MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

First Quarter FY2019

Q1	Q2	Q3	Q4
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Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 14, 2018

Board of Directors Report on Key Indicators of MWRA Performance

1st Quarter FY19

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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.

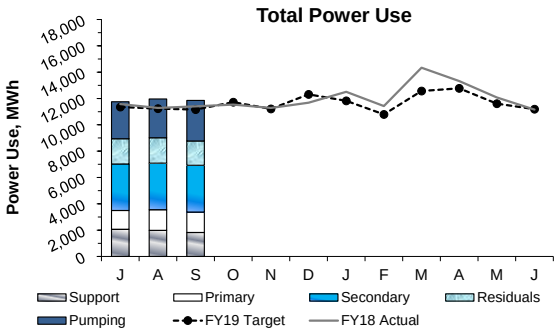
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer

November 14, 2018

OPERATIONS AND MAINTENANCE

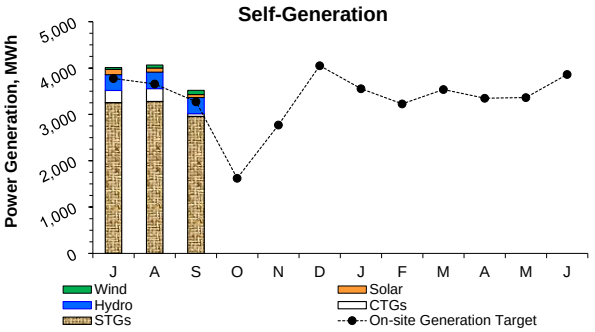
Deer Island Operations

1st Quarter - FY19

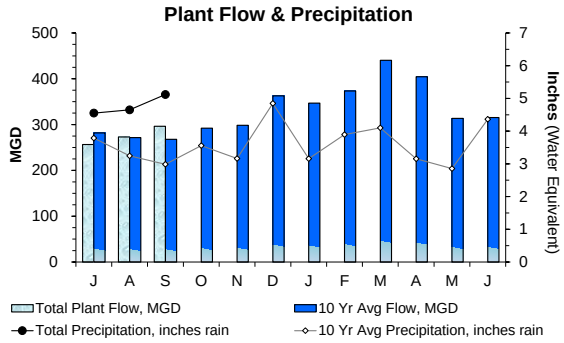


Total power usage in the 1st Quarter was 5.4% above target as Total Plant Flow was 15.8% above target with the 3 year average plant flow. Power used for wastewater pumping was 15.2% higher than target due to the higher plant flow, and usage in the secondary activated sludge treatment process, including for cryogenic oxygen production, was 4.5% above target due to a greater dissolved oxygen demand as a result of higher plant flows and higher seasonal temperatures.

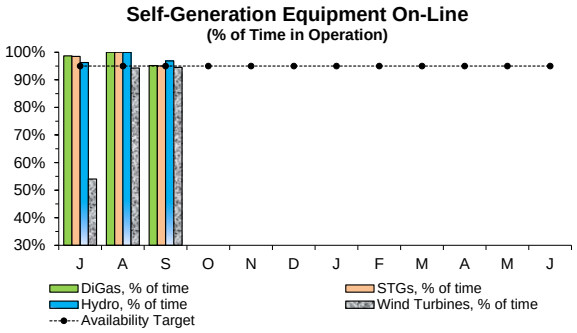
Note: Power usage projections are based on 3 year averages.



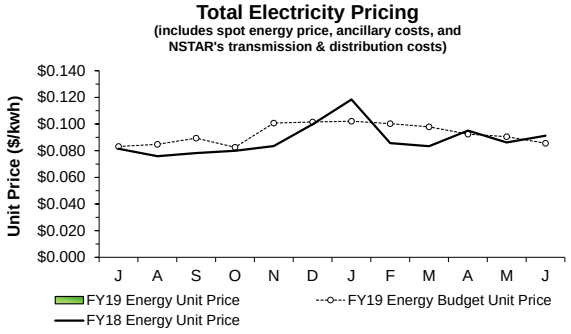
Power generated on-site during the 1st Quarter was 8.3% above target. Power generated by the STGs, Hydro Turbines, and CTGs all exceeded their target by 6.9%, 14.3%, and 59.6%, respectively. Generation by the Solar Panels was 5.0% below target. Wind Turbine generation was 25.0% below target due to failed electrical components which left Wind Turbine #2 out of service from April 17 through July 25. Also, there were brief outages caused by hydraulic fluid issues, as well as sporadic turbulence caused by wind blowing through the digesters tripping both turbines offline.



Total Plant Flow for the 1st Quarter was on target (+0.6%) with the 10 year average plant flow (275.3 MGD actual vs. 273.7 MGD expected) even though precipitation was 42.9% above target (14.32 inches actual vs. 10.02 inches expected).

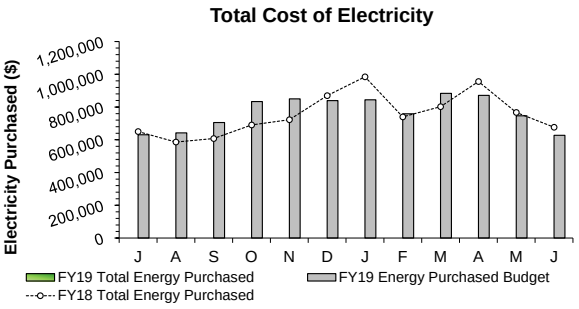


The DiGas system, STGs, and Hydro Turbines all exceeded the 95% availability target for the 1st Quarter. Wind Turbine availability fell 28.6% below target due to failed electrical components which left Wind Turbine #2 out of service from April 17 through July 25. Also, there were brief outages caused by hydraulic fluid issues, as well as sporadic turbulence caused by wind blowing through the digesters tripping both turbines offline.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual total energy unit prices for July, August, and September (Quarter 1) are not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

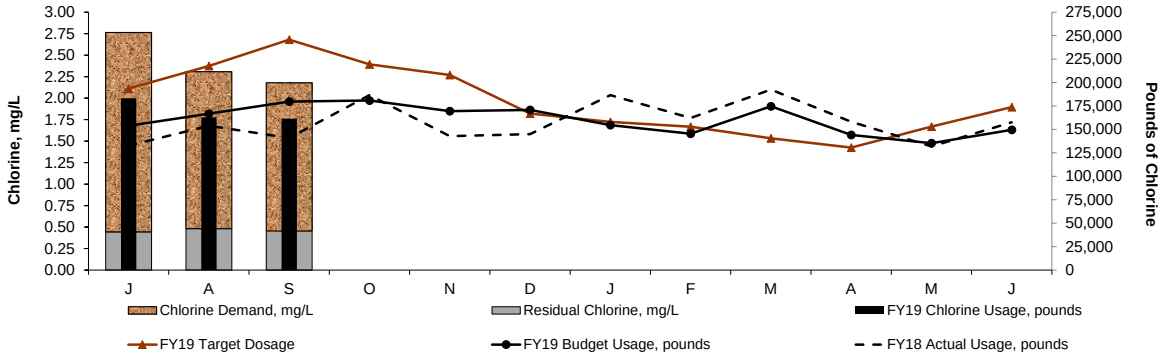
Note: Only the actual energy prices are reported. Therefore, the dataset lags by three (3) months due to the timing of invoice receipt and review.



The invoices for the total cost of Electricity Purchased for July, August, and September (Quarter 1) have not been received as of reporting time.

Note: Only the actual energy prices are reported. Therefore, the dataset lags by three (3) months due to the timing of invoice receipt and review.

Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 1st Quarter was within 1% of the target. DITP maintained an average disinfection chlorine residual of 0.46 mg/L this quarter with an average dosing rate of 2.42 mg/L (as chlorine demand was 1.96 mg/L). Actual sodium hypochlorite usage in pounds of chlorine was within 1.5% of the target this quarter as total plant flow was also similar to target.

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	1	1	0	99.5%	6.02
A	1	1	0	99.9%	2.96
S	2	2	0	99.4%	7.81
O					
N					
D					
J					
F					
M					
A					
M					
J					
Total	4	4	0	99.6%	16.79

99.6% of all flows were treated at full secondary during the 1st Quarter. There were four (4) secondary blending events this quarter, all due to high plant flow resulting from heavy rain. These blending events resulted in a total of 16.79 hours of blending and 105.14 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 1st Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:
The plant achieved an instantaneous peak flow rate of 995.4 MGD during the evening of July 17. This peak flow occurred during a storm event that brought 2.74 inches of rain within a 13 hour period from July 17 into July 18. Overall, Total Plant Flow in the 1st Quarter was on target (+0.6%) with the 10 year average plant flow target for the quarter.

The South System Pump Station (SSPS) wet well #2 was isolated on July 10 during dry weather conditions to allow staff to perform a routine visual inspection. The well was isolated in the morning, dewatered, and returned to service in the afternoon once the inspection was completed. The wet well was found to be clean with minimal accumulation of material.

Primary Treatment:
Repairs to the influent gate which feeds wastewater flow to primary battery C were performed in August as the hydraulic gate shaft that allows the gate to be opened and closed was found to be bent during a storm event on August 12. The gate was manually opened with a crane allowing the primary battery to be placed into operation until the gate was repaired. Staff were able to replace the gate shaft to restore full functionality to the gate several days later. There were no operational impacts as primary battery C remained operational during this time. Since that time, inspections for each of the influent gates to the other primary batteries were completed and no issues were found.

Deer Island Operations & Maintenance Report (continued)

Residuals:
Module #2 Digester #4 was taken out of service for approximately 16 days and the digester emptied of sludge to allow for scheduled maintenance to replace a broken mixer. The digester was returned to operation on August 10 and filled with digested sludge overflows from the other operating digesters. Normal sludge feed to the digester resumed on August 13.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 32.6% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 30.9% of Deer Island's total electrical power use for the quarter.

Work began in June to repair and replace the failed electrical and hydraulic components on Wind Turbine #2 which had been out of service since April 17. All failed components, including a new pitch ram and hydraulic fluid tank, were replaced in the turbine by July. The turbine was returned to operation on July 26 following the completion of all necessary repairs, as well as the consultant's report on the turbine blade inspection which concluded the wind turbine could be safely returned to operation.

The work to replace and upgrade the fire safety system (FSS) and vibration monitoring system (VMS) for CTG 1A was performed from July 23 to July 25. These system upgrades were completed on CTG 2B during the week of June 25.

The required annual boiler inspections were successfully completed by a Department of Public Safety certified inspector on September 19 for Boiler 101 and on October 10 for Boiler 201. No issues were cited during these inspections.

CTG 1-A was operated for 3.71 hours on September 3 in response to an electrical curtailment event, in addition to extremely high spot market prices, resulting in a savings of approximately $30,000 in electricity costs. Real-time electricity prices topped $2,600/MWh in New England on September 3 after unplanned generation outages and higher-than-expected energy demand from a Labor Day heat wave triggered unanticipated spikes in the regional electricity price.

The emissions compliance Annual Relative Accuracy Test Audit (RATA) was sucessfully completed by contractors on September 5 for Boiler 101 and on September 6 for Boiler 201. A RATA is required to confirm that data from the boiler's Continuous Emissions Monitor system (CEMS) is in agreement with corresponding EPA Reference Method test results. Quarterly emissions opacity audits for both boilers were also successfully completed on September 6.

Regulatory:
Emissions compliance testing for the East Odor Control (EOC) treatment system at DITP was conducted by consultants on July 16 to July 17. The EOC system treats process air from Primary Batteries A and B and the grit facility. The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the inlet and outlet of the odor control system over a 24-hour period for TRS at the outlet (stack) of the odor control system and for NMHC at the inlet. All emissions test results show that DITP was in compliance. The report prepared by the consultants summarizing the test results was submitted to the MA DEP following review by DITP staff.

Kevin Brander, a representative from the MA DEP, was on site at the DITP on September 25 for an unannounced (annual) site visit of the treatment plant to review and inspect the plant's wastewater treatment operations and practices. Mr. Brander was given a comprehensive plant tour covering the entire wastewater and residuals treatment facilities, and the Thermal Power Plant and back up power systems. Initial communications indicate the inspection had gone well and no issues were raised by the MA DEP.

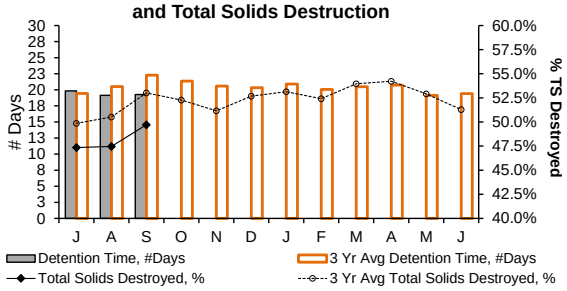
Clinton AWWTP:
Replaced Soda Ash System and belts in #2 Belt Filter Press. Both Chlorine Contact Channels were drained, cleaned and inspected .

Phosphorus Reduction Facility - Work completed or in progress during the 1st Quarter-FY19:
Contractor has completed Optimization testing of the phosphorus removal disc filters.

Deer Island Operations and Residuals

1st Quarter - FY19

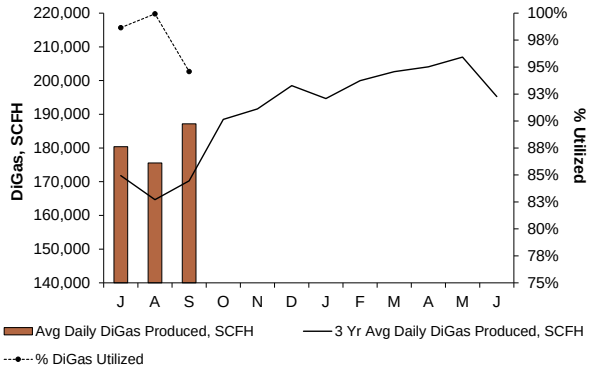
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 48.2% during the 1st Quarter, 5.8% below the 3 year average of 51.1% as the sludge detention time in the digesters was 19.4 days. TS destruction was lower than budget as the hydraulic detention time was 6.4% lower than the budgeted detention time of 20.7 days due to a higher volume of sludge going to digestion. DI operated with an average of 7.6 digesters similar to the 3 year average of 7.7 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.

Digester Gas Production and % Utilized

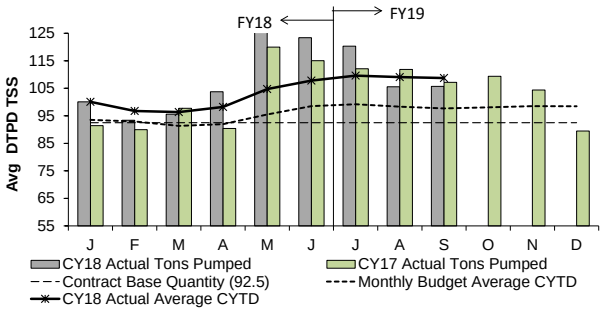


The Avg Daily DiGas Production in the 1st Quarter was 7.2% above target with the 3 Year Avg Daily DiGas Production. On average, 97.7% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant. Only 94.6% of the DiGas produced in September was utilized due to a 31 hour Thermal Power Plant shutdown to repair a deaerator flange in the boilers' common system.

Residuals Pellet Plant

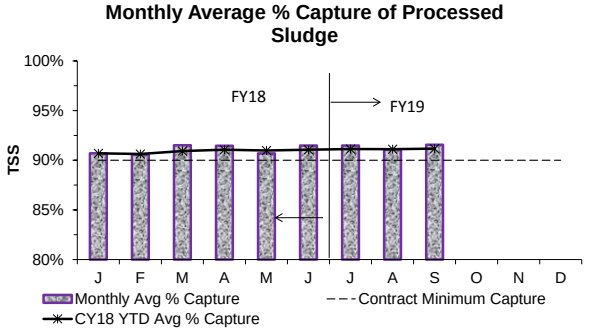
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended 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 (FY18's budget is 99.5 DTPD/TSS and FY19's budget is 98.9 DTPD/TSS).

Sludge Pumped From Deer Island



The average quantity of sludge pumped to the Biosolids Processing Facility (BPD) in the 1st Quarter was 110.5 DTPD - above target with the FY19 budget of 96.0 DTPD for the same period. Sludge delivered to the BPF was higher than expected due to higher primary and secondary sludge production, partly a result of the higher plant flow, and due to the empyting of a digester to replace a failed mixer.

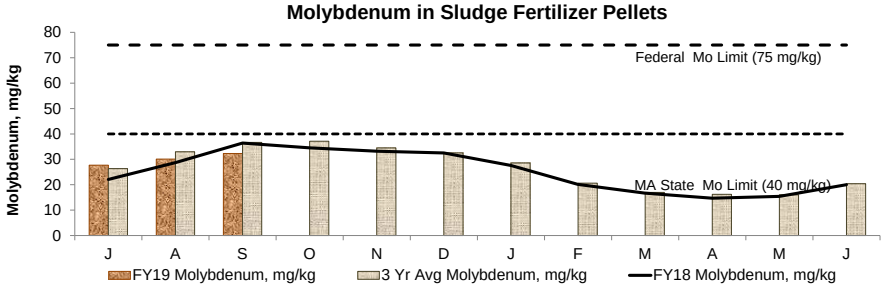
Monthly Average % Capture of Processed Sludge



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 1st Quarter was 91.4% and the CY18 to date average capture is 91.0%.

The CY18 average quantity of sludge pumped through September is 108.7 DTPD - 11.3% above target, compared with the CY18 average budget of 97.7 DTPD for the same time period.

Molybdenum in Sludge Fertilizer Pellets



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. 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.

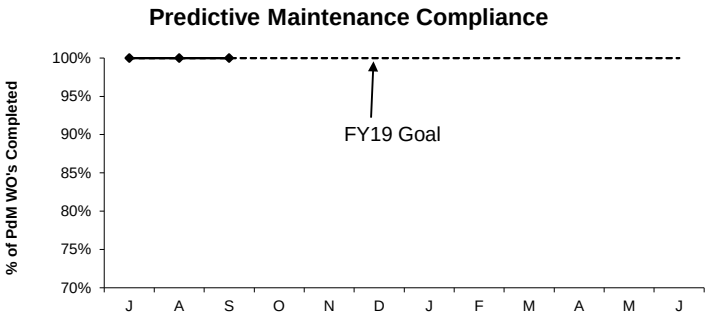
The levels have been below the DEP Type 1 limit for all three (3) metals. For Mo, levels in the MWRA sludge fertilizer pellets during the 1st Quarter averaged 30.0 mg/kg, similar to the 3 year average, and is 25% below the MA State Limit, and 60% below the Federal Limit.

Deer Island Maintenance

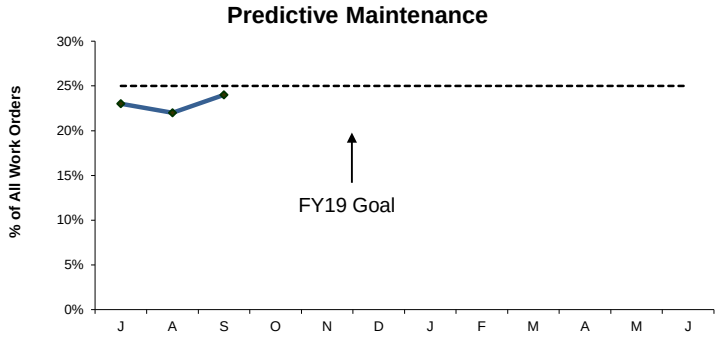
1st Quarter FY19

Productivity Initiatives

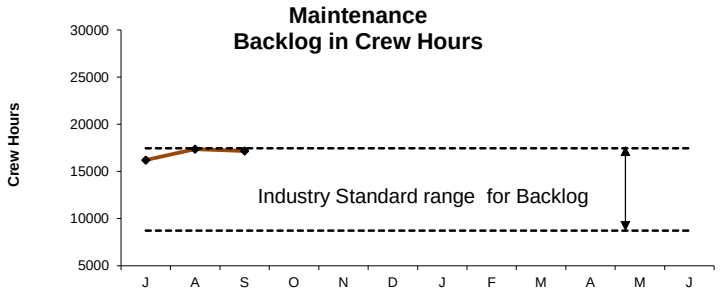
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.



Deer Island's FY19 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.



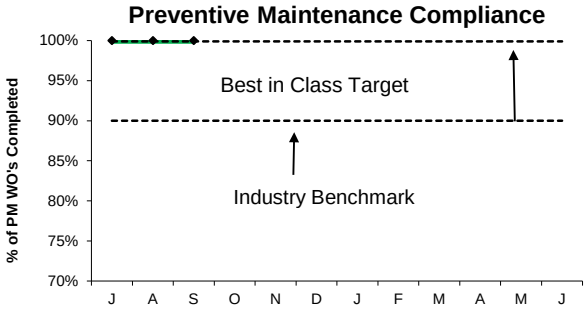
Deer Island's increased FY19 predictive maintenance goal is 25% of all work orders to be predictive. 23% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.



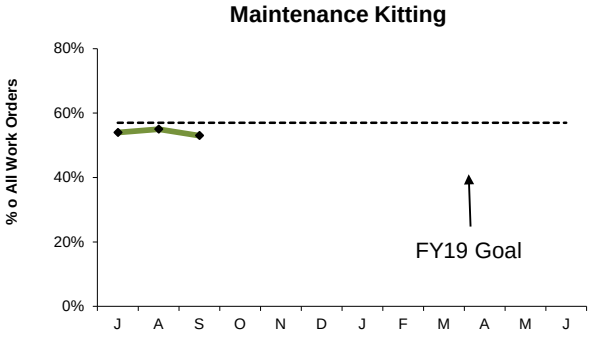
DITP's maintenance backlog at Deer Island is 17,184 hours this quarter. DITP is at the upper end of the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by three vacancies; (2) Electricians and an Instrument Technician. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

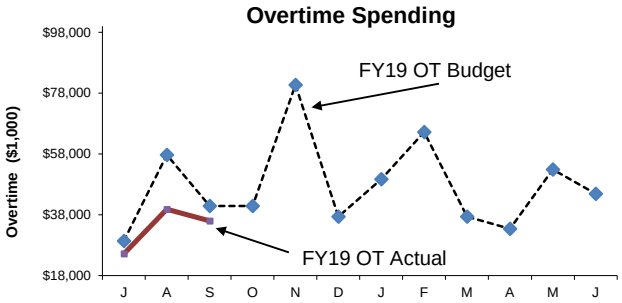
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.



Deer Island's FY19 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.



Deer Island's increased FY19 maintenance kitting goal is 57% of all work orders to be kitted. 54% 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.

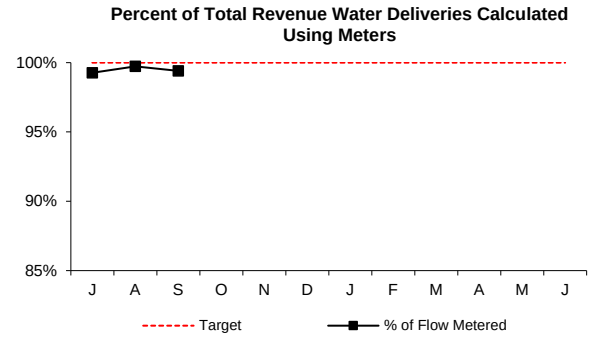


Maintenance overtime was under budget by $33K this quarter and $33k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Storm Coverage/High Flows, Gravity Thickener #4 Mixing Arm/Upright Repair, Removal of Electrical Conduit at Fore River Staging Area, Installation of Influent Valve Primary Battery C4, and Replacement of Recirculated Hot Water Heat Exchanger.

Operations Division Metering & Reliability

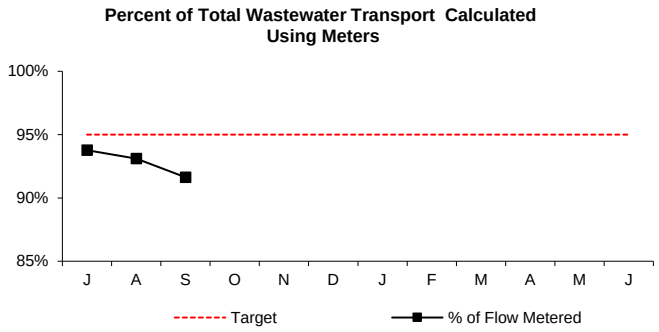
1st Quarter - FY19

WATER METERS



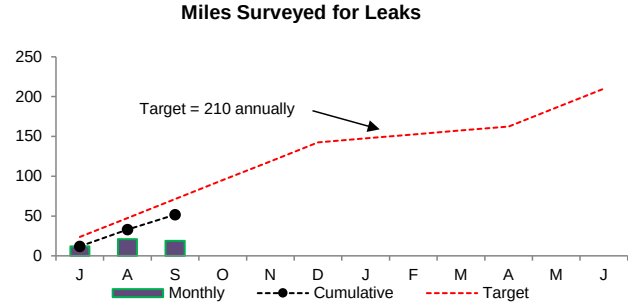
The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the first quarter of 2019, meter actuals accounted for 99.47% of flow; only 0.53% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.03%
Instrumentation Failure - 0.50%

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. Estimates are produced using data from previous time periods under similar flow conditions. During the first quarter of 2019, meter actuals accounted for 92.840% of flow. Due to instrumentation failures, 7.16% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES



During the 1st Quarter 51.69 miles of water mains were inspected.

Leak Backlog Summary													
Month	J	A	S	O	N	D	J	F	M	A	M	J	Totals
Leaks Detected	1	4	4										9
Leaks Repaired	0	0	3										3
Backlog	10	14	15										n/a

During the 1st Quarter of FY19, nine new leaks were detected and three were repaired. Refer to Leak Report below. Also community service ranging from individual leak location to hydrant surveys were conducted for: Boston, Canton, Malden, Mass DOT Ted Williams Tunnel, Medford, Milton, Newton, Reading, Revere, Somerville, Stoneham, Swampscott, Wakefield and Waltham.

FY19 Leak Report - 1st Quarter

Date Detected	Location of Leaks	Repaired
07/16/18	683 Boylston St., @ Lee St. Brookline	09/11/18
09/03/18	#2 Lynn Fells Pkwy., exit. Stoneham	09/05/18
09/07/18	Waverly Oaks Road. Waltham	09/15/18

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.
11/20/17	Peabody St., @ Washington St., Newton. Air Valve leak. Not surfacing.
11/26/17	Nonantum Rd. @ Maple St., Newton. Air valve leak. Not surfacing.
04/20/18	#634 Mystic Ave. @ Mt Vernon, Somerville. Not surfacing. Repair scheduled. Permit issues.
8/1/18	Morton St. @ Forest Hills Ave., West Roxbury.
8/8/18	Morton St. @ Forest Hills Cemetary. West Roxbury.
8/26/18	West St. @ Neponsett River. Hyde Park.
8/28/18	Morton St. @ Harvard St., Mattapan.
9/21/18	Felton St. @ Water St., Waltham.
9/27/18	Morton St. @ Norfolk St., Dorchester.

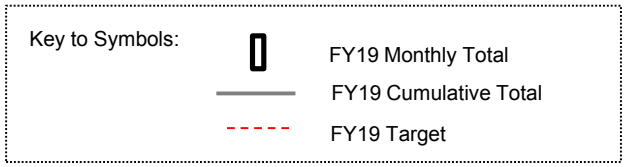
Water Distribution System Valves

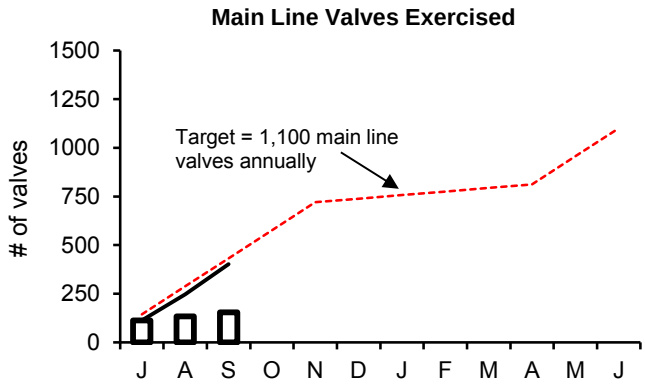
1st Quarter - FY19

Background

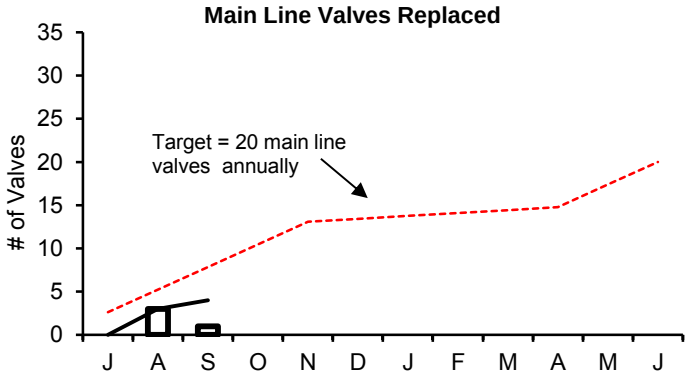
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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	
		FY19 to Date	FY19 Targets
Main Line Valves	2,159	96.5%	95%
Blow-Off Valves	1,317	98.1%	95%
Air Release Valves	1,380	94.9%	95%
Control Valves	49	100.0%	95%

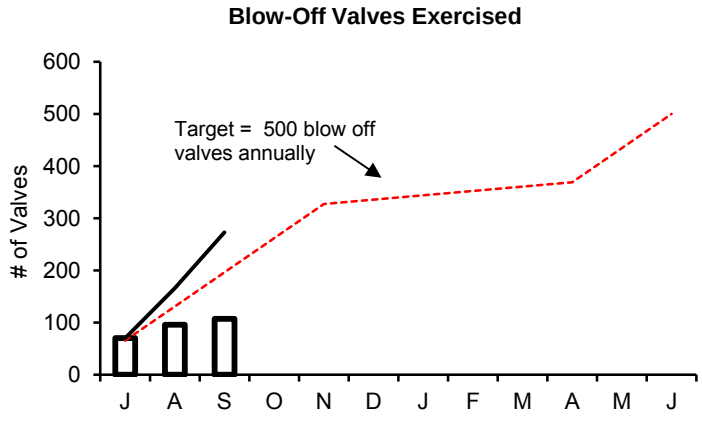




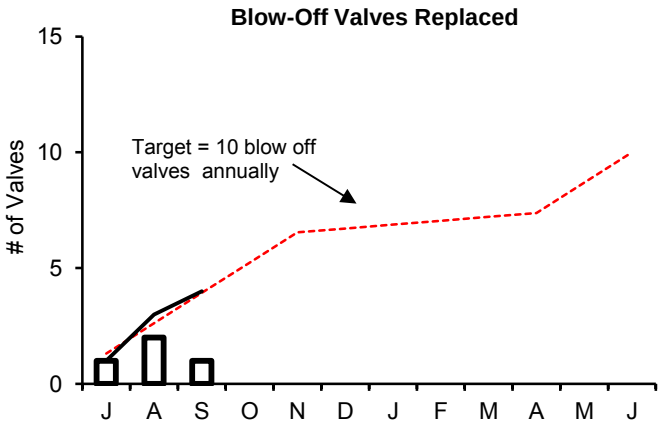
During the 1st Quarter of FY19, staff exercised 402 main line valves.



During the 1st Quarter of FY19, staff replaced four main line valves.



During the 1st Quarter of FY19, staff exercised 273 blow off valves.



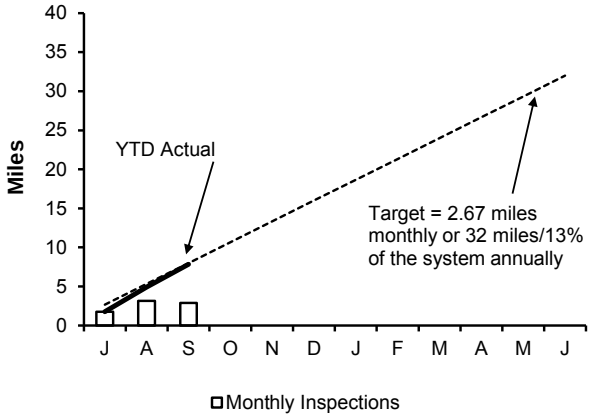
During the 1st Quarter of FY19, staff replaced four blow off valves.

Wastewater Pipeline and Structure Inspections and Maintenance

ONB 1st Quarter - FY 19

Inspections

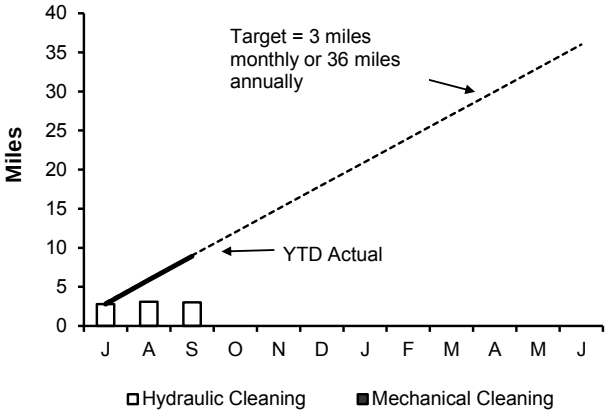
Pipeline Inspections



Staff internally inspected 7.84 miles of MWRA sewer pipeline during this quarter. The year to date total is 7.84 miles.
No Community Assistance was provided this quarter.

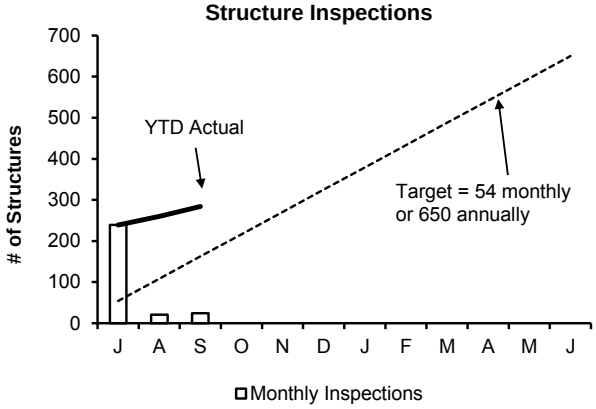
Maintenance

Pipeline Cleaning



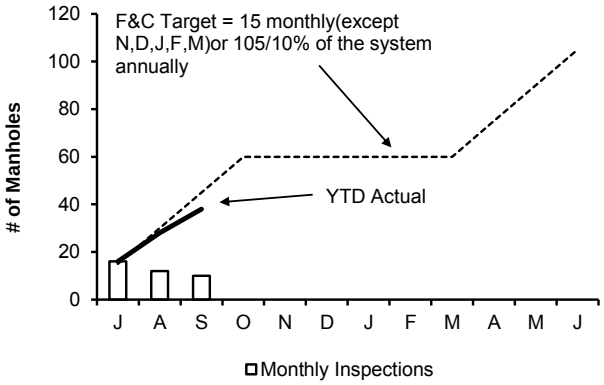
Staff cleaned 8.91 miles of MWRA's sewer system and removed 23 yards of grit and debris during this quarter. The year to date total is 8.91 miles. No Community Assistance was provided this quarter.

Structure Inspections



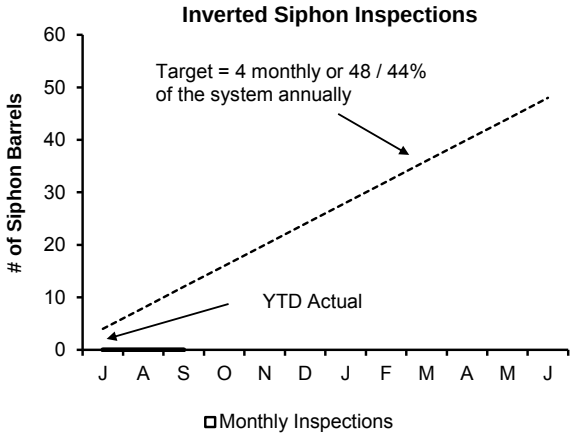
Staff inspected the 36 CSO structures and performed 284 additional manhole/structure inspections during this quarter. The year to date total is 284 inspections.

Manhole Rehabilitation



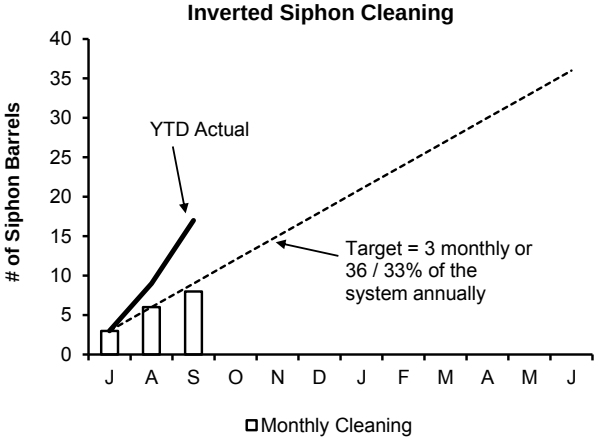
Staff replaced 38 frame & cover during this quarter.The year to date total is 38.

Inverted Siphon Inspections



Staff did not inspect any siphon barrels this quarter. Year to date total is 0 inspections.

Inverted Siphon Cleaning

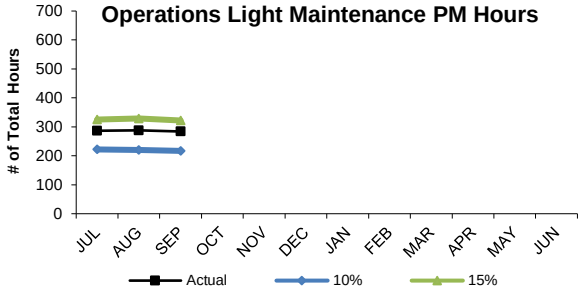


Staff cleaned 17 siphon barrels during this quarter. Year to date total is 17.

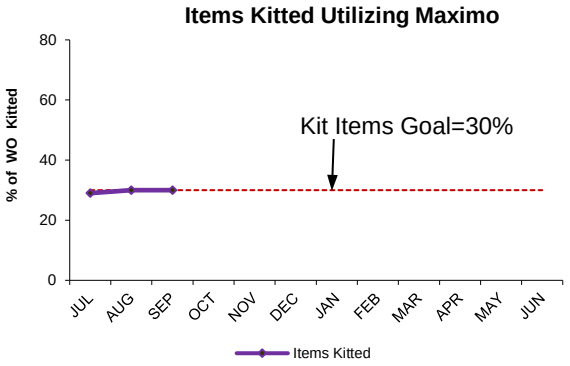
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY19

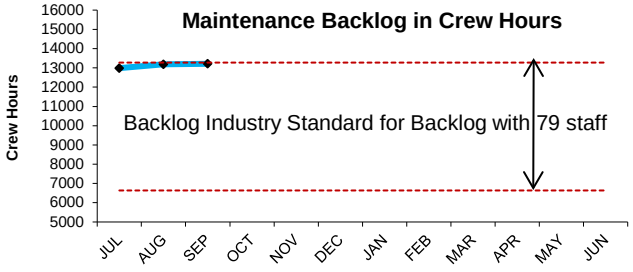
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



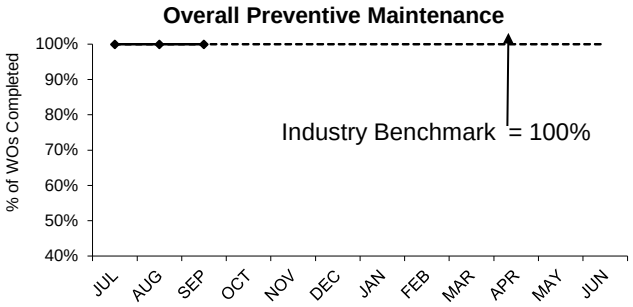
Operations staff averaged 286 hours of preventive maintenance during the 1st Quarter, an average of 14% of the total PM hours for the 1st Quarter, which is within the industry benchmark of 10% to 15%.



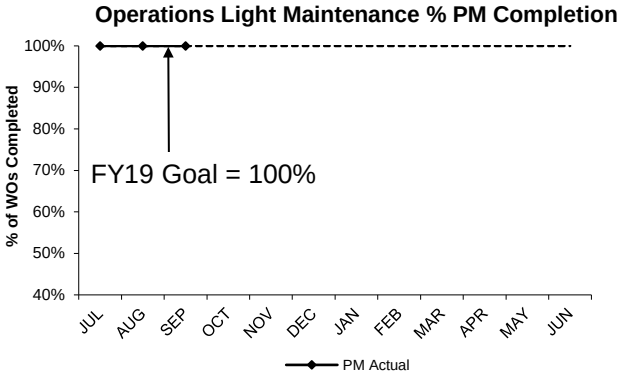
Operation's FY19 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 1st Quarter, 30% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



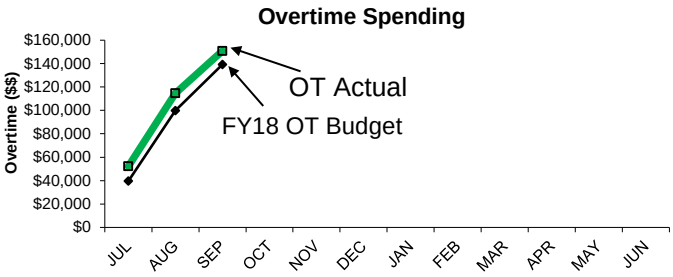
The 1st Quarter backlog average is 13129 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6636 to 13275 hours.



The Field Operations Department (FOD) preventive maintenance goal for FY19 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 1st Quarter.



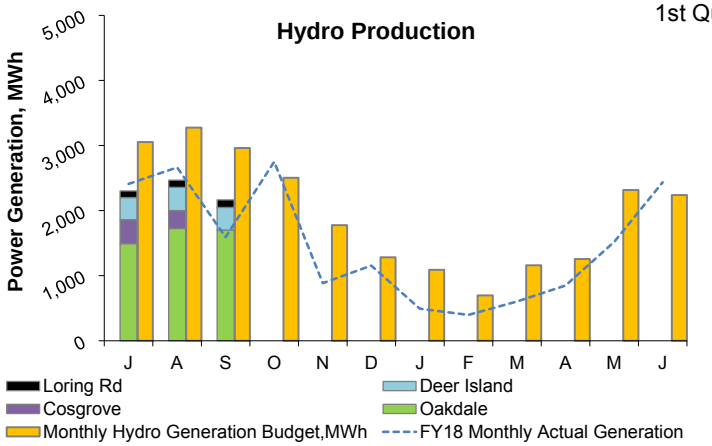
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY19 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 1st Quarter.



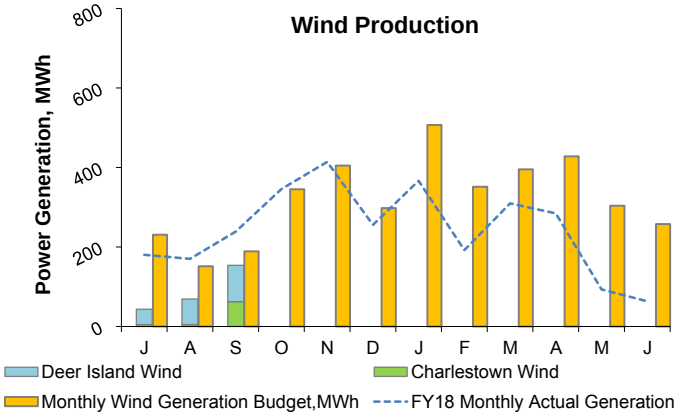
Maintenance overtime was $12k over budget for the 1st Quarter. Overtime was used for critical maintenance repairs.

Renewable Electricity Generation: Savings and Revenue

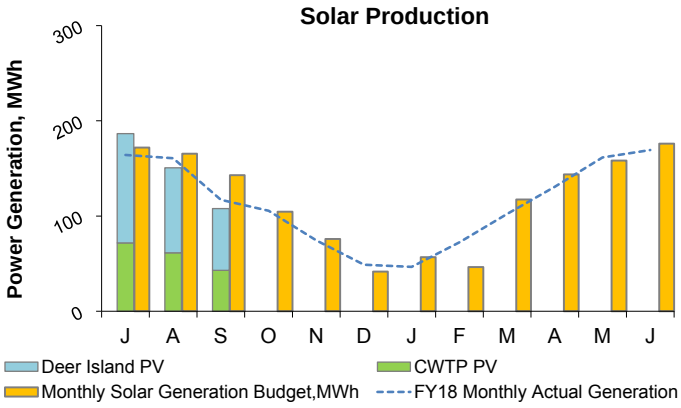
1st Quarter - FY19



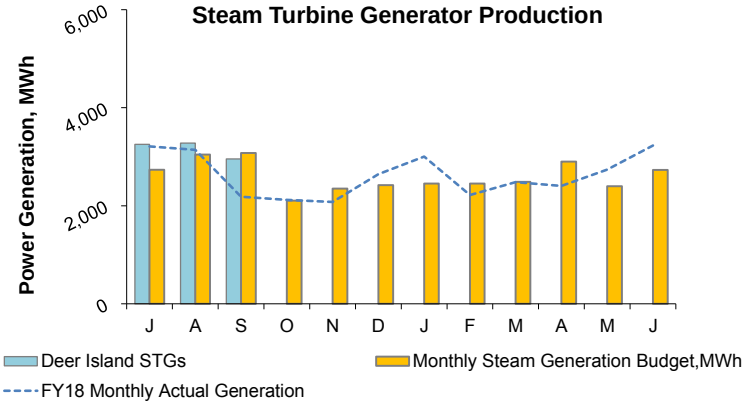
In the 1st quarter, the renewable energy produced from all hydro turbines totaled 6,936 MWh; 17% below budget[3] primarily due to Cosgrove generation values having been underestimated by the utility company. The utility data for Cosgrove is typically corrected and reconciled in later months of the year. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



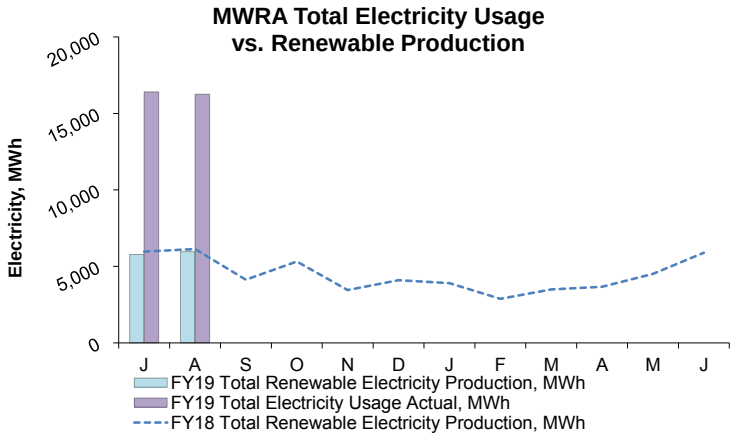
In the 1st quarter, the renewable energy produced from all wind turbines totaled 267 MWh; 55% below budget[3]; mostly due to Charlestown Wind generation values being underestimated by the utility company. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

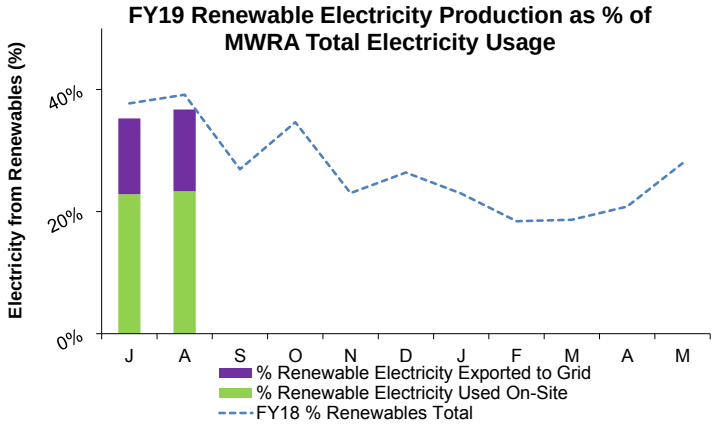


In the 1st quarter, the renewable energy produced from all solar PV systems totaled 445 MWh; 7% below budget[3]. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



In the 1st quarter, the renewable energy produced from all steam turbine generators totaled 9,487 MWh; 7% above budget[3]. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



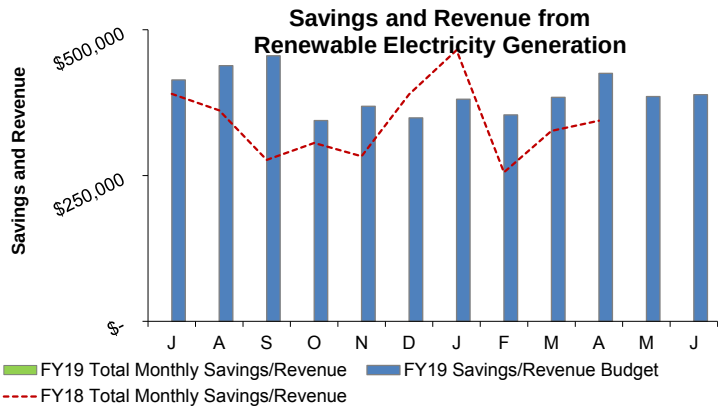


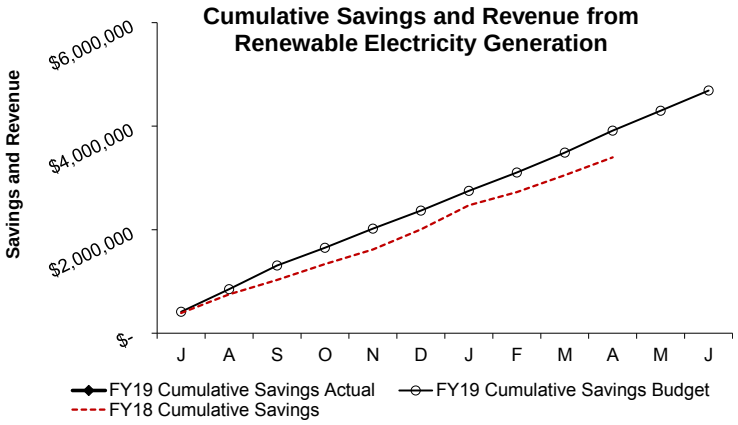
In the first 2 months of FY19, MWRA's electricity generation by renewable resources totaled 11,753 MWh. MWRA's total electricity usage was approximately 32,666 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site 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 2 months of FY19, green power generation represented approximately 36% 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

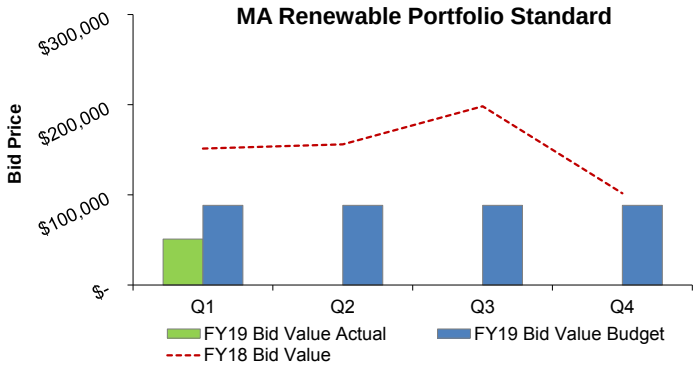
1st Quarter - FY19

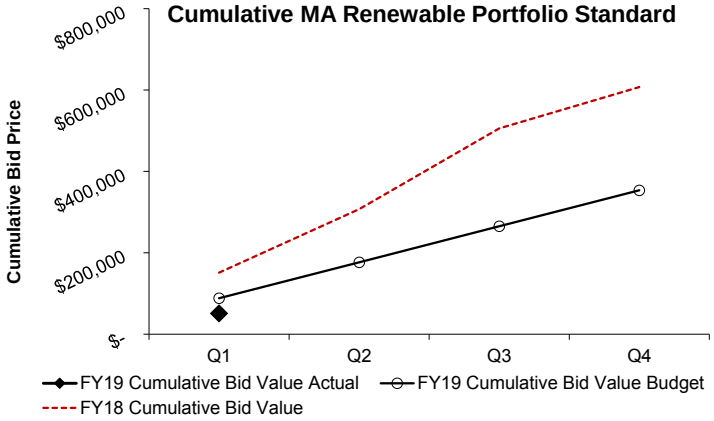




Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

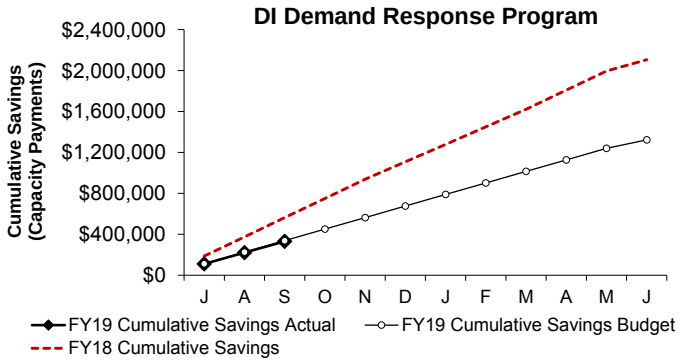
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source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

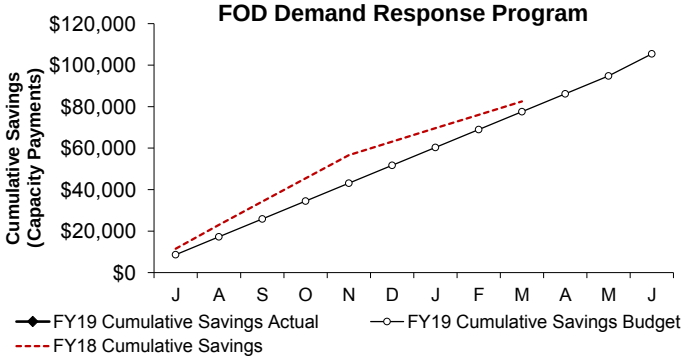




Bids were awarded during the 1st Quarter[1] from MWRA's Class 1 and Solar REC renewable energy assets; 6,520 Q1 CY2018 Class I Renewable Energy Certificates (RECs) and 51 Q1 CY2018 Solar RECs (SRECs) were sold for a total value of $51,009 RPS revenue; which is 42% below budget[3] for the Quarter. This is mainly due to Class I market prices being 49% below budget for the Quarter. 399 Class II RECs were banked during Q1 for future sale.

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.



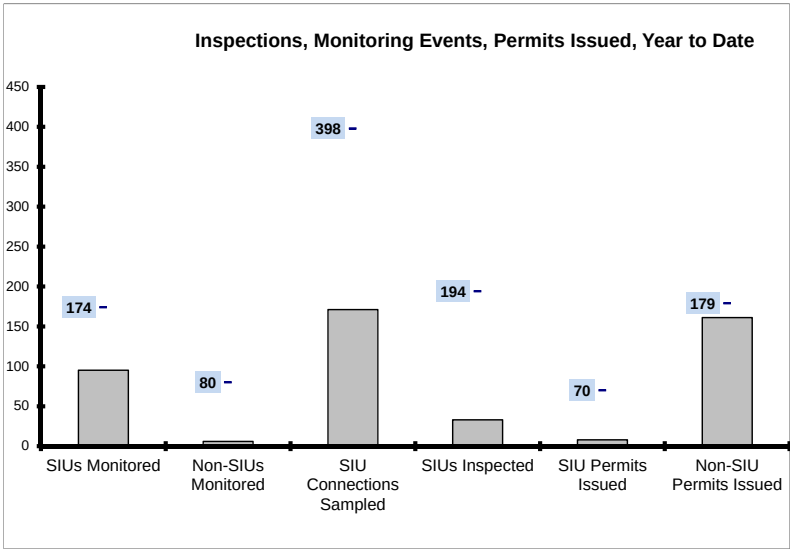


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE.
FY19 Cumulative savings (Capacity Payments only) total $330,722 for Deer Island. Payments for FOD are still pending receipt as of 1st quarter reporting time.

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

1ST Quarter - FY19



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 in the month. However, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

EPA requires MWRA to issue or renew 90% 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% of SIU permits to be issued within 180 days

Number of Days to Issue a Permit								
	0 to 120		121 to 180		181 or more		Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	1	11	0	1	1	3	2	15
Aug	2	122	1	1	0	2	3	125
Sep	2	14	0	2	1	5	3	21
Oct								
Nov								
Dec								
Jan								
Feb								
Mar								
Apr								
May								
Jun								
% YTD	63%	91%	13%	2%	25%	6%	8	161

In the 1st Quarter of FY19, one hundred and sixty-nine permits were issued, eight of which were SIUs. Among the permits issued in August were one hundred and fifteen non-SIU permits, representing the timely renewal of the majority of permits falling under the Group Permit for Food Processing Operations.

Five of the SIU permits were issued within 120 days, with three beyond the 120-day timeframe - falling far short of the EPA 's 90% requirement for the year. There were fourteen non-SIU permits issued beyond the 120-day timeframe with ten of them beyond the 180-day timeframe.

TRAC has had a very challenging time over the past several months dealing with personnel changes. This has affected the workflow, resulting in delays in processing permits. Other delays were attributable to having to wait for data from an industry, and/or approval from the municipality in which the industry was operating or intended to operate. Late payment on invoices remains a factor in late issuances.

The new Clinton NPDES permit effective March 1, 2017, requires TRAC to issue/renew all industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be an SIU.

There were no Clinton SIU permits issued during the first quarter ofthis fiscal year.

EPA Required SIU Monitoring Events
for FY19: 174
YTD : **95**

Required Non-SIU Monitoring Events
for FY19: 80
YTD : **6**

SIU Connections to be Sampled
For FY19: 398
YTD: **171**

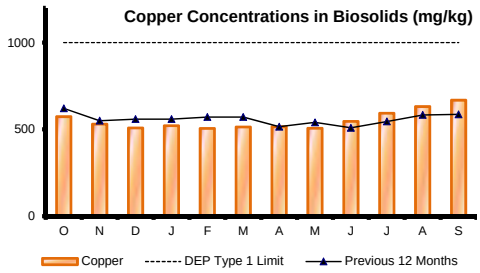
EPA Required SIU Inspections
for FY19: 194
YTD: **33**

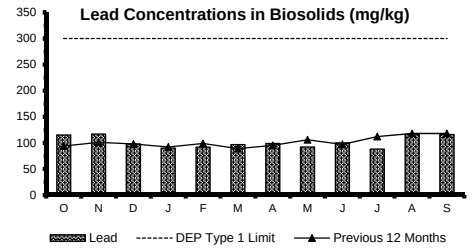
SIU Permits due to Expire
In FY19: 70
YTD: **8**

Non-SIU Permits due to Expire
for FY19: 179
YTD: **161**

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.





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.

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

1st Quarter – FY19

Western Water Operations and Maintenance

Carroll Water Treatment: Staff continued to support the Wachusett Aqueduct Pump Station Project and Marlboro Maintenance Facility. Functional testing continued, this required establishing flow in the aqueduct and coordinating with supply and receiving reservoirs to accommodate the increased flow. Staff began the process of furnishing the work spaces including ordering work benches and desks at the Marlboro Maintenance Facility.

Reservoir Operations: Regulatory dam safety inspections were completed for: Norumbega Reservoir, Schencks Pond, Spot Pond, Fells Reservoirs, and Ware Diversion Dam.

Metro Water Operations and Maintenance

Water Pipeline Program: In addition to conducting leak detection on MWRA pipelines, community assistance was provided to Boston, Canton, Malden, Mass DOT in the Ted Williams Tunnel, Medford, Milton, Newton, Reading, Revere, Somerville, Stoneham, Swampscott, Wakefield, and Waltham. The Ted Williams tunnel fire system assistance involved Mass DOT shutting down the tunnel to traffic to allow for leak detection work to be accomplished.

Water Quality Assistance: Staff collected samples from the MWRA system at Meter 153 in Malden as part of the review to assist the city in diagnosing water quality issues within the city's system. Assistance was also provided to Stoneham due to the *E. coli* positive water quality sample result in the town's system. A boil water notice was in effect for approximately 24 hours until the repeat samples were clear. The portable drinking fountains were deployed twenty-two (22) times during the quarter.

Cambridge Temporary Water Supply: On Sunday, August 5, Cambridge experienced issues at its water treatment plant. The MWRA-Cambridge connection was opened, and remained in service for about 24 hours, suppling 9.28 million gallons of water.

Bellevue Tank 2 Painting: Bellevue Tank 1 was placed into service in early September, allowing Bellevue Tank 2 to be drained for repainting. The overflow elevation of Bell 1 is 25 feet lower than Bell 2, requiring its operation to be limited to lower flow periods. Service in the Southern Extra High (SEH) service area has been normal. The paint removal and re-painting is expected to be completed in late fall.

Dig Safe Pilot Program: The Dig Safe Pilot Program continues to function successfully. Brookline, Chelsea and Saugus are included in the program that is related to MWRA water pipelines. During the first quarter, MWRA received 396 notices, of which 78 were of an emergency nature. Thirty (30) emergency mark outs and 51 regular mark outs were required from the 396 total notices.

Operations Engineering

Spot Pond Warranty Inspection: The ROV inspection was completed on July 5th, after the application of the new waterproofing membrane at the suspected leak site was completed and roof was saturated. The tank roof and wall were dry. Water quality samples were taken and the Tank was reactivated on July 9th after all water quality parameters passed.

Wastewater Operations & Maintenance

Nut Island Isolation Testing: Staff worked with Process Control staff to develop procedures to test the isolation of the Nut Island. The isolation testing is scheduled for October 2018.

Caruso PS Tour for BWSC Staff: Staff conducted a tour of the Caruso PS and reviewed MWRA East Boston system flows for BWSC staff on July 10th.

High Level Sewer Access Meeting: Staff attended a High Level Sewer access meeting with Quincy officials and the design consultant on July 11th.

Emergency Action Plan Review Meeting: Staff attended the EAP review meeting for the Nut Island Headworks and Hough's Neck PS on 8August 22nd.

Nut Island Tour: Staff conducted a tour of the Nut Island Headworks on for an author writing about the clean-up of Boston Harbor and also for fifth grade students and teachers from the Atherton Hough Elementary School in Quincy.

Wastewater Table Top Drill: Operations staff attended the drill which simulated a major wet weather event accompanied with other problems/issues.

TRAC

Compliance and Enforcement

During the first quarter of FY19, TRAC issued 11 Notices of Noncompliance, 55 Notices of Violation,

three Rulings, one Supplemental Order to Comply and one Penalty Assessment Notice.

Inspections and Permitting

This quarter TRAC, issued a total of 61 MWRA 8(m) Permits allowing companies to work within an easement or other property interest held by the Authority. The total number includes 32 permits issued for work within water infrastructure easements and 29 permits issued for work within sewer infrastructure easements. Permits issued this quarter were issued in an average of 85 days from the date the application for 8(m) permit was received by the MWRA.

TRAC Staff conducted 22 Annual SIU Inspections, 13 Industrial Surveys, and 262 other inspections. Annual SIU Inspections are required under TRAC's EPA approved Industrial Pretreatment Program. Other inspections include inspections for enforcement, permit renewal, NonSIU, follow-up, temporary construction dewatering sites, group/combined permit audits, out-of-business facility and survey.

TRAC monitored the septage receiving sites a total of 33 times. Staff conducted 212 inspections of existing gasoline/oil separators and 41 new construction gasoline/oil separators.

169 MWRA Sewer Use Discharge Permits (Permits) were issued and/or renewed to its sewer users.

One of the Group Permit for Food Processing Wastes was issued to an industry located in Lancaster. This permit was issued within 90 days of the expiration date of the company's previous permit.

Monitoring

Monitoring Events: SIU-307 events, NonSIU-11 events, 510 total other events (i.e., CSO hypochlorite tanks monitoring, Metropolitan Local Limits, Clinton NPDES sampling and Local Limits, Oakdale, special sulfide sampling for Framingham Extension Sewer (SPSULF, FES Muni), and CSO NPDES sampling.

Environmental Quality-Water

Algae: MWRA and DCR continued monitoring for nuisance taste and odor algae. Water quality buoy data at three in-reservoir stations was used to help monitor water quality. Staff performed routine algal toxin sampling and testing for both Quabbin & Wachusett systems, and in conjunction with Western and Eastern Operations, began weekly cyano-bacteria inspections at standby reservoirs.

Annual standby reservoir inspections and sampling occurred during July. The Reservoir Operations contractor collected various water quality samples; samples were sent to the Department of Laboratory Services or a contract laboratory for testing.

Community Support: Staff provided sampling and testing assistance to Bedford, Malden, Framingham, Stoneham, and Waltham. Staff also reviewed and submitted comments on two community Revised Total Coliform Rule Level 2 Assessments.
On September 12th staff deployed the S:CAN Mobile Trailer at the Emergency Response Plan Training for BWSC. On September 21st staff trained drinking water samplers from Marlborough, Malden and Winthrop, focusing on sample tap inspections, sampling technique, and chlorine residual testing.

Contaminant Monitoring System (CMS): Staff completed the fit-out of the S::CAN mobile trailer with a Telog wireless system in August. On September 13th, staff deployed the trailer to the Wachusett Aqueduct Pump Station to assist with turbidity monitoring, and to test the transfer and storage of data.

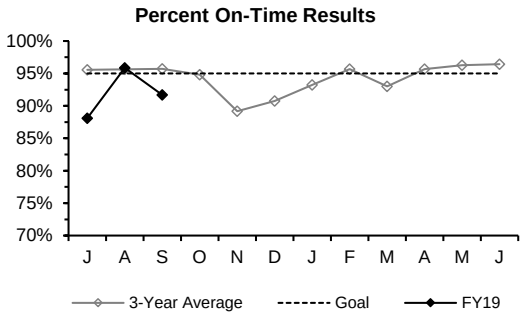
Environmental Quality-Wastewater

Ambient Monitoring: Working with a subcommittee of the regulator's Outfall Monitoring Science Advisory Panel (OMSAP), set the date (November 13, 2018) and agenda for a workshop to review the questions on which the monitoring is based. Received results from flounder liver health monitoring; flounder caught near the outfall continue to show no signs of impact from the effluent discharge. Preparation of reports on 2017 monitoring results is ongoing.

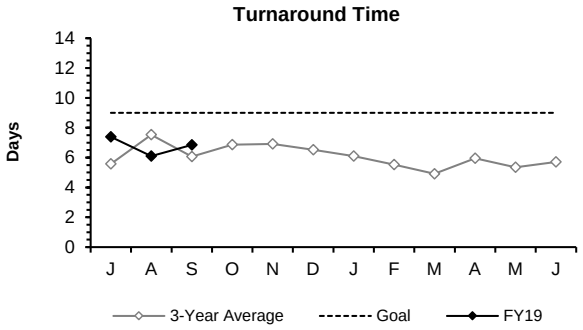
Harbor/CSO Monitoring: Made as-needed notifications of wastewater incidents, sewer overflows, and blending. Posted near-real-time web updates for wet weather CSO discharges and sanitary sewer overflows. Collected samples required by the new permit for discharge from the geothermal heating/cooling system at the Wachusett Aqueduct Pump Station.

Laboratory Services

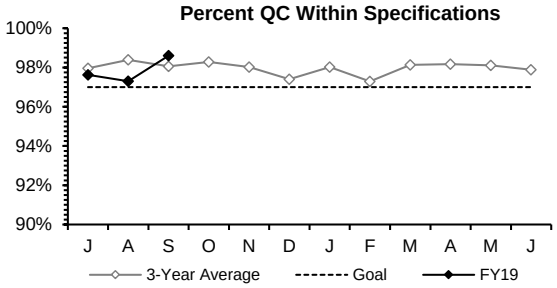
1st Quarter - FY19



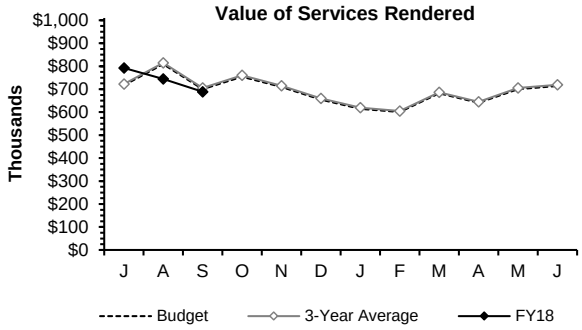
The Percent On-Time measurement was below the 95% goal for two months of the quarter, due to staff turnover, and time spent training new staff. Regulatory reporting deadlines were met.



Turnaround Time was faster than the 9-day goal three months of the quarter.



Percent of QC tests meeting specifications was above the 97% in-house goal three months of the quarter.



Value of Services Rendered was slightly below the seasonally adjusted budget projection two months of the quarter due to staff turnover.

Highlights:

Retirement:
Dr. Michael F. Delaney retired on 7/27/2018 after a 25 year career at the MWRA.

CSO Assessment:
We continued to perform weekend CSO receiving water sampling in the Charles and Mystic Rivers during/after significant wet weather events. This is intended to give additional data for the CSO Assessment to document the recovery of the rivers after it rains.

Communties:
Performed demonstrations of the wastewater treatment process at an annual science festival in Chelsea.

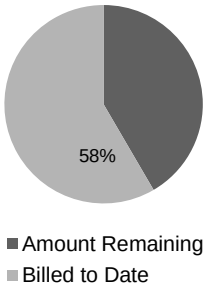
Lead Testing:
Accepted an EPA Environmental Merit Award for school lead testing on behalf of all of MWRA.

Mobile Lab:
Participated in a joint drill at JJCWTP with the Army National Guard Civil Support Team.

CONSTRUCTION PROGRAMS

Projects In Construction
1st Quarter – FY19

Money



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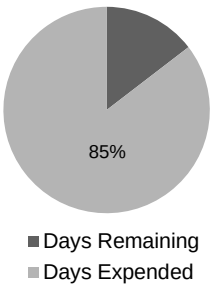


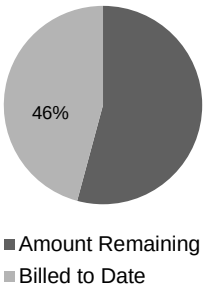
Reading Extension Sewer Rehabilitation

Project Summary: This project involves the rehabilitation of 10,820-linear feet of the Reading Extension Sewer and 2,280-linear feet of the Metropolitan Sewer and 62 associated manholes/structures.

Notice to Proceed: 10-Aug-2017 *Contract Completion:* 10-Dec-2018

Status and Issues: During September, the Contractor completed the grouting and installation of a cured in place spot repair at 100 Maple Street. They also developed a list of repairs for observed infiltration defects, with the final list still in discussion.

Money



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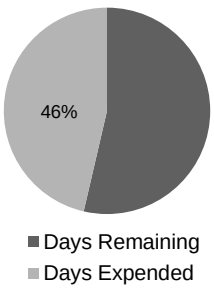


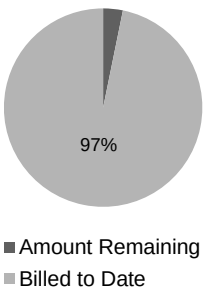
Chelsea Creek Headworks Upgrade

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 September, the Contractor placed concrete for the carbon adsorbers and fan foundations. They backfilled and installed the odor control condensate drain, excavated for the piles for the new communication tower foundation. The plumbing contractor installed 2" process air and 1" instrument air piping.

Money



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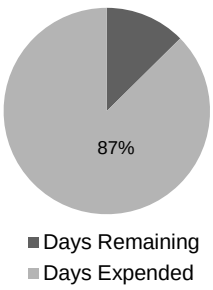


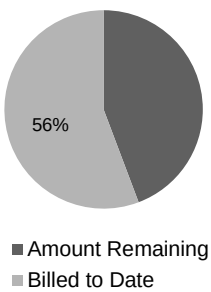
Wachusett Aqueduct Pumping Station

Project Summary: This project involves the construction of a 240 MGD pump station to supply water from the Wachusett Aqueduct to the Carroll Water Treatment Plant.

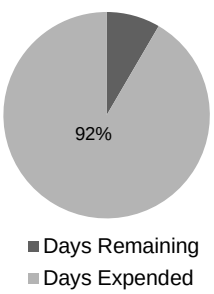
Notice to Proceed: 1-Mar-2016 *Contract Completion:* 14-Feb-2019

Status and Issues: As of September, the Contractor filled the channel and flushed and filled wells #1 through #7 with water from the Wachusett Aqueduct, for Witness Function Acceptance Testing (WFAT). They backfilled, graded and seed loamed at the east and west detention basins.

Money



Time



Alewife Brook Pump Station Improvements

Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

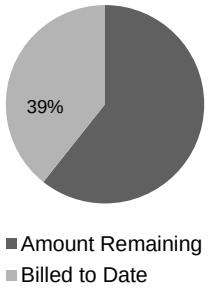
Notice to Proceed: 29-Jan-2016 *Contract Completion: 2*7-Nov-2018

Status and Issues: As of September, the Contractor began electrical testing on the switchgear, MCC, VFD's and pulled and terminated feeder cables to the generator. They also continued work on the lighting, security, fire alarm and gas monitoring systems.

Projects In Construction

1st Quarter – FY19

Money



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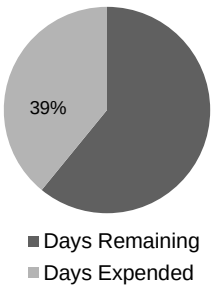


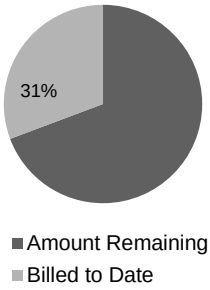
NIH Section 110 - Stoneham

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 September, the Contractor removed 2045-CY of ledge along Pond Street, Main Street and Wright Street, after which they installed 1098-LF of 48" DIP water main.

Money



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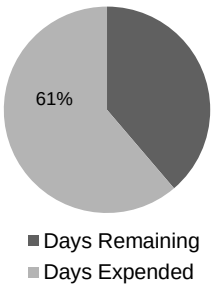


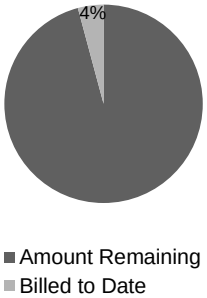
Winthrop Terminal VFD and Motor

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/Motor No 2 testing on-going. Troubleshooting Vibration issue with Motor No 6.

Money



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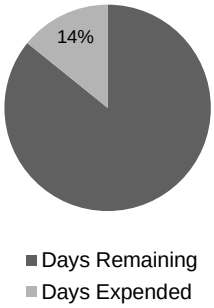


Gravity Thickener Rehabilitation

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: NTP issued May 11, 2018. Submittal review. No physical work to date.

CSO CONTROL PROGRAM

1st Quarter – FY19

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Of the $910.1 million budget in the FY19 CIP for the CSO Control Program, approximately $7 million remain to be spent through 2021.

Project/Item	Status as of September 30, 2018
BWSC Dorchester Interceptor Inflow Removal	MWRA's CIP and the MOU/FAA with BWSC included $5.4 million for additional inflow removal from the BWSC Dorchester Interceptor system in the South Dorchester Bay Sewer Separation area, of which $1.7 million was transferred to the BWSC MOU/FAA 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 $3.8 million from the BWSC 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 $3.8 million. BWSC continues to perform sewer system evaluations that will support its construction project recommendations.
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 final eligibility reviews and final reconciliation of the MOU/FAA costs.
MWRA CSO Performance Assessment	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 compliance assessments culminating in the submission of a report verifying attainment of court-ordered levels of CSO control to EPA and DEP in December 2020, in compliance with the last milestone in Schedule Seven. AECOM submitted a draft semi-annual CSO discharge and performance assessment report at the end of September which includes rainfall summaries and analyses, CSO meter data, metered CSO discharge quantifications, model predicted CSO discharges and related evaluations for storms in the period April through June 2018. The report is undergoing MWRA review and is expected to be finalized and published this November. In the meantime, MWRA staff continue to collect water quality data in CSO affected waters for eventual analysis by AECOM relative to compliance with water quality standards.

CIP Expenditures

1st Quarter – FY19

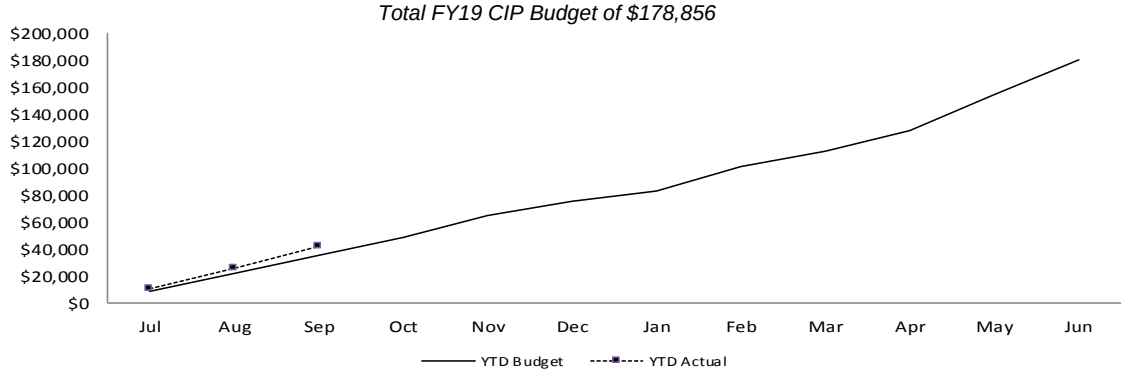
FY19 Capital Improvement Program Expenditure Variances through September by Program ($ in thousands)				
Program	FY19 Budget Through September	FY19 Actual Through September	Variance Amount	Variance Percent
Wastewater	20,067	13,163	(6,904)	-34%
Waterworks	14,427	28,883	14,456	100%
Business and Operations Support	839	357	(482)	-57%
Total	$35,333	$42,402	$7,069	20%

Project underspending within Wastewater was due less than anticipated community requests for grants and loans, progress on odor control foundation and Channel 1 work for the Chelsea Creek Headworks Upgrade Construction, delay in city of Somerville construction award for the Somerville Marginal In-System Storage, lead time for the delivery of equipment for the Winthrop Terminal Facility Variable Frequency Drives Replacements, timing of final work for the Alewife Brook Pump Station, and delay in delivery of screens for the DeLauri Pump Station and Security contract. This was partially offset by progress on Deer Island Gravity Thickener Rehabilitation, and work anticipated in FY18 that was completed in FY19 for the Prison Point Piping Rehabilitation and Sludge Tanks and Silo Coating contracts. Project overspending in Waterworks was due to greater than anticipated requests for community loans, construction progress for the Wachusett Aqueduct Pump Station, Northern Intermediate High Section 89 & 29 Phase 2, 1C, and Design/ESDC, and scheduled FY18 work invoiced in FY19 for the Rosemary Brook Building Repair. This was partially offset by timing of final work for the Section 14 Water Main Relocation (Malden), Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budget, and delay in test pit work for the WASM 3 MEPA Design/CA/RI contract.

Budget vs. Actual CIP Expenditures

($ in thousands)

Total FY19 CIP Budget of $178,856



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 9/29/2018	$110.0 million
Unused capacity under the debt cap:	$1.483 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-19
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 FY19 capital spending*:	$188 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY19

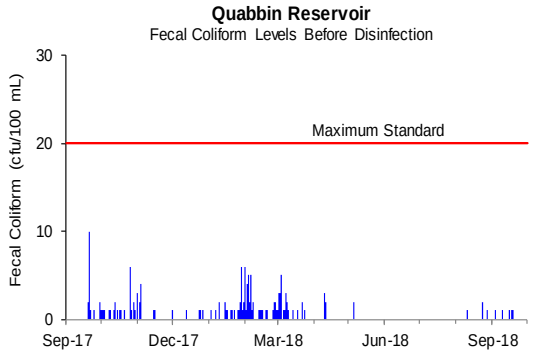
Source Water – Microbial Results

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 1st 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, compared to the allowable 10%.**

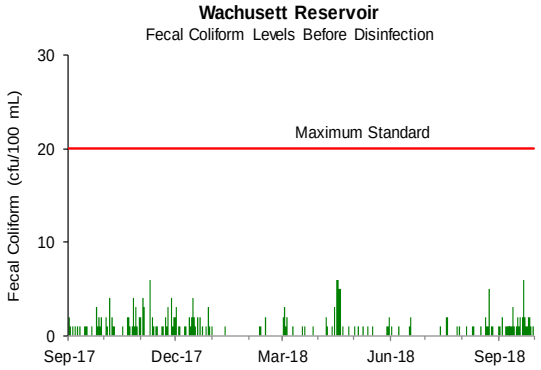


Sample Site: Wachusett Reservoir

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 1st Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

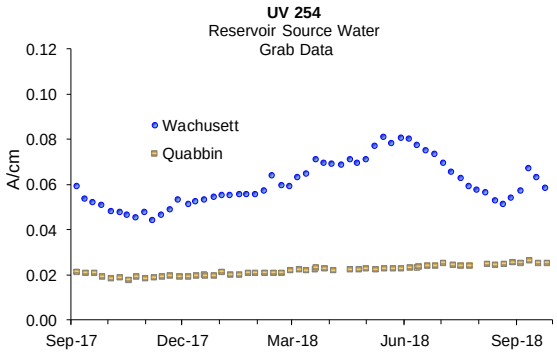


Source Water – UV Absorbance

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 0.026 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.059 A/cm.



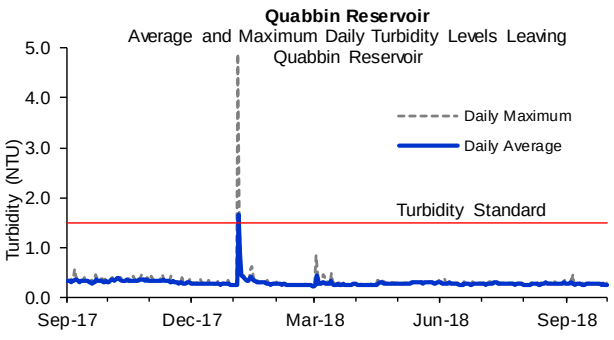
Source Water – Turbidity

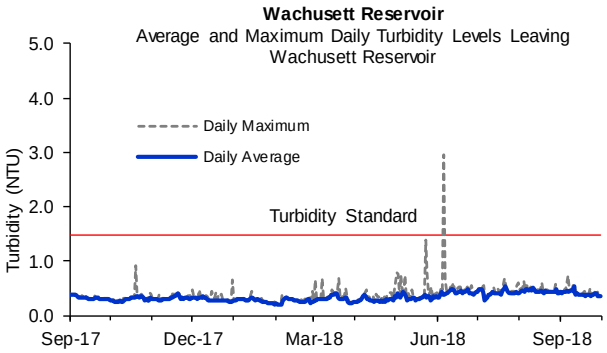
1st Quarter – FY19

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.



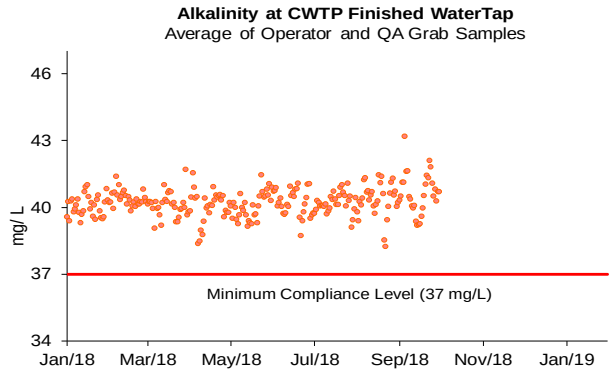


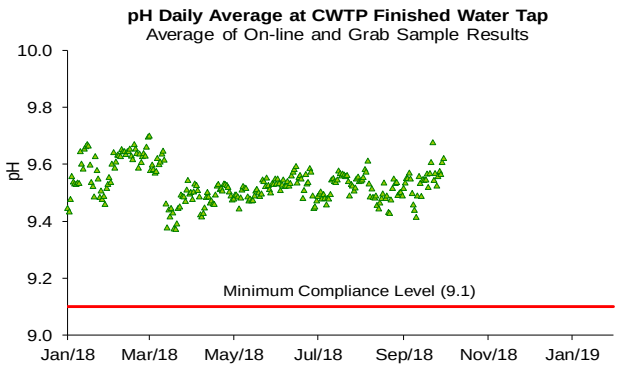
Treated Water – pH and Alkalinity Compliance

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 September 5 and 6, 2018. Distribution system sample pH ranged from 9.2 to 9.6 and alkalinity ranged from 38 to 41 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

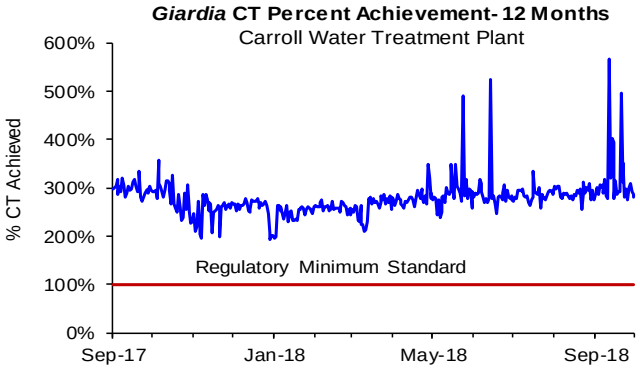
1st Quarter – FY19

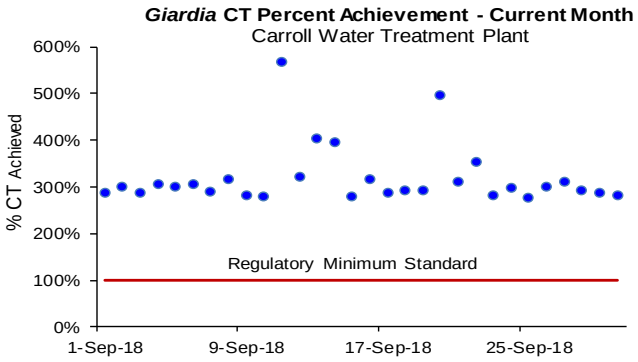
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA 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:

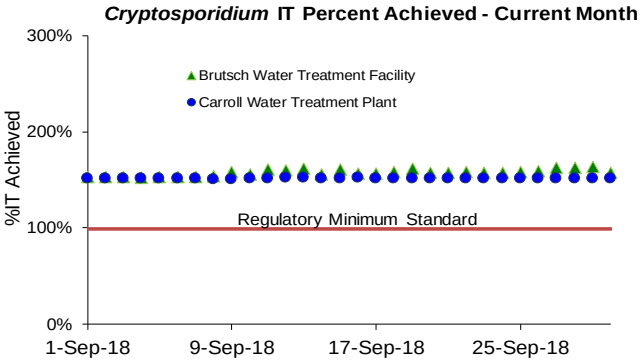
- Ozone dose at the CWTP varied between 1.7 to 2.4 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.
- The Wachusett Aqueduct Pump Station (WAPS) will improve redundancy in the MWRA water system. WAPS testing was initiated in June. Prior to and during WAPS testing, CWTP proactively increase the ozone dose and "CT achievement". This is visible in the two top graphs.

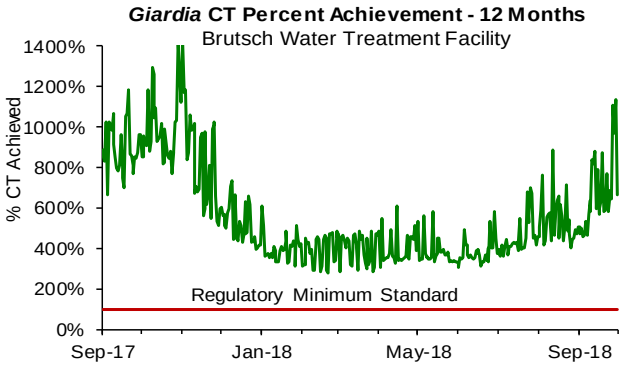


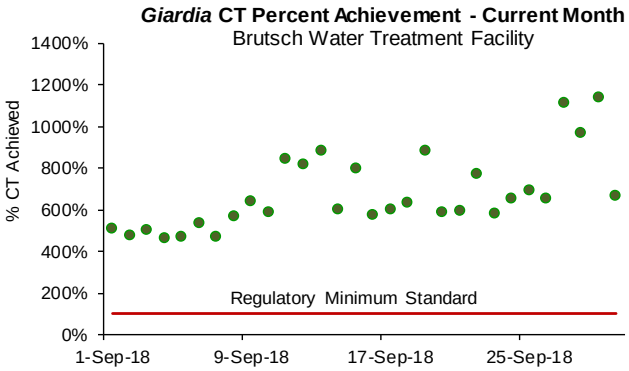


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 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 1.7 to 1.9 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%.







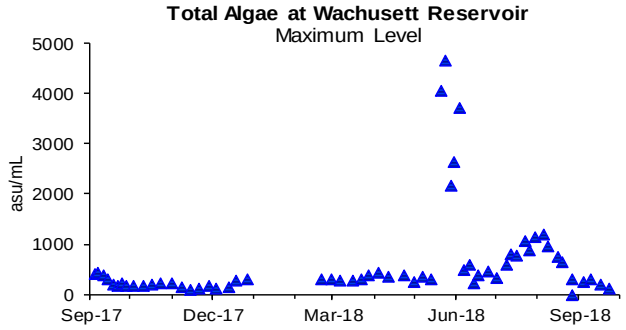
Source Water - Algae

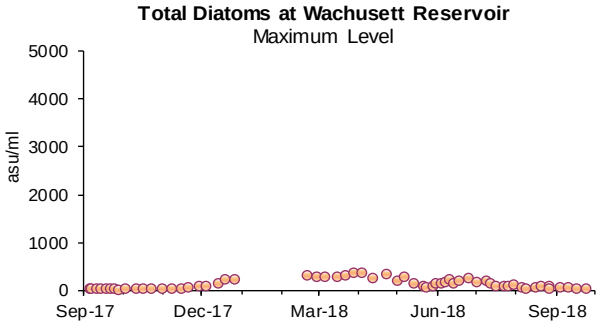
1st Quarter – FY19

Algae levels in Wachusett 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 reservoir 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 1st Quarter, no complaints which may be related to algae were reported from the local water departments.





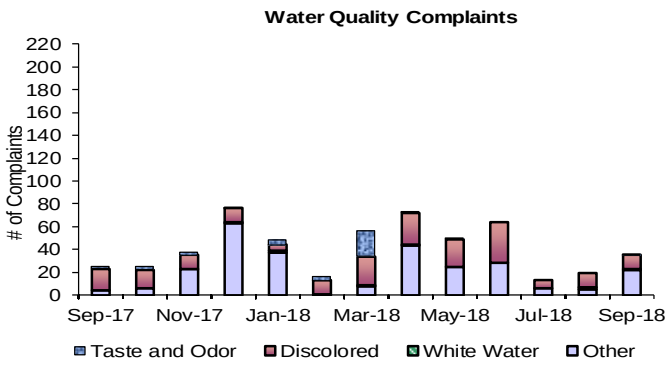
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

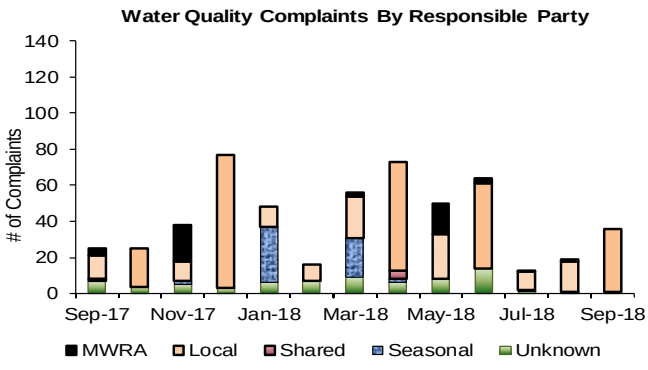
MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps 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 68 complaints during the quarter compared to 61 complaints from 1st Quarter of FY18. Of these complaints, 31 were for "discolored water", 1 was for "taste and odor", 3 were for "white water", and 33 were for "other". Of these complaints, 62 were local community issues, 2 were MWRA related, 2 were seasonal in nature, and 2 were unknown in origin.

- On September 6, Malden reported twenty low pressure complaints which may have been attributed to local flushing in the area.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY19

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 1st Quarter, 97 of the 6,389 community samples (1.52% system-wide) submitted to MWRA labs for analysis tested positive for total coliform. 19 of the 1,993 Shared community/MWRA samples (0.95%) tested positive for total coliform. In September, one sample (Stoneham, 9/12) tested positive for *E.coli* with a repeat sample positive for total coliform. This resulted in a town-wide Boil Water Order (an acute violation) and the need for a Level 2 Assessment. In August and September, Bedford and Canton each had more than one positive total coliform sample and, therefore, are required to conduct a Level 2 Assessment since this occurred twice within a rolling 12-month period. In September, South Hadley had more than one positive total coliform sample and, therefore will conduct a Level 1 Assessment. In September, Somerville and Woburn had greater than 5.0% of their samples that were total coliform positive and, therefore, are required to conduct a Level 1 Assessment. In September and August, Malden had greater than 5.0% of their samples that were total coliform positive and, therefore is required to conduct a Level 2 Assessment since this occurred twice within a rolling 12-month period. As part of the coliform investigation, Malden chose to continue repeat sampling throughout the month. Only 1.5% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L.

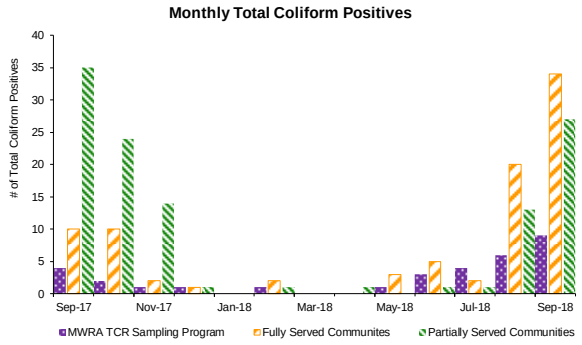
NOTES:

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	385	7 (1.82%)	0	
	a	Shared Community/MWRA sites	1608	12 (0.75%)	0	
		Total: MWRA	1993	19 (0.95%)	0	No
Fully Served		ARLINGTON	169	0 (0%)	0	
		BELMONT	104	0 (0%)	0	
		BOSTON	768	1 (0.13%)	0	No
		BROOKLINE	224	0 (0%)	0	
		CHELSEA	169	0 (0%)	0	
		DEER ISLAND	52	0 (0%)	0	
		EVERETT	187	6 (3.21%)	0	No
		FRAMINGHAM	243	3 (1.23%)	0	No
		LEXINGTON	118	1 (0.85%)	0	No
		LYNNFIELD	18	0 (0%)	0	
		MALDEN	271	24 (8.86%)	0	Yes
		MARBLEHEAD	72	0 (0%)	0	
		MEDFORD	221	0 (0%)	0	
		MELROSE	117	0 (0%)	0	
		MILTON	102	0 (0%)	0	
		NAHANT	30	0 (0%)	0	
		NEWTON	276	0 (0%)	0	
		NORTHBOROUGH	51	1 (1.96%)	0	No
		NORWOOD	100	0 (0%)	0	
		QUINCY	299	0 (0%)	0	
		READING	130	0 (0%)	0	
		REVERE	180	0 (0%)	0	
		SAUGUS	104	0 (0%)	0	
		SOMERVILLE	299	10 (3.34%)	0	Yes
		SOUTHBOROUGH	30	0 (0%)	0	
		STONEHAM	108	4 (3.70%)	1 (0.93%)	Yes
		SWAMPSCOTT	56	1 (1.79%)	0	
		WALTHAM	222	2 (0.90%)	0	
		WATERTOWN	136	2 (1.47%)	0	No
		WESTON	45	0 (0%)	0	No
		WINTHROP	75	1 (1.33%)	0	
		Total: Fully Served	*4976*	*56 (1.13%)*		
Partially Served		BEDFORD	84	24 (28.57%)	0	Yes
		CANTON	101	5 (4.95%)	0	Yes
		HANSCOM AFB	33	0 (0%)	0	
		MARLBOROUGH	126	0 (0%)	0	
		NEEDHAM	123	0 (0%)	0	
	c	PEABODY	224	1 (0.45%)	0	No
		WAKEFIELD	143	0 (0%)	0	
		WELLESLEY	113	0 (0%)	0	
		WILMINGTON	90	1 (1.11%)	0	No
		WINCHESTER	91	0 (0%)	0	
		WOBURN	210	5 (2.38%)	0	Yes
CVA	d	SOUTH HADLEY FD1	75	5 (6.67%)	0	Yes
		Total: CVA & Partially Served	*1413*	*41 (2.90%)*		
		Total: Community Samples	*6389*	*97 (1.52%)*		

Chlorine Residuals in Fully Served Communities

	2017				2018								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
% <0.1	1.0	0.7	0.7	0.5	0.2	0.1	0.1	0.0	0.2	0.0	0.3	0.7	0.5
% <0.2	2.6	2.4	2.5	1.1	0.5	0.2	0.2	0.3	0.2	0.4	0.5	1.0	1.5
% <0.5	6.2	5.6	5.7	3.1	1.4	0.5	0.8	0.7	0.4	0.7	1.5	3.4	4.6
% <1.0	10.5	9.4	9.6	6.0	3.2	2.2	1.4	1.5	1.3	1.6	3.2	8.9	11.9
% ≥1.0	89.5	90.6	90.4	94.0	96.8	97.9	98.6	98.5	98.7	98.4	96.8	91.1	88.2

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

1st Quarter – FY19

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 at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

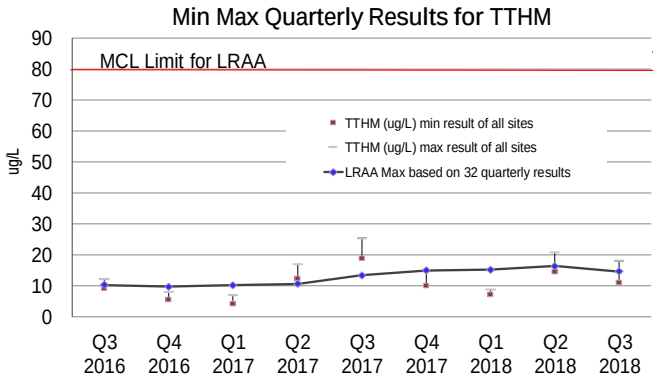
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

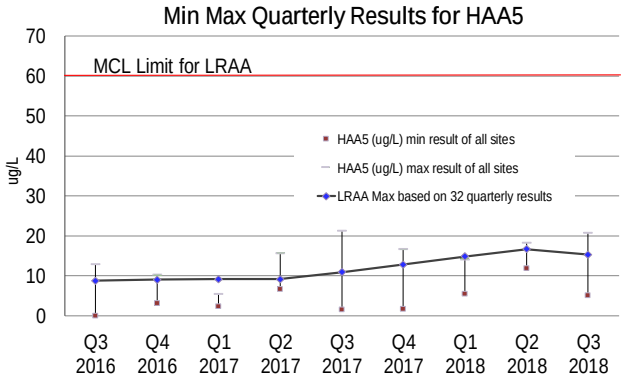
Bromate is tested monthly per DEP requirements for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA MCL standard for bromate is 10 ug/L.

The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 14.6 ug/L; HAA5s = 15.3 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

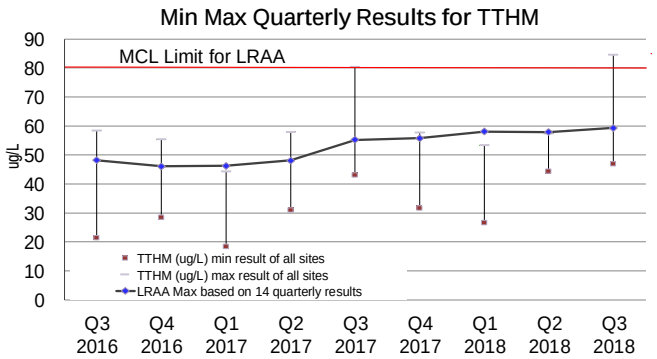
Westborough SH was removed from MWRA's Compliance Program in Q3, 2018.

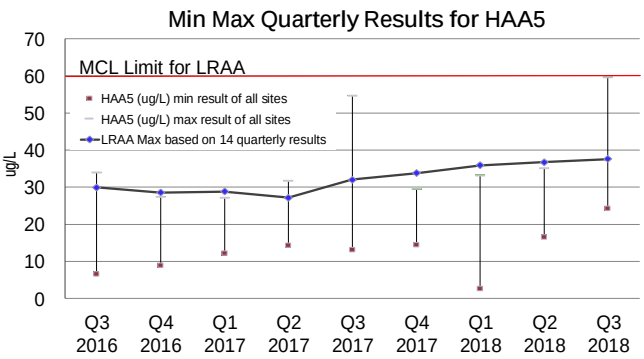
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

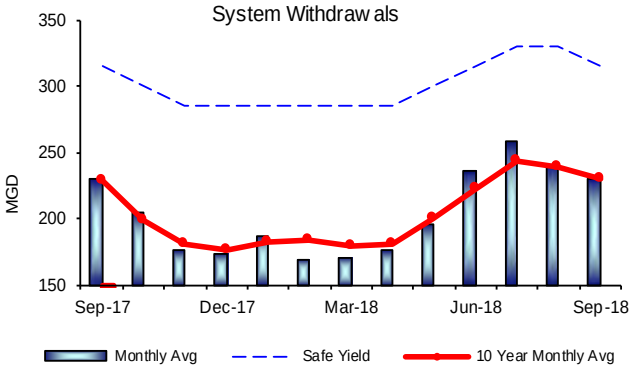
1st Quarter – FY19

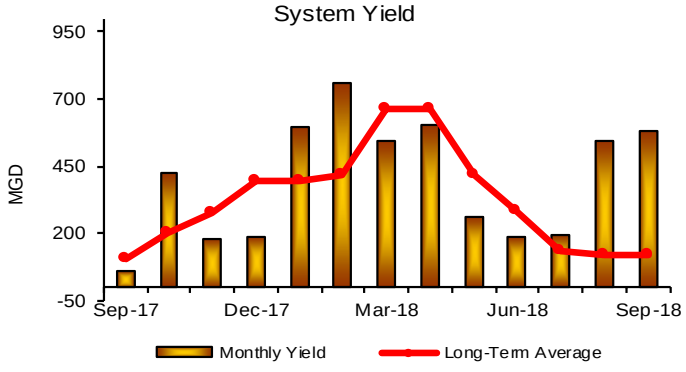
Background

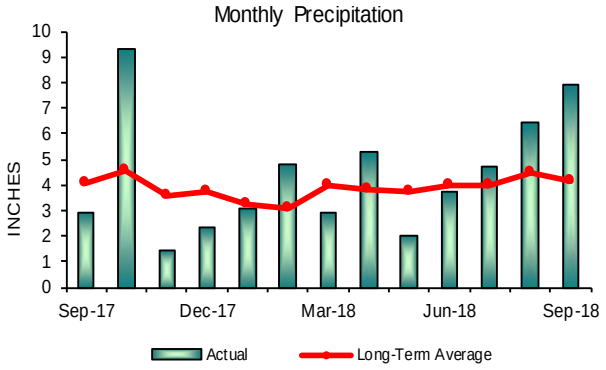
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

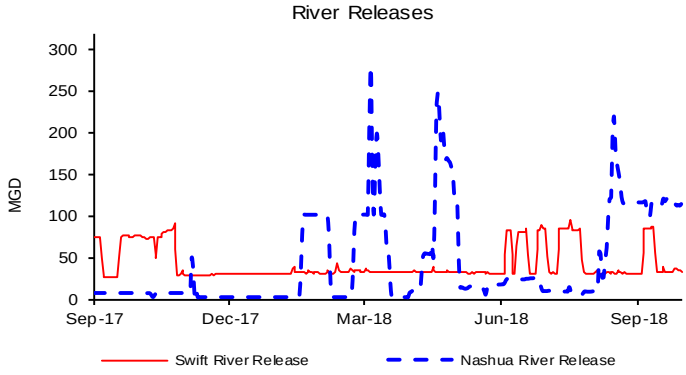
Outcome

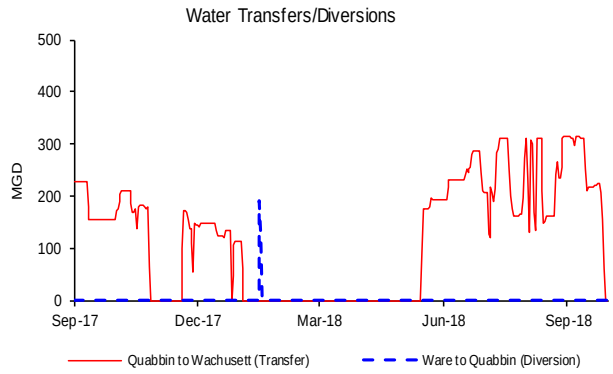
The volume of the Quabbin Reservoir was at 95.6% as of September 30, 2018; a 1.2% increase for the quarter, which represents a gain of more than 4.7 billion gallons of storage and an increase in elevation of 0.62' for the quarter. Quabbin level is in "normal" operating range. Precipitation and yield for the quarter were above their respective long term averages. System withdrawal for the quarter was at the 10 year monthly average.

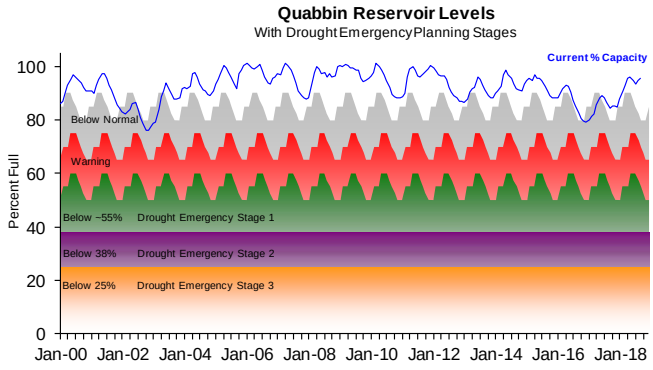












WASTEWATER QUALITY

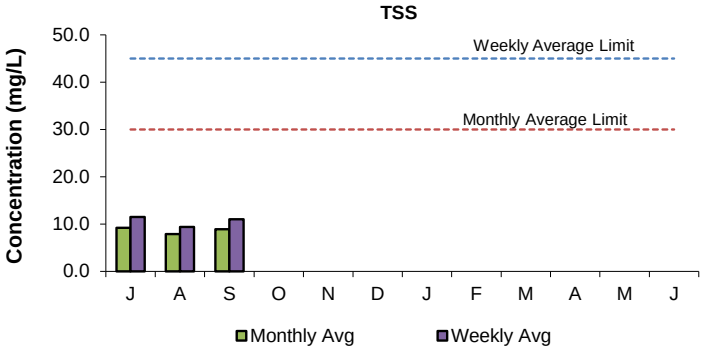
NPDES Permit Compliance: Deer Island Treatment Plant

1st Quarter - FY19

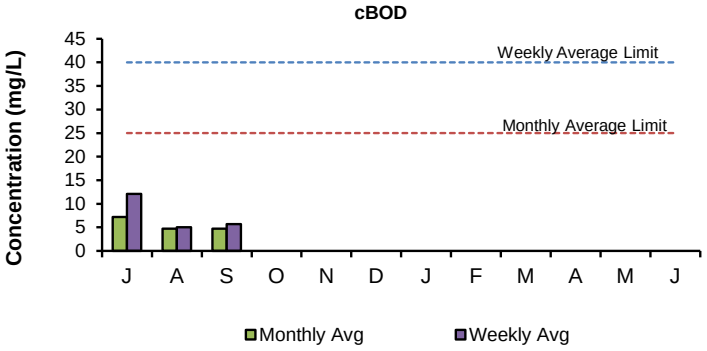
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*1st Quarter Violations*	*FY19 YTD Violations*
Dry Day Flow (365 Day Average):		mgd	436	271.2	274.2	277.2	0	0
cBOD:	Monthly Average	mg/L	25	7.2	4.7	4.7	0	0
	Weekly Average	mg/L	40	12.1	5.0	5.7	0	0
TSS:	Monthly Average	mg/L	30	9.2	7.9	8.9	0	0
	Weekly Average	mg/L	45	11.5	9.4	11.0	0	0
TCR:	Monthly Average	ug/L	456	0	0	0	0	0
	Daily Maximum	ug/L	631	0	0	0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	6	6	7	0	0
	Weekly Geometric Mean	col/100mL	14000	11	15	29	0	0
	% of Samples >14000	%	10	0	0	0	0	0
	Consecutive Samples >14000	#	3	0	0	0	0	0
pH:		SU	6.0-9.0	6.6-7.1	6.6-7.0	6.6-7.0	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	50	100	50	0	0

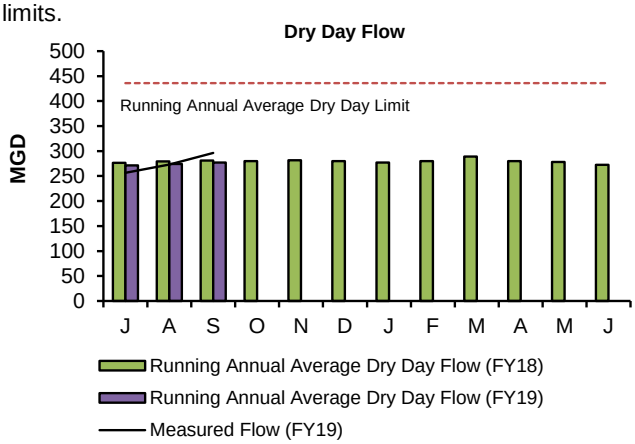
There have been no permit violations in FY19 to date at the Deer Island Treatment Plant (DITP).



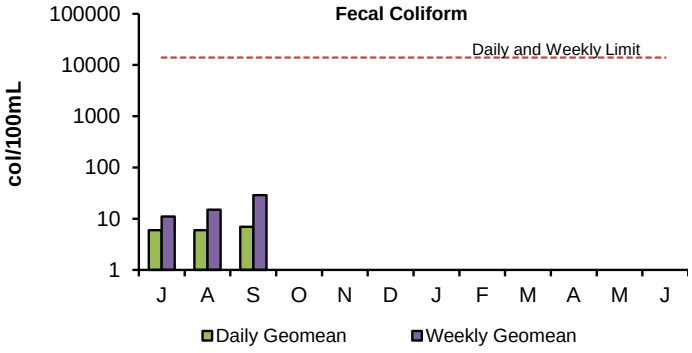
Total Suspended Solids (TSS) in the effluent is a measure of the amount of solids that remain suspended after treatment. All TSS measurements for the 1st Quarter were within permit limits.



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 1st 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 1st 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 1st Quarter, all permit conditions for fecal coliform were met.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

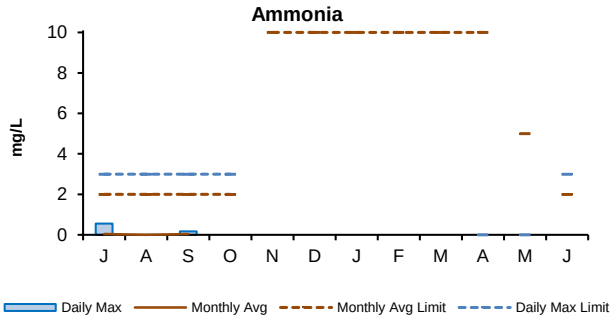
1st Quarter - FY19

NPDES Permit Limits

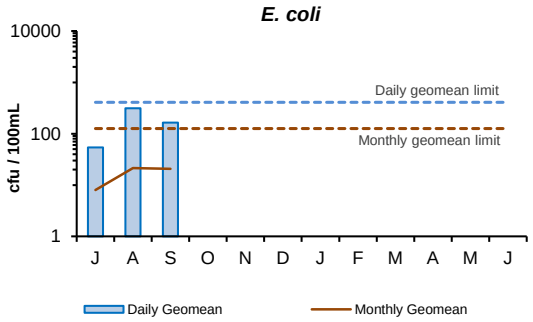
Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*4th Quarter Violations*	*FY19 YTD Violations*
Flow:	12-month Rolling Average:	mgd	3.01	2.51	2.61	2.73	0	0
BOD:	Monthly Average:	mg/L	20	2.5	1.7	1.4	0	0
	Weekly Average:	mg/L	20	3.8	1.8	1.8	0	0
TSS:	Monthly Average:	mg/L	20	4.3	5.3	5.5	0	0
	Weekly Average:	mg/L	20	4.8	9.3	7.7	0	0
pH:		SU	6.5-8.3	7.1-7.8	6.9-7.6	6.9-7.8	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	7.4	7.0	7.7	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	8.0	21.4	20.6	0	0
	Daily Geometric Mean:	cfu/100mL	409	54.0	314.6	164.0	0	0
TCR:	Monthly Average:	ug/L	17.6	0.0	0.0	0.2	0	0
	Daily Maximum:	ug/L	30.4	0.0	0.0	6.7	0	0
Copper:	Monthly Average:	ug/L	11.6	10.7	11.0	10.2	1	2
	Daily Maximum:	ug/L	14.0	10.7	13.5	11.8	0	0
Total Ammonia Nitrogen: June 1st - October 31st	Monthly Average:	mg/L	2.0	0.04	0.00	0.03	0	0
	Daily Maximum:	mg/L	3.0	0.55	0.00	0.17	0	0
Total Phosphorus: April 1st - October 31st	Monthly Average:	mg/L	1.0*	0.33	0.17	0.17	0	0
	Daily Maximum:	mg/L	RPT*	0.69	0.54	0.28	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 no permit violations in FY19 at the Clinton Treatment Plant.
1st Quarter: There were no permit violations in the first quarter.

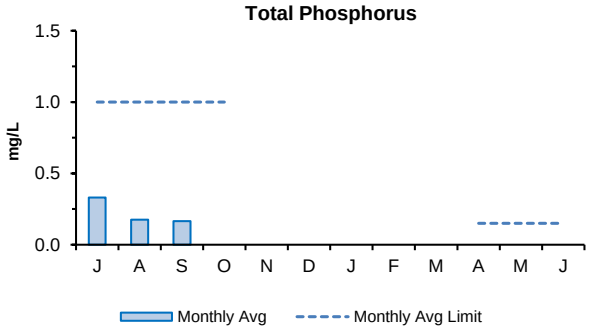
* The growing season (April 1 - October 31) monthly average phosphorus limit of 0.15 mg/L goes into effect April 1, 2019
+Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



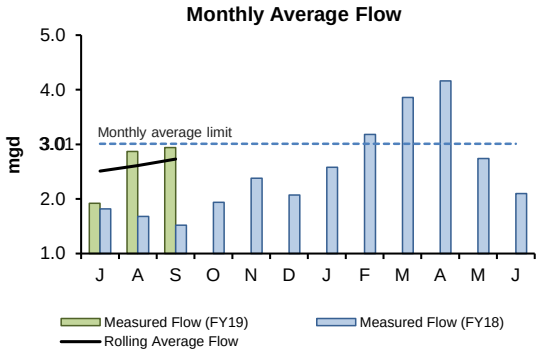
The 1st Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2 mg/L and 3 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



E. coli is an indicator for the possible presence of pathogens. There were no violations of permit limits in the 1st Quarter.The monthly and daily limits are 126 cfu/100 mL and 409 cfu/100 mL respectively.



The 1st Quarter's monthly average concentrations for total phosphorus were below permit limits. An interim permit limit of 1.0 mg/L is in effect from April through October, until April 1st, 2019, when the new permit limit of 0.15 mg/L goes into effect for April - October. The new permit limit of 1.0 mg/L from November through March goes into effect. November 1st, 2019.

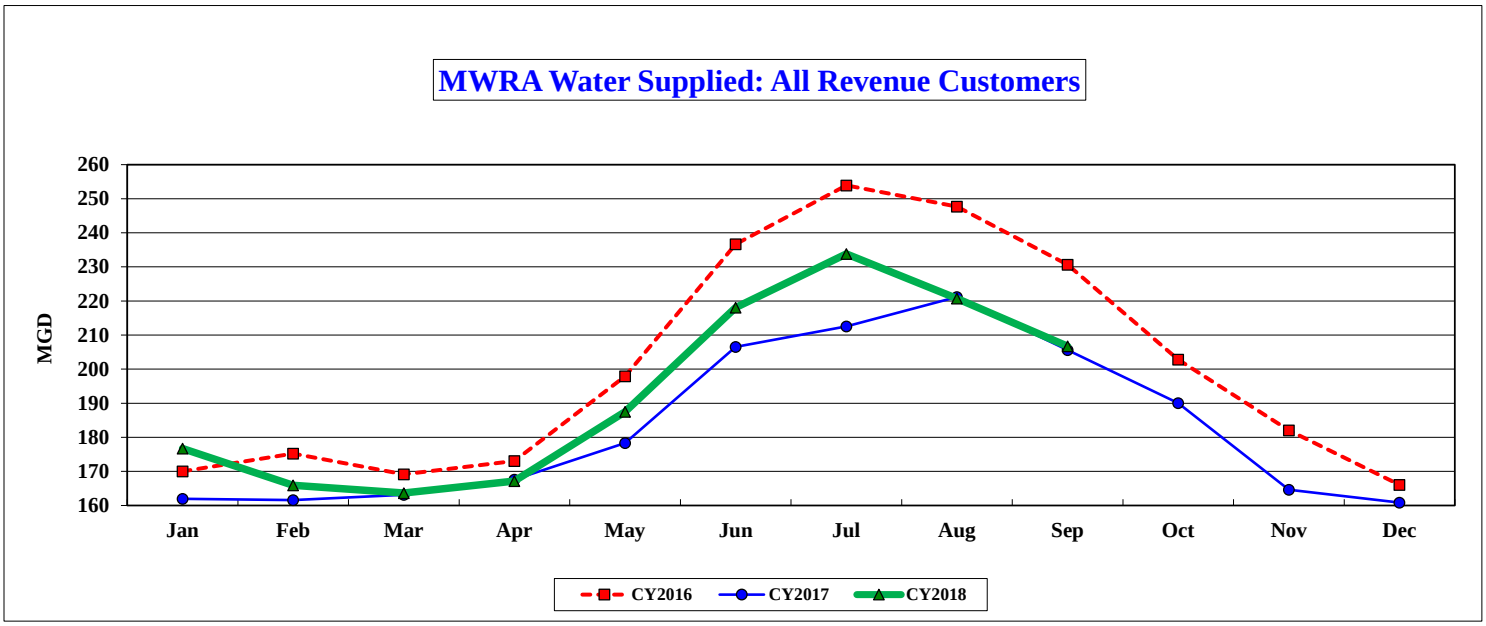


The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The average monthly flows during the 1st Quarter were below the NPDES permit limit.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use

1st Quarter - FY19



MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Annual Average
CY2016	170.0	175.2	169.2	173.1	197.9	236.6	253.9	247.7	230.6	202.8	182.0	166.1	206.2	200.5
CY2017	161.9	161.6	163.1	167.6	178.3	206.5	212.5	221.2	205.6	190.1	164.6	160.9	186.7	183.0
CY2018	176.7	166.0	163.7	167.2	187.5	218.0	233.8	220.7	206.7	0.0	0.0	0.0	193.6	193.6

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Annual Total
CY2016	5269.6	5081.6	5244.0	5192.4	6136.1	7099.3	7871.6	7678.1	6918.9	6287.7	5460.6	5147.8	56491.8	73387.9
CY2017	5020.2	4525.1	5057.0	5028.4	5528.3	6196.2	6588.5	6856.4	6167.4	5891.6	4938.3	4986.4	50967.4	66783.8
CY2018	5478.1	4646.8	5073.5	5014.8	5812.1	6541.4	7248.1	6842.4	6201.2	0.0	0.0	0.0	52858.4	52858.4

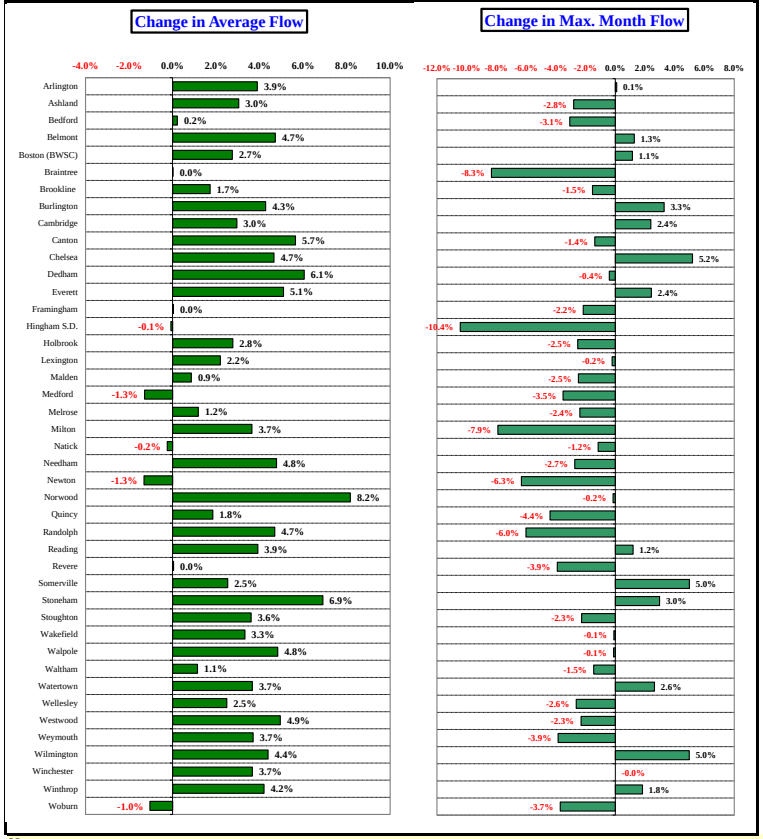
Calendar year 2018 water use will be used to allocate the FY20 water utility rate revenue requirement to MWRA water communities. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement.

September 2018 water supplied of 206.7 mgd (for revenue generating users) is up 1.1 mgd or 0.5% compared to September 2017. System-wide year to date consumption for CY18 remains higher than CY17 with 193.6 mgd being supplied to MWRA customers through September. This is 6.9 mgd higher than CY17, and is an increase of 3.7%.

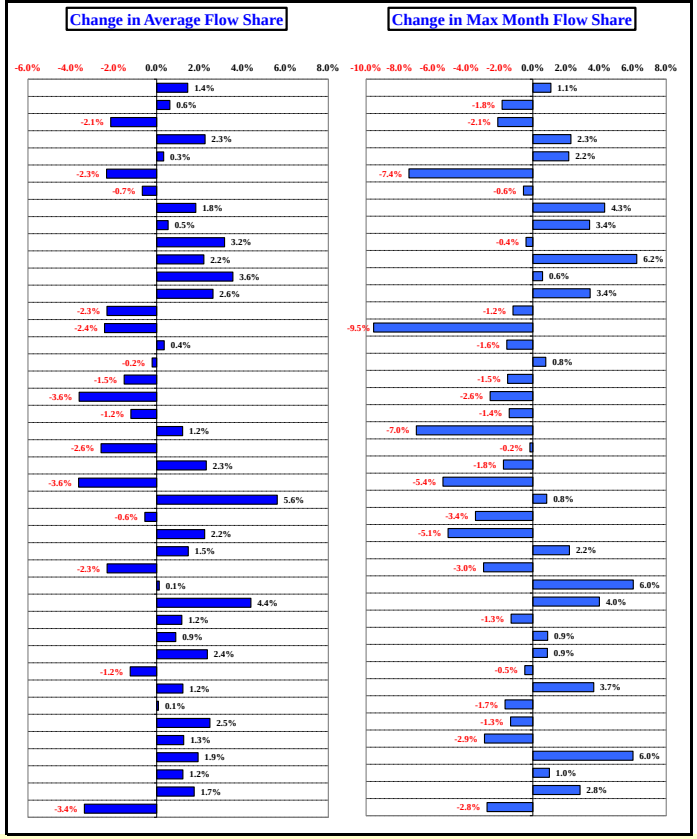
Community Wastewater Flows
1st Quarter - FY19

How Projected CY2018 Community Wastewater Flows Could Effect FY2020 Sewer Assessments [1,2,3]

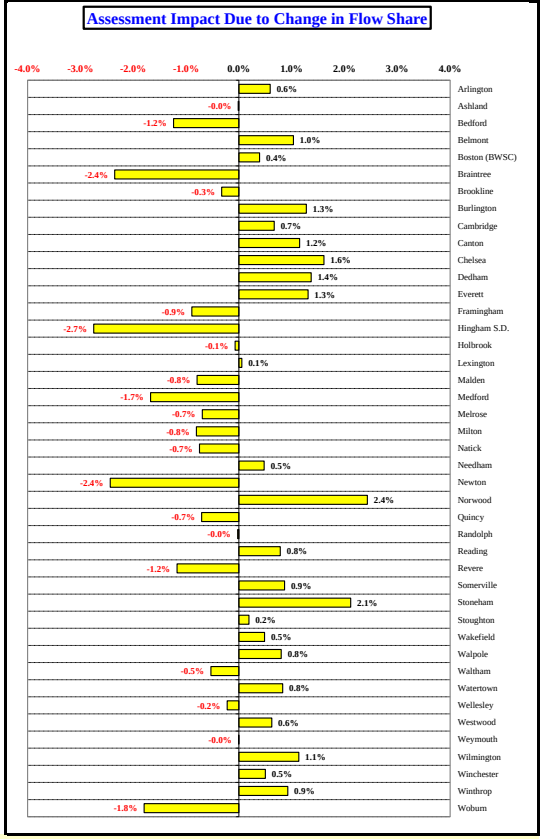
The flow components of FY2020 sewer assessments will be calculated using a 3-year average of CY2016 to CY2018 wastewater flows compared to FY2019 assessments that used a 3-year average of CY2015 to CY2017 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2016 to CY2018 flow share compared to CY2015 to CY2017 flow share, compared to all other communities in the system.



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



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 CY2015 to CY2018 average wastewater flows as of 10/17/18. Flow data is preliminary and subject to change pending additional MWRA and community review.**

[3] **CY2015 to CY2017 wastewater flows based on actual meter data. CY2018 flows based on actual meter data for January to August, and project flows for September to December.**

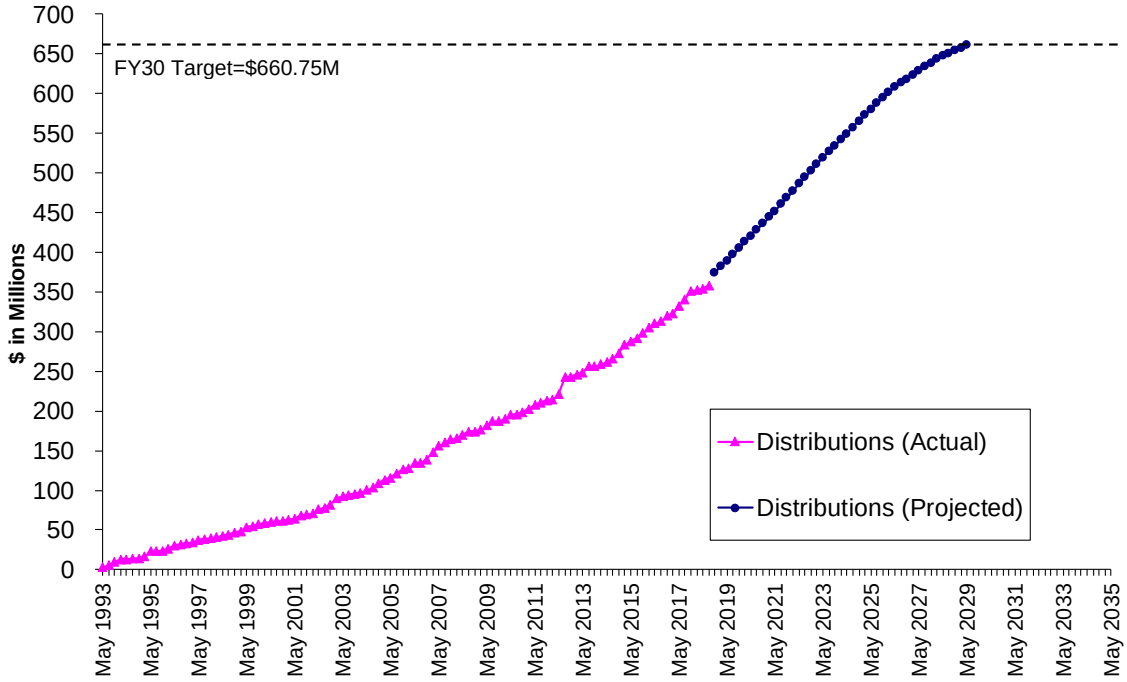
[4] **Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.**

Community Support Programs
1st Quarter – FY19

Infiltration/Inflow Local Financial Assistance Program

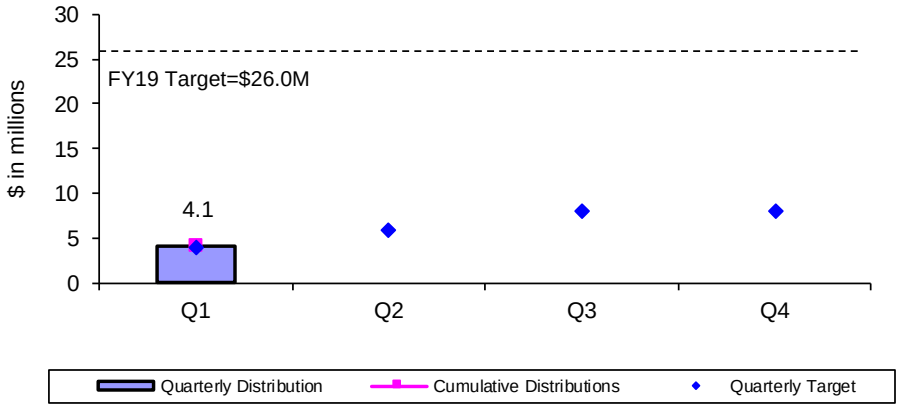
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $660.75 million in grants and interest-free loans (average of about $18 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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. An additional future Phase 13 providing $100 million in loan only funds is not yet included in this report.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 1st Quarter of FY19, $4.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Boston, Milton, Natick and Weymouth. Total grant/loan distribution for FY19 is $4.1 million. From FY93 through the 1st Quarter of FY19, all 43 member sewer communities have participated in the program and more than $358 million has been distributed to fund 549 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.

FY19 Quarterly Distributions of Sewer Grant/Loans

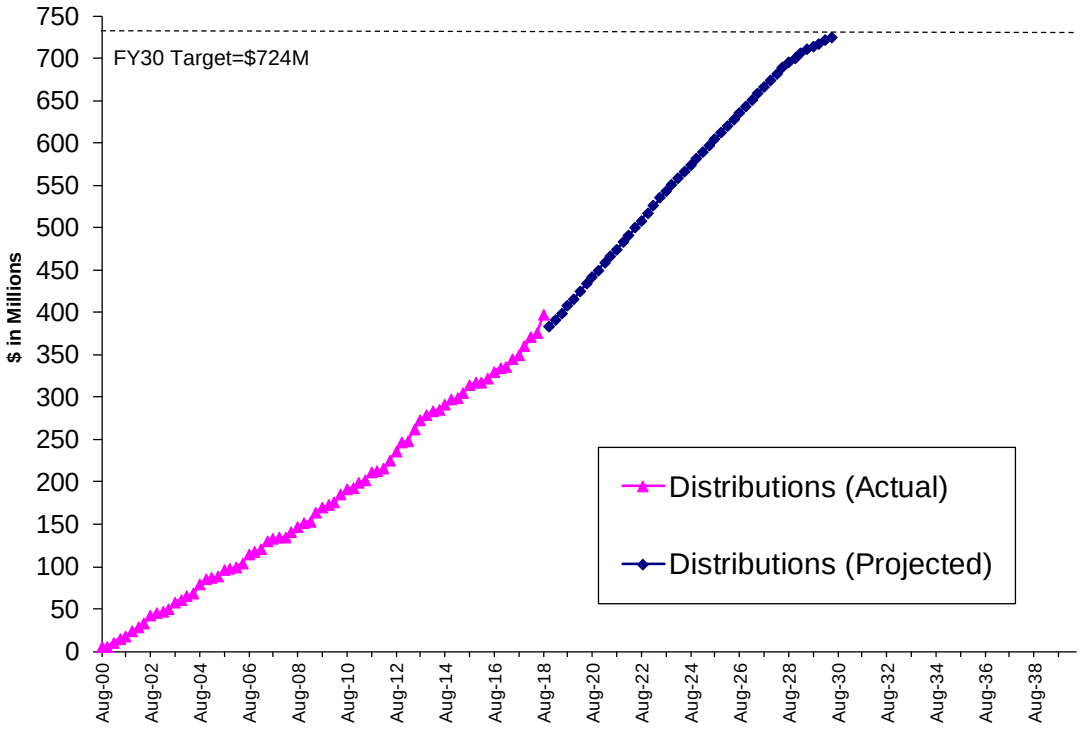


Community Support Programs
1st Quarter – FY19

Local Water System Assistance Program

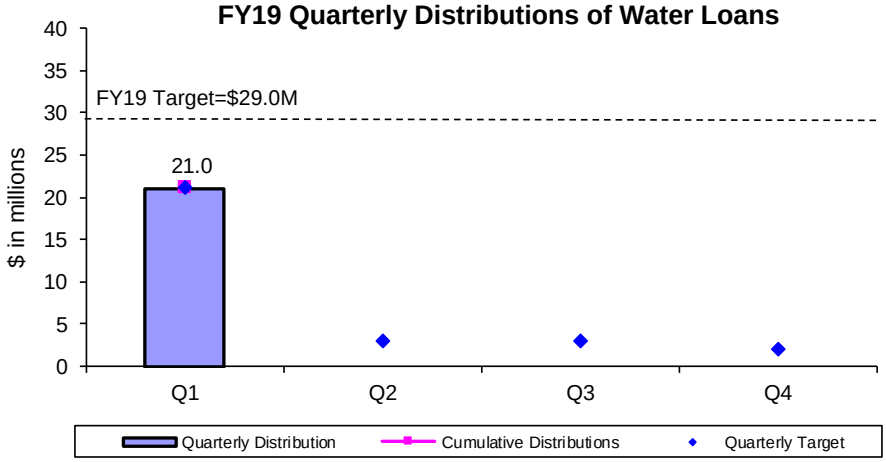
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have 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 1st Quarter of FY19, $21.0 million in interest-free loans was distributed to fund local water projects in Belmont, Boston, Melrose, Milton, Norwood, Quincy, Revere, Somerville and Wakefield. Total loan distribution for FY19 is $21.0 million. From FY01 through the 1st Quarter of FY19, more than $396 million has been distributed to fund 418 local water system rehabilitation projects in 42 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.

FY19 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY19

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. During FY17, MWRA made three Lead Loan Program distributions as noted in the Table below.

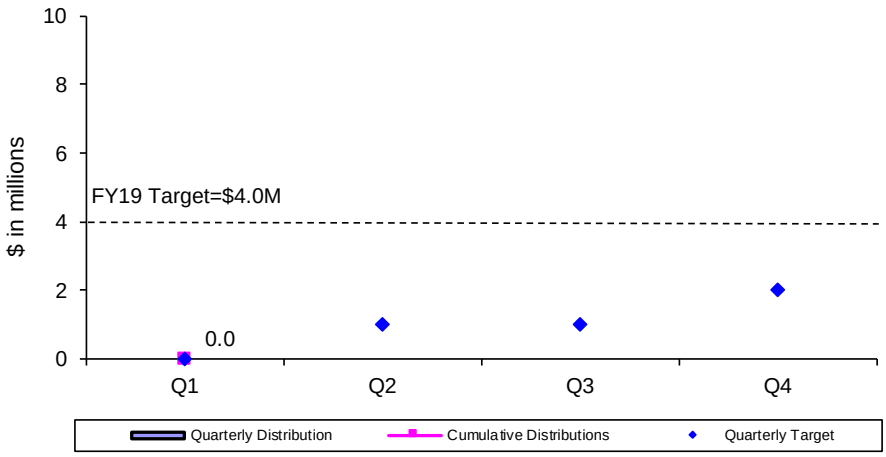
FY18 was the second year of the Lead Loan Program. During FY18, MWRA made five Lead Loan Program distributions as noted in the table below.

FY19 is the third year of the Lead Loan Program. No Lead Loans were made during the first quarter of FY19.

Summary of Lead Loans:

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	$9.0 Million

FY19 Quarterly Distributions of Lead Service Line Replacement Loans

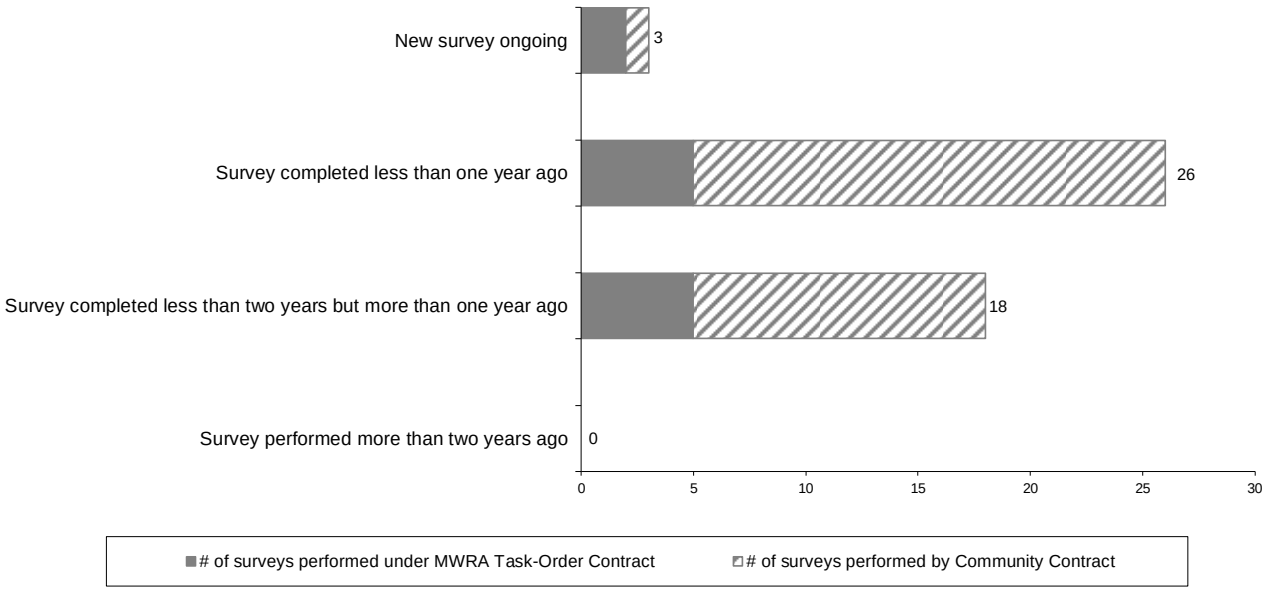


Community Support Programs

1st Quarter – FY19

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 1st Quarter of FY19, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 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	690				690
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	1,738				1,738
Toilet Leak Detection Dye Tablets	------	15,202				15,202

BUSINESS SERVICES

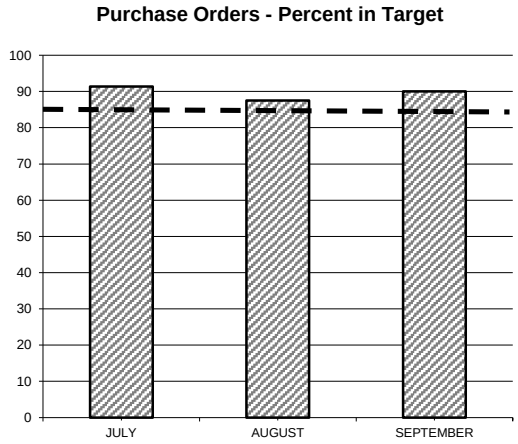
Procurement: Purchasing and Contracts

1st Quarter - FY19

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

Outcome: Processed 90% of purchase orders within target; Average Processing Time was 5.35 days vs. 4.68 days in Qtr 1 of FY18. Processed 61% (11 of 18) of contracts within target timeframes; Average Processing Time was 173 days vs. 154 days in Qtr 1 of FY18.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	529	3 DAYS	84.3%
$500 - $2K	661	7 DAYS	94.5%
$2K - $5K	456	10 DAYS	92.9%
$5K - $10K	42	25 DAYS	73.8%
$10K - $25K	49	30 DAYS	85.7%
$25K - $50K	12	60 DAYS	41.7%
Over $50K	17	90 DAYS	88.2%

The Purchasing Unit processed 1766 purchase orders, 255 less than the 2021 processed in Qtr 1 of FY18 for a total value of $9,797,360 versus a dollar value of $7,865,723 in Qtr 1 of FY18.

The purchase order processing target was not met for the $0 - $500 category due to price confirmations and item clarifications; the $5K - $10K category due to end user evaluations and sole source requirements; and the $25K - $50K category due to staff summary requirements.

Contracts, Change Orders and Amendments

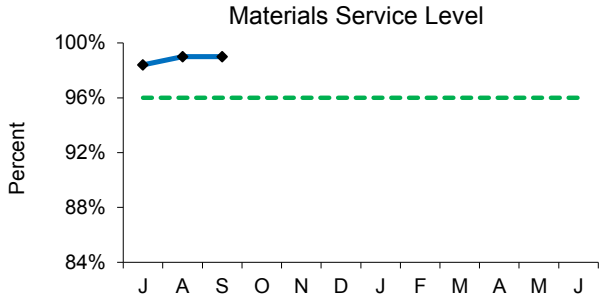
Seven contracts were not processed within the target timeframes. For two related contracts, the procurement process began in advance of the need for the services and the contract effective date was delayed by two days from the target timeframes to allow for the predecessor contracts to expire. The new contracts were in place according to schedule and budget needs. Another contract was delayed by eight days due to the additional time required to obtain insurance certificates and an executed Certificate of Vote of Authorization from the consultant. A fourth contract was delayed due to extensive revisions of the contract documents prior to bid to address design issues and numerous bidder questions; and another was delayed due to staff prioritization of assignments. A sixth contract was delayed due to required scope revisions. The final contract was delayed due to the postponement of the bid opening date due to project environmental concerns resulting in specification revisions. In addition, further delays occurred due to the withdrawal of the low bidder.

Procurement processed eighteen contracts with a value of $26,829,490 and six amendments with a value of $891,000. Forty two change orders were executed during the period. The dollar value of all non-credit change orders during Q1 FY19 was $1,615,344 and the value of credit change orders was ($224,572).

Staff reviewed 98 proposed change orders and 48 draft change orders.

Materials Management

1st Quarter - FY19



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,455 (99.0%) of the 7,542 items requested in Q1 from the inventory locations for a total dollar value of $1,577,936.

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 FY18 goal is to reduce consumable inventory from the July '18 base level ($8.4 million) by 2.0% (approximately $168,025), to $8.2 million by June 30, 2019 (see chart below).

Items added to inventory this quarter include:

- Deer Island – tripod, weed killer, circular blades, safety paint and rollers for Facilities; screws, fans, couplings and wire for Electrical Shop; transmitter and adapters for I&C; actuator, filters, anti-freeze and hoses for Liquid Train; belt drive, elbows, heat controller, fan blade, motor, pump, and clamps for HVAC; sprayer and sealer for Maintenance.
- Chelsea – circuit breakers for SCADA; belts and levers for Work Coordination; brackets and sensor plates for Metering; print cartridges for Wastewater Operations; air brake chamber and slack adjuster for Fleet Services; masonry pail, hoe and brush for FOD; barrier arm for Office of Emergency Preparedness.
- Southboro – saw blades, aluminum arms and hardware kits for Equipment Maintenance.

Property Pass Program:

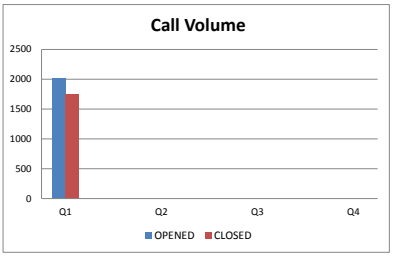
- Five audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to $10,839. Year to date revenue received amounted to $10,839.
- Revenue received from online auctions held during Q1 amounted to $132,768. Year to date revenue received amounted to $132,768.

Items	Base Value July-18	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,401,259	8,328,653	-72,606
Spare Parts Inventory Value	8,884,367	8,850,280	-34,087
Total Inventory Value	17,285,626	17,178,933	-106,693

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.

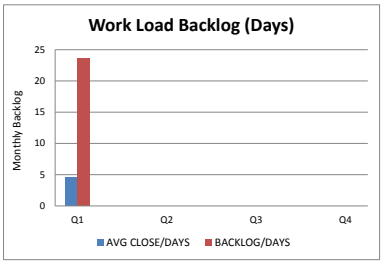
MIS Program

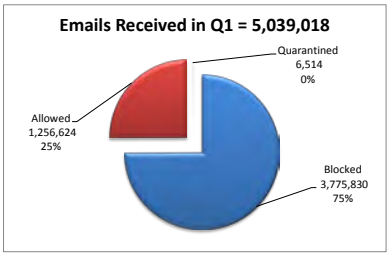
1st Quarter FY19



Performance & Backlog for Q1

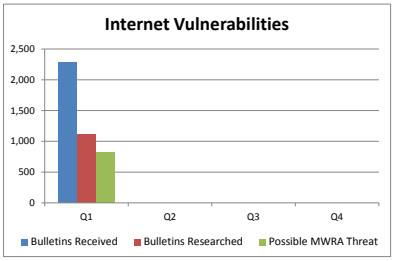
- 87% of open calls were closed.
- Call closure averaged 4.5 days.
- Priority 1 & 2 Service Level Agreements (SLA) were not met because of priorities and delayed closure. Workarounds provided.
- Backlog increase due to Maximo related asset management issues and vendor repair delays.





Information Security for Q1

- In Q1, pushed security fixes/updates to desktops/servers protecting against 533 vulnerabilities.
- McAfee quarantined 12 distinct viruses from 21 PCs. PCs are current with antivirus signatures for known malware.



Infrastructure:

Desktop Refresh: Continued deployment of test PCs for early testers. Began compiling and publishing Windows 10 issues identified by MIS staff who've received the first test computers. Continued identifying software for user testers.

External Facing Server Hardware Replacement: Telog private wireless network established on Verizon 4G network. Met with vendor to configure Telog on new infrastructure.

Audio/Visual Upgrades:
Product evaluations conducted. Initial upgrades to encompass four conference rooms.

DITP Circuit Upgrade: Testing new circuit. Scheduled for cutover in October.

Multi-Functional Devices (MFD): Eight printers replaced and the remaining two scheduled for early October.

AutoCad Upgrade: Completed.

Branch Office VPN Hardware Replacement: Completed.

Applications/Library & Records Center/Training:

Enterprise Content Management (ECM)/e-Construction: (1) Developed Draft Statement of Work (SOW) for preliminary review. Began compiling data from numerous systems to build a controlled vocabulary to support searching and assigning metadata for hardcopy records and electronic documents. (2) - Continued working with E&C staff to document requirements and workflows (50+). Documented 6 E&C Access databases that might be replaced by the new system. (3) Continued identifying Infostar reports and data, including Geology Sample data, which need to be replicated and/or migrated to the new system.

GIS: A security patch for ArcGIS was applied to address critical security vulnerability on the server which could cause improper access control validation when customized requests are initiated.

DCR Web Application: The website went live and allows DCR users to access data for up to a 100 days interval. Users can extract water quality data collected at the Quabbin and Wachusetts Reservoirs.

Water Conservation Fixtures and Literature Web Applications: Went live in August and is now available for residents of MWRA's served communities. Residents will now be able to fill out a web form to request low flow shower heads, faucet-aerators, dye tabs and/or brochures.

PIMS: Updated reports to accommodate new EPA test method requirements.
PIMS CROMERR: Application development work is complete. MIS and TRAC team testing to identify any gaps in functionality and meet compliance requirements.

LIMS: Analyst Certification Exception' Report which identifies analysts' expired certification was implemented to LIMS production.

Library & Records Center: Library: Fulfilled 23 research requests and supplied 50 books for circulation, provided 15 articles, and 9 standards. Research topics included: succession planning, legionella, limonene, sewage in surface waters, ethical lawyering, cybersecurity, nitrogen from wastewater treatment plant. Record Center: Added 91 new boxes and handled 235 total boxes. Performed database and physical searches as requested saving the delivery of 47 boxes. Disposed of 60 boxes, archived 29 boxes (Enqual) stored at DI, created 368 detailed indexes for older boxes, and shredded 6 boxes in house. Attended 3 Records Conservation Board meetings. Worked with the Tunnel Redundancy group to coordinate geosamples at various locations.

IT Training: For the quarter, 24 staff attended 5 classes. An Introduction to MS Outlook Mail 2016 class was developed and on-line Cyber Security classes were configured for staff access.

Legal Matters

1st Quarter - FY19

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits**: Reviewed fifty-three (53) 8(m) permits.

- **Real Property**: Drafted and finalized draft lease for procurement of storage space for records center. Drafted license for the use of certain Columbus Park Headworks land for a dog recreational area. Drafted and finalized Memorandum of Understanding by and between MWRA, Langwood Commons, LLC, and Alta Langwood, LLC regarding the mutual future release of certain easements on their respective adjoining parcels of land. Reviewed MWRA's Sudbury Aqueduct property rights adjacent to 969 Chestnut Street in Newton. Recorded affidavit required by MA Architectural Access Board relative to construction activities at the Prison Point CSO facility. Recorded Order of Conditions DEP 038-044 for MWRA water project in Lynn. Recorded Order of Conditions DEP 061-0719 for MWRA project in Revere. Reviewed MWRA lease for records center in Marlborough. Drafted two one-day licenses for use of a certain Deer Island land for two non-profit groups' walk/run events.

- **Public Records:** During the 1st Quarter of FY 2019, 110 public records requests were received and 117 public records requests were closed.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

A Charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of age.

A Charge was filed at the Massachusetts Commission Against Discrimination alleging that the MWRA discriminated against an employee on the basis of age, gender and race.

LITIGATION/CLAIMS

New lawsuits/claims: Greta Smith – Notice of Claim. Ms. Smith, through counsel, sent MWRA a Notice of Claim pursuant to GL c. 84, Sec. 18, in connection with injuries she sustained while walking near the intersection of Cross and Church Streets in Wellesley, on or about June 9, 2018. The Notice alleges that Ms. Smith stepped into an uncovered water/manhole in the street and sustained serious injuries. The Notice alleges negligence on MWRA's part in failing to maintain this "water/manhole cover." MWRA does not have water or wastewater facilities at or near the area in question, and denied the claim.

New lawsuits/claims (cont.):

Helmsman Management Services, Inc. - Notice of Claim. Helmsman Management Services, Inc. is the worker's compensation carrier for Ms. Isabelle Quinn, who has alleged injuries arising from an automobile accident with an MWRA vehicle on May 31, 2016. The accident occurred at the intersection of South Street (Rte. 30) and Park Road in Weston. Helmsman has paid Ms. Quinn's medical and lost time benefits in connection with the accident and now alleges that the accident was the fault of MWRA's driver. Helmsman intends to submit a final claim for reimbursement when Ms. Quinn completes medical treatment. To date, Helmsman's claimed expenses total $35,026.57. MWRA has not received any claim directly from Ms. Quinn.

Julie Ischia v. MWRA, D.S. Albanese, Inc., DCR, Stoneham, &DPW: Ms. Ischia claims that she was driving on Ravine Road in Stoneham on the evening of April 4, 2018 when her vehicle went over an unidentified object. Ms. Ischia claims damages of $1,200 to her vehicle. MWRA and Albanese, pursuant to Contract 7067, are engaged in the Northern Intermediate High Pipeline Project in Stoneham, but have no work on Ravine Road. MWRA had no prior notice of the incident, and first learned of it when the Notice of Small Claims Trial was served at the end of July. A small claims trial was scheduled for September 28, 2018; however, Ms. Ischia did not appear at the scheduled time and the magistrate dismissed the action. Ms. Ischia filed a motion to remove the dismissal which is scheduled for hearing on October 12, 2018.

AFSCME v. MWRA: This action is a complaint to vacate an arbitrator's award, with respect to damages.

Significant Developments

Greta Smith Claim: On July 31, Law Division sent a letter to Ms. Smith's attorney denying her claim.

Closed Cases/Claims:

Thang Viet Vu and Oanh Vu - Settlement: Auto Accident Claim; D/O/A 12/1/15: Thang Viet Vu and Oanh Vu were traveling on Granite Avenue in Quincy, when the vehicle in front of their van stopped abruptly and attempted to make an illegal left turn. The vehicle operated by Thang Viet Vu in turn stopped suddenly to avoid hitting that car, and an MWRA truck operated by an MWRA employee collided with the rear of the Vu's vehicle. Thang Viet Vu and Oanh Vu received chiropractic treatment for neck and back injuries totaling approximately $3,900 each and the vehicle sustained damage of approximately $895.00. Neither the Vu's nor MWRA's employee were able to identify the vehicle that had attempted the illegal left turn. The Vu's each accepted $4,000 in settlement of their respective claims.

Subpoenas During the First Quarter of FY 2019, three subpoenas were received and no subpoenas were pending at the end of the First Quarter FY 2019.

Wage Garnishments There are currently 14 Trustee Process matters, 4 of which are considered active and are monitored by Law Division.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2018	As of June 2018	As of March 2018
Construction/Contract/Bid Protest (other than BHP)	2	2	1
Tort/Labor/Employment	5	3	2
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
Total	**9**	**7**	**5**
Other Litigation matters (restraining orders, etc.)	2	2	2
Total – all pending lawsuits	**11**	**9**	**7**
Claims not in suit:	2	1	1
Bankruptcy	0	2	2
Wage Garnishment	4	4	15
TRAC/Adjudicatory Appeals	1	1	1
Subpoenas	0	1	1
TOTAL – ALL LITIGATION MATTERS	**18**	**18**	**27**

TRAC/MISC.

New Appeals: No new TRAC Appeals.

Settlement by Agreement of Parties No Settlement by Agreement of Parties.

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

Notice of Dismissal Fine paid in full No cases of Notices of Dismissal, Fine paid in full.

Tentative Decision There are no Tentative Decisions issued in the 1st Quarter FY 2019.

Final Decisions There are no Final Decisions issued in the 1st Quarter FY 2019.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
1st Quarter - FY19

Highlights
During the 1st Quarter FY19, IA completed audits of the leases for the Chelsea and Charlestown Navy Yard facilities. A reduction to the monthly deposits for real estate taxes and insurance into the escrow accounts was recommended for the Chelsea facility. IA also completed an incurred cost audit of AECOM with a recommended (and accepted.by AECOM) refund of $37,122.

Other assignments completed include three consultant preliminary reviews and three construction labor burden reviews. Management advisory services included the MWRA FY19 overhead rate and an overhead rate used to bill the Fore River Railroad Corporation. An analysis of sole source contract awards was prepared and assistance was provided on hourly labor rates for professional service contracts and contract pricing for the security guard contract.

Status of Recommendations
During FY19, two recommendations were closed 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 48 months, the appropriateness of the recommendation is re-evaluated.

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Unmatched Receipts and Accruals (6/30/15)	2	8	10
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	1	24	25
MIS Mobile Equipment Asset Tracking (9/26/16)	1	11	12
Wright Express (WEX) Credit Card Fuel Purchases (11/16/16)	3	10	13
Purchase Card Activity on Deer Island (3/31/17)	2	13	15
Review of Uniform Debit Card Program (3/30/18)	3	3	6
Overtime & Timesheet Review (6/30/18)	2	14	16
Fleet Services Process Review (6/30/18)	4	1	5
Total Recommendations	***18***	***84***	***102***

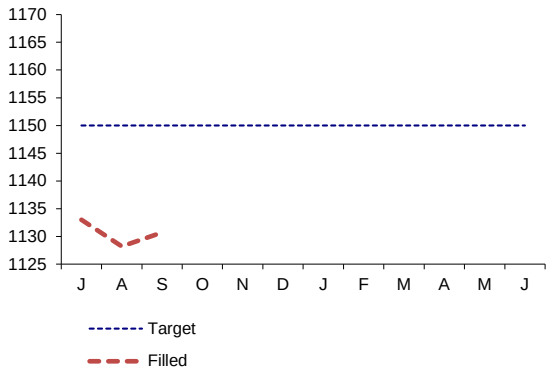
Cost Savings
IA's target is to achieve at least $1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY15	FY16	FY17	FY18	FY19 Q1	TOTAL
Consultants	$87,605	$88,312	$272,431	$118,782	$928	$568,058
Contractors & Vendors	$1,146,742	$1,772,422	$3,037,712	$1,323,156	$155,124	$7,435,156
Internal Audits	$543,471	$220,929	$224,178	$203,702	$50,950	$1,243,230
Total	**$1,777,818**	**$2,081,663**	**$3,534,321**	**$1,645,640**	**$207,002**	**$9,246,444**

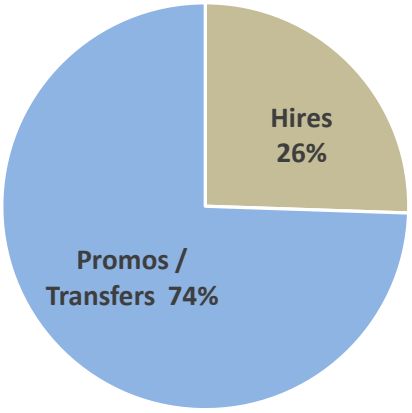
OTHER MANAGEMENT

Workforce Management
1st Quarter - FY19

FTE Tracking



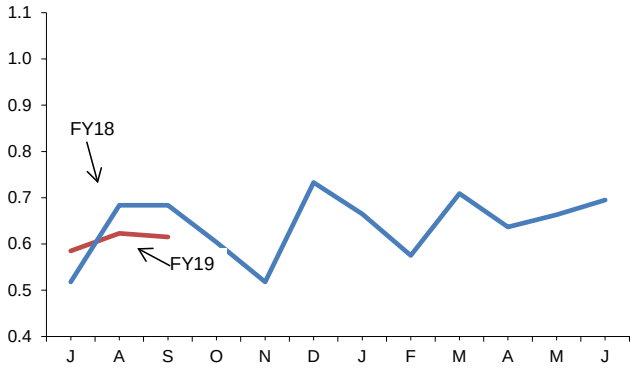
FY19 Target for FTE's = 1150
FTE's as of Sept 2018 = 1130.7



Position Filled by Hires/Promos & Transfer for YTD FY19

	Pr/Trns	Hires	Total
FY17	155 (68%)	72 (32%)	227
FY18	118 (61%)	74 (39%)	192
FY19	35 (74%)	12 (26%)	47

Average Monthly Sick Leave Usage
Per Employee

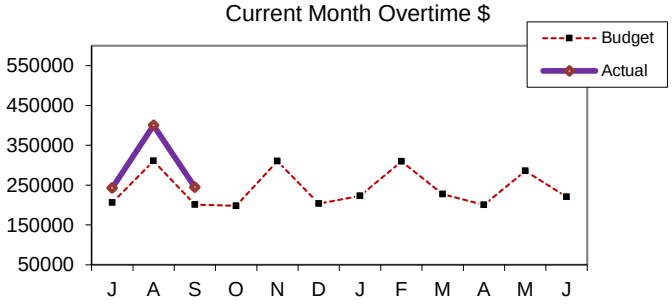


Average monthly sick leave for the 1st Quarter of FY19 decreased as compared to the 1st Quarter of FY18 (7.68 to 7.29 days)

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY18
Admin	136	1.96	7.83	13.1%	6.6
Aff. Action	6	1.60	6.38	13.5%	7.1
Executive	4	0.37	1.46	13.3%	3.3
Finance	34	2.34	9.36	13.3%	6.1
Int. Audit	7	0.64	2.55	13.5%	4.9
Law	15	2.37	9.48	13.4%	6.9
OEP	8	0.25	1.02	12.8%	3.6
Operations	926	1.79	7.16	12.9%	7.7
Tunnel Red	3	2.47	9.86	15.4%	0
Pub. Affs.	12	1.19	4.77	13.5%	10.4
MWRA Avg	**1151**	**1.82**	**7.29**	**12.9%**	**7.7**

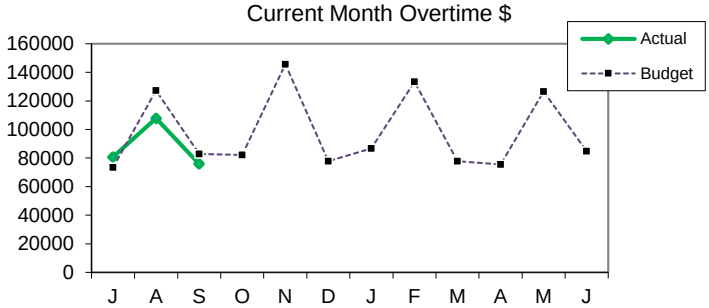
Percent of sick leave usage for FY19, attributable to Family and Medical Leave Act (FMLA) is 12.9% .

Field Operations
Current Month Overtime $



Total Overtime for Field Operations for the first quarter of FY2019 was $887,460 which is $170k over budget. Emergency overtime was $473k, which was $101k over budget. Rain events totaled $383k, emergency maintenance was $35k. Coverage overtime was $199k, which was $18k over budget, reflecting the month's shift coverage requirements. Planned overtime was $216k or $51k over budget, mainly for maintenance off-hours work at $110k, maintenance work completion at $19k, and Planned Operations at $9k. YTD, FOD has spent $887,461 on overtime which is $170k over budget.

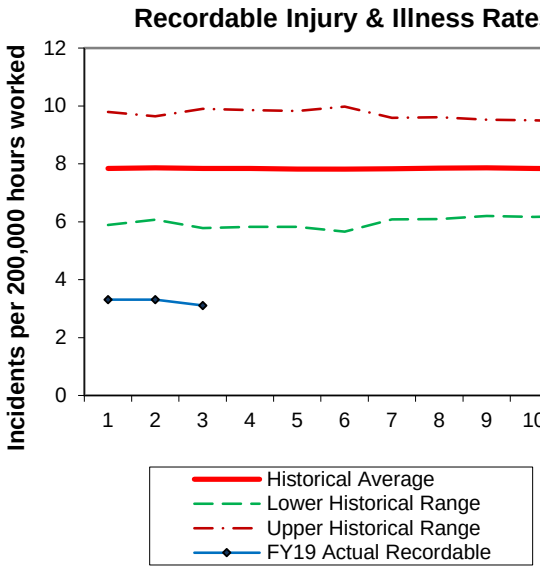
Deer Island Treatment Plant
Current Month Overtime $

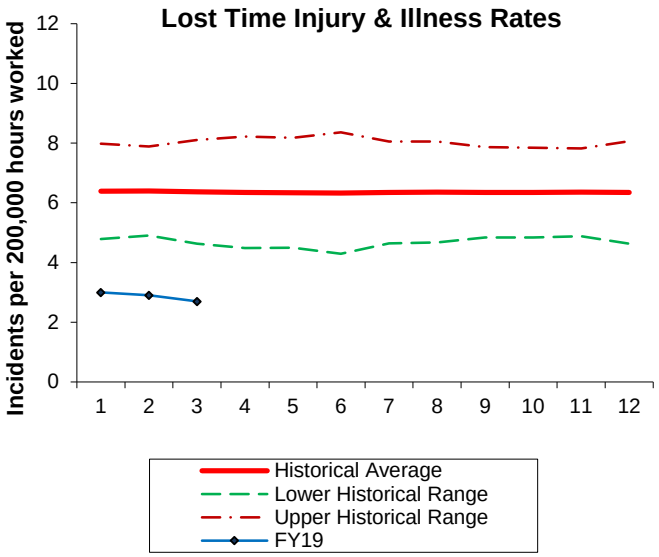


Total Overtime for Deer Island for the first quarter of FY2019 was $264,448 which is ($19,180) under budget. A combination of planned/unplanned overtime was ($20k) less than anticipated while shift coverage requirements were slightly higher than budget by $3K. YTD, Deer Island has spent $264,448 on overtime which is ($19k) under budget.

Workplace Safety

1st Quarter - FY19





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.

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.

3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY18. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.

WORKERS COMPENSATION HIGHLIGHTS

	1st Quarter Information		
	New	Closed	Open Claims
Lost Time	7	21	51
Medical Only	19	26	21
Report Only	18	18	
	QYTD		FYTD
Regular Duty Returns	10		10
Light Duty Returns	0		0

COMMENTS:

Regular Duty Returns

JULY 3 Employee returned to full duty/no restrictions
AUG 6 Employees returned to full duty/no restrictions
SEPT 1 Employee returned to full duty/no restrictions

Light Duty Returns

JULY N/A
AUG N/A
SEPT N/A

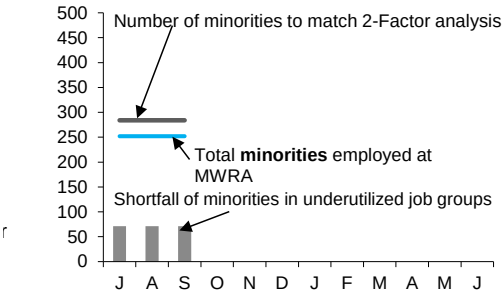
Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would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

*Report only claims are closed the month they are filed.

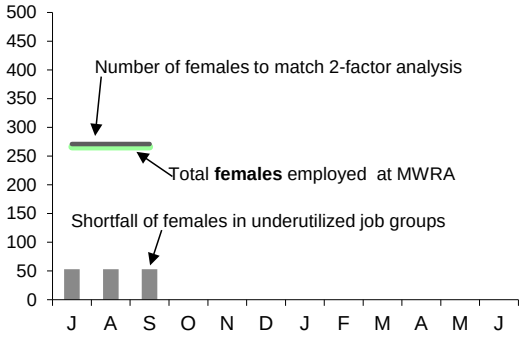
MWRA Job Group Representation

1st Quarter - FY19

Minority - Affirmative Action Plan Goals



Female - Affirmative Action Plan Goals



Highlights:

At the end of Q1 FY19, 8 job groups or a total of 71 positions are underutilized by minorities as compared to 7 job groups for a total of 40 positions at the end of Q1 FY18; for females 10 job groups or a total of 53 positions are underutilized females as compared to 10 job groups or a total of 64 positions at the end of Q1 FY18. During Q1, 3 minorities and 2 females were hired. During this same period 5 minorities and 7 females terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 9/30/2018	Minorities as of 9/30/2018	Achievement Level	Minority Over or Under Underutilized	Females As of 9/30/2018	Achievement Level	Female Over or Under Underutilized
Administrator A	23	1	3	-2	9	7	2
Administrator B	19	1	3	-2	5	3	2
Clerical A	31	12	7	5	26	21	5
Clerical B	27	9	7	2	9	10	-1
Engineer A	81	28	17	11	19	16	3
Engineer B	61	15	12	3	12	7	5
Craft A	117	19	42	-23	0	4	-4
Craft B	143	21	43	-22	2	4	-2
Laborer	68	18	14	4	2	3	-1
Management A	97	16	23	-7	34	38	-4
Management B	45	8	8	0	9	4	5
Operator A	66	3	13	-10	1	5	-4
Operator B	64	17	15	2	4	20	-16
Professional A	31	5	8	-3	19	15	4
Professional B	156	44	38	6	76	57	19
Para Professional	57	18	19	-1	31	44	-13
Technical A	55	14	11	3	8	12	-4
Technical B	7	3	1	2	0	1	-1
Total	**1148**	**252**	**284**	**38/-71**	**266**	**271**	**42/-53**

AACU Candidate Referrals for Underutilized Positions

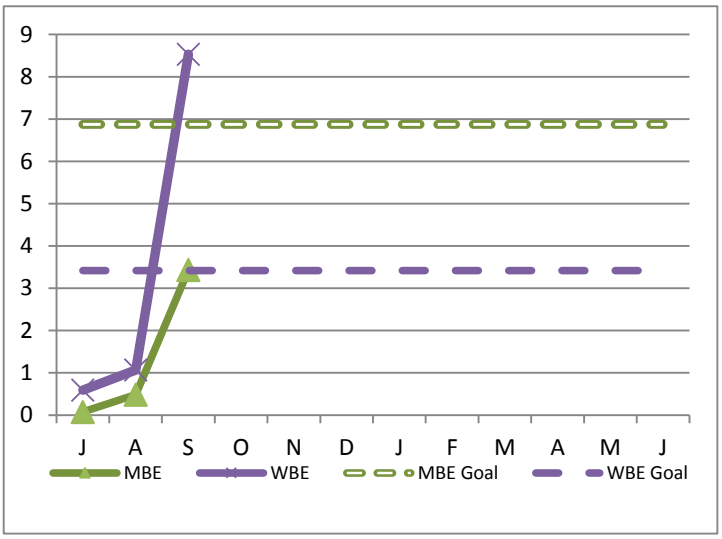
Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions /Transfers	AACU Ref. External	Position Status
Administrative A	Director, Procurement	1	Int	1	0	Promo =WM
Administrative A	Director, Design & Construction	1	Int	1	0	Promo =WM
Administrative B	Manager, Occupational Health & Safety	1	Int/Ext	0	0	RH =WM
Craft A	M&O Specialist	3	Int	3	1	Promo =2(HM) WM
Craft A	Sr. WDS/WSS General/Trades Foreman	3	Int	3	0	Promo =2(WM) BM
Craft A	Electrical Operations Supervisor	1	Int	1	0	Promo = WM
Craft B	Master Welder I	1	Int/Ext	0	0	NH = BM
Craft B	Instrumentation Specialist	1	Ext	1	0	Trans = WM
Craft B	Electrician	1	Ext	0	0	NH = WM
Craft B	Equipment Repair Specialist	1	Int/Ext	0	0	NH = WM
Craft B	Motor Equipment Repairman	1	Ext	0	0	NH = WM
Clerical B	Material Handler	1	Int	1	0	Trans = BM
Management A	Manager, Training & Development	1	Int/Ext	0	0	NH = WM
Operator A	Area Supervisor	3	Int	3	0	Promo = 2(WM) HM
Operator B	Operator	1	Int	1	0	Trans = WM
Professional B	Customer Service Technician	1	Ext	0	1	NH = BM
Technical A	Communication & Control Technician	1	Int/Ext	1	0	Promo = WF

MBE/WBE Expenditures
1st Quarter - FY19

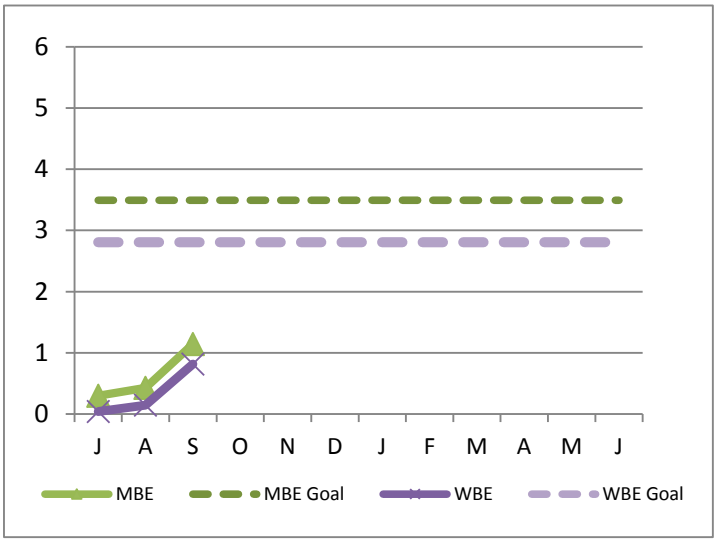
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY19 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they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

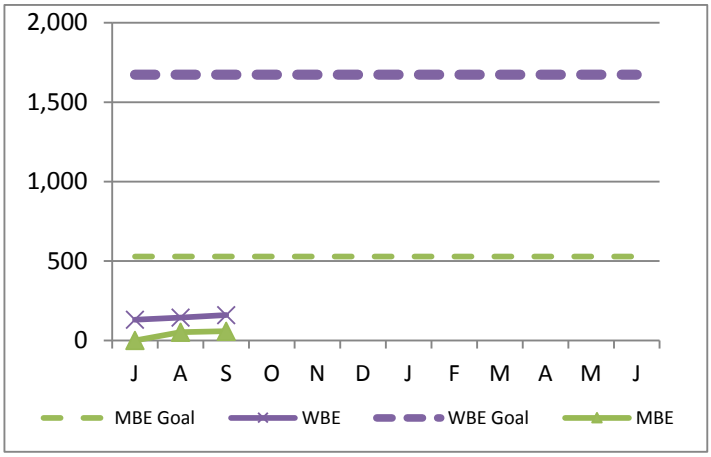
Construction



Professional Services



Goods/Services



FY19 spending and percentage of goals achieved, as well as FY18 performance are as follows:

MBE

FY19 YTD		FY18		
Amount	Percent	Amount	Percent	
3,431,333	44.2%	12,337,140	169.4%	Construction
1,142,716	67.0%	1,680,583	89.2%	Prof Svcs
58,679	11.1%	183,744	39.8%	Goods/Svcs
4,632,728	48.1%	14,201,467	298.4%	**Totals**

WBE

FY19 YTD		FY18	
Amount	Percent	Amount	Percent
8,530,231	220.9%	15,875,719	438.4%
816,170	59.6%	1,196,643	79.0%
160,201	9.6%	786,485	78.9%
9,506,602	155.0%	17,858,847	596.3%

FY19 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.
FY19 MBE/WBE dollar totals include F18 MBE/WBE dollars submitted in FY19.

MWRA FY19 - CEB Expenses
1st Quarter – FY19

As of September 2018, total expenses are $183.3 million, $3.1 million or 1.7% lower than budget, and total revenue is $191.5 million, $293k or 0.2% over budget, for a net variance of $3.4 million.

Expenses –

Direct Expenses are $54.9 million, $674k or 1.2% above budget.

- **Wages & Salaries** are under budget by $871k or 3.5%. Regular pay is $883k under budget, due to lower head count, and timing of backfilling positions. At the end of September, the average Full Time Equivalent (FTE) positions were 1,134, twenty-one fewer than the 1,155 FTE's budgeted.
- **Professional Services** expense $461k under budget or 23.2%, primarily due to under spending for Engineering and Other Professional Service of $206k and $113k, respectively.
- **Utilities** expenses are $455k or 9.7% over budget, due to higher spending of $360k for electricity at Deer Island and $101k for diesel fuel reflecting timing of purchases at Wastewater Operations.
- **Other Services** expenses are $367k over budget or 6.2% due to higher Sludge Pelletization costs, $332k over budget reflecting higher year-to-date processing volume.
- **Workers' Comp** expenses are $229k or 37.8% under budget due to lower compensation and medical payments of $96k and $116k, respectively.
- **Fringe Benefits** expenses are $213k or 4.1% under budget reflecting lower health insurance cost of $199k again due to lower head count.

Indirect Expenses are $14.9 million, $436k or 2.8% under budget reflecting lower than budgeted Watershed Reimbursement of $154k, lower HEEC related charge due to delay of the low voltage switchgear upgrade project of $150k, and lower insurance premium and claim payments of $129k.

Debt Service Expenses totaled $113.5 million, $2.0 million under budget due to lower than budgeted variable interest rates.

Revenue and Income –

Total Revenue and Income is $191.5 million, $293k higher than budget, primarily due to greater than budgeted investment income reflecting higher returns of $359k and Disposal of Equipment $83k, partially offset by lower energy revenue of $182k.

	September 2018 Year-to-Date			
	Period 3 YTD Budget	Period 3 YTD Actual	Period 3 YTD Variance	%
EXPENSES				
WAGES AND SALARIES	$ 25,196,564	$ 24,325,782	$ (870,782)	-3.5%
OVERTIME	1,088,982	1,263,356	174,374	16.0%
FRINGE BENEFITS	5,184,807	4,971,700	(213,107)	-4.1%
WORKERS' COMPENSATION	605,652	376,846	(228,806)	-37.8%
CHEMICALS	3,262,733	3,375,720	112,987	3.5%
ENERGY AND UTILITIES	4,699,746	5,155,170	455,424	9.7%
MAINTENANCE	6,524,242	6,479,488	(44,754)	-0.7%
TRAINING AND MEETINGS	90,261	128,972	38,711	42.9%
PROFESSIONAL SERVICES	1,988,421	1,527,599	(460,822)	-23.2%
OTHER MATERIALS	1,009,068	1,005,176	(3,892)	-0.4%
OTHER SERVICES	5,967,108	6,334,077	366,969	6.1%
TOTAL DIRECT EXPENSES	**$ 55,617,584**	**$ 54,943,886**	**$ (673,697)**	**-1.2%**
INSURANCE	$ 524,765	$ 396,253	$ (128,512)	-24.5%
WATERSHED/PILOT	6,601,607	6,447,909	(153,698)	-2.3%
HEEC PAYMENT	346,707	192,982	(153,725)	-44.3%
MITIGATION	403,565	403,566	1	0.0%
ADDITIONS TO RESERVES	470,450	470,450	-	0.0%
RETIREMENT FUND	7,000,000	7,000,000	-	0.0%
POST EMPLOYEE BENEFITS	-	-	-	---
TOTAL INDIRECT EXPENSES	**$ 15,347,094**	**$ 14,911,160**	**$ (435,935)**	**-2.8%**
STATE REVOLVING FUND	$ 20,597,518	$ 20,517,655	$ (79,863)	-0.4%
SENIOR DEBT	67,283,495	67,283,495	-	0.0%
DEBT SERVICE ASSISTANCE	(944,726)	(944,726)	-	0.0%
CURRENT REVENUE/CAPITAL	3,549,998	3,549,998	-	0.0%
SUBORDINATE MWRA DEBT	23,031,906	23,031,906	-	0.0%
LOCAL WATER PIPELINE CP	1,187,599	1,187,599	-	0.0%
CAPITAL LEASE	804,265	804,265	-	0.0%
DEBT PREPAYMENT	-	-	-	---
VARIABLE DEBT	-	(1,958,787)	(1,958,787)	---
DEFEASANCE ACCOUNT	-	-	-	---
TOTAL DEBT SERVICE	**$ 115,510,055**	**$ 113,471,405**	**$ (2,038,650)**	**-1.8%**
TOTAL EXPENSES	**$ 186,474,733**	**$ 183,326,451**	**$ (3,148,282)**	**-1.7%**
REVENUE & INCOME				
RATE REVENUE	$ 184,760,550	$ 184,760,550	$ -	0.0%
OTHER USER CHARGES	2,400,361	2,433,957	33,596	1.4%
OTHER REVENUE	862,277	762,753	(99,524)	-11.5%
RATE STABILIZATION	-	-	-	---
INVESTMENT INCOME	3,229,273	3,587,724	358,451	11.1%
TOTAL REVENUE & INCOME	**$ 191,252,461**	**$ 191,544,984**	**$ 292,523**	**0.2%**

Cost of Debt
1st Quarter – FY19

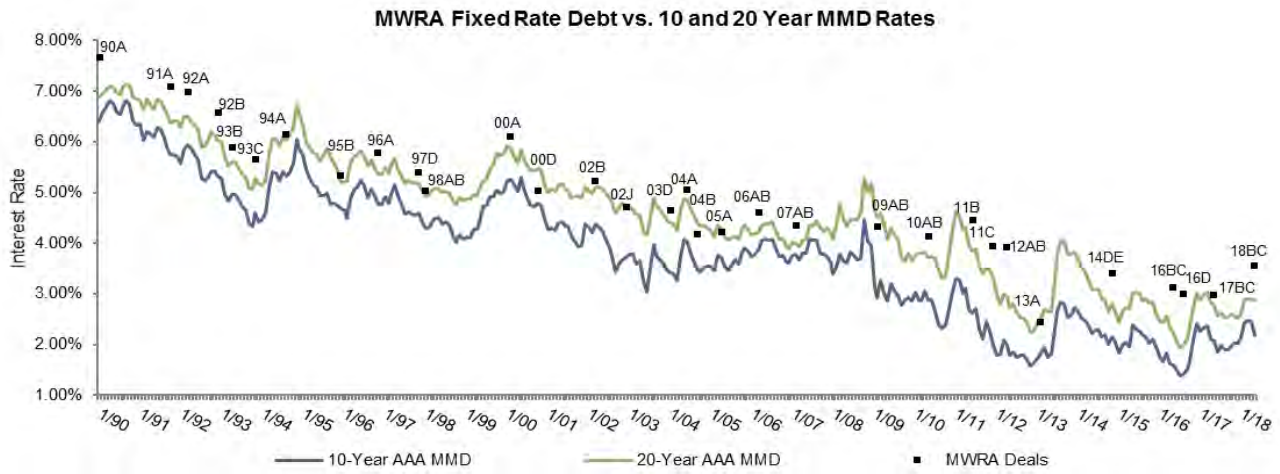
MWRA borrowing costs are a function of the fixed and variable tax exempt interest rate environment, the level of MWRA's variable interest rate exposure and the perceived creditworthiness of MWRA. Each of these factors has contributed to decreased MWRA borrowing costs since 1990.

Average Cost of MWRA Debt FYTD

Fixed Debt ($3,437 billion)	3.77%
Variable Debt ($418.9 million)	1.95%
SRF Debt ($935.7 million)	1.48%
Weighted Average Debt Cost ($4,791 billion)	3.17%

Most Recent Senior Fixed Debt Issue
May 2018

2018 Series B &C ($129.5 million) 3.56%

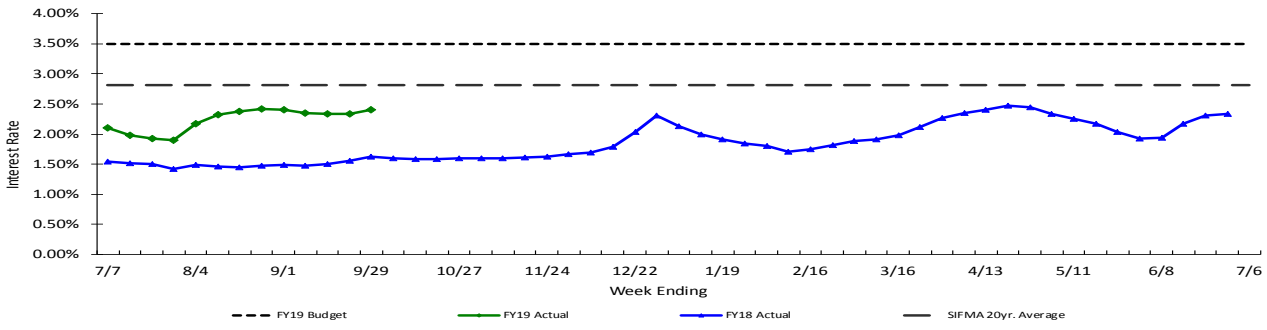


Bond Deal	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A	2004B
Rate	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%	4.17%
Avg Life	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs	13.5 yrs

Bond Deal	2005A	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014DEF	2016BC	2016D	2017BC	2018BC
Rate	4.22%	4.61%	4.34%	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%	3.56%
Avg Life	18.4 yrs	25.9 yrs	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

Weekly Average Variable Interest Rates vs. Budget

MWRA currently has eleven variable rate debt issues with $808.2 million outstanding, excluding commercial paper. Of the eleven outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has

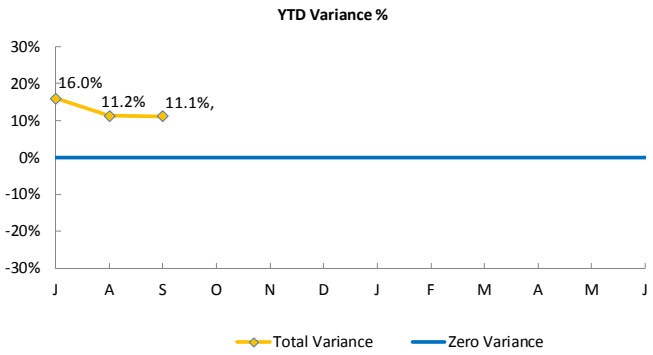


been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In September, SIFMA rates ranged from a high of 1.56% to a low of 1.48% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.

Investment Income

1st Quarter – FY19

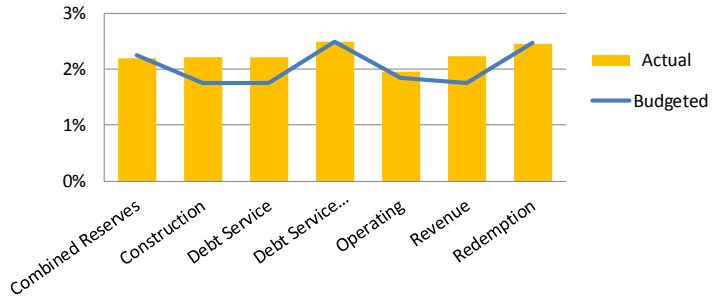
Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$8	($8)	0	0.0%
Construction	($48)	$111	63	13.5%
Debt Service	$19	$186	204	29.6%
Debt Service Reserves	$1	($0)	1	0.1%
Operating	$14	$17	31	10.7%
Revenue	($17)	$78	61	20.1%
Redemption	$0	($1)	(1)	-0.8%
Total Variance	($23)	$382	$358	11.1%

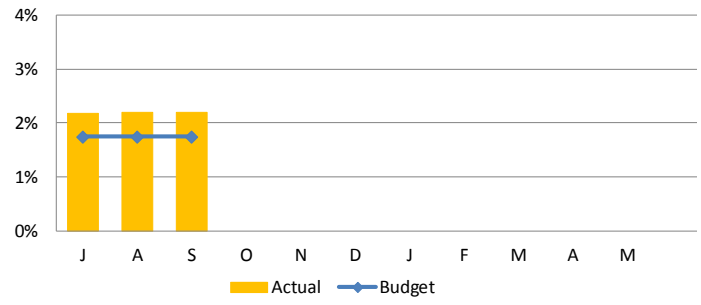
YTD Average Balances Budgeted vs. Actual

YTD Average Interest Rate Budgeted vs. Actual

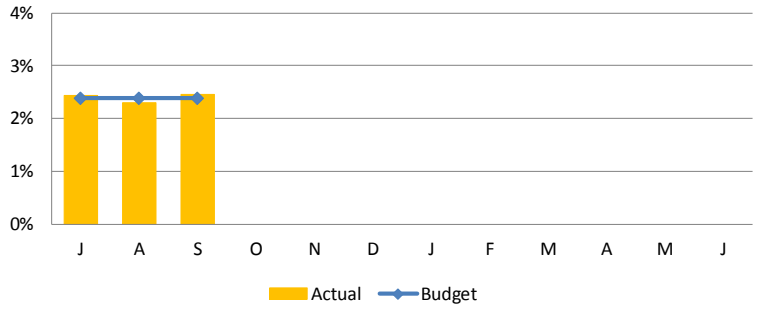


Monthly

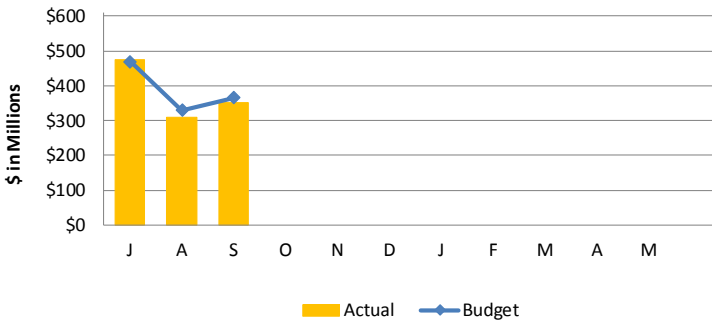
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances