MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

Second Quarter FY2021

Q1	Q2	Q3	Q4
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Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
February 17, 2021

Board of Directors Report on Key Indicators of MWRA Performance

2nd Quarter FY21

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

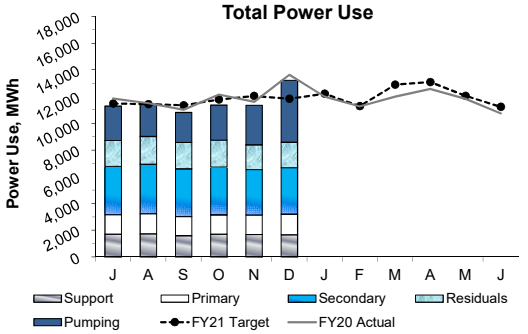
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

February 17, 2021

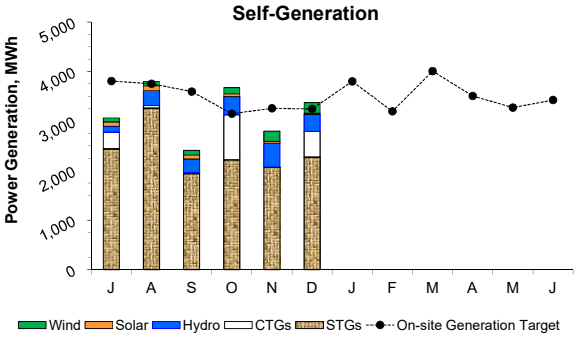
OPERATIONS AND MAINTENANCE

Deer Island Operations

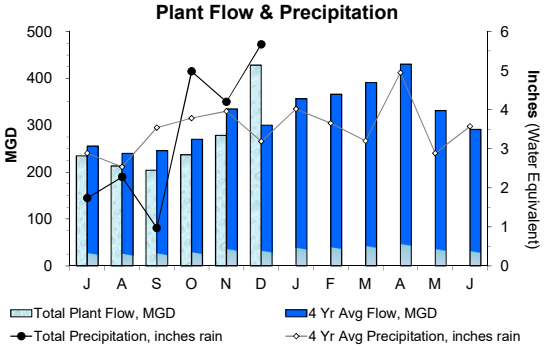
2nd Quarter - FY21



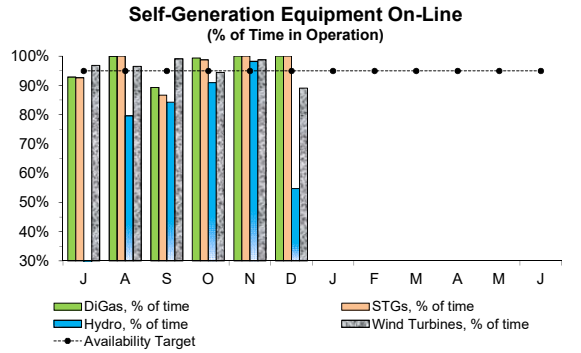
Total power usage in the 2nd Quarter was on target (+0.7%) even as plant flow for this period was 4.3% above target with historical data (4 year average) used to generate the electricity model. While power usage was near or below target for most plant processes, power usage for raw wastewater pumping was 6.6% above target due to increased pumping during high flow rain events.



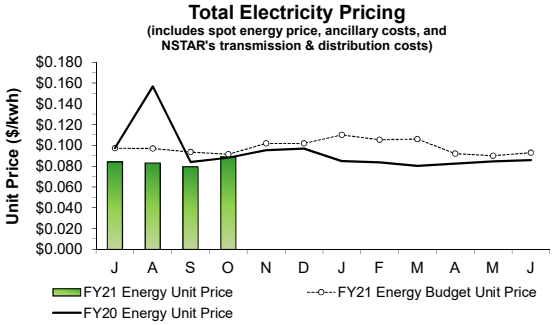
Power generated on-site during the 2nd Quarter was within 2.0% of target. CTG generation was above target by 45.8%, mainly due to continuous CTG operation for 82 hours in October during a required cross-harbor power cable inspection outage by Eversource and operation for nearly 40 hours in December during a nor'easter storm event with high flows and wind to prevent service disruptions (period with high potential for power outages). STGs generation was 6.6% below target as digester gas production was 9.9% lower-than-expected and Hydro Turbine generation was 25.3% above target. Generation from the Solar Panels was 9.5% below target and Wind Turbine generation was 4.7% below target, due in part to turbulence from wind blowing through the digesters on a number of days, causing the turbine to trip out of service.



Total Plant Flow for the 2nd Quarter was 4.3% above target with the budgeted 4 year average plant flow (314.6 MGD actual vs. 301.7 MGD expected) as precipitation was 36.0% above target (14.85 inches actual vs. 10.92 inches expected). The FY21 monthly average plant flow did not exceed target until December even though precipitation was above target each month in the 2nd Quarter. This delay in seeing the increase in plant flow in comparison to precipitation was due to a prolonged period of severe drought conditions that had persisted through the 1st Quarter of FY21.

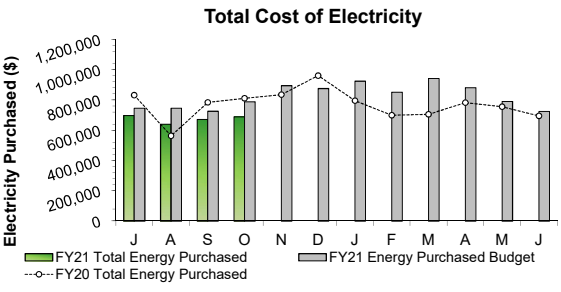


The availability of the DiGas system and STGs both met their 95% availability target, while Hydro Turbine and Wind Turbine availability fell below target during the 2nd Quarter. An unanticipated plant-wide power outage on October 19 caused Hydro Turbine #1 to trip and the unit was kept off line until DITP was reconnected to utility power on October 22. Additionally, Hydro Turbine #1 was intermittently offline in December for an inspection and due to mechanical issues (54.7% availability for the month) while Turbine #2 remained offline pending repair of the runner blade assembly. Wind Turbine availability fell slightly below target primarily due to wind turbulence on a number of days causing the turbines to trip offline.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in October (the most current invoice available) was 2.6% below target with budgetary estimates. The actual total energy unit prices in November and December are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

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



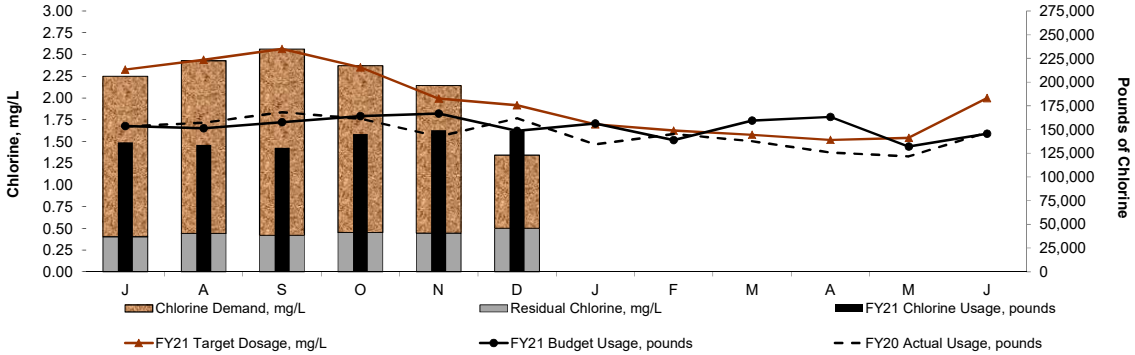
The Electricity cost data for Electricity Purchased in November and December are not yet available. Year-to-date Total Cost of Electricity is $306,127 (10.2%) lower than budgeted through October as the Total Energy Unit Price was 11.5% lower than target while the Total Electricity Purchased was only 1.5% above target.

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

Deer Island Operations

2nd Quarter - FY21

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 2nd Quarter was 6.0% below target with budgetary estimates. Actual sodium hypochlorite usage in pounds of chlorine was 7.7% lower than expected even though the 4 year average plant flow used for estimating the hypochlorite usage target was 4.3% higher-than-expected. DITP maintained an average disinfection chlorine residual of 0.47 mg/L this quarter with an average dosing rate of 1.95 mg/L (as chlorine demand was 1.49 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
J	0	0	0	100.0%	0.00
A	1	1	0	99.97%	1.17
S	0	0	0	100.0%	0.00
O	2	1	1	99.9%	2.62
N	3	3	0	99.0%	13.63
D	3	3	0	97.4%	41.94
J					
F					
M					
A					
M					
J					
Total	9	8	1	99.12%	59.36

98.5% of all flows were treated at full secondary during the 2nd Quarter. There were seven (7) secondary blending events due to high plant flows resulting from heavy rain and one (1) brief 13 minute (0.21 hours) secondary blending event that occurred on October 19 during the plant's recovery from an unanticipated plant-wide power loss event. These blending events resulted in a total of 58.19 hours of blending and 431.43 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity during the entire quarter was 700 MGD.

Secondary permit limits were met at all times during the 2nd Quarter of FY21.

Deer Island Operations & Maintenance Report

Environmental/Pumping:
The plant achieved an instantaneous peak flow rate of 1,203.1 MGD mid-day on December 25. This peak flow occurred during a storm event that brought 1.49 inches of precipitation to the metropolitan Boston area, and significant snowmelt also contributed to the high plant flow during this storm event. Overall, Total Plant Flow in the 2nd Quarter was 4.3% above target with the 4 year average plant flow estimate for the quarter.

Two (2) low plant flow records were set in October; the daily Total Plant Flow of 177.78 MGD on October 11 and the daily North System Influent Flow of 120.66 MGD on the same day, set new records for all-time lowest daily average flows since the plant began receiving influent flows from both the north and the south systems (July 1998). The previous daily Total Plant Flow record of 186.03 MGD was just recently set on September 6, 2020. The previous daily North System Influent Flow record of 121.90 MGD was set back in July 22, 2015 on a day when all North System Influent flows were suspended for eight (8) hours for trial #4 of a series of North Main Pump Station (NMPS) shutdowns in preparation for the NMPS valve replacement project.

Work on the Winthrop Terminal Facility (WTF) VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in 2018 and entails the demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). The pumps are currently powered by 600 volts service and will be changed to 4,160 volts, consistent with other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). The contractor completed the upgrade on WTF Pump #3. The pump successfully completed its 30 day performance test on December 9 and was turned over to Operations. To date, work has been completed on five (5) of the six (6) pumps (#6, #2, #5, #4, and #3). The last pump pending upgrade will be turned over to the contractor in January 2021.

Secondary Treatment:
Staff replaced a leaking 16 inch isolation valve on the Secondary Battery C waste sludge line on October 23. The sludge wasting in Secondary Battery C was temporarily suspended starting at 4:30 a.m. to allow the line to be drained and flushed in preparation for the valve replacement. As such, staff increased the sludge wasting in advance of the shutdown and increased the wasting after the repairs were completed to ensure a quicker recovery to normal activated sludge biomass levels. Secondary Battery C sludge wasting was resumed by 1:00 p.m.

Deer Island Operations & Maintenance Report (continued)

Secondary Treatment (continued):
Annual turnaround maintenance was performed on Train #1 in the Cryogenic Oxygen Facility in November. This turnaround maintenance is performed on roughly half of the components and systems in the Cryogenic Oxygen Facility. During this turnaround maintenance, the contractor calibrated all the instrumentation on Cold Box unit #1 as well as, a number of other components of the oxygen plant. The same turnaround maintenance was completed on Train #2 in July (delayed because the contractor had suspended all non-essential work activities and travel due to the nation-wide shutdown response to the COVID-19 pandemic).

Odor Control:
In October, Carbon adsorber (CAD) units #1 and #7 in the East Odor Control (EOC) Facility and unit #1 in the Residuals Odor Control (ROC) Facility were emptied and refilled with new carbon media as part of routine maintenance to replace spent activated carbon. The recoating of units #6 in the EOC Facility and #3 in the ROC Facility were completed and these units were also refilled with new regenerated carbon media.

On December 17, staff observed the vibration damper located near the top of the East Odor Control emissions stack was off-center and the stack was swaying during a storm when the extreme wind gusts were in excess of 55 mph. The vibration damper serves to stabilize the stack and to prevent the stack from oscillating during high wind conditions. This damper assembly is an eight (8) foot diameter steel ring with several stainless steel springs and their supports attached to the stack. Inspections indicated a failure to one of the springs had caused the steel support to break away from the stack. This entire assembly weighs approximately 700 pounds and was scheduled for repair as quickly as possible to prevent catastrophic damage to the stack and to ensure safety to personnel. On December 31, the contractor repaired a six (6) inch hole in the stack caused when the damper supports broke away, welded a new support to the damper, replaced all the springs, and reinstalled the damper ring.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 27.4% of Deer Island's total power use for Quarter 2. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 23.4% of Deer Island's total electrical power use for the quarter.

DITP experienced a brief plant-wide loss of power at 9:57 p.m. on October 19 when CTG-1A tripped due to a fuel valve failure while DITP was disconnected from utility power. The cross-harbor power cable was de-energized October 19 -22 to allow Eversource to perform a required 1 year inspection on the new power cable. Electricity to the plant was restored within two (2) minutes when the backup CTG-2B was placed into operation and flow to the plant resumed at 10:10 p.m. when the first raw wastewater pump was restarted. All flows were contained within the MWRA collection system. No untreated wastewater was released, and there were no NPDES permit violations as a result of this poweroutage.

A start air compressor for CTG-2B was replaced in early October. There are two (2) compressors, one (1) for each CTG unit, but each compressor can be used to start up either one of the CTG units. The CTG-1A start air compressor was replaced at the end of September after it had failed during a test operation. The CTG-2B start air compressor was therefore also replaced given the unit is the same age as the start air compressor on CTG-1A that had failed.

The quarterly Continuous Emissions Monitoring System (CEMS) cylinder gas audits, along with the quarterly Continuous Opacity Monitoring System (COMS) audits for the two (2) boilers in the Thermal Power Plant were successfully completed by the contractor on November 10. The CEMS measures the nitrogen oxides (NOx) emissions, the oxygen, carbon monoxide, and sulfur dioxide concentrations in the boiler flue gas. The cylinder gas audit measures each gas analyzer in the CEMS against known cylinder gas concentrations. The opacity audits measure the performance of the COMS through a number of required testing protocols specified in the regulations. DITP received passing results on all the audit tests that were performed and a final report was submitted to the MaDEP. The next round of audit tests will take place in February or early March 2021.

Routine non-invasive annual maintenance and inspections were conducted on CTG-2B during the week of November 30. CTG-1A remained available for operation during this work. The maintenance included non-invasive inspections, instrument calibrations and system checks. After the maintenance work was completed, CTG-2B was successfully test operated on December 4. The same scope of work was conducted on CTG-1A during the week of December 7, and the unit was successfully test operated on the morning of December 11. CTG-2B was available for operation during the work on CTG-1A.

CTG-2B was operated for approximately two (2) hours on December 18 for an ISO-New England declared Demand Response winter audit event.

DITP took delivery of 350,000 gallons of #2 fuel oil, a total of 35 oil tanker trucks, without incident from November 9 through November 17. This fuel oil is used for CTG operation, for boiler startup operations, and for supplemental fuel for boiler operation during periods of low or unstable digester gas production.

Public Access Area:
With the support of the MWRA, the Department of Fish and Game has been constructing a fish pier at Deer Island to promote and improve programs and opportunities for saltwater fishing with the intent that those programs will increase public access to marine recreational facilities. On November 24, contractors completed their work on the new Deer Island fish pier and parking lot and both were opened for public access. The pier is accessible to the public year-around, from sunrise to sunset. Funding for the fish pier project came from the Marine Recreational Fisheries Development Fund, administered by the Division of Marine Fisheries, which finances recreational fishing improvement programs and includes the fees from the sale of saltwater fishing licenses. The MWRA installed lighting, security cameras and emergency call boxes to enhance public safety in the area of the new pier. A ceremonial grand opening of the fish pier will likely be held in the Spring of 2021.

Clinton Operations & Maintenance Report

Dewatering Building
Maintenance replaced doctor blades on belt filter press #1. They also re-piped the polymer system that feeds the belt filter press. Operations staff washed down gravity thickener #2. Facility specialist rust proofed and painted polymer system skid base. Maintenance staff checked plant equipment for lubrication and proper operation.

Chemical Building
Maintenance staff replaced drive belt, cleaned auger and impeller then replaced a 2” and 3” valve on the soda ash system. Staff cleaned soda ash mixing tank and jetted #2 upper soda ash line. Maintenance repaired the hypochlorite tank #1 fill line.

Aeration Basins
Maintenance replaced 2 belts on intermediate lift pump #2. Operations staff also cleaned pH and DO probes.

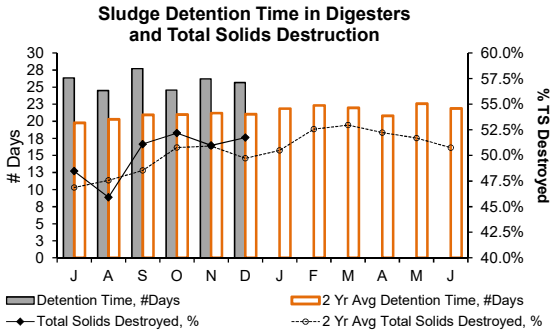
Phosphorus Building
Operations staff rebuilt #1 and #2 polymer pump that feeds the disk filters. Staff acid washed all three disk filters, cleaned troughs and inspected all nozzles. Phosphorus process is now off line for the season.

Headworks
Maintenance cleaned debris off of influent manual bar rack, greased upper and lower mechanical bar rack. They also installed an eye bolt to help in removal of bucket elevator chains.

Digester Building
Maintenance staff greased all pumps and the mixer. They also replaced all drive belts on #1, 2 and 3 recirculation pumps. Staff epoxy painted digester floor.

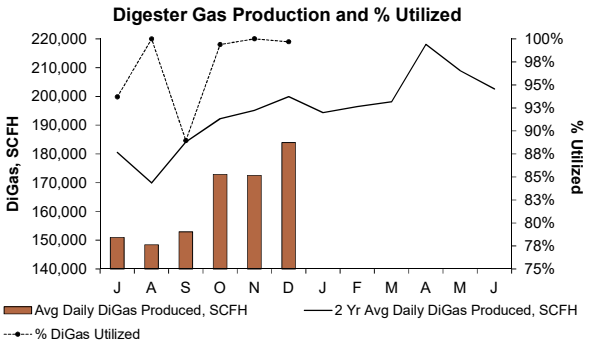
Deer Island Operations and Residuals

2nd Quarter - FY21



Total solids (TS) destruction following anaerobic sludge digestion averaged 51.6% during the 2nd Quarter, 2.3% above the 2 year average of 50.5%. Sludge detention time in the digesters was 25.5 days, 20.9% above target, as DI operated with an average of 8.0 digesters. The higher detention time is attributed to lower-than-expected sludge production due to much lower-than-expected plant flows in October and November.

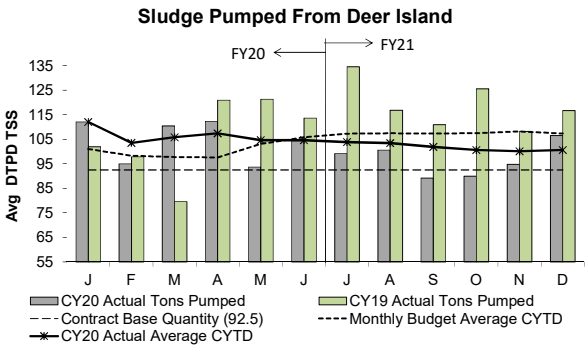
Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significantly impacted by changes in the number of digesters and the resulting shifting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



The Avg Daily DiGas Production in the 2nd Quarter was 9.9% below target with the 2 Year Avg Daily DiGas Production due to much lower-than-expected primary sludge production which breaks down more readily during anaerobic sludge digestion, and due to overall lower total sludge production. On average, 99.7% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP).

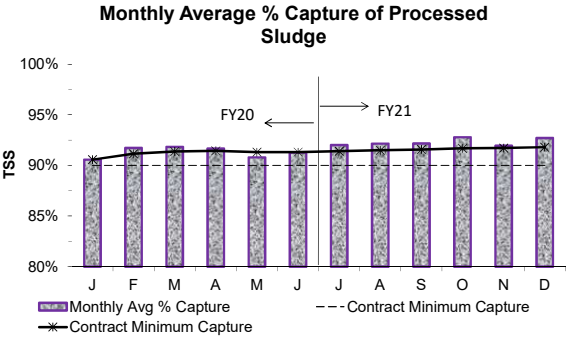
Residuals Pellet Plant

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 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 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 92.5 DTPD/TSS each year (FY20's budget is 107.4 DTPD/TSS and FY21's budget is 107.9 DTPD/TSS).

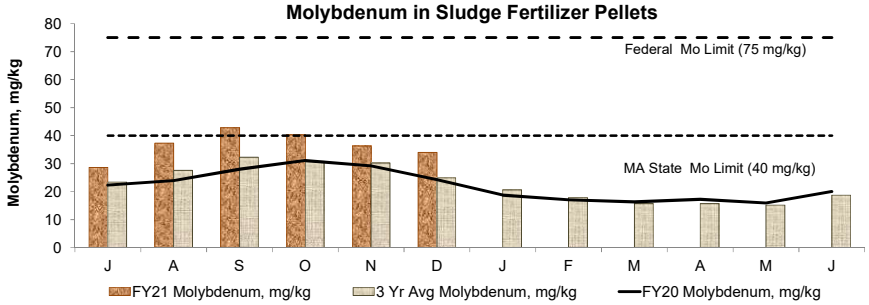


The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 2nd Quarter was 97.1 TSS Dry Tons Per Day (DTPD) - 9.6% below target with the FY21 budget of 107.3 TSS DTPD for the same period. Sludge delivered to the BPF was lower than expected during the quarter mainly due to lower-than-expected overall sludge production.

The CY20 average quantity of sludge pumped through December is 100.7 DTPD - 6.2% below target compared with the CY20 average budget of 107.4 DTPD during the same time period.



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 2nd Quarter was 92.5% and the CY20 average capture is 91.8%.



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. In 2016, Massachusetts Type I biosolids standard for molybdenum was changed to 40 mg/kg from the previous standard of 25 mg/kg. This has allowed MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms since NEFCO does not distribute product that does not meet the suitability standards.

Overall, the levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 2nd Quarter averaged 36.9 mg/kg, 29% above the 3 year average, 8% below the MA State Limit, and 51% below the Federal Limit. However, the average October Mo level was 1% above the MA State Limit, thus causing the sales of the pellets to be restricted to a smaller market where the product is still able to be utilized.

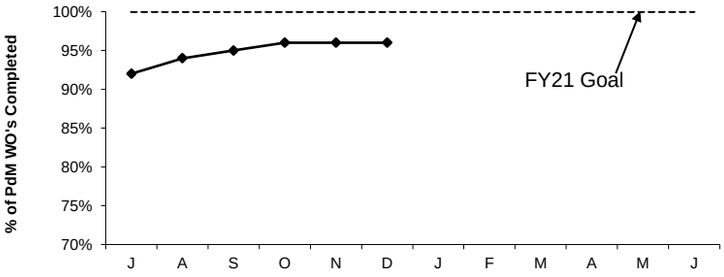
Deer Island Maintenance

2nd Quarter - FY21

Productivity Initiatives

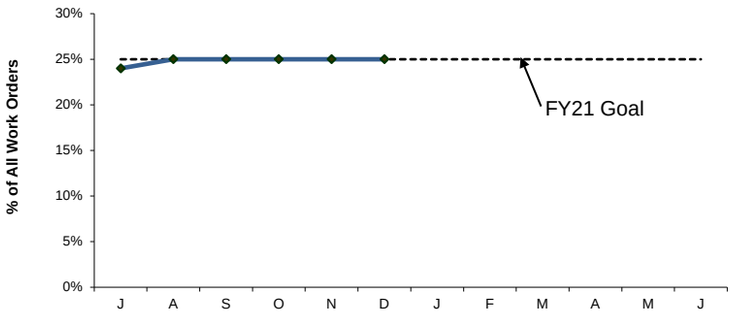
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



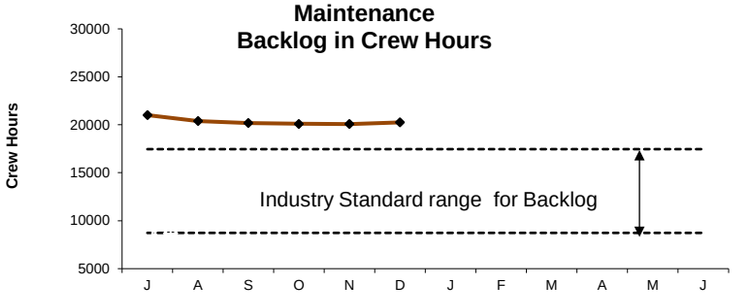
Deer Island's FY21 predictive maintenance goal is 100%. DITP completed 96% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program. Due to COVID-19 and limited staffing prior to June 22, 2020, our percentage is below our goal of 100%, we anticipate meeting our goal within the next few months.

Predictive Maintenance



Deer Island's increased FY21 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

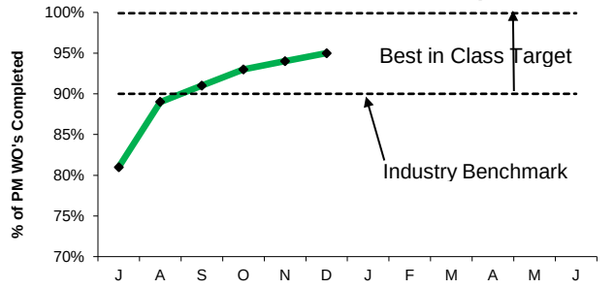


DITP's maintenance backlog at Deer Island is 20,142 hours this quarter. DITP is at the upper end of the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by five vacancies; (1) HVAC Tech, (1) I&C Tech and (3) Electricians. Management continues to monitor backlog and to ensure all critical systems and equipment are available. While our Backlog is over Industry Standards, maintenance staff has returned to regular hours and the Backlog is slowly moving towards Industry Standards.

Proactive Initiatives

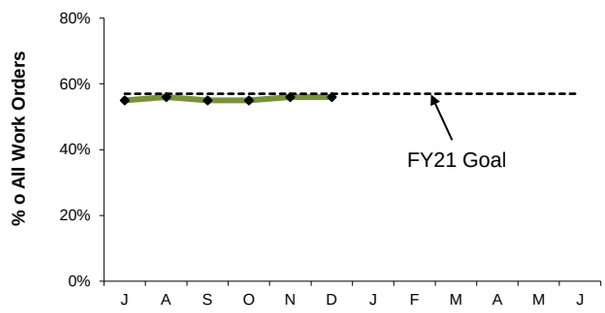
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



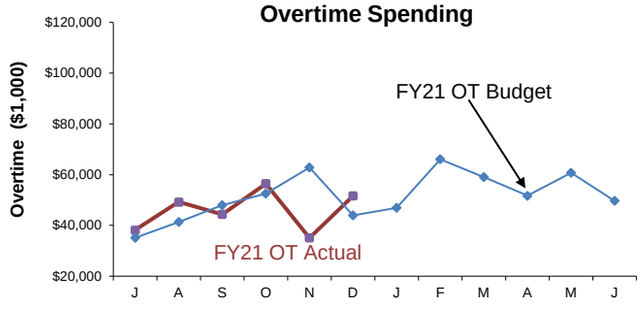
Deer Island's FY21 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 94% of all PM work orders this quarter. Due to COVID-19 and limited staffing prior to June 22, 2020, our percentage is below our goal of 100%, we anticipate reaching our goal withing the next few months.

Maintenance Kitting



Deer Island's increased FY21 maintenance kitting goal is 57% of all work orders to be kitted. 56% 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



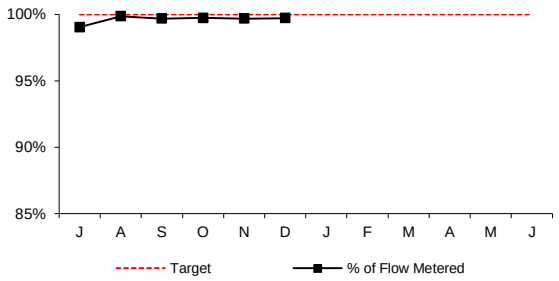
Maintenance overtime was under budget by $16K this quarter and $9k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarter's overtime was predominately used for Storm Coverage/High Flows, Grinder and Pump Clogging Issues, CTG Startup/Shutdown Testing, HVAC Winterization Preparations, Coil Replacement BD:SA.AHU-2 and Grit Screw Replacement on AD:GR.CLSF-16.

Operations Division Metering & Reliability

2nd Quarter - FY21

WATER METERS

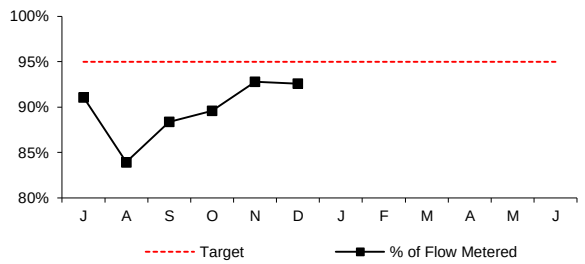
Percent of Total Revenue Water Deliveries Calculated Using Meters



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During Q2 of FY21 0.29% of the billed water flow was estimated. 99.71% was based on meter actuals. The entirety of this value was from instrumentation failure.

WASTEWATER METERS

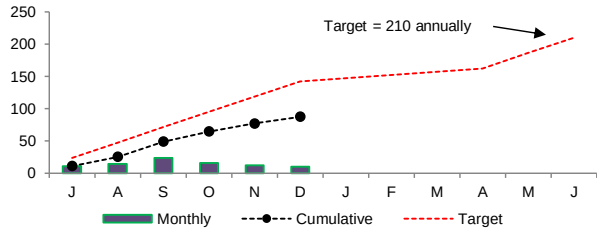
Percent of Total Wastewater Transport Calculated Using Meters



The target for revenue wastewater transport calculated using meters is 95% The data capture rate in Q2 of FY21 was 91.7%. Nearly 50% of the estimated flow during that time could be attributed to the failure of two styles of meters, ADFM and ADS Flowshark, both of which are obsolete technologies for which the Meter maintenance team can no longer procure replacement parts. We will be replacing these meters as part of the Wastewater Meter Replacement project scheduled to begin in January 2021.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During 2nd Quarter of FY21, 38.53 miles of water mains were inspected. The total inspected for the fiscal year to date is 87.39.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	2	2	5	3	1	1							14
Leaks Repaired	2	1	3	2	2	3							13
Backlog	6	7	9	10	9	7							n/a

During the 2nd Quarter of FY21 five new leaks were detected, and seven were repaired. Refer to FY21 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Boston, Malden, Medford, Newton, Revere, Somerville & Swampscott.

2nd Quarter - FY21 Leak Report

Date Detected	Location of Leaks	Repaired
07/05/20	Riverside Ave. @ Commercial St. Medford	07/08/20
07/28/20	Harvard Pilgrim Health, Wellesley	07/30/20
08/03/20	#93 Worcester Street, Wellesley	08/05/20
09/03/20	Felton St. @ Water St., Waltham	09/22/20
09/12/20	#56 Forbes Hill Rd., Quincy. Sec-22	09/12/20
09/24/20	Frontage Rd. @ Venner Rd., Arlington	09/25/20
09/24/20	#93 Worcester St., Wellesley. Sec-80	10/07/20
10/16/20	Morton St. @ Blue Hill Ave. Boston	10/23/20
10/20/20	Lee St. @ Boylston St. Brookline	11/12/20
10/30/20	#263 Brdwy. RT-1 Southbound-Saugus	11/05/20
09/02/20	Mt Vernon Ave @ E. Albion St., Somerville	12/04/20
11/06/20	#109 Broadway @ Spring St., Saugus	12/10/20
12/01/20	Second St. @ Carter St., Chelsea	12/09/20

Date Detected	Location of Leaks/Unrepaired
06/08/15	Allandale Rd. @ Grove St., Brookline, Sect 78, located acoustically. Not surfacing. No redundancy.
06/17/15	Washington St. at East St., Dedham; Sect 77, located acoustically. Not surfacing. Need redundant SEH pipeline to enable isolation.
07/01/16	241 Forest St. Winchester, Sect 89, leaking blow off valve. Not surfacing. Need redundant NIH pipeline to enable isolation.
12/04/16	1025 W Roxbury Pkwy, Brookline, Sect 95, located acoustically. Not surfacing. Leaking blow off valve. No redundancy.
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91. Not surfacing. Leaking emergency connection valve between MWRA and LWSC systems. LWSC has difficulty isolating 16" main.
07/20/17	Mystic Valley Parkway, Medford. Not surfacing.
08/27/20	Hyde Park Ave. @ River St., Hyde Park. BWSC is in process of isolating their water main first.

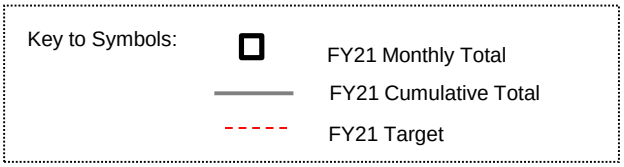
Water Distribution System Valves

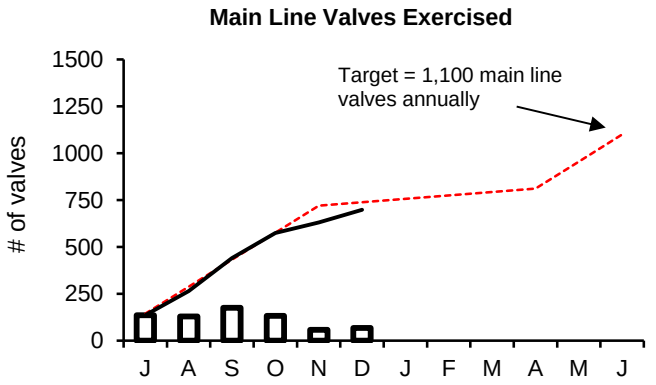
2nd Quarter - FY21

Background

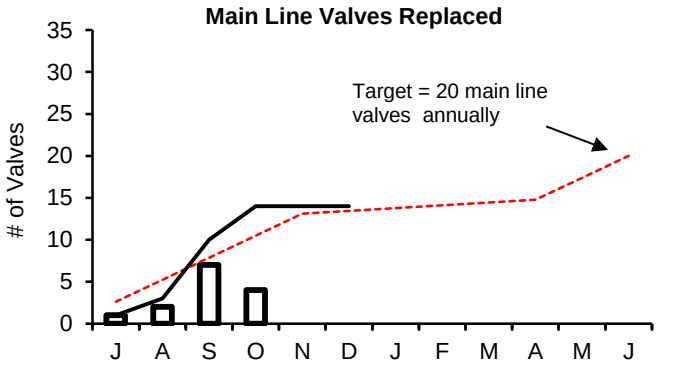
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but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

Type of Valve	Inventory #	Operable Percentage	
		FY21 to Date	FY21 Targets
Main Line Valves	2,159	97.3%	95%
Blow-Off Valves	1,317	98.6%	95%
Air Release Valves	1,380	95.2%	95%
Control Valves	49	100.0%	95%

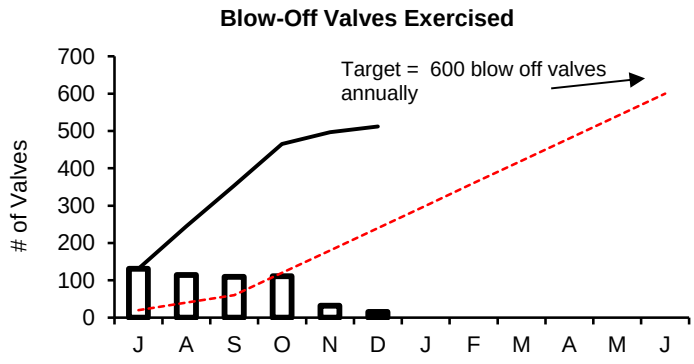




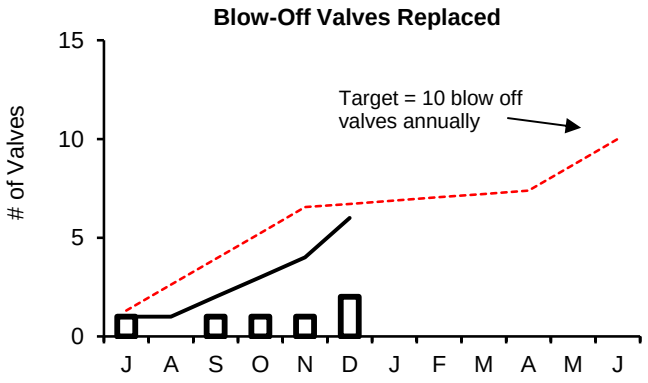
During the 2nd Quarter of FY21, 257 main line valves were exercised. The total exercised for the fiscal year to date is 698.



During the 2nd Quarter of FY21, there were four main line valves replaced. The total replaced for the fiscal year to date is 14.



During the 2nd Quarter of FY21, 158 blow off valves were exercised. The total exercised for the fiscal year to date is 512.



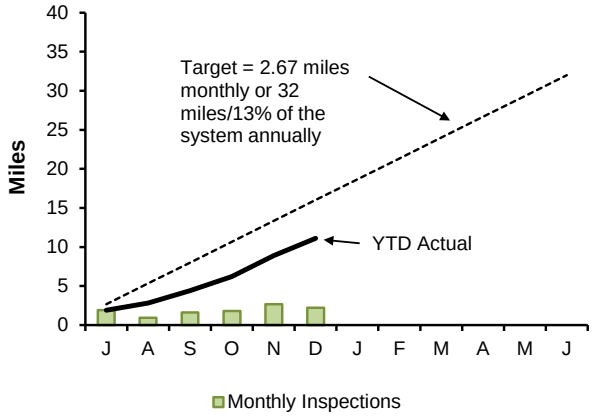
During the 2nd Quarter of FY21, there were four blow off valves replaced. The total replaced for the fiscal year to date is six.

Wastewater Pipeline and Structure Inspections and Maintenance

2nd Quarter - FY21

Inspections

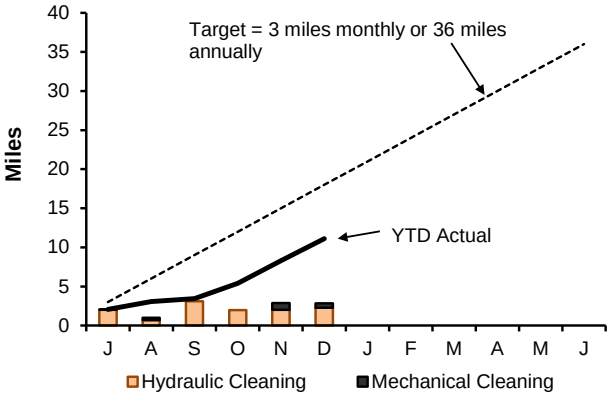
Pipeline Inspections



Staff internally inspected 6.69 miles of MWRA sewer pipe during this quarter.The year to date total is 11.11 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result of staffing availability, and equipment issues.

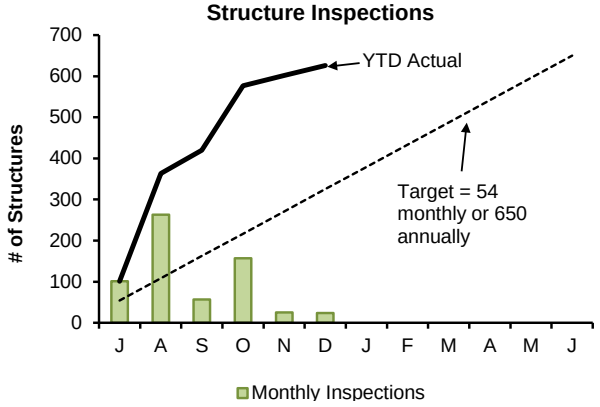
Maintenance

Pipeline Cleaning



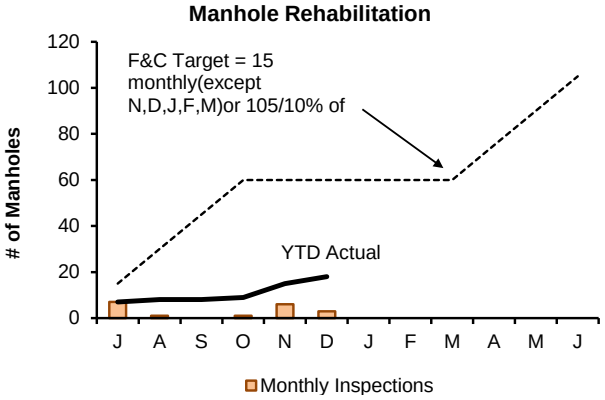
Staff cleaned 7.69 miles of MWRA sewer pipe, and removed 41.5 yards of grit. The year to date total is 11.11 miles. No Community Assistance was provided. Shortcomings for the quarter were a direct result assisting E&C with inspections, as part of MWRA Siphon Rehabilitation 6224 and staffing availability.

Structure Inspections



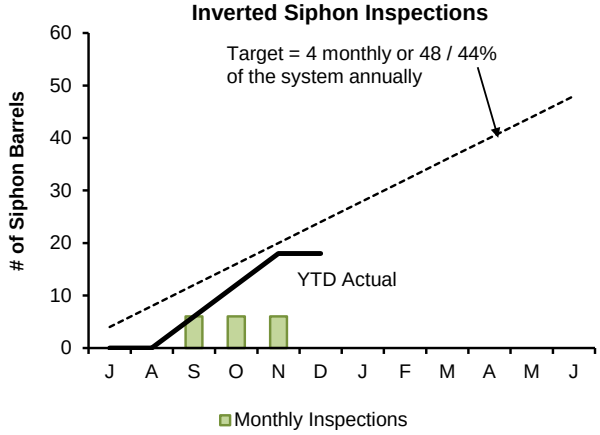
Staff inspected the 36 CSO structures and performed 170 other additional manhole/structure inspections during this quarter. The year to date total is 626 inspections.

Manhole Rehabilitation



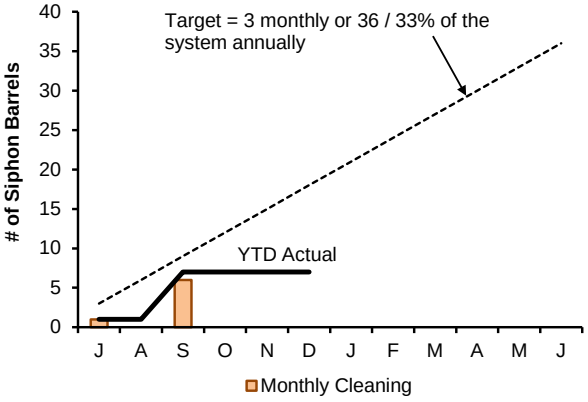
Staff replaced 10 frame and cover replacement this quarter.The year to date total is 18. Shortcomings for the month were a direct results of staffing availabilty.

Inverted Siphon Inspections



Staff performed 12 siphon barrel inspections this quarter. The year total is 18 inspections.

Inverted Siphon Cleaning

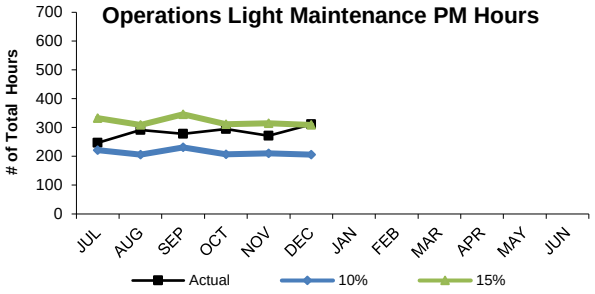


Staff did not clean any siphon barrel this quarter. Shortcomings for the month were a direct results of staffing availability.

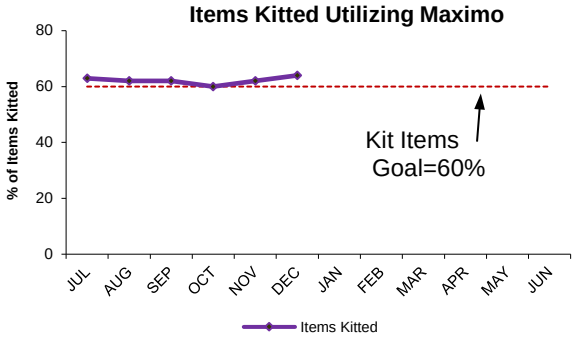
Field Operations' Metropolitan Equipment & Facility Maintenance

2nd Quarter - FY21

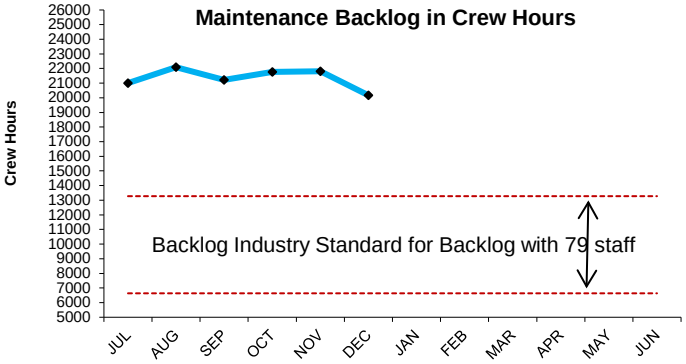
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance initiatives.



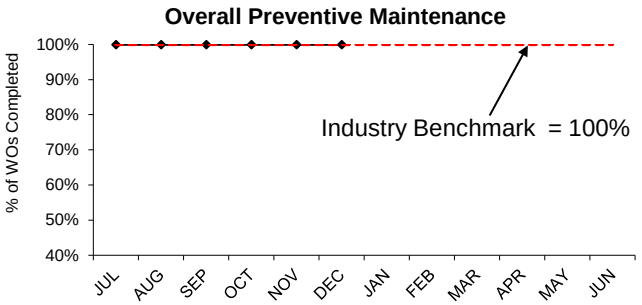
Operations staff averaged 272 hours per month of preventive maintenance during the 2nd Quarter, an average of 12% of the total PM hours for the 2nd Quarter, which is within the industry benchmark of 10% to 15%.



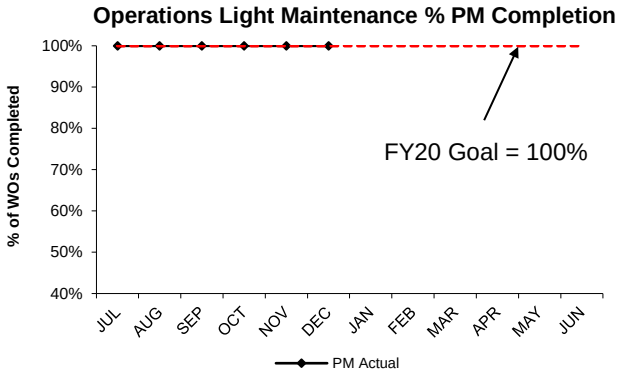
Operations' FY21 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 1st Quarter, 62% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



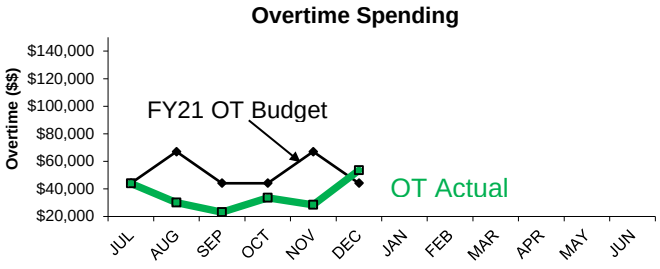
The 2nd Quarter backlog average is 21,440 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6,636 to 13,275 hours. The increase is due to reduced staffing levels due to COVID19.



The Field Operations Department (FOD) preventive maintenance goal for FY21 is 100% of all PM work orders. Staff completed 100% of all PM work orders in the 2nd Quarter.



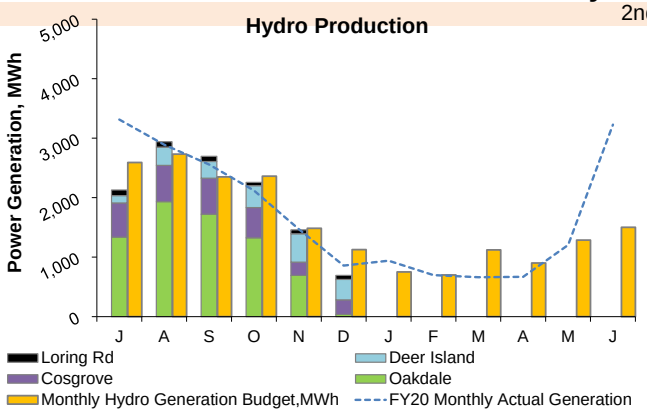
Wastewater Operations complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY21 PM goal is completion of 100% of all PM work orders assigned. Operations completed 100% of PM work



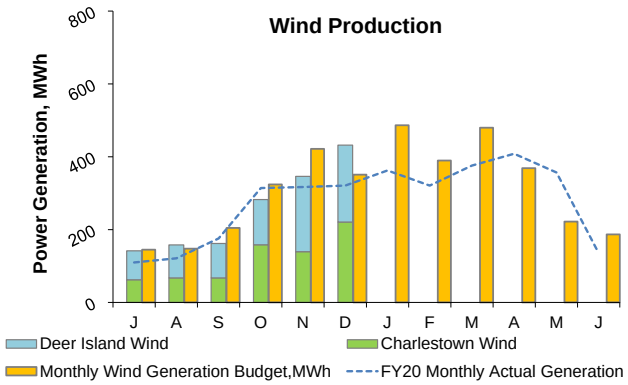
Maintenance overtime was $13k under budget on average, per month, for the 2nd Quarter. Overtime was used for critical maintenance repairs and wet weather events. The overtime budget for FY21 is $310k and is $98k under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

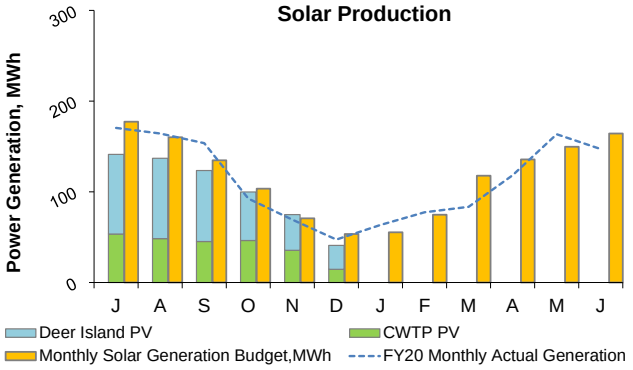
2nd Qtr - FY21



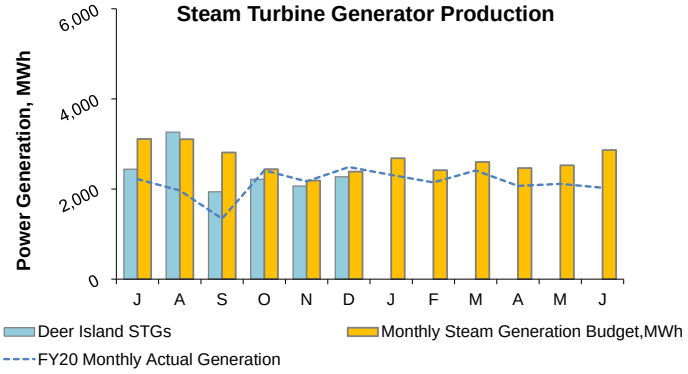
In the 2nd Quarter of FY21, the renewable energy produced from all hydro turbines totaled 4529 MWh; 12% above budget[3]. The total savings and revenue[2] to date in FY21 (actuals through October[1]) is $1,335,631 ; 17% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



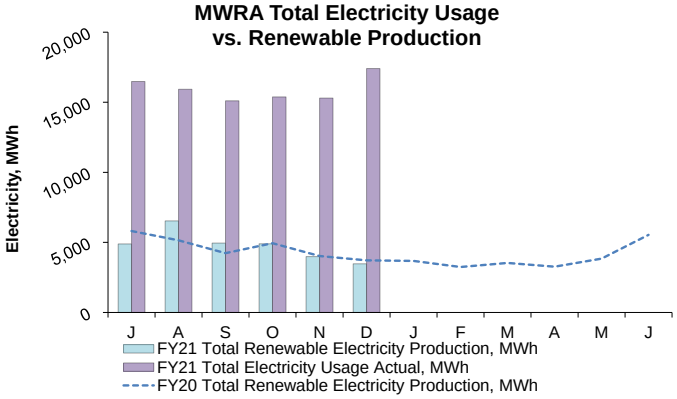
In the 2nd Quarter of FY21, the renewable energy produced from all wind turbines totaled $1,061 MWh; 3% below budget[3]. The total savings and revenue[2] to date in FY21 (actuals through October) is $105,426 ,14% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

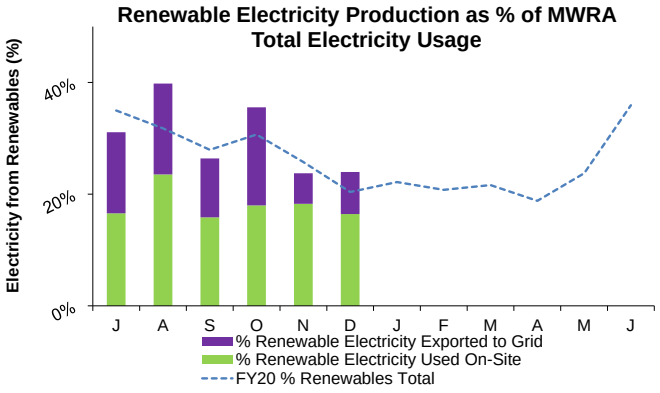


In the 2nd Quarter of FY21, the renewable energy produced from all solar PV systems totaled 216 MWh; 5% below budget[3]. The total savings and revenue[2] to date in FY21 (actuals through October[1]) is $58,695 , 21% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



In 2nd Quarter of FY21, the renewable energy produced from all steam turbine generators totaled 6,554 MWh; 7% below budget[3]. The total savings and revenue[2] to date in FY21 (actuals through October[1]) is $826,449 , 24% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



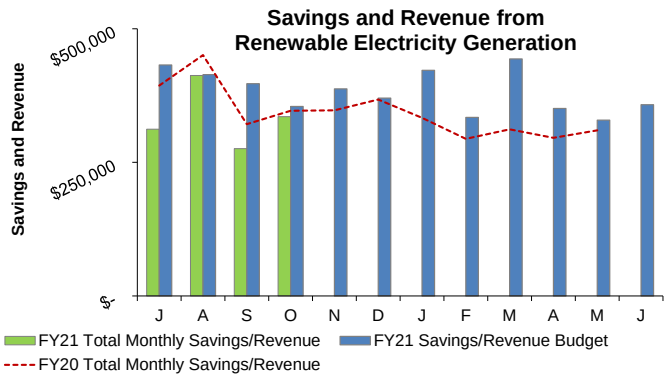


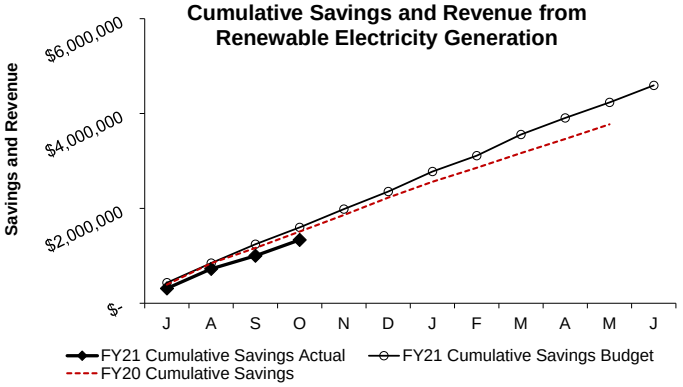
In the 2nd Quarter of FY21, MWRA's electricity generation by renewable resources totaled 12,359 MWh. MWRA's total electricity usage was approximately 48,080 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.
All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

Renewable Electricity Generation: Savings and Revenue

2nd Qtr - FY21

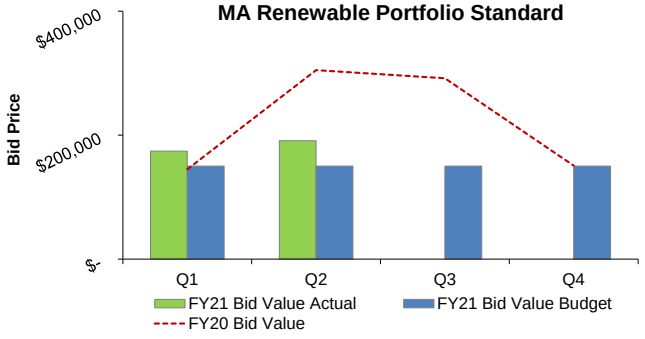


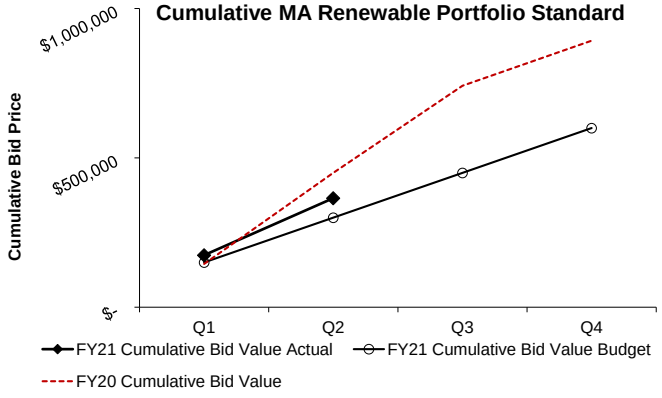


Savings and revenue from MWRA renewable electricity generation in the first four months of FY21 (actuals only through October) is $$1,335,631 which is 17% below the budget[3].

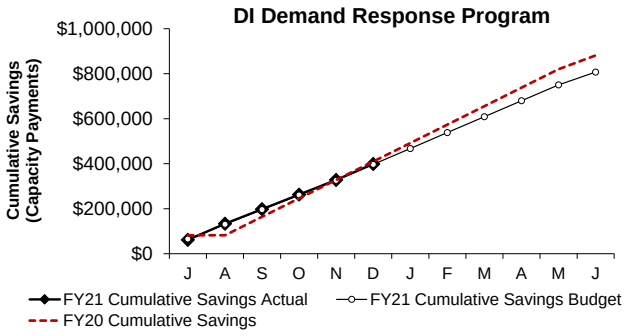
.

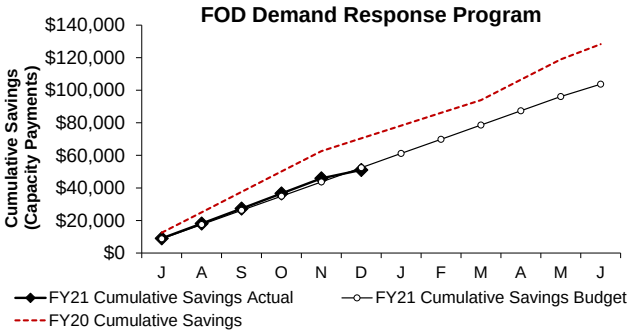
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value





Bids were awarded during the 2nd Quarter[1] from MWRA's renewable energy assets; 3,291 Q2 CY2020 Class I Renewable Energy Certificates (RECs) , 2,232 Class II RECs, and 90 Q2 CY2020 Solar RECs were sold for a total value of $190,871 RPS revenue; which is 27% above budget[3] for the Quarter.
REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.



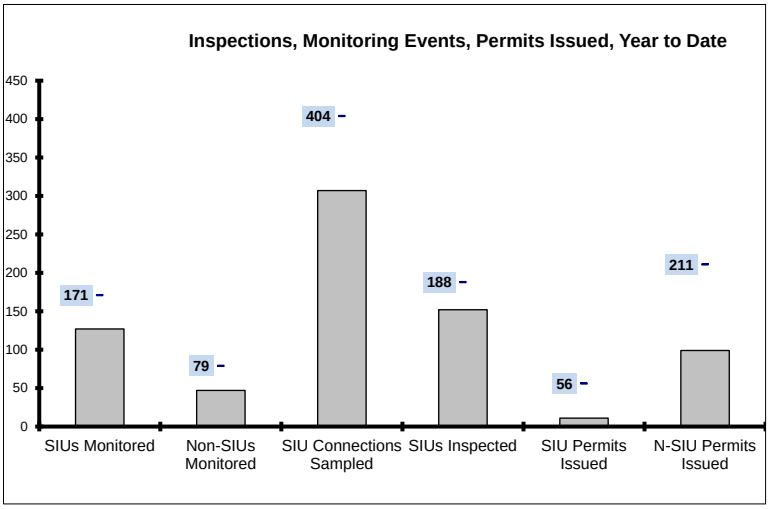


Currently Deer Island, JCWTP, Loring Rd, and Brutsch participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY21 Cumulative savings (Capacity Payments only) through December[1] total $399,006 for DI and $51,049 for FOD through December[1].

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

Toxic Reduction and Control

2nd Quarter - FY21



EPA Required SIU Monitoring Events
for FY20: 171
YTD : **127**

Required Non-SIU Monitoring Events
for FY20: 79
YTD : **47**

SIU Connections to be Sampled
For FY20: 404
YTD: **307**

EPA Required SIU Inspections
for FY20: 188
YTD: **152**

SIU Permits due to Expire
In FY20: 56
YTD: **11**

Non-SIU Permits due to Expire
for FY20: 211
YTD: **99**

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.

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; 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, increased inspections leading to permit category changes requiring additional monitoring events.

SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

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	1	4	0	4	0	3	1	11
Aug	2	15	0	1	0	1	2	17
Sep	1	20	0	3	0	1	1	24
Oct	2	15	0	1	0	2	2	18
Nov	2	17	0	1	0	1	2	19
Dec	3	9	0	0	0	1	3	10
Jan							0	0
Feb							0	0
Mar							0	0
Apr							0	0
May							0	0
Jun							0	0
% YTD	100%	81%	0%	10%	0%	9%	11	99

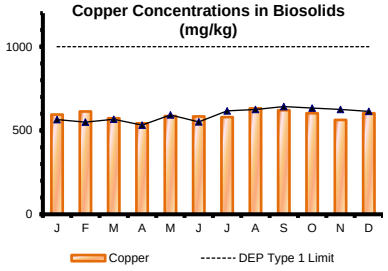
EPA requires MWRA to issue or renew 90 percent of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10 percent of SIU permits to be issued within 180 days.

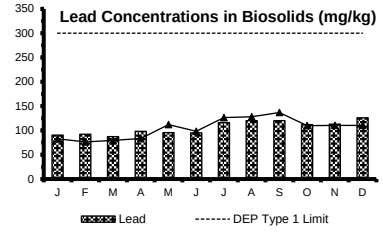
So far, in this fiscal year, 11 SIU permits have been issued with a 100% rate of issuances within 120 days.

In the second quarter of FY21, 54 permits were issued, seven of which were SIUs. All of the SIU permits were issued within the 120-day timeframe.

Six of the non-SIU permits were issued after the 120-day timeframe with four of them issued after the 180-day timeframe. Those six included hotel operations, new start-ups, septage hauling and construction dewatering - industries with operations that were most impacted by the COVID-19 pandemic. Late payment of the relevant permit charges was the primary reason for these late permit issuances.

For the Clinton Sewer Service area, no SIU permit was issued in this, the second quarter of the fiscal year.





Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer.

Overall, copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years.

A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion.

Field Operations Highlights
2nd Quarter – FY21

Each quarter, staff summarize monthly activities to provide a snapshot of work by teams across Operations and to highlight noteworthy actions.

Due to COVID-19 restrictions, Operations staff maintained physical and social distance from each other throughout the quarter. Due to COVID-19 restrictions, there was a decrease in field activity.

Western Water Operations and Maintenance

- Carroll Water Treatment Plant: Staff completed half plant shutdown maintenance and cleaning activities on the B side treatment process and met with DEP for the annual filtration waiver inspection

- Metro West Tunnel: Staff completed a valve replacement at the Edgell Road Pump Station connection in Framingham. Replacing this 24-inch butterfly valve required the tunnel to be dewatered and refilled at a specific flow rate after the valve was replaced. Staff replaced valve as well as coordinated dewatering and filling process.

- Lonergan Intake Facility, Quabbin Shaft 8: Staff operated the intake siphon facility to transfer water from the Ware River to the Quabbin reservoir. A sanitary survey was completed before the facility was activated, and water parameters checked. Water was transferred for one day with a total of 65 million gallons transferred.

Metro Water Operations and Maintenance

- Community Assistance: Valve Staff supported the Town of Reading with the disinfection of their Bear Hill Storage Tank. Pipeline and Valve Staff supported BWSC with by-pass pumping during their construction work in the Orient Heights area.

Operations Engineering

- Staff continued community assistance as needed:

o Winthrop supply issues/reactivation of tank
o Troubleshooting Revere water main breaks
o Milton hydraulic modeling

SCADA

- Staff completed migration of SCADA fiber communication at Hyde Park PS and completed updating security of the Human Machine Interface (HMI) account. Staff completed HMI and database modifications on generator and fuel tank display at Lexington St PS and troubleshot and repaired heat exchanger system at WAPS. Staff assisted Electrical Engineering Maintenance in troubleshooting of the main switchgear and the solar power system at JCWTP and worked on design support for Fuel Tank Replacement Projects for Weston, Southborough, Barre and Gillis. Staff continued to work on building SCADA Engineering office test bed at Marlboro

Maintenance facility and continued work on configuration and hardening of SCADA Windows operating system upgrades. Staff continued work on development of network firewall and continued on support for Comm. Ave. PS Improvement project and the PRV improvement project. Staff continued on-going technical support for JCWTP PLC replacement project.

.Wastewater Operations & Maintenance

- Braintree-Weymouth incident: A mechanical failure at the Braintree-Weymouth Pump Station prompted the facility to be put on a backup generator on November 13th. The fuel system of the generator needed to be rebuilt with new injectors and pumps. This work was completed by the contractor ASNE and returned to service on December 23rd.

Metro Equipment and Facility Maintenance

- Staff purchased two 600 HP VFDs and fabricated mounting frames on palletized bases making them portable. These are to be used temporarily in situations where permanently installed facility VFDs have failed and replacement parts and/or systems are not immediately available due to supply chain interruptions because of COVID. The two VFD units will be powered, charged and stored at the Gillis facility until needed to be put into service.

Metering

- Meter Data continued tracking how the Commonwealth COVID response recommendations have affected the demand in the fully supplied water communities. The state shutdown began on March 18, 2020 and continued into FY21. In general, most residential communities saw demand increases as the stay at home order was in effect, with some communities seeing a 20+% increase over the summer. Each community experienced an overall increase or very slight decrease in demand in 2020 with the exception of Boston which saw a significantly lower demand.

- Metering staff reached out to the following communities in the 2nd quarter of FY21 to alert them to observed flow changes in their monthly usage as compared to their historical usage: Melrose, Chelsea, Lexington, Framingham, Southborough, Reading, and Rutland-Holden Sewer district.

- CSO Public Notification: Metering staff continues to meet to support the CSO public notifications team. Metering has identified the equipment needed to maintain the meter sites currently monitored by the Authority's subcontractor ADS. The CSO monitoring database for non-revenue meters went live in August to power the CSO Notification tool.

- Verizon 4G Upgrade: The shutdown of Verizon's 3G network was scheduled for January 1, 2021. As of December 31, 2020, 399 of 400 total sites have been moved over to the Verizon 4G network. The one remaining site is a wastewater meter that is currently out of service. It has been pulled out of an active construction site for the duration of construction. This site will be fitted with a 4G modem prior to return to the field.

TRAC

- TRAC finalized the 36th Annual Industrial Waste Report. The report was transmitted to EPA and MassDEP on October 28, 2020 and is posted on MWRA's website.

- The Fiscal Year 2021 Annual Permitting and Monitoring Charge invoices were issued for all permits except the new group Dental Discharges permits. Those invoices will be issued in the Spring of 2021.

Environmental Quality-Water

- MWRA's algae monitoring season is complete. DCR continued to collect occasional algae samples on Wachusett Reservoir. Staff performed algal toxin and taste and/or odor compound sampling at treated water taps in October and November; this sampling coincided with UCMR4 community entry-point cyanotoxin monitoring.

- Community Support: Staff delivered virtual presentations to community DPW drinking water sampling staff on proper coliform sampling technique and chlorine residual measurement. Throughout the quarter, staff also notified several communities of low chlorine residuals.

- In October, staff assisted Reading with sampling of their Bear Hill Tank. In November, staff assisted Waltham with sampling of their Prospect Hill Tanks. Both tanks were drained, disinfected, and refilled to improve water quality. All test results were typical. On December 11, staff visited Winthrop to perform investigatory sampling at TCR sample sites.

- On December 3, staff provided support, along with MassDEP, during a PRV failure within the Winthrop public water system. MassDEP required a full round of sampling the following day. All samples were absent for total coliform and E. coli. Following the incident, Enqual and Operations assisted Winthrop with the submission of their Emergency After Action Report to MADEP.

- Staff had a virtual meeting with New York DEP staff to review water quality profiling buoy options for under ice reservoir monitoring and discuss winter weather challenges with buoy retrieval, as future buoy deployment extends into the winter season

Environmental Quality-Wastewater

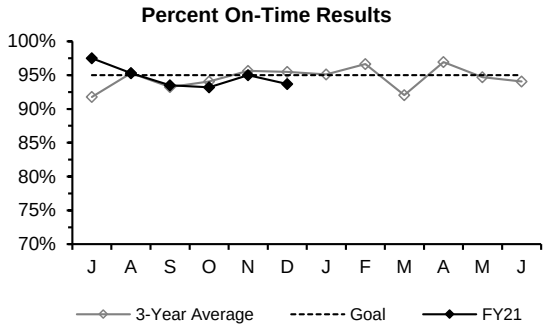
- Ambient Monitoring Field work for 2020 was completed in November. Sample/image analysis from 2020 water column and sediment surveys is largely complete. Staff submitted the annual "Outfall Monitoring Overview" as required by the NPDES permit; and formally requested changes to monitoring program that were already approved and implemented on an interim basis.

- Permitting and Compliance Reporting: Staff submitted required monthly and quarterly discharge monitoring reports, and the annual operations & maintenance report/status sheets required by the DITP permit. Staff made as-needed notifications of maintenance on electrical systems at DITP and of power outage/brief diversion around secondary treatment on October 19.

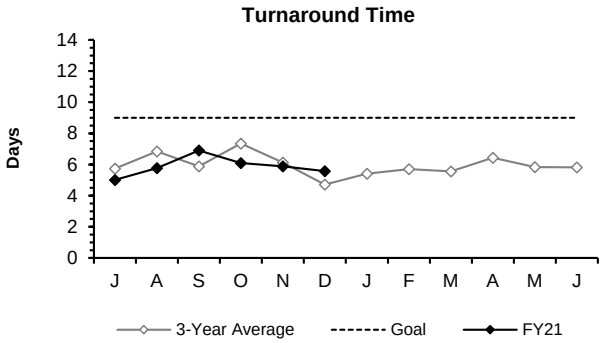
- Internal Coordination: Staff continued to work with Engineering & Construction and the DCOO on the receiving water quality analysis portion of the CSO Post-Construction Monitoring & Performance Assessment project. Staff participated in community CSO coordination meetings with Cambridge, Somerville, Chelsea, and BWSC, and received final receiving water model calibration report. Together with Operations Engineering, staff continued to refine documentation of procedures for determining CSO activations and volumes.

Laboratory Services

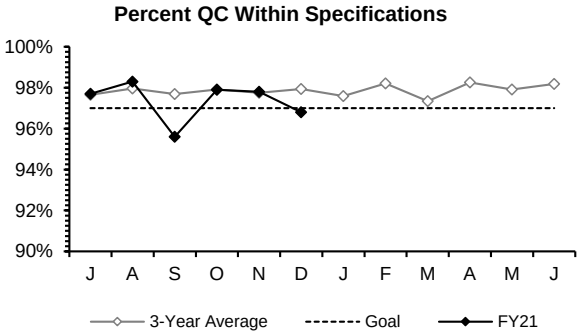
2nd Quarter - FY21



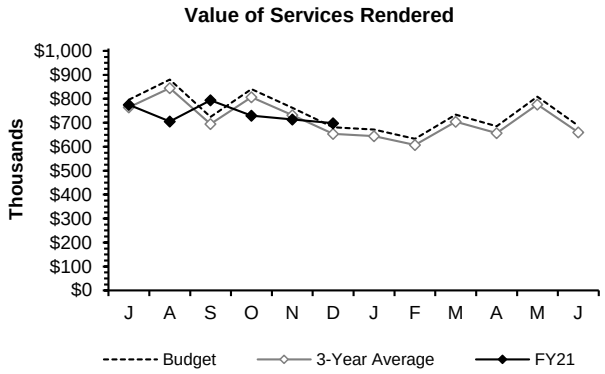
The Percent On-Time measurement is slightly below the 95% goal YTD.



Turnaround Time meets the 9-day goal.



Percent of QC tests meeting specifications meets the 97% goal YTD.



Value of Services Rendered is running slightly below the annual budget projection.

Highlights:

Performance: Year to date average Turnaround Time, Percent on time and Percent QC within Specification all met targets. Value of Services Rendered is running slightly below the three year average.

School Lead Program: During the 2nd quarter of FY21 , MWRA's lab completed 393 tests from 27 schools and childcare facilities in 12 communities. Since 2016, MWRA's Laboratory has conducted over 38,000 tests from 506 schools and daycares in 44 communities.

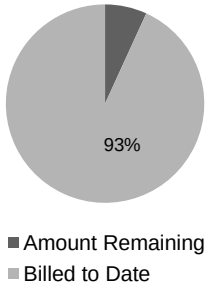
COVID-19 Testing: The wastewater pilot project continued throughout the 2nd quarter. Sample results are posted on MWRA.com as they are received.

CONSTRUCTION PROGRAMS

Projects In Construction
2nd Quarter– FY21

Southern Extra High Pipeline Section 111

Money



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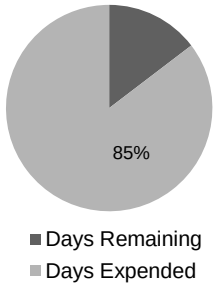


Project Summary: This project consists of 6,800 linear feet of 36-inch water main in Dedham and Westwood and includes pipe jackings at the Dedham Corporate MBTA Station and at the MassDOT Route 95 East Street Rotary.

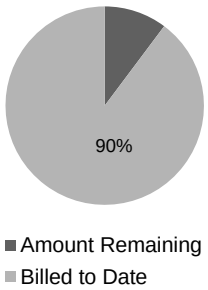
Contract Amount: $20,943,992.77 *Contract Duration:* 1,025 Days

Notice to Proceed: 10-Aug-2018 *Contract Completion:* 31-May-2021

Status and Issues: As of December, Crew 1 installed 29 LF of 36" DI pipe including two 36"X6" Tee's, a 36" butterfly valve, two 36" solid sleeves and a transition coupler to connect 36" DI pipe to Section 77 for isolation valve work on East St. Dedham. Crew 3 installed 32 LF of 36" DI pipe including, two 36" butterfly valves and solid sleeves and a transition coupler to connect to Section 77 in Harvard St. Dedham.

Chelsea Creek Headworks Upgrade

Money



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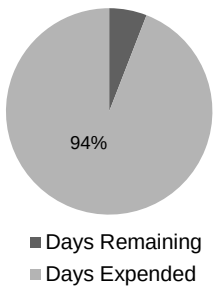


Project Summary: This project involves a major upgrade to the entire facility including: automation of screening collection & solids conveyance, replacement of the odor control, HVAC and electrical systems.

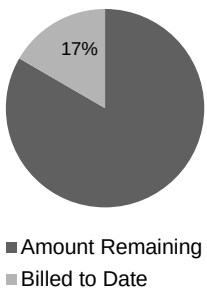
Contract Amount: $83,880,801.06 *Contract Duration:* 1,594 Days

Notice to Proceed: 22-Nov-2016 *Contract Completion:* 4-Apr-2021

Status and Issues: As of December, the Contractor worked on removing the inflatable plug from the influent piping in Channel 4, removed the temporary grit piping system west of the headworks, and performed leak tests for the Channel 4 influent and effluent sluice gates and stop logs.

Dorchester Interceptor Sewer

Money



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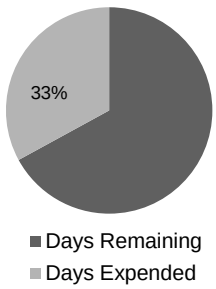


Project Summary: MWRA's Dorchester Interceptor conveys flows to MWRA's Columbus Park Connection and Headworks in South Boston

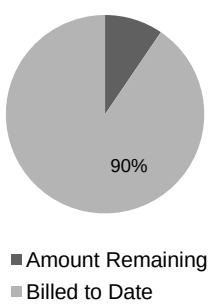
Contract Amount: $4,707,485 *Contract Duration:* 540 Days

Notice to Proceed: 6-Jul-2020 *Contract Completion:* 28-Dec-2021

Status and Issues: As of December, the Contractor installed and tested the bypass system. They completed the CIPP installation #1 Sta. 193+71 – 191+61 & 191+61 – 189+55. Completed CIPP installation #2 Sta. 189+55 – 184+43. The installation between 191+61 – 189+55 has a soft area of approximately 130' and will have a repair done.

Commonwealth Ave Pump Station Improvements

Money



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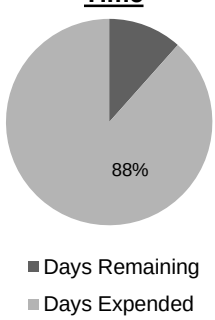


Project Summary: This project will provide a new connection to the station from two low service pipelines in Commonwealth A venue and add low service pumps so that the City of Newton can be supplied in the event of a City Tunnel failure.

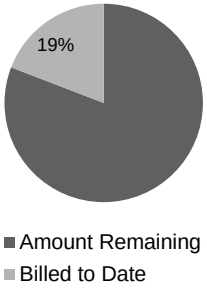
Contract Amount: $7,669,408.18 *Contract Duration:* 760 Days

Notice to Proceed: 28-Feb-2019 *Contract Completion:* 29-Mar-2021

Status and Issues: As of December, the Contractor installed WASM 2 60" east and west spool pieces, insulated restraint couplings, and restraint rods to join new and existing piping. They filled the WASM 2 pipe and performed a visual leak test with no observable leaks detected. They flushed the pipe in preparation for chlorination after which the pipe was chlorinated, de-chlorinated and flushed. The contractor has since demobilized from the site including the small frac tank.

Projects In Construction
2nd Quarter– FY21

Money



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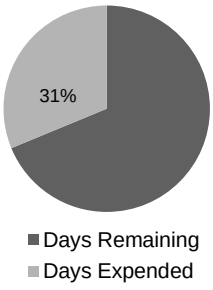


Nut Island Odor Control and HVAC

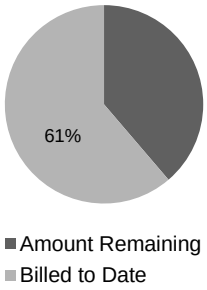
Project Summary: This project will provide upgrades to the odor control system, heating, ventilation and air conditioning system and other equipment.

Contract Amount: $57,590,394.58 *Contract Duration:* 1,034 Days

Notice to Proceed: 12-Feb-2020 *Contract Completion:* 12-Dec-2022

Status and Issues: As of December, the Contractor installed dowels and reinforcing steel for temporary concrete curb at Odor Control Room roof. They installed reinforcing steel and formwork for new sodium hydroxide containment walls and placed concrete for same and continued to install HVAC ductwork in Grit Room.

Money



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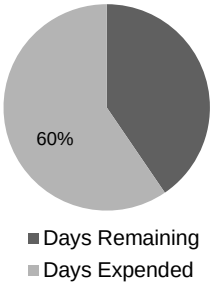


Chemical Tank Relining & Pipe Replacement

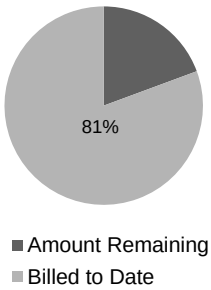
Project Summary: This project involves replacing the chlorobutyl rubber linings in 3 sodium hypochlorite and 2 sodium bisulfite storage tanks and assorted gravity thickener overflow piping at Deer Island.

Contract Amount: $8,570,041 *Contract Duration:* 850 Days

Notice to Proceed: 13-Aug-19 *Contract Completion:* 10-Dec-21

Status and Issues: As of December, the Contactor completed lining of Sodium Hypochlorite Storage Tank No. 1, and commenced with leak testing. They completed leak testing of Sodium Bisulfite Storage Tank No. 1, and turned tank the over to Operations. Work on the Gravity Thickener Overflow piping is on-going.

Money



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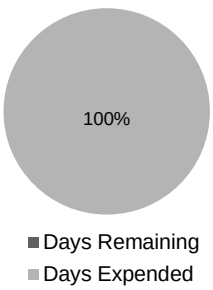


Winthrop Terminal VFD and Motor

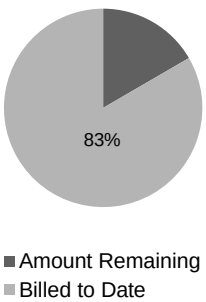
Project Summary: This project involves the replacement of 6, 600-HP motors, VFDs and associated electrical components in the Winthrop Terminal Facility.

Contract Amount: $11,950,754 *Contract Duration:* 1,549 Days

Notice to Proceed: 16-Jun-2016 *Contract Completion:* 12-Sep-2020

Status and Issues: As of December, the VFD/Motor No 3. completed the 30 day test period.

Money



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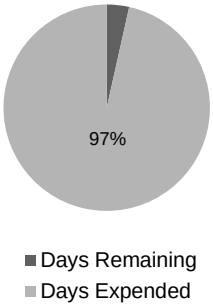


Gravity Thickener Rehabilitation

Project Summary: This project involves the upgrade of all six gravity thickeners, including the complete replacement of each tank's sludge and scum thickening equipment and 5 of the 6 FRP dome covers.

Contract Amount: $19,767,702.23 *Contract Duration:* 1,000 Days

Notice to Proceed: 11-May-2018 *Contract Completion:* 4-Feb-2021

Status and Issues: As of December, CT-6 was put on-line. The Contractor completed the concrete access drives and began demolition of GT-5. The insertion valve on Digested Sludge and Storage Tank 1 was installed and they installed the scaffolding in Digested Sludge and Storage Tank 2.

CSO CONTROL PROGRAM

2nd Quarter – FY21

All 35 projects in the CSO Long-Term Control Plan (LTCP) were complete as of December 2015 in compliance with milestones in the Federal District Court Order. MWRA is conducting a multi-year CSO post-construction monitoring program and performance assessment that will culminate in a report to EPA and DEP in December 2021 verifying whether the court-ordered LTCP levels of CSO control are attained. **Of the $912.5 million budget in the FY21 CIP for the CSO Control Program, approximately $6.7 million remain to be spent, as described below.**

Project/Item	Status as of December 31, 2020
BWSC Dorchester Interceptor Inflow Removal	The CSO MOU/FAA with BWSC included $5.4 million for additional inflow removal from BWSC's Dorchester Interceptor system as part of the South Dorchester Bay Sewer Separation project, of which MWRA transferred $1.7 million to the BWSC CSO account and $1.6 million of that was withdrawn by BWSC to fund related design and construction work. On May 17, 2017, MWRA's Board of Directors authorized removing the remaining $3.76 million from the MOU/FAA (which ended on June 30, 2017) and including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017. The new agreement limits MWRA financial assistance to reimbursement of the eligible costs of BWSC construction work reviewed and approved by MWRA, up to $3.76 million. BWSC submitted construction plans and a related cost estimate and estimated I/I removal quantity to MWRA on May 27, 2020. MWRA sent a letter to BWSC on July 21, 2020, approving the eligibility of the construction contract. BWSC awarded the contract to National Water Main in the amount of $1,581,387**, and expects the contract to be complete by June 30, 2021.** BWSC continues to evaluate additional I/I removal work it may pursue within the term of the agreement. The agreement is in effect through June 30, 2021.
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven. MWRA made a final transfer of funds to the Cambridge CSO account in December 2017, in the amount of $1,254,551, to cover eligible costs, including surface restoration costs, through June 30, 2018, when the 22 year-old, $100.2 million MOU/FAA ended. Cambridge continues to support ongoing MWRA review of the construction contracts Cambridge managed under the CSO MOU. Staff expect to complete the review and issue a final eligibility certification by **January 31, 2020**.
City of Somerville Financial Assistance Agreement	By this agreement, MWRA will provide up to $1.4 million for Somerville's repair of its combined sewer trunk line upstream of the Somerville Marginal CSO Facility. Pursuant to the agreement, the repair work is intended to maintain the full in-system storage capacity of the trunk sewer to support CSO control. Somerville is in design and expects to award the construction contract **in the fall of 2021**.
MWRA CSO Performance Assessment – Contract 7572	MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality impact assessments, culminating in the submission of a report to EPA and DEP in December 2021 verifying whether the LTCP goals are attained. Amendment 2 was executed on May 13, 2020, mainly to include additional site-specific control evaluations, increasing the contract amount by $1,431,700 to the current contract amount of $5,284,405. On August 30, 2019, DEP issued five-year CSO variances to water quality standards for the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River effective through August 31, 2024. The variance conditions include receiving water quality modeling and CSO and stormwater sampling; the evaluation of certain additional CSO controls; other requirements intended to minimize CSO discharges, their impacts and public health risk; and preparation of updated CSO control plans for these waters. In compliance with the CSO variances, MWRA has implemented a subscriber-based system to notify the public of CSO discharges at its permitted outfalls within 4 hours of the start of discharge at each location using meter readings. **MWRA also reports estimated discharge volumes on its CSO notification web page. Cambridge and Somerville, also parties to the variances, have implemented notification systems for their own outfalls.** • AECOM updated the hydraulic model to mid-2020 system conditions and continued to utilize CSO meter data to quantify CSO discharges and compare them to model predicted discharges for storms in the period Jan 1 - Jun 30, 2020, which was reported in Semiannual Progress Report No. 5 on October 30, 2020. • **AECOM submitted a final report on the development and calibration of the Charles River Basin and Alewife Brook/Upper Mystic River models. MWRA sent links to the final report to EPA, DEP, the CSO communities, the Charles River Watershed Association and the Mystic River Watershed Association on December 23, 2020.** • AECOM continues to make progress with Amendment 2 work that includes CSO variance-required project evaluations and other site-specific investigations to mitigate CSO discharges at locations where LTCP goals are not yet attained. In these efforts, MWRA is maintaining close coordination with the CSO communities. **Recently implemented CSO mitigation includes: Chelsea raised the overflow weir at Outfall CHE004, Cambridge removed heavy sediments in the Outfall CAM401A system, and MWRA is designing a replacement for the interceptor connection at Outfall CHE008 - all expected to bring these outfalls into attainment with their LTCP discharge goals. In addition, Cambridge completed the trial partial sewer separation improvements that reduce discharges from the Cottage Farm facility. To reduce discharges from the Somerville-Marginal CSO Facility to the Mystic River, albeit slightly, MWRA is designing the replacement of the leaky tide gate on the outfall and has modified the operational protocol for closing the facility's influent gates at the end of each storm.**

CIP Expenditures

2nd Quarter – FY21

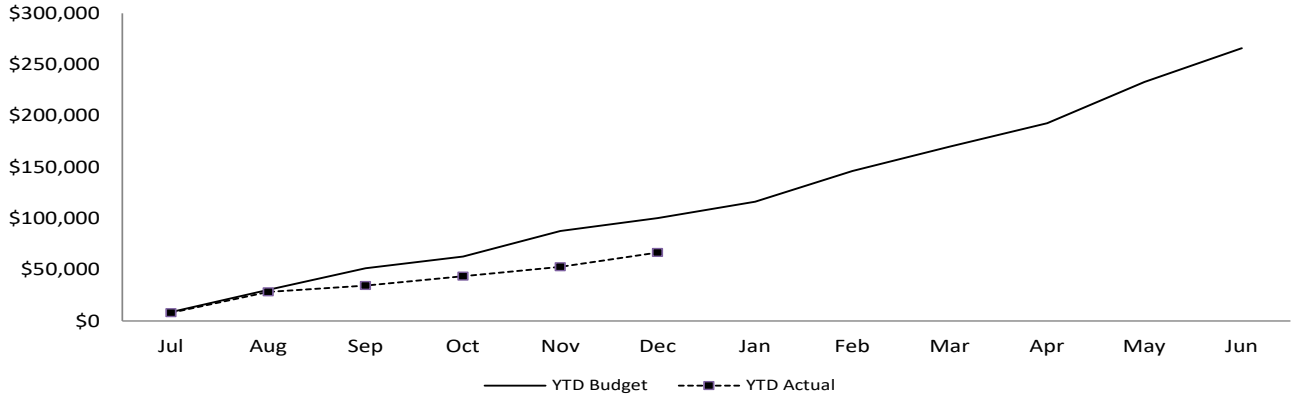
FY21 Capital Improvement Program Expenditure Variances through December by Program ($ in thousands)				
Program	FY21 Budget Through December	FY21 Actual Through December	Variance Amount	Variance Percent
Wastewater	55,552	44,581	(10,971)	-20%
Waterworks	38,043	20,809	(17,234)	-45%
Business and Operations Support	6,618	1,408	(5,210)	-79%
Total	$100,214	$66,798	($33,416)	-33%

Project underspending within Wastewater was due to Channel 4 work behind schedule for the Chelsea Creek Headworks Upgrades, delays in equipment delivery and Covid-19 shutdown for Nut Island Odor Control & HVAC Construction, timing of community repayments due to less than anticipated communities deferring their loan repayments, updated schedule for the Dorchester I/I Removal work, work anticipated in FY21 that was completed in FY20 for the Pellet Pipe Relocation and the Residuals Mechanical/Electrical/Dryer Drum Replacements, This underspending was partially offset by contractor progress for the DI Chemical Tank and Digester Pipe and Gas Protection System Replacement Phase 1 contracts. Project underspending in Waterworks was due to timing of community repayments due to less than anticipated communities deferring their loan repayments, delay in award for CP-1 Shafts 6, 8, and 9A,, updated schedule for CP-3 Sections 23, 24, and 47 Rehab, Weston Aqueduct Sluice Gate, Section 89 & 29 Replacement, and timing of consultant work for the Tunnel Preliminary Design & MEPA Review, This underspending was partially offset by contractor progress for WASM 3 CP-1, SEH Section 111 Construction 2 and 3, Commonwealth Avenue Pumping Station Rehab, and work anticipated in FY20 that was completed in FY21 for the Cosgrove Intake Roof Repair.

Budget vs. Actual CIP Expenditures

($ in thousands)

Total FY21 CIP Budget of $265,774



Construction Fund Management

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

Cash Balance as of 12/26/20	$279.0 million
Unused capacity under the debt cap:	$1.63 billion
Estimated date for exhausting construction fund without new borrowing:	Aug-21
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity / Revolving Loan	$128 million $350 million
Budgeted FY21 Cash Flow Expectancy*:	$203 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

2nd Quarter – FY21

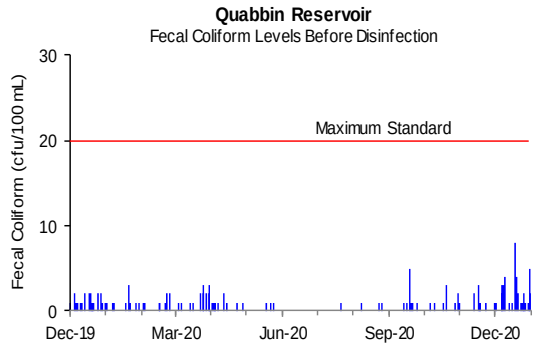
Source Water – Microbial Results

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

Sample Site: Quabbin Reservoir

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

All samples collected during the FY21 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.**

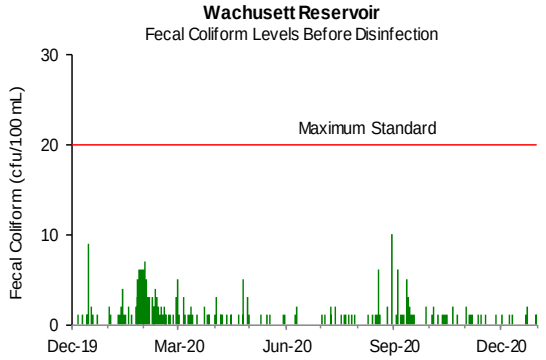


Sample Site: Wachusett Reservoir

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 2nd Quarter were below 20 cfu/100mL. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

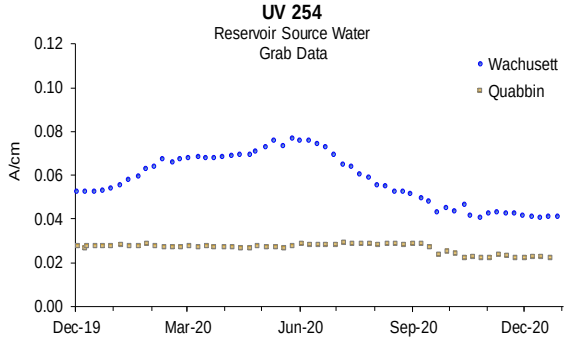


Source Water – UV Absorbance

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 0.022 A/cm for the quarter.

Wachusett Reservoir UV-254 levels averaged 0.042 A/cm for the quarter.



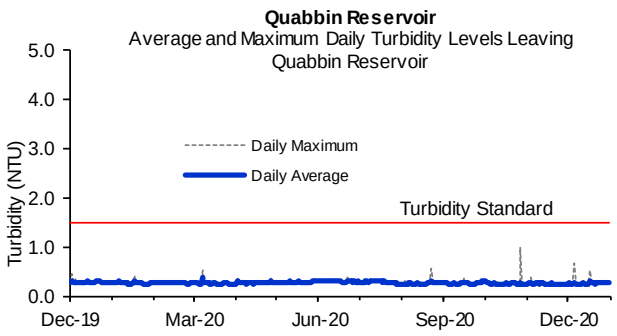
Source Water – Turbidity

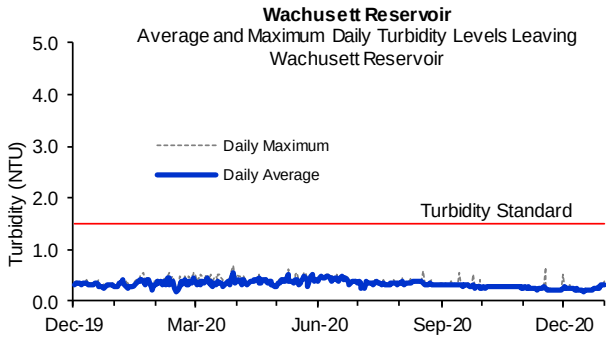
2nd Quarter – FY21

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

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

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



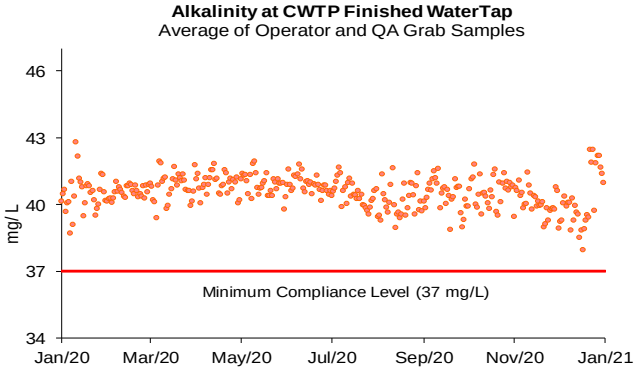


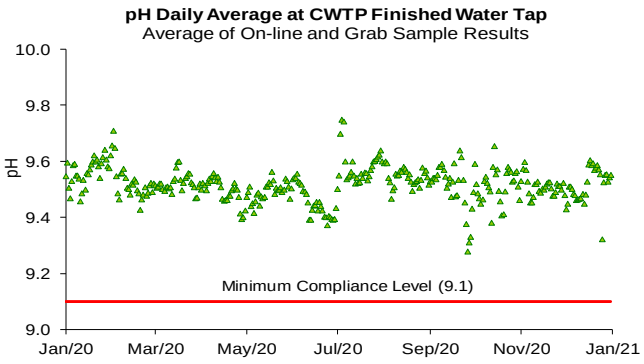
Treated Water – pH and Alkalinity Compliance

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

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

Quarterly distribution system samples were collected over a course of two weeks in November. Distribution system sample pH ranged from 9.2 to 9.6 and alkalinity ranged from 37 to 40 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

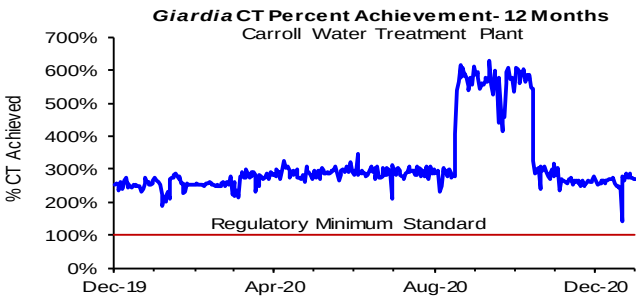
2nd Quarter – FY21

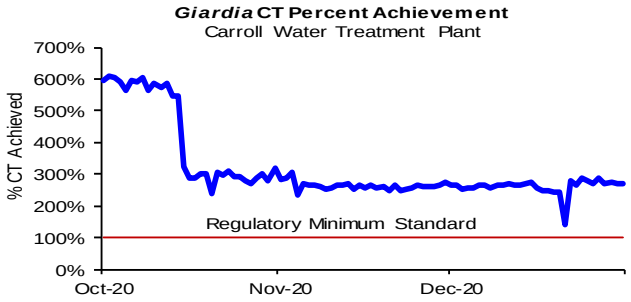
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

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

Wachusett Reservoir – MetroWest/Metro Boston Supply:

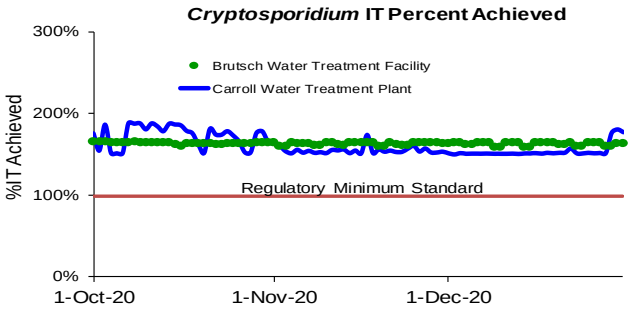
- Ozone dose at the CWTP varied between 1.3 to 2.2 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.
- The ozone dose was proactively raised mid-August 2020 in response to elevated reservoir total coliform levels. This is visible in the top left graph.
- The slight decrease on December 21 was due to Train B returning to service after undergoing winter maintenance. *Giardia* CT Achievement was met this day. This is visible in the top two graphs.

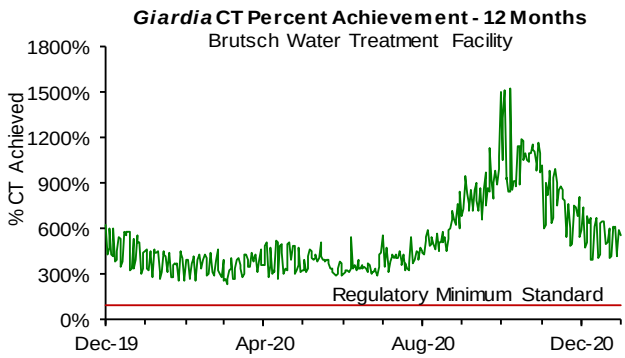


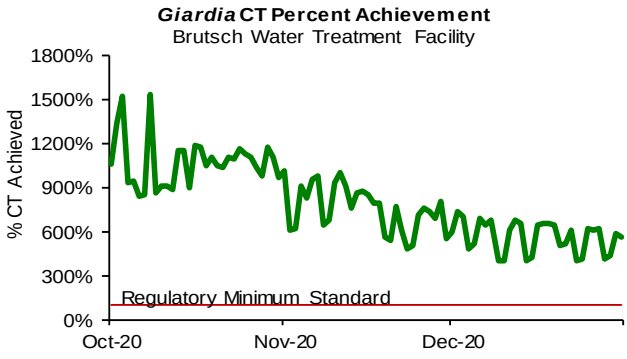


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- 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 1.3 to 1.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% for the quarter. Off-spec water was less than 5%.







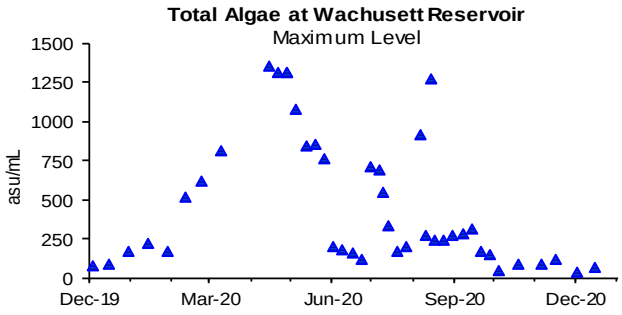
Source Water - Algae

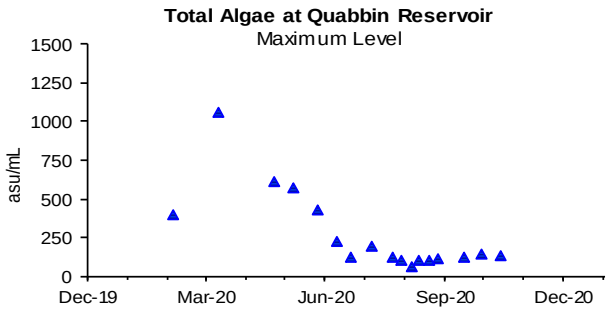
2nd Quarter – FY21

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

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

In the 2nd quarter, no taste and odor complaints which may be related to algae were reported from the local water departments.



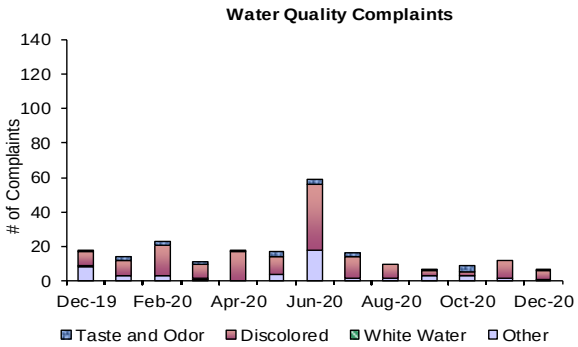


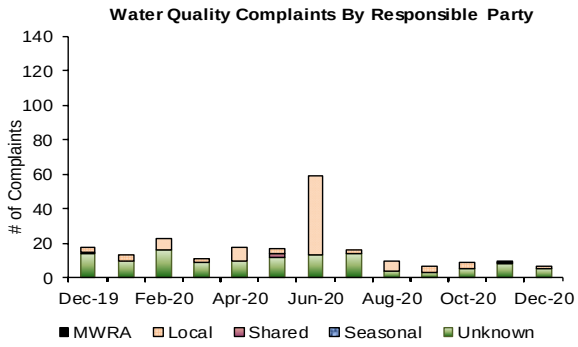
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 28 complaints during the quarter compared to 43 complaints from 2nd Quarter of FY20. Of these complaints, 17 were for “discolored water”, 5 were for “taste and odor”, and 6 were for “other”. Of these complaints, 7 were local community issues, 2 were MWRA related, 1 was seasonal in nature, and 18 were unknown in origin.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

2nd Quarter – FY21

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

The MWRA TCR program has 141 sampling locations. These locations include sites along MWRA's transmission system, water storage tanks and pumping stations, as well as a subset of the community TCR locations.

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

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

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

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

Highlights

In the 2nd Quarter, fifty-two of the 6,270 samples (0.83% system-wide) submitted to MWRA labs for analysis tested positive (Boston, Peabody, Quincy, Somerville, Southborough, Stoneham, Waltham, Winthrop - October; Boston, Waltham, Winthrop - November; Belmont, Boston - December). Three of the 1913 MWRA locations or Community/MWRA Shared samples (0.16%) tested positive for total coliform. Waltham had greater than 5.0% of their samples that were total coliform positive in October and, therefore, is required to conduct a Level 1 Assessment. In October and November, Winthrop had greater than 5.0% of their samples that were total coliform positive and, therefore, is required to conduct a Level 2 Assessment since this is the second occurrence within a rolling 12-month period. Wakefield had greater than 5.0% of their samples that were total coliform positive in October and, therefore, is required to conduct a Level 2 Assessment since this is the second occurrence within a rolling 12-month period, No samples tested positive for *E.coli*. Only 1.0% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

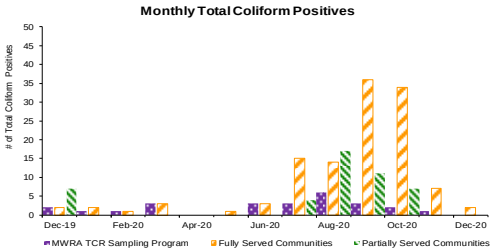
NOTES:

a) 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.

b) The number of samples collected depends on the population served and the number of repeat samples required.

c) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.

d) Part of the Chicopee Valley Aqueduct System. Free chlorine system.



			Total Coliform # Samples (b)	Total Coliform # (%) Positive	*E.coli* Positive	# Assessment Required
MWRA	a	MWRA Locations	345	0 (0%)	0	
		Shared Community/MWRA sites	1568	3 (0.19%)	0	
		Total: MWRA	1913	3 (0.16%)	0	No
Fully Served		ARLINGTON	156	0 (0%)	0	
		BELMONT	107	1 (0.93%)	0	No
		BOSTON	804	3 (0.37%)	0	No
		BROOKLINE	224	0 (0%)	0	
		CHELSEA	169	0 (0%)	0	
		DEER ISLAND	52	0 (0%)	0	
		EVERETT	169	0 (0%)	0	
		FRAMINGHAM	234	1 (0.42%)	0	No
		LEXINGTON	117	1 (0.85%)	0	No
		LYNNFIELD	18	0 (0%)	0	
		MALDEN	233	0 (0%)	0	
		MARBLEHEAD	72	0 (0%)	0	
		MARLBOROUGH	126	0 (0%)	0	
		MEDFORD	192	0 (0%)	0	
		MELROSE	117	0 (0%)	0	
		MILTON	102	0 (0%)	0	
		NAHANT	29	0 (0%)	0	
		NEWTON	276	0 (0%)	0	
		NORTHBOROUGH	48	0 (0%)	0	
		NORWOOD	99	0 (0%)	0	
		QUINCY	315	1 (0.32%)	0	No
		READING	130	0 (0%)	0	
		REVERE	195	0 (0%)	0	
		SAUGUS	104	0 (0%)	0	
		SOMERVILLE	259	2 (0.77%)	0	No
		SOUTHBOROUGH	33	1 (3.03%)	0	No
		STONEHAM	101	1 (0.99%)	0	No
		SWAMPSCOTT	57	0 (0%)	0	
		WALTHAM	229	6 (2.62%)	0	Yes
		WATERTOWN	130	0 (0%)	0	
		WESTON	45	0 (0%)	0	
		WINTHROP	114	28 (24.56%)	0	Yes
		Total: Fully Served	*5056*	*45 (0.89%)*		
Partially Served	c	BEDFORD	55	0 (0%)	0	
		CANTON	90	0 (0%)	0	
		NEEDHAM	123	0 (0%)	0	
		PEABODY	210	0 (0%)	0	
		WAKEFIELD	149	7 (4.70%)	0	Yes
		WELLESLEY	114	0 (0%)	0	
		WILMINGTON	87	0 (0%)	0	
		WINCHESTER	90	0 (0%)	0	
		WOBURN	195	0 (0%)	0	
CVA	d	CHICOPEE	61	0 (0%)	0	
		SOUTH HADLEY FD1	30	0 (0%)	0	
		WILBRAHAM	15	0 (0%)	0	
		Total: CVA & Partially Served	*1219*	*7 (0.57%)*		
		Total: Community Samples	*6275*	*52 (0.83%)*		

Chlorine Residuals in Fully Served Communities

	2019	2020											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% <0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.2	0.3	0.1
% <0.2	1.5	0.4	0.2	0.2	0.2	0.3	0.4	0.5	0.4	1.0	1.1	1.4	0.4
% <0.5	4.1	2.0	1.5	1.1	1.6	1.3	1.5	2.2	2.9	4.1	5.1	3.7	2.5
% <1.0	7.3	3.9	2.9	3.5	4.6	4.0	4.3	6.5	8.4	10.7	12.2	9.3	5.3
% ≥1.0	92.7	96.1	97.2	96.5	95.4	96.0	95.7	93.6	91.6	89.4	87.8	90.7	94.7

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

2nd Quarter – FY21

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA's locational running annual average (LRAA) standard is 80 µg/L for TTHMs and 60 µg/L for HAA5s.

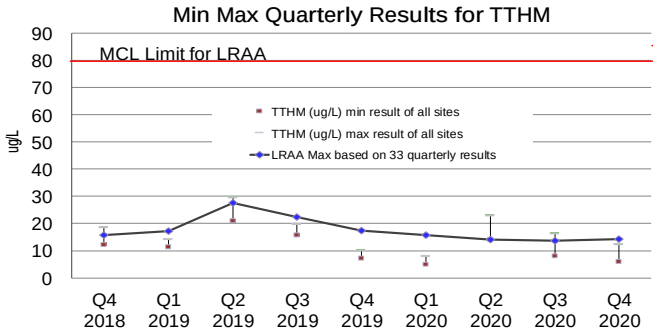
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

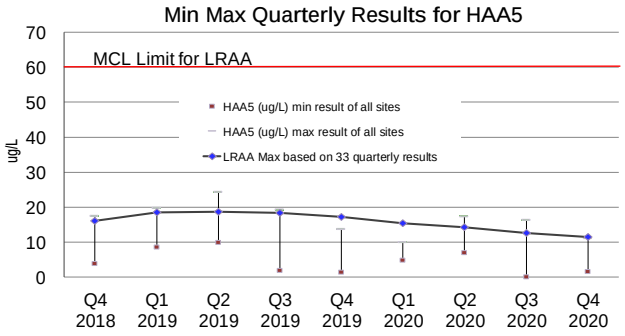
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines data for all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1). Each community is regulated individually.

Bromate is tested monthly as required for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA MCL standard for bromate is 10 ug/L.

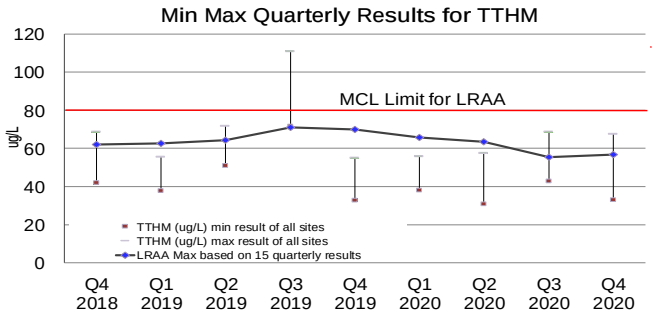
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 14.3 ug/L; HAA5s = 11.5 ug/L. The current RAA for Bromate = 0.0 µg/L. During the Q4 2019 sampling, one CVA location exceeded an HAA5 Operational Evaluation Level. While this does not result in a violation this requires an analysis and review of their water system and a report to MADEP. No LRAA exceedances or violations occurred this quarter for any of the CVA communities. MWRA and the CVA communities continue to closely monitor and manage the disinfection process to minimize DBP production. MWRA and the CVA communities continue to closely monitor and manage the disinfection process to minimize DBP production.

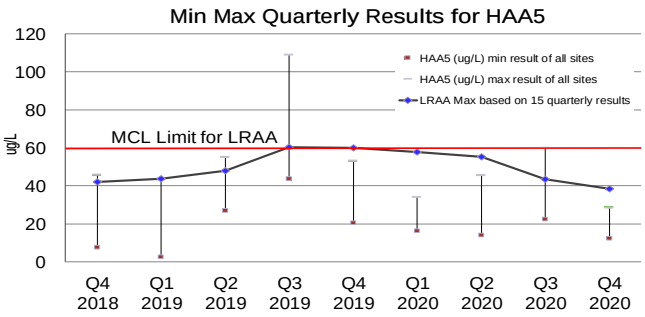
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

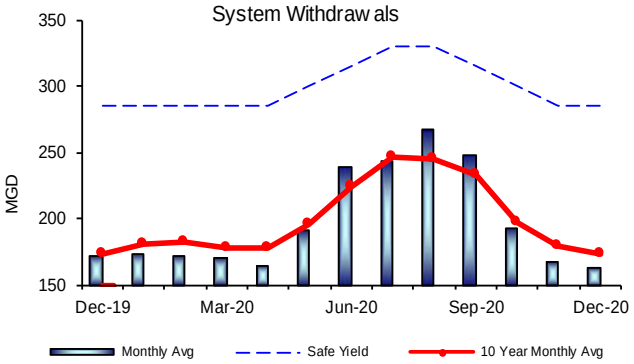
2nd Quarter – FY21

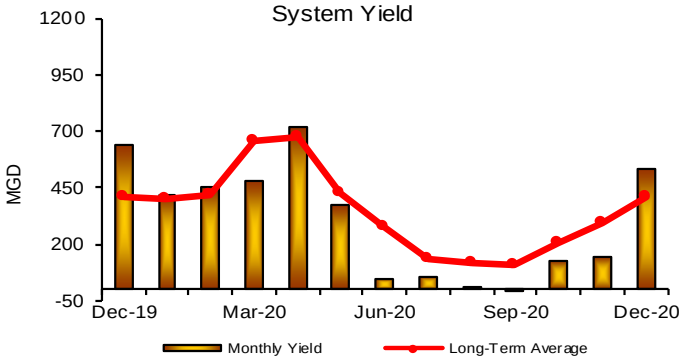
Background

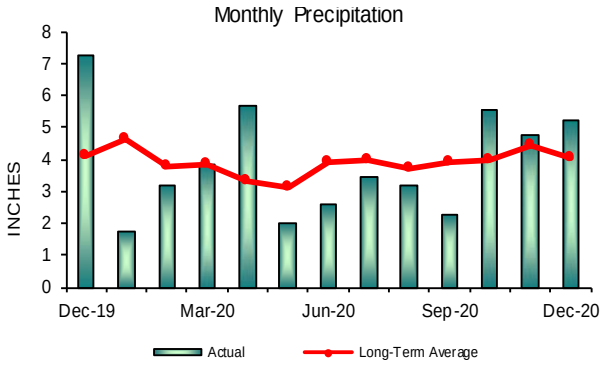
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

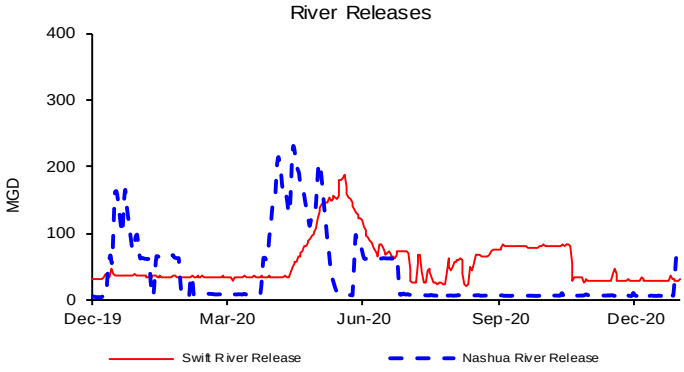
Outcome

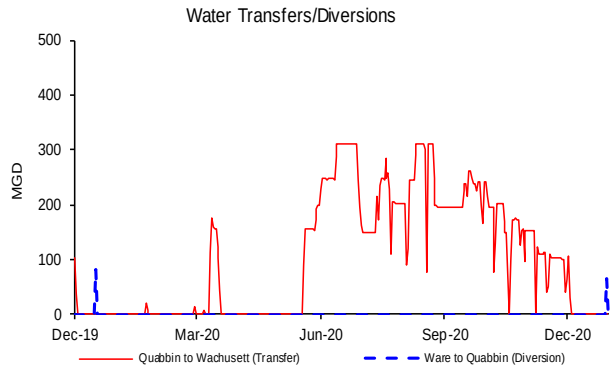
The volume of the Quabbin Reservoir was at 90.6% as of December 31, 2020; a 0.4 % increase for the quarter, which represents a gain of 1.73 billion gallons of storage and an increase in elevation of 0.23' for the quarter. System Withdrawal and Yield were below their respective long term quarterly averages. Precipitation was above its long term quarterly average. System stage remains in Normal Operating Range.

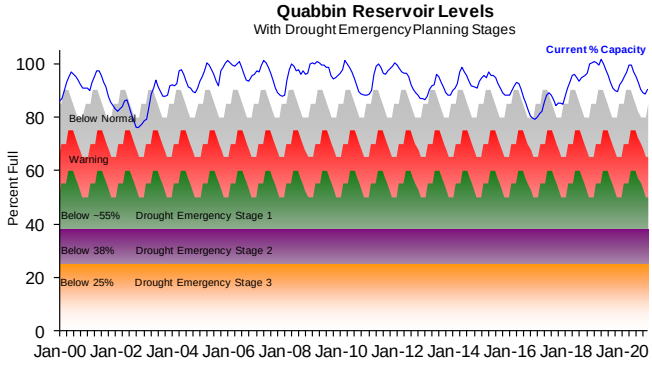












WASTEWATER QUALITY

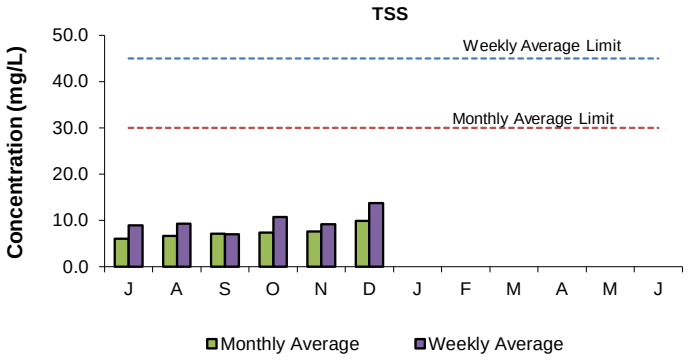
NPDES Permit Compliance: Deer Island Treatment Plant

2nd Quarter - FY21

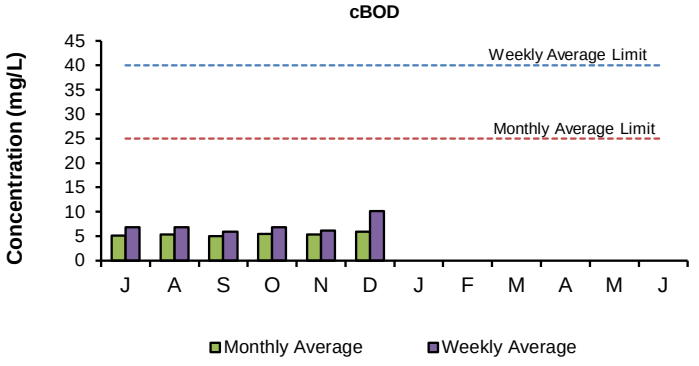
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*October*	*November*	*December*	*2nd Quarter Violations*	*FY21 YTD Violations*
Dry Day Flow (365 Day Average):		mgd	436	264.8	262.8	267.3	0	0
cBOD:	Monthly Average	mg/L	25	5.5	5.4	5.9	0	0
	Weekly Average	mg/L	40	6.8	6.2	10.2	0	0
TSS:	Monthly Average	mg/L	30	7.4	7.6	9.9	0	0
	Weekly Average	mg/L	45	10.8	9.2	13.8	0	0
TCR:	Monthly Average	ug/L	456	0.0	0.0	1.1	0	0
	Daily Maximum	ug/L	631	0.0	0.0	33.3	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	102.0	8.0	18.0	0	0
	Weekly Geometric Mean	col/100mL	14000	8.0	6.0	7.0	0	0
	% of Samples >14000	%	10	1.1	0.0	0.0	0	0
	Consecutive Samples >14000	#	3	1.0	0.0	0.0	0	0
pH:		SU	6.0-9.0	6.4-7.1	6.5-6.9	6.4-6.9	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	50	6.3	100	0	0

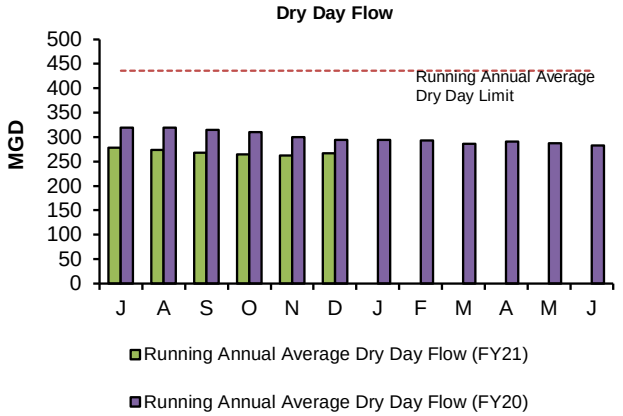
There have been no permit violations in FY21 to date at the Deer Island Treatment Plant (DITP).



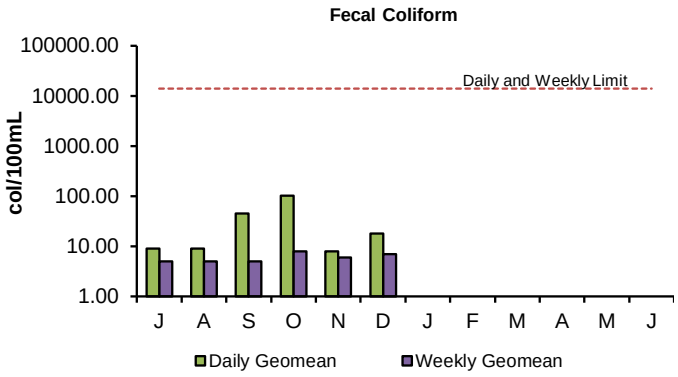
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 2nd Quarter were within permit limits.



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 2nd 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 2nd 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 2nd Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

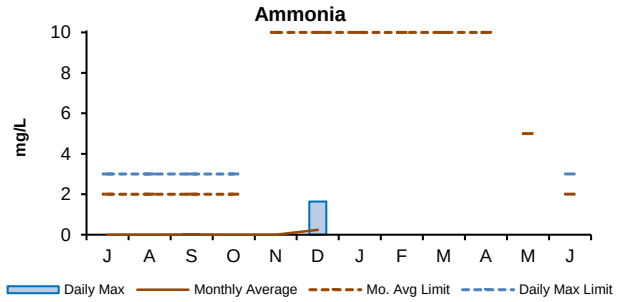
2nd Quarter - FY21

NPDES Permit Limits

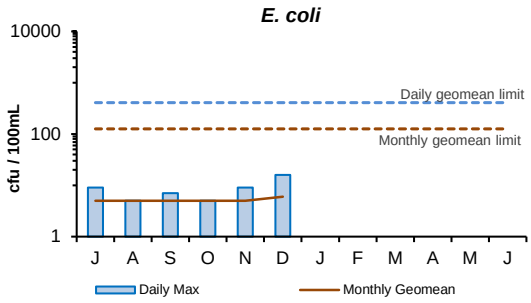
Effluent Characteristics		*Units*	*Limits*	*October*	*November*	*December*	*2nd Quarter Violations*	*FY21 YTD Violations*
Flow:	12-month Rolling Average:	mgd	3.01	2.34	2.34	2.35	0	0
BOD:	Monthly Average:	mg/L	20	1.70	1.70	2.50	0	0
	Weekly Average:	mg/L	20	1.90	2.20	2.40	0	0
TSS:	Monthly Average:	mg/L	20	1.10	2.20	5.50	0	0
	Weekly Average:	mg/L	20	2.10	3.40	5.90	0	0
pH:		SU	6.5-8.3	7.2-7.6	7.4-7.8	7.1-7.6	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	8.70	9.30	9.20	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	6	0	0
	Daily Geometric Mean:	cfu/100mL	409	5	9	16	0	0
TCR:	Monthly Average:	ug/L	17.6	0.00	0.00	0.00	0	0
	Daily Maximum:	ug/L	30.4	0.00	0.00	0.00	0	0
Copper:	Monthly Average:	ug/L	11.6	11.10	9.85	7.31	0	0
	Daily Maximum:	ug/L	14.0	11.10	9.85	8.21	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.00	0.00	0.24	0	0
	Daily Maximum:	mg/L	35.2	0.00	0.00	1.64	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	ug/L	1000	72	392	201	0	0
	Daily Maximum:	ug/L	RPT	115	567	281	0	0
Acute Toxicity+:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity+:	Daily Minimum:	%	≥62.5	N/A	N/A	100	0	1

There has been one permit violation in FY21 at the Clinton Treatment Plant.
1st Quarter: There was one permit violation in the first quarter. The quarterly chronic toxicity result of 25% was below the minimum permit limit of 62.5%.
2nd Quarter: There were no permit violations in the 2nd Quarter.

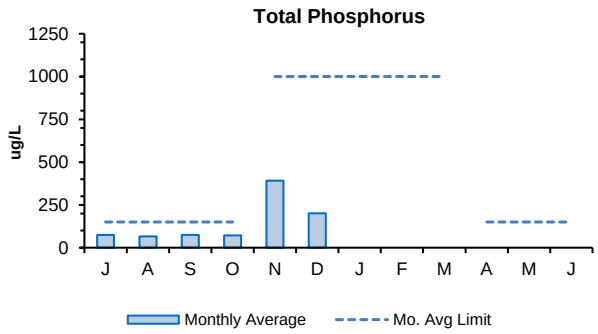
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



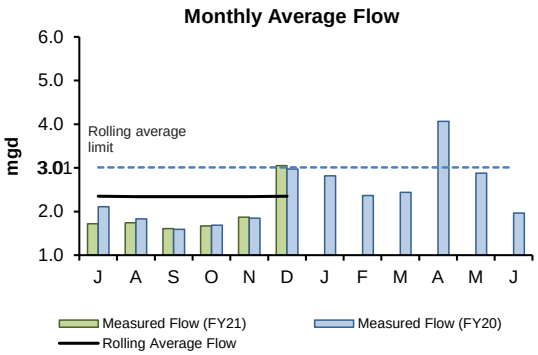
The 2nd Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 2nd Quarter are 2.0 and 3.0 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 2nd Quarter.The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



Total phosphorus limits are most stringent during the growing season from April to October. The 2nd Quarter's monthly average concentrations for total phosphorus were below permit limits.

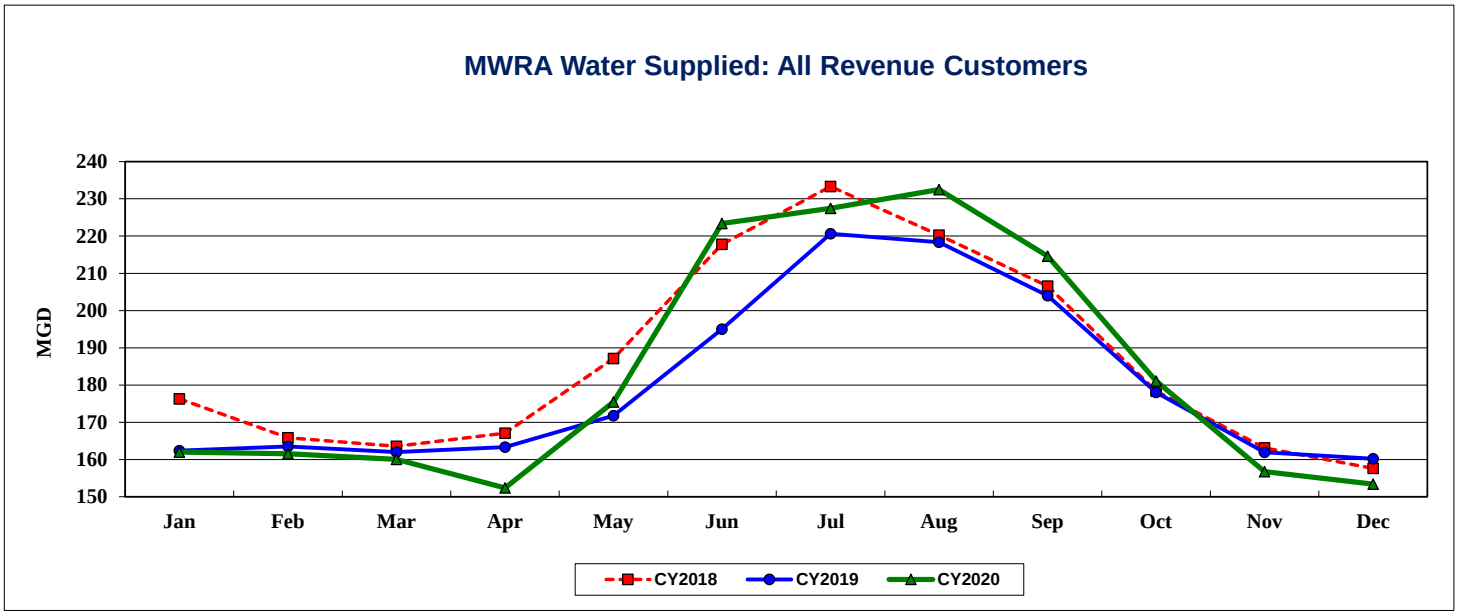


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant.
The 12-month rolling average flows during the 2nd Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

2nd Quarter - FY21



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2018	176.29	165.84	163.54	167.06	187.15	217.78	233.32	220.27	206.59	178.34	163.12	157.61	186.55	186.55
CY2019	162.37	163.49	161.98	163.35	171.77	195.02	220.62	218.38	204.00	178.00	161.94	160.21	180.22	180.22
CY2020	162.02	161.55	160.02	152.37	175.43	223.40	227.45	232.50	214.62	181.11	156.73	153.37	183.46	183.46

The December 2020 Community Water Use Report was recently distributed to communities served by the MWRA Metropolitan and Chicopee Valley waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2020 water use will be used to allocate the FY2022 water utility rate revenue requirement.

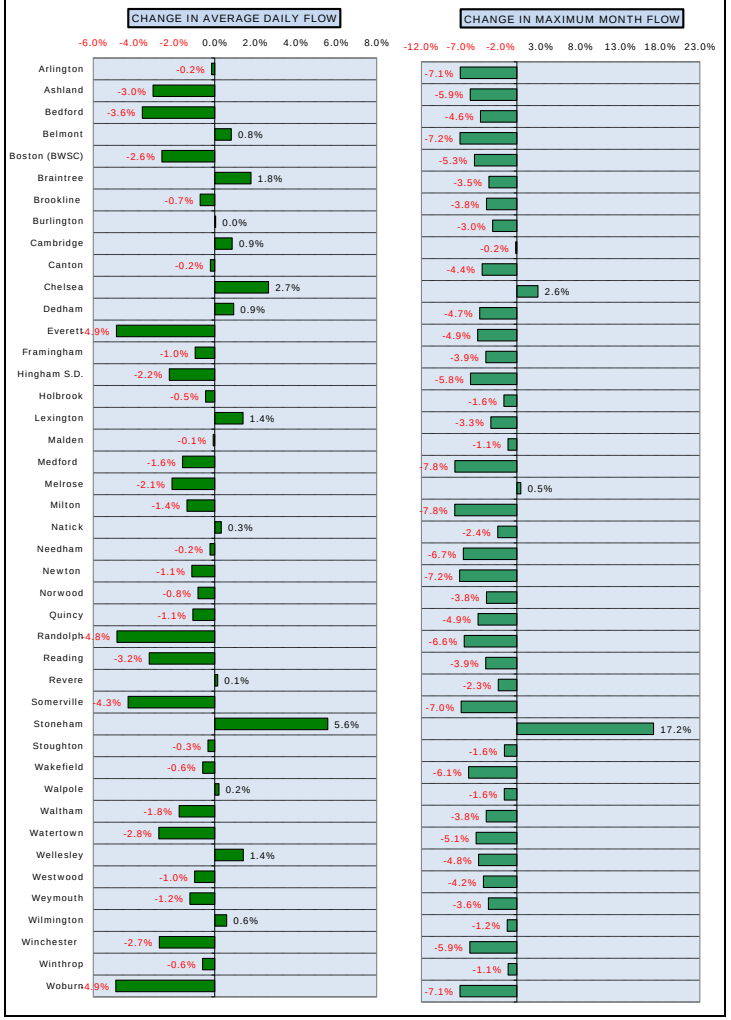
MWRA customers used an average of 163.8 mgd in the 2nd quarter of FY2021 (Oct-Dec). This is a decrease of 3.0 mgd or 1.8% compared to the 2nd quarter of FY2020.

Community Wastewater Flow

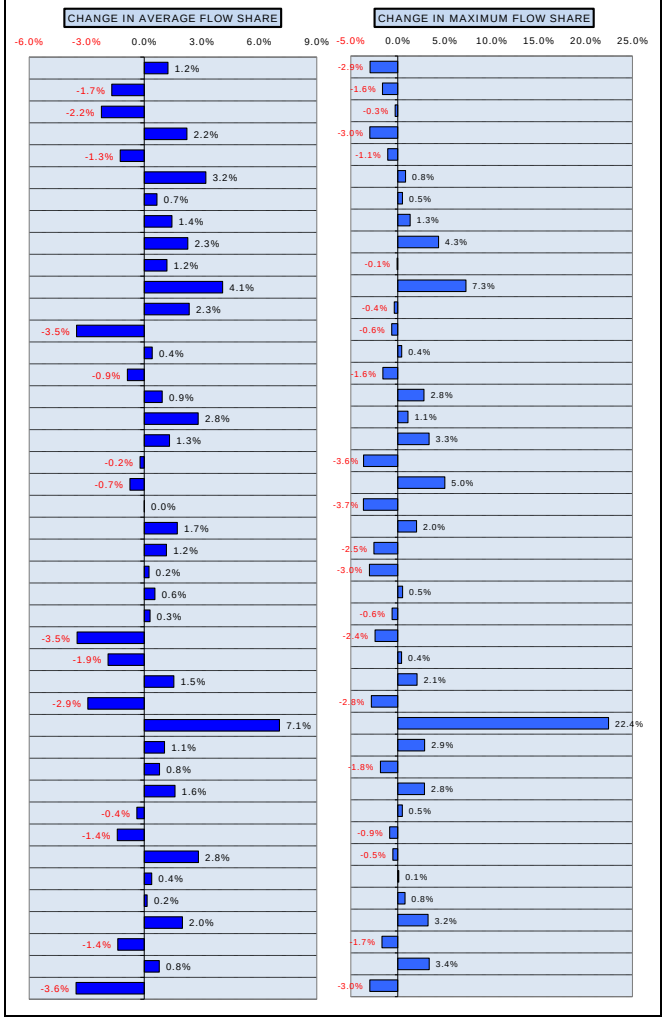
2nd Quarter - FY21

How Projected CY2020 Community Wastewater Flows Could Effect FY2022 Sewer Assessments [1,2,3]

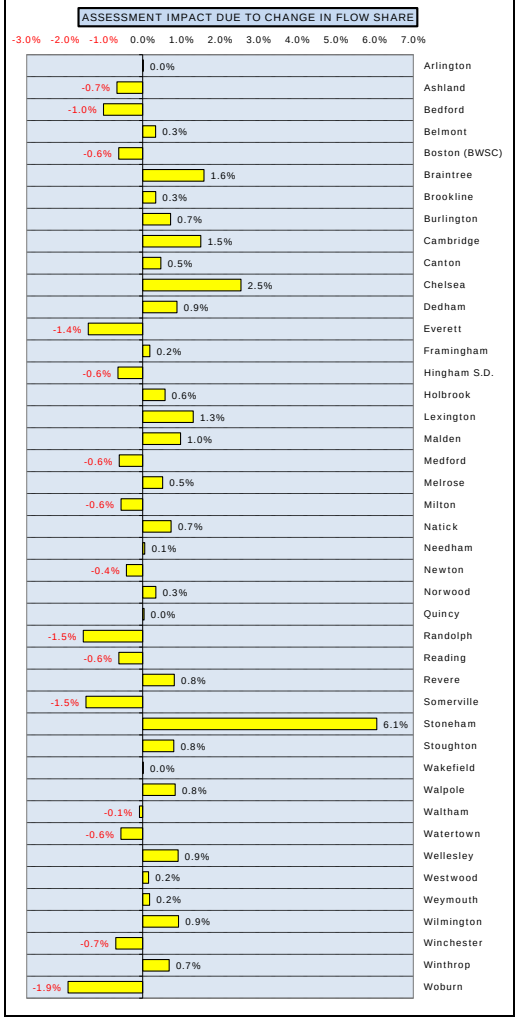
The flow components of FY2022 sewer assessments will be calculated using a 3-year average of CY2018 to CY2020 wastewater flows compared to FY2021 assessments that used a 3-year average of CY2017 to CY2019 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2018 to CY2020 flow share compared to CY2017 to CY2019 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 2017 to 2019, and January to March, and June to December 2020 (as of 02/02/21). April & May 2020 based on the average of three prior years, adjusted for 2020 water use.

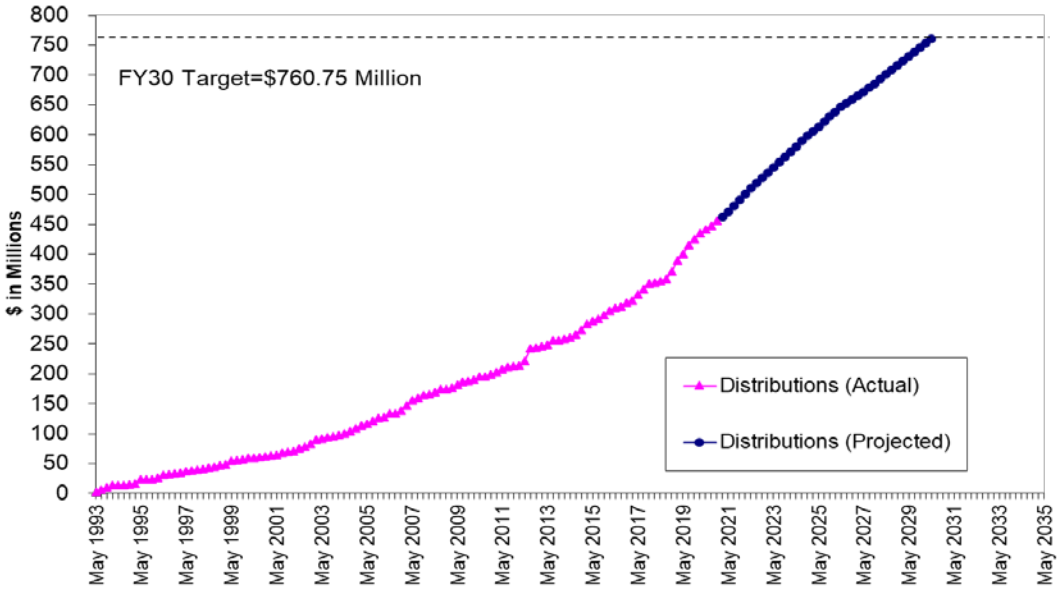
[3] Flow data is preliminary and subject to change pending additional MWRA and community review.

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

Infiltration/Inflow Local Financial Assistance Program

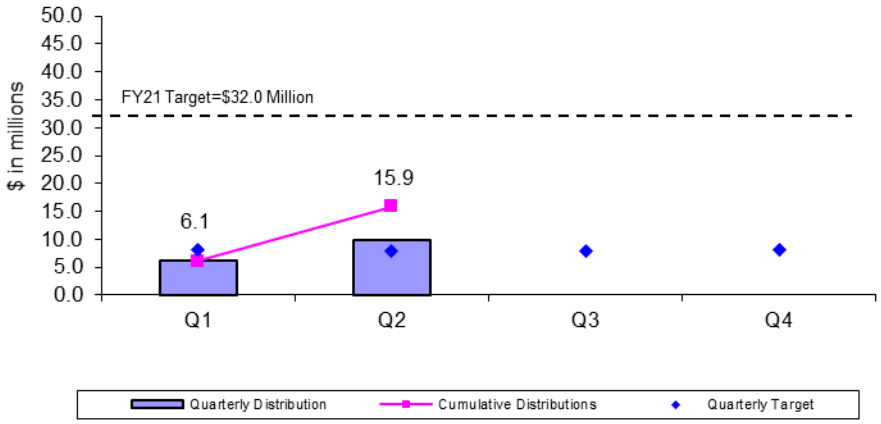
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $760.75 million in grants and interest-free loans (average of about $20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total $300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total $360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. Phase 13 provides an additional $100 million in ten-year loan-only funds.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 2nd Quarter of FY21, $9.8 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Belmont, Burlington, Newton, Quincy, Stoughton, and Weymouth. Total grant/loan distribution for FY21 is $15.9 million. From FY93 through the 2nd Quarter of FY21, all 43 member sewer communities have participated in the program and $457 million has been distributed to fund 616 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY21 Quarterly Distributions of Sewer Grant/Loans

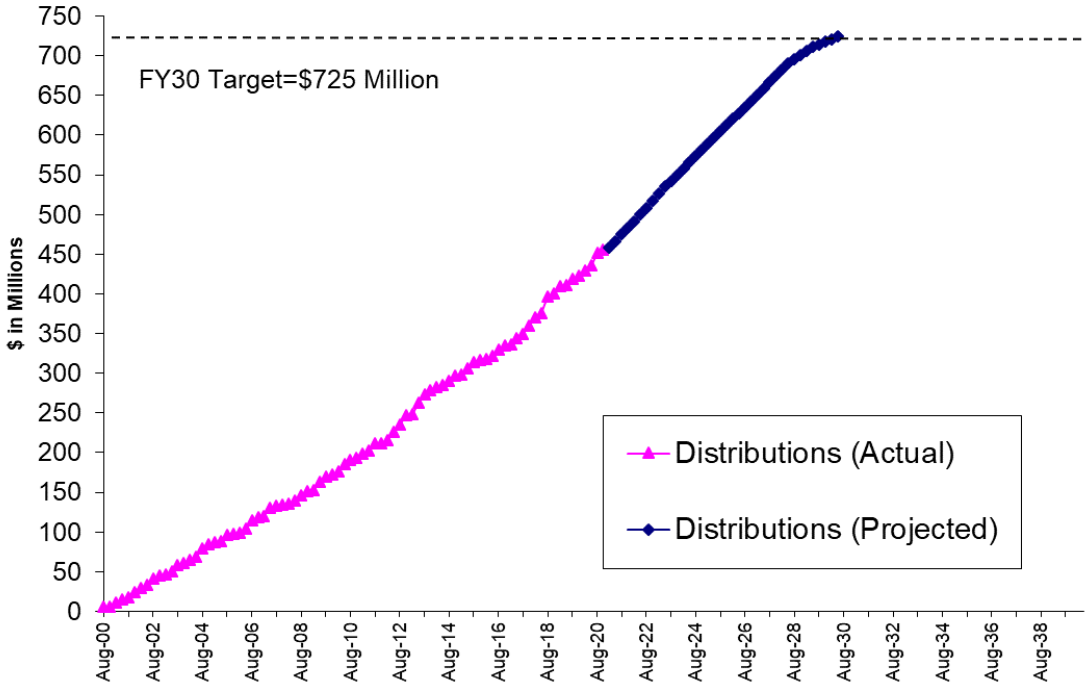


Community Support Programs
2nd Quarter – FY21

Local Water System Assistance Program

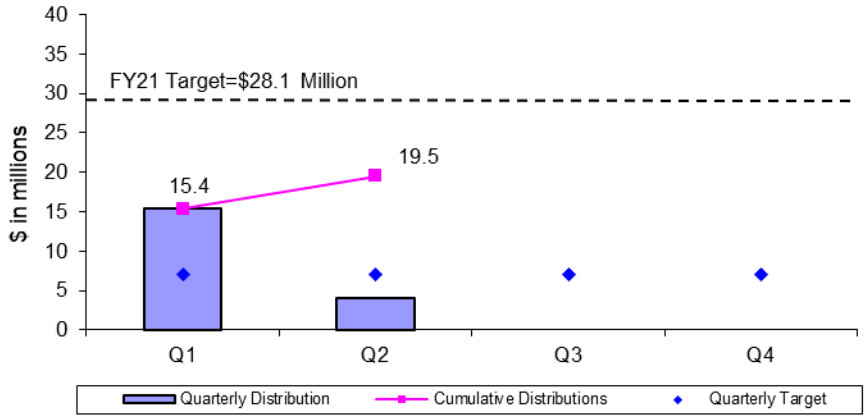
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at $222 Million, Phase 2 at $210 Million, and Phase 3 at $293 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with $222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 2nd Quarter of FY21, $4.1 million in interest-free loans was distributed to fund local water projects in Malden, Melrose, and Swampscott. Total loan distribution for FY21 is $19.5 million. From FY01 through the 2nd Quarter of FY21, $456 million has been distributed to fund 478 local water system rehabilitation projects in 43 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY21 Quarterly Distributions of Water Loans



Community Support Programs

2nd Quarter – FY21

Lead Service Line Replacement Loan Program

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

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

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

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

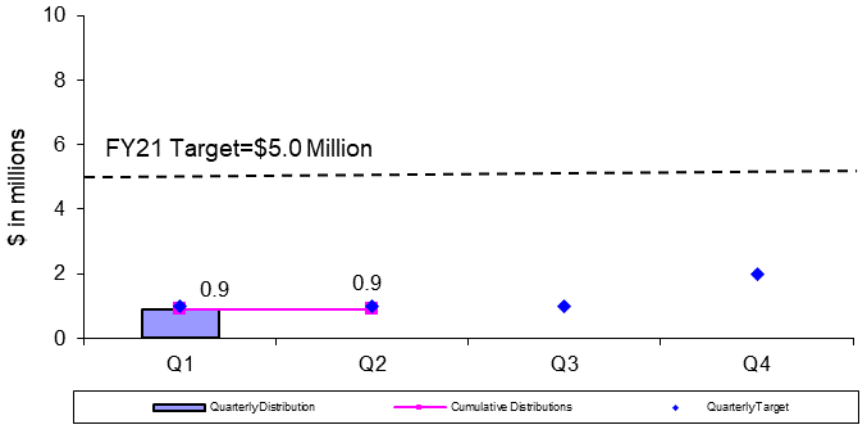
FY20 was the fourth year of the Lead Loan Program - MWRA made eight Lead Loans.

FY21 is the fifth year of the Lead Loan Program – Two Lead Loans were made in Q1 and none in the 2nd quarter.

Summary of Lead Loans:

Chelsea in FY21	$0.3 Million
Winchester in FY21	$0.6 Million
Everett in FY20	$0.5 Million
Marlborough in FY20	$1.0 Million
Winchester in FY20	$0.6 Million
Winthrop in FY20	$0.7 Million
Weston in FY20	$0.2 Million
Everett in FY20	$1.0 Million
Somerville in FY20	$0.9 Million
Chelsea in FY20	$0.3 Million
Marlborough in FY19	$1.0 Million
Winthrop in FY19	$0.5 Million
Chelsea in FY19	$0.1 Million
Everett in FY19	$1.0 Million
Needham in FY18	$1.0 Million
Winchester in FY18	$0.5 Million
Revere in FY18	$0.2 Million
Winthrop in FY18	$0.3 Million
Marlborough in FY18	$1.0 Million
Newton in FY17	$4.0 Million
Quincy in FY17	$1.5 Million
Winchester in FY17	$0.5 Million
TOTAL	$17.6 Million

FY21 Quarterly Distributions of Lead Service Line Replacement Loans

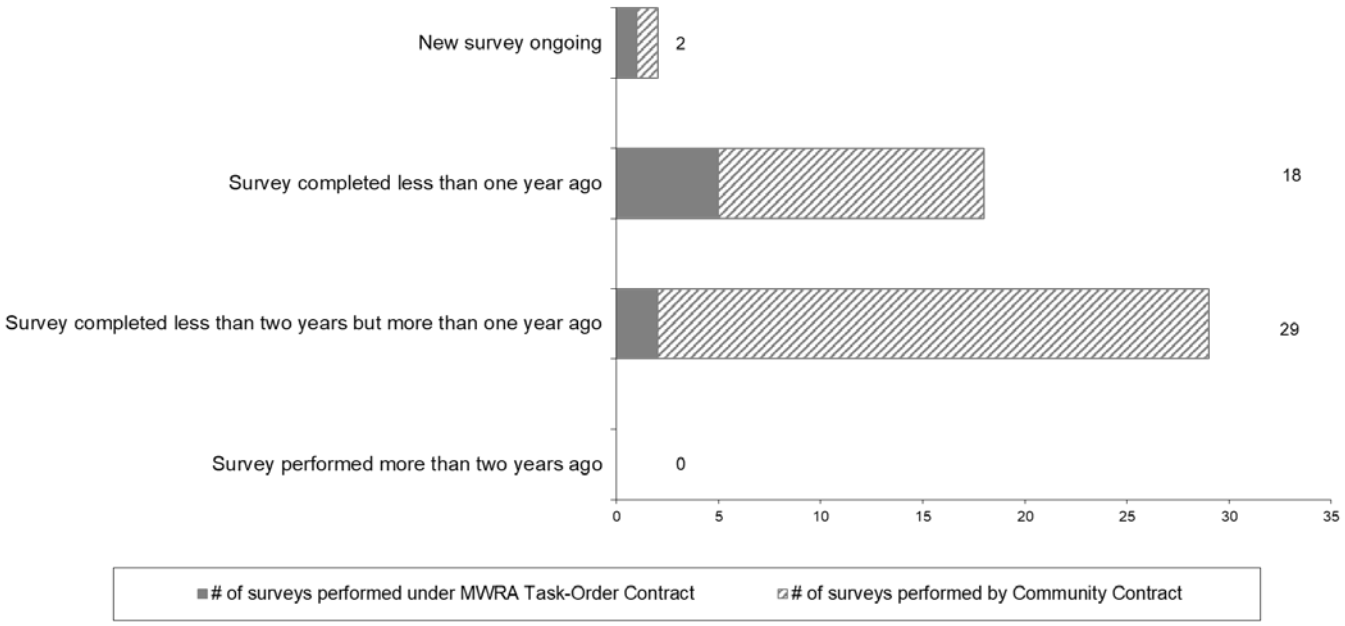


Community Support Programs

2nd Quarter – FY21

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA's task order leak detection contract. MWRA's task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 2nd Quarter of FY21, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

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

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	50,616	18,526			69,142
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	416	576			992
Toilet Leak Detection Dye Tablets	_____	864	279			1,143

BUSINESS SERVICES

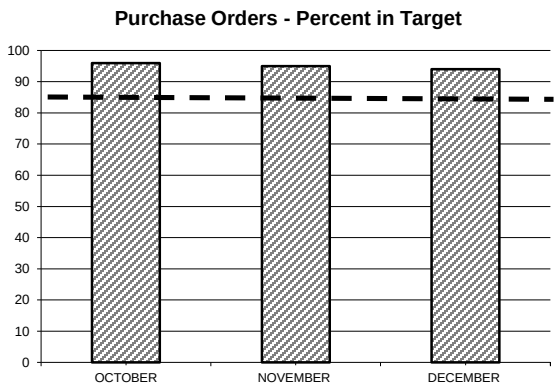
Procurement: Purchasing and Contracts

2nd Quarter - FY21

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

Outcome: Processed 94% of purchase orders within target; Average Processing Time was 4.30 days vs. 4.42 days in Qtr 2 of FY20. Processed 59% (10 of 17) of contracts within target timeframes; Average Processing Time was 183 days vs. 116 days in Qtr 2 of FY20.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	678	3 DAYS	92.1%
$500 - $2K	678	7 DAYS	97.0%
$2K - $5K	433	10 DAYS	96.9%
$5K - $10K	65	25 DAYS	83.0%
$10K - $25K	47	30 DAYS	81.2%
$25K - $50K	11	60 DAYS	81.8%
Over $50K	21	90 DAYS	90.4%

The Purchasing Unit processed 1933 purchase orders, 31 more than the 1902 processed in Qtr 2 of FY20 for a total value of $10,379,019 versus a dollar value of $10,770,038 in Qtr 2 of FY20.

The purchase order processing target was not met for the $5K-$10K category due to sourcing requirements and end user evaluations; the $10K-$25K category due to end user evaluations and the $25K-$50K due to end user evaluations and staff summary requirements.

Contracts, Change Orders and Amendments

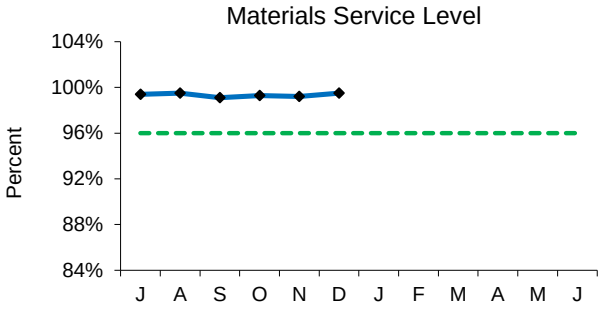
Procurement processed seventeen contracts with a value of $46,987,732 and seven amendments with a value of $453,365. Twenty five change orders were executed during the period. The dollar value of all non-credit change orders during Qtr 2 was $32,396,667 and the value of credit change orders was ($1,597,165).

Seven contracts were not processed within the target timeframes. One contract was delayed due to delays in finalizing the scope and delays in obtaining signatures from the consultant for E-tables. Another contract was delayed due to changes in the scope resulting in new specifications being added to the bid document for additional work as well as to account for new Covid-19 health and safety standards and guidelines. Several contracts were delayed due to revisions to specifications to account for new Covid-19 health and safety standards and guidelines. A fifth contract was delayed due to the need to add a Covid-19 related allowance, in addition to clarifying the Covid-19 health and safety specifications. This resulted in the need to re-bid the project. Another contract was delayed due to COVID-19 closures and the transition from a paper based procurement process to the Supplier Portal. The final contract was delayed due to the need to obtain corrected compensation tables in addition to delays due to the prioritization of staff assignments.

Staff reviewed 53 proposed change orders and 34 draft change orders.

Materials Management

2nd Quarter - FY21



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 8,647 (99.3%) of the 8,708 items requested in Q2 from the inventory locations for a total dollar value of $1,601,726.

Inventory Value - All Sites

Inventory goals focus on:

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

The FY21 goal is to reduce consumable inventory from the July '20 base level ($8.8 million) by 2.0% (approximately $176,369), to $8.6 million by June 30, 2021 (see chart below).

Items added to inventory this quarter include:

- Deer Island – pressure switches, flowmeters, solenoid valves, air regulators, gaskets and filter elements for I&C; LED wall mount fixtures, sheaves, butterfly valves, sump pump, brackets and starter motors for Maintenance; air filters, fuel additive and snow blow edges for Fleet Services; chemical gloves for Safety; disinfecting wipes and masks for Pandemic.
- Chelsea – circuit breakers and lugs for Electrical; face masks and sanitizer for Pandemic; expandable bars and support braces for Metering; toner cartridges for Security; air cabin filters and disinfectant for Fleet Service; air filters for HVAC.
- Southboro – disinfectant wipes for Pandemic; gas probes probe repair kits for Safety; sump pumps for Mechanical.

Property Pass Program:

- Seven audits were conducted during Q2.
- Scrap revenue received for Q2 amounted to $18,756. Year to date revenue received amounted to $30,247.
- Revenue received from online auctions held during Q1 amounted to $79,046. Year to date revenue received amounted to $145,463.

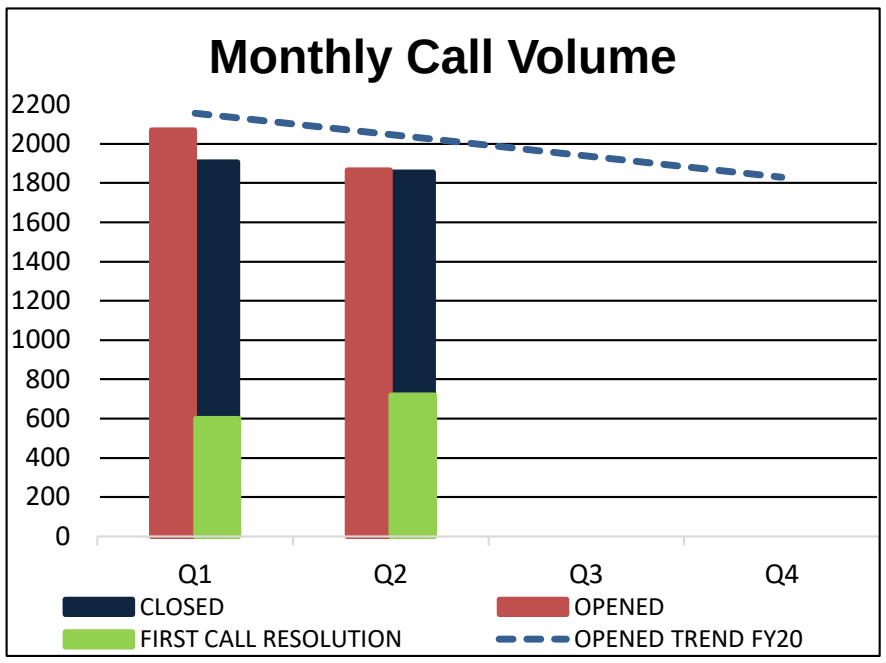
Items	Base Value July-20	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,818,459	8,862,865	44,406
Spare Parts Inventory Value	8,797,946	9,394,946	597,000
Total Inventory Value	17,616,405	18,257,811	641,406

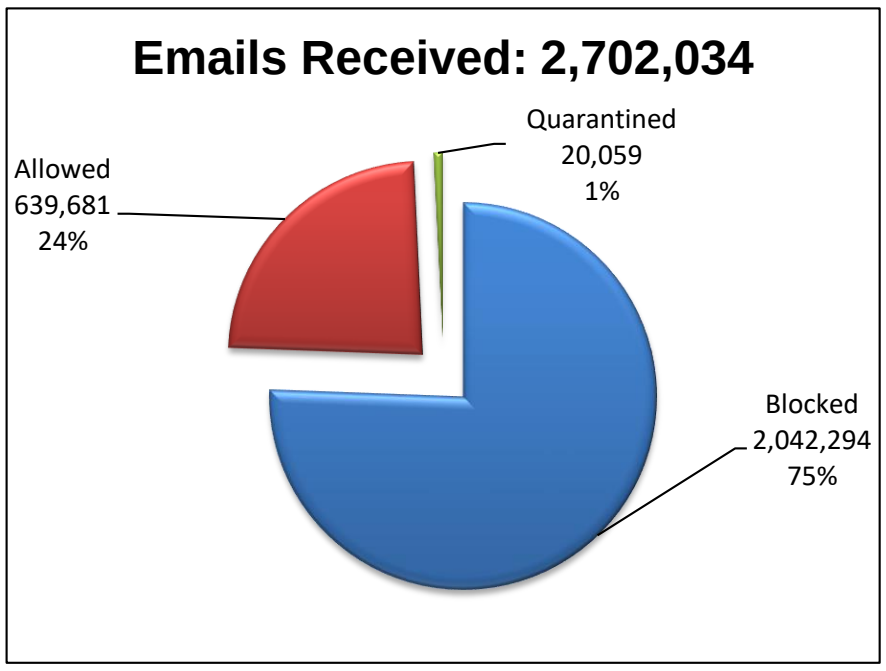
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

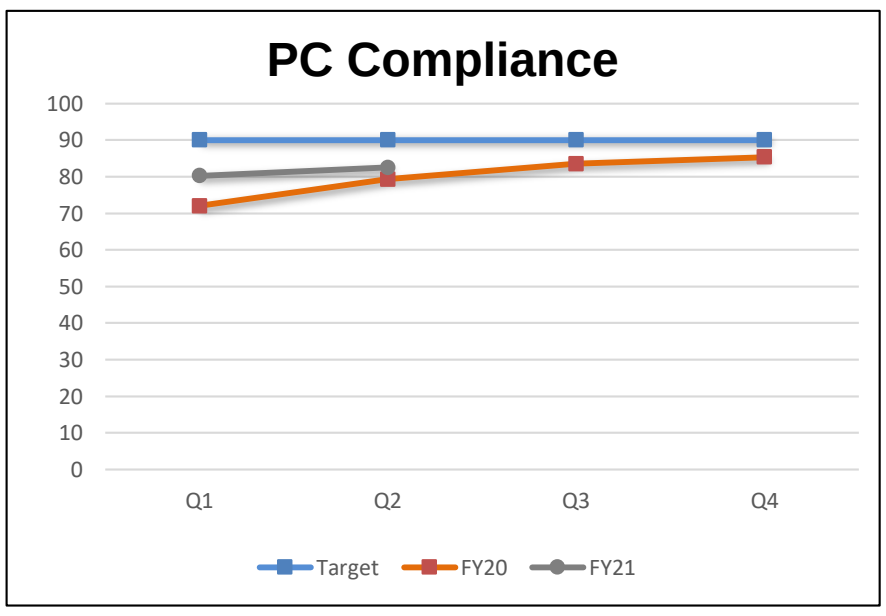
MIS Program

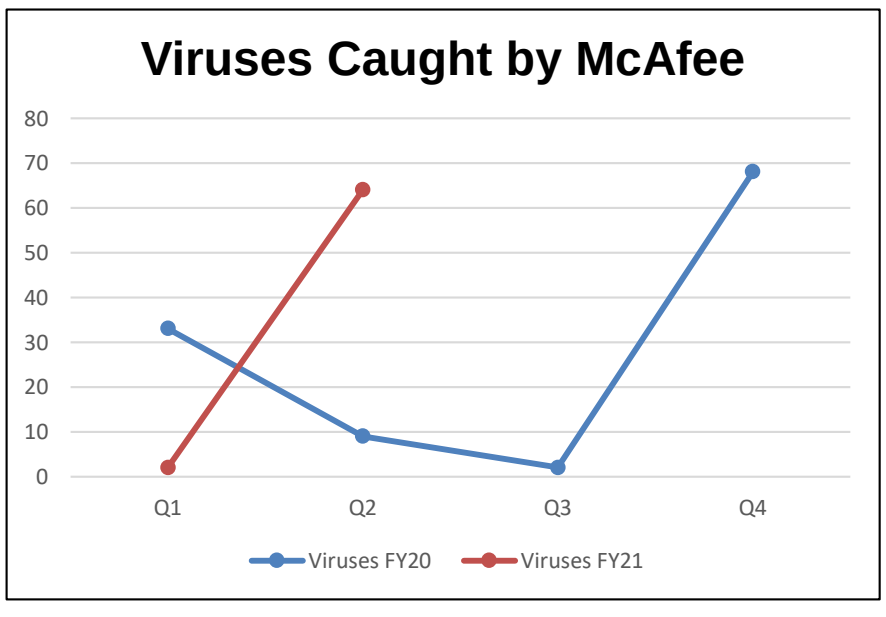
Second Quarter – FY21

Numbers & Statistics









Project Updates

Infrastructure & Security

AWIA Risk and Resiliency Assessment: Remediation work continued this quarter to resolve any identified vulnerabilities from the AWIA RRA; at the end of the quarter, 60% of the identified tasks were "Completed"; 19% were "In Progress"; and 21% were identified as longer term projects.

Audio Visual Upgrades: Completed all upgrades.

PBX (Telephone System) Upgrade: Scope of work and required services for the project continue to be refined and rewritten for reposting

Cyber Security: The following was completed in Q2:

- Final testing of the security improvements for passwords was completed, implementation scheduled for Q3.
- Rollout of multi-factor authentication (MFA) to teleworkers continued on schedule, to be completed in Q3.
- Cyber Security raining began in Dec. with a new provider, Proofpoint. At the end of the quarter 25% of 900+ employees had started or completed their assignments.

Maximo, Lawson & PI

Infor Lawson Upgrade: Upgrade to Infor v11 and associated modules only available as a Saas option. MIS is in the process rewriting the SOW to include these new requirements.

Maximo-PI Interface: Interface testing was successful. Source code ready for production.

PI – Buoy 5: Vendor DLL is working on resolution of identified issues regarding the successful processing of PI Buoy5 data.

Other Software & Custom Applications

ECM/Electronic Document Management: Completed final bidder demonstrations and selection committee scoring. Staff Summary completed and received Board of Directors approval in December meeting.

COVID Self-Certification: Refined a prototype of a COVID Self Certification web form based on the MWRAs paper form. Explored phone call-in service options as a partial solution for staff without smartphones or external web access. Began User Acceptance testing of the prototype and procurement of the phone system

Visitor Management Application: Server built, technical and business requirements identified and documented. Anticipated installation in February.

Learning Management System (LMS): Set up accounts in Test, Dev, and Training environments. Statement of Work (SOW) draft under review.

Discoverer to SAP-BO: MWRA met with vendor to provide feedback on 2 of 5 reports that have been completed.

Library, Record Center, & Training

Library: Supported 120 support requests for research assistance and resources including books, articles, and standards. Research topics included: Wachusett Dam Promenade historical data, grant funding for infrastructure projects, historic standards for internal audit, digital access for employees working from home (periodicals, books, etc.), and international wastewater utilities management of natural disasters.

Record Center (RC): Completed its relocation of all boxes and drawings, to our new location in Walpole MA. Ongoing services included adding 66 new boxes and analyzed or transferred 120 total boxes. The RC manager attended 2 virtual RCB meetings. The RC shredded on site, Nine - 65gallon bins of confidential documentation.

Training: In Q2, 10 online IT lessons were taken (17 YTD), by 6 employees (12 YTD), spanning 22 hours (33 YTD). Online Training LinkedIn Learning licenses were upgrade for enterprise-wide access for all classes. Created job aids on the following topics: how to add users to Linked In, How to switch from a free Webex account to a paid one, and how to download and install Webex Teams.

Legal Matters

2nd Quarter - FY21

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits**: Reviewed eighty-eight (88) 8(m) permits.

- **Real Property:** Reviewed City of Boston and Commonwealth water takings and deeds for properties adjacent to a portion of the Sudbury Aqueduct property interest that runs behind 701 Beacon Street, 693 Beacon Street, and 251 Grant Avenue in Newton between Grant Avenue and Dalton Road and reviewed and revised notification letter notifying abutters of MWRA's survey work in that portion of the Sudbury Aqueduct. Reviewed and revised permit template for the installation, operation, and maintenance of wireless equipment by public entities at MWRA's Turkey Hill water tank facility in Arlington and reviewed changes to AT&T's permit for the placement of wireless equipment on MWRA's Walnut Hill water tank facility in Lexington. Prepared four draft notice of offers related to the acquisition of proposed temporary easements for MWRA Contract 7540/7541 – Water Sections 50/57 Rehabilitation - Medford. Reviewed property rights for sewer section 6 in Winthrop and sewer section 7 in East Boston near Belle Isle related to the Mary Ellen Welch Greenway Extension. Reviewed MWRA's property rights for Deer Island. Revised documents related to Alta Langwood's release of easements and reduction of easement burdening MWRA's Spot Pond Covered Storage Parcel in Stoneham, MA. Reviewed and revised denial of 8(m) permit application for 251 Grant Avenue seeking to perform construction in Sudbury Aqueduct property interest and denial of JKB Inc.'s (Auto Bright car wash in Framingham) request for reduction of its fee for 8(m) permit 2185. Revised draft legislation for the release of certain easements burdening 777 Dedham Street in Canton. Summarized MWRA's right of first refusal in the Chelsea lease. Recorded Certificate of Compliance for Order of Conditions 297-0383 at Middlesex South Registry of Deeds related to MWRA Contract No. 7067 in Stoneham.

- **Sewer Connection Agreement**: Reviewed sewer connection agreement between MWRA and Parrish Family, LLC/Crescent Ridge Dairy, Inc., which is located in the Town of Sharon, allowing for Parrish Family, LLC/Crescent Ridge Dairy, Inc.'s sewer connection to the Town of Stoughton's sewer system.

- **Environmental**: Advised on blending notification letter to regulators and DOJ related to a dry weather-blending event on October 19, 2020. Drafted memoranda related to two (2) separate U.S. First Circuit Court of Appeals' decisions relative to appeals of nitrogen limits in NPDES permits issued in Massachusetts.

- **Legislation**: Reviewed and drafted memoranda on sections 46, 47, 68, 75, 76, 77, 78, 79 and 92 of Governor Baker’s revised budget.

- **Public Records Requests:** During the second quarter of FY 2021, MWRA received and responded to one hundred thirty seven (137) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

One demand for arbitration was filed.

A charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of his age and retaliation when he was not selected for a position.

Matters Concluded

The Massachusetts Department of Labor Relations dismissed a charge of prohibited practice alleging the MWRA violated Chapter 150E when it unilaterally began deductions for paid medical and family leave under Chapter 175M without bargaining to impasse. (MWRA and MOSES: SUP-20-8101 - Paid Medical Family Leave Act)

Decision in favor of former employee who did not timely renew her employment authorization card in an appeal of the denial of unemployment benefits at the Department of Unemployment Assistance. (DUA – Mate)

LITIGATION/CLAIMS

New lawsuits/claims: There are no new lawsuits or claims to report.

Significant Developments

MWRA v. NEL Corp., Dewberry, et al., C.A. No. 18-CV 01156-BLS1
The parties continue to take the depositions of various witnesses involved in the dispute.

MWRA v. Bharat Bhushan, et al., C.A. No. 19-CV-03586
On November 4, 2020, the defendants filed their answer to MWRA's complaint.

(Former Employee) v. MWRA, C.A. No. 19-CV-01847:
The Court extended tracking order deadlines.

Closed Cases:

J. D'Amico, Inc. v. MWRA v. Green International Assoc. Inc., C.A. No. 17-CV-04097
A Stipulation of Dismissal was filed with the Suffolk Superior Court on November 25, 2020.

Closed Claims: There are no closed claims to report.

Subpoenas During the Second Quarter of FY 2021, no subpoenas were received and no subpoenas were pending at the end of the Second Quarter FY 2021.

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 Dec 2020	As of Sept 2020	As of June 2020
Construction/Contract/Bid Protest (other than BHP)	1	2	2
Tort/Labor/Employment	3	3	3
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
Total	**6**	**7**	**7**
Other Litigation matters (restraining orders, etc.)	2	2	2
Total – all pending lawsuits	**8**	**9**	**9**
Claims not in suit:	0	0	0
Bankruptcy	1	1	1
Wage Garnishment	2	2	2
TRAC/Adjudicatory Appeals	0	0	0
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	**11**	**12**	**12**

TRAC/MISC.

New Appeals: There are no new appeals in the 2nd Quarter FY 2021.

Settlement by Agreement of Parties There are no Settlement by Agreement of Parties in the 2nd Quarter FY 2021.

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

Notice of Dismissal Fine paid in full No Notices of Dismissal, Fine Paid in Full.

Tentative Decision There are no Tentative Decisions issued in the 2nd Quarter FY 2021.

Final Decisions There are no Final Decisions issued in the 2nd Quarter FY 2021.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
2nd Quarter - FY21

Highlights

During the 2nd quarter FY21, Internal Audit (IA) completed the review of costs incurred on the new cross-harbor cable and the proposed revenue requirements with Harbor Electric Energy Company (HEEC), following various adjustments to costs and the revenue requirements. A review was conducted on the revenues earned by the Operator of the railroad and the share of revenues paid to Fore River Railroad Corporation, as well as verifying maintenance expenses. Support was provide for the pricing for the pellet plant contract extension and the amendment has been executed.

IA also completed preliminary reviews of 3 professional service contracts and 3 preliminary labor burden reviews. Support to staff continues on the Return to Work Guidance and internal reviews of overhead crane inspections and safety training is progressing.

Status of Recommendations

During FY21, 8 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 Process Review (6/30/18)	1	4	5
Fuel Use & Mileage Tracking (12/31/18)	3	5	8
Asset Tracking – Fleet Data Verification (8/21/19)	2	14	16
Fleet Services Non-Plated Equipment Inspections (3/30/20)	9	6	15
Total Recommendations	*15*	*29*	*44*

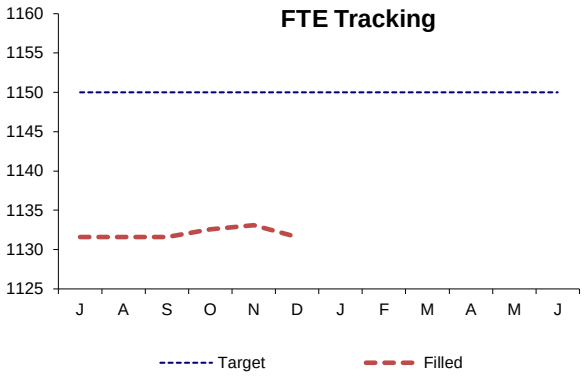
Cost Savings

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

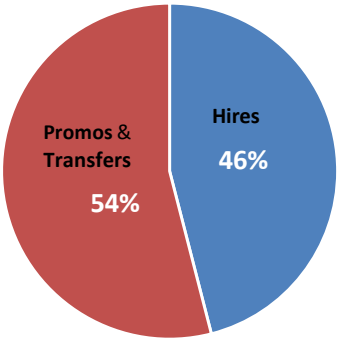
Cost Savings	FY17	FY18	FY19	FY20	FY21 Q2	TOTALS
Consultants	$272,431	$118,782	$262,384	$643,845	$200,255	$1,497,697
Contractors & Vendors	$3,037,712	$1,323,156	$3,152,884	$2,097,729	$1,441,495	$11,052,976
Internal Audits	$224,178	$204,202	$210,063	$212,517	$105,884	$956,844
Total	**$3,534,321**	**$1,646,140**	**$3,625,331**	**$2,954,091**	**$1,747,634**	**$13,507,517**

OTHER MANAGEMENT

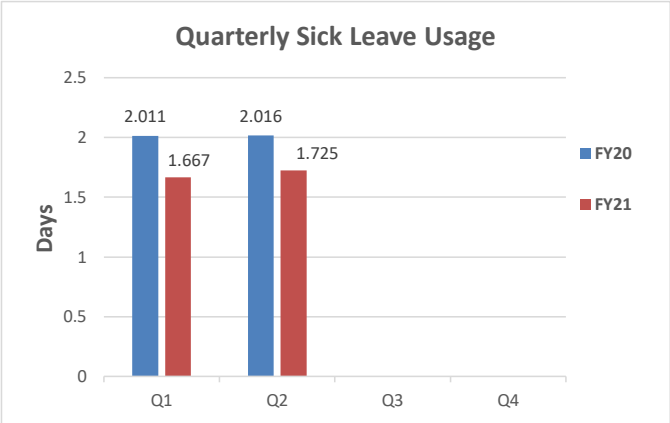
Workforce Management
2nd Quarter - FY21



FY21 Target for FTE's = 1150
FTE's as of December 2020 = 1131.6
Tunnel Redundancy as of Dec 2020 = 7.0



	Pr/Trns	Hires	Total
FY19	112 (60%)	76 (40%)	188
FY20	84 (59%)	58 (41%)	142
FY21	37 (54%)	32 (46%)	69

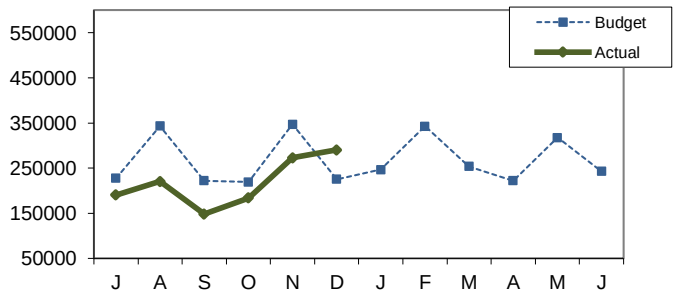


Sick leave usage in 2nd Quarter of FY21 is lower than usage in the 2nd Quarter of FY20.

	Number of Employees	YTD (usage to date)	Annualized Total	Annual FMLA %	FY20
Admin	138	2.43	4.87	20.7%	6.48
Aff. Action	6	1.97	3.94	0.0%	6.42
Executive	4	1.30	2.60	0.0%	1.81
Finance	34	1.78	3.56	0.0%	4.09
Internal Audit	6	0.23	0.47	0.0%	5.08
Law	14	3.09	6.18	16.7%	6.71
OEP	4	0.50	1.00	0.0%	1.00
Operations	926	3.70	7.40	24.8%	7.27
Tunnel Redundancy	7	0.94	1.88	0.0%	4.93
Public Affairs	11	0.54	1.08	0.0%	7.96
MWRA Avg	**1150**	**3.39**	**6.78**	**23.8%**	**6.94**

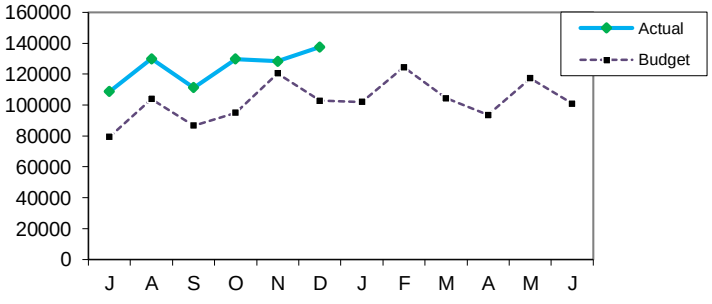
Percent of sick leave usage for FY21 attributable to Family and Medical Leave Act (FMLA) is 23.8%

Field Operations
Current Month Overtime $



Total Overtime for Field Operations for the second quarter of FY21 was $779k which is ($45k) under budget. Emergency overtime was $351k, which is ($59k) under budget. Rain events totaled $240k, Emergency Maintenance was $40k and Snow Removal was $28k. Coverage overtime was $157k which is $17k over budget, reflecting the month's shift coverage requirements. Planned overtime was $225k or ($4k) under budget with combined spending of $103k for Maintenance, $50k for Half Plant and $48k for Planned Ops.

Deer Island Treatment Plant
Current Month Overtime $

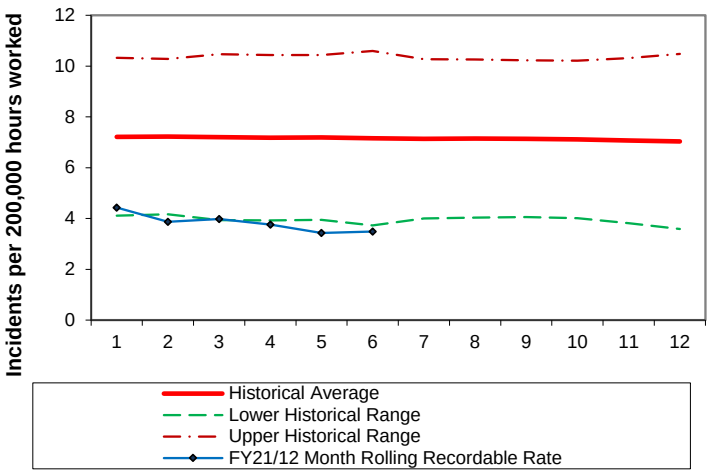


Deer Island's total overtime expenditure second quarter was $396K, which was $77K or 24.3% over budget. In the second quarter, Deer Island experienced higher than anticipated storm coverage of $32K, shift coverage of $23K and planned/unplanned overtime of $23K. YTD Deer Island's overtime spending is $746K, which is $157K or 26.7% over budget due to higher than anticipated shift coverage of $92K, planned/unplanned overtime of $37K, and storm coverage of $28K. During October, Eversource conducted 4 days of annual maintenance on the HEEC cable which accounted for $27K of the overspending for the year. COVID-19 OT has accounted for $17K for the year.

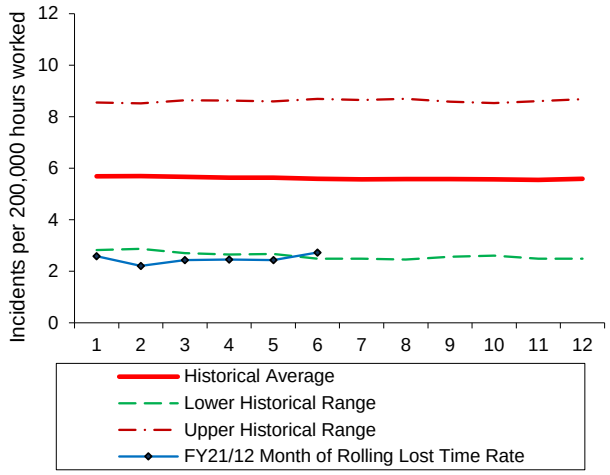
Workplace Safety

2nd Quarter - FY21

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 FY21. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.

4 With Changes in state law, in February 1, 2019, MWRA began record keeping and reporting according to Federal OSHA standards for injury and illness record keeping. Strictly adhering to the federal OSHA reporting regulation has caused an increase in recorded injuries and illnesses. This increase is causing both the Recordable injury and illness Rate and the Lost TIme Injury and Illness rate to trend higher than in past years but does not necessarily mean there is an increase in injuries or illnesses. OSHA injuries and illnesses, and lost time are recorded differently than the Massachusetts Workers' Compensation standards and could result in an increase in the OSHA rate while the Workers' Compensation claims are decreasing. Over time, the rise on the charts should stabilize as new data replaces the older data..

WORKERS COMPENSATION HIGHLIGHTS

	2nd Quarter Information		
	New	Closed	Open Claims
Lost Time	8	7	56
Medical Only	14	11	20
Report Only	17	17	
	QYTD		FYTD
Regular Duty Returns	3		7
Light Duty Returns	0		0
Indeminity payments as of Decembe 31 2020 included in open claims listed			21

COMMENTS:

Regular Duty Returns

OCT	1	Employees returned to full duty/no restrictions
NOV	0	Employees returned to full duty/no restrictions
DEC	2	Employees returned to full duty/no restrictions

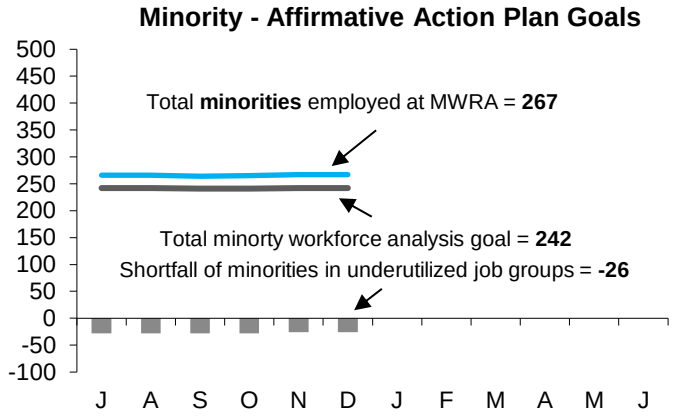
Light Duty Returns

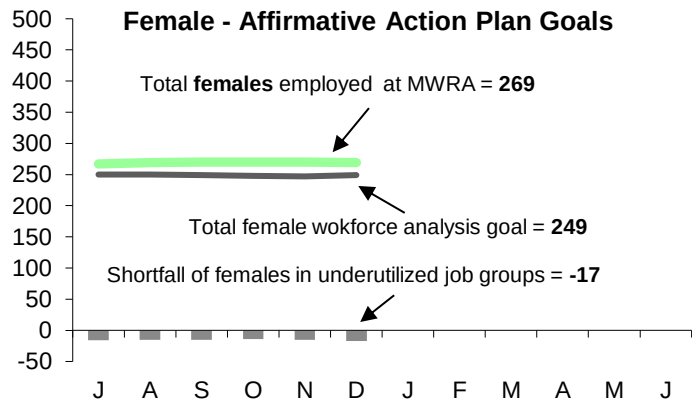
OCT-NOV-DEC-->N/A

Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would only count the claim as opened but not as a new claim. *Report only claims are closed the month they are filed.

MWRA Job Group Representation

2nd Quarter - FY21





Highlights:

At the end of Q2 FY21, 6 job groups or a total of 26 positions are underutilized by minorities as compared to 6 job groups for a total of 32 positions at the end of Q2 FY20; for females 6 job groups or a total of 17 positions are underutilized by females as compared to 7 job groups or a total of 25 positions at the end of Q2 FY20. During Q2, 5 minority and 2 females were hired. During this same period 1

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 12/31/2020	Minorities as of 12/31/2020	Achievement Level	Minority Over or Under Underutilized	Females As of 12/31/2020	Achievement Level	Female Over or Under Underutilized
Administrator A	23	3	3	0	12	6	6
Administrator B	22	0	6	-6	6	6	0
Clerical A	30	11	6	5	27	22	5
Clerical B	24	8	7	1	4	7	-3
Engineer A	85	24	19	5	20	19	1
Engineer B	61	21	16	5	14	10	4
Craft A	114	15	23	-8	0	4	-4
Craft B	143	23	24	-1	3	5	-2
Laborer	73	22	17	5	5	3	2
Management A	93	22	23	-1	33	32	1
Management B	41	10	5	5	9	9	0
Operator A	64	4	13	-9	2	4	-2
Operator B	71	21	11	10	3	1	2
Professional A	31	4	5	-1	21	13	8
Professional B	167	48	41	7	81	74	7
Para Professional	48	15	12	3	22	27	-5
Technical A	55	14	10	4	7	6	1
Technical B	5	2	1	1	0	1	-1
Total	**1150**	**267**	**242**	**51/-26**	**269**	**249**	**37/-17**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Engineer A	Sr. Civil Engineer	1	Int/Ext	1	0	Promo = WM
Engineer A	District Supervisor	1	Int.	1	0	Promo = WM
Engineer A	Program Manager, Ops Engineering	1	Int.	1	0	Promo = WM
Engineer A	Enviromental Manager	1	Int/Ext	0	0	NH = WM
Engineer A	Manager, Western Maintenance	1	Int/Ext	0	0	NH = WM
Craft A	Electrical Operations Supervisor	1	Int.	1	0	Promo = WM
Craft A	Unit Supervisor, Mech Cert	1	Int.	1	0	Promo = WM
Craft A	M & O Specialist	3	Int/Ext	1	0	NH = (1WM) (1HM) Promo = WM
Craft B	Electrician	1	Ext.	0	0	NH = BM
Management B	Area Manager	1	Int.	1	0	Promo = WM
Management B	Shift Operations Manager	1	Int.	1	0	Promo = BM
ParaProfessional	Planning/Scheduling Coord.	1	Int.	1	0	Promo = WM
Professional A	Sr. Contract Administrator	2	Int.	2	0	Promo = (1TF) (1WF)
Professional A	Sr. Staff Counsel	1	Ext.	0	0	NH = WF
Technical B	Field Inspector, Water/Wastewater	1	Int.	1	0	Promo = WM

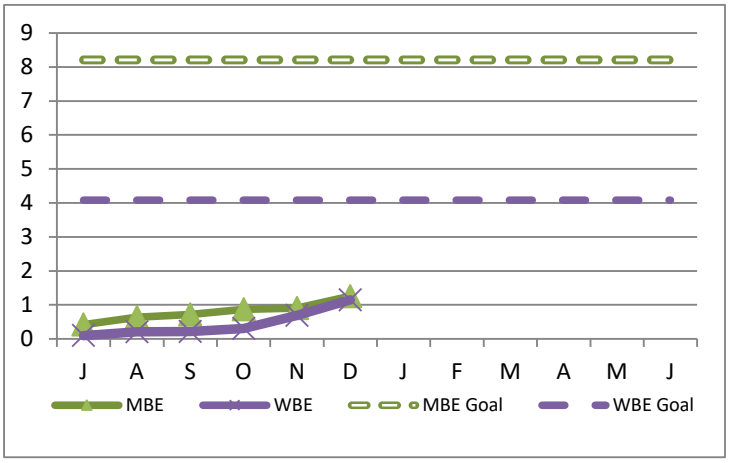
MBE/WBE Expenditures

2nd Quarter - FY21

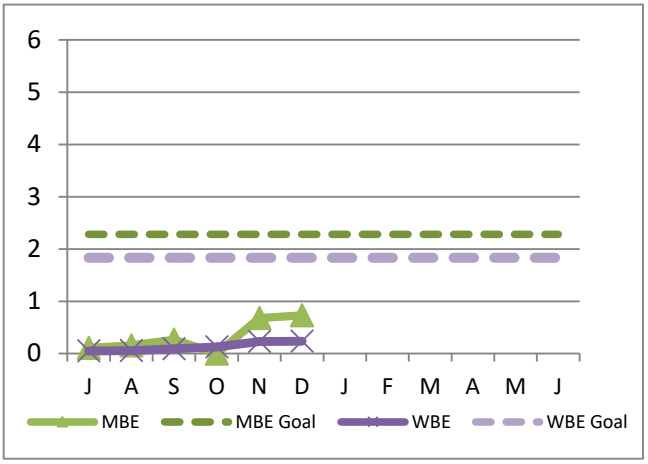
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY21 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

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

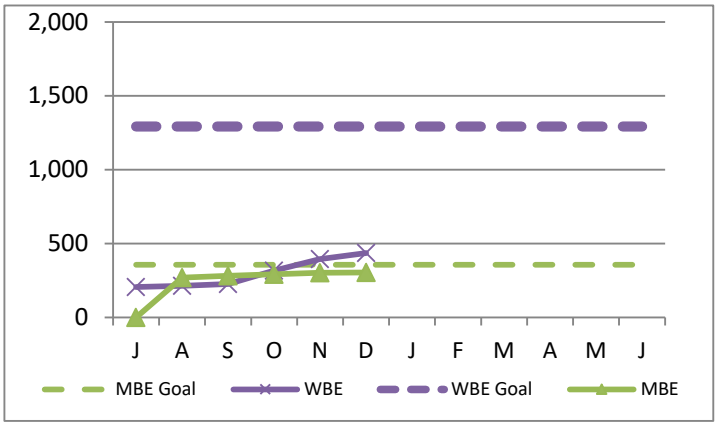
Construction



Professional Services



Goods/Services



FY21 spending and percentage of goals achieved, as well as FY20 performance are as follows:

MBE					WBE			
FY21 YTD		FY20			FY21 YTD		FY20	
Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
1,256,111	15.3%	3,641,145	45.6%	Construction	1,148,908	28.1%	2,446,388	61.7%
730,769	32.1%	2,322,007	111.9%	Prof Svcs	234,697	12.8%	942,850	56.6%
304,315	85.3%	340,656	94.1%	Goods/Svcs	435,872	33.7%	993,375	81.3%
2,291,195	21.1%	6,303,808	60.5%	**Totals**	1,819,477	25.2%	4,382,613	63.9%

FY21 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY21 CEB Expenses
2nd Quarter – FY21

As of December 2020, total expenses are $365.8 million, $5.5 million or 1.5% lower than budget, and total revenue is $396.9 million, $311k over budget, for a net variance of $5.8 million.

Expenses –

Direct Expenses are $115.7 million, $6.8 million or 5.5% under budget.

- **Wages & Salaries** are under budget by $2.1 million or 3.9%. Regular pay is also $2.1 million under budget, due to lower head count, and timing of backfilling positions. YTD through December, the average Full Time Equivalent (FTE) positions was 1,139, twenty-four fewer than the 1,163 FTE's budgeted.
- **Other Services** expenses are $1.4 million under budget or 10.8%, primarily due to under spending for Sludge Pelletization of $809k due to lower YTD quantities, Membership/Dues of $441k, Telecommunication expenses of $126k, and Grit Screen Removal of $107k due to lower YTD quantities.
- **Professional Services** expenses are $1.3 million under budget or 27.7%, primarily due to under spending for Computer Systems Consultants of $999k due to timing of several MIS projects, Engineering services of $357k, and Other services of $171k, partially offset by overspending on Lab Testing and Analysis of $394k due to the Biobot engagement.
- **Utilities** expenses are $717k under budget or 6.4%, primarily due to under spending for Electricity of $676k of which $346k is from Deer Island and $206k is from Water Operations, both due to favorable pricing and lower demand. Lower flows at Deer Island contributed to lower electricity demand. Water Operations is under budget primarily due to lower rates and quantity.
- **Fridge Benefits** expenses are $495k under budget or 4.5%, primarily due to lower headcount.
- **Workers Compensation** expenses are $252k under budget or 20.3%, primarily due to under spending for Compensation Payments of $108k and Medical Payments of $96k. Lower payments reflect fewer accidents and reduced severity of those accidents.
- **Overtime e**xpenses are $212k under budget or 8.6%, primarily due to reduced maintenance that require overtime at Metro Maintenance.

Indirect Expenses are $27.8 million, $1.3 million over budget or 4.8%, as revised costs for the new HEEC Cable associated with FY20 were recognized in November. The HEEC cable costs totaled $6.7 million through December, $3.1 million above budget. The HEEC adjustment was partially offset by Pension Expense which was $1.0 million under budget and Watershed Reimbursements which were $908k under budget reflecting lower operating costs. The pension contribution requirement was revised in response to the most recent actuarial valuation report's funding schedule which reduced pension expense by $1.0 million for FY21.

Debt Service Expenses totaled $222.3 million, matching budget after the transfer of $5.6 million to the Defeasance account, driven by lower than budgeted variable interest expense of $4.4 million due to lower interest rates and lower SRF spending of $1.5 million as a result of timing offset by higher senior debt costs.

Revenue and Income –

Total Revenue and Income is $396.9 million, or $311k over budget. Other Revenue of $5.1 million was over budget by $704k, reflecting higher energy revenue of $397k, miscellaneous revenue of $141k, and gains on disposal of equipment of $134k. This revenue gain was reduced by lower investment income. Investment income totaled $2.0 million, $467k under budget due to lower than budgeted interest rates (0.49% vs 0.73%) partially offset by higher than budgeted average balances.

	Dec 2020 Year-to-Date			
	Period 6 YTD Budget	Period 6 YTD Actual	Period 6 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 53,107,118	$ 51,040,469	$ (2,066,649)	-3.9%
OVERTIME	2,471,356	2,259,223	(212,133)	-8.6%
FRINGE BENEFITS	10,989,455	10,494,543	(494,912)	-4.5%
WORKERS' COMPENSATION	1,238,328	986,384	(251,944)	-20.3%
CHEMICALS	6,522,577	6,429,737	(92,840)	-1.4%
ENERGY AND UTILITIES	11,166,128	10,449,156	(716,972)	-6.4%
MAINTENANCE	16,837,460	16,791,999	(45,461)	-0.3%
TRAINING AND MEETINGS	187,537	54,399	(133,138)	-71.0%
PROFESSIONAL SERVICES	4,653,955	3,366,464	(1,287,491)	-27.7%
OTHER MATERIALS	2,514,579	2,439,916	(74,663)	-3.0%
OTHER SERVICES	12,810,536	11,426,460	(1,384,076)	-10.8%
TOTAL DIRECT EXPENSES	**$ 122,499,029**	**$ 115,738,750**	$ (6,760,277)	**-5.5%**
INSURANCE	$ 1,529,609	$ 1,621,631	$ 92,022	6.0%
WATERSHED/PILOT	8,633,052	7,725,035	(908,017)	-10.5%
HEEC PAYMENT	3,607,600	6,707,587	3,099,987	85.9%
MITIGATION	846,172	826,029	(20,143)	-2.4%
ADDITIONS TO RESERVES	907,539	907,539	-	0.0%
RETIREMENT FUND	11,000,000	10,000,000	(1,000,000)	-9.1%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	**$ 26,523,972**	**$ 27,787,821**	$ 1,263,849	**4.8%**
STATE REVOLVING FUND	$ 45,479,580	$ 44,023,509	$ (1,456,071)	-3.2%
SENIOR DEBT	125,843,307	126,119,680	276,373	0.2%
DEBT SERVICE ASSISTANCE	-	-	-	---
CURRENT REVENUE/CAPITAL	-	-	-	---
SUBORDINATE MWRA DEBT	49,366,018	49,366,018	-	0.0%
LOCAL WATER PIPELINE CP	-	-	-	---
CAPITAL LEASE	1,608,530	1,608,530	-	0.0%
VARIABLE DEBT	-	(4,444,119)	(4,444,119)	---
DEFEASANCE ACCOUNT	-	5,623,817	5,623,817	---
DEBT PREPAYMENT	-	-	-	---
TOTAL DEBT SERVICE	**$ 222,297,436**	**$ 222,297,436**	$ -	**0.0%**
TOTAL EXPENSES	**$ 371,320,437**	**$ 365,824,007**	$ (5,496,428)	**-1.5%**
REVENUE & INCOME				
RATE REVENUE	$ 384,692,500	$ 384,692,500	$ -	0.0%
OTHER USER CHARGES	4,289,930	4,362,778	72,848	1.7%
OTHER REVENUE	4,374,380	5,078,802	704,422	16.1%
RATE STABILIZATION	750,000	750,000	-	0.0%
INVESTMENT INCOME	2,492,027	2,025,454	(466,573)	-18.7%
TOTAL REVENUE & INCOME	**$ 396,598,837**	**$ 396,909,534**	$ 310,697	**0.1%**

Cost of Debt
2nd Quarter – FY21

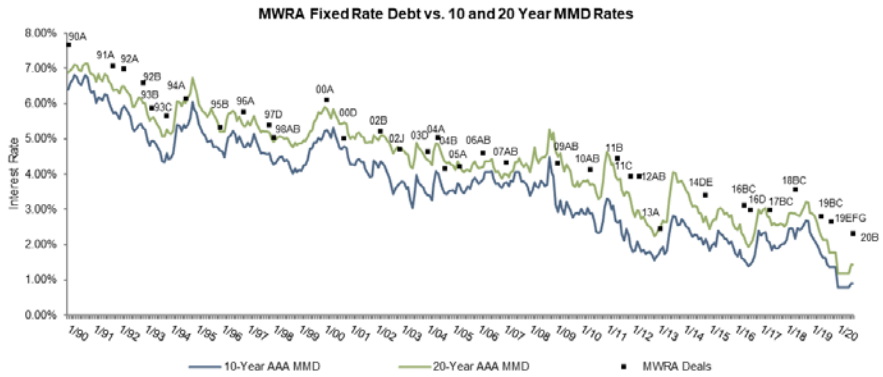
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt ($3.44 billion)	3.38%
Variable Debt ($330.7million)	0.52%
SRF Debt ($852.2 million)	1.57%
Weighted Average Debt Cost ($4.63 billion)	2.84%

Most Recent Senior Fixed Debt Issue
August 2020

2020 Series B ($160.0 million) 2.33 %

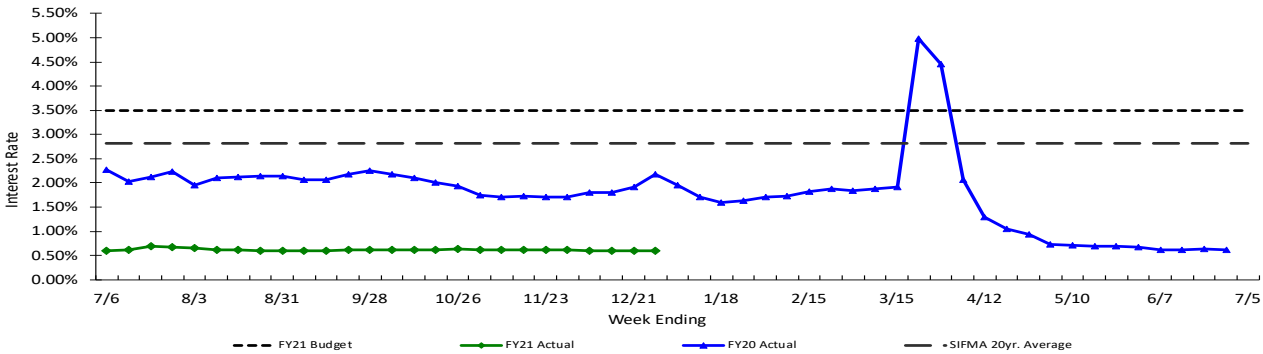


Bond Deal	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB	2007AB
Rate	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%
Avg Life	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs	24.4 yrs

Bond Deal	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG	2020B
Rate	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%	2.82%	2.66%	2.33%
Avg Life	15.4 yrs	16.4 yrs	18.8 yrs	16.5 yrs	17.9 yrs	9.9 yrs	15.1 yrs	17.4 yrs	18.8yrs	11.2 yrs	11.7yrs	11.9yrs	9.73 yrs.	15.6 yrs

Weekly Average Variable Interest Rates vs. Budget

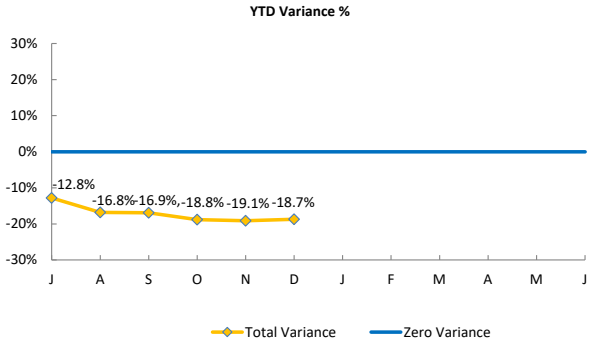
MWRA currently has ten variable rate debt issues with $596.6 million outstanding, excluding commercial paper. Of the ten outstanding series, four have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In December, SIFMA rate ranged from a high of 0.10% to a low of 0.09% 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.



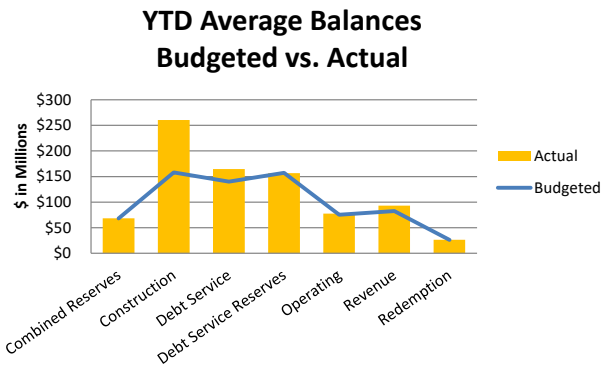
Investment Income

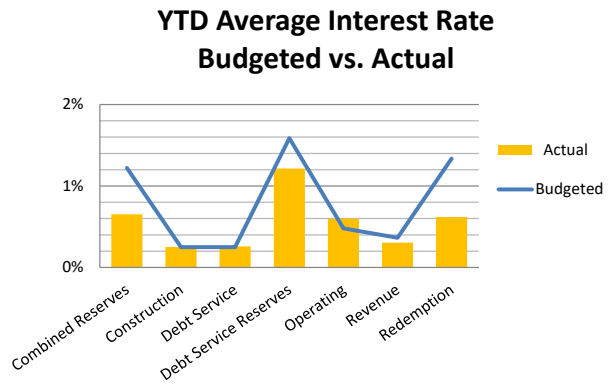
2nd Quarter – FY21

Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$1	($190)	(189)	-46.4%
Construction	$126	($26)	99	51.3%
Debt Service	$30	$8	38	22.1%
Debt Service Reserves	($3)	($285)	(288)	-23.6%
Operating	$6	($31)	(25)	-14.2%
Revenue	$20	($28)	(9)	-5.9%
Redemption	$1	($93)	(93)	-53.6%
Total Variance	$180	($646)	($467)	-18.7%





Monthly