 | Presentation - Draft Final CEB to Board of Directors | Presentation - Draft Final CIP to Board of Directors |
| 6/15/19 | Draft Final CEB Staff Summary | Draft Final CIP Staff Summary |
| 6/20/19 | 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 sewered 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

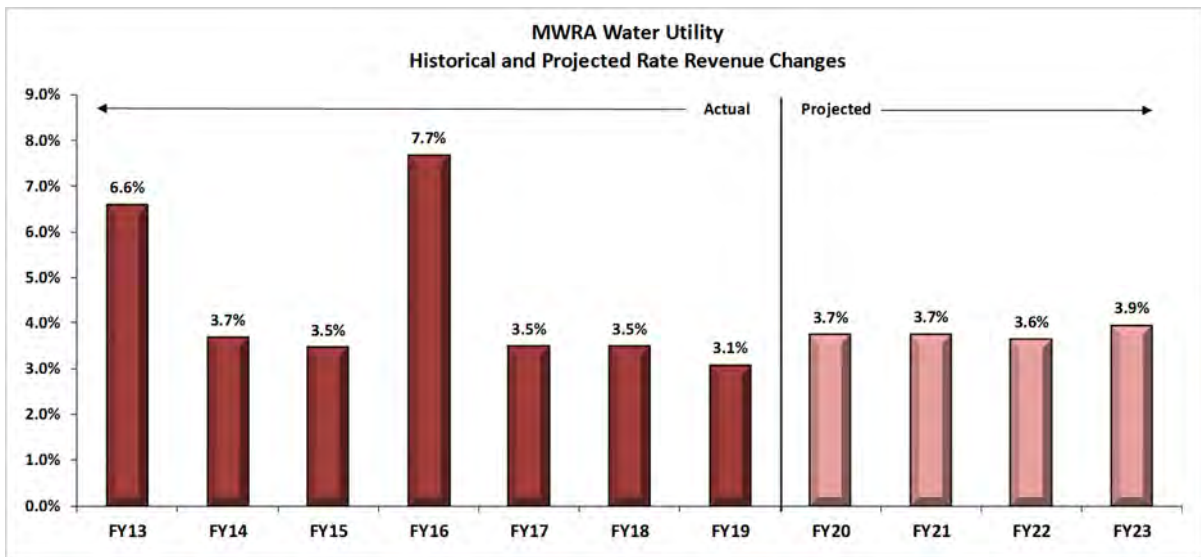
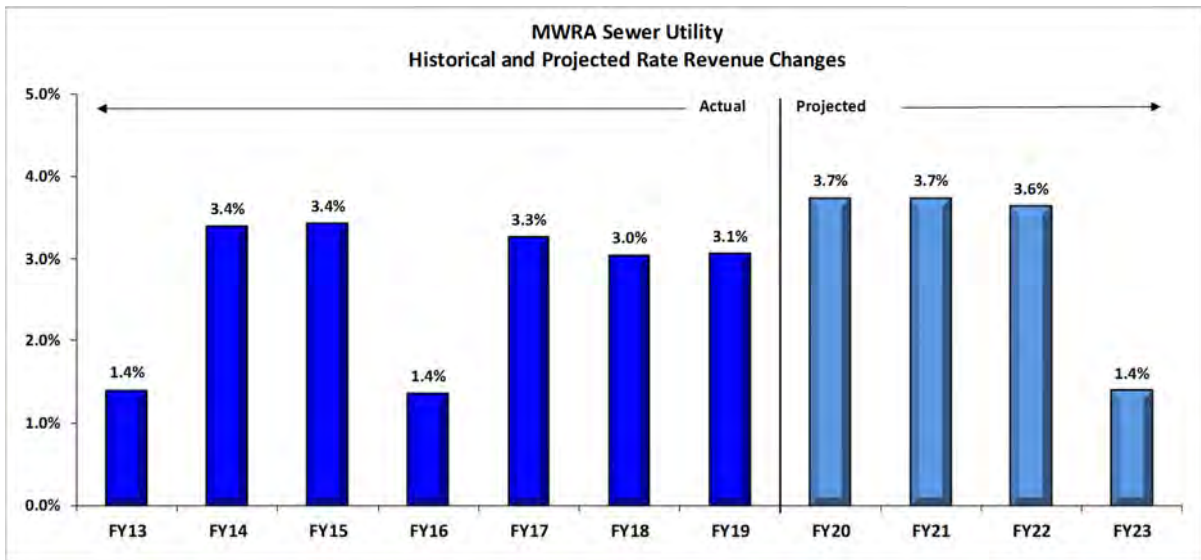
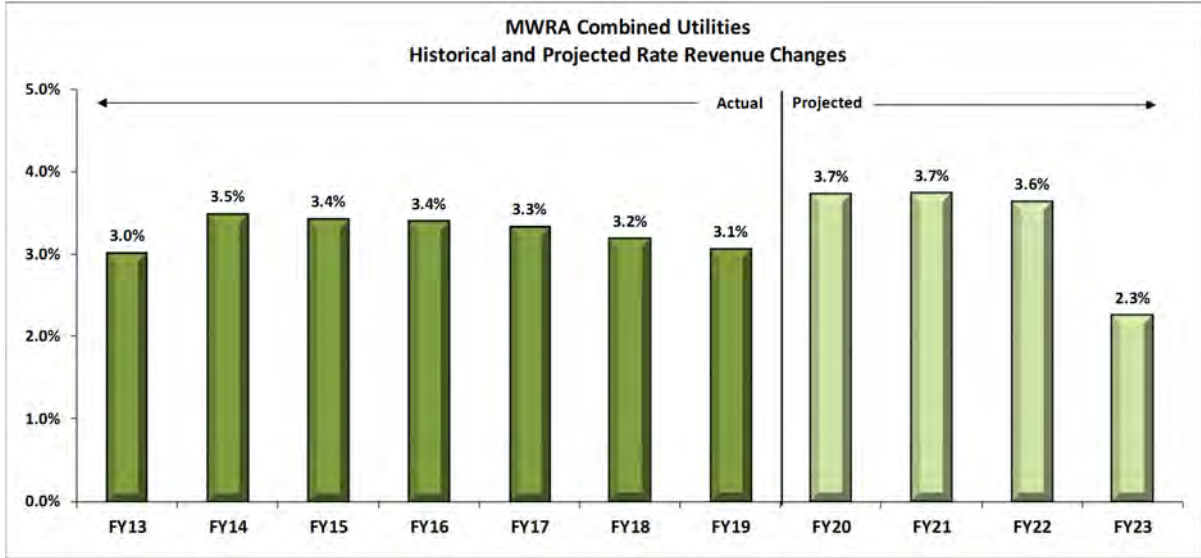
The Authority's statutory debt limit is \$6,450,000,000. The current debt is well below the debt limit. The Authority's debt limit was most recently amended by Chapter 312 of the Acts of 2008 of the Commonwealth of Massachusetts.

APPENDIX D

| MWRA Planning Estimates FY2020 to FY2029 | | | | | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | FY2027 | FY2028 | FY2029 |
| COMBINED UTILITIES | | | | | | | | | | |
| EXPENSES | | | | | | | | | | |
| Direct Expenses | \$248,751 | \$256,843 | \$263,691 | \$271,157 | \$278,779 | \$286,500 | \$294,542 | \$303,683 | \$311,335 | \$320,284 |
| Indirect Expenses | 50,724 | 52,377 | 54,647 | 56,190 | 57,973 | 60,778 | 55,823 | 54,417 | 55,678 | 56,976 |
| Capital Financing (before offsets) | 497,556 | 516,295 | 535,282 | 554,509 | 574,022 | 538,062 | 582,857 | 574,804 | 571,728 | 547,950 |
| Sub-Total Expenses | \$797,031 | \$825,516 | \$853,620 | \$881,856 | \$910,774 | \$885,340 | \$933,222 | \$932,904 | \$938,742 | \$925,210 |
| Debt Service Assistance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bond Redemption Savings | 0 | 0 | 0 | 0 | 0 | 0 | (23,500) | 0 | 0 | 0 |
| Variable Rate Savings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Expenses | \$797,031 | \$825,516 | \$853,620 | \$881,856 | \$910,774 | \$885,340 | \$909,722 | \$932,904 | \$938,742 | \$925,210 |
| REVENUE & INCOME | | | | | | | | | | |
| Non-Member and Other Revenue | \$14,870 | \$15,192 | \$15,521 | \$15,435 | \$15,693 | \$15,943 | \$16,236 | \$16,519 | \$16,816 | \$17,126 |
| Interest Income | 15,504 | 16,366 | 16,677 | 18,234 | 19,287 | 20,142 | 20,693 | 21,476 | 22,172 | 22,819 |
| Rate Stabilization | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Other Revenue | \$30,374 | \$31,558 | \$32,197 | \$33,668 | \$34,980 | \$36,085 | \$36,929 | \$37,995 | \$38,988 | \$39,945 |
| Total Rate Revenue | \$766,657 | \$793,958 | \$821,422 | \$848,188 | \$875,795 | \$849,255 | \$872,792 | \$894,910 | \$899,754 | \$885,265 |
| Rate Revenue Increase | 3.7% | 3.6% | 3.5% | 3.3% | 3.3% | -3.0% | 2.8% | 2.5% | 0.5% | -1.6% |
| Estimated Annual Household Charge ** | | | | | | | | | | |
| Based on water use of 61k gpy (weighted) | \$1,208 | \$1,261 | \$1,316 | \$1,372 | \$1,431 | \$1,461 | \$1,521 | \$1,584 | \$1,638 | \$1,684 |
| Based on water use of 90k gpy (weighted) | \$1,783 | \$1,861 | \$1,941 | \$2,025 | \$2,112 | \$2,155 | \$2,245 | \$2,337 | \$2,417 | \$2,485 |
| WASTEWATER UTILITY | | | | | | | | | | |
| EXPENSES | | | | | | | | | | |
| Direct Expenses | \$164,145 | \$168,823 | \$173,204 | \$178,123 | \$183,127 | \$188,159 | \$193,434 | \$199,707 | \$204,456 | \$210,264 |
| Indirect Expenses | 17,339 | 17,998 | 19,396 | 19,872 | 20,565 | 22,253 | 17,404 | 15,950 | 15,955 | 16,106 |
| Capital Financing (before offsets) | 340,463 | 353,150 | 365,897 | 377,400 | 388,670 | 344,032 | 358,579 | 360,603 | 347,730 | 313,738 |
| Sub-Total Wastewater Expenses | \$521,947 | \$539,971 | \$558,497 | \$575,395 | \$592,362 | \$554,444 | \$569,417 | \$576,261 | \$568,142 | \$540,109 |
| Debt Service Assistance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bond Redemption Savings | 0 | 0 | 0 | 0 | 0 | 0 | (3,175) | 0 | 0 | 0 |
| Variable Rate Savings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Wastewater Expenses | \$521,947 | \$539,971 | \$558,497 | \$575,395 | \$592,362 | \$554,444 | \$566,242 | \$576,261 | \$568,142 | \$540,109 |
| REVENUE & INCOME | | | | | | | | | | |
| Non-Member and Other Revenue | \$4,857 | \$4,976 | \$5,099 | \$5,226 | \$5,358 | \$5,456 | \$5,595 | \$5,739 | \$5,876 | \$6,005 |
| Interest Income | 9,623 | 9,492 | 9,749 | 10,651 | 11,204 | 11,568 | 11,924 | 12,414 | 12,606 | 12,740 |
| 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 | \$14,480 | \$14,468 | \$14,849 | \$15,877 | \$16,562 | \$17,023 | \$17,520 | \$18,154 | \$18,482 | \$18,746 |
| Wastewater Rate Revenue | \$507,468 | \$525,502 | \$543,648 | \$559,518 | \$575,800 | \$537,420 | \$548,722 | \$558,107 | \$549,659 | \$521,363 |
| Rate Revenue Increase | 3.7% | 3.6% | 3.5% | 2.9% | 2.9% | -6.7% | 2.1% | 1.7% | -1.5% | -5.1% |
| Estimated Annual Household Charge ** | | | | | | | | | | |
| Based on water use of 61k gpy (weighted) | \$730 | \$762 | \$795 | \$829 | \$863 | \$867 | \$901 | \$936 | \$961 | \$976 |
| Based on water use of 90k gpy (weighted) | \$1,077 | \$1,124 | \$1,174 | \$1,222 | \$1,274 | \$1,279 | \$1,330 | \$1,380 | \$1,418 | \$1,441 |
| WATER UTILITY | | | | | | | | | | |
| EXPENSES | | | | | | | | | | |
| Direct Expenses | \$84,607 | \$88,021 | \$90,487 | \$93,035 | \$95,652 | \$98,341 | \$101,108 | \$103,976 | \$106,879 | \$110,020 |
| Indirect Expenses | 33,385 | 34,380 | 35,251 | 36,318 | 37,408 | 38,525 | 38,419 | 38,467 | 39,723 | 40,869 |
| Capital Financing (before offsets) | 157,093 | 163,145 | 169,385 | 177,109 | 185,352 | 194,031 | 224,278 | 214,201 | 223,998 | 234,213 |
| Sub-Total Water Expenses | \$275,084 | \$285,545 | \$295,123 | \$306,461 | \$318,412 | \$330,896 | \$363,805 | \$356,643 | \$370,601 | \$385,102 |
| Debt Service Assistance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bond Redemption Savings | 0 | 0 | 0 | 0 | 0 | 0 | (20,325) | 0 | 0 | 0 |
| Variable Rate Savings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Water Expenses | \$275,084 | \$285,545 | \$295,123 | \$306,461 | \$318,412 | \$330,896 | \$343,480 | \$356,643 | \$370,601 | \$385,102 |
| REVENUE & INCOME | | | | | | | | | | |
| Non-Member and Other Revenue | \$10,013 | \$10,216 | \$10,421 | \$10,208 | \$10,334 | \$10,487 | \$10,641 | \$10,780 | \$10,940 | \$11,121 |
| Interest Income | 5,881 | 6,873 | 6,927 | 7,583 | 8,083 | 8,575 | 8,769 | 9,061 | 9,566 | 10,079 |
| 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 | \$15,894 | \$17,089 | \$17,349 | \$17,791 | \$18,417 | \$19,062 | \$19,410 | \$19,841 | \$20,506 | \$21,200 |
| Water Rate Revenue | \$259,190 | \$268,456 | \$277,774 | \$288,670 | \$299,995 | \$311,835 | \$324,070 | \$336,803 | \$350,095 | \$363,902 |
| Rate Revenue Increase | 3.7% | 3.6% | 3.5% | 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) | \$478 | \$499 | \$520 | \$544 | \$568 | \$594 | \$620 | \$648 | \$677 | \$708 |
| Based on water use of 90k gpy (weighted) | \$706 | \$736 | \$768 | \$802 | \$838 | \$876 | \$915 | \$956 | \$999 | \$1,044 |

** 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 2018 MWRA Advisory Board's Annual Water and Sewer Retail Rate Survey.

APPENDIX D



APPENDIX E
FY20 Proposed Current Expense Budget - Capital Financing Detail (as of 6/30/19)

| | Outstanding as of 6/30/19 | Total | Sewer | Water |
|--------------------------------|---------------------------|------------|------------|-----------|
| SRF¹ | | | | |
| Unrefunded (93A, 93D, 95A,98C) | | \$ - | \$ - | \$ - |
| 1999E Sewer | | 394,458 | 394,458 | - |
| 1999E Water | 5,998,260 | - | - | - |
| 1999F | 162,905,000 | 23,952,449 | 23,952,449 | - |
| 2000E Sewer | | 2,831,606 | 2,831,606 | - |
| 2000E Water | 42,690,117 | 565,920 | - | 565,920 |
| 2001C Water | 1,092,043 | 237,228 | - | 237,228 |
| 2001D Sewer | | 40,073 | 40,073 | - |
| 2001D Water | 1,100,784 | - | - | - |
| 2002H Sewer | | 3,142,544 | 3,142,544 | - |
| 2002H Water | 62,600,000 | 1,554,802 | - | 1,554,802 |
| 2002I Sewer | | 100,624 | 100,624 | - |
| 2002I Water | 1,449,195 | 1,470 | - | 1,470 |
| 2003A | 386,798 | 70,013 | - | 70,013 |
| 2003B | 964,604 | 212,937 | - | 212,937 |
| 2003C Sewer | | 1,357,844 | 1,357,844 | - |
| 2003C Water | 26,694,722 | 970,060 | - | 970,060 |
| 2004C Sewer | | 539,102 | 539,102 | - |
| 2004C Water | 7,081,943 | 40,614 | - | 40,614 |
| 2004D Sewer | | 2,690,073 | 2,690,073 | - |
| 2004D Water | 42,200,000 | 693,199 | - | 693,199 |
| 2005C Sewer | | 416,319 | 416,319 | - |
| 2005C Water | 4,467,872 | 68,636 | - | 68,636 |
| 2005D Sewer | | 3,037,845 | 3,037,845 | - |
| 2005D Water | 46,965,026 | 798,339 | - | 798,339 |
| 2005E Sewer | | 24,961 | 24,961 | - |
| 2005E Water | 197,008 | 5,479 | - | 5,479 |
| 2006C Sewer | | 485,639 | 485,639 | - |
| 2006D Sewer | | 2,801,453 | 2,801,453 | - |
| 2006D Water | 52,336,259 | 1,600,931 | - | 1,600,931 |
| 2006E Sewer | | 22,883 | 22,883 | - |
| 2006E Water | 242,943 | 10,281 | - | 10,281 |
| 2007C Sewer | | 297,842 | 297,842 | - |
| 2007C Water | 3,134,477 | 172,575 | - | 172,575 |
| 2007D Sewer | | 1,145,494 | 1,145,494 | - |
| 2007E Sewer | | 2,734,864 | 2,734,864 | - |
| 2007E Water | 49,920,529 | 1,255,820 | - | 1,255,820 |
| 2008G Sewer | | 397,838 | 397,838 | - |
| 2008G Water | 3,344,959 | 81,851 | - | 81,851 |
| 2009C Sewer | | 3,829,423 | 3,829,423 | - |
| 2009C Water | 68,889,102 | 1,879,398 | - | 1,879,398 |
| 2009D Sewer | | 644,172 | 644,172 | - |
| 2009D Water | 7,853,073 | 85,350 | - | 85,350 |
| 2010 D Sewer | | 1,419,751 | 1,419,751 | - |
| 2010 D Water | 34,555,875 | 1,432,598 | - | 1,432,598 |
| 2011A Sewer | | 362,249 | 362,249 | - |
| 2011A Water | 7,060,528 | 364,460 | - | 364,460 |
| 2012C Sewer | | 523,825 | 523,825 | - |
| 2012C Water | 8,101,564 | 254,880 | - | 254,880 |
| 2012D Sewer | | 2,858,978 | 2,858,978 | - |
| 2012D Water | 38,871,188 | 532,688 | - | 532,688 |
| 2013B Sewer | | 2,215,677 | 2,215,677 | - |
| 2013B Water | 31,046,023 | 533,990 | - | 533,990 |
| 2014C Sewer | | 283,529 | 283,529 | - |
| 2014C Water | 8,427,369 | 385,321 | - | 385,321 |
| 2015A Sewer | | 2,647,848 | 2,647,848 | - |
| 2015A Water | 57,248,728 | 979,972 | - | 979,972 |
| 2015B Sewer | | 254,731 | 254,731 | - |
| 2015B Water | 4,560,610 | 151,924 | - | 151,924 |
| 2016A Sewer | | 2,129,683 | 2,129,683 | - |
| 2016A Water | 49,507,917 | 848,196 | - | 848,196 |
| 2017A Sewer | | 541,839 | 541,839 | - |
| 2017A Water | 32,201,516 | 1,538,009 | - | 1,538,009 |
| 2018E Sewer | | 1,077,238 | 1,077,238 | - |
| 2018E Water | 50,000,000 | 2,020,825 | - | 2,020,825 |
| Pool 22 Sewer | | 2,784,035 | 2,784,035 | - |
| Pool 22 Water | | 1,510,000 | - | 1,510,000 |
| Pool 23 Sewer | | 2,784,035 | 2,784,035 | - |

APPENDIX E
FY20 Proposed Current Expense Budget - Capital Financing Detail (as of 6/30/19)

| | Outstanding as of 6/30/19 | Total | Sewer | Water |
|--|---------------------------|----------------------|-----------------------|-----------------------|
| Pool 23 Water | | 1,510,000 | - | 1,510,000 |
| Total SRF Debt | \$ 935,747,230 | \$ 93,138,692 | \$ 70,770,925 | \$ 22,367,766 |
| MWRA Senior Debt | | | | |
| 2002J Refunding (Fixed) | 145,045,000 | 55,325,650 | 49,793,085 | 5,532,565 |
| 2007B Refunding | 647,950,000 | 34,017,375 | 28,574,595 | 5,442,780 |
| 2009B Refunding | 105,820,000 | 2,017,000 | 1,452,240 | 564,760 |
| 2010B Refunding | 85,760,000 | 3,343,500 | 1,939,230 | 1,404,270 |
| 2011B New | 6,255,000 | 186,150 | 130,305 | 55,845 |
| 2011C Refunding | 291,160,000 | 14,424,275 | 5,625,467 | 8,798,808 |
| 2012A New | 72,655,000 | 3,627,300 | 1,813,650 | 1,813,650 |
| 2012B Refunding | 86,775,000 | 4,240,325 | 890,468 | 3,349,857 |
| 2013A Refunding | 102,515,000 | 4,934,850 | 2,763,516 | 2,171,334 |
| 2014D New | 60,165,000 | 3,008,250 | 2,045,610 | 962,640 |
| 2014E Refunding | 5,245,000 | 3,381,250 | 2,958,594 | 422,656 |
| 2014F Refunding | 141,410,000 | 6,396,700 | 1,982,977 | 4,413,723 |
| 2016B New | 62,090,000 | 2,994,450 | 1,497,225 | 1,497,225 |
| 2016C Refunding | 678,185,000 | 32,224,400 | 16,434,444 | 15,789,956 |
| 2016D | 104,260,000 | 4,524,000 | 2,940,600 | 1,583,400 |
| 2017B | 66,980,000 | 3,283,000 | 1,641,500 | 1,641,500 |
| 2017C | 245,500,000 | 12,067,700 | 5,430,465 | 6,637,235 |
| 2018B | 107,580,000 | 5,288,350 | 3,173,010 | 2,115,340 |
| 2018C | 21,900,000 | 1,095,000 | 821,250 | 273,750 |
| FY19 New Money | | 8,500,213 | 4,250,107 | 4,250,107 |
| FY20 New Money | | 5,083,333 | 2,541,667 | 2,541,667 |
| Defeasance Assumption | | (5,247,500) | (4,599,750) | (647,750) |
| Total Senior | \$ 3,037,250,000 | 204,715,571 | \$ 134,100,254 | \$ 70,615,317 |
| Subordinate Debt | | | | |
| 1999B | \$ 50,700,000 | \$ 6,156,875 | \$ 3,694,125 | \$ 2,462,750 |
| 2002C Refunding | 35,120,000 | 36,437,000 | 12,144,452 | 24,292,548 |
| 2008A Refunding | 203,940,000 | 45,064,595 | 39,656,844 | 5,407,751 |
| 2008C Refunding | 70,700,000 | 14,945,197 | 14,347,389 | 597,808 |
| 2008E Refunding | 133,640,000 | 36,735,488 | 33,796,649 | 2,938,839 |
| 2012E Refunding | 58,435,000 | 3,770,016 | 791,703 | 2,978,312 |
| 2012G Refunding | 26,500,000 | 8,762,891 | 8,412,375 | 350,516 |
| 2014A Refunding | 50,000,000 | 1,875,000 | 168,750 | 1,706,250 |
| 2014B Refunding | 54,095,000 | 13,178,375 | 1,186,054 | 11,992,321 |
| 2018A Refundng | 49,095,000 | 1,787,266 | 375,326 | 1,411,940 |
| 2018D Refunding | 50,000,000 | 1,875,000 | 168,750 | 1,706,250 |
| Total Subordinate Debt | \$ 782,225,000 | 170,587,702 | \$ 114,742,417 | \$ 55,845,285 |
| Total SRF & MWRA Debt Service² | \$ 4,755,222,230 | 468,441,964 | \$ 319,613,596 | \$ 148,828,368 |
| Other Capital | | | | |
| Water Pipeline Commercial Paper | \$ 175,000,000 | 5,846,823 | - | 5,846,823 |
| Current Revenue/Capital ³ | | 15,200,000 | 14,440,000 | 760,000 |
| Capital Lease | | 3,217,060 | 1,931,960 | 1,285,100 |
| Debt Prepayment ⁴ | | 4,850,000 | 3,564,750 | 1,285,250 |
| Total Other Capital | \$ 175,000,000 | \$ 29,113,883 | \$ 19,936,710 | \$ 9,177,174 |
| Total Capital Financing (before Debt Service Offsets) | \$ 4,930,222,230 | 497,555,848 | \$ 339,550,306 | \$ 158,005,542 |
| Debt Service Offsets | | | | |
| Debt Service Assistance | | | | |
| Bond Redemption | | | | |
| Total Debt Service Offsets | | | | |
| Total Capital Financing | \$ 4,930,222,230 | 497,555,848 | \$ 339,550,306 | \$ 158,005,542 |

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 \$8.4 billion to improve the wastewater and waterworks systems serving its 61 customer communities. 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 is currently 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 72% of spending to date:

- Boston Harbor Project - \$3.8 billion
- Combined Sewer Overflow - \$911 million
- MetroWest Tunnel - \$697 million
- Carroll Water Treatment Plant - \$423 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 allow for planned maintenance of the water system assets. Long-term water redundancy will be the largest future CIP initiative with estimated spending in excess of \$1.4 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 FY20 Proposed CIP 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 December 31, 2019, MWRA's total debt was \$4.9 billion. The Authority's capital finance (debt service) obligation as a percent of total expenses has increased from 36% in 1990 to 62.8% in the Final FY19 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.

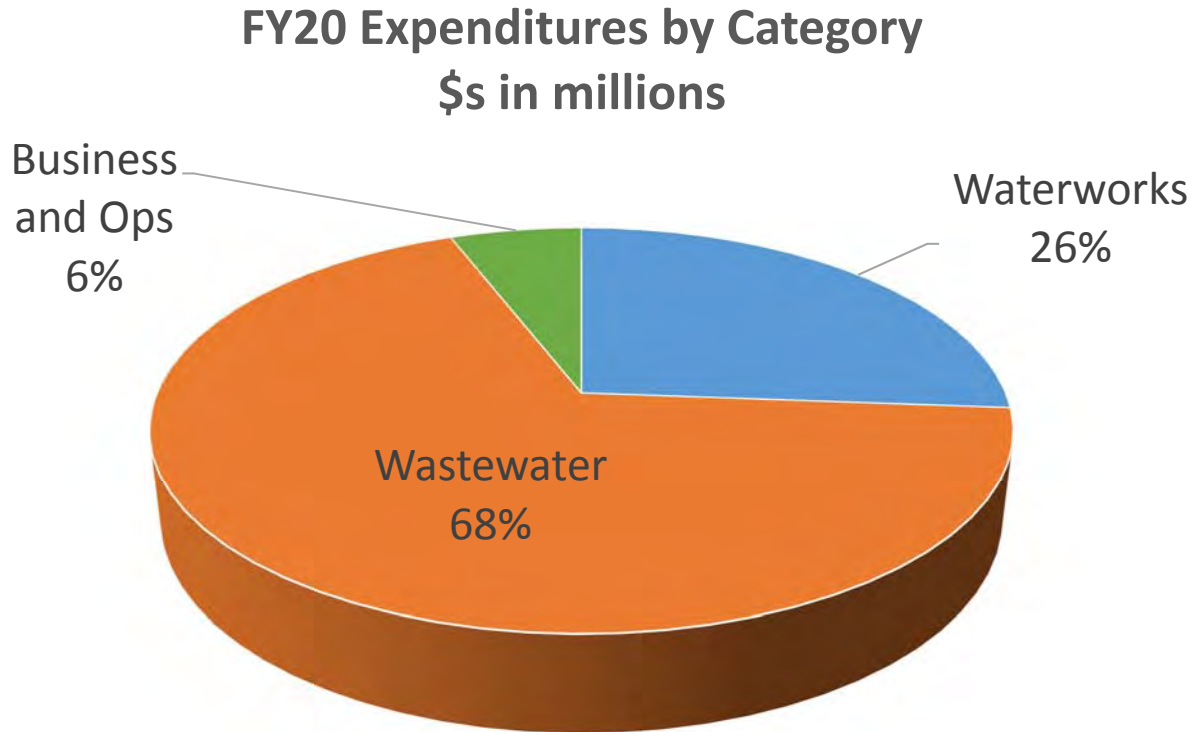
To arrive at the FY20 Proposed CIP, the Authority identified the needs of the capital programs taking into account the recommendations of the Master Plan. The long-term strategy for capital work is identified in the Authority's Master Plan which was published in 2006, updated in 2013, and in 2019. The Master Plan serves as a road map for inclusion of projects in the CIP in every budget cycle.

The FY20 Proposed CIP represents an update to the FY19 CIP approved by the MWRA Board in June 2018. 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.

FY20 Proposed CIP

FY20 Spending

The FY20 Proposed Capital Improvement Program projects \$249.8 million spending for FY20, of which \$169.7 million supports Wastewater System Improvements, \$65.4 million supports Waterworks System Improvements, and \$14.7 million is for Business and Operations Support.



The FY20 Proposed CIP includes \$35.4 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of \$25.7 million for the local Infiltration/Inflow program and net expenditures of \$9.7 million for the local water pipeline program.

Project contracts with spending greater than approximately \$6 million in FY20, excluding local community assistance programs, total \$104.7 million and account for nearly 42% of the total annual spending.

| Project | Contract | Projected FY20 Expenditures \$s in millions |
|---|--|---|
| DI Treatment Plant Asset Protection | Clarifier Rehab Phase 2 - Construction | \$23.1 |
| Facility Asset Protection | Chelsea Creek Upgrades - Construction | \$19.3 |
| Facility Asset Protection | Prison Point Rehabilitation Construction | \$18.6 |
| Local Water System Assistance Program | Phase 2 Loan Distributions | \$16.0 |
| Local Water System Assistance Program | Phase 3 Loan Distributions | \$12.0 |
| Corrosion & Odor Control | Nut Island Odor Control HVAC Improvement Construction Ph 2 | \$10.0 |
| DI Treatment Plant Asset Protection | HVAC Equipment Replacement Construction | \$8.0 |
| SEH Redundancy & Storage | Redundancy Pipeline Sect 111 - Construction 3 | \$7.0 |
| I/I Local Financial Assistance | Phase IX Grants | \$7.5 |
| I/I Local Financial Assistance | Phase X Grants | \$7.5 |
| Residuals Asset Protection | Residuals Electrical/Mechanical/Drum Dryer Replacement | \$6.4 |
| DI Treatment Plant Asset Protection | Gravity Thickener Rehabilitation | \$6.3 |
| New Connecting Mains -Shaft 7 to WASM 3 | CP3 Sections 23, 24, 47 Rehabilitation | \$6.0 |
| Total Contracts > \$6.0 million | | \$147.7 |
| % of FY20 Spending | | 59.1% |
| Excluding Community Loan Programs | | \$104.7 |
| % of FY20 Spending | | 41.9% |
| Total Projected FY20 Spending | | \$249.8 |

Contracts with the highest spending for FY20 are described below:



Chelsea Creek Headworks Upgrade Construction - \$19.3 million (\$81.8 million total construction cost). This major rehabilitation project includes replacement/upgrade to the screens, grit collection system, grit and handling systems, odor control systems, HVAC, mechanical, plumbing and instrumentation. Solids handling systems are being automated and the building's egress and fire suppressions systems are also being upgraded.

Prison Point Rehabilitation Construction - \$18.6 million (\$36.3 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.





Nut Island Odor Control and HVAC Improvements - Construction Phase 2 - \$10.0 million (\$39.9 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

Southern Extra High Redundancy Section 111 Phase 3 Construction - \$7.0 million (\$19.1 million total construction cost). This is a redundancy project for MWRA's Southern Extra High service area. This project will provide redundancy to Sections 77 and 88 serving Boston, Norwood, Stoughton, and Dedham-Westwood through construction of a redundant pipeline. Phase 1 was substantially complete in September 2018. Phase 2 and Phase 3 began in October 2017 and June 2018, respectively.



New Connecting Mains - Shaft 7 to WASM 3 – CP3 Sections 23, 24, 47 Rehabilitation - \$6.0 million (\$14.3 million total construction cost). This project includes cleaning and lining 21,950 linear feet of 20-inch diameter pipe (Sections 24 and 47) and 5,800 linear feet of 36-inch diameter pipe (Section 23).

Deer Island Wastewater Treatment Plant Asset Protection and Residuals:

Clarifier Rehabilitation Phase 2 Construction - \$23.1 million (\$135.0 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.





HVAC Equipment Replacement Construction - \$8.0 million (\$40.2 million total construction cost). Replace two obsolete HVAC control systems, reducing replacement parts and improving automation. Project includes central lab fume hoods and East/West Odor Control Handler replacements.



Gravity Thickener Rehabilitation - \$6.3 million (\$19.6 million total construction cost). This project involves installing catwalks around the perimeter of several tanks, removing concrete blocks in the effluent channels, and modifying the sludge thickener roofing to improve staff access and operating efficiency.

Residuals Electrical/Mechanical/Drum Dryer Replacement - \$6.4 million (\$8.6 million total construction cost). This project includes mechanical and electrical improvements to the Residuals Facility. Also, includes drum dryer replacements.



FY20 New Projects

The FY20 CIP adds \$54.5 million in new projects of which \$48.8 million are for Wastewater projects, \$0.8 million are for Waterworks projects, and \$5.0 million are for Business and Operations Support.

\$s in millions

| Project | Total Contract Amount | FY19-23 Spending |
|-------------------------------|-----------------------|------------------|
| Wastewater | \$ 48.8 | \$ 4.4 |
| Waterworks | \$ 0.8 | \$ 0.8 |
| Business & Operations Support | \$ 5.0 | \$ 5.0 |
| Total New Projects | \$ 54.5 | \$ 10.2 |

The following table shows new projects added by major programs:

\$s in millions

| Project | Total Contract Amount | FY19-23 |
|---|-----------------------|----------------|
| Pump Stations & CSO Facility Rehab Construction | \$ 37.5 | \$ - |
| Pump Stations & CSO Facility Rehab Design/CA/REI | \$ 7.5 | \$ 0.7 |
| Deer Island As-Needed REI | \$ 3.0 | \$ 3.0 |
| Sections 191 & 192 Charles River Valley Sewer | \$ 0.5 | \$ 0.5 |
| Clinton Equipment & Supplies Storage Building | \$ 0.3 | \$ 0.3 |
| Carroll Water Treatment Plant Emergency Generator No.1 Replacement (Electric Portion) | \$ 0.8 | \$ 0.8 |
| As-Needed Design Contract 18 | \$ 2.5 | \$ 2.5 |
| As-Needed Design Contract 19 | \$ 2.5 | \$ 2.5 |
| Total New Projects | \$ 54.5 | \$ 10.2 |

The largest project added is the Pumping Station and CSO Facility Rehabilitation - \$45.0 million upgrades to DeLauri, Hingham, and Hough's Neck Pumping Stations and the Somerville Marginal CSO Facility. At pumping stations and CSO facilities, operability of mechanical equipment and maintenance of electric/standby power systems are key elements to minimize risk of facility failure.

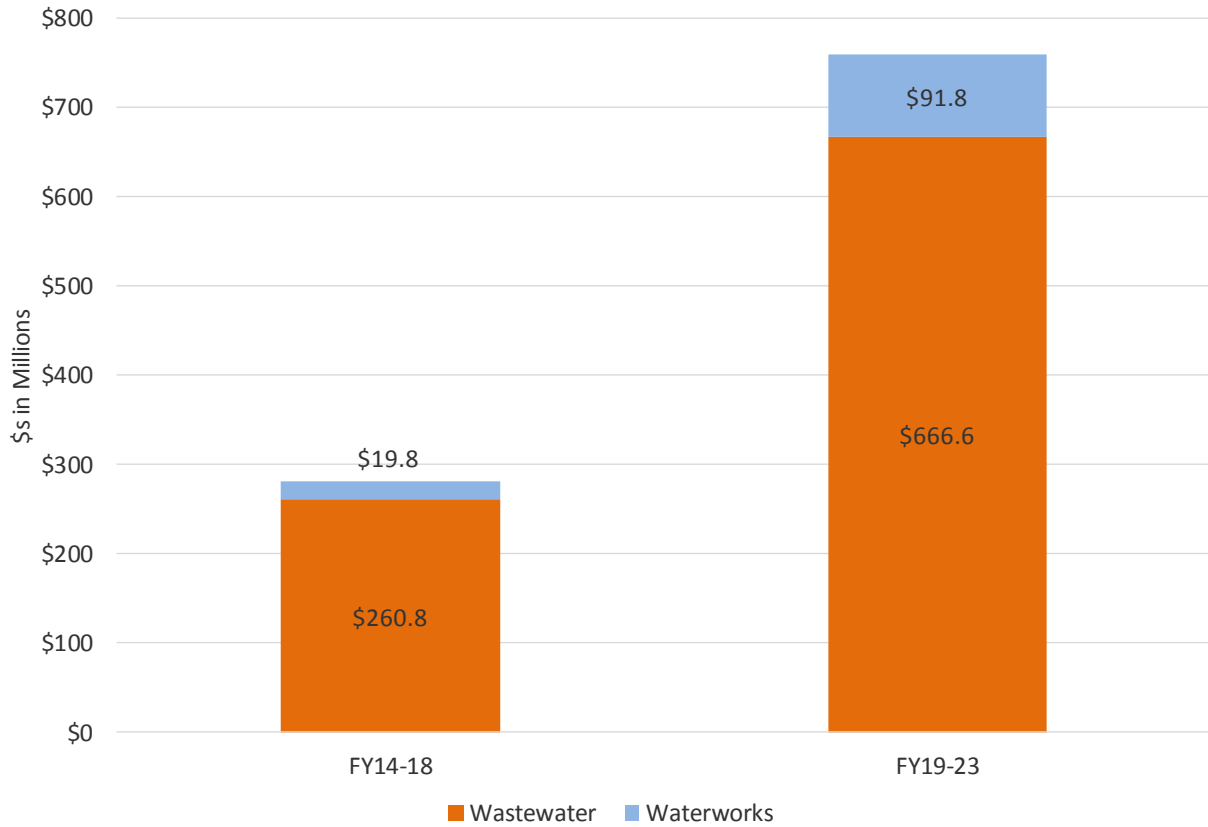


A complete list of new projects with cash flows and descriptions can be found in Appendix 3.

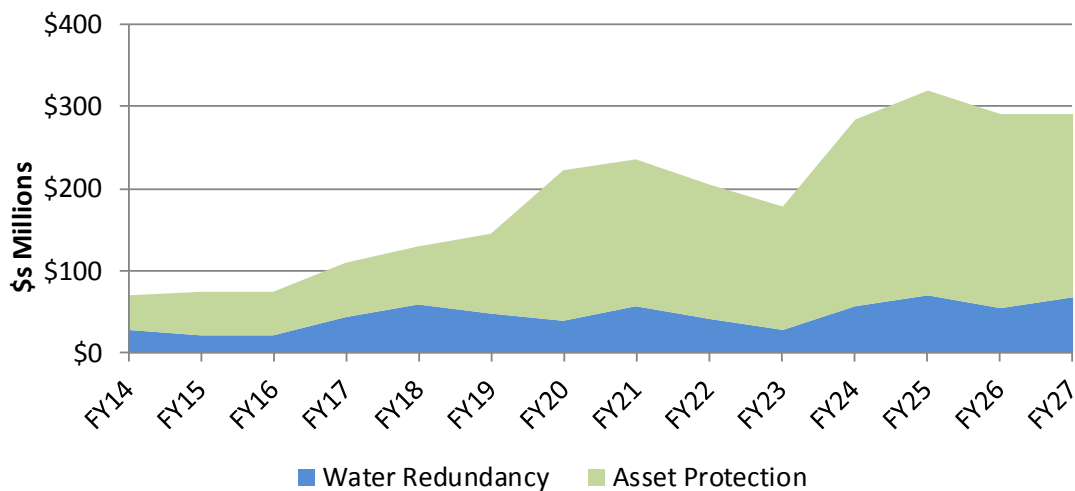
Asset Protection and Water System Redundancy

Asset Protection accounts for the largest share of capital expenditures for the FY19-23 period, nearly tripling the expenditure level of the FY14-18 spending period.

Asset Protection by Utility



As illustrated by the following graph, the next two waves of spending over the FY19-23 Cap period and the FY24-28 Cap 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 \$758.4 million or nearly 70% of projected spending. Similarly, water redundancy spending for FY19-23 is projected at \$213.2 million or 19.7% of projected FY19-23 spending.



Future Spending

Asset Protection accounts for the largest share of capital expenditures for the FY19-23 period. The FY20 Proposed CIP includes \$773.4 million for asset protection initiatives, representing over 71% of total MWRA spending in this timeframe. Wastewater and Waterworks Asset Protection are \$666.6 million and \$91.8 million, respectively. Deer Island Treatment Plant Asset Protection accounts for over \$309 million in spending. Spending for water system redundancy projects totals \$213.2 million in the same FY19-23 period, accounting for 19.7% of total spending.

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

| Project Category | FY14-18 | FY19-23 | FY24-28 |
|------------------|----------------|------------------|------------------|
| Asset Protection | \$284.6 | \$773.4 | \$1,095.4 |
| Water Redundancy | 174.6 | 213.2 | \$373.5 |
| CSO | 64.7 | 7.7 | \$0.0 |
| Other | 61.7 | 89.6 | \$109.5 |
| Total | \$585.6 | \$1,083.9 | \$1,578.4 |
| | | | |
| Asset Protection | 48.6% | 71.4% | 69.4% |
| Water Redundancy | 29.8% | 19.7% | 23.7% |
| CSO | 11.0% | 0.7% | 0.0% |
| Other | 10.5% | 8.3% | 6.9% |
| Total | 100.0% | 100.0% | 100.0% |

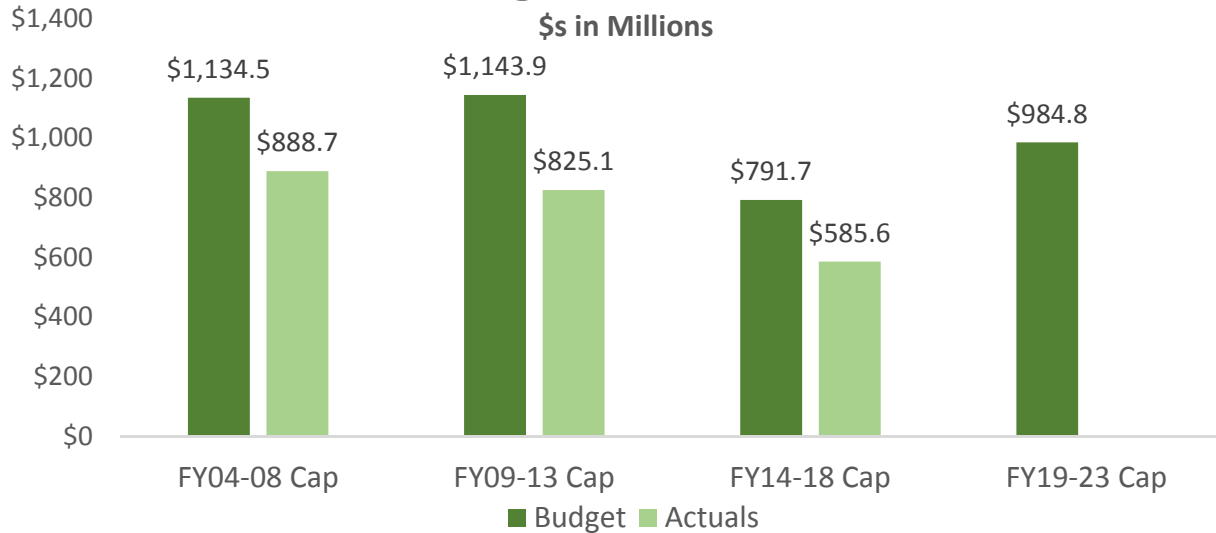
FY19-23 Five-Year Spending Cap

The 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.

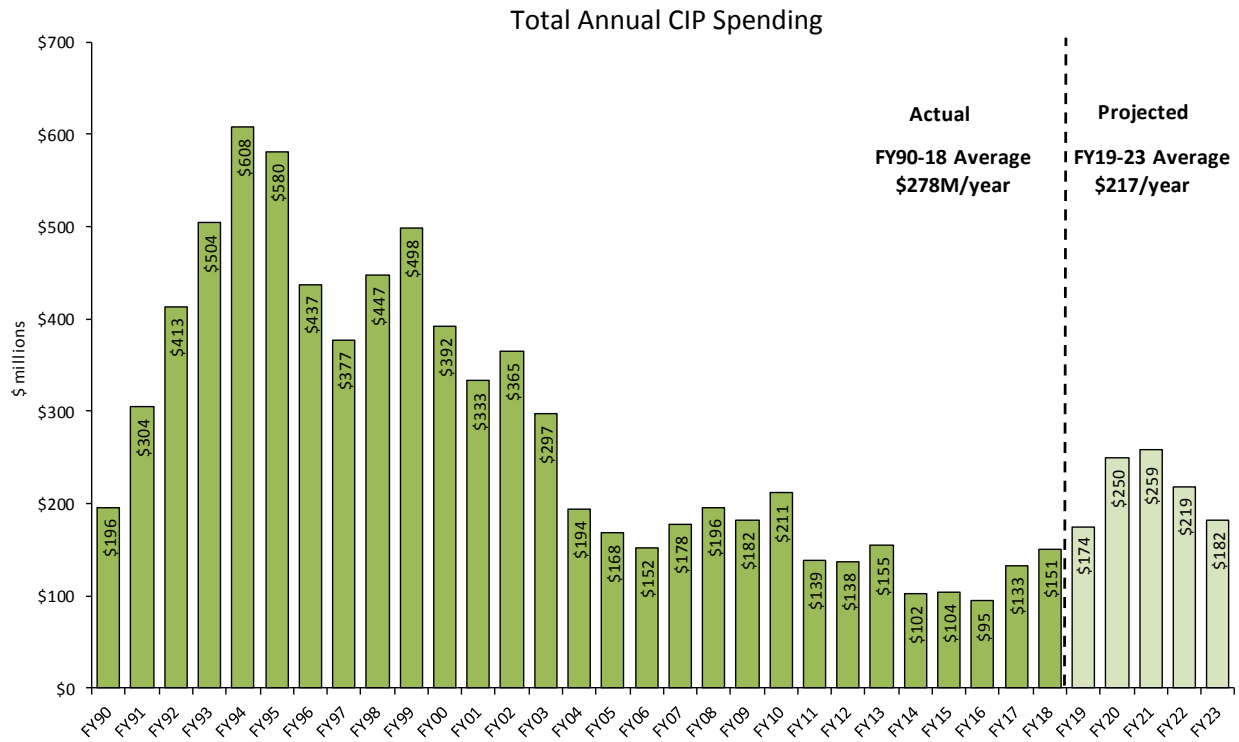
Cap Spending Budget and Actual

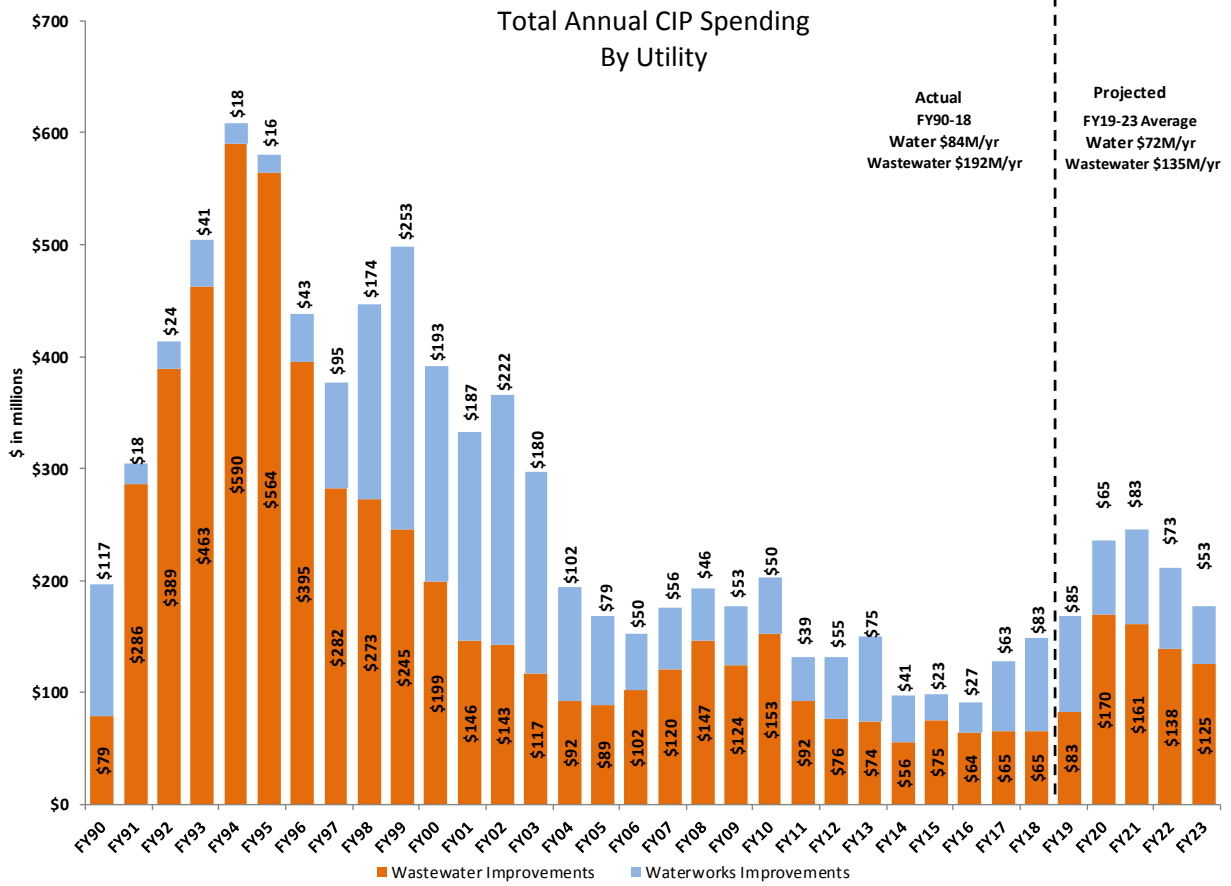


Today, the Authority is better positioned to reinvest in rehabilitation and replacement of aging facilities as result of conservative fiscal management which includes judicious control of expenses, and the fact that MWRA has implemented the practice of utilizing available funds resulting from positive 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.

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 \$910.0 million. The Authority's main focus going forward is asset protection and water system redundancy. The FY20 Proposed CIP includes approximately \$1.0 billion in future expenditures for asset protection and continues to fund the critical redundancy for the Metropolitan Tunnels System at approximately \$1.4 billion over a seventeen-year period. However, the FY19-23 period includes only \$15.1 million related to the tunnels.

The following two charts below capture the historical CIP spending through FY18 and projects spending through FY23 based on the FY20 Proposed CIP both overall at the MWRA level and by utility. Average total annual CIP spending through FY18 was \$278 million. Average annual CIP spending for the proposed FY19-23 Cap is projected to be \$217 million. Average annual CIP spending through FY18 was \$84 million for Waterworks and \$192 million for Wastewater. Average annual CIP spending for the proposed FY19-23 Cap is projected to be \$72 million for Waterworks and \$135 million for Wastewater.





The FY20 Proposed CIP includes approximately \$1.9 billion in future expenditures for asset protection and continues to fund the critical redundancy for the Metropolitan Tunnels System at approximately \$1.4 billion over a seventeen-year period.

| | Total FY19-23 | Total FY24-28 |
|--|------------------|------------------|
| Wastewater System Improvements | \$677.1 | \$855.9 |
| Interception & Pumping | 203.3 | 331.9 |
| Treatment | 317.2 | 371.9 |
| Residuals | 14.0 | 31.7 |
| CSO | 7.7 | - |
| Other Wastewater | 134.8 | 120.5 |
| | | |
| Waterworks System Improvements | \$359.9 | \$706.9 |
| Drinking Water Quality Improvements | 13.2 | 13.1 |
| Transmission | 131.6 | 357.9 |
| Distribution & Pumping | 140.3 | 298.6 |
| Other Waterworks | 74.7 | 37.3 |
| | | |
| Business & Operations Support | 47.0 | 15.6 |
| | | |
| Total MWRA | \$1,083.9 | \$1,578.4 |

The table to the left depicts CIP projected spending for the FY19-23 Cap period and FY24-28 Cap period by major program categories for Wastewater Systems Improvements, Waterworks System Improvements and Business and Operations Support. The Metropolitan Tunnels Redundancy projects accounts for the increase in Transmission spending for Waterworks in the FY24-28 Cap period.

Spending during the FY19-23 timeframe is planned to be \$1.1 billion, including local community spending of \$134.8 million for the I/I loan and grant program and \$37.5 for the water pipeline loan program.

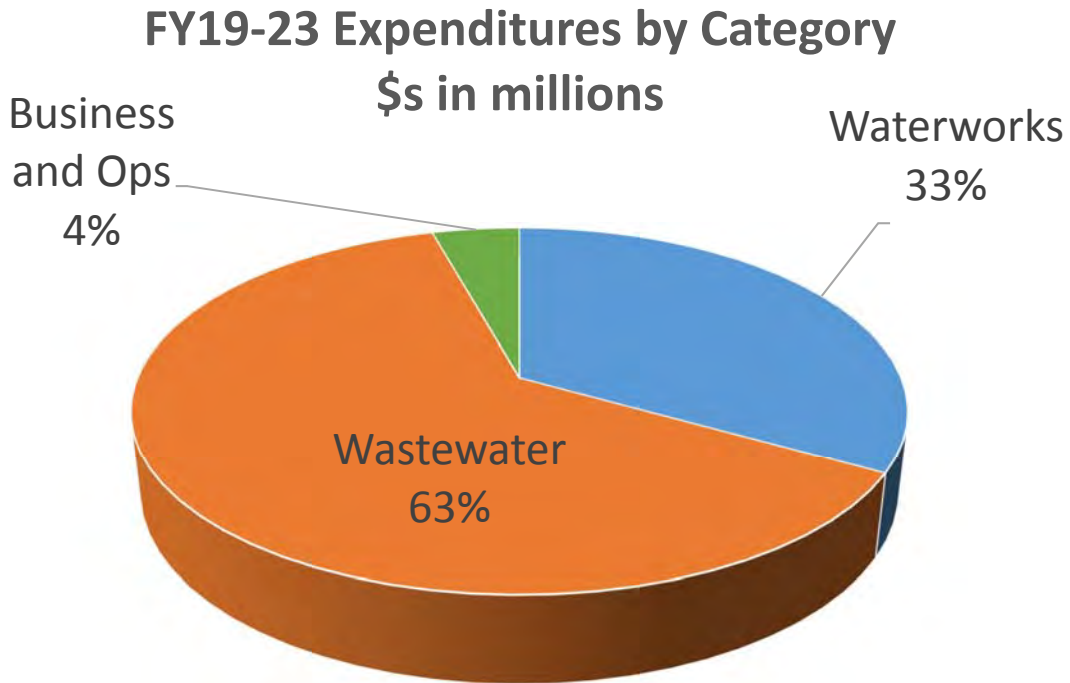
Annual cash flows for the proposed Cap period are shown below in millions:

| FY20 Proposed | | FY19 | FY20 | FY21 | FY22 | FY23 | Total FY19-23 |
|---------------------------------------|----------------|------------------------|----------------|----------------|----------------|----------------|---------------|
| | | Projected Expenditures | \$174.3 | \$249.8 | \$258.7 | \$218.8 | \$182.3 |
| I/I Program | (29.0) | (25.7) | (25.0) | (28.2) | (26.9) | (134.8) | |
| Water Loan Program | (22.4) | (9.7) | (5.2) | (4.4) | 4.2 | (37.5) | |
| MWRA Spending | 122.9 | 214.4 | 228.5 | 186.1 | 159.6 | \$911.6 | |
| Contingency | 0.0 | 13.6 | 14.8 | 12.5 | 10.7 | 51.6 | |
| Inflation on Unawarded Construction | 0.0 | 2.1 | 5.5 | 6.2 | 7.6 | 21.4 | |
| Chicopee Valley Aqueduct Projects | (0.0) | 0.0 | 0.0 | 0.0 | 0.0 | (0.0) | |
| FY19 Proposed FY19-23 Spending | \$122.9 | \$230.1 | \$248.8 | \$204.7 | \$178.0 | \$984.6 | |

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.

The proposed FY19-23 cap cash flow totals \$984.6 million, falling within the approved Cap of \$984.8 million.

Total Projected Expenditures for the Final FY19-23 Cap period by category, including community loan and grant programs, is illustrated in the pie chart below:



Breaking down the expenditures further, yearly projected spending for the FY19-23 Cap period by program, including community loan and grant programs, are shown below in millions:

| | FY19 | FY20 | FY21 | FY22 | FY23 | Total FY19-23 |
|--|----------------|----------------|----------------|----------------|----------------|------------------|
| Wastewater System Improvements | \$82.8 | \$169.7 | \$161.4 | \$138.5 | \$124.7 | \$677.1 |
| Interception & Pumping | 39.7 | 65.3 | 50.0 | 28.8 | 19.5 | 203.3 |
| Treatment | 12.1 | 66.4 | 80.6 | 80.7 | 77.3 | 317.2 |
| Residuals | 0.5 | 8.3 | 3.5 | 0.7 | 1.0 | 14.0 |
| CSO | 1.4 | 4.0 | 2.3 | 0.0 | 0.0 | 7.7 |
| Other Wastewater | 29.0 | 25.7 | 25.0 | 28.2 | 26.9 | 134.8 |
| Waterworks System Improvements | \$85.2 | \$65.4 | \$83.5 | \$73.2 | \$52.6 | \$359.9 |
| Drinking Water Quality Improvements | 1.8 | 3.1 | 3.6 | 3.4 | 1.3 | 13.2 |
| Transmission | 10.5 | 15.2 | 40.0 | 36.8 | 29.0 | 131.6 |
| Distribution & Pumping | 43.6 | 31.3 | 28.2 | 21.0 | 16.3 | 140.3 |
| Other Waterworks | 29.3 | 15.8 | 11.7 | 12.0 | 5.8 | 74.7 |
| Business & Operations Support | 6.4 | 14.7 | 13.9 | 7.1 | 5.0 | 47.0 |
| Total MWRA | \$174.3 | \$249.8 | \$258.7 | \$218.8 | \$182.3 | \$1,083.9 |

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 \$15 million for the FY19-23 Cap total \$685.3 million, including local community assistance programs, account for nearly 63.2% of spending.

| Project | Contract | Projected FY19-23 Expenditures \$s in millions |
|--|--|--|
| DI Treatment Plant Asset Protection | Clarifier Rehabilitation Phase 2 - Construction | \$125.0 |
| Local Water Pipeline Improvement | Phase 3 Loans - Distributions | \$85.3 |
| Local Water Pipeline Improvement | Phase 2 Loans - Distributions | \$59.9 |
| Facility Asset Protection | Chelsea Creek Headworks Upgrades - Construction | \$50.3 |
| DI Treatment Plant Asset Protection | HVAC Equipment Replacement - Construction | \$40.2 |
| Corrosion & Odor Control | Nut Island Odor Control HVAC Improvements - Construction | \$37.4 |
| Facility Asset Protection | Prison Point Rehabilitation - Construction | \$36.3 |
| I/I Local Financial Assistance | Phase X Grants | \$36.0 |
| I/I Local Financial Assistance | Phase XI Grants | \$35.0 |
| I/I Local Financial Assistance | Phase IX Grants | \$26.3 |
| Local Water Pipeline Improvement | Lead Service Line Replacement Loans | \$24.0 |
| I/I Local Financial Assistance | Phase XII Grants | \$21.0 |
| Metro Redundancy Interim Improvements | WASM 3 Construction 1 | \$20.4 |
| DI Treatment Plant Asset Protection | Gravity Thickener Rehabilitation | \$19.3 |
| SEH Redundancy and Storage | Redundancy Pipeline Sect 111 - Construction 3 | \$19.1 |
| NIH Redundancy & Storage | Section 89 & 29 Redundancy - Construction 2 | \$18.3 |
| NIH Redundancy and Storage | Section 89 & 29 Replacement - Construction | \$16.0 |
| DI Treatment Plant Asset Protection | Fire Alarm System Replacement - Construction | \$15.5 |
| Total Contracts > \$15.0 million % of FY19-23 Spending | | \$685.3 63.2% |

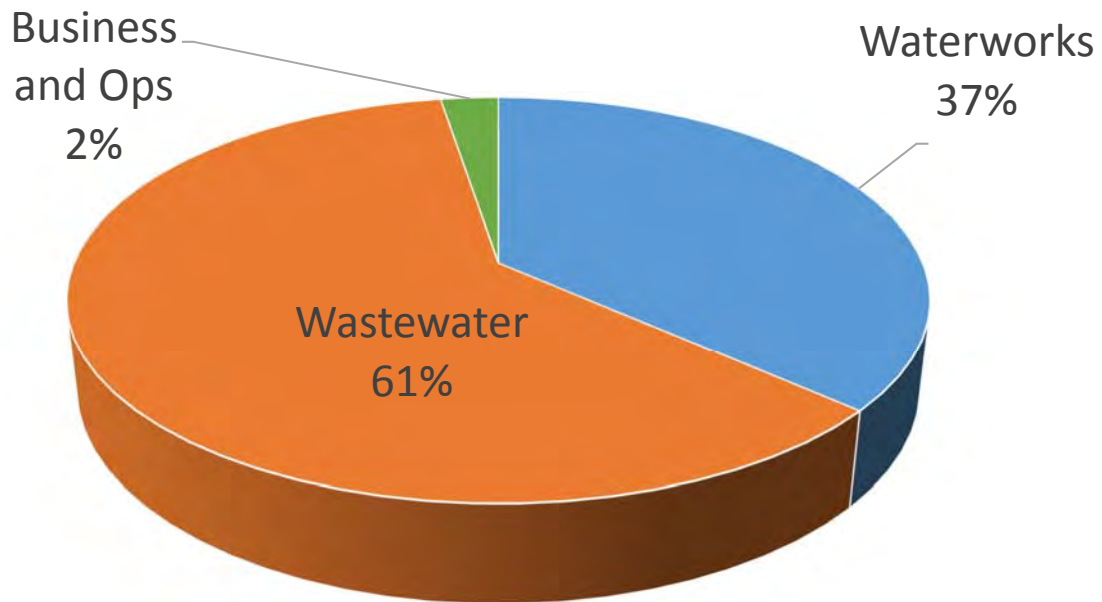
The FY19-23 timeframe is dominated by several large projects with the top five construction projects totaling nearly \$289.2 million and accounting for 26.7% of FY19-23 spending. Large initiatives include the Clarifier Rehabilitation at Deer Island and Chelsea Creek Upgrades at \$125.0 and \$50.3 million, respectively.

FY20 Anticipated Contract Awards

In Fiscal Year 2020, 54 contracts totaling \$182.5 million are projected to be awarded. The largest fifteen projected contract awards total \$145.7 million and account for nearly 80% of expected awards and are presented in the following table.

| Project | Subphase | Total Contract Amount (\$s in millions) |
|--|---|---|
| Facility Asset Protection | Prison Point Rehab - Construction | \$36.3 |
| DI Treatment Plant Asset Protection | Fire Alarm System Replacement - Construction | \$22.0 |
| Metropolitan Redundancy Interim Improvements | WASM 3 CP-1 | \$20.4 |
| NIH Redundancy & Storage | Section 89 & 29 Replacement - Construction | \$16.0 |
| Facility Asset Protection | Ward St & Columbus Park Headworks Design/CA | \$11.4 |
| Metropolitan Tunnel Redundancy | Preliminary Design & MEPA Review | \$9.3 |
| DI Treatment Plant Asset Protection | Digester & Storage Tank Rehab Design/ESDC | \$4.1 |
| DI Treatment Plant Asset Protection | DI Dystor Membrane Replacements | \$4.0 |
| Wastewater Meter System-Equipment | WW Metering Asset Protect/Equipment Purchase | \$4.0 |
| Watershed Division Capital Improvements | Maintenance Garage/Wash Bay/Storage Building Construction | \$3.9 |
| DI Treatment Plant Asset Protection | As-Needed REI - 1 | \$3.0 |
| Metropolitan Redundancy Interim Improvements | Section 101/Waltham Design/CA | \$3.0 |
| DI Treatment Plant Asset Protection | As-Needed Design 9-1 | \$2.8 |
| DI Treatment Plant Asset Protection | As-Needed Design 9-2 | \$2.8 |
| DI Treatment Plant Asset Protection | As-Needed Design 9-3 | \$2.8 |
| Top 15 Contract Awards | | \$145.7 |

FY20 Planned Contract Awards \$s in millions



Community Loan Programs

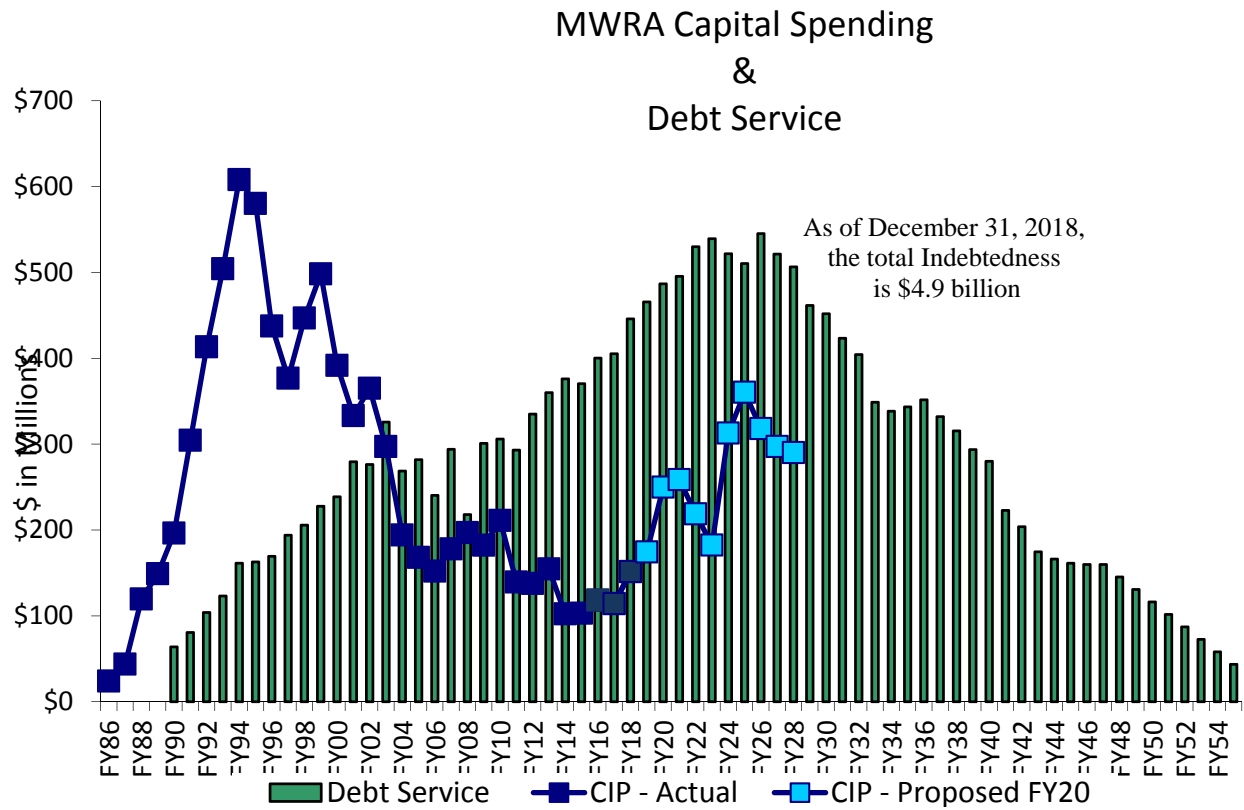
The MWRA offers its water and wastewater communities loan and grant opportunities for infrastructure preservation. Community loans are interest-free and repaid to MWRA over a 5-year or a 10-year period. On the water side, the program's goal is to improve local water system pipeline conditions to help maintain high water quality distribution from MWRA's treatment plant through local pipelines to customers' taps. The water loan program was established in 1988 and over 530 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 \$134.8 million in funding is projected to be distributed to MWRA wastewater communities and \$37.5 million is projected to be distributed to MWRA water communities.

| | FY19 | FY20 | FY21 | FY22 | FY23 | FY19-23 |
|---|--------|--------|--------|--------|---------|---------|
| I/I Financial Assistance (net of repayments) | \$29.0 | \$25.7 | \$25.0 | \$28.2 | \$26.9 | \$134.8 |
| Local Water System Assistance (net of repayments) | \$22.4 | \$9.7 | \$5.2 | \$4.4 | (\$4.2) | \$37.5 |

MWRA Capital Improvement Spending and Debt Service

As of December 31, 2018, MWRA's total debt is \$4.9 billion, which is \$113.5 million less than the MWRA's total debt as of December 31, 2017. While total outstanding debt is decreasing, debt service obligations continue to rise and are projected to increase in coming years.



APPENDIX H

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. Brutsch 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.

