



Massachusetts Water Resources Authority
**COMPREHENSIVE ANNUAL
FINANCIAL REPORT**

For the Fiscal Years Ended June 30, 2019 and 2018



Prepared by:
Finance Division

Massachusetts Water Resources Authority



Comprehensive Annual Financial Report

For the Fiscal Years Ended June 30, 2019 and 2018

Frederick A. Laskey

Executive Director

Prepared by

Thomas J. Durkin, Director, Finance

Robert M. Belkin, Controller, Finance

This document is available at the MWRA website: www.mwra.com



Nut Island Headworks and Surrounding Area

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Introductory Section



Quabbin Reservoir Spillway



MASSACHUSETTS WATER RESOURCES AUTHORITY

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September 19, 2019

To the members of the MWRA Board of Directors

We are pleased to submit to you this Comprehensive Annual Financial Report (CAFR) of the Massachusetts Water Resources Authority (MWRA) for the years ended June 30, 2019 and 2018. This document has been submitted to the Government Finance Officers Association to be awarded a Certificate of Achievement for Excellence in Financial Reporting. The financial section of this CAFR includes management's discussion and analysis, the basic financial statements and the combining financial statements and schedules, as well as the independent auditors' report on these financial statements.

As required by generally accepted accounting principles (GAAP), MWRA management is responsible for the accuracy, completeness, and fairness of the presentation, including all disclosures. Management's discussion and analysis provides an overview of the MWRA's financial results. This letter of transmittal is designed to complement management's discussion and analysis and should be read in conjunction with it. Management's discussion and analysis can be found immediately following the Independent Auditors' Report.

Management assumes full responsibility for the completeness and reliability of the information contained in this report, based upon a comprehensive framework of internal control that it has established for this purpose. Because the cost of internal control should not exceed anticipated benefits, the objective is to provide reasonable, rather than absolute assurance that the financial statements are free of any material misstatements.

MISSION

The Massachusetts Water Resources Authority is an independent authority 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, as amended, "the Enabling Act"), MWRA assumed 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 ("the Commonwealth") 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 all real property comprising the water and sewer systems, 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. 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 systems served approximately 3.0 million people and more than 5,500 businesses.

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

WATER SYSTEM



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 four-year supply of water.

The Quabbin and Wachusett Reservoirs are well 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 the watersheds are well-protected, the water in the Quabbin and Wachusett Reservoirs is of very high quality. MWRA has won numerous awards for quality, taste, and sustainability.



Ozone And UV Generators at the John J. Carroll Water Treatment Plant

Water for most MWRA communities is treated at the John J. Carroll Water Treatment Plant in Marlborough with two state-of-the-art methods – ozone and UV light. The treated water leaves the plant through the MetroWest Water Supply Tunnel and the Hultman Aqueduct. Along the way, it is stored in covered tanks. From there it is drawn into distribution mains and many smaller community pipes. Three member communities receive water directly from the Quabbin Reservoir: Chicopee, South Hadley Fire District #1 and Wilbraham. That water is treated at the Brutsch Water Treatment Facility in Ware and leaves the plant through the Chicopee Valley Aqueduct.

Meters installed by the member communities measure the amount of water delivered to each home or business.

Over 85% of the water delivered is via gravity, and, as the water travels through the system, electricity is generated at four hydroelectric facilities.

To maintain and ensure water quality, MWRA tests over 1,600 water samples per month, from the reservoirs all the way to household taps. In addition, MWRA uses real-time water quality monitoring throughout the system to immediately identify any issues with water quality.

Since its inception, MWRA has promoted water conservation among its member communities, requiring each to perform bi-annual leak detection surveys and providing educational materials to residents and students. Since 1985, the average annual water demand in the MWRA service area has decreased by over 130 million gallons.

WASTEWATER SYSTEM



Clinton Wastewater Treatment Plant

Wastewater is flushed through a building's pipes into the community's sewers. More than 5,300 miles of local sewers transport the flows from 43 communities into 226 miles of MWRA interceptor sewers. The interceptor sewers carry the region's wastewater to two MWRA treatment plants. Most communities' wastewater flows to the Deer Island Treatment Plant.

Before the flows reach the plant, they receive preliminary treatment at five headworks facilities that screen out larger objects, such as bricks and logs. These flows are then pumped through tunnels to the plant and receive Primary Treatment in settling tanks where up to 60% of the solids settle out as a mixture of sludge and water.

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

The treated wastewater, or effluent, is disinfected and discharged through a 9.5-mile underwater tunnel into Massachusetts Bay. The effluent is dispersed over the last mile and a quarter of the tunnel through 55 "diffusers." With water depths up to 120 feet, the outfall provides a much higher rate of mixing and dilution than was possible with discharges into the shallow waters of Boston Harbor prior to construction of the new Deer Island Plant.

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

MWRA also utilizes renewable energy at the Deer Island Treatment Plant, with wind, solar, hydroelectric and biogas systems. The plant currently generates over 50% of its total heat and electricity needs.

Because of inadequate sewage treatment facilities, Boston Harbor was known as the dirtiest harbor in the country in the 1980s. The Deer Island Treatment Plant was constructed in the 1990s as part of the federal court mandated Boston Harbor Clean-up Project, which is widely recognized as a national environmental success story. The Charles River, once the inspiration for the song “Love that Dirty Water” now receives high marks for water quality, and Boston’s beaches are among the cleanest urban beaches in the nation.

MWRA also operates the smaller Clinton Wastewater Treatment Plant, which serves the Town of Clinton and the Lancaster Sewer District.



Wind turbines and solar panels at the Deer Island Wastewater Treatment Plant



Pleasure Bay Beach, South Boston

RATES AND CHARGES

Over 95% of MWRA’s budgeted revenues are derived from wholesale rates and charges assessed to member communities. The Enabling Act requires MWRA to set its rates and charges at levels sufficient to pay, among other things, its current expenses and its debt service, and to provide debt service coverage required by MWRA’s General Bond Resolution (“the Resolution”).

In accordance with the Enabling Act, MWRA’s rate setting is exercised independently by its Board of Directors without being subject to the approval of any department, agency or other instrumentality of the Commonwealth of Massachusetts or any other governing body. MWRA establishes charges of general application separately for the services provided by the Waterworks System and the Sewer System. Rates and charges are adopted annually in June, after notice and public hearing, and review of non-binding recommendations by the MWRA Advisory Board. MWRA’s charges for services are billed directly to the member communities on a wholesale basis. Member committees include cities, towns, and other governmental entities tasked with providing retail water and/or sewer services.

In setting water rates, the total amount of revenue that must be raised through water rates in a given fiscal year is identified through a budgeting process, net of other sources of anticipated revenue, such as investment income, receipts from water supply contracts and other special arrangements. Generally, charges for water services are computed on the basis of the proportioned metered water use of each member community for the immediately preceding calendar year.

Sewer charges are computed on a proportional allocation basis utilizing, among other things, total flow, contributing population and census population for each member community. Consistent with the initial step in setting water rates, MWRA first determines the total amount of revenue required to be raised from sewer charges. The total amount of required revenue for the Sewer System is allocated either to operating costs or capital costs, based on a three-year average of total flows for operating costs and total flows, census information and other factors for capital costs.

MWRA has adopted policies to enforce collection of member community assessments, including use of local aid intercept. Local aid intercept would allow MWRA, after certification to the State Treasurer of any unpaid assessment, to instruct the State Treasurer to deduct unpaid assessment amounts from any state reimbursement, grant or local aid to cities and towns that are member communities and remit that amount to the MWRA. The local aid intercept is not available, however, for any non-municipal member community. Fortunately, MWRA has not needed to use local aid intercept in more than 20 years.

CAPITAL IMPROVEMENT PROGRAM

Since its establishment, MWRA has invested over \$8.4 billion to improve the wastewater and waterworks systems serving its 61 member communities. MWRA was created in response to and has been subject for most of its existence to a Clean Water Act enforcement action (Clean Water Act Case) 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). In 1982 and 1983, civil suits were filed against the MDC and other state agencies claiming that the Massachusetts Clean Waters Act had been violated as a result of discharges of untreated and partially treated sewage from Nut and Deer Islands. The Commonwealth, the Boston Water and Sewer Commission that provides retail water and sewer services within the city of Boston, the City of Quincy and the Town of Winthrop are also parties to the case.

The order of the federal court in the Clean Water Act Case (Court Order) set forth the schedules of activities to be undertaken to achieve compliance with the law. Since 1985, MWRA has complied with 420 milestones which included the completion of extensive new wastewater treatment facilities at Deer Island in Boston and Nut Island in Quincy, a residuals processing facility in Quincy, and 35 separate CSO control projects in Boston, Brookline, Cambridge, Chelsea and Somerville which comprise the long-term CSO control plan, the last of which was completed in December 2015, in compliance with the Court Ordered milestone.

Under the Court Order, MWRA was required to file monthly compliance and progress reports on its ongoing activities through December 15, 2000 and quarterly compliance and progress reports through December 2016. MWRA was then required to submit bi-annual compliance and progress reports through December 2020. The Court has further extended the assessment period through 2021.

During the same time, MWRA also complied with regulatory mandates to improve and modernize the waterworks facilities, including 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 to date. The five initiatives below account for over \$6.0 billion, or 72% of spending to date:

- Boston Harbor Clean-up Project - \$3.8 billion
- CSO Control Plan - \$911 million
- MetroWest Water Supply Tunnel - \$697 million
- Carroll Water Treatment Plant - \$423 million
- Covered Storage Facilities - \$239 million



Norumbega Covered Storage

As MWRA matures as an agency, the infrastructure modernization and new facilities construction phase is nearing completion, and, barring new mandates, most of the 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 capital assets. 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 is expected to be the largest future CIP initiative and includes two new tunnels 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.

Capital initiatives to date have been primarily funded through long-term borrowings in the form of tax-exempt bonds, and the debt service on these outstanding bonds represents a significant and growing portion of the MWRA's operating budget. As of June 30, 2019, MWRA's total debt was \$5.4 billion. The capital finance obligation as a percent of total expenses has increased from 36% in 1990 to 62.8% in the Final FY2019 Current Expense Budget.

MWRA's senior 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.

The long-term strategy for capital work is identified in the MWRA's Water and Wastewater Master Plans, which were published in 2006, updated in 2013, and again in 2019. 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.

AWARDS AND ACKNOWLEDGMENTS

The Government Finance Officers Association of the United States and Canada awarded a Certificate of Achievement for Excellence in Financial Reporting to MWRA for its comprehensive annual financial report (CAFR) for the fiscal year ended June 30, 2018. This was the first year that MWRA applied for and received this prestigious award. In order to be awarded a Certificate of Achievement, MWRA had to publish an easily readable and efficiently organized CAFR that satisfied both generally accepted accounting principles and applicable program requirements.

A Certificate of Achievement for Excellence in Financial Reporting is valid for a period of one year only. However, we believe that our current CAFR continues to meet the Certificate of Achievement for Excellence in Financial Reporting Program's requirements, and we are submitting it to the GFOA to determine its eligibility for another certificate.

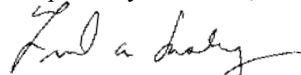
MWRA also received the Government Finance Officers Association's Distinguished Budget Presentation Award for its annual budget document dated September 2018. To qualify for the Distinguished Budget Presentation Award, the government's budget document had to be judged proficient as a policy document, a financial plan, and operations guide, and communications devise.

The preparation of this report would not have been possible without the skill, effort, and dedication of the entire staff of MWRA's Finance Division. We wish to thank all MWRA departments for their assistance in providing the data necessary to prepare this report. Credit is also due to the MWRA Board of Directors for their unfailing support for maintaining the highest standards of professionalism in the management of the MWRA's finances.

INDEPENDENT AUDIT

The Enabling Act requires that the MWRA's financial statements be audited annually by an independent certified public accounting firm. The MWRA General Bond Resolution and certain loan agreements, by reference, specify that the audit be conducted by independent accountants of nationally recognized standing and be satisfactory to the Trustee. The financial section of the 2019 Comprehensive Annual Financial Report begins with the report of our independent auditors, CliftonLarsonAllen LLP. This report expresses an unmodified opinion as to the fairness of the presentation of our financial statements.

Respectfully submitted,



Frederick A. Laskey
Executive Director



Thomas J. Durkin
Director of Finance



Robert M. Belkin, CPA
Controller



Government Finance Officers Association

Certificate of
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in Financial
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**Massachusetts Water Resources
Authority**

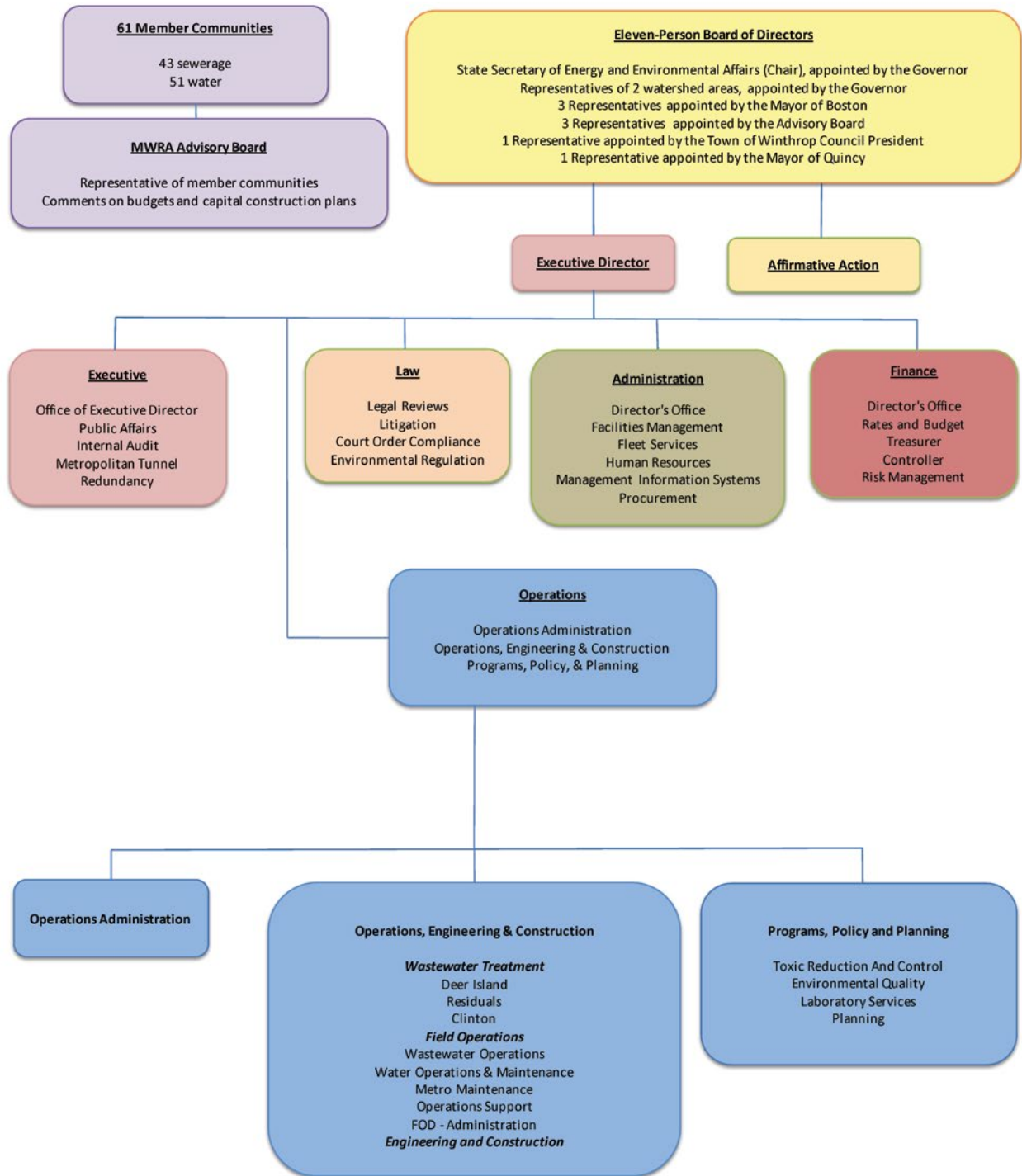
For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

June 30, 2018

Christopher P. Morrill

Executive Director/CEO

MWRA Organizational Chart



Principal Officials



Wachusett Aqueduct Pumping Station

BOARD OF DIRECTORS

Kathleen A. Theoharides, Chair
John J. Carroll, Vice Chair
Andrew M. Pappastergion, Secretary
Christopher Cook
Kevin L. Cotter
Paul E. Flanagan
Joseph C. Foti
Brian Peña
Henry F. Vitale
John J. Walsh
Jennifer L. Wolowicz

Executive Officers

Frederick A. Laskey, Executive Director
David W. Coppes, Chief Operating Officer
Thomas J. Durkin, Director, Finance
Michele S. Gillen, Director, Administration
Carolyn Francisco Murphy, General Counsel

Controller Department

Robert Belkin, CPA, Controller
Elizabeth Feloni, CPA, Accounting Manager
June Kwan, Senior Staff Accountant
Gaby DeLeon, Senior Staff Accountant
Samantha Wilson, Senior Staff Accountant

Financial Section



Bellevue Water Storage Tank next to the historic Bellevue Standpipe



The Board of Directors
Massachusetts Water Resources Authority
Boston, Massachusetts

Report on the Financial Statements

We have audited the accompanying statements of net position of the Massachusetts Water Resources Authority (the Authority) as of June 30, 2019 and 2018, and the related statements of revenues, expenses and changes in net position and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Authority as of June 30, 2019 and 2018, and the changes in financial position and cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis (located on pages 16 through 23) and certain pension and other post-employment benefits information (located on pages 65 through 68) be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary and Other Information

Our audit was conducted for the purpose of forming an opinion on the Authority's financial statements. The schedule of Accounts Established by the General Revenue Bond Resolution, Combining Statements of Net Position and Combining Statements of Revenues, Expenses and Changes in Net Position (Supplemental Schedules), Introductory Section and Statistical Section are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The Supplemental Schedules are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Supplemental Schedules are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The Introductory and Statistical Sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

The Board of Directors
Massachusetts Water Resources Authority

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated September 6, 2019 on our consideration of the Authority's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Authority's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Authority's internal control over financial reporting and compliance.

CliftonLarsonAllen LLP

CliftonLarsonAllen LLP

Boston, Massachusetts
September 6, 2019

MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2019 and 2018

(Unaudited)

This section of the Authority's annual financial report presents our discussion and analysis of the Authority's financial performance during the fiscal years ended June 30, 2019 and 2018. Please read it in conjunction with the Authority's financial statements, which immediately follow this section.

Financial Highlights – Fiscal Year 2019

The fiscal year 2019 customer service revenues were approximately \$750.7 million. Of this amount, rate revenues represent approximately 98.4%, or \$739 million, and were \$22 million higher than fiscal year 2018. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$305.1 million in fiscal year 2019. The 9.8% increase in total operating expenses over fiscal year 2018 is the result of increases in pension expense of \$17.7 million, increases in utility costs of \$2.5 million, increases in personnel costs of \$2.6 million, increases in maintenance costs of \$1.6 million, increases in chemical costs of \$1.2 million and increases in sludge pelletization costs of \$1.2 million.

Net nonoperating expenses decreased \$29.5 million, or 14.9%, primarily due to a \$23.2 million increase in investment income and a \$6.3 million reduction in interest expense. Interest income increased due to an increase in the unrealized gain on investments. Lower long-term interest rates have caused the market values of investments to increase. Interest expense decreased due to a combination of principal repayments and refunding/defeasance of outstanding debt.

Total assets at June 30, 2019 were approximately \$7.4 billion, a \$57.5 million, or 0.8%, decrease over total assets at June 30, 2018.

During fiscal year 2019 the Authority issued General Revenue Bonds, 2019 Series B for \$125 million and General Revenue Refunding Bonds, 2019 Series C for \$19.2 million. The proceeds from these bonds were used finance new construction projects and refund bonds outstanding. The interest rate on these bonds is 5%.

Total capital assets (net of depreciation) were approximately \$5.8 billion at June 30, 2019, a \$107.9 million, or 1.8%, decrease over June 30, 2018. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

Financial Highlights – Fiscal Year 2018

The fiscal year 2018 customer service revenues were approximately \$728.3 million. Of this amount, rate revenues represent approximately 98.5%, or \$717.1 million, and were \$22.2 million higher than fiscal year 2017. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$277.9 million in fiscal year 2018. The 2.9% decrease in total operating expenses over fiscal year 2017 is the result of decreases in pension and pollution remediation expenses totaling \$10.3 million and a decrease in maintenance costs of \$1.7 million, offset by increases in personnel costs of \$2 million and utility costs of \$1.7 million.

Net nonoperating expenses decreased \$16 million, or 7.4%, due to a \$14.5 million decrease in interest expense. Interest expense decreased due to a combination of principal repayments and refunding/defeasance of outstanding debt.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2019 and 2018

(Unaudited)

Total assets at June 30, 2018 were approximately \$7.5 billion, a \$160.2 million, or 2.1%, decrease over total assets at June 30, 2017.

During fiscal year 2018 the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series A for \$50.6 million, General Revenue Bonds, 2018 Series B for \$107.6 million, General Revenue Refunding Bonds, 2018 Series C for \$21.9 million and direct-purchase General Revenue Refunding Bonds, 2018 Series D for \$50 million. The proceeds from these bonds were used to retire commercial paper notes, retire a portion of the revolving loan, refund bonds outstanding and finance new construction projects. The interest rate on these bonds range from 3% to 5%.

Total capital assets (net of depreciation) were approximately \$5.9 billion at June 30, 2018, a \$75.1 million, or 1.2%, decrease over June 30, 2017. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

Overview of the Financial Statements

The financial section of this annual report consists of four parts: management's discussion and analysis (this section), the financial statements and related notes to the financial statements, required supplementary information, and other supplementary information.

The financial statements provide both long-term and short-term information about the Authority's overall financial status. The financial statements also include notes that explain some of the information in the financial statements and provide more detailed data. The statements are followed by a section of required supplementary information and other supplementary information that further explains and supports the information in the financial statements.

Financial Analysis of the Authority

Net Position

The Authority's total net position at June 30, 2019 was approximately \$1.6 billion, a \$39.3 million decrease from June 30, 2018. Total assets decreased \$57.5 million, or 0.8%, to \$7.4 billion, and total liabilities increased \$48 million, or 0.8%, to \$5.9 billion.

The Authority's total net position at June 30, 2018 was approximately \$1.6 billion, a \$60.9 million decrease from June 30, 2017. Total assets decreased \$160.2 million, or 2.1%, to \$7.5 billion, and total liabilities decreased \$168.2 million, or 2.8%, to \$5.9 billion.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2019 and 2018

(Unaudited)

Net Position
(Dollars in thousands)

	2019	2018	2017 *	Percentage change 2019–2018	Percentage change 2018–2017
Current assets	\$ 100,271	\$ 95,963	\$ 93,210	4.5%	3.0%
Restricted assets	837,850	727,104	707,255	15.2	2.8
Capital assets	5,840,416	5,948,350	6,023,414	(1.8)	(1.2)
Other assets	651,769	716,378	824,142	(9.0)	(13.1)
Total assets	<u>7,430,306</u>	<u>7,487,795</u>	<u>7,648,021</u>	<u>(0.8)</u>	<u>(2.1)</u>
Deferred outflows of resources from pension	64,041	17,154	47,910	273.3	(64.2)
Deferred outflows of resources from OPEB	333	-	-	100.0	-
Deferred outflows of resources from derivative instruments	31,640	20,988	35,755	50.8	(41.3)
Deferred outflows of resources from refunded debt	28,842	47,597	68,344	(39.4)	(30.4)
Current liabilities	362,949	350,382	349,139	3.6	0.4
Payable from restricted assets	156,048	157,721	154,597	(1.1)	2.0
Long-term debt	5,139,816	5,192,316	5,337,619	(1.0)	(2.7)
Long-term lease	26,093	27,219	28,261	(4.1)	(3.7)
Other liabilities	263,506	172,784	199,032	52.5	(13.2)
Total liabilities	<u>5,948,412</u>	<u>5,900,422</u>	<u>6,068,648</u>	<u>0.8</u>	<u>(2.8)</u>
Deferred inflows of resources from pension	6,066	14,963	11,810	(59.5)	26.7
Deferred inflows of resources from OPEB	7,907	10,032	-	(21.2)	-
Deferred inflows of resources from regulated activities	26,690	42,718	53,275	(37.5)	(19.8)
Net position:					
Net investment in capital assets	827,050	759,757	729,903	8.9	4.1
Restricted					
Construction	189,293	105,802	117,813	78.9	(10.2)
Debt Service	98,251	173,098	140,344	(43.2)	23.3
Operating	50,862	48,915	47,544	4.0	2.9
Revenue	30,126	29,952	33,372	0.6	(10.2)
Unrestricted	370,505	487,875	597,321	(24.1)	(18.3)
Total net position	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>(2.4%)</u>	<u>(3.7%)</u>

*Certain amounts were reclassified to conform to the fiscal year 2018 presentation

MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2019 and 2018

(Unaudited)

Changes in Net Position

The decrease in net position at June 30, 2019 was \$39.3 million, or 2.4%, as compared with June 30, 2018. The Authority's total operating revenues increased by 2.3% to \$755.3 million and total operating expenses increased 9.8% to \$305.1 million.

The decrease in net position at June 30, 2018 (including the restatement to comply with GASB 75) was \$60.9 million, or 3.7%, as compared with June 30, 2017. The Authority's total operating revenues increased by 3.0% to \$738.3 million and total operating expenses decreased 2.9% to \$277.9 million.

Changes in Net Position

(Dollars in thousands)

	2019	2018	2017	Percentage change 2019–2018	Percentage change 2018–2017
Operating revenues:					
Customer service revenues	\$ 750,742	\$ 728,281	\$ 705,933	3.1%	3.2%
Other revenues	4,594	10,023	10,843	(54.2)	(7.6)
Total operating revenues	<u>755,336</u>	<u>738,304</u>	<u>716,776</u>	<u>2.3</u>	<u>3.0</u>
Operating expenses:					
Operations	113,878	106,943	106,844	6.5	0.1
Maintenance	30,651	29,067	30,799	5.4	(5.6)
Payments in lieu of taxes	8,230	8,220	8,191	0.1	0.4
Engineering, general, and administrative	152,351	133,627	140,435	14.0	(4.8)
Total operating expenses	<u>305,110</u>	<u>277,857</u>	<u>286,269</u>	<u>9.8</u>	<u>(2.9)</u>
Depreciation and amortization	<u>207,127</u>	<u>202,799</u>	<u>201,481</u>	<u>2.1</u>	<u>0.7</u>
Operating income	<u>243,099</u>	<u>257,648</u>	<u>229,026</u>	<u>(5.6)</u>	<u>12.5</u>
Nonoperating items:					
Regulatory accounting provisions	(121,739)	(106,777)	(62,714)	14.0	70.3
Net nonoperating expenses	(168,861)	(198,327)	(214,288)	(14.9)	(7.4)
Changes in derivative related accounts	2,940	2,940	2,940	-	-
Total nonoperating items	<u>(287,660)</u>	<u>(302,164)</u>	<u>(274,062)</u>	<u>(4.8)</u>	<u>10.3</u>
Capital grants and contributions	<u>5,249</u>	<u>4,715</u>	<u>7,224</u>	<u>11.3</u>	<u>(34.7)</u>
Change in net position	<u>(39,312)</u>	<u>(39,801)</u>	<u>(37,812)</u>	<u>(1.2)</u>	<u>5.3</u>
Total net position – beginning of year	1,605,399	1,666,297	1,704,109	(3.7)	(2.2)
Restatement to comply with GASB 75	-	(21,097)	-	(100.0)	-
Total net position – end of year	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>(2.4%)</u>	<u>(3.7%)</u>

During fiscal year 2019, the increases in customer service revenues were primarily due to the 3.07% increase in the rate revenue requirement (\$22 million).

During fiscal year 2018, the increases in customer service revenues were primarily due to the 3.19% increase in the rate revenue requirement (\$22.2 million).

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Operating Costs by Functionality

(Dollars in thousands)

	2019	2018	2017	Percentage change 2019–2018	Percentage change 2018–2017
Wastewater treatment and transport	\$ 102,732	\$ 98,070	\$ 95,636	4.8%	2.5%
Water treatment and transport	38,731	37,144	37,110	4.3	0.1
Water and wastewater quality	9,734	9,600	9,068	1.4	5.9
Metering and monitoring	6,516	5,059	5,079	28.8	(0.4)
Facilities planning, design, and construction	11,362	11,515	11,188	(1.3)	2.9
Management information systems	12,617	11,785	11,991	7.1	(1.7)
Administration and support	51,989	51,573	50,650	0.8	1.8
Total direct operating costs	<u>233,681</u>	<u>224,746</u>	<u>220,722</u>	4.0	1.8
Indirect operating costs	<u>71,429</u>	<u>53,111</u>	<u>65,547</u>	34.5	(19.0)
 Total operating costs	 <u>\$ 305,110</u>	 <u>\$ 277,857</u>	 <u>\$ 286,269</u>	 9.8%	 (2.9%)

Increases in wastewater treatment and transport expenses were due primarily to a \$1.5 million increase in electricity costs and \$1.5 million increase in maintenance expenses at Deer Island as well as \$1.2 million increase in sludge pelletization costs of the residuals operations department. Increases in water treatment and transport are attributable to increases in wages & salaries (\$0.3 million), utilities (\$0.4 million), chemicals (\$0.3 million) and maintenance expenses (\$0.5 million). Increases in metering and monitoring are the result of reclassification of a cost center from operations to metering and monitoring. Increases in management information systems is due primarily to the roll-out of new PCs (\$0.8 million).

Other Post-Employment Benefits (OPEB) Irrevocable Trust

In April 2015, the Authority established the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The Trust was established for the sole purpose of providing for the advance funding of future costs of retired employee health insurance and other benefits provided to retirees. It is intended that the Trust shall constitute a “Qualified OPEB Trust” according to the standards set forth in GASB Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions* and the standards of GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. The Authority’s Board of Directors appointed a five-member Board of Trustees, made up of Authority senior managers, to control and manage the trust.

An initial deposit of \$10.8 million was made to the trust upon establishment of the trust. The balance of the trust at June 30, 2019 and 2018 was \$37.1 million and \$29.8 million, respectively.

MASSACHUSETTS WATER RESOURCES AUTHORITY

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(Unaudited)

Capital Assets and Debt Administration

Capital Assets

As of June 30, 2019 and 2018, the Authority had \$5.8 billion and \$5.9 billion of capital assets (net of depreciation), respectively. This includes land, construction in progress, plant and equipment for the water and sewer systems, furniture and fixtures, leasehold improvements, and motor vehicles and equipment. The Authority’s net capital assets decreased approximately \$107.9 million, or 1.8%, during fiscal year 2019, primarily due to the rate of depreciation being higher than the rate of capitalization.

Capital Assets					
(Net of depreciation, dollars in thousands)					
	2019	2018	2017	Percentage change 2019–2018	Percentage change 2018–2017
Land	\$ 29,885	\$ 29,878	\$ 29,873	0.0%	0.0%
Construction in progress	149,794	180,525	127,423	(17.0)	41.7
Plant and equipment, water, and sewer systems	5,653,489	5,730,797	5,859,216	(1.3)	(2.2)
Furniture and fixtures	68	132	213	(48.5)	(38.0)
Leasehold improvements	267	279	291	(4.3)	(4.1)
Motor vehicles and equipment	6,913	6,739	6,398	2.6	5.3
Total	<u>\$ 5,840,416</u>	<u>\$ 5,948,350</u>	<u>\$ 6,023,414</u>	<u>(1.8%)</u>	<u>(1.2%)</u>

Additional information on the Authority’s capital assets can be found in Note 8 of this financial report.

Debt Administration

The Authority’s bond sales must be approved by its board of directors (the Board) and must comply with rules and regulations of the United States Treasury Department. Neither the Commonwealth of Massachusetts (the Commonwealth) nor any political subdivision thereof shall be obligated to pay the principal of, or premium or interest on, any debt outstanding and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to such payment.

Bond Resolutions

Pursuant to its general bond resolution, the Authority must comply with a rate covenant that requires it to set rates to maintain revenues sufficient to pay: current expenses; debt service on indebtedness; required deposits to reserves; costs of maintenance, replacement, and/or improvements to the wastewater and water systems that are considered current expenses and any additional amounts the Authority may be required to pay by any law or contract.

In addition to the rate covenant, the Authority is required to meet two covenants with respect to debt service coverage. The primary debt service coverage requires that the Authority fix and adjust rates and charges to provide revenues available for bond debt service in an amount equal to 1.2 times that is required for debt service on all outstanding bonds, not including subordinated bonds. The subordinated debt service coverage requires that the Authority fix and adjust rates and charges to provide revenues available for bond debt service in an amount equal to 1.1 times that is required for debt service on all outstanding bonds, including subordinated bonds.

Additional information on the Authority’s long-term debt can be found in Note 6 of this financial report.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2019 and 2018

(Unaudited)

Credit Rating

The Authority's \$3.1 billion Senior Lien General Revenue Bonds are rated Aa1 from Moody's Investors Service, AA+ by S&P Global Ratings and AA+ from FitchRatings. The \$782 million Subordinate Lien General Revenue Bonds are rated Aa2 from Moody's Investors Service, AA by S&P Global Ratings and AA from FitchRatings. Some of the Authority's revenue bonds are enhanced by bond insurance. The credit ratings of these bond series will be the higher rating of either the Authority or the firm providing the enhancement. In the case of bonds enhanced by a letter of credit, the rating will be the highest of the Authority's, the provider or, if available, a joint rating. The subordinated debt of \$980 million with the Massachusetts Clean Water Trust is not rated as the Authority's debt.

Economic Factors and Next Year's Budget

In June 2019, the Board approved the fiscal year 2020 Current Expense Budget (CEB), which totals \$792.2 million in expenses.

The \$792.2 million expense total is comprised of \$493.1 million (62.2%) in capital financing costs and \$299.1 million (37.8%) in operating expenses, of which \$248.2 million (83.0%) is for direct expenses and \$50.9 million (17.0%) is for indirect expenses. The total represents an increase of \$33.4 million from fiscal year 2019 spending, which is comprised of \$22.1 million in higher operating costs and \$11.3 million in higher debt service costs.

The fiscal year 2020 rate revenue requirement approved by the Board is \$761.7 million; an increase of 3.07% compared with the fiscal year 2019 budget.

Fiscal year 2020 budgeted nonrate revenue totals \$30.5 million, a decrease of \$2.8 million from actual fiscal year 2019 nonrate revenue. The nonrate revenue budget is comprised of \$15.5 million in investment income, \$14.4 million in other user charges and other revenue and \$.6 million in entrance fees.

CIP 10 Year Plan

The Authority's planned spending for capital improvements in future years reflects the Authority's ongoing efforts to upgrade and maintain the system and to align its project prioritization process with the Master Plan.

Major planned and ongoing projects include:

- Commitment to long-term redundancy plan for the metropolitan water tunnel system.
- Improvement and replacement of equipment on Deer Island and at major headworks facilities to ensure continued efficient and effective operations.
- Continued asset protection projects for both wastewater and water systems (pump stations and pipelines).
- Dedication to using resources efficiently, responding to climate change and reducing the environmental impacts of the Authority's daily operations by installing alternative energy sources and promotion of improved self-generation.

MASSACHUSETTS WATER RESOURCES AUTHORITY

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(Unaudited)

- Enhanced commitment to the community assistance programs for both the sewer and water systems to improve local infrastructure, including a new initiative to provide interest-free loans to assist communities in replacing lead service lines.
- Continued investment for the upgrade of Management Information Systems to ensure the availability, integrity and security of data.
- Continue the Residuals Asset Protection program for maintaining and improving the operations and infrastructure of the biosolids processing in the long term.

Contacting the Authority's Financial Management

This report is designed to provide our bondholders, member communities and other interested parties with a general overview of the Authority's finances and to demonstrate the Authority's accountability for the revenue it receives. If you have questions about this report or need additional information, contact the Massachusetts Water Resources Authority, Finance Division, 100 First Avenue, Boston, MA 02129.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Statements of Net Position

June 30, 2019 and 2018

(Dollars in thousands)

Assets	2019	2018
Unrestricted current assets:		
Cash and cash equivalents (note 4)	\$ 54,810	\$ 52,614
Investments (note 4)	11,661	11,252
Intergovernmental loans (note 7)	32,732	31,254
Accounts receivable	1,068	843
Total unrestricted current assets	<u>100,271</u>	<u>95,963</u>
Restricted assets:		
Investments (note 4)	836,348	724,428
Interest receivable	1,502	1,731
Grants receivable	-	945
Total restricted assets	<u>837,850</u>	<u>727,104</u>
Capital assets:		
Capital assets – not being depreciated (note 8)	179,679	210,403
Capital assets – being depreciated – net (note 8)	5,660,737	5,737,947
Total capital assets	<u>5,840,416</u>	<u>5,948,350</u>
Regulatory assets (note 3)	370,030	505,915
Other assets, net (note 7)	281,739	210,463
Total assets	<u>7,430,306</u>	<u>7,487,795</u>
Deferred Outflows of Resources		
Deferred outflows from pension (note 10)	64,041	17,154
Deferred outflows from OPEB (note 11)	333	-
Deferred outflows from derivative instruments (note 6)	31,640	20,988
Deferred outflows from refunding debt	28,842	47,597
Liabilities		
Current liabilities:		
Accounts payable and accrued expenses	50,031	49,465
Commercial paper notes (note 6)	75,000	75,000
Current portion of long-term debt (note 6)	237,918	225,917
Total current liabilities	<u>362,949</u>	<u>350,382</u>
Payable from restricted assets:		
Accounts payable for construction	15,588	19,656
Accrued interest on bonds payable	80,504	79,991
Reserves (note 5)	59,956	58,074
Total payable from restricted assets	<u>156,048</u>	<u>157,721</u>
Retainage on construction in progress	7,918	9,567
Long-term debt – less current portion (note 6)	5,139,816	5,192,316
Long-term capital lease (note 9)	26,093	27,219
Net pension liability (note 10)	99,956	21,025
Net OPEB liability (note 11)	123,992	121,204
Liability for derivative instruments (note 6)	31,640	20,988
Total liabilities	<u>5,948,412</u>	<u>5,900,422</u>
Deferred Inflows of Resources		
Deferred inflows from pension (note 10)	6,066	14,963
Deferred inflows from OPEB (note 11)	7,907	10,032
Deferred inflows from regulated activities (note 3)	26,690	42,718
Net Position		
Net investment in capital assets	827,050	759,757
Restricted		
Construction	189,293	105,802
Debt Service	98,251	173,098
Operating	50,862	48,915
Revenue	30,126	29,952
Unrestricted	370,505	487,875
Total net position	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>
Commitments and contingencies (notes 9,10,11,12 and 13)		

See accompanying Notes to Financial Statements

MASSACHUSETTS WATER RESOURCES AUTHORITY

Statements of Revenues, Expenses, and Changes in Net Position

Years ended June 30, 2019 and 2018

(Dollars in thousands)

	<u>2019</u>	<u>2018</u>
Operating revenues (note 2):		
Customer services	\$ 750,742	\$ 728,281
Other	4,594	10,023
Total operating revenues	<u>755,336</u>	<u>738,304</u>
Operating Expenses:		
Operations	113,878	106,943
Maintenance	30,651	29,067
Payments in lieu of taxes	8,230	8,220
Engineering, general, and administrative	152,351	133,627
Total operating expenses	<u>305,110</u>	<u>277,857</u>
Income from operations before depreciation	450,226	460,447
Depreciation and amortization	<u>207,127</u>	<u>202,799</u>
Operating income	243,099	257,648
Regulatory accounting provisions:		
Change in reserves (note 5)	(1,882)	(821)
Change in regulatory provisions, net (note 3)	<u>(119,857)</u>	<u>(105,956)</u>
Total regulatory accounting provisions	<u>(121,739)</u>	<u>(106,777)</u>
Nonoperating revenues (expenses):		
Debt service grant	890	945
Investment income	27,210	3,995
Interest expense	(196,961)	(203,267)
Changes in derivative related accounts	2,940	2,940
Total nonoperating expenses	<u>(165,921)</u>	<u>(195,387)</u>
Net loss before capital grants and contributions	(44,561)	(44,516)
Capital grants and contributions	<u>5,249</u>	<u>4,715</u>
Decrease in net position	(39,312)	(39,801)
Total net position - beginning of year	1,605,399	1,666,297
Restatement to comply with GASB Statement No. 75 (note 2a)	<u>-</u>	<u>(21,097)</u>
Total net position - end of year	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>

See accompanying Notes to Financial Statements

MASSACHUSETTS WATER RESOURCES AUTHORITY

Statements of Cash Flows

Years ended June 30, 2019 and 2018

(Dollars in thousands)

	<u>2019</u>	<u>2018</u>
Cash flows from operating activities:		
Cash received from customers	\$ 750,509	\$ 728,207
Cash paid to suppliers for goods and services	(159,098)	(121,879)
Cash paid to employees for services	(142,878)	(131,123)
Cash paid in lieu of taxes	(8,230)	(8,220)
Other operating receipts	4,595	9,949
Net cash provided by operating activities	<u>444,898</u>	<u>476,934</u>
Cash flows from capital and related financing activities:		
Proceeds from sale of revenue bonds, loans, and notes	256,134	151,604
Capital grants for construction	5,249	4,715
Debt service grant	1,835	-
Capital lease principal payments	(1,125)	(1,041)
Capital lease interest payments	(2,091)	(2,175)
Repayment of debt	(265,380)	(261,177)
Interest paid on debt	(204,241)	(203,971)
Plant expenditures	(148,192)	(147,981)
Net cash used for capital and related financing activities	<u>(357,811)</u>	<u>(460,026)</u>
Cash flows from investing activities:		
Purchases of short-term investments	(9,763)	(9,910)
Changes in restricted money market investments	(92,297)	(17,400)
Interest received	17,169	12,750
Net cash used for investing activities	<u>(84,891)</u>	<u>(14,560)</u>
Net increase in cash and cash equivalents	2,196	2,348
Cash and cash equivalents - beginning of year	<u>52,614</u>	<u>50,266</u>
Cash and cash equivalents - end of year	<u>\$ 54,810</u>	<u>\$ 52,614</u>
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	\$ 243,099	\$ 257,648
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	207,127	202,799
Change in net pension liability	78,931	(24,779)
Change in deferred outflows from pension	(46,887)	30,756
Change in deferred inflows from pension	(8,897)	3,153
Change in net OPEB liability	2,788	(10,268)
Change in deferred outflows from OPEB	(333)	-
Change in deferred inflows from OPEB	(2,125)	10,032
Change in other accounts	(29,699)	5,059
Change in accounts payable	894	2,534
Net cash provided by operating activities	<u>\$ 444,898</u>	<u>\$ 476,934</u>

NONCASH CAPITAL AND RELATED FINANCING ACTIVITIES

In fiscal 2019, general revenue refunding bonds in the aggregate principal amount of \$19,190 were issued to defease \$20,340 of bonds outstanding.

In fiscal 2018, general revenue refunding bonds in the aggregate principal amount of \$122,510 were issued to defease \$75,545 of bonds outstanding and retire \$50,000 of commercial paper notes.

See accompanying Notes to Financial Statements

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(1) Organization

The Massachusetts Water Resources Authority (the Authority) was established in January 1985 pursuant to Chapter 372 (the Enabling Act) of the Act of 1984 of the Commonwealth of Massachusetts (the Commonwealth). The Authority, a successor agency to certain functions of the Metropolitan District Commission (the MDC) (which became part of the Department of Conservation and Recreation (the DCR) in July 2003), is a public instrumentality and, effective July 1, 1985, provides water supply services and sewage collection, treatment, and disposal services to areas of the Commonwealth.

The Authority is governed by an 11-member board of directors (the Board) chaired by the Secretary of Energy and Environmental Affairs for the Commonwealth. The Secretary and two other members are appointed by the Governor. Three members of the Board are appointed by the Mayor of Boston and three are appointed by the Authority's Advisory Board. One member is appointed by the Mayor of Quincy and one by the Winthrop Council President.

(2) Summary of Significant Accounting Policies

The accounting policies of the Authority conform to U.S. generally accepted accounting principles as applicable to government enterprises. The following is a summary of the Authority's significant accounting policies:

(a) Basis of Presentation

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. The Authority's 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 Authority distinguishes operating revenues and expenses from nonoperating 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, the Authority 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 the Authority'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. The effects of the Authority's accounting policies are discussed further in Note 3.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

The Authority has implemented GASB Statement No. 75, *Accounting and Financial Reporting of Postemployment Benefits Other Than Pensions*. This Statement requires that the net OPEB liability be reflected on the Statements of Net Position, as well as the deferred inflows and outflows of resources from OPEB activities. In accordance with the Statement, the Authority restated its Net Position at July 1, 2017.

The Authority has implemented GASB Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements*. This statement resulted in expanded disclosures related to debt.

(b) Capital Assets

On July 1, 1985, ownership of the MDC's sewer and waterworks personal property was transferred to the Authority. Pursuant to the Enabling Act, ownership of the real property of the MDC sewer and waterworks systems was not transferred from the Commonwealth to the Authority; however, the Authority has the right to use, improve, maintain, and manage that property. In addition, ownership of the real and personal property of the watershed system remains with the Commonwealth; however, the Authority has the right to utilize the water therefrom for water supply purposes.

The personal property, together with the rights to the real property and watershed system, was recorded at its estimated fair value of \$2,331,465 (including certain construction projects which were in progress as of July 1, 1985), based upon an appraisal performed by valuation specialists. Property, plant, and equipment acquired or constructed since July 1, 1985, is stated at acquisition cost, and includes the expenditure of capital grants in aid of construction.

Betterments and major renewals are capitalized and included in capital asset accounts, while expenditures for maintenance and repairs are charged to expense when incurred. The cost of depreciable assets and related accumulated depreciation is eliminated from the accounts when such items are disposed of or otherwise retired.

The Authority's capitalization threshold is \$100.

(c) Interest Cost and Principal Payments on Construction

During fiscal years 2019 and 2018, none of the Authority's interest expense was capitalized to construction in progress in accordance with its current policy of recovering such costs through rates as incurred. Rates collected for principal payments on debt related to assets under construction are deferred until the related asset is completed and depreciation commences.

(d) Depreciation

The Authority provides for depreciation by use of the straight-line method. Depreciation is intended to distribute the cost of depreciable properties, including those financed by capital grants in aid of construction, over the following estimated average useful lives:

	<u>Years</u>
Plant and Equipment, Water and Sewerage Systems	5–100
Motor Vehicles and Equipment	5
Furniture and Fixtures	7
Leasehold Improvements	3–5

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(e) Revenue Recognition

The Authority recognizes revenue as amounts become collectible from its customers for water and sewer services provided. The majority of the Authority's billings to cities and towns are subject to, in the event of nonpayment, the local aid intercept allowed by the Enabling Act.

(f) Net Position

When both restricted and unrestricted resources are available for use, it is the Authority's policy to use the restricted resources first, then unrestricted as they are needed.

(g) Cash and Cash Equivalents

The Authority's policy is to treat unrestricted investments with a maturity date of three months or less when purchased as cash equivalents for purposes of the statements of cash flows. Restricted cash and cash equivalents are combined with investments on the statements of net position, and shown separately on the statements of cash flows as an investing activity.

(h) Payments in Lieu of Taxes

The Enabling Act authorizes and directs the Authority to pay to the DCR (formerly the MDC) Division of Watershed Management, who in turn remits payment to each city or town in which land of the Quabbin watershed and Ware River watershed is located. Each such payment is equal to the amount which the respective city or town would receive in property taxes, based upon the fair value of such land if such land were not tax exempt.

(i) Investments

Investments are recorded at fair value, other than certain investments that are recorded at net asset value (NAV). The Authority uses an independent pricing source to determine the fair value of investments at quoted market prices. Changes in fair value are included in nonoperating investment income in the Statements of Revenues, Expenses, and Changes in Net Position. Investments that are measured at NAV are the investments in the Massachusetts Municipal Depository Trust (MMDT) which is a 2a7-like external investment pool that is overseen by the Massachusetts State Treasurer and whose fair value of each share is equal to the number of shares; thus NAV is equal to \$1.00 per share.

(j) Compensated Absences

Employees of the Authority may accumulate unused sick time of which 30% will be paid in cash upon retirement from the Authority. The liability for vacation leave is based on the amount earned but not used; for sick leave, it is based on a percentage of the amount accumulated at the statement of net position dates. The liability for both amounts is calculated based on the pay or salary rates in effect at the statements of net position dates.

(k) Pensions

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Plan and additions to/deductions from the Plan's fiduciary net position have been determined on the same basis as they are reported by the Authority. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

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(Dollars in thousands)

(l) Postemployment Benefits Other Than Pensions (OPEB)

For purposes of measuring the net OPEB liability, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the MWRA and additions to/deductions from the MWRA's fiduciary net position have been determined on the same basis as they are reported by the MWRA. For this purpose, the MWRA recognizes benefit payments when due and payable in accordance with the benefit terms. Investments are reported at fair value, except for money market investments and participating interest-earning investment contracts that have a maturity at the time of purchase of one year or less, which are reported at cost.

(m) Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

(3) Regulatory Assets and Deferred Inflows from Regulatory Activities

In accordance with GASB Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements*, regulatory assets and deferred inflows from regulatory activities that result primarily from differences between depreciation on property, plant, and equipment not financed by grants or capital contributions, which is recovered through rates as principal payments on debt service, and from amounts determined by the Board to be utilized in a subsequent year to reduce customer billings (rate stabilization).

A summary of the activity of regulatory assets and deferred inflows for fiscal years 2019 and 2018 is as follows:

	<u>Sewer</u>	<u>Water</u>	<u>Total</u>
Balance - June 30, 2017 - net	\$ 489,621	\$ 79,532	\$ 569,153
Difference Between Depreciation of Capital Assets Not Financed by Grants or Capital Contributions, and Debt Service in Excess of Interest Expense	(70,597)	(37,394)	(107,991)
Rate Stabilization, Net	(6,532)	-	(6,532)
Other, Net	<u>(157)</u>	<u>8,724</u>	<u>8,567</u>
Balance - June 30, 2018 - net	412,335	50,862	463,197
Difference Between Depreciation of Capital Assets Not Financed by Grants or Capital Contributions, and Debt Service in Excess of Interest Expense	(87,547)	(39,125)	(126,672)
Other, Net	<u>3,340</u>	<u>3,475</u>	<u>6,815</u>
Balance - June 30, 2019 - net	<u>\$ 328,128</u>	<u>\$ 15,212</u>	<u>\$ 343,340</u>

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The net balance at June 30, 2019 and 2018 is presented on the statements of net position as follows:

	<u>2019</u>	<u>2018</u>	<u>Current year change</u>
Regulatory Assets	\$ 370,030	\$ 505,915	\$ (135,885)
Deferred Inflows from Regulatory Activities	(26,690)	(42,718)	16,028
Net Change	<u>\$ 343,340</u>	<u>\$ 463,197</u>	<u>\$ (119,857)</u>

The balance in the rate stabilization reserve was \$43,044 at June 30, 2019 and 2018, respectively.

(4) Deposits and Investments

The following represents essential risk information about the Authority's deposits and investments:

(a) Custodial Credit Risk – Deposits

The custodial credit risk for deposits and certificates of deposit is the risk that, in the event of a bank failure, the Authority's deposits may not be recovered.

The bank deposits at June 30, 2019 and 2018 were \$52,267 and \$40,521, respectively. Of these amounts, \$52,017 and \$40,271, were exposed to custodial credit risks as uninsured and uncollateralized.

(b) Investments

The Authority is authorized by its general bond resolution to invest in obligations of the U.S. Treasury, its agencies and instrumentalities, bonds, or notes of public agencies or municipalities, bank time deposits, guaranteed interest contracts, Massachusetts Municipal Depository Trust (MMDT) accounts, interest rate swap agreements, and repurchase agreements. All investments are held by a third-party in the Authority's name. These investments are recorded at fair value.

(c) Credit Ratings

All debt securities purchased, such as FNMA, FHLMC, and FHLB issues have historically had a credit rating of AAA or they have been collateralized to AAA. On August 8, 2011, Standard & Poor's reduced the credit rating for these agencies to AA+. The reduction in credit rating did not affect the Authority's bond covenants or escrow requirements.

The Massachusetts Municipal Depository Trust funds are not rated.

The general bond resolution limits the Authority to investing in securities that are rated in the three highest rating categories as defined by S&P and Moody's or other rating agencies.

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June 30, 2019 and 2018

(Dollars in thousands)

(d) Concentration Risk

At June 30, 2019 and 2018, the Authority had no investments, at fair value, which exceeded 5% of the Authority's total investments.

(e) Interest Rate Risk

The following is a listing of the Authority's fixed income investments and related maturity schedule as of June 30, 2019 and 2018:

June 30, 2019					
Investment maturities (in years)					
Investment Type	Fair Value	<1	1-3	4-8	>9
Mass Municipal Depository Trust	\$ 599,315	\$ 599,315	\$ -	\$ -	\$ -
U.S. Agency Obligations	238,857	-	52,787	186,070	-
U.S. Treasury Bills	9,837	9,837	-	-	-
Total	<u>\$ 848,009</u>	<u>\$ 609,152</u>	<u>\$ 52,787</u>	<u>\$ 186,070</u>	<u>\$ -</u>

June 30, 2018					
Investment maturities (in years)					
Investment Type	Fair Value	<1	1-3	4-8	>9
Mass Municipal Depository Trust	\$ 479,319	\$ 479,319	\$ -	\$ -	\$ -
U.S. Agency Obligations	246,403	17,995	23,207	197,386	7,815
U.S. Treasury Bills	9,958	9,958	-	-	-
Total	<u>\$ 735,680</u>	<u>\$ 507,272</u>	<u>\$ 23,207</u>	<u>\$ 197,386</u>	<u>\$ 7,815</u>

The majority of the Authority's investments are held in short-term money market funds and long-term investments in U.S. agency obligations that are held in the debt service reserve funds where the intent is to hold until maturity.

(f) Investment Values

The Authority categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. Debt securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Debt securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices. The Authority has no securities classified in Level 3. The investment in MMDT, an external investment pool, is measured at \$1.00 per share – the net asset value determined by the pool.

The Authority has the following recurring fair value measurements as of June 30, 2019 and 2018: U.S. Government agency obligations \$238,857 and \$246,403 (Level 2), respectively, U.S. Treasury Bills \$9,837 and \$9,958 (Level 2), respectively, and MMDT \$599,315 and \$479,319 (NAV), respectively. There are no withdrawal restrictions or unfunded commitments related to the MMDT investment.

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June 30, 2019 and 2018

(Dollars in thousands)

(g) Restricted Investments by Fund

The following summarizes restricted investments as of June 30, 2019 and 2018 by various funds and accounts established by the Authority for debt covenants and other purposes:

	<u>2019</u>	<u>2018</u>
Restricted Investments:		
Construction	\$ 189,293	\$ 105,802
Debt Service Reserves	156,687	149,933
Debt Service Principal and Interest	318,545	302,690
Debt Service - Revenue Redemption	26,134	25,075
Operating Reserve	41,952	40,070
Rate Stabilization Reserve	43,044	43,044
Revenue	30,126	29,952
Combined Reserves - Renewal and Replacement Reserve	9,158	6,747
Combined Reserves - Insurance Reserve	14,000	14,000
Insurance Related Escrow Deposits	7,409	7,115
	<u>\$ 836,348</u>	<u>\$ 724,428</u>

(5) Bond Resolution Reserves

The components of the reserves funded from revenues and required by the general and supplemental bond resolutions at June 30, 2019 and 2018 are as follows:

<u>Reserves</u>	<u>Sewer</u>	<u>Water</u>	<u>Total</u>	
			<u>2019</u>	<u>2018</u>
Renewal and Replacement	\$ 2,544	\$ 1,457	\$ 4,001	\$ 4,001
Insurance	7,000	7,000	14,000	14,000
Operating	27,326	14,629	41,955	40,073
Total	<u>\$ 36,870</u>	<u>\$ 23,086</u>	<u>\$ 59,956</u>	<u>\$ 58,074</u>

A renewal and replacement reserve of \$6,000 was established through grant receipts transferred from the Commonwealth in 1985 and is included in restricted net position at June 30, 2019 and 2018.

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June 30, 2019 and 2018

(Dollars in thousands)

(6) Notes Payable and Long-Term Debt

Long-term debt at June 30, 2019 and 2018 consisted of the following:

	<u>2019</u>	<u>2018</u>
General Revenue Bonds:		
2002 Series J, 5 1/4% to 5 1/2%, issued December 18, 2002, due 2019 to 2022	\$ 140,895	\$ 189,020
2011 Series B, 4 1/8% to 5%, issued May 19, 2011, due 2019 to 2031	6,255	7,850
2012 Series A, 3 1/4% to 5%, issued April 19, 2012, due 2022 to 2042	72,655	74,590
2014 Series D, 5%, issued November 19, 2014, due 2021 to 2044	60,165	60,165
2016 Series B, 3% to 5%, issued May 12, 2016, due 2019 to 2040	62,090	63,370
2017 Series B, 5%, issued May 18, 2017, due 2019 to 2042	66,980	68,240
2018 Series B, 3% to 5%, issued May 16, 2018, due 2019 to 2043	107,580	107,580
2019 Series B, 5%, issued May 22, 2019, due 2023 to 2044	125,000	-
Total	<u>641,620</u>	<u>570,815</u>
General Revenue Refunding Bonds:		
2007 Series B, 5 1/4%, issued February 1, 2007, due 2023 to 2038	647,950	647,950
2009 Series B, 5%, issued February 19, 2009, due 2019 to 2022	65,480	126,415
2010 Series B, 5%, issued May 6, 2010, due 2019 to 2027	85,760	95,945
2011 Series C, 3 1/8% to 5 1/4%, issued December 8, 2011, due 2022 to 2042	291,160	321,160
2012 Series B, 4 1/4% to 5%, issued April 19, 2012, due 2026 to 2029	86,775	86,775
2013 Series A, 4% to 5%, issued March 27, 2013, due 2022 to 2036	102,515	102,515
2014 Series E, 5%, issued November 19, 2014, due 2019 to 2020	5,245	15,605
2014 Series F, 4% to 5%, issued November 19, 2014, due 2021 to 2041	141,410	141,410
2016 Series C, 4% to 5%, issued May 12, 2016, due 2022 to 2040	678,185	678,185
2016 Series D, 3% to 5%, issued August 24, 2016, due 2024 to 2042	104,260	104,260
2017 Series C, 4% to 5%, issued May 18, 2017, due 2021 to 2032	245,500	249,500
2018 Series C, 5%, issued May 16, 2018, due 2023 to 2026	21,900	21,900
2019 Series C, 5%, issued May 22, 2019, due 2021 to 2022	19,190	-
Total	<u>2,495,330</u>	<u>2,591,620</u>

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(Dollars in thousands)

	<u>2019</u>	<u>2018</u>
General Revenue Bonds with the Massachusetts		
Clean Water Trust:		
1998 Series C, 4 3/4%, issued July 9, 1998	\$ -	\$ 420
1999 Series E Sewer, 4 3/4%, issued October 6, 1999, due 2019 to 2029	5,198	5,583
1999 Series E Water, 4 3/4%, issued October 6, 1999, due 2019	800	1,580
1999 Series F, 5 3/4% to 6%, issued November 3, 1999, due 2019 to 2029	162,905	181,030
2000 Series E Sewer, 5 1/4% to 5 1/2%, issued November 1, 2000, due 2019 to 2030	41,020	43,511
2000 Series E Water, 5 1/4%, issued November 1, 2000, due 2019 to 2020	1,670	2,470
2001 Series C Water, 5% , issued July 26, 2001, due 2020 to 2021	720	1,065
2001 Series D Sewer, 5 3/8% to 5 1/2%, issued July 26, 2001, due 2019 to 2029	1,015	1,532
2001 Series D Water, 5 1/2%, issued July 26, 2001, due 2019	113	224
2002 Series H Sewer, 5% to 5 1/4%, issued October 31, 2002, due 2019 to 2032	54,125	57,095
2002 Series H Water, 5% to 5 1/4%, issued October 31, 2002, due 2019 to 2022	8,475	10,415
2002 Series I Sewer, 5 1/4% to 5 1/2%, issued October 31, 2002, due 2019 to 2030	1,445	1,539
2002 Series I Water, 5 1/4%, issued October 31, 2002, due 2019 to 2020	4	6
2003 Series A Water, 5%, issued October 31, 2002, due 2019 to 2022	386	475
2003 Series B Water, 5%, issued July 24, 2003, due 2020 to 2021	652	965
2003 Series C Sewer, 5% to 5 1/4%, issued November 6, 2003, due 2019 to 2033	20,015	21,010
2003 Series C Water, 4 3/4% to 5%, issued November 6, 2003, due 2019 to 2023	6,680	7,885
2004 Series C Sewer, 5% to 5 1/4%, issued October 26, 2004, due 2019 to 2033	6,787	7,123
2004 Series C Water, 5%, issued October 26, 2004, due 2019 to 2022	295	416
2004 Series D Sewer, 4 1/2% to 5%, issued November 29, 2004, due 2019 to 2034	36,980	38,605
2004 Series D Water, 5%, issued November 29, 2004, due 2019 to 2024	5,220	5,935
2005 Series C Sewer, 5% to 5 1/4%, issued November 3, 2005, due 2019 to 2033	4,118	4,415
2005 Series C Water, 5%, issued November 3, 2005, due 2019 to 2023	350	412

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June 30, 2019 and 2018

(Dollars in thousands)

	<u>2019</u>	<u>2018</u>
General Revenue Bonds with the Massachusetts		
Clean Water Trust (Continued):		
2005 Series D Sewer, 2 3/10%, issued November 16, 2005, due 2019 to 2035	\$ 41,552	\$ 43,526
2005 Series D Water, 0% to 2%, issued November 16, 2005, due 2019 to 2025	5,413	6,168
2005 Series E Sewer, 2%, issued November 16, 2005, due 2019 to 2025	161	182
2005 Series E Water, 2%, issued November 16, 2005, due 2019 to 2025	36	41
2006 Series C Sewer, 5%, issued October 26, 2006, due 2019 to 2034	5,244	5,590
2006 Series D Sewer, 2 3/10%, issued December 14, 2006, due 2019 to 2036	39,981	41,745
2006 Series D Water, 0% to 2%, issued December 14, 2006, due 2019 to 2026	12,356	13,862
2006 Series E Sewer, 2%, issued December 14, 2006, due 2019 to 2026	168	187
2006 Series E Water, 2%, issued December 14, 2006, due 2019 to 2026	75	84
2007 Series C Sewer, 2% to 2 3/10%, issued November 9, 2007, due 2019 to 2035	2,057	2,311
2007 Series C Water, 2%, issued November 9, 2007, due 2019 to 2025	1,077	1,229
2007 Series D Sewer, 2 3/10%, issued November 9, 2007, due 2019 to 2036	16,407	17,134
2007 Series E Sewer, 2 2/5%, issued December 18, 2007, due 2019 to 2037	39,926	41,562
2007 Series E Water, 2%, issued December 18, 2007, due 2019 to 2027	9,995	10,998
2008 Series G Sewer, 2%, issued December 9, 2008, due 2019 to 2026	2,757	3,092
2008 Series G Water, 2%, issued December 9, 2008, due 2019 to 2026	588	656
2009 Series C Sewer, 2% to 2 2/5%, issued March 18, 2009, due 2019 to 2038	52,200	56,504
2009 Series C Water, 2%, issued March 18, 2009, due 2019 to 2028	16,689	18,181
2009 Series D Sewer, 2% to 2 2/5%, issued December 15, 2009, due 2019 to 2037	7,163	7,626
2009 Series D Water, 2%, issued December 15, 2009, due 2019 to 2027	690	759
2010 Series D Sewer, 2% to 2 2/5%, issued July 8, 2010, due 2019 to 2040	19,613	20,521
2010 Series D Water, 2%, issued July 8, 2010, due 2019 to 2030	14,943	16,034
2011 Series A Sewer, 2% to 2 2/5%, issued March 15, 2011, due 2019 to 2038	3,847	4,130

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(Dollars in thousands)

	<u>2019</u>	<u>2018</u>
General Revenue Bonds with the Massachusetts		
Clean Water Trust (Continued):		
2011 Series A Water, 2%, issued		
March 15, 2011, due 2019 to 2028	\$ 3,213	\$ 3,505
2012 Series C Sewer, 2% to 2 2/5%, issued		
June 6, 2012, due 2019 to 2040	5,428	5,828
2012 Series C Water, 2%, issued		
June 6, 2012, due 2019 to 2030	2,673	2,866
2012 Series D Sewer, 2% to 2 2/5%, issued		
June 13, 2012, due 2019 to 2042	32,484	34,522
2012 Series D Water, 2%, issued		
June 13, 2012, due 2019 to 2032	6,387	6,774
2013 Series B Sewer, 2% to 2 2/5%, issued		
May 22, 2013, due 2020 to 2043	22,610	24,255
2013 Series B Water, 2%, issued		
May 22, 2013, due 2020 to 2033	6,404	6,792
2014 Series C Sewer, 2% to 2 2/5%, issued		
May 30, 2014, due 2019 to 2042	4,031	4,215
2014 Series C Water, 2%, issued		
May 30, 2014, due 2019 to 2032	4,396	4,681
2015 Series A Sewer, 2% to 2 2/5%, issued		
January 7, 2015, due 2020 to 2045	41,819	43,402
2015 Series A Water, 2%, issued		
January 7, 2015, due 2020 to 2035	13,165	13,847
2015 Series B Sewer, 2% to 2 2/5%, issued		
May 14, 2015, due 2019 to 2043	2,617	2,816
2015 Series B Water, 2%, issued		
May 14, 2015, due 2019 to 2033	1,722	1,835
2016 Series A Sewer, 2% to 2 2/5%, issued		
March 11, 2016, due 2020 to 2046	35,731	36,943
2016 Series A Water, 2%, issued		
March 11, 2016, due 2020 to 2036	11,987	12,565
2017 Series A Sewer, 2%, issued		
April 13, 2017, due 2020 to 2036	8,028	8,389
2017 Series A Water, 2%, issued		
April 13, 2017, due 2020 to 2037	22,787	23,812
2018 Series E Sewer, 2%, issued		
September 12, 2018, due 2019 to 2038	17,386	-
2018 Series E Water, 2%, issued		
September 12, 2018, due 2019 to 2038	32,614	-
2019 Series A Sewer, Interim loan, issued		
January 28, 2019	32,770	-
2019 Series A Water, Interim loan, issued		
January 28, 2019	19,720	-
	<u>979,883</u>	<u>942,880</u>
Total		
General Revenue Bonds (Variable Rates):		
1999 Series B, 1.02% to 2.51%, issued		
January 29, 1999, due 2019 to 2028	50,700	54,700
	<u>50,700</u>	<u>54,700</u>
Total		

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	<u>2019</u>	<u>2018</u>
General Revenue Refunding Bonds (Variable Rates):		
2002 Series C, 0.53% to 2.18%, issued August 15, 2002, due 2020	\$ 35,120	\$ 35,120
2008 Series A, 0.94% to 2.33%, issued May 29, 2008, due 2019 to 2037	203,940	209,425
2008 Series C, 0.87% to 2.16%, issued May 29, 2008, due 2019 to 2026	70,700	86,300
2008 Series E, 0.94% to 2.32%, issued May 29, 2008, due 2020 to 2037	133,640	133,640
2012 Series E, 1.39% to 2.75%, issued November 15, 2012, due 2019 to 2031 (Direct Borrowing)	58,435	59,950
2012 Series G, 1.34% to 2.70%, issued November 15, 2012, due 2019 to 2023 (Direct Borrowing)	26,500	36,900
2014 Series A, 1.93% to 2.36%, issued May 20, 2014, due 2022 to 2025 (Direct Borrowing)	50,000	50,000
2014 Series B, 2.01% to 2.44%, issued May 20, 2014, due 2019 to 2022 (Direct Borrowing)	54,095	64,755
2018 Series A, 2.00% to 2.36%, issued March 26, 2018, due 2019 to 2031 (Direct Borrowing)	49,095	50,610
2018 Series D, 1.34% to 2.70%, issued May 31, 2018, due 2025 to 2029 (Direct Borrowing)	<u>50,000</u>	<u>50,000</u>
Total	<u>731,525</u>	<u>776,700</u>
Revolving Loan:		
2015 Series C, issued November 1, 2015, due 2021	<u>53,000</u>	<u>53,000</u>
Total	<u>4,952,058</u>	<u>4,989,715</u>
Less:		
Unamortized Bond Premiums and Discounts	391,722	391,624
Current Portion of Long-Term Debt	<u>(237,918)</u>	<u>(225,917)</u>
Total	<u>153,804</u>	<u>165,707</u>
Long-Term Debt, Net	<u>\$ 5,105,862</u>	<u>\$ 5,155,422</u>

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June 30, 2019 and 2018

(Dollars in thousands)

Long-term obligations at June 30, 2019 and 2018 consisted of the following:

	2019			2019	Due
	Beginning	Additions	Reductions	Ending	Within
	Balance			Balance	One Year
General Revenue Bonds	\$ 625,515	\$ 125,000	\$ 58,195	\$ 692,320	\$ 33,615
General Revenue Refunding Bonds	3,056,105	19,190	136,565	2,938,730	112,230
Refunding from Direct Borrowings	312,215	-	24,090	288,125	24,990
General Revenue Bonds with the Massachusetts Clean Water Trust	942,880	102,490	65,487	979,883	67,083
Borrowings Associated with Derivative Instruments	36,894	-	2,940	33,954	-
Revolving Loan	53,000	-	-	53,000	-
Total	\$ 5,026,609	\$ 246,680	\$ 287,277	\$ 4,986,012	\$ 237,918
	2018			2018	Due
	Beginning	Additions	Reductions	Ending	Within
	Balance			Balance	One Year
General Revenue Bonds	\$ 580,035	\$ 107,580	\$ 62,100	\$ 625,515	\$ 52,665
General Revenue Refunding Bonds	3,152,800	21,900	118,595	3,056,105	83,675
Refunding from Direct Borrowings	275,145	100,610	63,540	312,215	24,090
General Revenue Bonds with the Massachusetts Clean Water Trust	1,006,451	565	64,136	942,880	65,487
Borrowings Associated with Derivative Instruments	39,834	-	2,940	36,894	-
Revolving Loan	79,000	-	26,000	53,000	-
Total	\$ 5,133,265	\$ 230,655	\$ 337,311	\$ 5,026,609	\$ 225,917

The Authority is required to establish water and sewer rates and charges at a level sufficient to provide, among other things, primary and subordinated debt service coverage ratios of 120% and 110%, respectively. For the year ended June 30, 2019, the Authority had primary and subordinated debt service coverage ratios of 192% and 118%, respectively.

Under the Authority's General Revenue Bond Resolution, all revenues, together with the investment earnings thereon, except to the extent that such earnings are required to be deposited in the Rebate Fund pursuant to a Supplemental Resolution, are pledged for payment of the Bonds.

The Act of 1984 imposes a limitation of \$600,000 on the total amount of bonds and notes which may be outstanding at any one time. The Authority has requested increases in its debt limit as necessary to allow for issuances of bonds in amounts required to finance the capital program. The state legislature increased the debt limit to \$6,450,000.

On May 22, 2019, the Authority issued General Revenue Bonds, 2019 Series B for \$125,000 and General Revenue Refunding Bonds, 2019 Series C for \$19,190.

The proceeds from the Series B bonds were used to finance new construction projects. The interest rate on these bonds is 5%.

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(Dollars in thousands)

The proceeds from the Series C bonds were used to refund \$20,340 of General Revenue Refunding Bonds 2009 Series B. The interest rate on these bonds is 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$1,619 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$1,551.

On May 31, 2018, the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series D for \$50,000. The proceeds from these bonds were used to retire commercial paper notes.

On May 16, 2018, the Authority issued General Revenue Bonds, 2018 Series B for \$107,580 and General Revenue Refunding Bonds, 2018 Series C for \$21,900.

The proceeds from the Series B bonds were used to finance new construction projects and to retire commercial paper notes (\$25,000) and a portion of the 2015 Series C Revolving Loan (\$26,000). The interest rate on these bonds is 3% to 5%.

The proceeds from the Series C bonds were used to refund \$24,935 of General Revenue Refunding Bonds 2006 Series B. The interest rate on these bonds is 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$4,426 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$3,808.

On March 26, 2018, the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series A for \$50,610. The proceeds from these bonds were used to refund in full the General Revenue Refunding Bonds, 2012 Series F.

The variable interest rate on these bonds will be based on 81.5% of LIBOR set on the first business day of each month. The monthly payment will be a combination of this variable interest and a fixed component of 37 basis points for 2018 Series A.

On November 1, 2015, the Authority entered into a revolving credit agreement with a bank. The Authority shall repay the loan at the Commitment Termination Date, November 17, 2021, at which point the Authority can elect to convert the revolving loan into a term loan. Interest is payable at 80% of the 1 month LIBOR rate, 2.40% and 2.09% at June 30, 2019 and 2018, respectively. Initial drawdown was \$100,000, which was reduced to \$79,000 at June 30, 2016. The balance was further reduced in fiscal year 2018 to \$53,000 using the proceeds from the General Revenue Bonds, 2018 Series B.

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Synthetic Fixed Rate Swap Transactions

In connection with several of its bond issues, the Authority has entered into various interest rate swap agreements to reduce the impact of changes in interest rates on its variable rate debt. Under these agreements, the Authority pays a fixed interest rate (ranging from 4.0% to 5.5%) and receives interest from the swap counterparties at a variable rate (either Securities Industry and Financial Markets Association (SIFMA) rate or a percentage of LIBOR). The SIFMA rate is based on the seven-day high-grade market index of tax-exempt variable rate demand obligations.

Item	Objective	Effective Date	Current Notional Amount	Termination Date	Fixed Payable Swap Rate	Variable Receivable Swap Rate	Fair Value at June 30,	
							2019	2018
A	Hedge changes in cash flows on the 2008 Series A Bonds	April 4, 2011	\$ 133,300	August 1, 2030	5.144%	67% LIBOR Plus 0.13%	\$ (8,747)	\$ (4,764)
B	Hedge changes in cash flows on the 2008 Series E Bonds	October 28, 2008	133,300	August 1, 2030	5.494	SIFMA	(15,272)	(11,284)
C	Hedge changes in cash flows on the 2008 Series A and 2008 Series E Bonds	August 1, 2030	70,400	August 1, 2037	6.585	67% LIBOR Plus 0.13%	(3,434)	(2,186)
D	Hedge changes in cash flows on the 2008 Series C Bonds	May 29, 2008	58,015	November 1, 2026	3.994	SIFMA	(3,860)	(3,380)
E	Hedge changes in cash flows on the 2008 Series C and 2012 Series G Bonds	May 29, 2008	38,680	November 1, 2026	4.033	SIFMA	(327)	626
Total							<u>\$ (31,640)</u>	<u>\$ (20,988)</u>

All of the above are pay-fixed interest rate swap agreements. Under these interest rate swap agreements, the Authority incurred net interest expense of \$12,290 and \$14,676 in fiscal year 2019 and fiscal year 2018, respectively.

For the swap effective on April 4, 2011, with a current notional amount of \$133,300, the fixed rate paid by the Authority is as follows: 4.120% from execution until August 2013, 5.144% from August 2013 until August 2019, and 6.585% from August 2019 until August 2030.

For the swap execution on October 28, 2008, with a current notional amount of \$133,300, the fixed rate paid by the Authority is as follows: 4.470% from execution until August 2013, 5.494% from August 2013 until August 2019, and 6.935% from August 2019 until August 2030.

The aggregate fair value balance of the derivative instruments at June 30, 2019 and 2018 is \$(31,640) and \$(20,988), respectively, and is reflected on the Authority's statements of net position as a liability for derivative instruments. This liability is offset by deferred outflows from derivative instruments. The original notional amounts of the interest rate swaps totaled \$535,895.

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The fair values of the interest rate swaps were estimated using the zero-coupon method. This method calculates the future net settlement payments required by the swap, assuming that the current forward rates implied by the yield curve correctly anticipate future spot interest rates. These payments are then discounted using the spot rates implied by the current yield curve for hypothetical zero-coupon bonds due on the date of each future net settlement on the swaps. The interest rate swaps are classified in Level 2 of the fair value hierarchy, as outlined in Government Accounting Standards Board Statement No. 72, *Fair Value Measurement and Application*, as valued using a market approach that considers benchmark interest rates.

Risk Disclosure

Credit Risk - Because all of the Authority's swaps rely upon the performance of the third parties who serve as swap counterparties, the Authority is exposed to credit risk, or the risk that a swap counterparty fails to perform according to its contractual obligations. The appropriate measurement of this risk at the reporting date is the fair value of the swaps, as shown in the columns labeled Fair Value in the tables above. To mitigate credit risk, the Authority maintains strict credit standards for swap counterparties. The Authority monitors swap counterparties' credit ratings by the three rating agencies (FitchRatings, Moody's Investors Service, and S&P Global Ratings). Collateral may be obtained from any counterparty that does not maintain a set credit rating. Since all derivatives are in a liability position, there is no amount exposed to credit risk.

The following represents the credit ratings of the counterparties as of June 30, 2019:

<u>Derivative instrument</u>	<u>Counterparty credit rating</u>
Derivative A	A+
Derivative B	AA-
Derivative C	A+
Derivative D	A
Derivative E	A

Basis Risk - The Authority is exposed to basis risk because the floating index the Authority receives on the swaps (SIFMA or 67% of LIBOR) may be different than the basis of the variable rate on the associated bonds. Should this occur, the expected savings may not be realized.

Termination Risk - The Authority or its counterparties may terminate a derivative instrument if the other party fails to perform under the terms of the contract. If, at the time of termination, a derivative is in a liability position, the Authority would be liable to the counterparty for a payment equal to the liability, subject to netting arrangements.

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Rollover Risk - The Authority can be exposed to rollover risk on hedging derivative instruments that are hedges of debt that terminate prior to the maturity of the debt. The Authority currently has no rollover risk. When derivative instruments A and B terminate in 2030, those bond series will then be hedged by derivative instrument C.

Swap Payments and Associated Bonds Outstanding

Bonds outstanding include certain variable rate bonds where the Authority pays a fixed interest rate and receives interest at a variable rate from the counterparty. The table below presents the debt service requirements and related net swap payments for these bonds. As rates vary, variable rate interest payments will vary.

Using rates as of June 30, 2019, debt service requirements of the hedged variable rate bonds and net swap payments, assuming current interest rates remain constant, were as follows:

<u>Fiscal Year Ending June 30:</u>	<u>Variable-rate</u>		<u>Interest Rate</u>	<u>Total</u>
	<u>Principal</u>	<u>Interest</u>	<u>Swaps, Net</u>	
2020	\$ 27,000	\$ 5,219	\$ 14,155	\$ 46,374
2021	70,400	4,201	14,685	89,286
2022	32,230	3,285	12,360	47,875
2023	67,345	2,655	9,482	79,482
2024	15,025	2,422	7,265	24,712
2025–2029	80,895	7,301	22,445	110,641
2030–2034	16,800	5,115	12,833	34,748
2035–2038	53,600	1,337	3,829	58,766
Total	<u>\$ 363,295</u>	<u>\$ 31,535</u>	<u>\$ 97,054</u>	<u>\$ 491,884</u>

Demand Bonds

Included in variable rate long-term debt of \$782,225 is \$494,100 of subordinated variable rate demand obligations (VRDOs). The bonds were issued on various dates from 1999 through 2008. Subordinated VRDOs are subject to purchase on the demand of the holder at a price equal to principal plus accrued interest. The ability of the Authority to purchase such bonds, if not remarketed, is secured through letters of credit and standby bond purchase agreements with various nationally recognized financial institutions that expire between May 2020 and August 2022. The VRDOs are classified as long-term debt because the liquidity agreement for each series contains term out provisions that, if demand is made to repurchase the bonds, calls for a two to three year amortization to repay the bonds.

In 2014, \$114,755 of 2014 Series A and B General Revenue Refunding Bonds were issued as direct-purchase bonds, to be held by the purchaser for a specific period of time and are not subject to purchase or remarketing at the demand of the holder and therefore do not require a letter of credit or standby bond purchase agreement. The \$50,000 of Series A and \$64,755 of Series B have been purchased through May 2020 and August 2022, respectively. These bonds, with a current total of \$104,095, in addition to 2012 Series E & G General Revenue Refunding Bonds, totaling \$84,935, have two to three year term out provisions beginning at the expiration date.

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At June 30, 2019, the following bonds outstanding are considered defeased in-substance:

<u>Description</u>	<u>Redemption date</u>	<u>Redemption price</u>	<u>Outstanding principal amount</u>
1992 Series A	2019	100	\$ 18,515
2002 Series J	2020	100	7,630
2009 Series A	2019	100	76,445
2009 Series B	2019	100	186,060
2010 Series A	2019-2020	100	95,265
2010 Series B	2019-2020	100	51,095
2011 Series B	2019-2021	100	124,285
2012 Series A	2020 and 2022	100	54,800
2013 Series A	2019-2022	100	4,185
2014 Series D	2019-2020, 2024	100	8,295
2014 Series E	2019	100	2,950
2014 Series F	2020	100	115
2016 Series B	2020	100	1,360
2017 Series C	2020	100	5,245

The proceeds and available funds were deposited in irrevocable trusts with escrow agents in an amount which will provide for payment of interest due to the redemption date and redemption of the defeased bonds outstanding on such date. The defeased portion of such debt, accrued interest thereon, and related unamortized issuance and discount costs were removed from the statements of net position in an in-substance defeasance transaction.

In June 2019, the Authority used funds on hand to defease \$4,150 of the 2002 Series J General Revenue Bonds and \$20,000 of the 2009 Series B General Revenue Refunding Bonds outstanding.

In September 2018, the Authority used funds on hand to defease \$1,380 of the 2002 Series J General Revenue Bonds and \$12,550 of the 2009 Series B General Revenue Refunding Bonds outstanding.

In June 2018, the Authority used funds on hand to defease \$2,100 of the 2002 Series J, and \$1,380 of the 2014 Series D General Revenue Bonds and \$5,495 of the 2006 Series B, \$15,200 of the 2009 Series B and \$5,245 of the 2017 Series C General Revenue Refunding Bonds outstanding.

In October 2017, the Authority used funds on hand to defease \$1,390 of the 2010 Series A, \$510 of the 2011 Series B and \$1,360 of the 2016 Series B General Revenue Bonds and \$3,610 of the 2009 Series B and \$2,700 of the 2010 Series B General Revenue Refunding Bonds outstanding.

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At June 30, 2019, outstanding bonds that are redeemable before their scheduled due dates are as follows:

Description	Redemption date	Redemption price	Outstanding principal amount
2010 Series B	August 2020	100	\$ 66,870
2011 Series B	August 2021	100	840
2011 Series C	August 2021	100	291,160
2012 Series A	August 2022	100	69,150
2012 Series B	August 2022	100	86,775
2013 Series A	August 2023	100	46,515
2014 Series D	August 2024	100	53,885
2014 Series F	August 2024	100	93,655
2016 Series B	August 2026	100	54,775
2016 Series C	August 2026	100	610,650
2016 Series D	August 2026	100	98,425
2017 Series B	August 2020	100	2,845
2017 Series B	August 2027	100	55,775
2017 Series C	August 2027	100	114,795
2018 Series B	August 2025	100	23,940
2018 Series B	August 2028	100	75,940
2019 Series B	August 2029	100	70,265

The variable rate General Revenue Bonds are subject to redemption prior to maturity at the option of the Authority in whole or in part, on any interest payment date for bond Series 1999B and 2002C and on any business day for bond Series 2008A, 2008C, 2008E, 2012G, 2014A, 2014B, 2018A and 2018D, respectively. Series 2012E is subject to redemption prior to maturity on any interest payment date after November 15, 2014.

During fiscal year 2019, the Authority executed loan agreements with the Massachusetts Clean Water Trust providing for 2018 Series E Sewer and Water loans in the principal amounts of \$17,386 and \$32,614, respectively. The Authority also executed interim loan agreements with the Massachusetts Clean Water Trust providing for 2019 Series A Sewer and Water loans in the principal amounts of \$32,770 and \$19,720, respectively. All proceeds for these loans were received by June 30, 2019.

Federal and Commonwealth subsidies for purposes of offsetting principal payments aggregating \$29,340 will be recognized as capital grants in aid of construction over the term of the loans.

Interest is payable semiannually on all debt, except on the commercial paper, on which interest is payable upon maturity and the General Revenue Bonds and General Revenue Refunding Bonds with variable interest rates on which interest is payable monthly. The Senior General Revenue Bonds and the General Revenue Refunding Bonds are collateralized equally and ratably by a lien and pledge on substantially all of the Authority's cash and revenues, except the operating fund.

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The subordinated debt series, including the commercial paper interest are collateralized equally and ratably by a subordinated pledge on substantially all of the Authority's revenues and cash and investments, except the operating, senior debt service, and debt service reserve funds. Premiums, discounts, issuance costs, and the excess of reacquisition price over the carrying amount of the defeased debt are being amortized over the lives of the respective issues.

The amounts of long-term debt, principal, and interest payable in future fiscal years are as follows:

<u>Year Ending June 30:</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
2020	\$ 237,918	\$ 207,755	\$ 445,673
2021	245,512	198,517	444,029
2022	295,807	188,943	484,750
2023	273,192	176,217	449,409
2024	299,389	165,639	465,028
2025–2029	1,404,053	636,522	2,040,575
2030–2034	992,883	368,114	1,360,997
2035–2039	814,936	176,362	991,298
2040–2044	375,430	32,481	407,911
2045–2046	12,938	365	13,303
Total	<u>\$ 4,952,058</u>	<u>\$ 2,150,915</u>	<u>\$ 7,102,973</u>

In fiscal year 2019 the Authority had \$75,000 of commercial paper notes outstanding. In fiscal year 2018 the Authority issued commercial paper notes of \$51,000 to finance capital expenditures.

These notes are secured by \$100,000 and \$150,000 irrevocable direct-pay letters of credit which expire on December 8, 2021, and April 12, 2023, respectively. These letters of credit carry a fee of 0.45% and 0.265% per annum, respectively, on the amount available. The maximum aggregate principal amount of commercial paper which may be outstanding at any one time is \$250,000.

Commercial paper at June 30, 2019 and 2018 consisted of the following:

	<u>2019 Beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2019 Ending balance</u>
0.94% Commercial Paper	\$ 75,000	\$ -	\$ 75,000	\$ -
1.86% Commercial Paper	-	75,000	-	75,000
Total	<u>\$ 75,000</u>	<u>\$ 75,000</u>	<u>\$ 75,000</u>	<u>\$ 75,000</u>
	<u>2018 Beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2018 Ending balance</u>
0.90% Commercial Paper	\$ 50,000	\$ -	\$ 50,000	\$ -
0.94% Commercial Paper	49,000	51,000	25,000	75,000
Total	<u>\$ 99,000</u>	<u>\$ 51,000</u>	<u>\$ 75,000</u>	<u>\$ 75,000</u>

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(7) Accounts Receivable/Intergovernmental Loans

The Authority has entered into various interest-free loan agreements with certain member communities. Under these agreements, the Authority loaned these communities \$50,641 and \$41,317 in fiscal years 2019 and 2018, respectively, to be received in five or ten equal annual installments.

The long-term portion of these loans at June 30, 2019 and 2018 is \$151,756 and \$133,871, respectively, and is included in other assets. The loans due within one year total \$32,732 and \$31,254 at June 30, 2019 and 2018, respectively. This program is designed to assist member communities with sewer and water systems rehabilitation.

(8) Capital Assets

Capital assets at June 30, 2019 and 2018 consisted of the following:

	<u>2018</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2019</u>
Capital assets not being depreciated:				
Land	\$ 29,878	\$ 7	\$ -	\$ 29,885
Construction in progress	180,525	86,441	(117,172)	149,794
Total capital assets not being depreciated	<u>210,403</u>	<u>86,448</u>	<u>(117,172)</u>	<u>179,679</u>
Capital assets being depreciated:				
Plant and equipment – water and sewage system	9,730,790	116,200	-	9,846,990
Furniture and fixtures	17,543	18	-	17,561
Leasehold improvements	2,423	-	-	2,423
Motor vehicles and equipment	9,933	947	-	10,880
Total capital assets being depreciated	<u>9,760,689</u>	<u>117,165</u>	<u>-</u>	<u>9,877,854</u>
Less: accumulated depreciation for:				
plant and equipment – water and sewage system	3,999,993	193,508	-	4,193,501
Furniture and fixtures	17,411	82	-	17,493
Leasehold improvements	2,144	12	-	2,156
Motor vehicles and equipment	3,194	773	-	3,967
Total accumulated depreciation	<u>4,022,742</u>	<u>194,375</u>	<u>-</u>	<u>4,217,117</u>
Total capital assets being depreciated, net	<u>5,737,947</u>	<u>(77,210)</u>	<u>-</u>	<u>5,660,737</u>
Total capital assets, net	<u>\$ 5,948,350</u>	<u>\$ 9,238</u>	<u>\$ (117,172)</u>	<u>\$ 5,840,416</u>

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Capital assets at June 30, 2018 and 2017 consisted of the following:

	<u>2017</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2018</u>
Capital assets not being depreciated:				
Land	\$ 29,873	\$ 5	\$ -	\$ 29,878
Construction in progress	<u>127,423</u>	<u>110,252</u>	<u>(57,150)</u>	<u>180,525</u>
Total capital assets not being depreciated	<u>157,296</u>	<u>110,257</u>	<u>(57,150)</u>	<u>210,403</u>
Capital assets being depreciated:				
Plant and equipment – water and sewage system	9,668,357	62,433	-	9,730,790
Furniture and fixtures	17,543	-	-	17,543
Leasehold improvements	2,423	-	-	2,423
Motor vehicles and equipment	<u>8,898</u>	<u>1,035</u>	<u>-</u>	<u>9,933</u>
Total capital assets being depreciated	<u>9,697,221</u>	<u>63,468</u>	<u>-</u>	<u>9,760,689</u>
Less: accumulated depreciation for:				
plant and equipment – water and sewage system	3,809,141	190,852	-	3,999,993
Furniture and fixtures	17,330	81	-	17,411
Leasehold improvements	2,132	12	-	2,144
Motor vehicles and equipment	<u>2,500</u>	<u>694</u>	<u>-</u>	<u>3,194</u>
Total accumulated depreciation	<u>3,831,103</u>	<u>191,639</u>	<u>-</u>	<u>4,022,742</u>
Total capital assets being depreciated, net	<u>5,866,118</u>	<u>(128,171)</u>	<u>-</u>	<u>5,737,947</u>
Total capital assets, net	<u>\$ 6,023,414</u>	<u>\$ (17,914)</u>	<u>\$ (57,150)</u>	<u>\$ 5,948,350</u>

Depreciation and amortization for fiscal years 2019 and 2018 was \$207,127 and \$202,799, respectively.

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(9) Leases

Operating

The Authority leases office space in Boston and other property under long-term operating leases. Future minimum rental payments required under operating leases having initial or remaining non-cancelable lease terms in excess of one year at June 30, 2019 are as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2020	\$ 1,726
2021	1,748
2022	1,724
2023	1,621
Total	<u>\$ 6,819</u>

Rental expense was \$3,744 and \$3,865 in fiscal years 2019 and 2018, respectively. Electrical power asset capacity charges and operation and maintenance charges are disclosed in Note 12.

Capital

In fiscal year 2002, the Authority entered into a 30-year capital lease agreement for the new maintenance facility. The interest rate for the capital lease is 7.83%. Future minimum lease payments for the capital lease at June 30, 2019 are as follows:

<u>Year Ending June 30:</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
2020	\$ 1,217	\$ 2,000	\$ 3,217
2021	1,316	1,901	3,217
2022	1,423	1,794	3,217
2023	1,538	1,679	3,217
2024	1,663	1,554	3,217
2025–2029	10,571	5,512	16,083
2030–2032	<u>8,365</u>	<u>1,019</u>	<u>9,384</u>
Total	<u>\$ 26,093</u>	<u>\$ 15,459</u>	<u>\$ 41,552</u>

Under this lease, the Authority is also responsible for “Additional Rent,” as defined in the lease. The Additional Rent includes real estate taxes, assessments, and other government charges.

The associated capital asset is reported in plant and equipment – water and sewage system at a cost of \$37,134 with \$21,043 of accumulated depreciation as of June 30, 2019.

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(10) Retirement Benefits

(a) Plan Description

The Enabling Act provided for the establishment of the Massachusetts Water Resources Authority Employees' Retirement System (the Plan), a contributory single-employer retirement system that is separate from the State Employees Retirement System. The Plan is a defined benefit pension plan covering those employees not employed by the MDC prior to July 1, 1985. Complete financial statements for the Plan can be obtained from the Authority's administrative offices at Charlestown Navy Yard, 100 First Avenue, Boston, MA 02129.

(b) Benefits Provided

The Plan provides retirement, disability and death benefits. For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 65, this percentage is 2.5%, which is reduced for individuals who retire prior to age 65 to reflect the longer pay out period.

For employees hired on or after April 2, 2012, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 67, this percentage is 2.5%.

Employees hired prior to April 2, 2012, may elect early retirement after 20 years of service or at any time after attaining age 55 with 10 years of eligible service. Plan members who become permanently and totally disabled may be eligible to receive a disability retirement allowance. The amount of benefits to be received depends on several factors, including the member's age, compensation, veteran status, years of service and whether or not the disability is work-related. In addition, certain death benefits exist for beneficiaries of employees who die in active service.

All MDC personnel who became employees of the Authority on July 1, 1985, and were members of the State Employees Retirement System, retained their membership in that system. The Authority is not liable for retirement allowances paid to or on account of these employees. Funding of the pension liability of the State Employees Retirement System is the obligation of the Commonwealth. Employees covered by this plan become 100% vested after 10 years of service.

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(c) Employees Covered by Benefit Terms

At December 31, 2018 (the date of the Plan's latest actuarial valuation), the following employees were covered by the benefit terms:

Retired Participants and Beneficiaries Receiving Benefits	625
Inactive Participants Entitled to a Return of their Employee Contributions	69
Inactive Participants with a Vested Right to a Deferred or Immediate Benefit	36
Active Participants	<u>1,109</u>
Total	<u><u>1,839</u></u>

(d) Contributions

Contributions made by employees are based upon a percentage of employee base pay (5% for employees hired before December 31, 1974, 7% for employees hired between January 1, 1975 and December 31, 1983, 8% for employees hired between December 31, 1983, and June 30, 1996, and 9% for employees hired after July 1, 1996). Additionally, certain employees earning in excess of \$30 contribute an extra 2% of their salary effective January 1, 1979. Employees receive full payment of contributions upon withdrawal from the Plan and 50% of interest earned for employees with five to nine years of service or 100% of interest earned for employees with 10 or more years of service.

The Authority's 2019 and 2018 contributions to the plan were based on an amount approved by the Retirement Board and the Authority's board of directors, which is based on an actuarially determined amount. The Authority's Enabling Act requires funding to be made in accordance with the Retirement Board's recommendation. In fiscal year 2019 the Authority made a \$7.0 million required contribution. In fiscal year 2018 the Authority made a \$3.3 million required contribution.

(e) Net Pension Liability

The Plan's net pension liability was measured as of December 31, 2018 and 2017. The total pension liability was determined by an actuarial valuations as of January 1, 2019 and January 1, 2018, respectively.

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Actuarial assumptions: The total pension liability in the January 1, 2019 and January 1, 2018 actuarial valuations were determined using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3%
Salary Increases	Based on years of service, starting at 5.75% at 0 years of service decreasing to 4% after 9 years of service
Investment Rate of Return	7.25% at December 31, 2018; 7.5% at December 31, 2017
Cost of Living Adjustments	3% of first \$13,000, increasing to 3% of first \$14,000 as of July 1, 2020 and to 3% of first \$15,000 as of July 1, 2021 at December 31, 2018; 3% of the first \$13,000 at December 31, 2017
Mortality Rates:	
Pre-Retirement:	RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017
Healthy Retiree:	RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017
Disabled Retiree:	RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year projected generationally with Scale MP-2017

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Rates of returns on investments: The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Plan's target asset allocation are summarized as follows:

<u>Asset Class</u>	<u>Target Allocation (%)</u>	<u>Long-Term Expected Rate of Return (%)</u>	
		<u>December 31, 2018</u>	<u>December 31, 2017</u>
Domestic Equity	22%	6.16	6.15
International Equity	20	6.69 - 9.47	7.11 - 9.41
Real Estate	10	4.58	4.9
Private Equity	10	10	10.28
Hedge Funds	17	3.68	3.94
Fixed Income	<u>21</u>	1.89 - 4.0	1.68 - 4.13
Total	<u><u>100%</u></u>		

(f) Discount Rate

The discount rate used to measure the total pension liability was 7.25% and 7.50% for December 31, 2018 and 2017, respectively. The projection of cash flows used to determine the discount rate assumed that Plan member contributions will be made at the current contribution rate and that the Authority contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current Plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

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(Dollars in thousands)

(g) Changes in the Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at June 30, 2017	\$ 511,406	\$ 465,602	\$ 45,804
Changes for the Year:			
Service Cost	11,308	-	11,308
Interest	38,520	-	38,520
Differences Between Expected and actual experience	(146)	-	(146)
Contributions - employer	-	3,277	(3,277)
Contributions - employee	-	9,091	(9,091)
Net investment income	-	70,517	(70,517)
Benefit payments	(18,222)	(18,222)	-
Administrative expenses	-	(447)	447
Changes of assumptions	7,977	-	7,977
Net changes	39,437	64,216	(24,779)
Balances at June 30, 2018	550,843	529,818	21,025
Changes for the year:			
Service cost	11,762	-	11,762
Interest	41,392	-	41,392
Differences between expected and actual experience	3,250	-	3,250
Contributions - employer	-	7,000	(7,000)
Contributions - employee	-	9,484	(9,484)
Net investment income	-	(17,114)	17,114
Benefit payments	(21,428)	(21,428)	-
Administrative expenses	-	(469)	469
Change of benefit terms	5,027	-	5,027
Changes of assumptions	16,401	-	16,401
Net changes	56,404	(22,527)	78,931
Balances at June 30, 2019	\$ 607,247	\$ 507,291	\$ 99,956

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(h) Sensitivity of the Net Pension Liability (Asset) to Changes in the Discount Rate

The following presents the net pension liability (asset), calculated using the discount rate of 7.25% and 7.50%, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is 1-percentage-point lower (6.25% and 6.50%) or 1-percentage-point higher (8.25% and 8.50%) than the current rate:

	1% Decrease (6.25%)	Current Discount (7.25%)	1% Increase (8.25%)
Net pension liability as of June 30, 2019	<u>\$ 175,471</u>	<u>\$ 99,956</u>	<u>\$ 35,953</u>
	1% Decrease (6.50%)	Current Discount (7.50%)	1% Increase (8.50%)
Net pension liability (asset) as of June 30, 2018	<u>\$ 89,971</u>	<u>\$ 21,025</u>	<u>\$ (37,437)</u>

(i) Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

For the years ended June 30, 2019 and 2018, the Authority recognized pension expense of \$30,146 and \$12,408, respectively, and reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	June 30, 2019		June 30, 2018	
	Deferred Outflow of Resources	Deferred Inflow of Resources	Deferred Outflow of Resources	Deferred Inflow of Resources
Differences between expected and actual experience	\$ 2,709	\$ 6,066	\$ -	\$ 9,010
Changes of assumptions	26,455	-	17,154	-
Net difference between projected and actual earnings on pension plan investments	<u>34,877</u>	<u>-</u>	<u>-</u>	<u>5,953</u>
Total	<u>\$ 64,041</u>	<u>\$ 6,066</u>	<u>\$ 17,154</u>	<u>\$ 14,963</u>

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2020	\$ 17,888
2021	11,466
2022	9,436
2023	15,910
2024	<u>3,275</u>
Total	<u>\$ 57,975</u>

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Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(11) Other Postemployment Benefits (OPEB)

(a) Plan Description

In addition to providing the pension benefits described, the Authority provides postemployment health care and life insurance benefits for retired employees through the Group Insurance Commission (GIC). The GIC is a quasi-independent state agency that administers an agent multi-employer defined benefit OPEB plan. The benefits, benefit levels, employee contributions and employer contributions are governed by the Authority and can be amended by the Authority. The plan does issue a separate financial report that can be obtained by contacting the Massachusetts Water Resources Authority, Finance Division, 100 First Avenue, Boston, MA 02129.

In April, 2015, the Authority established the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The Trust was established for the sole purpose of providing for the advance funding of future costs of retired employee health insurance and other benefits provided to retirees. An initial deposit of \$10.8 million was made to the trust upon establishment of the trust. The balance of the trust was \$37.1 million and \$29.8 million at June 30, 2019 and June 30, 2018, respectively.

(b) Plan Membership

At June 30, 2019 plan membership consisted of the following:

Inactive plan members or beneficiaries currently receiving benefits	833
Inactive plan members entitled to but not yet receiving benefits	36
Active plan members	<u>950</u>
Total	<u><u>1,819</u></u>

(c) Benefits Provided

The Authority provides medical, prescription drug, mental health/substance abuse and life insurance to retirees and their covered dependents. All active employees who retire from the Authority and meet the eligibility criteria will receive these benefits.

(d) Contributions

Retirees who retired on or before July 1, 1994 contribute 10% of the cost of the health plans, as determined by the GIC. Those who retired after July 1, 1994 contribute 15% of the cost of the health plan and those who retired after October 1, 2009 contribute 20% of the cost of the health plan, as determined by the GIC. The Authority contributes the remainder of the health plan costs on a pay-as-you-go basis.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(e) Investments

Investment policy. The assets are invested by the Trust with the Commonwealth of Massachusetts Pension Reserves Investment Trust (PRIT) fund. The Trust's Board of Trustees may vote to approve a different investment vehicle, at its discretion. The following was the PRIT fund's asset allocation at June 30, 2019:

<u>Asset Class</u>	<u>Target Allocation (%)</u>
Global Equity	39%
Fixed Income	23
Private Equity	13
Real Estate	10
Other	<u>15</u>
Total	<u><u>100 %</u></u>

Concentrations. No investment in any one organization represented 5% or more of the Trust's investments.

Rate of return. For the year ended June 30, 2019 and 2018, the annual money-weighted rate of return on investments, net of investment expense was 5.80% and 8.58%, respectively. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(f) Changes in the Net OPEB Liability

	Increase (Decrease)		
	Total OPEB Liability (a)	Plan Fiduciary Net Position (b)	Net OPEB Liability (a) - (b)
Balances at June 30, 2017	\$ 154,254	\$ 22,782	\$ 131,472
Changes for the year:			
Service cost	2,820	-	2,820
Interest	10,821	-	10,821
Differences between expected and actual experience	(11,860)	-	(11,860)
Contributions - employer	-	10,093	(10,093)
Net investment income	-	1,956	(1,956)
Benefit payments	(5,057)	(5,057)	-
Net changes	(3,276)	6,992	(10,268)
Balances at June 30, 2018	150,978	29,774	121,204
Changes for the year:			
Service cost	4,463	-	4,463
Interest	10,705	-	10,705
Differences between expected and actual experience	-	-	-
Contributions - employer	-	10,656	(10,656)
Net investment income	-	1,724	(1,724)
Benefit payments	(5,082)	(5,082)	-
Net changes	10,086	7,298	2,788
Balances at June 30, 2019	\$ 161,064	\$ 37,072	\$ 123,992

Actuarial assumptions. The total OPEB liability was determined by an actuarial valuation as of December 31, 2017, and update procedures were used to roll forward the total OPEB liability to June 30, 2019 and 2018. The following actuarial assumptions, applied to all periods included in the measurement, unless otherwise specified:

Inflation	3.0%
Salary increases	5.75%, decreasing over 9 years to an ultimate of 4.0%
Investment rate of return	7.0%, net of OPEB plan investment expense, including inflation
Healthcare cost trend rates	8.0% for 2018, decreasing 0.5% per year to an ultimate rate of 5.0%

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Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

Mortality rates were based on the RP-2014 Blue Collar Mortality Table for Employees projected using generational mortality and scale MP-2017 for active employees, the RP-2014 Blue Collar Mortality Tables for Healthy Annuitants projected using generational mortality and scale MP-2017 for retirees and the RP-2014 Blue Collar Mortality Tables for Healthy Annuitants projected using generational mortality and scale MP-2017 set forward one year for the disabled.

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of June 30, 2019 and 2018 (see discussion of the Trust's investment policy) are summarized in the following table:

<u>Asset Class</u>	<u>Long-Term Expected Rate of Return (%)</u>	
	<u>June 30, 2019</u>	<u>June 30, 2018</u>
Global Equity	6.16 - 9.47%	6.15 - 9.41%
Fixed Income	1.89 - 4.00	1.68 - 4.13
Private Equity	10.00	10.28
Real Estate	4.58	4.90
Other	3.68 - 4.77	3.94 - 4.71

Discount rate. The discount rate used to measure the total OPEB liability was 7.0% for both June 30, 2019 and 2018. The projection of cash flows used to determine the discount rate assumed that Authority contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the OPEB plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on OPEB plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability. The discount rate used in the prior actuarial valuation was 7.0%.

Sensitivity of the net OPEB liability to changes in the discount rate. The following presents the net OPEB liability of the Authority, as well as what the Authority's net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.0%) or 1-percentage-point higher (8.0%) than the current discount rate:

	<u>1% Decrease (6.0%)</u>	<u>Discount Rate (7.0%)</u>	<u>1% Increase (8.0%)</u>
Net OPEB Liability as of June 30, 2019	<u>\$ 146,464</u>	<u>\$ 123,992</u>	<u>\$ 105,452</u>

MASSACHUSETTS WATER RESOURCES AUTHORITY

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June 30, 2019 and 2018

(Dollars in thousands)

	<u>1% Decrease</u> <u>(6.0%)</u>	<u>Discount Rate</u> <u>(7.0%)</u>	<u>1% Increase</u> <u>(8.0%)</u>
Net OPEB Liability as of June 30, 2018	<u>\$ 142,517</u>	<u>\$ 121,204</u>	<u>\$ 103,608</u>

Sensitivity of the net OPEB liability to changes in the healthcare cost trend rates. The following presents the net OPEB liability of the Authority, as well as what the Authority's net OPEB liability would be if it were calculated using healthcare cost trend rates that are 1-percentage-point lower (7.0%) or 1-percentage-point higher (9.0%) than the current healthcare cost trend rates:

	<u>1% Decrease</u> <u>(7.0% - 4.0%)</u>	<u>Base Rate</u> <u>(8.0% - 5.0%)</u>	<u>1% Increase</u> <u>(9.0% - 6.0%)</u>
Net OPEB Liability as of June 30, 2019	<u>\$ 99,237</u>	<u>\$ 123,992</u>	<u>\$ 152,589</u>

	<u>1% Decrease</u> <u>(7.0% - 4.0%)</u>	<u>Base Rate</u> <u>(8.0% - 5.0%)</u>	<u>1% Increase</u> <u>(9.0% - 6.0%)</u>
Net OPEB Liability as of June 30, 2018	<u>\$ 98,898</u>	<u>\$ 121,204</u>	<u>\$ 146,968</u>

(g) OPEB Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

For the years ended June 30, 2019 and 2018, the Authority recognized OPEB expense of \$10,987 and \$9,856, respectively, and reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

	<u>June 30, 2019</u>		<u>June 30, 2018</u>	
	<u>Deferred Outflow</u> <u>of Resources</u>	<u>Deferred Inflow</u> <u>of Resources</u>	<u>Deferred Outflow</u> <u>of Resources</u>	<u>Deferred Inflow</u> <u>of Resources</u>
Differences between expected and actual experience	\$ -	\$ 7,907	\$ -	\$ 9,884
Net difference between projected and actual earnings on OPEB Trust investments	333	-	-	148
Total	<u>\$ 333</u>	<u>\$ 7,907</u>	<u>\$ -</u>	<u>\$ 10,032</u>

Amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2020	\$ (1,903)
2021	(1,903)
2022	(1,903)
2023	<u>(1,865)</u>
Total	<u>\$ (7,574)</u>

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

(12) Commitments and Contingencies

(a) General

The Authority's capital improvement program continues to proceed. As part of this program, the Authority has entered into a number of contracts for the design and construction of infrastructure and improvements to its facilities. Commitments under these contracts aggregated approximately \$898,950 at June 30, 2019.

The Authority's operating and construction plans are designed to comply with the Federal District Court's schedule of actions. The Authority has incurred capital expenditures of approximately \$8,500,000 from fiscal years 1986 through 2019, including those projects required to comply with the Federal District Court's schedule. The Authority anticipates spending an additional \$2,316,915 on these projects through fiscal year 2023. These capital expenditures have been forecasted based upon certain preliminary assumptions and estimates, which may change significantly as design and construction of the necessary facilities proceed. Funding is expected to come from various federal and state grants, as available and approved, and from the Authority's debt proceeds. To date, federal appropriations for the Boston Harbor Project have aggregated \$810,000.

(b) Boston Harbor Case

The Authority continues to be a defendant, along with Boston Water and Sewer Commission (BWSC) and the Commonwealth, in the federal Boston Harbor Case. The federal action was originally brought in 1985 by the United States on behalf of the United States Environmental Protection Agency (EPA) and by certain citizens' groups for Clean Water Act violations. As part of the Boston Harbor Case, the Authority was required to undertake certain corrective actions to meet wastewater treatment, discharge and combined sewer overflow (CSO) requirements, including the completion of new and improved primary and secondary treatment facilities at Deer Island. Beyond these major improvements to its wastewater treatment capabilities, the Authority also was required to improve water quality in the Alewife Brook and Charles and Mystic Rivers by its adoption of a Long Term CSO Control Plan which was comprised of 35 projects, the last three of which were completed on time by the close of calendar year 2015. In March 2016 the federal district court formally received the Authority's 2015 annual CSO project report, officially noting completion of all Plan projects.

In March 2006, the Authority reached agreement with the United States and the Massachusetts Department of Environmental Protection (DEP) on the scope and schedule for the remaining CSO projects which was filed with the Court as part of a joint motion to amend the Court Schedule. In April 2006, the Court allowed the joint motion and issued an Order with a schedule. Under the Order, the Authority had a three-year performance assessment period, from 2018 through 2020, to conduct analyses which will compare project benefits of the CSO program against actual performance results and to report those findings to the district court. The Court has further extended the assessment period through 2021.

MASSACHUSETTS WATER RESOURCES AUTHORITY

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June 30, 2019 and 2018

(Dollars in thousands)

As part of the agreement, DEP agreed to reissue and EPA agreed to approve five (5) consecutive variances of no more than three years duration each, through the year 2020, for the Charles River and Alewife Brook/Upper Mystic River that are consistent with and limited to the requirements in the Authority's revised Long Term CSO Control Plan. Variances have most recently been issued by DEP in or about August 2019. The variances will respectively remain in place for the Charles River until August 31, 2024 and for the Alewife/Upper Mystic until August 31, 2024. In addition, the United States and the Authority agreed to withdraw the February 27, 1987 *Stipulation of the United States and the Massachusetts Water Resources Authority on Responsibility and Legal Liability for Combined Sewer Overflows* and replace it with a Second Stipulation that requires the Authority to implement the CSO requirements set forth in the Court Schedule and to meet the levels of control described in the Authority's long term CSO Control Plan. Once these performance parameters have been reached, the Second Stipulation makes the Authority responsible for only those CSO outfalls which it owns and operates.

There has been no imposition of penalties by the Court against MWRA on the merits of the claims originally asserted in the Boston Harbor Case to date. The Court always retains the right to order remedial action and to assess penalties.

(c) Deer Island Submarine Power Cable

In 2004, the United States Army Corps of Engineers (Corps) notified Boston Edison Co. (NStar), its subsidiary Harbor Energy Electric Company (HEEC), and the Authority of allegations that each, as permittees, were in violation of certain depth requirements contained in a permit (MA BOSS 198900530, dated August 31, 1989) which authorized the installation of a submarine electric power cable running under the channel bed of Boston Harbor extending from South Boston to Deer Island, used to provide electric power for Deer Island operations. The Corps alleges that the power cable, in places, has been installed at depths less than those required by the permit and would eventually interfere with a project of harbor dredging known as the Boston Harbor Deep Draft Navigation Improvement Project (the "Project") which will allow deep-draft cargo vessels to dock in Boston Harbor.

MWRA's position is that it is not the owner of the cable, that it was not involved in the planning, design, location or installation of the cable, that it had no meaningful knowledge, participation in or control over the misplacement of the cable and therefore should have no legal responsibility to move it or relocate it. MWRA has also maintained that its status as a "permittee" in the Corps' permit differs substantially from that of NStar and HEEC as the former merely lent its name to an application for the permit solely because it would allow permit review by the Corps to be expedited. The cable is vitally important to MWRA as it provides the primary means by which electricity is delivered to Deer Island to power its wastewater operations.

Settlement Efforts

Efforts to resolve the dispute concerning compliance with the permit and responsibility for the cable protection costs date back to approximately 2005. Discussions during these prior years among the interested parties over the years produced only a proposed method intended by NStar and HEEC for protection of the cable from the Project which would have entailed carefully exposing the cable, placing concrete mats over it followed by backfilling of sediments over both the cable and mats without either moving it or burying the cable deeper in the channel. The Authority has consistently advised NStar and HEEC that it has and will accept no financial responsibility whatsoever for the costs of either protecting or relocating the cable.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

Litigation and Conditional Settlement

United States of America v. NSTAR Electric Company d/b/a Eversource Energy, Harbor Electric Energy Co., and Massachusetts Water Resources Authority, U.S. District Court, District of Massachusetts, C.A. No. 16-11470-RGS As a result of the need to achieve even deeper dredging depths than the Army Corps had initially recommended in 2016 and the likelihood that those depths might not be practicably reachable especially in light of the addition of the proposal to add protective concrete mats, the United States, acting on behalf of the Corps, commenced a lawsuit in July 2016 in the federal district court in Boston against MWRA, NSTAR and HEEC under the Rivers and Harbors Act and under the Clean Water Act asking the federal district court to determine the permittees' non-compliance with the 1990 permit and to assess penalties for the obstruction caused by the mis-located cable in two shipping channels of Boston Harbor. In that lawsuit, the Corps also asked that MWRA, NSTAR and HEEC, each named as permittees under the permit, be enjoined from further maintaining the cable in its present location. MWRA filed its Answer to the Complaint, including cross claims against co-defendants NSTAR and HEEC, in August 2016. Following a failed motion to dismiss both the Complaint and MWRA's cross-claims, NSTAR and HEEC eventually filed their Answer to the Complaint and cross-claimed against MWRA upon a theory of indemnification that MWRA had the primary obligation as the sole customer of the cable to pay any and all expenses necessary to correct the location of the cable improperly installed by HEEC.

Resolution of the federal court litigation was conditionally accomplished over the period of May through July 2017 when it became imperative that the Corps be able to determine whether it would be able to save the federal appropriation dollars for the Project without the aid of or reliance upon the federal court's enforcement powers. The first component of this recent resolution was the negotiation and execution of an agreement among MWRA, NSTAR and HEEC of an agreement whereby HEEC will provide MWRA with a new 115 kV power cable over a different cross-harbor route by December 31, 2019.

The agreement stipulates that the Authority will pay 50% of the cost of the cable, total estimated at \$114,000 less a credit of \$17,500, at the in-service date of the new cable or earlier if the parties mutually agree to such advance payment. The remainder of the total cost of the cable will be paid by the Authority to HEEC in accordance with the provisions for electric service set forth in the tariff established by the Massachusetts Department of Public Utilities. The credit of \$17,500 will be provided by HEEC to the Authority if the cable is placed in service by December 31, 2019. The credit will be applied at a rate of \$2,500 over a period of seven years, commencing in 2020. In Fiscal Year 2019 the Authority, upon agreement by HEEC, prepaid \$35,000 its estimated share of the cost of the cable.

The agreement is for a term of thirty years, at least the useful life of the cable. Annual tariff cost of the cable is estimated between \$4,500 and \$7,300 in the next ten years. In addition to the tariff cost, operating and maintenance costs will also be charged.

In August 2019 the cable was placed in service.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands)

The second component of the conditional resolution of the federal court lawsuit involves the entry of a Stipulation and Order in the federal lawsuit by the parties and the Court in July 2017 which, inter alia, compels NSTAR and HEEC, but not MWRA, to be responsible for all costs and efforts toward the design and installation, by the end of calendar year 2019 inclusive of all permitting, of the new 115 kV power cable along a new route to serve MWRA's power distribution needs at its Deer Island facility. NSTAR and HEEC, but not MWRA, have further agreed to de-energize and decommission the existing non-compliant power cable by February 2020 and remove from the harbor channels portions of the old cable by May 2020. The Order includes the potential assessment of stipulated penalties and/or actual delay damages against NSTAR and HEEC, but not MWRA, for failure without good cause to meet those milestones, the completion of which are necessary to allow the harbor and shipping channel-deepening Project to move forward. MWRA will not be a permittee with respect to the new Corps permit and satisfaction of HEEC and NSTAR's obligations regarding the installation of the new cable will preclude the Corps from any further enforcement of its 1990 permit against MWRA. All claims of all parties to the federal court lawsuit have been stayed pending satisfaction of the obligations of HEEC and NSTAR under the Stipulation and Order. Completion of all obligations under the Stipulation and Order will result in the eventual dismissal with prejudice of all such claims.

(d) Miscellaneous

The Authority is also a defendant in several legal actions and administrative proceedings arising out of its operation, maintenance, and improvement of the water and sewer systems under its care. It is the opinion of management that any judgments or settlements that may result from these actions will not have a materially adverse effect upon the Authority.

(13) Risk Management

The Authority is exposed to various risks of loss. The risk management program involves insurance and self insurance related to property, general liability (including automobile, marine and employers' liability), excess liability, public officials' liability, workers' compensation, unemployment liability, and employee health care and life insurance.

Buildings, plants, and equipment are fully insured on an all risk replacement basis to the extent that losses exceed \$2,500 per occurrence, up to a limit of \$300,000. The Authority maintains insurance coverage for general liability, automobile liability, marine liability, and employers' liability to the extent that losses exceed \$2,500 per occurrence, up to a limit of \$25,000. In addition to the primary liability insurance, the Authority maintains excess liability policies with additional limits of \$75,000. The Authority also maintains public officials' liability insurance with a limit of \$5,000 per occurrence with a \$1,000 deductible. All insurance policies are renewed on an annual basis. The amount of claim settlements has not exceeded insurance coverage in any of the previous three fiscal years.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Schedules of Employer Contributions – Last Ten Years
Required Supplementary Information—GASB No. 68

(Unaudited)

(Dollars in Thousands)

	Fiscal year ended June 30									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially Determined Contribution	\$ 7,000	\$ 3,277	\$ 3,133	\$ 8,159	\$ 7,808	\$ 5,919	\$ 5,766	\$ 5,512	\$ 5,343	\$ 5,621
Contributions in Relation to the Actuarially Determined Contribution	7,000	3,277	4,633	8,159	12,630	12,447	10,490	7,363	5,343	5,621
Contribution Deficiency (Excess)	\$ -	\$ -	\$ (1,500)	\$ -	\$ (4,822)	\$ (6,528)	\$ (4,724)	\$ (1,851)	\$ -	\$ -
Covered Payroll	\$ 95,819	\$ 92,975	\$ 89,755	\$ 89,169	\$ 88,646	\$ 84,829	\$ 84,829	\$ 82,870	\$ 82,870	\$ 81,962
Contributions as a Percentage of Covered Payroll	7.31%	3.52%	5.16%	9.15%	14.25%	14.67%	12.37%	8.89%	6.45%	6.86%

Notes to Required Supplementary Information

Valuation Date: Actuarial determined contributions for fiscal 2018 are determined with the January 1, 2018 actuarial valuation.
 Actuarial Cost Method: Entry age normal
 Amortization Method: Payments increase at 4.5% per year
 Remaining Amortization Period: 8 years from July 1, 2018
 Asset Valuation Method: Market value of assets as reported in the Plan's annual statement less unrecognized return in each of the last five years.
 Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 10% of the market value.

Actuarial Assumptions:

Investment Rate of Return	7.50%
Discount Rate	7.50%
Inflation Rate	3.00%
Projected Salary Increases	Based on years of service, ranging from 5.75% at 0 years of service decreasing to 4.00% after 9 years of service.
Cost of Living Adjustments	3% on first \$13,000

Plan Membership:

Retired Participants and Beneficiaries Receiving Benefits	582
Inactive Participants Entitled to a Return of their Employee Contributions	64
Inactive Participants with a Vested Right to a Deferred or Immediate Benefit	42
Active Participants	1,100
Total	1,788

See accompanying independent auditors' report

MASSACHUSETTS WATER RESOURCES AUTHORITY

Schedules of Changes in the Employer's Net Pension Liability and Related Ratios – Last Ten Years

Required Supplementary Information– GASB No. 68

(Unaudited)

(Dollars in Thousands)

	Measurement Date				
	December 31,				
	2018	2017	2016	2015	2014
Total Pension Liability:					
Service cost	\$ 11,762	\$ 11,308	\$ 11,080	\$ 10,638	\$ 10,529
Interest	41,392	38,520	36,917	34,598	33,587
Differences between expected and actual experience	3,250	(146)	(9,143)	-	(8,380)
Changes of assumptions	16,401	7,977	13,298	-	4,921
Changes of benefit terms	5,027	-	2,050	-	-
Benefit payments, including refunds of employee contributions	(21,428)	(18,222)	(16,129)	(15,390)	(12,963)
Net change in total pension liability	56,404	39,437	38,073	29,846	27,694
Total pension liability - beginning	550,843	511,406	473,333	443,487	415,793
Total pension liability - ending	<u>\$ 607,247</u>	<u>\$ 550,843</u>	<u>\$ 511,406</u>	<u>\$ 473,333</u>	<u>\$ 443,487</u>
Plan Fiduciary Net Position:					
Contributions - employer	\$ 7,000	\$ 3,277	\$ 4,633	\$ 8,159	\$ 12,630
Contributions - employee	9,484	9,091	8,757	8,402	8,245
Net investment income	(17,114)	70,517	24,183	(530)	20,484
Benefit payments, including refunds of employee contributions	(21,428)	(18,222)	(16,129)	(15,390)	(12,963)
Administrative expenses	(469)	(447)	(426)	(412)	(408)
Other - military service fund contribution	-	-	-	-	16
Net change in fiduciary net position	(22,527)	64,216	21,018	229	28,004
Plan fiduciary net position - beginning	529,818	465,602	444,584	444,355	416,351
Plan fiduciary net position - ending	<u>\$ 507,291</u>	<u>\$ 529,818</u>	<u>\$ 465,602</u>	<u>\$ 444,584</u>	<u>\$ 444,355</u>
Net Pension Liability (Asset) - Ending	\$ 99,956	\$ 21,025	\$ 45,804	\$ 28,749	\$ (868)
Plan's Fiduciary Net Position as a					
Percentage of the Total Pension Liability	83.54%	96.18%	91.04%	93.93%	100.20%
Covered Payroll	\$ 95,819	\$ 92,975	\$ 89,755	\$ 89,169	\$ 88,646
Net Pension Liability (Asset) as a Percentage of					
Covered Payroll	104.32%	22.61%	51.03%	32.24%	(0.98%)

This schedule is intended to present 10 years of data. Additional years will be presented when available.

See accompanying independent auditors' report.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Schedules of Changes in the Employer's Net OPEB Liability and Related Ratios – Last Ten Years

Required Supplementary Information– GASB No. 75

(Unaudited)

(Dollars in Thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Total OPEB Liability			
Total OPEB Liability - Beginning	\$ 150,978	\$ 154,254	\$ 146,143
Service Cost	4,463	2,820	2,705
Interest	10,705	10,821	10,253
Change of Benefit Terms	-	-	-
Differences between expected and actual experience	-	(11,860)	-
Change of assumptions	-	-	-
Benefit Payments	<u>(5,082)</u>	<u>(5,057)</u>	<u>(4,847)</u>
Net Change in total OPEB liability	10,086	(3,276)	8,111
Total OPEB Liability - Ending	<u>161,064</u>	<u>150,978</u>	<u>154,254</u>
Plan Fiduciary Net Position			
Plan fiduciary net position - beginning	<u>29,774</u>	<u>22,782</u>	<u>16,123</u>
Contributions - employer (claims + additional funding)	10,656	10,093	9,723
Contributions - employee	-	-	-
Net Investment Income	1,724	1,956	1,783
Benefit Payments	<u>(5,082)</u>	<u>(5,057)</u>	<u>(4,847)</u>
Net Change in plan fiduciary net position	7,298	6,992	6,659
Plan fiduciary net position - ending	<u>37,072</u>	<u>29,774</u>	<u>22,782</u>
Net OPEB Liability	<u>\$ 123,992</u>	<u>\$ 121,204</u>	<u>\$ 131,472</u>
Plan fiduciary net position as a percentage of the total OPEB liability	23.0%	19.7%	14.8%
Covered payroll	\$ 98,238	\$ 94,816	\$ 86,475
MWRA's net OPEB liability as a percentage of covered payroll	126.2%	127.8%	152.0%

Data is being accumulated annually to present 10 years of the reported information.

See accompanying independent auditors' report

MASSACHUSETTS WATER RESOURCES AUTHORITY
 Schedule of Employer Contributions - Last Ten Years
 Required Supplementary Information— GASB No. 75
 (Unaudited)

(Dollars in Thousands)

	Fiscal year ended June 30,									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined contribution	\$ 11,812	\$ 11,400	\$ 10,948	\$ 14,996	\$ 14,564	\$ 15,621	\$ 14,482	\$ 19,151	\$ 17,433	\$ 18,896
Contributions in relation to the actuarially determined contribution	106.56%	100.93%	97.23%	98.04%	148.52%	34.93%	281.3%	3.986%	32.93%	2.151%
Contribution deficiency (excess)	\$ 1,156	\$ 1,307	\$ 1,225	\$ 5,192	\$ (288)	\$ 12,128	\$ 11,669	\$ 15,165	\$ 14,140	\$ 16,745
Covered Payroll	\$ 98,238	\$ 94,816	\$ 86,475							
Contributions as a Percentage of Covered Payroll	10.8%	10.6%	11.2%							

Notes to Schedule

Methods and assumptions used to determine contributions rates:

- Actuarial cost method: Entry/Age Normal
- Amortization method: 30 years (closed)
- Asset valuation method: Market value of assets
- Inflation: 3%
- Healthcare cost trend rates: 8% for 2018, decreasing 0.5% per year for 6 years to an ultimate rate of 5%
- Discount rate: 7%
- Mortality:
 - Actives:* RP-2014 Blue Collar mortality table for employees projected using generational mortality and scale MP-2017
 - Retirees:* RP-2014 Blue Collar mortality tables for healthy annuitants projected using generational mortality and scale MP-2017
 - Disabled:* RP-2014 Blue Collar mortality tables for healthy annuitants projected using generational mortality and scale MP-2017. Set forward one year.

See accompanying independent auditors' report

MASSACHUSETTS WATER RESOURCES AUTHORITY
Accounts Established by the General Revenue Bond Resolution

June 30, 2019
(comparative totals for June 30, 2018)

(Dollars in thousands)

	<u>Construction</u>	<u>Debt Service</u>	<u>Operating</u>	<u>Rate Stabilization</u>	<u>Revenue</u>	<u>Combined Reserves</u>	<u>Total</u>
Balance – June 30, 2018	\$ 105,802	\$ 477,698	\$ 40,070	\$ 43,044	\$ 29,952	\$ 20,747	\$ 717,313
Proceeds from:							
Revenue Bonds and Loans	254,505	1,629	-	-	-	-	256,134
Cash Received							
from Customers	-	-	-	-	755,104	-	755,104
Interest Income	2,217	14,880	-	-	(9,266)	17,438	25,269
Debt Service Grant	-	1,835	-	-	-	-	1,835
Grant Receipts	273	4,976	-	-	-	-	5,249
Construction Payments	(148,192)	-	-	-	-	-	(148,192)
Capital Lease Payments	(1,130)	(2,086)	-	-	-	-	(3,216)
Debt Service Payment	(866)	(430,883)	-	-	(37,872)	-	(469,621)
Other Commonwealth							
Payments	-	-	-	-	(23,442)	-	(23,442)
Interfund Transfers	11,180	431,025	1,882	-	(430,942)	(13,145)	-
Transfers from (to)							
Operating Account	(34,496)	2,292	-	-	(253,408)	(1,882)	(287,494)
Balance – June 30, 2019	<u>\$ 189,293</u>	<u>\$ 501,366</u>	<u>\$ 41,952</u>	<u>\$ 43,044</u>	<u>\$ 30,126</u>	<u>\$ 23,158</u>	<u>\$ 828,939</u>

	<u>Sewer</u>	<u>Water</u>	<u>Total</u>	
			<u>2019</u>	<u>2018</u>
Restricted Investments:				
Construction	\$ 119,196	\$ 70,097	\$ 189,293	\$ 105,802
Debt Service - Debt Service Reserves	95,010	61,677	156,687	149,933
Debt Service - Debt Service P & I	222,460	96,085	318,545	302,690
Debt Service - Revenue Redemption	5,790	20,344	26,134	25,075
Operating Reserve	27,879	14,073	41,952	40,070
Rate Stabilization Reserve	25,547	17,497	43,044	43,044
Revenue	18,171	11,955	30,126	29,952
Combined - Renewal and Replacement Reserve	6,950	2,208	9,158	6,747
Combined - Insurance Reserve	7,000	7,000	14,000	14,000
Total Restricted Investments	<u>\$ 528,003</u>	<u>\$ 300,936</u>	<u>\$ 828,939</u>	<u>\$ 717,313</u>

See accompanying independent auditors' report.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Combining Statement of Net Position

June 30, 2019

(Dollars in thousands)

	Assets	Sewer	Water	Combined Total
Unrestricted current assets:				
Cash and cash equivalents		\$ 38,806	\$ 16,004	\$ 54,810
Investments		1,747	9,914	11,661
Intergovernmental loans		6,591	26,141	32,732
Accounts receivable		333	735	1,068
Total unrestricted current assets		<u>47,477</u>	<u>52,794</u>	<u>100,271</u>
Restricted assets:				
Investments		533,346	303,002	836,348
Interest receivable		1,319	183	1,502
Total restricted assets		<u>534,665</u>	<u>303,185</u>	<u>837,850</u>
Capital assets:				
Capital assets – not being depreciated		86,432	93,247	179,679
Capital assets – being depreciated – net		<u>3,367,256</u>	<u>2,293,481</u>	<u>5,660,737</u>
Total capital assets		<u>3,453,688</u>	<u>2,386,728</u>	<u>5,840,416</u>
Regulatory assets		337,404	32,626	370,030
Other assets, net		<u>112,477</u>	<u>169,262</u>	<u>281,739</u>
Total assets		<u>4,485,711</u>	<u>2,944,595</u>	<u>7,430,306</u>
	Deferred Outflows of Resources			
Deferred outflows from pension		41,775	22,266	64,041
Deferred outflows from OPEB		215	118	333
Deferred outflows from derivative instruments		28,590	3,050	31,640
Deferred outflows from refunding debt		15,716	13,126	28,842
	Liabilities			
Current liabilities:				
Accounts payable and accrued expenses		47,852	2,179	50,031
Commercial paper notes		21,000	54,000	75,000
Current portion of long-term debt		<u>171,822</u>	<u>66,096</u>	<u>237,918</u>
Total current liabilities		<u>240,674</u>	<u>122,275</u>	<u>362,949</u>
Payable from restricted assets:				
Accounts payable for construction		9,626	5,962	15,588
Accrued interest on bonds payable		51,757	28,747	80,504
Reserves		<u>36,870</u>	<u>23,086</u>	<u>59,956</u>
Total payable from restricted assets		<u>98,253</u>	<u>57,795</u>	<u>156,048</u>
Retainage on construction in progress		4,804	3,114	7,918
Long-term debt – less current portion		3,207,325	1,932,491	5,139,816
Long-term capital lease		18,289	7,804	26,093
Net pension liability		64,200	35,756	99,956
Other postemployment benefits		79,862	44,130	123,992
Liability for derivative instruments		<u>28,590</u>	<u>3,050</u>	<u>31,640</u>
Total liabilities		<u>3,741,997</u>	<u>2,206,415</u>	<u>5,948,412</u>
	Deferred Inflows of Resources			
Deferred inflows from pension		3,945	2,121	6,066
Deferred inflows from OPEB		5,089	2,818	7,907
Deferred inflows from regulated activities		9,276	17,414	26,690
	Net Position			
Net investment in capital assets		348,359	478,691	827,050
Restricted				
Construction		119,196	70,097	189,293
Debt Service		71,572	26,679	98,251
Operating		34,538	16,324	50,862
Revenue		18,171	11,955	30,126
Unrestricted		<u>219,864</u>	<u>150,641</u>	<u>370,505</u>
Total net position		<u>\$ 811,700</u>	<u>\$ 754,387</u>	<u>\$ 1,566,087</u>
Commitments and contingencies				
See accompanying independent auditors' report				

MASSACHUSETTS WATER RESOURCES AUTHORITY

Combining Statement of Net Position

June 30, 2018

(Dollars in thousands)

Assets	<u>Sewer</u>	<u>Water</u>	<u>Combined Total</u>
Unrestricted current assets:			
Cash and cash equivalents	\$ 35,778	\$ 16,836	\$ 52,614
Investments	1,687	9,565	11,252
Intergovernmental loans	6,641	24,613	31,254
Accounts receivable	130	713	843
Total unrestricted current assets	<u>44,236</u>	<u>51,727</u>	<u>95,963</u>
Restricted assets:			
Investments	463,896	260,532	724,428
Interest receivable	1,480	251	1,731
Grant receivable	856	89	945
Total restricted assets	<u>466,232</u>	<u>260,872</u>	<u>727,104</u>
Capital assets:			
Capital assets – not being depreciated	82,632	127,771	210,403
Capital assets – being depreciated – net	<u>3,469,413</u>	<u>2,268,534</u>	<u>5,737,947</u>
Total capital assets	<u>3,552,045</u>	<u>2,396,305</u>	<u>5,948,350</u>
Regulatory assets	431,941	73,974	505,915
Other assets, net	<u>50,624</u>	<u>159,839</u>	<u>210,463</u>
Total assets	<u>4,545,078</u>	<u>2,942,717</u>	<u>7,487,795</u>
Deferred Outflows of Resources			
Deferred outflows from pension	11,497	5,657	17,154
Deferred outflows from derivative instruments	18,963	2,025	20,988
Deferred outflows from refunding debt	26,872	20,725	47,597
Liabilities			
Current liabilities:			
Accounts payable and accrued expenses	46,917	2,548	49,465
Commercial paper notes	21,000	54,000	75,000
Current portion of long-term debt	<u>158,644</u>	<u>67,273</u>	<u>225,917</u>
Total current liabilities	<u>226,561</u>	<u>123,821</u>	<u>350,382</u>
Payable from restricted assets:			
Accounts payable for construction	15,214	4,442	19,656
Accrued interest on bonds payable	51,467	28,524	79,991
Reserves	<u>35,722</u>	<u>22,352</u>	<u>58,074</u>
Total payable from restricted assets	<u>102,403</u>	<u>55,318</u>	<u>157,721</u>
Retainage on construction in progress	3,759	5,808	9,567
Long-term debt – less current portion	3,269,376	1,922,940	5,192,316
Long-term capital lease	18,965	8,254	27,219
Net pension liability	13,229	7,796	21,025
Other postemployment benefits	78,062	43,142	121,204
Liability for derivative instruments	<u>18,963</u>	<u>2,025</u>	<u>20,988</u>
Total liabilities	<u>3,731,318</u>	<u>2,169,104</u>	<u>5,900,422</u>
Deferred Inflows of Resources			
Deferred inflows from pension	9,691	5,272	14,963
Deferred inflows from OPEB	6,461	3,571	10,032
Deferred inflows from regulated activities	19,606	23,112	42,718
Net Position			
Net investment in capital assets	275,012	484,745	759,757
Restricted			
Construction	66,596	39,206	105,802
Debt Service	126,522	46,576	173,098
Operating	33,312	15,603	48,915
Revenue	20,838	9,114	29,952
Unrestricted	<u>313,055</u>	<u>174,820</u>	<u>487,875</u>
Total net position	<u>\$ 835,335</u>	<u>\$ 770,064</u>	<u>\$ 1,605,399</u>

Commitments and contingencies

See accompanying independent auditors' report

MASSACHUSETTS WATER RESOURCES AUTHORITY

Combining Statement of Revenues, Expenses, and Changes in Net Position

Year Ended June 30, 2019

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined Total</u>
Operating revenues :			
Customer services	\$ 491,785	\$ 258,957	\$ 750,742
Other	3,087	1,507	4,594
Total operating revenues	<u>494,872</u>	<u>260,464</u>	<u>755,336</u>
Operating Expenses:			
Operations	66,731	47,147	113,878
Maintenance	21,344	9,307	30,651
Payments in lieu of taxes	-	8,230	8,230
Engineering, general, and administrative	94,703	57,648	152,351
Total operating expenses	<u>182,778</u>	<u>122,332</u>	<u>305,110</u>
Income from operating before depreciation	312,094	138,132	450,226
Depreciation and amortization	<u>147,206</u>	<u>59,921</u>	<u>207,127</u>
Operating Income	<u>164,888</u>	<u>78,211</u>	<u>243,099</u>
Regulatory accounting provisions:			
Change in reserves	(1,148)	(734)	(1,882)
Change in regulatory provisions, net	<u>(84,207)</u>	<u>(35,650)</u>	<u>(119,857)</u>
Total regulatory accounting provisions	<u>(85,355)</u>	<u>(36,384)</u>	<u>(121,739)</u>
Nonoperating revenues (expenses):			
Debt service grant	793	97	890
Investment income	16,457	10,753	27,210
Interest expense	(126,142)	(70,819)	(196,961)
Changes in derivative related accounts	2,528	412	2,940
Total nonoperating expenses	<u>(106,364)</u>	<u>(59,557)</u>	<u>(165,921)</u>
Net loss before capital grants and contributions	(26,831)	(17,730)	(44,561)
Capital grants and contributions	<u>3,196</u>	<u>2,053</u>	<u>5,249</u>
Decrease in net position	(23,635)	(15,677)	(39,312)
Total net position - beginning of year	<u>835,335</u>	<u>770,064</u>	<u>1,605,399</u>
Total net position - end of year	<u>\$ 811,700</u>	<u>\$ 754,387</u>	<u>\$ 1,566,087</u>

See accompanying independent auditors' report

MASSACHUSETTS WATER RESOURCES AUTHORITY

Combining Statement of Revenues, Expenses, and Changes in Net Position

Year Ended June 30, 2018

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined Total</u>
Operating revenues :			
Customer services	\$ 477,379	\$ 250,902	\$ 728,281
Other	7,989	2,034	10,023
Total operating revenues	<u>485,368</u>	<u>252,936</u>	<u>738,304</u>
Operating Expenses:			
Operations	62,402	44,541	106,943
Maintenance	20,007	9,060	29,067
Payments in lieu of taxes	-	8,220	8,220
Engineering, general, and administrative	82,250	51,377	133,627
Total operating expenses	<u>164,659</u>	<u>113,198</u>	<u>277,857</u>
Income from operating before depreciation	320,709	139,738	460,447
Depreciation and amortization	<u>144,454</u>	<u>58,345</u>	<u>202,799</u>
Operating Income	<u>176,255</u>	<u>81,393</u>	<u>257,648</u>
Regulatory accounting provisions:			
Change in reserves	(557)	(264)	(821)
Change in regulatory provisions, net	<u>(77,286)</u>	<u>(28,670)</u>	<u>(105,956)</u>
Total regulatory accounting provisions	<u>(77,843)</u>	<u>(28,934)</u>	<u>(106,777)</u>
Nonoperating revenues (expenses):			
Debt service grant	856	89	945
Investment income	2,911	1,084	3,995
Interest expense	(131,526)	(71,741)	(203,267)
Changes in derivative related accounts	2,528	412	2,940
Total nonoperating expenses	<u>(125,231)</u>	<u>(70,156)</u>	<u>(195,387)</u>
Net loss before capital grants and contributions	(26,819)	(17,697)	(44,516)
Capital grants and contributions	<u>2,545</u>	<u>2,170</u>	<u>4,715</u>
Decrease in net position	(24,274)	(15,527)	(39,801)
Total net position - beginning of year	866,276	800,021	1,666,297
Restatement to comply with GASB Statement No. 75	<u>(6,667)</u>	<u>(14,430)</u>	<u>(21,097)</u>
Total net position - end of year	<u>\$ 835,335</u>	<u>\$ 770,064</u>	<u>\$ 1,605,399</u>
See accompanying independent auditors' report			



Charlestown Wind Turbine



Chelsea Creek Headworks

This part of the Massachusetts Water Resources Authority's Fiscal Year 2019 Comprehensive Annual Financial Report presents detailed information to provide context to the information in the financial statements, note disclosures, required supplementary information and supplemental schedules.

CONTENTS

Financial Trends (76–79)

These schedules contain trend information to help the reader understand how MWRA's financial performance and well-being have changed over time.

Revenue Capacity (80–83)

These schedules contain information to help the reader assess MWRA's primary revenue source and community assessments.

Debt Capacity (84–87)

These schedules present information to help the reader assess the affordability of the MWRA's current level of outstanding debt and MWRA's ability to issue additional debt in the future.

Demographic and Economic Information (88–93)

These schedules offer demographic and economic indicators to help the reader understand the environment within which MWRA's financial activities take place.

Operating Information (94–96)

These schedules contain service and infrastructure data to help the reader understand how the information in MWRA's financial report relates to the services the MWRA provides and the activities it performs.

MASSACHUSETTS WATER RESOURCES AUTHORITY
Components of Net Position
Last Ten Fiscal Years
(Dollars in thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Net investment in capital assets	\$ 827,050	\$ 759,757	\$ 729,903	\$ 679,739
Restricted				
Construction	189,293	105,802	117,813	119,743
Debt Service	98,251	173,098	140,344	161,723
Operating	50,862	48,915	47,544	47,167
Revenue	30,126	29,952	33,372	17,733
Unrestricted	370,505	487,875	597,321	678,004
Total net position	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>\$ 1,704,109</u>

Source: FY2010–2019 financial statements, reclassified to conform to 2019 presentation

2015	2014	2013	2012	2011	2010
\$ 632,029	\$ 608,232	\$ 588,872	\$ 705,721	\$ 835,638	\$ 936,746
72,375	80,109	129,783	240,904	164,456	135,921
171,305	145,160	135,678	11,217	24,555	30,990
48,029	47,508	48,366	46,456	47,369	45,198
38,105	37,616	32,181	32,198	28,237	31,432
749,750	837,790	860,287	796,751	774,678	737,187
<u>\$ 1,711,593</u>	<u>\$ 1,756,415</u>	<u>\$ 1,795,167</u>	<u>\$ 1,833,247</u>	<u>\$ 1,874,933</u>	<u>\$ 1,917,474</u>

MASSACHUSETTS WATER RESOURCES AUTHORITY
Changes in Net Position
Last Ten Fiscal Years
(Dollars in thousands)

	2019	2018	2017	2016
Operating revenues:				
Customer service	\$ 750,742	\$ 728,281	\$ 705,933	\$ 683,501
Other	4,594	10,023	10,843	13,472
Total operating revenues	<u>755,336</u>	<u>738,304</u>	<u>716,776</u>	<u>696,973</u>
Operating expenses:				
Operations	113,878	106,943	106,844	98,972
Maintenance	30,651	29,067	30,799	30,978
Payments in lieu of taxes	8,230	8,220	8,191	8,129
Engineering, general, and administrative	152,351	133,627	140,435	133,959
Total operating expenses	<u>305,110</u>	<u>277,857</u>	<u>286,269</u>	<u>272,038</u>
Depreciation and amortization	207,127	202,799	201,481	197,128
Operating income	<u>243,099</u>	<u>257,648</u>	<u>229,026</u>	<u>227,807</u>
Nonoperating items:				
Regulatory accounting provisions	(121,739)	(106,777)	(62,714)	(72,162)
Net nonoperating expenses	(168,861)	(198,327)	(214,288)	(204,259)
Changes in derivative related accounts	2,940	2,940	2,940	2,940
Total nonoperating items	<u>(287,660)</u>	<u>(302,164)</u>	<u>(274,062)</u>	<u>(273,481)</u>
Capital grants and contributions	<u>5,249</u>	<u>4,715</u>	<u>7,224</u>	<u>38,190</u>
Change in net position	(39,312)	(39,801)	(37,812)	(7,484)
Total net position – beginning of year	1,605,399	1,666,297	1,704,109	1,711,593
Restatement to comply with GASB*	-	(21,097)	-	-
Total net position – end of year	<u>\$ 1,566,087</u>	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>\$ 1,704,109</u>

*2018 - GASB 75

*2015 - GASB 68

2015	2014	2013	2012	2011	2010
\$ 661,305	\$ 639,691	\$ 617,415	\$ 599,372	\$ 579,240	\$ 571,360
7,299	8,326	5,978	3,248	5,114	2,938
<u>668,604</u>	<u>648,017</u>	<u>623,393</u>	<u>602,620</u>	<u>584,354</u>	<u>574,298</u>
102,322	100,778	101,425	99,802	93,756	96,923
28,323	29,453	26,956	26,776	27,964	25,561
7,966	7,872	7,640	7,311	7,000	6,732
124,792	135,401	131,329	127,621	126,127	131,551
<u>263,403</u>	<u>273,504</u>	<u>267,350</u>	<u>261,510</u>	<u>254,847</u>	<u>260,767</u>
194,000	193,062	190,852	191,124	180,734	189,798
<u>211,201</u>	<u>181,451</u>	<u>165,191</u>	<u>149,986</u>	<u>148,773</u>	<u>123,733</u>
(41,634)	(3,808)	23,917	57,229	74,139	67,995
(217,218)	(225,293)	(239,616)	(259,537)	(263,761)	(234,588)
2,940	2,940	5,798	2,940	(8,728)	(21,453)
<u>(255,912)</u>	<u>(226,161)</u>	<u>(209,901)</u>	<u>(199,368)</u>	<u>(198,350)</u>	<u>(188,046)</u>
6,429	5,958	6,630	7,696	7,036	8,211
(38,282)	(38,752)	(38,080)	(41,686)	(42,541)	(56,102)
1,756,415	1,795,167	1,833,247	1,874,933	1,917,474	1,973,576
(6,540)	-	-	-	-	-
<u>\$ 1,711,593</u>	<u>\$ 1,756,415</u>	<u>\$ 1,795,167</u>	<u>\$ 1,833,247</u>	<u>\$ 1,874,933</u>	<u>\$ 1,917,474</u>

MASSACHUSETTS WATER RESOURCES AUTHORITY
Historical Rate Revenue and Percentage Increases
Last Ten Fiscal Years
(Dollars in millions)

	Water		Sewer		Combined	
	Amount	Increase	Amount	Increase	Amount	Increase
2019	\$249.8	3.1%	\$489.2	3.1%	\$739.0	3.1%
2018	242.4	3.5	474.6	3.0	717.0	3.2
2017	234.3	3.5	460.6	3.3	694.9	3.3
2016	226.4	7.7	446.1	1.4	672.4	3.4
2015	210.2	3.5	440.1	3.4	650.3	3.4
2014	203.2	3.7	425.5	3.4	628.7	3.5
2013	196.0	6.6	411.5	1.4	607.5	3.5
2012	183.9	2.0	405.8	4.2	589.7	3.5
2011	180.2	0.6	389.6	1.9	659.8	1.5
2010	179.1	(0.6)	382.3	6.0	651.4	3.8

Note: Rate revenue is derived exclusively from member community assessments and does not include other charges and fees.

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MASSACHUSETTS WATER RESOURCES AUTHORITY
Historical Revenues, Expenses and Fund Deposits
Last Ten Fiscal Years
(Dollars in thousands)

	2019	2018	2017	2016
Revenues:				
Rates and Charges	\$ 748,389	\$ 726,073	\$ 703,688	\$ 681,223
Investment Income	16,985	12,755	9,758	10,303
Transfer from Rate Stabilization Fund	-	-	-	-
Other Income	6,947	12,231	13,088	15,750
Total Revenues	772,321	751,059	726,534	707,276
Operating Expenses				
Operating Expenses	277,104	263,226	258,046	293,682
Capital Lease	3,217	3,217	3,217	3,217
Net Operating Revenues	492,000	484,616	465,271	410,377
Debt Service				
Debt Service on Bonds	\$ 285,663	\$ 279,790	\$ 286,666	\$ 274,212
Other Debt Service	169,017	158,485	139,430	114,481
Debt Prepayment	7,100	10,900	10,995	-
Amount Available After Operations and Debt Service	\$ 30,220	\$ 35,441	\$ 28,180	\$ 21,685
Fund Deposits:				
Reserve Funds	\$ 1,882	\$ 821	\$ (168)	\$ (35)
Construction Fund	\$ 16,740	\$ 14,683	\$ 13,059	\$ 11,462
Core Fund	\$ -	\$ -	\$ -	\$ -
Rate Stabilization	\$ -	\$ 6,532	\$ -	\$ -

Note: Schedule prepared in accordance with MWRA General Bond Resolution.

2015	2014	2013	2012	2011	2010
\$ 650,316	\$ 628,721	\$ 607,512	\$ 589,700	\$ 569,800	\$ 561,431
9,689	12,130	13,590	16,268	15,193	15,223
-	3,500	-	1,092	5,030	7,312
18,289	19,296	15,881	12,920	14,554	12,866
678,294	663,647	636,983	619,980	604,577	596,832
258,534	257,724	252,333	245,210	240,678	244,729
3,217	3,217	3,217	3,217	3,217	3,217
416,543	402,706	381,433	371,553	360,682	348,886
\$ 233,079	\$ 228,652	\$ 209,826	\$ 208,332	\$ 224,746	\$ 199,368
161,736	160,032	158,666	145,722	124,656	136,677
-	-	-	-	-	-
\$ 21,728	\$ 14,022	\$ 12,941	\$ 17,499	\$ 11,280	\$ 12,841
\$ 483	\$ 169	\$ 1,398	\$ 195	\$ (407)	\$ (653)
\$ 10,464	\$ 9,516	\$ 8,535	\$ 7,481	\$ 7,539	\$ 5,967
\$ 730	\$ 132	\$ -	\$ -	\$ -	\$ -
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

MASSACHUSETTS WATER RESOURCES AUTHORITY
Debt Service Coverage
Last Ten Fiscal Years
(Dollars in thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Operating Revenues	\$ 755,336	\$ 738,304	\$ 716,776	\$ 696,973
Interest Income	16,985	12,755	9,758	10,303
Special Payment Obligation	-	-	-	-
Transfers from Rate Stabilization Fund	-	-	-	-
Total Revenues	\$ 772,321	\$ 751,059	\$ 726,534	\$ 707,276
Operating Expenses	\$ (276,631)	\$ (263,394)	\$ (266,415)	\$ (278,887)
Special Payment Obligation	-	-	-	-
Commonwealth Obligations	23,412	23,757	23,912	27,470
OPEB	331	(236)	3,449	11,555
Pollution Remediation	1,078	1,225	4,752	322
Capital Lease	(3,217)	(3,217)	(3,217)	(3,217)
Net Revenues	\$ 517,294	\$ 509,194	\$ 489,015	\$ 464,519
CORE Fund Deposits	-	-	-	-
Revenues Available for Primary and SRF Primary Coverage (Before Provision for Transfer to Rate Stabilization Fund)(A)	\$ 517,294	\$ 509,194	\$ 489,015	\$ 464,519
Provision for Transfer to Rate Stabilization Fund	\$ -	\$ 6,532	\$ -	\$ -
Revenues Available for Primary and SRF Primary Coverage (After Provision for Transfer to Rate Stabilization Fund)(B)	\$ 517,294	\$ 502,662	\$ 489,015	\$ 464,519
Required Senior Debt Service Fund Deposits(C)	\$ 269,435	\$ 261,383	\$ 262,093	\$ 272,570
Required Subordinated Debt Service Deposits(D)	\$ 169,017	\$ 158,485	\$ 139,430	\$ 114,481
Coverage:				
Before Provision for Transfer to Rate Stabilization Fund:				
Primary	192%	195%	187%	170%
SRF Primary	118%	121%	122%	120%
After Provision for Transfer to Rate Stabilization Fund:				
Primary	192%	192%	187%	170%
SRF Primary	118%	120%	122%	120%
Required CORE Fund Deposits	\$ -	N/A	N/A	N/A
CORE Fund Deposits	\$ -	N/A	N/A	N/A

Note: Schedule prepared in accordance with MWRA General Bond Resolution.

	2015	2014	2013	2012	2011	2010
\$	668,605	\$ 648,017	\$ 623,393	\$ 602,620	\$ 584,354	\$ 574,297
	9,689	12,130	13,590	16,268	15,193	15,223
	-	-	-	-	-	-
	-	3,500	-	1,092	5,030	7,312
\$	678,294	\$ 663,647	\$ 636,983	\$ 619,980	\$ 604,577	\$ 596,832
\$	(271,329)	\$ (273,500)	\$ (267,351)	\$ (261,510)	\$ (254,846)	\$ (260,765)
	-	-	-	-	-	-
	27,168	26,641	26,004	25,630	24,709	23,349
	9,401	13,521	13,123	15,118	14,169	16,838
	3,394	2,261	--	--	--	--
	(3,217)	(3,217)	(3,217)	(3,217)	(3,217)	(3,217)
\$	443,711	\$ 429,353	\$ 405,542	\$ 396,001	\$ 385,392	\$ 373,037
	862	132	-	-	-	-
\$	442,849	\$ 429,221	\$ 405,542	\$ 396,001	\$ 385,392	\$ 373,037
\$	-	\$ -	\$ -	\$ -	\$ 4,148.00	\$ 7,527.00
\$	442,849	\$ 429,221	\$ 405,542	\$ 396,001	\$ 381,244	\$ 365,510
\$	208,500	\$ 203,338	\$ 192,834	\$ 188,054	\$ 199,294	\$ 179,440
\$	161,737	\$ 160,032	\$ 151,598	\$ 145,236	\$ 117,656	\$ 129,667
	212%	211%	210%	211%	193%	208%
	120%	118%	118%	119%	122%	121%
	212%	211%	210%	211%	191%	204%
	120%	118%	118%	199%	120%	118%
	\$862	\$132	\$ -	\$ -	\$ -	\$ -
	\$862	\$132	\$ -	\$ -	\$ -	\$ -

MASSACHUSETTS WATER RESOURCES AUTHORITY
Long Term Debt by System
Last Ten Fiscal Years
(Dollars in thousands)

	2019		2018		2017		2016	
	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water
General Revenue Bonds:								
1993C Series Bonds	-	-	-	-	-	-	-	-
2002B Series Bonds	-	-	-	-	-	-	-	-
2002J Series Bonds	128,338	12,557	171,651	17,369	218,739	22,601	247,895	26,285
2003D Series Bonds	-	-	-	-	-	-	-	-
2004A Series Bonds	-	-	-	-	-	-	-	-
2006A Series Bonds	-	-	-	-	-	-	-	-
2007A Series Bonds	-	-	-	-	-	-	-	-
2009A Series Bonds	-	-	-	-	-	-	-	-
2010A Series Bonds	-	-	-	-	973	417	3,630	1,556
2011B Series Bonds	4,379	1,877	5,495	2,355	5,852	2,508	55,892	23,954
2012A Series Bonds	36,328	36,328	37,295	37,295	37,295	37,295	49,043	49,043
2014D Series Bonds	40,912	19,253	40,912	19,253	41,851	19,694	46,427	21,848
2016B Series Bonds	31,045	31,045	31,685	31,685	32,985	32,985	32,985	32,985
2017B Series Bonds	33,490	33,490	34,120	34,120	34,120	34,120	-	-
2018B Series Bonds	64,548	43,032	64,548	43,032	-	-	-	-
2019B Series Bonds	87,500	37,500	-	-	-	-	-	-
General Revenue Refunding Bonds:								
1997D Series Bonds	-	-	-	-	-	-	-	-
1998B Series Bonds	-	-	-	-	-	-	-	-
2004B Series Bonds	-	-	-	-	-	-	-	-
2005A Series Bonds	-	-	-	-	-	-	118,730	145,115
2005B Series Bonds	-	-	-	-	-	-	25,082	50,163
2006B Series Bonds	-	-	-	-	22,823	7,608	23,614	7,871
2007B Series Bonds	544,278	103,672	544,278	103,672	544,278	103,672	544,278	103,672
2009B Series Bonds	47,146	18,334	91,019	35,396	104,562	40,663	113,386	44,094
2010B Series Bonds	49,741	36,019	55,648	40,297	57,214	41,431	62,608	45,337
2011C Series Bonds	113,552	177,608	125,252	195,908	125,252	195,908	125,252	195,908
2012B Series Bonds	18,223	68,552	18,223	68,552	18,223	68,552	18,223	68,552
2013A Series Bonds	57,408	45,107	57,408	45,107	79,537	62,493	92,758	72,882
2014E Series Bonds	4,589	656	13,654	1,951	13,654	1,951	22,133	3,162
2014F Series Bonds	43,837	97,573	43,837	97,573	43,837	97,573	43,837	97,573
2016C Series Bonds	345,874	332,311	345,874	332,311	347,624	333,991	347,624	333,991
2016D Series Bonds	67,769	36,491	67,769	36,491	67,769	36,491	-	-
2017C Series Bonds	110,475	135,025	112,275	137,225	114,635	140,110	-	-
2018C Series Bonds	16,425	5,475	16,425	5,475	-	-	-	-
2019C Series Bonds	13,817	5,373	-	-	-	-	-	-
General Revenue Bonds (variable rates):								
1999B Series Bonds	30,420	20,280	32,820	21,880	35,160	23,440	35,160	23,440
General Revenue Refunding Bonds (variable rates):								
2002C Series Bonds	11,290	23,830	11,290	23,830	11,290	23,830	11,290	23,830
2002D Series Bonds	-	-	-	-	-	-	-	-
2008A Series Bonds	179,467	24,473	184,294	25,131	187,343	25,547	206,664	28,181
2008B Series Bonds	-	-	-	-	-	-	-	-
2008C Series Bonds	67,872	2,828	82,848	3,452	97,248	4,052	101,395	4,225
2008D Series Bonds	-	-	-	-	-	-	-	-
2008E Series Bonds	122,949	10,691	122,949	10,691	122,949	10,691	122,949	10,691
2008F Series Bonds	-	-	-	-	-	-	4,500	45,500
2012E Series Bonds	12,271	46,164	12,590	47,361	12,897	48,518	13,194	49,636
2012F Series Bonds	-	-	-	-	10,936	41,139	12,663	47,637
2012G Series Bonds	25,440	1,060	35,424	1,476	45,024	1,876	47,789	1,991
2014A Series Bonds	4,500	45,500	4,500	45,500	4,500	45,500	4,500	45,500
2014B Series Bonds	4,869	49,226	5,828	58,927	5,828	58,927	5,828	58,927
2018A Series Bonds	10,310	38,785	10,628	39,982	-	-	-	-
2018D Series Bonds	4,500	45,500	4,500	45,500	-	-	-	-
Revolving Loan:								
2015C Revolving Loan	26,500	26,500	26,500	26,500	39,500	39,500	39,500	39,500
General Revenue Bonds with the Massachusetts Clean Water Trust:								
	767,588	212,295	766,343	176,538	814,296	192,155	853,081	182,716
Total	3,127,650	1,824,408	3,177,882	1,811,833	3,298,193	1,795,238	3,431,908	1,885,764

2015		2014		2013		2012		2011		2010	
Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water
8,807	1,258	17,172	2,453	25,117	3,588	25,117	3,588	28,446	4,064	31,583	4,512
254,960	27,070	268,703	28,597	268,703	28,597	268,703	28,597	397,898	131,397	397,898	131,397
-	-	-	-	-	-	-	-	37,780	75,560	37,780	75,560
-	-	-	-	-	-	-	-	7,865	97,005	7,865	97,005
-	62,320	-	149,990	-	149,990	-	200,000	-	200,000	-	200,000
33,660	164,340	33,660	164,340	33,660	164,340	33,660	164,340	34,000	166,000	34,000	166,000
48,180	16,060	57,334	19,111	60,210	20,070	68,370	22,790	70,504	23,501	73,500	24,500
59,605	25,545	67,571	28,959	68,418	29,322	69,227	29,669	70,000	30,000	70,000	30,000
94,350	40,436	98,098	42,042	101,388	43,452	103,135	44,201	105,000	45,000	-	-
66,310	66,310	69,683	69,683	72,338	72,338	75,000	75,000	-	-	-	-
48,052	22,613	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	6,871	439	6,871	439
-	-	-	-	-	-	-	-	18,557	773	23,270	970
-	-	33,604	4,801	42,831	6,119	42,831	6,119	43,216	6,174	43,216	6,174
138,173	168,878	155,174	189,657	155,174	189,657	160,499	196,166	160,499	196,166	171,158	209,193
26,763	53,527	26,763	53,527	26,763	53,527	26,763	53,527	26,763	53,527	26,763	53,527
129,431	43,144	162,701	54,234	162,701	54,234	197,955	65,985	197,955	65,985	198,709	66,236
544,278	103,672	544,278	103,672	544,278	103,672	544,278	103,672	544,278	103,672	544,278	103,672
193,043	75,072	195,142	75,888	197,352	76,748	201,758	78,462	203,443	79,117	205,344	79,856
95,836	69,399	100,824	73,011	106,471	77,099	106,471	77,099	106,471	77,099	106,471	77,099
127,592	199,568	127,592	199,568	127,592	199,568	127,592	199,568	-	-	-	-
18,223	68,552	18,223	68,552	18,223	68,552	18,223	68,552	-	-	-	-
95,102	74,723	95,108	74,727	95,556	75,079	-	-	-	-	-	-
24,714	3,531	-	-	-	-	-	-	-	-	-	-
43,873	97,652	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
35,160	23,440	35,160	23,440	37,380	24,920	37,380	24,920	41,580	27,720	43,560	29,040
11,290	23,830	11,290	23,830	11,290	23,830	11,290	23,830	23,108	47,467	23,108	47,467
-	-	-	-	-	-	56,450	-	56,450	-	56,450	-
251,438	34,287	294,224	40,121	297,154	40,521	297,154	40,521	297,154	40,521	297,154	40,521
-	-	-	-	-	-	25,857	97,273	25,857	97,273	25,857	97,273
105,427	4,393	109,286	4,554	112,973	4,707	174,432	7,268	180,192	7,508	181,632	7,568
-	-	-	-	-	-	-	-	-	-	12,240	-
122,949	10,691	122,949	10,691	159,215	13,845	193,816	16,854	193,816	16,854	193,816	16,854
4,500	45,500	4,500	45,500	14,828	149,927	16,642	168,268	16,642	168,268	16,642	168,268
13,194	49,636	13,194	49,636	13,194	49,636	-	-	-	-	-	-
12,663	47,637	12,663	47,637	12,663	47,637	-	-	-	-	-	-
50,477	2,103	53,050	2,210	55,507	2,313	-	-	-	-	-	-
4,500	45,500	4,500	45,500	-	-	-	-	-	-	-	-
5,828	58,927	5,828	58,927	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
859,991	182,973	853,322	177,847	892,160	184,391	899,618	187,141	884,690	185,558	888,758	166,628
3,528,369	1,912,586	3,591,594	1,932,704	3,713,138	1,957,678	3,782,221	1,983,408	3,779,037	1,946,646	3,717,924	1,899,757

MASSACHUSETTS WATER RESOURCES AUTHORITY
Schedule of Sewer Flows
Last Ten Fiscal Years
(Million gallons per day)

MWRA Community	2019	2018	2017	2016
Arlington	5.28	4.79	4.64	3.96
Ashland	1.37	1.28	1.36	1.11
Bedford	2.72	2.51	2.46	2.34
Belmont	3.40	2.93	2.69	2.31
Boston (BWSC)	101.54	89.82	87.04	80.51
Braintree	8.74	7.07	6.26	6.63
Brookline	9.72	8.05	7.72	7.07
Burlington	3.95	3.58	3.38	3.00
Cambridge	19.08	17.98	17.83	16.31
Canton	3.35	3.24	2.79	2.59
Chelsea	5.90	5.49	5.12	4.67
Dedham	4.52	3.92	3.41	3.06
Everett	6.43	5.60	5.12	4.54
Framingham	7.86	7.32	6.87	7.15
Hingham Sewer District	1.62	1.32	1.25	1.22
Holbrook	1.01	0.91	0.85	0.83
Lexington	5.85	5.03	4.59	4.22
Malden	9.35	8.73	8.45	8.19
Medford	7.79	7.52	7.17	6.72
Melrose	4.80	4.18	4.29	3.69
Milton	3.97	3.28	3.04	2.56
Natick	3.28	2.77	2.76	2.80
Needham	4.28	3.68	3.52	3.06
Newton	16.50	14.21	14.73	14.11
Norwood	6.93	6.20	5.41	4.58
Quincy	14.92	13.48	12.58	12.11
Randolph	4.06	3.85	3.58	2.82
Reading	3.63	2.88	2.89	2.42
Revere	7.18	6.18	6.14	5.97
Somerville	10.25	10.63	10.27	9.96
Stoneham	3.57	3.13	2.68	2.39
Stoughton	3.55	3.24	2.75	2.60
Wakefield	5.02	4.17	4.09	3.59
Walpole	2.48	2.07	1.99	1.75
Waltham	10.02	9.07	8.39	8.10
Watertown	3.84	3.48	3.36	3.00
Wellesley	3.80	3.22	3.15	2.82
Westwood	1.99	1.76	1.78	1.50
Weymouth	10.14	8.65	7.93	7.15
Wilmington	1.56	1.45	1.40	1.28
Winchester	2.73	2.30	2.23	1.94
Winthrop	2.40	2.10	2.14	1.85
Woburn	5.97	6.29	6.48	5.83

Source: MWRA metering

2015	2014	2013	2012	2011	2010
4.56	4.15	4.47	5.08	4.72	5.88
1.16	1.20	1.22	1.24	1.10	1.34
2.57	2.42	2.41	2.52	2.33	2.85
2.89	2.56	2.92	3.10	3.05	3.98
87.21	85.18	94.79	97.02	95.81	100.40
7.08	6.39	6.58	6.82	6.52	6.97
8.62	8.89	9.09	10.03	9.61	11.74
3.31	3.12	3.22	3.45	3.53	4.18
17.93	16.15	17.28	17.16	16.84	19.60
2.77	2.98	2.77	2.26	2.44	2.40
5.16	4.76	4.88	4.91	5.08	5.35
3.53	3.44	3.57	3.61	3.39	4.42
4.95	4.85	5.15	5.81	4.81	6.08
7.62	6.76	7.05	6.11	6.28	7.73
1.37	1.25	1.32	1.26	1.28	1.41
0.89	0.86	0.92	0.76	0.78	0.90
4.93	4.47	5.06	5.25	5.00	6.96
9.20	8.13	8.95	9.11	9.18	9.72
8.26	7.09	7.96	7.68	7.63	9.95
4.64	3.86	4.50	4.69	3.91	4.89
3.26	2.93	3.14	3.33	3.32	4.24
2.93	2.95	3.07	3.10	2.95	2.94
3.39	3.29	3.52	3.62	3.71	4.69
15.22	13.29	15.31	17.09	15.61	19.43
5.29	4.97	5.13	4.82	4.50	5.52
13.56	12.96	13.45	14.09	13.79	16.36
3.52	3.41	3.66	3.63	3.43	4.07
2.83	2.65	2.86	3.07	2.87	3.46
6.82	6.13	7.01	7.50	7.36	7.97
10.70	9.30	10.87	10.63	10.79	11.86
3.16	2.70	3.15	3.47	3.12	3.91
3.20	2.67	2.66	3.09	2.83	4.35
4.26	3.50	3.88	4.42	4.21	5.27
1.88	1.89	2.00	1.93	1.92	2.55
9.11	8.06	9.26	9.39	9.77	11.28
3.31	3.14	3.49	3.68	3.66	4.30
3.14	3.05	3.38	3.63	3.29	4.25
1.50	1.28	1.42	1.42	1.33	1.78
7.82	6.90	8.18	7.56	7.39	8.94
1.33	1.20	1.20	1.32	1.27	1.53
2.24	1.99	2.30	2.39	2.28	2.74
1.90	1.84	1.99	2.21	2.22	2.53
6.86	6.97	7.34	7.28	7.48	9.08

MASSACHUSETTS WATER RESOURCES AUTHORITY
Schedule of Water Flows
Last Ten Fiscal Years
(Million gallons per day)

MWRA Water Customer	2019	2018	2017	2016
Arlington	3.573	3.676	3.782	3.907
Belmont	1.990	2.032	2.105	2.187
Boston (BWSC)	62.331	63.418	64.334	64.902
Brookline	4.903	4.948	5.068	5.275
Chelsea	3.278	3.368	3.323	3.283
Chicopee	4.878	5.131	5.122	5.306
Clinton	1.390	1.416	1.433	1.637
Everett	3.710	3.778	3.905	3.883
Framingham	5.669	5.752	5.883	6.017
Lexington	5.034	5.047	5.304	5.377
Lynnfield W.D.	0.488	0.549	0.560	0.522
Malden	5.101	5.088	4.941	5.225
Marblehead	1.654	1.804	1.817	1.839
Medford	4.292	4.587	4.624	4.944
Melrose	1.976	2.038	2.071	2.207
Milton	2.271	2.420	2.578	2.632
Nahant	0.315	0.323	0.390	0.384
Newton	8.540	8.511	8.973	9.986
Norwood	2.662	2.771	2.835	2.776
Quincy	7.894	8.106	8.869	9.209
Reading	1.540	1.610	1.658	1.646
Revere	3.558	3.600	3.673	3.770
Saugus	2.830	2.852	2.926	2.862
Somerville	5.653	5.636	5.805	6.186
So. Hadley Fire District #1	0.978	1.034	1.070	1.091
Southborough	0.904	0.934	0.984	1.050
Stoneham	1.865	2.220	2.247	2.336
Swampscott	1.473	1.461	1.426	1.431
Waltham	6.400	6.600	6.599	7.077
Watertown	2.547	2.640	2.582	2.553
Weston	1.566	1.739	1.973	1.940
Wilbraham	1.066	1.107	1.166	1.193
Winthrop	1.258	1.224	1.196	1.225
Cambridge (Partial)	0.025	0.000	1.403	0.942
Canton (Partial)	1.342	1.198	1.867	1.559
Dedham-Westwood W.D. (Partial)	0.210	0.134	0.198	0.140
Lynn (LWSC) (Partial)	0.330	0.269	0.233	0.690
Marlborough (Partial)	3.883	4.074	3.834	3.570
Needham (Partial)	0.834	0.638	0.703	0.933
Northborough (Partial)	0.893	0.890	0.912	0.906
Peabody (Partial)	1.562	3.487	2.105	1.126
Stoughton (Partial)	0.078	0.102	0.154	0.526
Wakefield (Partial)	1.782	1.541	1.667	1.426
Wellesley (Partial)	1.158	1.160	0.994	1.054
Wilmington (Partial)	0.461	0.456	0.485	0.539
Winchester (Partial)	1.230	1.144	1.407	1.542
Woburn (Partial)	2.766	2.400	2.627	2.482
Worcester (Partial)	0.000	0.000	2.322	0.001
Comm. of Mass. - Fernald (Other)	-	-	-	-
D.C.R. Parks/ Pools/Blue Hills (Other)	0.077	0.103	0.044	0.052
MWRA - Deer Island Water (Other)	1.310	1.275	1.325	1.397
Other Reservoir Withdrawals (Other)	6.146	6.001	2.821	-
Quinapoxet Withdrawal (Other)	3.192	5.250	2.654	7.582
Westboro State Hospital (Other)	-	-	-	-
Westboro State Hospital (DYS) (Other)	0.008	0.024	0.023	0.024

Source: MWRA metering

2015	2014	2013	2012	2011	2010
3.826	3.778	3.933	4.061	4.309	3.872
2.157	2.113	2.169	2.174	2.092	2.186
64.567	63.184	64.325	64.395	65.128	65.530
5.500	5.462	5.344	5.078	5.120	5.110
3.248	3.306	3.121	3.095	3.036	3.036
5.251	5.285	5.394	5.496	5.457	5.620
1.700	1.719	1.951	1.975	1.896	1.689
3.755	3.832	3.902	3.857	4.007	4.168
6.621	6.504	6.542	6.578	6.859	6.426
5.824	5.145	4.961	4.534	4.990	4.548
0.488	0.463	0.415	0.354	0.415	0.360
5.684	5.250	5.372	5.524	5.486	5.252
1.803	1.791	1.715	1.698	1.757	1.751
5.059	5.075	4.957	4.835	5.077	4.994
2.323	2.235	2.218	2.144	2.247	2.101
2.598	2.394	2.464	2.442	2.383	2.288
0.357	0.331	0.307	0.290	0.311	0.287
10.095	9.174	8.858	8.891	8.871	8.448
2.932	2.892	2.736	2.808	3.241	2.904
9.330	9.173	8.933	8.878	9.126	9.051
1.625	1.616	1.648	1.601	1.728	1.669
3.919	3.909	3.798	3.871	3.975	4.116
2.935	2.805	2.632	2.668	2.892	2.906
5.672	5.609	5.843	5.521	5.706	5.815
1.082	1.074	1.128	1.159	1.209	1.142
1.014	0.956	0.909	0.860	0.973	0.886
2.573	2.793	2.982	2.785	2.849	2.687
1.380	1.559	1.459	1.546	1.510	1.397
7.133	6.823	6.855	6.753	7.451	7.369
2.599	2.661	2.606	2.583	2.664	2.550
1.919	1.675	1.608	1.599	1.719	1.368
1.153	1.112	1.153	1.121	1.174	1.047
1.312	1.263	1.243	1.241	1.264	1.182
-	5.874	-	-	-	-
1.068	0.875	1.082	1.560	1.968	2.292
0.273	0.039	0.089	0.063	0.046	0.001
0.175	0.227	0.172	0.233	0.230	0.177
3.247	3.482	2.969	2.260	3.294	2.243
0.907	0.787	0.894	1.091	0.802	0.303
0.891	0.875	0.882	0.882	0.760	0.707
1.257	1.155	0.828	0.509	0.668	0.442
0.979	0.759	0.753	0.632	0.658	0.544
1.505	1.355	1.439	1.360	1.531	1.436
0.820	0.686	1.499	0.789	1.058	0.906
0.456	0.256	0.204	0.084	0.555	0.206
1.042	1.048	0.987	0.928	0.978	0.819
2.673	2.383	3.029	2.520	2.317	1.813
-	-	0.002	-	-	-
0.015	0.063	0.066	0.060	0.070	0.083
0.058	0.061	0.052	0.047	0.052	0.050
1.279	1.247	1.310	1.448	1.341	1.418
-	-	-	-	0.160	0.908
3.824	4.110	6.241	0.530	5.544	-
-	-	0.014	0.015	0.039	0.121
0.045	0.017	0.017	-	-	-

MASSACHUSETTS WATER RESOURCES AUTHORITY
Sewer-System Total
Community Population Estimates
Last Ten Calendar Years

Population	Customer Type	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Arlington	Sewer & Water	45,624	45,510	45,052	44,204	44,212	44,028	43,711	43,290	42,844	41,719
Ashland	Sewer	17,739	17,706	17,684	17,185	17,191	17,150	16,993	16,767	16,593	15,381
Bedford	Sewer	14,195	14,197	14,411	14,058	14,086	13,975	13,765	13,455	13,320	13,813
Belmont	Sewer & Water	26,330	26,458	26,171	25,425	25,431	25,332	25,204	24,987	24,729	23,723
Boston Water & Sewer Comm.	Sewer & Water	694,583	685,094	673,184	651,710	649,917	645,966	636,479	625,087	617,594	645,169
Braintree	Sewer	37,250	37,156	37,297	36,984	36,968	36,727	36,249	35,990	35,744	35,488
Brookline	Sewer & Water	59,310	59,157	59,126	59,277	59,246	59,128	59,115	59,132	58,732	56,417
Burlington	Sewer	28,742	27,176	26,351	25,502	25,507	25,463	25,165	24,755	24,498	25,749
Cambridge	Sewer	118,977	113,630	110,651	107,705	107,732	107,289	106,471	106,038	105,162	108,771
Canton	Sewer & Partial Water	23,629	23,444	22,952	22,257	22,246	22,221	21,932	21,710	21,561	22,370
Chelsea	Sewer & Water	40,160	40,227	38,599	37,359	37,881	37,670	36,828	35,649	35,177	37,483
Chicopee	Water	55,582	55,363	55,342	55,789	56,233	55,882	55,795	55,583	55,305	55,220
Clinton	Water	14,022	13,958	13,873	13,837	13,788	13,748	13,693	13,643	13,624	13,596
Dedham	Sewer & Partial Water	25,334	25,364	25,263	25,322	25,346	25,299	24,974	24,895	24,729	24,811
Everett	Sewer & Water	46,880	46,324	44,840	43,484	43,110	42,935	42,567	42,101	41,667	38,299
Framingham	Sewer & Water	73,123	72,032	71,594	70,569	70,583	70,441	70,068	68,991	68,318	67,191
Hingham Sewer District	Sewer	7,586	7,611	7,708	7,370	7,260	7,475	7,279	7,201	7,162	7,863
Hollbrook	Sewer	11,048	11,026	11,022	10,994	10,988	10,952	10,899	10,866	10,791	10,732
Lexington	Sewer & Water	33,792	33,727	33,410	32,810	32,817	32,650	32,272	31,718	31,394	30,925
Lynnfield	Water	13,041	12,944	12,839	12,765	12,667	12,409	11,821	11,726	11,621	11,535
Malden	Sewer & Water	61,036	61,246	60,840	60,776	60,788	60,509	60,374	60,071	59,450	56,146
Marblehead	Water	20,634	20,559	20,467	20,428	20,364	20,256	20,119	19,980	19,854	19,776
Marlborough	Partial Water	39,825	39,788	39,793	39,799	39,691	39,468	39,305	38,934	38,580	38,187
Medford	Sewer & Water	57,765	57,797	57,213	57,266	57,385	57,170	57,033	56,738	56,173	55,578
Melrose	Sewer & Water	28,193	28,367	27,928	27,777	27,810	27,690	27,435	27,263	26,983	27,091
Milton	Sewer & Water	27,616	27,575	27,351	27,358	27,345	27,270	27,158	27,182	27,003	26,186
Nahant	Water	3,524	3,506	3,493	3,496	3,483	3,474	3,446	3,432	3,417	3,415
Natick	Sewer	36,229	36,246	36,137	35,326	35,339	35,214	33,760	33,349	33,006	32,333
Needham	Sewer & Partial Water	31,248	30,999	30,755	29,797	29,785	29,736	29,366	29,083	28,886	29,021
Newton	Sewer & Water	88,904	88,994	89,045	87,908	87,927	87,971	86,307	85,945	85,146	84,592
Northborough	Partial Water	15,101	15,038	14,962	14,944	14,905	14,749	14,646	14,664	14,397	14,148
Norwood	Sewer & Water	29,327	29,195	29,097	29,021	29,007	28,951	28,800	28,801	28,602	28,442
Peabody	Partial Water	53,278	53,008	52,809	52,661	52,489	52,243	51,913	51,633	51,403	50,844
Quincy	Sewer & Water	94,580	94,166	93,688	93,373	93,327	93,494	93,027	92,909	92,271	91,028
Randolph	Sewer	34,398	34,272	33,610	33,541	33,519	33,456	33,226	32,336	32,112	31,022
Reading	Sewer & Water	25,337	26,106	25,834	25,397	25,433	25,327	25,192	25,001	24,747	23,509
Revere	Sewer & Water	53,821	53,993	53,157	53,316	54,063	53,756	53,179	52,459	51,755	51,693
Saugus	Water	28,385	28,265	28,125	28,080	27,976	27,826	27,387	27,047	26,730	26,493
Somerville	Sewer & Water	81,562	81,360	81,322	78,929	78,857	78,804	77,104	76,519	75,754	76,491
South Hadley Fire District #1	Water	17,806	17,836	17,765	17,625	17,712	17,715	17,834	17,817	17,726	17,504
Southborough	Water	10,169	10,138	10,087	10,015	9,936	9,894	9,851	9,816	9,775	9,695
Stonham	Sewer & Water	22,729	22,036	21,953	21,803	21,808	21,734	21,605	21,659	21,437	21,558
Stoughton	Sewer & Partial Water	28,950	28,528	28,431	28,197	28,183	28,106	27,849	27,150	26,962	27,154
Swampscott	Water	15,227	14,976	14,898	14,564	14,085	14,025	13,949	13,874	13,807	13,783
Wakefield	Sewer & Partial Water	27,135	27,157	26,753	26,147	26,182	26,080	25,613	25,191	24,932	25,196
Walpole	Sewer	25,209	25,073	25,125	24,788	24,776	24,818	24,562	24,234	24,070	23,448
Waltham	Sewer & Water	62,962	62,442	63,002	62,412	62,424	62,227	61,918	61,181	60,632	60,604
Watertown	Sewer & Water	35,954	35,756	34,025	33,124	33,130	32,996	32,863	32,248	31,915	33,117
Wellesley	Sewer & Partial Water	29,673	29,479	29,215	28,897	29,180	29,090	28,748	28,152	27,982	27,398
Weston	Water	12,134	12,119	12,100	12,066	11,921	11,845	11,698	11,515	11,370	11,241
Westwood	Sewer & Partial Water	16,127	16,056	15,279	14,904	14,896	14,876	14,768	14,721	14,618	14,322
Weymouth	Sewer	57,719	56,664	55,972	55,510	55,482	55,419	54,906	54,116	53,743	53,977
Wilbraham	Water	14,749	14,625	14,588	14,573	14,477	14,432	14,366	14,311	14,226	14,161
Wilmington	Sewer & Partial Water	23,907	23,803	23,570	23,199	23,204	23,147	22,936	22,557	22,325	22,369
Winchester	Sewer & Partial Water	22,851	22,838	22,808	22,159	22,166	22,079	21,869	21,594	21,374	21,495
Winthrop	Sewer & Water	18,688	18,625	18,190	17,979	18,232	18,111	17,940	17,737	17,497	19,235
Woburn	Sewer & Partial Water	40,397	39,701	39,452	39,162	39,170	39,083	38,949	38,520	38,120	38,983
SYSTEM		2,680,096	2,656,436	2,626,208	2,580,923	2,579,666	2,569,781	2,542,261	2,513,323	2,489,345	2,507,492

Source: U.S. Census Bureau

MASSACHUSETTS WATER RESOURCES AUTHORITY
Sewer-System Total
Community Population Estimates
Last Ten Calendar Years

System Share	Customer Type	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Arlington	Sewer & Water	1.70%	1.71%	1.72%	1.71%	1.71%	1.71%	1.72%	1.72%	1.72%	1.66%
Ashland	Sewer	0.66%	0.67%	0.67%	0.67%	0.67%	0.67%	0.67%	0.67%	0.67%	0.61%
Bedford	Sewer	0.53%	0.53%	0.55%	0.54%	0.55%	0.54%	0.54%	0.54%	0.54%	0.55%
Belmont	Sewer & Water	0.98%	1.00%	1.00%	0.99%	0.99%	0.99%	0.99%	0.99%	0.99%	0.95%
Boston Water & Sewer Comm.	Sewer & Water	25.92%	25.79%	25.63%	25.25%	25.19%	25.14%	25.04%	24.87%	24.81%	25.73%
Braintree	Sewer	1.39%	1.40%	1.42%	1.43%	1.43%	1.43%	1.43%	1.43%	1.44%	1.42%
Brookline	Sewer & Water	2.21%	2.23%	2.25%	2.30%	2.30%	2.30%	2.33%	2.35%	2.36%	2.25%
Burlington	Sewer	1.07%	1.02%	1.00%	0.99%	0.99%	0.99%	0.98%	0.98%	0.98%	1.03%
Cambridge	Sewer	4.44%	4.28%	4.21%	4.17%	4.18%	4.18%	4.19%	4.22%	4.22%	4.34%
Canton	Sewer & Partial Water	0.88%	0.88%	0.87%	0.86%	0.86%	0.86%	0.86%	0.86%	0.87%	0.89%
Chelsea	Sewer & Water	1.50%	1.51%	1.47%	1.45%	1.47%	1.45%	1.42%	1.42%	1.41%	1.49%
Chicopee	Water	2.07%	2.08%	2.11%	2.16%	2.18%	2.17%	2.19%	2.21%	2.22%	2.20%
Clinton	Water	0.52%	0.53%	0.53%	0.54%	0.53%	0.54%	0.54%	0.54%	0.55%	0.54%
Dedham	Sewer & Partial Water	0.95%	0.95%	0.96%	0.98%	0.98%	0.98%	0.98%	0.99%	0.99%	0.99%
Everett	Sewer & Water	1.75%	1.74%	1.71%	1.68%	1.67%	1.67%	1.67%	1.68%	1.67%	1.53%
Frammingham	Sewer & Water	2.73%	2.71%	2.73%	2.73%	2.74%	2.74%	2.76%	2.75%	2.74%	2.68%
Hingham Sewer District	Sewer	0.28%	0.29%	0.29%	0.29%	0.28%	0.29%	0.29%	0.29%	0.29%	0.31%
Holbrook	Sewer	0.41%	0.42%	0.42%	0.43%	0.43%	0.43%	0.43%	0.43%	0.43%	0.43%
Lexington	Sewer & Water	1.26%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.26%	1.26%	1.23%
Lynnfield	Water	0.49%	0.49%	0.49%	0.49%	0.49%	0.48%	0.46%	0.47%	0.47%	0.46%
Malden	Sewer & Water	2.28%	2.31%	2.32%	2.35%	2.36%	2.35%	2.37%	2.39%	2.39%	2.24%
Marblehead	Water	0.77%	0.77%	0.78%	0.79%	0.79%	0.79%	0.79%	0.79%	0.80%	0.79%
Marlborough	Partial Water	1.49%	1.50%	1.52%	1.54%	1.54%	1.54%	1.55%	1.55%	1.55%	1.52%
Medford	Sewer & Water	2.16%	2.18%	2.18%	2.22%	2.22%	2.22%	2.24%	2.26%	2.26%	2.22%
Melrose	Sewer & Water	1.05%	1.07%	1.06%	1.08%	1.08%	1.08%	1.08%	1.08%	1.08%	1.08%
Milton	Sewer & Water	1.03%	1.04%	1.04%	1.06%	1.06%	1.06%	1.07%	1.08%	1.08%	1.04%
Nahant	Water	0.13%	0.13%	0.13%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%
Natick	Sewer	1.35%	1.36%	1.38%	1.37%	1.37%	1.37%	1.33%	1.33%	1.33%	1.29%
Needham	Sewer & Partial Water	1.17%	1.17%	1.17%	1.15%	1.15%	1.16%	1.16%	1.16%	1.16%	1.16%
Newton	Sewer & Water	3.32%	3.35%	3.39%	3.41%	3.41%	3.42%	3.39%	3.42%	3.42%	3.37%
Northborough	Partial Water	0.56%	0.57%	0.57%	0.58%	0.58%	0.57%	0.58%	0.58%	0.58%	0.56%
Norwood	Sewer & Water	1.09%	1.10%	1.11%	1.12%	1.12%	1.13%	1.13%	1.15%	1.15%	1.13%
Peabody	Partial Water	1.99%	2.00%	2.01%	2.04%	2.03%	2.03%	2.04%	2.05%	2.06%	2.03%
Quincy	Sewer & Water	3.53%	3.54%	3.57%	3.62%	3.62%	3.64%	3.66%	3.70%	3.71%	3.63%
Randolph	Sewer	1.28%	1.29%	1.28%	1.30%	1.30%	1.30%	1.31%	1.29%	1.29%	1.24%
Reading	Sewer & Water	0.95%	0.98%	0.98%	0.98%	0.99%	0.99%	0.99%	0.99%	0.99%	0.94%
Revere	Sewer & Water	2.01%	2.03%	2.02%	2.07%	2.10%	2.09%	2.09%	2.09%	2.08%	2.06%
Saugus	Water	1.06%	1.06%	1.07%	1.09%	1.08%	1.08%	1.08%	1.08%	1.07%	1.06%
Somerville	Sewer & Water	3.04%	3.06%	3.10%	3.06%	3.06%	3.07%	3.03%	3.04%	3.04%	3.05%
South Hadley Fire District #1	Water	0.66%	0.67%	0.68%	0.68%	0.69%	0.69%	0.70%	0.71%	0.71%	0.70%
Southborough	Water	0.38%	0.38%	0.38%	0.39%	0.39%	0.39%	0.39%	0.39%	0.39%	0.39%
Stonham	Sewer & Water	0.85%	0.83%	0.84%	0.84%	0.85%	0.85%	0.85%	0.86%	0.86%	0.86%
Stoughton	Sewer & Partial Water	1.08%	1.07%	1.08%	1.09%	1.09%	1.09%	1.10%	1.08%	1.08%	1.08%
Swampscott	Water	0.57%	0.56%	0.57%	0.56%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%
Wakefield	Sewer & Partial Water	1.01%	1.02%	1.02%	1.01%	1.01%	1.01%	1.01%	1.00%	1.00%	1.00%
Walpole	Sewer	0.94%	0.94%	0.96%	0.96%	0.96%	0.97%	0.97%	0.96%	0.97%	0.94%
Waltham	Sewer & Water	2.35%	2.35%	2.40%	2.42%	2.42%	2.42%	2.44%	2.43%	2.44%	2.42%
Watertown	Sewer & Water	1.34%	1.35%	1.30%	1.28%	1.28%	1.28%	1.29%	1.28%	1.28%	1.32%
Wellesley	Sewer & Partial Water	1.11%	1.11%	1.11%	1.12%	1.13%	1.13%	1.13%	1.12%	1.12%	1.09%
Weston	Water	0.45%	0.46%	0.46%	0.47%	0.46%	0.46%	0.46%	0.46%	0.46%	0.45%
Westwood	Sewer & Partial Water	0.60%	0.60%	0.58%	0.58%	0.58%	0.58%	0.58%	0.59%	0.59%	0.57%
Weymouth	Sewer	2.15%	2.13%	2.13%	2.15%	2.15%	2.16%	2.16%	2.15%	2.16%	2.15%
Wilbraham	Water	0.55%	0.55%	0.56%	0.56%	0.56%	0.56%	0.57%	0.57%	0.57%	0.56%
Wilmington	Sewer & Partial Water	0.89%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.89%
Winchester	Sewer & Partial Water	0.85%	0.86%	0.87%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%
Winthrop	Sewer & Water	0.70%	0.70%	0.69%	0.70%	0.71%	0.70%	0.71%	0.71%	0.70%	0.77%
Woburn	Sewer & Partial Water	1.51%	1.49%	1.50%	1.52%	1.52%	1.52%	1.53%	1.53%	1.53%	1.55%
SYSTEM		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

MASSACHUSETTS WATER RESOURCES AUTHORITY
Full-time Equivalent Employees by Function
Last Ten Fiscal Years

Division	2019		2018		2017		2016	
	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate
Executive	4.0	20.00%	4.0	20.00%	5.0	0.00%	5.0	0.00%
Internal Audit	5.7	25.00%	6.7	12.50%	6.7	12.50%	6.7	12.50%
Public Affairs	9.9	28.57%	10.9	15.38%	11.9	7.69%	12.9	7.14%
Affirmative Action	5.0	28.57%	6.0	0.00%	4.0	33.33%	6.0	0.00%
Emergency Preparedness	4.0	0.00%	8.0	0.00%	8.0	0.00%	5.8	0.00%
Tunnel Redundancy	7.0	0.00%	1.0	0.00%	-	-	-	-
Finance	31.5	23.81%	33.5	19.05%	35.5	14.29%	37.5	11.63%
Operations	922.8	8.51%	923.3	8.70%	930.0	7.35%	922.7	6.93%
Law	12.5	31.58%	13.5	26.32%	13.5	26.32%	15.5	15.79%
Administration	136.8	15.63%	135.5	13.46%	135.4	12.26%	138.0	10.32%

2015		2014		2013		2012		2011		2010	
FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate
5.0	0.00%	5.0	0.00%	5.0	0.00%	5.0	0.00%	4.0	0.00%	4.0	0.00%
6.7	12.50%	7.5	0.00%	7.5	0.00%	7.5	0.00%	7.5	0.00%	7.2	0.00%
12.9	7.69%	11.9	7.69%	12.9	0.00%	12.9	0.00%	13.9	0.00%	14.9	0.00%
5.0	33.33%	6.0	14.29%	7.0	0.00%	6.8	12.50%	7.0	12.50%	8.0	0.00%
4.8	0.00%	5.8	0.00%	4.8	0.00%	3.8	0.00%	4.8	0.00%	3.8	0.00%
-		-		-		-		-		-	
38.3	9.30%	39.3	4.65%	39.3	6.98%	41.3	4.55%	42.3	2.27%	43.2	2.22%
925.1	7.35%	917.2	7.55%	935.1	4.96%	939.8	4.77%	949.4	3.35%	955.0	4.68%
14.5	26.32%	14.9	15.79%	15.1	15.79%	16.1	10.53%	17.1	5.26%	17.1	10.00%
138.0	9.74%	136.6	9.03%	139.6	8.97%	144.8	5.77%	147.4	3.85%	147.1	7.41%

MASSACHUSETTS WATER RESOURCES AUTHORITY

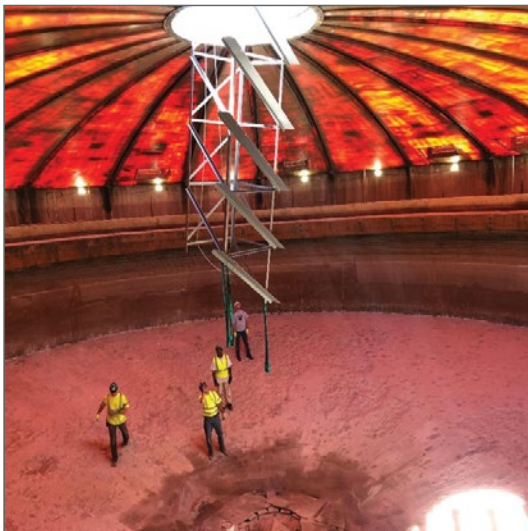
Capital Asset Statistics by Function



Southern Extra High Pipeline, Boston

WATER SYSTEM

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



Deer Island Gravity Thickener Rehabilitation

WASTEWATER SYSTEM

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



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