MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Third Quarter FY2020

Q1	Q2	Q3	Q4
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Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
May 27, 2020

Board of Directors Report on Key Indicators of MWRA Performance

3rd Quarter FY20

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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.

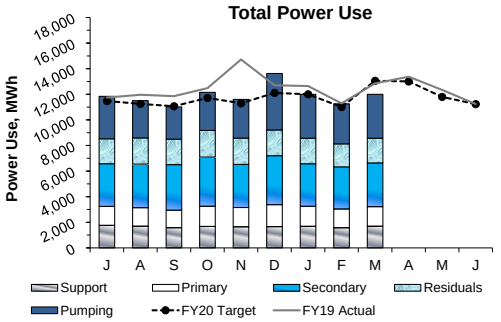
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

May 27, 2020

OPERATIONS AND MAINTENANCE

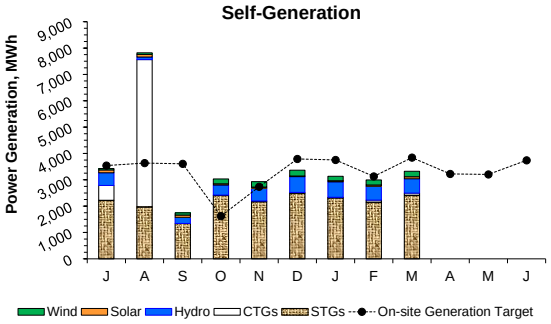
Deer Island Operations

3rd Quarter - FY20

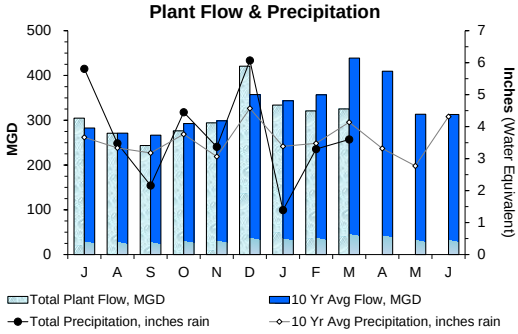


Total power usage in the 3rd Quarter was 2.2% below target as the Total Plant Flow was 10.1% below target with the 4 year average plant flow. Power usage for raw wastewater pumping was 9.9% lower than target and was similar to or below target in all process areas, except in the biological secondary treatment process. 6.1% more than expected power was used in the secondary treatment process for oxygen generation and mixing in the reactors to ensure target dissolved oxygen levels were in the activated sludge.

Note: Power usage projections are based on 4 year averages.

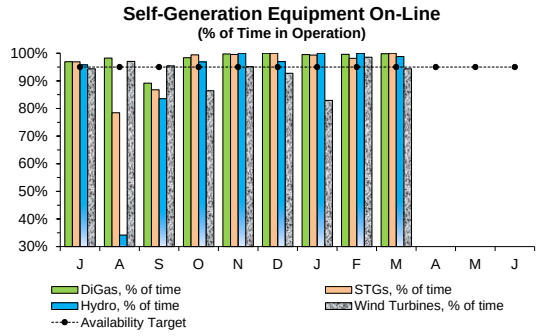


Power generated on-site during the 3rd Quarter was 11.9% below target. The CTGs were operated for emissions testing, testing following CTG-1A auto voltage regulator (AVR) system upgrade, and briefly throughout the quarter for maintenance/checkout purposes. Nevertheless, CTGs generation fell below target by 78.2% as there was no precautionary operation during storm events. The FY20 budget estimate is based on generation data from FY15 to FY18 which included periods when the CTGs were in operation during storm events. Generation by the STGs was 9.4% below target as a result of the units being taken out of operation for scheduled maintenance and during CTG testing following the AVR upgrade. Hydro Turbine generation was 19.7% above target. Generation from the Solar Panels was 13.4% above target, while Wind Turbine generation was 22.3% below target, partially due to downtime caused by an issue with the cooler fan on Turbine #1 and a hydraulic system issue on Turbine #2.

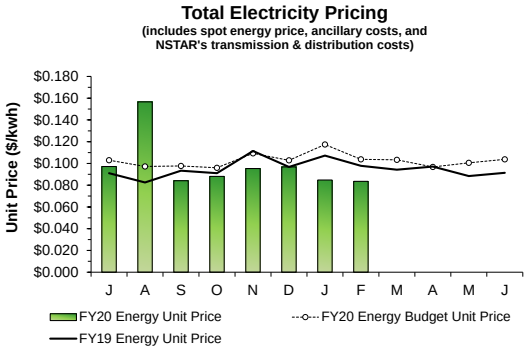


Total Plant Flow for the 3rd Quarter was 14.0% below target with the budgeted 10 year average plant flow (326.7 MGD actual vs. 379.8 MGD expected) as precipitation was 24.6% below target (8.29 inches actual vs. 11.0 inches expected). Total Plant Flow was 10.1% lower than the 4 year average plant flow used for energy budget projections.

Note: Plant Flow and precipitation projections are based on 10 year averages but are 4 year averages for the energy budget projections.

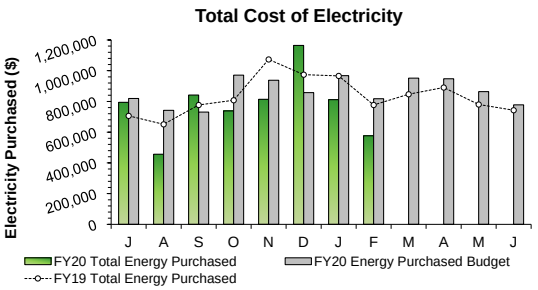


The DiGas system, STGs, and Hydro Turbines all met or exceeded the 95% availability target for the 3rd Quarter. Wind Turbine availability was just under target by 3.1% due to brief periods of downtime from a combination of mechanical issues and turbulence caused by wind blowing through the digesters, tripping the turbine out of service.



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 February (the most current invoice available) was 19.5% below target with budgetary estimates. The actual total energy unit price in March is 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.

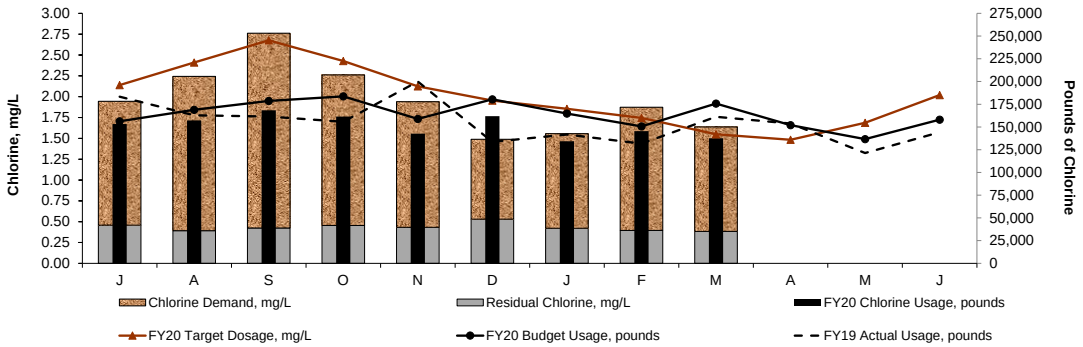
Note: Only the actual energy prices are reported. Therefore, the dataset lags by one (1) month due to the timing of invoice receipt and review.



The Electricity cost data for Electricity Purchased in March is not yet available. Year-to-date Total Cost of Electricity is $557,858 (8.2%) lower than budgeted through February. While the Total Energy Unit Price was 9.5% lower than target, the Total Electricity Purchased was 1.4% higher than target.

Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by one (1) month due to the timing of invoice receipt and review.

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 3rd Quarter was 2.0% below target with budgetary estimates. Actual sodium hypochlorite usage in pounds of chlorine was also 15.0% lower than expected as the 4 year average plant flow used for estimating the hypochlorite usage target was 10.1% lower than expected. DITP maintained an average disinfection chlorine residual of 0.40 mg/L this quarter with an average dosing rate of 1.69 mg/L (as chlorine demand was 1.29 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	4	4	0	99.6%	10.26
A	2	2	0	99.3%	7.64
S	1	1	0	99.8%	2.45
O	3	3	0	99.0%	11.13
N	1	1	0	99.6%	4.81
D	2	2	0	99.4%	17.99
J	0	0	0	100.0%	0.00
F	0	0	0	100.0%	0.00
M	1	1	0	99.4%	7.45
A					
M					
J					
Total	14	14	0	99.6%	61.73

99.8% of all flows were treated at full secondary during the 3rd Quarter. There was one (1) secondary blending event due to high plant flow resulting from heavy rain. This blending event resulted in a total of 7.45 hours of blending and 62.16 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

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

Deer Island Operations & Maintenance Report

Environmental/Pumping:
The plant achieved an instantaneous peak flow rate of 1,011.3 MGD near midnight on March 23. This peak flow occurred during a storm event that brought 1.73 inches of precipitation to the metropolitan Boston area. Overall, Total Plant Flow in the 3rd Quarter was 14.0% below target with the 10 year average plant flow estimate for the quarter.

The MWRA has an on-going project to inspect, and eventually rehabilitate, the shafts that transport wastewater between the remote headworks facilities and the DITP. In order to support the inspections, the remote headworks facilities were temporarily shut down to perform physical and remote inspections. DITP worked closely with Wastewater Operations staff during two (2) shutdowns of the remote headworks facilities in January. The Columbus Park and Ward Street Headworks Facilities were isolated on January 9 in order to remotely inspect the effluent shafts at the Columbus Park and Ward Street Headworks with cameras. The Chelsea Creek Headworks Facility was isolated on January 15 in order to inspect the effluent channels and to remotely inspect the effluent shaft with cameras. Both shutdowns were approximately two (2) to two-and-a-half (2.5) hours in duration with each facility isolation starting at 1:00 AM or 2:00 AM when the diurnal flows were at the lowest levels.

Raw wastewater pump #9 at the North Main Pump Station (NMPS) was taken out of service on December 12 to allow the contractor to refurbish the pump and to recoat the pump's volute. The goal of this pump refurbishment was to to return the pump to like-new condition and in so doing; increase energy efficiency, reliability, and extend the pump's useful life. The Eversource approved energy-efficiency incentive for this project is $58,955 and is based on energy savings from the current state of the pump to the proposed increase in efficiency once the pump is refurbished. The pump refurbishment work was completed in December and the pump was returned to service in January under the direction of the manufacturer's representative. This work did not impact pumping capacity as seven (7) pumps are required to maintain maximum pumping capacity at the NMPS and nine (9) pumps were available during this work.

Deer Island Operations & Maintenance Report (continued)

Disinfection:
The contract to strip and replace the internal lining in hypochlorite storage tanks #1 and #3 is currently in place with preparation work beginning on tank #3 in mid-March. The contract includes: disconnecting all piping to each tank; removing the existing adhered rubber system utilizing hydro demolition equipment with water pressures exceeding 40,000 psi; sandblasting of all interior surfaces to the white metal; applying a new quarter-inch rubber polycorp to the interior surface; and steam curing for 60 hours at 212 degrees Farenheit. The contractor will also reconnect all piping and install new insulation as required after the new liner passes inspection. Tank #3 and tank #1 were both previously relined in late 2007.

Odor Control:
The Residuals Odor Control (ROC) Facility was taken offline on three (3) separate occasions during the quarter.The duration of each shutdown was approximately six (6) hours. The ROC shutdown on February 19 was necessary toallow staff to safelyinstall an expansion band to repair a minor leak in the ductwork on the Gravity Thickener treatment side of the ROC Facility. The ROC Facility was again taken offline on March 9 and on March 17. Blanks were installed in the ductwork on March 9 to isolate fan #2 on wet chemical scrubber #2, which allowed the fan maintenance contractor to perform repairs to the fan from March 12 to March 13. The ROC Facility shutdown on March 17 was necessary to allow staff to remove the blanks in the ductwork making scrubber #2 available for operation. Process air was contained within the building and there were no resident odor complaints received during any of these shutdowns.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 26.8% of Deer Island's total power use during Quarter 3. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 26.3% of Deer Island's total electrical power use for the quarter.

One (1) of the two (2) start air compressors, which is necessary for CTG startup operation and had failed in early January, was replaced in early February. Each CTG unit is equipped with a compressed air tank that supplies pressurized start air for the CTG. The pressurized start air enables the CTGs to start without any outside electrical power. The compressed air tank has sufficient pressurized air to provide up to three (3) starts per CTG. Each compressed air tank (one per CTG) is replenished by a start air compressor (also one per CTG). Staff have the ability to common up the compressed air tanks using a single compressor to supply compressed air to both the tanks simultaneously (as is currently configured). Therefore, the failure of this single start air compressor did not directly impact the availability or the operation of either CTG unit. However, this did delay the CTG auto-voltage regulator replacement work (explained below) which was originally scheduled to take place in January. The manufacturer's repair was expedited and the CTG service contractor reinstalled the repaired compressor and completed the equipment checkout testing on February 7.

Each CTG is equipped with an automatic voltage regulator (AVR) which is a critical component that controls the voltage, reactive power and power factor for each unit. The existing AVR's are original components which have been deemed obsolete and are no longer supported by the manufacturer. Contractors and staff began work to replace the AVR system on CTG-1A on February 24. The installation and configuration of the new AVR system was completed on February 26. Testing was then conducted over the course of three (3) days by operating CTG-1A, as well as operating both CTGs simultaneously, under progressively challenging operating conditions. Several minor issues were identified during the testing process and were corrected. The CTG-1A unit was returned to normal standby status following successful completion of the testing on February 29.

DITP took delivery of 126,000 gallons of #2 fuel oil, a total of 13 oil tanker trucks, without incident from March 30 through April 1. 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.

Clinton Treatment Plant Operations

Dewatering Building:
Maintenance replaced top wash box seals and adjusted the lower wash box seal on #1 and #2 belt filter press. Staff also replaced coupling on #2 Sludge Feed Pump. The polymer system was repaired to allow more flexibility between the two belt filter presses. Contractor installed a new transformer and a main 50 AMP breaker on #1 belt filter press.

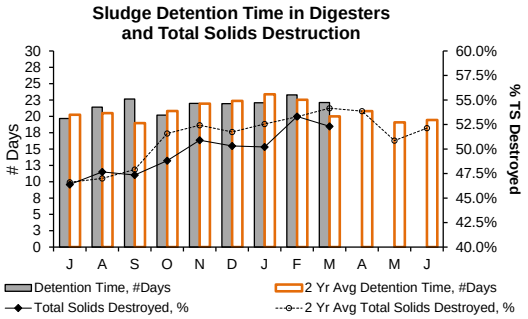
Chemical Building:
Maintenance staff rebuilt the Sodium Bisulfite carry water flow meter. Staff removed a blockage from WAS line flow meter. A bearing and belt were replaced on soda ash auger. Staff replaced a relief valve on the #1 Sodium Hypochlorite pump. Contractor replaced the rate of rise heat detectors in chemical building. Contractor performed laser alignment on #2 RAS pump. Maintenance staff replaced #1 Ferric Chloride pump, replaced aeration diffusion blower and replaced #2 Sodium Bisulfite pump. Soda Ash mixer replaced in lower collection tank.

Aeration Basins:
Operations staff calibrated PH meters and cleaned pH and DO probes. Contractor inspected and took oil samples from aeration blowers.

Phosphorus Building:
Maintenance staff and Deer Island ERT staff replaced 40 filters and reinstalled 10 bands on #1 & 2 disc filters. Maintenance staff acid washed #1, 2, & 3 disk filters, cleaned troughs, and inspected all nozzles. Staff installed a modified wash band on #1 disc filter for easier cleaning. Staff repaired several leaks in #3 disc filter. The chlorine analyzers have been rebuilt. Staff also replaced a faucet in PRF bathroom sink.

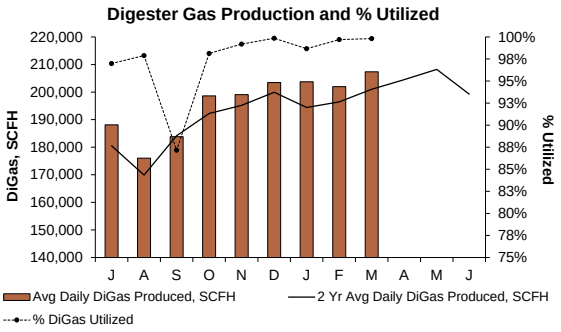
Headworks:
Maintenance staff checked, cleaned & lubricated all equipment in upper grit. Staff rebuilt hot water circulator pump. Contractor replaced the condensate tank float assembly on head works boiler. Contractor replaced the block heater on 450 KW Diesel Generator.

Digester Building:
Maintenance staff replaced 1 in. gas shutoff valve on methane gas trap.
Equipment inspected for proper operation. State plumbing inspector approved #1 boiler for duel fuel (natural gas and methane) use.



Total solids (TS) destruction following anaerobic sludge digestion averaged 52.0% during the 3rd Quarter, 2.6% below target with the 3 year average of 53.3%. This lower destruction is attributed to a higher-than-expected amount of secondary waste sludge, which is more difficult to break down during anaerobic sludge digestion. Sludge detention time in the digesters was 2.4% higher than target at 22.5 days as DI operated with an average of 8.0 digesters.

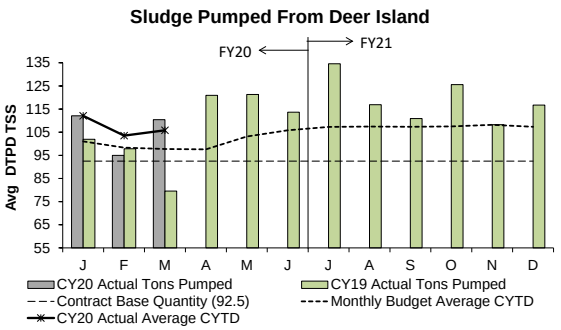
Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significanty impacted by changes in the number of digesters and the resulting shifting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



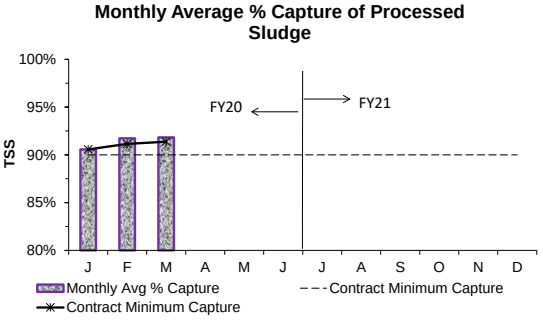
The Avg Daily DiGas Production in the 3rd Quarter was 3.6% above target with the 2 Year Avg Daily DiGas Production. On average, 99.4% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant (TPP).

Residuals Pellet Plant

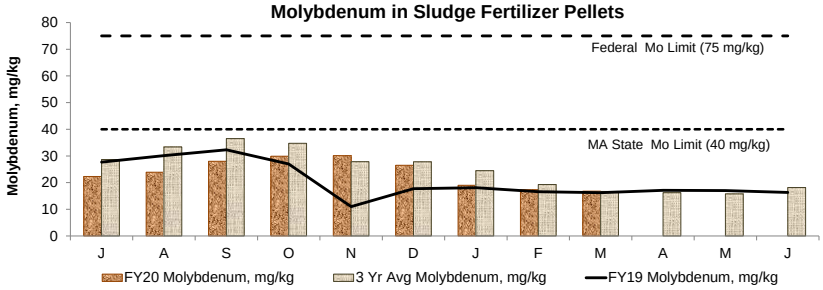
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended 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 3rd Quarter and for the first three (3) months of CY20 was 105.8 TSS Dry Tons Per Day (DTPD) - 8.2% above target with the FY20 budget of 97.8 TSS DTPD for the same period. Sludge delivered to the BPF was higher than expected during the quarter mainly due to higher-than-expected primary and secondary sludge production, in addition to inventory shifts in the digested sludge holding tanks on DITP.



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 3rd Quarter and for the first three (3) months of CY20 was 91.4%.



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.

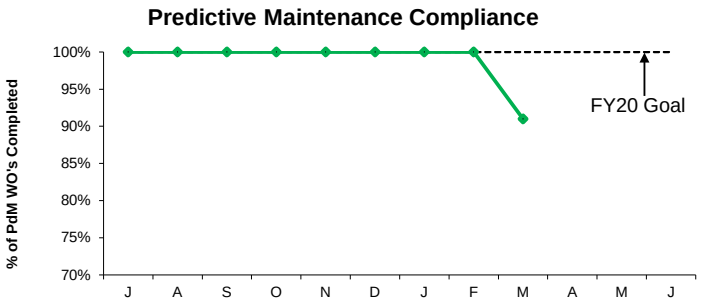
The levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, the level in the MWRA sludge fertilizer pellets during the 3rd Quarter averaged 17.7 mg/kg, 12% below the 3 year average, 56% below the MA State Limit, and 76% below the Federal Limit.

Deer Island Maintenance

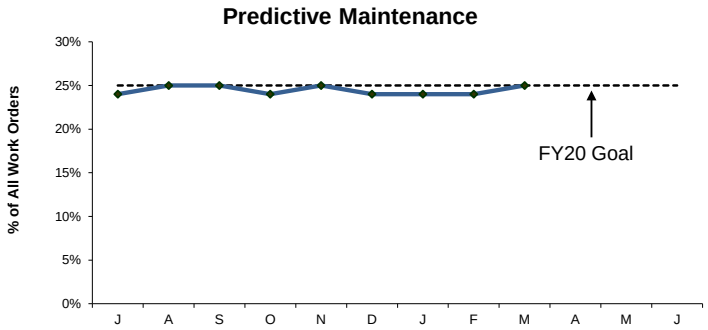
3rd Quarter - FY20

Productivity Initiatives

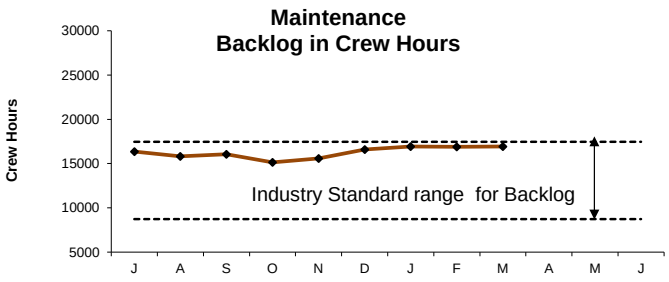
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog



Deer Island's FY20 predictive maintenance goal is 100%. DITP completed 97% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program. This quarter's dip is because of limited staffing, due to the COVID-19 Virus.



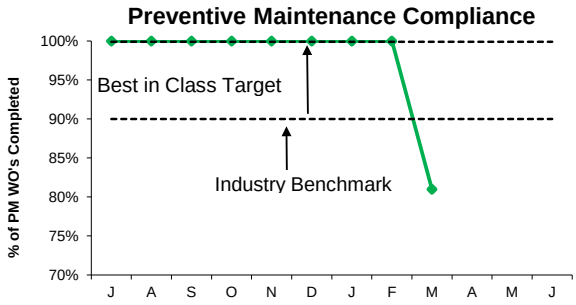
Deer Island's increased FY20 predictive maintenance goal is 25% of all work orders to be predictive. 24% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.



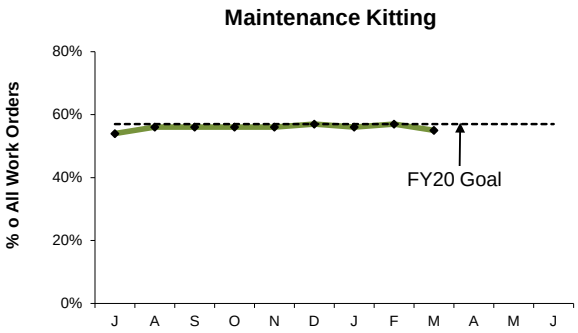
DITP's maintenance backlog at Deer Island is 16,931 hours this quarter. DITP is at the upper end of the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by the following five vacancies; (3) Electricians, (1) Instrument Technician and (1) HVAC Technician. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

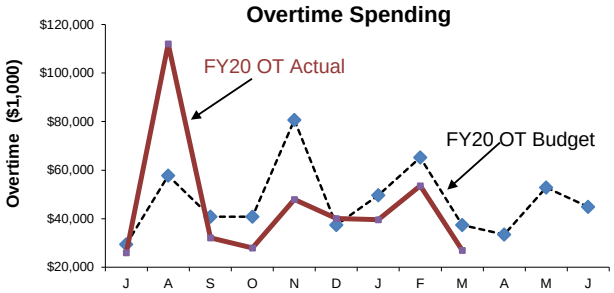
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.



Deer Island's FY20 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 94% of all PM work orders this quarter. This quarter's dip is because of limited staffing, due to the COVID-19 Virus



Deer Island's increased FY20 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.

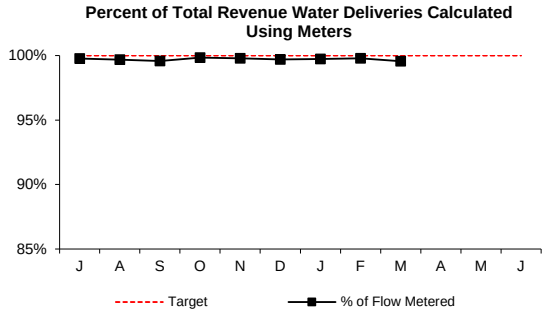


Maintenance overtime was under budget by $36k this quarter and is $60k under for the FY20. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarter's overtime was predominately used for Storm Coverage/High Flows, GTO/PSL/RSL Pumps Clogged, Grinder Replacements, Thermal Plant VFD Replacement, and the Installation of North Main Pump Station #9.

Operations Division Metering & Reliability

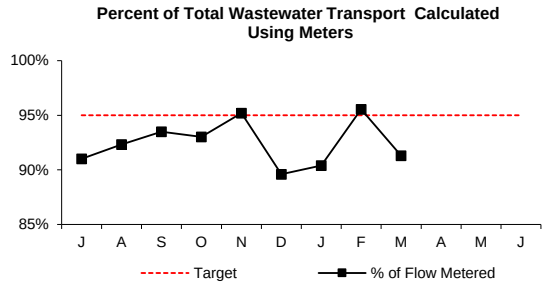
3rd Quarter - FY20

WATER METERS



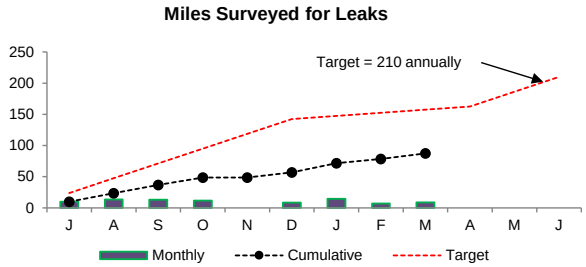
The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the third quarter of FY20, March 2020, 0.31% of the billed water flow was estimated. 99.69% was based on meter actuals. The entirety of this value was from instrumentation failure.

WASTEWATER METERS



The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. During the 3rd Quarter of FY20 the percent of revenue wastewater calculated by meters was 92.4%. January was an uncharacteristially low month because BO-DI-2, one of the largest meters in our system, experienced a failure in late December and was repaired on January 10. In March, social distancing efforts limited the availability of metering personnel, which led to cancelling most PM on revenue wastewater meters. Data quality is expected to continue to decline in the short term.

WATER DISTRIBUTION SYSTEM PIPELINES



During Q3, 30.31 miles of water mains were inspected. The total inspected for the fiscal year to date is 87.36. Below target due to staffing shortage and community support work during FY20.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	5	1	1	6	0	3	3	2	2				23
Leaks Repaired	2	3	2	3	2	0	6	1	2				21
Backlog	9	7	6	9	7	10	7	8	8				n/a

During the 3rd Quarter, seven new leaks were detected, and nine were repaired. Refer to FY20 Leak Report below for details. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Boston, Brookline, Dedham, Lynn, Malden, Medford, Milton, Newton, Revere, Saugus, Somerville and Wakefield.

3rd Quarter - FY20 Leak Report

Date Detected	Location of Leaks	Repaired
07/19/19	Ocean Ave., @ Revere St., Revere	07/31/19
07/29/19	Wadsworth Rd., Dow St., Arlington	07/31/19
07/16/19	Watham St. @ Concord Ave., Lexington	08/14/19
07/24/19	#1098 Waltham St., Lexington	08/14/19
08/11/19	South Street Court, Medford	08/12/19
09/04/19	Pearl St. @ Center St. Malden	09/04/19
07/08/19	River St. Bridge @ Memorial Dr., Cambridge	09/05/19
10/09/19	Essex St. @ Highland St., Chelsea	10/09/19
10/14/19	Mass Ave. @ Appleton Pl., Arlington	10/24/19
10/15/19	Alewife Brook Sewer P.S. Somerville	10/16/19
10/30/19	Felton St. @ Water St., Waltham	11/05/19
10/16/19	Stone Zoo, Pond St., Stoneham	11/06/19
12/16/19	Linden St. @ Waverly Oaks Rd., Waltham	01/07/20
12/16/19	#271 Waverly Oaks Rd., Waltham	01/08/20
12/16/19	#1010 Pleasant St., Belmont	01/14/20
01/05/20	#429 Pleasant St., Belmont	01/16/20
01/06/20	Madison St. @ Main St., Malden	01/06/20
01/15/20	Comm. Ave. @ Lexington St., Newton	01/16/20
02/02/20	Lynnway @ Harding St., Lynn	02/02/20
02/26/20	Diminios Sub Shop, Winthrop Ave., Revere	03/02/20
03/01/20	#685 Revere Beach Reservation, Revere	03/09/20

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 of 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.
10/23/19	Concord Ave. @ April Lane, Lexington. Cannot isolate main.
03/17/20	B.C. Train Stop Commonwealth Ave., Newton

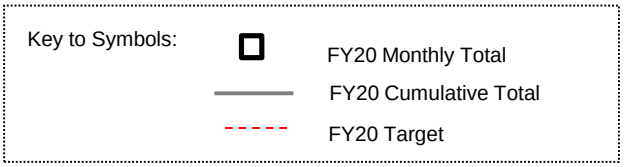
Water Distribution System Valves

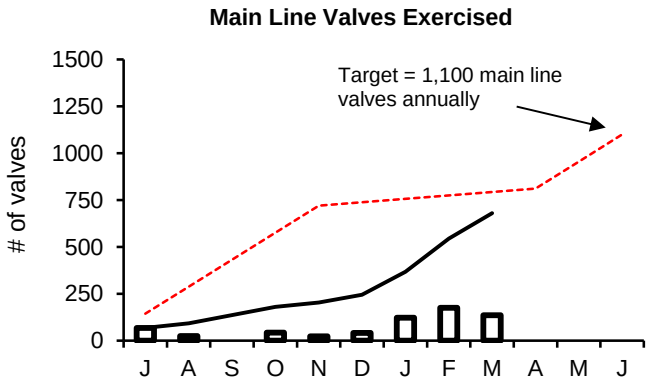
3rd Quarter - FY20

Background

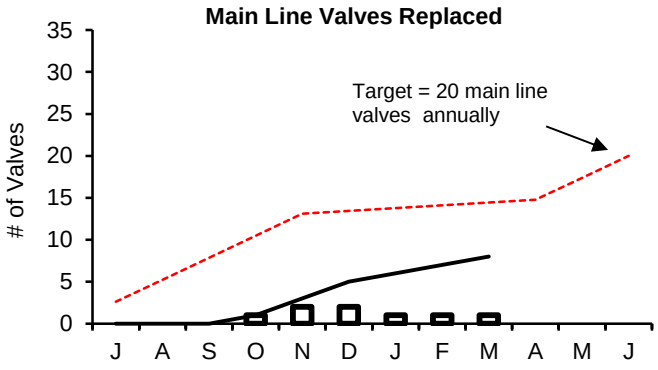
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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	
		FY20 to Date	FY20 Targets
Main Line Valves	2,159	96.5%	95%
Blow-Off Valves	1,317	98.6%	95%
Air Release Valves	1,380	95.0%	95%
Control Valves	49	100.0%	95%

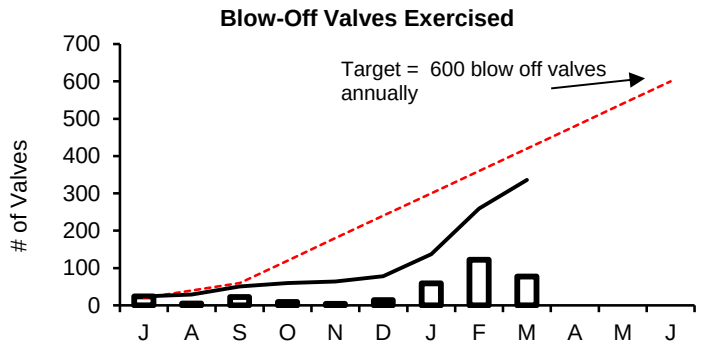




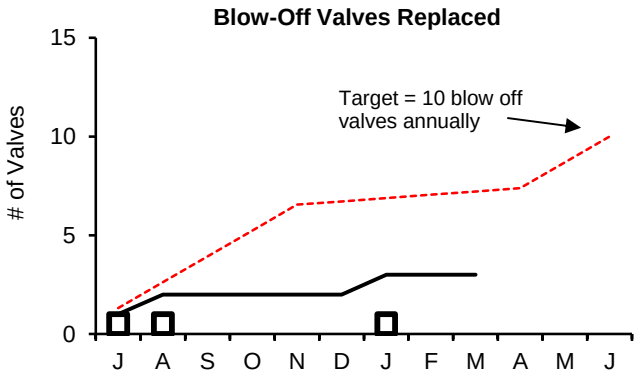
During the 3rd Quarter of FY20, 435 main line valves were exercised. Below target due to high priority CIP project; WASM 1. The total exercised for the fiscal year to date is 680.



During the 3rd Quarter of FY20, there were three main line valve replaced. Below target due to isolation and permit issues. The total replaced for the fiscal year to date is eight.



During the 3rd Quarter of FY20, 258 blow off valves were exercised. Below target due to high priority CIP project; WASM 1. The total exercised for the fiscal year to date is 336.



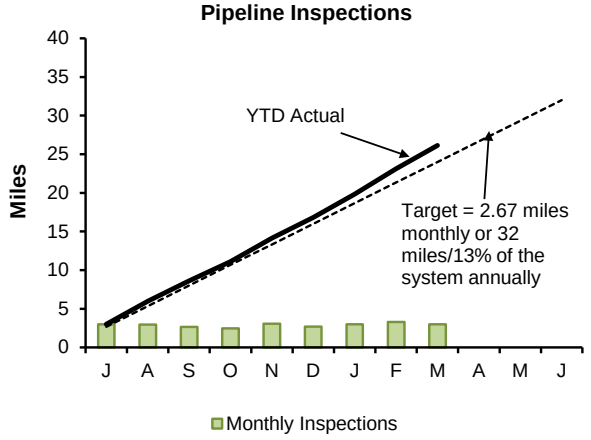
During the 3rd Quarter of FY20, there was one blow off valve replaced. Below target due to isolation and permit issues. The total replaced for the fiscal year to date is three.

Wastewater Pipeline and Structure Inspections and Maintenance

3rd Quarter - FY20

Inspections

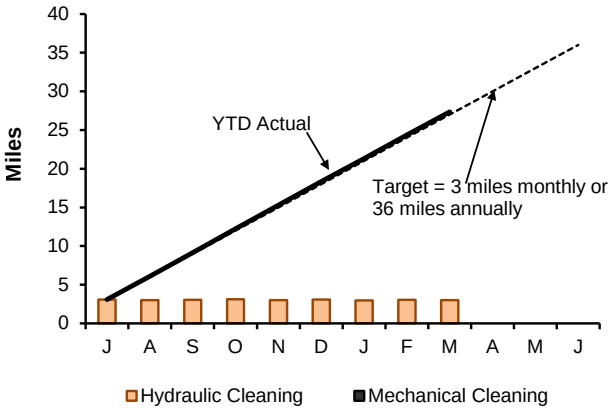
Pipeline Inspections



Staff internally inspected 9.30 miles of MWRA sewer pipeline during this quarter. The year to date total is 26.14 miles. No Community Assistance was provided quarter.

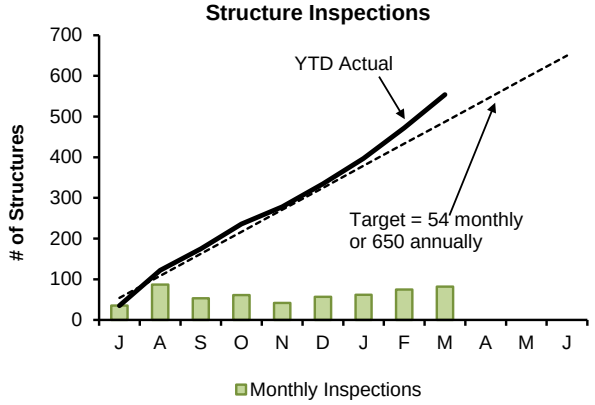
Maintenance

Pipeline Cleaning



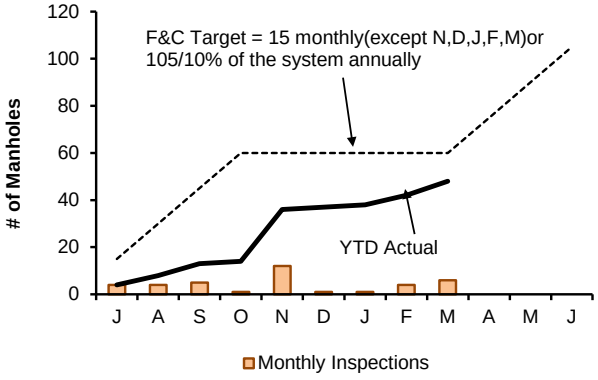
Staff cleaned 9.01 miles of MWRA's sewer system and removed 24 yards of grit and debris during this quarter. The year to date total is 27.35 miles. No Community Assistance was provided this quarter.

Structure Inspections



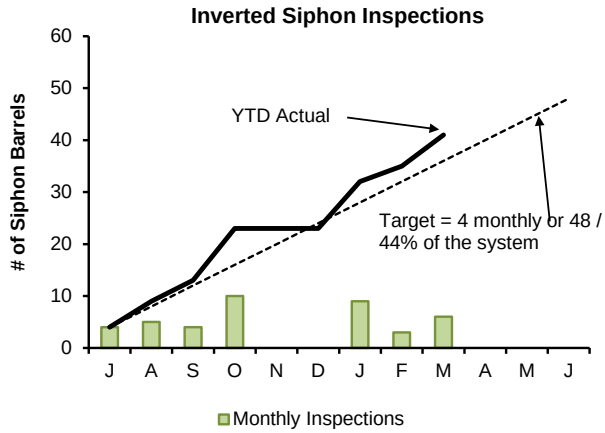
Staff inspected the 36 CSO structures and performed 183 additional manhole/structure inspections during this quarter. The year to date total is 554 inspections.

Manhole Rehabilitation



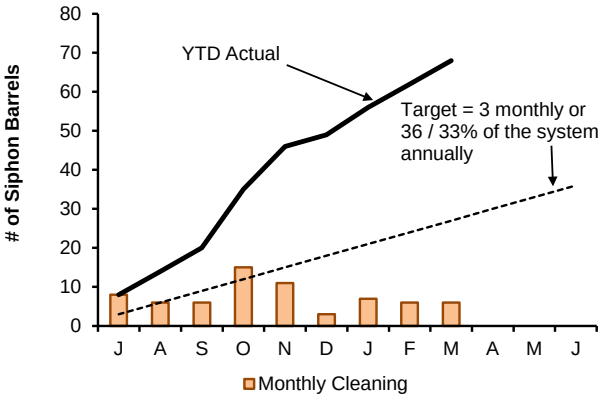
Staff replaced 11 frames & covers during this quarter. The year to date total is 48. Staff have been working the DITP Shaft Project shutdowns.

Inverted Siphon Inspections



Staff inspected 18 siphon barrels this quarter. Year to date total is 41 inspections.

Inverted Siphon Cleaning

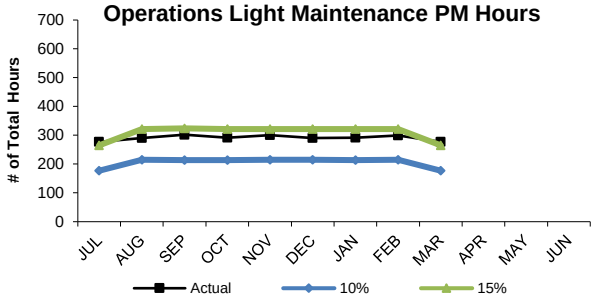


Staff cleaned 19 siphon barrels during this quarter. Year to date total is 68.

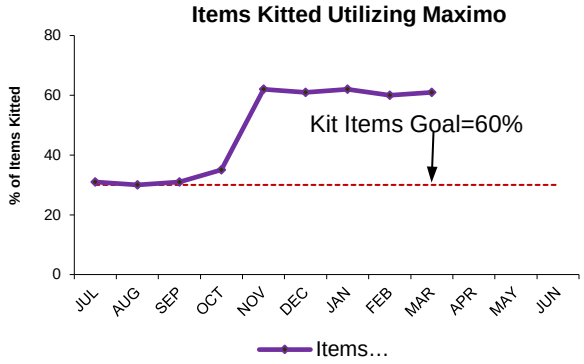
Field Operations' Metropolitan Equipment & Facility Maintenance

3rd Quarter - FY20

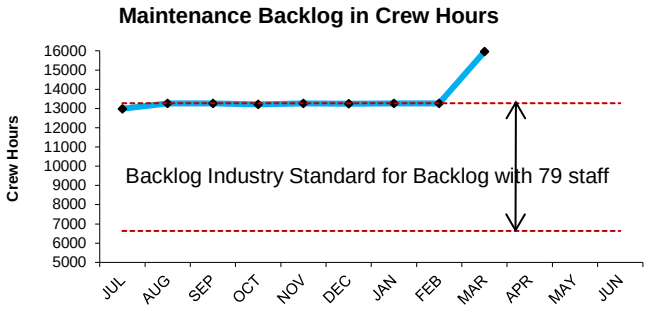
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



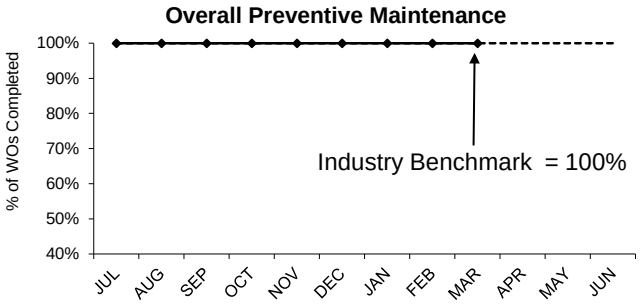
Operations staff averaged 289 hours of preventive maintenance during the 3rd Quarter, an average of 14% of the total PM hours for the 3rd Quarter, which is within the industry benchmark of 10% to 15%.



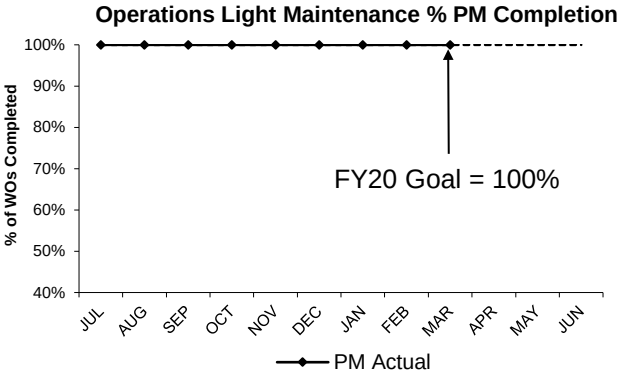
Operation's FY20 maintenance kitting goal has been set at 60% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 3rd Quarter, 61% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



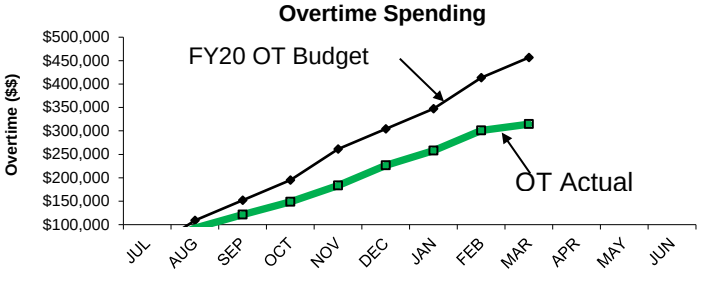
The 3rd Quarter backlog average is 14161 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6636 to 13275 hours. The slight increase is due to reduced staffing levels due to COVID19



The Field Operations Department (FOD) preventive maintenance goal for FY20 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 3rd Quarter.



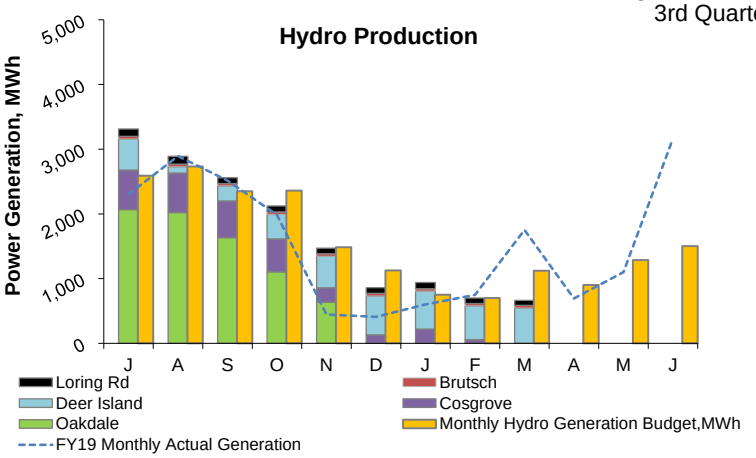
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY20 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 3rd Quarter.



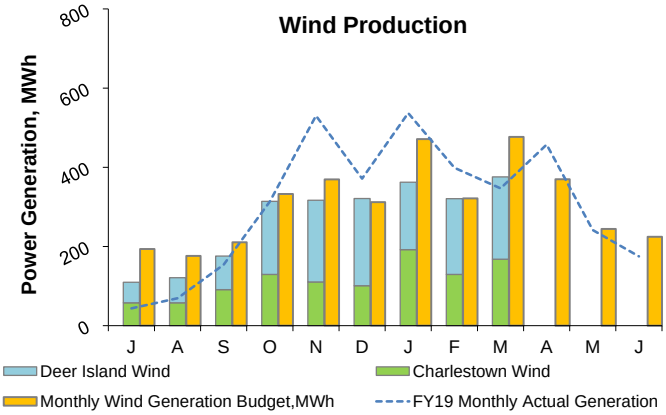
Maintenance overtime was $64k under budget for the 3rd Quarter. Overtime was used for critical maintenance repairs and wet weather events. Overtime for FY20 is $314k which is currently $142k under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

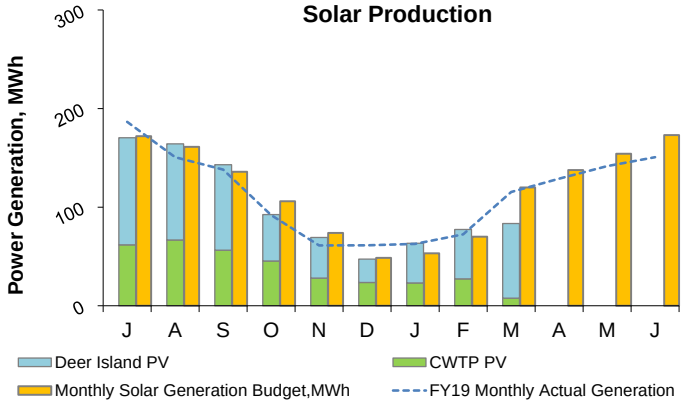
3rd Quarter - FY20



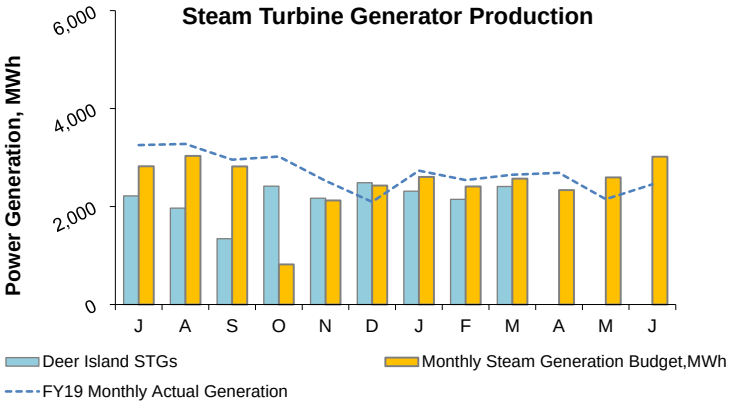
In the 3rd Quarter of FY20, the renewable energy produced from all hydro turbines totaled 2,301 MWh; 11% below budget[3]. There were no Quabbin Tunnel transfers during the quarter. The total energy produced to-date in FY20 is 15,518 MWh; 2% above budget[3].
The total savings and revenue[2] to date in FY20 (actuals through February[1]) is $693,489; 9% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



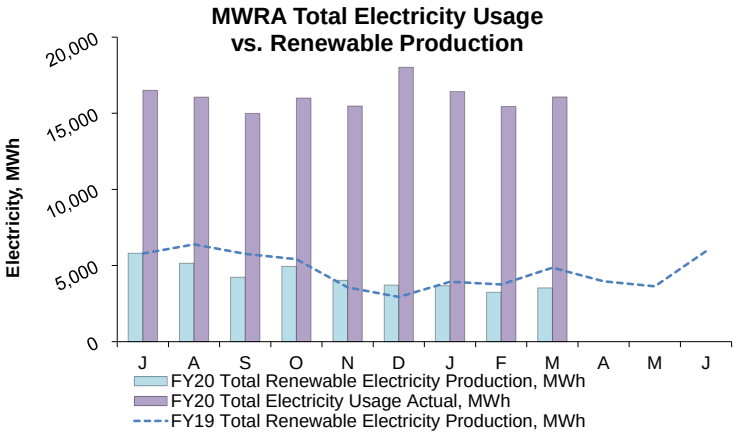
In the 3rd Quarter of FY20, the renewable energy produced from all wind turbines totaled 1,059 MWh; 17% below budget[3] . The total energy produced to-date in FY20 is 2,417 MWh; 16% below budget[3].
The total savings and revenue[2] to date in FY20 (actuals through February[1]) is $289,986; 18% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

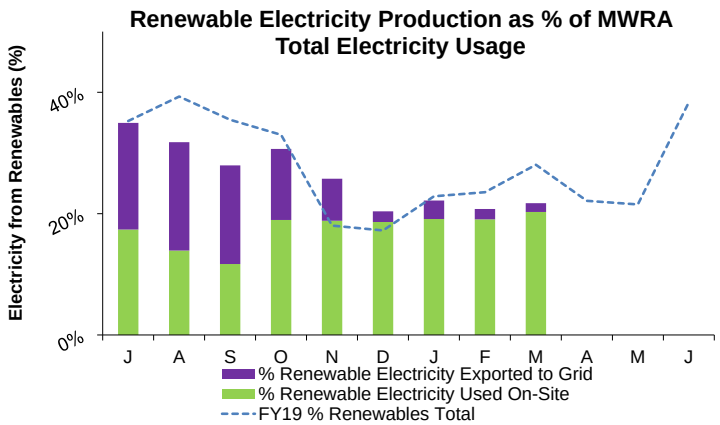


In the 3rd Quarter of FY20, the renewable energy produced from all solar PV systems totaled 224 MWh; 8% below budget[3] . The total energy produced to-date in FY20 is 922 MWh; 2% below budget[3].
The total savings and revenue[2] to date in FY20 (actuals through February[1]) is $199,044; 84% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



In the 3rd Quarter of FY20, the renewable energy produced from all steam turbine generators totaled 6,871 MWh; 9% below budget[3]. The total energy produced to-date in FY20 s 19,472 MWh; 10% below budget[3].
The total savings and revenue[2] to date in FY20 (actuals through February[1]) is $1,672,605; 15% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



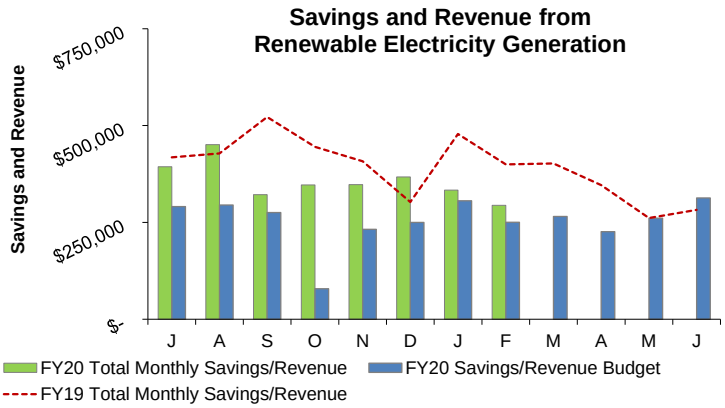


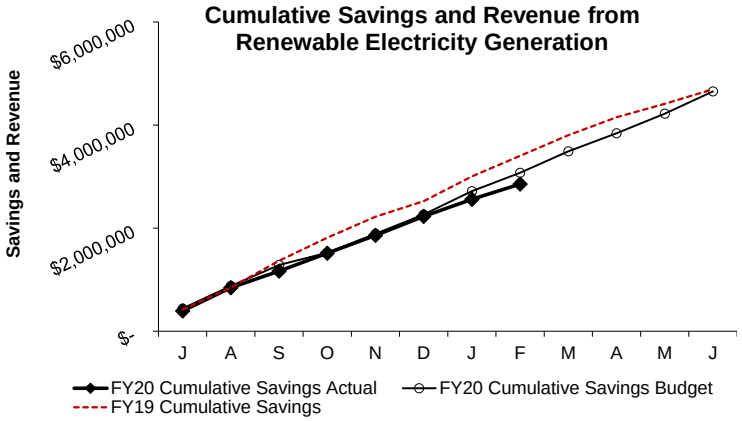
In the first three quarters of FY20, MWRA's electricity generation by renewable resources totaled 38,328 MWh. MWRA's total electricity usage was approximately 145,026 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used 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.
In the first three quarters of FY20, green power generation represented approximately 26% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

Renewable Electricity Generation: Savings and Revenue

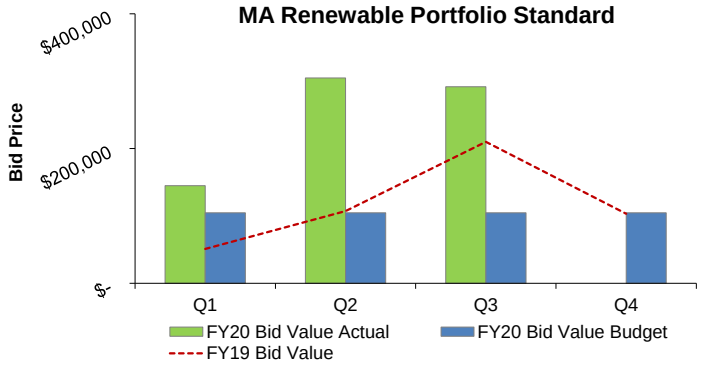
3rd Quarter - FY20

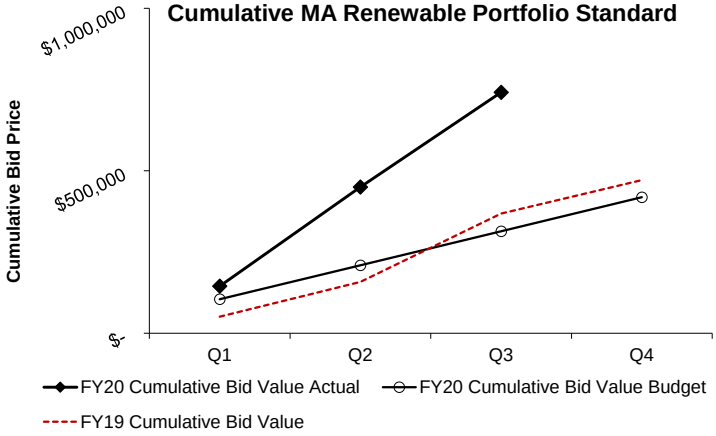




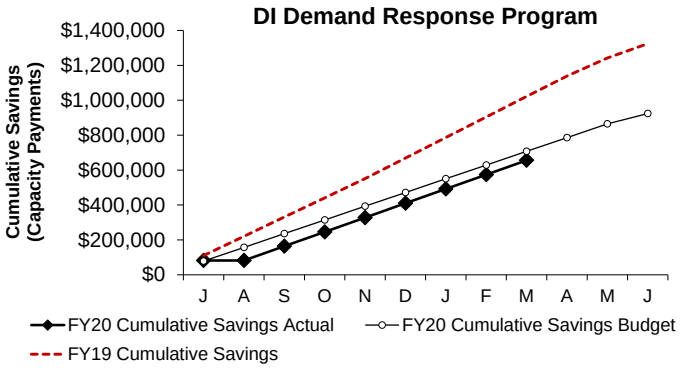
Savings and revenue from MWRA renewable electricity generation in the first 8 months of FY20 (actuals only through February[1]) is $2,855,124 which is 7% below the budget[3].

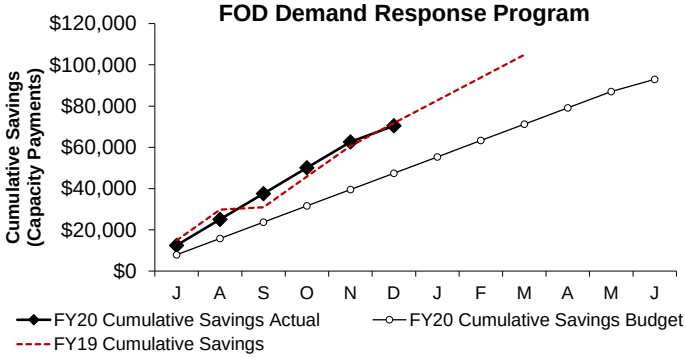
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).





Bids were awarded during the 3rd Quarter[1] from MWRA's renewable energy assets; 3,110 Q3 CY2019 Class I Renewable Energy Certificates (RECs), 7,405 Q3 CY2019 Class II RECs, and 100 Q3 CY2019 Solar RECs were sold for a total value of $291,783 RPS revenue; which is 179% above budget[3] for the Quarter. This is mostly due to Class I REC prices being over 200% above the budget 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.



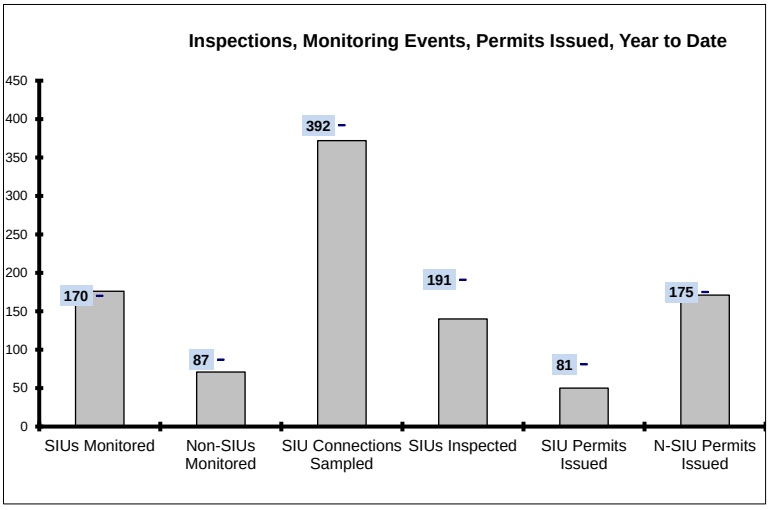


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY20 Cumulative savings (Capacity Payments only) through March[1] total $655,890 for DI and payments for FOD total $70,438 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

3rd Quarter - FY20



EPA Required SIU Monitoring Events
for FY20: 170
YTD : **176**

Required Non-SIU Monitoring Events
for FY20: 87
YTD : **71**

SIU Connections to be Sampled
For FY20: 392
YTD: **372**

EPA Required SIU Inspections
for FY20: 191
YTD: **140**

SIU Permits due to Expire
In FY20: 81
YTD: **50**

Non-SIU Permits due to Expire
for FY20: 175
YTD: **171**

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

TRAC also monitors one-third of the non-SIUs each year. 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. Due to the COVID-19 pandemic, TRAC put all field operations (sampling and inspections) on hold as of March 20, 2020.

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	2	19	0	0	0	0	2	19
Aug	4	21	0	4	1	0	5	25
Sep	7	16	0	0	0	0	7	16
Oct	6	19	0	1	0	1	6	21
Nov	5	17	0	2	0	0	5	19
Dec	9	12	0	3	0	1	9	16
Jan	4	16	0	3	0	0	4	19
Feb	7	25	0	3	0	0	7	28
Mar	4	5	0	1	1	2	5	8
Apr								
May								
Jun								
% YTD	96%	88%	0%	10%	4%	2%	50	171

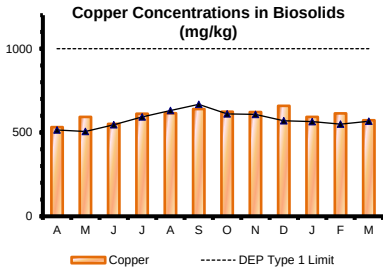
EPA requires MWRA to issue or renew 90 percent of SIU permits within 120 days of receipt of the application or the permit expiration date - whichever is later. EPA also requires the remaining 10 percent of SIU permits to be issued within 180 days.

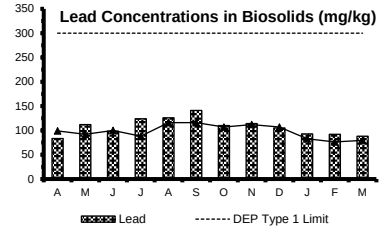
In the 3rd quarter of FY20, 71 permits were issued, 16 of which were SIUs. Fifteen of the SIU permits were issued within the 120-day timeframe. There is a 96 percent compliance in the timely issuance of SIU permits so far.

In this quarter, 11 of the non-SIU permits were issued after the 120-day timeframe. Timely availability of much needed data for permit processing coupled with the late payment of the permit fees, led to those permits being issued beyond the 120-day timeframe.

For the Clinton Sewer Service area, no SIU permit was issued in this quarter and none so far in the fiscal year.

Due to the COVID-19 pandemic, TRAC put all field operations (sampling and inspections) on hold as of March 20, 2020. TRAC is continuing to issue permits.





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
3rd Quarter – FY20

Western Water Operations and Maintenance

- Carroll Water Treatment: Staff continued to troubleshoot the engine/generator issues on emergency generator number 1 with help from the engine manufacturer and a vibration analysis expert. Staff completed half plant maintenance and cleaning activities on both sides of the treatment process and flushed the upper Hultman Aqueduct and Metro West Tunnels prior to reactivation.

- Staff completed plans to isolate a section of the Metrowest tunnel to facilitate replacing a valve on the riser shaft at Edgell road in Framingham. This project is on hold to prevent staff exposure working in close proximity in the valve chamber. Staff also operated the Sudbury Aqueduct to refill Chestnut Hill reservoir.

Metro Water Operations and Maintenance

- Staff support to communities included assisting Framingham with shock chlorinating their Beebe water storage tanks.

- Staff completed installation of a new main line valve at Cary Circle in Revere and an eight-inch gate valve on Section 5, in Medford; Dug a test pit at Framingham's Edgell Road Pumping Station in preparation for an upcoming valve replacement; Provided assistance to the Camp Sayre Boy Scout Facility in Milton, repairing a leak and locating a buried valve. Deployed a Mobile Pumping Unit to the Lexington Street Pump Station as a contingency after the station experienced an electrical failure.

SCADA

- Staff completed on installation of temporary OCC SCADA view nodes at CWTP UV building in support for JCWTP PLC replacement project.

- **Wastewater Operations & Maintenance**

- Mystic River Water Shed Association Tour: Operations staff gave a tour of the Chelsea Creek Headworks and Chelsea Screenhouse to Mystic River Water Association staff to have pictures taken by a professional photojournalist on 1/22/20.

- Towable Generator Docking Station: Operations staff continued to work with Construction on this project. Operations staff was on site at Braintree/Weymouth PS on in January and February for a utility power outage required to install the new electrical equipment associated with this contract. Staff then went to Quincy PS on 3/25/20 to complete the install of new electrical equipment.

- Remote Headworks & Deer Island Shafts Study: Operations supported this project on 1/16/20 as flow was stopped at the Chelsea Creek Headworks, as part of this shaft inspection project. Shutdown was for the internal inspection of the channels at Chelsea Creek.

- Operations staff accompanied MWRA's insurance carrier FM Global on a site visit to Prison Point on 2/26/20 and then met with Risk Management, Engineering, Water and Maintenance staff to discuss future facility protections and mitigating risks.

- CSO Assessment Monthly Meetings: Operations staff continued to provide details of existing metering, what is lacking, how data can be monitored during storm events and responded to in a timely manner for the future.

- Tool Box Talk: Operations management held tool box talks with staff about social distancing and the distribution/handling of PPE during the CoVid-19 pandemic.

Metering

Community Outreach

- In response to a request by BWSC, staff began tracking how sheltering in place has affected water demand. While most residential communities are only affected slightly by the change (with some seeing slight increases in demand), BWSC has seen a sharp decline in demand during this time.

Metering staff met with Chelsea and Everett personnel on February 14 to discuss potential open valves between Everett and Chelsea. During various water main leaks in the Chelsea low service area metering observed spikes in flow in the Everett low service area indicating the potential for a community interconnection being open. Everett DPW found an open valve on the morning of February 14. Review of previous monthly average data to see if the authority had overbilled either community did not indicate any abnormal flow volumes in either Chelsea or Everett. Chelsea water system management engineer (Weston and Sampson) subsequently requested assistance with identification and estimation of several large water main leaks that were repaired in CY 2019.

Staff continued to track an issue in Somerville. The bypass valve for meter #91 in Somerville was placed back into service in December 2019. Despite the valve functioning properly, the Somerville Low Service Area is still approximately 500,000 gpd higher than historical values. Metering worked with leak detection to perform a complete leak detection hydrant survey of the low service area in Somerville. While several small service leaks were identified, there was not a major leak that would result in a large decrease in demand. Metering continued to monitor the situation and Operations have begun testing other meter sites to identify other potential spots where water may be returning to the MWRA system.

Metering staff reached out to the following communities in February to alert them to observed flow increases in their monthly usage on their CY 2019 draft assessments; Somerville (3x), Nahant, Southborough, and Everett (Likely related to Casino opening June 2019).

CSO Public Notification: Metering staff continued to support the CSO public notifications team, identifying the equipment needed to maintain the meter sites after the CSO evaluation project is complete.

Due to the Social distancing guidelines due to CoVid, MWRA's specialty metering contractor is unavailable to travel to site visits to inspect the existing wastewater metering equipment. Metering crews will assist with inspection of the meters once ADS is available.

Teleworking Collaboration: The Meter data and Meter Engineering teams successfully migrated to teleworking in the month of March due to social distancing requirements. Meter Data is also operating as a pilot program for operation with the WebEx Teams software to maintain contact remotely. Meter Maintenance remains on an A/B schedule on a report-as-needed basis.

Verizon 4G Upgrade: Metering staff has been preparing for Verizon to shut off their 3G data network permanently. Of the 2 remaining 4G modem installations, all are at SCADA sites. We anticipate completing rollout of all 4G modems and RU-35s well before the Verizon 3G shutoff at the end of 2020.

TRAC

- On January 22, a large amount of grease and rags showed up on the bar screens at Caruso Pump Station. TRAC Inspections staff determined that the grease resulted from the cleanup of a sewage blockage at the airport with 50-70,000 of material discharged to a manhole on Massport's property.

- On March 1, TRAC staff responded to a spill of transformer fluid to a storm drain in Cambridge from a car accident with a telephone pole causing the pole to fall to the pavement and spill the contents of 3 transformers. None of the fluid reached the sewer and there was no impact to the sewer service.

Environmental Quality-Water

Regulatory and Non-Regulatory Sampling Programs

- Throughout the quarter, staff provided drinking water sampler training to nine communities and internal staff on the proper procedure for collection of a coliform sample and testing of chlorine residual and temperature. Staff developed a visual guide and operating procedure on how to collect a drinking water sample for coliform analysis.

- COVID19 Coordination with DEP/EPA: MWRA staff began bi-weekly online meetings with DEP and EPA representatives on March 26. MWRA provided an update on planning and operations prior to and during the emergency.

Community Support

- In January and February, staff provided support to Framingham for sampling and testing associated with the disinfection and refilling of three water storage tanks.

- On January 13, MWRA staff along with DEP NERO attended a meeting at the Hanscom Air Force Base. The discussion focused on the Base's recent issues with drinking water program compliance and the DEP issuance of four consecutive Level 2

- RTCR Assessments. In February, EnQual-Water staff visited the Base to perform investigatory sampling at various total coliform rule sample sites. All results revealed an improvement in several water quality parameters.

- On January 16, EnQual-staff provided community support to Norwood regarding discolored water samples on a particular service line at a local café. Further investigation and testing revealed that the carbonation system at the beverage fountain was the source of the issue. The low pH condition resulted in blue-colored water with elevated levels of copper, zinc, and other heavy metals. Norwood Water Dept. notified their Board of Health and the DEP throughout the event. Repairs to the carbonation system resolved the problem.

- Staff continued to monitor disinfection byproducts results within the CVA communities and help with required DEP submittals. CVA communities sampled Q1 disinfection byproducts in February and March; no communities exceeded an Operational Evaluation Level (OEL) or Locational Running Annual Average (LRAA). Staff continue to collect monthly disinfection byproducts samples at Ludlow Monitoring Station and the Nash Hill Covered Storage tanks. Additional EnQual-Water monitoring for TOC in the Quabbin system continued and weekly reports now have additional graphs or data for UV254 (addition of online monitoring), Quabbin Reservoir algae data, Ludlow Monitoring and CWTP finished water disinfection byproducts results.

- Staff continued work with DCR on the purchase, deployment, and care of a water quality-profiling buoy on the Quabbin reservoir. Procurement and installation of the two 300-pound buoy anchors is underway. Upgrades of modems and dataloggers for the Wachusett buoys underway.

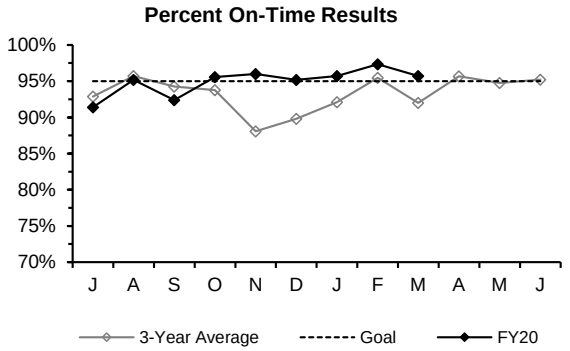
- Staff completed annual bulk chemical purity sampling to ensure its quality and monitor contract compliance. Provided an update on chemical supply conditions and the COVID19 pandemic. All bulk chemical supplies are at acceptable levels and vendors are not experiencing any issues with manufacture, distribution or transport.

Environmental Quality-Wastewater

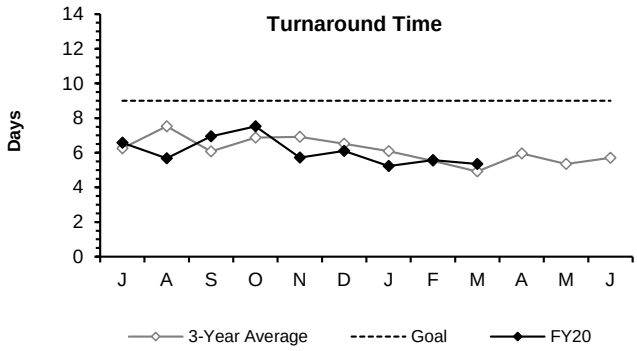
- Biweekly harbor wide monitoring continued until early March, and then was suspended because of laboratory field staff unavailability due to COVID-19 response. Seasonal CSO Receiving Water monitoring in variance waters will resume next month at a reduced level of effort.
- Staff made the required notification of exceedance, for 2019, of the total annual effluent nitrogen load threshold in the Contingency Plan. Continued work on the receiving water quality analysis portion of the CSO Post-Construction Monitoring & Performance Assessment project; Continued to prepare for CSO notification requirements in the new CSO variances.

Laboratory Services

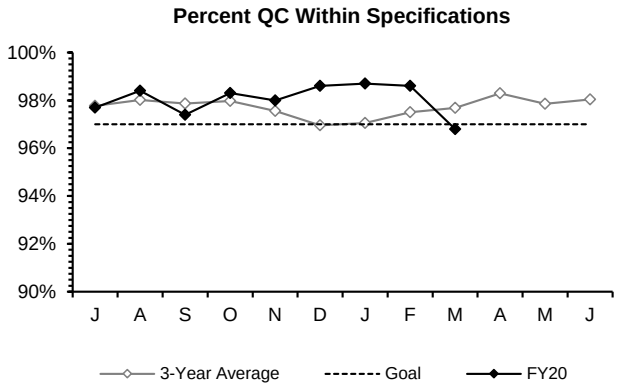
3rd Quarter - FY20



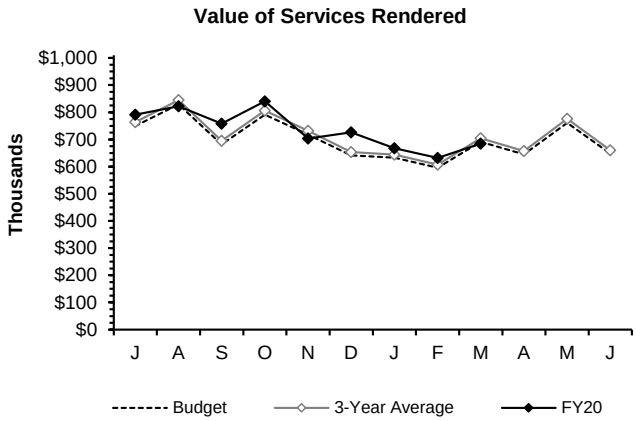
The Percent On-Time measurement met the 95% goal.



Turnaround Time met the 9-day goal.



Percent of QC tests meeting specifications fell to slightly below the 97% in-house goal in March due to an error that impacted a large number of QC results, but did not impact reportable samples.



Value of Services Rendered met the annual budget projection.

Highlights:

ENQUAL:

Conducted the 1st field trial of the Fluidion unit. The Fluidion is a field instrument that can be remotely deployed and activated for the analysis of *E. coli* or Enterococcus. The test results can also be remotely uploaded when complete.

Performance:

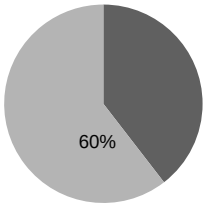
Met on-time and turnaround time indicators in March at reduced staffing level.

CONSTRUCTION PROGRAMS

Projects In Construction

3rd Quarter– FY20

Money



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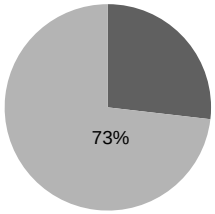


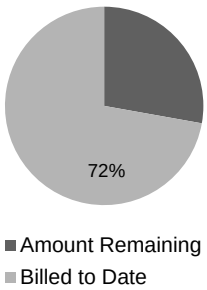
Southern Extra High Pipeline Section 111

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.

Notice to Proceed: 10-Aug-2018 *Contract Completion:* 7-Nov-2020

Status and Issues: As of March, Crew 1 Installed Gate 36" Gate Valve at Sta. 48+25 and installed two 36" X 8" MJ Tee at Sta. 48+20 & Sta. 48+41 and by-pass piping for Gate Vault structure in Rustcraft Road. Crew 2 Installed 128 LF 36" Steel pipe on both sides of I-95 at East Street Rotary. Crew 3 Installed 53 LF of 12" DWWD new water main and installed a two access manhole on both sides of I-95 at East Street Rotary.

Money



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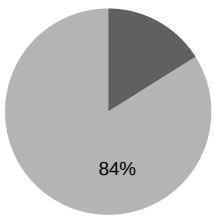


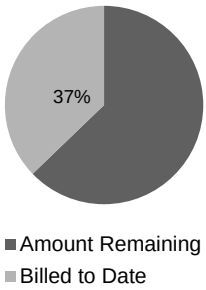
Chelsea Creek Headworks Upgrade

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.

Notice to Proceed: 22-Nov-2016 *Contract Completion:* 21-Nov-2020

Status and Issues: As of March, the Contractor backfilled the card reader and gate motor duct bank at the south east entrance. They removed grit collection chain and flights from Channel 1 and cleaned the channel for chain replacement. They also worked in the Grit Bin Room and drilled and installed adhesive dowels into the floor slab.

Money



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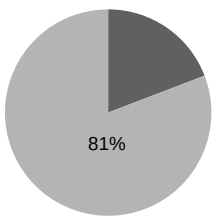


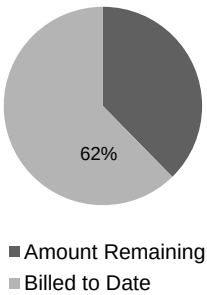
Cottage Farm & Gillis PS Roof Replacement

Project Summary: This project involves the replacement of the rubber roofing membrane system at the Cottage Farm CSO and the Gillis Pumping station.

Notice to Proceed: 10-Jul-2019 *Contract Completion:* 9-Jul-2020

Status and Issues: As of March, the Contractor demolished the existing flat roof and completed 98% installation of roof at Gillis Pump Station. At Cottage Farm, they replaced and sealed insulation & Ethylene propylene diene monomer (EPDM) on lower roof's 1, 2, & 3 and high roof and replaced roof drains/strainers. Also, they created extension to interior of parapet/pre-cast concrete panels with pressure treated wood for lower coping cover to secure to.

Money



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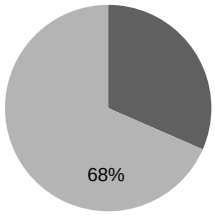


Commonwealth Ave Pump Station Improvements

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.

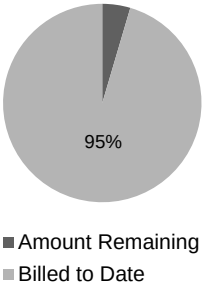
Notice to Proceed: 28-Feb-2019 *Contract Completion:* 30-Sep-2020

Status and Issues: As of March, the Contractor poured concrete for thrust block Type B detail B in median, equipment pads for condensing units south of West Building, concrete pipe supports for discharge piping and surge control valve in East Building basement, and second base floor and associated concrete pipe supports in Vault D.

Projects In Construction

3rd Quarter– FY20

Money



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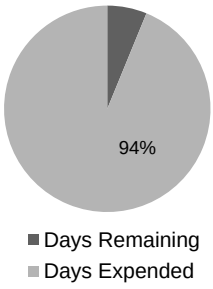


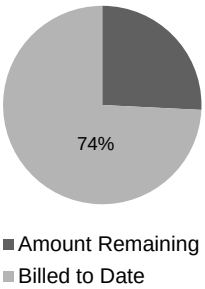
NIH Section 110 - Stoneham

Project Summary: This project consists of the replacement of 14,000 linear feet of 48-inch diameter transmission main in the Town of Stoneham.

Notice to Proceed: 5-Sep-2017 *Contract Completion:* 1-Jun-2020

Status and Issues: As of March, Contractor worked sporadically during the month on Contract punchlist work.

Money



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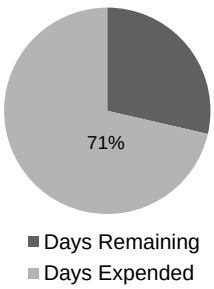


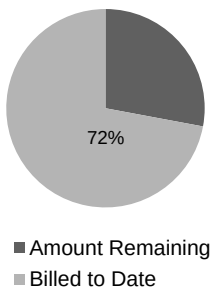
Capital Improvements at the Biosolids Facility

Project Summary: This project involves the replacement of nine mechanical conveyors and ancillary equipment, as well as three sludge processing rotary dryer drums.

Notice to Proceed: 9-Apr-19 *Contract Completion:* 21-Aug-20

Status and Issues: As of March, the Contractor completed Train No 3. They continued construction work on Train No 6.

Money



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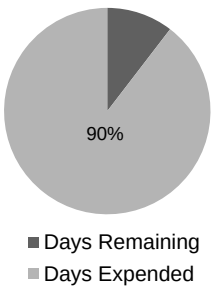


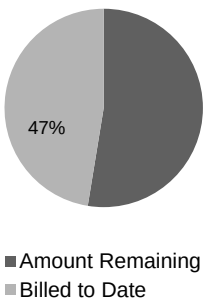
Winthrop Terminal VFD and Motor

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

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

Status and Issues: VFD No 5 commission test on-going.

Money



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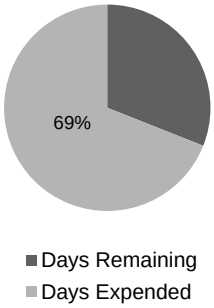


Gravity Thickener Rehabilitation

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.

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

Status and Issues: As of March, the Contractor Installed FRP cover (90%)Placed grout floor, performed control panel testing, electrical testing and torque testing of the mechanism. In addition, they continued work on installing high pressure plant water connection and started work on replacing flushing water hydrant.

CSO CONTROL PROGRAM

3rd Quarter – FY20

All 35 projects in the Long-Term CSO Control Plan were complete as of December 2015 in compliance schedule 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 long-term levels of CSO control are attained. Of the $911.1 million budget in the FY20 CIP for the CSO Control Program, approximately $6.3 million remain to be spent, as described below.

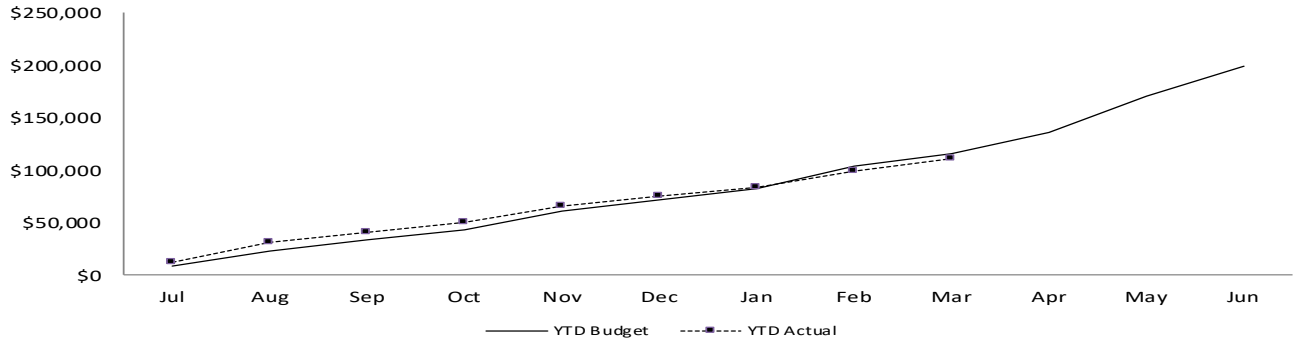
Project/Item	Status as of March 31, 2020
BWSC Dorchester Interceptor Inflow Removal	The CSO MOU/FAA with BWSC included $5.4 million for additional inflow removal from BWSC's Dorchester Interceptor system as part of the South Dorchester Bay Sewer Separation project, of which MWRA transferred $1.7 million 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 expects to submit construction contract plans to MWRA for approval, then award the contract, in the fall of 2020, and complete the work within the term of the agreement (by 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, and attained substantial completion of related surface restoration work by the end of 2017. 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 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 and Financial Assistance Agreement. Staff expect to complete the review and issue a final eligibility certification by **June 30, 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 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 court-ordered levels of CSO control are attained. • **AECOM completed refinements to the upgrade and recalibration of MWRA's hydraulic model in January 2020. Calibrated model results have allowed a comparison of model predicted CSO discharges with the discharges measured in the CSO metering program that began in April 2018.** A key objective of the CSO performance assessment is to bring the model and meter results closer together to gain stakeholder confidence in the accuracy of the model in predicting CSO discharges and assessing compliance with the Long Term Control Plan's (LTCP) Typical Year levels of control. • **On February 14, 2020, MWRA filed a Supplemental Progress Report with the Federal District Court describing completion of model calibration refinements and presenting current system Typical Year performance predictions compared with the LTCP's level of control.** • **MWRA will issue a fourth semiannual progress report on April 30, 2020, covering the data collection and CSO discharge quantification period of July 1 – December 31, 2019, calibration of MWRA's hydraulic model and updated Typical Year model predictions, and other work progress.** • Temporary CSO meters continue to be employed at 36 of the original 57 metered locations, in accordance with Amendment 1 to the AECOM contract. • MWRA and AECOM continue to conduct, in close coordination with the CSO communities, investigations into the higher overflow activities measured at several outfalls to better understand the factors contributing to overflows and identify system adjustments that may help bring discharges into compliance with the long-term levels of control. 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 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. • AECOM continues to make progress in developing the receiving water models for the Charles River and the Alewife Brook/Upper Mystic River. MWRA staff support the modeling effort by collecting CSO and stormwater quality data with the assistance of the cities of Cambridge, Somerville, Arlington and Medford. • **Specific additional CSO mitigation projects required by the variances will be added to the AECOM Contract 7572 by Amendment 2, authorized by the Board on 3/18/20.**

CIP Expenditures
3rd Quarter - FY20

FY20 Capital Improvement Program Expenditure Variances through March by Program ($ in thousands)				
Program	FY20 Budget Through March	FY20 Actual Through March	Variance Amount	Variance Percent
Wastewater	63,256	69,545	6,289	10%
Waterworks	45,716	38,269	(7,447)	-16%
Business and Operations Support	7,452	2,992	(4,460)	-60%
Total	$116,424	$110,806	($5,618)	-5%

Project overspending within Wastewater was due to timing of community requests for grants and loans for the Infiltration/Inflow (I/I) Program, contractor progress for the Residuals/Electrical/Mechanical/Drum Dryer Replacements, Chelsea Creek Headworks Upgrades Construction, work anticipated in FY19 that was completed in FY20 for the Clinton Roofing Rehabilitation, and earlier than anticipated equipment purchases for the Wastewater Meter Equipment project. This was partially offset by updated schedule for the Nut Island Odor Control and HVAC Improvements, Dorchester Interceptor Sewer Construction, updated schedule for the Dorchester I/I Removal Construction, vibration issue on VFD No. 5 for the Winthrop Terminal Facility VFD Replacement Construction, timing of work for the Gravity Thickener Rehabilitation contract, and project scope change for the Clinton Valves and Pipe Replacement project. Project underspending in Waterworks was due to timing of community loan requests, less than anticipated consultant progress for Section 50/57 Water and Section 21/20/19 Sewer Design, paving delays for SEH Section 111 Construction 2, and schedule changes for CWTP Ancillary Modifications and CP-1 Shafts 6,8, and 9A. This was partially offset by contractor progress for SEH Section 111 Construction 3, work anticipated in FY19 that was completed in FY20 for the Bellevue 2/Turkey Hill Tank Painting and Cosgrove Intake Roof Repair, and timing of final work for the Wachusett Aqueduct Pumping Station Design/CA/REI contract.

Budget vs. Actual CIP Expenditures
($ in thousands)
Total FY20 CIP Budget of $199,147



Construction Fund Management

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

Cash Balance as of 3/28/20	$119.3 million
Unused capacity under the debt cap:	$1.54 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-20
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 FY20 Cash Flow Expectancy*:	$183 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

3rd Quarter – FY20

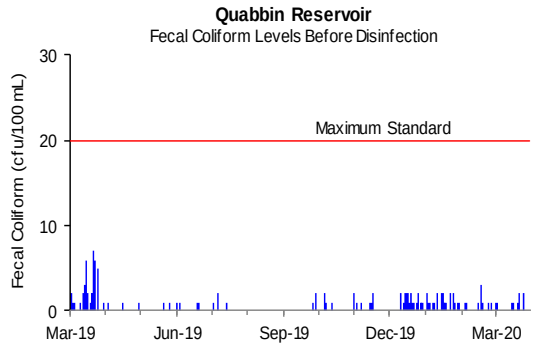
Source Water – Microbial Results

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

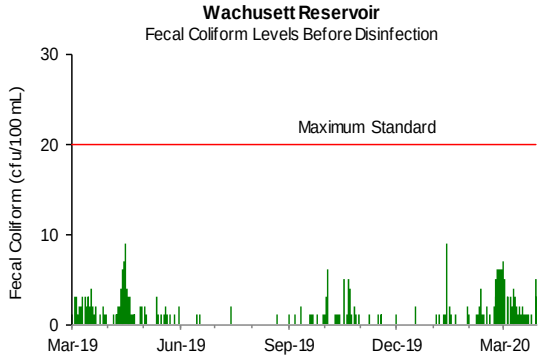


Sample Site: Wachusett Reservoir

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

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

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

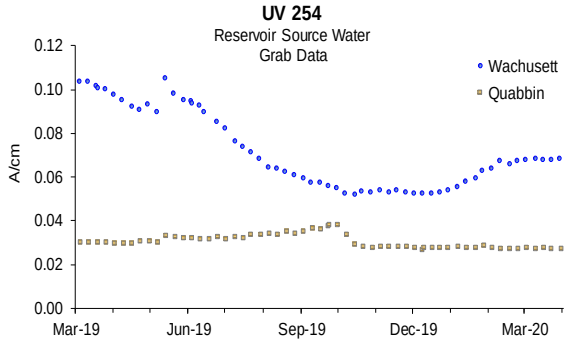


Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.027 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.68 A/cm.



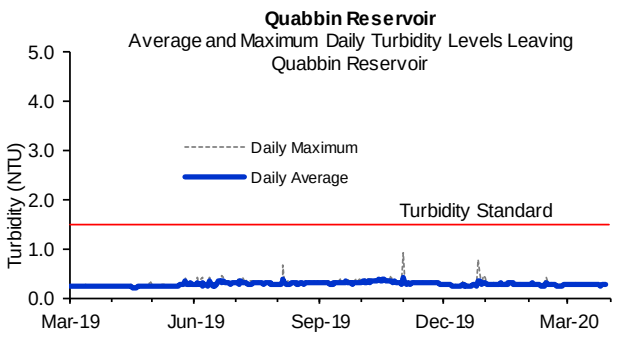
Source Water – Turbidity

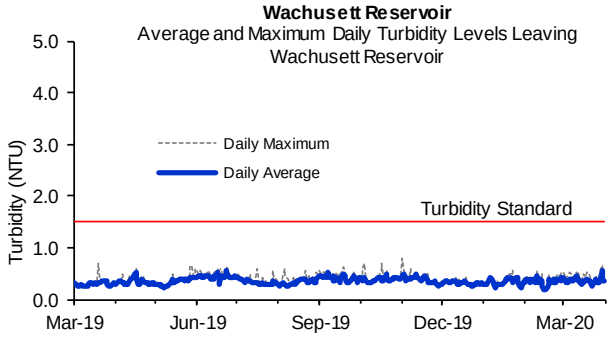
3rd Quarter – FY20

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.



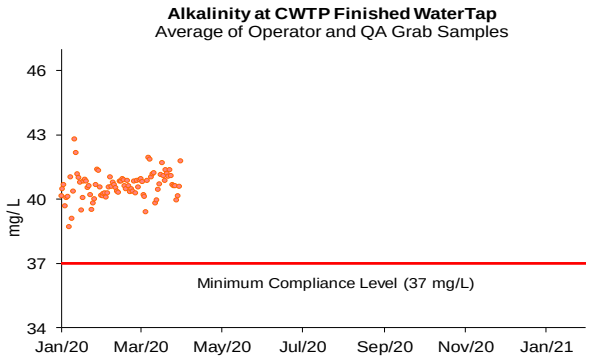


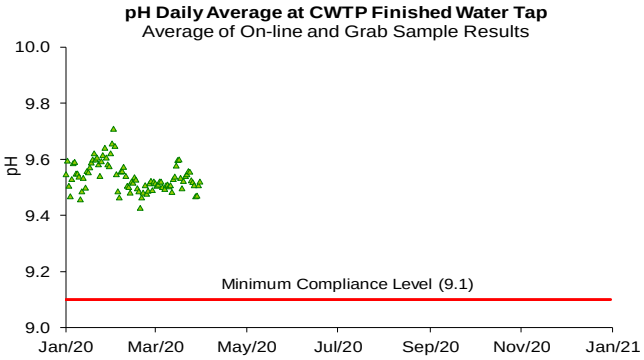
Treated Water – pH and Alkalinity Compliance

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.

Distribution system samples were collected on March 10, 11, and 12, 2020. Distribution system sample pH ranged from 9.4 to 9.6 and alkalinity ranged from 41 to 43 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

3rd Quarter – FY20

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 1.6 to 2.4 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% during the month. Off-spec water was less than 5%.
- The ozone dose was proactively increased from early September 2019 to mid October 2019 in response to a *Chrysosphaerella* algae bloom. This is visible in the top left graph.

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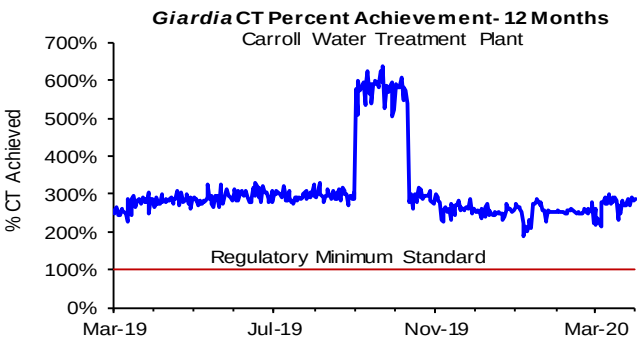
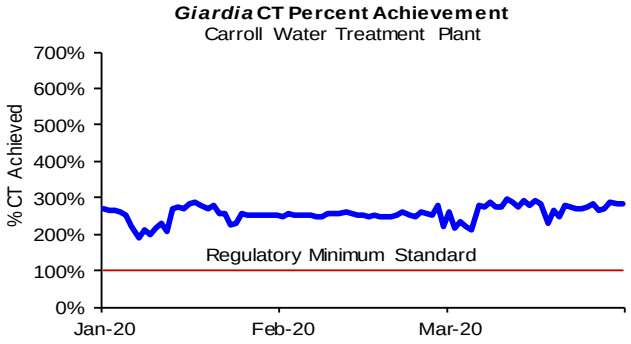
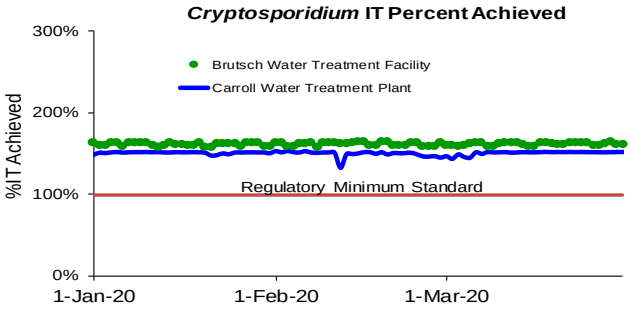
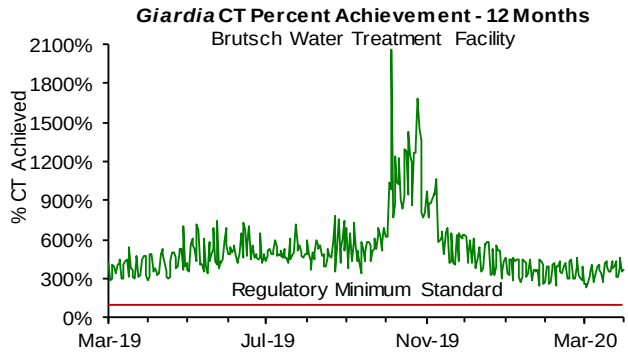


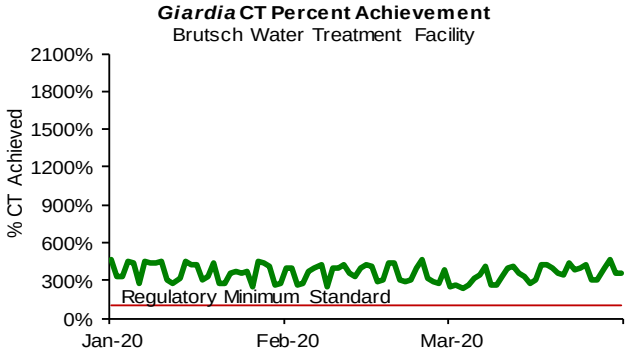


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 mg/L (November 01 – May 31) and >1.0 mg/L (June 1– October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.2 to 1.3 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% during the month. Off-spec water was less than 5%.







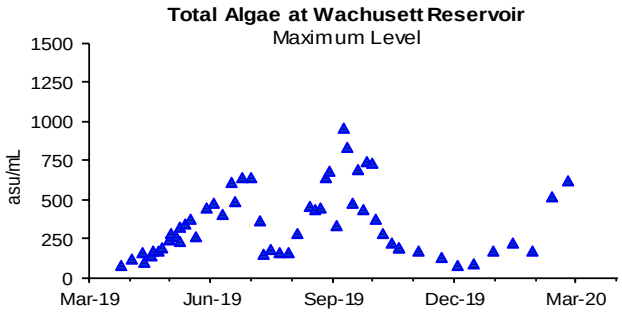
Source Water - Algae

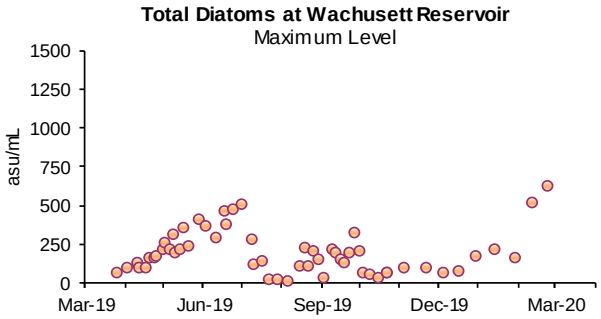
3rd Quarter – FY20

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



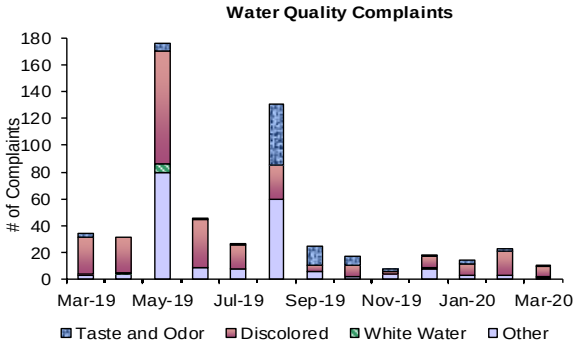


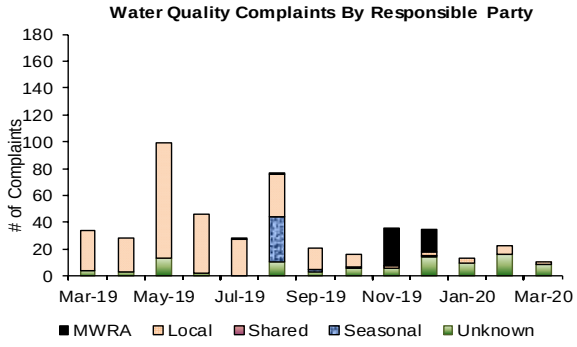
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 48 complaints during the quarter compared to 70 complaints from 3rd Quarter of FY19. Of these complaints, 35 were for "discolored water", 5 were for "taste and odor", 1 was for "white water", and 7 were for "other". Of these complaints, 12 were local community issues, 1 was an MWRA related issue, and 35 were unknown in origin.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

3rd Quarter – FY20

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* is a specific coliform species whose presence likely indicates potential contamination of fecal origin.
If *E.coli* are detected in a drinking water sample, this is considered evidence of a potential public health concern. Public notification is required if repeat tests confirm the presence of E.coli or total coliform.
Total coliform provide a general indication of the sanitary condition of a water supply. If total coliform are detected in more than 5% of samples in a month (or if more than one sample is positive when less than 40 samples are collected), the water system is required to investigate the possible source/cause with a Level 1 or 2 Assessment, and fix any identified problems.
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 3rd Quarter, 6 of the 6,159 community samples (0.10% system-wide) submitted to MWRA labs for analysis tested positive for total coliform (January: Boston, Lexington; February: Norwood; Mach: Arlington). Five of the 1,923 Shared Community/MWRA samples (0.26%) tested positive for total coliform (January: Lexington; February: Norwood; March: Arlington). No sample tested positive for *E.coli*. Only 0.3% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

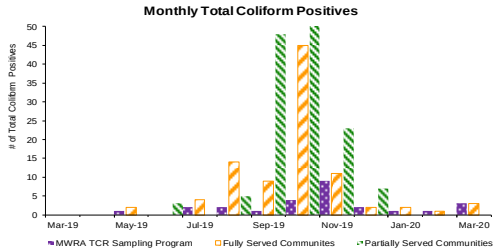
NOTES:

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		MWRA Locations	336	0 (0%)	0	
MWRA	a	Shared Community/MWRA sites	1587	5 (0.32%)	0	
MWRA		*Total: MWRA*	1923	5 (0.26%)	0	No
Fully Served		ARLINGTON	176	3 (1.70%)	0	No
Fully Served		BELMONT	104	0 (0%)	0	
Fully Served		BOSTON	773	1 (0.13%)	0	No
Fully Served		BROOKLINE	223	0 (0%)	0	
Fully Served		CHELSEA	169	0 (0%)	0	
Fully Served		DEER ISLAND	52	0 (0%)	0	
Fully Served		EVERETT	169	0 (0%)	0	
Fully Served		FRAMINGHAM	238	0 (0%)	0	
Fully Served		LEXINGTON	118	1 (0.85%)	0	No
Fully Served		LYNNFIELD	18	0 (0%)	0	
Fully Served		MALDEN	232	0 (0%)	0	
Fully Served		MARBLEHEAD	72	0 (0%)	0	
Fully Served		MARLBOROUGH	126	0 (0%)	0	
Fully Served		MEDFORD	204	0 (0%)	0	
Fully Served		MELROSE	108	0 (0%)	0	
Fully Served		MILTON	101	0 (0%)	0	
Fully Served		NAHANT	29	0 (0%)	0	
Fully Served		NEWTON	276	0 (0%)	0	
Fully Served		NORTHBOROUGH	48	0 (0%)	0	
Fully Served		NORWOOD	103	1 (0.97%)	0	No
Fully Served		QUINCY	339	0 (0%)	0	
Fully Served		READING	119	0 (0%)	0	
Fully Served		REVERE	195	0 (0%)	0	
Fully Served		SAUGUS	104	0 (0%)	0	
Fully Served		SOMERVILLE	252	0 (0%)	0	
Fully Served		SOUTHBOROUGH	30	0 (0%)	0	
Fully Served		STONEHAM	91	0 (0%)	0	
Fully Served		SWAMPSCOTT	56	0 (0%)	0	
Fully Served		WALTHAM	216	0 (0%)	0	
Fully Served		WATERTOWN	126	0 (0%)	0	
Fully Served		WESTON	45	0 (0%)	0	
Fully Served		WINTHROP	72	0 (0%)	0	
Fully Served		*Total: Fully Served*	*4984*	*6 (0.12%)*		
Partially Served	c	BEDFORD	56	0 (0%)	0	
Partially Served	c	CANTON	91	0 (0%)	0	
Partially Served	c	HANSCOM AFB	33	0 (0%)	0	
Partially Served	c	NEEDHAM	123	0 (0%)	0	
Partially Served	c	PEABODY	187	0 (0%)	0	
Partially Served	c	WAKEFIELD	133	0 (0%)	0	
Partially Served	c	WELLESLEY	112	0 (0%)	0	
Partially Served	c	WILMINGTON	87	0 (0%)	0	
Partially Served	c	WINCHESTER	98	0 (0%)	0	
Partially Served	c	WOBURN	195	0 (0%)	0	
CVA	d	SOUTH HADLEY FD1	60	0 (0%)	0	
		Total: CVA & Partially Served	*1175*	*0 (0.0%)*		
		Total: Community Samples	*6159*	*6 (0.10%)*		

Chlorine Residuals in Fully Served Communities

	2019										2020		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
% <0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.7	1.1	1.7	0.2	0.1	0.1	0.1
% <0.2	0.1	0.1	0.1	0.1	0.7	1.3	2.3	3.3	3.3	1.5	0.4	0.2	0.2
% <0.5	0.4	0.3	0.3	0.9	2.5	4.5	7.2	8.7	7.7	4.1	2.0	1.5	1.1
% <1.0	1.7	1.4	1.9	3.2	7.0	11.0	14.9	17.8	12.6	7.3	3.9	2.9	3.5
% ≥1.0	98.4	98.7	98.1	96.8	93.0	89.0	85.1	82.2	87.4	92.7	96.1	97.2	96.5

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

3rd Quarter – FY20

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.

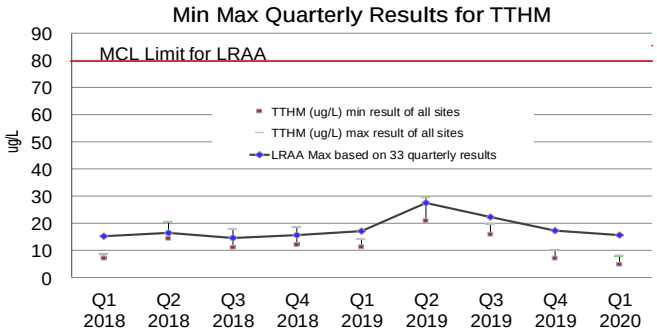
The locational running annual average calculated quarterly at each individual sampling location must be below the Total HAA5 or Total TTHM MCL standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

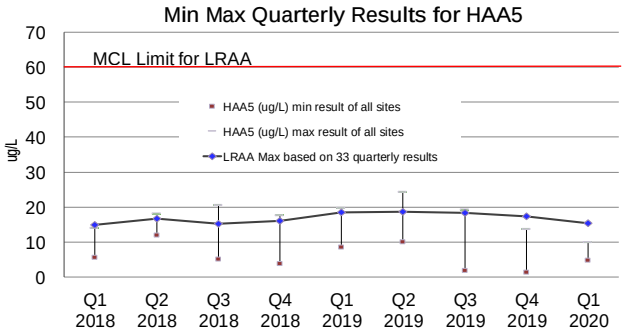
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines data for all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1). Although, they are separately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

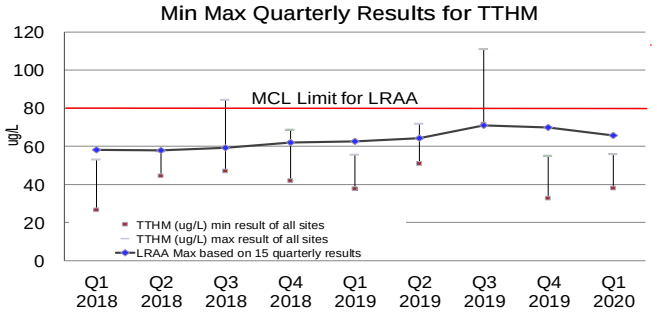
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 15.7 ug/L; HAA5s = 15.4 ug/L. The current RAA for Bromate = 0.0 µg/L. During the Q4 2019 sampling, one CVA community exceeded an HAA5 Operational Evaluation Level at three locations. 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.

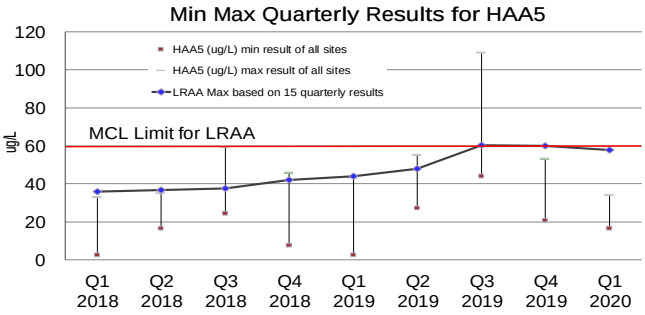
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

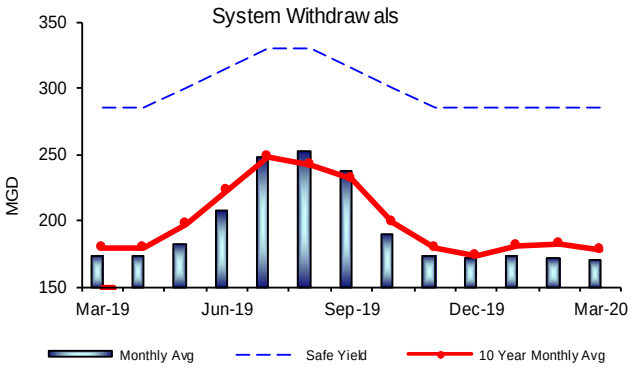
3rd Quarter – FY20

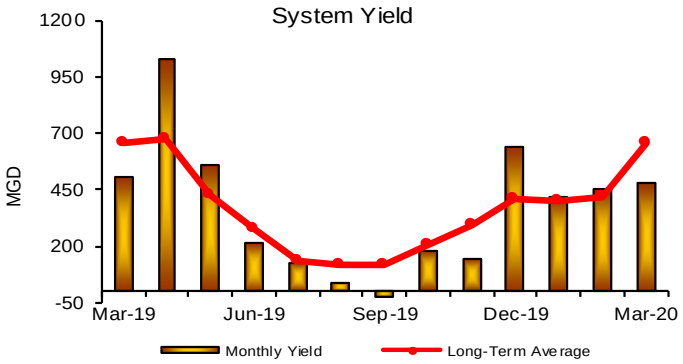
Background

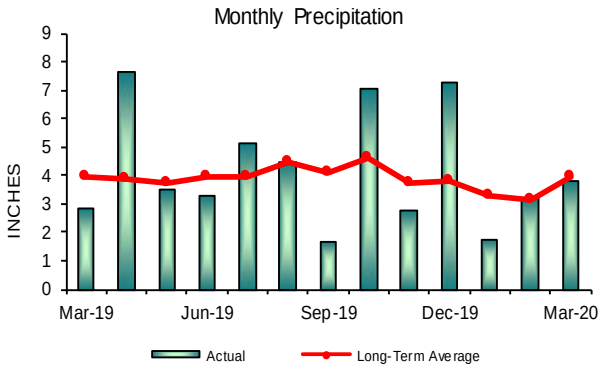
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir 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.

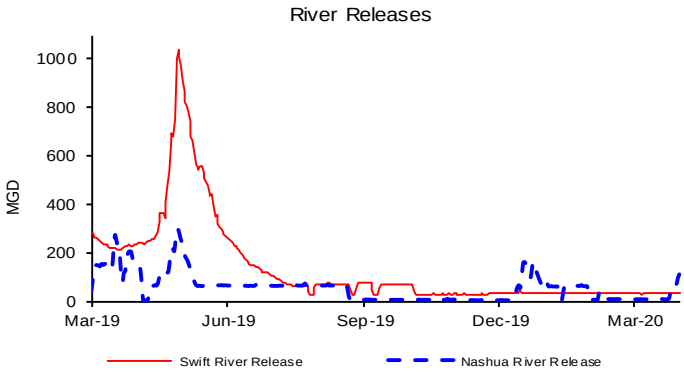
Outcome

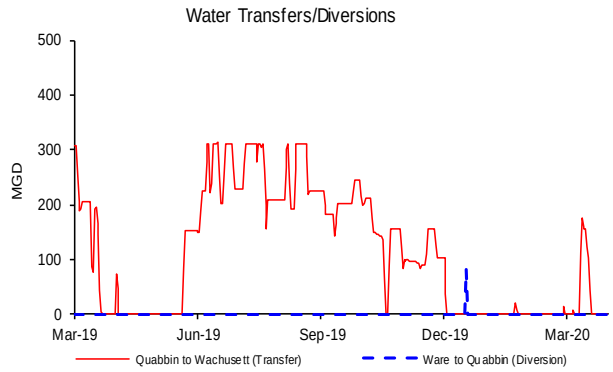
The volume of the Quabbin Reservoir was at 96.8% as of March 31, 2020; a 4.7% increase for the quarter, which represents an addition of more than 19.4 billion gallons of storage and an increase in elevation of 2.57' for the quarter. System withdrawal for the quarter was below the 10 year monthly average. Precipitation and Yield for the quarter were below their respective long term quarterly averages.

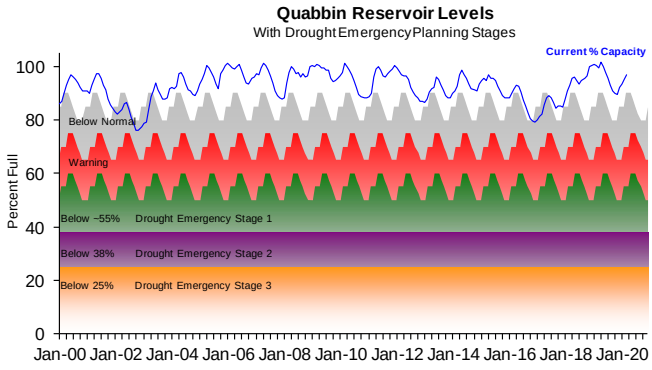












WASTEWATER QUALITY

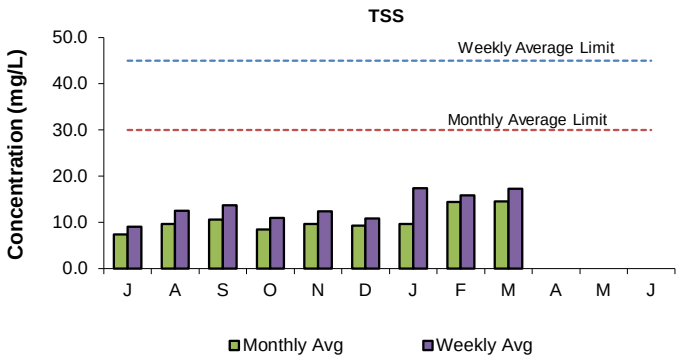
NPDES Permit Compliance: Deer Island Treatment Plant

3rd Quarter - FY20

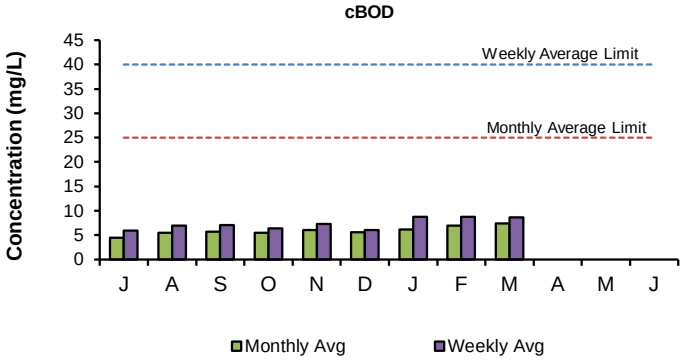
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*January*	*February*	*March*	*3rd Quarter Violations*	*FY20 YTD Violations*
Dry Day Flow (365 Day Average):		mgd	436	294.0	292.8	286.6	0	0
cBOD:	Monthly Average	mg/L	25	6.2	6.9	7.4	0	0
	Weekly Average	mg/L	40	8.8	8.8	8.7	0	0
TSS:	Monthly Average	mg/L	30	9.6	14.4	14.5	0	0
	Weekly Average	mg/L	45	17.4	15.9	17.3	0	0
TCR:	Monthly Average	ug/L	456	2.2	0.0	0.0	0	0
	Daily Maximum	ug/L	631	43.3	0.0	0.0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	54.0	31.0	9.0	0	0
	Weekly Geometric Mean	col/100mL	14000	9.0	8.0	6.0	0	0
	% of Samples >14000	%	10	1.0	0.0	0.0	0	0
	Consecutive Samples >14000	#	3	0.0	0.0	0.0	0	0
pH:		SU	6.0-9.0	6.5-7.0	6.5-6.90	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	100	100	100	0	0

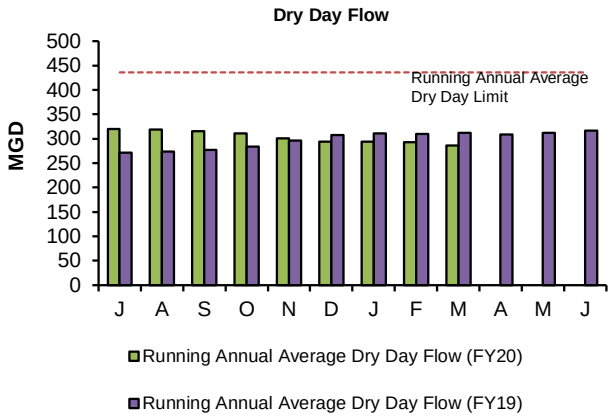
There have been no permit violations in FY20 to date at the Deer Island Treatment Plant (DITP).



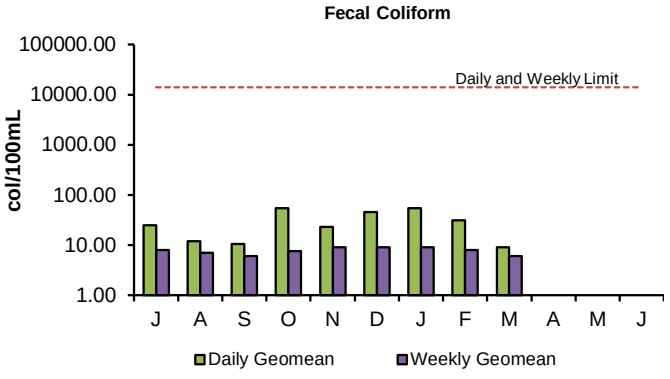
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 3rd Quarter were within permit limits.



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



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



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

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

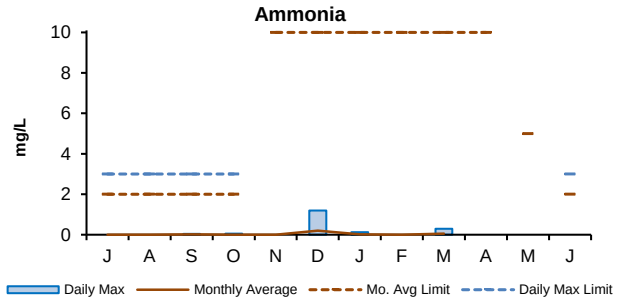
3rd Quarter - FY20

NPDES Permit Limits

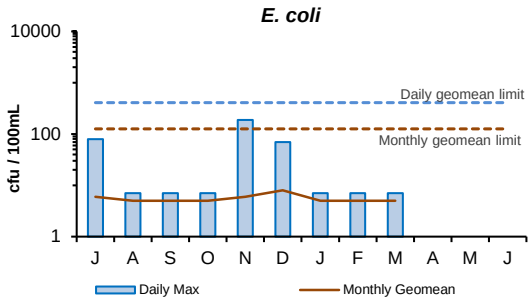
Effluent Characteristics		*Units*	*Limits*	*January*	*February*	*March*	*3rd Quarter Violations*	*FY20 YTD Violations*
Flow:	12-month Rolling Average:	mgd	3.01	2.51	2.47	2.40	0	3
BOD:	Monthly Average:	mg/L	20	2.70	2.90	1.70	0	0
	Weekly Average:	mg/L	20	3.00	3.30	2.50	0	0
TSS:	Monthly Average:	mg/L	20	4.50	4.40	2.90	0	0
	Weekly Average:	mg/L	20	5.10	4.90	3.80	0	0
pH:		SU	6.5-8.3	7.3-7.7	7.3-7.6	7.2-7.6	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	10.80	10.70	9.70	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	5	5	5	0	0
	Daily Geometric Mean:	cfu/100mL	409	7	7	7	0	0
TCR:	Monthly Average:	ug/L	17.6	0.26	0.00	0.26	0	0
	Daily Maximum:	ug/L	30.4	8.00	0.00	4.00	0	0
Copper:	Monthly Average:	ug/L	11.6	6.26	6.27	7.18	0	0
	Daily Maximum:	ug/L	14.0	6.26	6.27	7.89	0	0
Total Ammonia Nitrogen: November 1st - March 31st	Monthly Average:	mg/L	10.0	0.02	0.00	0.05	0	0
	Daily Maximum:	mg/L	35.2	0.12	0.00	0.29	0	0
Total Phosphorus: November 1st - March 31st	Monthly Average:	ug/L	1000	153	322	146	0	0
	Daily Maximum:	ug/L	RPT	186	375	351	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	0

There have been three permit violations in FY20 at the Clinton Treatment Plant.
1st Quarter: There were three permit violations in the first quarter. The 12-month rolling average flow exceeded the limit of 3.01 MGD due to excessive rains in the region in late 2018.
2nd Quarter: There were no permit violations in the 2nd Quarter.
3rd Quarter: There were no permit violations in the 3rd Quarter.

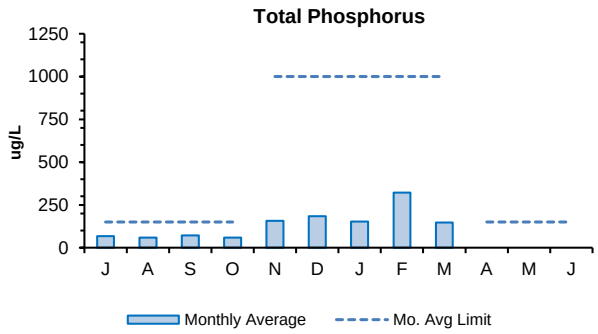
+ Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



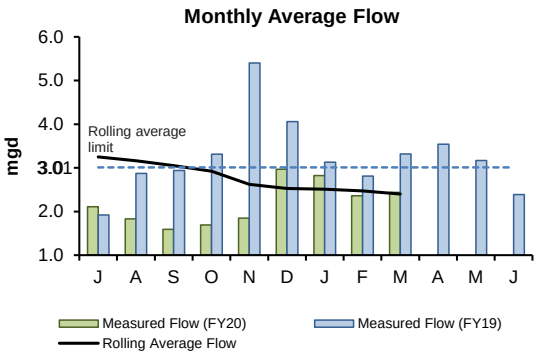
The 3rd Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 3rd Quarter are 10 and 35.2 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 3rd Quarter.The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



The 3rd Quarter's monthly average concentrations for total phosphorus were below permit limits. The new seasonal permit limits went into effect April 1, 2019.

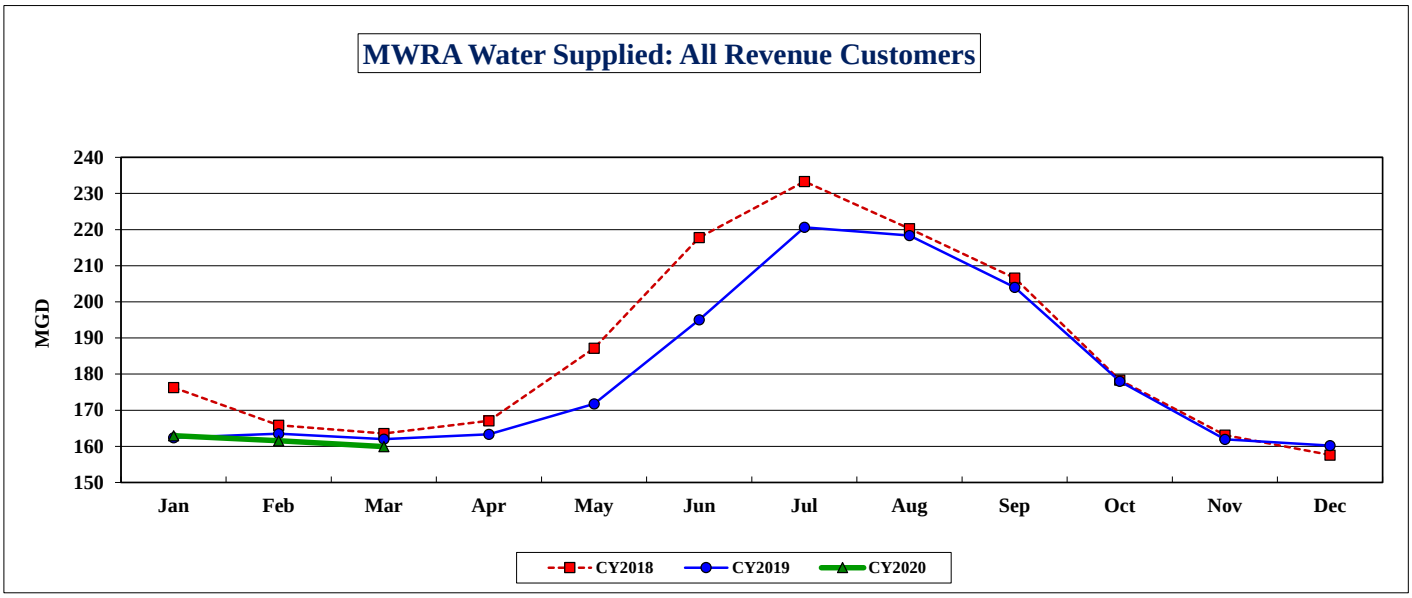


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 3rd Quarter were below the permit limit.

COMMUNITY FLOWS AND PROGRAMS

Customer Water Use

3rd Quarter - FY2020



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2018	176.294	165.841	163.539	167.056	187.145	217.776	233.321	220.268	206.586	178.340	163.125	157.612	168.649	186.553
CY2019	162.367	163.492	161.984	163.350	171.773	195.025	220.621	218.376	203.996	177.998	161.941	160.207	162.585	180.220
CY2020	162.954	161.557	159.930	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	161.479	161.479

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2018	5,465.125	4,643.548	5,069.719	5,011.695	5,801.508	6,533.267	7,232.949	6,828.310	6,197.590	5,528.550	4,893.739	4,885.979	15,178.392	68,091.978
CY2019	5,033.385	4,577.769	5,021.508	4,900.488	5,324.952	5,850.742	6,839.258	6,769.663	6,119.890	5,517.952	4,858.240	4,966.431	14,632.662	65,780.279
CY2020	5,051.575	4,685.154	4,957.836	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14,694.564	14,694.564

The March 2020 Community Water Use Report was recently distributed to communities served by the MWRA 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.

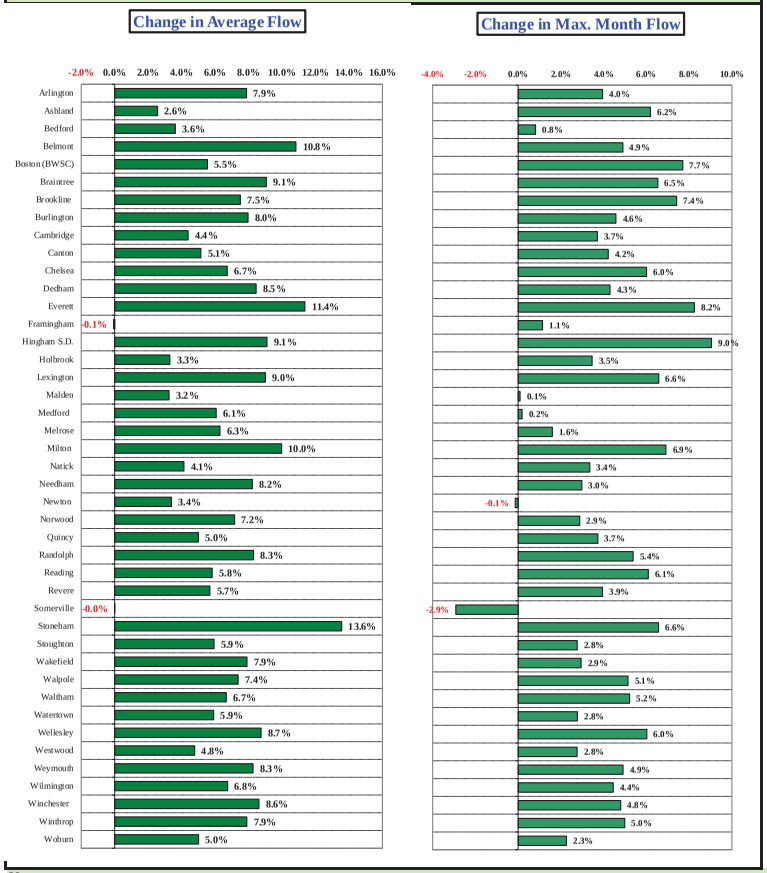
MWRA customers used an average of 161.5 mgd in the 3rd quarter (Jan-Mar) of FY2020. This is a decrease of 1.1 mgd or 0.7% compared to the 3rd quarter of FY2019.

Community Wastewater Flows

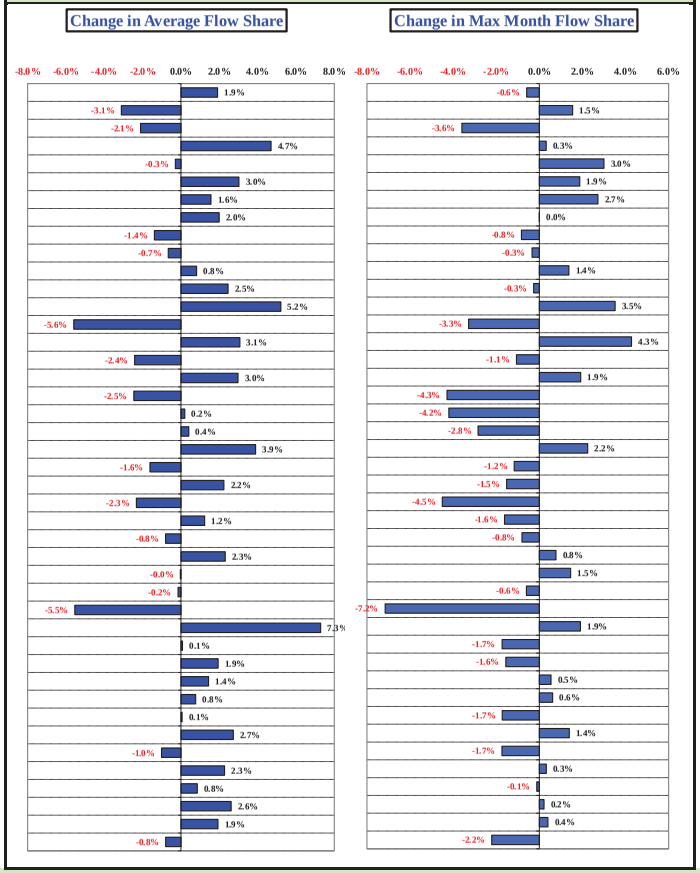
3rd Quarter - FY20

How Projected CY2019 Community Wastewater Flows Could Effect FY2021 Sewer Assessments [1,2,3]

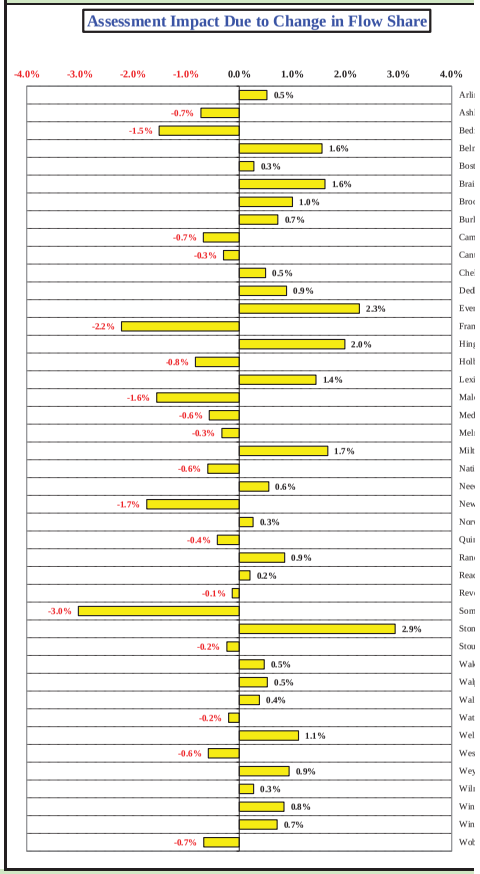
The flow components of FY2021 sewer assessments will be calculated using a 3-year average of CY2017 to CY2019 wastewater flows compared to FY2020 assessments that used a 3-year average of CY2016 to CY2018 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2017 to CY2019 flow share compared to CY2016 to CY2018 flow share, compared to all other communities in the system.



The chart below illustrates the change in the TOTAL BASE assessme FLOW SHARE CHANGES. [4]



Notes:

[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 CY2016 to CY2019 average wastewater flows as of 02/04/20. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2016 to CY2019 wastewater flows based on actual meter data.

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

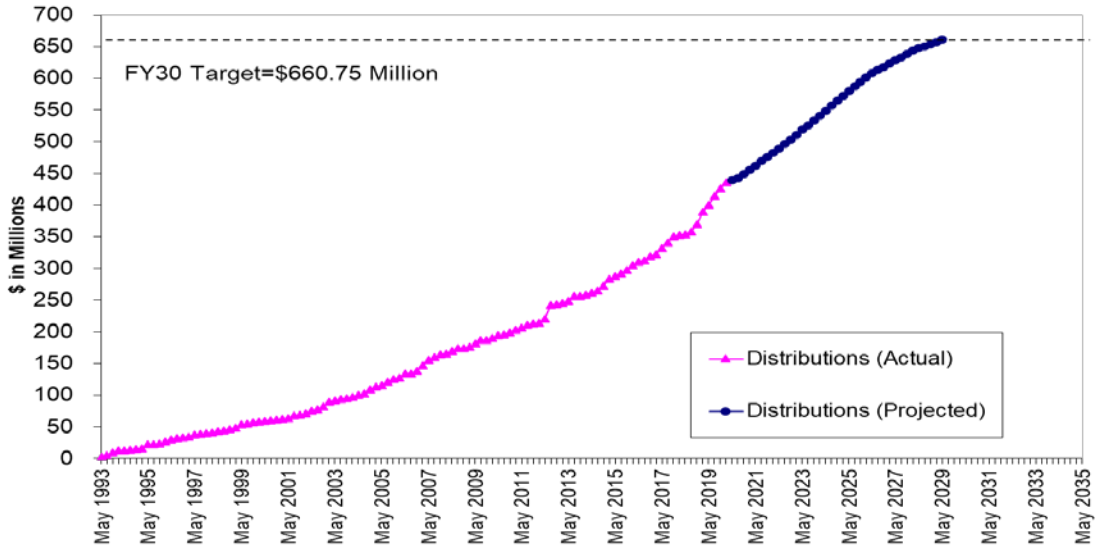
Community Support Programs

3rd Quarter – FY20

Infiltration/Inflow Local Financial Assistance Program

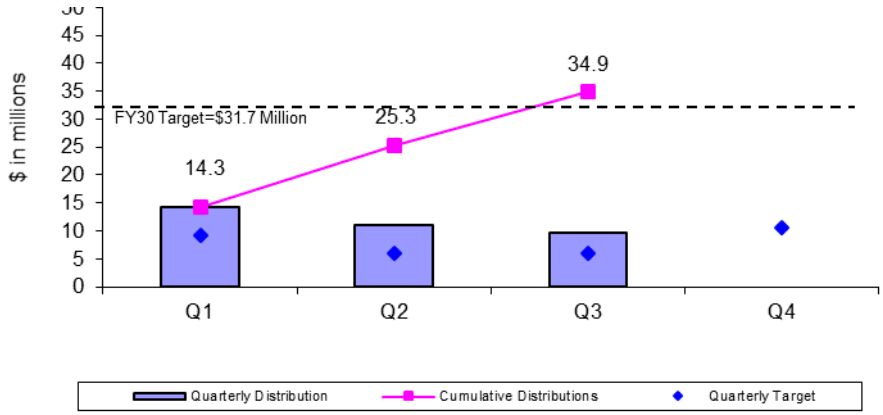
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $760.75 million in grants and interest-free loans (average of about $20 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 loan-only funds (not yet included in the graph of distributions below).

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 3rd Quarter of FY20, $9.6 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Braintree, Chelsea, Quincy, Randolph, Wakefield, Walpole, and Winthrop. Total grant/loan distribution for FY20 is $34.9 million. From FY93 through the 3rd Quarter of FY20, all 43 member sewer communities have participated in the program and $436 million has been distributed to fund 601 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.

FY20 Quarterly Distributions of Sewer Grant/Loans



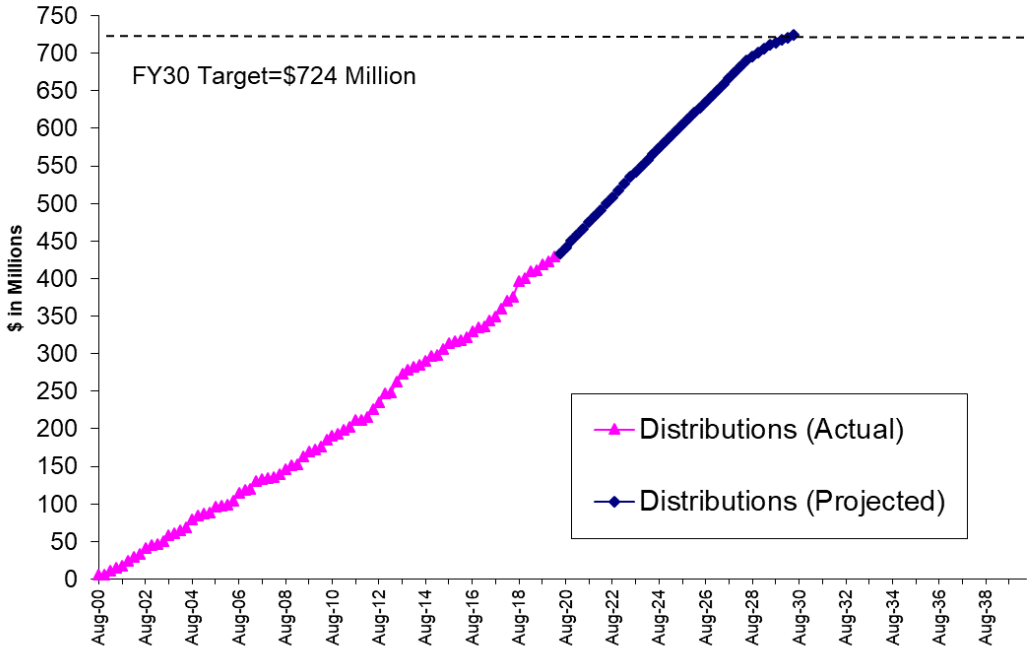
Community Support Programs

3rd Quarter – FY20

Local Water System Assistance Program

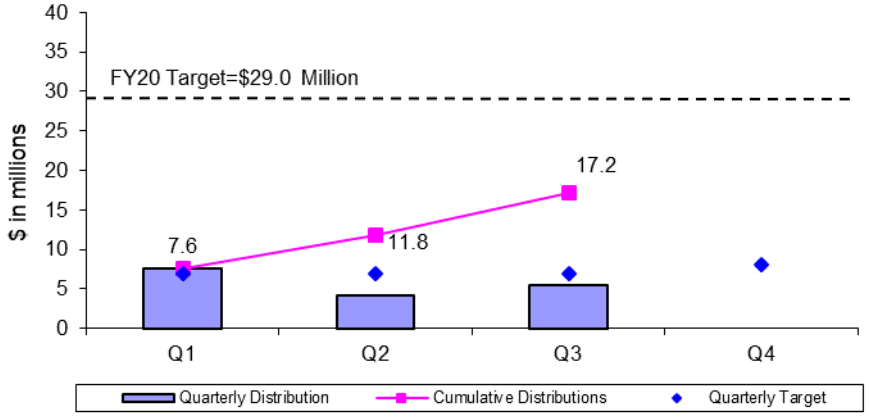
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at $222 Million, Phase 2 at $210 Million, and Phase 3 at $292 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 3rd Quarter of FY20, $5.4 million in interest-free loans was distributed to fund local water projects in Chelsea, Marblehead, Watertown, and Weston. Total loan distribution for FY20 is $17.2 million. From FY01 through the 3rd Quarter of FY20, $429 million has been distributed to fund 462 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.

FY20 Quarterly Distributions of Water Loans



Community Support Programs

3rd Quarter – FY20

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.

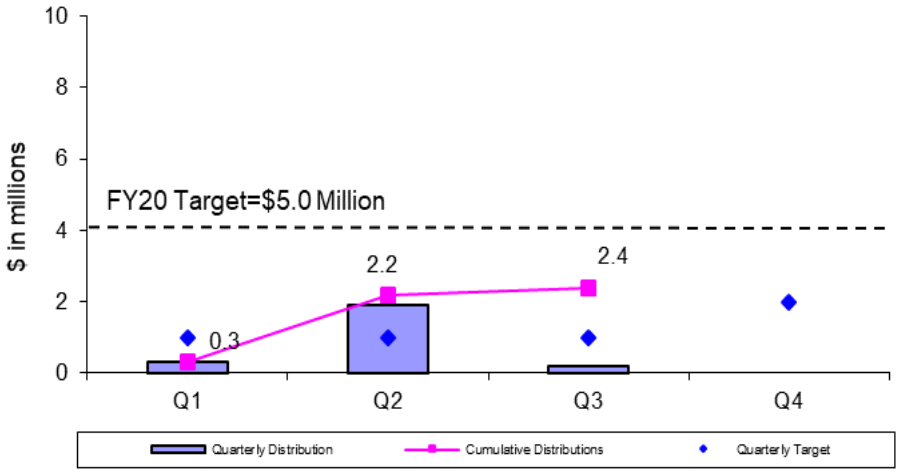
FY19 was the third year of the Lead Loan Program - MWRA made four Lead Loans.

FY20 is the fourth year of the Lead Loan Program. One Lead Loan was made during the 1st quarter of FY20: $300,000 to Chelsea. Two Lead Loans were made during the 2nd quarter of FY20: $1.0 Million to Everett and $900,000 to Somerville. One Lead Loan was made during the 3rd quarter of FY20: $160,000 to Weston.

Summary of Lead Loans:

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	$14.0 Million

FY20 Quarterly Distributions of Lead Service Line Replacement Loans

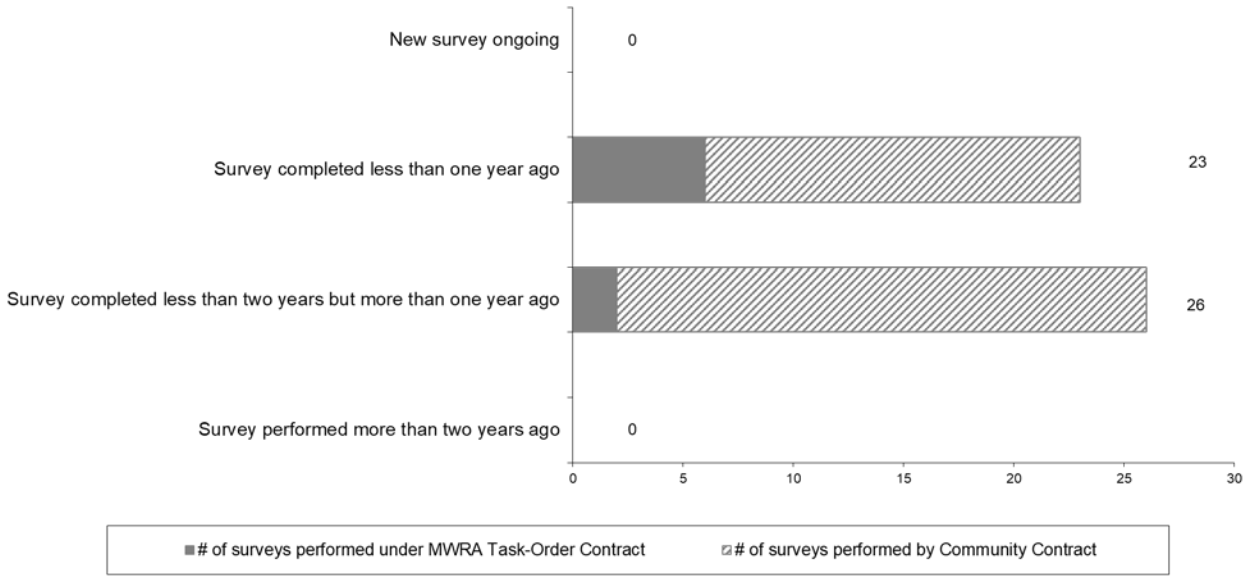


Community Support Programs

3rd Quarter – FY20

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA's task order leak detection contract. MWRA's task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 3rd Quarter of FY20, all member water communities were in compliance with MWRA's Leak Detection Regulation.



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 205 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor and 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	640	19,735	109		20,484
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	791	832	433		2,056
Toilet Leak Detection Dye Tablets	_____	419	35,431	258		36,108

BUSINESS SERVICES

Procurement: Purchasing and Contracts

3rd Quarter - FY20

Background:

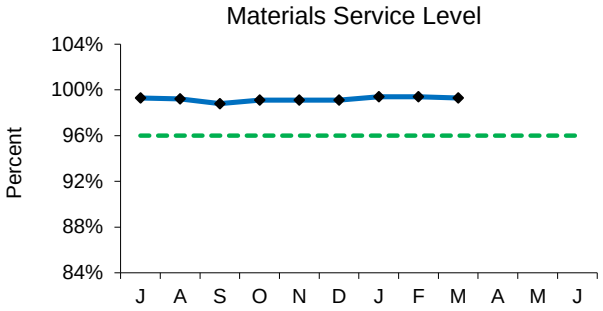
Outcome:

Purchasing

Contracts, Change Orders and Amendments

Materials Management

3rd Quarter - FY20



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 8,070 (99.3%) of the 8,123 items requested in Q3 from the inventory locations for a total dollar value of $1,772,417.

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 FY20 goal is to reduce consumable inventory from the July '19 base level ($8.4 million) by 2.0% (approximately $169,249), to $8.2 million by June 30, 2020 (see chart below).

Items added to inventory this quarter include:

- Deer Island – modules and flowmeters for I&C; air filters and sensor cleaners for Fleet Services; lifelines for Safety; motor, switches and connectors for Electrical; gaskets for Maintenance and disinfectants and gloves for Maintenance.
- Chelsea – manual switches for Work Coordination; phone holders for Fleet Services; speakerphones for MIS; lifelines for Safety; fluke meters for Metering and transmitters for Process Control.
- Southboro – sensors for Water Quality Assurance; electrical cords for Equipment Maintenance; rubber gloves for Valve Maintenance; disinfectant cleaner and disinfectant wipes for Operations.

Property Pass Program:

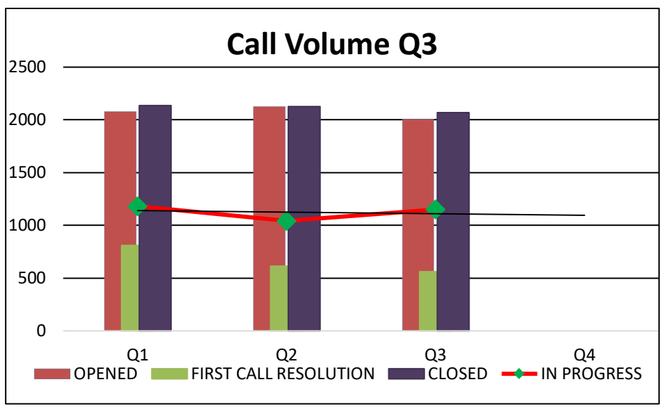
- Due to Pandemic circumstances, one audit was conducted at Deer Island during Q3. Chelsea Property Pass audits will be reported once operations resume.
- Scrap revenue received for Q3 amounted to $1,402. Year to date revenue received amounted to $19,266.
- Revenue received from online auctions held during Q3 amounted to 19,361. Year to date revenue received amounted to $206,398.

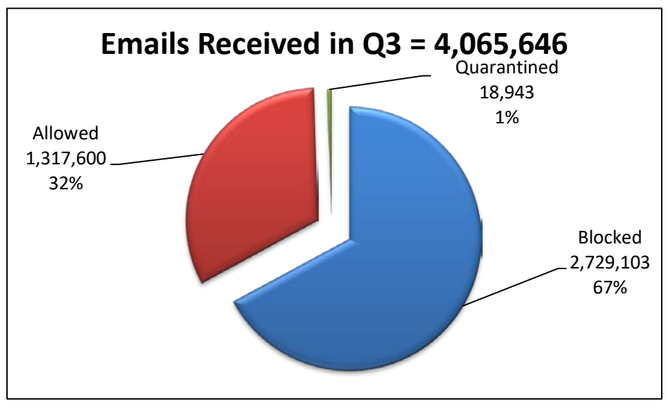
Items	Base Value July-19	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,462,463	8,523,368	60,905
Spare Parts Inventory Value	9,183,923	8,926,185	-257,738
Total Inventory Value	17,646,386	17,449,553	-196,833

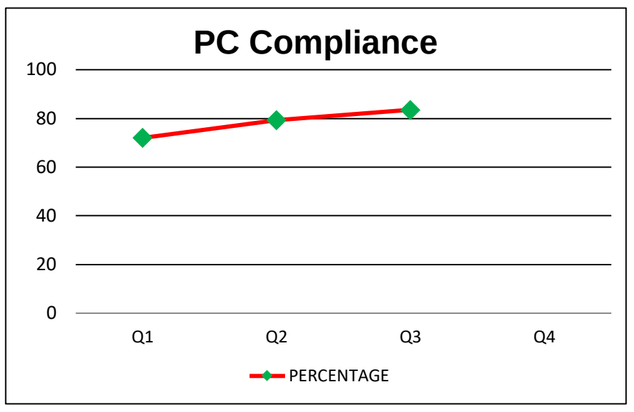
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

MIS Program

3rd Quarter - FY20







Performance & Backlog for Q3

- 2170 calls were completed this quarter.
- Call closure averaged 7.8 days.
- Priority 1 & 2 Service Level Agreements (SLA) were met this quarter with the exception of a single Priority 2 SLA in January

Cyber Security Q3

- In Q2, pushed 142 security fixes/updates to desktops/servers. 84% of all PCs/Laptops are compliant with approved patches.
- McAfee quarantined 2 distinct viruses from 1 PC. PCs are current with antivirus signatures for known malware.

Teleworking: Expanded the Citrix Workspace infrastructure and increased the license capacity to support 500 remote workers. Expand and promote the use of Webex for virtual meetings including Board of Directors meetings. Developed training documentation for remote access, Webex meetings, phone conferences and participation with tablets, laptops, PCs and smartphones. New pay codes added to time tracking.

Audio/Visual Upgrades: Installations moved out to April while scope is further negotiated with the vendor.
Exchange Upgrade: Exchange migration (from 2016 to 2019) was completed this quarter.

AWIA Risk and Resiliency Assessment: Phase I of the cyber security assessment through JANUS Associates completed this quarter, and the final report was issued. Phase I dealt with all Internet-facing servers and applications and all internal financial applications, as required by AWIA. Staff have begun to remediate any vulnerabilities that were found in Phase I, working to the Q1 FY21 target completion date set by AWIA. Phase II, which includes assessing all remaining internal servers and applications, will be complete and final report issued in Q4 FY20.

Chelsea Environmental Controls Monitoring System: Revised Statement of Work (SOW) was reposted in January 2020. Reviewing the two submitted vendor responses.

PBX (Telephone System) Upgrade: The Statement of Work (SOW) was submitted to the Procurement Department for review.

Fuel Management System: The implementation of FDS Fuel Management System hardware planned for April is TBS. Until then, software installation and configuration is moving forward plus limited data migration and associated verification and validation.

Infrastructure Upgrades: New Virtual Host servers weree updated with firmware and security. New NetApp storage disk units are installed and configured to accommodate additional backup storagecapacity.

DI Ops Hardware Segmentation: File, Print, and Application Servers have all been successfully migrated.
LIMS: LIMS Server upgrade to windows OS version 2016 completed.

GIS: Six new GIS data layers and one view were created in database to store Real Property data. These layers will help better track MWRA property. The new web service that was added will expose the new data layers and the updated web map.

Infor/Lawson Upgrade: Lawson upgrade SOW reviewed by Procurement and first comments sent to MIS for corrections.

Maximo/Lawson Interface: The Clinton Purchasing Workflows Maximo / Lawson Interface was moved to production. MIS identified a small bug that occurred due to certain non-stock warehouse site IDs being undefined. Efforts are underway to correct this issue.

Maximo: An email notification has been configured to send emails to the Users when an IT Service Request created by User is in "In Progress" status and in "Resolved" Status.

Enterprise Content Management (ECM)/e-Construction: ECM Bid closed with 6 proposers. Selection Committee met twice to review proposals and developed clarification questions for proposers that were issued by Procurement. Responses will allow ranking and determination of what proposers will be asked to provide product demonstrations.

Dental Certifications Application: Completed and published Quick Reference Card for dental office users and a User Guide for TRAC Department Application Administrators. Two dental facilities were identified to participate in pilot testing the dental permit application that TRAC Department is coordinating one pilot customer has started testing by creating an account.

Library & Records Center: **The Library** undertook 15 research requests, supplied 12 books for circulation, provided 20 articles, and 25 standards. The MWRA Library Portal supported 1094 end-user searches. Research topics included covid-19 updates, history of aqueducts, Boston Fire 1872, cavitation related to water transient, model of multispecies water quality parameters.
The Record Center (RC) added 95 new boxes and handled 194 total boxes. The RC manager attended 3 RCB meetings. The RC shredded on-site 8 bins of confidential documentation. Research included Geological Samples for Contract C58, Submittals for Walnut Hill (CWTP), and Pelletizer conveyance system (FRSA).

IT Training: For the quarter, 42 staff attended 7 classes. 5% of the workforce has attended at least one class year-to-date. New Instructional documentation for MWRA end-uses included *Citrix Workspace App* job aid for user to access IT Resources remotely, *Using Maximo IT Self-Service* job aid, and *Installing Webex Meeting Software* for video and teleconferencing. Updates were made to both the *Accessing ITX Online Learning* and *Connecting to the MWRA-GUEST Wi-Fi* job aids.

Legal Matters
3rd Quarter FY 2020

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed fifty-four (54) 8(m) permits and one (1) direct connect permit.

- **Environmental:** Drafted summary of the United States Environmental Protection Agency (EPA) Office of Enforcement and Compliance Assurance's (OECA) March 26, 2020 COVID-19 Temporary Enforcement and Compliance Policy. Clinton (Cell 1) Landfill Post-Closure Liability Review. Reviewed DEP's regulations at 310 CMR 19.00 and its guidance for post closure requirements for residual landfills.

- **Real Property:** Recorded Deed and Notice of Restriction for the Wachusett Aqueduct Dam with Worcester County Registry of Deeds and Deed and Notice of Restriction for the Alewife Brook Pump Station with Middlesex Registry of Deeds. Recorded Grant of Temporary Easement in Milton with the Norfolk Registry of Deeds for the construction of the Dorchester Interceptor Sewer Rehabilitation Project (MWRA Contract No. 7279). Recorded Extension Permit for Order of Conditions DEP File No. 297-0383 related to MWRA Project No. 7067 – NIH Pipeline in Stoneham. Reviewed First Amendment to Grant of Permanent Access Easement located at 777 Dedham Street, Canton, MA. Drafted and finalized Air Force Technical Applications Center (AFTAC) License for AFTAC's access and use of designated areas at DITP for the placement of equipment to gather information pertinent to underground, surface, and atmospheric activities. Drafted Massachusetts State Police License for the placement of an antenna array at DITP for the purpose of gathering information pertinent to communications between drones and their remote controls. Finalized Notice of Activity and Use Limitation for the Cottage Farm CSO Facility, which is related to the 2010 oil spill at the Cottage Farm CSO Facility. Reviewed temporary access rights for private property in Lynn and Revere related to Contract No.7454 Section 56 Saugus River Crossing Project. Reviewed MWRA's property rights related to MBTA's Wedgemere Station in Winchester, MWRA's former Mystic Shops parcel in Somerville, Broadway Plaza in Arlington, and for the placement of solar panels at MWRA's Arlington Covered Water Storage Tank Site, Cottage Farm CSO Facility Site, Southborough Site, and Loring Road Covered Water Storage Site.

- **Memorandum of Agreement:**

Drafted and Finalized Memorandum of Agreement between the Town of Arlington and MWRA related to cost sharing related to MWRA Contract No. 6544 - Rehabilitation of WASM 3 Sections W11/W12/W16/51 Water Mains, Medford, Somerville, and Arlington.

- **Construction Contracts Release of Retainage**:

Reviewed Partial Release of Retainage to Albanese D&S, Inc. for Northern Intermediate High Section 110-Stoneham - Contract 7067; Final Release of Retainage for Northern Intermediate High Section 110 – Stoneham and Wakefield - Contract 7478; Final Release of Retainage for Fire Protection Sprinkler System Services -Contract OP-348; Final Release of Retainage for Grounds Keeping Services at Deer Island Treatment Plant-Contract S552.

- **Miscellaneous:**

Reviewed and advised on orders and guidance related to CVOID-19 pandemic. Reviewed and advised on law related to the use of federally licensed two-way radios while operating a motor vehicle.

- **Public Records Requests:**

During the third quarter of FY 2020, MWRA received one hundred fifty-four (154) public records requests and responded to one hundred fifty four (154) public records requests.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters
One demand for arbitration was filed.

Matters Concluded
Settled an arbitration case alleging the MWRA violated a collective bargaining agreement when an employee alleged he was performing work of a higher title.

Received an MCAD dismissal due to settlement of a complaint alleging that the MWRA discriminated against a former employee on the basis of age, disability and race/color and retaliated against her during her employment with the MWRA.

Miscellaneous
Reviewed and advised on Families First Coronavirus Response Act.

LITIGATION/CLAIMS

New lawsuits/claims: There is one new class action claim.

IN RE: GSE Bonds Anti-Trust Litigation, No. 1:19-cv-01704 (JSR): The Authority was given notice of a pending antitrust class action against various broker dealers relating to certain government-sponsored enterprise (GSE) bond transactions. The plaintiffs allege that the defendants conspired to fix prices for certain unsecured GSE bonds. The defendants deny the allegations. Certain defendants have agreed to settle the plaintiffs' claims. On January 29, 2020, the Authority filed a claim in the class action requesting participation in the settlement.

There is one new wage attachment matter.

Worldwide Asset Purchasing Li Lic. v. (Current Employee
MWRA received one new Wage Garnishment matter filed in the Lynn District Court.

Significant Developments

MWRA v. N.E.L. Corporation, Dewberry Engineers, et al.
MWRA employees were deposed during the months of December and January. Depositions of representatives of the various parties continued throughout the month of February.

MWRA v. Bhushan & Sukhija:
Defendant homeowners submitted an 8(m) Permit Application to the MWRA Waterworks Permitting Group with proposed plans for remediating the encroached portion of the Sudbury Aqueduct land.

(Current Employee) v. MWRA
Summary Judgment Hearing was held on January 9, 2020. The Court denied MWRA's motion for summary judgment.

(Former Employee) v. MWRA
Second day of plaintiff's audio-visual deposition was completed.

Closed Cases: There are no closed cases.

Closed Claims:

Contract No. S551, Thermal and Hydro Power Plant Maintenance**.** MWRA entered into a Settlement Agreement with the Contractor to resolve a claim related to the replacement of the speed increaser for Hydro Turbine Generator No. 1 at the Deer Island Treatment Plant.

Subpoenas
During the 3rd Quarter of FY 2020, two subpoenas were received and no subpoenas were pending at the end of the Third Quarter FY 2020.

Wage Garnishments
There are currently fifteen Trustee Process matters, only two of which are considered active and monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Mar 2020	As of Dec 2019	As of Sept 2019
Construction/Contract/Bid Protest (other than BHP)	2	2	2
Tort/Labor/Employment	4	4	4
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
Total	**8**	**8**	**8**
Other Litigation matters (restraining orders, etc.) 1. Army Corp of Engineers v. MWRA, NSTAR & Harbor Electric 2. IN RE: GSE Bonds Anti-Trust Litigation	2	1	1
Total – all pending lawsuits	**10**	**9**	**9**
Claims not in suit:	0	0	0
Bankruptcy	0	0	0
Wage Garnishment	2	1	4
TRAC/Adjudicatory Appeals	0	1	1
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	**12**	**11**	**14**

TRAC/MISC.

New Appeals: There are no new appeals in 3rd Quarter FY 2020.

Settlement by Agreement of Parties There are no Settlement by Agreement of Parties in 3rd Quarter FY 2020.

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 3rd Quarter FY 2020.

Final Decisions There are no Final Decisions issued in the 3rd Quarter FY 2020.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
3rd Quarter FY20

Highlights

During the 3rd quarter FY20, Internal Audit (IA) completed a review of Fleet Services Non-Plated Equipment Inspections to determine if the MWRA is complying with OSHA and industry standards that require certain types of equipment to be inspected annually and to have deficiencies corrected in a timely manner. IA reviewed inspection reports for vehicle lifts, forklifts, scissor lifts, aerial lifts, and mobile cranes/buckets and found certain assets were overdue for their annual inspection and deficiencies were not corrected timely. Recommendations include developing written procedures for equipment inspections, assigning responsibility for scheduling inspections, removing equipment from service if overdue for inspections, and maintaining copies of inspection reports.

In addition, IA completed incurred cost audits of CDM Smith and Dewberry and two construction labor burden reviews. A final review of Force Account costs incurred by Cambridge was conducted with a recommended refund for excess ineligible costs taken. A review of costs incurred continued on the new HEEC cable as the project nears preparation of the tariff filing. Management advisory services included a follow-up on an inventory control task force report, DITP electricity rate and support on the MWRA's leases.

Status of Recommendations

During FY20, 33 recommendations were closed of which 22 are from prior fiscal years' audits.

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)	10	6	16
Fleet Services Non-Plated Equipment Inspections (3/30/20)	11	4	15
Total Recommendations	*25*	*19*	*44*

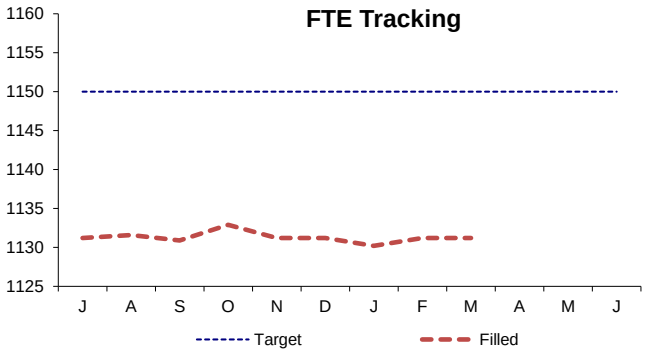
Cost Savings

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	FY16	FY17	FY18	FY19	FY20 Q3	TOTALS
Consultants	$88,312	$272,431	$118,782	$262,384	$611,250	$1,353,159
Contractors & Vendors	$1,772,422	$3,037,712	$1,323,156	$3,156,524	$1,761,910	$11,051,724
Internal Audits	$220,929	$224,178	$204,202	$210,063	$159,575	$1,018,947
Total	**$2,081,663**	**$3,534,321**	**$1,646,140**	**$3,628,971**	**$2,532,735**	**$13,423,830**

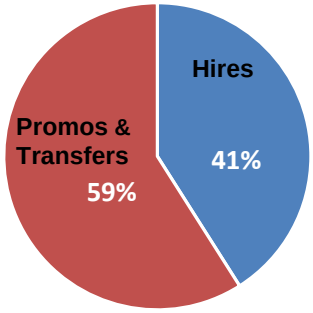
OTHER MANAGEMENT

Workforce Management
3rd Quarter - FY20



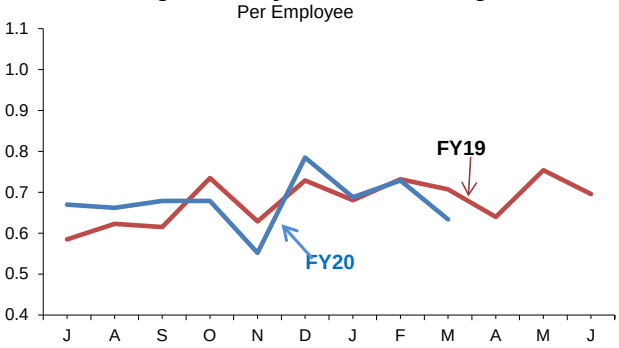
FY20 Target for FTE's = 1150
FTE's as of March 2020 = 1131.2
Tunnel Redunancy as of Mar 2020 = 7.0

Position Filled by Hires/Promos & Transfer for YTD



	Pr/Trns	Hires	Total
FY18	118 (61%)	74 (39%)	192
FY19	112 (60%)	76 (40%)	188
FY20	79 (59%)	54 (41%)	133

Average Monthly Sick Leave Usage
Per Employee



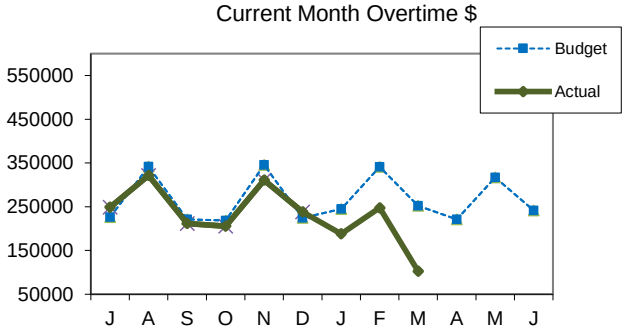
Average monthly sick leave for the 3rd Quarter of FY20 decreased as compared to the 3rd Quarter of FY19 (0.675 to 0.677)

MWRA Average Cumulative Sick Leave Use By Division Per Employee

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY19
Admin	139	5.31	7.09	24.6%	7.78
Aff. Action	6	6.34	8.45	7.2%	6.28
Executive	4	1.81	2.41	0.0%	7.05
Finance	33	3.98	5.31	0.0%	2.28
Int. Audit	6	4.58	6.11	13.9%	4.06
Law	13	5.56	7.41	9.6%	7.80
OEP	4	1.00	1.33	0.0%	5.97
Operations	926	6.31	8.41	22.2%	8.35
Tunnel Red	7	4.09	5.45	48.0%	8.11
Pub. Affs.	11	7.91	10.54	59.6%	4.45
MWRA Avg	**1149**	**0.90**	**8.10**	**22.5%**	**8.13**

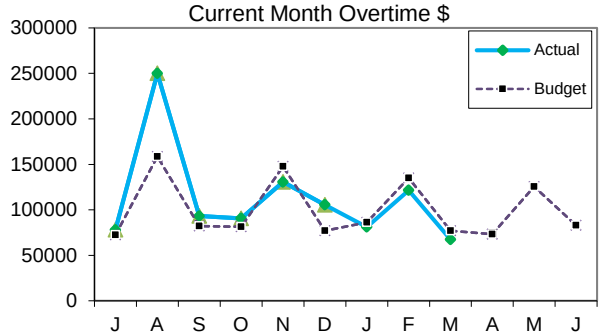
Percent of sick leave usage for FY20, attributable to Family and Medical Leave Act (FMLA) is 22.5% .

Field Operations
Current Month Overtime $



Total Overtime for Field Operations for the third quarter of 2020 was $538k which is ($300k) under budget. Emergency overtime was $210k, which was ($211k) under budget. Rain events totaled $117k, Emergency maintenance was $46k and snow removal was $25k. Coverage overtime was $127k, which was ($21k) under budget, reflecting the month's shift coverage requirements. Planned overtime was $201k or ($68k) under budget. Maintenance Off-Hours was $55k, Half-Plant Operations was $52k, Training was $24k and Maintenance Work Completion was $21k. Year-to-date, FOD has spent $2m on overtime, which is ($341k) under budget.

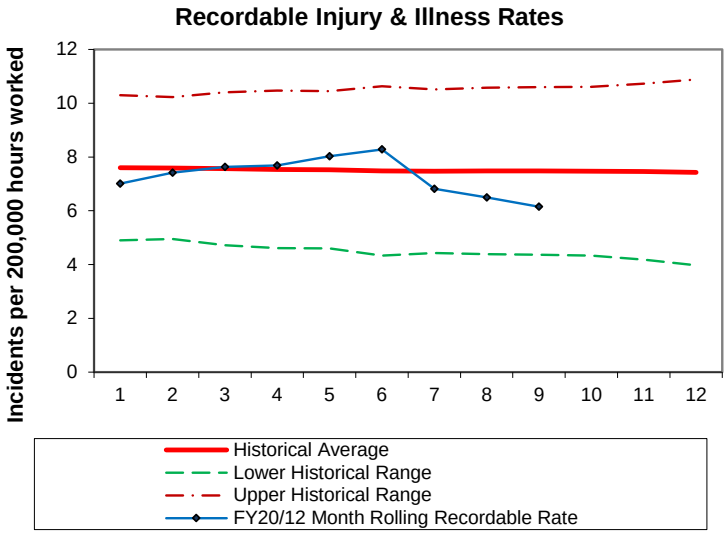
Deer Island Treatment Plant
Current Month Overtime $

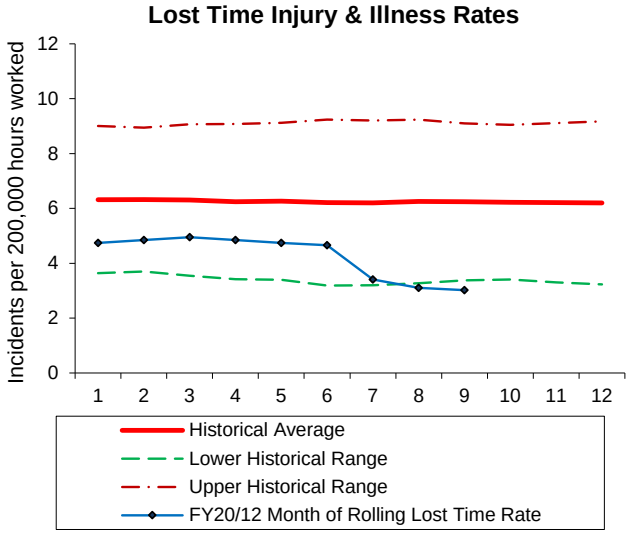


Deer Island's total overtime expenditure for the third quarter was $270K, which was $28K or 9.4% under budget. In the Thrid quarter Deer Island experienced higher than anticipated shift coverage requirements of $5K and planned/unplannded overtime of $5K. This is offset by less storm coverage of ($37k). YTD Deer Island's overtime spending is $1.0M which is $100K or 11% over budget due to higher spending related to the HEEC cable outage of $110k and shift coverage $66K. This is offset by lower spending on storm coverage of ($75K). The FY20 CEB included $30k for HEEC overtime vs. $140k spent. The outage lasted 18 days as opposed to the 5 days anticipated.

Workplace Safety

3rd Quarter - FY20





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 FY19. 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

	3rd Quarter Information		
	New	Closed	Open Claims
Lost Time	2	12	50
Medical Only	10	19	20
Report Only	19	19	
	QYTD		FYTD
Regular Duty Returns	2		16
Light Duty Returns	0		1
Indemnity payments as of Mar 31 2020 included in open claims listed			18

COMMENTS:

Regular Duty Returns

JAN	2	Employees returned to full duty/no restrictions
FEB	0	Employees returned to full duty/no restrictions
MARCH	0	Employees returned to full duty/no restrictions

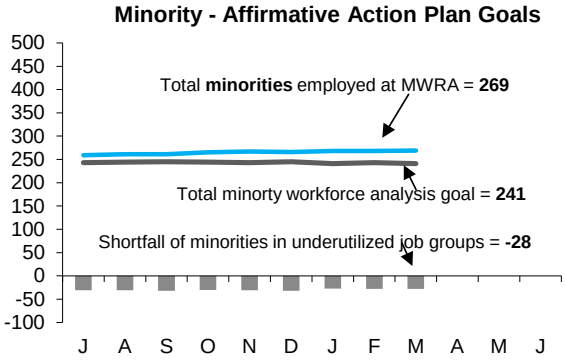
Light Duty Returns

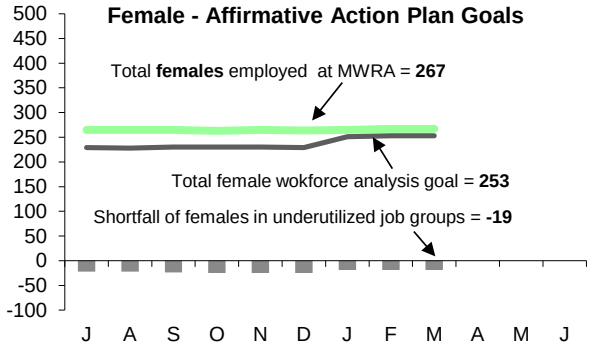
JAN - FEB - MARCH N/A

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

3rd Quarter - FY20





Highlights:

At the end of Q3 FY20, 5 job groups or a total of 28 positions are underutilized by minorities as compared to 7 job groups for a total of 32 positions at the end of Q3 FY19; for females 8 job groups or a total of 19 positions are underutilized by females as compared to 6 job groups or a total of 22 positions at the end of Q3 FY19. During Q3, 6 minorities and 5 females were hired. During this same period 1 minority and 1 female were terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 3/31/2020	Minorities as of 3/31/2020	Achievement Level	Minority Over or Under Underutilized	Females As of 3/31/2020	Achievement Level	Female Over or Under Underutilized
Administrator A	23	3	3	0	11	6	5
Administrator B	24	0	7	-7	7	7	0
Clerical A	29	11	5	6	26	21	5
Clerical B	25	9	7	2	5	7	-2
Engineer A	80	25	18	7	16	18	-2
Engineer B	61	22	16	6	15	10	5
Craft A	119	15	24	-9	0	4	-4
Craft B	141	21	23	-2	3	5	-2
Laborer	66	23	15	8	5	3	2
Management A	97	24	24	0	34	34	0
Management B	43	9	6	3	9	10	-1
Operator A	67	6	14	-8	2	5	-3
Operator B	67	19	10	9	3	1	2
Professional A	29	3	5	-2	19	13	6
Professional B	163	47	40	7	79	72	7
Para Professional	53	16	13	3	26	30	-4
Technical A	56	14	10	4	7	6	1
Technical B	6	2	1	1	0	1	-1
Total	**1149**	**269**	**241**	**56/-28**	**267**	**253**	**33/-19**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Administrative B	Manager, Metering and Monitoring	1	Int.	1	0	Promo = WM
Craft A	M&O Specialist	2	Int/Ext.	2	0	Promo = (WM) (BM)
Craft A	M&O Specialist	1	Ext.	1	0	NH = WM
Craft B	HVAC Specialist	1	Ext.	1	0	NH = MW
Operators A	Area Supervisor	1	Int/Ext.	1	0	NH = WM
Para Professional	Administrative Systems Coordinator	1	Ext.	1	0	NH = HF

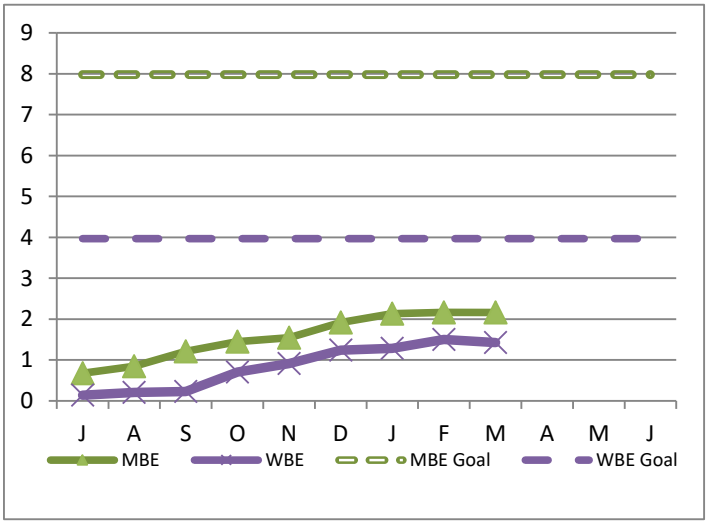
MBE/WBE Expenditures

3rd Quarter - FY20

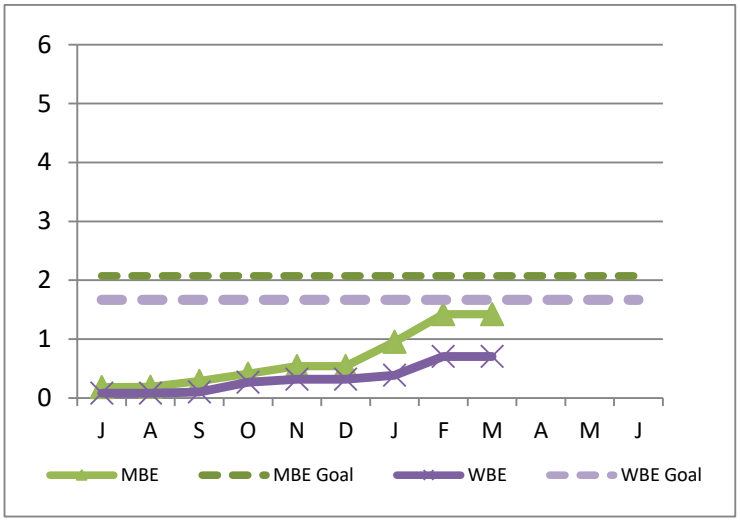
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY19 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they 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 March.

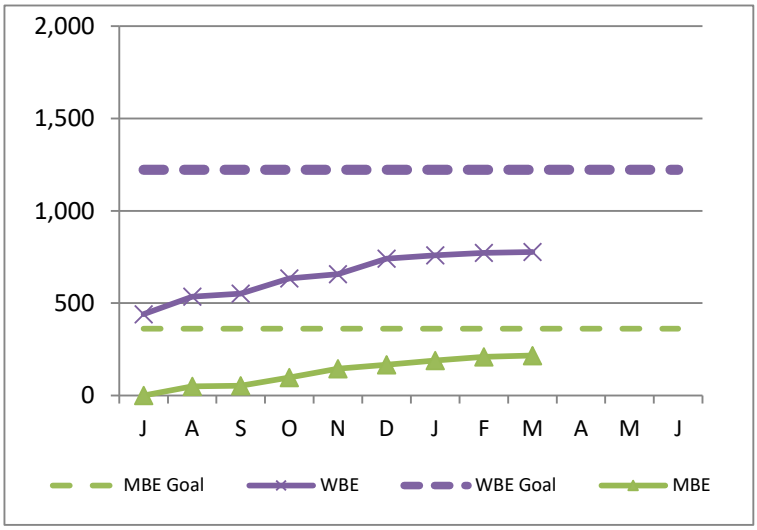
Construction (millions $)



Professional Services (millions $)



Goods/Services (Thousands $)



FY20 spending and percentage of goals achieved, as well as FY19 performance are as follows:

MBE					WBE			
FY20 YTD		**FY19**			**FY20 YTD**		**FY19**	
Amount	**Percent**	**Amount**	**Percent**		**Amount**	**Percent**	**Amount**	**Percent**
2,164,222	27.1%	11,699,641	150.6%	Construction	1,524,916	38.4%	20,152,509	521.8%
1,423,161	68.6%	2,285,171	134.1%	Prof Svcs	704,918	42.3%	1,551,120	113.2%
216,678	59.9%	213,198	40.3%	Goods/Svcs	777,083	63.6%	780,760	46.7%
3,804,061	36.5%	14,198,010	142.0%	**Totals**	3,006,917	43.9%	22,484,389	325.6%

FY20 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY20 CEB Expenses
3rd Quarter - FY20

As of March 2020, total expenses are $548.2 million, $11.2 million or 2.0% lower than budget, and total revenue is $596.3 million, $2.3 million or 0.4% over budget, for a net variance of $13.5 million.

Expenses –

Direct Expenses are $174.2 million, $7.1 million or 3.9% under budget.

- **Wages & Salaries** are under budget by $2.4 million or 3.1%. Regular pay is $2.5 million under budget, due to lower head count, and timing of backfilling positions. YTD through March, the average Full Time Equivalent (FTE) positions was 1,138, twenty fewer than the 1,158 FTE's budgeted.
- **Professional Services** expenses are $1.1 million under budget or 18.3%, primarily due to under spending for Computer System Consultants of $711k and $257k underspending on Other Professional Services, including Finance and Law, partially offset by overspending of $92k for Lab & Testing & Analysis.
- **Ongoing Maintenance** expense $905k under budget or 3.8%, as underspending on Plant & Machine Services of $1.5 million was partially offset by $827k in overspending on Building and Grounds Service. Maintenance variance reflects the actual timing of projects.
- **Utilities** are $817k under budget or 4.5% as lower electricity spending of $1.3 million reflecting CTG usage at Deer Island during HEEC cable electrification and lower pricing. Lower interval pricing also contributing to overall electricity variance. This underspending was partially offset by overspending on diesel of $469k for CTG operation during HEEC cable installation and fuel deliveries to replenish diesel inventory.
- **Fringe Benefit** expenses are $507k under budget or 3.2%, primarily due to under spending for Health Insurance of $387k, driven by lower headcount.
- **Chemical** expenses are $417k under budget or 4.7%, primarily due to lower than budget spending on Soda Ash at Carroll Water Treatment Plant and Clinton Plant of $236k due to lower flows and lower Activated Carbon of $213k driven by improvements in odor control process reducing usage. This is partially offset by higher than budget spending on Sodium Bisulfite and ferric chloride which are over budget by $93k and $166k, respectively, due to lower flows of 4.1% and 3.0% at Deer Island and Carroll Water Treatment Plant flows, respectively, through March. Timing of deliveries is an important factor in chemical spending.
- **Worker's Compensation** expenses are $379k under budget or 21.5%, reflecting lower compensation payments of $257k, medical payments of $78k, and administrative expenses of $44k.
- **Other Materials** expenses are $309k under budget or 7.9%, primarily due to underspending on computer hardware of $542k in MIS partially offset by vehicle purchases of $344k.

Indirect Expenses are $29.9 million, $4.0 million or 11.9% under budget driven by lower than expected Watershed Reimbursement of $3.9 million due to lower costs associated with compensation, fringe benefits, equipment, professional services, and prior period adjustments.

Debt Service Expenses totaled $344.2 million, right on budget, after $8.2 million year-to-date savings was transferred to the defeasance account. The savings is the result of lower than budgeted variable interest expense of $5.8 million and refunding savings of $2.3 million.

Revenue and Income –

Total Revenue and Income is $596.3 million or $2.3 million higher than budget primarily due to a favorable variance of $1.4 million for Other Revenue, including RPS energy revenue of $380k due to timing, gains on disposal of equipment of $366k, Miscellaneous Revenue $304k, Energy Rebates of $160k, and receipt of an unbudgeted operating grant for $106k. Other User Charges were $0.9 million above budget driven by Stoughton's prepayment of its remaining Entrance Fee.

	Mar 2020 Year-to-Date			
	Period 9 YTD Budget	Period 9 YTD Actual	Period 9 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 79,848,366	$ 77,403,351	$ (2,445,015)	-3.1%
OVERTIME	3,718,447	3,556,981	(161,466)	-4.3%
FRINGE BENEFITS	15,986,808	15,479,539	(507,269)	-3.2%
WORKERS' COMPENSATION	1,765,692	1,386,467	(379,225)	-21.5%
CHEMICALS	8,825,161	8,408,565	(416,596)	-4.7%
ENERGY AND UTILITIES	18,345,365	17,527,931	(817,434)	-4.5%
MAINTENANCE	23,988,750	23,084,140	(904,610)	-3.8%
TRAINING AND MEETINGS	380,222	289,050	(91,172)	-24.0%
PROFESSIONAL SERVICES	6,198,718	5,065,775	(1,132,943)	-18.3%
OTHER MATERIALS	3,901,254	3,592,064	(309,190)	-7.9%
OTHER SERVICES	18,323,332	18,395,226	71,894	0.4%
TOTAL DIRECT EXPENSES	**$ 181,282,115**	**$ 174,189,089**	**$ (7,093,025)**	**-3.9%**
INSURANCE	$ 1,958,417	$ 1,797,304	$ (161,113)	-8.2%
WATERSHED/PILOT	20,125,200	16,243,507	(3,881,693)	-19.3%
HEEC PAYMENT	1,733,446	1,733,445	(1)	0.0%
MITIGATION	1,240,964	1,238,301	(2,663)	-0.2%
ADDITIONS TO RESERVES	1,570,713	1,570,713	-	0.0%
RETIREMENT FUND	7,315,000	7,315,000	-	0.0%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	**$ 33,943,740**	**$ 29,898,270**	**$ (4,045,470)**	**-11.9%**
STATE REVOLVING FUND	$ 67,180,982	$ 66,944,381	$ (236,601)	-0.4%
SENIOR DEBT	147,895,331	160,330,155	12,434,824	8.4%
DEBT SERVICE ASSISTANCE	(890,235)	(890,235)	-	0.0%
CURRENT REVENUE/CAPITAL	-	-	-	---
SUBORDINATE MWRA DEBT	127,603,121	112,885,119	(14,718,002)	-11.5%
LOCAL WATER PIPELINE CP	-	-	-	---
CAPITAL LEASE	2,412,795	2,412,795	-	0.0%
DEBT PREPAYMENT	-	-	-	---
VARIABLE DEBT	-	(5,772,109)	(5,772,109)	---
DEFEASANCE ACCOUNT	-	8,237,210	8,237,210	---
TOTAL DEBT SERVICE	**$ 344,201,994**	**$ 344,147,316**	**$ (54,677)**	**0.0%**
TOTAL EXPENSES	**$ 559,427,849**	**$ 548,234,675**	**$ (11,193,172)**	**-2.0%**
REVENUE & INCOME				
RATE REVENUE	$ 571,325,250	$ 571,325,250	$ -	0.0%
OTHER USER CHARGES	6,693,619	7,542,540	848,921	12.7%
OTHER REVENUE	4,895,129	6,315,659	1,420,530	29.0%
RATE STABILIZATION	-	-	-	---
INVESTMENT INCOME	11,064,400	11,129,310	64,910	0.6%
TOTAL REVENUE & INCOME	**$ 593,978,398**	**$ 596,312,759**	**$ 2,334,360**	**0.4%**

Cost of Debt
3rd Quarter - FY20

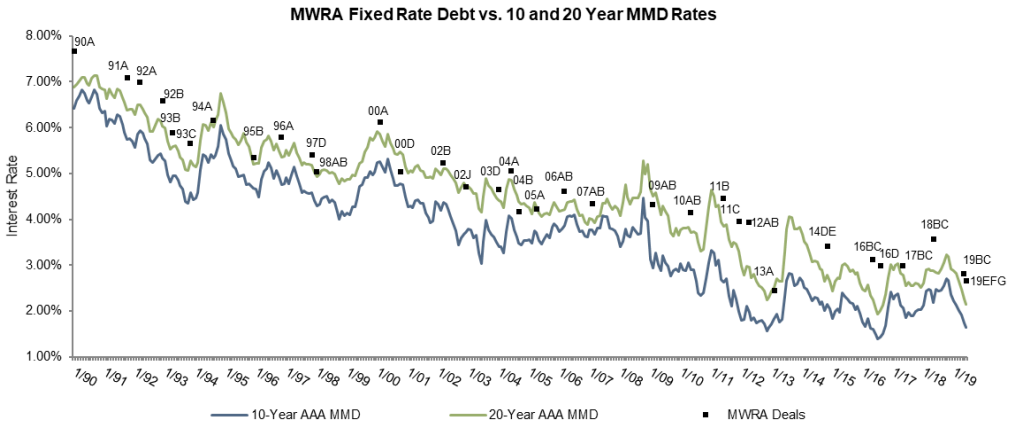
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt ($3.49 billion)	3.47%
Variable Debt ($354.8 million)	1.89%
SRF Debt ($921.4 million)	1.55%
Weighted Average Debt Cost ($4.94 billion)	2.98%

Most Recent Senior Fixed Debt Issue
November 2019

2019 Series E, F &G ($620.6 million) 2.66 %

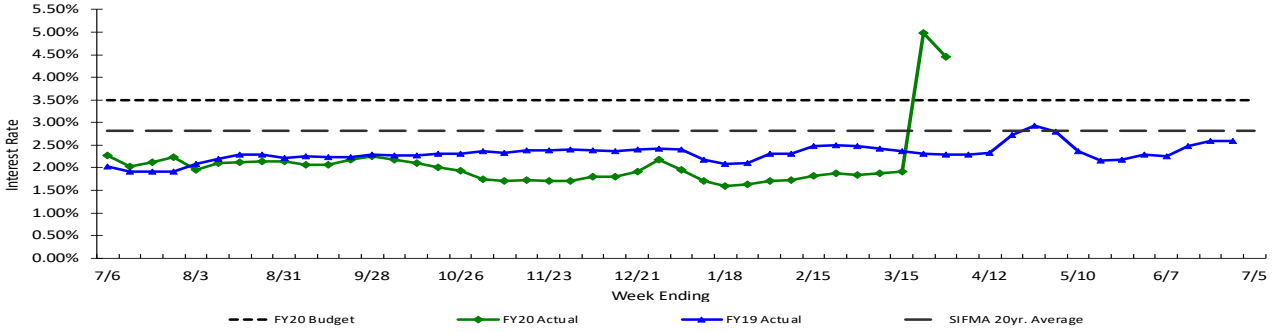


Bond Deal	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B	2005A	2006AB
Rate	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%	4.22%	4.61%
Avg Life	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs	18.4 yrs	25.9 yrs

Bond Deal	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014D-F	2016BC	2016D	2017BC	2018BC	2019BC	2019EFG
Rate	4.34%	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%
Avg Life	24.4 yrs	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.

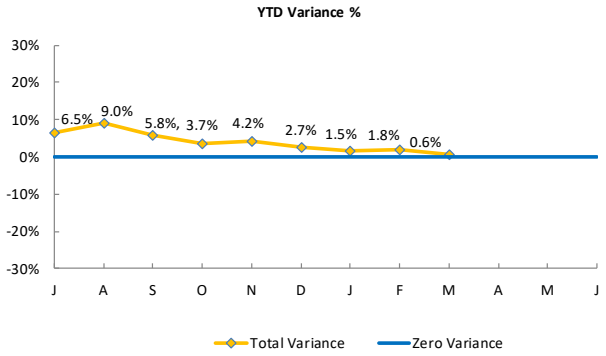
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has ten variable rate debt issues with $782.2 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 March, SIFMA rates ranged from a high of 5.20% to a low of 1.25% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.

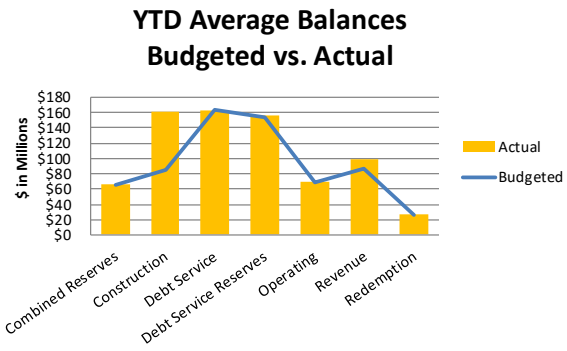


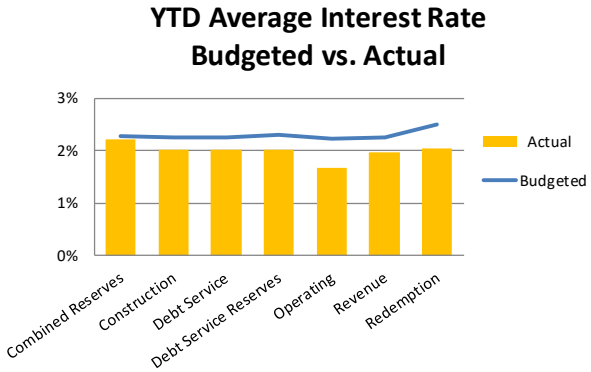
Investment Income
3rd Quarter - FY20

Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$27	($32)	(6)	-0.5%
Construction	$1,267	($284)	983	68.7%
Debt Service	($44)	($289)	(333)	-12.0%
Debt Service Reserves	$27	($333)	(306)	-11.5%
Operating	$8	($174)	(166)	-14.6%
Revenue	$189	($205)	(17)	-1.1%
Redemption	($2)	($88)	(90)	-18.5%
Total Variance	$1,471	($1,406)	$65	0.6%





Monthly