

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

Third Quarter FY2023

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
May 24, 2023

Board of Directors Report on Key Indicators of MWRA Performance

3rd Quarter - FY23

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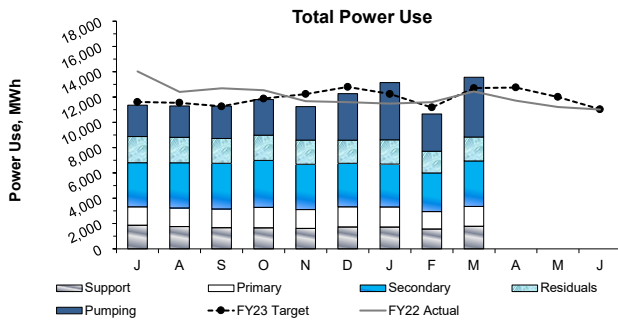
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director
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May 24, 2023

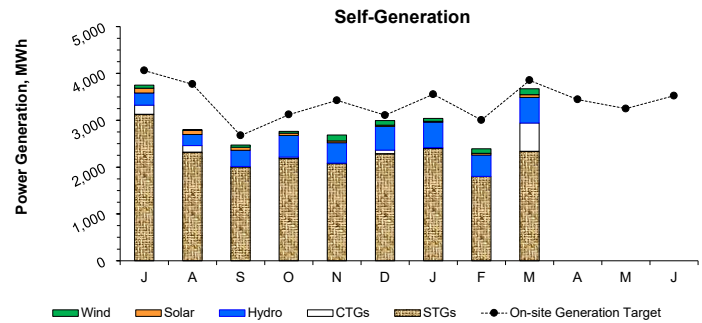
OPERATIONS AND MAINTENANCE

Deer Island Operations

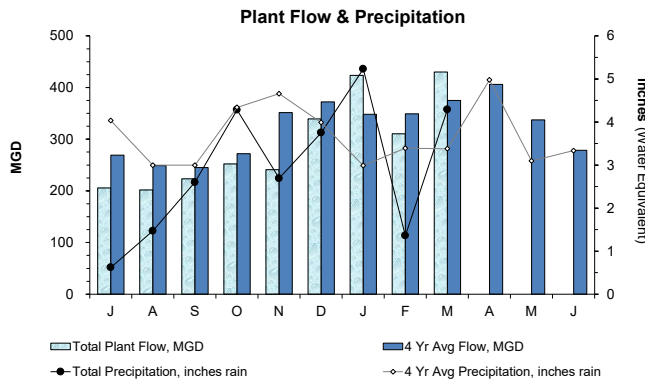
3rd Quarter - FY23



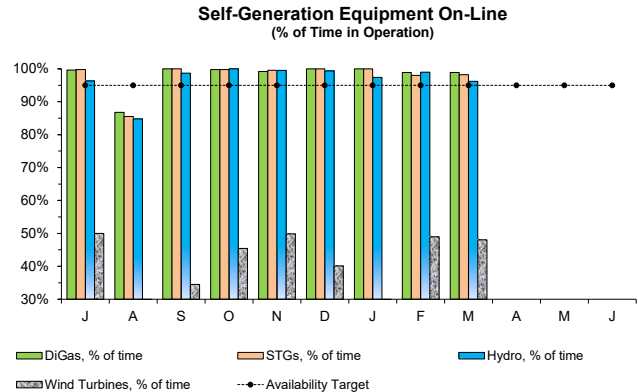
Total power usage in the 3rd Quarter was 3.4% above target as plant flow for this period was 8.5% above target with historical (4 year average) data used to generate the electricity model. As a result, power usage in nearly all areas and treatment processes was similar to or were slightly above target, with power used for raw wastewater pumping 11.1% above target as a result of the higher plant flows.



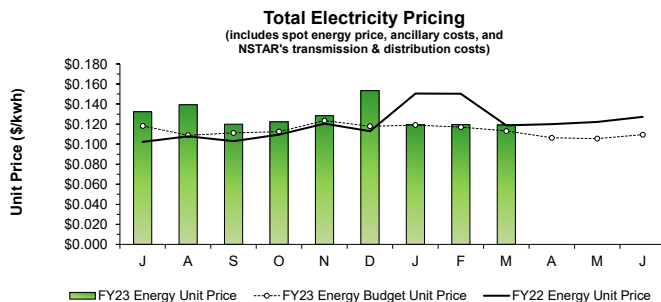
Power generated on-site during the 3rd Quarter was 12.5% below the target. A single CTG was operated for nearly 41 continuous hours in mid-March as potential backup power during a lengthy significant rain and high wind event with very elevated plant flows. The CTGs were also operated for annual compliance testing, as well as for routine maintenance. STGs generation was 10.4% below target as the main STG was out of service for several days in February due to an electrical issue following a brief under-voltage incident which caused the Thermal Power Plant to trip. Hydro Turbine generation was 3.1% above target due to higher plant flows. Wind Turbine generation was 55.8% below target as Turbine #1 has been out of service pending repairs to the failed main shaft bearing. Solar Panel generation was 23.6% below target partially due to overcast conditions during the quarter. Additionally, there was an A/C contactor issue with the Maintenance-Warehouse Building solar array, beginning on March 21, and the Residuals Odor Control Facility solar array remains offline pending the return of a repaired grid inverter.



Total Plant Flow for the 3rd Quarter was 8.5% above target with the budgeted 4 year average plant flow (388.0 MGD actual vs 357.5 MGD expected) as precipitation was 11.5% above target this quarter (10.88 inches actual vs. 9.76 inches expected).

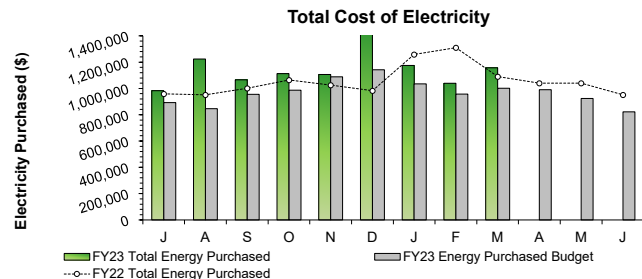


The DiGas System, STGs, and Hydro Turbines availability exceeded the 95% availability in the 3rd Quarter. The combined Wind Turbine availability was only 42.2% due to a main shaft bearing failure on Turbine #1. Wind Turbine #2 was available 84.5% of the time during the quarter as it was out of service for 13 days at the start of 2023 due to a faulty gear oil motor.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Prices for FY23 are not yet available as the complete invoices have not been received. Therefore, the estimated pricing information is provided. The estimated Total Energy Unit Price during the 3rd Quarter was 2.6% above target with budgetary estimates. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges. The invoices with the fixed block and spot energy prices have been pending receipt since March 2022.

Note: Only estimated energy prices are reported for March FY22 to current time as the invoices for the fixed block and spot energy prices have been pending receipt for this period of time.

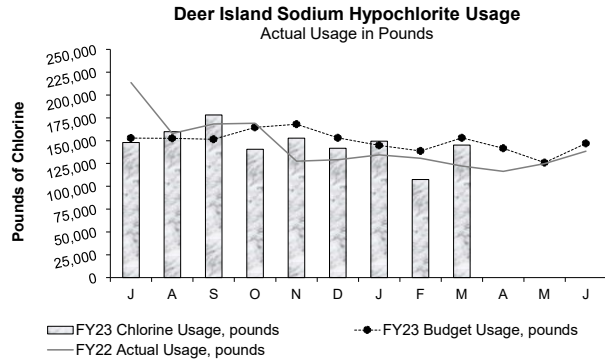
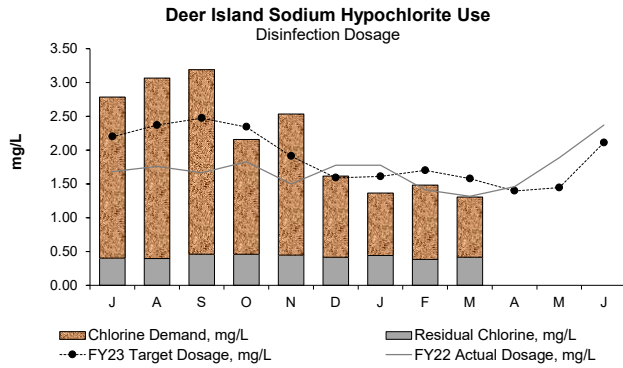


The actual Electricity cost data for Electricity Purchased during FY23 are not yet available as the complete invoices have not been received. Therefore, the estimated Total Cost of Electricity is provided. Fiscal Year-to-date Total estimated Cost of Electricity is \$1,390,912 (15.6%) higher than budgeted through March as the estimated Total Energy Unit Price was 10.6% higher than target and the estimated Total Electricity Purchased was 4.5% above target. The invoices with the fixed block and spot energy prices have been pending receipt since March 2022.

Note: Only estimated Total Cost of Electricity data are reported for March FY22 to current time as the invoices for the fixed block and spot energy prices have been pending receipt for this period of time.

Deer Island Operations

3rd Quarter - FY23



The disinfection dosing rate in the 3rd Quarter was 15.0% below target with budgetary estimates. As a result, actual sodium hypochlorite usage in pounds of chlorine was similarly 7.9% lower-than-expected as chlorine demand remained low this quarter in comparison to earlier in the fiscal year. DITP maintained an average disinfection chlorine residual of 0.41 mg/L this quarter with an average dosing rate of 1.38 mg/L (as chlorine demand was 0.97 mg/L).

The overall disinfection dosing rate (target and actual) is dependent on plant flow, target effluent total chlorine residual levels, effluent quality and NPDES permit levels for fecal coliform.

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
July	0	0	0	100.0%	0.00
August	0	0	0	100.0%	0.00
September	0	0	0	100.0%	0.00
October	1	1	0	99.8%	2.43
November	1	1	0	99.9%	2.12
December	4	4	0	99.5%	17.95
January	3	3	0	98.7%	28.99
February	0	0	0	100.0%	0.00
March	2	2	0	96.8%	48.02
April					
May					
June					
Total	11	11	0	99.2%	99.51

98.4% of all flows were treated at full secondary during the 3rd Quarter. There were five (5) secondary blending events due to high plant flows from heavy precipitation and snowmelt. These blending events resulted in 77.01 hours of blending and a total of 592.61 MGal of primary-only treated effluent blended with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD.

Secondary permit limits were met at all times during the 3rd Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 1,240.2 MGD during the mid-day of March 14. This peak flow occurred during a multi-day storm event that brought 2.54 inches of precipitation to the metropolitan Boston area combined with snowmelt. The Total Plant Flow in Quarter 3 was 8.5% above the 4 year average plant flow target for the quarter.

The backflow preventers that serve the North Main Pump Station water feed to the seal water for the raw wastewater pumps were replaced by DITP staff on March 30. The existing backflow preventers were 30 years old and the isolation valves were no longer providing adequate isolation. Prior to the replacement of the backflow preventers, a 45 minute test was successfully conducted on March 29 to ensure the fire hydrant and temporary hose connection (using a back flow preventer) that was put in place for use during the replacement work, would be able to supply the seal water to the raw wastewater pumps without issue for the duration of the work which was expected to take approximately four (4) to six (6) hours.

Residuals Treatment:

In January, DITP staff began the process of transitioning digester operation from Module #1 to Module #3. This is a lengthy process to complete, as each digester is slowly filled one-at-a-time using the digested sludge overflows from the online digesters, then allowing the digester to slowly acclimate before it can begin taking normal sludge feed. As each digester in Module #3 is placed into service, a digester in Module #1 can then be taken out of service to be eventually drained of sludge. This transition from Module #1 to Module #3 operation was completed in early February. The draining of the sludge in the Module #1 digesters began one (1) digester at a time after the Module #1 to #3 transition was completed.

Odor Control Treatment:

Carbon adsorber (CAD) unit #4 in the North Pumping Odor Control (NPOC) Facility, units #1 and #2 in the East Odor Control (EOC) Facility, and unit #4 in the Residuals Odor Control (OC) Facility were emptied and refilled with new regenerated activated carbon media this month as part of routine maintenance to replace spent activated carbon.

Deer Island Operations

3rd Quarter - FY23

Deer Island Operations & Maintenance Report (continued)

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 24.4% of Deer Island's total power use for the 3rd Quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 22.7% of Deer Island's total electrical power use for the quarter.

Wind Turbine #2 was out of service from December 30 to January 13 due to a faulty gear oil motor.

Hydro Turbine #1 was out of service for general routine maintenance from January 30 through February 3. This maintenance outage did not impact hydro turbine generation as Turbine #2 remained in operation while Turbine #1 was out of service for maintenance.

On Friday February 3, DITP experienced an under voltage situation causing the boiler at the Thermal Power Plant to trip at 10:32 p.m. Digester gas was diverted to the waste gas flares however, only one (1) of the three (3) flares started. The other flares were frozen due to extreme temperature conditions and could not be operated. Regional recording setting low temperature conditions existed during this evening with temperatures registering at -5 degrees Fahrenheit around the time of the event and a low of -9.6 degrees Fahrenheit by 2:32 a.m. on February 4. The excess digester gas that could not be burned by the single operating flare was intermittently released to the atmosphere through pressure relief valves at the top of the digesters for several hours until the boiler was restarted and could begin to utilize the digester gas. The under voltage also caused instrumentation issues that complicated and delayed the restart of the boiler. Multiple staff were called on-site to assist with the varied issues caused by the under voltage event.

Later in the evening of February 4, a digester gas compressor in the Thermal Power Plant tripped causing the boiler to again trip. The digester gas was diverted to the flares. By this time, two (2) flares were operable as one of the previously frozen flares had thawed sufficiently to operate. However, the Module 1 flare was still frozen and could not be operated, and was later found to be damaged, a result of the extreme freezing cold. A small amount of excess digester gas that could not be burned by the two (2) operating flares was released to the atmosphere from the Digester complex for less than an hour this time before the boiler was returned to operation. Overall, the majority of the produced digester gas was either contained within the system or used by the boiler, and only a small fraction was released to the atmosphere. No odor complaints were received as a result of these events and the regulators were provided notification per requirements of Deer Island's Air Operating Permit. Staff repaired the failed Module 1 flare during the week, and additional measures have been implemented to prevent the waste gas flares from freezing in the future when severe cold and freezing conditions are expected.

On February 2, the fuel oil flow meter was removed from CTG 2B and sent off-site for certified calibration as required every five (5) years per emissions regulations. The removal of the fuel oil flow meter does not impact the operation of the CTG. However, for emissions reporting considerations, this CTG would be operated only in the event of an emergency as CTG 1A was available for operation and CTG 2B would then be available as a backup. CTG 2B was successfully test operated on March 16 following the return and reinstallation of the calibrated flow meter.

Opacity testing for each CTG unit was successfully completed on March 29 as part of the annual regulatory requirements for emissions reporting on the CTGs and the results of this test demonstrated the units were in compliance. The test requires each CTG to be operated (one at a time) at full load for one (1) hour. During this time a certified "smoke reader" visually observes the condition of the stack exhaust and records the results.

Clinton Operations & Maintenance Report

Dewatering Building

Maintenance staff replaced a six (6) inch valve on the #3 Moyno pump suction piping side. Staff also checked the other valves in the lower Dewatering Building for proper operating condition. Staff rebuilt the dry polymer loading dock door and the hinge assembly for the belt filter press system. A leaking 2-1/2 OS&Y and check valves on the Dewatering Building heat loop were also replaced. Staff also removed a large non-functioning water heater storage tank in preparation for a new water heater installation. Maintenance staff participated in a tool audit performed by the inventory control specialist from the Chelsea Facility. A contractor completed the replacement of the leaking four (4) inch cast iron pump in the lower Dewatering Building.

Chemical Building

Maintenance staff and the Facilities Specialist jet cleared the Soda Ash (A) line. Staff also rebuilt both the #1 and #2 Penn Valley Pumps, including replacing diaphragms and gaskets on both pumps, and the trunnions clacker valve on the #1 pump. Maintenance staff completed monthly preventative maintenance (PM) for the eyewash stations and air handler units. A contractor and the mechanics installed a new two (2) inch waste activated sludge flow meter. A contractor installed and wired a new damper actuator motor for the exhaust fans. A contractor also replaced several oxygen sensors in the Hypochlorite & Ferric Chloride containment areas. Plant staff tried unsuccessfully to drain the chlorine mix tank completely to inspect the diffuser piping.

Aeration Basins

Operations staff cleaned the pH and D.O. probes. Maintenance staff completed all PM's on all five (5) blowers. Deer Island staff replaced 10 battery back-up systems in the VFD Building.

Phosphorus Reduction Facility (PRF)

Maintenance staff acid washed all three (3) disk filters, cleaned the troughs, and inspected all nozzles. Operations staff cleaned both CL17 chlorine analyzers. The PRF Building and the chemical feed system were placed into operation. Plant staff dismantled and inspected the Wipps PRF sluice gate valve and determined a replacement is warranted.

Headworks Building

Maintenance staff cleaned the influent & mechanical bar rack and greased the upper and lower pin racks. Staff also assisted Xylem Pump with influent pump maintenance. Staff set up the new pump that replaced the old hydraulic pump in the influent wet well. Maintenance staff removed an old leaking water valve from the Headworks Building boiler room. They also replaced a leaking seal on the Weismann boiler condensate pump.

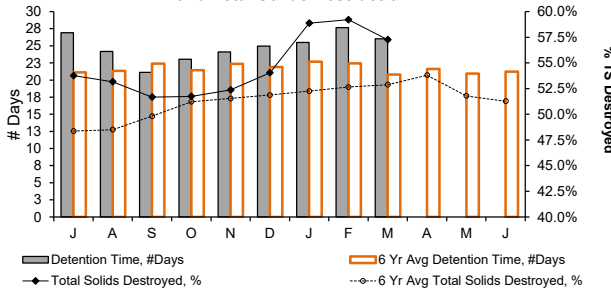
Digester Building

Maintenance staff checked all equipment for proper operation. They also greased the Ovivo mixer on the digester floating cover. Staff completed staging safety rails and platforms on the digester mixer access platform.

Deer Island Operations and Residuals

3rd Quarter - FY23

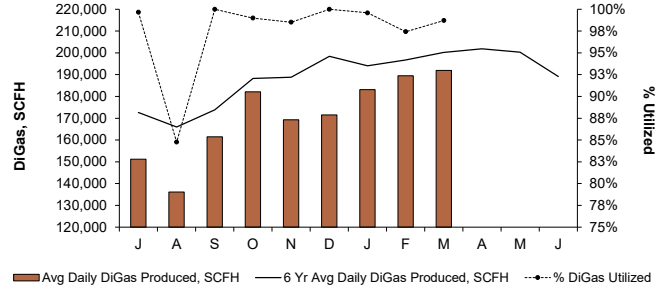
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 58.5% during the 3rd Quarter, 11.1% above target with the 6 year average of 52.6%. Sludge detention time in the digesters was 26.4 days, 20.1% above the 22 days detention time target. 7.9 digesters were in operation, on target with projections. The higher sludge detention time is attributed to the filling of four (4) digesters during the quarter using the digested sludge overflows from the other on-line digesters as Module #3 was in the process of being placed into service, while the Module #1 digesters were being rotated out of service for maintenance.

Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting around of sludge.

Digester Gas Production and % Utilized

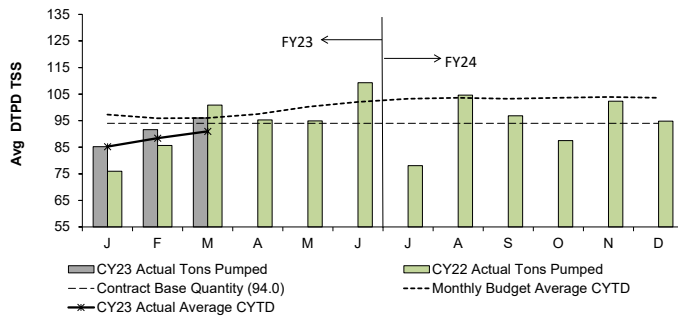


The Avg Daily DiGas Production in the 3rd Quarter was 4.5% below the 6 Year Avg Daily DiGas Production due to 6.0% lower-than-expected primary sludge production, and a 17.2% reduction in sludge feed to the digesters. 98.6% of the Digas produced was utilized at the Thermal Power Plant.

Residuals Pellet Plant

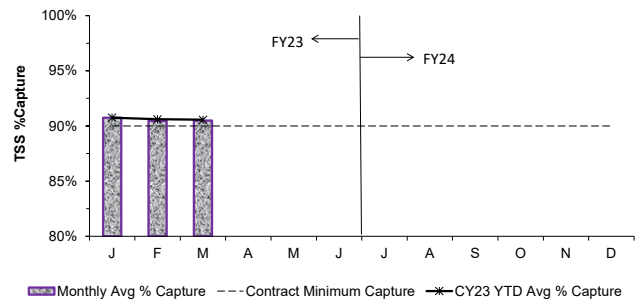
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 94.0 DTPD/TSS as an annual average (for the extended contract period of January 1, 2021 through December 31, 2023). The monthly invoice is based on 94.0 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. On average, MWRA processes more than 94.0 DTPD/TSS each year (FY23's budget is 103.3 DTPD/TSS and the preliminary FY24's budget is 103.2 DTPD/TSS).

Sludge Pumped From Deer Island



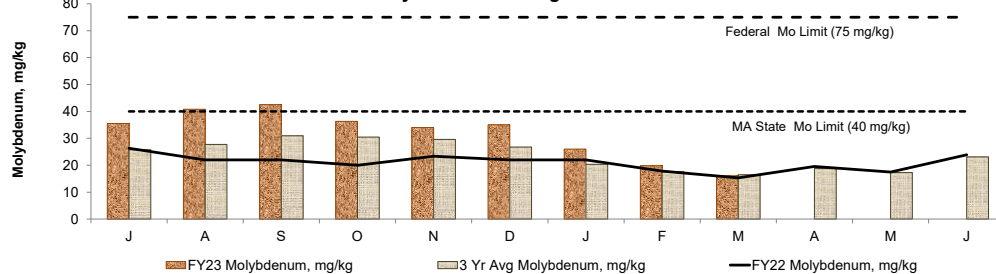
The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 3rd Quarter was 91.0 TSS Dry Tons Per Day (DTPD), 5.3% below target with the FY23 budget of 96.1 TSS DTPD for the same period. The lower amount of sludge sent to the BPF is mainly a result of digested sludge being diverted to fill the four (4) Module #3 digesters rather than being sent to the DSL holding tanks, and thus to the BPF, due the transitioning from Module #1 to Module #3 digester operation.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 3rd Quarter was 90.57%.

Molybdenum in Sludge Fertilizer Pellets



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. The Massachusetts Type I biosolids standard for molybdenum was changed from 25 mg/kg to 40 mg/kg in 2016, allowing MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state.

Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 3rd Quarter averaged 20.6 mg/kg, 14% above the 3 year average, 48% below target with the MA State Limit, and 73% below the Federal Limit.

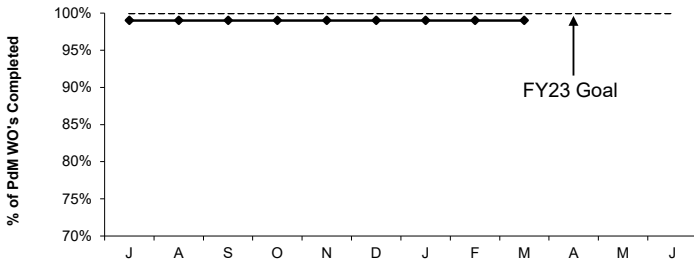
Deer Island Maintenance

3rd Quarter - FY23

Productivity Initiatives

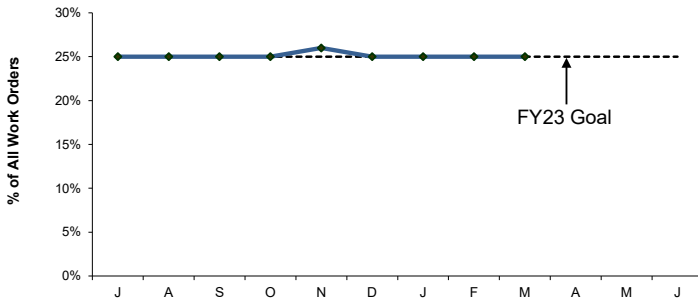
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



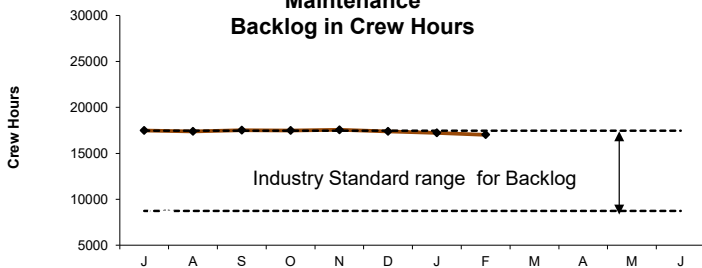
Deer Island's FY23 predictive maintenance goal is 100%. DITP completed 99% of all PdM work orders this quarter.

Predictive Maintenance



Deer Island's increased FY23 predictive maintenance goal is 25% of all work orders to be predictive. 25% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.

Maintenance Backlog in Crew Hours

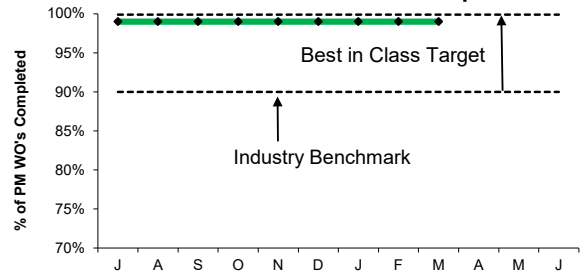


DITP's maintenance backlog at Deer Island is 17,010 hours this quarter. DITP is slightly above the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by (5) vacancies; (2) Electricians, (1) O&M Specialist, (1) HVAC Technician and (1) I&C Tech. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

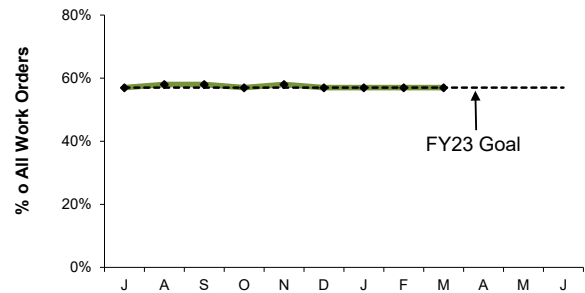
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



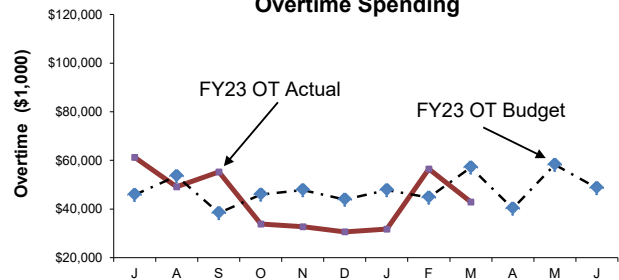
Deer Island's FY23 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 99% of all PM work orders this quarter.

Maintenance Kitting



Deer Island's increased FY23 maintenance kitting goal is 57% of all work orders to be kitted. 57% of all work orders were kitted this quarter. Kitting is staging of parts or material necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.

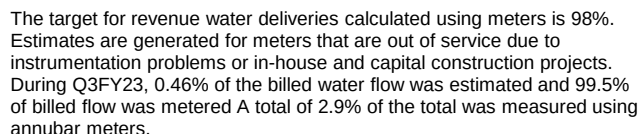
Overtime Spending



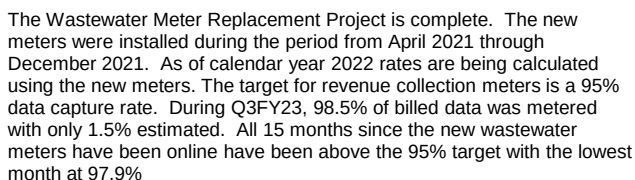
Maintenance overtime was over under by 18K this quarter and \$31k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarter's overtime was predominately used for Storm Coverage/High Flows, Grinder/Pump Clogging Issues, Mod #1 WGB Flare Repair, Replacement of AA:H1S.HEX-3 Heat Exchanger, Functional Testing and Startup of MOD 3, Centrifuge #2 Liner Repair/Installation, Fabrication of New Strainer for Thermal, and Miscellaneous Clarifier Work.

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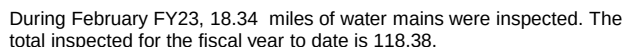
Percent of Total Revenue Water Deliveries Calculated Using Meters



Percent of Total Wastewater Transport Calculated Using Meters



Miles Surveyed for Leaks



During February FY23 no leaks were detected, and none were repaired. Refer to FY23 Leak Report below for details. Also, community service ranging from individual leak location to surveys were conducted for Medford, Revere, Somerville and Swampscott.

[illegible]

Date Detected	Location of Leaks/Unrepaired
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91. Not surfacing. Leaking emergency connection valve btw MWRA & LWSC systems. LWSC has difficulty isolating 16" main.
08/27/20	**Hyde Park Ave. @ River St. Hyde Park. BWSC is in process of isolating their water main first.
01/14/22	#2 Woodland Rd., Gillis P.S. - Stoneham
06/09/22	West St. @ Pierce St., Hyde Park. Leak repair to be coordinated with Milton. Mobile Pumping Unit will need to be utilized.
12/08/22	Canal St @ Medford St., Malden
	** See above for: Hyde Park Ave. = MWRA is currently evaluating the abandonment of this pipeline based on hydraulic needs.

Water Distribution System Valves

3rd Quarter - FY23

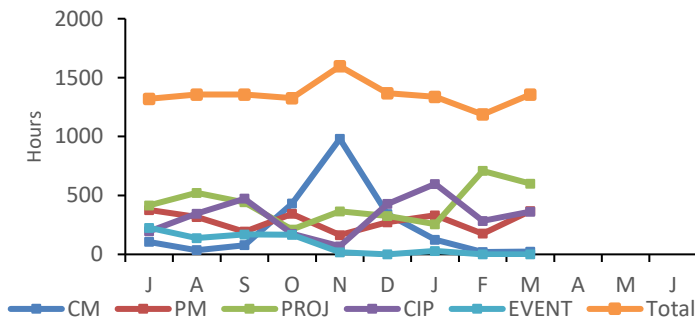
Background

Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but is often displaced during the construction season. This is due to the fact that a large number of construction contracts involving rehabilitation, replacement, or new installation of water lines, requires valve staff to operate valves and assist with disinfection, dechlorination, pressure-testing, and final acceptance. Valve exercising can also be impacted due to limited redundancy in the water system; valve exercising cannot be performed in areas where there is only one source of water to the community meters or flow disruptions will occur.

Type of Valve	Inventory #	Operable Percentage	
		FY23 to Date	FY23 Targets
Main Line Valves	2,159	97.0%	95%
Blow-Off Valves	1,682	98.8%	95%
Air Release Valves	1,519	96.3%	95%
Control Valves	49	100.0%	95%

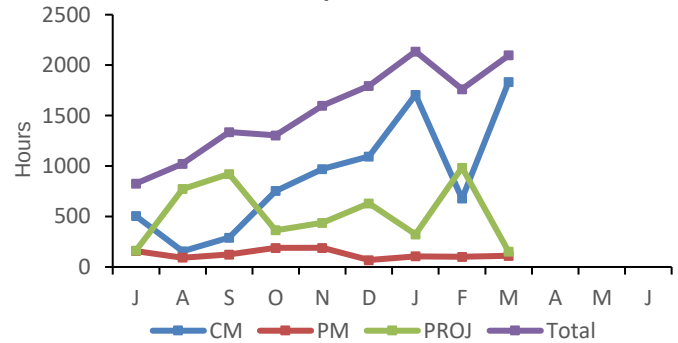


Water Valve Labor Hours



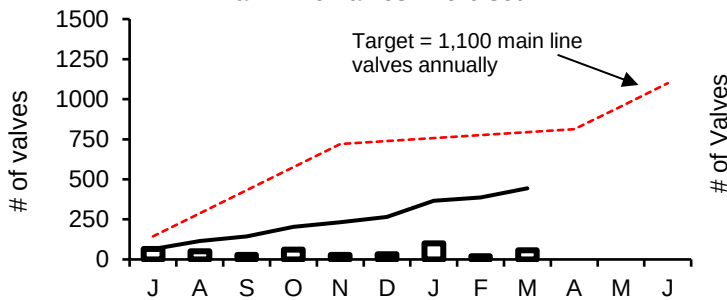
During Q3 of FY23 there was a total of 3880 hours worked. Percentage breakdown; Corrective Maintenance 4%, Preventative Maintenance 23%, Project 40%, Capital Improvement Project 32%, Event - Wtr Fountain 0%

Water Pipeline Labor Hours



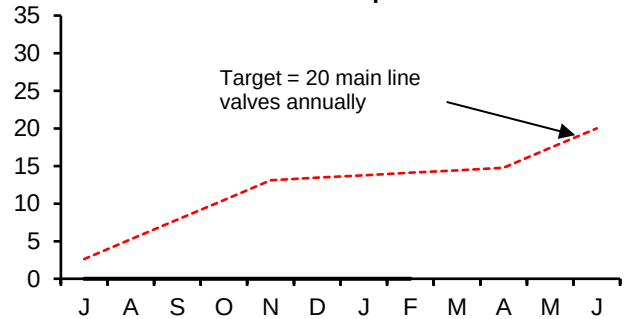
During Q3 of FY23 there was a total of 5996 hours worked. Percentage breakdown; Corrective Maintenance 71%, Preventative Maintenance 5%, Project 24%

Main Line Valves Exercised



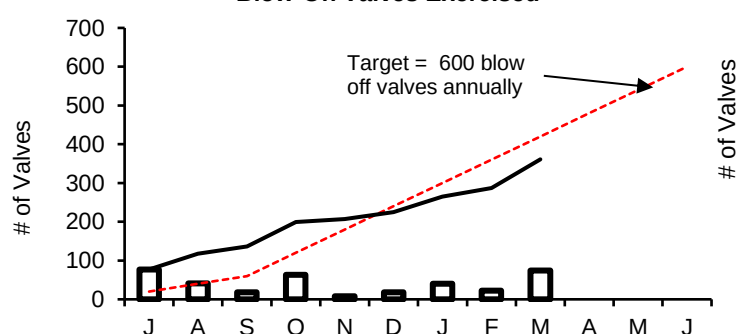
During Q3 of FY23, 179 main line valves were exercised. The total exercised for the fiscal year to date is 444. Below target due to necessary hours spent to support Capital Improvement Projects and in-house construction work.

Main Line Valves Replaced



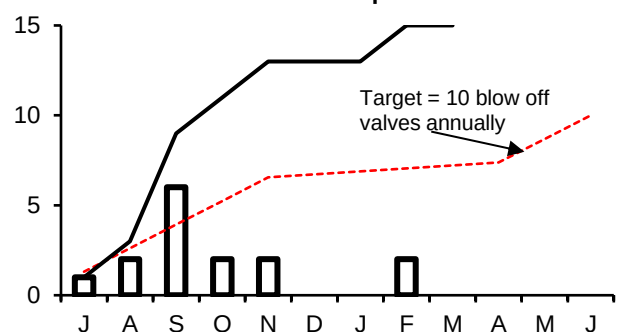
During Q3 of FY23, there were no main line valves replaced. The total replaced for the fiscal year to date is 0. Below target due to staff vacancies.

Blow-Off Valves Exercised



During Q3 of FY23, 136 blow off valves were exercised. The total exercised for the fiscal year to date is 361.

Blow-Off Valves Replaced



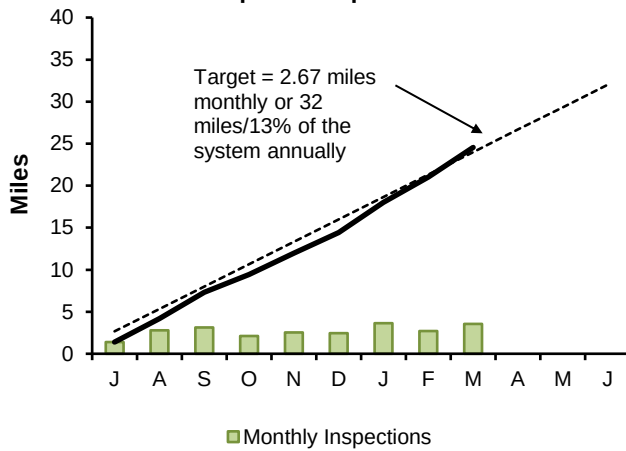
During Q3 of FY23, there were 2 blow off valves replaced. The total replaced for the fiscal year to date is 15.

Wastewater Pipeline and Structure Inspections and Maintenance

3rd Quarter - FY23

Inspections

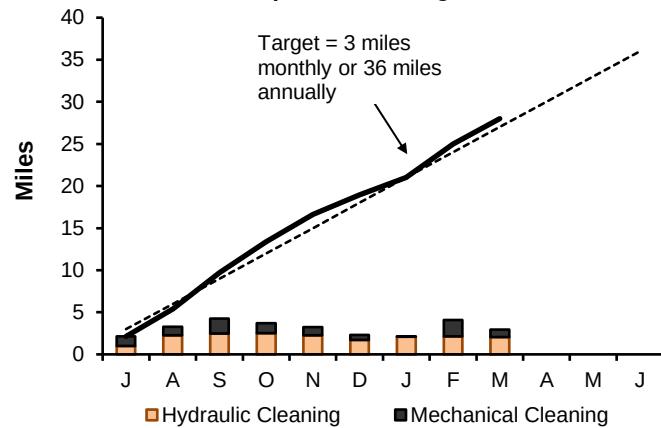
Pipeline Inspections



Staff internally inspected 10.0 miles of MWRA sewer pipe during this quarter. The year to date total is 25.55 miles. No Community Assistance was provided.

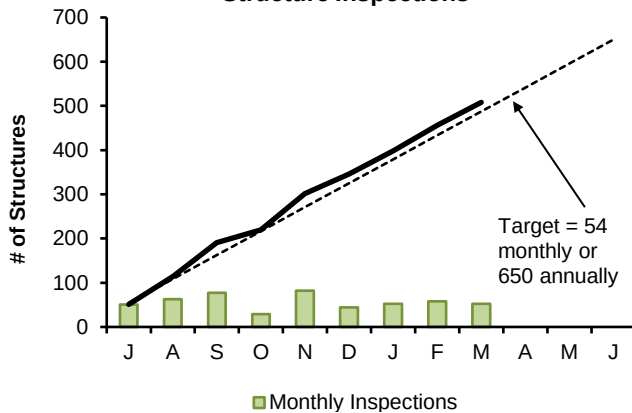
Maintenance

Pipeline Cleaning



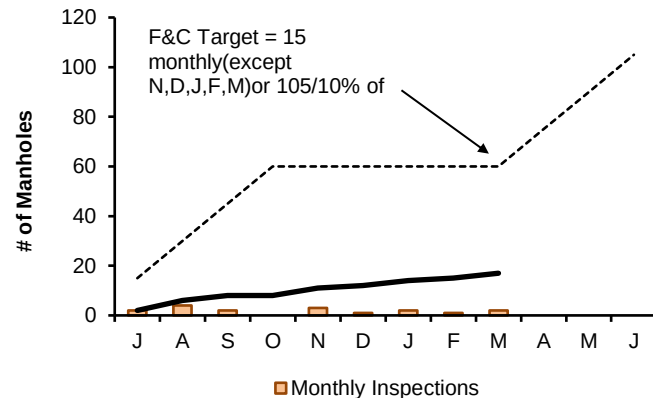
Staff cleaned 9.00 miles of MWRA sewer pipe, and removed 27 yards of grit. The year to date total is 28.00 miles. No Community Assistance was provided.

Structure Inspections



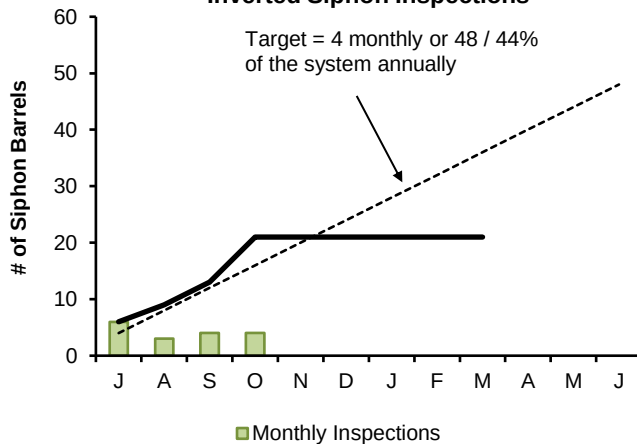
Staff inspected the 36 CSO structures and performed 126 other additional manhole/structure inspections during this quarter. The year to date total is 508 inspections.

Manhole Rehabilitation



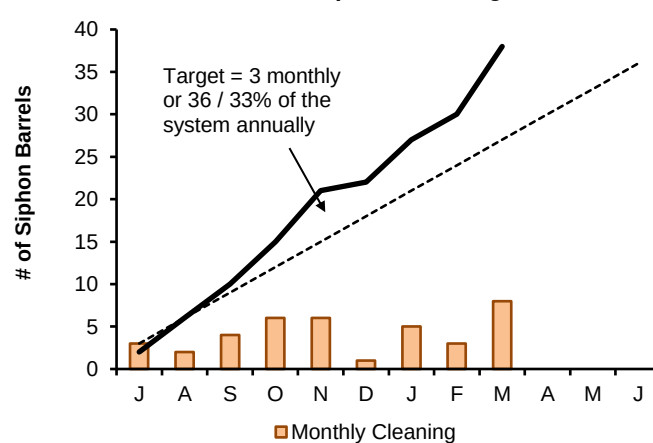
Staff replaced 5 frame and cover replacements this quarter. The year to date total is 17.

Inverted Siphon Inspections



Staff inspected 6 siphon barrels this quarter. The year total is 36 inspections.

Inverted Siphon Cleaning

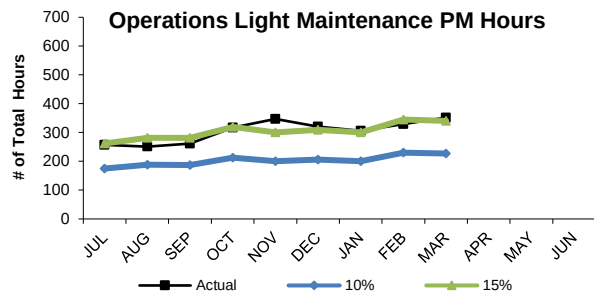


Staff cleaned 16 siphon barrels this quarter.

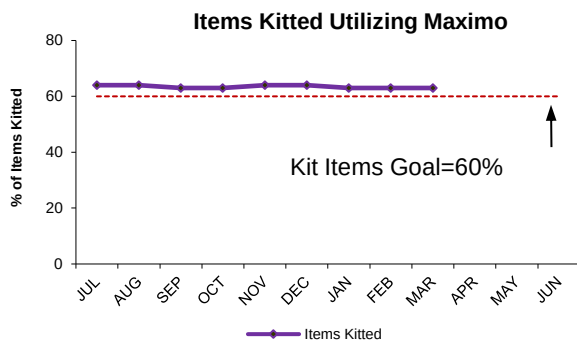
Field Operations' Metropolitan Equipment & Facility Maintenance

3rd Quarter - FY23

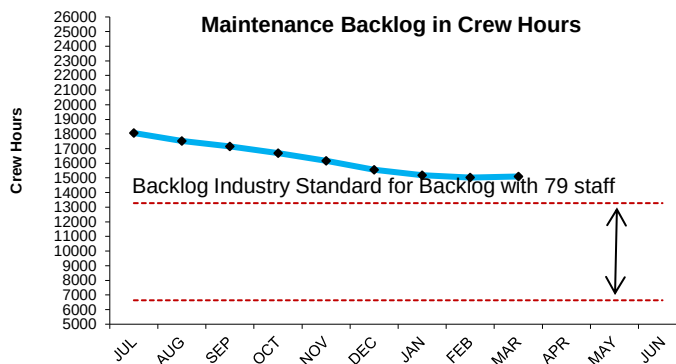
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion is 100%. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance initiatives.



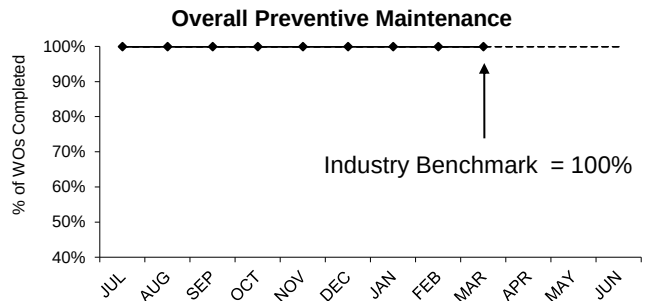
Operations staff averaged 329 hours per month of preventive maintenance during the 3rd Quarter of FY23, an average of 15% of the total PM hours for the 3rd Quarter, which is within the industry benchmark of 10% to 15%.



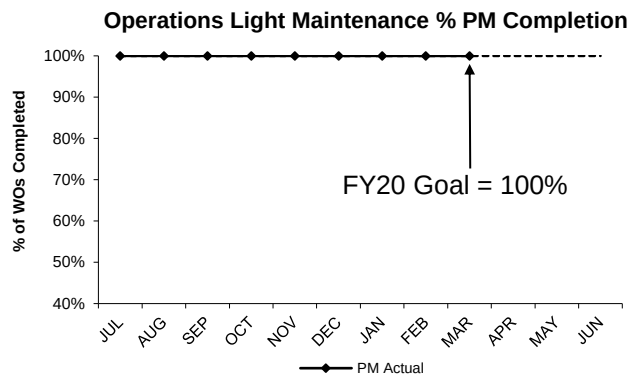
Operations' FY23 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 3rd Quarter of FY23, 63% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



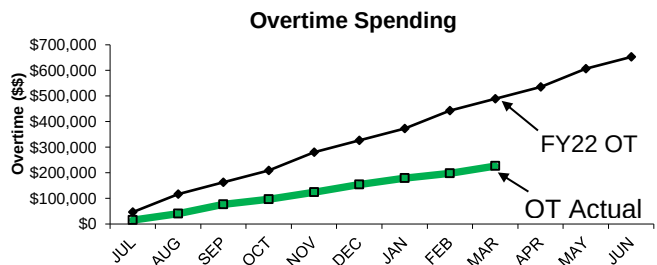
The 3rd Quarter of FY23 backlog average is 15,101 hours. Management's goal is to continue to control overtime and try to get back within the industry benchmark of 6,636 to 13,275 hours. The increase is due to vacancies and several large maintenance projects.



The Field Operations Department (FOD) preventive maintenance goal for FY23 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 3rd Quarter of FY23.



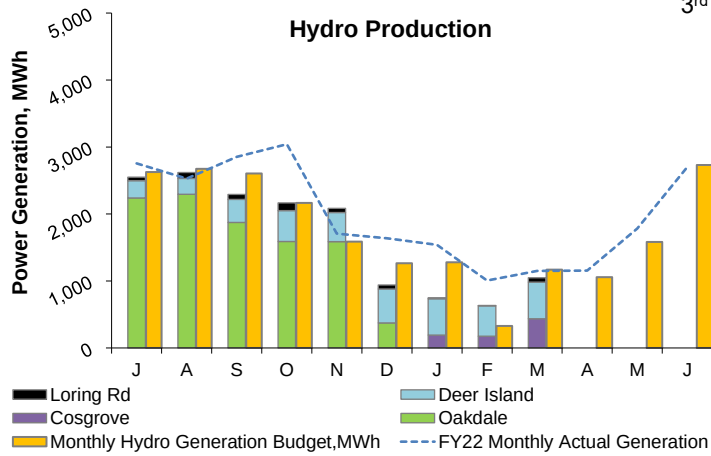
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY23 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work orders in the 3rd Quarter of FY23.



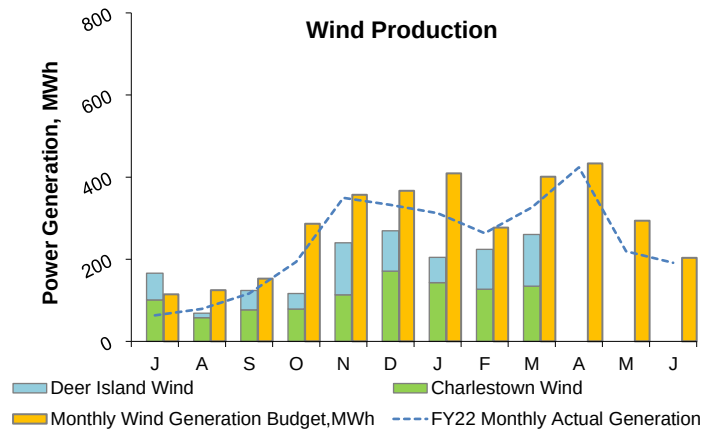
Maintenance overtime was \$30,432 under budget on average, per month, for the 3rd Quarter of FY23. Overtime is used for critical maintenance repairs and wet weather events. The overtime budget through the 3rd Quarter of FY23 is \$489,414. Overtime spending was \$226,301 which is \$263,113 under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

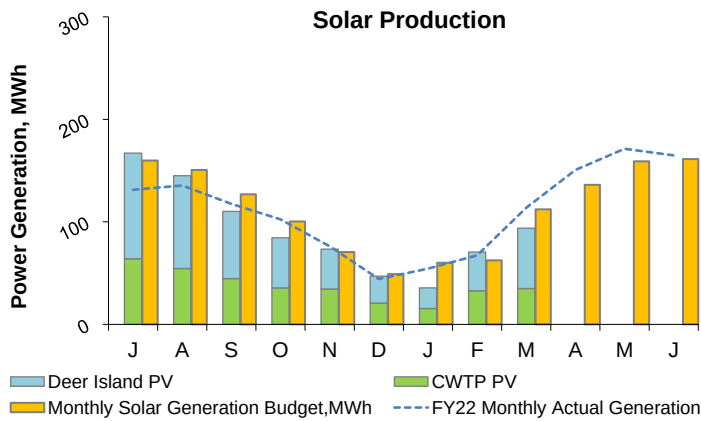
3rd Quarter - FY23



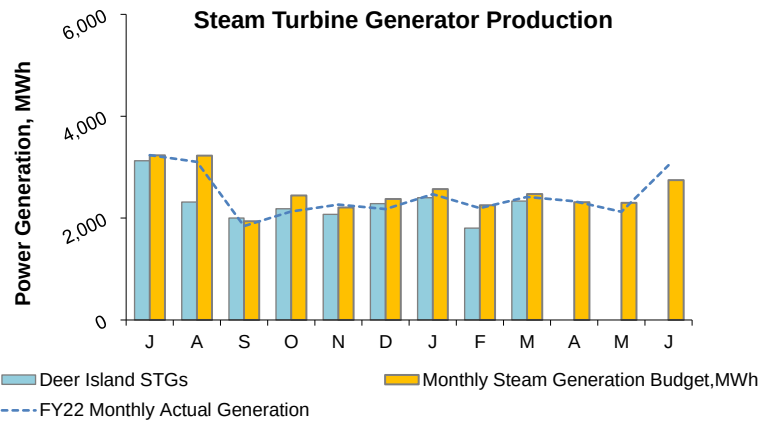
In Quarter 3, the renewable energy produced from all hydro turbines totaled 2531 MWh; 9% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



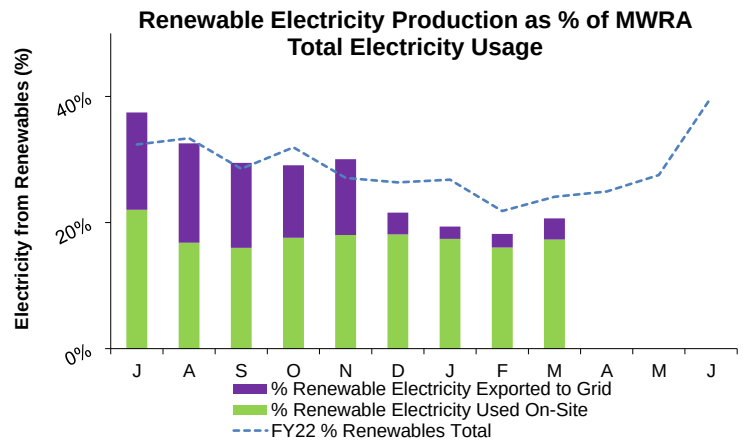
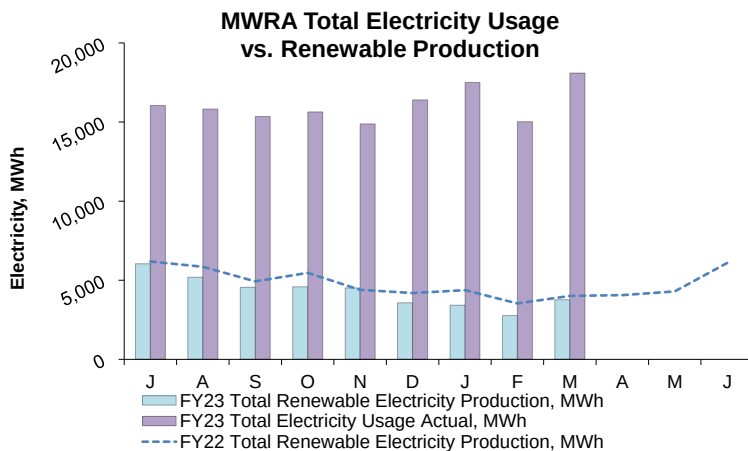
In Quarter 3, the renewable energy produced from all wind turbines totaled 689 MWh; 37% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



In Quarter 3, the renewable energy produced from all solar PV systems totaled 200 MWh; 15% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.



In Quarter 3, the renewable energy produced from all steam turbine generators totaled 6,538 MWh; 10% below budget³. Savings and revenue invoices have not yet been received for this FY23 reporting period.

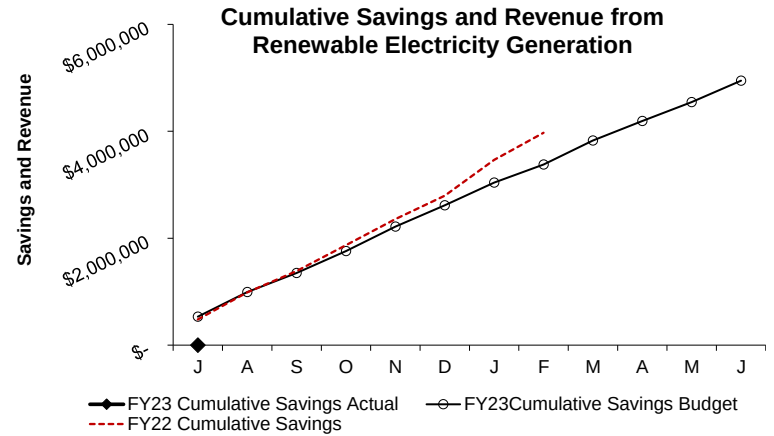
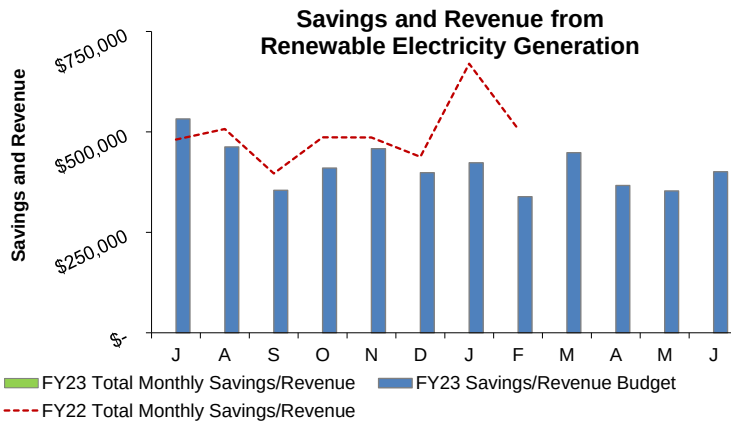


In Quarter 3 MWRA's electricity generation by renewable resources totaled 9,959 MWh, 13% below budget. MWRA's total electricity usage was approximately 50,617 MWh. Renewable resources were 19.7% of total usage. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 2 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.

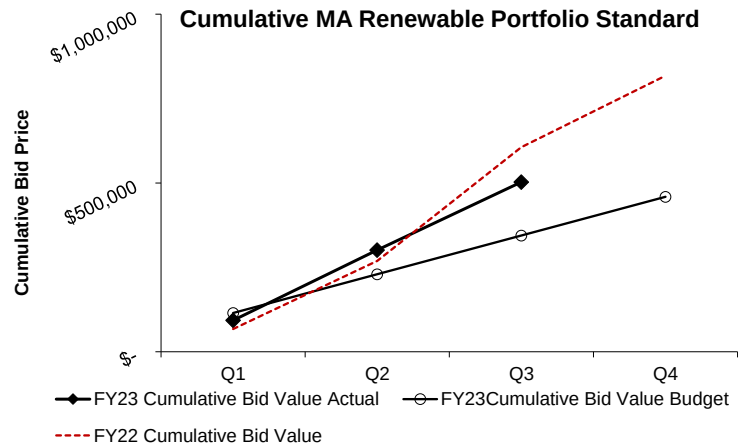
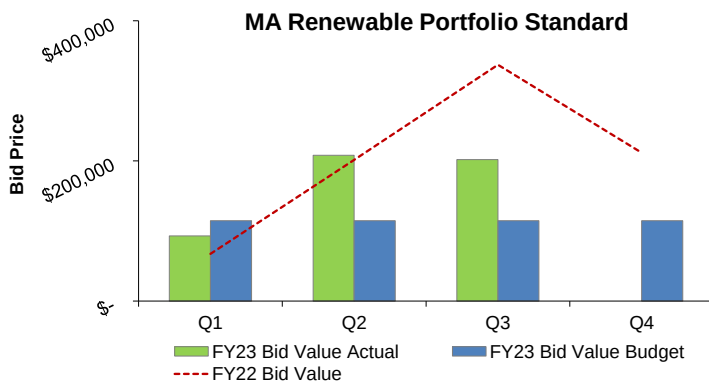
Renewable Electricity Generation: Savings and Revenue

3rd Quarter - FY23



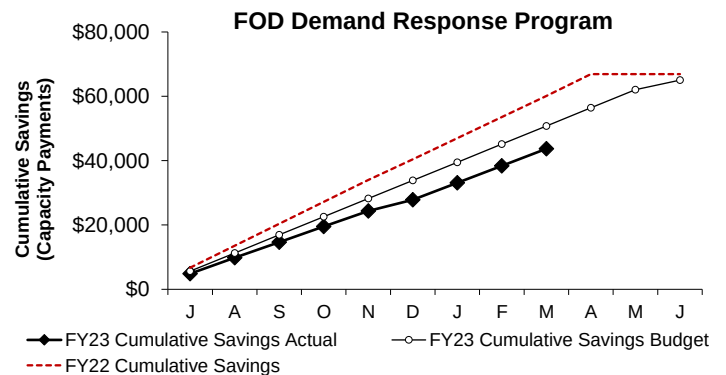
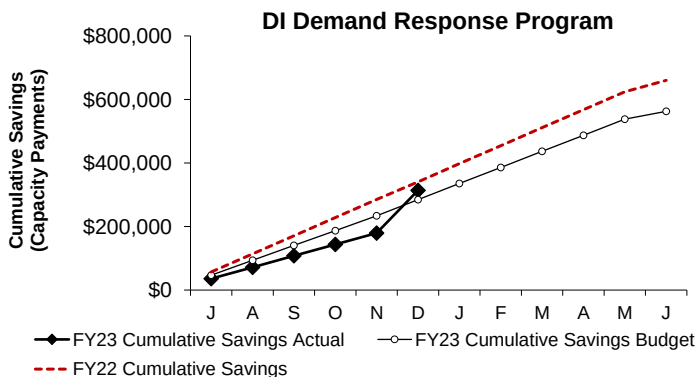
Savings and revenue invoices have not yet been received for this FY23 reporting period.

Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 3rd Quarter¹ from MWRA's renewable energy assets; 1,425 Q3 CY2022 Class I Renewable Energy Certificates (RECs); and 5,110 Q3 CY2022 Class 2 RECs were sold for a total value of \$201,832 RPS revenue; which is 76% above budget³ for the Quarter. REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

*MWRA's SRECs have transitioned to the Class 1 REC category starting in FY23.

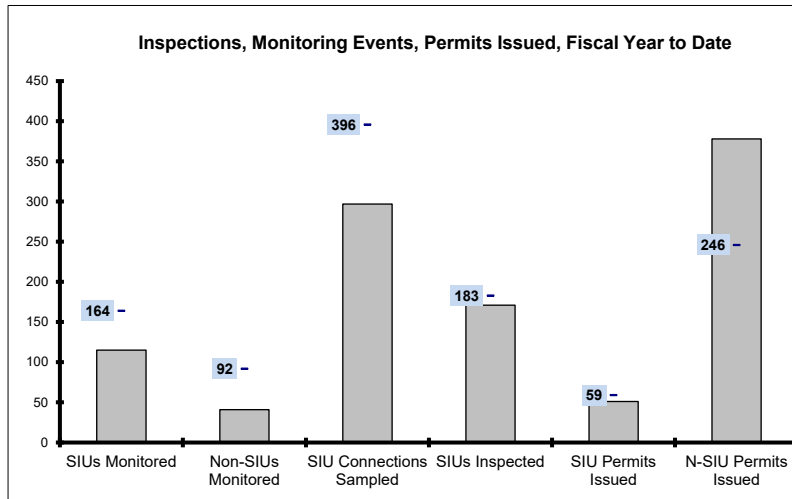


Currently Deer Island, JCWTP, Loring Rd, and Brutsch participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY23 Cumulative savings (Capacity Payments only) through December¹ total \$313,903 for DI and payments for FOD total \$43,689 through March¹.

- Notes:
1. Only the actual energy prices are being reported. Therefore, some of the data lags up to 3 months due to timing of invoice receipt.
 2. Savings and Revenue: Savings refers to any/all renewable energy produced that is used on-site therefore saving the cost of purchasing that electricity, and revenue refers to any value of renewable energy produced that is sold to the grid.
 3. Budget values are based on historical averages for each facility and include operational impacts due to maintenance work.
 4. Chelsea Creek, Columbus Park, Ward St., and Nut Island participated in the ISO Demand Response Program through May 2016, until an emissions related EPA regulatory change resulted in the disqualification of these emergency generators, beginning June 2016. MWRA is investigating the cost-benefit of emissions upgrades for future possible participation.

Toxic Reduction and Control

3rd Quarter - FY23



EPA Required SIU Monitoring Events
for FY23: 164
YTD : **115**

Required Non-SIU Monitoring Events
for FY23: 92
YTD : **41**

SIU Connections to be Sampled
For FY23: 396
YTD: **297**

EPA Required SIU Inspections
for FY23: 183
YTD: **171**

SIU Permits due to Expire
In FY23: 59
YTD: **51**

Non-SIU Permits due to Expire
for FY23: 246
YTD: **378**

Significant Industrial Users (SIUs) are MWRA's highest priority industries due to their flow, type of industry, and/or their potential to violate limits. SIUs are defined by EPA and require a greater amount of oversight. EPA requires that all SIUs *with flow* be monitored at least once during the fiscal year.

The "SIU Monitored" data above, reflects the number of industries monitored; however, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

EPA requires MWRA to issue or renew 90 percent of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10 percent of SIU permits to be issued within 180 days.

Number of Days to Issue a Permit								
	0 to 120		121 to 180		181 or more		Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	0	9	0	3	1	8	1	20
Aug	1	38	1	8	1	18	3	64
Sep	5	14	0	5	0	25	5	44
Oct	5	12	0	3	0	12	5	27
Nov	2	31	0	13	0	16	2	60
Dec	3	31	1	7	2	31	6	69
Jan	18	25	1	5	0	10	19	40
Feb	0	2	0	0	0	14	0	16
Mar	10	30	0	4	0	4	10	38
Apr							-	-
May							-	-
Jun							-	-
% YTD	86%	51%	6%	13%	8%	37%	51	378

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs. Monitoring of SIUs and Non-SIUs is dynamic for several reasons, including: newly permitted facilities; sample site changes within the year requiring a permit change; changes in operations necessitating a change in SIU designation; non-discharging industries; a partial sample event is counted as an event even though not enough sample was taken due to the discharge rate at the time; and also, increased/decreased inspections leading to permit category changes requiring additional monitoring events.

This is the end of the third quarter of the MWRA fiscal year, FY23.

In the 3rd quarter, of the 123 permits issued, there were 29 SIUs. All but 1 of the SIUs were issued within the 120-day timeframe with 1 issued beyond the 120-day timeline.

Fiscal year to date through March, 429 permits have been issued, 51 were SIUs.

86% of the SIU permits were issued within the 120-day timeframe, with 8% issued beyond 180 days; falling short of the EPA requirement.

There were 378 non-SIU permits issued, of which 186 were issued beyond the 120-day timeline.

Reasons for late issuances continue to include:

- staffing due to turnover and vacancies
- waiting for critical data needed for permit processing
- delays relating to new start-up operations and
- the late payment of the relevant permit charges.

There are new Industrial Coordinators on board which cause some slow-down in processing while they get acquainted with their roles and there is still a backlog of permits/amendments waiting to be processed.

So far, in FY23, there were 193 completely new permits issued: 2 SIUs and 191 N-SIUs among which were 68 Low Flow Permits, 92-Dental, 1-Food Processing, 1-Septage and 10-Construction dewatering.

For the Clinton Sewer Service area, there were no SIU permits issued during the first nine months of the FY23 fiscal year.

Field Operations Highlights

3rd Quarter – FY23

Western Water Operations and Maintenance

- Carroll Water Treatment Plant – Staff provided overall site familiarization to Marlboro Fire Department personnel; completed half plant operations and returned to full plant operations while supporting construction projects for chemical feed and SCADA controls upgrades.
- Brutsch Water Treatment Facility – Staff worked with Engineering to develop plans and specs for replacement of Sodium Hypochlorite dosing system. Staff replaced the actuator on one of the primary flow control valves and will install the second actuator after testing is complete.
- Cosgrove Hydroturbine Generator – Staff replaced a vacuum relief line on the scroll case of Turbine #1. This required lowering the stilling basin and hydraulic grade line of the Cosgrove Tunnel while maintenance staff installed a stop log and drained the Turbine scroll case.
- Wachusett Dam Bastion Building – The construction group and their contractors completed the rebuilding/repairs of the Bastion building walls and ceiling. Final punch list items remain but we were able to inspect the facility and test operation of the spillway crest gate.
- Reservoir Operations, Misc. – Reservoirs Spill Response Training for HazWoper held for watershed personnel on 03.08.23. Staff participated in the Interagency Salt Working Group sponsored by MA DEP on March 14th.

Metro Water Operations and Maintenance

- Water Pipeline Program: Staff completed a Blow-Off replacement in Malden (Sections 84). Additional work during the quarter included leak repairs on the Section 69 (20-inch main) in Revere and Section 84 (48-inch main) in Malden. Leak detection was performed on over 49 miles of MWRA water main and assistance was provided to eight customer communities.

Operations Engineering

- Staff continued to provide technical support for Design and Construction Contracts including; Low System PRV Upgrades, Columbus Park and Ward St Headworks Upgrades, Nut Island Odor Control Improvements, Hayes Pump Station Upgrades, NEH improvements, WASM3 CP1 and CP2, Section 101, Storage Tank Improvements, Section 23, 24 and 47 Rehabilitation, Walnut Street Bridge (section 4), IHS

Improvement, Hydraulic Model upgrades, BWRPS Upgrades and Section 89 Replacement.

- Staff continued to monitor the wet scrubber system at the Nut Island Headworks and continued supporting the development of the facility manual and training.
- Hydraulic Model Upgrades: Staff continued to provide an in-depth review of the draft model and review of calibrations.
- Ward St and Columbus Park Headworks: Staff provided PDR review comments.
- Staff continued to support Pipeline and Valve Programs with some of the following activities: Operation Shutdown Plans, Exercise Schedule Packages and Disinfection Plans and Permitting;
- Staff continued community assistance, including support for system expansion studies; support to Newton for their covered storage project and Malden for the installation of a new meter.
- Staff coordinated the disinfection and reactivation of Section 84 after the leak was repaired. Staff coordinated the work for a leak to be repaired on Section 44 and potential leak at meter 134.
- Staff assisted in several wet weather storm events, compiled and finalized storm reports, monitored and reported on CSO activation durations and volumes and provided follow up on operational and SCADA issues.

SCADA

- Continued technical support for the Carroll Water Treatment Plant PLC replacement project; configured and hardened SCADA Operating system upgrades; continued work on network management improvements at the CWTP; modified the flow measurement system at Nut Island.

TRAC

- TRAC issued 1 Administrative Order, 24 NON/Orders, 73 Notices of Violation, 1 PAN, 4 Return to Permit Letters, and 1 Extension Letter
- Dental Permit Fees: TRAC issued annual fee invoices to permitted dental facilities. The total amount of dental fee invoices was \$164,724.
- PAN: TRAC issued a PAN and Administrative Order to Tradebe Treatment and Recycling of Stoughton for discharging excessive levels of Phenol, Cyanide (total), and Formaldehyde into the MWRA sewer system. The amount of the Civil Administrative Penalty is \$60,000.

Field Operations Highlights

3rd Quarter – FY23

Inspections and Permitting

- TRAC issued a total of 111 8(m) Permits allowing companies to work within an MWRA easement or other property interest, including 64 water and 47 wastewater permits. Permits were issued in an average of 115 days.
- TRAC monitored the septage receiving sites a total of 27 times. Staff conducted inspection at 49 new construction gasoline/oil separators and 261 existing gasoline/oil separators.
- 122 MWRA Sewer Use Discharge Permits (Permits) were issued or renewed to sewer users. One permit was issued or renewed in the Clinton Service Area.

Environmental Quality-Water

Algae: DCR staff continued to collect algae samples at Wachusett Reservoir and Quabbin Reservoir. All nuisance algae were below levels of concern and there were no algae related taste and odor complaints from any community.

Community & In-House Support

- Sampling & Analysis: Throughout the quarter staff conducted sampling at the CWTP Tank A overflow weir, Norumbega Covered Storage Tank Cell 2, Bellevue Storage Tank #1, Sudbury Aqueduct, and at several new or rehabilitated pipelines including Section 63, 84, and 89, Suffolk Downs, and Beacon Street in Brookline. On several occasions during February and March, staff assisted DCR with potability sampling at the new Quabbin Administration well and pipeline.
- On February 16, staff assisted Somerville with a repeat coliform sample collection due to an *E.coli* positive at one routine Total Coliform Rule site. Water quality managers also assisted Somerville with planning for a Boil Water Order. All repeat samples were negative, and thus no boil water order occurred.
- The CWTP **lead pipe-rig** study sampling continued throughout the quarter on a biweekly basis. Staff are working with CWTP and Operations Engineering staff to plan a small-scale fluoride tracer travel time study and are evaluating the use and reliability of a portable fluoride meter.

Contaminant Monitoring System (CMS):

- Staff responded to three CMS alarms this quarter, following routine response. Staff performed sampling at

all CMS sites in March. Monitoring stations will be offset to grab values once data are validated by the testing laboratory.

- Staff replaced a chlorine analyzer at one of MWRA's monitoring facilities. In addition, MWRA received new contaminant monitoring equipment and will begin replacing current versions over the next six months.

Data Management:

- Staff completed data review for MWRA and fully and partially supplied communities for the annual Consumer Confidence Report (CCR), and assisted with reviews of draft CCR letters.
- Chemical Supply Contracts: Staff are closely monitoring bulk chemical inventories and adherence to delivery schedules. Annual NPDES Pollution prevention meeting held on January 20 and annual NPDES certification letters were submitted on January 15. Prepared Sodium Hypochlorite chemical supply contract for advertisement and bidding.

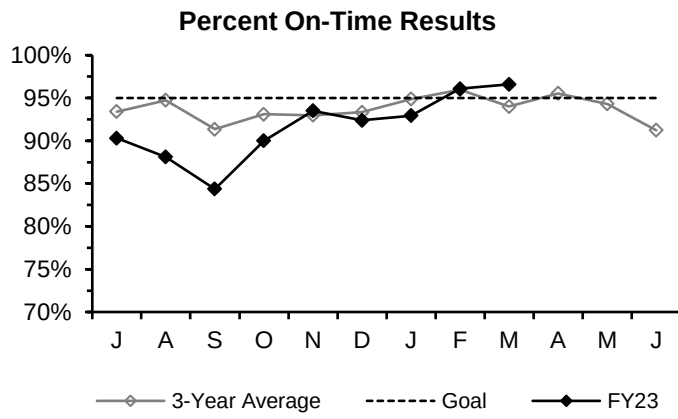
Environmental Quality-Wastewater

- Ambient Monitoring: The 2023 field season began with the February and March water column surveys. Laboratory analysis and review/synthesis of 2022 data continues. Staff presented results of 2021 monitoring and the Bays Eutrophication Model to the Outfall Monitoring Science Advisory Panel (OMSAP), and discussed recent Contingency Plan threshold exceedances and MWRA's PFAS monitoring efforts.
- Harbor/CSO Receiving Water Monitoring: Biweekly harbor monitoring continues, and CSO receiving water sampling began in March. Worked with DLS to prepare for the 2023 field season.
- Permitting and Compliance Reporting: Submitted as-needed notifications of CSOs and blending, and submitted the Final Public Notification Plan for sewage discharges. Prepared for new Clinton permit with start date of April 1, 2023.
- Cooperation with other agencies: Continued follow up communication with metro Boston CSO permittees about the new sewage notification regulation; completed development of signage for public access areas. Staff attended meetings of the Stellwagen Bank Sanctuary Advisory Council, the MWRA Wastewater Advisory Committee, and the Massachusetts Bays Partnership (MBP).

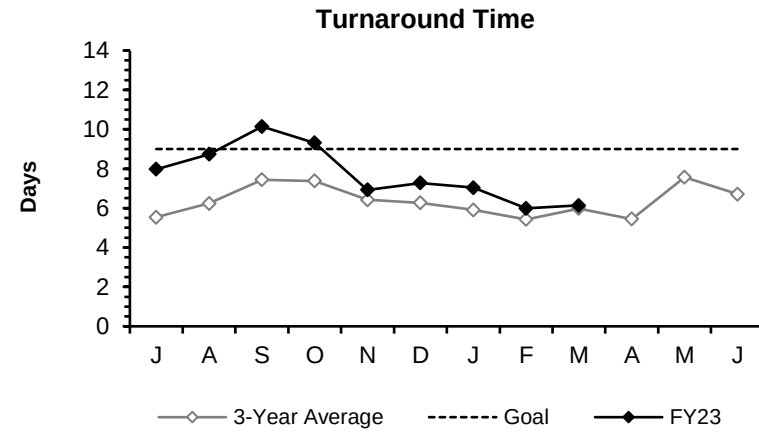
Laboratory Services

3rd Quarter - FY23

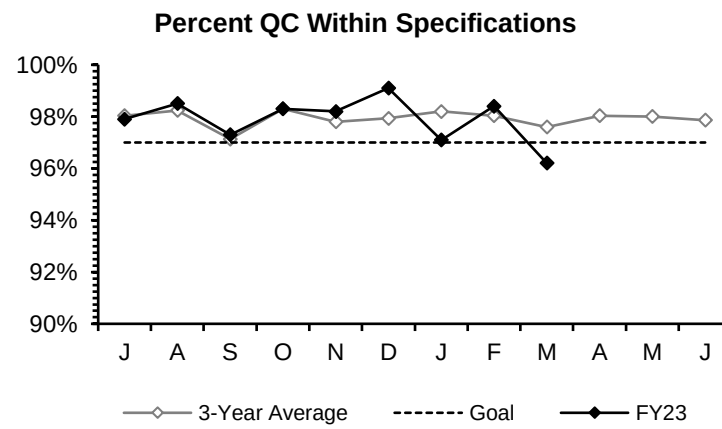
Laboratory Services supports the laboratory sampling, testing, and consulting needs of various client groups primarily in the Operations Division. This includes drinking water transmission and treatment, wastewater collection and treatment, wastewater residuals management, industrial-pretreatment monitoring, and environmental quality.



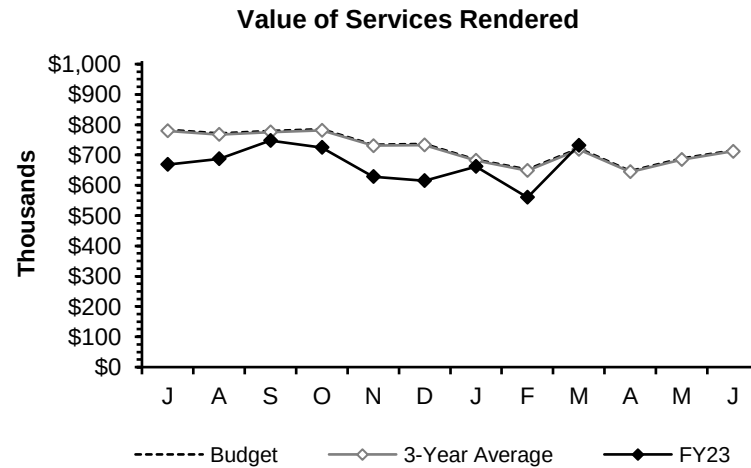
The Percent On-Time measurement assesses performance against internal client due dates. These due dates are shorter than the compliance reporting requirements to allow for internal review of the data.



Turnaround Time measures the average time from sample receipt to sample completion.



Percent QC Within Specifications measures the fraction of Quality Control tests that meet required limits during the month (see discussion in Performance Summary below).



Value of Services Rendered models the true cost of the lab work performed, including fringe benefits that are not a part of the Laboratory Services budget.

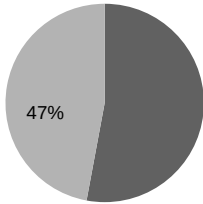
Performance Summary: Every measure missed its goal for one or two months during the 3rd quarter. This was largely due to continued staffing vacancies. The March Percent QC within Specification failed to meet the goal, largely due to a single failure affected a large number of QC results. The failure was immediately corrected before it could impact any client test results. All other goals were met for March.

School Lead Program: During the 3rd quarter of FY23, MWRA's lab completed 4 tests from 1 childcare facility in 1 community. Since 2016, MWRA's Laboratory has conducted over 40,000 tests from 560 schools and daycares in 44 communities. We have also completed over 830 home lead tests under the DPH sampling program since 2017.

CONSTRUCTION PROGRAMS

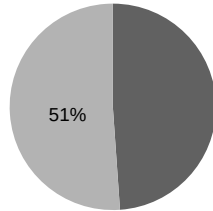
Projects In Construction 3rd Quarter – FY23

Cost



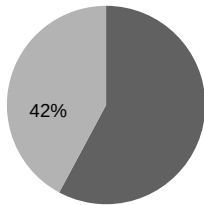
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Time



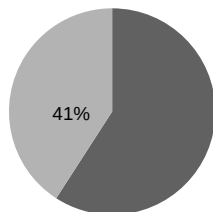
■ Time Remaining
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Cost



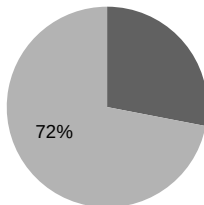
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■ Billed to Date

Time



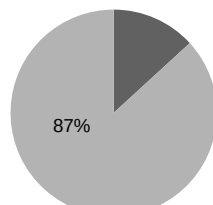
■ Time Remaining
■ Time Expended

Cost



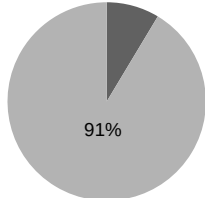
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Time



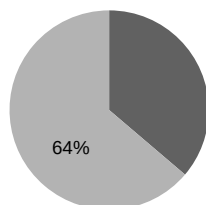
■ Time Remaining
■ Time Expended

Cost



■ Amount Remaining
■ Billed to Date

Time



■ Time Remaining
■ Time Expended

Carroll Water Treatment Plant SCADA Improvements

Project Summary: The current SCADA control equipment has reached the end of its useful life, and future vendor support for the installed PLC base is no longer guaranteed. This contract includes the supply and installation of replacement instrumentation panels, PLCs, UPS backup power, fiber-optic communication network, wiring between the existing panels, and new equipment and refurbishment of the operator control room. In addition, a new server room equipped with HVAC and fire suppression is being constructed to house redundant computer hardware supporting active and backup SCADA systems.

Contract Amount: \$13,068,612.84

Contract Duration: 1,127 Days

Notice to Proceed: 1-Sep-21

Contract Completion: 2-Oct-24

Section 89 Replacement Pipeline

Project Summary: This project will include replacement of a 10,500-foot portion of PCCP with class IV reinforcing wire, line valves and appurtenances, and abandonment of the 118-year-old, 24-inch diameter cast iron Section 29 pipeline.

Contract Amount: \$32,619,000

Contract Duration: 1,475 Days

Notice to Proceed: 5-Aug-21

Contract Completion: 19-Aug-25

Low Service PRV Improvements

Project Summary: This project will demolish the existing Nonantum Road and Mystic Valley Parkway PRV vault structures, including four 24-inch PRVs and appurtenances, and construct 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 will be installed. Additionally, a new master meter will be constructed at the Mystic Valley Parkway pressure reducing valves and the existing master meter located near the Nonantum Road pressure reducing valves will be upgraded to accommodate the increased flow.

Contract Amount: \$11,580,859.21

Contract Duration: 720 Days

Notice to Proceed: 14-Jul-21

Contract Completion: 4-Jul-23

Rehabilitation of WASM 3

Project Summary: This construction contract includes rehabilitation of approximately 13,800 feet of 56-inch and 60-inch diameter water main in Arlington, Somerville and Medford. The rehabilitation consists of cleaning and internal cement mortar lining the pipe and adding valves for better operational flexibility. In addition, two old 36-inch valves are being removed to eliminate reduced sections of pipe.

Contract Amount: \$19,764,209.73

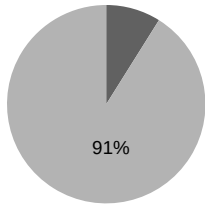
Contract Duration: 1,383 Days

Notice to Proceed: 28-Oct-20

Contract Completion: 11-Aug-24

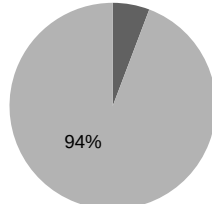
Projects In Construction 3rd Quarter – FY23

Cost



■ Amount Remaining
■ Billed to Date

Time



■ Time Remaining
■ Time Expended

Nut Island Odor Control and HVAC

Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment. Most of the equipment is at or near the end of its useful life and replacement is required to ensure the continued reliability of this critical facility. This contract will also provide reconfiguration of ductwork serving the odor control system to expand the system's operational flexibility, and will improve surface access into the below-grade odor control room, the need for which was made evident during the January 2016 fire.

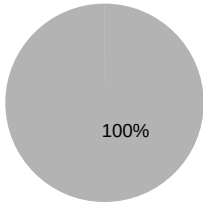
Contract Amount: \$59,919,644.62

Contract Duration: 1,084 Days

Notice to Proceed: 12-Feb-20

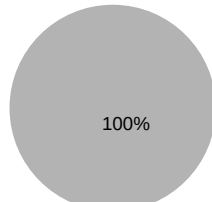
Contract Completion: 10-Jun-23

Cost



■ Amount Remaining
■ Billed to Date

Time



■ Time Remaining
■ Time Expended

Chemical Tank Relining & Pipe Replacement

Project Summary: This project involves replacing the chlorobutyl rubber linings in 3 sodium hypochlorite and 2 sodium bisulfite storage tanks and assorted gravity thickener overflow piping at Deer Island.

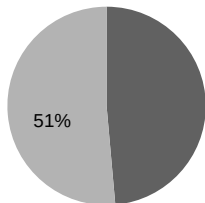
Contract Amount: \$8,794,899

Contract Duration: 850 Days

Notice to Proceed: 13-Aug-19

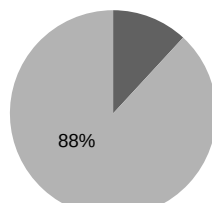
Contract Completion: 10-Dec-21

Cost



■ Amount Remaining
■ Billed to Date

Time



■ Time Remaining
■ Time Expended

DITP Odor Control Damper Replacement

Project Summary: This project includes replacing three existing 30-inch diameter steel dampers with stainless steel dampers, surface preparation and coatings application on the existing 30-inch diameter ductile iron pipe. The damper and piping are part of the odor control system that serves the sludge wet wells in the centrifuge building at the Deer Island Treatment Plant.

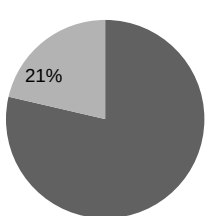
Contract Amount: \$538,000

Contract Duration: 455 Days

Notice to Proceed: 3-Feb-22

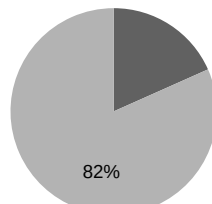
Contract Completion: 4-May-23

Cost



■ Amount Remaining
■ Billed to Date

Time



■ Time Remaining
■ Time Expended

Clinton Screw Pump Replacement

Project Summary: This project involves demolishing and replacing the three screw pumps and motors, replacing three existing 72-inch by 60-inch pump isolation slide gates and associated electrical and controls; providing a temporary bypass pumping system to ensure the plant's pumping capacity is maintained during the construction phase; and providing concrete remediation in the pump channels.

Contract Amount: \$3,452,985

Contract Duration: 540 Days

Notice to Proceed: 14-Jan-22

Contract Completion: 8-Jul-23

CSO CONTROL PROGRAM

3rd Quarter – FY23

Overview

In compliance with milestones in the Federal District Court Order, all 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015. Subsequently, MWRA completed a multi-year CSO post-construction monitoring program and performance assessment, filing the Final CSO Post Construction Monitoring Program and Performance Assessment Report with the Court and submitted copies to EPA and DEP in December 2021. The report shows that there has been an 87% reduction in CSOs in a typical year, from 3.3 billion gallons to 414 million gallons, with 70 of 86 outfalls meeting the LTCP goals for CSO activation frequency and volume. MWRA and its member CSO communities are moving forward with plans to bring 10 of the 16 CSOs in line with the LTCP goals. With respect to the remaining 6 challenging CSO outfalls, MWRA and its CSO Consultant (AECOM) continue to investigate alternative to move closer to LTCP goals.

MWRA CSO Performance Assessment

- In November 2017, MWRA signed a contract for CSO Post-Construction Monitoring and Performance Assessment with AECOM Technical Services, Inc. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and MassDEP in December 2021 verifying whether the LTCP goals are attained.
- AECOM continues to support efforts to advance project identified to meet performance goals at 10 of the 16 CSOs that didn't meet LTCP goals, evaluate alternatives for the remaining 6 challenging sites, and predict and report on annual CSO discharges. Two of those 16 outfalls are now meeting LTCP goals (BOS014 and BOS003).

Court Ordered Levels of CSO Control

Progress on the work to comply with the court ordered levels of CSO control is discussed with the EPA/MassDEP at progress meetings held quarterly. Most recent quarterly meeting was on **3/23/23** and the next meeting is scheduled for **6/22/23**

Ongoing Projects as of December 31, 2022

- *East Boston CSO Control*: As part of the East Boston CSO a FAA/MOU was executed in June 2021 for \$2.1M, BWSC designed and is constructing additional sewer separation in East Boston, including modifications to the BOS003 system regulators and modification to the BOS014 system. Work at BOS014, BOS003 is complete and are now meeting LTCP goals. Sewer separations is expected to be completed in Summer 2023. Plans for Phase 4 sewer separation with five new contracts starting in 2023 (through 2028) will result in most of East Boston being separated.
- *CHE008 Pipe Replacement – Enlarging the CHE008 regulator connection is designed and now in construction. The \$1.57M construction project is expected to be completed June 2023.*
- *Somerville Marginal New Pipe Connection* came out of the variance optimization study that recommended adding a new pipe from the facility's CSO influent conduit to the interceptor with an added

control gate. The \$1.2M (est.) construction project is expected to be completed by December 2024.

- *Fort Point Channel and Mystic Confluence* - BOS062, BOS065, BOS070 DBC and BOS017: FAA/MOU established for \$10M to design and construct improvement at these 4 CSOs. Currently in design with substantial completion of construction by December 2024.

CSO variances

As part of MWRA's CSO Control Program, MassDEP has issued a series of multi-year CSO variances that allow MWRA, Cambridge, and Somerville to continue to have limited CSO discharges to Alewife Brook and the Upper Mystic River, as well as the Charles River lower basin. The most recent variances, issued in 2019, require the development of Updated LTCPs for the CSO outfalls that each entity owns and operates that may discharge to the corresponding waterbody. The Updated LTCPs must include a description of the existing level of CSO control, an evaluation of the costs and the performance and water quality improvements achieved by additional CSO control alternatives, a public participation plan, and an affordability analysis.

- o MassDEP and EPA conditionally approved MWRA's Updated CSO Control Plan Scope of Work on **5/11/2022**. The Authority is currently working closely with the CSO communities of Cambridge and Somerville to develop these plans over the upcoming years.
- o Schedule Extension Request for Deliverables Associated with Updated CSO Control Plan was submitted 9/22/22. EPA/MassDEP acknowledge that the extension request is officially under consideration. EPA/MassDEP are briefing the new Commissioner and other new staff before a determination will be made.
- o As identified in the variance the progress is reported at monthly meetings with EPA/MassDEP. The last meeting was on **3/8/23** and the next meeting is scheduled for **4/12/23**. Key elements of the Updated CSO Control Plan are discussed including the development of an Updated Typical year which includes climate change and the development of a Unified Hydraulic Model.
- o The 2nd of 8 planned meetings was held on 12/15/22. **The next Public Meeting is scheduled for the spring.**
- o Development and Submittal of Studies as required under variance included the following:
 - o Alewife PS Optimization Evaluation was submitted on 4/27/2021
 - o Somerville Marginal CSO Reduction, Study and Preliminary Design was submitted on 12/27/2021
 - o Alewife Brook and Charles River System Optimization Evaluation was submitted on 12/28/2022
 - o MWRA CSO Variances Additional System Optimization Measures Report was submitted on 1/31/2023.

CIP Expenditures

3rd Quarter – FY23

FY23 Capital Improvement Program Expenditure Variances through March by Program - (\$ in thousands)				
Program	FY23 Budget Through March	FY23 Actual Through March	Variance Amount	Variance Percent
Wastewater	\$65,473	\$27,396	(\$38,077)	-58%
Waterworks	\$98,779	\$64,319	(\$34,460)	-34%
Business and Operations Support	\$23,981	\$12,791	(\$11,191)	-46%
Total	\$188,234	\$104,505	(\$83,728)	-44%

Wastewater:

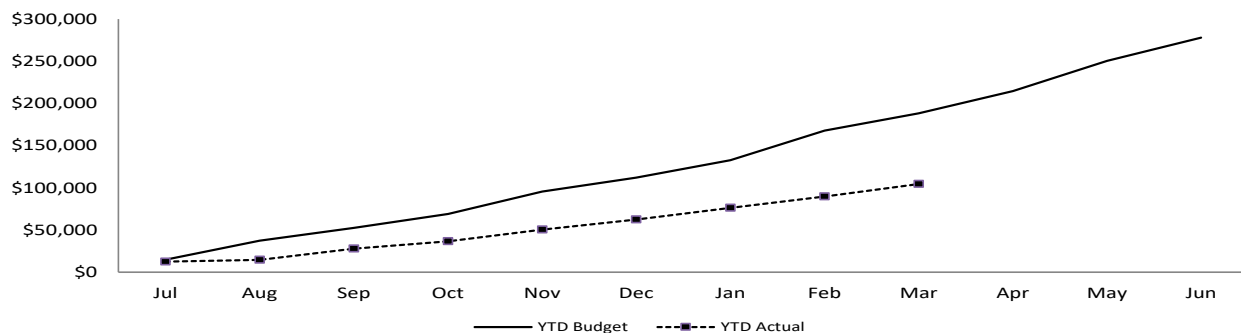
- Underspending due to timing of grant and loan distributions for the I/I Local Financial Assistance program
- Updated schedules for Primary & Secondary Clarifier Rehab Phase 2 Construction and DITP Roof Replacement contracts
- Contractor behind schedule for the Nut Island Odor Control and HVAC Improvements
- Completion of some design and inspection tasks were later than anticipated for Ward Street and Columbus Park Headworks Upgrades Design/Construction Administration

Water:

- Underspending in Waterworks was due to timing of community distributions for the Water Loan program
- Long lead time for piping materials for Waltham Water Pipeline Construction
- Timing of work and long lead time for materials for Carroll Water Treatment Plant SCADA Improvements
- Updated schedules for CP-2 Shaft 5 Construction, and Quabbin Maintenance Garage/Wash Bay/Storage Building - Construction
- This underspending was partially offset by contractor progress for NIH Section 89 & 29 Replacement and CP-1 NEH Improvements, and timing of consultant work for Metropolitan Tunnel Redundancy Preliminary Design & Massachusetts Environmental Policy Act Review and Section 53 and 99 Improvements - Design/Construction Administration

Budget vs. Actual CIP Expenditures (\$ in thousands)

Total FY23 CIP Budget of \$278,053



Construction Fund Management

All payments to support the capital program are made from the Construction Fund. Sources of fund in-flows include bond proceeds, commercial paper, SRF reimbursements, loan repayments by municipalities, and current revenue. Accurate estimates of cash withdrawals and grant payments (both of which are derived from CIP spending projections) facilitate planning for future borrowings and maintaining an appropriate construction fund balance.

Cash Balance as of 3/25/23	\$130.8 million
Unused capacity under the debt cap:	\$2.1 billion
Estimated date for exhausting construction fund without new borrowing:	JUN-23
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding:	\$140 million
Commercial paper capacity / Revolving Loan	\$110 million
Budgeted FY23 Cash Flow Expectancy*:	\$248 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

3rd Quarter – FY23

Source Water – Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliforms, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal tract of mammals. They act as indicators of possible fecal contamination. The Surface Water Treatment Rule for unfiltered water supplies allows for no more than 10% of source water samples prior to disinfection over any six-month period to have more than 20 fecal coliforms per 100mL.

Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the William A. Brutsch Water Treatment Facility raw water tap before being treated and entering the CVA system.

All samples collected during the quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL.**

Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled at the CWTP raw water tap in Marlborough before being treated and entering the MetroWest/Metropolitan Boston systems.

In the wintertime when smaller water bodies near Wachusett Reservoir freeze up, many waterfowl will roost in the main body of the reservoir - which freezes later. This increased bird activity tends to increase fecal coliform counts. DCR has an active bird harassment program to move the birds away from the intake area.

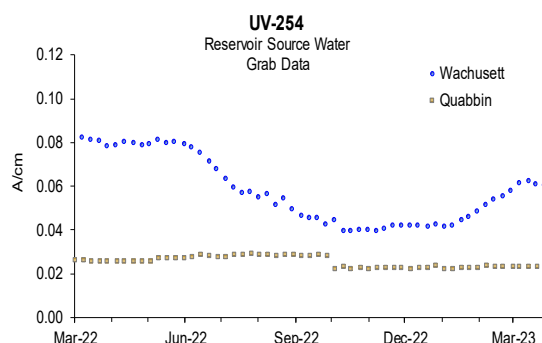
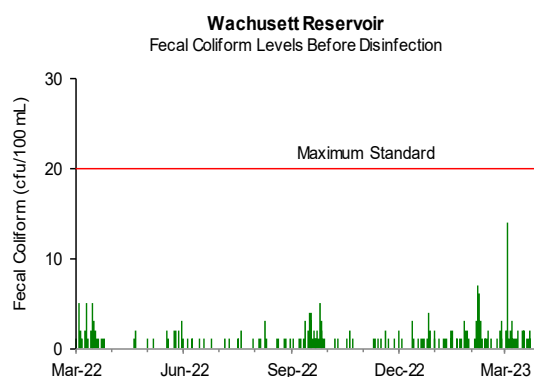
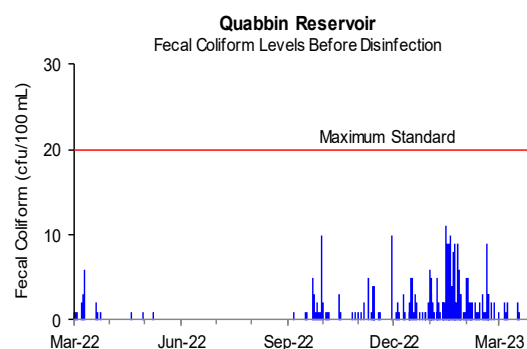
All samples collected during the 3rd Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

Source Water – UV Absorbance

UV Absorbance at 254nm wavelength (UV-254), is a measure of the amount and reactivity of natural organic material in source water. Higher UV-254 levels cause increased ozone and chlorine demand resulting in the need for higher ozone and chlorine doses, and can increase the level of disinfection by-products. UV-254 is impacted by tributary flows, water age, sunlight and other factors.

Quabbin Reservoir UV-254 levels averaged 0.023 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.052 A/cm for the quarter.



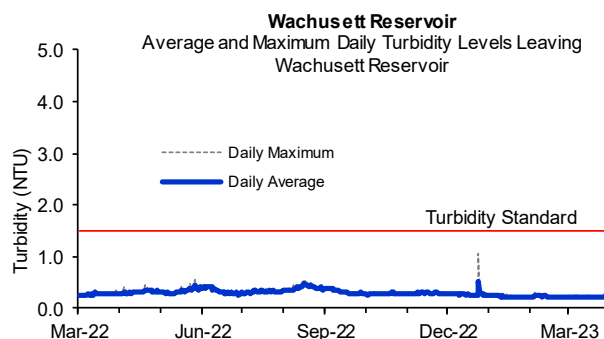
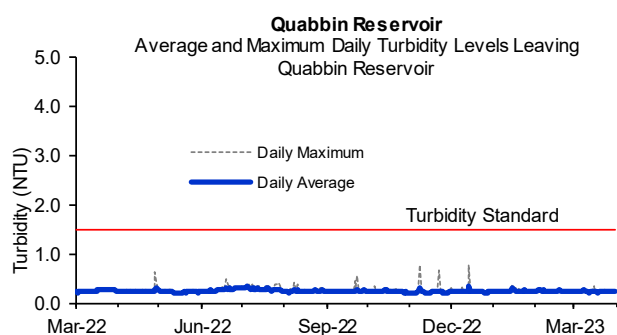
Source Water – Turbidity

3rd Quarter – FY23

Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may protect bacteria from disinfection effects, thereby interfering with the disinfectant residual throughout the distribution system.

There are two standards for turbidity: all water must be below five NTU (Nephelometric Turbidity Units), and water only can be above one NTU if it does not interfere with effective disinfection.

Turbidity of Quabbin Reservoir water is monitored continuously at the Brutsch Water Treatment Facility (BWTF) before UV and chlorine disinfection. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation and UV disinfection. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

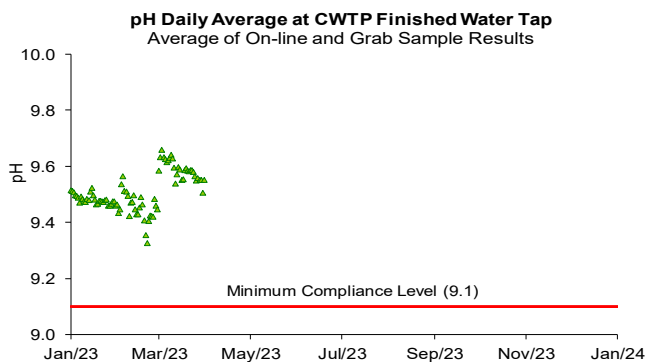
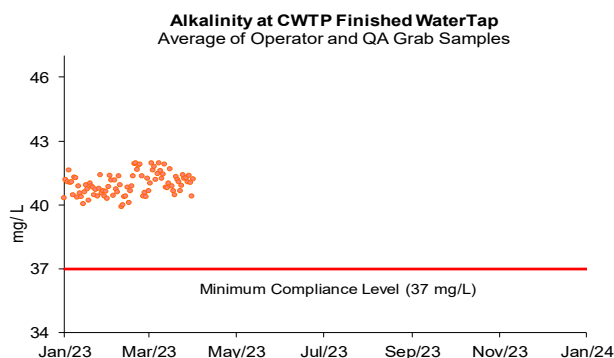


Treated Water – pH and Alkalinity Compliance

MWRA adjusts the alkalinity and pH of Wachusett water at CWTP to reduce its corrosivity, which minimizes the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA tests finished water pH and alkalinity daily at the CWTP's Fin B sampling tap. MWRA's target for distribution system pH is 9.3; the target for alkalinity is 40 mg/l. Per DEP requirements, CWTP finished water samples have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system locations have a minimum compliance level of 9.0 for pH and 37 mg/L for alkalinity. Results must not be below these levels for more than nine days in a six month period. Distribution system samples are collected in March, June, September, and December.

Each CVA community provides its own corrosion control treatment. See the CVA report: www.mwra.com/water/html/awqr.htm.

Quarterly distribution system samples were collected over a course of two weeks in March. Distribution system sample pH ranged from 9.5 to 9.7 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

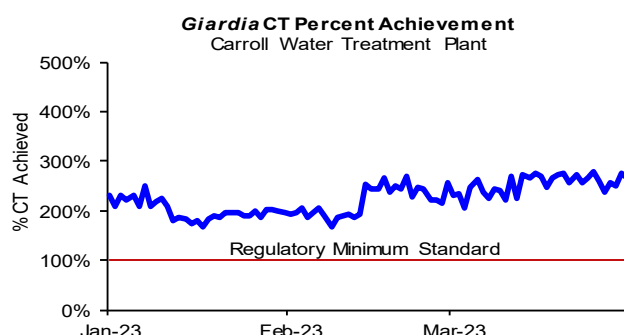
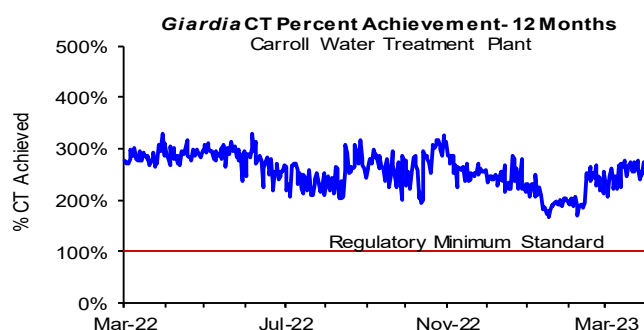
3rd Quarter – FY23

At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA calculates inactivation rates hourly and reports *Giardia* inactivation at maximum flow and *Cryptosporidium* inactivation at minimum UV dose. MWRA must meet 100% of required CT and IT.

CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. For *Cryptosporidium*, there is also an “off-spec” requirement. Off-spec water is water that has not reached the full required UV dose or if the UV reactor is operated outside its validated ranges. No more than 5% off-spec water is allowed in a month.

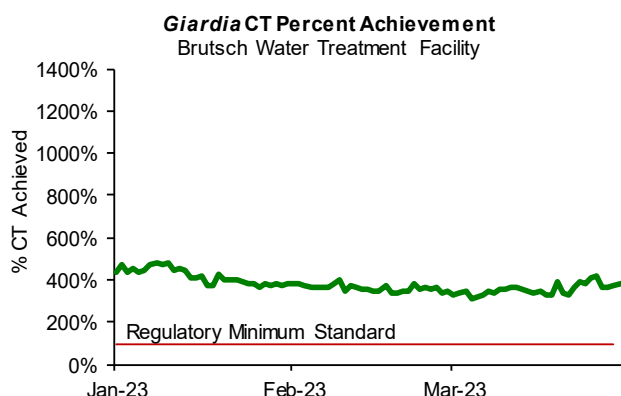
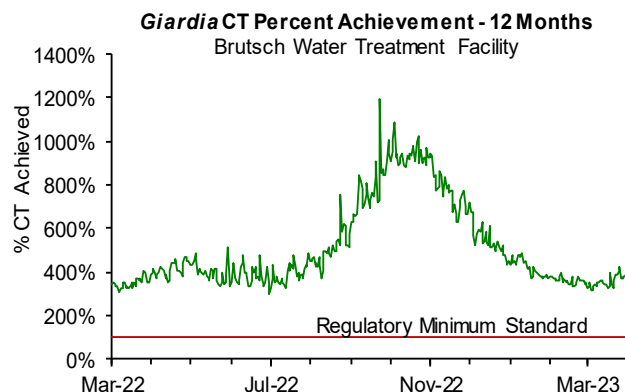
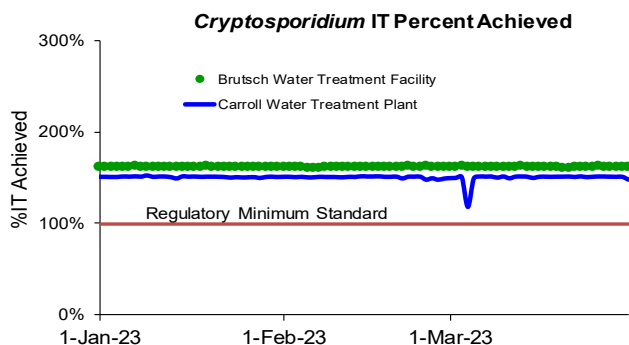
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- The chlorine dose at the CWTP varied between 2.85 and 3.35 mg/L for the quarter.
- Ozone dose at the CWTP varied between 1.25 to 2.23 mg/L for the quarter.
- Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.



Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of 0.75 - 0.85 mg/L (November 1 – May 31) and 0.85 - 1.05 mg/L (June 1 – October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.25 to 1.38 mg/L for the quarter.
- Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.



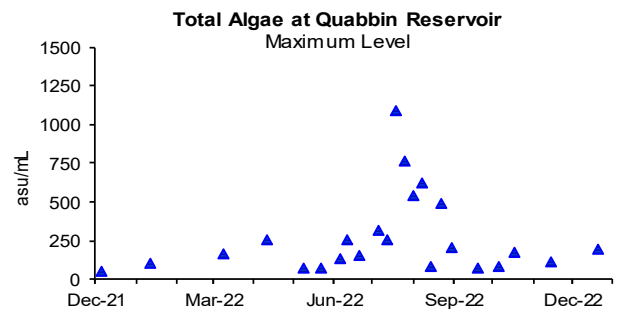
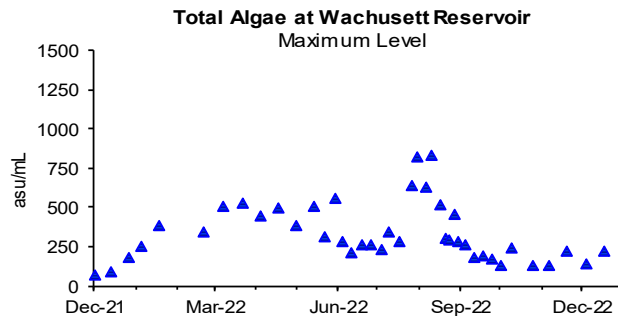
Source Water - Algae

3rd Quarter – FY23

Algae levels in the Wachusett and Quabbin Reservoir are monitored by DCR and MWRA. These results, along with taste and odor complaints, are used to make decisions on source water treatment for algae control.

Taste and odor complaints at the tap may be due to algae, which originate in source reservoirs, typically in trace amounts. Occasionally, a particular species grows rapidly, increasing its concentration in water. When *Synura*, *Anabaena*, or other nuisance algae bloom, MWRA may treat the reservoirs with copper sulfate, an algicide. During the winter and spring, diatom numbers may increase. While not a taste and odor concern, consumers that use filters may notice a more frequent need to change their filters.

In the 3rd quarter, there were no complaints which may be related to algae reported from the local water departments.

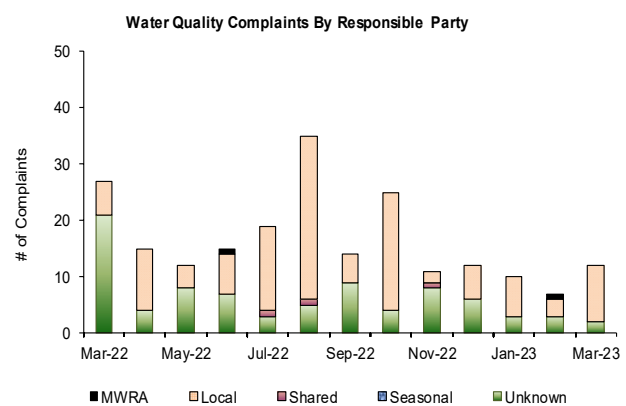
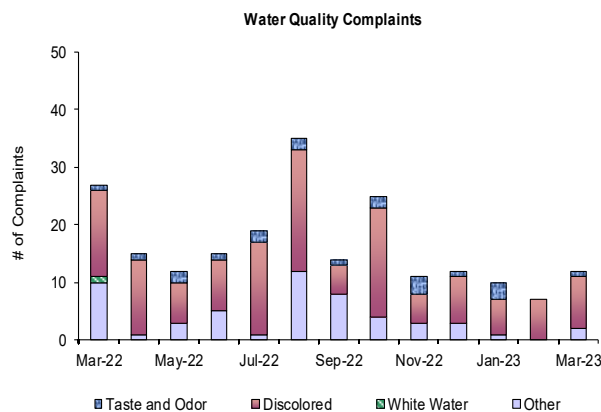


Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

MWRA collects information on water quality complaints that typically fall into four categories: 1) discoloration due to MWRA or local pipeline work; 2) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3) white water caused by changes in pressure or temperature that traps air bubbles in the water; or 4) "other" complaints including no water, clogged filters or other issues.

MWRA routinely contacts communities to classify and tabulate water complaints from customers. This count, reflecting only telephone calls to towns, probably captures only a fraction of the total number of customer complaints. Field Operations staff have improved data collection and reporting by keeping track of more kinds of complaints, tracking complaints to street addresses and circulating results internally on a daily basis.

Communities reported 29 complaints during the quarter compared to 81 complaints from 3rd Quarter of FY22. Of these complaints, 22 were for "discolored water", 4 were for "taste and odor", and 3 were for "other". Of these complaints, 20 were local community issues, 1 was a shared local community and MWRA related issue, and 8 were unknown in origin.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

3rd Quarter – FY23

While all communities collect bacteria samples and chlorine residual data for the Total Coliform Rule (TCR), data from the 44 systems that use MWRA's Laboratory are reported below.

The MWRA TCR program has 144 sampling locations. These locations include sites along MWRA's transmission system, water storage tanks and pumping stations, as well as a subset of the community TCR locations.

Samples are tested for total coliform and *Escherichia coli* (*E.coli*). *E.coli* is a specific coliform species whose presence likely indicates potential contamination of fecal origin.

If *E.coli* are detected in a drinking water sample, this is considered evidence of a potential public health concern. Public notification is required if repeat tests confirm the presence of *E.coli* or total coliform.

Total coliform provide a general indication of the sanitary condition of a water supply. If total coliform are detected in more than 5% of samples in a month (or if more than one sample is positive when less than 40 samples are collected), the water system is required to investigate the possible source/cause with a Level 1 or 2 Assessment, and fix any identified problems.

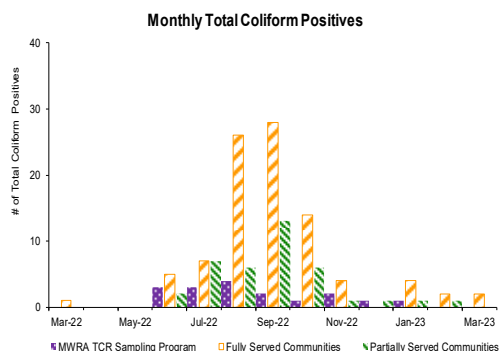
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 3rd Quarter, ten of the 6,285 samples (0.16% system-wide) submitted to MWRA labs for analysis tested positive. Two of the 1865 MWRA locations or Community/MWRA Shared samples (0.11%) tested positive for total coliform. None of the 393 CVA/MWRA community samples tested positive for total coliform. No communities were required to perform a Level Assessment. One sample, collected on 2/15, in Somerville tested positive for *E.coli*. Repeat samples did not confirm for total coliform or *E.coli*, thus, no Level Assessment or Boil Water Order was required. Only 0.1% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

NOTES:

- MWRA total coliform and chlorine residual results include data from community locations. In most cases these community results are indicative of MWRA water as it enters the community system; however, some are strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.
- The number of samples collected depends on the population served and the number of repeat samples required.
- These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
- Part of the Chicopee Valley Aqueduct System. Free chlorine system.



		Total Coliform		<i>E.coli</i> Positive	# Assessment Required
		# Samples (b)	# (%) Positive		
MWRA	a	MWRA Locations	364	0 (0%)	
		Shared Community/MWRA sites	1501	2 (0.13%)	
		Total: MWRA	1865	2 (0.11%)	No
		ARLINGTON	169	0 (0%)	
		BELMONT	104	0 (0%)	
		BOSTON	783	0 (0%)	
		BROOKLINE	225	1 (0.13%)	No
		CHELSEA	169	0 (0%)	
		DEER ISLAND	52	0 (0%)	
		EVERETT	169	0 (0%)	
Fully Served		FRAMINGHAM	237	0 (0%)	
		LEXINGTON	120	0 (0%)	
		LYNNFIELD	18	0 (0%)	
		MALDEN	237	1 (0.42%)	No
		MARBLEHEAD	72	0 (0%)	
		MARLBOROUGH	126	0 (0%)	
		MEDFORD	208	0 (0%)	
		MELROSE	117	0 (0%)	
		MILTON	102	0 (0%)	
		NAHANT	30	0 (0%)	
		NEWTON	277	0 (0%)	
		NORTHBOROUGH	51	1 (1.96%)	No
		NORWOOD	99	0 (0%)	
		QUINCY	351	0 (0%)	
		READING	130	0 (0%)	
		REVERE	186	2 (1.08%)	No
		SAUGUS	104	0 (0%)	
		SOMERVILLE	255	1 (0.39%)	No
		SOUTHBOROUGH	30	0 (0%)	
		STONEHAM	91	0 (0%)	
		SWAMPSCOTT	51	0 (0%)	
		WALTHAM	216	0 (0%)	
		WATERTOWN	143	0 (0%)	
		WESTON	45	0 (0%)	
		WINTHROP	72	2 (2.78%)	No
		Total: Fully Served	5039	8 (0.16%)	
Partially Served		BEDFORD	57	1 (1.75%)	No
		BURLINGTON	129	0 (0%)	
		CANTON	89	0 (0%)	
		NEEDHAM	123	0 (0%)	
		PEABODY	208	0 (0%)	
		WAKEFIELD	134	0 (0%)	
		WILMINGTON	87	0 (0%)	
		WINCHESTER	94	0 (0%)	
		WOBURN	211	1 (0.47%)	No
		Total: Partially Served	1246	2 (0.16%)	
CVA		Total: Community Samples No CVA	6285	10 (0.16%)	
	d	MWRA CVA Locations	103	0 (0%)	
		CHICOPEE	185	0 (0%)	
		SOUTH HADLEY FD1	60	0 (0%)	
		WILBRAHAM	45	0 (0%)	
		Total: CVA	393	0 (0%)	

Chlorine Residuals in Fully Served Communities

	2022											2023		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar
% ≥ 0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0		0.0	0.0	0.0
% ≥ 0.2	0.0	0.0	0.1	0.0	0.1	0.3	0.4	0.5	0.8	0.2		0.1	0.1	0.1
% ≥ 0.5	0.5	0.6	0.5	0.5	1.4	1.6	1.8	2.1	2.4	1.5		1.2	0.7	0.5
% ≥ 1.0	2.3	2.3	2.1	2.6	4.0	5.7	6.5	5.8	5.7	3.9		2.4	1.8	1.3
% ≥ 1.0	97.7	97.7	97.9	97.4	96.0	94.3	93.5	94.2	94.4	96.2		97.7	98.2	98.7

Treated Water Quality: Disinfection By-Product (DBP) Levels in Communities

3rd Quarter – FY23

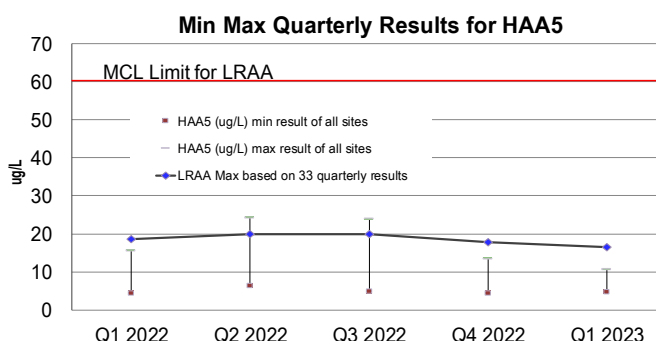
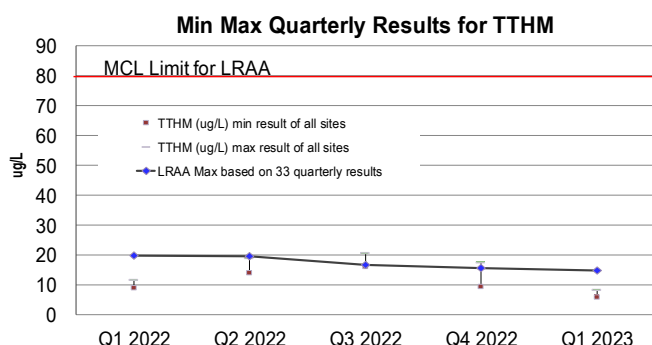
Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. They are of concern due to their potential adverse health effects at high levels. EPA's locational running annual average (LRAA) standard, using the most recent four quarterly results, is 80 µg/L for TTHMs and 60 µg/L for HAA5s. The locational running annual average at each individual sampling location must be below the standard.

Bromate is tested monthly as required for water systems, like CWTP, that treat with ozone. EPA's RAA Maximum Contaminant Level (MCL) standard for bromate is 10 µg/L. The current RAA for Bromate at the CWTP finished water tap is 0.0 µg/L.

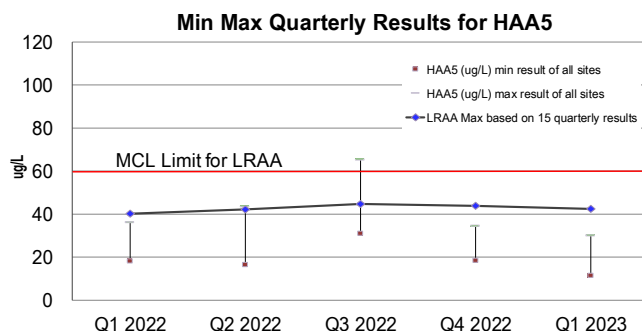
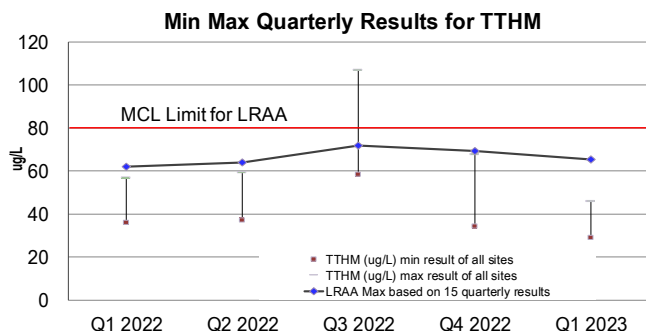
MWRA's TTHM and HAA5 sampling program includes sampling at 33 MetroWest and Metro Boston communities sites. Partially served and CVA communities are responsible for their own compliance monitoring and are regulated individually.

The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remains below current standards. The Max LRAA in the quarter for TTHMs = 14.8 µg/L; HAA5s = 16.6 µg/L. No LRAA exceedances or violations occurred this quarter for MetroBoston and for any of the CVA communities.

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results Chicopee, Wilbraham, & South Hadley FD1)



Water Supply and Source Water Management

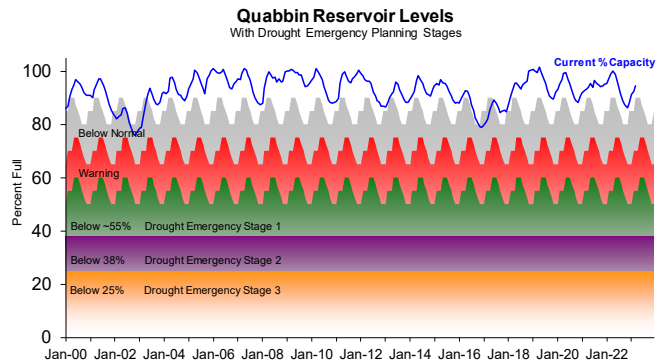
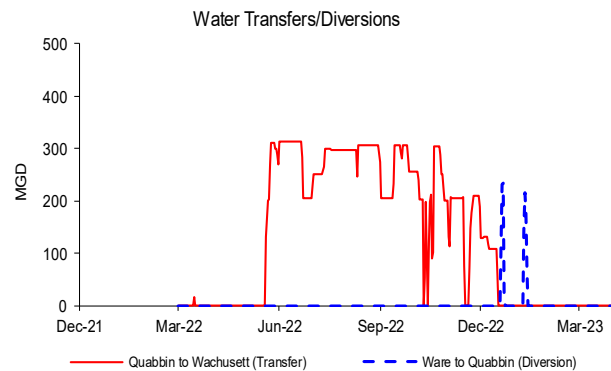
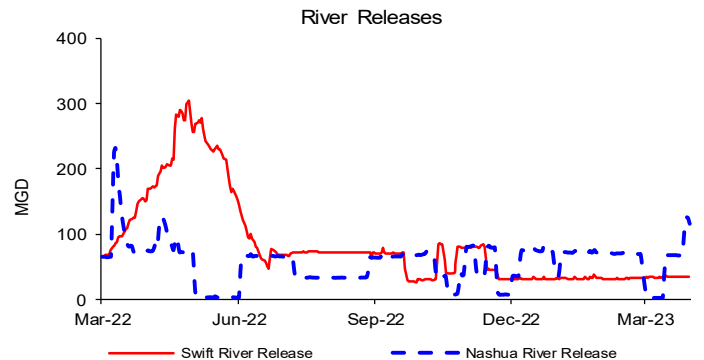
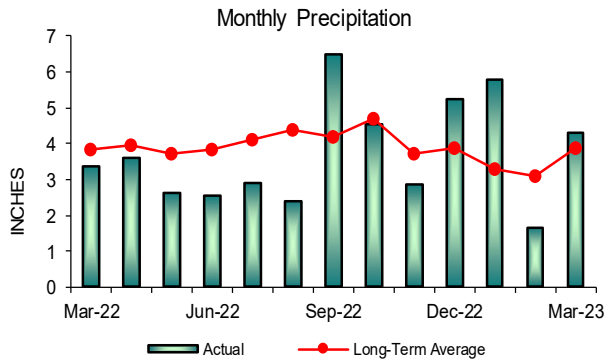
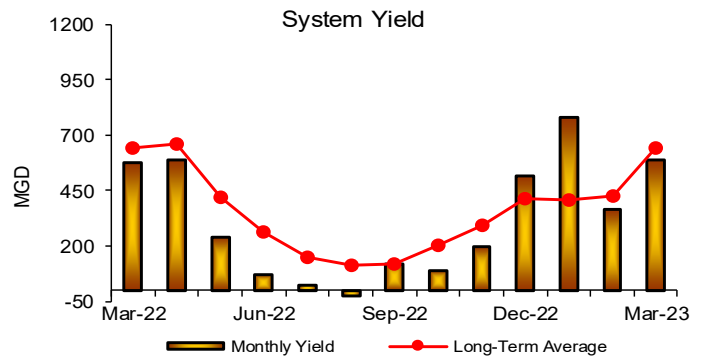
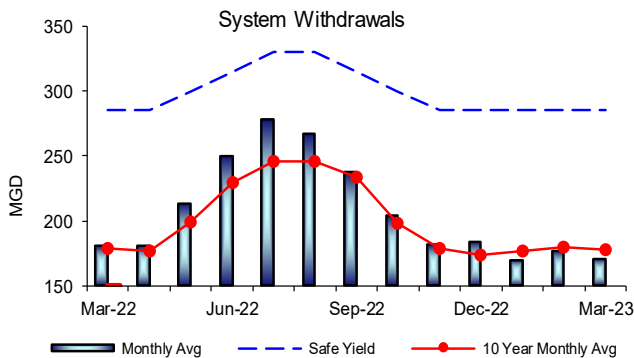
3rd Quarter – FY23

Background

A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir was designed to effectively supply water to the service areas under a range of climatic conditions and has the ability to endure a range of fluctuations. Wachusett Reservoir serves as a terminal reservoir to meet the daily demands of the Greater Boston area. A key component to this reservoir's operation is the seasonal transfer of Quabbin Reservoir water to enhance water quality during high demand periods. On an annual basis, Quabbin Reservoir accounts for nearly 50% of the water supplied to Greater Boston. The water quality of both reservoirs (as well as the Ware River, which is also part of the System Safe Yield) depend upon implementation of DCR's DEP-approved Watershed Protection Plans. System Yield is defined as the water produced by its sources, and is reported as the net change in water available for water supply and operating requirements.

Outcome

The volume of the Quabbin Reservoir was at 94.8% as of March 31, 2023; a 6.8 % increase for the quarter, which represents a gain of more than 28 billion gallons of storage and an increase in elevation of 3.66'. System withdrawal was below its long term quarterly average. Precipitation and Yield were above their long term quarterly average. Quabbin is in Normal Operating Range for this time of year.



WASTEWATER QUALITY

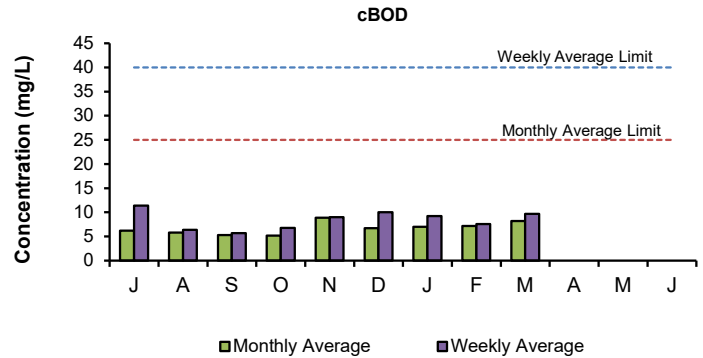
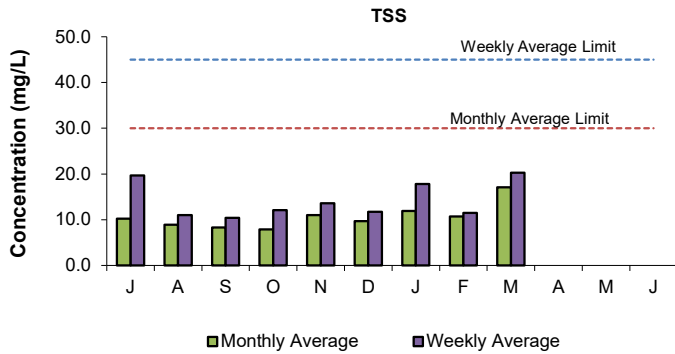
NPDES Permit Compliance: Deer Island Treatment Plant

3rd Quarter - FY23

NPDES Permit Limits

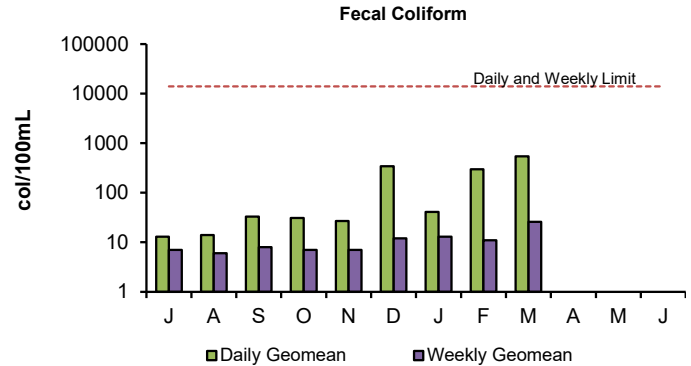
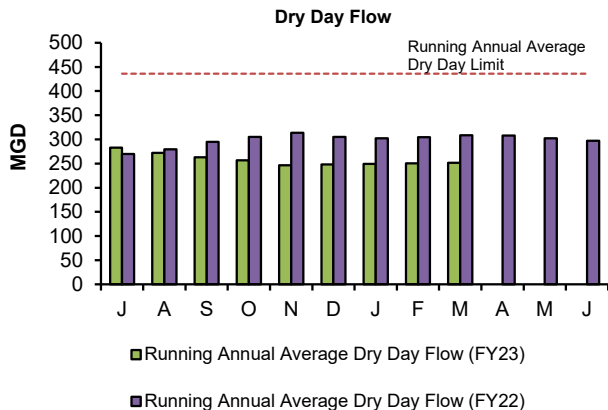
Effluent Characteristics	Units	Limits	January	February	March	3rd Quarter Violations	FY23 YTD Violations
Dry Day Flow (365 Day Average):	mgd	436	249.4	250.4	251.3	0	0
cBOD: Monthly Average	mg/L	25	7.0	7.2	8.2	0	0
Weekly Average	mg/L	40	9.2	7.6	9.7	0	0
TSS: Monthly Average	mg/L	30	11.9	10.7	17.1	0	0
Weekly Average	mg/L	45	17.8	11.5	20.3	0	0
TCR: Monthly Average	ug/L	456	0.0	0.0	0.0	0	0
Daily Maximum	ug/L	631	0.0	0.0	0.0	0	0
Fecal Coliform: Daily Geometric Mean	col/100mL	14000	41	296	540	0	0
Weekly Geometric Mean	col/100mL	14000	13	11	26	0	0
% of Samples >14000	%	10	0	0	1	0	0
Consecutive Samples >14000	#	3	0	0	1	0	0
pH:	SU	6.0-9.0	6.5-7	6.6-6.9	6.5-7	0	0
PCB, Aroclors: Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity: Inland Silverside	%	≥50	>100	>100	>100	0	0
Mysid Shrimp	%	≥50	>100	>100	>100	0	0
Chronic Toxicity: Inland Silverside	%	≥1.5	50	50	100	0	0
Sea Urchin	%	≥1.5	50	100	100	0	0

There have been no permit violations in FY23 to date at the Deer Island Treatment Plant (DITP).



Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 3rd Quarter were within permit limits.

Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 3rd Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 3rd Quarter was well below the permit limit of 436 MGD.

Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 3rd Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

3rd Quarter - FY23

NPDES Permit Limits

Effluent Characteristics		Units	Limits	January	February	March	3rd Quarter Violations	FY23 YTD Violations
Flow:	12-month Rolling Average:	mgd	3.01	2.46	2.38	2.38	0	1
BOD:	Monthly Average:	mg/L	20	1.3	2.3	1.3	0	0
	Weekly Average:	mg/L	20	1.9	2.3	3.5	0	0
TSS:	Monthly Average:	mg/L	20	2.4	2.6	2.5	0	0
	Weekly Average:	mg/L	20	3.1	2.8	3.4	0	0
pH:		SU	6.5-8.3	7-7.7	7.4-7.7	7.3-7.8	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	10.7	10.6	10.6	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	5	0	0
	Daily Geometric Mean:	cfu/100mL	409	5	9	11	0	0
TCR:	Monthly Average:	ug/L	17.6	0.00	0.29	0.00	0	0
	Daily Maximum:	ug/L	30.4	0.00	4.00	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	8.00	6.17	7.32	0	2
	Daily Maximum:	ug/L	14.0	8.00	6.17	7.94	0	0
Total Ammonia Nitrogen:	Monthly Average:	mg/L	10.0	0.00	0.00	0.08	0	0
November 1st - March 31st	Daily Maximum:	mg/L	35.2	0.00	0.00	0.15	0	0
Total Phosphorus:	Monthly Average:	ug/L	1000	99.0	203.3	128.3	0	0
November 1st - March 31st	Daily Maximum:	ug/L	RPT	117.0	323.0	262.0	0	0
Acute Toxicity ⁺ :	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity ⁺ :	Daily Minimum:	%	≥62.5	N/A	N/A	100	0	1

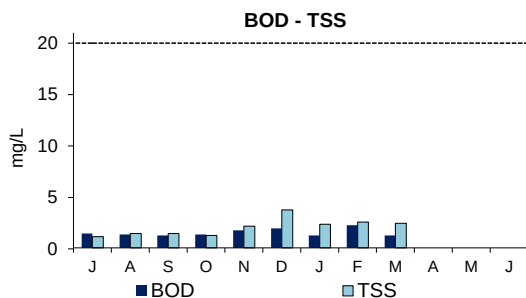
There have been four permit violations in FY23 at the Clinton Treatment Plant.

1st Quarter: There were four permit violations in the first quarter. In July, plant flows exceeded the 12-month rolling average. July and August copper monthly averages exceeded the permit limit of 11.6 ug/L. The quarterly chronic toxicity result of 12.5% was below the minimum permit limit of 62.5%.

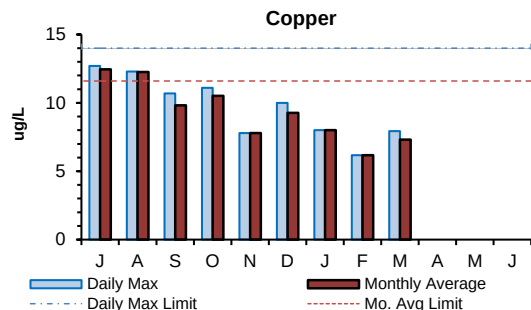
2nd Quarter: There were no permit violations in the second quarter.

3rd Quarter: There were no permit violations in the third quarter.

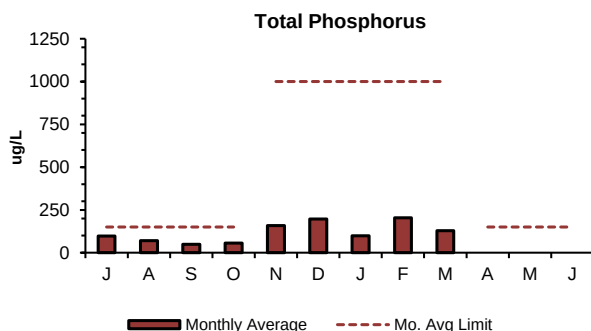
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



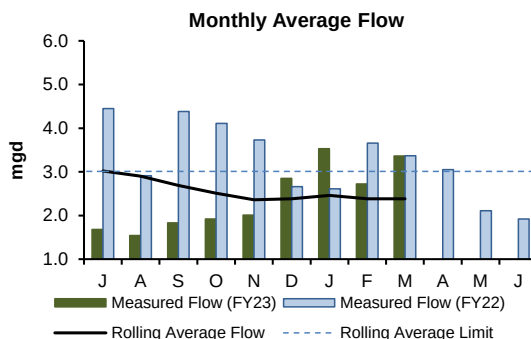
The 3rd Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 3rd Quarter are variable. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



Daily maximum and monthly average concentrations of copper were below permit limits in the 3rd Quarter. Permit daily and monthly limits are 14.0 ug/L and 11.6 ug/L respectively.



Total phosphorus limits are most stringent during the growing season from April to October. The 3rd Quarter's monthly average concentrations for total phosphorus were below permit limits.

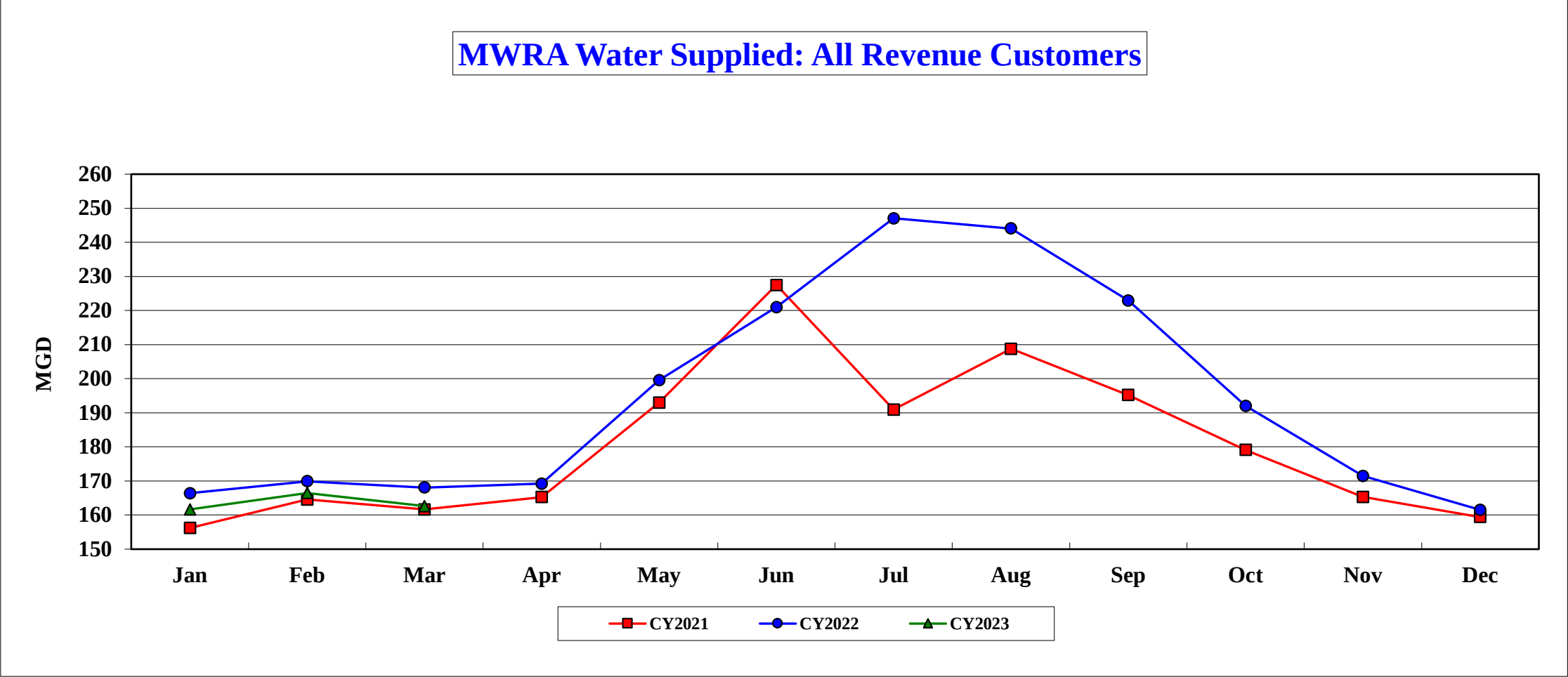


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 3rd Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

3rd Quarter - FY23



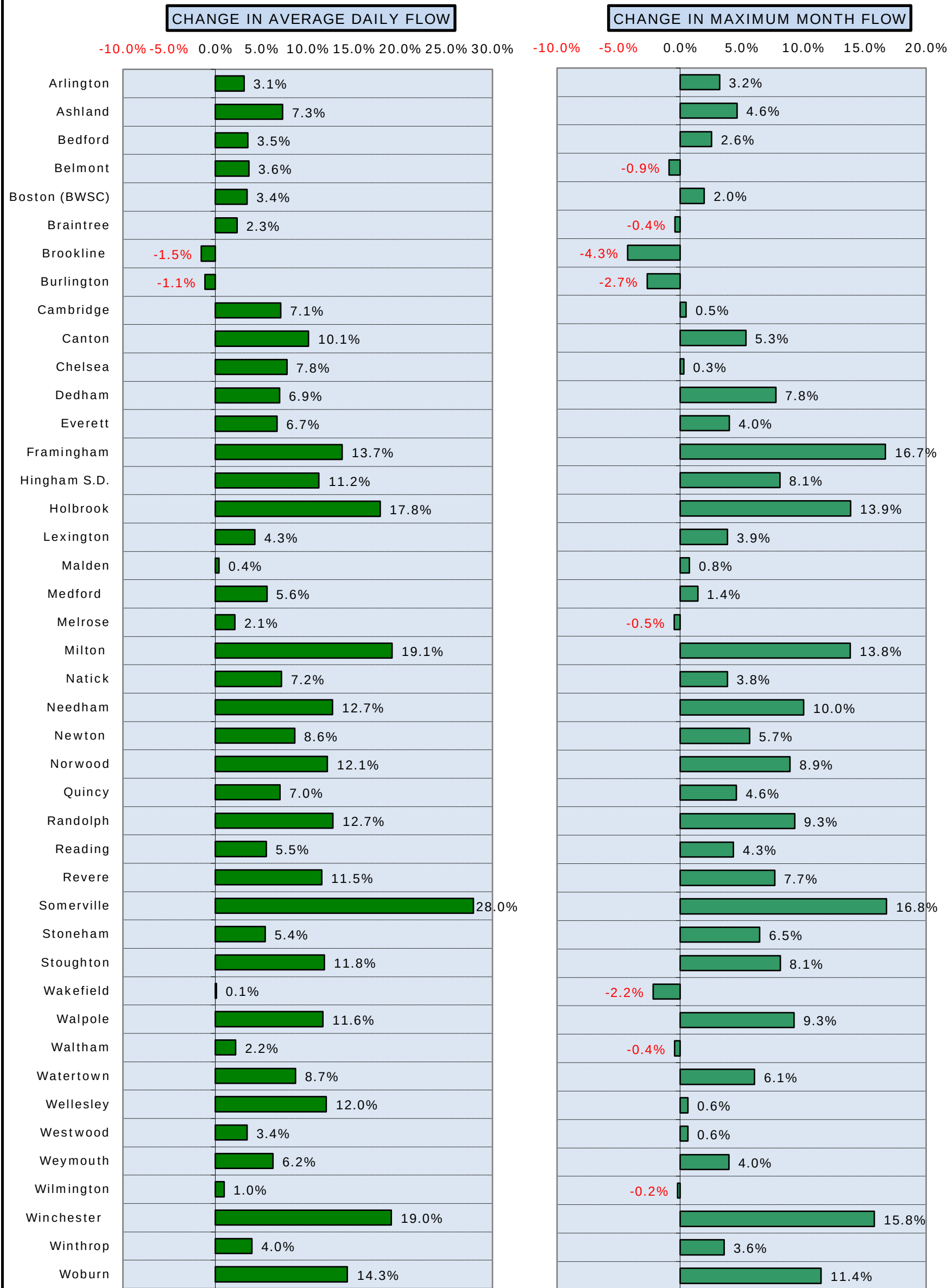
	Water Use (million gallons per day)												YTD Average	Annual Average
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
CY2021	156.213	164.567	161.697	165.284	192.998	227.522	190.945	208.810	195.229	179.116	165.302	159.442	160.701	180.641
CY2022	166.445	169.923	168.101	169.253	199.626	221.002	247.075	244.069	222.906	192.000	171.454	161.527	168.097	194.631
CY2023	161.670	166.463	162.662	-	-	-	-	-	-	-	-	-	163.503	163.503

The March 2023 Community Water Use Report was recently distributed to communities and customers served by the MWRA's Metropolitan and Chicopee Valley waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2023 water use will be used to allocate the FY2025 water utility rate revenue requirement.

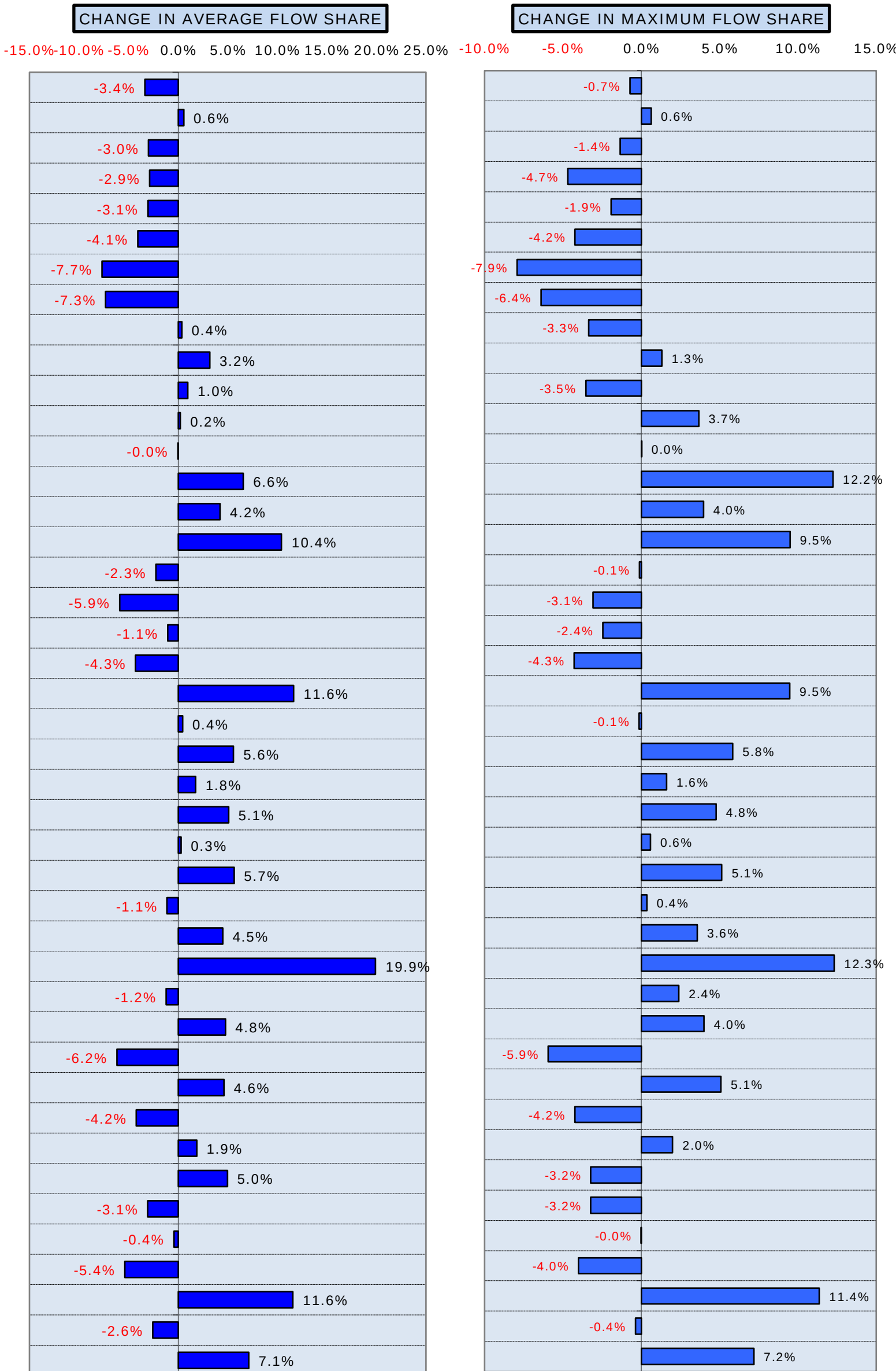
MWRA customers used an average of 163.5 mgd in the 3rd quarter (Jan-Mar 2023) of FY2023. This is a decrease of 4.6 mgd or 2.7% compared to the 3rd quarter of FY2022.

How CY2021-23 Community Wastewater Flows Could Effect FY2025 Sewer Assessments ^{1,2,3}

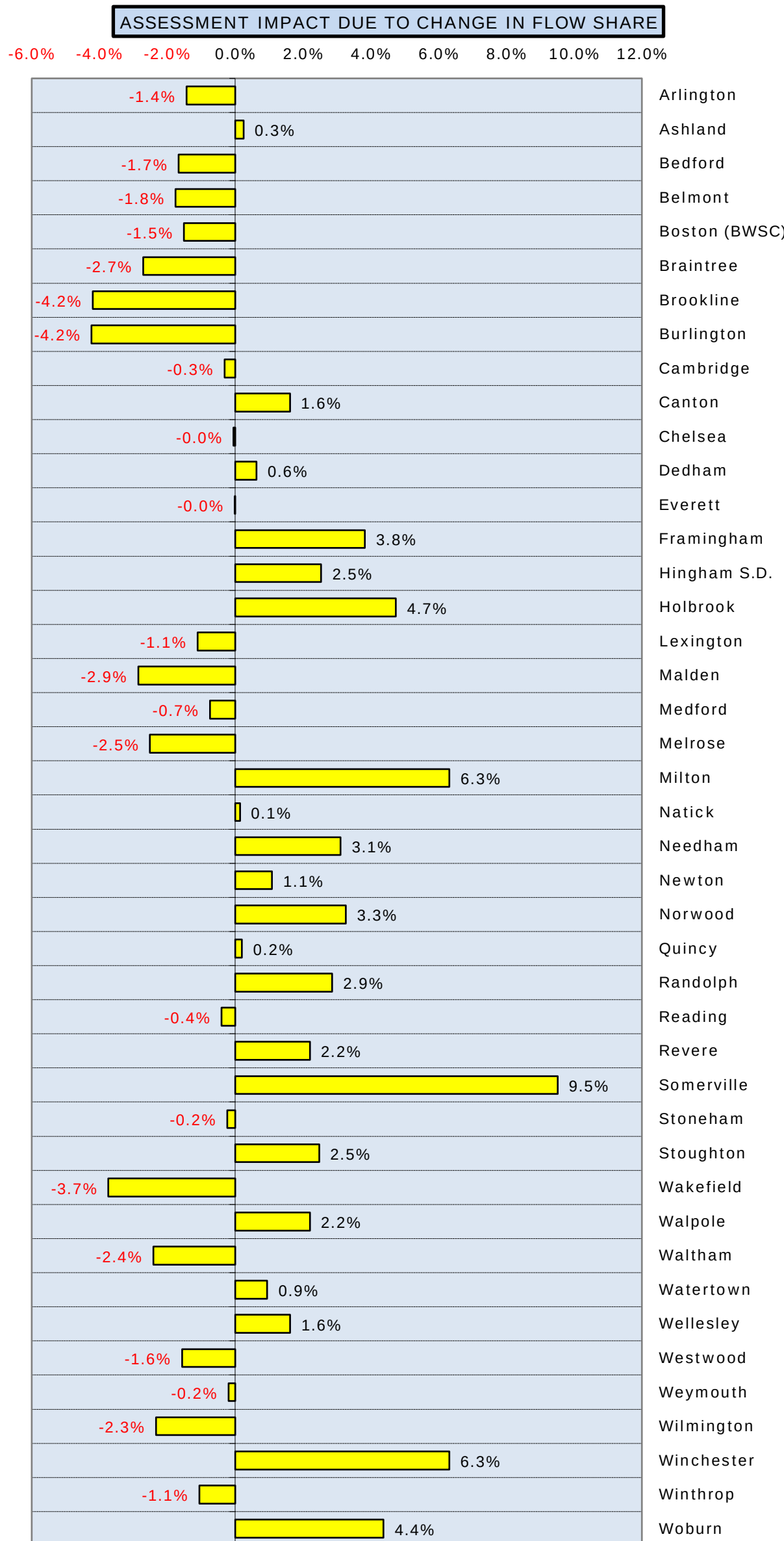
The flow components of FY2025 sewer assessments will be calculated using a 3-year average of CY2021 to CY2023 wastewater flows compared to FY2024 assessments that will use a 3-year average of CY2020 to CY2022 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2021 to CY2023 flow share compared to CY2020 to CY2022 flow share, compared to all other communities in the system.



The chart below illustrates the change in the TOTAL BASE assessment due to FLOW SHARE CHANGES. ⁴



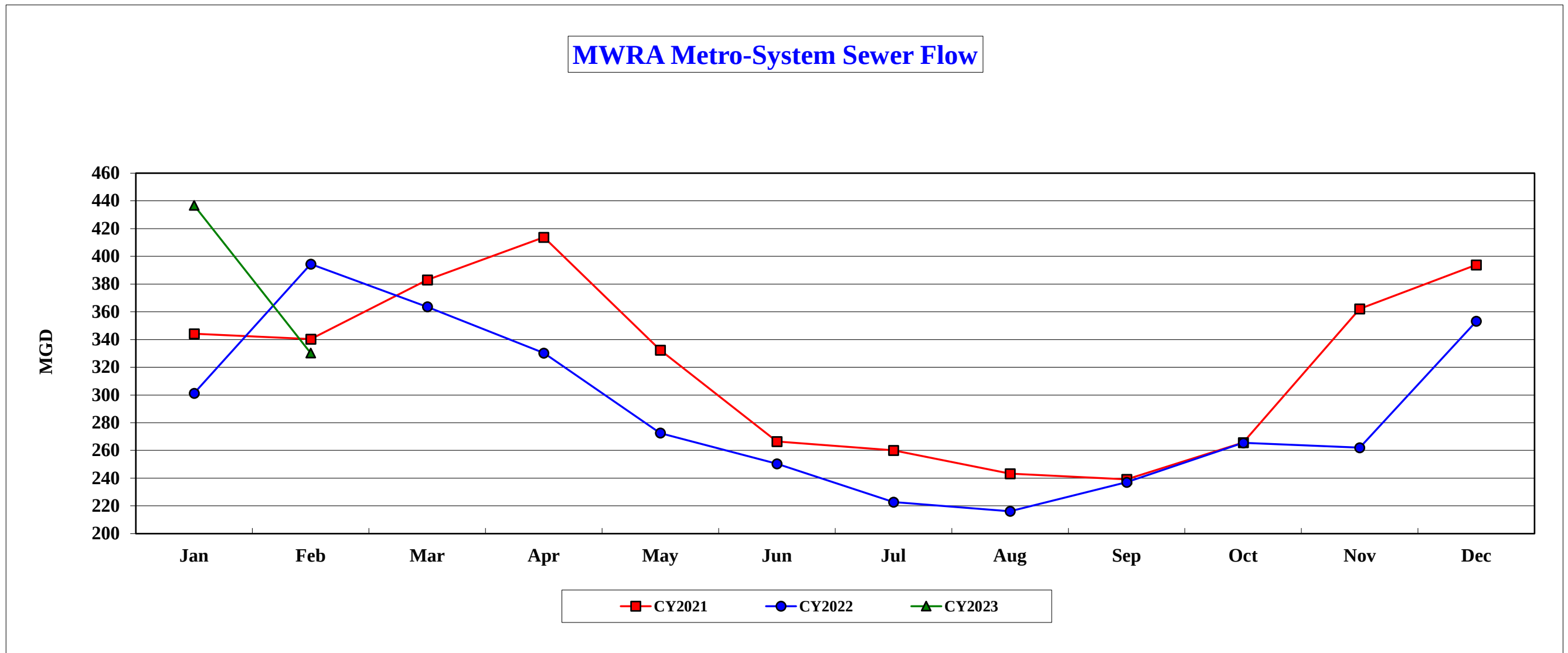
¹ MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smoothes the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.

² Based on actual flows for 2022 and 2023 (through February), and January to March, and June to December 2020. April & May 2020 based on the average of 3 prior years, adjusted for 2020 water use. January to December 2021 estimated based on the average of the 3 prior years.

³ Flow data is preliminary and subject to change pending additional MWRA and community review.

⁴ Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

Community Sewer Flow YTD - FY23



Sewer Flow (million gallons per day)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2021	344.203	340.320	383.107	413.769	332.385	266.443	260.030	243.310	239.147	265.670	362.143	393.833	342.360	320.199
CY2022	301.220	394.440	363.600	330.280	272.550	250.410	222.840	216.120	237.000	265.440	261.960	353.160	345.460	288.429
CY2023	436.780	330.210	-	-	-	-	-	-	-	-	-	-	386.204	307.828

The 2023 2-Month Community Sewer Flow Report was recently distributed to the 43 communities served by the MWRA's Metropolitan sewer system. Each community's share of sewer flow relative to the system as a whole is used to allocate the annual sewer rate revenue requirement to MWRA sewer communities. The average of calendar year 2021-2023 sewer flow will be used to allocate the FY2025 sewer utility rate revenue requirement.

MWRA customer sewer flow averaged 386.204 mgd in the first two months of CY2023. This is an increase of 40.744 mgd or 11.8% compared to the first two months of CY2022.

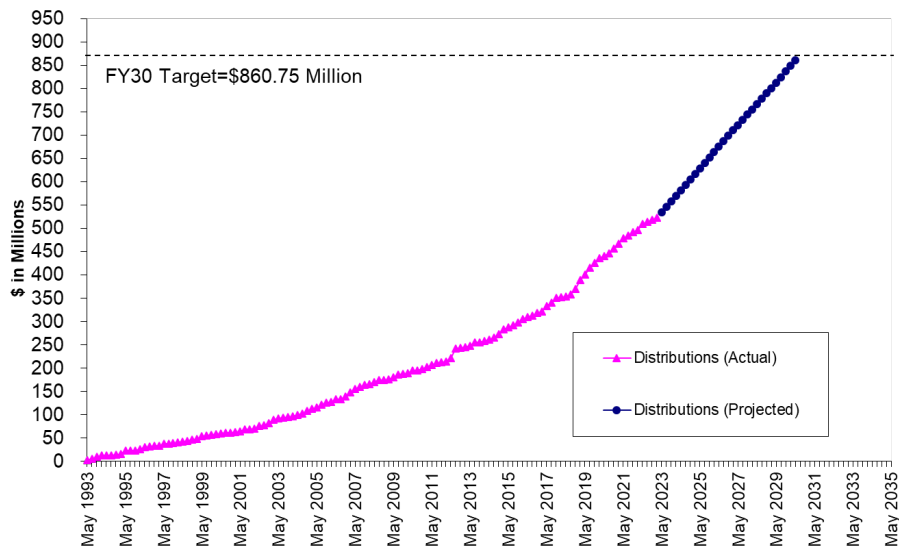
Community Support Programs

3rd Quarter – FY23

Infiltration/Inflow Local Financial Assistance Program

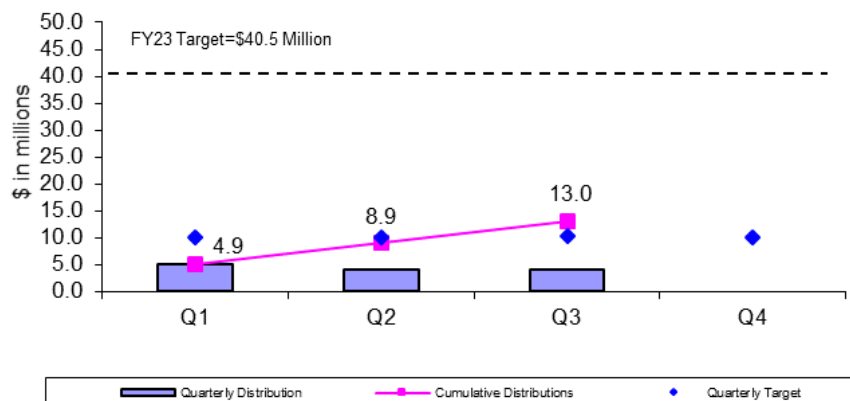
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$860.75 million in grants and interest-free loans (average of about \$22 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total \$300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total \$360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. Phase 13 provides an additional \$100 million in ten-year loan-only funds. Phase 14 funds (total \$100 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 3rd Quarter of FY23, \$4.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Braintree, Stoughton, Walpole and Weymouth. Total grant/loan distribution to date for FY23 is \$13 million. From FY93 through 3rd Quarter of FY23, all 43 member sewer communities have participated in the program and \$523 million has been distributed to fund 659 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY23 Quarterly Distributions of Sewer Grant/Loans



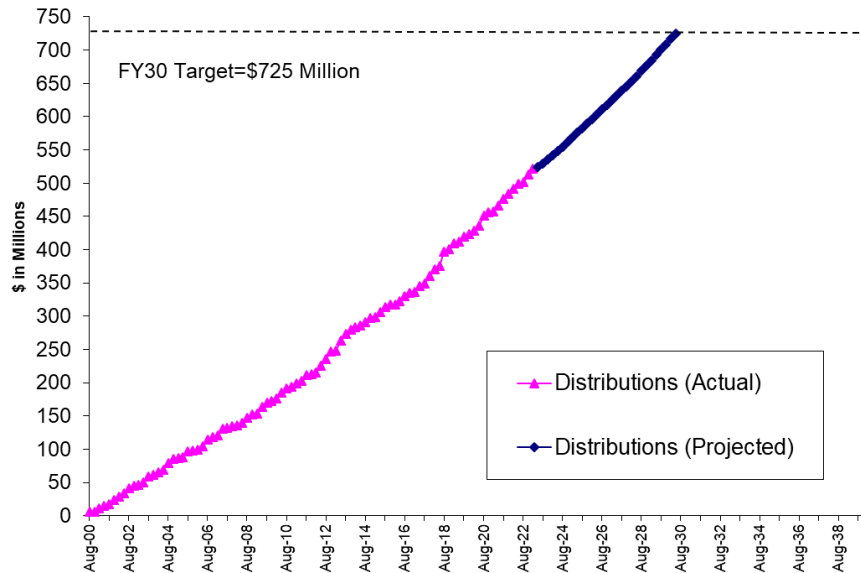
Community Support Programs

3rd Quarter – FY23

Local Water System Assistance Program

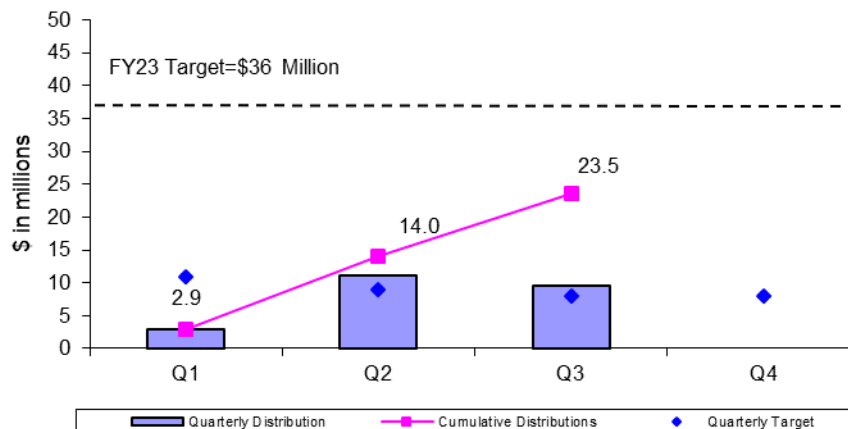
MWRA's Local Water System Assistance Programs (LWSAP) provides \$725 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been three (3) funding phases: Phase 1 at \$222 Million, Phase 2 at \$210 Million, and Phase 3 at \$293 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with \$222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY25. The Phase 3 Water Loan Program is authorized for distributions from FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 3rd Quarter of FY23, \$9.5 million in interest-free loans was distributed to fund local water projects in Brookline, Chicopee, Reading, and Wakefield. Total loan distribution to date for FY23 is \$23.5 million. From FY01 through the 3rd Quarter of FY23, \$522 million has been distributed to fund 514 local water system rehabilitation projects in 43 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY23 Quarterly Distributions of Water Loans



Community Support Programs

3rd Quarter – FY23

Lead Service Line Replacement Loan Program

By its vote on March 16, 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to \$100 million in 10-year zero-interest loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is also referenced as the Lead Loan Program or LLP. Each community can develop its own program, tailored to their local circumstances. MWRA's goal in providing financial assistance to member communities is to improve local water systems so that the high quality water MWRA delivers can make it all the way to the consumer's tap. The presence of a lead service line connecting a home to the main in the street can lead to elevated lead levels in tap water, especially if that water sits stagnant for an extended period. MWRA's stable water quality and effective corrosion control treatment reduce the risk that a lead service line will cause elevated lead levels, and measured lead levels in high risk homes have decreased by 90 percent since corrosion control was brought on-line in 1996. However, the risk of elevated levels remains as long as lead service lines are in use. To date, \$35.5 million dollars have been distributed to 14 communities.

FY17 was the first year of the Lead Service Line Replacement Loan Program - MWRA made three Lead Loans.

FY18 was the second year of the Lead Loan Program - MWRA made five Lead Loans.

FY19 was the third year of the Lead Loan Program - MWRA made four Lead Loans.

FY20 was the fourth year of the Lead Loan Program - MWRA made eight Lead Loans.

FY21 is the fifth year of the Lead Loan Program - MWRA made seven Lead Loans.

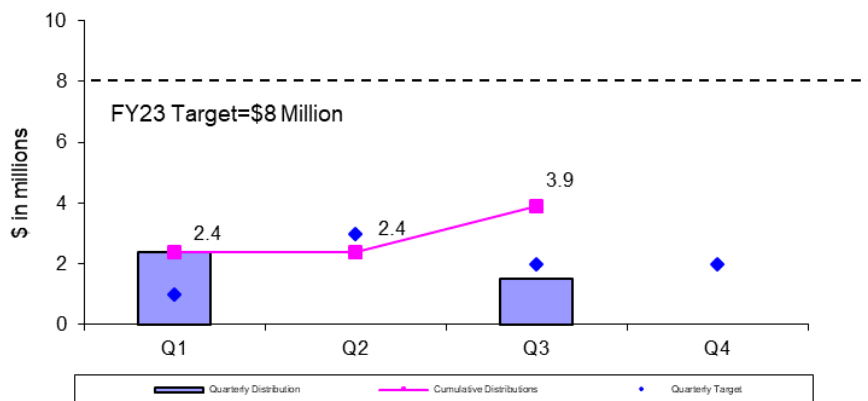
FY22 is the sixth year of the Lead Loan Program - MWRA made six Lead Loans.

FY23 is the seventh year in the Lead Loan Program - MWRA has made six Lead Loans in the first three quarters.

Summary of Lead Loans:

Chelsea in FY23	\$0.5 Million	Everett in FY20	\$1.0 Million
Watertown in FY23	\$0.3 Million	Somerville in FY20	\$0.9 Million
Winthrop in FY23	\$0.7 Million	Chelsea in FY20	\$0.3 Million
Reading in FY23	\$1.5 Million	Marlborough in FY19	\$1.0 Million
Watertown in FY23	\$0.3 Million	Winthrop in FY19	\$0.5 Million
Winchester in FY23	\$0.6 Million	Chelsea in FY19	\$0.1 Million
Everett in FY22	\$1.5 Million	Everett in FY19	\$1.0 Million
Boston in FY22	\$0.9 Million	Needham in FY18	\$1.0 Million
Winthrop in FY22	\$0.8 Million	Winchester in FY18	\$0.5 Million
Somerville in FY22	\$1.6 Million	Revere in FY18	\$0.2 Million
Revere in FY22	\$1.3 Million	Winthrop in FY18	\$0.3 Million
Chelsea in FY22	\$0.3 Million	Marlborough in FY18	\$1.0 Million
Watertown in FY21	\$0.6 Million	Newton in FY17	\$4.0 Million
Marlborough in FY21	\$2.0 Million	Quincy in FY17	\$1.5 Million
Everett in FY21	\$1.5 Million	<u>Winchester in FY17</u>	<u>\$0.5 Million</u>
Boston in FY21	\$2.6 Million	TOTAL	\$35.5 Million
Winthrop in FY21	\$0.8 Million		
Chelsea in FY21	\$0.3 Million		
Winchester in FY21	\$0.6 Million		
Everett in FY20	\$0.5 Million		
Marlborough in FY20	\$1.0 Million		
Winchester in FY20	\$0.6 Million		
Winthrop in FY20	\$0.7 Million		
Weston in FY20	\$0.2 Million		

FY23 Quarterly Distributions of Lead Service Line Replacement Loans

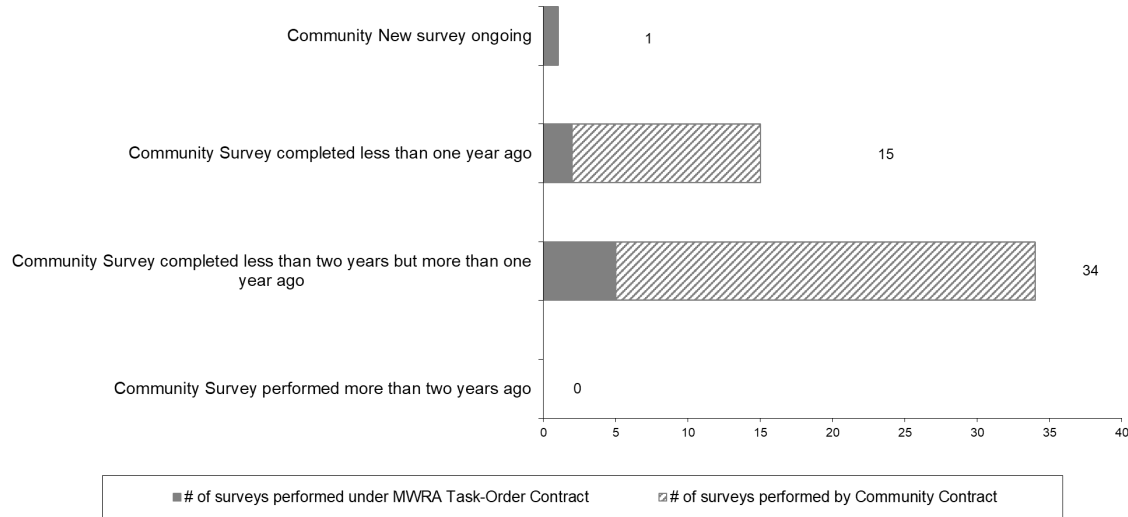


Community Support Programs

3rd Quarter – FY23

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA's task order leak detection contract. MWRA's task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 3rd Quarter of FY23, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 200 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor - outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, and toilet leak detection dye tabs), all at no cost to member communities or individual customers. The Program's annual budget is \$25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	17,985	418	15,302		33,705
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,302	62	464		2,828
Toilet Leak Detection Dye Tablets	_____	3,151	28	3,257		6,436

BUSINESS SERVICES

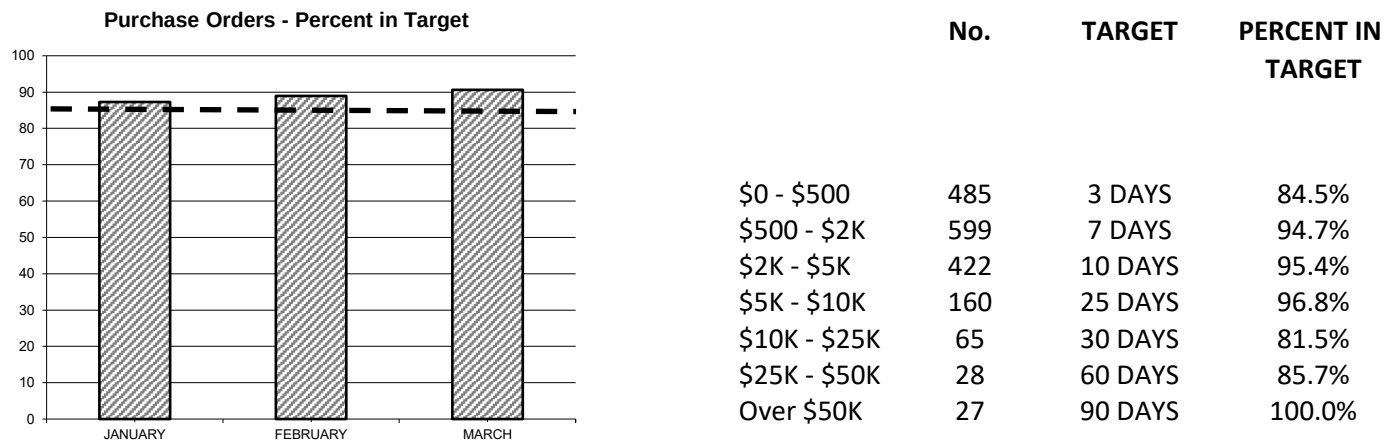
Procurement: Purchasing and Contracts

3rd Quarter - FY23

Background: Goal is to process 85% of Purchase Orders and 80% of Contracts within Target timeframes.

Outcome: Processed 92% of purchase orders within target; Average Processing Time was 4.82 days vs. 4.51 days in Qtr 3 of FY22. Processed 64% (9 of 14) of contracts within target timeframes; Average Processing Time was 185 days vs. 203 days in Qtr 3 of FY22.

Purchasing



The Purchasing Unit processed 1786 purchase orders, 49 more than the 1737 processed in Qtr 3 of FY22 for a total value of \$11,341,237 versus a dollar value of \$12,639,174 in Qtr 3 of FY22.

The purchase order processing target was not met for the 0\$ - \$500 category due to vendor delays providing quotes and price confirmations and the \$10K - \$25K category due to delays in vendor bid responses and end user approvals.

Contracts, Change Orders and Amendments

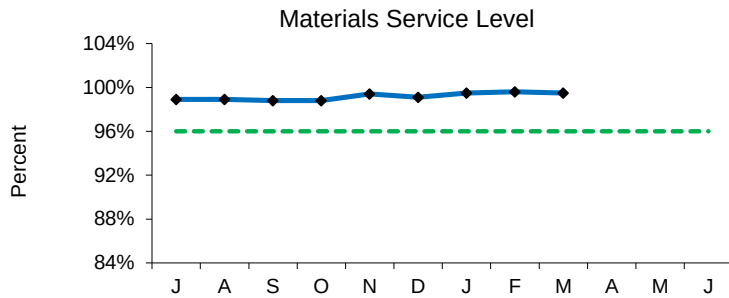
Procurement executed fourteen contracts with a value of \$298,740,601 and two amendments with a value of \$0. Twenty four change orders were executed during the period. The dollar value of all non-credit change orders during Q3 FY23 was \$1,562,904 and the value of credit change orders was (\$204,878).

Five contracts were not executed within the target timeframe. One contract was delayed due to specification revisions which took longer than anticipated. Another contract was delayed due to staffing changes in addition to delays associated with the receipt of insurance certificates and bonds precipitated by a company merger involving the awarded vendor. A third contract was delayed due to contractor delays returning signed contract documents and the revised certificate of insurance. A fourth contract was delayed due to changes to the original scope of services in addition to delays by the consultant returning signed documents. The final contract was delayed due to a request to hold the notice to proceed until the construction contractor mobilized on-site.

Staff reviewed 35 proposed change orders and 27 draft change orders.

Materials Management

3rd Quarter - FY23



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,531 (99.5%) of the 7,568 items requested in Q3 from the inventory locations for a total dollar value of \$2,179,702.

Inventory Value - All Sites

Inventory goals focus on:

- Maintaining optimum levels of consumables and spare parts inventory
- Adding new items to inventory to meet changing business needs
- Reviewing consumables and spare parts for obsolescence
- Managing and controlling valuable equipment and tools via the Property Pass Program

The FY23 goal is to reduce consumable inventory from the July '22 base level (\$8.3 million) by 2.0% (approximately \$167,437), to \$8.2 million by June 30, 2023.

Items added to inventory this quarter include:

- Deer Island – circuit boards, optical assemblies, contactors and transfer switches for Electrical; valves and expansion fittings for Maintenance; reagents, sample cells and blowers for Thermal.
- Chelsea – full body harnesses and leg pads for harnesses for Safety; cement lined pipe and butt straps for Pipeline, heater for Metering; Motors and couplings for Field Operations; filters for Fleet Services and power supplies for SCADA.
- Southboro – full body harnesses, leg pads for harnesses, tripod and winches for Safety.

Property Pass Program:

- Eleven audits were conducted during Q3.
- Scrap revenue received for Q3 amounted to \$7,656. Year to date revenue received amounted to \$27,402.
- Revenue received from online auctions held during Q3 amounted to \$7,638. Year to date revenue received amounted to \$185,268.

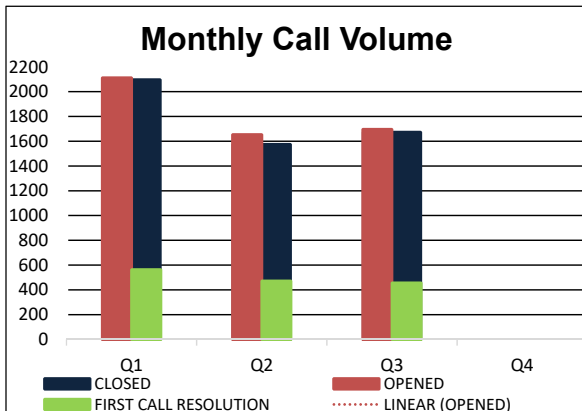
Items	Base Value July-22	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,371,867	8,419,690	47,823
Spare Parts	9,447,310	9,824,567	377,257
Total	17,819,177	18,244,257	425,080

Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

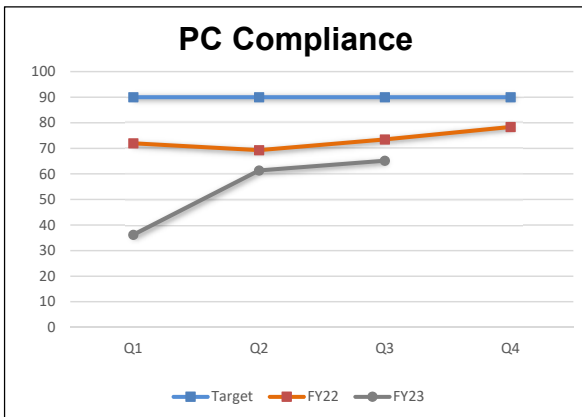
MIS Program

3rd Quarter – FY23

Numbers & Statistics



Summary of calls managed by the Helpline.



Percentage of user endpoints that are in compliance with system updates. These numbers are a direct reflection of accessibility to these systems. Daytime patching began in January for mobile devices.

Project Updates

Infrastructure & Security

Office Space Planning: Chelsea and Deer Island phase 1 users have moved into their new spaces. Phase 2 of construction is in progress. Preparation for users in the Navy Yard to move are in process.

Technology Updates: Staff continue to migrate users to FortiClient for remote access and the implementation of email archiving.

Managed Security Services Contract: Device logging completed. Design review and validation activities are under review. Awaiting completion of SD-WAN infrastructure before deploying additional devices.

Network Upgrades/Improvements: MIS continued to work with Comcast on site surveys and wiring diagrams to provide Internet connectivity to all purchased sites. Completion targeted for the end of Q1 of FY24. Implemented network segmentation for printers in Chelsea and Deer Island to improve security. Hardware refresh of Edge Switches completed in all remote locations.

VMWare Workspace ONE: This solution will replace Citrix Workspace and XenMobile used for remote access and mobile device management, Absolute used for device tracking, and Ivanti used for software deployment and asset management. This solution is currently being tested and MIS. Users will begin being move to new solution next month.

Library, Record Center, & Training

Library: Undertook 21 research requests, supplied 16 books for circulation, provided 14 new books and 20 new standards (aside from subscription). The MWRA Library Portal supported 602 end user searches, including: environmental justice events, North Dorchester Bay CSO, Cordaville Pipeline, Shaft 12 Screen, Stearn's Reservoir Gatehouse #1 sluice gate, and Alewife CSO design.

Record Center (RC): The Record Center added 457 new boxes (1,052 YTD), handled 512 total boxes, and shredded 24, 65 gallon bins and 3, 96 gallon bins of confidential documentation this quarter. The scanning initiative continues and has resulted in the scanning of over 300 boxes of physical records since starting in Q1. The RC performed database and physical box searches for various departments on topics such as administrative information, Staff Summaries, Law Research, and Project related information for various engineering groups.

MIS Training: In Q3, 50 online IT lessons were taken (82 YTD), by 61 employees (89 YTD). 1 Standard class lesson was taken by 41 employees.

Other Software & Custom Applications

ECM/Electronic Document Management: Went live with the first phase of the ECM project, which included Records Management and Physical Records Management. Successfully migrated over 500,000 physical object records into the system. Retired the InfoStar platform. Began planning for the next phase of the project, which includes a large migration of electronic CAD drawings into a newly built Master Repository.

MWRA Website Refresh: Procurement process completed. Vendor was selected and presented at the March Board Meeting. Hope for a Notice to Proceed to be complete by the end of April.

Telog Infrastructure Upgrade: The production MS SQL database was upgraded to new version and additional CPUs were added to enhance performance. New development and pre-production environments have been setup and tested for future go-live activities.

Infor Upgrade: Selection committee has met and reviewed the drafts of the Statement of Work (SOW) and Request for Quote/ Proposal. Bid event is planned to start mid- April.

InspectNTrack Upgrade: Went live on March 1st. Deer Island-Ops and Waste Water-Ops groups have started using the system. New test environments have been setup for remaining groups to complete User Acceptance testing before they can be implemented. Waste Water metering report is also being upgraded with expectation to release report in April.

Cumulus Canto: This application is used to catalog images. User training sessions were completed in March. MIS staff worked with the vendor (Canto) to configure Single-Sign On (OKTA) integration. User sign-off of the solution is scheduled for the first week of April.

Discoverer to Business Objects Enterprise (BOE) Migration: Current Discoverer application that is used to create reports is being discontinued and therefore being replaced with BOE. Reports currently available in Crystal Reports are being migrated to new reports application. 80% of the workbooks and 50% of the worksheets have been completed.

Legal Matters
3rd Quarter - FY23

PROJECT ASSISTANCE

Real Estate, Contract, Energy, Environmental and Other Support:

- **8(m) Permits, License Agreements, and Other Permits:** Reviewed ninety-five (95) 8(m) permits, including any related MEPA Section 61 findings. Reviewed and finalized two (2) wastewater direct connection permits.
- **Real Property:** Reviewed two (2) watershed real property acquisition projects by the Department of Conservation and Recreation. Prepared license agreement for temporary use of land at various locations to support MWRA's Siphon Juncture Rehabilitation Project. Finalized a ground lease for an MWRA support building location. Provided review of property rights for parcels of interest for Tunnel Redundancy Program.
- **Energy:** Favorably resolved a billing dispute with a local gas distribution company regarding an MWRA facility account. Reviewed grant applications and agreements regarding renewable and energy efficiency incentives for MWRA facilities.
- **Environmental/NPDES:** Provided ongoing counsel and support to ENQUAL and other MWRA divisions regarding NPDES and other environmental related issues.
- **Miscellaneous:** Reviewed various pieces of proposed legislation for potential impacts to MWRA.
- **Public Records Requests:** MWRA received and responded to one hundred and fifty-nine (159) public records requests. Provided counsel and support to various MWRA divisions and records access officers regarding the Public Records Law and Massachusetts Statewide Records Retention Schedule.

New Matters

- An employee filed a charge of discrimination against MWRA at the Massachusetts Commission Against Discrimination, based upon age, sexual orientation, race and color.
- A union filed a request for arbitration alleging MWRA violated the collective bargaining agreement when it disciplined 2 employees for violations of the COVID-19 Vaccination Mandate and exemption procedures.
- A union filed a request for arbitration alleging MWRA violated the collective bargaining agreement when it disciplined an employee for violations of the MWRA's Code of Conduct, Non-Discrimination Policy and Harassment Prevention Policy.
- A union filed an arbitration demand alleging MWRA violated the collective bargaining agreement when it denied certain employees overtime to finish spill cleanup.

Matters Concluded

- Following a hearing as a result of the MWRA's appeal, a Hearing Officer from the Department of Unemployment Assistance reversed, in favor of the MWRA, the Department's earlier decision granting unemployment benefits to a former employee. The former employee did not file a timely appeal of the decision to the Department's Review Board.
- A union withdrew a grievance and request for arbitration alleging MWRA violated the collective bargaining agreement when it approved an employee's overtime pay rather than callback pay.
- A union withdrew a grievance alleging that MWRA violated the collective bargaining agreement because it did not pay an employee call back pay when the employee worked overtime.
- Following a settlement with the Authority, a union withdrew a demand for arbitration alleging that MWRA violated a collective bargaining agreement when an employee was working out of grade.

New Lawsuits There are no new lawsuits to report.

New Claims: There is one new claim to report.

Seaport Diagnostics, Inc. Telemere Diagnostic

On February 1, 2023, a Notice of Commencement of Creditor's trust was received on behalf of Seaport Diagnostics, Inc., and its affiliate Telomere Diagnostic (f/k/n Orig3n.). This company is a TRAC permittee.

**Significant
Developments:**

Jon Eldridge, et al. v City of Framingham, MWRA and RJV Construction Corporation, Middlesex Superior Court, 2281CV03049. Both MWRA and co-defendant RJV Construction have filed Motions to Dismiss. The court scheduled a hearing on the two pending Motions for May 4, 2023.

Closed Cases: Conservation Law Foundation (CLF) v. MWRA, D. Mass., Case No. 1:22-cv-10626-RGS. On February 17, 2023, the Court granted MWRA's Motion to Dismiss. No appeal was filed, and this matter is closed.

Closed Claims: There was one closed claim to report in 3rd Quarter FY 2023.

Abdessamad Marah, MVA Claim

MWRA and the claimant settled this personal injury claim arising from a motor vehicle accident involving an MWRA vehicle.

Subpoenas: There are no new subpoenas received and no subpoenas that closed in 3rd Quarter FY 2023.

**Wage
Garnishments**

There are two wage garnishment matters that are active and monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of March 2023
Construction/Contract/Bid Protest	0
Tort/Labor/Employment	3
Environmental/Regulatory/Other	3
Eminent Domain/Real Estate	0
TOTAL	6
Other Litigation matters (restraining orders, etc.) Class Action suit	1
TOTAL – all pending lawsuits	7
Claims not in suit	2
Bankruptcy	3
Wage Garnishment	2
TRAC/Adjudicatory Appeals	1
Subpoenas	0
TOTAL – ALL LITIGATION MATTERS	15

TRAC/MISC.

Pending Appeals: There is one pending Administrative Appeal.

1058 Beacon Street; MWRA Docket No. 22-10

**Settlement by
Agreement of
Parties**

There were no Settlements by Agreement of Parties in 3rd Quarter FY 2023.

**Stipulation of
Dismissal**

There were no Stipulations of Dismissal in 3rd Quarter FY 2023.

**Notice of
Dismissal
Fine paid in full**

No were no Notices of Dismissal, Fines Paid in Full in 3rd Quarter FY 2023.

Tentative

No Tentative Decisions were issued in 3rd Quarter FY 2023.

**Final
Decisions**

No Final Decisions were issued in 3rd Quarter FY 2023.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES

3rd Quarter - FY23

Highlights

During the 3rd quarter FY23, Internal Audit (IA) completed and issued the Compliance Status of Employees' Mandatory Confined Space Entry Training audit report. IA provided recommendations to enhance procedures related to tracking, recording and reporting training compliance. In addition, IA completed and issued the Water and Wastewater Licenses and Certifications audit report. IA provided recommendations to enhance procedures related to identifying, tracking, recording and reporting required licenses and enhancing escalation procedures related to failure to obtain a required license or failure to renew a required license. A fleet physical inventory of all plated vehicles and equipment in coordination with management is nearing completion. An internal review of MIS assets is progressing.

Internal Audit completed 2 labor burden reviews and 2 incurred cost audits. There are 2 labor burden review and 2 incurred cost audits in process. IA also issued 27 indirect cost rate letters to consultants following a review of their consultant disclosure statements.

Status of Recommendations

During FY23, 5 recommendations were closed.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 36 months, the appropriateness of the recommendation is re-evaluated.

All Open Recommendations Pending Implementation – Aging Between 0 and 36 Months

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Fleet Services Non-Plated Equipment Inspections (3/30/20)	1	14	15
Compliance Status of Employees' Mandatory Confined Space Entry Training (2/24/23)	1	3	4
Water and Wastewater Licenses and Certifications (3/31/23)	2	1	3
Total Recommendations	4	18	22

Cost Savings

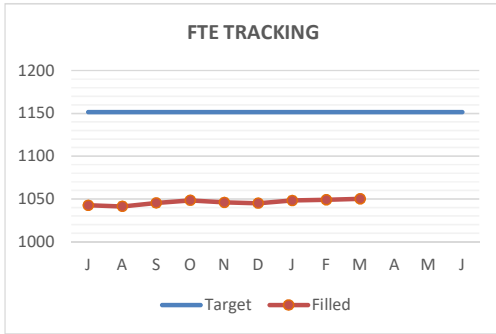
IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY19	FY20	FY21	FY22	FY23 Q3	TOTALS
Consultants	\$262,384	\$643,845	\$563,525	\$39,938	\$218,599	\$1,728,291
Contractors & Vendors	\$3,152,884	\$2,097,729	\$1,547,223	\$1,714,614	\$1,695,352	\$10,207,802
Internal Audits	\$210,063	\$212,517	\$214,458	\$222,554	\$167,129	\$1,026,721
Total	\$3,625,331	\$2,954,091	\$2,325,206	\$1,977,106	\$2,081,080	\$12,962,815

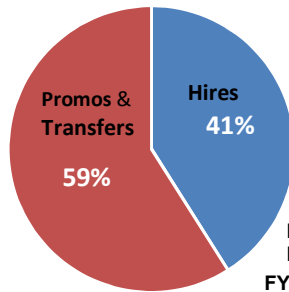
OTHER MANAGEMENT

Workforce Management

3rd Quarter - FY23



Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY21	81 (56%)	64 (44%)	145
FY22	138 (68%)	65 (32%)	203
FY23 YTD	102 (59%)	71 (41%)	173

FY23 Budget for FTEs = 1151.4

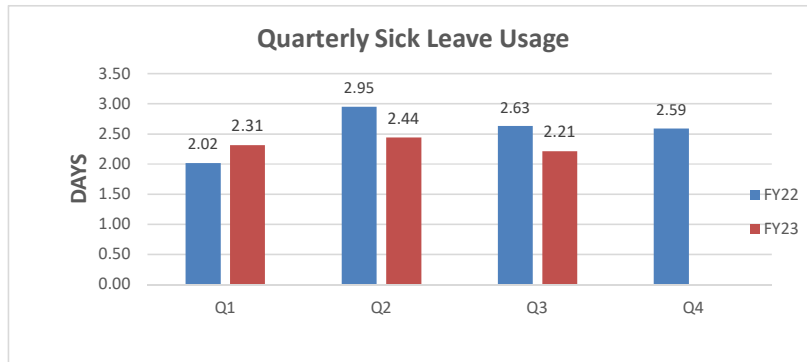
FTEs as of March 2023 = 1045

Tunnel Redundancy as of March 2023 = 10

POSITION CHANGE by FY

FY	HIRES	PROMOS	TRANSFER	RETIRE	RESIGN	DISMISS	DECEASED
FY19	76	87	25	40	32	9	4
FY20	58	70	14	38	23	2	1
FY21	64	66	15	58	15	2	2
FY22	65	108	30	82	45	2	3
FY23*	71	89	13	42	21	3	3

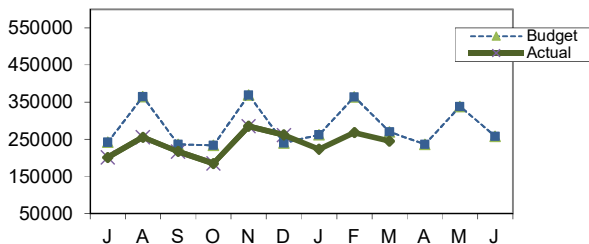
* as of 3/31/2023



Average quarterly sick days for the 3rd Quarter of FY23 has decreased as compared to the 3rd Quarter of FY22 (2.21 from 2.63).

Field Operations

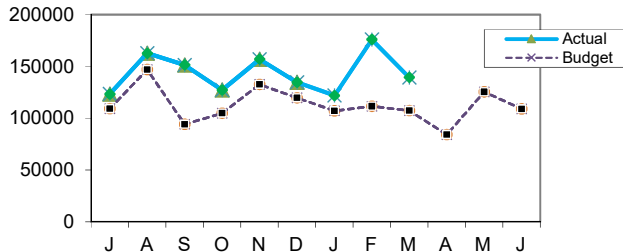
Third Quarter FY23 Overtime \$



Total Overtime for Field Operations for third quarter was \$727K, which is \$169K or 18.9% under budget. Emergency overtime was \$281K, which is \$159K under budget or 36%, primarily due to fewer winter inclement weather events. Coverage overtime totaling \$222K which is \$65K over budget or 41%, primarily due to vacant shifts going unfilled. Planned overtime was \$223K or \$19K under budget with a combination spending of \$70K for scheduled maintenance; and \$200K for various coverage shifts.

Deer Island Treatment Plant

Third Quarter FY23 Overtime \$

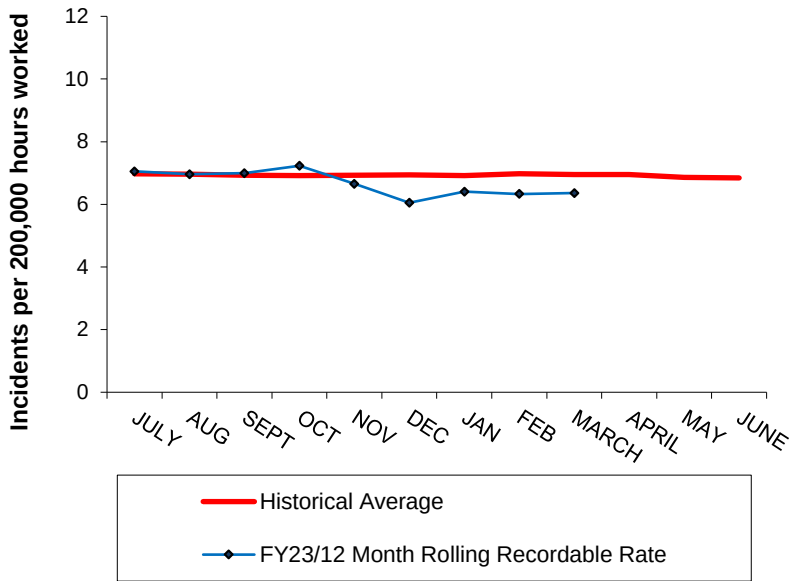


Deer Island's total overtime expenditure third quarter was \$437K, which is \$111K or 34.1% over budget due to higher than anticipated shift coverage of \$153K and planned/unplanned overtime of \$7K. This is offset by lower spending for storm coverage of (\$49K). YTD Deer Island's overtime spending is \$1.3 M, which is \$260K or 25.2% over budget due to higher than anticipated shift coverage of \$379K. This is offset by lower than anticipated storm coverage of (\$117K) and planned/unplanned overtime of (\$1K).

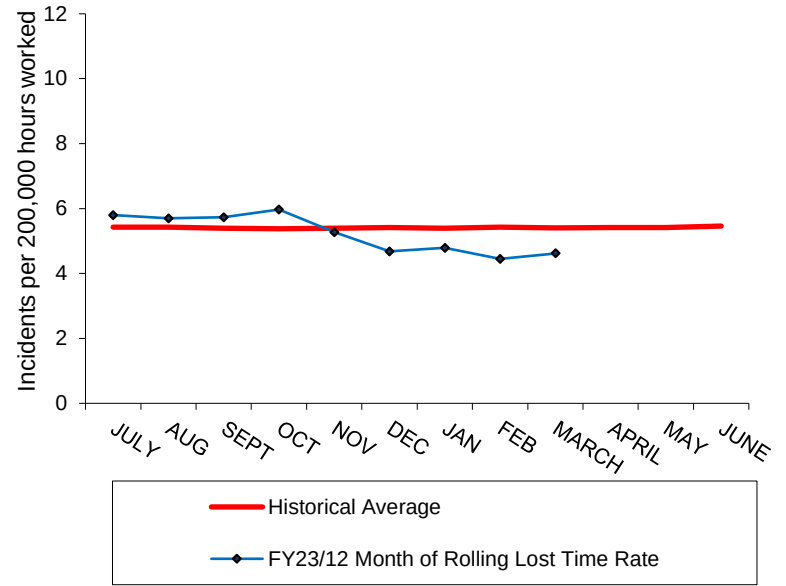
Workplace Safety

3rd Quarter - FY23

Recordable Injury & Illness Rates



Lost Time Injury & Illness Rates

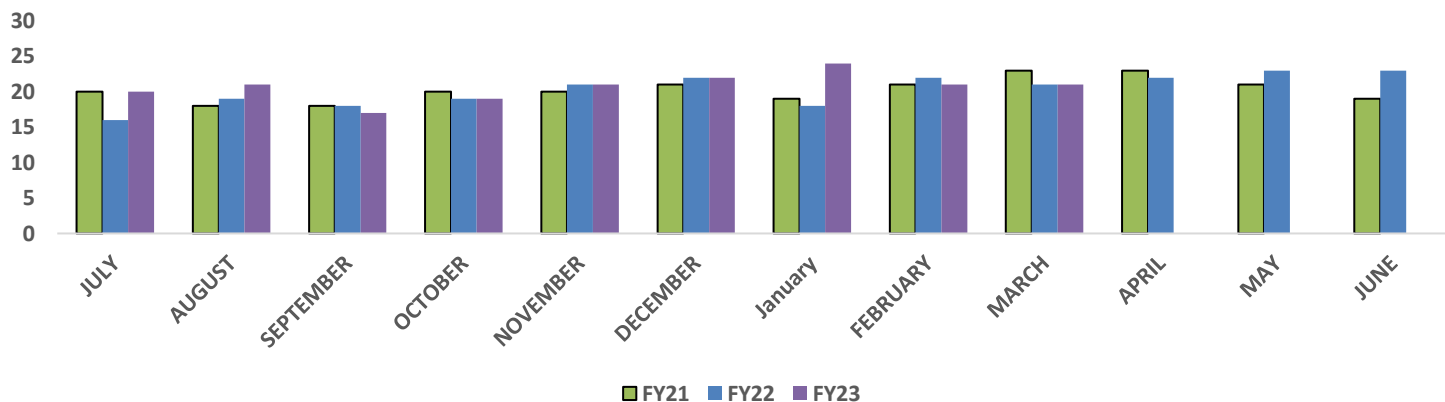


- 1 "Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid. Each month this rate is calculated using the previous 12 months of injury data.
- 2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness. Each month this rate is calculated using the previous 12 months of injury data.
- 3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY22.

WORKERS COMPENSATION HIGHLIGHTS

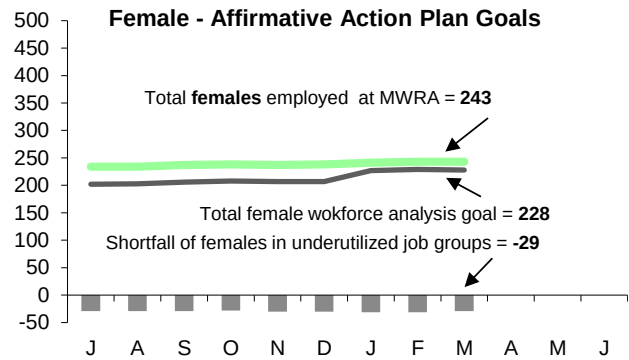
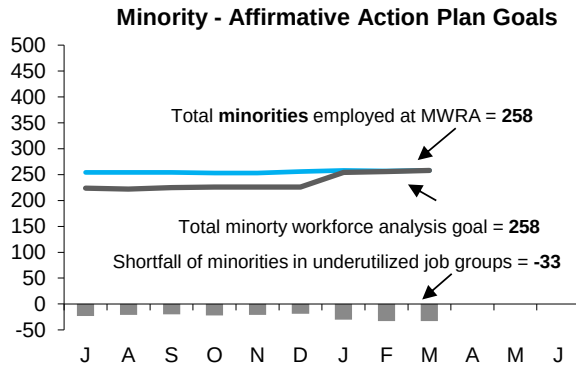
	3rd Quarter Information		Open Claims
	New	Closed	
Lost Time	2	5	49
Medical Only	2	7	110
Report Only	6	6	
	QYTD		FYTD
Regular Duty Returns	4		17
Light Duty Returns	1		1
Indemnity payments as of March 2023 included in open claims listed			22

Worker Compensation Settlements by FY



MWRA Job Group Representation

3rd Quarter - FY23



Highlights:

At the end of Q3 FY23, 6 job groups or a total of 33 positions are underutilized by minorities as compared to 6 job groups for a total of 24 positions at the end of Q3 FY22; for females 7 job groups or a total of 29 positions are underutilized by females as compared to 8 job groups or a total of 30 positions at the end of Q3 FY22. During Q3, 5 minorities and 10 females were hired. During this same period 3 minorities and 4 females were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 3/31/2023	Minorities as of 3/31/2023	Achievement Level	Minority Over or Underutilized	Females As of 3/31/2023	Achievement Level	Female Over or Underutilized
Administrator A	26	5	2	3	12	6	6
Administrator B	24	1	5	-4	6	7	-1
Clerical A	23	7	5	2	18	17	1
Clerical B	24	7	6	1	3	12	-9
Engineer A	82	19	21	-2	23	21	2
Engineer B	56	18	16	2	14	14	0
Craft A	110	16	25	-9	0	6	-6
Craft B	123	26	26	0	1	5	-4
Laborer	55	14	16	-2	3	2	1
Management A	88	19	22	-3	32	25	7
Management B	38	11	10	1	6	9	-3
Operator A	65	4	17	-13	3	7	-4
Operator B	58	18	9	9	3	2	1
Professional A	29	8	8	0	16	13	3
Professional B	154	47	45	2	70	49	21
Para Professional	49	18	11	7	25	23	2
Technical A	53	17	12	5	7	9	-2
Technical B	7	3	2	1	1	1	0
Total	1064	258	258	33/-33	243	228	44/-29

AACU Candidate Referrals for Underutilized Positions

Job Group	Job Title	# of Vacancies	Requisition Internal/ External	Promotions/ Transfers	AACU Referral External	Position Status New Hire/Promotion
Administrative B	Associate General Counsel	2	Int./Ext.	1	0	PROMO = WF NH=WF
Engineer A	Mechanical Designer	1	Ext.	0	0	NH = WF
Engineer A	Sr. Program Manager	4	Int./Ext.	4	0	PROMO = 2WM, 2WF
Engineer A	Laboratory Manager	1	Int.	1	0	PROMO = WF
Engineer A	Project Engineer	1	Int.	1	0	PROMO = WF
Craft A	Sr. Med Volt Elect Specialist	1	Int.	1	0	PROMO = WM
Craft B	Construction Pipelayer	1	Int./Ext.	1	0	PROMO = WM
Craft B	Specialty Valve Installer	1	Int.	1	0	PROMO = BM
Craft B	Master Welder I	1	Ext.	0	0	NH= WM
Craft B	Plumber/Pipefitter	1	Ext.	0	0	NH=WM
Craft B	Electrician	1	Ext.	0	0	NH=BM
Laborers	OMC Laborer	4	Ext.	0	0	NH = 3WM, 1HM
Management A	Manager, Energy	1	Ext.	0	0	NH = WF
Management A	Manager, Policy & Planning	1	Ext.	0	0	NH = WF
Management A	Manager, Emergency Planning	1	Ext.	0	0	NH=WM
Management A	Construction Coordinator	1	Int./Ext.	1	0	PROMO=HM
Management B	Area Manager	1	Int.	1	0	PROMO = WM
Operator A	Transmission & Treatment Operator	1	Int.	1	0	PROMO = WM
Operator A	Area Supervisor	1	Ext.	0	0	NH = WM
Technical A	Business Systems Analyst III	1	Int./Ext.	0	0	NH = WF
Technical A	Communication & Control Tech.	45 3	Int./Ext.	3	0	PROMO = 3WM

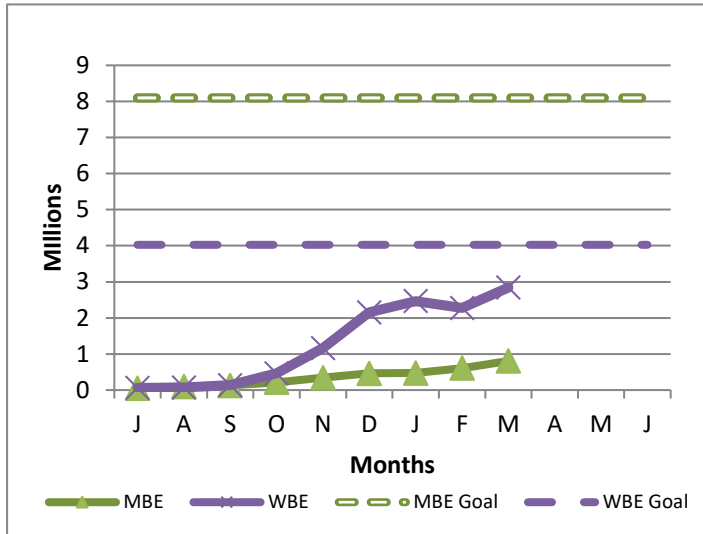
MBE/WBE Expenditures

3rd Quarter - FY23

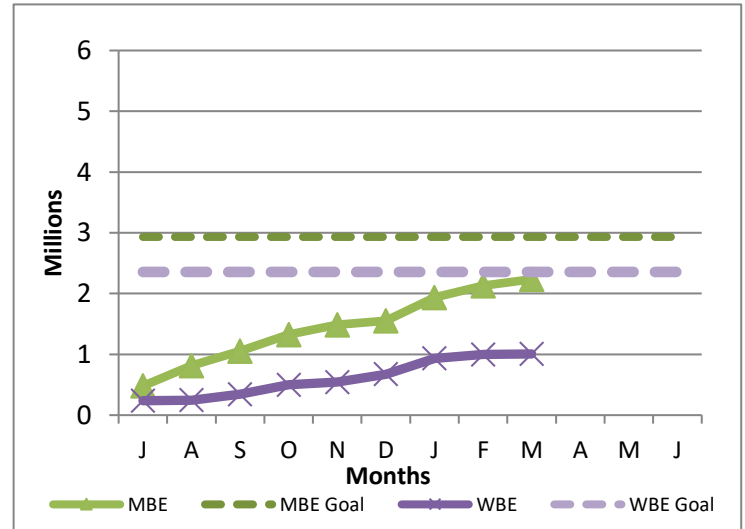
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The spending goals for FY23 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects that do not meet the established monetary thresholds and/or have limited opportunities for subcontracting have been excluded from the goals as they have no MBE/WBE spending goals. The spending goals for FY23 for Goods and Services are based on the average spending of MBE/WBE dollars for the previous 5 years.

MBE/WBE percentages are the results from a 2002 Availability Analysis, and MassDEP's Availability Analysis. As a result of the Availability Analyses, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through March.

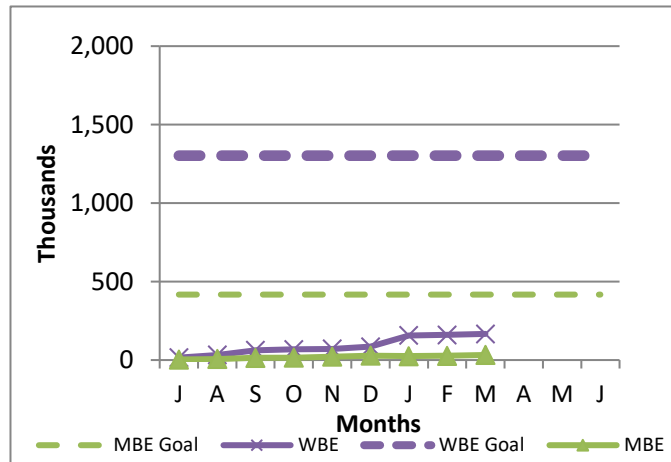
Construction



Professional Services



Goods/Services



FY23 spending and percentage of goals achieved, as well as FY22 performance are as follows:

MBE			
FY23 YTD		FY22	
Amount	Percent	Amount	Percent
805,754	10.0%	3,102,188	56.2%
2,235,871	76.3%	3,156,867	147.1%
32,169	7.7%	387,120	102.7%
3,073,794	26.9%	6,646,175	82.6%

Construction
Prof Svcs
Goods/Svcs

Totals

WBE			
FY23 YTD		FY22	
Amount	Percent	Amount	Percent
2,841,454	70.6%	1,276,049	46.5%
1,007,097	42.7%	1,737,850	100.8%
166,669	12.8%	365,393	27.6%
4,015,220	52.3%	3,379,292	58.3%

FY23 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY23 CEB Expenses through 3rd Quarter 2023

As of March 2023, total expenses are \$586.5 million, \$8.8 million or 1.5% lower than budget, and total revenue is \$645.3 million, \$14.9 million or 2.4% over the estimate, for a net variance of \$23.7 million.

Expenses –

Direct Expenses are \$192.2 million, \$6.8 million or 3.4% under budget.

- **Wages & Salaries** are \$9.0 million under budget or 10.5%. Regular pay is \$9.2 million under budget, due to lower head count, and timing of backfilling positions. YTD through March, the average Full Time Equivalent (FTE) positions was 1,056, 111 below the 1,167 FTE's budgeted.
- **Chemicals** are \$2.0 million over budget or 18.0% due to higher spending for Sodium Hypochlorite, \$1.1 million over budget due to greater usage at DITP due to lower flows and greater need for odor control and higher contract price at the Carroll Water Treatment Plant. Spending for Ferric Chloride and Hydrogen Peroxide were over budget by \$646k and \$173k, respectively. Similarly, Carbon Dioxide was \$159k above budget.
- **Utilities** expenses are over budget by \$1.8 million or 7.7%. This reflects higher spending on Electricity of \$1.8 million, 10.4% over budget. Spending at Deer Island Treatment Plant (DITP) was \$1.4 million above budget due to higher real time pricing as well as higher usage, and peak demand charges. Higher usage reflects a 13.1% drop in on-site generation which drove a 4.1% rise in purchased power. This offset lower power requirements due to flows being 7.2% under budget. Similarly, Electricity in Field Operations was greater than budget by \$446k due to T&D and Generation costs being greater than budget.
- **Ongoing Maintenance** is \$1.5 million over budget or 5.9%. The variance reflects the actual timing of projects and the Norumbega Tank Cleaning contract award being greater than budget.
- **Other Services** expenses are \$1.1 million under budget or 5.1%, due to lower lower than anticipated Telecommunication costs of \$549k, lower Space/Lease Rentals of \$211k due to Rock Shed Lease timing, and lower Grit Screening Removal of \$108k due to lower quantities.

Indirect Expenses are \$44.3 million, \$2.0 million or 4.4% under budget due primarily to lower Watershed Reimbursement of \$2.3 million.

Capital Finance Expenses totaled \$350.0 million, matching budget after transfer of \$8.1 million to defeasance account. Defeasance savings due primarily to lower than budgeted variable interest expense which was \$2.9 million under budget and lower Senior Debt spending of \$3.7 million as a result of timing for the new money transaction, and lower SRF spending of \$1.5 million due to timing.

Revenue and Income –

Total Revenue and Income is \$645.3 million or \$14.9 million over the estimate or 2.4%. The surplus was driven by Other User Charges which were \$4.7 million over the estimate reflecting water purchases from the City of Cambridge during facility maintenance, Investment income \$9.1 million over the estimate due to higher than budget interest rates, and Other Revenue of \$1.2 million primarily due to timing for Miscellaneous Revenue of \$361k and Energy Revenue of \$342k, Permit Fees of \$319k, and an unplanned COVID operating grant from FEMA of \$168k.

	Mar 2023 Year-to-Date				
	Period 9 YTD Budget	Period 9 YTD Actual	Period 9 YTD Variance	%	FY23 Approved
EXPENSES					
WAGES AND SALARIES	\$ 85,629,444	\$ 76,629,478	\$ (8,999,966)	-10.5%	\$ 118,980,689
OVERTIME	4,047,244	3,767,717	(279,527)	-6.9%	5,337,896
FRINGE BENEFITS	17,654,591	16,950,995	(703,596)	-4.0%	23,961,641
WORKERS' COMPENSATION	1,889,813	1,386,517	(503,296)	-26.6%	2,519,751
CHEMICALS	11,060,927	13,053,003	1,992,076	18.0%	14,994,036
ENERGY AND UTILITIES	23,157,081	24,938,595	1,781,514	7.7%	30,896,365
MAINTENANCE	24,501,632	25,955,957	1,454,325	5.9%	33,241,023
TRAINING AND MEETINGS	375,373	179,518	(195,855)	-52.2%	492,197
PROFESSIONAL SERVICES	5,935,651	5,666,956	(268,695)	-4.5%	8,197,575
OTHER MATERIALS	3,674,598	3,659,155	(15,443)	-0.4%	6,728,862
OTHER SERVICES	21,096,812	20,012,782	(1,084,030)	-5.1%	28,372,237
TOTAL DIRECT EXPENSES	\$ 199,023,166	\$ 192,200,673	\$ (6,822,493)	-3.4%	\$ 273,722,272
INSURANCE	\$ 2,937,002	\$ 2,945,563	\$ 8,561	0.3%	\$ 3,916,002
WATERSHED/PILOT	23,056,591	20,757,074	(2,299,517)	-10.0%	28,890,762
HEEC PAYMENT	4,695,810	4,958,573	262,763	5.6%	6,225,566
MITIGATION	1,301,771	1,301,771	-	0.0%	1,735,694
ADDITIONS TO RESERVES	1,813,840	1,813,840	-	0.0%	2,418,453
RETIREMENT FUND	12,555,203	12,555,203	-	0.0%	12,555,203
POST EMPLOYEE BENEFITS	-	-	-	---	4,754,061
TOTAL INDIRECT EXPENSES	\$ 46,360,217	\$ 44,332,024	\$ (2,028,193)	-4.4%	\$ 60,495,741
STATE REVOLVING FUND	\$ 67,749,415	\$ 66,206,913	\$ (1,542,502)	-2.3%	\$ 96,342,495
SENIOR DEBT	224,473,289	220,806,619	(3,666,670)	-1.6%	302,169,940
DEBT SERVICE ASSISTANCE	(1,182,494)	(1,182,494)	-	0.0%	(1,182,494)
CURRENT REVENUE/CAPITAL	-	-	-	---	18,200,000
SUBORDINATE MWRA DEBT	56,504,181	56,504,181	-	0.0%	75,491,975
LOCAL WATER PIPELINE CP	-	-	-	---	6,233,882
CAPITAL LEASE	2,412,795	2,412,795	-	0.0%	3,217,060
VARIABLE DEBT	-	(2,924,368)	(2,924,368)	---	-
DEFEASANCE ACCOUNT	-	8,133,540	8,133,540	---	-
DEBT PREPAYMENT	-	-	-	---	5,500,000
TOTAL CAPITAL FINANCE EXPENSE	\$ 349,957,185	\$ 349,957,185	\$ -	0.0%	\$ 505,972,858
TOTAL EXPENSES	\$ 595,340,568	\$ 586,489,881	\$ (8,850,687)	-1.5%	\$ 840,190,871
REVENUE & INCOME					
RATE REVENUE	\$ 610,986,000	\$ 610,986,000	\$ -	0.0%	\$ 814,648,000
OTHER USER CHARGES	7,246,717	11,903,415	4,656,698	64.3%	9,836,507
OTHER REVENUE	5,219,486	6,405,630	1,186,144	22.7%	6,139,104
RATE STABILIZATION	735,000	735,000	-	0.0%	980,000
INVESTMENT INCOME	6,187,270	15,266,847	9,079,577	146.7%	8,587,260
TOTAL REVENUE & INCOME	\$ 630,374,473	\$ 645,296,892	\$ 14,922,418	2.4%	\$ 840,190,871

Cost of Debt

3rd Quarter – FY23

MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

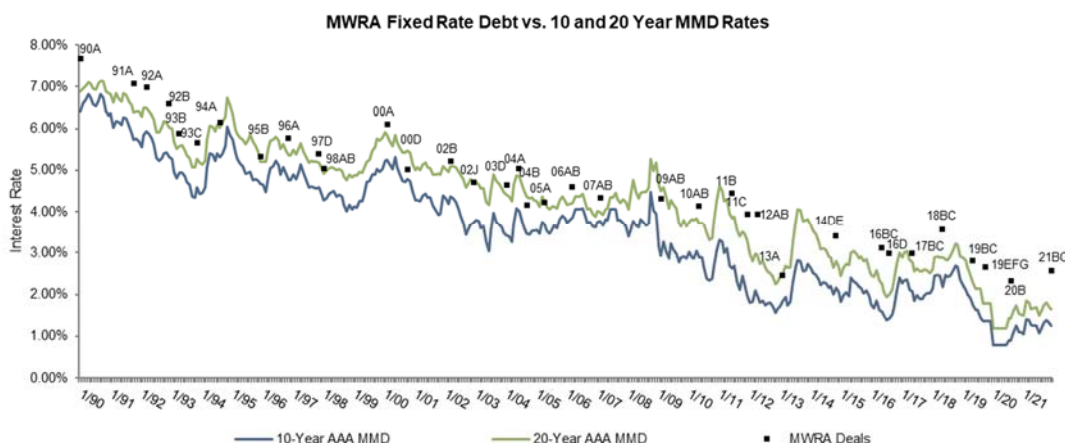
Average Cost of MWRA Debt FYTD

Fixed Debt (\$3.20 billion)	3.28%
Variable Debt (\$269.01million)	2.76%
SRF Debt (\$758.6 million)	1.67%

Weighted Average Debt Cost (\$4.22 billion) 2.99%

Most Recent Senior Fixed Debt Issue December 2021

2021 Series B and C (\$748.0 million) 2.56%

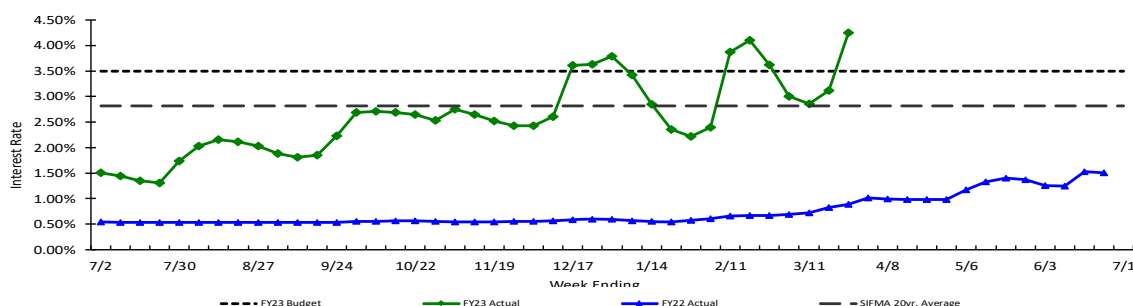


Bond Deal	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB	2009AB
Rate	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%	4.32%
Avg Life	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs	15.4 yrs

Bond Deal	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B	2021BC
Rate	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%	2.82%	2.66%	2.33%	2.56%
Avg Life	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8 yrs	11.2 yrs	11.7 yrs	11.9 yrs	9.73 yrs	15.6 yrs	12.2 yrs

Weekly Average Variable Interest Rates vs. Budget

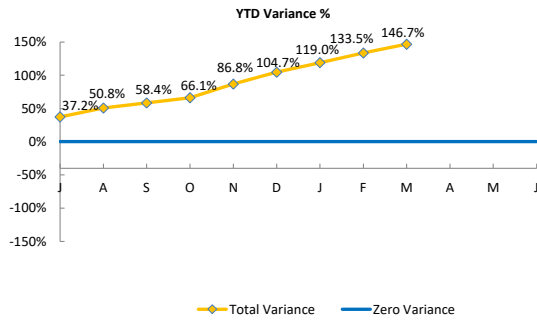
MWRA currently has eight variable rate debt issues with \$443.9 million outstanding, excluding commercial paper. Of the eight outstanding series, three have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In March, the SIFMA rate ranged from a high of 4.35% to a low of 2.21% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



Investment Income

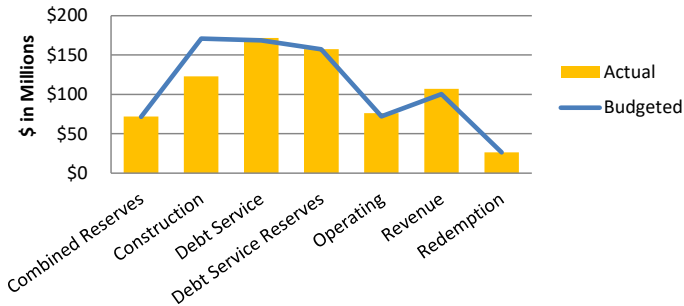
3rd Quarter – FY23

Year To Date

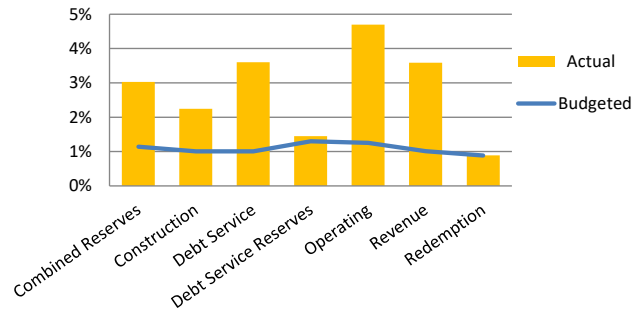


	YTD BUDGET VARIANCE			
	(\$000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	\$3	\$996	\$999	166.5%
Construction	-\$473	\$1,625	\$1,152	91.6%
Debt Service	\$22	\$3,284	\$3,306	266.2%
Debt Service Reserves	\$0	\$171	\$171	11.3%
Operating	\$41	\$1,329	\$1,370	206.7%
Revenue	\$50	\$2,031	\$2,081	278.9%
Redemption	\$0	\$0	\$0	0.0%
Total Variance	-\$356	\$9,436	\$9,080	146.7%

YTD Average Balances Budgeted vs. Actual

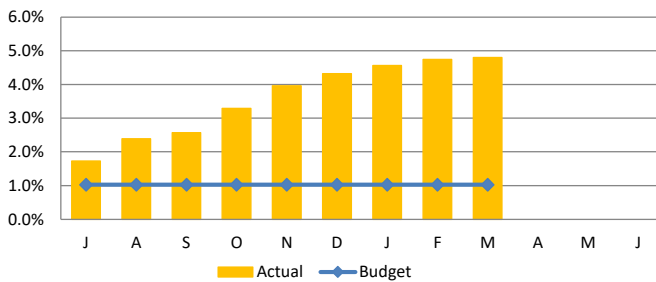


YTD Average Interest Rate Budgeted vs. Actual

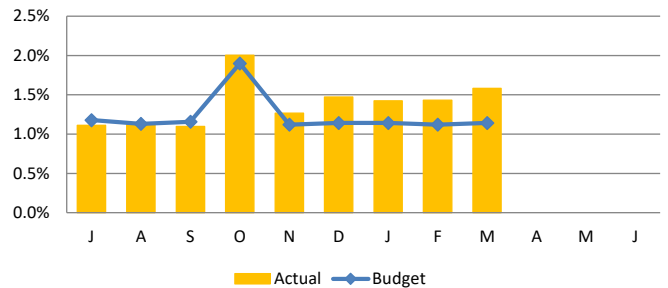


Monthly

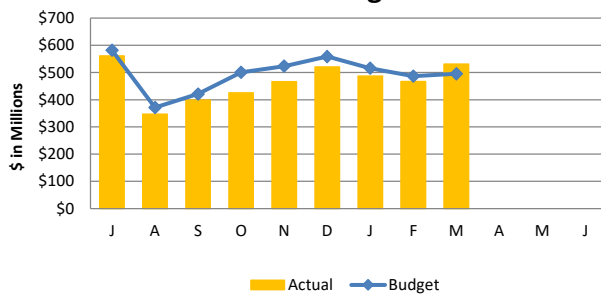
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances

