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MASSACHUSETTS WATER RESOURCES AUTHORITY
Deer Island
33 Tafts Avenue
Boston, MA 02128

Frederick A. Laskey
Executive Director
Chair: R. Tepper
Vice-Chair: A. Pappastergion
Secretary: B. Peña
Board Members:
P. Flanagan
J. Foti
L. Taverna
H. Vitale
J. Walsh
P. Walsh
M. White-Hammond
J. Wolowicz

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BOARD OF DIRECTORS' MEETING

Date: Wednesday, January 17, 2024

Time: 1:00pm

Location: MWRA Chelsea Administration Building, 2nd Floor, Rooms 2C and D
2 Griffin Way
Chelsea, MA 02150

A photo ID will be required for entry.

The meeting will also be available via Webex. The Webex meeting link, event number and password to attend virtually are:
Webex meeting link (registration required):

https://mwra.webex.com/weblink/register/r540d80901d5acd5e5d4a881014551b4a

Event number: 2340 403 3797 11724

REVISED AGENDA

I. APPROVAL OF MINUTES

II. REPORT OF THE CHAIR

A. Annual Meeting: Election and Appointment of MWRA Officers, Retirement Board Member and Committee Assignments (materials to follow)

III. REPORT OF THE EXECUTIVE DIRECTOR

IV. EXECUTIVE SESSION

i. Approval of December 13, 2023 Executive Session Minutes

A. Real Estate

1. Watershed Land Acquisition

B. Litigation

1. Annual Litigation Update

2. Prison Point CSO Facility Improvements: Contract 7462

V. WATER POLICY & OVERSIGHT

A. Approvals

1. First Amendment to the Memorandum of Agreement By and Between Massachusetts Water Resources Authority and the City of Newton Relating to Contract 6392 – Rehabilitation of Sections 23, 24 and 47 Water Mains

V. WATER POLICY & OVERSIGHT (Continued)

B. Contract Amendments/Change Orders

1. Low Service Pressure Reducing Valve Improvements - Boston/Medford: RJV Construction Corporation, Contract 7563, Change Order 6

2. Wachusett Lower Gatehouse Pipe and Boiler Replacement: J.F. White Contracting Co., Contract 7380, Change Order 1

VI. WASTEWATER POLICY AND OVERSIGHT

A. Approvals

1. Second Amendments to Both the Memorandum of Understanding and Financial Assistance Agreement with the Boston Water and Sewer Commission for Implementation of the Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects

VII. ADMINISTRATION, FINANCE AND AUDIT

A. Information

1. Delegated Authority Report – December 2023

2. FY2021-FY2025 Strategic Business Plan Annual Update for FY23

3. Overview of MWRA's Greenhouse Gas Inventory for 2022

4. FY2024 Financial Update and Summary through December 2023

B. Approvals

1. Transmittal of the FY2025 Proposed Capital Improvement Program (CIP) to the MWRA Advisory Board

2. Bond Defeasance of Future Debt Service

C. Contract Awards

1. Bond Counsel Services: Greenberg Traurig, LLP, Contract F273

VIII. PERSONNEL & COMPENSATION

A. Approvals

1. January 2024 PCR Amendments

IX. CORRESPONDENCE TO THE BOARD

X. OTHER BUSINESS

XI. ADJOURNMENT

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Board of Directors

December 13, 2023

A meeting of the Massachusetts Water Resources Authority ("MWRA") Board of Directors was held on December 13, 2023 at MsWRA's headquarters at Deer Island in Boston, and also via remote participation.

Chair Tepper presided from MWRA headquarters. Board Members Flanagan, Foti, Pappastergion, Peña, Taverna, Jack Walsh, and White-Hammond also participated from MWRA headquarters. Board Members Vitale, Patrick Walsh and Wolowicz participated remotely.

MWRA Executive Director Frederick Laskey; General Counsel Carolyn Francisco Murphy; Chief Operating Officer David Coppes; Deputy Chief Operating Officer Rebecca Weidman; Director of Finance Thomas Durkin; Director of Administration Michele Gillen; Special Assistant for Affirmative Action Patterson Riley; Director of Planning and Sustainability Stephen Estes-Smargiassi; Deer Island Treatment Plant Director David Duest; Deer Island Engineering Services Manager Richard Adams; Director of SCADA Metering and Monitoring Ethan Wenger; Director of Security Gary Cacace; Tunnel Program Director Kathy Murtagh; Human Resources Director Wendy Chu; Chief Engineer Brian Kubaska; Chief of Staff Katie Ronan; Associate General Counsel Kristen Schuler Scammon; and, Assistant Secretary Kristin MacDougall participated at MWRA headquarters.

Vandana Rao, EEA, and Matt Romero, MWRA Advisory Board, also participated at MWRA Headquarters.

Chair Tepper called the meeting to order at 1:06pm.

ROLL CALL

MWRA General Counsel Francisco Murphy took roll call of Board Members in attendance and announced that Board Members Vitale, Patrick Walsh and Wolowicz were participating remotely. The Chair announced that the meeting was being held at MWRA's headquarters at Deer Island and virtually, via a link posted on MWRA's website. She added that the meeting would be recorded, and that the agenda and meeting materials were available on MWRA's website. She also announced that individual roll call votes would be conducted after each motion was made and given an opportunity for discussion.

APPROVAL OF NOVEMBER 15, 2023 MINUTES

A motion was duly made and seconded to approve the minutes of the Board of Directors' meeting of November 15, 2023.

Chair Tepper asked if there was any discussion or questions from the Board. Hearing none, she requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
		Foti
Pappastergion		

Yes	No	Abstain
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. I)

REPORT OF THE CHAIR

Chair Tepper updated Board Members on the Healy-Driscoll Administration's Forest as Climate Solutions Initiative. She explained that the Initiative is a series of programs designed to accelerate progress toward the Administration's land conservation goals such as the expansion of existing state land conservation programs; investment in forest conservation; enhancement of the network of forest reserves; and the provision of incentives to private landowners for the advancement of climate-focused practices. She then reported that the Administration has convened a Land Forestry Committee to provide the Secretariat with expert, science-informed guidance and recommendations to help the state enforce its forestry and land management decisions while prioritizing climate mitigation and resilience. She explained that the guidance will apply to state lands, including MWRA watershed lands managed by the DCR's Division of Water Supply. The Chair then reported that review of the state's Climate Smart Forest Management Practices is underway, and that the Land Forestry Committee has met several times since the Initiative's launch. She noted that the Committee's report on its recommendations is expected to be released to the public soon and will be posted on the Forestry as Climate Solutions webpage. She advised that the report will inform the Administration's efforts toward keeping its commitment to resume its Forestry Program. She then explained that EEA, DCR, and MassWildlife will review the Committee's recommendations and public input to determine an implementation approach for new projects going forward. Finally, Chair Tepper advised that MWRA will continue to be informed about the Climate as Forestry Solutions Initiative's schedule and next steps. (ref. II)

REPORT OF THE EXECUTIVE DIRECTOR

Fred Laskey, MWRA Executive Director, reported that Personnel and Compensation Committee Chair Wolowicz, Committee Vice Chair White-Hammond and MWRA staff participated in a productive workforce development meeting on December 4, 2023 to discuss a NOAA workforce grant opportunity. He noted added that staff invited DCR staff to participate in future discussions, and asked Board Members White-Hammond and Wolowicz to share their perspectives.

Board Member White-Hammond provided brief background on the NOAA workforce grant opportunity. She explained that the grant reflects ongoing shifts in the ways city and state agencies operate due to climate change, and the growing need to provide training and support that prepares workers for emerging careers that promote climate resilience. She noted that the grant emphasizes the development of opportunities for a more diverse workforce, and aligns with the staffing needs of the

City of Boston, DCR and MWRA and other potential grant partners.
Board Member Wolowicz added that the meeting participants also discussed helpful and creative ideas for recruiting staff and generating interest in water and wastewater careers, and that she is looking forward to continuing these collaborative efforts.

Mr. Laskey resumed his report. He noted that staff will update the Board on the progress of the Metropolitan Water Tunnel Program in the coming months. Next, he reported that EPA had recently issued a draft of the revised Lead and Copper Rule ("LCR") and invited Stephen Estes-Smargiassi, MWRA Director of Planning and Sustainability, to update Board Members. Mr. Estes-Smargiassi advised that the new LCR will include a reduced Lead Action Level of 10 parts per billion (ppb), vs. the current 15 ppb Action Level. He further advised that EPA is proposing a ten-year mandate for the removal of every lead service line in the United States. He noted that staff will provide more details at a future Board meeting. Mr. Laskey stressed that meeting the new LCR requirements will require a large financial investment.

Next, Mr. Laskey reported that MWRA staff had successfully completed the termination of its outstanding Interest Rate Hedge Agreements ("SWAPs") and thanked Finance staff for their work. He then reminded Board Members of an upcoming deadline to complete required Conflict of Interest training. Finally, Mr. Laskey discussed proposed changes to the format and locations of MWRA Board of Directors meetings, including holding some meetings at the MWRA Chelsea facility.

There was discussion about potential adjustments to the Board Meeting format, various meeting locations, and a return to holding monthly Board Committee meetings in the morning, followed by a full Board of Directors meeting in the afternoon. There was also general discussion about the public notices and typical agendas for Committee and Board meetings, quorum requirements, and Board Members' schedules. Rev. White Hammond proposed that the Committees meet quarterly, and Chair Tepper suggested that the Committees begin meeting in March 2024. Rev. White-Hammond requested that quarterly Committee meetings be scheduled ahead. Board Member Vitale invited the Board of Directors to meet at the Boston Water and Sewer Commission's headquarters and Charlestown location. There was further brief, general discussion about the Board meeting schedule and locations. (ref. III)

EXECUTIVE SESSION

Chair Tepper requested that the Board move into Executive Session to discuss Real Estate and Litigation, since discussing such in Open Session could have a detrimental effect on the negotiating and litigating positions of the Authority. She announced the planned topics for discussion in Executive Session were a watershed land acquisition, approvals of orders of taking, and the Reardon v. MWRA et al Superior Court case. She announced that the Board would return to Open Session after the conclusion of Executive Session.

A motion was duly made and seconded to enter Executive Session for these purposes, and to resume Open Session after Executive Session adjournment.

General Counsel Francisco Murphy reminded Board members that under the Open Meeting Law members who were participating remotely in Executive Session must state that no other person is present or able to hear the discussion at their remote location. A response of "yes" to the Roll Call to

enter Executive Session when their name was called would also be deemed their statement that no other person was present or able to hear the Executive Session discussion.

Upon a motion duly made and seconded, a roll call vote was taken in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

Voted: to enter Executive Session, and to resume Open Session after Executive Session adjournment.

*** EXECUTIVE SESSION ***

The meeting entered Executive Session at 1:26pm and adjourned at 2:20pm.

*** CONTINUATION OF OPEN SESSION ***

WASTEWATER POLICY AND OVERSIGHT

Contract Awards

Combustion Turbine Generator Maintenance, Deer Island Treatment Plant: O'Connor Corporation, Contract S616

A motion was duly made and seconded to approve the award of Contract S616, Combustion Turbine Generator Maintenance, Deer Island Treatment Plant, to the lowest responsible and eligible bidder, O'Connor Corporation, and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the not to exceed amount of $5,670,334 for a contract term of 1,096 calendar days from the Notice to Proceed.

David Duest, MWRA Deer Island Treatment Plant Director, presented an overview of a proposed combustion turbine generator (CTG) maintenance contract. He described the specifications and capacity of the CTG system at the Deer Island Treatment Plant (DITP), and explained that the CTGs provide backup power as required by MWRA's NPDES permit. He described benefits of MWRA's CTGs, including the generation of non-rate revenue ($1.9 million in FY2023); capacity payment avoidance; and continuity of MWRA sewer service. Mr. Duest then discussed the scope and terms of the proposed CTG

maintenance contract, which includes three years of regular maintenance services and allowances for emergency and non-emergency maintenance and spare parts. He noted that the contractor would only be paid for work completed. He further noted that the contract also includes a task order for a one-time major upgrade of the CTGs' control systems, which were installed approximately 25 years ago.

Next, Mr. Duest described the procurement process for this contract. He explained that it was advertised as a Chapter 149 contract and that twelve vendors had requested bid documents. He advised that only one bid was received, from O'Connor Corporation, the incumbent contractor. He further advised that O'Connor's bid was 51.2% higher than the Engineers Estimate of $1.2 million. Mr. Duest explained that some key items, with a total value of approximately $1.5 million, had been inadvertently omitted from the Engineers' Estimate.

Board Member Foti asked who had prepared the Engineer's Estimate. Mr. Duest explained that the Engineer's Estimate was prepared by MWRA staff. There was brief, general discussion about the disparity with the Engineer's Estimate and its causes.

Richard Adams, MWRA Deer Island Engineering Services Manager, described factors that contributed to the disparity. He explained that the extent of the work needed to perform the one-time control system upgrade was not known until after the contract requisition was submitted, and that overhead costs were inadvertently omitted because they are not typically included in Chapter 149 contracts. There was brief discussion about Chapter 149 contracts. Mr. Foti requested clarification on the causes of the disparity. David Coppes, MWRA Chief Operating Officer, explained that the disparity was largely caused by procedural errors. There was brief discussion about the difference between the Engineer's Estimate and the contract cost, and driving factors. Mr. Foti noted that in his view, disparities between cost estimates and final bid prices have become more frequent industry-wide since the COVID-19 pandemic began. Mr. Coppes advised that staff had considered re-advertising the CTG contract due to the disparity, but decided to move forward with O'Connor's bid because of the criticality of the CTG maintenance and repair contact, the lack of competition for qualified vendors, and the potential for a second round of bids to come in at a higher cost. There was general discussion about the legal requirements and potential ramifications of a hypothetical re-advertisement.

Board Member Jack Walsh requested more information about the CTGs' manufacturer. Mr. Duest explained that the CTGs were manufactured by Pratt & Whitney Power Systems, Inc., which has since been acquired by Mitsubishi Heavy Industries, Ltd. Mr. Walsh asked if proprietary CTG technology limits the pool of potential operations and maintenance contractors. Mr. Duest responded in the affirmative. He explained that MWRA's CTG units require maintenance but are expected to continue operating well into the future because they are used infrequently, and advised that the cost of maintenance is expected to rise. Mr. Coppes added that MWRA is embarking on a study of new, greener, combined heat and power technology for Deer Island. Mr. Walsh expressed concern about the limited number of vendors qualified to maintain MWRA's CTGs. There was brief, general discussion about the challenges of proprietary technologies.

Rev. White-Hammond recommended that staff investigate and identify any structural causes of Engineer's Estimate disparities and the frequency of single bid contracts. Mr. Duest noted that staff

packaged its CTG procurements as two separate contracts in an effort to elicit as many qualified vendors as possible. There was brief, general discussion about the long-term benefits of reviewing MWRA's contractor procurement and estimation processes. Mr. Walsh expressed concerns about the potential impacts of a hypothetical CTG failure, and the availability of spare parts. Mr. Coppes advised that the CTG project includes the replacement of obsolete and hard-to-find parts, and that the proposed operations and maintenance contract includes a spare parts allowance. Mr. Duest added that the control system upgrade represented the bulk of the Engineer's Estimate disparity. There was brief discussion about various ways the proposed contract could have been packaged, the location of O'Connor Corporation staff, and MWRA's emergency response plan for any CTG issues.

Chair Tepper asked if there was further discussion or questions from the Board. Hearing none, she requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. V A.1)

(Board Member Peña temporarily left the meeting after the roll call vote.)

WATER POLICY AND OVERSIGHT

Contract Amendments/Change Orders

John J. Carroll Water Treatment Plant SCADA System Upgrade - Design, Engineering Services During Construction and Resident Engineering Services: Arcadis U.S., Inc., Contract 7581, Amendment 4

A motion was duly made and seconded to authorize the Executive Director, on behalf of the Authority, to approve Amendment 4 to Contract 7581, John J. Carroll Water Treatment Plant SCADA System Improvements, Design, Engineering Services During Construction and Resident Engineering Services, with Arcadis U.S., Inc. in the amount of $1,232,905, increasing the contract amount from $6,010,390.04 to $7,243,295.04 with no increase in contract term.

Ethan Wenger, MWRA Director of SCADA Metering and Monitoring, presented the reasons for a proposed amendment to a design, engineering and resident engineering services contract for SCADA systems upgrades at the Carroll Water Treatment Plant. He briefly described the functions of the Carroll plant and its SCADA system, and the scope of the contract, which includes the construction of a new, parallel SCADA system. Mr. Wenger then discussed the benefits of the upgrade and parallel system, and

the importance of the project to MWRA's ability to deliver drinking water without interruption. Next, he provided a brief overview of the contract's amendments to date, and advised that staff were seeking approval of an amendment for SCADA system programming, additional SCADA screens and screen improvements, added testing, and associated administrative costs. Mr. Wenger then described the benefits of the work under the proposed amendment, including better efficiency for operators, improved ease of maintenance, and reduced risk during the transition to the new system. Next, he discussed some upcoming challenges for the project that could impact the contract's duration and cost, such as long lead times for SCADA components and a complex testing and system transition process. He then stressed that the project is critical to MWRA operations, and that staff continues to seek ways to improve MWRA's systems. Finally, Mr. Wenger provided more detail on the SCADA system component replacement process.

(Mr. Peña returned to the meeting during the presentation.)

Mr. Peña requested more information about Programmable Logic Controller ("PLC") security. Mr. Wenger described MWRA's PLC security protocols. There was brief, general discussion about PLC security.

Board Member Taverna asked for more information about Arcadis U.S., Inc.'s staff qualifications. Mr. Wenger explained that the work under the proposed amendment would be performed by Aztec Automation Company ("Aztec"), a well-qualified subcontractor with experience on MWRA projects. Mr. Taverna asked where the subcontractor is located. Mr. Wenger advised that Aztec is located in Massachusetts, and that additional staff supporting the contract were located in Vermont and Connecticut. There was brief, general discussion about the proposed amendment's travel and meal allowance line item.

Hearing no further discussion or questions from the Board, Chair Tepper requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. VI A.1)

ADMINISTRATION, FINANCE AND AUDIT

Contract Awards

Security Officer Services for Various MWRA Facilities: United Security, Inc., Contract EXE-048

A motion was duly made and seconded to approve the recommendation of the Selection Committee to award Contract EXE-048, Security Officer Services for Various MWRA Facilities, to United Security, Inc. and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed $8,694,782.87 for a period of 1,095 calendar days from the Notice to Proceed, with an option to extend the contract for two additional 365 calendar day periods, subject to further Board of Directors' approval.

Gary Cacace, MWRA Director of Security, summarized the scope and terms of a proposed contract for security officer services. He explained that MWRA's Deer Island Treatment Plant, Carroll Water Treatment Plant and Chelsea Facility are guarded by uniformed security personnel on a 24/7 basis. He described the security guards' duties, including routine access control, facility patrol, security system monitoring, event reporting, coordinated response, and as-needed emergency access. Finally, Mr. Cacace discussed the contract procurement process and advised that the contract selection committee had unanimously ranked United Security, Inc. as the preferred bidder.

There was brief, general discussion about United Security, Inc.'s qualifications, the merits of its proposal and the previous security officer services contract. Mr. Taverna requested more information about the terms of the proposed contract. Mr. Cacace advised that the contracted security staff are paid on an hourly basis. There was brief, general discussion about contract line items, including vehicles.

Chair Tepper asked if there was further discussion or questions from the Board. Hearing none, she requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. VII A.1)

PERSONNEL AND COMPENATION

Information

Recruitment and Retention Update

Michele Gillen, MWRA Director of Administration, thanked Board Members for their support of MWRA's

efforts to recruit and retain qualified and diverse staff. She then invited questions from the Board.

Hearing no discussion or questions from the Board, Committee Chair Wolowicz moved to the next information item. (ref. VIII A.1)

Administration Division Proposed Organizational Changes

Ms. Gillen presented organizational charts for current and proposed Administration Division staffing, and invited Board Members' questions.

Hearing no discussion or questions from the Board, Ms. Wolowicz moved to the next information item. (ref. VIII A.2)

Metropolitan Water Tunnel Program Consultant and Contract Structure Update and Tunnel Department Proposed Organizational Changes

Kathy Murtagh, MWRA Tunnel Program Director, presented an overview of proposed organizational changes for the Metropolitan Water Tunnel Department. She explained that the proposed changes reflected the Tunnel Program's transition from preliminary design to final design. Ms. Murtagh added that the proposed staffing structure includes the reduction of one position, and emphasizes more senior, experienced staff members to manage upcoming large contracts. She then invited questions from Board Members.

Mr. Taverna requested an update on the progress of filling vacant positions within the Tunnel department. Ms. Murtagh advised that staff would provide more information at a later date.

Hearing no further discussion or questions from the Board, Ms. Wolowicz moved to Approvals. (ref. VIII A.3)

Approvals

December 2023 PCR Amendments

A motion was duly made and seconded to approve amendments to the Position Control Register (PCR) as presented and filed with the records of this meeting.

Wendy Chu, MWRA Human Resources Director, advised that the proposed PCR amendments for December 2023 included adjustments to meet the previously-discussed Administration Division and Metropolitan Water Tunnel Department staffing needs (ref. VIII A.2 and A.3), and invited questions from Board Members.

Chair Tepper asked if there was any discussion or questions from the Board. Hearing none, she requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		

Yes	No	Abstain
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. VIII B.1)

Appointment of Ivana McGrail, Manager, Benefits & HRIS

A motion was duly made and seconded to approve the appointment of Ms. Ivana McGrail as Manager, Benefits & HRIS (Grade 14, Non-Union) in the Administration Division at an annual salary of $135,854.00 commencing on a date to be determined by the Executive Director.

Ms. Chu provided background on the proposed appointment of the Benefits and HRIS Manager as well as a Human Resources Operations Manager (ref. VIII B.3). She explained that these positions reflect a reallocation of existing staff due to a recent retirement. She then described the qualifications and work experience of the proposed candidate for the Benefits and HRIS Manager, and the position's job duties.

Hearing no discussion or questions from the Board, Chair Tepper requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. VIII B.2)

Appointment of Jeannie Teixeira, Manager, Human Resources Operations

A motion was duly made and seconded to approve the appointment of Ms. Jeannie Teixeira to the position of Manager, Human Resources Operations (Non-Union, Grade 14), in the Administration Division, Human Resources Department at the recommended annual salary of $133,989, commencing on a date to be determined by the Executive Director.

Ms. Chu briefly discussed the operational need for the Human Resources Operations Manager position and described the proposed candidate's qualifications and work experience.

Mr. Vitale requested more information about the number of union and non-union staff in MWRA's Human Resources Department. Ms. Chu explained that the Human Resources Department includes seven union positions, including confidential positions. Mr. Vitale asked if having union staff in Human Resources positions affects collective bargaining contract negotiations. Ms. Chu advised that Human Resources' union staff are excluded from participating in the collective bargaining negotiations process. There was brief, general discussion about challenges related to union Human Resources staff concerning collective bargaining.

Hearing no further discussion or questions from the Board Chair Tepper requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. VIII B.3)

Chair Tepper announced that the Board would postpone all further Information items on the meeting agenda due to time constraints.

WATER POLICY AND OVERSIGHT (Continued)
Contract Amendments/Change Orders
Metropolitan Water Tunnel Program: Program Support Services, JCK Underground, Inc., Contract 7655, Amendment 2 – First Optional 24-Month Renewal

A motion was duly made and seconded to authorize the Executive Director, on behalf of the Authority, to approve Amendment 2 to Contract 7655, Program Support Services for the Metropolitan Tunnel Redundancy Program, with JCK Underground, Inc., to exercise the first optional 24-month renewal, increasing the contract amount by $7,000,000, from $10,247,877 to $17,247,877, and extending the contract term by 24 months, from April 1 2024 to April 1 2026.

Ms. Murtagh invited questions from Board Members.

Mr. Pappastergion asked if the proposed Amendment represented an extension of an existing contract with JCK Underground, Inc. ("JCK"). Ms. Murtagh responded in the affirmative. Chair Tepper requested more information about the reasons for the proposed increase to the contract amount. Ms. Murtagh explained that when the contract was first awarded in 2019, MWRA staff envisioned that the

Metropolitan Water Tunnel Department would have a larger staff. She further explained that the proposed contract Amendment is needed to maintain the Tunnel Program's schedule, which is currently on track. Mr. Taverna asked if JCK has adequate staff to maintain the Program schedule. Ms. Murtagh responded in the affirmative.

Hearing no further discussion or questions from the Board, Chair Tepper requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. IX A.1)

WASTEWATER POLICY AND OVERSIGHT

Approvals

First Amendments to Both the Memorandum of Understanding and Financial Assistance Agreement with the Boston Water and Sewer Commission for Implementation of the Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects

A motion was duly made and seconded to authorize the Executive Director, on behalf of the Authority, to execute the First Amendment to the Memorandum of Understanding and the First Amendment to the Financial Assistance Agreement by and between Massachusetts Water Resources Authority and Boston Water and Sewer Commission for the Implementation of Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control, substantially in the form attached to the December 13, 2023 staff summary presented and filed with the records of this meeting, with no increase to not-to-exceed amount of $10,000,000 or change in term of 32 months, from November 1, 2022, through June 30, 2025.

Brian Kubaska, MWRA Chief Engineer, presented an overview of a proposed Amendment to both a Memorandum of Understanding ("MOU") and a Financial Assistance Agreement ("FAA") with the Boston Water and Sewer Commission ("BWSC"). He began with a brief progress update on procurements recently advertised under the original MOU (abatements for CSO outfalls BOS017, BOS062, BOS065 and BOS070/DBC).

Next, Mr. Kubaska explained that the purpose of the proposed Amendment is to add work at CSO outfall BOS013 in East Boston. He advised that the CSO outfalls in this area are closed or meeting MWRA's Long

Term Control Plan goals, with the exception of BOS013 which is materially meeting and BOS009. He noted that the BOS009 work will fall into compliance after the expected completion of a BWSC sewer separation project in summer 2024. He further noted that the work at BOS013 is being added to the MOU/FAA. Mr. Kubaska then advised that bids received this day came in over the Engineer's Estimate and the value of the currently proposed BWSC MOU/FAA which also includes design services. Finally, he explained that staff will work with BWSC to determine appropriate next steps.

There was brief, general discussion about the scope of the MOU/FAA.

Hearing no further discussion or questions from the Board, Chair Tepper requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. X A.1)

Contact Awards

Electrical Equipment Testing, Deer Island Treatment Plant: Infra-Red Building and Power Services, Inc., Contract S618

A motion was duly made and seconded to approve the award of Contract S618, Electrical Equipment Testing, Deer Island Treatment Plant, to the lowest responsible and eligible bidder, Infra-Red Building and Power Services, Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed $2,339,858 for a contract term of 1,095 calendar days from the Notice to Proceed.

Mr. Duest summarized the scope and procurement process for an electrical equipment testing contract for the Deer Island Treatment Plant. He advised that Infra-Red Building and Power Services, Inc. ("Infra-Red") submitted the lowest bid, which is 2.5% lower than the Engineer's Estimate and 6.7% lower than the incumbent contractor's bid. He noted that Infra-Red has experience working on MWRA projects.

Mr. Jack Walsh requested the price of the previous contract. Mr. Duest advised that it is $1.928 million. There was brief, general discussion about the range of bids received.

Chair Tepper asked if there was further discussion or questions from the Board. Hearing none, she requested a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		
Vitale		
J. Walsh		
P. Walsh		
White-Hammond		
Wolowicz		

(ref. X B.1)

ADMINISTRATION, FINANCE AND AUDIT

Information

Delegated Authority Report – November 2023

This agenda item was postponed due to time constraints. (ref. XI A.1)

FY21-FY25 Strategic Business Plan: Annual Update for FY23

This agenda item was postponed due to time constraints. (ref. XI A.2)

FY2024 Financial Update and Summary through November 2023

This agenda item was postponed due to time constraints. (ref. XI A.3)

CORRESPONDENCE TO THE BOARD

There was no correspondence to the Board (ref. XII)

OTHER BUSINESS

There was no other business. (ref. XIII)

ADJOURNMENT

A motion was duly made and seconded to adjourn the meeting.

A roll call vote was taken in which the members were recorded as follows:

Yes	No	Abstain
Tepper		
Flanagan		
Foti		
Pappastergion		
Peña		
Taverna		

	Yes	No	Abstain
Vitale			
J. Walsh			
P. Walsh			
White-Hammond			
Wolowicz			

(ref. XIV)

The meeting adjourned at 3:21pm.

Approved: January 17, 2024

Attest: _____

Brian Peña, Secretary

LIST OF DOCUMENTS AND EXHIBITS USED

- Draft Minutes of November 15, 2023 MWRA Board of Directors' Meeting (ref. I)
- December 13, 2023 Staff Summary and presentation – Combustion Turbine Generator Maintenance: Deer Island Treatment Plant, O'Connor Corporation, Contract S616 (ref. V A.1)
- December 13, 2023 Staff Summary and presentation – John J. Carroll Water Treatment Plant SCADA System Upgrade - Design, Engineering Services During Construction and Resident Engineering Services: Arcadis U.S., Inc., Contract 7581, Amendment 4 (ref. VI A.1)
- December 13, 2023 Staff Summary – Security Officer Services for Various MWRA Facilities: United Security, Inc., Contract EXE-048 (ref. VII A.1)
- December 13, 2023 Staff Summary – Recruitment and Retention Update (ref. VIII A.1)
- December 13, 2023 Staff Summary and presentation - Administration Division Proposed Organizational Changes (ref. VIII A.2)
- December 13, 2023 Staff Summary and presentation – Metropolitan Water Tunnel Program: Consultant and Contract Structure Update and Tunnel Department Proposed Organizational Changes (ref. VIII A.3)
- December 13, 2023 Staff Summary – December 2023 PCR Amendments (ref. VIII B.1)
- December 13, 2023 Staff Summary – Appointment of Ivana McGrail, Manager, Benefits & HRIS (ref. VIII B.2)
- December 13, 2023 Staff Summary – Appointment of Jeannie Teixeira, Manager, Human Resources Operations (ref. VIII B.3)
- December 13, 2023 Staff Summary – Metropolitan Water Tunnel Program: Program Support Services, JCK Underground, Inc., Contract 7655, Amendment 2 – First Optional 24-Month Renewal (ref. IX A.1)
- December 13, 2023 Staff Summary and presentation – First Amendments to Both the Memorandum of Understanding and Financial Assistance Agreement with the Boston Water and Sewer Commission for Implementation of the Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects (ref. X A.1)
- December 13, 2023 Staff Summary – Electrical Equipment Testing, Deer Island Treatment Plant: Infra-Red Building and Power Services, Inc., Contract S618 (ref. X B.1)

Documents used for this meeting and cited in these minutes, including the documents and exhibits referenced above, are posted on MWRA's website: https://www.mwra.com/02org/html/bodmtg.htm

STAFF SUMMARY

TO: Board of Directors

FROM: Rebecca L. Tepper, Chair

DATE: January 17, 2024

SUBJECT: Annual Meeting: Election and Appointment of MWRA Officers, Retirement Board Member and Committee Assignments

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RECOMMENDATION:

That the Board of Directors (1) designate this January 17, 2024 meeting as the Annual Meeting which, as provided in the Authority's by-laws, will be deemed a special meeting of the Board for the purpose of election of officers; (2) elect a Vice-Chairman of the Board; and (3) appoint a Secretary of the Board, an MWRA Treasurer, and such Assistant Secretaries and Assistant Treasurers of the Board as the Board deems appropriate. New Committee Chairs will be appointed approximately every two years.

To ratify the following appointments of Board members to standing Committees:

Administration, Finance and Audit	Wastewater Policy and Oversight	Water Policy and Oversight	Personnel and Compensation
Chair: J. Foti	Chair: J. Walsh	Chair: H. Vitale	Chair: J. Wolowicz
Vice Chair: P. Flanagan	Vice Chair: P. Walsh	Vice Chair: L. Taverna	Vice Chair: M. White- Hammond
A. Pappastergion	A. Pappastergion	J. Foti	B. Pena
L. Taverna	B. Pena	P. Flanagan	L. Taverna
J. Walsh	H. Vitale	J. Walsh	P. Flanagan
P. Walsh	M. White Hammond	P. Walsh	J. Foti
M. White-Hammond	J. Wolowicz	J. Wolowicz	H. Vitale

DISCUSSION:

Article IV, Section 1, of the by-laws, which specifies the officers to be elected, provides that:

> "The Board of Directors shall annually elect one of its members as Vice-Chairman and shall annually appoint a Secretary and a Treasurer, who need not be members of the Board of Directors."

The by-laws also provide that:

> "Upon the recommendation of the Executive Director, the Board of Directors may also elect one or more Assistant Secretaries and Assistant Treasurers."

<u>Retirement Board Appointments</u>

The provisions of G.L. c. 32 § 20 (4 7/8 D) regarding the MWRA Retirement Board, provide that:

". . . the secretary of the Authority shall be a member *ex officio*. . . ."

That same section of that statute further provides that a second member of the Retirement Board ". . . shall be appointed by the board of directors of the authority for a term of 3 years . . .". At last year's annual meeting Matthew Horan was appointed as a member of the Retirement Board to complete the unexpired portion of an existing term, which is expiring on June 30, 2024. It is recommended that Mr. Horan be re-appointed as a member of the Retirement Board for a three-year term beginning on July 1, 2024.

Nomination of Officers

Currently, the following individuals serve as the MWRA's officers:

Vice-Chair:	Andrew M. Pappastergion
Secretary:	Brian Pena
Treasurer:	Matthew Horan
Retirement Board Member:	Matthew Horan
Assistant Secretaries:	Kristin MacDougall Rose Marie Convery
Assistant Treasurer:	William Kibaja Michael Cole

The Chair wishes to request that a motion be made to nominate the following as officers, inclusive of appointments of certain MWRA staff as Treasurer, Retirement Board Member, Assistant Secretaries and Assistant Treasurers, as follows:

Vice-Chair:	Andrew M. Pappastergion
Secretary:	Brian Pena
Treasurer:	Matthew Horan
Retirement Board Member:	Matthew Horan
Assistant Secretaries:	Kristin MacDougall Katherine Ronan
Assistant Treasurers:	William Kibaja Michael Cole

There are no special procedures for election of officers, except as governed by Robert's Rules of Order. Thus, any Board member may make a nomination to elect an officer, and the nomination will carry upon a majority vote of the quorum.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Low Service Pressure Reducing Valve Improvements - Boston/Medford
RJV Construction Corporation
Contract 7563, Change Order 6

COMMITTEE: Water Policy & Oversight

____ INFORMATION
__X__ VOTE

Martin E. McGowan, Director, Construction
Terrence Flynn, P.E., Construction Coordinator
Preparer/Title

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 6 to Contract 7563, Low Service Pressure Reducing Valve Improvements - Boston/Medford, with RJV Construction Corporation, extending the contract term by 90 calendar days from December 31, 2023 to March 30, 2024, with no increase in contract amount.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7563 in an amount not to exceed the aggregate of $250,000 and to extend the contract term by 180 days in accordance with the Management Policies and Procedures of the Board of Directors.

DISCUSSION:

This project was developed as an interim improvement to enhance MWRA's emergency response to a failure of the Metropolitan Tunnel system until a redundant tunnel is constructed. The contract included demolition of the existing Nonantum Road and Mystic Valley Parkway pressure reducing valves' (PRVs) vault structures, including four 24-inch PRVs and appurtenances, and construction of new, larger cast-in-place vaults. At Mystic Valley Parkway, two 42-inch PRVs and at Nonantum Road two 30-inch PRVs, isolation valves, piping, and other appurtenances were installed. Additionally, a new master meter was constructed at the Mystic Valley Parkway pressure reducing valves and the existing master meter located near the Nonantum Road pressure reducing valves was upgraded to accommodate the increased flow.

This Change Order

Change Order 6 consists of the following item:

Extend Contract Time by 90 Calendar Days	$0.00

Change Order 4 was executed on October 31, 2023, to extend the contract term by 60 days from November 1, 2023 to December 31, 2023 due to delays with the installation of dedicated Verizon

T-1 lines to the sites, which is one of the primary means of communication to these sites along with cellular service. Although the Verizon lines were originally anticipated to be completed by early September 2023 so that the PRVs could be tested, Verizon encountered delays with the installation and the contract was extended. Unfortunately, the lines are still not installed and based on recent communications with Verizon, the lines will not be installed until mid-January at the earliest. A 90-day extension would allow for February and March to be used for startup and testing. Therefore, the contract time must now be extended by an additional 90 calendar days from December 31, 2023 to March 30, 2024.


W14 PRV Chamber


W16 Pedestal Cabinet

This item was identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to extend the contract term by 90 calendar days from December 31, 2023 to March 30, 2024, with no increase in contract amount.

CONTRACT SUMMARY:

	Amount	Time	Dated
Original Contract:	$11,326,000.00	720 Days	07/14/21
CHANGE ORDERS			
Change Order 1*	$254,859.21	0 Days	10/17/22
Change Order 2*	$507,307.89	0 Days	05/05/23
Change Order 3*	$60,932.48	120 Days	07/21/23
Change Order 4*	$0.00	60 Days	10/31/23
Change Order 5*	$56,738.06	0 Days	Pending
Change Order 6	$0.00	90 Days	Pending
Total Change Orders	$879,837.64	270 Days	
Adjusted Contract:	$12,205,837.64	990 Days	

*Approved under delegated authority

If Change Order 6 is approved, the cumulative value of all change orders will be $879,837.64 or 7.8% of the original contract. Work on this contract is 90% complete.

BUDGET/FISCAL IMPACTS:

Change Order 6 is for a time extension only and will have no budgetary impact.

MBE/WBE PARTICIPATION:

The MBE and WBE participation requirements for this contract were established at 7.24% and 3.6%, respectively. The Contractor has been notified that these requirements are still expected to be met.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: First Amendment to Memorandum of Agreement By and Between Massachusetts Water Resources Authority and the City of Newton
Contract 6392, Rehabilitation of Sections 23, 24 and 47 Water Mains

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COMMITTEE: Water Policy & Oversight

____ INFORMATION
__X__ VOTE

Martin E. McGowan, Director, Construction

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to execute the First Amendment to the Memorandum of Agreement by and between Massachusetts Water Resources Authority and the City of Newton relating to Contract 6392, Rehabilitation of Sections 23, 24 and 47 Water Mains, substantially in the form attached hereto, for the City of Newton to update its certification of appropriation, from $2,720,400 to $3,435,428, for costs for City of Newton work including change orders.

DISCUSSION:

MWRA Contract 6392 includes cleaning and cement mortar lining of approximately 4,500 linear feet of Section 23, which is a 36-inch diameter cast iron water main, 10,800 feet of 20-inch Section 24 and Section 47 cast iron water main, and 500 feet of 20-inch steel water main along Section 24. The construction work also includes installing, by open-cut, 3,600 feet of 36-inch ductile iron Section 23 water main, 6,400 feet of 24-inch ductile iron Section 24 water main, new valves and appurtenances, and replacing the check valve assembly at Boston Meter 120.

On March 20, 2019, the Board of Directors approved a Memorandum of Agreement (MOA) with the City of Newton to include in Contract 6392, at Newton's cost, replacing approximately 2,400 linear feet of City of Newton 20-inch diameter, 140-year-old cast iron water main on Ward Street, between Manet Road and Waverly Avenue, that runs parallel to the Authority's replacement of Sections 23 and 24 water mains. Pursuant to the MOA, the Authority invoices Newton and Newton pays the Authority for the City of Newton work.

The MOA also provides that Newton will reimburse the Authority for approved change order work. Certain Newton change order work has arisen under MWRA Contract 6392 including:

- installation of an additional water main from Manet Road to Mt. Alvernia Academy campus, to place the campus on the high-water pressure zone;

- extension of a temporary 20-inch bypass pipe to connect the existing City of Newton 20-inch water main to the existing MWRA 36-inch water main, to feed water to the covered reservoir during construction;
- removal and relocation of additional sewer and drain pipes to place the City of Newton 20-inch water main in its location; and
- additional milling, paving and pavement markings on Waverley Ave and Ward Street, due to the extent of the water main work.

Newton originally appropriated $2,720,400 to cover the costs of Newton's work. Newton has requested that the MOA be amended to update its certification of appropriation of an additional $715,028, from $2,720,400 to a total appropriation of $3,435,428, to cover costs for the City of Newton work including change orders.

Work on the project is approximately 90% complete. Remaining work includes pipeline disinfection, final paving and site restoration. The project is currently expected to reach substantial completion in May 2024.

BUDGET/FISCAL IMPACT:

The FY24 CIP includes $24,583,000 for Contract 6392.

ATTACHMENT:

Amendment 1 to the Memorandum of Agreement by and between Massachusetts Water Resources Authority and the City of Newton

AMENDMENT 1
MEMORANDUM OF AGREEMENT
BY AND BETWEEN
MASSACHUSETTS WATER RESOURCES AUTHORITY
AND
THE CITY OF NEWTON

This AMENDMENT 1 to the MEMORANDUM OF AGREEMENT ("MOA") is made this _____ day of _____, 2024, by and between the MASSACHUSETTS WATER RESOURCES AUTHORITY ("MWRA"), a body corporate and politic and an independent authority pursuant to St. 1984, c. 372 of the laws of the Commonwealth of Massachusetts, as amended, and the CITY OF NEWTON ("City of Newton"), duly incorporated as a City under the laws of the Commonwealth of Massachusetts (each individually a "Party" and collectively the "Parties").

WHEREAS, on March 22, 2019, MWRA and the City of Newton executed the MOA whereby MWRA agreed to include, and the City of Newton agreed to pay for, certain City of Newton Work included in MWRA Contract 6392 – Rehabilitation of Sections 23, 24 and 47 Water Mains.

WHEREAS, certain change order work has arisen under MWRA Contract 6392 relating to the City of Newton Work including the following:

- An additional water main was required to be installed from Manet Road to Mt. Alvernia Academy campus, to place the campus on the high-water pressure zone.
- The temporary 20-inch bypass pipe was required to be extended, in order to connect the existing City of Newton 20-inch water main to the existing MWRA 36-inch water main, to feed water to the covered reservoir during construction.
- Additional sewer and drain pipes were required to be removed and relocated, in order to place the City of Newton 20-inch water main in its location.
- Additional milling, paving and pavement markings were required on Waverley Ave and Ward Street, due to the extent of the water main work.

WHEREAS, Newton desires to update its appropriation to pay MWRA for the City of Newton Work and change order work.

WHEREAS, Section 7 of the MOA provides that it may be amended by a writing duly executed by both Parties.

WHEREAS, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, MWRA and the City of Newton agree to amend the MOA as follows:

1. Add a new paragraph 15 as follows:

15. ADDITIONAL CERTIFICATION

The City of Newton hereby certifies that it has appropriated an additional $715,028.00, for a total appropriation of $3,435,428.00 to cover costs for the design and construction of the City of Newton Work including change order work.

2. All other terms and conditions of the MOA remain the same.

IN WITNESS WHEREOF, the Parties hereto have caused Amendment 1 to the MOA to be executed as a sealed instrument and signed in duplicate by their duly authorized representatives.

EXECUTED AS A SEALED INSTRUMENT this _____ day of _____, 2024.

MASSACHUSETTS WATER RESOURCES AUTHORITY

By: _____
Frederick A. Laskey
Executive Director

CITY OF NEWTON, MA

_____
James McGonagle, Commissioner Public Works

I certify that the following additional funds are available in the following account:

_____ = $715,028.00

_____
Stephen Curley, Comptroller

Approved as to legal form and character:

_____
Alissa O. Giuliani, City Solicitor
City of Newton

_____

Mayor Ruthanne Fuller
City of Newton

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Wachusett Dam Lower Gatehouse Pipe and Boiler Replacement
J.F. White Contracting Company
Contract 7380, Change Order 1

COMMITTEE: Water Policy & Oversight

____ INFORMATION
__X__ VOTE

Martin E. McGowan, Director, Construction
Jami Walsh, P.E., Construction Coordinator
Preparer/Title

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 1 to Contract 7360, Wachusett Dam Lower Gatehouse Pipe and Boiler Replacement, with J.F. White Contracting Company for a not-to-exceed amount of $1,300,000, increasing the contract amount from $19,333,573 to $20,633,573, and extending the contract term by 243 calendar days from August 17, 2024, to April 17, 2025.

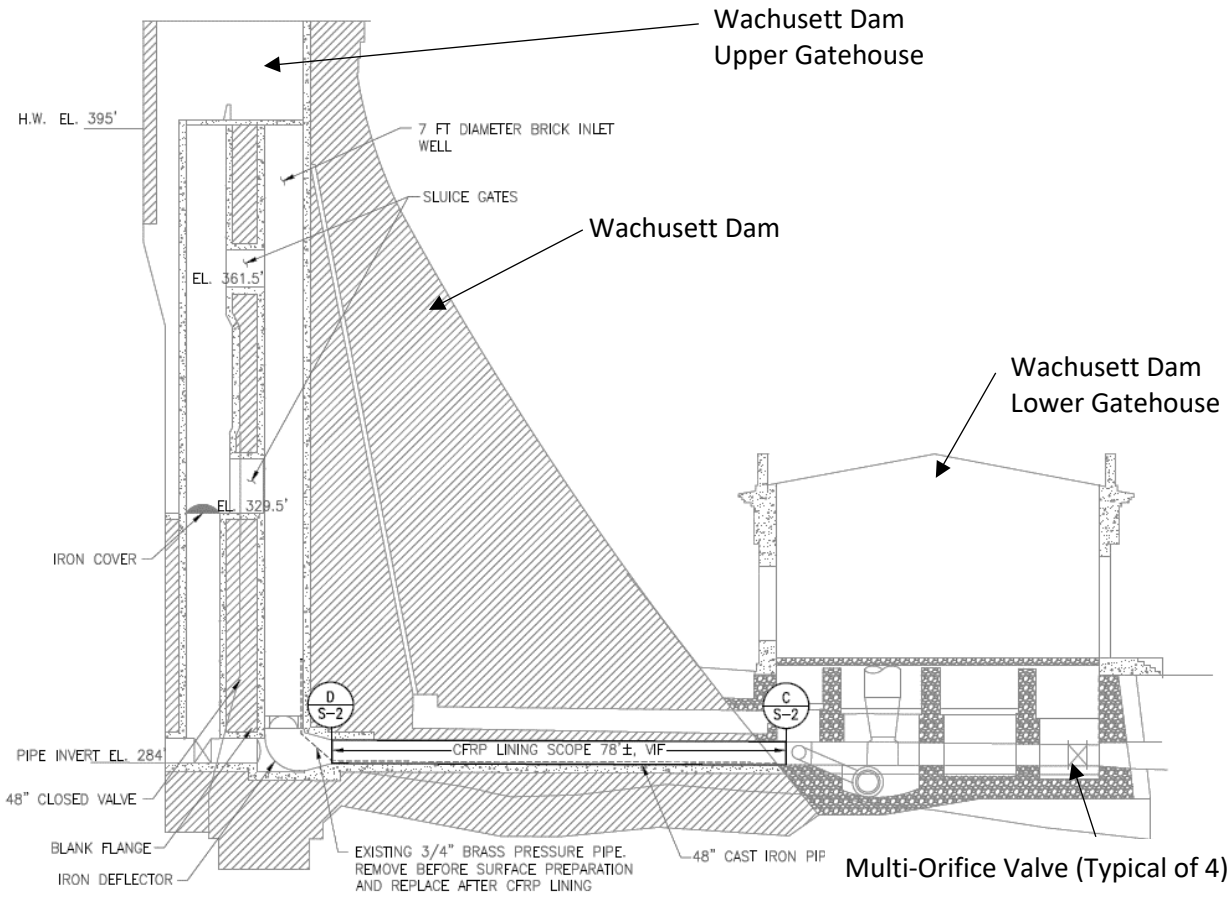
Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7360 in an amount not to exceed the aggregate of $1,000,000 and to extend the contract term by 180 days in accordance with the Management Policies and Procedures of the Board of Directors.

DISCUSSION:

The Wachusett Dam Lower Gatehouse releases water from the Wachusett Reservoir utilizing three supply lines to the Wachusett Aqueduct that supplies the John J. Carroll Water Treatment Plant in Marlborough via the Wachusett Aqueduct Pumping Station. The Lower Gatehouse also releases water to the Nashua River via the ten-inch diameter fountain line to meet MWRA's 12 million-gallon-per-week statutory requirement. A sliding sleeve valve on the fourth supply line in the Lower Gatehouse is used periodically to release up to 100 million gallons per day to the Nashua River to facilitate the transfer of higher quality water from the Quabbin Reservoir. This contract includes replacement or lining of the original 1905 pipes and valves that remain in the Lower Gatehouse, including the equalizer pipe that interconnects all four supply lines that failed in 2018. Due to the equalizer pipe failure, the release to the Nashua River has been reduced by 50 percent, impacting the ability to transfer water from the Quabbin Reservoir. In addition, the condition of the pipes that pass through the Wachusett Dam to the Lower Gatehouse causes concerns when releasing large rates of flow down the Wachusett Aqueduct to the new pumping station. Therefore, the four 48-inch outlet pipes that run through the Wachusett Dam will be lined with carbon fiber reinforced polymer.

This contract also includes installation of a new bathroom on the first floor at the Lower Gatehouse. In addition, this contract includes hazardous material abatement of the lead-based paint in the administration area of the building and on the original non-operational hydro turbines. The abatement will improve safety for MWRA Operations staff working in the Lower Gatehouse.

This contract originally included the replacement of the two existing propane boilers, unit heaters, and associated heating equipment. During contract award, it was determined that the boiler replacement portion of this project should be removed from the contract so that alternative heating methods, such as air source heat pumps, could be evaluated. Deletion of the work associated with boiler replacement is being negotiated and will be addressed in a future credit change order. The heating system at the Lower Gatehouse will be replaced in a future construction project.



Section through Wachusett Dam from Upper Gatehouse to Lower Gatehouse

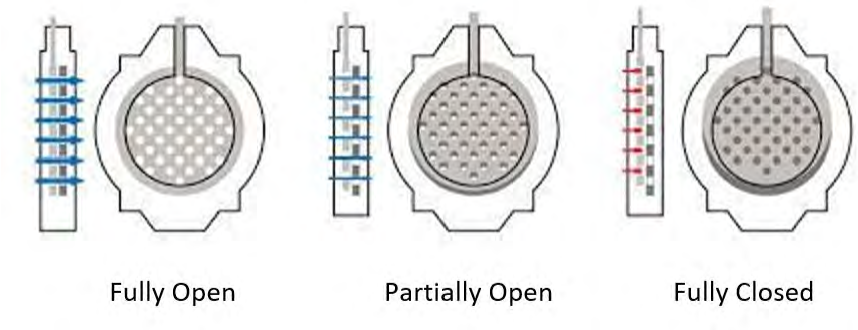
This Change Order

Change Order 1 consists of the following two items:

<u>Install Multi-Orifice Valves with Hardened Stainless Steel Orifice Plates</u> NTE $1,300,000

This project requires the existing cast iron piping and associated valves located in the basement level of the facility be replaced. There are four existing supply pipelines that convey water from

the Wachusett Upper Gatehouse to the Nashua River. The new design includes four multi-orifice valves (MOVs) to reduce the hydraulic head by dissipating the energy prior to discharging to the river. The multi-orifice valves are flow-throttling style valves in which two plates slide across one another to increase or decrease the orifice openings to safely control the flow while reducing the hydraulic head. See schematic below.



Multi-Orifice Valve Schematic

Given the limited space within the Lower Gatehouse and the hydraulic requirements of the valves to be used, a multi-orifice type energy dissipation valve is the only type of valve available that can acceptably reduce head pressures and pass flow with a laying length that will fit within the existing space. The specifications listed two proprietary manufacturers for the MOVs. During the shop drawing review process, it came to the Authority's attention that the chosen manufacturer utilizes a fluoropolymer coating on its orifice plates to reduce friction and prevent galling of the steel plates. This coating detail was not shared with the design consultant during the design phase and was not considered in the proprietary selection process. The other named MOV manufacturer does not coat its orifice plates, but instead uses hardened stainless steel orifice plates.

The coating contains a polyfluoroalkyl (PFAS) substance. PFAS is an emerging contaminant of concern. The contract documents do not require, nor do they forbid, the use of a coating system on the orifice plates of the valves. However, given the nature of PFAS substances, it is staff's opinion that utilizing MOVs without a coating is preferable for this project. This required a design change so that the new MOVs would have uncoated plates.

The Contractor's first chosen manufacturer was asked to submit a MOV without a fluoropolymer coating, which still conforms to all other specification requirements. The manufacturer stated it could eliminate the coating, but would use a different material than specified in the contract documents. Therefore, staff elected to recommend this change order in order to use the other named manufacturer. If approved, the Contractor must now furnish and install four MOVs with hardened stainless steel orifice plates in lieu of the fluoropolymer-coated valves.

This item was identified by MWRA staff as a design change. MWRA staff, the Consultant, and the Contractor have agreed to an amount not to exceed $1,300,000. The Contractor proceeded with this work at its own risk in order to complete the remainder of the contract work.

Extend the Contract Time by 243 Calendar Days $0.00

The MOVs have a lead time of 32 weeks from the placement of the order. This change in MOVs requires that new shop drawings from the manufacturer be submitted for review and conformance with the specifications. Given the time remaining in the contract, the fabrication and delivery of these alternate MOVs will now drive the project's critical path. As a result of this design change, the contract time must be extended by 243 calendar days, from August 17, 2024, to April 17, 2025. This item was identified by MWRA staff as a design change.

Wachusett Dam Lower Gatehouse

CONTRACT SUMMARY:

	Amount	**Time**	**Dated**
Original Contract:	$19,333,573.00	547 Days	02/17/23
Change Orders:			
Change Order 1	$1,300,000.00	243 Days	Pending
Total Change Orders:	$1,300,000.00	243 Days	
Adjusted Contract:	$20,633,573.00	790 Days	

*Approved under delegated authority

If Change Order 1 is approved, the cumulative value of all change orders to this contract will be $1,300,000 or 6.7% of the original contract amount. Work on this contract is approximately 6% complete.

BUDGET/FISCAL IMPACT:

The FY24 CIP includes $18,993,573 for Contract 7380. Including this change order for $1,300,000, the adjusted subphase total will be $20,633,573 or $1,640,000 over the CIP amount. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The minimum MBE and WBE participation requirements for this contract are 7.24% and 3.6% respectively. The contractor has been notified that it is expected to meet these requirements.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Second Amendments to Both the Memorandum of Understanding and Financial Assistance Agreement with the Boston Water and Sewer Commission for Implementation of the Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects

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COMMITTEE: Wastewater Policy & Oversight

____ INFORMATION
__X__ VOTE

Brian L. Kubaska, P.E., Chief Engineer
Jeremy R. Hall, Program Manager
Preparer/Title

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to execute the Second Amendment to the Memorandum of Understanding and the Second Amendment to the Financial Assistance Agreement by and between Massachusetts Water Resources Authority and Boston Water and Sewer Commission for the Implementation of Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control, substantially in the form attached hereto, increasing the not-to-exceed amount by $1,881,274 from $10,000,000 to $11,881,274, with no change in term.

Further to authorize the Executive Director, on behalf of the Authority, to approve and execute additional amendments to such Memorandum of Understanding and Financial Assistance Agreement, in an amount not to exceed the aggregate of $1,000,000 for additional financial assistance in the Executive Director's discretion for construction change order costs that the Executive Director determines is appropriate and should be reimbursed by the Authority; such reimbursement remains otherwise subject to the term and conditions of said Memorandum of Understanding and Financial Assistance Agreement.

DISCUSSION:

On October 19, 2022, the Board approved a Memorandum of Understanding (MOU) and Financial Assistance Agreement (FAA) with the Boston Water and Sewer Commission (BWSC) for the implementation of Fort Point Channel and Mystic/Chelsea Confluence combined sewer overflow (CSO) control work. BWSC agreed to design and construct certain CSO abatement projects for four CSO outfalls - BOS017, BOS062, BOS065, BOS070/DBC (see figure 1 and 2) – that did not meet the MWRA long-term control plan (LTCP) typical year goals for those outfalls in connection with the Boston Harbor case.[1] MWRA agreed to provide funding for eligible design and construction work, for a total not to exceed $10,000,000. During the last year, BWSC has designed CSO abatement projects at the four CSO outfalls and released the resultant contract documents for

1 United States of America v. Metropolitan District Commission, et al, USDC No. 85-0489-RGS; Conservation Law Foundation of New England, Inc. v. Metropolitan District Commission, et al., USDC No. 83-1614-RGS

competitive bid on November 15, 2023.

On December 13, 2023, the Board approved the first amendment to the MOU and FAA to add certain improvement work at an additional outfall - BOS013 (see figure 3). Although BOS013 was determined to materially meet the LTCP typical year goals, further system adjustment, as constructed at similar CSO systems in East Boston, are forecasted to further reduce activations and bring BOS013 in-line with the LTCP goals.

Figure 1: Location of BOS017

Figure 2: Location of BOS062, BOS065 & BOS070/DBC

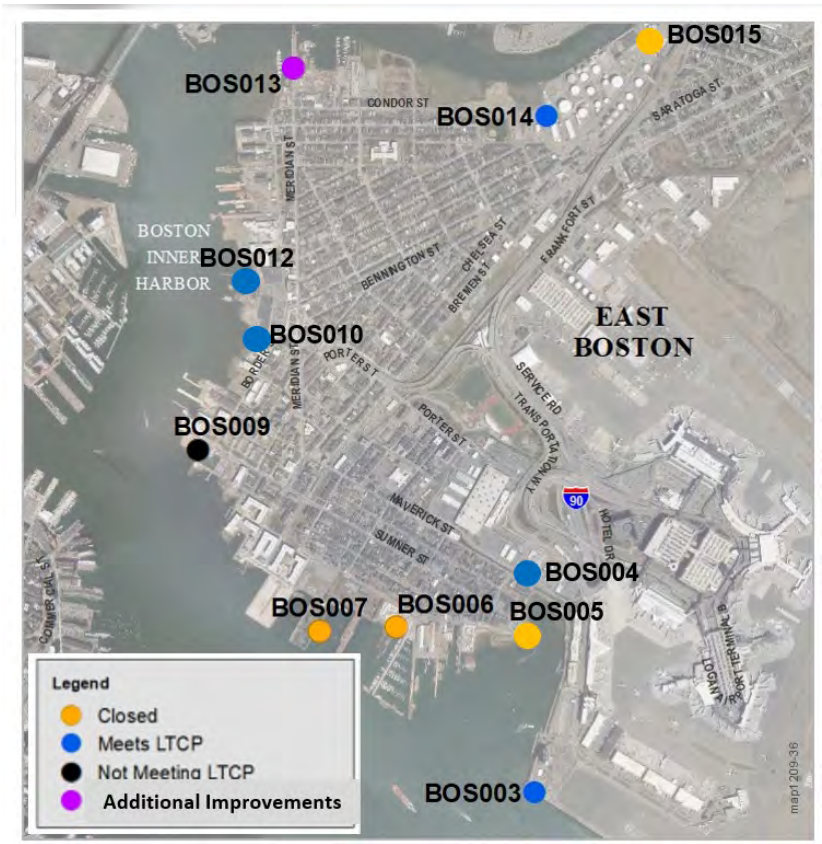


Figure 3: Location of BOS013

BWSC developed contract documents to construct CSO abatement improvements for the four original CSO outfalls included in the MOU/FAA. Operating at its own risk, BWSC included the BOS013 modifications within these contract documents, which was subsequently added through the first amendment to the MOU and FAA. BWSC competitively bid this contract as BWSC Contract No. 23-309-014 and received five bids. MWRA staff were notified of the bid amounts and informed the Board at the December 13 Board meeting of the higher than anticipated bids under review. This included five bids with the second and third lowest bid being within approximately $158,000 and $1M, respectively of the lowest bid. BWSC

determined that the low bidder's price of $10,426,025.05 is approximately 42% higher than the Engineer's estimate of $7,348,840.00. The estimate was developed by BWSC's consultant, using unit prices from recent and similar past Commission projects in accordance with a long-standing protocol. Unit prices were also adjusted to account for increased costs and escalation in an uncertain bidding environment. BWSC noted that the difficulty in working exclusively in areas of extreme traffic congestion, likely resulting in night-time operations, have considerably increased costs and the resulting bid price. BWSC has reviewed the bids and concluded that the lowest bid is realistic, competitive, allows for satisfactory completion of the work, and therefore recommended award to the low bidder at their December 21, 2023 Commissioners meeting, which was approved.

The MOU/FAA provides funding for eligible design and construction work. Summing the BWSC professional services contract of $1,455,248.00 to design and supervise the construction to the awarded construction contract amount results in a total value of $11,881,273.05. Therefore, the parties seek to amend the MOU and FAA to increase the not-to-exceed amount approved for the project by $1,881,274, for a total of $11,881,274. Staff are in agreement with BWSC's award of the construction contract and recommend Board approval of the second amendments to the MOU and FAA substantially in the form attached hereto.

Staff further request authorization for the Executive Director to approve and execute further amendments to the MOU and FAA, in an amount not to exceed the aggregate of $1,000,000, for additional financial assistance deemed appropriate in the Executive Director's discretion for construction change order costs that the Executive Director determines is appropriate and should be reimbursed by the Authority. Such authorization is consistent with Executive Director's delegated authority on construction contracts, which authorizes the Executive Director to award change orders or amendments to contracts by not more than 25% of the original contract amount or $1,000,000, whichever is less. This authorization would offer a commensurate level of discretion for the Executive Director to approve additional financial assistance to BWSC in the event of future changes as the CSO abatement improvements proceed through construction (*i.e.*, construction contract change orders) and the Executive Director determines that such additional costs are appropriate and should be reimbursed by the Authority. Any exercise of this delegated authority will be reported to the Board in the monthly Delegated Authority report. MWRA staff will continue to work cooperatively with BWSC staff and hold regular coordination meetings to review the progress of BWSC's work and expenditures.

BUDGET/FISCAL IMPACT:

The FY24 Capital Improvement Program (CIP) includes $10,000,000 for contract number 8054. Including this amendment for $1,881,274, the adjusted FAA value will be $11,881,274 or $1,881,274 over the amount in the CIP. This amount will be absorbed in the FY24-28 CIP Spending Cap.

MBE/WBE PARTICIPATION:

For BWSC-implemented projects funded by MWRA, MBE/WBE participation requirements are included in compliance with DEP requirements and in accordance with BWSC policy.

ATTACHMENTS:

Attachment 1 – Second Amendment to the Memorandum of Understanding by and between Massachusetts Water Resources Authority and Boston Water and Sewer Commission for Implementation of Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control

Attachment 2 – Second Amendment to the Financial Assistance Agreement by and between Massachusetts Water Resources Authority and Boston Water and Sewer Commission for *Implementation of Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control*

SECOND AMENDMENT TO THE MEMORANDUM OF UNDERSTANDING BETWEEN THE MASSACHUSETTS WATER RESOURCES AUTHORITY AND THE BOSTON WATER AND SEWER COMMISSION FOR THE IMPLEMENTATION OF FORT POINT CHANNEL AND MYSTIC/CHELSEA CONFLUENCE COMBINED SEWER OVERFLOW CONTROL PROJECTS

WHEREAS, on November 14, 2022, the Massachusetts Water Resources Authority ("MWRA") and the Boston Water and Sewer Commission ("BWSC") executed a *Memorandum of Understanding For The Implementation Of Fort Point Channel And Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects* ("MOU"), whereby the BWSC agreed to implement assigned Combined Sewer Overflow ("CSO") Projects ("Projects") and MWRA agreed to provide the BWSC financial assistance for project design and construction costs;

WHEREAS, on _____, 2024, the MWRA and the BWSC executed a First Amendment to the MOU to include an additional project for outfall BOS013 (Regulator 013-1), whereby the BWSC agreed to also implement the additional project for outfall BOS013 and the MWRA agreed to provide the BWSC financial assistance for project design and construction costs;

WHEREAS, Section I.c. of the MOU memorializes that the MWRA will provide financial assistance to BWSC in an amount not to exceed ten million dollars ($10,000,000.00) for the Projects;

WHEREAS, following the conclusion of competitive public bid process by BWSC in December 2023, the total cost of the Projects will exceed the amount of financial assistance provided under the MOU;

WHEREAS, the MWRA and BWSC now wish to further amend the MOU to increase the total amount of financial assistance so as not to exceed eleven million, eight hundred and eighty-one thousand two hundred and seventy-four dollars ($11,881,274); and

WHEREAS, Section VII. of the MOU provides that the MOU may be amended from time-to-time by mutual agreement in writing.

NOW THEREFORE, in consideration of the foregoing and the promises contained herein, the MWRA and the BWSC agree to further amend the MOU, as follows:

1. Delete Section I.c. of the MOU in its entirety and replace it with the following:

I. INTRODUCTION

c. Purpose of the MOU

The purpose of this MOU is to provide a framework within which the Parties will continue to cooperate in the coordination and management of the administrative, financial, and technical activities necessary to implement the conceptually-designed projects in the Final Assessment Report for the corresponding four BOS CSO Outfalls, as well as the Authority's ongoing system improvements. Major components of the implementation program and this MOU are twofold:

i. design and construction of CSO control projects by BWSC with funding and review by the Authority. BWSC is responsible for ensuring that the engineering performance objectives of these projects are satisfied and for owning, operating and maintaining the new facilities at BWSC's cost. BWSC projects are defined in Section III.a. of this MOU; and

ii. the Authority will provide financial assistance to BWSC in the form of annual grants to cover eligible costs for design and construction of the BWSC-implemented projects in a total maximum amount not to exceed eleven million, eight hundred and eighty-one thousand, two hundred and seventy-four dollars ($11,881,274). BWSC is solely responsible for any costs for the Projects in excess of this amount.

By this MOU, the Parties formally acknowledge the appropriateness and importance of implementing the CSO control projects recommended in the Final Assessment Report, to comply with the Clean Water Act, and to improve water quality and protect uses in the receiving waters. The Parties agree to assume and complete each and all of the respective duties and obligations, set forth herein, within the timeframe set forth herein. Each Party agrees to provide the support and coordination of the steps necessary for it to perform in order to complete these projects. All activities under this MOU are subject to and will be performed in accordance with applicable federal, state and local laws, regulations, codes and requirements.

The Financial Assistance Agreement Between the Massachusetts Water Resources Authority and the Boston Water and Sewer Commission for the Implementation of Fort Point Channel and Mystic/Chelsea Combined Sewer Overflow Control Projects, ("Financial Assistance Agreement"), separately executed by the Parties, is incorporated by reference herein. Detailed requirements and procedures related to the conduct of work and cooperative efforts in implementing the CSO projects are defined in the Financial Assistance Agreement.

2. All other terms and conditions of the MOU shall remain the same.

IN WITNESS WHEREOF, the Parties hereto have caused this Second Amendment to the MOU to be executed as a sealed instrument and signed in duplicate by their duly authorized representatives.

MASSACHUSETTS WATER RESOURCES AUTHORITY

BY: _____ Date: _____
Frederick A. Laskey
Executive Director

BY: _____ Date:_____
Matthew R. Horan
Treasurer

BOSTON WATER AND SEWER COMMISSION

BY:_____ Date:_____
Henry F. Vitale
Executive Director

Approved as to Form

BY: _____

Office of General Counsel

SECOND AMENDMENT TO THE FINANCIAL ASSISTANCE AGREEMENT BETWEEN THE MASSACHUSETTS WATER RESOURCES AUTHORITY AND THE BOSTON WATER AND SEWER COMMISSION FOR THE IMPLEMENTATION OF FORT POINT CHANNEL AND MYSTIC/CHELSEA CONFLUENCE COMBINED SEWER OVERFLOW CONTROL PROJECTS

This Second Amendment to the Financial Assistance Agreement for the Implementation of Fort Point Channel and Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects ("Financial Assistance Agreement") is made by and between the Massachusetts Water Resources Authority, a body politic and corporate and public instrumentality, existing under Chapter 372 of the Acts of 1984, with its principal place of business at Deer Island, 33 Tafts Avenue, Boston, MA 02128, ("Authority" or "MWRA") and the Boston Water and Sewer Commission, an independent body politic and corporate and political subdivision of the Commonwealth established pursuant to Chapter 436 of the Acts of 1977, with its principal place of business at 980 Harrison Avenue, Boston, MA 02119 ("Awardee") (the Authority and the Awardee are collectively referred to as the "Parties").

WHEREAS, on November 14, 2022, the Parties concurrently executed the initial Financial Assistance Agreement and a *Memorandum of Understanding For The Implementation Of Fort Point Channel And Mystic/Chelsea Confluence Combined Sewer Overflow Control Projects* ("MOU"), which is hereby incorporated by reference, whereby the Awardee agreed to implement assigned Combined Sewer Overflow ("CSO") Projects ("Projects") and MWRA agreed to provide Awardee financial assistance for project design and construction costs;

WHEREAS, on _____ 2024, the Parties concurrently executed a *First Amendment to the Financial Assistance Agreement and the MOU*, whereby the Awardee agreed to also implement the additional project for outfall BOS013 and MWRA agreed to provide Awardee financial assistance for project design and construction costs;

WHEREAS, Section II.A of the Financial Assistance Agreement memorializes that the MWRA will provide financial assistance to BWSC in an amount not to exceed ten million dollars ($10,000,000.00) for the Projects;

WHEREAS, following the conclusion of competitive public bid process by BWSC in December 2023, the total cost of the Projects will exceed the amount of financial assistance provided under the Financial Assistance Agreement;

WHEREAS, the Parties now wish to amend the Financial Assistance Agreement to increase the total amount of financial assistance so as not to exceed eleven million, eight hundred and eighty-one thousand, two hundred and seventy-four dollars ($11,881,274);

WHEREAS, Section II.A of the Financial Assistance Agreement provides that revisions to the amount of financial assistance requires MWRA Board of Directors approval and amendment of the Financial Assistance Agreement and the MOU;

WHEREAS, on _____, 2024, the Parties concurrently executed a *Second Amendment to the MOU*, which is hereby incorporated by reference, which increased the total amount of financial assistance so as not to exceed eleven million, eight hundred and eighty-one thousand, two hundred and seventy-four dollars ($11,881,274);

WHEREAS, the MWRA will provide financial assistance ("Award") to the Awardee for its Projects, including under certain terms and conditions, hereinafter provided; and

WHEREAS, the MWRA may finance the Award from the proceeds of an issue of its tax-exempt Revenue Bonds ("MWRA Bonds"), which proceeds are subject to certain limitations as to investment and application.

NOW THEREFORE, in consideration of the foregoing and the promises contained herein, the Parties agree to further amend the Financial Assistance Agreement, as follows:

1. Delete Section II.A. of the Financial Assistance Agreement in its entirety and replace it with the following:

   II. FINANCIAL ASSISTANCE.

   A. The Authority shall provide the Award to the Awardee in the form of annual grant disbursements ("Proceeds"). The Proceeds will be established by MWRA and disbursed to Awardee in accordance with Article II.(B). The total amount of the Award ("Total Award Amount") over the term of this Financial Assistance Agreement shall not exceed eleven million, eight hundred and eighty-one thousand, two hundred and seventy-four dollars ($11,881,274). BWSC is solely responsible for any costs for the Projects in excess of the Total Award Amount. Revision of the Total Award Amount requires approval of MWRA Board of Directors or the approval of the MWRA Executive Director under his delegated authority authorized at the January 17, 2024, Board of Directors meeting, as well as the amendment of this Financial Assistance Agreement and the MOU. The actual amount of the Award at the termination of this Financial Assistance Agreement shall be the summation of all eligible costs incurred by Awardee to complete its assigned CSO Projects, but in no instance may this exceed the Total Award Amount. Nothing in this Financial Assistance Agreement or the MOU shall be construed as an obligation on MWRA's part either to fund or reimburse, in whole or in part, any amount for the Projects in excess of the Total Award Amount.

2. All other terms and conditions of the Financial Assistance Agreement shall remain the same.

IN WITNESS WHEREOF, the Parties have executed this Second Amendment to the Financial Assistance Agreement under seal.

MASSACHUSETTS WATER RESOURCES AUTHORITY

BY: _____ Date: _____
Frederick A. Laskey
Executive Director

BY: _____ Date:_____
Matthew R. Horan
Treasurer

AWARDEE: Boston Water and Sewer Commission

BY: _____ Date:_____
Henry F. Vitale
Executive Director

Approved as to Form

BY: _____
Office of General Counsel

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Delegated Authority Report – December 2023

COMMITTEE: Administration, Finance & Audit

X INFORMATION
___ VOTE

Michele S. Gillen
Director, Administration

Betty Hill, Acting Admin. Systems Coordinator
Barbara Aylward, Administrator A & F
Preparer/Title

Douglas J. Rice
Director of Procurement

RECOMMENDATION:

For information only. Attached is a listing of actions taken by the Executive Director under delegated authority for the period December 1 - 31, 2023.

This report is broken down into three sections:

- Awards of Construction, non-professional and professional services contracts and change orders and amendments in excess of $25,000, including credit change orders and amendments in excess of $25,000;
- Awards of purchase orders in excess of $25,000; and
- Amendments to the Position Control Register, if applicable.

DISCUSSION:

The Board of Directors' Management Policies and Procedures, as amended by the Board's vote on February 16, 2022, delegate authority to the Executive Director to approve the following:

Construction Contract Awards:

Up to $3.5 million if the award is to the lowest bidder.

Change Orders:

Up to 25% of the original contract amount or $1,000,000.00, whichever is less, where the change increases the contract amount, and for a term not exceeding an aggregate of six months; and for any amount and for any term, where the change decreases the contract amount. The delegations for cost increases and time can be restored by Board vote.

Professional Service Contract Awards:

Up to $1,000,000 and three years with a firm; or up to $200,000 and two years with an individual.

Non-Professional Service Contract Awards:

Up to $1,000,000 if a competitive procurement process has been conducted, or up to $100,000 if a procurement process other than a competitive process has been conducted.

Purchase or Lease of Equipment, Materials or Supplies:

Up to $3.5 million if the award is to the lowest bidder.

Amendments:

Up to 25% of the original contract amount or $500,000, whichever is less, and for a term not exceeding an aggregate of six months.

Amendments to the Position Control Register:

Amendments which result only in a change in cost center.

BUDGET/FISCAL IMPACT:

Recommendations for delegated authority approval include information on the budget/fiscal impact related to the action. For items funded through the capital budget, dollars are measured against the approved capital budget. If the dollars are in excess of the amount authorized in the budget, the amount will be covered within the five-year CIP spending cap. For items funded through the Current Expense Budget, variances are reported monthly and year-end projections are prepared at least twice per year. Staff review all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA budget.

Construction & Professional Services Delegated Authority Items December 1 – 31, 2023

No.	Date of Award	Title and Explanation	Contract	Amend/CO	Company	Value
C-1	**12/05/23**	**Section 101 Pipeline Extension (Waltham)** Install a new 24-inch insertion valve, provide traffic control, pavement and site restoration on Bacon Street; Furnish and install a 10-inch cap on the City's main at Totten Pond Road during a brief overnight isolation; Furnish and install two additional 4-foot by 8-foot MWRA project signs.	**7457**	**2**	**Baltazar Contractors, Inc.**	**$126,454.82**
C-2	**12/08/23**	**Diesel Generator Maintenance** Final balancing change order to decrease the following bid items: Maintenance repair, emission testing, replacement parts and authorized manufacturer's representative services.	**OP-402**	**3**	**KNM Holdings, LLC d/b/a ASNE**	**($184,986.20)**
C-3	**12/08/23**	**Metropolitan Operations Paving** Award of a contract to the lowest responsive bidder to provide permanent paving on an as-needed basis for a term of 1,096 calendar days.	**OP-465**	**Award**	**Sunshine Paving Corp.**	**$1,053,036.50**
C-4	**12/15/23**	**CHE008 Pipe Replacement Project** Remove and replace 40 linear feet of 6-inch ductile iron pipe with restraints on all bends on Eastern Avenue to eliminate the potential for future sudden failures during the project.	**7915**	**3**	**D'Allessandro Corp.**	**$69,269.28**
C-5	**12/15/23**	**Fuel Storage Tank Maintenance Services** Award of a contract to the lowest responsive bidder for the annual preventive maintenance for underground and above ground fuel storage tanks for a term of 1,095 calendar days.	**OP-468**	**Award**	**Dependable Service Company, Inc.**	**$525,000.00**

Purchasing Delegated Authority Items December 1-31, 2023

No.	Date of Award	Title and Explanation	Company	Value
P-1	**12/1/2023**	**Purchase Order for Professional Services for the Implementation of Microsoft Azure AD Integration with Okta - *State Contract ITS60*** MWRA currently uses an on premise version of Microsoft Office and Exchange for back office tools. In 2025, Microsoft will stop support for the on premise version of Exchange; as a result, MWRA will need to migrate to O365. Staff reviewed the bid submitted by Carahsoft Technology Corporation and determined that it meets all of the requirements of the bid specifications.	**Carahsoft Technology Corporation**	**$25,272.89**
P-2	**12/1/2023**	**Confirming Purchase Order for a Delivery of Ultra Low Sulfur Diesel Fuel to Columbus Park Headworks - *State Contract ENE47*** The Columbus Park Headworks provides screening and grit removal, flow metering and flow control for Deer Island North Main Pump Station. The facility uses diesel fuel to power both the heating system and the backup emergency generator. On October 23, 2023, Dennis K. Burke, Inc. delivered 8,001 gallons of ULSD to the facility. The Massachusetts State Contract price for that day was $3.3428/gallons.	**Dennis K. Burke, Inc.**	**$26,811.59**
P-3	**12/1/2023**	**Purchase Order for Ten Stainless Steel Expansion Joints** Deer Island Treatment Plant utilizes Plant Water (W3), also known as treated plant effluent in place of single-pass potable water. W3 is used for various tasks such as wash downs, sludge dilution, flushing tanks prior to cleaning, as flushing water to clean process pipeline systems. W3 water can contain small traces of grit and residual chlorine. These contaminants can corrode stainless steel over a period of time and cause leaks in the W3 piping systems including the expansion joints. Once this happens, those components require replacement. This procurement is for materials only. MWRA staff will perform all functions related to the removal and installation of the expansion joints.	**Valve Industries, Inc.**	**$39,590.00**
P-4	**12/1/2023**	**One-Year Purchase Order Contract for Maintenance and Support of SAP Business Objects' Business Intelligence Suite** SAP BusinessObject Business Intelligence Suite is MWRA's standard report and ad hoc query tool. This annual agreement for SAP BusinessObjects BI Suite v4.2 provides maintenance and support for 10 named licenses and 25 concurrent licenses. The agreement provides 24/7 support including access to new releases and updates of the licensed software, access to SAP's support advisory center, and remote support. Under the current contract with Carahsoft	**Carahsoft Technology Corporation**	**$46, 707.90**

No.	Date of Award	Title and Explanation	Company	Value
		Technology, which expires on December 29, 2023, MWRA is paying $45,213.89. Pricing under this contract reflects a 4.5% increase from the existing contract.		
P-5	**12/1/2023**	**Purchase Order for One Mower Tractor - *State Contract FAC116*** The recommended tractor is a Ventrac 4520 with mowing deck, that allows for the mowing of slopes in excess of 25-degress which can operate in areas previously only accessible to a slopemaster mower. Additionally, the tractor will include a V-blade plow, snow blower, drop spreader, winter cab, dual wheels, and a power broom to be used for snow and ice removal at the JCWTP. Due to the size and weight of the tractor, no special license is required for its operation.	**MTE Turf Equipment Solutions, Inc**	**$65,106.00**
P-6	**12/6/2023**	**Purchase Order for Eighty 55-Gallon Drums of Ethylene Glycol Heat Transfer Fluid** Deer Island adds heat transfer fluid to critical H2S systems to lower the freeze point, similar to coolant or radiator fluid in a car to ensure maximum operability and reliability during extreme cold temperatures. This freeze protection ensures that equipment and pipelines will not burst in the event the H1S heating loop fails to provide sufficient heat for the H2S loops throughout Deer Island. This recommendation will replenish the heat transfer fluid stocked at Deer Island's warehouse.	**Astro Chemicals, Inc**	**$34, 980.00**
P-7	**12/06/2023**	**Sole Source Purchase for Replacement Parts for Flowrox/Valmet Pumps for the Deer Island Treatment Plant** The Deer Island Treatment Plant has six Gravity Thickeners that are available to concentrate primary sludge prior to addition to the anaerobic digesters. DITP Maintenance staff perform annual maintenance on the TPS pumps. This purchase is for direct replacement of TPS pump rotors, stators and other consumable parts used for the existing Flowrox/Valment pumps. Parts are stocked at the Deer Island warehouse and are periodically drawn out and installed by MWRA maintenance staff.	**Valmet Flow Controls, Inc**	**$35,874.42**
P-8	**12/11/2023**	**Purchase Order for One 24-Inch Vertical Gate Valve** As a part of its overall maintenance and operation of the Metropolitan water system, Operations' Water Pipeline Unit replaces approximately twenty main line valves of varying sizes each year. To ensure that the proper sized valve is always available to minimize down time and to be able to immediately respond in the event of a sudden break in service, valves of various dimensions are stocked at the Chelsea Facility. These valves are used on an as-needed basis by MWRA staff to complete pipeline projects	**Everett J. Prescott, Inc**	**$25,782.50**

No.	Date of Award	Title and Explanation	Company	Value
P-9	**12/12/2023**	**Critical Need Purchase Order for the Rental and Installation of a Temporary Air Handling System for the Columbus Park Headworks** On Friday, October 13 staff discovered that one of the air handling units at the Columbus Park Headworks had failed, reducing the fresh air changes into the classified operating spaces. Due to the emergency nature of this procurement, MWRA requested a waiver of the bidding and advertising requirements under M.G.L. c. 149 Sections 44A(4) and 44J(6), from the Division of Capital Asset Management and Maintenance, which was approved on November 1, 2023. CAM's proposal of $301,419.80, is a turnkey solution that provides fresh tempered air to keep the facility safely operational for a duration of seven months. This will get the facility through the heating season and will allow sufficient time to determine a time frame for the long term permanent solution, which will rely on equipment lead time.	**CAM HVAC & Construction, Inc.**	**$301,419.80**
P-10	**12/11/2023**	**One Year Sole Source Purchase Order for ASI Controls Systems Services at the John J Carroll Water Treatment Plant** The John J. Carroll Water Treatment Plant utilizes an HVAC platform manufactured by ASI Controls Company (ASIC Company) to maintain an appropriate environment for the water treatment equipment. American Energy Management (AEM) developed the programming and the logic for the control of all the HVAC components at Carroll at the time of plant construction. The possession of the ASIC software "tools" is necessary for uploading, downloading, and modifying the programming code for these controllers. These are the most common activities that are performed when problems arise with the control systems. This purchase order will provide an as needed contract for one year to diagnose and resolve HVAC control system problems at the Carroll Water Treatment Plant. Staff estimate up to 25 days of service will be required during the one year term.	**American Energy Management**	**$30,000.00**
P-11	**12/7/2023**	**Confirming Purchase Order for a Delivery of Ultra Low Sulfur Diesel Fuel to the Prison Point Combined Sewer Overflow Facility - *State Contract ENE47*** The Prison Point CSO Facility pumps dry weather flows collected in the Cambridge Marginal Conduit and Boston Marginal Conduit, into the Charlestown Branch Sewer. The facility uses diesel fuel to power both the heating system and the backup emergency generator. On November 28, 2023, Dennis K. Burke, Inc. delivered 9,000 gallons of ULSD to the facility. The Mass State Contract price for that day was $2.9902/gallons.	**Dennis K. Burke Inc.**	$**27,389.07**

No.	Date of Award	Title and Explanation	Company	Value
P-12	**12/18/2023**	**Purchase Order for Four Vertical Gate Valves and One Resilient Gate Valve** As a part of its overall maintenance and operation of the Metropolitan water system, Operations' Water Pipeline Unit replaces approximately twenty main line valves of varying sizes each year. To ensure that the proper sized valve is always available to minimize down time and to be able to immediately respond in the event of a sudden break in service, valves of various dimensions are stocked at the Chelsea Facility. These valves are used on an as-needed basis by MWRA staff to complete pipeline projects.	**Billerica Winwater Works Co**	$56,139.00

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: FY21-FY25 Strategic Business Plan: Annual Update for FY23

COMMITTEE: Administration, Finance and Audit

_X_ INFORMATION
____VOTE

Rebecca Weidman, Deputy Chief Operating Officer
Denise Breiteneicher, Program Manager, Energy and Environmental Management
Preparer/Title

David W. Coppes, P.E
Chief Operating Officer

MWRA's five-year Business Plan, covering FY21 through FY25, was presented to the Board in December 2020. The plan described MWRA's mission, identified values, and outlined six key strategic priorities and 20 goals, as well as specific initiatives associated with these goals, which provide a framework for MWRA's business initiatives over the five-year period. This staff summary presents a review of the third year of the current five-year business plan, including accomplishments and progress made on initiatives.

RECOMMENDATION:

For information only.

DISCUSSION:

The fiscal year FY21 through FY25 MWRA Business Plan is a strategic blueprint that articulates the mission statement, values, and goals of the agency, as well as specific initiatives associated with these goals to be achieved or evaluated over the five-year period. The document was developed as a tool to guide staff in prioritizing projects and programs within the broader framework of MWRA goals and mandates, and to evaluate system-wide performance.

Six strategic themes integral to MWRA's mission form the basis of the Plan:

I. Drinking Water Quality and System Performance
II. Wastewater Management and System Performance
III. Infrastructure Management and Resilience
IV. Finance and Management
V. Diversity, Equity, Inclusion, and Workforce Development
VI. Environmental Sustainability

MWRA identified a series of goals to help it achieve its stated priorities, as well as core and special initiatives that describe the specific projects and direction MWRA plans to undertake over this five-year period. Core Initiatives address the activities that MWRA must do to meet its

performance goals, regulatory requirements and financial commitments. Special Initiatives address activities, projects and emerging issues that staff will be assessing or undertaking in order to improve MWRA's performance of its core responsibilities. Existing reporting mechanisms, such as the Orange and Yellow Notebooks, continue to be used to track monthly and quarterly performance.

The annual update allows MWRA staff to assess progress toward achievement of its goals as well as to assess progress made on individual projects within Core Initiatives and on Special Initiatives. It also provides an opportunity for managers to review projects at a high level and decide whether the priority status of the project has changed since the development of the current Business Plan, and whether the level of resources devoted to the project should remain the same or be increased or reduced.

The attached document presents all the goals by priority areas with the associated initiatives. Symbols included show progress made in FY23, and an associated list of highlights for each initiative. Completed items are identified. Arrows identify many initiatives related to ongoing requirements.

Some of the highlights for FY23 listed by strategic theme are:

<u>Drinking Water Quality and System Performance</u>

- Recognized by the Massachusetts Department of Environmental Protection in May 2023, with a large public water system award for continued outstanding performance delivered during 2022.
- Continue to assist member communities to improve local water distribution systems including:
    - completed 248 lead and copper tests from 66 schools and childcare facilities in 31 communities;
    - performed follow-up sampling at 18 locations in which a residence was over the Action Level within three days as required by the new Lead and Copper Rule; and
    - provided technical and sampling assistance for 16 water quality sampling events, six water quality complaints, 11 drinking water sampler training events, and 39 additional community requests.
- Completed the Annual Water Quality Report in June with additional focus for FY23 on MWRA's inclusive approach to water quality for all customers.

<u>Wastewater Management and System Performance</u>

- Received the Platinum award for Deer Island Treatment Plant from the National Association of Clean Water Agencies for 16 consecutive years without a NPDES permit violation.

- Issued a Notice to Proceed for the Braintree-Weymouth Pump Station Improvements construction contract, #7366, in September 2022.

- Initiated extensive coordination with metropolitan Boston CSO communities and regional Boards of Health, posting signs at public access areas affected by CSOs as required by the new Sewage Notification Law.

Infrastructure Management, Resilience, and Redundancy

- Incorporated components of Crime Prevention Through Environmental Design into the MWRA's Physical Security Policy in an effort to enhance MWRA's physical security. MWRA is also working with its telecommunications provider to upgrade traditional telephone lines to fiber optic cables capable of transmitting alarm and CCTV camera images at faster speeds with better reliability and resolution.
- Submitted the Environmental Impact Report (EIR) for the Metropolitan Water Tunnel Program in October 2022 and received a certificate from the Secretary of Energy and Environmental Affairs on the draft EIR (DEIR). The certificate required the submittal of a Supplemental EIR (SDEIR), and staff began work on the SDEIR in FY23.
- Staff provided training on reservoirs flood control to a large number of Western and Metro Operations staff for succession planning.

Financial and Management

- Assessments for the Water and Sewer utilities continue to be "smoothed" reducing the volatility of year-to-year assessment changes thereby improving the sustainability and predictability for member communities.
- Staff sold $234.3 million of bonds comprised of $100.3 million in refunding bonds and $134.0 million in tax-exempt new money bonds. The refunding resulted in $12.9 million in present value debt service savings applied between FY2023 and FY2037.
- The move to Deer Island and Chelsea for staff from the Charlestown Navy Yard was successfully completed by the end of FY23.

Diversity, Equity, Inclusion and Workforce Development

- Partnered with Core Consulting to design, implement and manage a mentoring program for MWRA staff in FY23.
- Continued to engage with Vocational Technical Schools, expanding efforts to promote co-operative education opportunities and careers at the MWRA through partnerships with Quincy High School and the Boston Green Academy.
- Subcommittees have been created to advance several initiatives and enhance employee engagement. Efforts include Heritage Month Celebrations and a Lunchtime Speakers Series.
- MWRA expanded the use of the Safety Reports application to include safety observations and job safety analysis, allowing more efficient tracking of potential hazards and making it easier to create reports of findings and provide them to stakeholders to continue to ensure a safe working environment for all staff.
- Finalized MWRA's Environmental Justice Strategy and submitted it to the Executive Office of Energy and Environmental Affairs.

Environmental Sustainability

- Staff continued to incorporate decarbonization elements into major facility rehabilitations. Currently, Hayes Pump Station and Braintree-Weymouth Pump Station are undergoing rehab and include such energy efficiency elements as HVAC and pump upgrades, the installation of heat pumps to reduce oil use at the facility, ventilation setbacks, LED lighting, and the installation of a jockey pump at Braintree-Weymouth Pump Station to increase pumping efficiency.
- MWRA was awarded a grant for $96,053 from MassDEP to assist with the installation of heat pumps at a water and a wastewater pump station to replace oil fired boilers.
- Received approval from Eversource to participate in its Make Ready Program that provides the majority of the funding for electric vehicle charging infrastructure installation. An additional 30 spaces have been approved under this program for Chelsea. Deer Island and Southborough have also been approved to participate in the program.

BUDGET/FISCAL IMPACT:

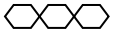
Any budgetary impacts of the initiatives in the Business Plan are accounted for in the CEB and CIP.

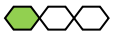
ATTACHMENTS:

Attachment 1: MWRA Five Year Strategic Business Plan, FY21-FY25 (link below)
https://www.mwra.com/publications/businessplan/2021-2025finalmwrabp.pdf

Attachment 2: Review of MWRA Five Year Strategic Business Plan, FY21-FY25, with FY23 updates

KEY:

Not started 

Initiated 

In progress 

Achieved 

On-going Core Activities ⟶

I. Drinking Water Quality and System Performance

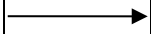
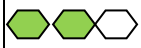
Goal #1: Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Optimize operation of water treatment facilities to produce high quality, safe drinking water while maximizing water aesthetics (e.g., taste, clarity, and odor).	⟶	• MWRA met all regulatory requirements for safe drinking water. • In May 2023, the Massachusetts Department of Environmental Protection (MassDEP) recognized MWRA with a large public water system award for continued outstanding performance during 2022. • Along with MassDEP and Chicopee Valley Aqueduct (CVA) contiguous community representatives, MWRA ran a desktop drill associated with a loss of disinfection at Brutsch Water Treatment Facility (BWTF) in October 2022.
B. Monitor drinking water quality in collaboration with member communities and the Massachusetts Department of Conservation and Recreation (DCR) in order to verify high quality water and provide guidance for operating decisions.	⟶	• MWRA continues to coordinate monitoring efforts with DCR for both routine algae and algal toxin monitoring as well as reservoir emergency response planning. • MWRA continued weekly inspections to monitor for cyanobacteria blooms in standby and active reservoirs during May-September using a GIS Environmental Systems Research Institute application. • MWRA continued to coordinate field and laboratory resources to aid local water departments and in-house staff in the

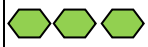
		resolution of water quality complaints, low chlorine residuals or coliform detections, and water storage tank cleaning projects or activations. In FY23, staff assisted communities with sampling on 16 occasions and with water quality complaint sampling on six occasions. and with offline pipeline or tank clearance sampling on 39 occasions. • Data regarding key water quality parameters and reservoir conditions (during summer months) were distributed electronically every morning to key decision makers at MWRA. A monthly reports is submitted to each community with their water systems performance compared to historical data. Annually, a total of 528 reports are sent. • Continued MWRA research projects with UMass Amherst under new Interdepartmental Service Agreement to investigate strategies to minimize contaminants of concern such as disinfection by-products, algae and algal toxins in MWRA's finished water. • Continue to assist communities with sampling plan updates, level assessments, water quality complaint reporting, MWRA's Emergency Response Plan (ERP) training sessions, and data requests. • Performed training in various capacities including 11 training sessions for drinking water sampling. • Updated the source reservoir spill contamination response Standard Operating Procedure (SOP). • As part of the new Lead and Copper Rule, any residence that is over the Action Level needs a follow-up sample at a nearby total coliform site within three days. MWRA's Environmental Quality Department (ENQUAL) performed this task in 2023 at 18

		locations, all within the required MassDEP timeline.
C. Ensure reliability of data presented in required regulatory compliance reports.	→	• Increased the number of processes that are currently automated, replacing some older applications and making others more robust. Overall, there have 16 processes have been automated and six more are underway. • First draft of the Consumer Confidence Report (CCR) automation script/business rules was completed for calendar year 2022. However, this process is ongoing as new requirements are incorporated.
D. Work cooperatively with DCR on various water quality initiatives including chloride, nutrients, algae and disinfection byproduct precursor monitoring programs. Jointly develop operational response plans for nuisance and harmful algal blooms, algal toxin detections, and taste and odor events.	→	• Staff reviewed and commented on the update of the Quabbin, Ware, and Wachusett Watersheds Protection Plans. • Staff met with DCR and UMass Amherst to review seasonal increases in total coliform counts in the Quabbin Reservoir. Investigative research studies to determine cause of seasonal coliform bloom were initiated under DCR's existing Interdepartmental Service Agreement with UMass Amherst. • Staff participated in an MWRA/DCR work group to help both agencies work together on monitoring programs. MWRA staff also met with an algal treatment vendor to assess copper-based treatment efficacy on *Chrysosphaerella* algae for use at Quabbin.
E. Continue to encourage DCR to meet its obligations under its Watershed Protection Plan overseen by the Water Supply Protection Trust, and monitor progress toward achieving those obligations.	→	• Conducted regular senior manager coordination, reservoir operations, and water quality monitoring/laboratory meetings. • Reviewed and commented on DCR Land Management Plans and updates to Public Access Plans. • Facilitated annual DEP inspection visits at Quabbin/Ware watersheds and Wachusett watershed under the filtration avoidance determination.

		• Continued active involvement on DCR Land Acquisition Panel, and presented proposed land acquisitions to MWRA's Board of Directors. From MWRA's creation in 1985 through 2023, a total of 27,454 acres have been protected at a total cost of $143.7 million. This amount includes MWRA's commitment of $29.0 million to date for watershed land acquisitions, of which $27.4 million has been spent through September 2022. Furthermore, MWRA has proposed another $5 million (or $1 million per year) in the next 5-year Capital Improvement Plan (CIP).
F. Operate the reservoir system to optimize both quality and quantity of water available for water supply purposes and to meet statutory and regulatory requirements for downstream releases.	→	• Met all statutory requirements for downstream releases. • MWRA manages the timing and amount of water transferred from Quabbin to Wachusett Reservoir to maximize raw water quality while minimizing potential downstream flood impacts and safeguarding supply reliability, using data from multiple water quality monitoring stations and reservoir management models. • MWRA completed annual standby reservoir monitoring during annual water quality sonde profiling and grab sample analysis. • Installed Nitrate sensor (Buoy #2) and fluorescent dissolved organic matter (FDOM) sensor (Buoy #4) to monitor tributary loadings of nitrogen and organic components into Wachusett Reservoir. • Installed secondary batteries on all four profiling buoys for increased electrical storage to avoid missing profiles during low sunlight periods. • Sudbury Reservoir, Foss Reservoir, Chestnut Hill Reservoir, Fells Reservoir, and Spot Pond are all kept within their normal operating ranges. Level control has been maintained through the removal of excess water when

		the elevation has been above the normal operating range. • Continue to deploy annual monitoring and control efforts for aquatic invasive species (AIS) at source and emergency reservoirs.
G. Implement database management systems for handling data, and incorporating web-based technologies for reporting near real time water quality metrics and provide easy access to data to the MWRA community.		• In fiscal year (FY) 2023, staff continued to develop automated applications accessible on the Data Management Group's internal web site. Staff continue web page development with links to reports, applications, SOPs, regulations and administrative content. • Working with MIS and a contract vendor, staff facilitated the upgrade of Aquarius 3.10 to Aquarius NG for regulatory disinfection compliance reporting. Aquarius NG is now in use.
H. Enhance the safety and security of the water supply and watershed system against accidental or intentional threats and hazards.		• Continued implementation of consequence management practices to guide alarm response at contaminant monitoring locations. In FY23, 15 actionable alarm events were responded to across MWRA contaminant monitoring system locations. • Successfully installed new generation of online contaminant monitoring systems at Carroll Water Treatment Plant. • Continued seasonal deployment of water quality profiling buoys and sondes for monitoring source water quality and collecting profiling data in Wachusett and Quabbin Reservoirs. Three buoys were deployed in Wachusett Reservoir at Basin South, Basin North and the intake locations and one buoy was deployed in Quabbin Reservoir near the intake. Data is processed in real-time, and can be viewed through the Buoy App found on the Data Management Group Homepage as well as from the daily emails. • Continue to provide professional training to MWRA and DCR watershed operations staff on spill response in the watersheds and

		reservoirs. Continue to maintain prepositioned spill response trailers and equipment in the watersheds.
I. Maintain water quality sampling from treatment to throughout the distribution system, including monitoring for emerging contaminants.		• Purchased instrumentation to add the capability to monitor per- and polyfluoroalkyl substances (PFAS) in-house in FY21 and were certified by MassDEP to do drinking water testing in FY22; we are expect to start performing wastewater testing for PFAS in FY24. • Commenced sampling for Unregulated Contaminant Monitoring Rule (UCMR) 5 in 12 consecutive communities on a quarterly basis.
J. Identify and evaluate the impact of different treatment strategies and scenarios on the mitigation of transportation related contaminants into the source water. COMPLETED		• Completed UMass Amherst research project to evaluate strategies for minimizing impacts of an oil spill and cyanotoxins in Wachusett Reservoir using treatment scenarios at the Carroll Water Treatment Plant in December 2020. Findings from the final report were presented to MWRA and DCR staff at the Reservoir Operations meeting.
K. Evaluate new water quality monitoring equipment and testing techniques to monitor and maintain high quality water all the way to the ends of the community systems.		• In FY21 and FY22, staff developed a draft report for multi-year review of water quality data for all standby reservoirs. That draft report was finalized in FY23 and will be disseminated by the end of CY23. • Nine communities borrowed field water quality monitoring equipment in FY23 to help monitor low chlorine residuals and other trouble spots in their distribution systems.
L. Participate with other water utilities nationwide in Water Research Foundation studies, specifically researching opportunities pertaining to algae monitoring and mitigation strategies in source water.		• In FY23, participated in Water Research Foundation studies on energy efficiency, PFAS, Lead Pipe Rig design, and other distribution system water quality issues. • Continued collaboration with New York City on watershed programs, following publication of the National Academy of Sciences (NAS) review.
M. Collaborate with CVA communities to modify chlorine dosing strategy to minimize the		• New chlorine dosing strategy and residual targets continues to be implemented in BWTF-CVA system in collaboration with CVA

formation of disinfection byproducts. COMPLETED		community Superintendents to minimize disinfection by-products.
N. Evaluate data from UCMR4 2018-2020 monitoring and compare against nationwide occurrence data. COMPLETED		• Completed UCMR4 monitoring on behalf of the communities and posted all data on MWRA's website, responded to public questions on the data, and used the data to demonstrate MWRA's excellent source water quality.
O. Advocate for responsible and reasonable new and revised state and federal drinking water regulations, and provide training and technical support to communities for new regulations.		• MWRA staff continue to be active in state and federal review of the Lead and Copper Rule, and microbial and disinfection byproducts rules, as well as other proposed rule and guidance changes. Continued to participate in MassDEP/ U.S. Environmental Protection Agency (EPA) work group on lead public notice and public education templates, and MassDEP/Massachusetts Department of Public Health (DPH) work group on Disinfection Byproducts public notice template. • MWRA staff are closely tracking EPA's efforts to regulate PFAS. In June 2022, EPA issued new Health Advisories (HAs) for four PFAS compounds, including new HAs for PFOS (perfluorooctanesulfonic acid) and (perfluorooctanoic acid) PFOA. EPA proposed drinking water limits for six PFAS compounds in March 2023; MWRA provided comments to EPA in April. Final PFAS rules will likely be issued in late 2023 or early 2024. • EPA proposed revisions to the Consumer Confidence Rule (CCR) in April 2023, including a requirement for twice annual reports. MWRA provided comments in May. • MassDEP issued changes to the state Water Management Act that added conditions to registration renewals. MWRA provided comments. Staff are working on required changes to MWRA's drought management plan.

		• Conducted training session on Lead and Copper Rule revisions for all MWRA communities.

Goal #2: Continue to effectively report and communicate water quality information to our customers and public officials.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Distribute the federally required annual water quality report, the Consumer Confidence Report (CCR), to all households.	→	• Completed Annual Water Quality report in June and distributed to homes, as well as posted on MWRA website. Additional focus in FY23 was on MWRA's inclusive approach to water quality for all customers as well as lead-related issues.
B. Maintain and improve water quality and public health information on MWRA's web page, www.MWRA.com, and through widely distributed weekly and monthly reports.	→	• During FY23, MWRA continued to update and add water quality information to its website. • In FY23, the Annual Water Quality Report was prominently featured at the top of the home page and was publicized through Twitter and other news outlets. The monthly water quality reports were posted regularly and sent directly to subscribers through the Everbridge application. • MWRA again participated in the Association of Metropolitan Water Agency's (AMWA) "Imagine A Day Without Water" in October 2022 and American Water Works Association's (AWWA's) "Drinking Water Week" in May 2023 with relevant postings on MWRA.com and Twitter.
C. Regularly communicate routine Total Coliform Rule (TCR) monitoring data to Water Departments and assist with water quality sampling or training, as needed	→	• Developed and distributed monthly reports to member communities with data from their TCR sampling events. • Continue to install, develop, and upload monitoring data in Excel and Microsoft Access databases. The automation of CCR and Weekly report has been completed. • In coordination with MIS, developed a community-Operations Management Monitoring System (OMMS) web-portal to enable community access to latest water quality data.

D. Continue to strengthen planning and emergency response documents for Boil Water Order (BWO) events. Create, disseminate, and train staff on materials that can be used during a BWO event or at a public information call center.	→	• A SOP and training materials have been developed for use in training volunteers staffing a public information call center. Staff included examples during community ERP trainings.
Goal #3: Assist member communities to improve local water distribution systems through ongoing financial, technical and operational support programs to maximize long-term water quality benefits.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Provide technical and operational support through training, on-call contracts, and targeted assistance, as needed.	→	• During FY23, MWRA's lab completed 248 lead and copper tests from 66 schools and childcare facilities in 31 communities. Since 2016, MWRA's Laboratory has conducted over 40,000 tests from 560 schools and daycares in 44 communities. We have also completed 864 home lead tests under the DPH sampling program since 2017. Overall, MWRA's lab has completed 2,629 drinking water lead and copper tests in FY23. • Provided technical and sampling assistance to communities for the following initiatives: o Sixteen water quality sampling events; o Six water quality complaint assistance events; o Thirty-nine offline pipeline or tank clearance sampling events; and o Eleven drinking water sampler training events. • Provided assistance to 9 communities for leak detection and 9 communities for valve operations. • Conducted virtual MWRA community ERP training sessions and discussed various water quality subjects including coliform, E.coli and potential boil water orders, PFAS, pandemic response, cyber security, and changes to the lead rules.

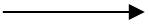
B. Promote and manage MWRA's Local Water System Assistance Program to help facilitate improvements in local community infrastructure.		• In FY23, $29 million in MWRA interest-free loans were distributed to member water communities. In total, more than $527 million in loans have been distributed to fund 519 local projects, with 43 of the 45 eligible water communities participating. Since 1998, 603 miles of local water main have been replaced or cleaned & lined (about 8 percent of the regional system) via projects funded by MWRA financial assistance. • In FY17, the $100 million lead service line replacement loan program began. In FY23, $4 million was distributed to member water communities through this Program. In total, $36 million in loans, targeting full removal of lead water services, have been distributed. • Conducted significant outreach associated with the Lead Service Line Replacement program, as well as additional outreach on other local lead issues.
C. Enhance outreach and technical assistance within the existing Lead Service Line Replacement program to support communities as they respond to EPA's revisions to the Lead and Copper Rule.		• Coordination with the Advisory Board on development of Phase 3 Local Water System Assistance Program was completed in FY17. Beginning with the Final FY18 CIP, a new $293 million Phase 3 of the community water loan program was approved by the Board of Directors and has been made available to member communities. As of FY23, some communities have little or no funds available. Staff and the Advisory Board will evaluate the timing and scale of funding in the coming year for the next phase. • Continued to conduct outreach and training on lead service line replacement and the requirements of the Revised Lead and Copper Rule, including segments in community ERP training in the fall and spring of FY23. Assisted communities in preparation for EPA audits of community lead programs.
D. Develop the capability to evaluate potential changes to corrosion control treatment		• Continued to work with a stakeholder panel of national lead corrosion experts, community and regulatory staff to provide

using a pipe loop system constructed using “harvested” lead service lines.		guidance on the set up and operation of a lead pipe rig to evaluate corrosion control options. • Continuing in FY23, staff conducted biweekly sampling from a lead pipe rig system at CWTP as the system continued to acclimate. This project involves multiple departments across the Authority. • Procured a consultant to assist in designing and analyzing the corrosion control evaluation. Completed the acclimation phase, and received expert panel advice on beginning the experiments.

II. Wastewater Quality and System Performance

Goal #4: Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to carry out the Pretreatment Program to protect receiving water quality, maximize the beneficial reuse of wastewater residuals, and protect workers, MWRA's wastewater treatment plants, and receiving waters.	→	• Conducted a total of 1,158 industrial waste inspections (Significant Industrial Users (SIUs) and non-SIUs), 1,046 gas/oil separator inspections, and 121 septage and septage hauler inspections. • Responded to all discharge violations for both SIUs and Non--SIUs by taking the appropriate action in accordance with its EPA approved Enforcement Response Plan (ERP) and federal regulations. TRAC issued a total of 201 Notices of Violations and 70 higher-level enforcement actions (66 Notices of Noncompliance, two Administrative Orders and two Penalty Assessment Notice) to industrial and commercial facilities. Link to the Pretreatment Program's annual report: https://www.mwra.com/annual/tracindustrialwastereport/iwr-2023.pdf • Conducted a total of 2,415 sampling events for the following activities: o 1,262 industrial; o 166 National Pollutant Discharge Elimination System (NPDES) permit related; o 15 for emergency response; o 248 for local limits; and o 724 for special projects. • Sampled 160 permitted SIUs with a discharge at least once in FY23. • Issued or renewed 514 permits.
B. Continue to monitor Deer Island Treatment Plant (DITP) processes to ensure high quality treated effluent optimizing plant performance to ensure all applicable NPDES permit limits continue to be attained.	→	• Deer Island was awarded a Platinum award from the National Association of Clean Water Agencies (NACWA) for 16 consecutive years without a NPDES permit violation.
C. Operate the enhanced phosphorus control system at the Clinton Wastewater Treatment Plant to ensure	→	• The seasonal effluent phosphorus limit of 150 micrograms per liter (ug/L) and 3.8 pounds per day loading limit became effective starting April 1, 2019. The effluent through the end of the fiscal year has met these limits.

compliance with its NPDES permit.		
Goal #5: Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Prepare updated Local Limits Studies for Clinton and Deer Island in accordance with EPA guidelines to confirm appropriate discharge limits from industries.		• Awaiting EPA's issuance of new NPDES permit for DITP. A draft permit was issued on May 31, 2023. • MWRA received a final NPDES permit for the Clinton Plant from EPA that went into effect on April 1, 2023. EPA also issued a new General Permit for all Medium Wastewater Treatment Facilities in September 2022 that became effective on November 1, 2022.
B. Continue to review all Ambient Monitoring Plan questions and conduct evaluations to ensure they address MWRA needs and public concerns.		• MWRA continued to update the Outfall Monitoring Science Advisory Panel and the public on MWRA's monitoring program, including Contingency Plan exceedances of *Alexandrium* and dissolved oxygen.
C. Continue to closely follow developing permit issues such as the impact of changes in bacterial and nutrient water quality standards, effluent loading limits, emerging contaminants and PFAS regulations, stormwater permitting, endangered species designations, co-permittees, and phosphorus and PFAS in biosolids.		• Key issues in FY23 were emerging contaminants including PFAS compounds and pharmaceuticals, rapid notification of combined sewer overflow (CSO) discharges, industrial stormwater permitting, microplastics, and nitrogen limits. In FY23, MWRA provided comments on draft NPDES permits in the region including: Holyoke, Montague, Amherst and Billerica, particularly on a "major storm plan" requirement that was later included in the draft DITP permit. • A draft permit for DITP/metro Boston was issued on May 31, 2023. Like all recent permits including that for Clinton, the new DITP permit will require sampling of PFAS in influent, effluent, biosolids, and industrial wastewater. • A new Approval of Suitability (AOS) permit for the beneficial use of the biosolids pellets for the Biosolids Processing Facility went into effect November 2020. This AOS requires the pellets to be tested on a quarterly basis for 16 perfluorinated compounds.

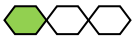
D. Develop a plan to address emerging contaminants (e.g., PFAS and microplastics) as they are identified and frame an approach to respond to the public's concerns about these constituents.		• In FY23, MWRA continued to provide support to a Water Research Foundation project to study PFAS compounds in wastewater. • MWRA has provided effluent samples for a study with the University of Rhode Island, the Woods Hole Oceanographic Institution (WHOI), and the National Oceanic and Atmospheric Administration to measure the presence of PFAS and other contaminants of emerging concern, in wastewater and the ambient Massachusetts Bay receiving waters. The report has been drafted but not released. • MWRA is supporting academic researchers from WHOI on a research project investigating microplastics in wastewater influent, effluent, and Massachusetts Bay receiving waters. Sampling continued in early FY23 with the researchers hosted on a routine MWRA oceanographic survey of the bay. A final report on findings has not been issued. • Conducted a total of 28 sampling events at industrial users; 75 sampling events for Local Limits and two sampling events for NPDES permit compliance to better understand where PFAS could be entering the sewer system.
E. Assess thresholds for annual nitrogen loading, including evaluating the existing thresholds and the environmental impact of nitrogen, as well as, whether these thresholds developed over 20 years ago are valid or should be modified.		• In FY23, runs of the Bay Eutrophication Model continued to show minimal impacts of effluent nitrogen on Massachusetts Bay. DITP met the total nitrogen Contingency Plan threshold in 2022.
F. Review new waste treatment technologies, as they arise, to continuously improve treatment performance and efficiency.		• In FY23 ENQUAL and DITP Process Control collaborated to update evaluations of an expanded list of technologies for nitrogen removal and the design criteria used for evaluating nitrogen removal technologies at Deer Island, should it be required.
G. Continue to work with researchers investigating the use of wastewater as an indicator of the presence of the COVID-19-19 virus.		MWRA continues to support wastewater based epidemiology (WBE) research for tracking the spread of COVID-19. MWRA has provided in-kind samples to research groups from the Massachusetts Institute of Technology, Northeastern, Tufts and UMass Amherst as well as the national program run by the Massachusetts Department of Health and Human Services (HHS). MWRA continued the wastewater monitoring

		throughout FY23 by submitting samples from DITP to Biobot Analytics, Inc. for the analysis of the genetic signal for the SARS-CoV-2 virus that causes COVID-19. The results of these analyses are shared with the state COVID-19 Command Center as they are received and shared with the public on MWRA.com. At DPH's request we also submitted samples to the WastewaterSCAN project from December 2022 onwards. These samples are tested for SARS-CoV-2 virus ribonucleic acid (RNA) and 10 other pathogens. Results are reported publicly on the WastewaterSCAN Dashboard, https://data.wastewaterscan.org.
Goal #6: Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.		
Objective	**FY2023**	**Highlights/Progress Updates**
A. Continue to design and implement facility rehabilitation projects for various pump stations, headworks, CSO facilities and the Deer Island Treatment Plant.	→	• Specific rehabilitation projects include: o Design of Prison Point CSO Facility Improvements, Contract 7462 to upgrade, replace and add major facility components (gates, screens, conveyors, pump engines, mixers, etc.) was completed, competitively bid and awarded. However, construction was terminated shortly after starting due to contract disagreements. Staff are carving out a few project components which require more immediate attention (discharge header rehabilitation and installing a manual transfer switch) for bid and will work to advance the full facility rehabilitation in future procurements. o Nut Island Headworks Odor Control & HVAC Systems Improvements construction contract, #7548, is nearing completion with substantial completion expected in September 2023. o Braintree-Weymouth Pump Station improvements construction contact #7366 notice to proceed (NTP) was issued in September 2022 with completion anticipated in 2024. o Ward Street & Columbus Park Headworks Design (Design/ESDC Contract 7429) began in January 2021. Incorporating lessons learned from the Chelsea Headworks (CCHW) Construction project, the will include a new above-grade structure on both sites instead of rehabilitating the existing facility superstructures. Final design is expected to be complete in January 2024. o Hayes Pump Station Rehab design (7162) is nearing completion with construction (7357) expected to begin in spring 2024.

		o Prison Point Discharge Piping Rehab (8013) NTP will be in September 2023 with anticipated completion in 2024. o CHE008 CSO Rehab (7915) NTP was in December 2022 and substantially complete in June 2023. o Somerville Marginal CSO Pipe Connection design (7691) is nearing completion with an anticipated construction (7985) to begin in spring 2024. o Phase 1 of the Siphon Headhouse rehabilitation project is near design completion. The project will improve flood protection, site access, structural conditions, operational requirements, and odor control at 41 structures throughout the MWRA's service area. The anticipate construction NTP is expected in 2024. o Various wastewater facility improvements are underway through in-house and consultant Technical Assistance task order design efforts to support facility and system reliability, including but not limited to: Nut Island Fire Pump Replacement, Phase 2 & 3 Fuel Tank Replacements, Braintree-Weymouth Intermediate Pump Station Transformer Replacement, Somerville Tide Gate Replacement, CCHW Microwave Radio Link, Cottage Farm CSO Engine Silencers Replacement, Belle Isle Sandcatcher Rehab, Phase 3 Duct Cleaning. o Deer Island Odor Control Damper Replacement Contract 7913 was substantially complete in January 2023. o Deer Island Clarifier rehabilitation Phase II construction contract was issued in February 2023. Construction contract focus on tank concrete and coating systems, gate replacements and other critical work within the primary and secondary treatment sections of the DITP (construction contract 7395).
B. Continue to implement an ongoing program to review, prioritize and accelerate interceptor renewal projects.	→	• Evaluated wastewater interceptors and prioritized them for rehabilitation. • The design of Interceptor Renewal No. 7 (Malden/Melrose) sections 41/42/49/54/65), to line 26,400 linear feet of sewer was awarded in June 2020. Design was completed at the end of CY2022. • The West Roxbury Tunnel (Sections 637 & 637A) requires an inspection to evaluate its condition and identify any repairs. Design contract (7991) is

		currently preparing a contract to inspect the tunnel in 2024. • Siphon and Junction Structure Rehab design (6224) is evaluating 40 structures in 17 communities as part of Phase 1 rehab. Construction (6225) is scheduled to begin in 2024.
Goal #7: Complete all CSO milestones by 2024 and demonstrate that the CSO Plan meets its performance objectives.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Implement CSO performance assessment through ongoing contract with AECOM that will culminate in a report to MassDEP/EPA in December 2021 and a supplemental report in December 2024 verifying whether the approved long-term CSO control plan goals are attained.		• In December 2021 MWRA submitted the Final CSO Post Construction Monitoring Program and Performance Assessment Report. MWRA has completed the last of seven semi-annual reports documenting the progress of the performance assessment. • The performance assessment results indicated that although substantial improvements were made, 16 of the 86 CSOs fell short of meeting the Long Term Control Plan (LTCP) volume and/or activation goals. The report further defined the limited impact remaining CSOs have on water quality. The MWRA and the court parties have agreed and the court has approved a 3-year extension to the court order, for MWRA to implement additional identified projects and perform additional investigations to determine what can be done to further reduce CSO at the 16 sites. A supplemental report will be submitted in December 2024, documenting final performance and conclusion for the 16 outfalls. • MWRA has advanced projects that will allow 10 outfalls to materially attain the LTCP activation and volume goals by December 2024. This includes: Sewer Separation Work in East Boston partially funded through a financial assistance agreement (FAA) with Boston Water and Sewer Commission (BWSC) Project under construction with substantial completion expected in spring 2024, this project already resulted in the closure of BOS003 and BO009. Installation of connection relief for CHE008 (Construction completed summer 2023); and installation of a new pipe connection upstream of Somerville Marginal CSO (in design with construction going to bid in January 2024 and an NTP expected March 2024).

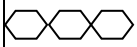
		• MWRA has a Memorandum of Understanding (MOU)/FAA with BWSC to design and construct modifications to BOS017, BOS062, BOS065 and BOS070. • MWRA continues to investigate alternatives and develop costs for possible projects to address CSO compliance issues for the remaining 10 of 16 difficult sites and will document its findings and recommendation in the supplemental performance assessment report to be submitted in December 2024.
B. Comply with the CSO Variances for the Alewife Brook/Upper Mystic River Basin and the Lower Charles River/Charles Basin issued to MWRA and CSO communities for the term of 9/1/19 through 8/31/24.		• MWRA continues to use the CSO public notification system implemented in July 2020 to make required notifications to regulatory agencies, boards of health, and subscribers. (Also see Objective D below). • Staff have commenced and completed project evaluations required by the CSO variances, including completion of the CSO System Optimization for Alewife Brook and Lower Charles River Basins Project in December 2022. Further studies to minimize discharges from CSO regulators that contribute CSO to the variance waters continue. • A significant variance requirement includes the development of an Updated CSO Control Plan for MWRA's discharges to the Variance Waters. Work towards complying with this requirement has included the development and MassDEP/EPA approval of a scope of services, work towards development of a new Typical Year, and close coordination with Cambridge and Somerville in obtaining public and watershed input, and developing a unified hydraulic model for each entity's use in analyzing alternatives. Further efforts will include alternative development and evaluation, preparation of an affordability analysis, and development of draft and final Updated CSO Control Plans. • Due to the complexity of the coordination and public input required for the Updated CSO Control Plan, MWRA, Cambridge, and Somerville requested an extension of the Variance. MassDEP expects to hold a public hearing in the fall of 2023, and issue new Variances in approximately the winter of 2024, extending the completion timeline by 36 months. • Staff continue to comply with all other variance conditions to minimize CSO impacts.

		• Variance-required monitoring of receiving waters continued throughout FY23. The monitoring results were used to prepare the annual water quality report as required by the variances. The report on 2021 conditions was issued in July 2022.
C. Conduct an evaluation of the CSO treatment processes to determine potential opportunities to better meet permit limits. Confirm or reassess treatment processes as part of the CSO facility rehabilitation projects.		• As part of the scope of the CSO performance assessment noted above, staff and the consultant are investigating site-specific measures that can further reduce CSO discharges where needed to help meet the CSO LTCP. MWRA's consultant generated a technical memo for Cottage Farm CSO Treatment Facility which evaluated facility optimization and reviewed adding chemical enhanced primary treatment as a means to improve effluent water quality.
D. Implement a subscriber based CSO Public Notification Program. Provide notification of a CSO overflow within four hours of the start of a discharge. COMPLETED		• As of January 2023, notifications are being sent to over 200 external subscribers within two hours of the start of a CSO discharge, including the required notifications to regulatory agencies and boards of health. • The new Sewage Notification Law and the implementing regulation 314 CMR 16.00 required continuing improvements to the notification program during FY23. Extensive coordination efforts with metropolitan Boston CSO communities and regional Boards of Health were initiated in FY22 and continues into FY24. MWRA issued the required expanded public notifications starting in July 2022. Signs at public access areas potentially affected by CSOs were produced by MWRA and installed by MWRA and CSO communities around metropolitan Boston. The final Notification Plan was submitted on January 6, 2023 as required, with an opportunity for public comment; MassDEP requested some revisions which were completed on June 23, 2023.

E. Implement a near real-time Sanitary Sewer Overflow (SSO) reporting system to provide public information and ensure reporting timeframes meet regulatory requirements. COMPLETED		• In 2015, MWRA began posting SSOs to its web site soon after they occurred. The new Sewage Notification regulation 314 CMR 16.00 requires notification of some SSOs. Expansion of the existing system was completed in FY22 and MWRA began issuing public notifications as required starting in July 2022. • MWRA continues to improve its ability to rapidly gather data on SSOs, which happen very infrequently in MWRA's collection system. FY22 saw a number of unusually large storms that caused SSOs. Standard operating procedures were developed and updated to allow effective communication and training for future staff in case of the next very large storms.
Goal #8: Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Provide technical and operational support including TV inspections, fieldwork assistance, or other targeted assistance, as needed.		• Staff routinely provide technical assistance when requested. In FY22, no requests were submitted by the communities for TV inspections.
B. Promote and manage MWRA's Inflow/Infiltration (I/I) Local Financial Assistance Program to facilitate reduced I/I in local community infrastructure.		• In FY23, $22 million in MWRA grants and interest-free loans were distributed to member sewer communities. In total, more than $532 million in grants and loans have been distributed to fund 664 local projects. All 43 sewer member communities are participating in this Program. Since 1989, average annual wastewater flow to DITP has been reduced by about 67 mgd, a 17% reduction. (See more information in the Annual NPDES I/I Reduction Report). MWRA's Regulatory Reporting Page

III. Infrastructure Management and Resilience

Goal #9: Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support service levels.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to ensure proper operations and maintenance of the water and wastewater systems and minimize system downtime by performing Preventative, Predictive, and Corrective maintenance on equipment and linear assets, water system leak surveys, valve inspections and exercise, and performing inspections and cleaning of wastewater pipelines, structures, water storage tanks, and inverted siphons inspections, and cleaning.	→	• Replaced 15 water blow-off retrofits and two main line valves, entailing excavating and isolating the main from the valve, cutting out the old valve and installing a new one. • Inspected 166.86 miles of MWRA water mains and repaired 13 leaks. • Performed independent water meter testing to confirm the accuracy of the meters supplying the municipalities in MWRA Service Area. • Inspected 33.62 miles of MWRA wastewater interceptors and 652 sewer manholes and other sewer structures such as diversion chambers, tidegates, etc. • Cleaned approximately 37.85 miles of wastewater interceptors and 46 siphon barrels. • Replaced 38 wastewater manhole frames and covers and repaired 45 sewer manhole structures.
B. Inspect, maintain, and improve the dams, dikes, and other facilities constituting the infrastructure of the reservoir system through ongoing maintenance and an adequate multi-year capital improvement program in order to ensure dams' regulatory compliance, long-term operational viability and spillway operation and maintenance to limit potential flood hazards.	→	• Since 2005, over $25 million has been invested in capital and major maintenance of source and distribution water supply dams across the system, with over $7 million committed in current CIP projects. • Contracts underway for needed dam repairs design, bid document production and engineering services during construction (ESDC) for Sudbury Dam spillway masonry and vent repairs, Wachusett North Dike earthen berm restoration for overtopping protection, Foss Dam overtopping protection. FY23 award of most recent dam

		safety inspection contract and instrumentation design underway. The calendar 2023 biennial Phase 1 Dam Safety Inspections were completed on schedule. Additional dam instrumentation design and repair efforts are underway. Chapter 30 construction on the Chestnut Hill Reservoir Dam and Weston Reservoir Dam instrumentation was completed in FY23.
C. Expand Condition Monitoring techniques to provide earlier indication of asset degradation. COMPLETED		• Condition Monitoring techniques continue to be utilized in normal business practices at DITP. Deer Island is now expanding its lube oil program. Staff are able to perform basic oil testing in lieu of sending samples out. This provides immediate results about MWRA's assets and reduces downtime. • Condition Monitoring techniques continue to be utilized in normal business practices in the Field Operations Department (FOD), including all the headworks, pump stations, and CSO facilities. Actions include oil sampling to determine the remaining life expectancy of the oil, ultrasonic testing of the grit pipes in the headworks, and vibration analysis. Staff continue to implement infrared thermography and utilize laser alignment of pumps and fans. Initial staff training has been completed, and training will continue with new staff when brought on board, specifically on vibration analysis and laser alignment.
D. Conduct an updated benchmarking analysis in order to identify gaps and sustain the goal of maximizing asset protection while potentially identifying new best practices in the industry.		• No work on this initiative to date.

E. Update the wastewater metering system and evaluate new technologies to ensure continued accurate flow accounting and to enhance its usefulness for operational and evaluation purposes. COMPLETED		• The new wastewater meter system was installed and tested on schedule by the end of CY2021. The new meters are now being used for billing of communities as of January 2022.
F. Continue to research and develop Key Performance Indicators (KPI) to compare our performance internally and against the industry.		• The MAXIMO upgrade was completed in FY19. The updated MAXIMO continues assisting MWRA in making KPI's easy to track, display and compare with other public utilities.
G. Enhance and monitor water pipeline protection to maximize pipeline lifetime.		• In FY16, MWRA began the process of replacing old cathodic protection on MWRA water mains. In FY23, this work continued in force, with the following activities: o Capital program has added design and construction phases to replace and upgrade cathodic protection systems based upon testing results. o Designed 11 replacement cathodic protection systems for Section 57, an 80 year old 48-inch diameter steel water main in the northern low service area. In-house construction staff are working to replace these systems. Nine of these systems were completed in FY17-FY18, and work continues on the remaining two. o A scope is being developed for the Beacon Street Line Rehabilitation Project which includes the evaluation/replacement of 54 test stations in Boston and Brookline. o The Shafts E, L, N & W Cathodic Protection Improvements Project (Contract 6439) is currently at the 100 percent R1 design phase.

		o Testing was completed for Contract OP-393 – Cathodic Protection System Testing, which included inspection/testing of 182 existing test stations. A final report was submitted in July 2023.
H. Expand integration between MWRA's Authority-wide Enterprise Asset Management System (MAXIMO) with Lawson, Process Information (PI) and Automated Vehicle Location systems to expand the use of predicative Management tasks increasing functionality, asset tracking and improved workflow to reduce equipment and downtime ad control budget spikes. Utilize updated MAXIMO to increase opportunities for more paperless work. COMPLETED		• MAXIMO now tracks life-cycle costs for Clinton, DITP, FOD, IT and Lab assets. End of Life asset values are now captured in the Property Pass site. • MAXIMO Spatial (GIS) interface updates the mapping features giving staff easier access to buried assets history for the Water Distribution and Wastewater Collection systems. • MAXIMO Anywhere (mobile solution) allows staff to receive work and update work orders and asset history in the field.
I. Continue to upgrade and improve upon the Supervisory Control and Data Acquisition (SCADA) hardware and software to meet the current industry standard and to address cyber security concerns.		• PLC upgrade was completed at Comm. Ave West Pump Station; Comm. Ave East has been upgraded under the recent redundancy project. A new PLC Panel was designed, purchased and installed at BWTF, with the system programmed in-house. A design contract for the JJCWTP SCADA Improvement was finalized in January 2019 and construction began in September 2021 with substantial completion anticipated in September 2025. PLC upgrades for BOS019 and Framingham PS are have been initiated but will be postponed until the work at JJCWTP is completed due to staffing constraints. Additional PLC replacements are being performed as part of facility rehabilitation projects (Nut Island Headworks, Wachusett Dam Lower Gate House, Braintree-Weymouth, and Water Tank Improvements, etc.), and will be developed in future PLC upgrade projects for water and wastewater facilities.

		• Standards templates and guidelines were developed for MWRA Human Machine Interface (HMI) Graphics. New graphics will be implemented to improve operator situational awareness through ongoing design and construction projects and MWRA staff implementation. • Continued to improve the SCADA network architecture to enhance security. • Established internal committees to review MWRA's physical resilience, and identify deficiencies and subsequently safety systems to provide multiple levels of protection from cyber attacks on MWRA's assets.
Goal #10: Prepare for catastrophic events that could affect the water and wastewater delivery systems.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to improve and incorporate redundancy and operational flexibility within the water system to ensure uninterrupted service.	→	• Northern Intermediate High, Sections 89/29 Replacement was awarded in June 2021 with an NTP issued in August 2021 and an anticipated construction completion date of August 2025. • Sections 23, 24, and 47 Rehabilitation Construction Contract 6392 NTP was issued in November 2021 with an anticipated substantial completion date in May 2024. When constructed, it will provide redundancy to Boston and Watertown. • Intermediate High Improvements Design Contract 6955 was awarded January 2019 and will, when complete (expected in CY 2026), interconnect two Intermediate High Service Areas to provide redundancy and operational flexibility in the event of pipe failures.
B. Design and implement projects including those that eliminate or mitigate single points of failure within MWRA's water transmission and distribution.		• Design Contract 6539 for the replacement of WASM3 was awarded in 2013 and amended in 2018 for rehabilitation only. Construction contract #6544, for sections W11, W12, W16/51 in Medford, Somerville, and Arlington was approved by the Board at the September 2020 Board meeting. Work

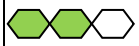
	→	is expected to be completed by August 2024, however, construction is currently progressing ahead of schedule. • CP1 Construction Contract 6544 NTP was issued in October 2020 and includes rehabilitation of approximately 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford. Construction achieved substantial completion in May 2023, more than one year ahead of schedule. CP2 Construction Contract 6543 is currently in design with construction scheduled to start in 2024. • Low Service Pressure Reducing Valve Improvements Construction Contract 7563 was awarded May 2021 and will provide additional operational flexibility to provide water service during emergencies. A construction NTP was issued in July 2021 with substantial completion anticipated in November 2023. • Improvements to the top of shafts are being implemented to provide strengthening of pipes directly connected to the tunnel system, waterproofing of underground vaults and replacement of nuts on valve connections. Performing interim improvements at the top of shafts consists of three Construction Packages (CP). CP1 - Top of Shafts 6, 8 and 9A (construction achieved substantial completion in April 2022); CP2 - Top of Shafts 5 (construction to begin in 2024); and CP3 - Top of Shafts 7, 7B, 7C and 7D (in design). • Waltham Water Pipeline Design, Technical Allowance Contract 7692 Task Order 3, includes a new water main extension to provide redundancy for the Lexington Street Pump Station. Construction Contract 7457 had an NTP in July 2022 with an anticipated substantial completion date in 2025.
C. Continue to train staff on various potential emergency scenarios and participate in broader		• Internal trainings and exercises included the following: site characterization, reservoir spill response, Deer Island emergency

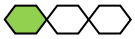
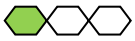
training exercises including with the Massachusetts Emergency Management Agency (MEMA).	→	response team drills, boom deployment, terrestrial spills, severe weather response, mobile disinfection, communications, and MWRA has also conducted community Emergency Response Plan training and coliform sampler training to support our service communities. A number of community coordination/training sessions were held relating to work on Section 89. • All MWRA staff continued training in cybersecurity awareness; and IT and OT staff continued training in advanced technical cyber security topics. • Western Operations staff provided training on reservoirs flood control to a large number of Western and Metro Operations staff for succession planning.
D. Work with Departments throughout MWRA to continue to implement a comprehensive security and emergency preparedness program including an analysis of lessons learned (ongoing) during the COVID-19-State of Emergency.	→	• Lessons learned during the COVID-19 State of Emergency was compiled into a preliminary "after-action" report on MWRA's response and recovery efforts to COVID-19. Staff continued to work on a more comprehensive report in FY23 which will also include recommended corrective actions to address goals and areas of need. • Several facility Emergency Action Plans were updated to include implementation of flood protection measures and a comprehensive update to all plans commenced. • Dams Emergency Action Plans are reviewed and updated annually. • Staff continue to upgrade and expand the MWRA security system. Components and cameras were added and /or replaced. • The MWRA has invested in an enterprise-class Video Management System that is integrated with the access-control and intrusion detection system to drastically improve responsiveness to critical alarms in the water distribution infrastructure in both staffed and remote locations.

		• Our efforts to improve our technology and security program have greatly improved our relationships between Security and Emergency response agencies across the Commonwealth of Massachusetts. • Continued providing information to the state auditor's office on MWRA's compliance with the requirements of AWIA, particularly those related to physical security, use of treatment chemicals, and security training. • The MWRA utilizes extensive liaison contacts within the Intelligence Community, Law Enforcement Organizations and the Private Sector in an effort to identify present and future potential threats to its employees and assets.
E. Develop and implement an Information Security Plan (ISP) to increase the resiliency and sustainability of the MWRA's data security practices.		• MWRA's ISP includes both approved and drafted cybersecurity policies, standards, and procedures. These drafts continue to be revised to correspond with the latest version of the NIST Cyber Security Framework and to be integrated into both MWRA Information Technology ("IT" – *i.e.* MIS) and Operational Technology ("OT" -- *i.e.* SCADA, PICS, I&C, and Physical Security) areas. Approved policies are reviewed on an annual basis. • Staff continue to apply current cyber security standards, controls, and best practices when appropriate to MWRA computer systems and network.

F. Redesign Cyber Security Network perimeter defense in-depth strategy to mitigate the new and evolving threats by taking advantage of next generation technologies.		• MWRA initiated a cybersecurity planning effort that will encompass the next 5 years and will inform the scope of the next Managed Security Services contract. • MWRA staff continue remediation of identified vulnerabilities from the risk and resiliency assessment of key IT network components required by the America's Water Infrastructure Improvement Act (AWIA). • Staff continue to update the internal cyber security incident response plan.
G. Develop and implement an updated Physical Security Plan including Crime Prevention Through Design (CPTED) to decrease vulnerabilities and increase capacities so that threats are reduced, thereby reducing risk.		• The MWRA Physical Security Policy, which incorporated CPTED components, was approved. Additionally, drafts of other Physical Security Policies, programs and plans are being finalized in an effort to enhance MWRA's physical security. All Physical and Cybersecurity policies are reviewed annually.

H. Assess current communication technology and implement communication redundancies where needed within the security network.		• Staff continue to upgrade and expand the MWRA security system. The security team identifies perceived areas of exposure to the MWRA's critical water distribution infrastructure and plan ways of executing improvements and advancements to our existing system. The MWRA is currently using some of the highest rated cameras in the industry that are able to withstand the environmental and communication challenges facing MWRA facilities. Our network is limited by strict security protocols and is not internet facing. The security program includes standard operating procedures that are updated annually and specifically include daily tests of both our alarm and video system for response time, clarity and quality of video and alarm response. • The MWRA is working with its telecommunications provider to upgrade traditional telephone lines to fiber optic cables capable of transmitting alarm and CCTV camera images at faster speeds with better reliability and resolution. • As cameras age in our system we assess new products and look for cameras that provide the best technology currently available. Eighteen cameras were replaced and/or added in FY23.

I. Complete the Preliminary Design and Environmental Impact Report for the Metropolitan Water Tunnel Program and initiate final design.		• In May 2020, a contract was awarded for Preliminary Design, Geotechnical Investigation and Environmental Impact Report. • In March 2021, an Environmental Notification Form (ENF) for the Metropolitan Water Tunnel Program was submitted to the Massachusetts Environmental Policy Act (MEPA) office to initiate the public environmental review process. • A certificate from the Secretary of Energy and Environmental Affairs on the ENF was received in May 2021. The Environmental Impact Report (EIR) was developed in FY22 and submitted in October 2022. • In June 2021, a geotechnical field investigation program was initiated to support the preliminary design of the proposed tunnels. A second phase geotechnical field investigation program was completed in the summer/fall of 2022. An additional phase was initiated in May 2023 and is on-going. • A certificate from the Secretary of Energy and Environmental Affairs on the draft EIR (DEIR) was received in December 2022 requiring a Supplemental DEIR (SDEIR) be filed with MEPA. The SDEIR was filed in July 2023 and MWRA received the Secretary's Certificate in September 2023. A Final EIR (FEIR) is anticipated to be filed by the end of 2023. • Property for construction of a connection shaft was purchased in Waltham in September 2021. • Preliminary design work is expected to be complete by January 2024. • Procurement for a final design consultant has begun and is expected to be awarded in late 2024.

		• Outreach to key communities, property owners, relevant state agencies, and key stakeholders has been initiated and is ongoing.
J. Update MWRA's earthquake preparedness to bring our facilities up to current standards, as they are rehabilitated. COMPLETED		• As part of the review under the AWIA, staff developed an assessment of each water facility's earthquake design standard and created an SOP to ensure earthquake stability is included in all rehabilitation projects. • MWRA dams have had seismic conditions and factors of safety assessed as part of Seepage and Stability Analyses.
K. Move forward Wastewater Facility Emergency Response Planning to identify potential measures to minimize disruptions from failures of facilities, including development of a comprehensive Emergency Response Plan for each facility.		• A team of staff have developed an approach to conduct these reviews, but implementation will be overseen by MWRA's new emergency planner. Staff are evaluating how this objective interacts with the newly proposed similar requirements in the NPDES permit for Deer Island. Elements of this effort related to climate change related future flooding and its impact on wastewater facilities have been include in the draft Deer Island NPDES permit.
L. Create and implement a predetermined schedule of review for facility risk assessments.		• The AWIA process will require a regular five-year cycle for review of all water facilities. Staff are working on a similar process for wastewater facilities. MWRA hired a new Manager for Emergency Planning who is participating in preparations for the next AWIA submission.
M. Participate in Lower Mystic Resiliency Planning as an abutter to the Lower Mystic.		• MWRA staff continue to participate in Resilient Mystic Collaborative meetings, specifically to provide facility insight, maps, and guidance regarding Lower Mystic climate resiliency planning. In FY23, MWRA partnered with members of the Resilient Mystic collaborative to form a taskforce focused on upcoming waterfront development.

IV. Finance and Management

Goal #11: Ensure Financial Sustainability, Integrity, and Transparency.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue the long-term strategic budgeting practice to ensure sustainable and predictable sewer and water assessments to our member communities.	→	• Community Assessments increased by 2.85% for FY23, a reduction from the proposed 3.4 percent due to revised budgetary estimates and assumptions. Assessments are projected to increase no more than 3.4 percent annually through FY2027. Assessments for the Water and Sewer utilities continue to be "smoothed" reducing the volatility of year-to-year assessment changes thereby improving the sustainability and predictability for member communities.
B. Continue to implement MWRA's approach to rate increases while accounting for the pandemic's effects on its communities' revenue. COMPLETED	⬡⬡⬡	• MWRA offered to allow communities to restructure their Community Loan repayments, due in FY20-FY22, to mitigate the impact of COVID-19. Five communities took advantage of the offer and restructured their loans.
C. Manage debt and investment portfolios to maximize savings/returns in compliance with all applicable rules and regulations.	→	• Staff again took advantage of the low interest rate environment and sold $234.3 million of bonds comprised of $100.3 million in refunding bonds and $134.0 million in tax-exempt new money bonds. The refunding resulted in $12.9 million in present value debt service savings applied between FY2023 and FY2037. MWRA accepted $120.1 million of tendered bonds. The tender process is not often used but was advantageous due to market conditions. The All-In True Interest Cost for the transaction was 3.35 percent,with an average life of 10.4 years. • Staff continue to explore opportunities for refunding for interest rate savings.
D. Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.	→	• Staff continue to seek prudent diversification.
E. Maintain a system of internal controls to best protect the organization's resources.	→	• Staff continue to review and monitor key controls and limit physical and electronic access to assets.

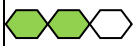
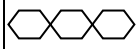
F. Continue to employ budget and expense control practices to manage expenses.	→	• Continued to drive cost improvement and containment measures throughout FY23 that allowed MWRA to set a 2.89 percent rate of increase to the combined Rate Revenue Requirement and a 2.4 percent for FY24.
G. Identify and pursue optimization in all aspects of MWRA financial operations.		• Continued the effort of reducing the use of paper by publishing documents on-line. Staff are actively evaluating the electronic financial system's existing and possible additional software modules to optimize operations. • MWRA again received the Distinguished Budget Presentation Award from the Government Finance Officers Association for FY23 and plan to apply again for FY24. MWRA has submitted the paperwork for the Government Finance Officers Association Certificate for Achievement in Financial Reporting for FY22. Additionally, MWRA is preparing the paperwork for FY23. • The Budget Department continues to explore a software solution to replace existing obsolete software. • The Accounts Payable and Payroll units of the Controllers department continue to record transactional work with electronic documents, having removed all paper from the processing. By employing an additional monitor to assist in data entry, paper was replaced by electronic files archived securely on the network.
H. Continue to conduct strategic energy procurements.	→	• Continued to procure electricity based on competitive bid process and review of other procurement options including purchasing collaboratives and state programs.
I. Continue to fund the pension fund at the annual required contribution level and to develop strategies to address the growing Other Post- Employment Benefits (OPEB).	→	• The pension fund's funding ratio slipped slightly from 89.05 percent to 88.36 percent in the Actuarial Valuation Study as of 1/1/2023. The cost of living adjustment (COLA) was 5 percent. • The Retirement Board further increased the COLA calculation base from $17,000 to $18,000 adding some additional pressure on

		the annual Required Contribution. Staff will explore possible ways to minimize the amortization of the Unfunded Liability • The June 30, 2023 OPEB Trust balance (Net position) increased again to $72.4 million up from $63.9 million for the prior year reflecting a Plan net position of 61.46 percent up from 56.20 percent for the prior year. The annual funding practice has been and is projected to be half the annual determined contribution. Retiree health Insurance premiums are paid from the MWRA Current Expense Budget. This practice will be evaluated annually and may be changed according to overall budgetary conditions.
Goal #12: Promote Effective Business Operations and Resource Management.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Maintain and expand MWRA-wide recycling efforts. COMPLETED		• As of July 1, 2021, the MWRA implemented a single stream recycling program at the Chelsea Facility in conjunction with existing paper, cardboard, and metal recycling efforts.
B. Pursue, and administer any Federal and or State infrastructure, stimulus or COVID-19 related grants. COMPLETED		• Staff are actively monitoring the various COVID-19 related stimulus and/or grants that might be available. Staff have applied for reimbursement from the Federal Emergency Management Agency for costs incurred during the disaster. MWRA will be receiving American Rescue Plan Act (ARPA) funding from the Massachusetts Clean Water Trust as part of its next borrowing. • MWRA received $247,100 from the Commonwealth for the FY22 costs associated with the Biobot Sampling. The FY21 and FY22 payments from the Commonwealth totaling $689,765 fully reimbursed MWRA for all of the Biobot costs.
C. Evaluate office footprint and needs in light of pandemic lessons learned. Make changes where practical. COMPLETED		• At the June 22, 2022 Board of Directors' meeting, the Board approved a contract with a general contractor to upgrade the office space at both Deer Island and Chelsea to accommodate hybrid work spaces, including updates to office spaces, the electrical

		system and MIS services to accommodate staff previously working in the Charlestown Navy Yard (CNY). The office upgrade work is substantially complete. CNY staff have been relocated to Deer Island or Chelsea and CNY was vacated and left "broom clean" prior to the May 2023 lease expiration.
Goal #13: Leverage Information Technology to Improve Organizational Effectiveness.		
Objective	**FY2023**	**Highlights/Progress Updates**
A. Deliver secure Information Technology (IT) services and solutions efficiently and effectively.	→	• Completed migration to Crowdstrike for endpoint protection and response with managed services for all workstations and mobile devices. • Completed engagement with design consultant for the evaluation and gap analysis used to assist in the development of the scope for the next Managed Security Services Contract. Scope of Work for RFQ/P underway. • Implemented Single Sign-on solution and migrated five applications to it. • Additional highlights under specific initiatives below.
B. Provide Information Technology solutions to streamline work processes while ensuring the security and integrity of MWRA data by leveraging the use of existing or emerging technologies.	→	• Expanded use of secure remote access technologies in support of teleworkers in response to the COVID-19 pandemic. These technologies remain in place for teleworking staff post-pandemic and are continuously evaluated. • Expanded use of WebEx application for collaboration and virtual meetings in support of teleworking. Designed and built new Board Room on DITP and implemented similar technology in all conference rooms. • Expanded wireless network within Deer Island Treatment Plant, Southborough and Carroll Water Treatment Plant.

		• MWRA.com website re-design: Kick-off held and mockups received and approved for a new mwra.com website. • Records Management: Continued scanning initiative to digitize active records and potentially records to be archived in support of the workplace consolidation.
C. Obtain feedback from users on satisfaction levels and desired new services and implement changes accordingly.		• Continued monthly meeting with ENQUAL and Lab Services.
D. Maintain current technology hardware, software, and network infrastructure.		• Deployed over 19,000 updates to existing hardware and software throughout the year to ensure currency and mitigate vulnerabilities. • Upgraded Vmware infrastructure supporting 450 virtual servers. • Upgraded circuit bandwidth at five locations in support of the new phone system rollout. • Upgrade 75 percent of all SQL and Oracle databases was completed.
E. Enhance Information Technology workforce capabilities through new certification and license requirements.		• Training for the IT Department staff was online/virtual during FY23. Fifty-two online IT classes were taken by 20 staff. • MIS delivered four courses attended by 104 staff.
F. Implement an Application Improvement Program that will continue MWRA's efforts to update and enhance the multitude of applications used in the MWRA to improve efficiencies of business processes, mobile devices, and effectiveness of staff.		The following is a list of applications that were either updated or had functionality changes throughout FY23: o SAP Business Objects**:** The system supports reporting functions for MAXIMO. Following a successful proof of concept migrating Discoverer reports, the remaining Discoverer reports are being migrated to SAP Business Objects Webi. 75 percent of the Discoverer reports have been migrated to SAP Business Objects. o Community OMMS**:** MWRA started upgrade of existing community OMMS application. Two towns were selected

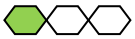
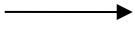
		for pilot and have been submitted for User Acceptance Testing based on initial scope. Scope expanded to includes GIS integration. o Harbor and Outfall Monitoring Loading (HOML): Used by contracted labs to submit sample data. o Pretreatment Information Management System (PIMS): Used in the management of the pretreatment program. Implementation of dental fees and first round of invoicing was processed, WebSMR Cross-Media Electronic Reporting Rule (CROMERR) implementation completed along with system updates. Phase 1 of PIMS infrastructure upgrades completed.
G. Implement an archive and purge system that will provide an automated and integrated solution for archiving electronic content that will allow the Authority to intelligently store, manage and discover e-mail and all critical business information sources, while providing easy and intuitive access for end users.		• Began implementation of an archiving solution as an add-on to existing backup technology. Personal folders ingested into PST archiving solutions.
H. Execute a Technology Infrastructure Improvement Program that will assess and implement consolidated and optimized versions of MWRA's core IT infrastructure elements and improve data management practices.		• Implemented new Phone System. Unified Communications in the form of calling, instant messaging, virtual meetings and presence was consolidated into one application. • Exploring new technologies to provide redundancy, resiliency and network traffic optimizations. Began the implementation of SD-WAN technology. SD-WAN technology allows MWRA to leverage any combination of information transport services to securely connect users to applications.
I. Upgrade and enhance MWRA's Enterprise Resource Planning system leveraging out-of-the-box functionality		• Learning Management System (LMS): Completed implementation of a new Infor/Lawson product for managing all training including on-line training developed

while striving to eliminate customizations and adoption of technology standards.		in house and from third parties including LinkedIn Learning. Installation and configuration is underway. • Legacy Contract Management System Contracts*:* All Open contracts were migrated to Infor Lawson. Reporting capabilities have been developed for closed contracts that were not be migrated to Infor Lawson. • Lawson MAXIMO Integration**:** Project underway to enhance existing interfaces to improve data flow between Lawson and MAXIMO systems.
J. Implement Enterprise Content Management for e-Construction, e-Engineering and Records Management.		• The Enterprise Content Management System will initially support selected Construction and Engineering processes, replace the legacy document/records management system and provide the infrastructure for expansion and integrations with other systems. Phase 1 of this project completed with the rollout of Records Management.
K. Implement a unified communication (UC) collaboration platform to improve business processes, team communication and collaboration and distributed work force.		• Implementation and configuration of new UC VOIP phone system began. The UC system will integrate with WebEx virtual meetings and provide call capabilities to teleworking staff. UC deployed to Chelsea, Southboro, CWTP, Nut Island, Clinton and DITP impacted by the construction. • Cabling and circuit upgrades started in support of new UC system. • Implemented digital message boards at four facilities to provide unified messaging and improved communications to all staff.
L. Move towards the use of AI and Machine Learning technology to address computational and process problems.		• No progress on this objective in FY23.
M. COVID-19 Employee Reporting Systems COMPLETED		• COVID-19 Self Certification Applications: Two applications were implemented to allow staff to self-certify they do not have COVID-19 symptoms prior to coming to work. One is an in-house developed web application with COVID-19 screening

		questions and the other is a telephone call in number. Both systems write to the same database for Human Resources and management reporting. • Employee Availability Tracking Application: Tested, updated and activated an existing in-house developed employee availability application designed for managing staff availability in emergencies such as pandemic outbreaks. • Completed custom application developed for employee vaccination attestation.

V. Diversity, Equity, Inclusion & Workforce Development

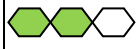
Goal #14: Foster and Sustain an Excellent Workforce **Objective**	**FY2023**	**Highlights/ Progress Updates**
A. Prioritize Succession Planning in anticipation of critical retirements over the next five years.	→	• Continue to identify succession planning initiatives including training programs, leadership programs, career path development, and expedited replacement hiring processes in advance of critical retirements. • The comprehensive exit procedure developed in FY19 for use when employees leave the MWRA, documenting knowledge and information on projects, contacts, and location of files, continued to be implemented and updated. • Staff negotiated a number of recruitment and retention programs with affected unions relative to certain critical positions, including class recruitment rates, development of entry-level positions, and employee referral fees.
B. Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce.	→	• Wastewater and Water license prep courses as well as collection system certification classes provided at least twice per year on a virtual platform, or at approved vendor locations. Additional classes were brought to Deer Island for Water Distribution exam prep and Wastewater exam prep. • Employees may be sent to approved vendor locations throughout the year for prep training to obtain Water Distribution or Treatment licenses. Virtual, in-person, and hybrid classes are regularly offered to employees to meet continuing education requirements for license renewals and required hours. • Training staff worked to redesign all in-house training to a virtual format in response to COVID-19. Post pandemic training remains a combination of on-line and in-person training.

C. Continue MWRA's in-house job shadowing, career development training programs and explore a pilot program for job rotation of certain titles.		• Continued the on-the-job training programs on an as-needed basis. DITP continued with its M&O shadowing program. This has been an on-going program for several years. • Continued to offer supervisory development programs. • Implemented a formal MWRA Mentoring program with Core Consulting through NACWA.
D. Continue to improve MWRA's teleworking capabilities and productivity incorporating lessons learned during the COVID-19 pandemic.		• Staff negotiated a new, more permanent Telework Policy with the unions which includes a new performance evaluation process to ensure productivity. Staff have modified the Policy as needed.
E. Institute programs with a focus on professional and leadership development.		• Due to COVID-19, the Leadership Development Program for non-union managers through Bentley University was put on hold in FY21. • Several employees participated in an Emerging Leaders training offered through NACWA.
F. Expand intern initiative.		• Continued the summer intern program in 2023. As of June 2023 we had 28 interns.
G. Continue to ensure compliance with new state and federal regulations and labor.		• Staff reviewed all non-union and bargaining unit positions and the incumbents as required by the Massachusetts Equal Pay Act. • The Massachusetts paid family and medical leave benefits began in 2021. Staff process claims, as needed, and, where applicable, run such leave concurrent with FMLA leave benefits. MWRA continued to meet ongoing notice requirements relative to maximum benefit allowances and employee contribution rates. • Staff reviewed all reasonable accommodation requests consistent with post-COVID changes in federal and state law.

Goal #15: Foster a diverse and inclusive workplace.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Cultivate a safe work environment for all employees that is free from harassment and encourages respect.	→	• Staff are working on a procurement for Respect in the Workplace training to be delivered in early FY24.
B. Provide training to all employees on diversity, inclusion, equity, respect, and harassment prevention in the workplace.	→	• Along with the bi-annual harassment prevention training, we have added off-year training on unconscious bias and respect in the workplace.

C. Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities, and veterans.	→	• A variety of job fairs, such as Veteran Career Fair Recruit Military and College Job Fairs, were attended by staff, including Mass Maritime, Merrimack College, and Benjamin Franklin Institute of Technology. • In addition to increasing access to diverse pools of candidates, staff continue to promote MWRA as an organization with excellent benefits and employee relations through social media. LinkedIn has been incorporated to expand networking efforts for FY23 along with other professional associations and websites. • Staff continue to conduct outreach and foster networking partnerships with Mass Hire Central Mass, City of Cambridge Workforce Development Program, X-Cel Education, Community Teamwork in Lowell and Boston Veteran Collaborative. • Continued the use of The Local Job Network, a web-based recruiting site where entry, mid-level and senior level positions are posted to expand outreach to diverse protected classes. Continued utilizing Handshake to post job openings on college and professional association job boards. • Continued to add to the existing 258 recruitment sources for minorities, women, individuals with disabilities, and veterans in addition to its existing 53 recruitment sources identified in the Affirmative Action Plan. • Hired 96 new employees including 27 (28 percent) females and 22 (23 percent) minorities. • Promoted 111 employees including 27 (24 percent) females and 30 (27 percent) minorities. • Staff continue to engage with Vocational Technical Schools, and have expanded their

		efforts to promote co-operative education opportunities and careers at the MWRA through partnerships with Quincy High School and Boston Green Academy.
D. Develop leadership skills at every level to increase opportunities for staff advancement and ownership.	→	• Implemented a formal MWRA Mentoring program with Core Consulting through NACWA.
E. Pursue an inclusive leadership approach that considers innovation and diverse points of view to respond to the evolving needs of the Authority.	→	• DEI workgroup was expanded to include more staff. • Established a speaker series to highlight important initiatives and programs (e.g., environmental justice). • Working on an employee survey on engagement and inclusion.
F. Create and maintain a work group whose mission is to improve diversity, inclusion, equity and respect in the workplace. Implement workgroup recommendations with measurable goals.	→	• The Diversity, Equity, and Inclusion (DEI) workgroup was established in FY21. The purpose of the DEI workgroup is to ensure that the MWRA creates an inclusive environment that promotes equity in the workplace. This leads to a culture that leverages diversity to its fullest potential so that every employee can have a sense of belonging regardless of his or her background. • The DEI workgroup is developing several sub-working groups to further several initiatives and to enhance employee engagement. • The DEI workgroup progress in FY23 toward achieving our goals include the following: o Staff continue to celebrate and embrace the diversity of our staff and regularly post widely recognized awareness month(s)/day(s) for a specific group, culture, or cause on the DEI pipeline page. The purpose of these awareness months and day(s) is to raise awareness and understanding for the group, culture, or cause.

		○ In collaboration with the Environmental Justice task force, the DEI working group has created subcommittees to focus on efforts across the Authority. We have formed subcommittees to support heritage month recognitions, as well as a subcommittee to support employer engagement. ○ Staff celebrated LGBTQ+ pride month by hosting the 2nd annual voluntary Pride walk and luncheon. This year's event expanded to celebrate Caribbean celebration month. • The DEI workgroup is preparing to launch a follow-up survey to the original staff survey distributed in 2021 to collect feedback regarding Professional Development including mentoring, educational training, team-building, etc.
G. Implement an Environmental Justice Strategy (EJ) which outlines MWRA's actions and visions for promoting EJ considerations across MWRAs programs, policies and activities.		• Deliver services equitably across a diverse service area. • The Executive Office of Energy & Environmental Affairs (EEA) 2017 Environmental Justice Policy (EJ) has directed all EEA agencies to develop their own EJ Strategies. The MWRA is committed to this mission articulated in Article 97 of the Massachusetts Constitution for all residents of the Commonwealth and has joined the EEA's Environmental Justice (EJ) Task Force. Tomeka Cribb, Associate Special Assistant, Affirmative Action and Compliance serves as the EJ point of contact representing MWRA. • MWRA responded to comments on a draft MWRA EJ Strategy submitted to EEA in FY23. MWRA's EJ Strategy was subsequently finalized in August 2023. • Progress on the following objectives were made in FY23:

		o Established the MWRA lunchtime speaker series, with guest speakers discussing a variety of industry topics. Dr. Mariana Matus, CEO and Cofounder of Biobot Analytics, Green Roots, and Working for Environmental Justice and Improved Quality of life have been among the speakers. o Continued to Promote Public Awareness of Sewage Pollution of any combined sewer overflows (CSOs) or certain sanitary sewer overflows (SSOs) MWRA is using Google Translate to translate all notifications into 14 identified EJ languages, and is issuing notices through email and text via Everbridge. o To Promote Public Awareness of Sewage Pollution of any combined sewer overflows (CSOs) MWRA created signs for public access area that include warnings about health risks in 11 identified EJ languages. o The MWRA continues to update the public-facing EJ web page. There are a number of resources available on this new page, including links to other MWRA web pages, such as summaries of construction projects, job postings, CSO and SSO notifications.
Goal #16: Ensure a safe and healthful work place for all employees, contractors and visitors free of recognized hazards		
Objective	FY2023	Highlights/ Progress Updates
A. Continue to identify hazards and assess associated risks. Provide training on programs and procedures to prevent or control incidents and ensure employee safety.	→	• Continued to develop the Occupational Health and Safety Department including program and policy review and development, facility audits and by participating in training classes. Expanding use of safety software to aid in reducing workplace injuries and preparing

		Occupational Safety and Health Administration (OSHA) regulatory reports. • Continued to develop ad identify safety training for employees. Utilize leading and lagging safety metrics to identify areas of concern to address through training or hazard mitigation strategies. • Continued to improve safety culture through communication and leading by example. • Continued to assess the risks associated with tasks and provide the appropriate training, procedures and equipment to eliminate the risks. Worked with training department to secure safety training that will address identified safety concerns.
B. Continue to review and implement best safety practices during the COVID-19 pandemic to protect the safety of all employees and ensure continuity of critical services. COMPLETED		• Discontinued many COVID protocols consistent with the end of the COVID emergency declaration. Continue to follow guidance on isolation and quarantine. Continue to stock COVID tests and masks for use if necessary
C. Maintain compliance with Massachusetts Occupational Safety and Health for State Workers regulation (454 CMR 25.00) by meeting the requirements set forth under the Occupational Safety and Health Act of 1970.		• Safety and training staff continue certificate training in safety disciplines, which improves the overall safety knowledge of the Authority as it relates to OSHA regulations. • Expanded the use of the Safety Reports application to include safety observations and job safety analysis. This expansion now allows in addition to performing formal OSHA inspections of facilities, to conduct walk-through observations on a frequent basis to identify hazards and track them efficiently. Staff can create reports of findings and provide them to stakeholders. • Filled one Safety position to maintain safety support to all areas of the Authority.

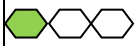
D. Maintain records concerning occupational injuries, illnesses, deaths, and exposure to toxic materials in compliance with regulations.	→	• All injuries are reported to the Safety Department and reviewed per OSHA recordkeeping regulations to determine if the injury is recorded. Injuries that meet the recordkeeping requirements are recorded on the OSHA 300 and 300A log. Injured employees complete the OSHA 301 form at the time of injury.

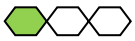
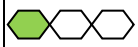
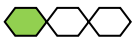
VI. Environmental Sustainability

Goal #17: Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Assist the Commonwealth in meeting its Greenhouse Reductions Goals set forth in the Global Warming Solutions Act.	→	• Through continued implementation of energy efficiency projects, use of renewable energy generation, and low emission technologies, such as electric vehicles and battery powered landscaping equipment, MWRA continues to reduce its greenhouse gas (GHG) emissions. From 2006 through 2022, MWRA has reduced its GHG emissions by about 41 percent Staff is currently working on the update to the GHG report through 2022. MWRA joined ICLEI (Local Governments for Sustainability) and now utilize their GHG inventory platform to improve our tracking and projection of emissions. • Staff continue to follow Governor Baker's Executive Order 594, "Decarbonizing and Minimizing Environmental Impacts of State Government" signed Earth Day 2021 – which provides goals and guidelines to reduce fossil fuel use. MWRA has already met the 2025 goals of 33 percent reductions in GHG emissions.
B. Continue to conduct energy audits at all facilities as needed.	→	• Staff are working with utilities to identify and audit facilities for replacement of delivered fuel heating systems with heat pumps. • Conducted an energy audit at Clinton in FY20 that resulted in a series of recommendations for the operations building. Work began on planning for influent pumping upgrade and adding variable frequency drives (VFDs) to the screw pumps at Clinton. This work is currently underway and is expected to be completed in FY24. • A contract is currently under development by Deer Island Electrical Staff for the replacement of exterior and interior building light fixtures.

C. Optimize processes to save energy.	→	• Work continues on identifying processes that can be optimized to save energy.
D. Continue to incorporate cost efficient energy efficiency, non-fossil fuel heating, electric vehicle (EV) charging capabilities, and renewable energy projects into new construction, rehabilitation projects, and equipment replacement.	→	• The rehabilitation of the odor control and HVAC at Nut Island which contains several energy efficient components, began construction in February 2020 and is scheduled to be completed in September 2023. • Hayes Pumping Station rehabilitation project contains several energy efficiency elements including HVAC and pump upgrades as well as the installation of a heat pump to reduce the facilities use of diesel fuel for heating. Rehab design (7162) is nearing completion with construction (7357) expected to begin in spring 2024. • Braintree-Weymouth Pump Station improvements Design Contract is complete with a construction NTP issued in September 2022. This project includes several energy efficiency components including jockey pumps for increased pumping efficiency, ventilation setbacks, and LED lighting. Construction expected to be completed in late CY2024.
E. Continue to invest in new stand-alone renewable energy projects at MWRA facilities.	→	• Staff are currently working on repackaging of a previous bid that was not executed for a 1-2 MW solar canopy with energy storage at Deer Island. Construction is expected to begin in FY25. • Staff are also working through the approval process for solar arrays over underground water storage tanks. Preliminary approvals have been given by MassDEP. If allowed, the work is expected to begin in FY25.
F. Continue to maximize revenue from generation assets including additional Demand Response opportunities.	→	• FOD hydro assets were in operation between 92 and 100 percent of the time, with the exception of Loring Road, which was in operation 83 percent of the time due to maintenance and operational issues over a two month span. Deer Island wind turbine experienced a significant failure and the other turbine was taken out of service for

		evaluation and repair. Charlestown wind maintained its normal operations. • Deer Island and the Carroll Water Treatment Plant used backup generators in FY23 in order to: Participate in Independent Systems Operator – New England (ISO-NE) and Eversource Demand Response programs, cutting load when dispatched, with Deer Island earning under $500,000 and Carroll earning approximately $53,000 in incentives; and, to reduce load during ISO-NE system – side one-hour peak to avoid installed capacity charges of over $1 million per year. As of the summer of 2023, neither Carroll nor DITP can use diesel generators to participate in the Eversource Connected Solutions Program as fossil-fueled generation is no longer eligible. However, DITP has deferred Cryo operation to curtail 2 MW of power demand during these events • Staff applied for and received grant funding from the Mass. Clean Energy Center for an assessment of the hydro turbines at Deer Island project. The feasibility study, which will look at replacing or refurbishing the existing two 1.1 MW hydro turbine to optimize their generation, will begin in late FY24.
G. Take full advantage of utility energy efficiency rebate opportunities.	→	• Staff are working with National Grid and Eversource to update the existing Memorandum of Understandings (MOUs). The MOUs are non-binding, but commit MWRA to continue to implement energy efficiency projects, while obtaining a higher incentive amount from the utilities. For example, replacement of three single-speed 50-HP water booster pumps with energy-efficient variable speed pumps at DITP resulted in qualifying for $70,000 in Eversource incentives at the higher than typical rate of $0.325/kWh. • Participating in an Eversource Demand Reduction project that utilizes battery storage technology to reduce electricity demand costs at Brattle Ct. Pumping Station

		and the Chelsea Admin. Building in which Eversource provided the batteries at no cost to the MWRA. Batteries began operating in February/March of CY21. Demand savings from the batteries in FY23 totaled $17,367. The batteries were also enrolled in the Eversource Targeted Demand Dispatch program beginning in FY23 resulting in direct payments from Eversource for discharging the batteries at peak load times, totaling approximately $16,100. • Staff continue to access any available rebates from utilities pertaining to installation and utilization of more efficient equipment.
H. Incorporate employee education on energy efficiency in MWRA training outlets, e.g. tool box talks and HR training classes.		• Staff developed an outline of tool box talks for Metro and Western Ops staff. They had been scheduled for FY20, but they were postponed due to the pandemic. Staff are planning on outreach to staff on several energy topics in FY24.
I. Design new gas turbine combined heat and power equipment to take advantage of the higher power and thermal efficiencies of new equipment, maximizing the production of additional electric power for on-site use at Deer Island as well as cost savings while reducing maintenance spending on aging equipment.		• A project to evaluate DITP's comprehensive energy programs relative to Heat and Power was completed in FY21. Staff are developing specs for a design project for a new CHP system and expect to bid in FY24.
J. Evaluate and implement, where feasible, combined heat and power technology in plant operations to improve energy efficiency (e.g. pellet plant, Clinton). COMPLETE		• Staff completed Combined Heat and Power (CHP) evaluations for the Pellet Plant and Clinton Treatment Plants. Currently these technologies are not recommended for these facilities given unfavorable life cycle cost analyses.
K. Continue to develop the battery storage projects and work with the utility and its contractor to optimize demand savings. Evaluate opportunities for future battery storage projects.		• In FY21, staff discussed possible large scale battery projects at Deer Island and property on the Mystic River with vendors and state representatives and examined potential revenue streams. Staff applied for grant funding from the Lead by Example Program under Massachusetts Dept. of Energy Resources for the Deer Island project and

		have received preliminary approval pending an award of a contract. The procurement of professional services to evaluate the potential for a large-scale battery installation at Deer Island is currently in process.
L. Explore community solar opportunities that will stimulate large-scale remote solar installations and save money on MWRA's electric bills. COMPLETE		• Staff investigated the possibility of MWRA's participation in community solar and after much discussion determined that at this time, MWRA is best positioned to prioritize on developing its own solar arrays though may be interested in community solar or other opportunities to support large-scale renewable energy.
M. Expand our fleet of electric vehicles and charging stations.		• In FY23, staff purchased an additional five all-electric Chevy Bolts and 15 Level II and five level III chargers. There are now a total of 15 Bolts and three Volts in MWRA's fleet. • MWRA received approval for funding of $50,000 from MassDEP through its MassEVIP program, for EV charging equipment for the Chelsea facility. • Eversource also approved MWRA's Chelsea, Southborough and Deer Island applications to its EV Make Ready program that would provide MWRA with electric vehicle charging infrastructure. Work in Chelsea is expected to begin late in CY 2023 or early in CY2024.
N. Explore a new MWRA-wide building/plant information management system that includes a comprehensive energy management system.		• In FY21, staff began to examine artificial intelligence/ machine learning platforms to optimize plant operations and save energy at Deer Island. This effort is on-going.
O. Explore and implement building electrification to reduce MWRA's reliance on fuel oil for heating. NEW		• Staff have incorporated the requirement to review the feasibility of using heat pumps into the designs of new construction or facility rehabs. • MWRA was awarded a grant from MassDEP's Clean Energy Program to do a pilot installation of heat pumps at two pump stations, one water and one wastewater. This comes after an evaluation was done of these facilities to determine the feasibility of using heat pumps to replace fossil fuel boilers.

		• Audits of facilities using fuel oil or with old gas-fired boilers are also being conducted to determine the feasibility of installing heat pumps at these facilities.
Goal #18: Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to incorporate design modifications into facility renovations and maintenance activities to address sea level rise and storm surge.		• Continued to update flood elevations as the Federal Emergency Management Agency (FEMA) revised its projections. Now regularly including these design parameters in all renovation and new construction projects.
B. Plan and install flood protection barriers at water and wastewater sites which fall below expected elevations of flood waters under condition of a FEMA 100 year storm plus 2.5 feet to minimize damage and still provide service.		• Flood protection barriers have been installed at Chelsea Administration Building, Chelsea Maintenance Building, South Boston CSO, Squantum Pump Station, Quincy Pump Station, Braintree Weymouth Relief Pump Station and Chelsea Screen House. The update to flood protection at Hough's Neck Pump Station will be completed by the end of September 2023. Staff have developed SOPs and are in the process of performing installation drills. Flood protection procedures have been developed utilizing sand bags for the former pump station facility at Alford Street and for the Delauri Pump Station. • Flood protection for the MWRA/BWSC jointly owned Union Park CSO/Pump Station is in final planning stage. • MWRA utilized new data from the Massachusetts Coastal Flood Risk Model, to update expected flood levels for a 100-year storm in 2030, 2040, and 2050. We will incorporate the new levels, which closely align with the 100 year 2.5 ft of sea level rise standard, in future resiliency efforts. • Continued coordination with Boston on development of Moakley Park adaptation planning so that MWRA's CSO Tunnel vent structure and Columbus Park headworks are protected from sea level rise flooding.

		• Flood protection was incorporated into the rehabilitation of the Chelsea Headworks. Flood protection is being incorporated in the rehabilitation of the Columbus Park Headworks. As facility rehabilitation projects arise, flood protection will be included if the facility is located in an identified flood zone.
C. Work with State and regional organizations and academic institutions to identify how MWRA's existing long-term environmental data sets can be used to help assess and project impacts of climate change.		• Distinguishing climate change impacts from potential effects of MWRA's outfall in Massachusetts Bay, and how to best leverage the long-term environmental monitoring data set, is the subject of discussions internally and with the Outfall Monitoring Science Advisory Panel.
Goal #19: Advance reasonable water system expansion.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to provide assistance to communities seeking admission to the MWRA's water system or seeking emergency withdrawals.		• Provided guidance on the Water System Admission process to prospective communities and developments including: Hopkinton, the Former Naval Air Station, Lynnfield Center Water District, Natick, Walpole, Wayland, Wellesley, and Weymouth. • Completed three system expansion studies, one for the South Shore, one for the Ipswich River Basin Communities, and one for 21 Metro West communities. These studies were all completed in FY23.
B. Work with prospective communities to inform them of the benefits of admission.		• Work continues on this initiative through outreach to communities, watershed groups, and associations and through requests from consultants representing the communities.
C. Work with MWRA's Advisory Board on legislative initiatives to pursue funding for connection assistance for new communities connecting to the water system.		• In September 2022, the MWRA Board of Directors voted to approve a recommendation by the MWRA Advisory Board to waive the Entrance Fee. To be eligible for the Entrance Fee waiver, new communities seeking admission to MWRA must show that they have water quality issues, water quantity issues, or are unable to meet existing or future demands due to potential economic development opportunities. This waiver only applies to the

		first 20 mgd of water sold to new communities, and any community wishing to claim the waiver must be approved for admission to MWRA's water system by the MWRA Advisory Board and Board of Directors by the end of December 2027. • MWRA staff will continue to work with the MWRA Advisory Board to seek additional sources of funding to cover the infrastructure costs associated with connecting to MWRA's water system.
Goal #20: Continue to recognize the environmental, cultural, historical, and recreational importance of the watershed lands, the aqueduct system, and the unique location on Boston Harbor of the Deer Island Treatment Plant and Nut Island Headworks, to the citizens of the Commonwealth.		
Objective	**FY2023**	**Highlights/ Progress Updates**
A. Continue to work cooperatively with DCR and cities and towns to ensure that these lands are available for appropriate public access.	→	• Staff have participated in the DCR Land Acquisition Panel (LAP) offering guidance since 1995. The MWRA Board has had approval oversight of watershed land purchases under the CIP since FY07. Staff continue to be active in the LAP attending quarterly meetings and offering MWRA viewpoints on land purchases, preservation restrictions and disposition. *This update also supports Goal #1, assisting MWRA to maintain drinking water quality.* The Executive Director is chairing the Boston Harbor Islands Partnership, a federally sanctioned group that maintains stewardship responsibilities of the Harbor Island National Park.
B. Continue to work with cities and towns to implement the Public Access Initiative on the Wachusett, Weston, Sudbury, and Cochituate Aqueducts. This program creates a partnership between MWRA and communities that host each piece of infrastructure, granting access to applicant communities to use MWRA controlled	→	• The MWRA Aqueduct Trails Program is an innovative initiative that has opened up new recreational opportunities in communities across Metro West on appropriate MWRA aqueduct infrastructure. • Since 2011, MWRA staff have been working with aqueduct communities to provide technical assistance through the 8(m) permit process and have had great success opening access to these resources for the first time.

aqueduct right-of-ways of the Cochituate, Sudbury, Wachusett, and Weston Aqueducts, along with the lands surrounding the Weston and Norumbega distribution reservoirs.		• To date, MWRA staff have issued many Section 8 (m) Permits as part of the Aqueducts Trails Program authorizing approximately 30 miles of Aqueduct Trails. MWRA estimates that approximately 23 miles are currently open to the public. • MWRA staff have worked with a local historian to develop a web page on the history of the Metropolitan Water System, utilizing historic State archive reports and Digital Commonwealth photos. Website "beforetherwasadam.com" creator has won the 2023 New England Water Works Association "Distinguished Public Involvement Award" for this work.
C. Continue to provide public access to Boston Harbor at Deer and Nut Islands, while ensuring appropriate security for MWRA's operations.	→	• MWRA, state and local officials, and fishing advocates cut the ribbon on the new Deer Island Recreational Fishing Pier on June 24, 2021 for its official grand opening. The fishing pier was constructed by the Division of Marine Fisheries (DMF) and the MWRA. MWRA participates in an annual "Reel Fun Fishing Day" at the Pier.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: MWRA Greenhouse Gas Inventory for 2022

COMMITTEE: Administration, Finance and Audit

X INFORMATION
VOTE

Stephen Estes-Smargiassi, Director Planning & Sustainability
Malcolm Ragan, Environmental Planner
Michael O'Keefe, Senior Program Manager, Planning
Preparer/Title

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only.

DISCUSSION:

MWRA has a long standing and successful commitment to energy savings and decarbonization. This commitment was recently acknowledged with MWRA's selection for the Commonwealth's 2023 Leading by Example Award, which recognizes public entities that have implemented policies and programs resulting in significant and measurable environmental and energy benefits. In support of the Commonwealth's leadership and the establishment of net zero greenhouse gas (GHG) emissions targets in 2050, MWRA continues to take measures to mitigate GHG emissions across its operations. This staff summary provides an overview of MWRA's latest GHG emissions inventory update for 2022, detailing the substantial progress since 2006[1] and plans to improve efficiencies and reduce emissions. Since 2006, MWRA's net electricity usage has decreased by 15% and GHG emissions have dropped by 41%.

Over the past two decades, MWRA's commitment to innovative energy efficiency improvements, renewable energy development, and electrification yielded considerable reduction in GHG emissions. MWRA has worked to meet the goals of the Commonwealth's Clean Energy and Climate Plan, which commits the Commonwealth to net zero GHG emissions by 2050 with intermediate targets of 33% and 50% reductions by 2025 and 2030, respectively. With a 41% reduction in GHG emissions since 2006, MWRA has already met the 2025 target and is on track to meet the 2030 target. These efforts were launched and completed without compromising MWRA's core mission of providing reliable and high quality water and wastewater services as well as ensuring fiscal responsibility to our ratepayers to manage costs.

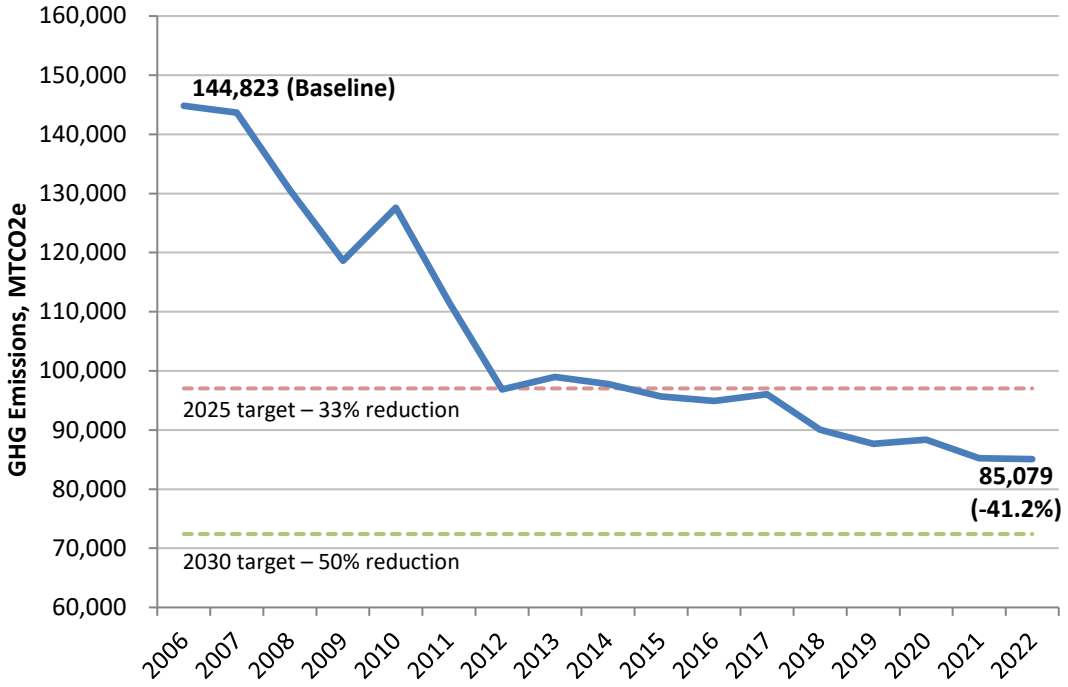
Highlights of MWRA's Greenhouse Gas Emissions Inventory Update for 2022[2] are described in the sections below.

[1] Since 2006 is the earliest year that MWRA has reliable data on GHG emissions, 2006 serves as the base year for emissions reductions.
[2] MWRA's first GHG Inventory was released in 2016 for the years 2006 – 2014 and the Board was briefed at the November 2016 meeting. The inventory has been updated several times since.

Greenhouse Gas Emissions Summary

MWRA started collecting data in 2006, and since that time, its GHG emissions[3] have dropped 41% – an overall decrease of 59,744 metric tons of carbon dioxide (CO_2) equivalent[4] ($MTCO_2e$), comparable to taking over 13,000 passenger vehicles off the road per year. A large majority of this reduction, roughly 84%, is from electricity savings, which was achieved through MWRA's focus on energy efficiency, leading to reduced electricity purchases, as well as a cleaner regional grid. Figure 1 shows interim emission reduction guidelines of 33% and 50% by 2025 and 2030, respectively. MWRA has met the 2025 target well ahead of schedule and expects to meet the 2030 target.

Figure 1: MWRA GHG Emissions, Metric Tons of CO_2 Equivalents (2006 – 2022)



When interpreting these reductions and steps for further mitigation, it is important to note that MWRA's energy demand is influenced by many factors, including precipitation, customer demand, and evolving regulatory requirements. This is the case for the wastewater system, which accounts for nearly 90% of MWRA's emissions due to energy intensive processes, such as pumping, odor control, and pure oxygen generation. Specifically, wet weather events increase the treatment plant flows due to increased inflow and infiltration and flow from the remaining combined sewers in some MWRA communities, leading to a strong correlation between MWRA's yearly electricity demand and the flows at the Deer Island Treatment Plant.

[3] MWRA emissions include "scope 1" (*i.e.*, direct emissions from onsite energy use and process emissions from MWRA operations) and "scope 2" (*i.e.*, indirect emissions associated with the consumption of energy at MWRA facilities, *i.e.*, emissions at utility plants from electricity generation).In addition, "scope 3" (*i.e.*, indirect emissions not included in scope 2 from facilities or operations not owned or controlled by MWRA) are discussed in the inventory, but not included in our total emissions, as directed by most reporting protocols.

[4] Carbon dioxide equivalent is a measure that allows the comparison of the emissions of other GHGs, such as methane and nitrous oxide, relative to one unit of CO_2.

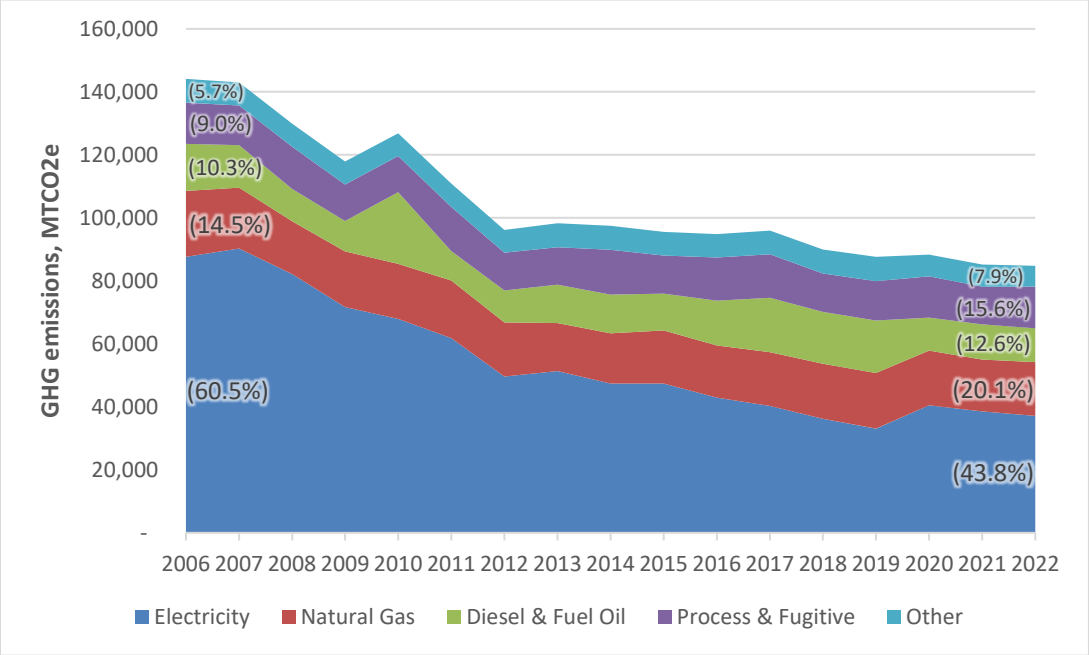
Regardless of MWRA's efforts, energy demand will always fluctuate annually based on the amount of precipitation in the service area.

Greenhouse Gas Emissions by Source

MWRA's emissions are generated from four main sources, as well as several other smaller contributors, which, as shown in Figure 2, have decreased at different rates since 2006. As of 2022, the breakdown is:

- Electricity, **43.8%**
- Natural gas (dryers at the biosolids processing plant, building space heating), **20.1%**
- Process and fugitive emissions (nitrous oxide and methane emissions at wastewater treatment plants, landfills, and the sludge pelletizing plant), **15.6%**
- Diesel and fuel oil (standby generators, process and building heating), **12.6%**
- Other (emissions from incomplete combustion of digester gas, vehicle fleet, refrigerants), **7.9%**

Figure 2: MWRA GHG Emission Sources, 2006-2022

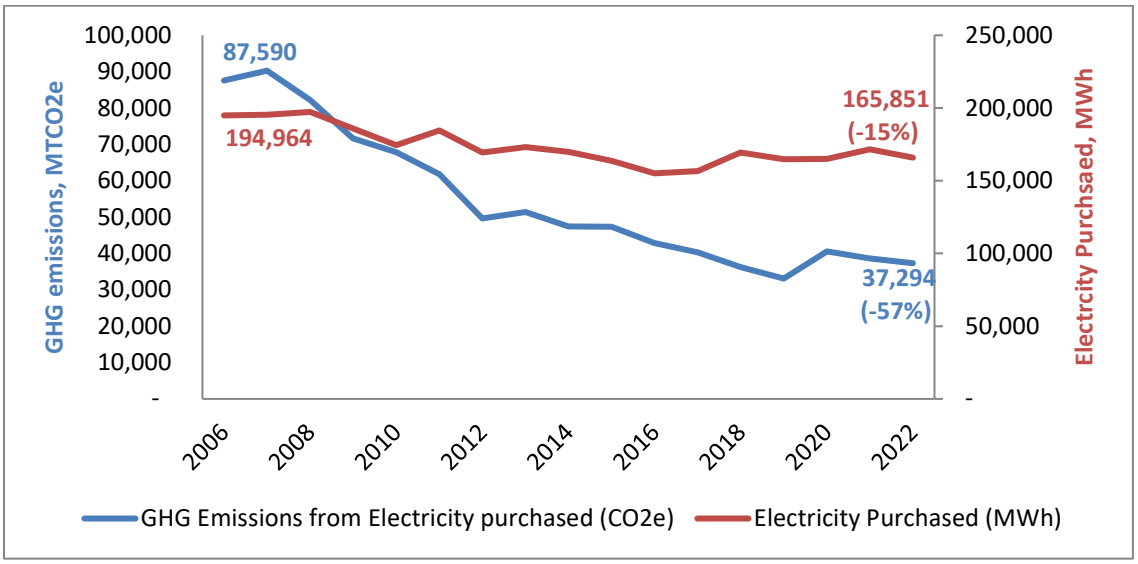


Electricity

Electricity purchases account for the largest portion of GHG emissions at nearly 44%. However, this is also where MWRA has made the most substantial reductions – total electricity purchases have reduced by 15% and emissions from electricity by 57%. While MWRA's energy efficiency and renewable energy efforts produced tangible results, their impact on emissions is amplified by the steady decrease in the state-wide electricity emission factor that reflects a regional shift away

from carbon emitting generation sources toward a greater proportion of renewables[5]. Figure 3 illustrates the effect of the greener regional grid on MWRA's electricity emissions.

Figure 3: MWRA Electricity Purchases and Resulting Emissions



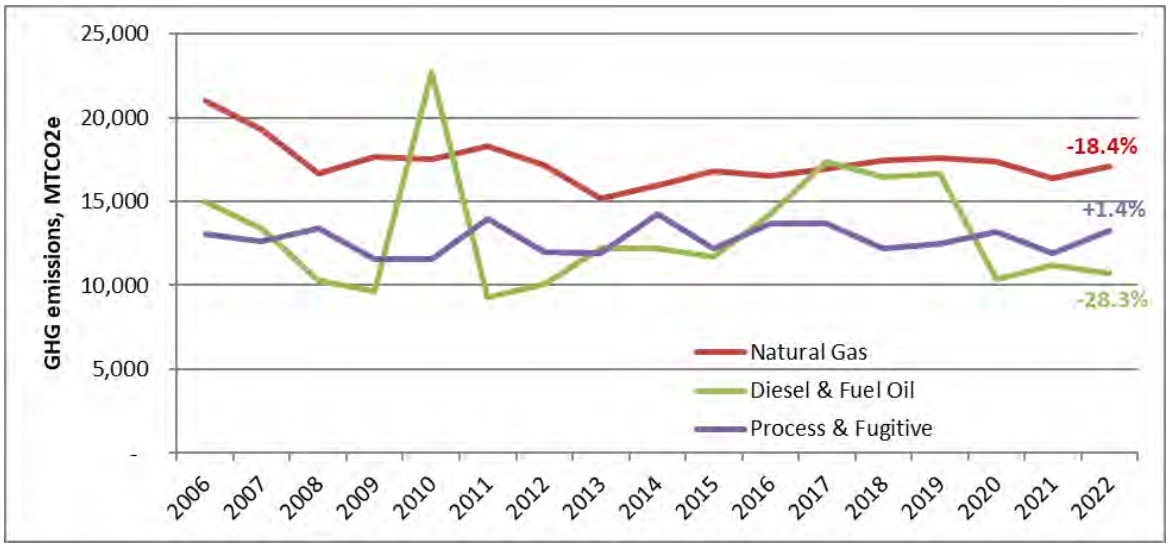
As major wind and other renewable energy projects come online in the region over the next few decades, the expectation is that emissions from electricity will become minimal.

Natural Gas

MWRA uses natural gas to heat facilities throughout the system, but the most significant use is thermal drying at the Quincy pelletizing plant for processing biosolids, which accounts for nearly 80% of MWRA's emissions from natural gas. The pelletizing plant utilizes energy intensive drying to convert sludge (the solids that remain after the wastewater treatment process) into fertilizer pellets for land application. Figure 4 shows that overall emissions from natural gas have decreased by 18.4% since 2006, due to efficiencies at the pelletizing plant.

[5] Electricity emission factors enable the conversion of megawatt hours of electricity consumed into the equivalent metric tons of CO_2 equivalent ($MTCO_2e$). The smaller the emission factor, the less emissions per MWh of electricity use. MWRA uses emissions factors updated annually by the MassDEP, which is calculated based on energy used in Massachusetts, has been reduced by roughly half since 2006.

Figure 4: MWRA Emissions from Natural Gas, Diesel & Fuel Oil, Process & Fugitive



Diesel and Fuel Oil

Diesel and fuel oil are mainly consumed for building space heating and by standby power generators at multiple MWRA facilities. Since 2006, MWRA reduced emissions from diesel and fuel oil by 28%, mainly due to a decreased need to use the combustion turbine generators (CTGs) for standby power at Deer Island as a result of fewer major storms in 2022.[6] MWRA also converted several facilities from fuel oil to natural gas, which is less carbon intensive, for heating, thereby reducing emissions from fuel oil. Currently, emphasis has shifted to converting to electric air and/or water source heat pump technology.

Process and Fugitive Emissions

Process and fugitive emissions refer to both expected and unexpected releases of GHGs during the wastewater treatment process. Process emissions result from biochemical reactions during wastewater treatment that release methane and nitrous oxide. Fugitive emissions result from uncontrolled or unintentional releases of GHGs from pressurized environments, as well as from landfill disposals.

Since both process and fugitive emissions are inherent to the wastewater treatment process and partially dependent on the size of the service populations, they are difficult to reduce, as evidenced by their emissions remaining relatively static since 2006 (Figure 4). While MWRA continues to explore pathways for reducing these types of emissions, they will continue to prove difficult. This is acknowledged in the Massachusetts 2050 Decarbonization Roadmap which states that "there are no clear pathways for significant and reliable emissions reductions" and that "no clear policies or technologies exist to achieve deep decarbonization" in the wastewater treatment sector.

[6] During high precipitation, intense storms that cause high flows at Deer Island, MWRA operates the CTGs as a standby emergency power source to ensure continued service in the case of a power outage. Fewer major storms means less frequent operation the CTGs and less oil used.

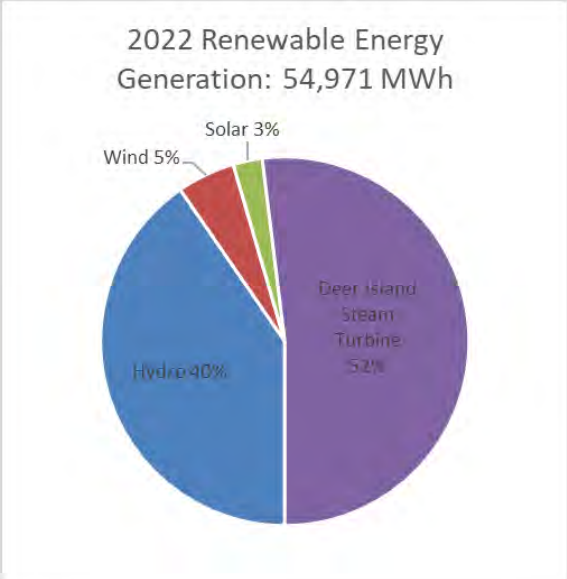
Emissions from Other Sources

Aside from those mentioned above, other sources of GHG emissions include digester gas combustion and flaring, MWRA's vehicle fleet, refrigerants, and small quantities of propane. Overall emissions from these categories have fallen 12% since 2006. Recent reductions are mostly the result of reduced vehicle fleet emissions, which decreased by over 15% compared to 2006 levels. This reduction was achieved by improvements in vehicle fuel efficiency and, more recently, by the adoption of hybrid and electric vehicles. Fleet emissions are expected to continue falling in coming years as the electric vehicle fleet is expanded.

Renewable Energy and Avoided Emissions

As detailed at the July Board meeting, MWRA has pursued the development of clean energy projects for decades and built up a significant portfolio of renewable energy infrastructure. Onsite generation of renewable energy enables MWRA to decrease its GHG emissions by reducing reliance on grid electricity at some facilities. This is particularly the case with the steam turbine generators at Deer Island, which comprises 52% of MWRA's renewable energy production. Deer Island combusts the methane gas that is emitted during the sludge digestion process in a boiler based combined heat and power (CHP) system to meet the facility's thermal demand and provide much of its electricity. This system provides the heating equivalent of over five million gallons of fuel oil each year and more than 28 million kilowatt-hours (kWh) of electricity. As described in detail below, MWRA will be installing a new CHP system that will substantially increase renewable energy production.

Figure 5: MWRA Renewable Energy by Source in 2022



In addition to the steam turbine generators, MWRA has wind turbines, five hydroelectric generators, and three photovoltaic solar sites. Other than the Deer Island assets, most of these renewables provide clean energy to the electric grid rather than being used onsite. In 2022, MWRA-generated 54,971 megawatt-hours (MWh) from renewables (Figure 5) and 36,102 MWh of this total was consumed onsite, avoiding 14,820 $MTCO_2e$ that otherwise would have been associated with MWRA electric grid usage. While the renewable electricity MWRA sells is not accounted for as part of our emissions reductions, it adds green power to the grid, reducing the Commonwealth's overall emissions.

GHG Emissions Reduction Successes

Reducing overall energy use by increasing efficiency continues to be MWRA's most effective strategy for mitigating GHG emissions. Energy audits conducted over the last decade resulted in measures such as the installation of variable frequency drives in pumping facilities, piping

insulation, energy efficient lighting, efficient heating and cooling systems, and other customized solutions. Energy Management Systems have been installed in several MWRA buildings, providing staff the ability to actively manage heating, ventilation and air conditioning energy use.

In addition to physical improvements, MWRA has integrated emissions mitigation into internal processes. MWRA established standard operating procedures to ensure that energy efficiency and costs are considered whenever facilities are rehabilitated or newly constructed. Major investments for furthering efficiency are planned in coming years and staff continue to explore opportunities to shift energy use more towards electrification and to reduce MWRA's reliance on purchased power. To ensure that energy saving and GHG emission reducing efforts are considered in capital planning, MWRA has also adopted a social cost of carbon of $125 per metric ton of CO_2 for use when evaluating the life cycle costs of new projects. The social cost of carbon is an estimate of the economic costs, or damages, of emitting one additional metric ton of CO_2 into the atmosphere[7].

Future Emissions Reduction

MWRA will continue to build on its successful GHG reduction strategies and use the Commonwealth's long-term emission reduction goals as a guide as staff focus on energy efficiency, electrification, and renewable energy expansion in the coming years.

Aside from energy efficiency improvements and electrification incorporated as part of major facility rehabilitations which will save hundreds of $MTCO_2e$ annually, MWRA's largest ongoing energy saving project is the design and construction of a new CHP plant at Deer Island. As reported to the Board in September 2022, the new digester-gas fueled system would eliminate the steam system and replace it with water-based boilers and an array of reciprocating engine generators.

The new CHP system is estimated to result in the production of an additional 40 gigawatt-hours (GWh) of electricity along with a reduction in fuel oil usage by roughly 300,000 gallons annually. These energy savings are expected to result in a 15% decrease of MWRA total emissions compared to 2022 levels.[8] The project will potentially include development of a micro grid with a battery energy storage system designed to reduce the running time of existing backup generators and coordinate the different energy sources at Deer Island with the potential to further decrease GHG emissions. With completion of the new CHP system expected within the next decade, the associated emissions mitigation should help MWRA achieve the 50% emission reduction target.

In addition to expanding electrification through installing air or water source heat pumps facilities throughout the system and installing additional solar arrays where possible, MWRA is exploring more innovative approaches to reducing emissions, most notably through battery storage and wastewater heat recovery pilot programs.

Next Steps

Achieving the Commonwealth's emissions targets requires that MWRA continue to implement the multi-pronged approach described above and integrate energy reduction into operations decisions across our facilities. It is also critical to have accurate projections of future emissions and the

[7] Based on the Federal Interagency Working Group methodology, using a 2% discount rate.
[8] This value was calculated using MassDEP's electricity emissions factor. Previous values for the new CHP were calculated with the supplier-specific emission factor reported for the Deer Island account.

impacts that various efforts will have on achieving our goals. In order to bolster this vital planning process, staff are currently working on detailed projections and potential pathways to further reduce emissions and understand what will be necessary to further work towards net zero by 2050.

BUDGET/FISCAL IMPACT:

The FY24 Current Expense Budget (CEB) includes $31.1 million for utilities, driven by $23.4 million for electricity, $3.8 million for diesel fuel, and $1.1 million for natural gas.

Greenhouse Gas Emissions Inventory Update

2006-2022

Massachusetts Water Resources Authority

January 2024

This report updates the Massachusetts Water Resource Authority (MWRA) report, *Greenhouse Gas Emissions Inventory Update 2006-2019*, with the latest available data in order to present and examine MWRA greenhouse gas (GHG) emissions from 2006-2022.

Disclaimer: All calculations presented in this report are based on data collected and estimated by MWRA as well as emissions factors and global warming potentials published by the Intergovernmental Panel on Climate Change (IPCC), Environmental Protection Agency (EPA), Massachusetts Department of Environmental Protection (MassDEP), and the Australian Government Department of the Environment. Every effort has been made to ensure the accuracy of the data. This report is intended to provide a reasonable estimation of greenhouse gas emissions and provide information from which MWRA can base policy decisions.

MWRA Key Contributors:

Denise Breiteneicher – Program Manager, Energy & Environmental Management
Stephen Estes-Smargiassi – Director, Planning & Sustainability
Hillary Monahan – Senior Planner
Christian Murphy – Program Manager, Energy Management, Deer Island
Michael O'Keefe – Senior Program Manager, Planning
Kristen Patneaude – Manager, Energy
Malcolm Ragan – Environmental Planner

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Executive Summary

This report provides an updated accounting of MWRA's greenhouse gas (GHG) emissions from 2006 to 2022. The objectives of this inventory are to:

1. Present an analysis of GHG emissions to identify major sources and reveal trends
2. Highlight successes to date regarding GHG emission reductions
3. Identify emissions reduction opportunities

The Commonwealth of Massachusetts has committed to net-zero GHG emissions by 2050, with intermediate targets of 33% and 50% reductions by 2025 and 2030, respectively. The MWRA has achieved the 2025 target, reducing emissions by 41% compared to a baseline of 2006.

Wastewater collection and treatment continues to be much more energy and emissions intensive than drinking water treatment and transport, accounting for nearly 90% of MWRA's total emissions over the past 17 years. In terms of emissions sources, electricity purchases are the largest, accounting for roughly 44% of the total. Other major sources of emissions include treatment processes and fugitive gases, natural gas, and diesel and fuel oil combustion used to run standby generators and heat facilities.

Although electricity accounts for a significant portion of MWRA's emissions, it is also where there has been the greatest reductions, accounting for 84% of total progress. Electricity consumption has been reduced at many facilities through energy efficiency measures such as high efficiency lighting and controls, more efficient heating, cooling, and ventilation (HVAC) systems, building management systems, variable frequency drives (VFDs), and process optimizations. Greenhouse gas emissions from electricity are also partially offset by MWRA's use of on-site renewable energy, which includes using anaerobic digester gas to power processes at the Deer Island Treatment Plant, as well as a portfolio of hydroelectric, wind, and solar photovoltaic generation. Additional solar facilities are being considered at Deer Island, several covered water storage sites, and new construction, major facility upgrades, or roof renovations. Emissions from electricity have fallen faster than total demand because of the continued buildout of non-emitting generation sources supplying the electric grid, making the regional electricity greener over the years. This trend is expected to continue at an even faster pace as major wind and hydroelectric projects are utilized by the Commonwealth.

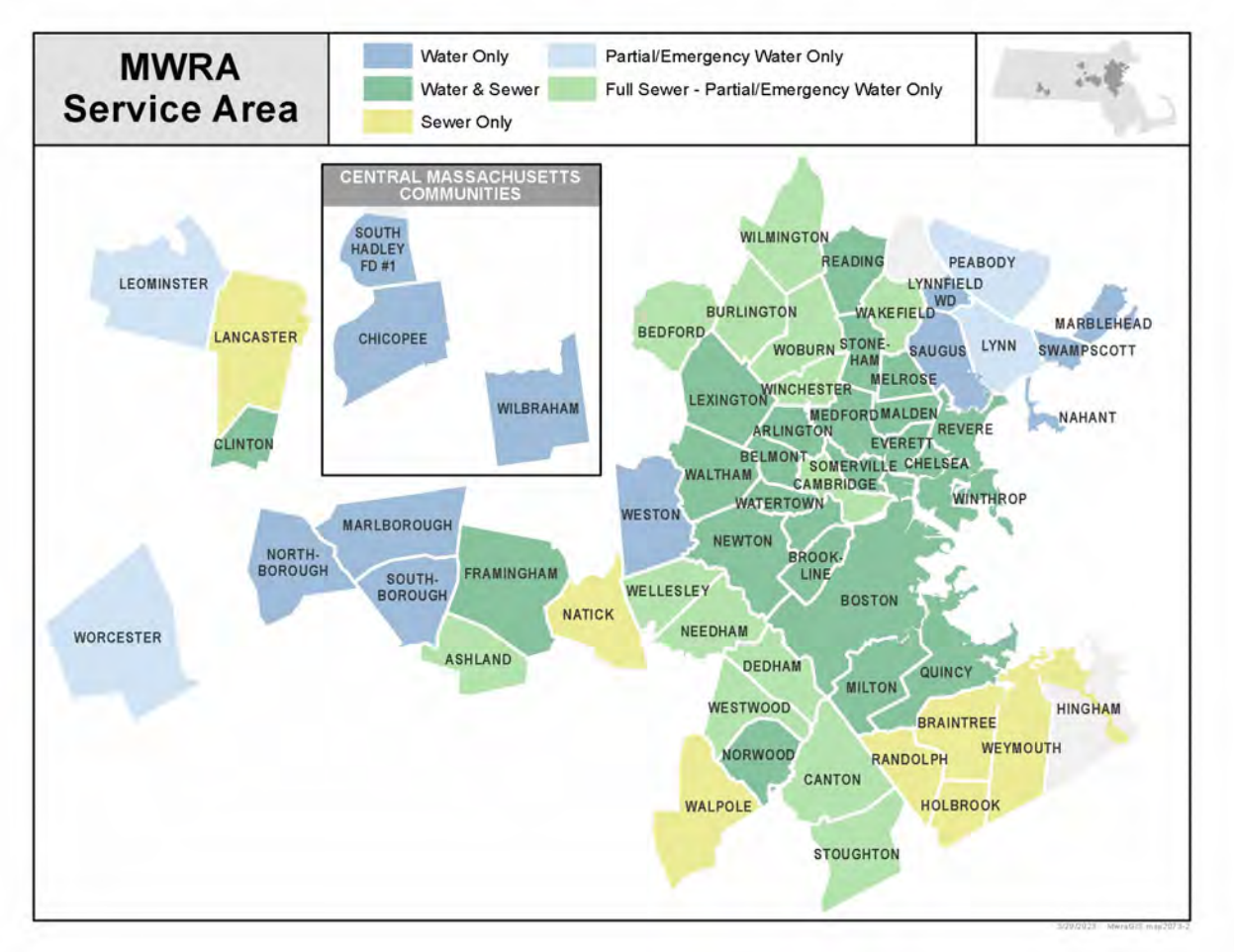
While significant progress has been made since 2006, the rate of GHG reductions has decreased in recent years. This recent slowdown reflects that many of the lower cost, readily available methods of mitigation have been implemented. Major emissions reductions are expected from the replacement of the existing combined heat and power (CHP) system at Deer Island, which is currently scheduled for completion within the next decade. MWRA will continue to pursue additional efficiency and renewable energy projects to meet future emissions targets.

1 - Introduction

Overview and Background

Massachusetts Water Resources Authority (MWRA) provides wholesale water and sewer services to over 3.1 million people and 5,500 industrial and commercial users in 61 metro Boston communities.

Figure 1: MWRA Service Area

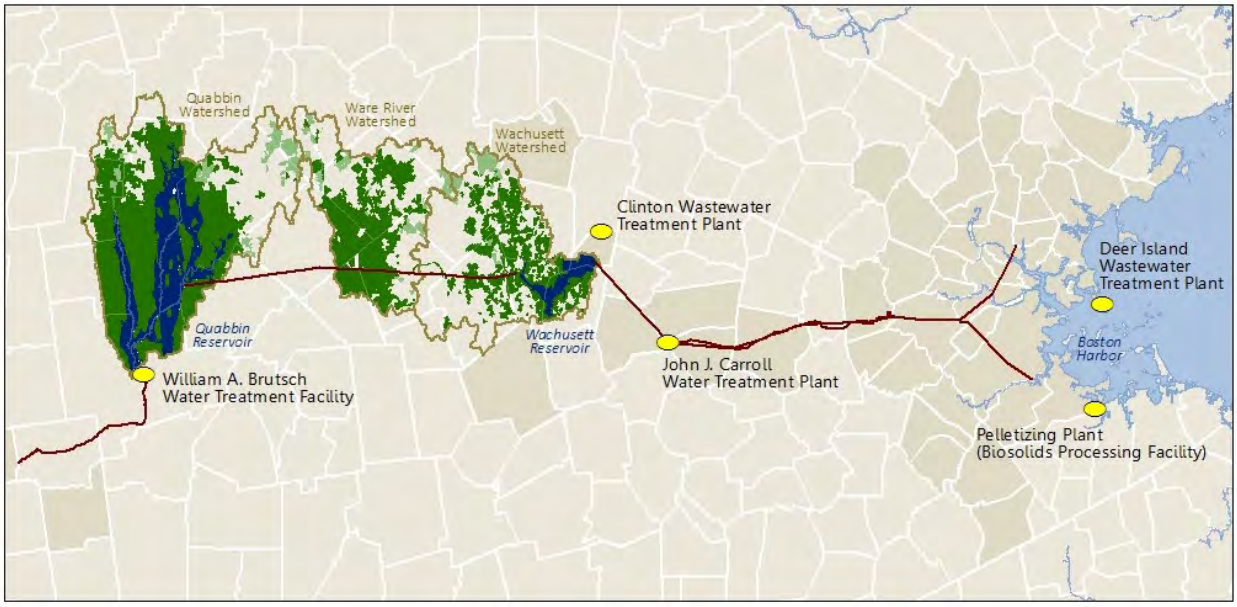


Water and wastewater trasnsport and treatment are energy intensive enterprises, and energy consumption is a significant contributor to GHG emissions. MWRA is committed to being a leader in environmental stewardship and has worked to reduce the GHG emissions required to provide safe drinking water and high quality wastewater treatement to its member communities. This commitment was recently acknowledged by the Commonwealth with MWRA's selection for the 2023 Leading by Example Award. This annual award, which MWRA also received in 2007 and 2011, recognizes outstanding efforts among Commonwealth agencies, public colleges and universities, and municipalities that have implemented policies and programs resulting in

significant and measurable environmental and energy benefits. MWRA fulfills its core mission with a variety of facilties, including:

- John J. Carroll Water Treatment Plant
- William A. Brutsch Water Treatment Facility
- 11 water pumping stations
- Deer Island Wastewater Treatment Plant
- Clinton Wastewater Treatment Plant
- Biosolids Processing Facility
- 12 wastewater pumping stations
- 4 headworks facilities
- 4 combined sewer overflow (CSO) treatment facilities
- 2 large warehouse and maintenance buildings
- Covered water storage, aqueducts, meter vaults, dams, and numerous other small facilities
- 1 administrative building

Figure 2: Major MWRA Water and Wastewater Treatment Facility Locations



Objectives

MWRA has worked to meet or exceed the goals of Massachusetts Executive Order 594, which establishes emissions reduction targets for state agencies, as well as the Clean Energy and Climate Plan, which commits the Commonwealth to net zero greenhouse gas emissions by 2050 with intermediate targets of 33% and 50% reductions by 2025 and 2030, respectively.

This report is developed to assist in tracking the progress toward meeting these goals and to inform stakeholders about MWRA's efforts to reduce emissions. The objectives of this document are:

1. Present an analysis of GHG emissions to identify major sources and reveal trends
2. Highlight successes to date regarding GHG emission reductions
3. Identify emissions reduction opportunities

By adding data from calendar years 2020 through 2022, this report serves as an update to MWRA's 2006-2019 Greenhouse Gas Emissions Inventory, and reports on MWRA's ongoing initiatives to reduce overall GHG emissions.

GHG Accounting Methodology

This inventory utilizes methods from multiple GHG reporting protocols and involves significant data collection and staff input. These reporting protocols define three different categories, or "scopes" of GHG emissions:

- *Scope 1*: Direct emissions from on-site energy use and process emissions from MWRA operations
- *Scope 2*: Indirect emissions (not on MWRA property) associated with the consumption of energy at MWRA facilities (i.e. emissions at utility plants from electricity generation)
- *Scope 3*: Indirect emissions not included in Scope 2 from facilities or operations not owned or controlled by the MWRA, such as those from employee vehicles used to commute to work and the lifecycle emissions from treatment chemicals and construction materials.[1]

Scope 3 emissions have not been included in this report. Obtaining data needed to estimate scope 3 emissions can be challenging and measurements are often less straightforward than indicators such as electricity or fuel purchased. Additionally, reporting is considered optional under the Local Government Operations Protocol (LGOP) [2] and is not mentioned in Executive Order 594.

[1] A limited analysis of Scope 3 emissions for MWRA can be found in the 2014 GHG Report.
[2] See §4.6 Scope 3 Emissions in the Local Government Operations Protocol v. 1.1.

Biogenic emissions, those resulting from processes not directly a result of human activity, are also not considered in this inventory report. The LGOP specifies that biogenic emissions should not be included in Scope 1 or Scope 2 estimates, but should be tracked separately. See Appendix A for more discussion of the accounting methodology used. Appendix C provides a limited estimate of some of MWRA's biogenic emissions.

GHG Emissions Factors

Key parameters used in the determination of GHG inventories are GHG emissions factors. These factors are multiplied by the amount of energy used in order to generate a value for the GHG emissions from an energy source consumption. An example of such a factor would be used to convert the megawatt hours of electricity consumed from the utility into the equivalent metric tons of carbon dioxide (CO_2) equivalent ($MTCO_2e$)[3].

The electricity emissions factor used in this inventory, calculated by the Massachusetts Department of Environmental Protection (MassDEP), has been reduced by roughly half since 2006. This reflects a shift away from carbon emitting generation sources toward a greater mix of renewables.

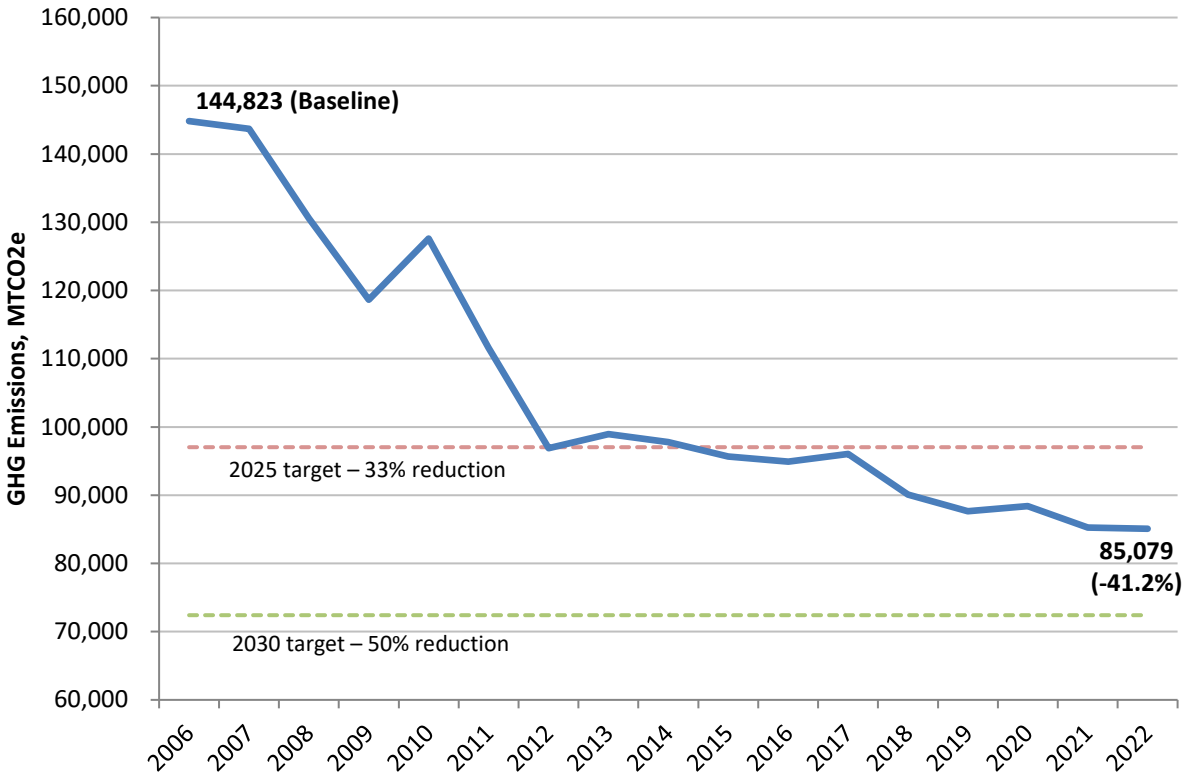
Other emissions factors, such as those for fuels combusted by the MWRA, are published and regularly updated by the US EPA. Tables with the emission factors used in this inventory can be found in Appendix B.

[3] CO_2e is carbon dioxide equivalent, which is a measure that allows the comparison of the emissions of other greenhouse gases, such as methane and relative to one unit of CO_2.

2 - Greenhouse Gas Emissions Summary

As shown in Figure 3, MWRA's 2022 GHG emissions are 41% lower than 2006 levels, an overall decrease of 59,744 $MTCO_2e$, comparable to taking nearly 13,000 passenger vehicles off the road per year. A majority of this reduction, roughly 84%, was achieved through reduced electricity purchases and a cleaner regional grid. Emissions increased slightly in 2020, mostly due to recent increases in electricity demand and the regional electric grid emissions factor. The dashed lines in Figure 3 show interim emission reduction targets as established by state legislation, which calls for an 85% reduction by 2050 compared to baseline levels in order to achieve "net-zero" emissions (in combination with various carbon offsets). Note that these targets apply to total GHG emissions within the Commonwealth and not one specific sector or organization. MWRA is using these reduction goals as guidelines until specific internal emissions reductions targets out to 2050 are established.

Figure 3: MWRA GHG Emissions, Metric Tons of CO_2 Equivalents (2006 – 2022) [4]

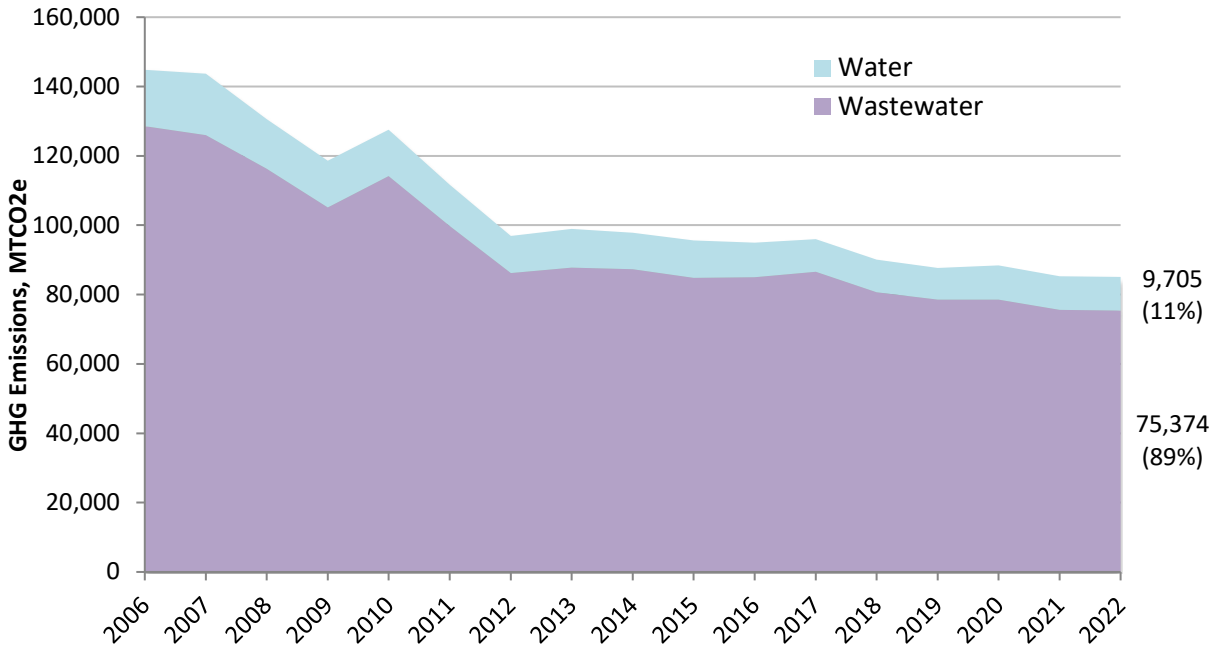


[4] The spike in emissions in 2010 was due to unusual weather patterns necessitating extended use of the backup Combustion Turbine Generators (CTGs) at the Deer Island Wastewater Treatment Plant, to ensure continuous pumping and treatment during extreme high flows which significantly increased diesel fuel usage for that year.

Comparison of Water & Wastewater GHG Emissions

As shown in Figure 4 below, the wastewater system is much more emissions intensive than the drinking water system. Every million gallons of drinking water delivered results in emissions of 133 kilograms (kg) of carbon dioxide equivalent (CO_2e), compared to 772 kg of CO_2e emitted per million gallons of wastewater treated. This is partly due to the fact that the drinking water distribution system is primarily gravity fed whereas the wastewater system is powered by pumping at Deer Island and pump stations throughout the service area. Between 2006 and 2022, the water system has accounted for an average of 11% of MWRA's total GHG emissions, while wastewater has accounted for the other 89%.

Figure 4: GHG Emissions from Water & Wastewater Sectors (2006-2022)



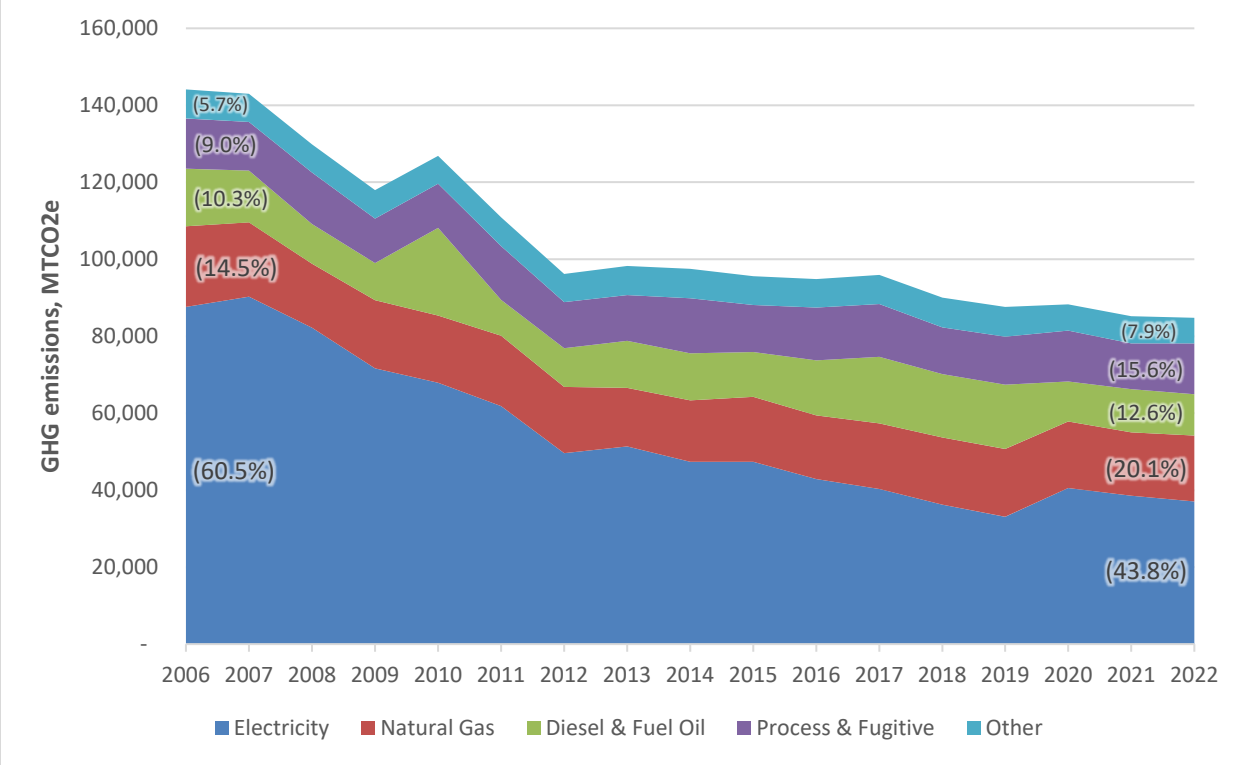
3 - GHG Emissions by Source

As shown in Figure 5 below, in 2022 the major sources of GHG emissions in the MWRA's operations (as a percent of total emissions) included:

- Electricity (includes water and wastewater treatment plants, pump stations, and headworks facilities), **43.8% (37,294 MTCO$_2$e)**
- Natural gas (dryers at the biosolids processing plant, building space heating), **20.1% (17,096 MTCO$_2$e)**

- Process and Fugitive[5] (nitrous oxide and methane emissions at wastewater treatment plants, landfills, and the sludge pelletizing plant), **15.6% (13,238 MTCO$_2$e)**
- Diesel and fuel Oil (standby generators, process and building heating), **12.6% (10,729 MTCO$_2$e)**
- Other (stationary CH_4 emissions from incomplete combustion of Digester Gas, vehicle fleet, refrigerants), **7.9% (6,732 MTCO$_2$e)**

Figure 5: MWRA GHG Emission Sources, 2006-2022



Electricity Emissions

Electricity purchases make up the majority of MWRA's utility spending and account for nearly 44% of total emissions. The energy demand that drives these emissions is influenced by many factors, including precipitation, customer demand, and evolving regulatory requirements.

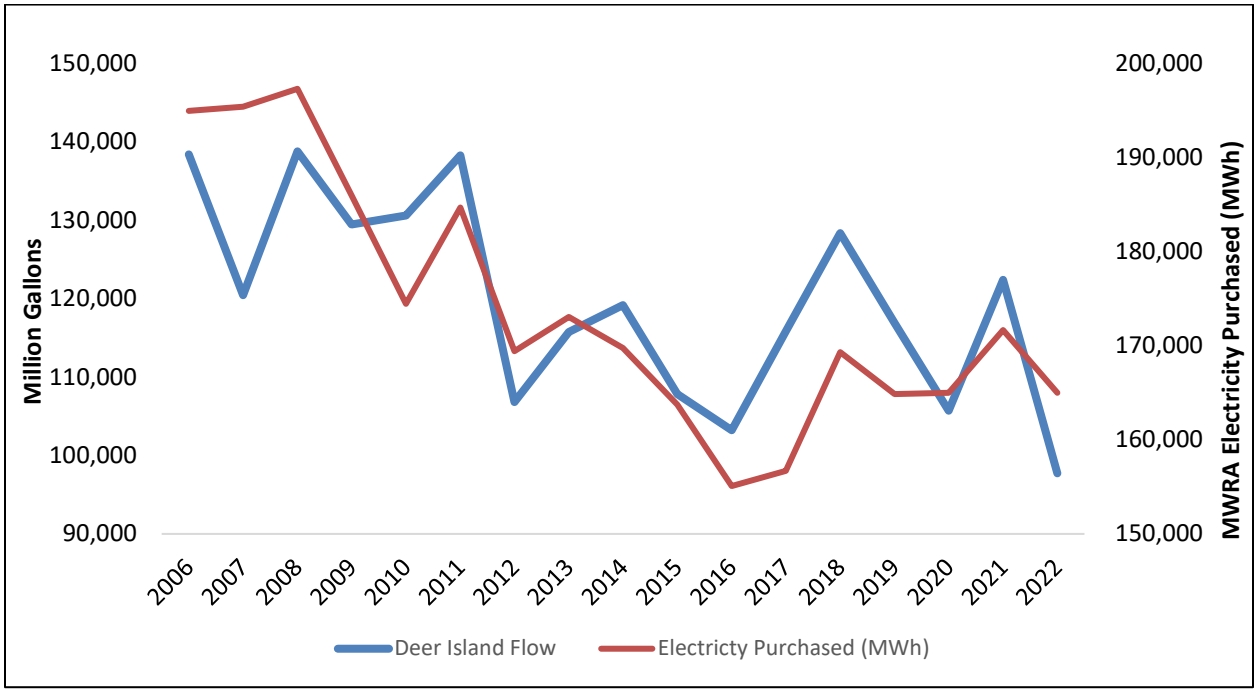
Because the Deer Island Wastewater Treatment Plant, the second largest in the United States, accounts for an average of 62% of these electricity purchases, the total electricity demand tends to vary with Deer Island wastewater flows (Figure 6). The flow through Deer Island varies with

[5] Process emissions refer to expected releases of gas during treatment processes, and fugitive emissions refer to unintended leaks of gases from a pressurized environment. These emissions are not measured directly, but estimated based on activity data using formulas provided in reporting protocols.

rainfall totals in the service area, as several MWRA-served communities use combined sewer systems, accepting both wastewater and stormwater for treatment and discharge. Even many separated sewer systems convey excess groundwater or stormwater during extended wet periods, so treatment flows are expected to continue varying with precipitation totals.

Changing environmental regulations can have substantial impacts on MWRA's energy demands. In 2006, the Environmental Protection Agency (EPA) introduced the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which required the MWRA to add an ultraviolet (UV) disinfection at its two water treatment plants. The addition of these UV systems increases energy demand at the treatment facilities.

Figure 6: Deer Island Total Flow & MWRA Annual Electricity Purchases (2006-2022)[6]

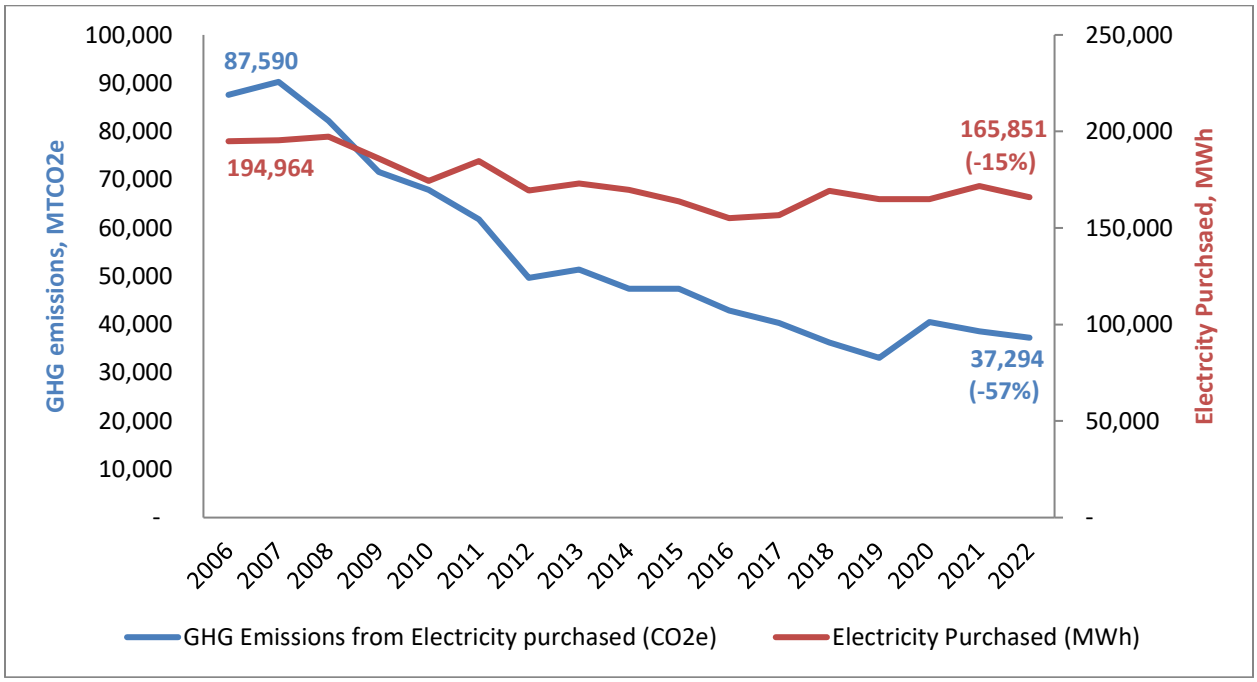


Despite these challenges, MWRA has reduced total electricity purchases by 15% and emissions from electricity by 57% between 2006 and 2022 (Figure 7). The state-wide emission factor has been falling steadily as renewable and non-emitting sources account for a larger share of total generation[7], and this has amplified the effects of MWRA's electricity saving efforts. Figure 7 shows that emissions have declined at a faster rate than electricity purchased, owing to a falling emission factor. This underscores the fact that much of MWRA's emissions reductions are the result of regional efforts to introduce lower carbon generation sources into the electric grid.

[6] Low values in 2016 and 2017 are due to the replacement of the 115 kV submerged cable that supplies power to Deer Island, during which the facility was powered entirely by standby generators. The increase in 2021 was due to high precipitation that summer, as also evident in the Deer Island Treatment Plant flow data.

[7] The increase in emissions in 2020 (seen in Figure 7) and is largely due to an increase in the emissions factor as discussed in the introduction. At time of writing, MassDEP has not yet published an emissions factor for 2022, and a 2021 value is used as a placeholder.

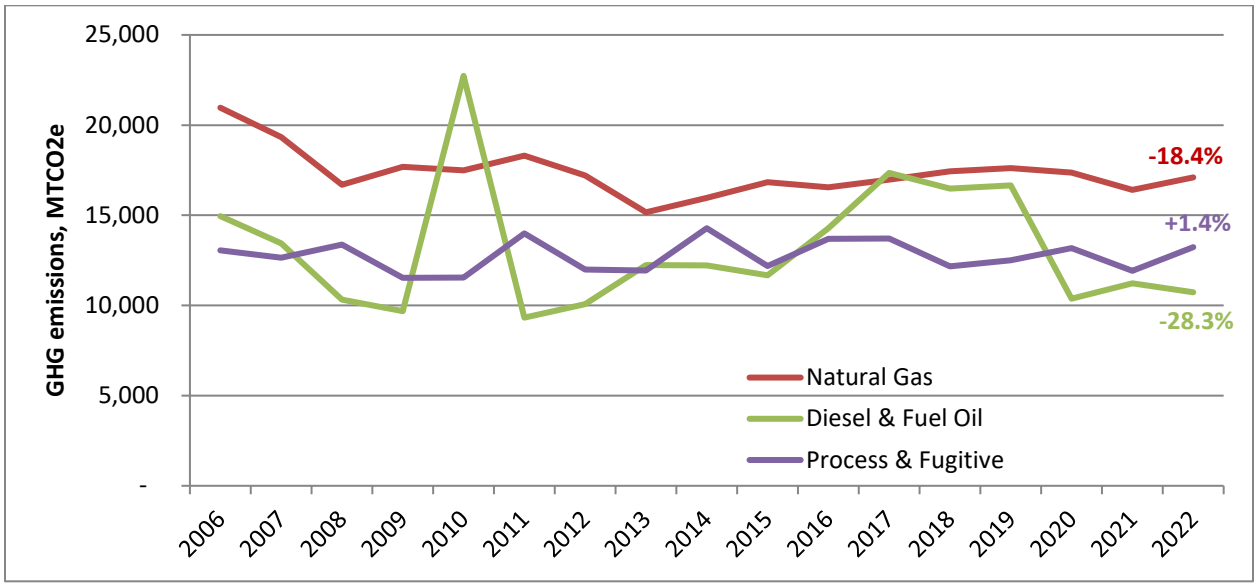
Figure 7: MWRA Electricity Purchases and Resulting Emissions ($MTCO_2e$)



Natural Gas Emissions

Natural gas is used to heat facilities throughout the MWRA system and a number of facilities have reduced their use of diesel for heating and converted to natural gas use. The most significant use of natural has is thermal drying at the Quincy pelletizing plant (biosolids processing facility), accounting for nearly 80% of MWRA's emissions from natural gas. The biosolids processing facility utilizes an energy intensive process to convert sludge (the solids that remain after the wastewater treatment process) into fertilizer pellets for gardening and landscaping. Figure 8 shows that overall emissions from natural gas have decreased by 18.4% since 2006. Although natural gas demand at the biosolids processing facility has been reduced by 26% compared to 2006 levels, conversions from fuel oil to natural gas heating at facilities such as the Chelsea Headworks have partially offset this decrease. Because natural gas is a less carbon intensive energy source than fuel oil, the net effect of these conversions is a decrease in overall GHG emissions.

Figure 8: Emissions from Natural Gas, Diesel & Fuel Oil, Process & Fugitive



Diesel & Fuel Oil Emissions

Diesel and fuel oil are consumed by standby power generators at multiple MWRA facilities. Although diesel is also used by the MWRA vehicle fleet, those emissions are accounted for separately. Since 2006, emissions from diesel and fuel oil were reduced by 28%, mainly due to a decreased need to use the combustion turbine generators (CTGs) for standby power at Deer Island as a result of fewer major storms in 2022.[8] The 2010 spike in fuel oil emissions seen in Figure 8 is due to a period of extreme precipitation which required extended use of the CTGs and the spike beginning in 2017 is due to the cable that provides Deer Island electricity being temporarily taken out of service for a harbor dredging project.

Process & Fugitive Emissions

Process emissions result from biochemical reactions during wastewater treatment and discharge at Deer Island and Clinton Wastewater Treatment Plants. Process emissions include CH_4 (methane) and N_2O (nitrous oxide) emissions, whereas CO_2 (carbon dioxide) emissions are considered biogenic and accounted for separately (see Table 3 in appendix C). Fugitive emissions result from uncontrolled or unintentional releases of GHGs from pressurized environments and also result from landfill disposals. Fugitive emissions are difficult to measure directly, and values reported here reflect informed estimates based on flow data following accepted GHG reporting protocols.

[8] During high precipitation, intense storms that cause high flows at Deer Island, MWRA operates the CTGs as a standby emergency power source to ensure continued service in the case of a power outage. Fewer major storms means less frequent operation the CTGs and less oil used.

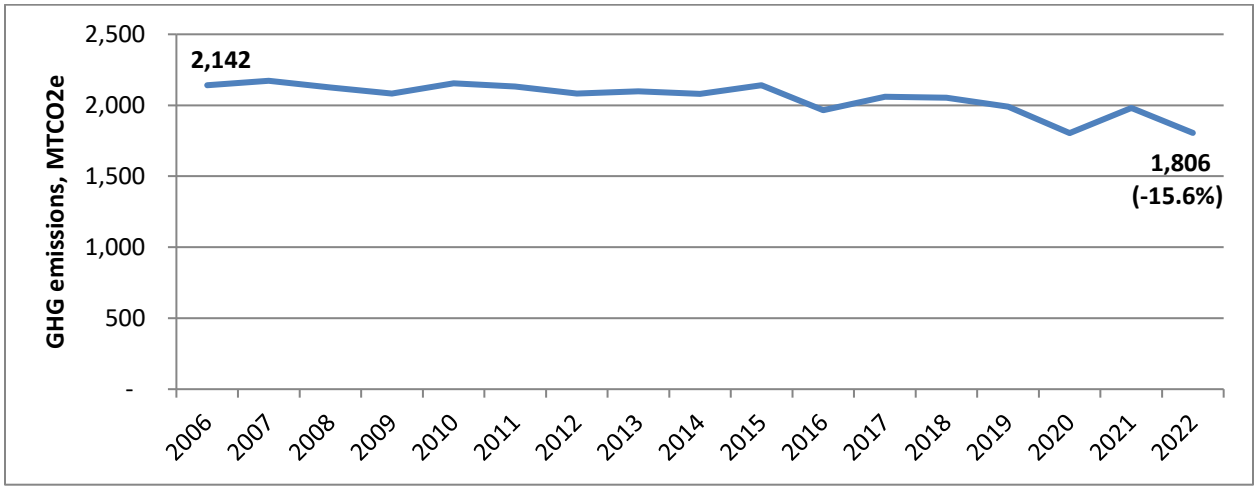
Total process and fugitive emissions are 1.4% higher than 2006 levels. However, it should be noted that methane emissions from the Deer Island odor control systems, which make up more than half of estimated process emissions, were likely undercounted prior to 2012. Increases in the service population will make methane removal from the Deer Island odor control processes challenging and available bio filtration technologies would be challenging to install and could pose operational risks. MWRA staff may assess options for greater methane removal from DITP processes as part of future emissions reduction planning.

Emissions from Other Sources

Other sources of GHG emissions include an anthropogenic component of digester gas combustion and flaring, MWRA's vehicle fleet, refrigerants, and small quantities of propane. Overall emissions from these categories have fallen 12% since 2006, to a total of 6,660 metric tons of CO2e in 2022. Recent reductions are mostly the result of reduced vehicle fleet emissions.

MWRA vehicle fleet emissions decreased by just over 15% compared to 2006 levels. This reduction was achieved by improvements in vehicle fuel efficiency and, more recently, by the adoption of hybrid and electric vehicles. Fleet emissions are expected to continue falling in coming years as the electric vehicle fleet is expanded, especially as electric versions of medium- and heavy-duty work vehicles suitable for MWRA use become readily available.

Figure 9: Emissions from MWRA Vehicle Fleet



4 - Renewable Energy and Avoided Emissions

Onsite generation of renewable energy enables MWRA to decrease GHG emissions, even if total energy consumption is not reduced.[9] In addition to wind turbines, hydroelectric generators, and photovoltaic solar installations, MWRA utilizes the methane gas that is emitted during sludge digestion at Deer Island, which is then combusted in a boiler based combined heat and power (CHP) plant. This system comprises the majority of MWRA's onsite energy generation, providing the heating equivalent of over 5 million gallons of fuel oil each year and more than 28 million kilowatt-hour (kWh) of electricity. The full list of onsite renewable sources and their capacity is provided in Table 1.

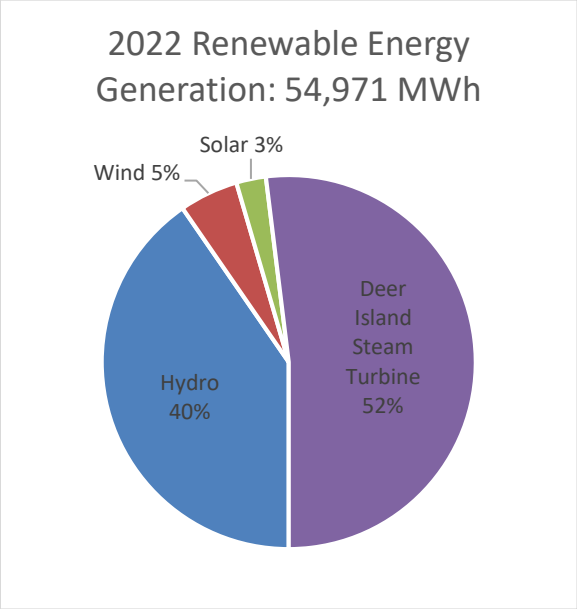
Table 1: List of Renewable Electricity Generation Facilities and Rated Capacities

Facility	Rated Capacity (Megawatt (MW) or Kilowatt (kW))
Digester Gas Powered Steam	
Deer Island Steam Turbine Generator	19 MW
Hydroelectric Generators	
Oakdale	3.5 MW
Deer Island	2 @ 1 MW
Cosgrove	2 @ 1.7 MW
Loring Road	200 kW
Brutsch Treatment Facility (Hatchery)	60 kW
Wind Turbines	
Charlestown	1.5 MW
Deer Island	2 @ 600 kW[10]
Photovoltaic Solar	
Carroll Water Treatment Plant	496 kW
Four Locations at Deer Island	736 kW
Wachusett Aqueduct Pumping Station	76 kW

[9] GHG emissions figures and total electrical utility consumption already account for the electricity generated onsite with renewables.

[10] In 2023 one of the two wind turbines failed and has been deactivated while its future is determined. For the time of the data for this report, however, Deer Island had two wind turbine generators.

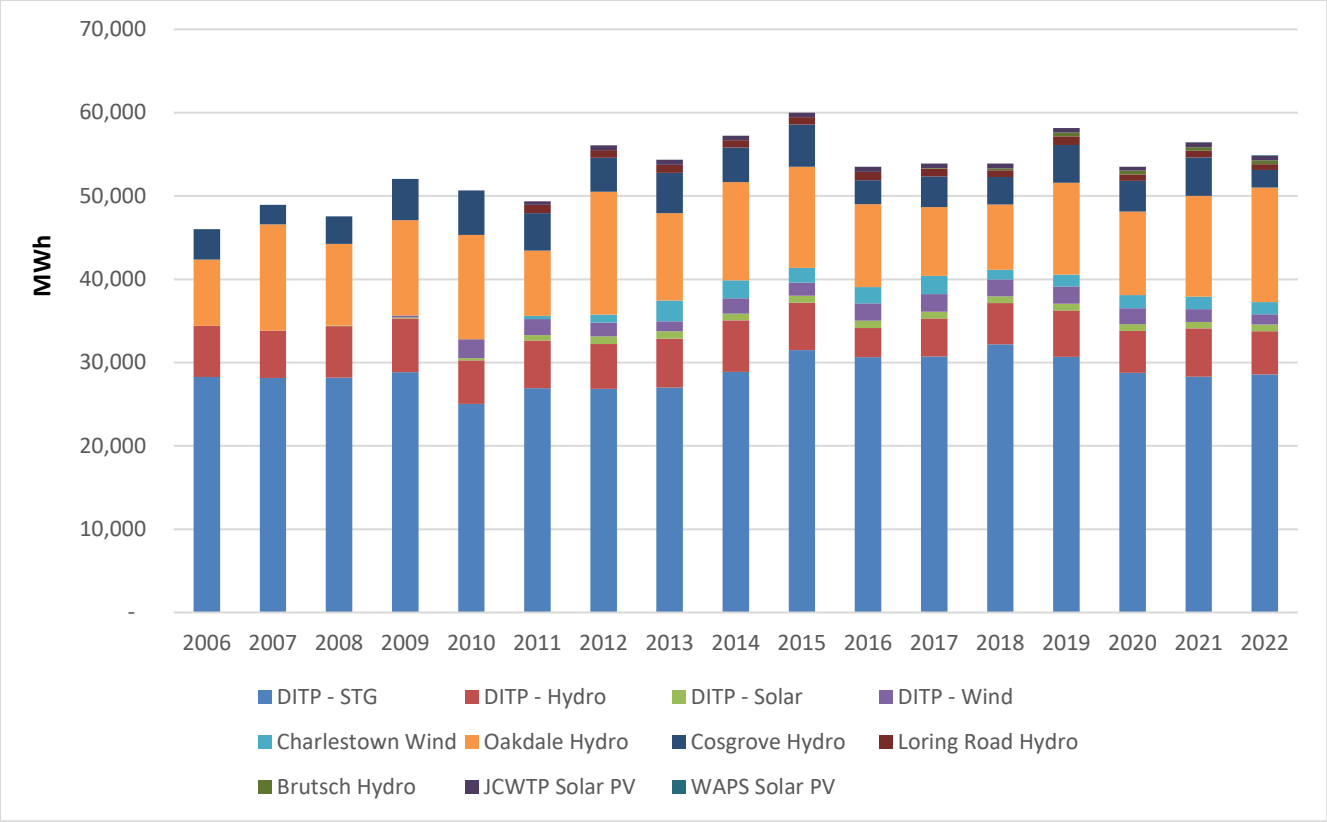
Figure 10: MWRA Renewable Energy by Source in 2022 (MWh)



In 2022, MWRA generated 54,971 megawatt-hour (MWh) from renewables (Figure 10). 36,102 MWh of this total was consumed on site, avoiding 14,820 $MTCO_2e$ that otherwise would have been associated with MWRA electric grid usage. Figure 11 shows a more detailed breakdown of renewable energy generation at all of MWRA's installations since 2006.

Renewable energy sold to the grid is not counted as a direct reduction in MWRA's emissions from electricity, although providing more renewable sources to the regional generation mix contributes to the continued reduction in the grid emissions factor. All sources of renewable energy at Deer Island are consumed on site, whereas most other facilities sell power back to the regional grid.

Figure 11: Renewable Energy Generation 2006-2022 (MWh)



William A. Brutsch Hydroelectric Facility and the McLaughlin Fish Hatchery Pipeline

Since 2017, MWRA has operated a hydroelectric turbine at the Brutsch Treatment Facility in a pipeline to the Division of Fisheries and Wildlife's (DFW) McLaughlin Fish Hatchery. This successful project has multiple benefits, including, reducing MWRA's greenhouse gas emissions by generating renewable hydroelectric power, providing revenue to MWRA through energy sales to the electrical grid, reducing the hatchery's carbon footprint by eliminating electrical demand associated with pumping water from the Swift River, and delivering cold, well oxygenated water to the fish hatchery without pumping, benefiting the health and growth of the fish.

Renewable Energy Certificates

In addition to renewable energy generation, for several years MWRA was voluntarily purchasing enough renewable energy certificates (RECs) to ensure that an amount of power equivalent to MWRA's electrical utility demand is being supplied from renewable sources. A renewable energy certificate is a market-based instrument that represents the property rights to the environmental, social and other non-energy attributes of renewable electricity generation. RECs are issued when one MWh of electricity is generated and delivered to the electricity grid from a renewable energy resource. In 2022, MWRA purchased enough New England sourced "Class II" (generation facilities in operation before 1998) RECs to account for 100% of the Authority's electricity, in addition to the required RECs for any electricity supplied to Massachusetts electricity customers.[11] Although this does not technically mean that 100% of MWRA's electricity is generated from renewable sources, it does support the continued operation of that equivalent renewable capacity across the regional grid. The reporting protocol that MWRA relies on specifies that these voluntary purchases cannot be deducted from Scope 2 emissions, as doing so would constitute a double counting. This is because the renewable energy portion of each utility's energy supply is already accounted for in the statewide emissions factor that is being multiplied by MWRA's activity data.[12]

[11] Massachusetts' Renewable Energy Portfolio Standard (RPS) was one of the first programs in the nation that required a certain percentage of the state's electricity to come from renewable energy.
[12] See §6.2.4 of the Local Governments Operations Protocol v1.1.

MWRA captures value from the sale of RECs created by our own renewable electricity production for the financial benefit of our water and sewer rate payers. MWRA has generated and traded RECs since 2002. The sale of these RECs is a reliable source of revenue, generating over $16.6 million in non-rate revenue to date, at an average of approximately $750,000 annually. RECs created by the MWRA come from a variety of sources and are classified depending on the type of source and the year the system came online, and market values depending on the classification.

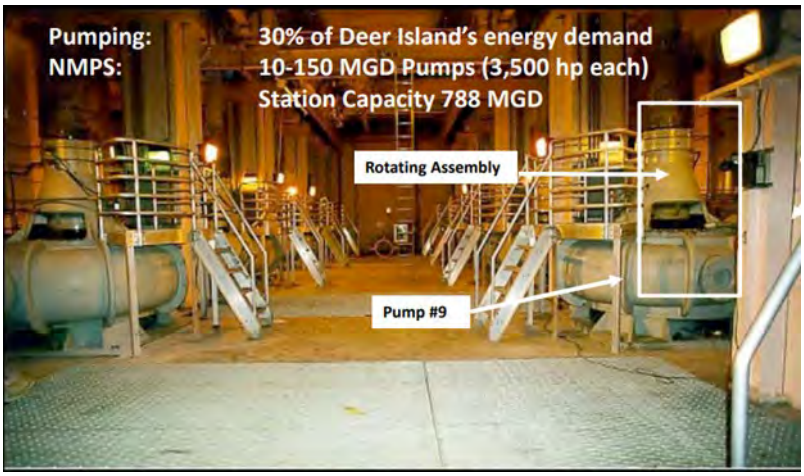
5 - GHG Emissions Reduction Successes

Reducing overall energy use by increasing efficiency continues to be MWRA's most effective strategy for reducing GHG emissions. Energy audits conducted over the last decade resulted in measures such as the installation of VFDs in pumping facilities, energy efficient lighting, more efficient heating and cooling systems, and other customized solutions. Energy Management Systems (EMS) have been installed in several MWRA buildings, providing staff the ability to actively manage HVAC energy use. Significant savings are also achieved through process changes. For example, at Deer Island in 2011, changes to secondary treatment resulting from installation of dissolved oxygen probes and control panels allowed for a reduction in blower and dissolved oxygen use, resulting in a savings of 9.2 million kWh/yr.

Several examples of completed energy efficiency initiatives are listed below. A longer list of completed efficiency projects can be found in Chapter 13 of the MWRA Wastewater Master Plan.

- Deer Island has ten raw wastewater pumps in the North Main Pump Station (NMPS). MWRA staff routinely maintain these pumps to ensure they operate at maximum efficiency. In an effort to identify opportunities for optimization of the pumping equipment for energy savings, Pump Number 9 was identified as operating below an acceptable pump efficiency level. In December 2019, Pump Number 9 was refurbished, including an epoxy resin recoating, thereby increasing energy efficiency, reliability, and extending the pump's useful life (Figure 12). This project provides an estimated 236,000 kWh savings per year.

Figure 12: DITP North Main Pump Station - Pump 9



- Wachusett Aqueduct Pumping Station (WAPS) is a critical component of MWRA's water transmission redundancy plan and a model for sustainability. Completed in 2019, WAPS includes: 1) enhanced building envelope and subgrades insulation; 2) a cold roof that was added to the project to minimize energy transfer from the sun and outside air into the building; 3) a geothermal heat pump that circulates forebay water into the building, where it interacts with a heat exchanger that is connected to a water-cooled heat pump; 4) LED lights connected to motion and daylight sensors; and 5) 76 kilowatt (kW) of roof top and ground mount solar panels.

Figure 13: WAPS Geothermal Heat Pump Installation

- Five LED lighting upgrade projects from 2020-2022 (384,633 kWh saved annually)
- Pipe insulation at four water facilities to decrease the need for dehumidification (215,170 kWh saved annually)

- Installation of VFDs on the ventilation at Union Park Combined Sewer Overflow Facility to avoid constant running at full throttle (23,400 kWh saved annually)
- Installation of VFDs on 3 pumps at Deer Island Treatment Plant in September 2021 (227,461 kWh saved annually)

To ensure that energy saving and GHG emission reducing efforts are considered as part of normal capital planning, MWRA adopted a social cost of carbon (SCC) of $125 per metric ton of CO_2 for assessments when evaluating the life cycle costs of new projects in 2022. The social cost of carbon is an estimate of the economic costs, or damages, of emitting one additional metric ton of carbon dioxide into the atmosphere.

6 - Future Emissions Reduction Opportunities

Several projects are currently in development that will support the reduction of MWRA's GHG emissions. The following are the primary methods to reduce GHG emissions:

1. Reduction of energy use or use of energy more efficiently (efficiency)
2. Installation of onsite renewable energy (renewables)
3. Transition from fossil fuel to electricity as energy source (electrification)

The following subsections discuss future projects planned in each of these areas.

Efficiency

Efficiency improvements are an effective method to reduce GHG emissions and MWRA has internal standard operating procedures to ensure that energy efficiency is considered whenever facilities are rehabilitated or newly constructed. This has resulted in efficiency improvements being incorporated into facility rehabilitations at Chelsea Creek, Nut Island, Ward Street, and Columbus Park Head Works, Braintree-Weymouth, Alewife Brook, Hingham and Hayes Pump Stations, and the Quabbin Reservoir Administration building. Improvements include LED lighting, HVAC system upgrades, and installation of energy management systems that allow for remote operation. Rehabilitations of the Chelsea Creek and Nut Island facilities alone are expected to save 1.7 million kWh annually.

Efficiency improvements can also be accomplished by extracting more utility from existing renewable energy sources. The existing CHP system at Deer Island provides thermal and electrical energy from the digester gas generated onsite as part of the treatment plant process. Through simulations it was determined significantly more energy could be extracted from this digester gas resource. MWRA is currently engaged in working towards the design and construction of a new CHP facility with construction estimated to be completed in the next decade. This project is estimated to result in the production of an additional 40 gigawatt-hour (GWh) of electricity per year; along with a reduction in fuel oil usage by roughly 300,000 gallons per year. These are expected to reduce emissions by 12,800 $MTCO_2e/yr$, a 15% decrease

of MWRA total emissions compared to 2022 levels.[13] The project will potentially include development of a microgrid with a battery energy storage system designed to reduce the running time of existing backup generators and coordinate the different energy sources at Deer Island with the potential to further decrease GHG emissions from Deer Island.

Expansion of Renewables

MWRA is committed to siting new renewable energy projects at as many facilities as economically feasible and continues to aggressively seek out any available grant and loan funds to improve project paybacks.

Additional solar photovoltaic capacity is in the early stages of development at several MWRA facilities. At Deer Island, a 2 MW parking lot canopy system is targeted for operation in 2026. Scopes of work are also being developed for a 5 MW array at the Norumbega covered storage facility, a 1.5 MW array at the Loring Road covered storage, and a 300 kW array at the Arlington covered storage. Several upcoming roof replacement projects will also assess the viability of rooftop solar on a case-by-case basis.

Electrification

Electrification converts an energy source from one that uses fossil fuels locally to one that uses electricity. This will obviously increase the electricity consumption, but as the electrical grid is supplied by more renewable energy (or onsite renewable resources are expanded) the GHG emissions of those facilities will be reduced.

Though they contribute only a small portion of the total MWRA GHG emissions, the vehicle fleet is also being electrified. The installation of an additional 60 electric vehicle charging ports at major facilities is planned over the next several years. These will support the continued expansion of the number of electric vehicles in the MWRA fleet. Up to this point electric vehicle purchases have focused on passenger vehicles, but with the production of electric light-duty pickups beginning in 2023, MWRA will target the replacement of the existing light-duty pickup trucks beginning in 2024. Further opportunities for fleet electrification will be assessed as more manufacturers and vehicles enter the market. MWRA will continue to lead by example and work toward the Commonwealth's goal of 100% zero emission vehicles by 2050.

Heat pumps can be installed to either replace or augment the operation of fossil fuel fired boilers for space heating needs. The thermal source for these heat pumps can be either air or water. MWRA is evaluating use of air source heat pumps as well as water/wastewater source heat pumps at drinking water and wastewater pump stations. Major rehabilitation projects at the Ward

[13] This value was calculated using the GHG emissions factor for this analysis. Previous values for the new CHP were calculated with the supplier-specific emission factor reported for the Deer Island account, which is nearly 50% higher than the regional estimate provided by MASSDEP. As a result, this GHG emissions reduction contribution is lower than reported elsewhere.

Street and Columbus Park headworks, currently in the design phase, are also evaluating the feasibility of heat pumps.

7 - Conclusion

As this report shows, the MWRA has been successful at reducing GHG emissions from the base year of 2006 – having already met the state's 2025 target of a 33% reduction in emissions. GHG emissions have been reduced roughly 41% compared to 2006 baseline levels. This reduction was accomplished through projects and practices to reduce energy use and install renewables, and further aided by a falling regional electric grid emissions factor.

As many of the low cost and easy to implement tasks have been accomplished, it could become more difficult to locate additional opportunities. However, a major overhaul of the CHP system at Deer Island and further expansion of onsite renewable energy, plus many other smaller projects, will build on past successes. The further buildout of renewable energy in New England, especially once additional hydro power from Canada and offshore wind power are interconnected with the regional grid, will mean the electricity MWRA must consume to fulfill its critical mission will be cleaner and more sustainable.

Appendices

Appendix A: Methodology

The approach to building the MWRA GHG inventory is consistent with international and national standards and best practices. Both the Greenhouse Gas Protocols - Corporate Accounting and Reporting Standard[i], and the Local Government Operations Protocol (LGOP), version 1.1[ii], were used as the core guiding documents. The U.S. Environmental Protection Agency (EPA) Climate Leadership for Greenhouse Gas Inventories[iii] was used to identify emissions factors and the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report[iv] was referenced for global warming potentials. Although the IPCC has since published new editions of the Assessment Report, EPA will continue to use global warming potentials from the Fourth edition until 2024. The Australian National Greenhouse and Energy Reporting[v] (NGER) protocol was used to estimate nitrogen emissions from wastewater treatment plant (WWTP) effluent to receiving bodies of water. Massachusetts Department of Environmental Protection (MassDEP) emission factors were used to estimate emissions from electricity purchases. In previous GHG inventories, supplier specific emissions factors were used to try to more accurately estimate MWRA's emissions. However, following recommendations by the MassDEP and Executive Office of Energy & Environmental Affairs (EOEEA), the latest inventory instead employs a consumer-level (i.e., accounting for losses during transmission and distribution) statewide emission factor.

There are seven major greenhouse gases included in the GHG Protocol, however the five listed below are the only ones that MWRA's operations contribute to:

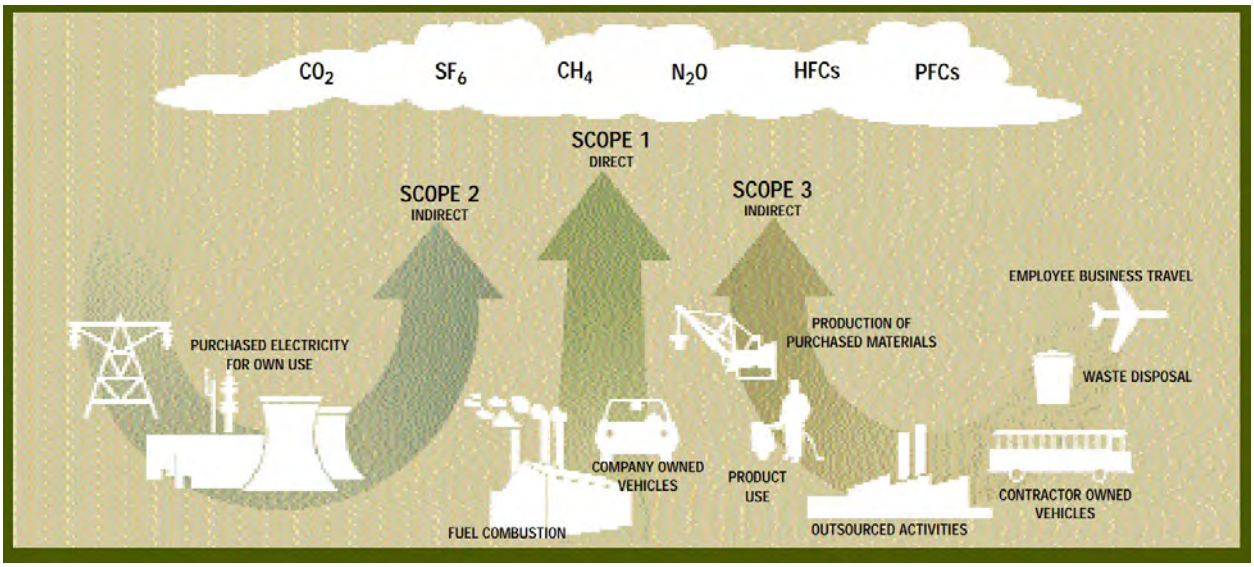
- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs) (minor contribution)
- Sulphur hexafluoride (SF_6) (minor contribution)

MWRA operations are not believed to emit perfluorocarbons (PCFs) or nitrogen trifluoride.

The base year for this greenhouse gas inventory is 2006 because it is the earliest year with consistent and reliable data for all emissions sources. As the MWRA monitors and tracks progress over time in reducing GHG emissions, consideration will be given for extending the base year further back.

<u>Operational Boundaries</u>

In order to categorize direct and indirect emissions, to improve transparency, to standardize accounting practices, and to identify different types of climate policies and goals, emissions are reported within the bucket of one of three Scopes:



Source: GHG Protocol

Scope 1 emissions include stationary combustion to produce power at a fixed location, mobile combustion of fuels in fleet transportation sources, and process and fugitive emissions.

Process emissions include:

- Process CH_4 from WWTP
- Process N_2O from WWTP without nitrification
- Process N_2O from WWTP with nitrification
- Process N_2O from effluent discharge to receiving aquatic environments

Fugitive emissions include:

- CH_4 from incomplete combustion of digester gas
- CH_4 emissions from venting digester gas
- CH_4 fugitive emissions from distribution
- CO_2 fugitive emissions from dry tonnage sludge
- CH_4 from landfill without LFG collection

Scope 2 emissions include:

- Emissions from electricity purchased estimated with MassDEP and supplier-based emission factors

Biogenic emissions were also accounted for, but not included in the inventory (aggregate emissions) per standard practices and guidance from the GHG Protocol and LGOP (See Appendix C).

Biogenic emissions include:

- Digester gas combustion and flaring (CO_2)
- Process CO_2 from digester gas
- Biogenic emissions from electricity purchases

- Mobile emissions from biodiesel and ethanol

Biogenic vs. Anthropogenic Emissions[vi]

The combustion of biomass and biomass-based fuels (such as wood, wood waste, landfill gas, ethanol, etc.) emit CO_2 emissions, but these CO_2 emissions are distinct from Scope 1 emissions generated by combusting fossil fuels. The CO_2 emissions from biomass combustion are tracked separately because the carbon in biomass is of a biogenic origin—meaning that it was recently contained in living organic matter—while the carbon in fossil fuels has been trapped in geologic formations for millennia. Because of this biogenic origin, the IPCC Guidelines for National Greenhouse Gas Inventories requires that CO_2 emissions from biomass combustion be reported separately.[vii]

Not included in the MWRA GHG inventory:

Scope 1

- Refrigerants from field operations (Deer Island and Biosolids Processing Facility refrigerants are included)
- CH_4 and N_2O emissions from operating field equipment

Scope 3

- Grit & screenings disposed of in landfills by MWRA contractor
- Life cycle emissions of chemicals used (including liquid oxygen and soda ash)
- Contracted transportation
- Energy extraction/production/transportation
- Contracting construction and new projects
- Life cycle emissions of goods and services procured
- Waste emissions

Rationale for exclusion of certain emissions sources

Per the guidelines set forth in the LGOP, the water and wastewater systems at MWRA were studied and interviews conducted with facilities managers and engineers in order to identify any additional potential emissions sources.

Emissions from refrigerants were only accounted for at the Deer Island and Biosolids Processing facilities because emissions from refrigerants in field operations are considered insignificant, and data is difficult or impossible to source outside these large facilities.

Several Scope 3 emissions sources, which are optional to report, were excluded from this inventory. Future updates may be expanded to include Scope 3 emissions from sources such as contracted transportation (trucks, trains, barges), life cycle of chemicals (especially liquid oxygen and soda ash), and energy extraction and distribution. Scope 3 emissions, despite being indirect, often provide important and actionable information. For this reason, MWRA conducted an authority-wide Employee Commuter Survey in 2014 to assess Scope 3 emissions associated with employee commuting. Post COVID-19 pandemic, most MWRA office staff are splitting

their time between remote work and a consolidated office at the Chelsea facility, so a new survey of employee commuting patterns is needed.

Calculation methods:

Activity data[viii] are the relevant measurement of energy use or other GHG generating processes. Examples of activity data referenced in this Protocol include fuel consumption by fuel type, metered energy consumption, and vehicle mileage by vehicle type. Activity data are used in conjunction with an emission factor (see Appendix B) to determine emissions using the following generalized equation:

$$Emissions = Activity\ Data \times Emission\ Factor$$

Appendix B: Emission Factors and Global Warming Potentials

Emission factors[ix] are calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source. Emission factors are used to convert activity data, like energy usage, into the associated GHG emissions and thus are central to creating an emissions inventory. Emissions factors are usually expressed in terms of emissions per unit of energy used (e.g., lbs. of CO_2 per kWh).

Emission factors are determined by means of direct measurement, laboratory analyses or calculations based on representative heat content and carbon content. The Local Government Operations Protocol (LGOP) provides default emission factors for most calculation methodologies.

Massachusetts-based (MassDEP) approach reflects the average emissions of electricity generation for all energy that is consumed by the state. [x]

In previous inventories for electricity use, MWRA used a combination of supplier specific, EPA eGRID, and MassDEP emissions factors to estimate emissions. The current inventory update uses only a MassDEP non-biogenic statewide emission factor, which has been applied to all years of available data. MassDEP generally publishes these statewide values with a lag of about 3 years, so a 2021 value is being used to estimate 2022 emissions. The estimate of 2022 emissions from electricity may change when an updated factor becomes available, and will be reflected in a later emissions inventory update.

Stationary Scope 1 Emissions Factors
(Source: EPA Climate Leaders Emission Factors, updated April 2023)

Natural Gas	CO2	CH4	N2O
	kg CO2/mmBtu	g CH4 / mmBtu	g N2O / mmBtu
	53.06	1	0.1
	kg CO2/mmBtu	kg CH4 / mmBtu	kg N2O / mmBtu
	53.06	0.001	0.0001

Digester Gas	CO2	CH4	N2O
	kg CO2 / MMBtu	kg CH4 / mmBtu	kg N2O / mmBtu
	52.07	0.0032	0.00063

Diesel Fuel (Mobile)	CO2	CH4	N2O
	kg CO2 / gallon	kg CH4 / gallon	kg N2O / gallon
	10.21	0.00041	0.00008

Diesel (Stationary) - Distillate Fuel #2	CO2	CH4	N2O
	kg CO2 / MMBtu	kg CH4 / mmBtu	kg N2O / mmBtu
	73.96	0.003	0.0006

Propane	CO2	CH4	N2O
	kg CO2/mmBtu	g CH4 / mmBtu	g N2O / mmBtu
	62.87	3	0.6
	kg CO2/mmBtu	kg CH4 / mmBtu	kg N2O / mmBtu
	62.87	0.003	0.0006

Mobile Emissions Factors
(Source: EPA Climate Leaders Emission Factors, updated April 2023**)**

Vehicle Fuel Use	CO2
Mobile Combustion CO2	kg CO2 / gallon
Motor Gasoline	8.78
Diesel Fuel	10.21
Ethanol	5.75
Biodiesel	9.45

Vehicle Mileage			
		CH4	N2O
Vehicle Type	**Vehicle Year**	**kg/mile**	**kg/mile**
Diesel Heavy-Duty Vehicle	1960-present	0.0000051	0.0000048
Diesel Light-Duty Truck	1983-1995	0.0000005	0.000001
Diesel Light-Duty Truck	1996-present	0.0000005	0.000001
CNG Light-Duty Truck	All	0.000737	0.00005
Gasoline Heavy-Duty Vehicle	1990-1995	0.0003246	0.0001142
Gasoline Heavy-Duty Vehicle	1997	0.0000924	0.0001726
Gasoline Heavy-Duty Vehicle	1998	0.0000641	0.0001693
Gasoline Heavy-Duty Vehicle	1999	0.0000578	0.0001435
Gasoline Heavy-Duty Vehicle	2000	0.0000493	0.0001092
Gasoline Heavy-Duty Vehicle	2001	0.0000528	0.0001235
Gasoline Light-Duty Truck	1987-1993	0.0000813	0.0001035
Gasoline Light-Duty Truck	1994	0.0000646	0.0000982
Gasoline Light-Duty Truck	1995	0.0000517	0.0000908
Gasoline Light-Duty Truck	1996	0.0000452	0.0000871
Gasoline Light-Duty Truck	1997	0.0000452	0.0000871
Gasoline Light-Duty Truck	1998	0.0000391	0.0000728
Gasoline Light-Duty Truck	1999	0.0000321	0.0000564
Gasoline Light-Duty Truck	2000	0.0000346	0.0000621
Gasoline Light-Duty Truck	2001	0.0000151	0.0000164
Gasoline Light-Duty Truck	2002	0.0000178	0.0000228
Gasoline Light-Duty Truck	2003	0.0000155	0.0000114
Gasoline Light-Duty Truck	2004	0.0000152	0.0000132
Gasoline Light-Duty Truck	2005	0.0000157	0.0000101
Gasoline Light-Duty Truck	2006	0.0000159	0.0000089
Gasoline Light-Duty Truck	2007	0.0000161	0.0000079
Gasoline Light-Duty Truck	2008-present	0.0000163	0.0000066
Gasoline Passenger Car	1992	0.0000704	0.0000647
Gasoline Passenger Car	1995	0.0000358	0.0000473
Gasoline Passenger Car	1996	0.0000272	0.0000426
Gasoline Passenger Car	1998	0.0000249	0.0000393
Gasoline Passenger Car	2000	0.0000178	0.0000273
Gasoline Passenger Car	2002	0.0000107	0.0000153
Gasoline Passenger Car	2003	0.0000114	0.0000135
Gasoline Passenger Car	2009-present	0.0000173	0.0000036

Process and Fugitive Emissions Factors

Emission factor for a WWTP without nitrification/ denitrification (g N2O/person/year)	**3.2**
Emission factor for a WWTP with nitrification/denitrification (g N2O/person/year)	**7**
Emission factor [kg N2O-N/kg sewage-N produced]	**0.005**
Natural Gas Fugitve Emissions from Distribution: Simplified Estimation Method: Emissions Factor (mt CH4/mile of pipe)	**1.611**

Source: LGOP v1.1 & GRP electric power sector, ST-07

Electricity Emissions Factors

MA DEP Non-Biogenic Emission Factor** (lbs. CO2e / kWh)	
2006	0.990
2007	1.019
2008	0.918
2009	0.849
2010	0.858
2011	0.738
2012	0.646
2013	0.655
2014	0.616
2015	0.638
2016	0.610
2017	0.567
2018	0.472
2019	0.443
2020	0.541
2021	0.496
2022**	0.496

Source: MassDEP

*The number above represent the MA-based non-biogenic emissions factor with transmission loss of 5-7% applied.
** No value has been published for 2022 at time of writing. 2021 value used as placeholder

EPA eGRID Renewable and Avoided Emission Factor (lbs. / kWh)			
	CO2	CH4	N2O
2006	1.315	7.7E-05	1.6E-05
2007	1.205	6.1E-05	1.3E-05
2008	1.205	6.1E-05	1.3E-05
2009	1.157	6.2E-05	1.4E-05
2010	1.107	6.2E-05	1.2E-05
2011	1.107	6.2E-05	1.2E-05
2012	1.080	6.8E-05	1.3E-05
2013	1.080	6.8E-05	1.3E-05
2014	1.066	1.1E-04	1.5E-05
2015	1.066	1.1E-04	1.5E-05
2016	0.975	8.6E-05	1.1E-05
2017	0.975	8.6E-05	1.1E-05
2018	0.931	8.6E-05	1.1E-05
2019	0.840	8.9E-05	1.2E-05
2020	0.883	7.0E-05	9.0E-06
2021	0.900	7.3E-05	9.0E-06
2022*	0.900	7.3E-05	9.0E-06

Source: EPA, Northeast Power Coordinating Council (NPCC) New England Emission factors used for calculating avoided emissions from renewables use “Annual Non-Baseload Output Emissions Rates”. See p. 18.

* No value has been published for 2022 at time of writing. 2021 value used as placeholder

Global Warming Potentials (GWP) are conversion factors used to compare all greenhouse gas emissions to carbon dioxide equivalent units. The GWP represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing thermal infrared radiation. All calculations presented in this report are based on global warming potentials published by the IPCC Fourth Assessment Report[xi].

Global Warming Potentials	
CO2	**1**
CH4	**25**
N2O	**298**

Source: IPCC, AR4

Refrigerants

Global Warming Potentials	
R-134a	1,430
R-404A	3,922
R-407C	1,774
R-410A	2,088

Source: IPCC, AR4

Appendix C: Emissions Tables (including Biogenic)

MWRA's greenhouse gas emissions in metric tons of CO_2e by scope and year since 2006 are shown in Table 3 below. Net reductions in emissions are primarily due to reductions from purchased electricity, while other categories are relatively stable over this period. Reductions in electricity emissions are due to efficiency gains and deployment of on-site renewable energy that have reduced overall demand, as well as continued deployment across the regional electric grid that has reduced the amount of emissions per unit of purchased power.

Table 2 shows that indirect energy consumption is the largest single source of emissions. These emissions were calculated using Mass DEP's non-biogenic electricity emission factors. Losses during transmission and distribution, which are estimated at 5.7-7% depending on year, are accounted for in these emission factors. Statewide as opposed to supplier specific factors have been used to provide a consistent and conservative estimate of emissions that recognizes the interconnectedness of the regional power grid.

Large contributors to direct energy consumption associated GHG emissions include natural gas use - primarily by the heaters and dryers at the Biosolids Processing Facility, and diesel use - most significantly by the backup generators at DITP, and in the MWRA's vehicle fleet. Scope 3 emissions, which are considered optional to report under the LGOP standards, have not been reported. Lifecycle emissions from treatment chemicals and construction materials are likely the largest sources of scope 3 emissions, and these have not yet been estimated. We hope to begin estimating these values in annual reporting from 2023 onwards. While some scope 3 emissions from employee commutes have been estimated, these are based on a 2014 survey of commuting patterns that are no longer considered relevant, especially given MWRA's office space and major expansion of remote work.

Table 3 below includes estimated biogenic emissions from MWRA's use of digester gas to produce heat at Deer Island. The LGOP specifies that biogenic CO_2 emissions from combustion of biomass should be quantified and reported, but should not be included in scope 1 emissions. [xii] These values should not be considered a complete estimate of biogenic emissions at the MWRA.

Table 2: GHG Emissions by Scope – CY 2006 through 2022

Metric tons CO2e by type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Scope 1 (direct)																	
Stationary	36,483	33,317	27,556	27,896	40,739	28,161	27,756	27,925	28,734	29,041	31,350	34,865	34,511	34,871	28,264	28,134	28,328
Mobile	2,142	2,173	2,125	2,082	2,155	2,131	2,083	2,099	2,081	2,142	1,966	2,060	2,052	1,990	1,804	1,981	1,805
Process	6,726	6,655	7,498	5,263	5,599	7,777	6,082	5,780	8,115	7,253	7,877	7,511	6,796	6,815	8,103	6,663	8,001
Fugitive	11,883	11,265	11,185	11,756	11,199	11,752	11,318	11,765	11,458	9,836	10,850	11,259	10,464	10,883	9,676	9,871	9,650
Total Scope 1	57,234	53,409	48,364	46,997	59,692	49,821	47,239	47,568	50,388	48,271	52,043	55,695	53,824	54,559	47,846	46,649	47,784
Scope 2 (indirect)																	
Electricity (MassDEP Emission Factor)	87,590	90,270	82,183	71,641	67,893	61,807	49,643	51,379	47,403	47,387	42,892	40,327	36,243	33,094	40,529	38,600	37,294
Total (metric tons CO2e) Scope 1 & 2	**144,823**	**143,679**	**130,547**	**118,637**	**127,585**	**111,628**	**96,882**	**98,947**	**97,791**	**95,657**	**94,935**	**96,022**	**90,066**	**87,653**	**88,375**	**85,249**	**85,079**

Table 3: MWRA Biogenic Emissions – CY 2006 through 2022

tCO2e by type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Biogenic Biogas Combustion CO2	51,526	49,342	49,798	51,816	48,774	52,296	50,612	53,003	53,382	50,194	53,474	54,599	54,982	55,248	49,437	49,227	47,190
Biogenic Biogas Flaring CO2	2,191	1,311	1,025	947	1,854	1,202	1,414	1,324	1,689	998	1,560	1,065	637	1,710	885	1,149	928
Biogenic Ethanol CO2	57	82	76	70	64	62	61	60	60	57	57	58	57	52	53	50	47
Biogenic Biodiesel CO2	48	50	51	54	61	62	60	62	60	66	57	61	61	62	51	62	56
Digester Gas Process CO2	32,875	31,693	31,693	33,311	30,480	33,754	33,039	32,435	32,613	33,276	32,215	33,240	34,222	34,632	31,531	31,919	32,050
Biogenic Emissions	**86,697**	**82,477**	**82,644**	**86,197**	**81,233**	**87,375**	**85,187**	**86,883**	**87,805**	**84,590**	**87,363**	**89,023**	**89,959**	**91,703**	**81,958**	**82,407**	**80,271**

Appendix D: Endnotes

i https://ghgprotocol.org/corporate-standard

ii https://ww2.arb.ca.gov/sites/default/files/classic/cc/protocols/lgo_protocol_v1_1_2010-05-03.pdf

iii https://www.epa.gov/climateleadership/ghg-emission-factors-hub

iv https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

v See Division 5.3.5 of the National Greenhouse and Energy Reporting (Measurement) Determination 2008
https://www.legislation.gov.au/Details/F2022C00737/Html/Text#_Toc107314679

vi See EPA Accounting Framework for Biogenic CO2 Emissions from Stationary Sources: http://www.epa.gov/climatechange/Downloads/ghgemissions/Biogenic-CO2-Accounting-Framework-Report-Sept-2011.pdf

vii See the LGOP v1.1, http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

viii See the LGOP v1.1, http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

ix See the LGOP v1.1, http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

x Technical Support Document: GHG Emission Factors:
https://www.mass.gov/lists/massachusetts-greenhouse-gas-ghg-reporting-program-data

xi https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

xii See the LGOP v1.1, http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: FY24 Financial Update and Summary through December 2023

COMMITTEE: Administration, Finance & Audit

_X_ INFORMATION
___ VOTE

Michael J. Cole, Budget Director
James J. Coyne, Budget Manager
Preparer/Title

Thomas J. Durkin
Director, Finance

RECOMMENDATION:

For information only. This staff summary provides the financial results and variance highlights for Fiscal Year 2024 through December 2023, comparing actual spending to the budget.

DISCUSSION:

In December, MWRA continued the practice of setting aside favorable Capital Finance variances into the Defeasance Account with the intention of recommending Board approval to use these funds to defease debt and provide rate relief in future years. Targeted defeasances are a critical component of the Authority's multi-year rate management strategy. As such, in December the year-to-date debt related savings of $1.6 million was transferred to the Defeasance Account. This variance is primarily due to lower than budgeted variable interest expense and savings from the swap terminations.

The total Year-to-Date variance for the FY24 CEB is $16.3 million, due to lower direct expenses of $11.4 million, indirect expenses of $1.0 million, and higher revenue of $3.9 million.

FY24 Current Expense Budget

The CEB expense variances through December 2023 by major budget category were:

- Lower Direct Expenses of $11.4 million or 7.6% under budget. Spending was lower for Wages & Salaries, Chemicals, Professional Services, Other Services, Fringe Benefits, Utilities, and Training & Meetings. Spending was higher than budget for Maintenance, Other Materials, Overtime, and Workers' Compensation.

- Lower Indirect Expenses of $1.0 million or 2.8% under budget due primarily to lower Watershed Reimbursements.

- Debt Service expenses were on budget after the transfer of $1.6 million to the defeasance account.
- Revenue was $3.9 million or 0.9% over budget driven by higher Investment Income of $4.0 million due to higher than budgeted interest rates and higher average balances.

FY24 Budget and FY24 Actual Variance by Expenditure Category
(in millions)

	FY24 Budget	FY24 Actual	$ Variance	% Variance
Direct Expenses	$150.2	$138.8	-$11.4	-7.6%
Indirect Expenses	$36.7	$35.6	-$1.0	-2.8%
Capital Financing	$221.6	$221.6	$0.0	0.0%
Total	**$408.5**	**$396.1**	**-$12.4**	**-3.0%**

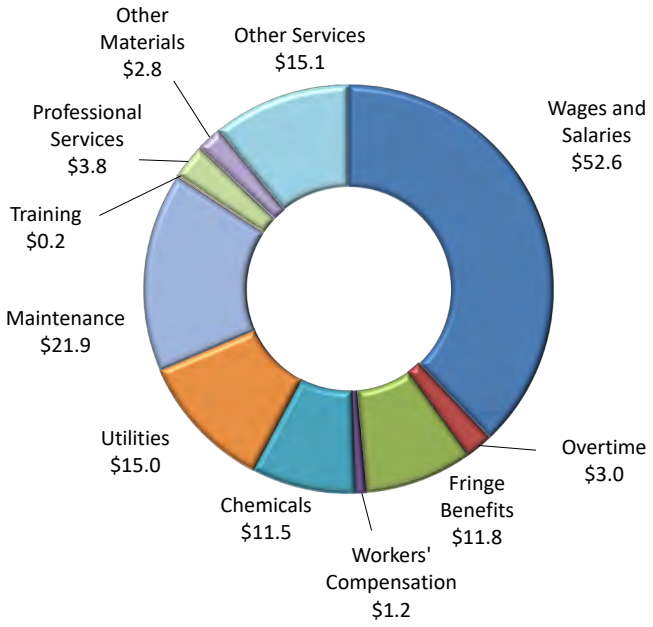
Totals may not add due to rounding

Please refer to Attachment 1 for a more detailed comparison by line item of the budget variances for FY24.

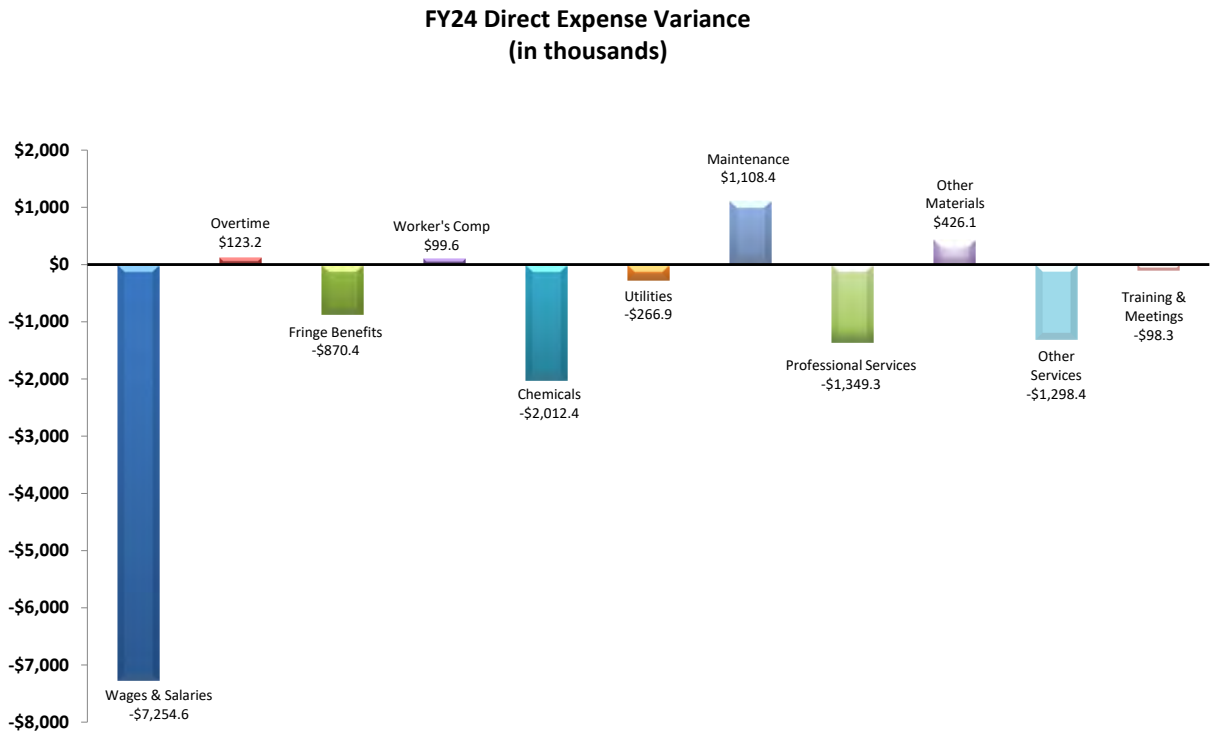
Direct Expenses

FY24 Direct Expenses through December totaled $138.8 million, which was $11.4 million or 7.6% less than budgeted.

FY24 Direct Expenses
(in millions)

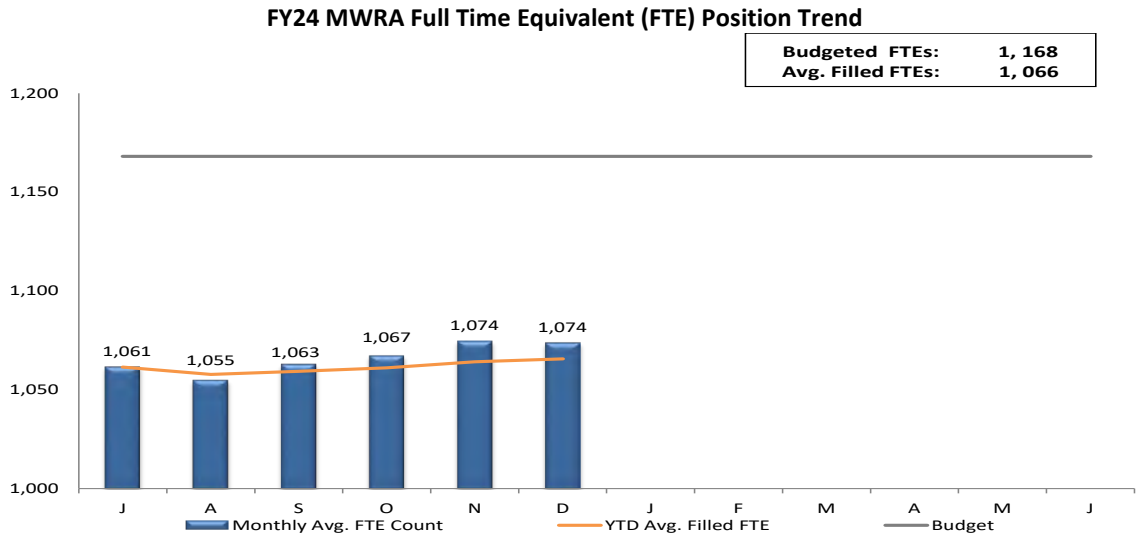


Spending was lower than budget for Wages & Salaries, Chemicals, Professional Services, Other Services, Fringe Benefits, Utilities, and Training & Meetings. These were partially offset by higher than budgeted spending for Maintenance, Other Materials, Overtime, and Workers' Compensation.



Wages and Salaries

Wages and Salaries were under budget by $7.3 million or 12.1%. Through December, there were 102 fewer average FTEs (1,066 versus 1,168 budget) or 8.7% and lower average salaries for new hires versus retirees. The timing of backfilling vacant positions also contributed to Regular Pay being under budget.



Chemicals

Chemicals were lower than budget by $2.0 million or 14.9%. Lower than budgeted spending on Sodium Hypochlorite of $1.1M driven by lower Water Operations of $1.1 million and Wastewater Operations of $143,000 due to contract pricing, partially offset by higher use at DITP of $199,000 due to additional usage for disinfection and odor control due to higher flows. Carbon Dioxide was lower than budget by $354,000 primarily due to lower dosages needed, Aqua Ammonia of $160,000 due to lower usage and deliveries due to lower flows, Polymer of $146,000 due to lower secondary waste sludge production due to the multiple rain events resulting in higher plant flows, Sodium Bisulfite of $127,000 primarily driven by Deer Island due to lower quantities to dechlorinate the effluent, and Other Oxidizers (Bioxide) at Framingham PS was lower than budget by $111,000 due to less deliveries and lower price, partially offset by higher Hydrogen Peroxide of $174,000 which is added to the DITP influent to reduce elevated H2S levels for odor pretreatment and corrosion control, and allows staff to perform maintenance activities more safely within the tanks. DITP flows are 5.2% greater than the budget and the CWTP preliminary flows are 4.1% less than the budget through December. It is important to note that Chemical variances are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries is an important factor.

Professional Services

Professional Services were less than budget by $1.3 million or 26.3% driven by lower Other Services of $594,000 due to timing of services including the Disparity Study, Computer Systems Consultant of $208,000, Lab & Testing Analysis of $171,000, Legal Services of $166,000 all due to timing of spending.

Other Services

Other Services were lower than budget by $1.3 million or 7.9% driven by Telecommunications of $561,000 due to less than anticipated costs, Sludge Pelletization of $223,000 and Grit & Screenings Removal of $222,000 both due to lower quantities, Other Services of $111,000 due to timing and less than anticipated needs, and Police Details of $83,000 due to less than anticipated needs.

Maintenance

Maintenance was greater than budget by $1.1 million or 5.3%, largely driven by the timing of projects. Maintenance Materials are over budget by $895,000 million driven by higher Plant & Machinery Materials of $925,000 due to timing and higher spending for glass lined pipe/fittings, seals, and grinder cartridges, Electrical Materials of $111,000 due to timing, and Warehouse Inventory of $596,000 due to need for spare parts as well as purchasing of materials early due to supply chain issues. These are partially offset by lower Special Equipment Materials of $307,000 due to timing including the purchase of hatch covers at Loring Road, HVAC Materials of $247,000, Building and Grounds Materials of $131,000, and Pipeline Materials of $103,000 also due to timing. Maintenance Services were greater than budget by $213,000 driven by higher Computer Software-Licenses/Upgrades of $839,000 primarily due to timing, Plant & Machinery Services of $340,000 due to timing and higher spending for gearbox rebuilds at DITP. This greater than budgeted spending was partially offset by lower Electrical Services of $436,000, Computer

Services of $204,000, Special Equipment Services of $114,000, and HVAC Services of $105,000 all due to timing of work.

Fringe Benefits

Fringe Benefit spending was lower than budget by $870,000 or 6.9%. Spending was lower than budget for Health Insurance of $880,000, due to fewer than budgeted participants in health insurance plans, increased contribution by external new hires vs. lower contribution rates of staff retiring, and the shift from family to individual plans which are less expensive.

Other Materials

Other Materials were greater than budget by $426,000 or 17.8% driven by higher Computer Hardware of $351,000 primarily due to timing of equipment purchases including purchases that will be reclassified to the CIP, and Vehicle Expense of $125,000 due to timing of vehicle expenses including the electrical vehicle charging stations originally anticipated to be completed by FY23.

Utilities

Utilities were lower than budget by $267,000 or 1.7%. Underspending in Diesel Fuel of $1.4 million primarily due to timing of purchasing at Deer Island Treatment Plant (DITP). The Diesel Fuel purchase is expected later in the fiscal year. Overspending in Electricity of $1.2 million primarily at DITP of $663,000 is driven by a new pass through cost associated with the Mystic Power Station and higher demand usage charges due to the many rain events. Electricity in Field Operations was greater than budget by $509,000 due to higher use, partially offset by lower pricing than budget.

Worker's Compensation

Worker's Compensation expenses were greater than budget by $100,000 or 9.3%. The greater than budgeted expenses were due to higher Medical Payments of $86,000 and Compensation Payments of $31,000, partially offset by lower Administrative Expenses of $17,000. Due to uncertainties of when spending will happen, the budget is spread evenly throughout the year.

Overtime

Overtime expenses were greater than budget by $123,000 or 4.2%. Greater than budgeted spending at Deer Island Treatment Plant of $221,000 is due to shift coverage, partially offset by lower OT in Field Operations of $30,000 due to less than planned emergency, and planned overtime due to existing vacancies, and Engineering & Construction of $31,000. Year-to-date rainfall was a major contributor for the increased overtime.

Training & Meetings

Training & Meetings was lower than budget by $98,000 or 35.3% primarily due to timing of spending.

Indirect Expenses

Indirect Expenses totaled $35.6 million, which is $1.0 million or 2.8% lower than budget. The variance is driven by lower Watershed Reimbursements.

Based on FY24 operating activity only, the Watershed Division is $1.1 million or 11.7% under budget. Lower spending on Wages and Salaries, Fringe Benefits, and Maintenance are driving the variance. When factoring in the FY23 balance forward of $157,000 which was a credit towards FY24, Watershed Reimbursement is $1.3 million or 13.4% below budget through December 2023.

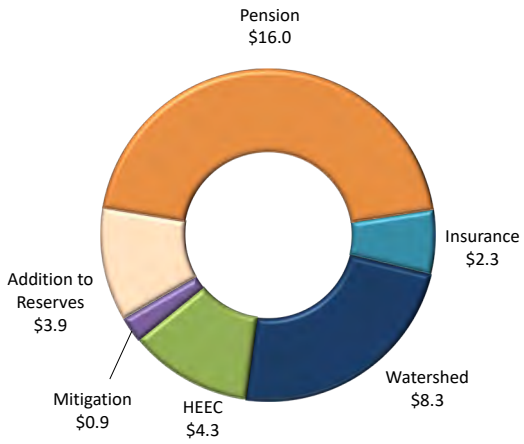
FY24 Watershed Protection Variance

$ in millions	YTD Budget	YTD Actual	YTD $ Variance	YTD % Variance
Operating Expenses	10.3	9.0	-1.3	-13.0%
Operating Revenues - Offset	0.7	0.5	-0.2	-30.5%
FY24 Operating Totals	**9.6**	**8.5**	**-1.1**	**-11.7%**
DCR Balance Forward (FY23 year-end accrual true-up)	0.0	-0.2	-0.2	
FY24 Adjusted Operating Totals	**9.6**	**8.3**	**-1.3**	**-13.4%**
PILOT	0.0	0.0	0.0	0.0%
Total Watershed Reimbursement	**9.6**	**8.3**	**-1.3**	**-13.4%**

Totals may not add due to rounding

MWRA reimburses the Commonwealth of Massachusetts Department of Conservation (DCR) and Recreation - Division of Water Supply Protection – Office of Watershed Management for expenses. The reimbursements are presented for payment monthly in arears. Accruals are being made monthly based on estimated expenses provided by DCR and trued-up monthly based on the monthly invoice. MWRA's budget is based on the annual Fiscal Year Work Plan approved by the Massachusetts Water Supply Protection Trust (with a vacancy adjustment applied). The FTE count at the end of December was 149 (and 144.5 on a year-to-date basis) vs. a budget of 150.

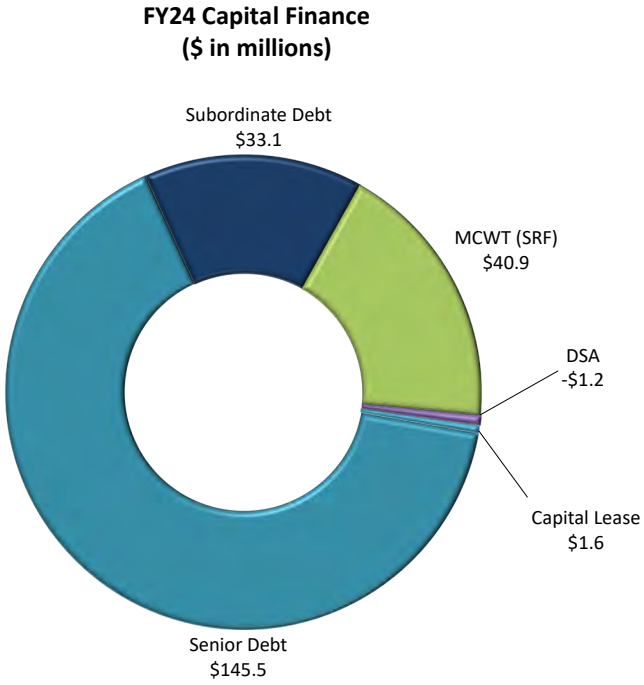
FY24 Indirect Expenses
(in millions)



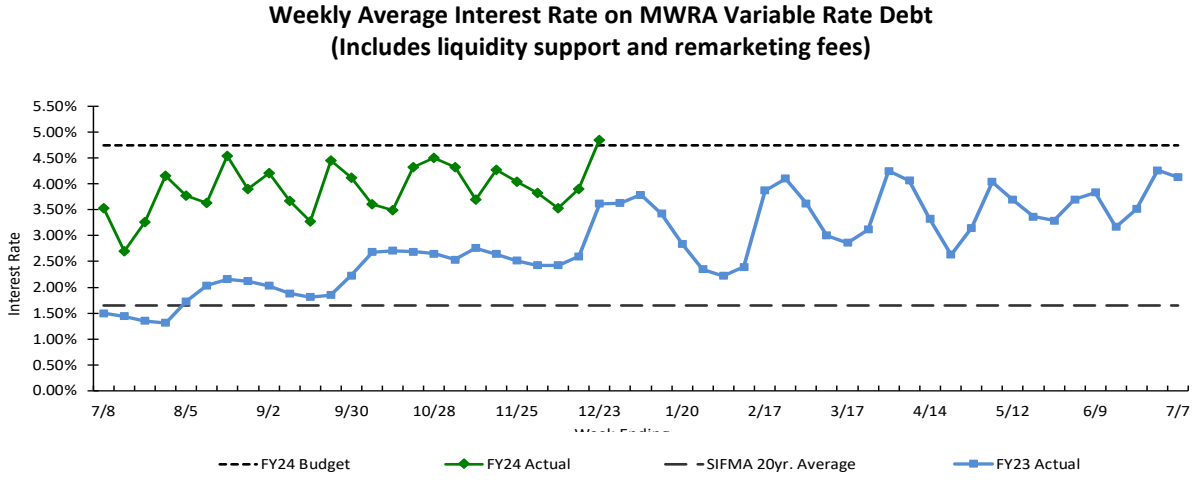
Capital Financing

Capital Financing expenses include the principal and interest payments for fixed senior debt, the variable subordinate debt, the Massachusetts Clean Water Trust (SRF) obligation, the commercial paper program for the local water pipeline projects, current revenue for capital, Optional Debt Prepayment, and the Chelsea Facility lease payment.

Capital Financing expenses for FY24 through December totaled $221.6 million, which is at budget after the transfer of $1.6 million to the Defeasance account. The transfer reflects lower variable rate debt expense due to lower than anticipated interest rates as well as savings from the swap terminations.



The graph below reflects the FY24 actual variable rate trend by week against the FY24 Budget.



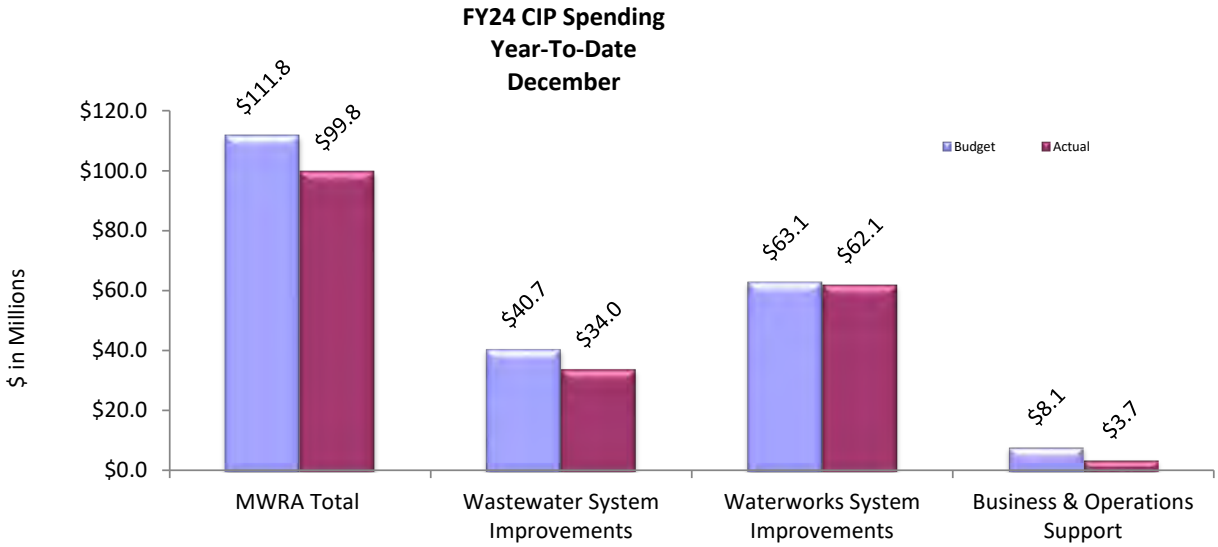
Revenue & Income

Revenues of $441.3 million were $3.9 million or 0.9% over the estimate driven by Investment Income which was $4.0 million or 37.6% over the estimate due to higher than anticipated interest rates and higher average balances.

FY24 Capital Improvement Program

Capital expenditures in Fiscal Year 2024 through December total $99.8 million, $12.0 million or 10.7% under planned spending.

After accounting for programs which are not directly under MWRA's control, most notably the Inflow and Infiltration (I/I) grant/loan program, the Local Water System Assistance loan program, and the community managed Combined Sewer Overflow (CSOs) projects, capital spending totaled $59.2 million, $19.1 million or 24.4% under planned spending.



Overall, CIP spending reflects under planned spending in Wastewater Improvements ($6.6 million), Waterworks ($1.0 million) and Business and Operations Support ($4.4 million). Major variances in Wastewater are primarily due to timing of community grants and loans for the I/I Local Financial Assistance Program, timing of work and construction delays for Braintree/Weymouth Improvements – Construction, delay in performing shaft inspections and issuing NTP for Final Design for the Ward Street & Columbus Park Headworks Upgrades - Design/CA contract, and lower than projected task order work for DITP As-Needed Design contracts. This was partially offset by equipment received ahead of schedule for the Clarifier Rehabilitation Phase 2 – Construction contract, work scheduled for FY24 that was completed in

FY23 for Chelsea 008 Pipe Replacement, contractor progress for DITP Radio Repeater System Upgrade, and timing of work for Clinton Screw Pumps Replacement Phase 1 – Construction.

Waterworks variances are primarily due to timing of work for Section 89/29 Replacement – Construction, timing of consultant's work for Tunnel Redundancy Preliminary Design and Massachusetts Environmental Policy Act (MEPA) Review, and timing of services for Geotechnical Support. This was partially offset by timing of community loan distributions for the Water Loan Program, timing of work for Waltham Water Pipeline and contractor progress for CP-2, Sections 25 & 24 – Construction contracts, and work scheduled in FY23 that was completed in FY24 for the CWTP Chemical Feed System Improvements – Construction.

$ in Millions	Budget	Actuals	$ Var.	% Var.
Wastewater System Improvements				
Interception & Pumping	14.0	7.7	(6.2)	-44.7%
Treatment	3.7	9.8	6.1	165.7%
Residuals	0.0	0.0	0.0	0.0%
CSO	1.9	0.5	(1.4)	-72.6%
Other	21.1	16.0	(5.1)	-24.2%
Total Wastewater System Improvements	**$40.7**	**$34.0**	**($6.6)**	**-16.3%**
Waterworks System Improvements				
Drinking Water Quality Improvements	1.6	1.1	(0.5)	-30.6%
Transmission	24.2	19.1	(5.1)	-21.1%
Distribution & Pumping	21.2	14.3	(6.9)	-32.4%
Other	16.0	27.5	11.5	71.8%
Total Waterworks System Improvements	**$63.1**	**$62.1**	**($1.0)**	**-1.5%**
Business & Operations Support	**$8.1**	**$3.7**	**($4.4)**	**-54.6%**
Total MWRA	**$111.8**	**$99.8**	**($12.0)**	**-10.7%**

FY24 Spending by Program:

The main reasons for the project spending variances in order of magnitude are:

Other Waterworks: Net over planned spending of $11.5 million

- $12.6 million for Local Financial Assistance due to timing of community loan distributions.
- This over planned spending was partially offset by less than planned spending of $0.4 million for Steel Tank Improvements due to updated schedule.

Water Distribution and Pumping: Net under planned spending of $6.9 million

- $4.1 million for Section 89/29 Replacement – Construction, $2.3 million for CP-1 NEH Improvements due to timing of work, and $0.6 million for Section 75 Extension - Construction CP-1 due to updated schedule.

Interception & Pumping: Net under planned spending of $6.2 million

- $3.6 million for Braintree/Weymouth Improvements – Construction due to timing, long lead time for equipment and delay in fabrication of structural steel.

$0.7 million for Ward Street & Columbus Park Headworks Upgrades - Design/CA due to delay in performing shaft inspections and issuing NTP for Final Design.

Wastewater Treatment: Net over planned spending of $6.1 million

- $6.6 million for Clarifier Rehabilitation Phase 2 – Construction due to equipment received ahead of schedule.
- $0.3 million for Clinton Screw Pumps Replacement Phase 1 – Construction due to timing of work.
- $0.3 million for Radio Repeater System Upgrade 2 due to contractor progress.
- This over planned spending was partially offset by under planned spending of $0.5 million for Deer Island As-Needed Design contracts due to lower than projected task order work.

Waterworks Transmission: Net under planned spending of $5.1 million

- $3.0 million for Tunnel Redundancy Preliminary Design & MEPA Review due to timing of consultant work.
- $1.2 million for Geotechnical Support Services due to timing of support services.
- $0.9 million for WASM 3 Rehabilitation CP-1 due to work scheduled for FY24 performed in FY23.

  This under planned spending was partially offset by over planned spending of $3.2 million for Waltham Water Pipeline due to work scheduled in FY23 that was performed in FY24.

Other Wastewater: Net under planned spending of $5.1 million

$5.1 million for Community I/I due to timing of community distributions of grants and loans.

Business & Operations Support: Net under planned spending of $4.4 million

- $2.0 million for As-Needed Design Contracts due to lower than projected task order work.
- $1.0 million for Security Equipment & Installation due to timing of security initiatives.
- $0.5 million for MAXIMO Interface Enhancements, $0.4 million for Oracle Database Appliance, and $0.3 for Core Switches due to timing and scheduling of work.

Combined Sewer Overflow: Net underspending of $1.4 million

- $0.8 million for Chelsea 008 CSO Pipe Replacement due to work scheduled for FY24 performed in FY23, and $0.4 million for Fort Point Channel & Mystic due to timing of community work.

Construction Fund Balance

The construction fund balance was $123.1 million as of the end of December. Commercial Paper/Revolving Loan available capacity was $120 million.

ATTACHMENTS:

Attachment 1 – Variance Summary December 2023
Attachment 2 – Current Expense Variance Explanations
Attachment 3 – Capital Improvement Program Variance Explanation

ATTACHMENT 1
FY24 Actuals vs. FY24 Budget

	Dec 2023 Year-to-Date				
	Period 6 YTD Budget	Period 6 YTD Actual	Period 6 YTD Variance	%	FY24 Approved
EXPENSES					
WAGES AND SALARIES	$ 59,899,414	$ 52,644,767	$ (7,254,647)	-12.1%	$ 127,828,242
OVERTIME	2,910,062	3,033,220	123,158	4.2%	5,727,593
FRINGE BENEFITS	12,683,527	11,813,159	(870,368)	-6.9%	25,823,383
WORKERS' COMPENSATION	1,072,197	1,171,801	99,604	9.3%	2,144,395
CHEMICALS	13,502,534	11,490,114	(2,012,420)	-14.9%	28,269,124
ENERGY AND UTILITIES	15,255,312	14,988,460	(266,852)	-1.7%	31,064,890
MAINTENANCE	20,760,785	21,869,227	1,108,442	5.3%	38,574,256
TRAINING AND MEETINGS	278,658	180,345	(98,313)	-35.3%	498,597
PROFESSIONAL SERVICES	5,127,251	3,777,963	(1,349,288)	-26.3%	10,410,484
OTHER MATERIALS	2,391,828	2,817,881	426,053	17.8%	7,167,400
OTHER SERVICES	16,360,275	15,061,918	(1,298,357)	-7.9%	38,494,660
TOTAL DIRECT EXPENSES	**$ 150,241,843**	**$ 138,848,855**	**$ (11,392,987)**	**-7.6%**	**$ 316,003,024**
INSURANCE	$ 2,032,690	$ 2,255,817	$ 223,127	11.0%	$ 4,065,380
WATERSHED/PILOT	9,597,465	8,313,612	(1,283,853)	-13.4%	30,358,187
HEEC PAYMENT	4,232,163	4,252,503	20,340	0.5%	7,500,650
MITIGATION	889,543	889,543	-	0.0%	1,779,086
ADDITIONS TO RESERVES	3,930,518	3,930,518	-	0.0%	7,861,035
RETIREMENT FUND	15,972,804	15,972,804	-	0.0%	15,972,804
POST EMPLOYEE BENEFITS	-	-	-	---	2,849,365
TOTAL INDIRECT EXPENSES	**$ 36,655,183**	**$ 35,614,797**	**$ (1,040,386)**	**-2.8%**	**$ 70,386,507**
STATE REVOLVING FUND	$ 40,920,462	$ 40,920,462	$ -	0.0%	$ 90,798,263
SENIOR DEBT	145,534,072	145,534,072	-	0.0%	294,055,644
DEBT SERVICE ASSISTANCE	(1,187,297)	(1,187,297)	-	0.0%	(1,187,297)
CURRENT REVENUE/CAPITAL	-	-	-	---	19,200,000
SUBORDINATE MWRA DEBT	34,713,059	34,713,059	-	0.0%	69,931,072
LOCAL WATER PIPELINE CP	-	-	-	---	7,744,625
CAPITAL LEASE	1,608,530	1,608,530	-	0.0%	3,217,060
VARIABLE DEBT	-	(1,578,944)	(1,578,944)	---	-
DEFEASANCE ACCOUNT	-	1,578,944	1,578,944	---	-
DEBT PREPAYMENT	-	-	-	---	4,000,000
TOTAL CAPITAL FINANCE EXPENSE	**$ 221,588,825**	**$ 221,588,825**	**$ -**	**0.0%**	**$ 487,759,367**
TOTAL EXPENSES	**$ 408,485,851**	**$ 396,052,477**	**$ (12,433,373)**	**-3.0%**	**$ 874,148,898**
REVENUE & INCOME					
RATE REVENUE	$ 417,134,000	$ 417,134,000	$ -	0.0%	$ 834,268,000
OTHER USER CHARGES	5,256,048	5,208,738	(47,310)	-0.9%	10,390,434
OTHER REVENUE	4,311,235	4,283,045	(28,190)	-0.7%	5,838,903
RATE STABILIZATION	152,741	152,741	-	0.0%	305,482
INVESTMENT INCOME	10,585,807	14,566,381	3,980,574	37.6%	23,346,079
TOTAL REVENUE & INCOME	**$ 437,439,831**	**$ 441,344,905**	**$ 3,905,074**	**0.9%**	**$ 874,148,898**

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY24 Budget YTD December	FY24 Actuals December	FY24 YTD Actual vs. FY24 Budget		Explanations
			$	%	
Direct Expenses					
Wages & Salaries	59,899,414	52,644,767	(7,254,647)	-12.1%	Wages and Salaries are under budget by $7.3 million or 12.1%. Year to date, there have been 102 fewer average FTEs (1,066 versus 1,168 budget), lower average new hire salaries versus retirees, the timing of backfilling vacant positions.
Overtime	2,910,062	3,033,220	123,158	4.2%	Overtime expenses were greater than budget by $123,000 or 4.2%. Greater than budget spending at Deer Island of $221,000 due to shift coverage, partially offset by Field Operations of $30,000 due to less than planned emergency, and planned overtime due to existing vacancies and Engineering & Construction of $31,000. Year-to-date rainfall was a major contributor for the increased overtime.
Fringe Benefits	12,683,527	11,813,159	(870,368)	-6.9%	Fringe Benefit spending was lower than budget by $870,000 or 6.9%. Spending was lower than budget in **Health Insurance** of $880,000, due to fewer than budgeted participants in health insurance plans, increased contribution by external new hires vs. lower contribution rates of staff retiring, and the shift from family to individual plans which are less expensive.
Worker's Compensation	1,072,197	1,171,801	99,604	9.3%	Worker's Compensation expenses were greater than budget by $100,000 or 9.3%. The higher than budgeted expenses were due to **Medical Payments** of $86,000 and **Compensation Payments** of $31,000, partially offset and **Administrative Expenses** of $17,000. Due to uncertainties of when spending will happen, the budget is spread evenly throughout the year.
Chemicals	13,502,534	11,490,114	(2,012,420)	-14.9%	Chemicals were lower than budget by $2.0 million or 14.9%. Lower than budget spending on **Sodium Hypochlorite** of $1.1M driven by Water Operations of $1.1 million and Wastewater Operations of $143,000 due to contract pricing, partially offset by DITP of $199,000 due to additional usage for disinfection and odor control due to higher flows. **Carbon Dioxide** was lower than budget by $354,000 primarily due to lower dosage needed, **Aqua Ammonia** of $160,000 due to lower usage and deliveries due to lower flow, **Sodium Bisulfite** of $149,000 primarily driven by Deer Island due to lower quantities to dechlorinate the effluent, and **Polymer** of $146,000 due to lower secondary waste sludge production due to the multiple rain events resulting in higher plant flows, and **Other Oxidizers** (Bioxide) at Framingham PS was lower than budget by $111,000 due to less deliveries and lower price, partially offset by **Hydrogen Peroxide** of $174,000 which is added to the DITP influent to reduce elevated H2S levels for odor pretreatment and corrosion control, and allows staff to perform maintenance activities more safely within the tanks. DITP flows are 5.2% greater than the budget and the CWTP preliminary flows are 4.1% less than the budget through December. It is important to note that Chemical variances are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries is an important factor.

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY24 Budget YTD December	FY24 Actuals December	FY24 YTD Actual vs. FY24 Budget		Explanations
			$	%	
Utilities	15,255,312	14,988,460	(266,852)	-1.7%	Utilities were lower than budget by $267,000 or 1.7%. Underspending in **Diesel Fuel** of $1.4 million primarily due to timing of purchasing at Deer Island Treatment Plant (DITP). Purchase is expected later in the fiscal year. Overspending in **Electricity** of $1.2 million primarily at DITP of $663,000 driven by new pass through cost associated with the Mystic Power Station and higher demand usage charges due to the many rain events. Electricity in Field Operations was greater than budget by $509,000 due to higher use, partially offset by lower pricing than budget.
Maintenance	20,760,785	21,869,227	1,108,442	5.3%	Maintenance was greater than budget by $1.1 million or 5.3%, largely driven by the timing of projects. M*aintenance Materials* are over budget by $895,000 million driven by **Plant & Machinery Materials** of $925,000 due to timing and higher spending for glass lined pipe/fittings, seals, and grinder cartridges and **Electrical Material**s of $111,000 due to timing, and **Warehouse Inventory** of $596,000 due to need for spare parts as well as purchasing of materials early due to supply chain issues, partially offset by **Special Equipment Materials** of $307,000 due to timing including the purchase of hatch covers at Loring Road, **HVAC Materials** of $247,000, **Building and Grounds Materials** of $131,000, and **Pipeline Materials** of $103,000 due to timing. *Maintenance Services* were greater than budget by $213,000 driven by **Computer Software-Licenses/Upgrades** of $839,000 primarily due to timing, **Plant & Machinery Services** of $340,000 due to timing and higher spending for gearbox rebuilds at DITP. This greater than budgeted spending was partially offset by **Electrical Services** of $436,000, **Computer Services** of $204,000, and **Pipeline Services** of $77,000 all due to timing of work.
Training & Meetings	278,658	180,345	(98,313)	-35.3%	Training & Meetings was lower than budget by $98,000 or 35.5% is primarily due to timing driven by MIS ($54,000), Procurement ($10,000), Water Redundancy ($15,000), and Engineering & Construction ($8,000), partially offset by higher spending in Field Operations $8,000.
Professional Services	5,127,251	3,777,963	(1,349,288)	-26.3%	Professional Services were less than budget by $1.3 million or 26.3% driven by lower **Other Services** of $594,000 due to timing of services including the Disparity Study, **Lab & Testing Analysis** of $171,000**, Legal Services** of $166,000 and **Computer Systems Consultant** of $208,000, all due to timing.
Other Materials	2,391,828	2,817,881	426,053	17.8%	Other Materials were greater than budget by $426,000 or 17.8% driven by **Computer Hardware** of $351,000 primarily due to timing of equipment purchases including purchases that will be reclassified to the CIP, **Vehicle Expense** of $125,000 due to timing of vehicle expenses including the electrical vehicle charging stations originally anticipated to be completed by FY23, and **Health/Safety** of $81,000 due to timing of purchases.
Other Services	16,360,275	15,061,918	(1,298,357)	-7.9%	Other Services were lower than budget by $1.3 million or 7.9% driven by **Telecommunications** of $561,000 due to less than anticipated costs, **Sludge Pelletization** of $223,000 and **Grit & Screenings Removal** of $222,000 due to lower quantities, **Other Services** of $111,000 due to timing and less than anticipated need, and **Police Details** of $83,000 due to less than anticipated need.
Total Direct Expenses	**150,241,843**	**138,848,855**	**(11,392,988)**	**-7.6%**	

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY24 Budget YTD December	FY24 Actuals December	FY24 YTD Actual vs. FY24 Budget		Explanations
			$	%	
Indirect Expenses					
Insurance	2,032,690	2,255,818	223,128	11.0%	Higher Payments/Claims of $199,000 and higher Premiums of $24,000 than budgeted
Watershed/PILOT	9,597,465	8,313,612	(1,283,853)	-13.4%	Lower Watershed Reimbursement of $1.3 million driven by lower spending on Wages & Salaries, Fringe Benefits, and Equipment/Maintenance.
HEEC Payment	4,232,163	4,252,503	20,340	0.5%	HEEC True Up of $1,456.
Mitigation	889,543	889,542	(1)	0.0%	
Addition to Reserves	3,930,518	3,930,518	-	0.0%	
Pension Expense	15,972,804	15,972,804	-	0.0%	
Post Employee Benefits	-	-	-		
Total Indirect Expenses	**36,655,183**	**35,614,797**	**(1,040,386)**	**-2.8%**	
Debt Service					
Debt Service	222,776,123	222,776,123	-	0.0%	Capital Financing was on budget after the transfer of $1.6 million to the Defeasance account. The transfer reflects lower variable rate debt expense due to lower than budget variable interest expense of $1.6 million as a result of lower interest rates and the impact of the swap terminations.
Debt Service Assistance	(1,187,297)	(1,187,297)	-	0.0%	
Total Debt Service Expenses	**221,588,826**	**221,588,826**	**-**	**0.0%**	
Total Expenses	**408,485,852**	**396,052,478**	**(12,433,373)**	**-3.0%**	

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY24 Budget YTD December	FY24 Actuals December	FY24 YTD Actual vs. FY24 Budget		Explanations
			$	%	
Revenue & Income					
Rate Revenue	417,134,000	417,134,000	-	0.0%	
Other User Charges	5,256,048	5,208,738	(47,310)	-0.9%	**Other User Charges** were $47,310 or 0.9% lower than budget due to less than anticipated community water treatment plant billing.
Other Revenue	4,311,235	4,283,045	(28,190)	-0.7%	Other Revenue was $28,000 or 0.7% lower than budget due to **Energy Revenue** of $166,000, **Profit and Loss on Disposal of Equipment** of $132,000, partially offset by **Miscellaneous Revenue** of $115,000 and **Penalties** of $105,000.
Rate Stabilization	152,741	152,741	-	0.0%	HEEC Reserve.
Investment Income	10,585,807	14,566,381	3,980,574	37.6%	Investment Income is over budget due to higher than budgeted interest rates and higher average balances.
Total Revenue	**437,439,831**	**441,344,905**	**3,905,074**	**0.9%**	
Net Revenue in Excess of Expenses	**28,953,979**	**45,292,427**	**16,338,447**		

ATTACHMENT 3
FY24 CIP Variance Report ($000s)

	FY24 Budget December	FY24 Actuals December	Actuals vs. Budget		Explanations
			$	%	
Wastewater					
Interception & Pumping (I&P)	$13,963	$7,720	($6,243)	-44.7%	Underspending Braintree/Weymouth Improvements - Construction: $3.6M (timing of work, long lead time for equipment and delay in fabrication of structural steel) Ward Street & Columbus Park Headworks Upgrades - Design/CA: $748k (delay in performing shaft inspections and issuing NTP for Final Design) Chelsea Creek Upgrades - Design/CA: $400k (claim settlement) Fuel Oil Tank Replacement - Construction Phase 2: $334k (delays due to unforseen items while excavating including contaminated soil and a concrete vault)
Treatment	$3,688	$9,800	$6,111	165.7%	Clarifier Rehabilitation Phase 2 - Construction: $6.6M (equipment received ahead of schedule) Radio Repeater System Upgrade 2: $289k (contractor progress) Clinton Screw Pumps Replacement Phase 1 - Construction: $272k (timing of work) Offset Underspending DITP As-Needed Design: $508k (lower than projected task order work) SSPS VFD Replacement - Design/ESDC/REI: $438k (Preliminary Design Report phase is more complicated than originally believed)
Residuals	$0	$0	$0	0.0%	
CSO	$1,900	$520	($1,380)	-72.6%	Underspending Chelsea 008 Pipe Replacement: $764k (work scheduled for FY24 performed in FY23) Fort Point Channel & Mystic: $417k (timing of community work)
Other Wastewater	$21,099	$15,992	($5,106)	-24.2%	Underspending I/I Local Financial Assistance: $5.1M (timing of community distributions of grants and loans)
Total Wastewater	**$40,650**	**$34,032**	**($6,618)**	**-16.3%**	
Waterworks					
Drinking Water Quality Improvements	$1,646	$1,142	($504)	-30.6%	Underspending CWTP Technical Assistance: $1.1M (lower than projected task order work) Offset Overspending CWTP Chemical Feed System Improvements - Construction: $557k (work scheduled for FY23 performed in FY24)

ATTACHMENT 3
FY24 CIP Variance Report ($000s)

	FY24 Budget December	FY24 Actuals December	Actuals vs. Budget		Explanations
			$	%	
Transmission	$24,210	$19,113	($5,098)	-21.1%	Tunnel Redundancy Preliminary Design & MEPA Review: $3.0M (timing of consultant work) Geotechnical Support Services: $1.2M (timing of support services) WASM 3 Rehabilitation CP-1: $939k (work scheduled for FY24 performed in FY23) WASM 3 - MEPA/Design/CA/RI: $668k (timing of consultant work) Wachusett Lower Gatehouse Pipe & Boiler Replacement - Construction: $565k (longer lead time on some larger items and a change in design for the multi-orifice valve) Watershed Land Acquisition: $445k (timing of land purchases) Offset Overspending Waltham Water Pipeline - Construction: $3.2M (work scheduled in FY23 performed in FY24)
Distribution & Pumping	$21,214	$14,349	($6,865)	-32.4%	Underspending Section 89/29 Replacement - Construction: $4.1M, CP-1 NEH Improvements: $2.3M, and CP3-Sections 23, 24 & 47 Rehabilitation: $212k (timing of work) Section 75 Extension - Construction CP-1: $600k (updated schedule) Offset Overspending CP-2, Sections 25 & 24 - Construction: $481k (contractor progress)
Other Waterworks	$16,020	$27,518	$11,497	71.8%	Overspending Local Water Pipeline Financial Assistance Program: $12.6M (timing of community loan distributions) Offset Underspending Steel Tank Improvements - Construction: $372k and Design/CA: $360k (updated Construction schedule)
Total Waterworks	**$63,091**	**$62,121**	**($970)**	**-1.5%**	

ATTACHMENT 3
FY24 CIP Variance Report ($000s)

	FY24 Budget December	FY24 Actuals December	Actuals vs. Budget		Explanations
			$	%	
Business & Operations Support					
Total Business & Operations Support	**$8,075**	**$3,665**	**($4,410)**	**-54.6%**	Underspending As-Needed Design Contracts: $2.0M (lower than projected task order work) Security Equipment & Installation: $1.0M (timing of security initiatives) MAXIMO Interface Enhancements: $500k, Oracle Database Appliance: $388k, and Core Switches: $320k (timing of work) FY24-28 Vehicle Purchases: $340k (timing of purchases) Offset Overspending Office Space Modifications: $821k (FY23 planned work completed in FY24)
Total MWRA	**$111,816**	**$99,819**	**($11,997)**	**-10.7%**	

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Transmittal of the FY25 Proposed Capital Improvement Program to the MWRA Advisory Board

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COMMITTEE: Administration, Finance & Audit

___ INFORMATION
_X_ VOTE

Michael J. Cole, Budget Director
James J. Coyne, Budget Manager
Preparer/Title

Thomas J. Durkin
Director, Finance

RECOMMENDATION:

To approve the transmittal of the FY25 Proposed Capital Improvement Program to the MWRA Advisory Board for its 60-day review and comment period.

DISCUSSION:

The Fiscal Year 2025 Proposed Capital Improvement Program (CIP) represents an update to the program approved by the Board in June 2023 for Fiscal Year 2024. The FY25 Proposed CIP includes the latest cost estimates, revised schedules, and new projects.

The FY25 Proposed Capital Improvement Program projects $377.3 million in spending for FY25, of which $195.8 million supports Wastewater System Improvements, $158.4 million supports Waterworks System Improvements, and $23.1 million is for Business and Operations Support. The projects with significant spending in FY25 include Deer Island Clarifier Rehabilitation Phase 2 Construction ($50.0 million), Northern High Service CP-1 Section 53 Connection-Construction ($12.8 million), and Metropolitan Tunnel Redundancy Final Design/Engineering Services During Construction ($10.0 million).

The CIP continues to address critical redundancy improvements for the Metropolitan Tunnel System. The FY25 Proposed CIP includes $2.1 billion in spending for this project, an increase of $347.8 million over the FY24 Approved CIP driven by updated cost estimates from the now completed preliminary design. The initial contract for Program Support Services began in April 2019 and Preliminary Design and MEPA Review was awarded in May 2020. Spending for Preliminary Design and MEPA Review began in early FY21 and is expected to be completed by January 2024. The third contract, Metropolitan Water Tunnel Program Geotechnical Support Services, for $12.8 million and a term of 36 months was awarded in December 2022. This contract is critical to identifying geological conditions and selecting the optimal tunnel route. Spending under this contract began in February 2023. The Final Design/ESDC is expected to commence in June 2024. A full briefing on this project will be given at the MWRA Board of Directors Meeting in March 2024.

The FY25 Proposed CIP includes $29.7 million for projects supporting DCR's Division of Water Supply Protection. Upcoming projects with spending in the FY24-28 Cap Period include the Quabbin Administration Building Design and Construction ($15.1 million), the New Salem Building Design and Construction ($6.1 million), and the Quabbin Maintenance Garage Design and Construction ($5.4 million).

The FY25 Proposed Capital Program reaffirms MWRA's commitment to the community financing assistance programs on both the water and wastewater sides. Today, the Authority is better positioned to reinvest in rehabilitation and replacement of aging facilities as a result of conservative fiscal management which includes judicious control of expenses, and the fact that MWRA has implemented the practice of utilizing available funds for defeasances resulting in the reduction of debt service expenses. MWRA projects an overall reduction in outstanding indebtedness during the FY24-28 period.

The Baseline Cap (FY24-28) of $1,364.2 million was set in June 2023 and now includes a Spend Rate Adjustment to account for the historic underspending of the capital program. In addition to the proposed Spend Rate Adjustment, the format of the Cap table is adjusted to account separately for MWRA spending, which excludes the local I/I grant and loan program and the local water pipeline loan spending which are both outside of MWRA's control. As in past Caps, contingency for each fiscal year is incorporated into the CIP to fund the uncertainties inherent to construction. The contingency budget is calculated as a percentage of budgeted expenditure outlays. Specifically, contingency is 7% for non-tunnel projects and 15% for tunnel projects. Inflation is added for unawarded construction contracts. Finally, the Cap excludes Chicopee Valley Aqueduct system projects.

FY24 Approved

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

It is important to note that the spending on capital programs is largely determined by the nature, magnitude, and number of upcoming projects. In the prior five-year Caps, specifically FY04-08 and FY09-13, the majority of spending was driven by court-mandated projects and building new facilities whereas the FY19-23 period began to the focus on Asset Protection and Water Redundancy.

Shown in the following table, the Proposed FY25 CIP does not exceed the Baseline 5-year Cap. Future spending continues to focus on Asset Protection and Redundancy initiatives.

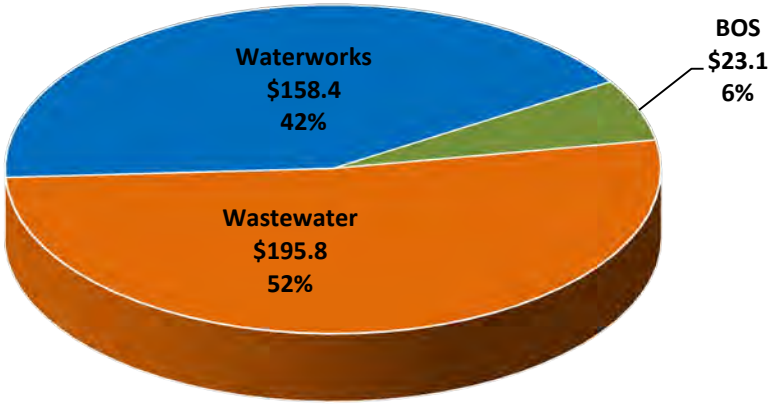
FY25 Proposed

FY25 Proposed CAP		FY24	FY25	FY26	FY27	FY28	FY24-28
	Projected Expenditures excl. Metro Tunnel	$251.3	$354.3	$331.1	$350.3	$398.2	$1,685.2
	Metropolitan Tunnel	$12.8	$23.0	$37.0	$39.8	$67.9	$180.4
	I/I Program	(31.6)	(48.6)	(29.8)	(28.5)	(34.5)	(173.1)
	Water Loan Program	(52.5)	(10.3)	(2.8)	9.6	14.8	(41.2)
	MWRA Spending	**$180.0**	**$318.3**	**$335.5**	**$371.2**	**$446.3**	**$1,651.3**
	Contingency	10.8	20.5	22.7	25.3	30.8	110.1
	Inflation on Unawarded Construction	0.0	3.2	7.8	16.5	30.6	58.1
	Chicopee Valley Aqueduct Projects	0.0	(0.5)	(0.3)	0.0	0.0	(0.8)
	Projected Spending before Adjustment	**$190.8**	**$341.6**	**$365.8**	**$413.0**	**$507.8**	**$1,818.9**
	Spend Rate Adjustment (25%)*	(47.7)	(85.4)	(91.4)	(103.2)	(126.9)	(454.7)
	FY25 Proposed FY24-28 Spending	**$143.1**	**$256.2**	**$274.3**	**$309.7**	**$380.8**	**$1,364.1**

Proposed FY25 Spending

The FY25 Proposed Capital Improvement Program projects $377.3 million in spending for FY25, of which $195.8 million supports Wastewater System Improvements, $158.4 million supports Waterworks System Improvements, and $23.1 million is for Business and Operations Support.

FY25 Spending



The FY25 Proposed CIP includes $58.9 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of $48.6 million for the local Infiltration/Inflow program and net expenditures of $10.3 million for the local water pipeline program, of which $8.0 million is for lead service line replacement loans for FY25. To date, 17 communities have taken these loans totaling $41.3 million.

The $377.3 million in projected spending is driven by 42 active wastewater and water projects. Of this $377.3 million in spending, project contracts with spending greater than $8.0 million in FY25, excluding local community assistance programs, total $135.9 million and account for 36.0% of the total annual spending. These projects are presented in the following table:

Project	Subphase	FY25 $s in Millions
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	$50.0
NHS - Revere & Malden Pipelines	CP-1 Section 53 Connection - Construction	12.8
Metro Tunnel Redundancy	Final Design/ESDC	10.0
Waterworks Facility Asset	Steel Tank/Impr Construction	9.8
Quabbin Transmission System	Wach LGH Pipe & Boiler Replacement Construction.	9.6
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	9.5
Metro Redundancy Interim Improvements	Waltham Water Pipeline Construction	9.5
Northern Extra High Service New Pipelines	CP-2 NEH Improvements	8.5
Facility Asset Protection	Hayes Pump Station Rehab Construction	8.2
Deer Island Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	8.0
Total Contracts > $8 million (excl. Loan Programs)		**$135.9**
% of FY25 Spending		**36.0%**
Total FY25 Spending		**$377.3**

Clarifier Rehabilitation Phase 2 Construction - $50.0 million ($289.4 million total construction cost). This project will rehabilitate the sludge removal system in the primary tanks and the aeration/recirculation systems in the secondary tanks. The influent gates, effluent launders and aeration systems, and concrete corrosion in primary clarifiers will also be addressed and repaired.

CP-1 Section 53 Connection Construction - $12.8 million ($55.5 million total construction cost). Construction of 6,000 linear feet of new 48-inch pipe in Malden. These proposed pipelines will eliminate hydraulic restrictions and better integrate Section 53 into the Northern High distribution system.

Metro Tunnel Redundancy Final Design/ESDC - $10.0 million ($117.8 million total project cost). Final Design and Engineering Services During Construction of the Northern and Southern Tunnels, including connecting mains.

Waterworks Facility Asset Protection Steel Tank Improvement Construction - $9.8 million ($9.8 million total construction cost). Construction to recoat the interior and exterior, replace cathodic protection systems and make necessary improvements to the Walnut Hill steel water storage tanks.

Wachusett Lower Gatehouse Pipe & Boiler Replacement Construction - $9.6 million ($19.6 million total construction cost). Replace the oldest piping in the Lower Gatehouse. Provide CFRP lining of the pipes between the dam and the Lower Gatehouse. Replace the existing propane fueled boilers and radiators. A separate staff summary presented at this meeting provides further information and an update on this project.

Northern Intermediate High Redundancy Section 89 and 29 Replacement Construction - $9.5 million ($35.6 million total construction cost). This is a redundancy project for MWRA's Northern Intermediate High service area. Section 89 will be replaced now that the redundant pipeline is completed. This contract was awarded in May 2021.

Waltham Water Pipeline Construction - $9.5 million ($28.4 million total construction cost). This contract will include installation of approximately 8,920 linear feet of new 36-inch diameter water main along Lexington Street in Waltham, from Meter 182 to a new meter near Totten Pond Road, including installation of valves, meters and other appurtenances, by-pass pumping, replacement of certain utilities, pavement restoration, traffic and environmental controls.

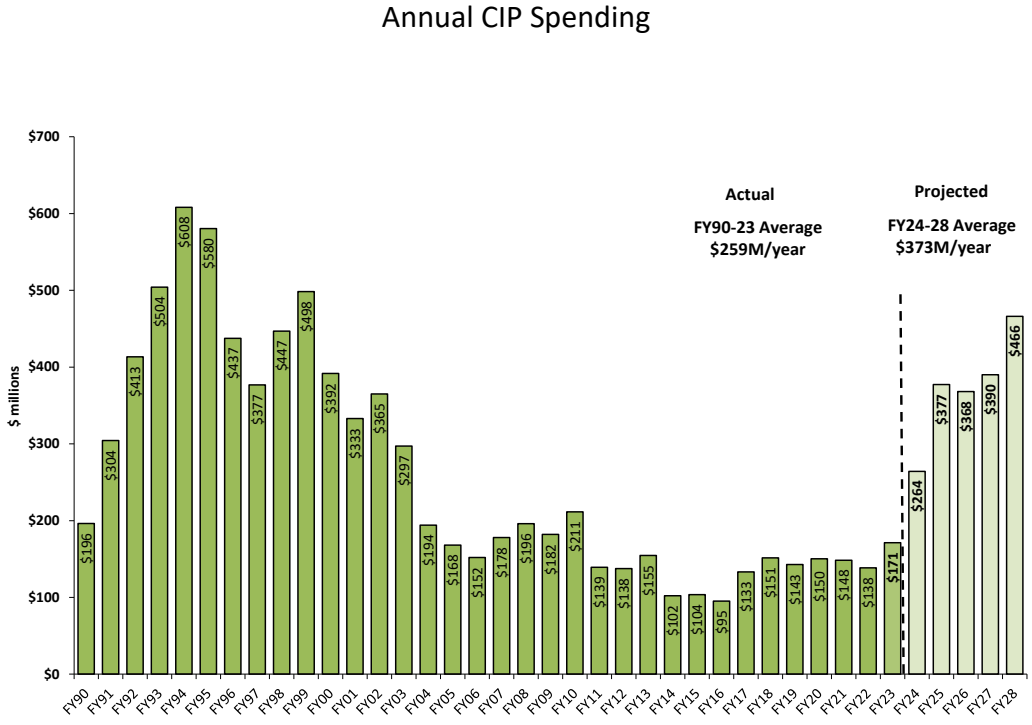
Northern Extra High Service New Pipelines CP-2 NEH Improvements - $8.5 million ($20.7 million total construction cost). CP2 includes installation of up to 11,100 linear feet of new water main in Lexington to interconnect an existing MWRA water main to the new water main installed in CP1 to help improve redundancy. CP2 also includes installation of a new meter for Lexington and replacement of 3,400 linear feet of existing, undersized water main in Arlington.

Hayes Pump Station Rehab Construction - $8.2 million ($22.7 million total construction cost). Construction of improvements to Hayes Pump Station, which was constructed in 1987. Due to its age, all major facility components require replacement or rehabilitation.

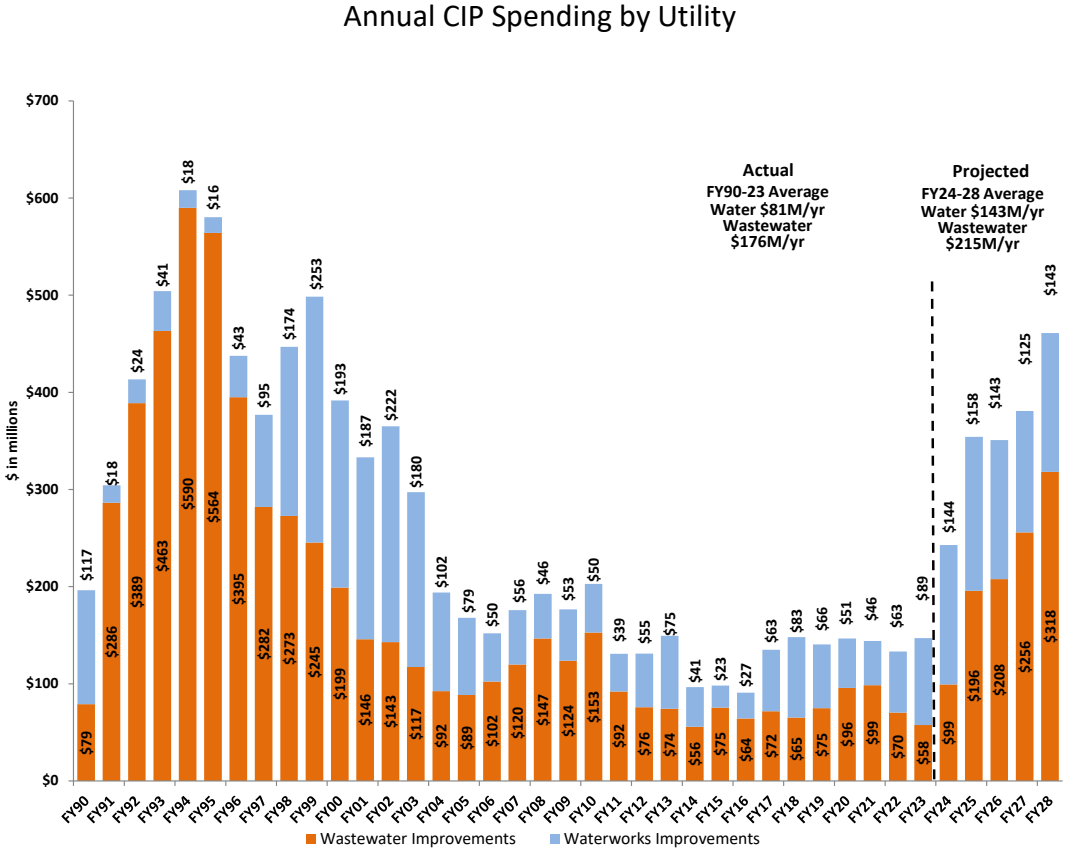
Fire Alarm System Replacement - $8.0 million ($35.0 million total construction cost). The project will replace obsolete fire alarm monitoring & control systems. Design awarded October 2015; construction phase to commence in FY23 and approximately every 20 years thereafter.

Historical & Projected Spending

The following chart captures the historical CIP spending through FY23 and projects spending through FY28 based on the FY25 Proposed CIP. Average annual CIP spending through FY23 was $259 million. Average annual CIP spending for the proposed FY24-28 period is projected to be $373 million.



The following chart shows the historical CIP spending from FY90 through FY23 by utility with projections through FY28. Average annual CIP spending through FY23 was $81 million for Waterworks and $176 million for Wastewater. Average annual CIP spending for FY24-28 is projected to be $143 million for Waterworks and $215 million for Wastewater.



FY24-28 Spending

Spending during the FY24-28 timeframe is planned to be $1.9 billion, including local community spending of $173.1 million for the I/I loan and grant program and $41.2 million for the water pipeline loan program. Spending under the Wastewater and Waterworks programs is projected at $1,076.9 million and $712.8 million, respectively, followed by Business and Operations at $75.9 million. The spending projections set forth here include updates to the approved FY24 CIP with the latest cost estimates, revised schedules, and new projects.

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

	Future Spending Beyond FY23	FY24	FY25	FY26	FY27	FY28	Total FY24-28	Beyond FY28
Wastewater System Improvements	**$2,405.5**	**$99.3**	**$195.8**	**$207.8**	**$255.9**	**$318.1**	**$1,076.9**	**$1,328.5**
Interception & Pumping	880.5	27.9	33.2	41.4	75.2	110.0	287.8	592.7
Treatment	1,281.0	33.6	103.6	126.6	146.4	169.3	579.5	701.5
Residuals	90.6	0.0	1.7	10.0	5.8	3.5	20.9	69.7
CSO	19.9	6.2	8.6	0.0	0.0	0.8	15.7	4.2
Other Wastewater	133.4	31.6	48.6	29.8	28.5	34.5	173.1	-39.6
Waterworks System Improvements	**$3,041.9**	**$143.6**	**$158.4**	**$143.1**	**$124.8**	**$143.0**	**$712.8**	**$2,329.1**
Drinking Water Quality Improvements	70.4	5.0	4.7	7.0	4.2	7.8	28.8	41.6
Transmission	2,414.3	43.7	57.9	64.1	64.3	86.5	316.6	2,097.7
Distribution & Pumping	610.0	34.7	62.8	58.8	53.1	49.2	258.7	351.4
Other Waterworks	(52.8)	60.2	32.9	13.2	3.1	-0.6	108.8	-161.6
Business & Operations Suppport	**$77.4**	**$21.2**	**$23.1**	**$17.3**	**$9.3**	**$4.9**	**$75.9**	**$1.6**
Total MWRA	**$5,524.8**	**$264.1**	**$377.3**	**$368.2**	**$390.1**	**$466.0**	**$1,865.6**	**$3,659.2**

It is important to emphasize that the majority of spending within the Wastewater and Waterworks programs is concentrated in several larger projects with significant spending in the FY24-28 timeframe. Project contracts with expenditures greater than $22.0 million for the FY24-28 period total $748.1 million, which excludes local community assistance programs. These 15 projects account for 40.1% of total period spending. Largest construction initiatives in terms of FY24-28 spending include the Clarifier Rehabilitation at Deer Island of $224.0 million (total cost of $289.4 million), Final Design Metro Tunnel Redundancy $70.5 million (total cost of $117.8 million), CP-1 Section 53 Connection Construction $55.5 million (total cost of $55.5 million), South System Pump Station VFD Replacement of $55.5 million (total cost of $90.5 million), Ward Street Headworks of $44.3 million (total cost of $147.8 million), Prison Point Rehabilitation of $38.7 million (total cost of $38.7 million), NIH Storage Construction $34.0 million (total cost of $34.0), and Combined Heat & Power Construction of $33.5 million (total cost of $114.0 million.

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

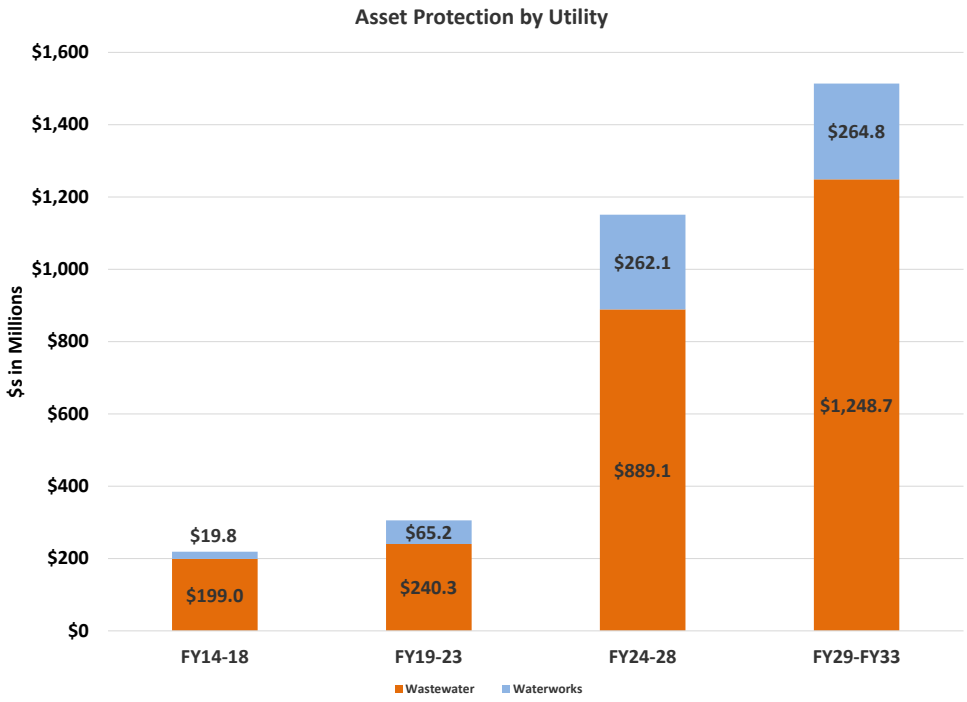
Project	Subphase	FY24-FY28 $s in Millions
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	$224.0
Metro Tunnel Redundancy	Final Design/ESDC	70.5
NHS - Revere & Malden Pipelines	CP-1 Section 53 Connection-Construction	55.5
Deer Island Treatment Plant Asset Protection	SSPS VFD Replace Construction	55.5
Facility Asset Protection	Ward St Headworks Construction	44.3
Facility Asset Protection	Prison Point Rehab Repackaged	38.7
Metro Tunnel Redundancy	Admin Legal & Public Outreach	35.5
NIH Redundancy & Storage	NIH Storage - Construction	34.0
Deer Island Treatment Plant Asset Protection	Combined Heat & Power - Construction	33.5
Deer Island Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	31.0
Facility Asset Protection	Columbus Park HW Construction	29.6
Metro Tunnel Redundancy	Tunnel Construction South CP2	25.0
Metro Redundancy Interim Improvements	Waltham Water Pipeline Construction	24.8
Deer Island Treatment Plant Asset Protection	MCC & Switchgear Replacement Construction	23.5
Facility Asset Protection	Hayes Pump Station Rehab Construction	22.7
		$748.1
% of FY24-28 Spending		**40.1%**
FY24-28 Spending		**$1,865.6**

Asset Protection accounts for the largest share of capital expenditures for the FY24-28 period. The FY25 Proposed CIP includes $1.2 billion for asset protection initiatives, representing 62.6% of total MWRA spending in this timeframe. Asset protection spending by program is as follows: Wastewater ($889.1 million), Waterworks ($262.1 million), and Business and Operations Support ($16.7 million). Spending for water system redundancy projects totals $384.5 million in the same FY24-28 period, accounting for 20.6% of total spending.

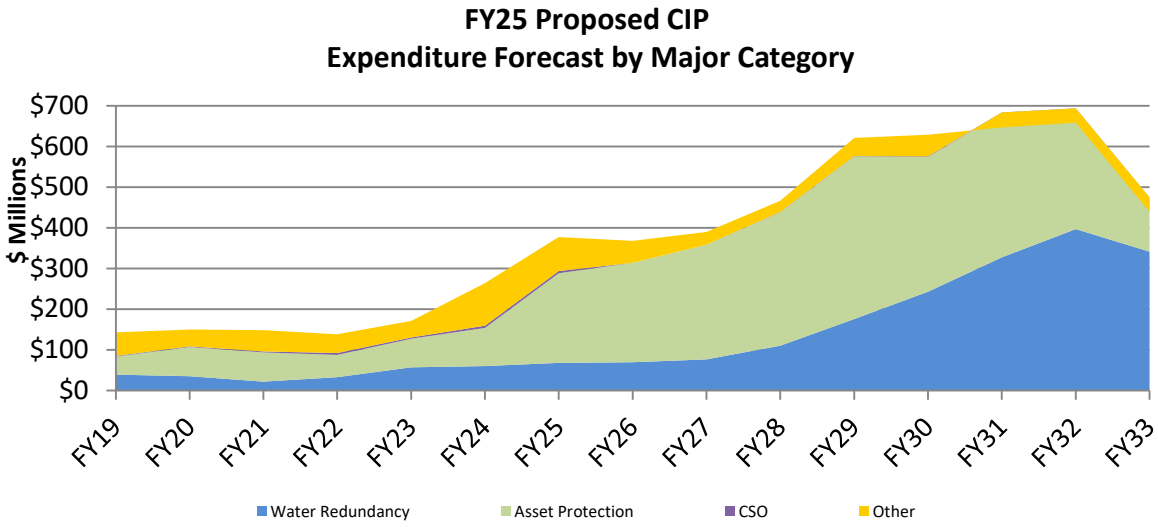
Changing nature of the CIP by Category
($s in millions)

Project Category	FY19-23	FY24-28	FY29-33
Asset Protection	$313.4	$1,167.8	$1,515.1
Water Redundancy	$186.9	$384.5	$1,484.7
CSO	$12.6	$11.6	$4.2
Other	$238.4	$301.8	-$10.1
Total	**$751.3**	**$1,865.6**	**$2,993.8**
Asset Protection	**41.7%**	**62.6%**	**50.6%**
Water Redundancy	**24.9%**	**20.6%**	**49.6%**
CSO	1.7%	0.6%	0.1%
Other	31.7%	16.2%	-0.3%
Total	**100.0%**	**100.0%**	**100.0%**

In terms of utility spending, wastewater asset protection accounts for 76.1% of the FY24-28 projected asset projection spending at $889.1 million of which $565.6 million is designated for the Deer Island Wastewater Treatment Plant and $323.5 million for headworks and pipelines. The $262.1 million targeted for waterworks asset protection includes $157.1 million for water pipeline projects.



As illustrated by the following graph, the next two waves of spending over the FY24-28 and the FY29-33 periods will be for asset protection and water redundancy. This reflects MWRA's commitment to maintaining its physical plant and addressing the need for water system redundancy in some critical service areas. Total asset protection spending for FY24-28 is projected at $1.2 billion or 62.6% of projected spending. Similarly, water redundancy spending for FY24-28 is projected at $384.5 million or 20.6% of projected FY24-28 spending. For the FY29-33 spending window, total asset protection expenditures are projected at $1.5 billion, 50.6% of projected spending. Similarly, water redundancy spending for FY29-33 is projected at $1.5 billion or 49.6% of projected spending. Other spending includes a net inflow of $96.9 million reflecting repayments under the loan programs. Loan repayments are partially offset by Other project spending of $86.8 million.



FY25 Proposed CIP Future Expenditures

The FY25 Proposed CIP contains future spending (beyond FY23) estimated at $5.5 billion, including $2.4 billion for Wastewater (primarily Asset Protection of $2.2 billion) and $3.0 billion for Waterworks (primarily Redundancy projects of $2.6 billion). Wastewater Asset Protection includes $1.3 billion for Deer Island and $982.9 million for Wastewater Facility Asset Protection (primarily pump station rehabilitation). Redundancy projects include the Metro Tunnel Redundancy and Metro Redundancy Interim Improvement projects with future spending of $2.1 billion and $148.5 million, respectively. FY24-FY28 spending is projected at $1.9 billion or 33.8% of future spending.

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

	Future Spending Beyond FY23	Total FY24-28	Total FY29-33	Beyond FY33
Wastewater System Improvements	**$2,405.5**	**$1,076.9**	**$1,293.3**	**$35.2**
Interception & Pumping	880.5	287.8	561.7	31.1
Treatment	1,281.0	579.5	648.3	53.2
Residuals	90.6	20.9	45.3	24.5
CSO	19.9	15.7	4.2	0.0
Other Wastewater	133.4	173.1	33.9	-73.5
Waterworks System Improvements	**$3,041.9**	**$712.8**	**$1,699.0**	**$630.2**
Drinking Water Quality Improvements	70.4	28.8	41.6	0.0
Transmission	2,414.3	316.6	1,500.5	597.3
Distribution & Pumping	610.0	258.7	258.8	92.6
Other Waterworks	(52.8)	108.8	-101.9	-59.7
Business & Operations Suppport	**$77.4**	**$75.9**	**1.6**	**0.0**
Total MWRA	**$5,524.8**	**$1,865.6**	**$2,993.8**	**$665.4**

New Projects

The FY25 Proposed CIP includes 3 new projects at a total cost of $18.7 million with projected spending of $18.0 million over the FY24-28 period. There is a single wastewater projects for $5.0 million and 2 waterworks projects totaling $13.7 million. The largest new project is the Shaft L Interconnection project at $7.6 million followed by the New Salem Building project for $6.0 million. A complete listing of projects is included as Attachment C.

$s in Millions

Project	Total Contract Amount	FY24-28 Spending
Shaft L Interconnection Project	$7.6	$7.4
New Salem Building Design & Construction	$6.1	$5.6
Total Waterworks(#2)	**$13.7**	**$13.0**
High Level Sewer Culverts	$5.0	$5.0
Total Wastewater (#1)	$5.0	$5.0
3 New Projects	**$18.7**	**$18.0**

CIP Review and Adoption Process

The Advisory Board will have no less than 60 days from the transmittal of the FY25 Proposed CIP to review the budget and prepare comments and recommendations. During the review period, Advisory Board and MWRA staff will continue to meet and discuss the changes to the capital budget. The Advisory Board will then transmit its comments and recommendations to MWRA in the spring after its review. Staff will prepare draft responses to the Advisory Board's recommendations for discussion at the budget hearing. During the spring, MWRA will update the CIP to incorporate the latest information into the Final budget. In June, staff will present the FY25 Final to the Board for adoption.

ATTACHMENTS:

A. FY25 Proposed Project Level Expenditure Forecast
B. Overview of the FY25 Proposed CIP and Changes from the FY24 Final CIP
C. FY25 Proposed New Projects

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
Total MWRA	**10,549,840**	**5,025,023**	**5,524,816**	**751,261**	**264,098**	**377,269**	**368,163**	**390,052**	**466,025**	**1,865,607**	**2,993,787**	**762,832**
Wastewater	**4,863,891**	**2,458,441**	**2,405,453**	**397,123**	**99,333**	**195,793**	**207,825**	**255,903**	**318,083**	**1,072,514**	**1,293,276**	**66,324**
Interception & Pumping	**1,644,370**	**763,859**	**880,513**	**161,458**	**27,927**	**33,243**	**41,389**	**75,248**	**109,966**	**287,773**	**561,654**	**31,086**
102 Quincy Pump Facilities	25,907	25,907	-						-	-	-	
104 Braintree-Weymouth Relief Facilities	248,714	232,410	16,303	4,706	11,001	1,752			-	12,752	3,551	
105 New Neponset Valley Relief	30,300	30,300	-						-	-	-	
106 Wellesley Extension Replacement	64,359	64,359	-						-	-	-	
107 Framingham Extension Relief Sewer	47,856	47,856	-						-	-	-	
127 Cummingsville Replacement Sewer	8,999	8,999	-						-	-	-	
130 Siphon Structure Rehabilition	24,362	3,103	21,259	2,163	2,620	5,834	2,249	818	2,068	13,590	7,669	
131 Upper Neponset Valley Sewer System	54,174	54,174	-						-	-	-	
132 Corrosion & Odor Control	104,434	69,442	34,992	63,262	4,785	184			-	4,969	26,008	
136 West Roxbury Tunnel	10,964	10,314	650		325	325			-	650	-	
137 Wastewater Central Monitoring	27,482	19,926	7,556	144			627	1,328	1,269	3,224	4,332	
139 South System Relief Project	4,939	3,439	1,500						-	-	1,500	
141 Wastewater Process Optimization	8,310	2,200	6,111	698					-	-	6,111	
142 Wastewater Meter System - Equipment Replacement	21,058	11,950	9,109	6,225	(17)				-	(17)	-	
143 Regional I/I Management & Planning	169	169	-						-	-	-	
145 Facility Asset Protection	956,645	179,311	777,335	84,260	9,213	23,273	36,013	72,477	106,629	247,605	511,785	
146 Deer Island Cross Harbor Tunnel	5,000	-	5,000			1,875	2,500	625	-	5,000	-	
147 Randolph Trunk Sewer Relief	698	-	698						-	-	698	

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
Treatment	**1,645,491**	**364,487**	**1,281,005**	**63,330**	**33,574**	**103,642**	**126,642**	**146,356**	**169,310**	**579,525**	**648,315**	**53,165**
182 DI Primary and Secondary Treatment	(958)	(958)	-						-	-	-	
200 DI Plant Optimization	33,279	33,279	-						-	-	-	
206 DI Treatment Plant Asset Protection	1,575,182	311,593	1,263,589	59,234	31,475	98,426	124,282	143,768	167,600	565,552	644,872	
210 Clinton Wastewater Treatment Plant	35,776	18,361	17,416	4,096	2,099	5,216	2,360	2,588	1,710	13,973	3,443	
211 Laboratory Services	2,212	2,212	-						-	-	-	
Residuals	**171,326**	**80,697**	**90,629**	**15,649**		**1,650**	**9,950**	**5,800**	**3,492**	**20,892**	**45,261**	**24,476**
261 Residuals	63,811	63,811	-						-	-	-	
271 Residuals Asset Protection	107,515	16,886	90,629	15,649		1,650	9,950	5,800	3,492	20,892	45,261	
CSO	**934,838**	**914,964**	**19,874**	**12,568**	**6,239**	**8,635**			**820**	**11,269**	**4,180**	
CSO MWRA Managed	**439,289**	**434,864**	**4,425**	**1,330**	**961**	**3,464**						
339 North Dorchester Bay	221,510	221,510	-						-	-	-	
347 East Boston Branch Sewer Relief	85,637	85,637	-						-	-	-	
348 BOS019 Storage Conduit	14,288	14,288	-						-	-	-	
349 Chelsea Trunk Sewer	31,399	31,109	290	1,330	290				-	290	-	
350 Union Park Detention Treatment Facility	49,583	49,583	-						-	-	-	
353 Upgrade Existing CSO Facilities	22,385	22,385	-						-	-	-	
354 Hydraulic Relief Projects	6,430	2,295	4,135		671	3,464			-	4,135	-	
355 MWR003 Gate & Siphon	4,424	4,424	-						-	-	-	
357 Charles River CSO Controls	3,633	3,633	-						-	-	-	

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
CSO Community Managed	**433,780**	**424,530**	**9,250**	**4,513**	**4,625**	**4,625**			**-**	**9,250**		
340 Dorchester Bay Sewer Separation (Fox Point)	55,029	55,029	-						-	-	-	
341 Dorchester Bay Sewer Separation (Commercial Point)	61,443	61,443	-	1,581					-	-	-	
342 Neponset River Sewer Separation	2,492	2,492	-						-	-	-	
343 Constitution Beach Sewer Separation	3,731	3,731	-						-	-	-	
344 Stony Brook Sewer Separation	44,319	44,319	-						-	-	-	
346 Cambridge Sewer Separation	104,552	104,552	-						-	-	-	
351 BWSC Floatables Controls	946	946	-						-	-	-	
352 Cambridge Floatables Controls	1,127	1,127	-						-	-	-	
356 Fort Point Channel Sewer Separation	21,507	12,257	9,250	750	4,625	4,625			-	9,250	-	
358 Morrissey Boulevard Drain	32,181	32,181	-						-	-	-	
359 Reserved Channel Sewer Separation	70,524	70,524	-						-	-	-	
360 Brookline Sewer Separation	24,715	24,715	-						-	-	-	
361 Bulfinch Triangle Sewer Separation	9,032	9,032	-						-	-	-	
362 East Boston CSO Control	2,182	2,182	-	2,182					-	-	-	
CSO Planning & Support	**61,769**	**55,570**	**6,199**	**6,725**	**653**	**546**			**820**	**2,019**	**4,180**	
324 CSO Support	61,769	55,570	6,199	6,725	653	546			820	2,019	4,180	
Other Wastewater	**467,866**	**334,434**	**133,432**	**144,118**	**31,593**	**48,623**	**29,844**	**28,499**	**34,495**	**173,055**	**33,866**	**(73,489)**
128 I/I Local Financial Assistance	467,585	334,153	133,432	144,118	31,593	48,623	29,844	28,499	34,495	173,055	33,866	
138 Sewerage System Mapping Upgrades	281	281	-						-	-	-	
Waterworks	**5,467,810**	**2,425,862**	**3,041,948**	**314,447**	**143,552**	**158,364**	**143,081**	**124,812**	**143,005**	**712,814**	**1,698,951**	**630,184**

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
Drinking Water Quality Improvements	**731,140**	**660,773**	**70,367**	**10,801**	**5,019**	**4,658**	**7,007**	**4,238**	**7,829**	**28,750**	**41,616**	
542 Carroll Water Treatment Plant	443,780	429,803	13,977	6,687	2,727	2,000	-	-	-	4,727	9,250	
543 Quabbin Water Treatment Plant	19,973	19,973	-	-	-	-	-	-	-	-	-	
544 Norumbega Covered Storage	106,674	106,674	-	-	-	-	-	-	-	-	-	
545 Blue Hills Covered Storage	40,083	40,083	-	-	-	-	-	-	-	-	-	
550 Spot Pond Covered Storage Facility	60,126	60,126	-	-	-	-	-	-	-	-	-	
555 Carroll Water Treatment Plant (CWTP) Asset Protection	60,504	4,114	56,390	4,114	2,292	2,658	7,007	4,238	7,829	24,024	32,366	
Transmission	**3,345,060**	**930,762**	**2,414,298**	**105,562**	**43,661**	**57,936**	**64,138**	**64,291**	**86,533**	**316,559**	**1,500,460**	**597,280**
597 Winsor Station Pipeline	71,830	7,475	64,355	1,741	-	-	-	-	-	-	58,105	
601 Sluice Gate Rehabilitation	9,158	9,158	-	-	-	-	-	-	-	-	-	
604 MetroWest Tunnel	709,574	697,182	12,392	-	-	229	549	3,608	5,673	10,059	2,333	
615 Chicopee Valley Aqueduct Redundancy	8,666	8,666	-	-	-	-	-	-	-	-	-	
616 Quabbin Transmission System	41,597	14,573	27,024	5,906	8,502	10,730	4,701	1,850	725	26,509	515	
617 Sudbury/Weston Aqueduct Repairs	12,534	4,870	7,664	2,638	-	-	338	1,850	1,600	3,788	3,876	
620 Wachusett Reservoir Spillway Improvements	9,287	9,287	-	-	-	-	-	-	-	-	-	
621 Watershed Land	34,000	28,879	5,121	6,033	805	1,000	1,000	1,000	1,316	5,121	-	
622 Cosgrove Tunnel Redundancy	58,619	58,619	-	6,601	-	-	-	-	-	-	-	
623 Dam Projects	11,875	3,731	8,144	615	4,280	2,532	132	400	800	8,144	-	
625 Metropolitan Tunnel Redundancy	2,142,343	27,808	2,114,534	24,353	12,775	23,000	37,017	39,750	67,868	180,410	1,343,842	
628 Metropolitan Redundancy Interim Improvements	205,894	57,417	148,477	54,579	17,126	17,342	14,996	12,597	6,191	68,252	79,479	
630 Watershed Division Capital Improvements	29,682	3,096	26,586	3,096	173	3,103	5,405	3,236	2,360	14,276	12,310	

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
Distribution And Pumping	**1,202,266**	**592,223**	**610,042**	**127,866**	**34,707**	**62,844**	**58,764**	**53,141**	**49,223**	**258,679**	**258,774**	**92,590**
618 Peabody Pipeline Project	1,448	1,448	-	389	-	-	-	-	-	-	-	
677 Valve Replacement	12,016	12,016	-	-	-	-	-	-	-	-	-	
678 Boston Low Service - Pipe & Valve Rehabilitation	23,691	23,691	-	-	-	-	-	-	-	-	-	
683 Heath Hill Road Pipe Replacement	19,358	19,358	-	-	-	-	-	-	-	-	-	
689 James L. Gillis Pump Station	33,419	33,419	-	-	-	-	-	-	-	-	-	
692Northern High Service (NHS) - Section 27 Improvements	2,141	124	2,017	-	4	-	-	-	-	4	2,013	
693 NHS - Revere & Malden Pipeline Improvements	128,741	35,569	93,172	7,008	1,084	21,275	28,612	23,325	4,425	78,722	14,450	
702 New Connecting Mains - Shaft 7 to WASM 3	101,808	33,044	68,764	20,119	20,883	15,329	14,990	2,182	10,500	63,884	4,880	
704 Rehabilitation of Other Pump Stations	51,572	30,090	21,482	33	-	-	594	793	793	2,180	19,302	
706 NHS - Connecting Mains from Section 91	2,360	2,360	-	-	-	-	-	-	-	-	-	
708 Northern Extra High Service (NEH) - New Pipelines	67,046	17,048	49,999	13,415	2,436	10,401	9,901	7,361	8,753	38,852	11,147	
712 Cathodic Protection Of Distribution Mains	7,268	1,160	6,108	891	-	3,665	2,443	-	-	6,108	-	
713 Spot Pond Supply Mains Rehabilitation	67,284	65,672	1,612	183	812	-	-	-	-	812	800	
714 Southern Extra High Sections 41 & 42	3,657	3,657	-	-	-	-	-	-	-	-	-	
719 Chestnut Hill Connecting Mains	55,509	18,287	37,222	-	-	-	-	-	-	-	23,205	
720 Warren Cottage Line Rehabilitation	1,205	1,205	-	-	-	-	-	-	-	-	-	
721 Southern Spine Distribution Mains	112,152	38,661	73,491	1,978	243	285	284	285	3,766	4,863	66,612	
722 Northern Intermediate High (NIH) Redundancy & Storage	155,751	93,577	62,174	44,682	9,164	11,817	1,853	18,551	18,900	60,284	1,890	
723 Northern Low Service Rehabilitation - Section 8	68,970	5,546	63,425	2,591	7	11	11	11	11	51	63,374	
725 Hydraulic Model Update	598	598	-	-	-	-	-	-	-	-	-	

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
727 Southern Extra High (SEH) Redundancy & Storage	172,202	65,022	107,180	36,577	72	61	73	75	1,291	1,572	29,051	
730 Weston Aqueduct Supply Mains (WASM)	80,403	80,403	-	-	-	-	-	-	-	-	-	
731 Lynnfield Pipeline	5,626	5,626	-	-	-	-	-	-	-	-	-	
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	2,717	2,717	-	-	-	-	-	-	-	-	-	
735 Section 80 Rehabilitation	25,322	1,925	23,398	-	2	1	2	558	784	1,348	22,050	
Other Waterworks	189,344	242,103	(52,759)	70,218	60,165	32,926	13,173	3,143	(580)	108,826	(101,899)	(59,686)
753 Central Monitoring System	45,251	33,104	12,147	12,400	5,421	3,655	1,083	844	301	11,304	843	
763 Distribution Systems Facilities Mapping	3,087	1,575	1,513	538	226	24	-	346	345	941	572	
764 Local Water Infrastructure Rehabilitation	7,488	7,488	-	-	-	-	-	-	-	-	-	
765 Local Water System Assistance Program	-	184,472	(184,472)	44,199	52,512	10,297	2,800	(9,600)	(14,800)	41,209	(130,765)	
766 Waterworks Facility Asset Protection	133,518	15,465	118,053	13,081	2,006	18,950	9,290	11,553	13,574	55,373	27,451	
Business & Operations Support	218,139	140,723	77,416	39,693	21,213	23,112	17,255	9,337	4,937	75,854	1,562	
881 Equipment Purchase	43,983	26,965	17,017	5,109	4,127	4,654	3,181	3,255	1,800	17,017	-	
925 Technical Assistance	1,300	-	1,300	-	327	549	425	-	-	1,300	-	
930 MWRA Facility - Chelsea	9,812	9,812	-	-	-	-	-	-	-	-	-	
931 Business Systems Plan	24,562	24,562	-	(1)	-	-	-	-	-	-	-	
932 Environmental Remediation	1,479	1,479	-	-	-	-	-	-	-	-	-	
933 Capital Maintenance Planning/Development	38,996	22,078	16,919	7,877	4,166	3,691	2,500	2,500	2,500	15,356	1,562	
934 MWRA Facilities Management & Planning	22,874	18,690	4,184	18,320	1,484	-	873	1,195	633	4,184	-	
935 Alternative Energy Initiatives	28,184	18,184	10,000	(234)	-	4,000	6,000	-	-	10,000	-	

Attachment A
FY25 Proposed Capital Expenditure Forecast
at Project Level

Program / Project Name	Total Program/Project Budget Amount	Life-to-Date Spending through FY23	Remaining Balance	FY19-FY23	FY24	FY25	FY26	FY27	FY28	FY24-FY28	FY29-FY33	Beyond FY33
940 Applications Improvements Program	23,975	6,295	17,680	3,403	5,097	5,919	4,276	2,387	-	17,680	-	
942 Information Security Program (ISP)	4,509	3,112	1,397	1,404	360	1,032	-	-	5	1,397	-	
944 Information Technology (IT) Management Program	2	2	-	2	-	-	-	-	-	-	-	
946 IT Infrastructure Program	18,464	9,544	8,920	3,813	5,653	3,267	-	-	-	8,920	-	

ATTACHMENT B
Overview of the FY25 Proposed CIP and Changes from the FY24 Final CIP

Program and Project	FY24 Final				FY25 Proposed				Change from Final FY24			
	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33
Total MWRA	**10,106,708**	**1,824,753**	**2,198,351**	**1,037,902**	**10,549,839**	**1,865,609**	**2,993,791**	**665,425**	**443,129**	**40,855**	**795,441**	**(372,480)**
Wastewater	**4,821,408**	**1,094,737**	**1,212,629**	**51,671**	**4,863,891**	**1,076,938**	**1,293,275**	**35,237**	**42,483**	**(17,799)**	**80,646**	**(16,434)**
Interception & Pumping	**1,622,777**	**299,537**	**507,613**	**46,639**	**1,644,370**	**287,773**	**561,654**	**31,086**	**21,593**	**(11,764)**	**54,041**	**(15,553)**
102 Quincy Pump Facilities	25,907	-	-	-	25,907	-	-	-	-	-	-	-
104 Braintree-Weymouth Relief Facilities	248,035	11,580	3,448	-	248,714	12,752	3,551	-	679	1,172	103	-
105 New Neponset Valley Relief Sewer	30,300	-	-	-	30,300	-	-	-	-	-	-	-
106 Wellesley Extention Replacement Sewer	64,359	-	-	-	64,359	-	-	-	-	-	-	-
107 Framingham Extension Relief Sewer	47,856	-	-	-	47,856	-	-	-	-	-	-	-
127 Cummingsville Replacement Sewer	8,999	-	-	-	8,999	-	-	-	-	-	-	-
130 Siphon Structure Rehabilitation	24,362	13,251	7,669	-	24,362	13,590	7,669	-	-	339	-	-
131 Upper Neponset Valley Sewer	54,174	-	-	-	54,174	-	-	-	-	-	-	-
132 Corrosion & Odor Control	103,497	2,969	26,768	3,145	104,434	4,969	26,008	4,015	937	2,000	(760)	870
136 West Roxbury Tunnel	10,964	650	-	-	10,964	650	-	-	-	-	-	-
137 Wastewater Central Monitoring	27,482	3,322	4,234	-	27,482	3,224	4,332	-	-	(98)	98	-
139 South System Relief Project	4,939	-	1,500	-	4,939	-	1,500	-	-	-	-	-
141 Wastewater Process Optimization	8,310	-	6,111	-	8,310	-	6,111	-	-	-	-	-
142 Wastewater Meter System-Equipment	21,030	-	-	8,674	21,058	(17)	-	9,126	28	(17)	-	452
143 Regional I/I Management Planning	169	-	-	-	169	-	-	-	-	-	-	-
145 Facility Asset Protection	936,696	262,765	457,185	34,820	956,645	247,605	511,785	17,945	19,949	(15,160)	54,600	(16,875)
146 D.I. Cross Harbor Tunnel Inspection	5,000	5,000	-	-	5,000	5,000	-	-	-	-	-	-
147 Randolph Trunk Sewer Relief	698	-	698	-	698	-	698	-	-	-	-	-
Treatment	**1,626,193**	**595,762**	**619,033**	**53,164**	**1,645,491**	**579,525**	**648,315**	**53,164**	**19,298**	**(16,237)**	**29,282**	**-**
182 DI Primary and Secondary	(958)	-	-	-	(958)	-	-	-	-	-	-	-
200 DI Plant Optimization	33,279	-	-	-	33,279	-	-	-	-	-	-	-
206 DI Treatment Plant Asset Protection	1,556,032	581,371	616,539	53,165	1,575,182	565,552	644,872	53,165	19,150	(15,819)	28,333	-
210 Clinton Wastewater Treat Plant	35,628	14,391	2,494	-	35,776	13,973	3,443	-	148	(418)	949	-
211 Laboratory Services	2,212	-	-	-	2,212	-	-	-	-	-	-	-
Residuals	**171,326**	**8,586**	**57,567**	**24,476**	**171,326**	**20,892**	**45,261**	**24,476**	**-**	**12,306**	**(12,306)**	**-**
261 Residuals	63,811	-	-	-	63,811	-	-	-	-	-	-	-
271 Residuals Asset Protection	107,515	8,586	57,567	24,476	107,515	20,892	45,261	24,476	-	12,306	(12,306)	-

ATTACHMENT B
Overview of the FY25 Proposed CIP and Changes from the FY24 Final CIP

Program and Project	FY24 Final				FY25 Proposed				Change from Final FY24			
	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33
CSO	**933,246**	**16,352**	**2,166**	**-**	**934,838**	**15,693**	**4,179**	**-**	**1,592**	**(659)**	**2,013**	**-**
324 CSO Support	61,769	3,815	2,167	-	61,769	2,019	4,180	-	-	(1,796)	2,013	-
339 North Dorchester Bay	221,510	-	-	-	221,510	-	-	-	-	-	-	-
340 Dorchester Bay Sewer Separation (Fox Point)	55,029	-	-	-	55,029	-	-	-	-	-	-	-
341 Dorchester Bay Sewer Separation (Commercial Point)	61,443	-	-	-	61,443	-	-	-	-	-	-	-
342 Neponset River Sewer Separation	2,492	-	-	-	2,492	-	-	-	-	-	-	-
343 Constitution Beach Sewer Separation	3,731	-	-	-	3,731	-	-	-	-	-	-	-
344 Stony Brook Sewer Separation	44,319	-	-	-	44,319	-	-	-	-	-	-	-
346 Cambridge Sewer Separation	104,552	-	-	-	104,552	-	-	-	-	-	-	-
347 East Boston Branch Sewer Relief	85,637	-	-	-	85,637	-	-	-	-	-	-	-
348 BOS019 Storage Conduit	14,288	-	-	-	14,288	-	-	-	-	-	-	-
349 Chelsea Trunk Sewer	31,779	1,000	-	-	31,399	290	-	-	(380)	(710)	-	-
350 Union Park Detention Treatment Facility	49,583	-	-	-	49,583	-	-	-	-	-	-	-
351 BWSC Floatables Controls	946	-	-	-	946	-	-	-	-	-	-	-
352 Cambridge Floatables Control	1,127	-	-	-	1,127	-	-	-	-	-	-	-
353 Upgrade Existing CSO Facilities	22,385	-	-	-	22,385	-	-	-	-	-	-	-
354 Hydraulic Relief Projects	4,458	2,163	-	-	6,430	4,135	-	-	1,972	1,972	-	-
355 MWR003 Gate & Siphon	4,424	-	-	-	4,424	-	-	-	-	-	-	-
356 Fort Point Channel Sewer Separation	21,507	9,375	-	-	21,507	9,250	-	-	-	(125)	-	-
357 Charles River CSO Controls	3,633	-	-	-	3,633	-	-	-	-	-	-	-
358 Morrissey Boulevard Drain	32,181	-	-	-	32,181	-	-	-	-	-	-	-
359 Reserved Channel Sewer Separation	70,524	-	-	-	70,524	-	-	-	-	-	-	-
360 Brookline Sewer Separation	24,715	-	-	-	24,715	-	-	-	-	-	-	-
361 Bulfinch Triangle Sewer Separation	9,032	-	-	-	9,032	-	-	-	-	-	-	
362 East Boston CSO Control	2,182	-	-	-	2,182	-	-	-	-	-	-	-
Other Wastewater	**467,866**	**174,500**	**26,250**	**(72,608)**	**467,866**	**173,055**	**33,866**	**(73,489)**	**-**	**(1,445)**	**7,616**	**(881)**
128 I/I Local Financial Assistance	467,585	174,500	26,250	(72,608)	467,585	173,055	33,866	(73,489)	-	(1,445)	7,616	(881)
138 Sewerage System Mapping Upgrade	281	-	-	-	281	-	-	-	-	-	-	-
Total Waterworks	**5,072,430**	**663,864**	**984,159**	**986,234**	**5,467,808**	**712,817**	**1,698,954**	**630,188**	**395,378**	**48,953**	**714,795**	**(356,046)**
Drinking Water Quality	**730,720**	**26,574**	**41,616**	**-**	**731,140**	**28,751**	**41,616**	**-**	**420**	**2,177**	**-**	**-**
542 Carroll Water Treatment Plant	444,062	4,057	9,250	-	443,780	4,727	9,250	-	(282)	670	-	-
543 Quabbin Water Treatment Plant	19,973	-	-	-	19,973	-	-	-	-	-	-	-
544 Norumbega Covered Storage	106,674	-	-	-	106,674	-	-	-	-	-	-	-
545 Blue Hills Covered Storage	40,083	-	-	-	40,083	-	-	-	-	-	-	-
550 Spot Pond Storage Facility	60,126	-	-	-	60,126	-	-	-	-	-	-	-
555 CWTP Asset Protection	59,802	22,517	32,366	-	60,504	24,024	32,366	-	702	1,507	-	-

ATTACHMENT B
Overview of the FY25 Proposed CIP and Changes from the FY24 Final CIP

Program and Project	FY24 Final				FY25 Proposed				Change from Final FY24			
	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33
Transmission	**2,976,392**	**293,910**	**783,153**	**961,781**	**3,345,061**	**316,561**	**1,500,462**	**597,282**	**368,669**	**22,651**	**717,309**	**(364,499)**
597 Winsor Station Pipeline	70,000	-	57,248	5,403	71,830	-	58,105	6,251	1,830	-	857	848
601 Sluice Gate Rehabilitation	9,158	-	-	-	9,158	-	-	-	-	-	-	-
604 MetroWest Tunnel	700,184	3,002	-	-	709,574	10,059	2,333	-	9,390	7,057	2,333	-
615 Chicopee Valley Aqueduct Redundancy	8,666	-	-	-	8,666	-	-	-	-	-	-	-
616 Quabbin Transmission System	40,506	22,063	515	-	41,597	26,509	515	-	1,091	4,446	-	-
617 Sudbury/Weston Aqueduct Repairs	12,913	6,912	1,131	-	12,534	3,788	3,876	-	(379)	(3,124)	2,745	-
620 Wachusett Reservior Spillway Improvement	9,287	-	-	-	9,287	-	-	-	-	-	-	-
621 Watershed Land	34,000	5,523	-	-	34,000	5,121	-	-	-	(402)	-	-
622 Cosgrove/Wachusett Redundancy	58,619	-	-	-	58,619	-	-	-	-	-	-	-
623 Dam Projects	10,523	6,813	-	-	11,875	8,144	-	-	1,352	1,331	-	-
625 Metro Tunnel Redundancy	1,794,583	166,208	643,921	955,630	2,142,343	180,410	1,343,842	590,283	347,760	14,202	699,921	(365,347)
628 Metro Redundancy Interim Improvement	204,369	67,943	75,626	746	205,894	68,252	79,479	746	1,525	309	3,853	-
630 Watershed Division Capital Improvement	23,582	15,444	4,710	-	29,682	14,276	12,310	-	6,100	(1,168)	7,600	-
Distribution & Pumping	**1,178,967**	**248,143**	**251,656**	**87,505**	**1,202,263**	**258,679**	**258,775**	**92,590**	**23,296**	**10,536**	**7,119**	**5,085**
618 Peabody Pipeline	1,448	-	-	-	1,448	-	-	-	-	-	-	-
677 Valve Replacement	12,016	-	-	-	12,016	-	-	-	-	-	-	-
678 Boston Low Service-Pipe & Valve Rehabilitation	23,691	-	-	-	23,691	-	-	-	-	-	-	-
683 Heath Hill Road Pipe Replacement	19,358	-	-	-	19,358	-	-	-	-	-	-	-
689 James L. Gillis Pump Station Rehabilitation	33,419	-	-	-	33,419	-	-	-	-	-	-	-
692 NHS - Section 27 Improvements	2,141	-	2,013	-	2,141	4	2,013	-	-	4	-	-
693 NHS - Revere & Malden Pipeline Improvement	122,270	72,135	14,441	-	128,741	78,722	14,450	-	6,471	6,587	9	-
702 New Connect Mains-Shaft 7 to WASM 3	99,669	66,163	-	-	101,808	63,884	4,880	-	2,139	(2,279)	4,880	-
704 Rehabilitation of Other Pump Stations	51,572	2,180	19,302	-	51,572	2,180	19,302	-	-	-	-	-
706 NHS-Connecting Mains from Section 91	2,360	-	-	-	2,360	-	-	-	-	-	-	-
708 Northern Extra High Service New Pipelines	59,771	35,098	8,063	-	67,046	38,852	11,147	-	7,275	3,754	3,084	-
712 Cathodic Protection Of Distrubution Mains	7,268	6,108	-	-	7,268	6,108	-	-	-	-	-	-
713 Spot Pond Supply Mains Rehabilitation	67,282	187	800	-	67,284	812	800	-	2	625	-	-
714 Southern Extra High Sections 41 & 42	3,657	-	-	-	3,657	-	-	-	-	-	-	-
719 Chestnut Hill Connecting Mains	54,433	-	23,205	12,941	55,509	-	23,205	14,017	1,076	-	-	1,076
720 Warren Cottage Line Rehabilitation	1,205	-	-	-	1,205	-	-	-	-	-	-	-
721 South Spine Distribution Mains	113,605	2,356	71,889	681	112,152	4,863	66,612	2,016	(1,453)	2,507	(5,277)	1,335
722 NIH Redundancy & Storage	151,514	59,371	-	-	155,751	60,284	1,890	-	4,237	913	1,890	-
723 Northern Low Service Rehabilitation Section 8	68,982	69	63,351	-	68,970	51	63,374	-	(12)	(18)	23	-
724 Northern High Service - Pipeline Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-
725 Hydraulic Model Update	598	-	-	-	598	-	-	-	-	-	-	-
727 Southern Extra High Redundancy & Storage	169,288	3,130	27,189	73,883	172,202	1,572	29,051	76,557	2,914	(1,558)	1,862	2,674
730 Weston Aqueduct Supply Mains	80,403	-	-	-	80,403	-	-	-	-	-	-	-
731 Lynnfield Pipeline	5,626	-	-	-	5,626	-	-	-	-	-	-	-
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	2,717	-	-	-	2,717	-	-	-	-	-	-	-
733 NHS Pipeline Rehabilitation 13-18 & 48	-	-	-	-	-	-	-	-	-	-	-	-

ATTACHMENT B
Overview of the FY25 Proposed CIP and Changes from the FY24 Final CIP

Program and Project	FY24 Final				FY25 Proposed				Change from Final FY24			
	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33	Total Budget Amount	FY24-28	FY29-33	Beyond 33
734 Southern Extra High Pipelines-Sections 30, 39,40, & 44	-	-	-	-	-	-	-	-	-	-	-	-
735 Section 80 Rehabilitation	24,675	1,347	21,402	-	25,322	1,348	22,050	-	647	1	648	-
Other	**186,351**	**95,237**	**(92,266)**	**(63,054)**	**189,344**	**108,826**	**(101,899)**	**(59,686)**	**2,993**	**13,589**	**(9,633)**	**3,368**
753 Central Monitoring System	43,500	11,043	-	-	45,251	11,304	843	-	1,751	261	843	-
763 Distribution Systems Facilities Mapping	3,087	1,461	-	-	3,087	941	572	-	-	(520)	572	-
764 Local Water Infrastructure Rehabilitation Assistance Program	7,488	-	-	-	7,488	-	-	-	-	-	-	-
765 Local Water Pipeline Improvement Loan Program	-	24,000	(115,300)	(97,285)	-	41,209	(130,765)	(94,916)	-	17,209	(15,465)	2,369
766 Waterworks Facility Asset Protection	132,276	58,734	23,034	34,231	133,518	55,373	27,451	35,230	1,242	(3,361)	4,417	999
Business & Operations Support	**212,870**	**66,152**	**1,563**	**-**	**218,140**	**75,854**	**1,562**	**-**	**5,268**	**9,701**	**-**	**-**
881 Equipment Purchase	42,623	15,648	-	-	43,983	17,017	-	-	1,360	1,369	-	-
925 Technical Assistance	1,300	940	-	-	1,300	1,300	-	-	-	360	-	-
930 MWRA Facility - Chelsea	9,812	-	-	-	9,812	-	-	-	-	-	-	-
931 Business Systems Plan	24,562	-	-	-	24,562	-	-	-	-	-	-	-
932 Environmental Remediation	1,479	-	-	-	1,479	-	-	-	-	-	-	-
933 Capital Maintenance Planning	39,160	14,479	1,562	-	38,996	15,356	1,562	-	(164)	877	-	-
934 MWRA Facilities Management	22,700	2,700	-	-	22,874	4,184	-	-	174	1,484	-	-
935 Alternative Energy Initiatives	28,184	10,000	-	-	28,184	10,000	-	-	-	-	-	-
940 Applicat Improv Program	21,375	13,387	-	-	23,975	17,680	-	-	2,600	4,293	-	-
942 Info Security Program ISP	3,709	592	-	-	4,509	1,397	-	-	800	805	-	-
944 Info Tech Mgmt Program	2	-	-	-	2	-	-	-	-	-	-	-
946 IT Infrastructure Program	17,966	8,407	-	-	18,464	8,920	-	-	498	513	-	-

Attachment C
New Capital Projects Added to the FY25 CIP

Program	Project	Subphase	Total Contract Amount	NTP	SC	FY25	FY26	FY27	FY28	FY24-28	Beyond FY28	Total Expenditures
Interception & Pumping	Facility Asset Protection	High Level Sewer Culverts	$ 5,000,000	Apr-26	Oct-27	$ -	$ -	$ 3,157,000	$ 1,843,000	$ 5,000,000	$ -	**$ 5,000,000**
Transmission	MetroWest Tunnel	Shaft L Interconnection Des/ESDC	$ 1,140,000	Jul-24	Jul-29	$ 228,000	$ 228,000	$ 228,000	$ 228,000	$ 912,000	$ 228,000	**$ 1,140,000**
Transmission	MetroWest Tunnel	Shaft L Interconnection-Constr.	$ 5,700,000	Jul-26	Jul-28	$ -	$ -	$ 2,850,000	$ 2,850,000	$ 5,700,000	$ -	**$ 5,700,000**
Transmission	MetroWest Tunnel	Shaft L Interconnection-REI	$ 750,000	Jul-26	Jul-28	$ -	$ -	$ 375,000	$ 375,000	$ 750,000	$ -	**$ 750,000**
Transmission	Watershed Division Capital Improvements	New Salem Building Design	$ 2,100,000	Jul-24	Jan-30	$ 410,000	$ 410,000	$ 410,000	$ 410,000	$ 1,640,000	$ 460,000	**$ 2,100,000**
Transmission	Watershed Division Capital Improvements	New Salem Building Constr	$ 4,000,000	Jan-27	Jan-29	$ -	$ 2,000,000	$ 2,000,000	$ -	$ 4,000,000	$ -	**$ 4,000,000**
SUMMARY:												
Total Wastewater Projects			**$ 5,000,000**			**$ -**	**$ -**	**$ 3,157,000**	**$ 1,843,000**	**$ 5,000,000**	**$ -**	**$ 5,000,000**
Total Water Projects			**$ 13,690,000**			**$ 638,000**	**$ 2,638,000**	**$ 5,863,000**	**$ 3,863,000**	**$ 13,002,000**	**$ 688,000**	**$ 13,690,000**
Total Projects			**$ 18,690,000**			**$ 638,000**	**$ 2,638,000**	**$ 9,020,000**	**$ 5,706,000**	**$ 18,002,000**	**$ 688,000**	**$ 18,690,000**

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Bond Defeasance of Future Debt Service

COMMITTEE: Administration, Finance & Audit

X VOTE
INFORMATION

Matthew R. Horan, Deputy Director, Finance/Treasurer
Preparer/Title

Thomas J. Durkin
Director of Finance

Consistent with MWRA's multi-year rates management strategy, MWRA staff are recommending the execution of an approximately $13.0 million defeasance to reduce future year rate increases. The $12.4 million in available funds required for the defeasance are derived from the remaining FY23 positive budget variance after $27.9 million was utilized to terminate MWRA's Swap Agreements in November 2023. These funds will be used to prepay debt service coming due in FY25 through FY28 ($11.4 million in principal and $1.6 million in interest). The defeasance of debt, coupled with diligent management of operational expenses, have been the keys to MWRA's ability to keep assessment increases sustainable and predictable.

RECOMMENDATION:

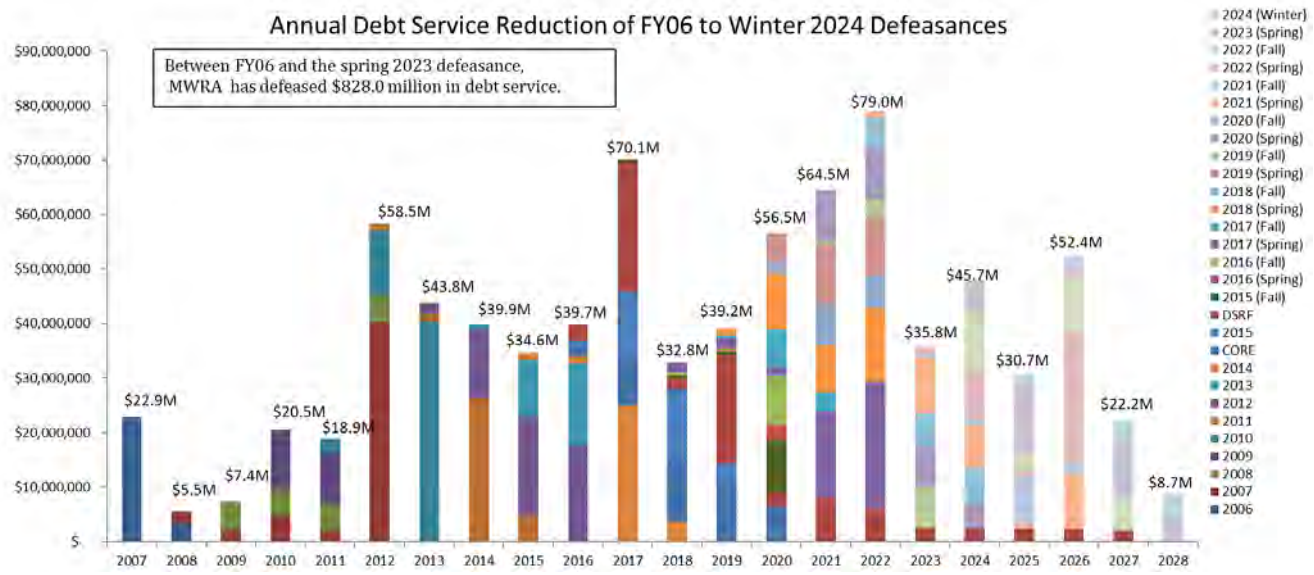
To authorize the Executive Director or his designee, on behalf of the Authority, to enter into, execute and deliver all necessary agreements and other instruments and to take such other actions necessary to effectuate the redemption and defeasance of an aggregate principal amount of $11,350,000 of outstanding MWRA senior bonds including to cause the escrow of cash and/or securities in an amount necessary to fund such redemption and defeasance, in order to reduce the debt service requirement by approximately $13.0 million in the FY25 through FY28 timeframe.

DISCUSSION:

In November 2023, MWRA utilized approximately $27.9 million from the FY23 positive budget variance to terminate its outstanding swap agreements for future debt service savings. After completion of the swap terminations, there is approximately $12.5 million of FY23 funds remaining. Staff recommend using those funds to complete a defeasance of outstanding bonds for future year debt service savings and to continue to help manage the impact of the assessment pressure on the water utility communities.

MWRA's ongoing use of defeasances has had a significant impact in lowering future debt service payments and limiting annual rate revenue increases. From 2006 through this proposed

transaction, MWRA has defeased $828.0 million in debt service to reduce future year rate revenue requirements. The following chart details the multi-year impact of those defeasances.



The application of these defeasances has had a significant impact on rate increases. The chart below shows the estimated rate increase without the application of the defeasances.

Staff reviewed all bonds available to be defeased, and have identified the maturities of the bonds in the following table as the most advantageous defeasance candidates to manage future debt service on both total budget and utility level.

Series	Maturity	Call Date	Principal	Defeasance Cost[1]
2016C	August 1, 2025	August 1, 2025	$ 1,500,000	$ 1,575,000
2016C	August 1, 2026	August 1, 2026	$ 2,225,000	$ 2,447,500
2016C	August 1, 2027	August 1, 2026	$ 3,500,000	$ 3,850,000
2016C	August 1, 2028	August 1, 2026	$ 4,125,000	$ 4,537,500
		Total	**$ 11,350,000**	**$ 12,410,000**

(1) Defeasance costs is only anticipated funds from surplus and does not included current year deposits.

The following table details the annual budget savings by fiscal year for the proposed FY24 Winter Defeasance.

Budget Reduction by Fiscal Year				Total CEB
2025	2026	2027	2028	Savings
$ 2,067,500	$ 2,717,500	$ 3,881,250	$ 4,331,250	$ 12,997,500

The proposed defeasance reduces debt service by a total of $13.0 million between FY25 and FY28. The total debt service reduction attributable to the defeasance is approximately $587,500 higher than the defeasance cost because the 2027 and 2028 maturities of the 2016 Series C bonds are callable prior to its maturity date. The payment of these bonds on the call date will yield interest savings, as a result of paying off the bonds prior to maturity without interest accruing. Since 2006, MWRA has avoided $39.4 million in interest by defeasing callable bonds. In addition to the interest rate savings, the defeasance also directly targets water utility principal coming due in FY25, FY26 and FY27 to continue to manage the assessment increase pressure on MWRA's water communities.

The funds will be utilized to purchase governmental securities in an amount sufficient to make all future interest and principal payments on the bonds to be defeased, offset by the interest earned on the securities.

The governmental securities purchased will be deposited with an escrow agent (bond trustee). Once established, an escrow is irrevocable, replacing any future debt service payments due for the bonds being escrowed, and therefore reducing the rate revenue requirement. Establishing an escrow reduces debt service requirements for each fiscal year from the time it is executed until the defeased bonds mature or are called.

Establishing an escrow to defease debt requires that MWRA's bond counsel draft an agreement to this effect and an independent verification agent must certify that the funds in the escrow are sufficient to pay the remaining debt service. Bonds that are defeased are not included in the MWRA's debt cap or debt service coverage calculations. Staff will continue to monitor market conditions and the maturities available to be defeased to ensure that the bonds selected provide MWRA with the highest available debt service savings.

BUDGET/FISCAL IMPACT:

The defeasance of these bonds will decrease the FY25 through FY28 debt service requirement by approximately $13.0 million. The cost associated with bond counsel and financial advisory services will be paid out of the Treasury Department's professional services budget.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: Bond Counsel Services
Greenberg Traurig, LLP
Contract F273

COMMITTEE: Administration, Finance & Audit

X VOTE
INFORMATION

Michele S. Gillen
Director, Administration

Matthew R. Horan, Deputy Director, Finance/Treasurer
Preparer/Title

Thomas J. Durkin
Director, Finance

RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract F273 to Greenberg Traurig, LLP for Bond Counsel Services and to authorize the Executive Director, on behalf of the Authority, to execute Contract F273 in an amount not to exceed $1,566,960 and for a term of four years from the Notice to Proceed.

DISCUSSION:

Issuers of tax-exempt debt are required to have a Bond Counsel to ensure that bonds are being issued in compliance with all applicable federal and state laws and regulations. Revenue bond issuers, like MWRA, also require Bond Counsel to ensure the bonds are issued in compliance with their bond resolution. For each bond transaction, Bond Counsel will render an opinion that the bonds are legal, binding obligations of the Authority and, if applicable, are exempt from federal and state income taxes. Beyond the issuance process, Bond Counsel assists with providing legal opinions and advice on the management of the outstanding debt, ensuring compliance with the requirements of the General Revenue Bond Resolution and all applicable laws, regulations, and pronouncements on an ongoing basis. Along with the maintenance of the existing outstanding debt, Bond Counsel also provides MWRA with advice as it relates to questions raised by the rating agencies, Internal Revenue Service, bondholders, underwriters and other interested parties.

PROCUREMENT PROCESS:

The procurement process to select Bond Counsel utilized a one-step Request for Qualification Statements and Proposals (RFQ/P), which was issued on October 26, 2023. The procurement was publically advertised in the Goods and Services Bulletin, Boston Herald, Banner Publications, El Mundo and via the MWRA Supplier Portal. In addition to MWRA's standard procurement

advertising requirements, copies of the advertisement were sent directly to eight firms. Three firms, Greenberg Traurig, LLP (Greenberg), Locke Lord LLP (Locke), and McCarter & English, LLP (McCarter) submitted proposals on November 17, 2023. During the procurement process Mintz, Levin, Cohn, Ferris, Glovsky, and Popeo, P.C. sent a letter indicating that there were unable to provide a proposal for bond counsel services since they serve as bond and program counsel to the Massachusetts Clean Water Trust, and there was a potential for disalignment of interest.

As part of the procurement process, proposers are required to provide Disclosure Statements assuring that the firm's engagement would not result in a conflict of interest or other activity prohibited by Rules 1.7-1.10 of the Massachusetts Supreme Judicial Court Rule 3:07 Rules of Professional Conduct. Those statements are reviewed by a separate Disclosure Panel, comprised of staff from Procurement and the Law Division, which reports any areas of non-compliance or concern to the Selection Committee. After review of the Disclosure Statements, the Panel determined that Greenberg, Locke, and McCarter did not have conflicts of interest or other prohibited activity under the SJC Rules.

The Selection Committee evaluated and ranked the proposals from Greenberg, Locke, and McCarter based on the criteria contained in the RFQ/P: Cost (30 pts), Qualifications and Key Personnel (30 pts), Experience and Past Performance (25 pts), and Technical Approach, Capacity/Organization, and Management Approach (15 pts). The proposals for Bond Counsel Services were ranked as follows:

Rank	Firm	Cost	Total Points	Order of Preference
1	Greenberg Traurig	$1,566,960	424	5
2	Locke Lord	$1,392,595*	388	10
3	McCarter & English	$1,703,255*	325	15

Order of Preference represents the sum of the individual Selection Committee members' rankings where the firm receiving the highest number of points is assigned a "1"; the firm receiving the next highest number of points a "2" and so on.

*Reflects corrections due to math/hourly rate errors

The current Bond Counsel contract (Contract F253) has a not-to-exceed amount of $1,588,800 derived from an estimated number of bond transactions and level of effort for other tasks. Based on actual tasks completed, MWRA has expended $767,973 on Contract F253.

All three proposals reviewed by the Selection Committee were from firms with significant relevant experience that are well respected in the municipal bond market. Greenberg proposed a total cost of $1,566,960 with a total of 2,802 hours. Those hours were allocated 84% to the partner level and 16% at the "of counsel" level. Greenberg's cost proposal did not include any escalation in hourly rates over the term of the contract. Greenberg proposed a strong team that has significant familiarity with MWRA and its capital financing program. The proposed lead partner has been involved with MWRA's debt issuance since 2008 and as an associate and partner level attorney has previously served as Disclosure Counsel and Bond Counsel. Greenberg has also provided MWRA with assistance related to the amendment to the General Revenue Bond Resolution, as well as other tax and bond related matters. Greenberg's experience with both MWRA and the broader bond markets make it well suited to assist MWRA with its complex debt portfolio. Greenberg provided a detailed and well-structured technical approach.

Locke proposed a total contract cost of $1,392,595 with a total of 2,405 hours. Those hours were allocated 60% to the partner level, 32% to the associate level and 8% to paralegal staff. Locke proposed a $20 per hour increase to all key personnel in years three and four, which resulted in a 3% to 7% increase depending on the key personnel's hourly rate for each year of the contract period. While overall Locke presented a strong team, the Selection Committee was concerned with 32% of the level of effort being assigned to an associate with only five years of experience and 8% allocated to paralegal staff. Given the complex nature of MWRA's debt portfolio there was concern that portions of the work might require a higher level of expertise. This may result in higher costs to MWRA since the proposed partners' hourly rates are significantly higher than the associate. In addition, Locke proposed 4 hours of the tax partner's time for each bond transaction, which was lower than expected and likely not sufficient. In the technical approach Locke proposed two co-lead partners, which the Selection Committee found less advantageous than one lead partner.

McCarter proposed a total contract cost of $1,703,255 with a total of 3,689 hours. The hours were allocated 78% partner, 19% associate counsel and 4% paralegal. McCarter proposed increasing hourly rates between years three and four of the contract. This increase ranged from 10% to 20% depending on the individual. While McCarter proposed a team with significant experience in the bond market, much of the experience related to MWRA was with a previous lead partner who is no longer with the firm.

Based on the cost, experience and qualifications of the firm, the Selection Committee recommends award of Contract F273 Bond Counsel Services to Greenberg Traurig, LLP.

BUDGET/FISCAL IMPACT:

Most costs associated with Bond Counsel services are included as part of the cost of issuance and are funded from the proceeds of bond transactions. A small portion of the work is funded through the CEB. The FY24 CEB has sufficient funds to pay for the work included in this contract.

MBE/WBE PARTICIPATION:

There were no MBE/WBE participation requirements established for this contract due to the limited opportunities for subcontracting.

STAFF SUMMARY

TO: Board of Director
FROM: Frederick A Laskey, Executive Director
DATE: January 17, 2024
SUBJECT: January 2024 PCR Amendments

COMMITTEE: Personnel and Compensation

____ INFORMATION
_X_ VOTE

Wendy Chu, Director of Human Resources
Preparer/Title

Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve amendments to the Position Control Register (PCR) included in the attached chart.

DISCUSSION:

The Position Control Register lists all positions of the Authority, filled and vacant. It is updated as changes occur and it is published at the end of each month. Any changes to positions during the year are proposed as amendments to the PCR. All amendments to the PCR, except those resulting only in a change in title or cost center, must be approved by the Personnel Committee of the Board of Directors. All amendments resulting in an upgrade of a position by more than one grade level, and/or an amendment which creates a position increasing annual cost by $10,000 or more, must be approved by the Board of Directors after review by the Personnel and Compensation Committee.

January 2024 PCR Amendments

There are five PCR Amendments this month.

Organizational Changes:

1. Grade change to one vacant position in the Administration Division, MIS Department from Library Supervisor, Unit 6 Grade 9, to Library Supervisor, Unit 6 Grade 10, due to changes in responsibilities.
2. Salary adjustment to four filled positions in the Operations Division, Deer Island Trade Maintenance Department Area Manager Unit 6F Grade 12 due to pay equity per union agreement.

BUDGET/FISCAL IMPACT:

The annualized budget impact of these PCR amendments will be a maximum cost of $32,046. Staff will ensure that the cost associated with these PCR amendments will not result in spending over the approved FY24 Wages and Salaries budget.

ATTACHMENTS:

Job Descriptions

MASSACHUSETTS WATER RESOURCES AUTHORITY
POSITION CONTROL REGISTER AMENDMENTS
FISCAL YEAR 2024

PCR AMENDMENTS REQUIRING BOARD APPROVAL - January 17, 2024

Number	Current PCR #	V/F	Type	Current Title	UN	GR	Amended Title	UN	GR	Current/Budget Salary	Estimated New Salary			Estimated Annual $ Impact			Reason For Amendment
B66	Administration MIS Department 8510008	V	G	Library Supervisor	6	9	Library Supervisor	6	10	$101,543	$73,040	-	$111,764	-$28,503	-	$10,221	Grade better reflects responsibility level.
B67	Operations Deer Island Trades Maintenance 2988052	F	S	Area Manager, Residuals	6F	12	Area Manager, Residuals	6F	12	$117,248	$124,426	-	$124,426	$7,178	-	$7,178	Salary adjustment due to pay equity, per union agreement.
B68	Operations Deer Island Trades Maintenance 29880128	F	S	Area Manager, Secondary	6F	12	Area Manager, Secondary	6F	12	$117,248	$126,917	-	$126,917	$9,669	-	$9,669	Salary adjustment due to pay equity, per union agreement.
B59	Operations Deer Island Trades Maintenance 2988071	F	S	Area Manager, Elec/Piping	6F	12	Area Manager, Elec/Piping	6F	12	$121,987	$124,426	-	$124,426	$2,439	-	$2,439	Salary adjustment due to pay equity, per union agreement.
B70	Operations Deer Island Trades Maintenance 2988095	F	S	Area Manager, HVAC and I&C	6F	12	Area Manager, HVAC and I&C	6F	12	$126,916	$129,455	-	$129,455	$2,539	-	$2,539	Salary adjustment due to pay equity, per union agreement.
				BOARD TOTAL =	5						**TOTAL:**			-$6,678	-	$32,046	

MWRA
POSITION DESCRIPTION

OLD

POSITION: Library Supervisor

DIVISION: Administration & Finance

DEPARTMENT: Management Information Systems (MIS)

BASIC PURPOSE:

Provides and maintains a comprehensive library and information resource center including computer access to research sources that will assist staff in accomplishing the MWRA mission.

SUPERVISION RECEIVED:

Works under the close supervision of the Librarian / Records Manager.

SUPERVISION EXERCISED:

Exercises close supervision of the Library Specialist and Library interns/temporary staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Executes in-depth technical research requested by staff through the utilization of on-line services..

- Recommends informational materials for MWRA library collection, including books, subscriptions, periodicals, and multi-media, then reviews collection to ensure that standards and specifications are up-to-date.

- Ensures staff assignments are completed including data entry of news clips, photocopying of reference requests, re-shelving of returned materials, processing of interlibrary loan requests, cataloging new materials and other duties as assigned.

- Provides access to the library information sources including books, journals, multi-media assets, news clips, photographs, flood plain maps and historical items.

- Classifies new materials and consultant reports in accordance with library classifications schemes and notifies staff of new acquisitions by issuing Library updates and updating Intranet site.

- Manages and maintains the integrity and standardization of existing information stored in

library computer databases and web pages.

- Fields and responds to information requests from all levels of authority staff, the public, students and consultants via phone, e-mail and on-site visits.

- Provides on-site staff training for computer access to library collections.

- Manages the monthly report of library activities by summarizing pertinent research questions.

- Oversees the library Intranet homepage and portal.

- Implements changes and updates to the Library Portal.

- Attends authority informational meetings as necessary.

- Adheres to all Record Management policies and supports records center as assigned.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

(A) Four (4) year college program in Information Services, Liberal Arts or Science. A masters degree in Library and Information Science preferred; and

(B) Specific understanding of library science and information services as acquired through four (4) to seven (7) years experience, of which at least three (3) years is in a supervisory capacity; or

(C) Any equivalent combination of education and/or experience.

Necessary Knowledge, Skills and Abilities:

(A) Proficiencies in computer application including MS Office, MS Access, and on-line search tools are required. HTML and database skills are required.

(B) Capable of using Micro media equipment.

(C) Excellent analytical, interpersonal, written and oral communications skills are required.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Operators License.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone**,** personal computer including word processing and other software, copy and fax machine**.**

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls, reach with hands and arms, and talk or hear. The employee frequently is required to stand, sit, climb or balance. The employee occasionally is required to walk, stoop, kneel, crouch or crawl, taste or smell.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job**,** the employee regularly works in an office environment.

The noise level in the work environment is usually a moderately quiet office setting.

March, 2017

MWRA
POSITION DESCRIPTION

NEW

POSITION: Library Supervisor

DIVISION: Administration

DEPARTMENT: Management Information Systems (MIS)

BASIC PURPOSE:

Provides and maintains a comprehensive library and information resource center including computer access to research sources that will assist staff in accomplishing the MWRA mission. Provides support to the Library/Records Manager on the deployment and maintenance of workflows and physical/electronic records related information within the Electronic Content Management (ECM) system.

SUPERVISION RECEIVED:

Works under the close supervision of the Library / Records Manager.

SUPERVISION EXERCISED:

Exercises close supervision of Library intern(s).

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Executes in-depth technical research requested by staff through the utilization of on-line services and the ECM system.

- Recommends informational materials for MWRA library collection, including books, subscriptions, periodicals, and multi-media, then reviews collection to ensure that standards and specifications are up-to-date.

- Ensures tasks are completed including data entry of news clips, photocopying of reference requests, re-shelving of returned materials, processing of interlibrary loan requests, and cataloging new materials in both the library catalog and the ECM system.

- Provides access to the library information sources including books, journals, multi-media assets, news clips, photographs, flood plain maps and historical items.

- Classifies new materials and consultant reports in accordance with library and ECM classifications schemes and notifies staff of new acquisitions by issuing Library updates and updating Intranet site.

- Manages and maintains the integrity and standardization of existing information stored in library computer databases, ECM system, and web pages.

- Fields and responds to information requests from all levels of authority staff, the public, students and consultants via phone, e-mail and on-site visits.

- Provides on-site staff training for computer access to library collections and ECM system.

- Manages the monthly report of library activities by summarizing pertinent research questions.

- Oversees the library Intranet homepage and portal.

- Implements changes and updates to the Library Resources Portal.

- Adheres to all Record Management policies and supports records center as assigned.

- Assists Library/Records Manager with the deployment and maintenance of the ECM system related to records management.

- Works with MIS to define requirements and test new business solutions through the ECM system related to records management.

- Helps coordinate with end users and MIS around the new ECM system related to library and records management.

SECONDARY DUTIES:

- Performs other duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

(A) A Bachelor's degree required in any field preferably Information Services. A Master's degree in Library and Information Science preferred; and

(B) Specific understanding of library science, information services, content management, records management, or research as acquired through at least four (4) years of experience, of which at least one (1) year is in a supervisory capacity; or

(C) Any equivalent combination of education and/or experience.

Necessary Knowledge, Skills and Abilities:

(A) Proficiencies in computer application including MS Office, MS Access, and on-line search tools are required. HTML and database skills are required.

(B) Capable of using Micro media equipment.

(C) Excellent analytical, interpersonal, written and oral communications skills.

(D) Previous experience with Electronic Content Management (ECM) platforms desirable.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Operators License for traveling to MWRA sites including the Records Center.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone**,** personal computer including word processing and other software, copy and fax machine**.**

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls, reach with hands and arms, and talk or hear. The employee frequently is required to stand, sit, climb or balance. The employee occasionally is required to walk, stoop, kneel, crouch or crawl, taste or smell.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job**,** the employee regularly works in an office environment.

The noise level in the work environment is usually a moderately quiet office setting.

January 2024

MWRA
POSITION DESCRIPTION

POSTION: Area Manager (Electrical)

DIVISION: Operations

DEPARTMENT: Operations Division / Deer Island

BASIC PURPOSE:

Manages maintenance activities (labor, materials, services) and monitors performance against operational needs and requests.

SUPERVISION RECEIVED:

Works under general supervision of the Maintenance Manager.

SUPERVISION EXCERCISED:

Exercises close supervision of assigned operations/maintenance staff.

ESSENTIAL DUTIES AND RESPONSIBILITES:

- Manages a group of maintenance personnel who perform tasks related to maintenance and construction.
- Coordinates with other managers, supervisors, work coordination staff and others for optimal functioning of assigned staff.
- Monitors "Work-In-Progress" by coordinating with Maintenance Supervisors, Operations Managers and Planner Schedulers, and also monitors backlog with object of minimization.
- Prepares budget for assigned cost center and monitors performance against approved budget. Approves and tracks spending, justifies variances from budget, and provides support documentation as requested.
- Reviews, monitors, evaluates work performed, and recommends appropriate improvements on equipment, techniques, and procedures.
- Provides project management of outside contract services as assigned.
- Provides technical input for major maintenance projects and reviews new construction proposals to insure maintainability.
- Reviews assigned employee performance according to MWRA procedures as established and maintained by the Human Resources Department.
- Recommends upgrades to plant equipment and facilities to ensure continued optimal operation. Includes tracking major projects and the coordination of outside contractors, as required.
- Promotes the MWRA Safety Policy and Program by participating in and supporting activities as detailed by the Authority Safety Group.

- Acts as liaison between and promotes harmonious relations with other Maintenance Managers, Operations Managers, vendors and MWRA departments.

- Performs supervisory responsibilities of roving field crews and operational personnel located within an operational control center (OCC) as needed.

- Coordinates shutdown and start-up of process equipment in support of maintenance activities.

- Ensures plant cleanliness and makes rounds to ensure plant facility is maintained by staff.

- Schedules and works overtime as required.

- Needs to be available during any emergency.

- Provides training to assigned staff.

- Directs remedial action in all emergencies.

- Assists employee with procurement of tools, parts and materials.

- Operates motor vehicles, such as vans and pick-up trucks, to transport materials to work sites, pick up equipment, etc.

- Generates inspection lists and maintenance reporting through the Computerized Maintenance Management System.

- Inspects and troubleshoots various systems and equipment

SECONDARY DUTIES:

- Assists employees with the preparation of injury and illness reports, safety work orders, and maintenance work order requests, reviews requests for completeness and accuracy.

- Assists in maintaining harmonious labor management relations through proper application of collective bargaining agreement provisions and established personnel policies.

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

(A) A four (4) year degree in Electrical Engineering, or any related field; and

(B) Seven (7) – nine (9) direct experience of principles, procedures, methods, equipment and materials used in the operation, repair and maintenance of a large municipal wastewater or water treatment facility; and

(C) Two (2) must be in a supervisory capacity; or

(D) Any equivalent combination of education and experience.

Necessary Knowledge, Skills and Abilities:

(A) A working knowledge of the methods, techniques, operations, systems, equipment, principles and practices of wastewater or water treatment.

(B) Must have a working knowledge of High, Medium and Low voltage distribution systems, switchgear operation and inspection, control systems, VFDs, lighting systems, as well as applicable federal, state and local codes.

(C) Proficient with personal computers (PCs) and PC programs Word & Excel. Experience using CMMS (Computerized Maintenance Management System). Experience with developing and managing contract services.

(D) Ability to plan, organize, direct, train and assign duties to subordinates, as obtained through successful completion of supervisory training program or an approved substitution.

(E) Extensive knowledge of safety practices and applications in wastewater treatment operations.

(F) Ability to plan, organize, direct, train and assign duties to subordinates.

SPECIAL REQUIREMENTS:

- A valid Class D Massachusetts Motor Vehicle Operator License.
- A valid Massachusetts Master Electrician's license preferred.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, mobile radio, beeper, personal computer, including word processing and other software, copy and fax machine.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls and reach with hands and arms. The employee frequently is required to stand and talk or hear. The employee is occasionally required to walk; sit; climb or balance; stoop, kneel, crouch, or crawl; taste or smell.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move more than 50 pounds. Specific vision abilities required by this job include close vision, distance vision, color vision, depth perception, peripheral vision and the ability to adjust focus.

WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee regularly works in outside weather conditions. The employee occasionally works near moving mechanic parts and is occasionally exposed to wet and/or humid conditions and vibration. The employee occasionally works in high, precarious places and is occasionally exposed to fumes or airborne particles, toxic or caustic chemicals.

The noise level in the work environment is usually loud in field settings, and moderately quiet in an office setting.

March 2015