

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Third Quarter FY2019

| Q1 | Q2 | Q3 | Q4 |
|----|----|----|----|
| | | | |



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
May 29, 2019

Board of Directors Report on Key Indicators of MWRA Performance

3rd 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.

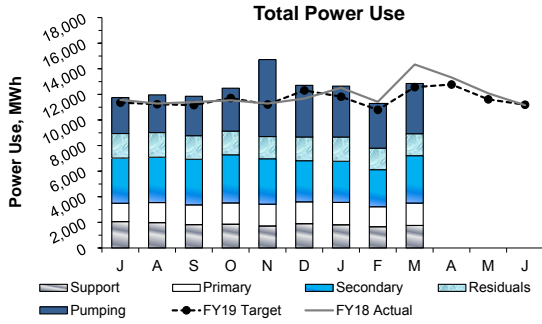
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
May 22, 2019

OPERATIONS AND MAINTENANCE

Deer Island Operations

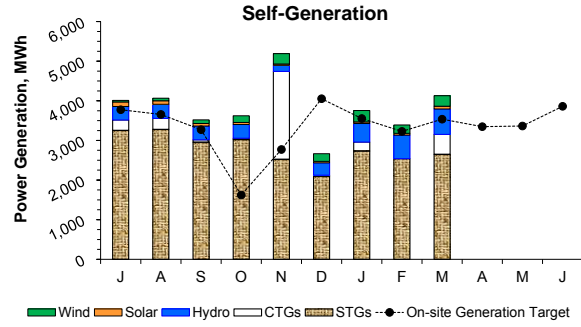
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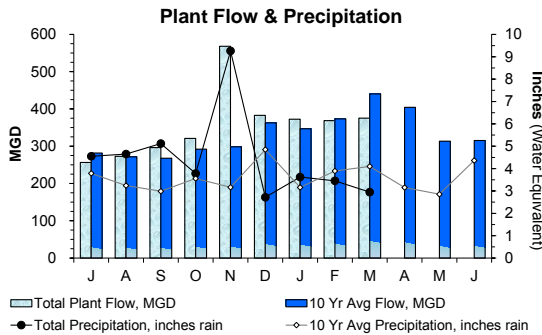


Total power usage in the 3rd Quarter was 4.6% above target as Total Plant Flow was 6.9% above target with the 3 year average plant flow. Power usage for a number of plant processes were similar to or above target as a result of the higher plant flow, including power used for raw wastewater pumping which was 7.8% above target. Power used for raw wastewater pumping from the north influent system was 3.4% higher-than-target and was 19.1% higher-than-target for pumping the wastewater from the south influent system.

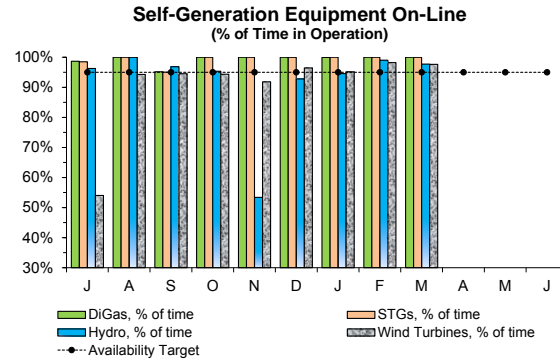
Note: Power usage projections are based on 3 year averages.



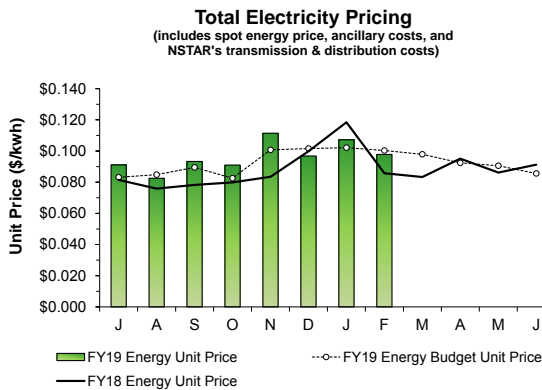
Power generated on-site during the 3rd Quarter was 9.3% above target. This was partly due to the 17 hour CTGs operation in January, as a precaution during a nor'easter storm event with high winds from January 24 to January 25, and the 22 hour operation for compliance testing in March. As a result, power generated by the CTGs was 77.2% higher than expected during Quarter 3. Power generated by the STGs and the Solar Panels were both 5% higher -than-target. Power generated by the Hydro Turbines was 15.3% higher than target as the newly repaired, more efficient, Hydro Turbine #1 was returned to operation in mid-January. Generation by the Wind Turbines also exceeded the target by 3.9%.



Total Plant Flow for the 3rd Quarter was 3.8% below the budgeted 10 year average plant flow (372.2 MGD actual vs. 386.9 MGD expected) as precipitation was 11.2% below target (10.02 inches actual vs. 11.15 inches expected). However, Total Plant Flow was 6.9% higher than the 3 year average plant flow used for energy budget projections. Total Plant Flow and precipitation was above the 10 year target in January but was below target during the months of February and March.

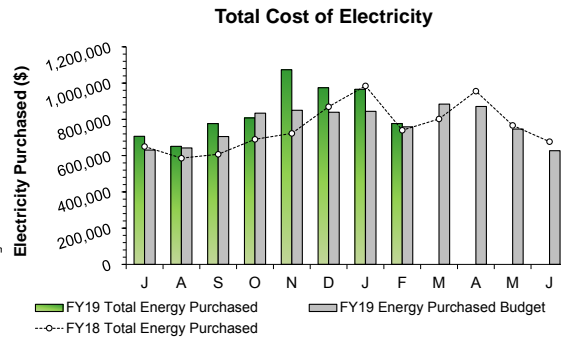


The DiGas system, STGs, Hydro Turbines, and Wind Turbines all met or exceeded the 95% availability target for the 3rd Quarter.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in February (the most current invoice available) was 2.5% below target with budgetary estimates. The actual total energy unit price in March is not yet available as the complete invoices have not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

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



The Electricity cost data for Electricity Purchased in March is not yet available. Year-to-date Total Cost of Electricity is \$628,237 (10.3%) higher than budgeted through February as the Total Energy Unit Price and the Total Electricity Purchased were both higher than target by 4.2% and 5.8%.

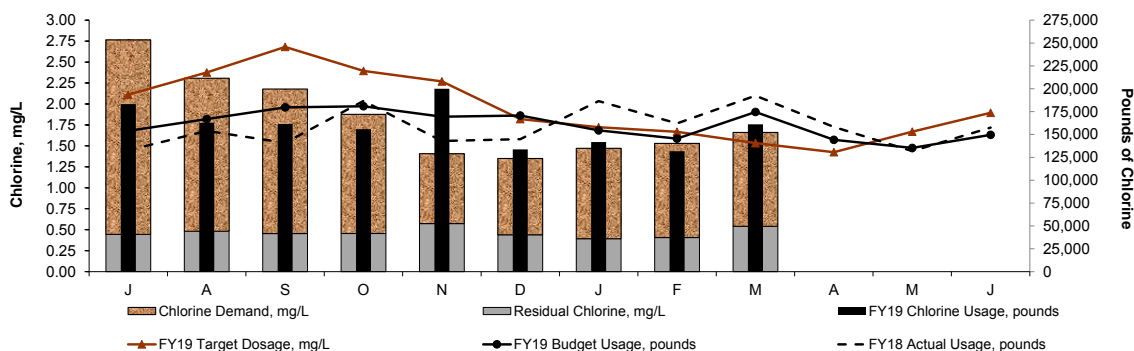
Note: Only months with complete Electricity Purchased data are reported. Therefore, the dataset lags by one (1) month due to the timing of invoice receipt and review.

Deer Island Operations

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Deer Island Sodium Hypochlorite Use



The disinfection dosing rate in the 3rd Quarter was 5.3% below target with budgetary estimates. Actual sodium hypochlorite usage in pounds of chlorine was also 8.4% lower than expected. The lower sodium hypochlorite dosage and usage is indicative of a lower chlorine demand in the wastewater. DITP maintained an average disinfection chlorine residual of 0.45 mg/L this quarter with an average dosing rate of 1.55 mg/L (as chlorine demand was 1.11 mg/L).

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

Secondary Blending Events

| Month | Count of Blending Events | Count of Blending Events Due to Rain | Count of Blending Events Due to Non-Rain-Related Events | Secondary, as a Percent of Total Plant Flow | Total Hours Blended During Month |
|--------------|--------------------------|--------------------------------------|---|---|----------------------------------|
| J | 1 | 1 | 0 | 99.5% | 6.02 |
| A | 1 | 1 | 0 | 99.9% | 2.96 |
| S | 2 | 2 | 0 | 99.4% | 7.81 |
| O | 3 | 3 | 0 | 99.5% | 9.58 |
| N | 12 | 12 | 0 | 96.2% | 100.05 |
| D | 2 | 2 | 0 | 99.9% | 9.68 |
| J | 1 | 1 | 0 | 98.9% | 12.37 |
| F | 0 | 0 | 0 | 100.0% | 0.00 |
| M | 0 | 0 | 0 | 100.0% | 0.00 |
| A | | | | | |
| M | | | | | |
| J | | | | | |
| Total | 22 | 22 | 0 | 99.0% | 148.47 |

99.6% of all flows were treated at full secondary during the 3rd Quarter. There was one (1) secondary blending event due to high plant flow resulting from heavy rain. This blending event resulted in a total of 12.37 hours of blending and 129.63 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

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

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 1,163.0 MGD during the evening of January 24. This peak flow occurred during a storm event that brought 1.00 inch of rain to the metropolitan Boston area combined with already elevated plant flows from a significant rain event on January 20. Overall, Total Plant Flow in the 3rd Quarter was 3.8% below the 10 year average plant flow target for the quarter.

Work on the Winthrop Terminal Headworks Facility (WTF) VFD (Variable Frequency Drive) and Synchronous Motor Replacement project was started by the contractor in 2018 and entails the demolition of existing older obsolete equipment (electrical systems, motors and VFDs on each of the six (6) raw wastewater pumps). The pumps are currently powered by 600 volts service and will be changed to 4,160 volts, consistent with other major pumps in both the South System Pump Station (SSPS) and the North Main Pump Station (NMPS). Work and all performance testing was successfully completed for WTF Pump #6 by early December. The contractor began working on WTF Pump #2 on December 10 and performance testing on this pump began in February and continued through the remainder of the quarter.

The 15 kVA uninterruptible power supply (UPS) that provides near-instantaneous protection from input power interruptions to the raw wastewater pumps in the Winthrop Terminal Headworks Facility was replaced in early January. This UPS protects the VFDs, that control the pump's motor speed, from occasional power fluctuations on the grid which can occur several times each year.

Deer Island Operations

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Deer Island Operations & Maintenance Report (continued)

Odor Control:

The Residuals Odor Control (ROC) Facility, which is responsible for treating the process airflows from the primary gravity thickeners and the secondary centrifuge thickeners, was taken offline for a total of 8 hours and 59 minutes on February 6. This odor control treatment shutdown was necessary to allow staff to replace the airflow fan and fan assembly for wet chemical scrubber #2. During this shutdown, stray process air was contained within the buildings served by this odor control treatment area and there were no odor complaints associated with this work. Fan performance testing on February 12 was successfully completed while a representative from the fan manufacturer was onsite.

The gravity thickener airflow treatment portion of the ROC Facility was taken for a total shutdown of 6 hours and 30 minutes to allow contractors to replace the damper in the facility that serves Gravity Thickener #1. This damper replacement is part of a Gravity Thickener Rehabilitation project. The remaining five (5) gravity thickener dampers are scheduled to be replaced later this year. The centrifuge thickener odor control treatment portion of the ROC Facility was not impacted and continued to operate and treat the air from the centrifuge thickeners. Stray process air was contained within the buildings served by this odor control treatment area and there were no resident odor complaints received as a result of this shutdown.

Energy and Thermal Power Plant:

Overall, total power generated on-site accounted for 30.6% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 28.7% of Deer Island's total electrical power use for the quarter.

Contractors and staff from Eversource continued their work in preparation for the installation of the new cross-harbor power cable, specifically the on-island components of the cable. This work involved trenching from the Eversource building (Station 132) down the roadway inside the perimeter fence line ending at the northwestern section of parking lot #1 which took place at the end of 2018 and continued into the early part of Quarter 3. This new cross-harbor power cable will replace the existing cross-harbor power cable that serves as the primary means of transmitting electricity to Deer Island, and is expected to be available near the end of calendar year 2019.

Hydro Turbine #1 was successfully returned to operation on January 15 following a lengthy period of downtime that included a major repair of the turbine's rotating assembly which was completed by the contractor. The turbine has continued to operate without issue and there has been a significant improvement in the power generation efficiency since the turbine has been in operation as demonstrated by the 15.3% higher-than-target generation in the 3rd Quarter. Hydro Turbine #2 was taken offline for much needed maintenance when Hydro Turbine #1 was returned to operation.

Routine non-invasive annual maintenance and inspections were conducted on CTG-1A during the week of March 4. CTG-2B remained available for operation during this work. The maintenance included non-invasive inspections, instrument calibrations and system checks. After the maintenance work was completed, CTG-1A was test operated which revealed the under/over voltage relay associated with this CTG unit was not working correctly. The identical relay associated with CTG-2B was installed into CTG-1A's electrical system to ensure the CTG unit was able to operate properly and provide full power. Several suppliers were identified and relays were immediately procured with expedited shipment. A new relay was received and installed into CTG-2B's electrical system on March 21 and this unit was successfully test operated the same day once the new relay was installed.

Stack Emissions Testing was conducted in March for both CTGs as required by Deer Island's Title V Air Permit. Emissions testing for CTG-1A was performed on March 12 and March 13 and testing was performed on March 27 and March 28 for CTG-2B. Complete emissions testing is required once every five (5) years and was last conducted in March 2014. Emissions testing was conducted on the exhaust stacks of both CTGs (one unit at a time) and also reestablishes parametric emissions curves for CTG operation at various operating loads to full load to allow for nitrogen oxides (NOx) emission rate reporting under the Federal NOx Budget Trading Program. In addition to the development of new emissions curves, the test program also collected measurements to demonstrate compliance with the emission limits as listed in the Title V Air Permit including particulates testing and smoke reader evaluations. The emissions were tested for NOx, carbon monoxide (CO), and non-methane hydrocarbons (NMHC) at four (4) operating load conditions (30%, 50%, 70%, and 100%), and for specified operating durations. Non-methane hydrocarbons is also referred to as volatile organic compounds (VOC). Filterable particulate matter (FPM) and condensable particulate matter (CPM) were tested at the 100% load operating condition. The purpose of this test program is to quantify the controlled emissions of NOx, CO, NMHC, FPM, and CPM and to compare the results to the applicable emission limits as promulgated by the Massachusetts Department of Environmental Protection (MADEP) and the United States Environmental Protection Agency (USEPA). The contractor is in the process of preparing the final report.

Clinton AWWTP:

- #1 Elevator: Replaced buckets, shafts, gears, and cables.
- #1 Grit Screw: Replaced packing.
- #1 Primary Clarifier: Repaired cross collector and longitudinal drives.
- #2 Final Clarifier: Replaced 10" RAS valve.
- #2 Belt Filter Press Sludge Supply Pump: Replaced rotor and stator.

Phosphorus Reduction Facility:

Work completed or in progress during the Second Quarter:
Added vacuum breakers to chemical piping.
Started plant and chemical flow to Phosphorus Reduction Facility
Acid washed and inspected #1,2, &3 disk filters.

Painting and Coatings contract:

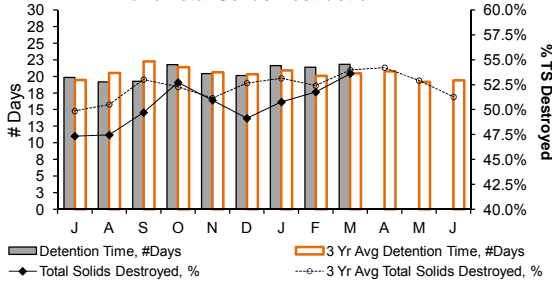
Contractor has completed bead blasting and painting piping in the Chemical Building Basement.

Deer Island Operations and Residuals

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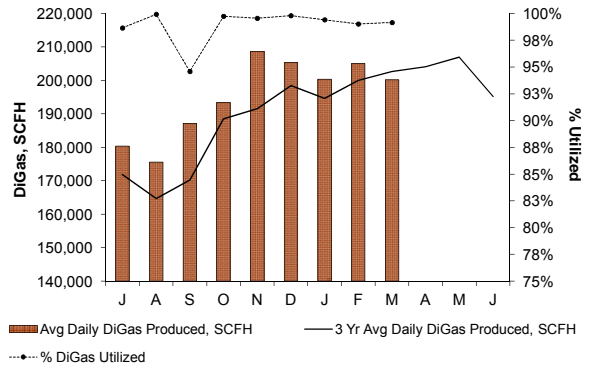
Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 51.9% during the 3rd Quarter, 2.4% below the 3 year average of 53.2% even though the sludge detention time in the digesters was 5.5% above target at 21.6 days. DI operated with an average of 8.0 digesters similar to the 3 year average. TS destruction was lower than expected partially due to a higher secondary waste sludge content than was expected which reduces the overall destruction of the sludge during the digestion process.

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

Digester Gas Production and % Utilized

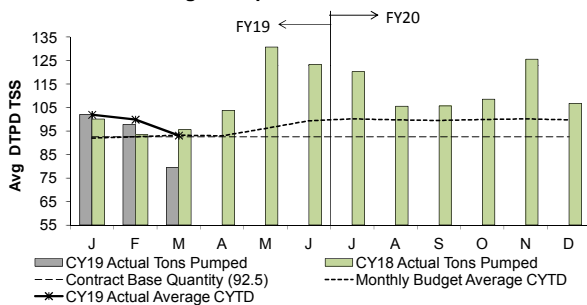


The Avg Daily DiGas Production in the 3rd Quarter was 1.4% above target with the 3 Year Avg Daily DiGas Production. On average, 99.2% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

Residuals Pellet Plant

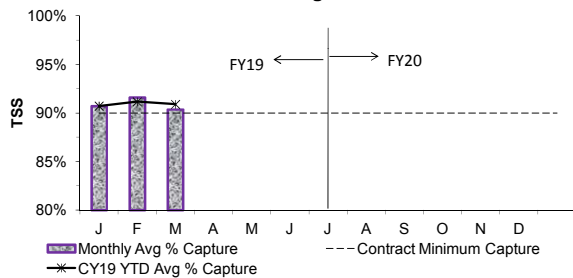
New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended 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 (FY19's budget is 98.9 DTPD/TSS and FY20's preliminary budget is 100.9 DTPD/TSS).

Sludge Pumped From Deer Island



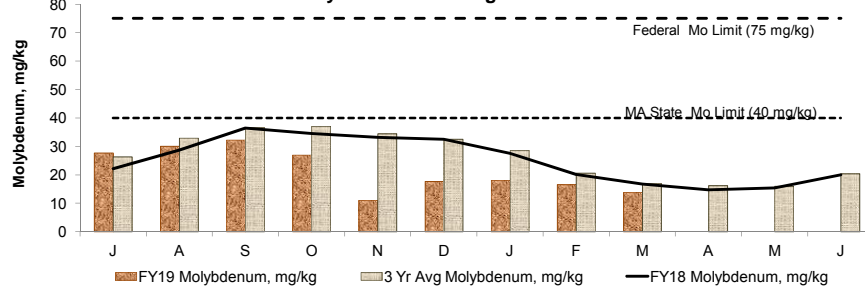
The average quantity of sludge pumped to the Biosolids Processing Facility (BPF) in the 3rd Quarter and for CY19 to date was 93.1 TSS Dry Tons Per Day (DTPD) - on target (-0.1%) with the FY19 budget of 93.2 TSS DTPD for the same period. Sludge delivered to the BPF was higher than expected in January and February but was lower than expected in March.

Monthly Average % Capture of Processed Sludge



The contract requires NEFCO to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility. The average capture for the 3rd Quarter and for CY19 to date was 90.9%.

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, the level in the MWRA sludge fertilizer pellets during the 3rd Quarter averaged 14.6 mg/kg, 34% below the 3 year average, 64% below the MA State Limit, and 81% below the Federal Limit.

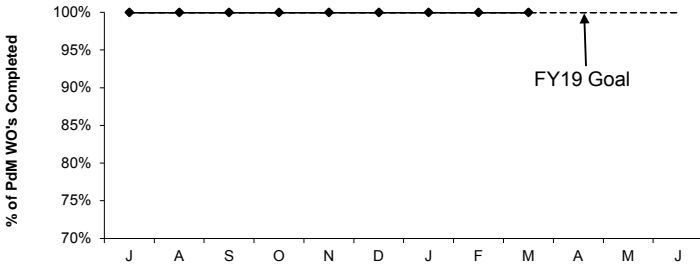
Deer Island Maintenance

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Productivity Initiatives

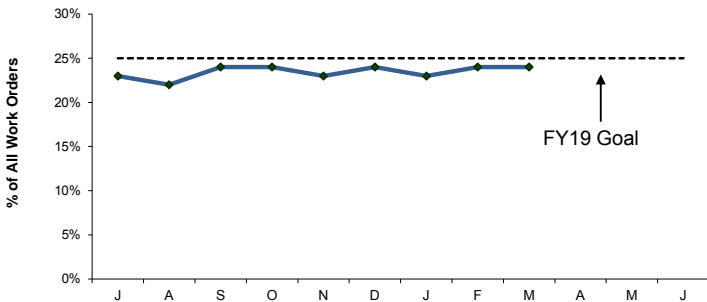
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



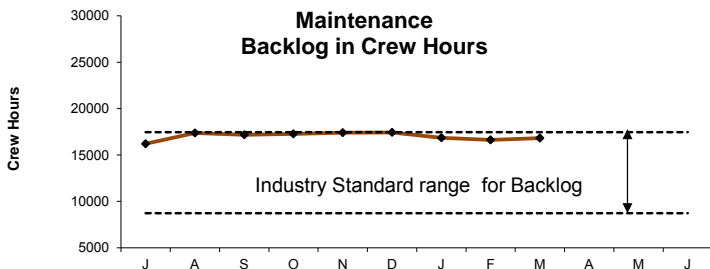
Deer Island's FY19 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.

Predictive Maintenance



Deer Island's increased FY19 predictive maintenance goal is 25% of all work orders to be predictive. 24% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.

Maintenance Backlog in Crew Hours

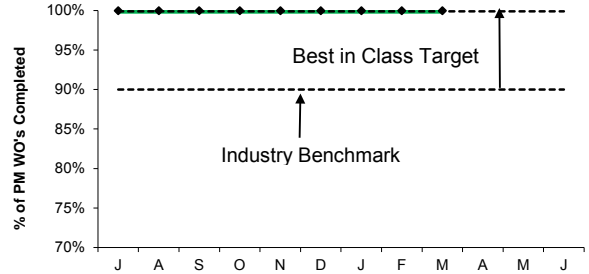


DITP's maintenance backlog at Deer Island is 16,810 hours this quarter. DITP is at the upper end of the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by six vacancies; (1) HVAC Technician, (2) Plumber, (2) Electricians and (1) Instrument Technician. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

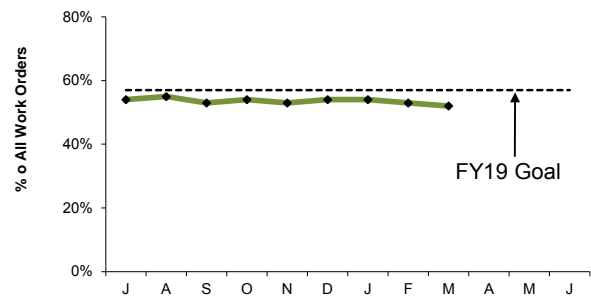
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



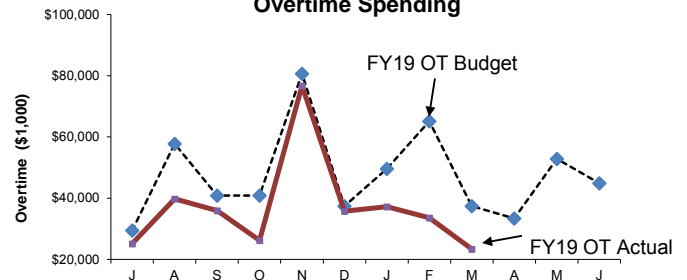
Deer Island's FY19 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.

Maintenance Kitting



Deer Island's increased FY19 maintenance kitting goal is 57% of all work orders to be kitted. 53% of all work orders were kitted this quarter. Kitting is staging of parts or material necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.

Overtime Spending



Maintenance overtime was under budget by \$55K this quarter and \$104k 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, Discharge Piping Repair for South Main Pump Station Raw Wastewater Pump #8 (SMPS AB:RWW.P-8), Residuals Odor Control Fan #2, and Cryo Multi Stage Compressor 3B/C Repairs.

Water Distribution System Valves

3rd Quarter - FY19

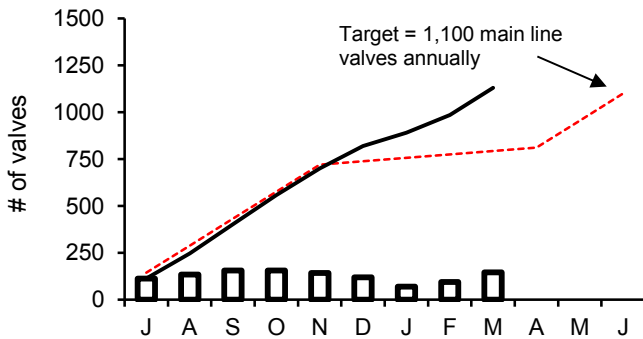
Background

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 | 96.6% | 95% |
| Blow-Off Valves | 1,317 | 98.5% | 95% |
| Air Release Valves | 1,380 | 95.0% | 95% |
| Control Valves | 49 | 100.0% | 95% |

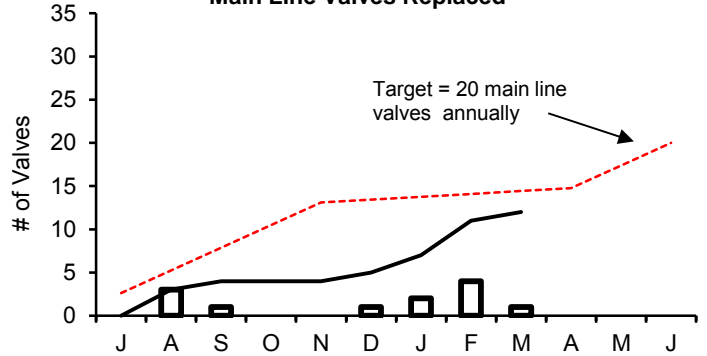


Main Line Valves Exercised



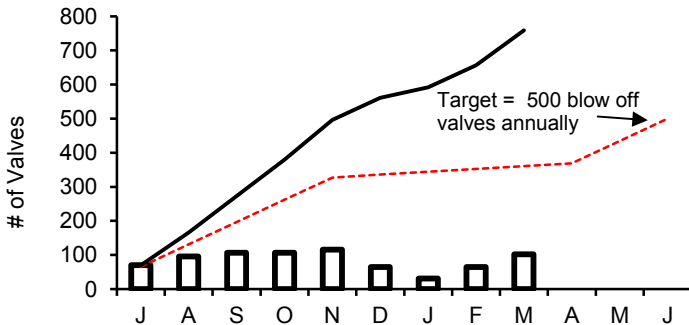
During the 3rd Quarter of FY19, 310 main line valves were exercised. The total exercised for the fiscal year to date is 1,130. Main Line Valves Exercised have exceeded the target due to full staffing and CIP projects coming to completion.

Main Line Valves Replaced



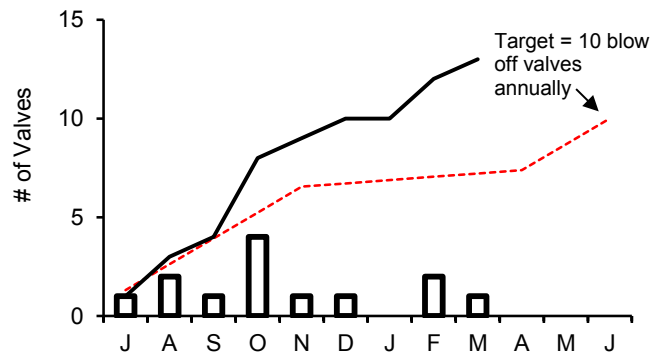
During the 3rd Quarter of FY19, there were seven main line valves replaced. The total replaced for the fiscal year to date is twelve. Focus has been on Blow-Off valve replacements related to available pipeline isolations.

Blow-Off Valves Exercised



During the 3rd Quarter of FY19, 198 blow off valves were exercised. The total exercised for the fiscal year to date is 759. Valve exercising has exceeded the target due to full staffing and CIP projects coming to completion.

Blow-Off Valves Replaced



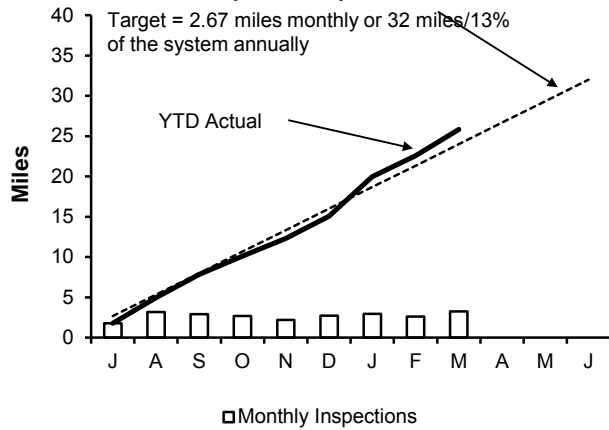
During the 3rd Quarter of FY19, there were three blow off valves replaced. The total replaced for the fiscal year to date is thirteen. Blow off valve retrofit project schedules have been driven by requested community roadway reconstruction projects.

Wastewater Pipeline and Structure Inspections and Maintenance

3rd Quarter - FY19

Inspections

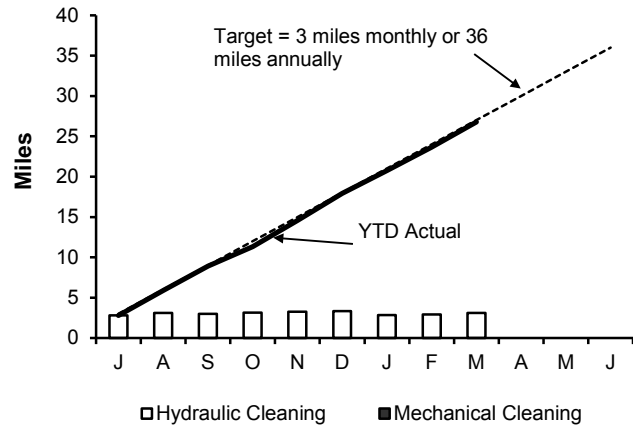
Pipeline Inspections



Staff internally inspected 8.79 miles of MWRA sewer pipeline during this quarter. The year to date total is 25.83 miles. No Community Assistance was provided this quarter.

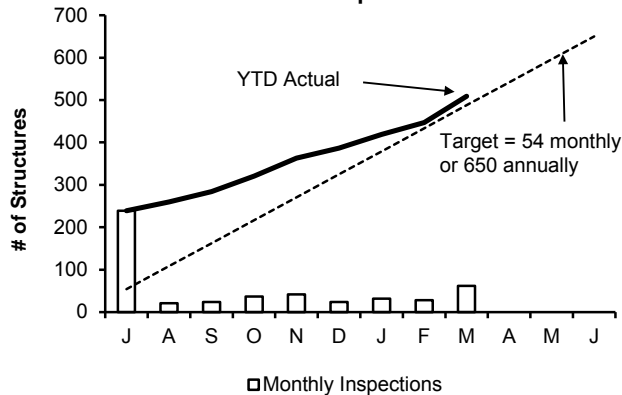
Maintenance

Pipeline Cleaning



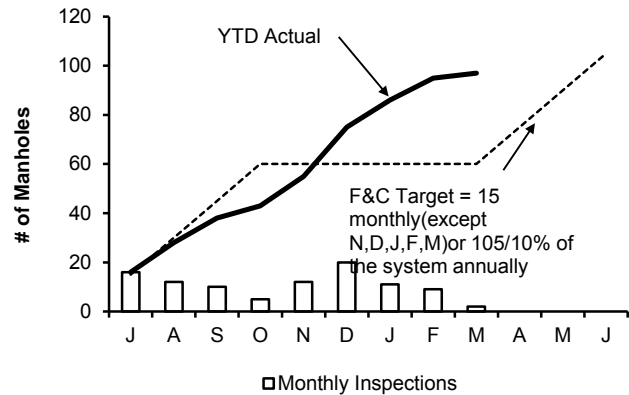
Staff cleaned 8.85 miles of MWRA's sewer system and removed 37 yards of grit and debris during this quarter. The year to date total is 26.78 miles. No Community Assistance was provided this quarter.

Structure Inspections



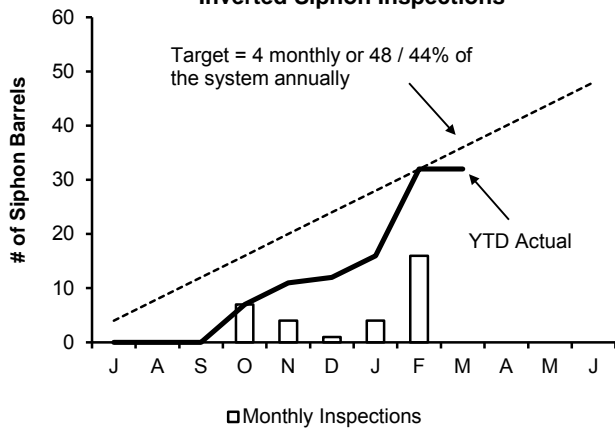
Staff inspected the 36 CSO structures and performed 86 additional manhole/structure inspections during this quarter. The year to date total is 509 inspections.

Manhole Rehabilitation



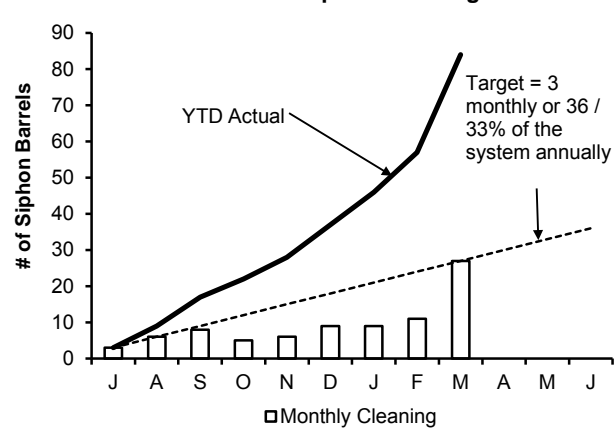
Staff replaced 22 frames & covers during this quarter. The year to date total is 97.

Inverted Siphon Inspections



Staff inspected 20 siphon barrels this quarter. Year to date total is 32 inspections.

Inverted Siphon Cleaning

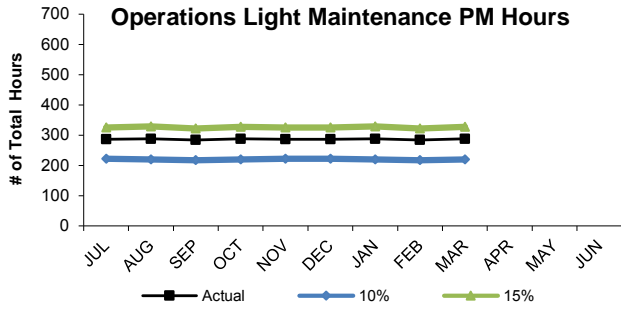


Staff cleaned 47 siphon barrels during this quarter. Year to date total is 84.

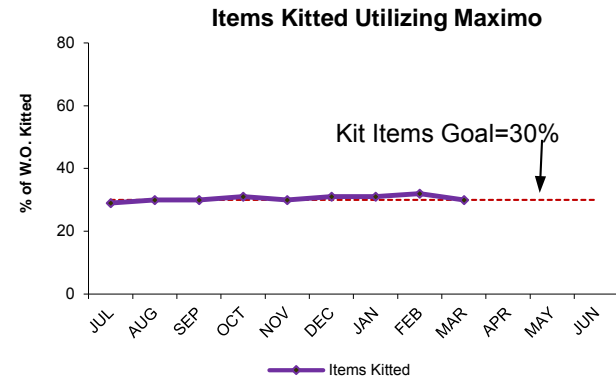
Field Operations' Metropolitan Equipment & Facility Maintenance

3rd Quarter - FY19

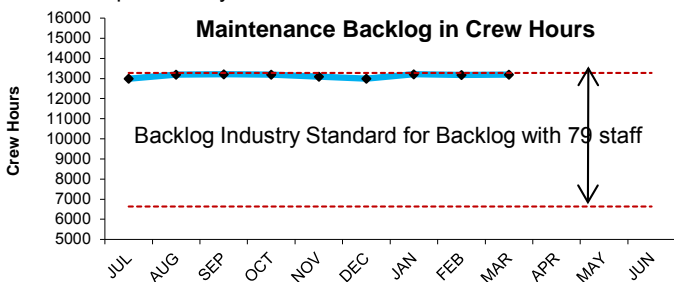
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



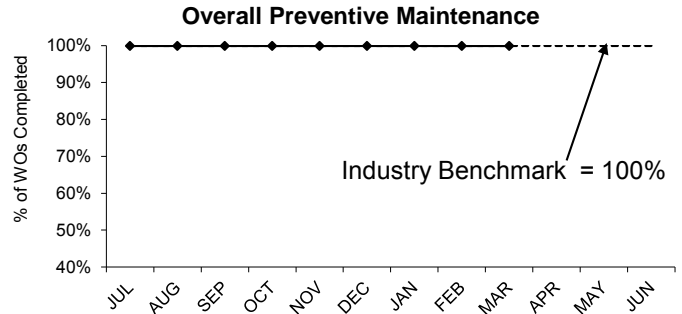
Operations staff averaged 287 hours of preventive maintenance during the 3rd Quarter, an average of 14% of the total PM hours for the 3rd Quarter, which is within the industry benchmark of 10% to 15%.



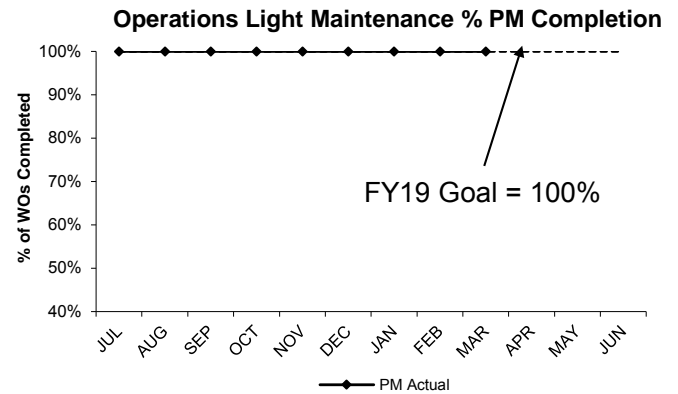
Operation's FY19 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 3rd Quarter, 31% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



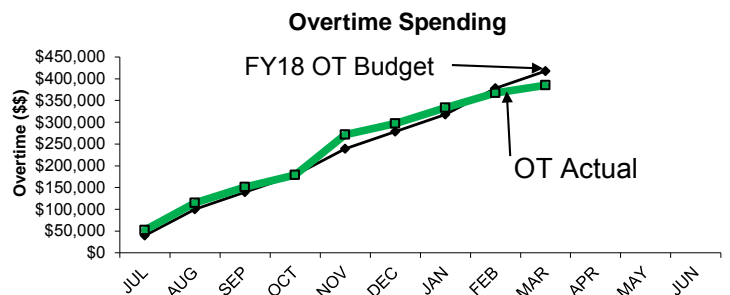
The 3rd Quarter backlog average is 13196 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6636 to 13275 hours.



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 3rd Quarter.



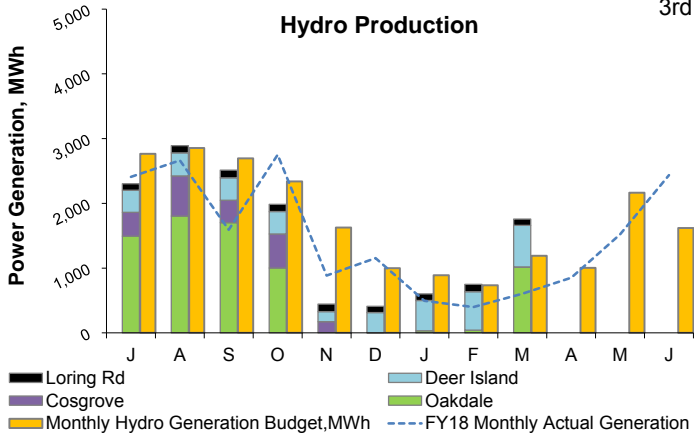
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY19 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 3rd Quarter.



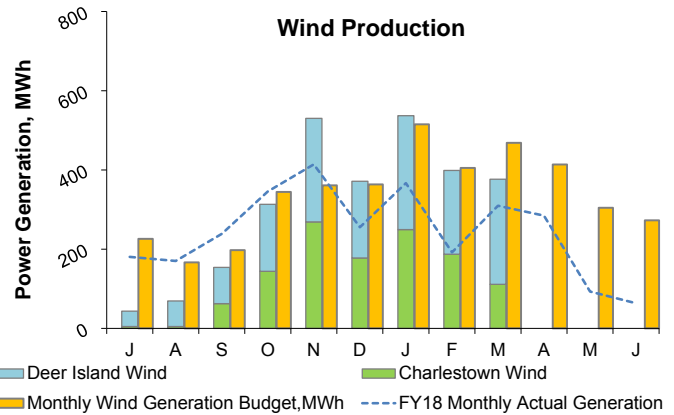
Maintenance overtime was \$29k under budget for the 3rd Quarter. Overtime was used for critical maintenance repairs. Overtime for FY19 is \$385k which is currently \$33k under budget for the fiscal year.

Renewable Electricity Generation: Savings and Revenue

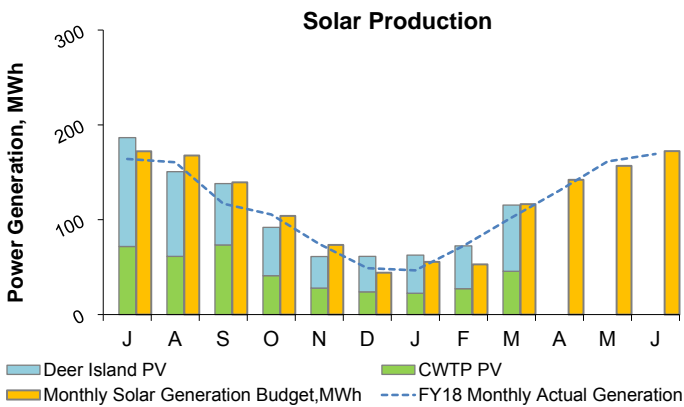
3rd Quarter - FY19



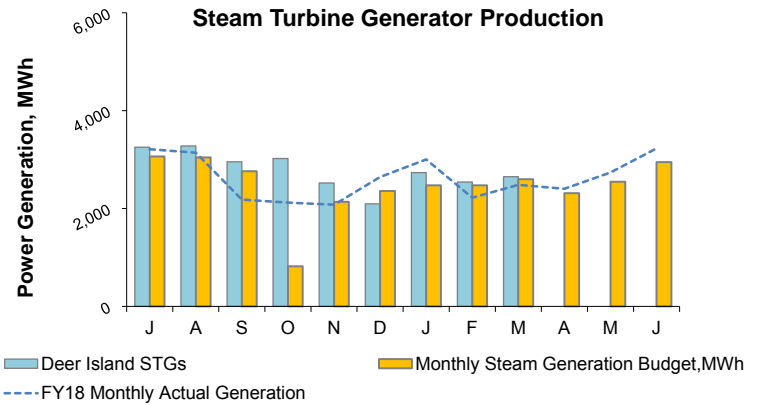
In the 3rd Quarter, the renewable energy produced from all hydro turbines totaled 3,107 MWh; 10% above budget³. The total energy produced to date in FY19 is 13,655 MWh; 15% below budget³ primarily due to Cosgrove generation values having been underestimated by the utility company and Oakdale being offline. The utility data for Cosgrove is typically corrected and reconciled in later months of the year. The total savings and revenue² to date in FY19 (actuals through December¹) is \$615,372; 11% below budget³, due to the reasons stated above. The savings and revenue value does not include RPS REC revenue (see next page).



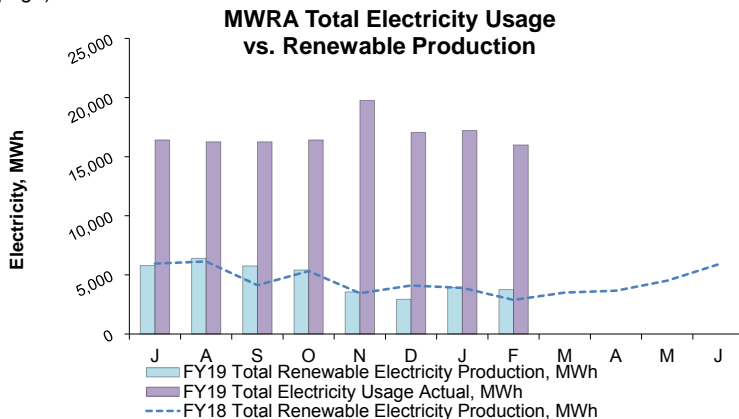
In the 3rd Quarter, the renewable energy produced from all wind turbines totaled 1,312 MWh; 5% below budget³. The total energy produced to date in FY19 is 2,794 MWh; 8% below budget³, mostly due to Charlestown Wind generation values being underestimated by the utility company. The total savings and revenue² to date in FY19 (actuals through December¹) is \$216,759; 6% below budget³, due to the reasons stated above. The savings and revenue value does not include RPS REC revenue (see next page).



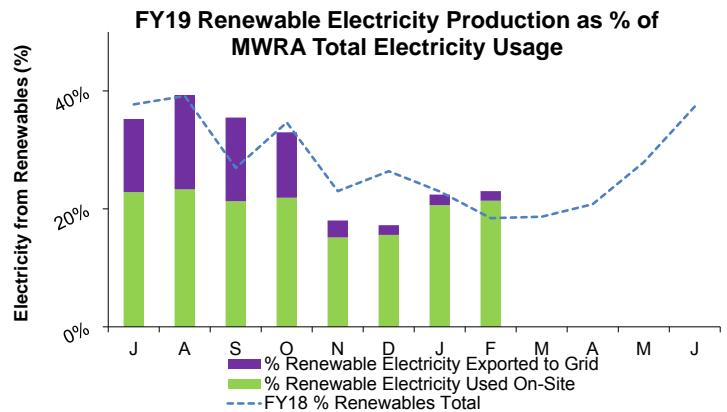
In the 3rd Quarter, the renewable energy produced from all solar PV systems totaled 250 MWh; 11% above budget³. The total energy produced to date in FY19 is 940 MWh; 2% above budget³. The total savings and revenue² to date in FY19 (actuals through December¹) is \$90,162; 7% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



In the 3rd Quarter, the renewable energy produced from all steam turbine generators totaled 7,923 MWh; 5% above budget³. The total energy produced to date in FY19 is 25,051 MWh; 15% above budget³. The total savings and revenue² to date in FY19 (actuals through December¹) is \$1,601,724; 32% above budget³. The savings and revenue value does not include RPS REC revenue (see next page).



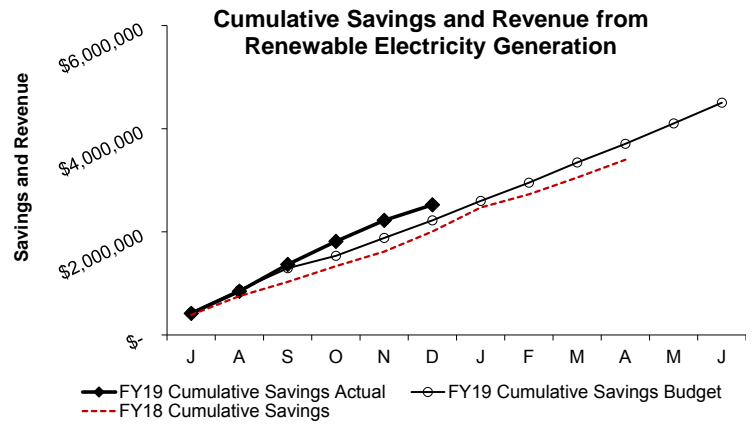
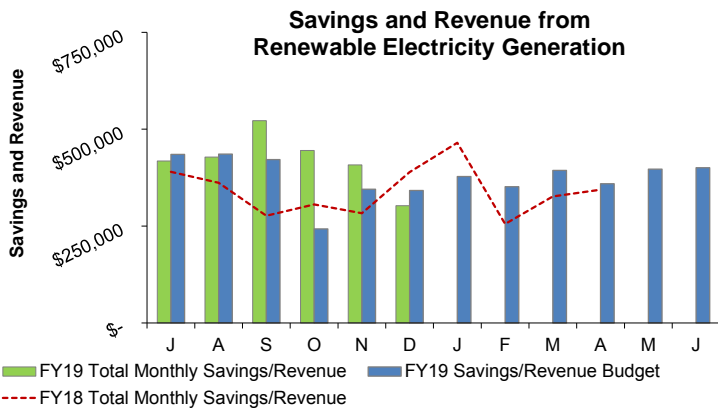
In the first 8 months of FY19, MWRA's electricity generation by renewable resources totaled 37,543 MWh. MWRA's total electricity usage was approximately 135,345 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site 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 8 months of FY19, green power generation represented approximately 28% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.



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

Renewable Electricity Generation: Savings and Revenue

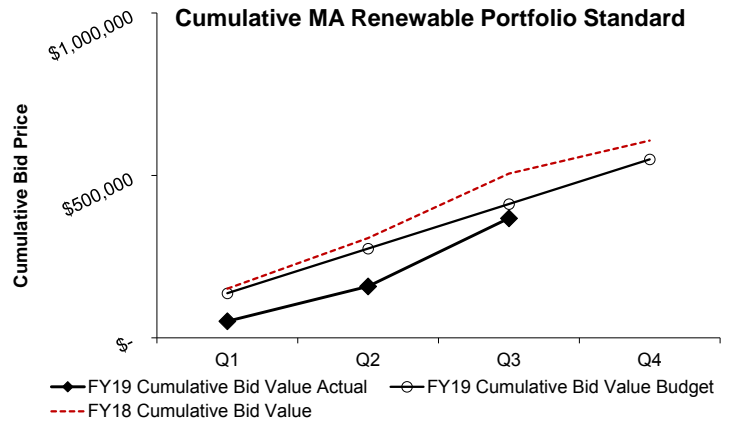
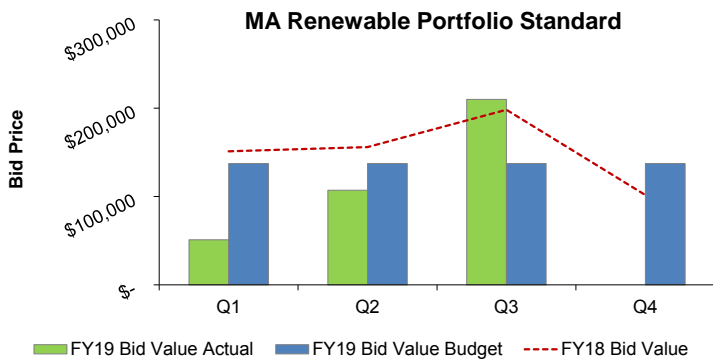
3rd Quarter - FY19



Savings and revenue from MWRA renewable electricity generation in the first half of FY19 (actuals only through December¹) is \$2,524,017; which is 14% above budget³.

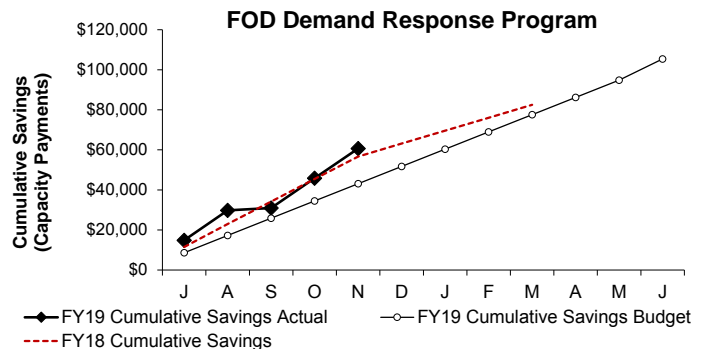
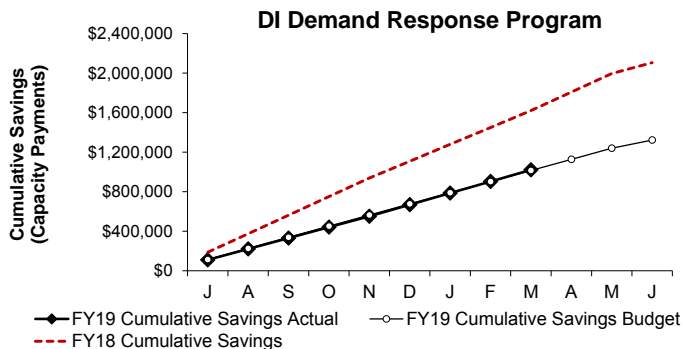
Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).

The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 3rd Quarter¹ from MWRA's Class 1, Class 2, and Solar REC renewable energy assets; 8,319 Q3 CY2018 Class 1 Renewable Energy Certificates (RECs), 5,031 Q3 CY2018 Class 2 RECs, and 95 Q3 CY2018 Solar RECs (SRECs) were sold for a total value of \$209,943 RPS revenue; which is 53% above budget³ for the Quarter. This is mainly due to Class 2 REC production being 87% over budget for the Quarter.

REC values reflect the bid value on the date that bids are accepted. Cumulative bid values reflects the total value of bids received to date.

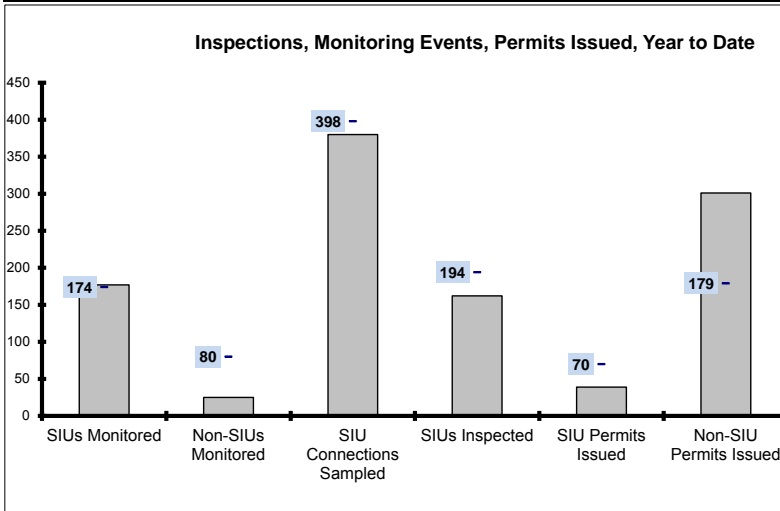


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY19 Cumulative savings (Capacity Payments only) total \$1,021,522 for Deer Island through March and \$60,684 for FOD through November¹.

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

Toxic Reduction and Control

3rd Quarter - FY19



EPA Required SIU Monitoring Events for FY19: 174
YTD : **177**

Required Non-SIU Monitoring Events for FY19: 80
YTD : **25**

SIU Connections to be Sampled For FY19: 398
YTD: **380**

EPA Required SIU Inspections for FY19: 194
YTD: **162**

SIU Permits due to Expire In FY19: 70
YTD: **39**

Non-SIU Permits due to Expire for FY19: 179
YTD: **301**

Significant Industrial Users (SIUs) are MWRA's highest priority industries due to their flow, type of industry, and/or their potential to violate limits. SIUs are defined by EPA and require a greater amount of oversight. EPA requires that all SIUs *with flow* be monitored at least once during the fiscal year. The "SIU Monitored" data above, reflects the number of industries monitored; however, many of these industries have more than one sampling point and the "SIU Connections Sampled" data reflect samples taken from multiple sampling locations at these industries.

During the compilation of monitoring events for March, an error was identified. Samples collected by two sample associates were not showing in TRAC's reports; as a result, monitoring events for this fiscal year have been under reported. This error has been corrected for the third quarter. TRAC has completed almost all of its EPA required SIU monitoring events and connections. TRAC is focusing on completing the required non-SIU monitoring events during the last quarter of the fiscal year, as only about one third of those events have been completed.

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.

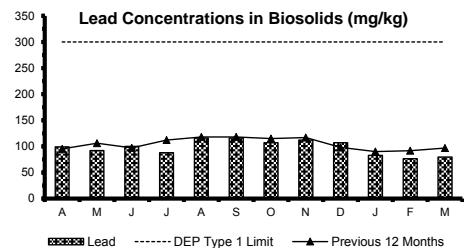
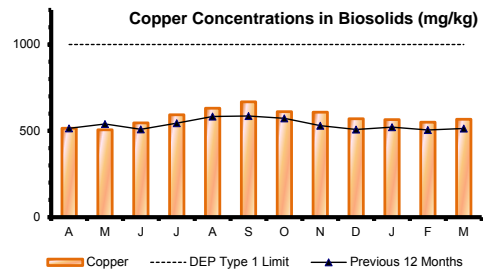
| | Number of Days to Issue a Permit | | | | | | Permits Issued | |
|-------|----------------------------------|---------|------------|---------|-------------|---------|----------------|---------|
| | 0 to 120 | | 121 to 180 | | 181 or more | | SIU | Non-SIU |
| | SIU | Non-SIU | SIU | Non-SIU | SIU | 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 | 3 | 16 | 0 | 7 | 0 | 14 | 3 | 37 |
| Nov | 2 | 10 | 0 | 2 | 0 | 7 | 2 | 19 |
| Dec | 5 | 4 | 0 | 4 | 0 | 2 | 5 | 10 |
| Jan | 3 | 12 | 0 | 3 | 0 | 3 | 3 | 18 |
| Feb | 9 | 18 | 0 | 2 | 0 | 4 | 9 | 24 |
| Mar | 9 | 24 | 0 | 2 | 0 | 6 | 9 | 32 |
| Apr | | | | | | | | |
| May | | | | | | | | |
| Jun | | | | | | | | |
| % YTD | 92% | 77% | 3% | 8% | 5% | 15% | 39 | 301 |

In the 3rd Quarter of FY19, 95 permits were issued, 21 of which were SIUs. All twenty-one of the SIU permits were issued within 120 days. 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. TRAC anticipates that it will meet both its target for SIU permit issuance and that the remaining SIU permits will be ready for issuance within the 120 day timeframe.

79% of all permits issued during the third quarter were issued in the 120 day timeframe, 7% in the 120-180 days timeframe, and the remaining 14% after 180 days. The workflow issues resulting from staff turnover earlier in the fiscal year have been addressed and any future permit issuances exceeding 180 days should be attributable to circumstances out of the control of TRAC, such as: waiting for data from an industry, approval from the municipality in which the industry was operating or intended to operate, or the late payment of a permit fee.

Two SIU permits for the Clinton Sewerage Service area were issued during the third quarter of this fiscal year, both within the 90 day timeframe.

Although TRAC has only issued 39 SIU permits to date (56% of fiscal year goal), it is anticipated that TRAC will meet this goal. A majority of the SIU permits expiring in FY19 are expiring at the end of the fiscal year.



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

Copper and lead levels remain relatively constant, below the DEP Type 1 Limit, and within the range of values over the past several years. A discussion of molybdenum concentrations in biosolids is included in the Deer Island Residuals Pellet discussion.

Field Operations Highlights

3rd Quarter – FY19

Western Water Operations and Maintenance

Carroll Water Treatment: Staff completed the half plant operations, flushed the upper MetroWest tunnel system, and placed the treatment process in full plant operations in preparation.

Wachusett Reservoir and Lower Gatehouse: Management Staff, along with Reservoir Operations Staff, operated the crest gate to control the reservoir elevation. Staff worked with Engineering and Consultants to address concerns within the piping and structure of the lower gatehouse and Bastion Buildings. Staff installed a temporary fence along River Road access to decrease travel to one lane.

Reservoir Operations: Staff continued to monitor the seep discovered at Schencks Pond Dam in January. Response included lowering Schencks operating band by closing transfers and adjusting outlet releases. Staff also responded to a new seepage condition discovered at Chestnut Hill Reservoir in March. Response included lowering operating band, and lowering pool. Seep *in situ* controls were placed and water quality was monitored

Metro Water Operations and Maintenance

Valve Program Section 57 was refilled, flushed, and disinfected after the completion of the internal inspection in December. The disinfection was performed by segmenting the water main in half using isolation valves. The eastern portion of the main was returned to service in late January, and the western portion of the main returned to service in February. Valve operations were provided for in-house, CIP, and 8M permit work. Also included was the isolation of Section 29 and the 60" Spot Pond bypass line to support the Section 110 CIP Contract. The isolation of the Spot Pond bypass line required that the Spot Pond covered storage tanks be placed in float operation as opposed to normal flow-through operation. Service in the Northern Extra Low Service are remained normally through the isolation and following system reconfiguration. Activation of the Spot Pond Bypass Line allowed for the return of the Northern Extra Low Service system to its normal configuration and the flow-through operation of the Spot Pond covered storage tanks in mid-March.

Water Pipeline Program: Six leaks were repaired during this quarter. Staff excavated a suspected leak on Section 80 near Recreation Road in Weston. The leak was found on the insulating flange and is covered under warranty. The contractor mobilized and repaired the leak. Six valves were replaced or installed, and blow-off retrofit work was completed on two BOVs at the Cassidy Field at Cleveland Circle. Leak detection was performed on 27.3 miles of MWRA water main, and community assistance was provided to Arlington, Alewife Brook Pump Station (MWRA wastewater), Chelsea, Framingham, Lynn, Marlboro, Medford, Milton, Newton, Revere, Saugus, Somerville, Swampscott, and Wellesley.

Northern Extra High Service/Park Circle/Turkey Hill Tanks: The Turkey Hill Tanks are being painted this season. To provide service during construction, the Park Circle Tank (normally inactive) has been reactivated. Piping and valve work was performed at Park Circle during the first part of this quarter to prepare the tank to enter service. The Park Circle Tank was filled, disinfected, sampled, and placed into service on February 20. Turkey Hill Tank was isolated, drained, and turned over to the contractor for painting in March. Activation of the Park Circle Tank maintains two active tanks in the Northern Extra High Service area as the Walnut Hill Tank remains in service. The Park Circle Tank will remain in service until the Turkey Hill Tank is returned to service with the completion of its painting. Northern Extra High service remains normal.

Operations Engineering

Control System Upgrades PLC: Operations Engineering continues to work to upgrade Control Systems PLC at the Carroll Water Treatment Plant, the Brutsch Treatment Plant, Boston 19 and Framingham. The manufacturer no longer supports these systems and upgrades are necessary. Arcadis was awarded the contract for the upgrade design at the Carroll Water Treatment Plant. They completed an extensive site evaluation in March.

Community Emergency Response Training Program: Emergency response training required by DEP, is being provided by MWRA staff and is being delivered to local staff from the MWRA water communities and MWRA.

Community Water Quality Meetings: Operations Engineering, Planning and Water Quality Assurance meet with the communities to discuss current DEP policies, water quality, hydraulics, lead and MWRA loan programs. This quarter we met with the City of Revere.

Wastewater Operations & Maintenance

Wastewater Operations

Remote Headworks Upgrades: Wastewater Operations Staff continues to work with Engineering & Construction Staff and the Contractor on the Remote Headworks Upgrades Project. Operations Staff attended biweekly construction coordination meetings with Construction & Engineering Staff, the Contractor and the Consultants. Channel #1 was turned over to the contractor for rehabilitation at the beginning of January 2018. Operations Staff attended multiple review meetings in FY19 3rd Quarter, including reviews on the grit pod cut-in plan and the odor control system. Staff attended a Channel #1 Startup Meeting on 03/15/19 and a Channel #1 Punch List Walk-Through Meeting at the facility on 03/27/19. Vendor training for Channel #1 started in January 2019 and continued throughout the quarter. The installation of the #1 Influent Gate started in January 2019 and was completed in March.

Alewife Brook Pump Station Rehabilitation-Contract: Wastewater Operations Staff is working with Construction Staff and the Contractor for this project. The bypass pumping system was placed in service and the facility pumps were taken out of service on 01/02/18. Operations Staff attended the monthly coordination meeting onsite at the facility. Operations staffed the facility when the facility pumps were placed in service and the bypass pumping system was decommissioned in February 2019. Staff also remotely monitored the operation of the bypass pumping system during the rain events at the beginning of the quarter. Facility training was ongoing in March 2019.

DeLauri Pump Station Replacement of Bar Screens and Security Upgrades: Wastewater Operations Staff continues to work with Engineering & Construction Staff on this project. Channel #1 was turned over to the contractor for screen replacement in October 2018. Operations Staff attended the biweekly coordination meetings onsite at the facility. The 14-day Wet Test for Screen #1 was completed successfully in January and the 14-day Wet Test for Screen #2 was completed successfully in March.

- SOP Development for Wastewater Operations: Operations Staff continued to work with the Process Control Staff to develop "simple" SOPs for Wastewater Operators during FY19 3rd Quarter.
-
- Nut Island Isolation Testing: Operations Staff worked with the Process Control Staff to develop procedures to test the isolation of Nut Island. The isolation testing is scheduled to take place in May 2019.
-
- Braintree Weymouth Pump Station Rehabilitation Project-Contract #7435: Staff attended monthly progress meetings throughout the quarter. Operations Staff attended an onsite meeting with Engineering & Construction Staff and the Consultant on 01/10/19 to review the project scope. Operations Staff went to the Greater Lawrence Sanitary District and the Nashua, NH WWTP with the Engineering Staff and the Consultant (Wright Pierce) inspected screens and screening presses that may be proposed for this project on 02/27/19.
-
- Nut Island Safety Audit: Operations Staff took part in a voluntary safety audit of Nut Island Headworks with the Massachusetts Department of Labor Standards (DLS) and Authority Safety Staff. Overall, the DLS Representative thought the facility was in great condition and recommended a few minor corrective actions. Operations Staff reviewed the DLS Audit report with the Manager of Occupational Health & Safety on 02/13/19 to ensure all action items have been addressed.
-
- Shaft Inspection Project: Operations Staff attended meetings on 02/13/19 and 02/25/19 to review the proposed shutdown plan for inspecting the effluent shaft at the Chelsea Creek Headworks during low flow conditions (early a.m. hours).
-
- Flood Protection Meeting with FM Global: Operations Staff attended a meeting on 02/15/19 with MWRA's insurance provider, FM Global, to review the flood protection program for MWRA facilities.

Field Operations Highlights

3rd Quarter – FY19

North Dorchester Bay Storage Tunnel: Operations Staff attended a meeting with internal staff and AECOM to plan the internal inspection of the North Dorchester Bay Storage Tunnel on 03/05/19.

Union Park SCADA Security: Operations Staff met with the security company that is reviewing SCADA security at the Union Park CSO Facility with Woodard & Curran on 03/29/19.

Metro Equipment and Facility Maintenance

Chelsea Maintenance Facility: HVAC Technicians installed a split A/C unit in the office area of the Chelsea Maintenance Facility.

Prison Point CSO and Gillis Pump Station: Mechanics replaced the engine start batteries for the emergency generators.

Ward Street Headworks: Mechanics repaired the rake for the #2 Screen.

IPS and Nut Island: Machinists fabricated spare shafts for the facility grit and screening conveyors.

Lexington Street Pump Station: MWRA electricians replaced and repaired all emergency lights at the Lexington Street Pump Station.

DeLauri Pump Station: MWRA machinist and welders fabricated and installed a safety screen for the #1 Screen.

New Neponset Pump Station: MWRA electrician, machinist and mechanic install and laser aligned a new motor for the #2 Pumping Unit.

Chelsea Administration Building: MWRA plumber working with wastewater pipeline staff unclogged the main drain for the Administration Building.

Chelsea Maintenance Building: Electrical and Plumbing Crews built a new welding area in the machine shop.

Nut Island: MWRA electricians installed a new ultra sonic level transmitter to control the operation of the dewatering pumps. This work required extensive conduit runs, hole coring and wire pulls.

Hyde Park Pump Station: MWRA HVAC specialists installed a new split A/C unit in the Facility Control Room.

Nut Island: MWRA mechanics replaced the #4 Scour Pump.

Prison Point: MWRA plumbers rehabilitated the #2 Tank washdown piping. This work consisted of removal of the existing piping and hangers to install new grooved stainless steel piping and pipe hangers.

Metering

Community Assistance: On 22 separate occasions, staff contacted member communities to inform them of increased water usage possibly indicative of underground leakage.

TRAC

During this quarter, TRAC issued 3 Cease and Desist Orders, 1 Demand Letter, 2 Enforcement Orders, 16 Notices of Noncompliance, 65 Notices of Violation, 1 Notice of Proposed Permit Suspension, 4 Return to Permit Letters, and 3 Penalty Assessment Notices.

During this quarter, TRAC issued a total of 53 MWRA 8(m) Permits allowing companies to work within an easement or other property interest held by the Authority. Permits issued this quarter were issued in an average of 88 days from the date the application for 8(m) Permit was received by the MWRA.

TRAC Staff conducted 61 Annual SIU Inspections and 310 other inspections. Annual SIU Inspections are required under TRAC's EPA-approved Industrial Pretreatment Program. Other inspections include inspections for enforcement, permit renewal, NonSIU, followup, temporary construction dewatering sites, group/combined permit audits, out-of-business facility reviews, and surveys.

TRAC monitored the septage receiving sites a total of 33 times. Staff conducted 287 inspections of existing gasoline/oil separators, 21 new

construction gasoline/oil separators and 2 septage hauler permit-related inspections. 95 MWRA Sewer Use Discharge Permits (Permits) were issued and/or renewed to its sewer users.

Two Permits were issued to industries located in Clinton and one Permit was issued to an industry located in Lancaster. These permits were issued within 90 days of the expiration date of the company's previous permit.

TRAC issued 36 annual permits to municipalities in the Authority's sewerage service area.

Environmental Quality-Water

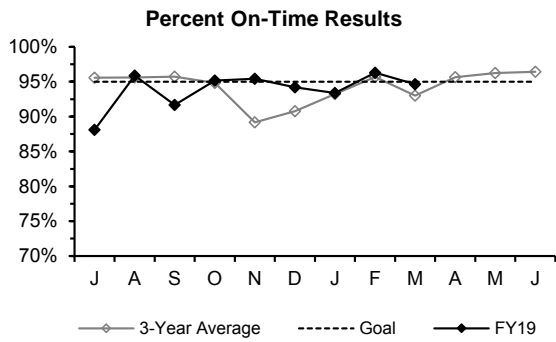
- Planning began for MWRA's biennial drinking water sampling training. EnQual and Department of Lab Services staff will train community samplers from MWRA's fully and partially served communities. Several sessions will be offered discussing chlorine residual testing, bacteriological sampling technique, and sample site investigations. DEP Drinking Water Program staff will also participate.
- ENQUAL Staff, in conjunction with other departments, met with DEP and EPA on March 12th. Status updates were provided on source and finished water quality and coliform trends. Other topics included changes to the CWTP UV action spectra correction factor and MWRA's storage tank cleaning or painting projects.

Staff trained Western Operations Staff for fuel oil delivery acceptance at the Southborough, Norumbega and Weston Facilities.

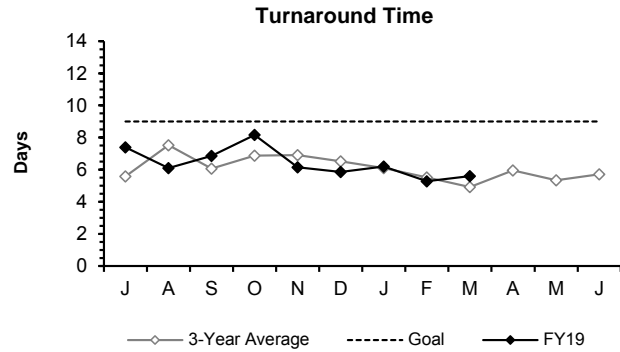
Environmental Quality-Wastewater

- Ambient Monitoring: Analysis of samples from 2018 monitoring was completed and the remaining Contingency Plan Threshold Tests were run (there were no exceedances). Analysis of the results from 2018 is underway, with an internal meeting scheduled for early April to evaluate the results. A meeting of EPA and DEP's Outfall Monitoring Science Advisory Panel is scheduled for April. This meeting will follow up on the November 2018 Ambient Monitoring Review Workshop and establish a framework for modifying MWRA's permit-attached Ambient Monitoring Plan. Field monitoring for 2019 has begun as has sample analysis.
- Harbor/CSO Monitoring: CSO receiving water monitoring in support of the water quality standards variance and the CSO assessment continued with wintertime shoreline sampling. No storm sampling was conducted. Biweekly harbor-wide monitoring continued.
- Permitting and Compliance Reporting: Completed routine monthly/quarterly discharge monitoring reporting. Submitted the annual O&M report/status sheets of key O&M indicators and the annual Nitrogen Removal Technologies Report, both as required by the Deer Island permit, reports on Deer Island and Clinton residuals, as well as a permit-required status report on optimization of the Phosphorus Removal Facility at Clinton. The O&M report for the Clinton collection system was also submitted. Staff assisted in the revision of the Clinton Operations and Maintenance Manual with Clinton and DITP Staff, as well as commenting specifically on the landfill portion of the manual. Posted near-real-time web updates for wet weather CSO discharges.
- Coordination with Other MWRA Departments: Continued to work with Engineering & Construction and the DCOO to address regulatory agency questions and concerns about the receiving water quality analysis portion of the CSO Post-Construction Monitoring & Performance Assessment Project. Worked with Laboratory Services to add a sampling location in the Charles to better characterize potential CSO impacts on water quality.
- Cooperation with Other Agencies: Provided letters of support for two UMass research proposals. Staff attended the NEWEA Annual Conference in Boston, as well as a MCWRS Workshop on PFAS/PFOA and CSO notification. Provided data to researchers at UMass, Dartmouth Division of Marine Fisheries, and a local yacht club interested in water quality. Participated in regional harmful algal bloom meeting with researchers and shell fishing regulators from Maine to Rhode Island to evaluate the results of 2018 studies and discuss research and monitoring plans for 2019. Participated in a DEP workshop on water quality standard updates.

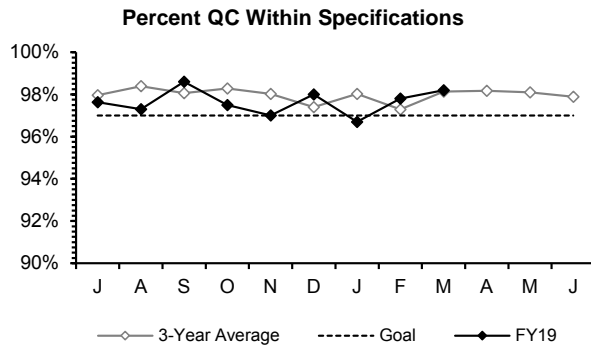
Laboratory Services 3rd Quarter - FY19



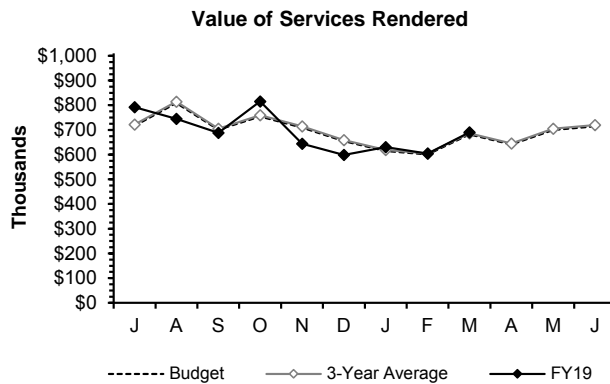
The Percent On-Time measurement was at or near the 95% goal.



Turnaround Time was faster than the 9-day goal.



Percent of QC tests meeting specifications met the 97% in-house goal.



Value of Services Rendered met the seasonally adjusted budget projection.

Highlights:

DEP Reporting:

MWRA Department of Laboratory Services completed our 10th year of electronic reporting of drinking water testing results to DEP via their eDEP interface. DEP recently ran a count and indicated that we have submitted >1,050,000 individual results in that time. We are the most active lab entity using the eDEP reporting system.

Proficiency Testing:

Passed >99% of annual chemistry proficiency tests required by DEP in our first round of testing for 2019 (378 out of 380 tests passed).

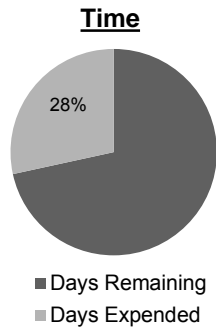
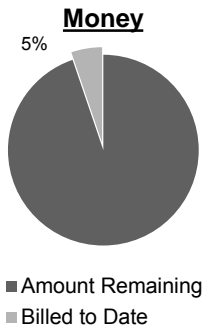
QA:

The Central Laboratory was accredited under the National Environmental Laboratory Accreditation Program by New Hampshire Department of Environmental Services. This is one part of a process required to allow our fecal coliform results for fertilizer pellets to be accepted by the state of Pennsylvania.

CONSTRUCTION PROGRAMS

Projects In Construction

3rd Quarter – FY19

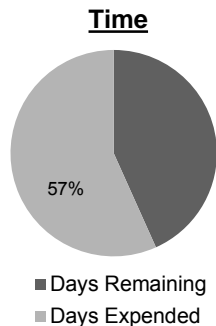
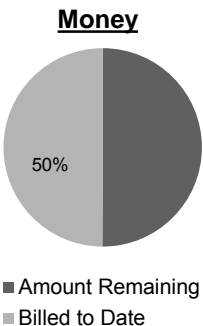


Southern Extra High Pipeline Section 111

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

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

Status and Issues: As of March the Contractor installed erosion control on Rustcraft Road and set up Mobile Message Units for traffic information.

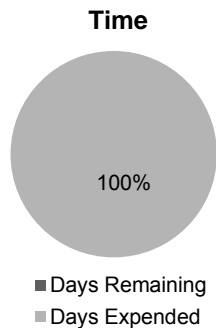
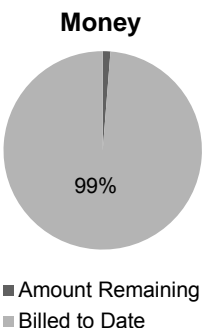


Chelsea Creek Headworks Upgrade

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

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

Status and Issues: As of March, the Contractor conducted Operational Readiness Testing and vendor training and Application Software Operational Readiness Testing for Channel 1. The Operators' SCADA and Facility Training for Channel 1 has been completed.

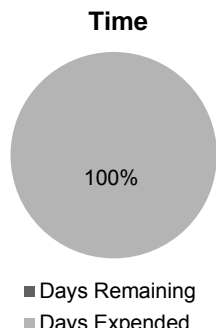
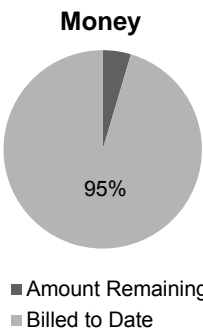


Wachusett Aqueduct Pumping Station

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: Substantial completion was declared during February. The Contractor continues to work on punch list items.



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.

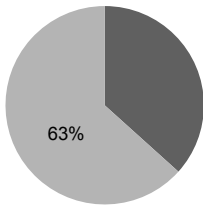
Notice to Proceed: 29-Jan-2016 **Contract Completion:** 14-Dec-2018

Status and Issues: As of March, the Contractor continued submitting shop drawings (O&Ms & 1080s), and completed the removal of the bypass pumping system. The subcontractors have continued demobilizing from the site.

Projects In Construction

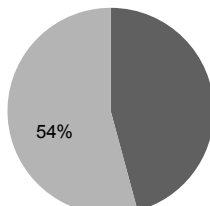
3rd Quarter – FY19

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

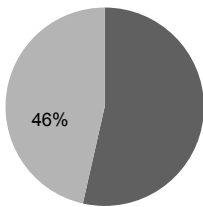
NIH Section 110 - Stoneham

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

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

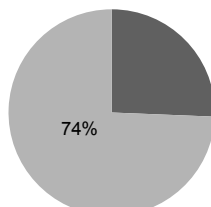
Status and Issues: As of March, the Contractor installed 225-LF of 48" DIP water main along Pond Street. They completed the Gillis Pump Station pipe installation and completed various structure work along the pipeline.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

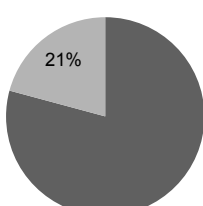
Winthrop Terminal VFD and Motor

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

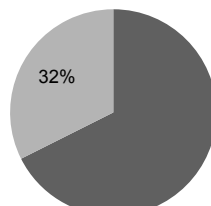
Status and Issues: VFD/Motor No. 2 commission testing is on-going.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Gravity Thickener Rehabilitation

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

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

Status and Issues: As of March, the Contractor completed the installation of the FRP cover and completed the installation of approximately 90% of the Gravity Thickener #1 mechanism.

CSO CONTROL PROGRAM

3rd Quarter – FY19

All 35 projects in the Long-Term CSO Control Plan were complete as of December 2015 in compliance with Schedule Seven. Of the \$910.1 million budget in the FY19 CIP for the CSO Control Program, approximately \$6.7 million remain to be spent. On April 17, 2019, the MWRA Board of Directors authorized Amendment 1 to CSO Contract 7572 in the amount of \$931,490 (described below), increasing the remaining amount to be spent on CSO control to approximately \$7.6 million.

| Project/Item | Status as of March 31, 2019 |
|---|---|
| <p>BWSC Dorchester Interceptor Inflow Removal</p> | <p>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.</p> <p>BWSC recently completed sewer system evaluations and is preparing a construction contract for inflow removal that it plans to submit to MWRA for eligibility approval this fall.</p> |
| <p>City of Cambridge Memorandum of Understanding and Financial Assistance Agreement</p> | <p>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.</p> <p>Cambridge continues to support ongoing MWRA review of Cambridge’s completed construction contracts towards final eligibility certification by June 30, 2019.</p> |
| <p>MWRA CSO Performance Assessment – Contract 7572</p> | <p>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. MWRA issued the first of five planned progress reports on November 30, 2018 and plans to issue the second progress report in April 2019. The progress reports present the analyses of rainfall and CSO meter data collected in the periods April 15 - June 30, 2018 and July 1 – December 31, 2018, respectively. The remaining progress reports will cover subsequent six-month data collection periods, as well as describe hydraulic model related activities. AECOM is making progress with the recalibration and verification of MWRA’s hydraulic model using CSO and sewer system data collected in 2018. Model recalibration and verification will bring the meter results and model predictions closer together to gain assurance of the accuracy of the model in predicting CSO discharges and verifying attainment of the Long Term Control Plan’s typical year levels of CSO control.</p> <p>AECOM is also conducting investigations at several outfalls where metered CSO discharges differ from historical model predictions.</p> <p>[On April 17, 2019, the MWRA Board of Directors approved Amendment 1 to Contract 7572 in the amount of \$931,470. The amendment adds receiving water quality modeling of the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River in lieu of water quality data statistical analyses; extends temporary CSO metering to June 2020 at 36 CSO regulators; and provides for the eventual transfer of the temporary meters at regulators tributary to MWRA CSO outfalls for MWRA’s long-term use in complying with expected CSO public notification requirements.]</p> <p>MWRA staff continue to collect water quality data in CSO affected waters, with emphasis in the Charles River and Alewife Brook/Upper Mystic River, in part to support AECOM’s receiving water modeling.</p> |

CIP Expenditures

3rd Quarter – FY19

| FY19 Capital Improvement Program Expenditure Variances through March by Program (\$ in thousands) | | | | |
|---|------------------------------|------------------------------|--------------------|---------------------|
| Program | FY19 Budget Through March | FY19 Actual Through March | Variance Amount | Variance Percent |
| Wastewater | 56,975 | 56,860 | (115) | -0% |
| Waterworks | 49,317 | 55,968 | 6,651 | 14% |
| Business and Operations Support | 4,941 | 1,749 | (3,192) | -65% |
| Total | \$111,233 | \$114,576 | \$3,343 | 3% |

Project underspending within Wastewater was due to delays in Channel 1 work, odor control equipment delivery, and redesign of the lower roofs for the Chelsea Creek Headworks Upgrade Construction, DI HVAC Equipment Replacement schedule change, delay in city of Somerville design and construction awards for the Somerville Marginal In-System Storage, motor commission testing problem for the Winthrop Terminal Facility Variable Frequency Drives Replacements, delay in the notice to proceed for the Residuals Electrical and Mechanical contracts due to a combined scope of services, temporary meter work and police details were less than anticipated for the Metering Study/Design, and timing of final work for the Alewife Brook Pump Station. This was partially offset by greater than anticipated community requests for grants and loans, progress on Deer Island Gravity Thickener Rehabilitation, and FY18 work completed in FY19 for the Reading Extension Sewer contract. Project overspending in Waterworks was due to greater than anticipated requests for community loans, progress for the Southern Extra High Section 111 Construction 2, Section 56 Pipe Demolition, Southern Extra High Section 111 Construction 2, Northern Intermediate High Section 89 & 29 construction Phase 1C, Wachusett Aqueduct Pump Station, timing of Watershed Land purchases, and scheduled FY18 work invoiced in FY19 for the Rosemary Brook Building Repair. This was partially offset by SEH Section 111 Construction 3 delay in notice-to-proceed and issue with MBTA crossing, Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budget and behind schedule due to additional structural repairs and antenna relocation, schedule delay for the Maintenance Building/Garage Washbay/Storage Building contract, delay in CP3 Sections 23, 24, 47 Design/CA/RI due to utility relocations, and Peabody Pipeline Design/ESDC due to project being terminated.

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 3/30/2019 | \$50.8 million |
| Unused capacity under the debt cap: | \$1.48 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: | \$128 million |
| Commercial paper capacity / Revolving Loan | \$350 million |
| Budgeted FY19 Cash Flow Expectancy*: | \$188 million |

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

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

Sample Site: Wachusett Reservoir

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

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

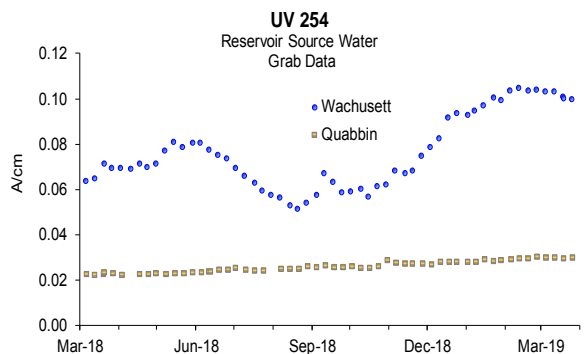
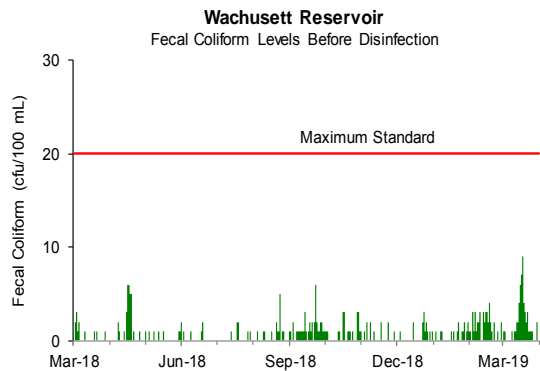
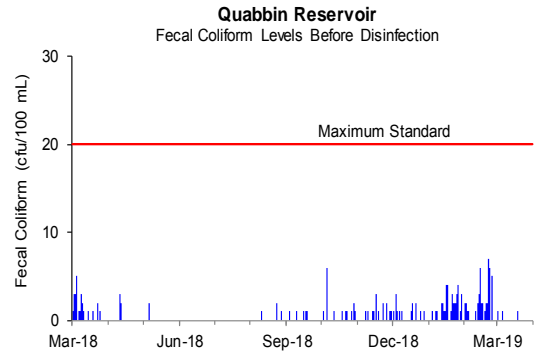
All samples collected during the 3rd Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.030 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.100 A/cm.



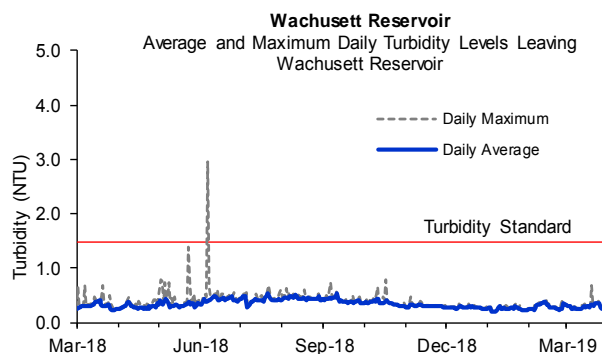
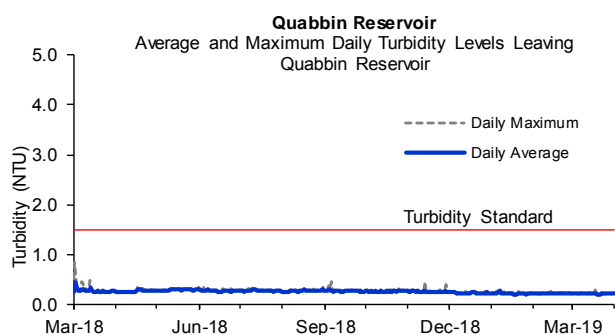
Source Water – Turbidity

3rd 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.

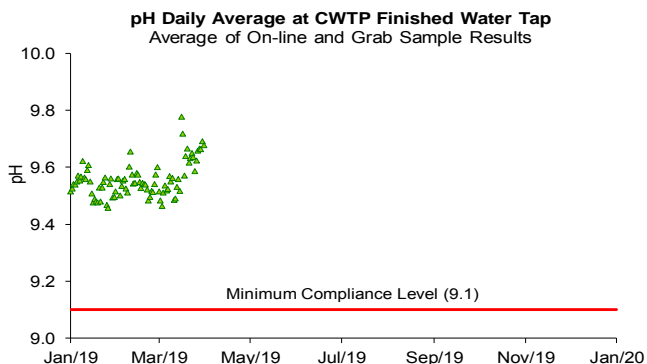
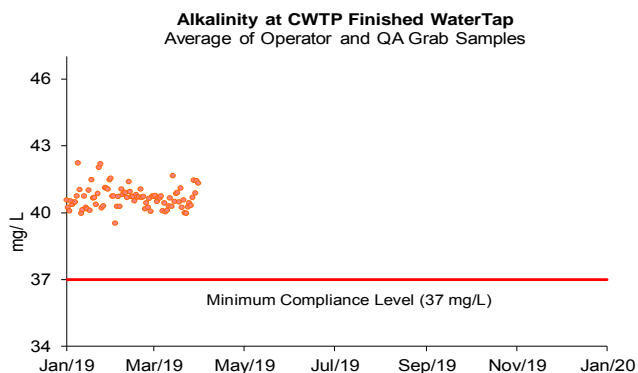


Treated Water – pH and Alkalinity Compliance

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 March 13 and 14, 2019. Distribution system sample pH ranged from 9.4 to 9.7 and alkalinity ranged from 39 to 42 mg/L. No sample results were below DEP limits for this quarter.



Treated Water – Disinfection Effectiveness

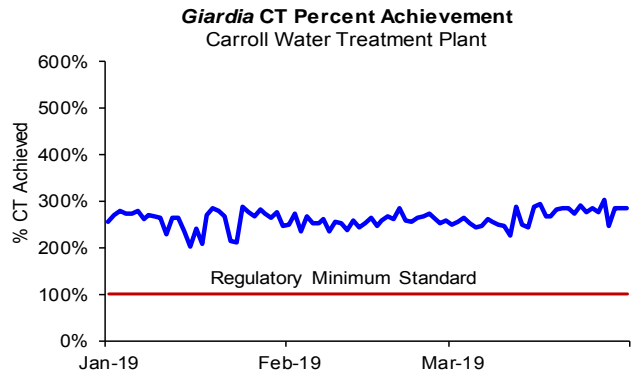
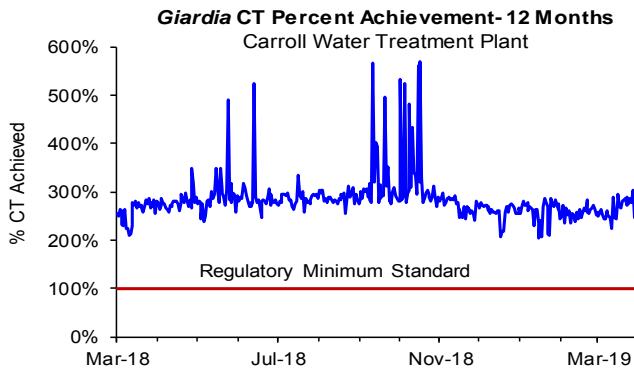
3rd Quarter – FY19

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.

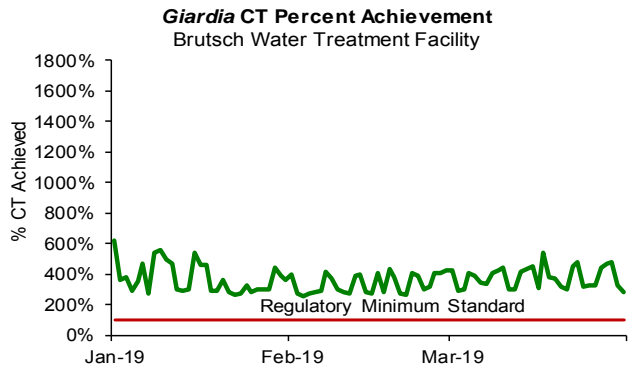
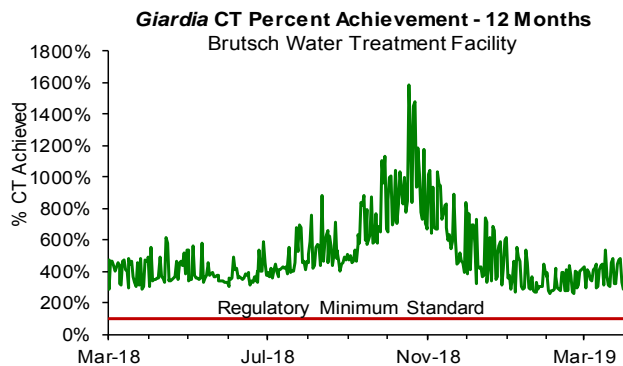
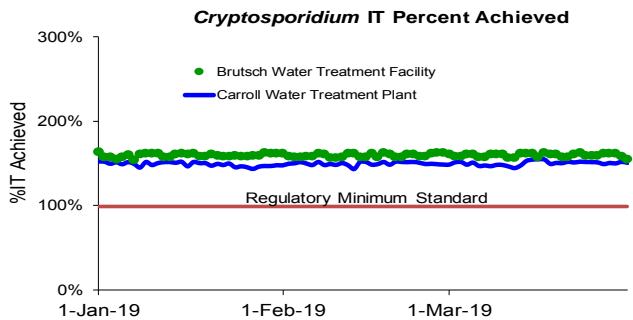
Wachusett Reservoir – MetroWest/Metro Boston Supply:

- Ozone dose at the CWTP varied between 2.6 to 3.0 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 2018 and continued through October 2018. Prior to and during WAPS testing, CWTP proactively increased the ozone dose and "CT achievement". This is visible in the top left graph.



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 1.5 to 1.6 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.



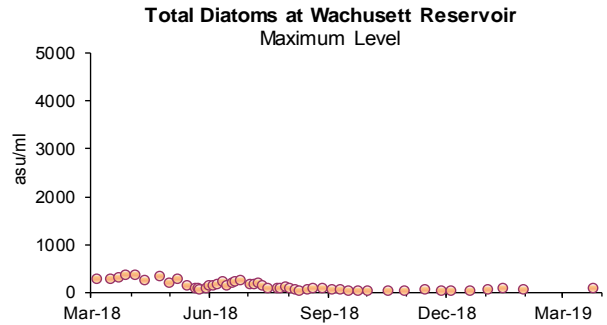
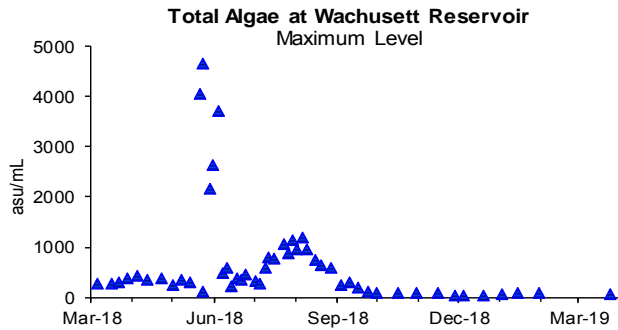
Source Water - Algae

3rd Quarter – 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 3rd Quarter, one complaint which may be related to algae was reported from a local water department.



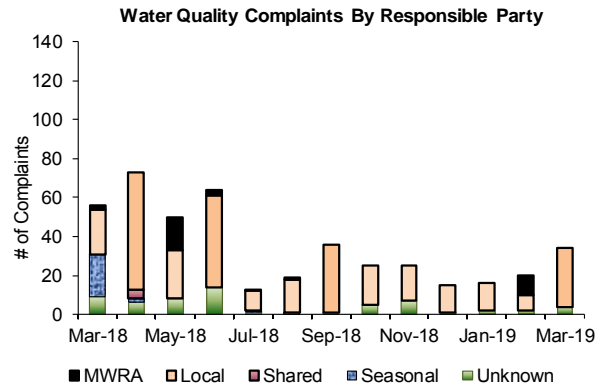
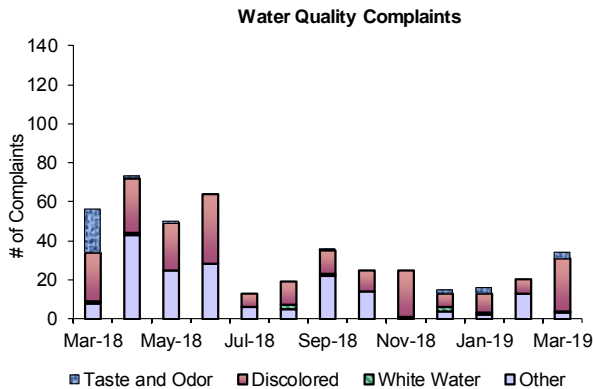
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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 70 complaints during the quarter compared to 120 complaints from 3rd Quarter of FY18. Of these complaints, 44 were for "discolored water", 6 were for "taste and odor", 2 were for "white water", and 18 were for "other". Of these complaints, 52 were local community issues, ten were MWRA related issues, and 8 were unknown in origin.

On February 15, Arlington reported 10 low pressure complaints when MWRA staff were in the area performing routine maintenance on a meter.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

3rd 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.

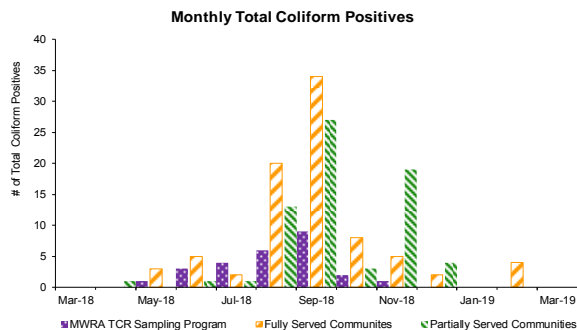
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

In the 3rd Quarter, 4 of the 6,221 community samples (0.06% system-wide) submitted to MWRA labs for analysis tested positive for total coliform (Milton, Southborough, Swampscott – February). None of the 1,888 Shared community/MWRA samples (0.00%) tested positive for total coliform. Only 0.2% of the Fully Served community samples had chlorine residuals lower than 0.2 mg/L for the quarter.

NOTES:

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



| | Total Coliform | | E.coli # Positive | Assessment Required |
|--|-----------------------------|------------------|-------------------|---------------------|
| | # Samples (b) | # (%) Positive | | |
| MWRA | MWRA Locations | 319 | 0 (0%) | 0 |
| | Shared Community/MWRA sites | 1569 | 0 (0%) | 0 |
| | Total: MWRA | 1888 | 0 (0%) | 0 |
| Fully Served | ARLINGTON | 169 | 0 (0%) | 0 |
| | BELMONT | 104 | 0 (0%) | 0 |
| | BOSTON | 765 | 0 (0%) | 0 |
| | BROOKLINE | 224 | 0 (0%) | 0 |
| | CHELSEA | 169 | 0 (0%) | 0 |
| | DEER ISLAND | 52 | 0 (0%) | 0 |
| | EVERETT | 169 | 0 (0%) | 0 |
| | FRAMINGHAM | 237 | 0 (0%) | 0 |
| | LEXINGTON | 108 | 0 (0%) | 0 |
| | LYNNFIELD | 18 | 0 (0%) | 0 |
| | MALDEN | 216 | 0 (0%) | 0 |
| | MARBLEHEAD | 72 | 0 (0%) | 0 |
| | MEDFORD | 221 | 0 (0%) | 0 |
| | MELROSE | 117 | 0 (0%) | 0 |
| | MILTON | 108 | 2 (1.85%) | 0 |
| | NAHANT | 30 | 0 (0%) | 0 |
| | NEWTON | 276 | 0 (0%) | 0 |
| | NORTHBOROUGH | 48 | 0 (0%) | 0 |
| | NORWOOD | 99 | 0 (0%) | 0 |
| | QUINCY | 338 | 0 (0%) | 0 |
| | READING | 130 | 0 (0%) | 0 |
| | REVERE | 195 | 0 (0%) | 0 |
| | SAUGUS | 104 | 0 (0%) | 0 |
| | SOMERVILLE | 273 | 0 (0%) | 0 |
| | SOUTHBOROUGH | 33 | 1 (3.03%) | 0 |
| | STONEHAM | 91 | 0 (0%) | 0 |
| | SWAMPSCOTT | 57 | 1 (1.75%) | 0 |
| WALTHAM | 216 | 0 (0%) | 0 | |
| WATERTOWN | 130 | 0 (0%) | 0 | |
| WESTON | 45 | 0 (0%) | 0 | |
| WINTHROP | 72 | 0 (0%) | 0 | |
| Total: Fully Served | 4886 | 3 (0.08%) | | |
| Partially Served | BEDFORD | 57 | 0 (0%) | 0 |
| | CANTON | 87 | 0 (0%) | 0 |
| | HANSCOM AFB | 28 | 0 (0%) | 0 |
| | MARLBOROUGH | 126 | 0 (0%) | 0 |
| | NEEDHAM | 123 | 0 (0%) | 0 |
| | PEABODY | 208 | 0 (0%) | 0 |
| | WAKEFIELD | 159 | 0 (0%) | 0 |
| | WELLESLEY | 114 | 0 (0%) | 0 |
| | WILMINGTON | 87 | 0 (0%) | 0 |
| | WINCHESTER | 91 | 0 (0%) | 0 |
| | WOBURN | 195 | 0 (0%) | 0 |
| | SOUTH HADLEY FD1 | 60 | 0 (0%) | 0 |
| Total: CVA & Partially Served | 1335 | 0 (0.00%) | | |
| Total: Community Samples | 6221 | 4 (0.06%) | | |

Chlorine Residuals in Fully Served Communities

| | 2018 | | | | | | | | | | | 2019 | | |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | |
| % <0.1 | 0.1 | 0.0 | 0.2 | 0.0 | 0.3 | 0.7 | 0.5 | 0.7 | 0.7 | 0.2 | 0.3 | 0.2 | 0.1 | |
| % <0.2 | 0.2 | 0.3 | 0.2 | 0.4 | 0.5 | 1.0 | 1.5 | 1.9 | 1.6 | 1.0 | 0.3 | 0.2 | 0.1 | |
| % <0.5 | 0.8 | 0.7 | 0.4 | 0.7 | 1.5 | 3.4 | 4.6 | 5.8 | 3.8 | 2.3 | 1.1 | 0.6 | 0.4 | |
| % <1.0 | 1.4 | 1.5 | 1.3 | 1.6 | 3.2 | 8.9 | 11.9 | 11.2 | 8.3 | 5.2 | 2.8 | 1.8 | 1.7 | |
| % >1.0 | 98.6 | 98.5 | 98.7 | 98.4 | 96.8 | 91.1 | 88.2 | 88.8 | 91.7 | 94.8 | 97.2 | 98.2 | 98.4 | |

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

3rd 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.

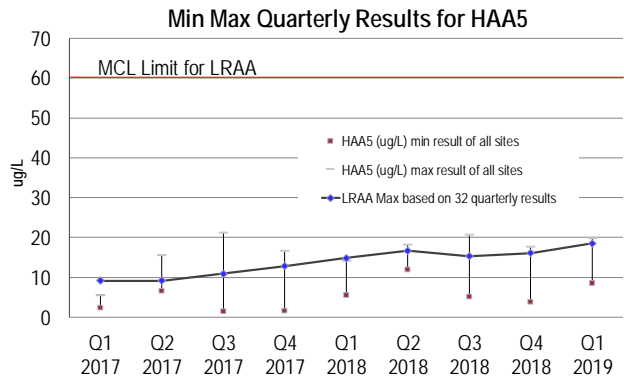
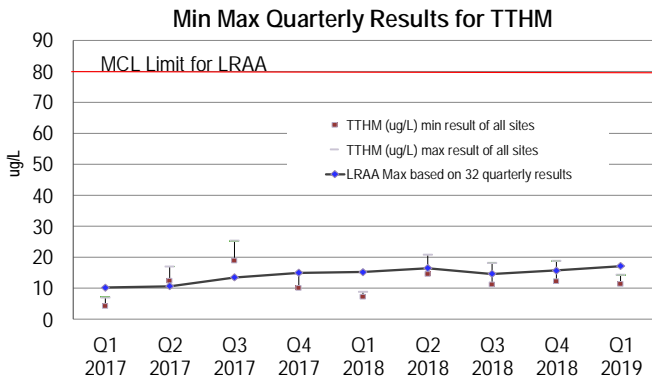
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

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).

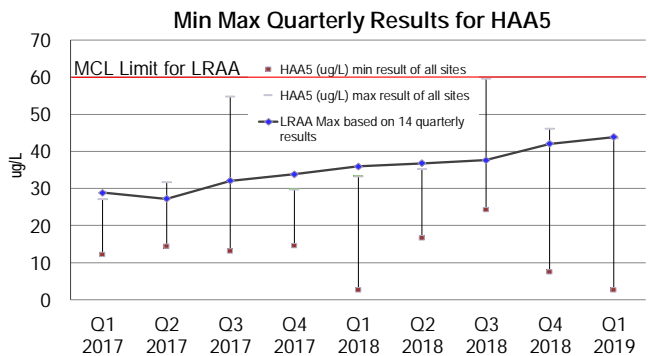
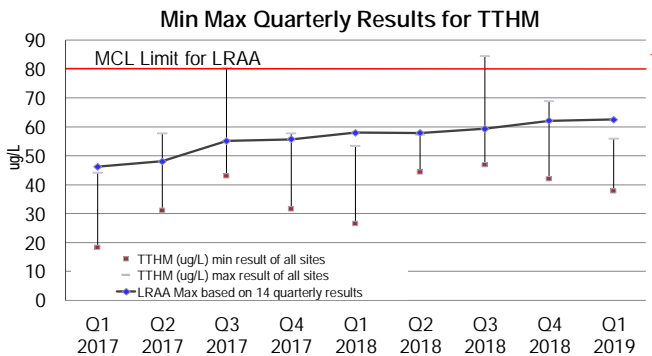
Bromate is tested monthly per DEP requirements for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA’s RAA MCL standard for bromate is 10 µg/L.

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 = 17.1 µg/L; HAA5s = 18.5 µg/L. The current RAA for Bromate = 0.0 µg/L. CVA’s DBP levels continue to be below current standards.

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results)



Water Supply and Source Water Management

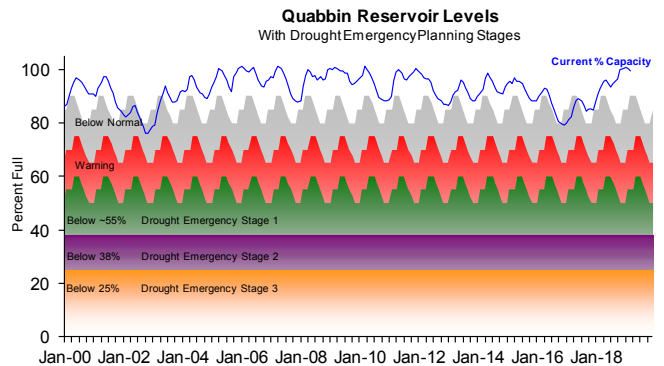
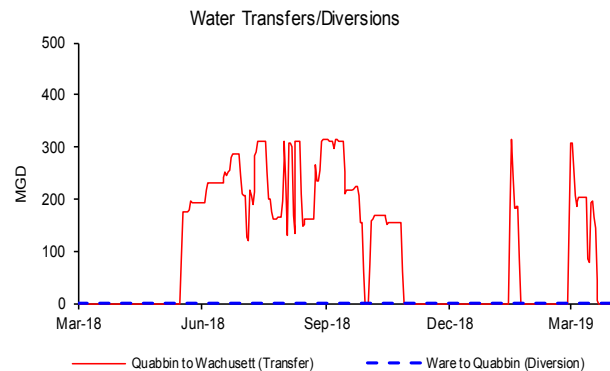
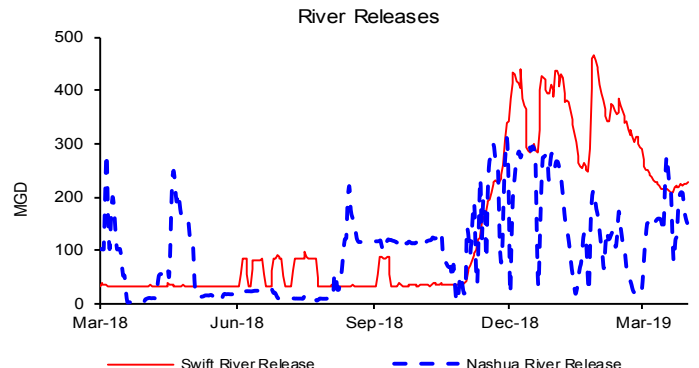
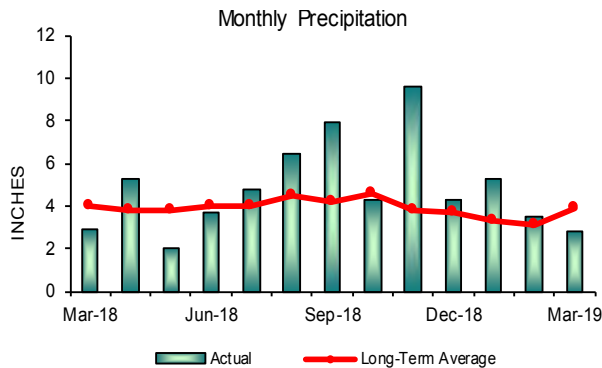
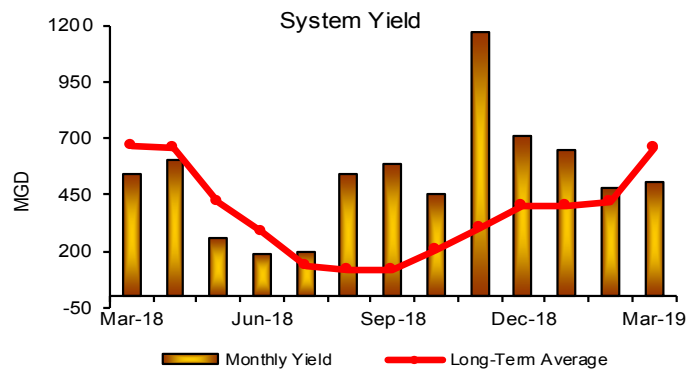
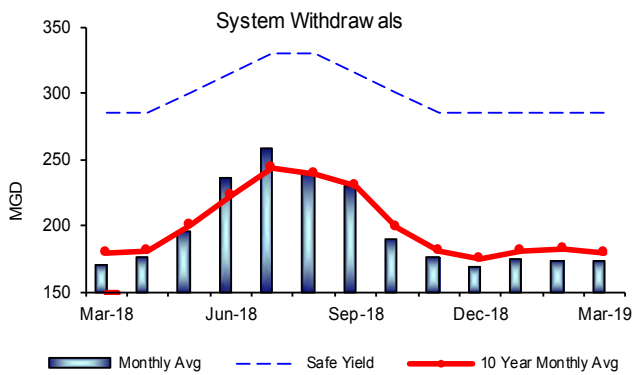
3rd Quarter – FY19

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 99.5% as of March 31, 2019; a 1.1% decrease for the quarter, which represents a loss of more than 4.4 billion gallons of storage and a decrease in elevation of 0.55' 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 below the 10 year monthly average.



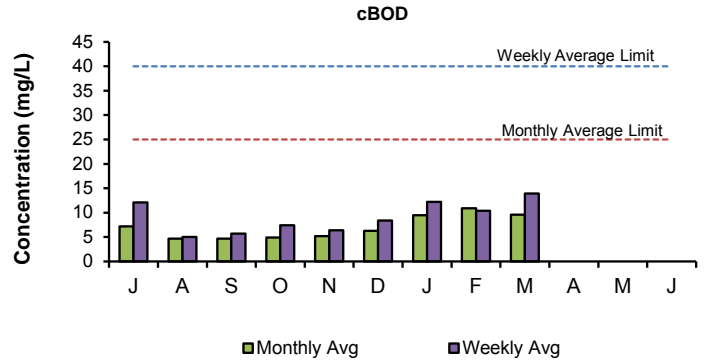
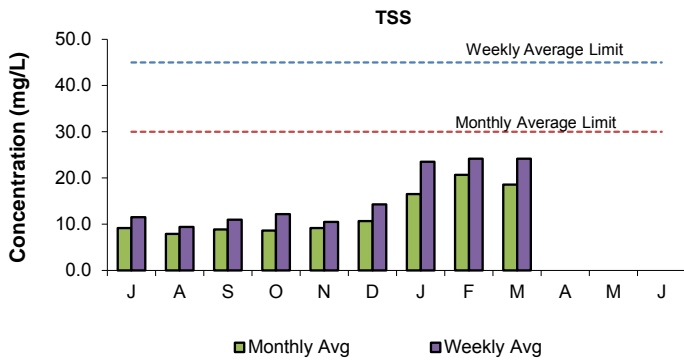
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 3rd Quarter - FY19

NPDES Permit Limits

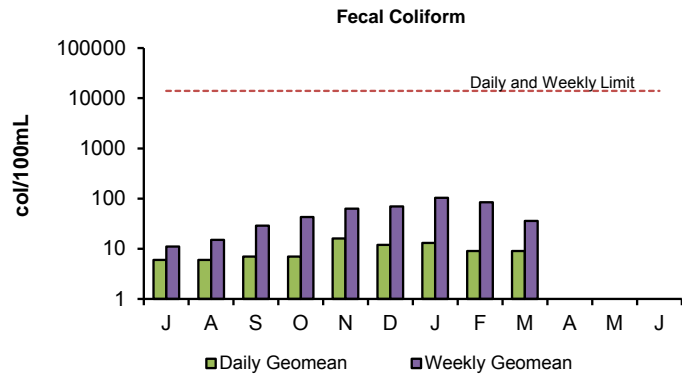
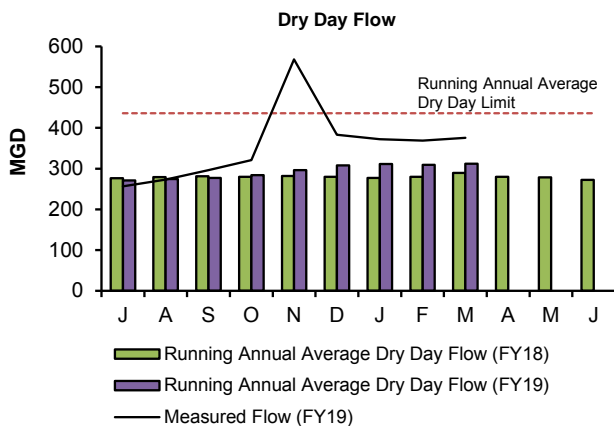
| Effluent Characteristics | | Units | Limits | January | February | March | 3rd Quarter Violations | FY19 YTD Violations |
|---------------------------------|----------------------------|-----------|----------|------------|----------|---------|------------------------|---------------------|
| Dry Day Flow (365 Day Average): | | mgd | 436 | 311.2 | 309.5 | 312.0 | 0 | 0 |
| cBOD: | Monthly Average | mg/L | 25 | 9.5 | 10.9 | 9.6 | 0 | 0 |
| | Weekly Average | mg/L | 40 | 12.2 | 10.4 | 13.9 | 0 | 0 |
| TSS: | Monthly Average | mg/L | 30 | 16.5 | 20.7 | 18.6 | 0 | 0 |
| | Weekly Average | mg/L | 45 | 23.5 | 24.2 | 24.2 | 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 | 13 | 9 | 9 | 0 | 0 |
| | Weekly Geometric Mean | col/100mL | 14000 | 103 | 85 | 36 | 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 | 6.4-7.1 | 6.4-6.9 | 6.3-6.9 | 0 | 0 |
| PCB, Aroclors: | Monthly Average | ug/L | 0.000045 | UNDETECTED | | | 0 | 0 |
| Acute Toxicity: | Mysid Shrimp | % | ≥50 | >100 | >100 | >100 | 0 | 0 |
| | Inland Silverside | % | ≥50 | >100 | >100 | >100 | 0 | 0 |
| Chronic Toxicity: | Sea Urchin | % | ≥1.5 | 100 | 100 | 100 | 0 | 0 |
| | Inland Silverside | % | ≥1.5 | 100 | 50 | 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 3rd Quarter were within permit limits.

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



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

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

NPDES Permit Compliance: Clinton Wastewater Treatment Plant
3rd Quarter - FY19

NPDES Permit Limits

| Effluent Characteristics | | Units | Limits | January | February | March | 3rd Quarter Violations | FY19 YTD Violations |
|--|---------------------------|-----------|------------|---------|----------|---------|------------------------|---------------------|
| Flow: | 12-month Rolling Average: | mgd | 3.01 | 3.30 | 3.27 | 3.23 | 3 ¹ | 5 |
| BOD: | Monthly Average: | mg/L | 20 | 5.5 | 2.6 | 1.5 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 7.1 | 3.7 | 2.1 | 0 | 0 |
| TSS: | Monthly Average: | mg/L | 20 | 7.9 | 4.1 | 3.6 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 10.9 | 5.9 | 4.4 | 0 | 1 |
| pH: | | SU | 6.5-8.3 | 7.0-7.6 | 7.1-7.7 | 6.9-7.4 | 0 | 0 |
| Dissolved Oxygen: | Daily Average Minimum: | mg/L | 6 | 9.2 | 9.8 | 9.9 | 0 | 0 |
| E. Coli: | Monthly Geometric Mean: | cfu/100mL | 126 | 6.0 | 7.0 | 6.0 | 0 | 0 |
| | Daily Geometric Mean: | cfu/100mL | 409 | 26.0 | 667.0 | 12.0 | 1 ² | 1 |
| 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 | 4.0 | 0 | 0 |
| Copper: | Monthly Average: | ug/L | 11.6 | 5.4 | 4.9 | 5.9 | 0 | 1 |
| | Daily Maximum: | ug/L | 14.0 | 5.4 | 4.9 | 7.6 | 0 | 0 |
| Total Ammonia Nitrogen: November 1st - March 31st | Monthly Average: | mg/L | 2.0 / 10.0 | 0.09 | 0.81 | 0.25 | 0 | 0 |
| | Daily Maximum: | mg/L | 3.0 / 35.2 | 0.29 | 1.54 | 1.14 | 0 | 0 |
| Total Phosphorus: November 1st - March 31st | Monthly Average: | mg/L | 1.0 / RPT* | 0.27 | 0.17 | 0.07 | 0 | 0 |
| | Daily Maximum: | mg/L | RPT* | 0.33 | 0.27 | 0.12 | 0 | 0 |
| Acute Toxicity [†] : | Daily Minimum: | % | ≥100 | N/A | N/A | >100 | 0 | 0 |
| Chronic Toxicity [†] : | Daily Minimum: | % | ≥62.5 | N/A | N/A | 62.5 | 0 | 0 |

There have been seven permit violations in FY19 at the Clinton Treatment Plant.

1st Quarter: There were no permit violations in the first quarter.

2nd Quarter: There were three permit violations in the second quarter.

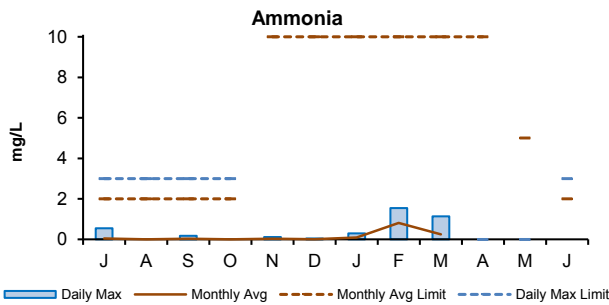
3rd Quarter: There were four permit violations in the third quarter.

¹The 12-month rolling average flow exceeded the limit of 3.01 MGD from January through March, due to excessive rains in the region in November and December 2018.

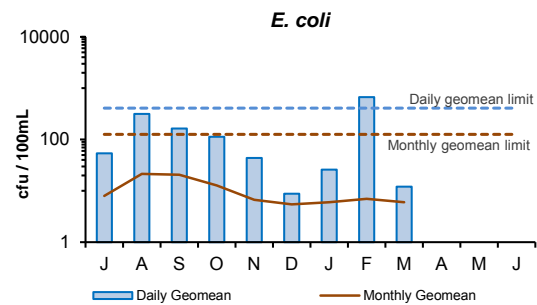
²See *E. coli* figure below.

* The winter period (November 1st - March 31st) monthly average phosphorus limit of 1.0 mg/L goes into effect November 1st, 2019

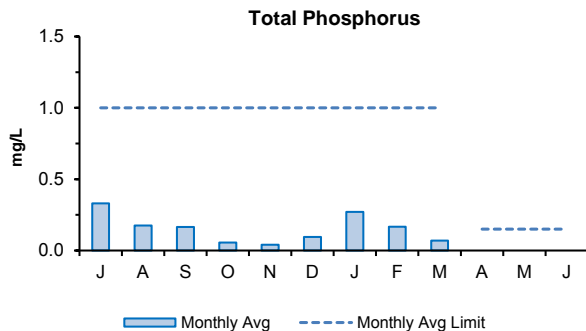
†Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



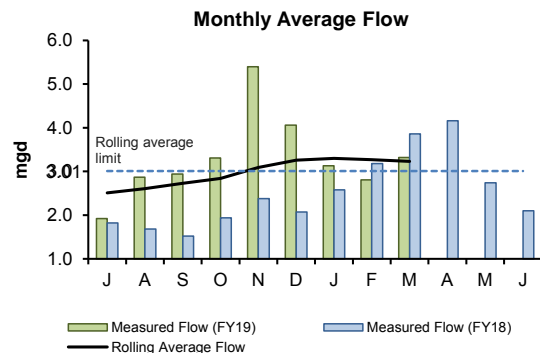
The 3rd Quarter's monthly average and daily maximum concentrations of ammonia were below the permit limits. The monthly average and daily maximum limits for the 3rd Quarter are 10 and 35.2 mg/L respectively. The permit limits are most stringent from June to October when warm weather conditions are most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



E. coli is an indicator for the possible presence of pathogens. ²The *E. coli* daily geomean on February 15th was 667 cfu/100mL, exceeding the permit limit of 409 cfu/100mL. A return activated sludge valve failure on February 13th in Final Clarifier 2 ultimately led to this exceedance. *E. coli* levels were very low during February outside of this incident, reflected by the monthly geometric mean of 7 cfu/100mL.



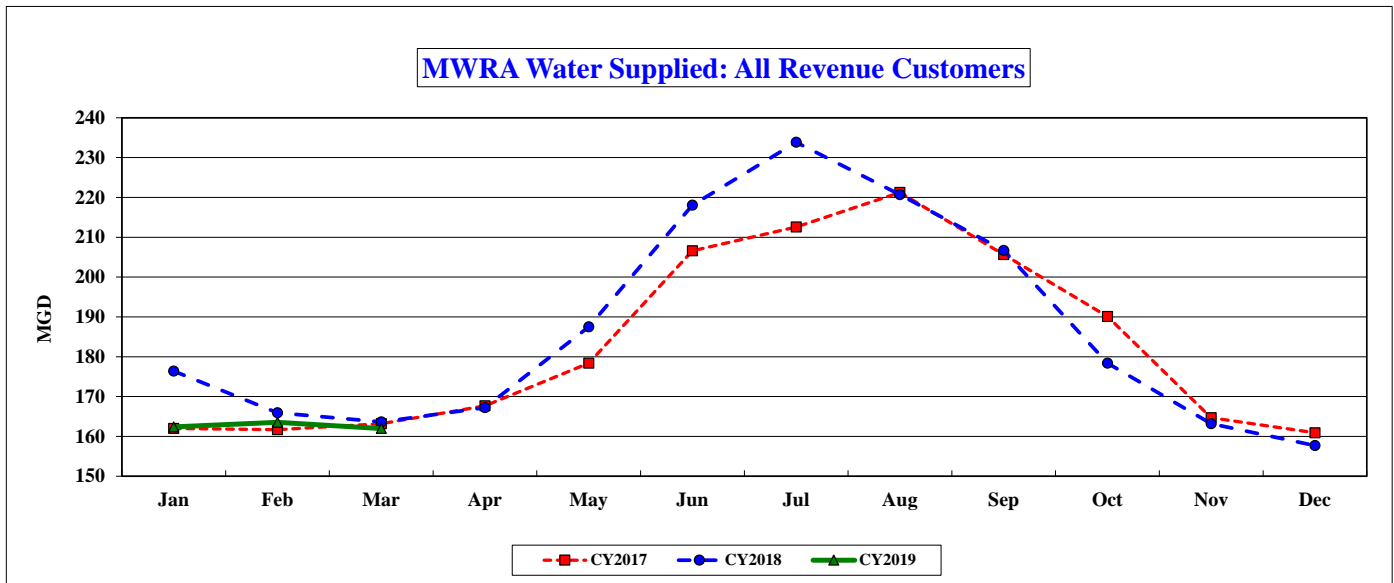
The 3rd Quarter's monthly average concentrations for total phosphorus were below permit limits. The new permit limit of 0.15 mg/L from April through October goes into effect April 1st, 2019. The new permit limit of 1.0 mg/L from November through March goes into effect. November 1st, 2019.



The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The 12-month rolling average flows during the 3rd quarter exceeded the limit of 3.01 due to excessive rains in the region during November and December 2018.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use 3rd Quarter - FY19



| MGD | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD Average | Annual Average |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|----------------|
| CY2017 | 162.004 | 161.672 | 163.192 | 167.676 | 178.393 | 206.603 | 212.595 | 221.238 | 205.641 | 190.115 | 164.673 | 160.915 | 162.310 | 183.032 |
| CY2018 | 176.393 | 165.940 | 163.638 | 167.203 | 187.521 | 218.075 | 233.842 | 220.725 | 206.719 | 178.404 | 163.188 | 157.695 | 168.748 | 186.758 |
| CY2019 | 162.393 | 163.534 | 161.969 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 162.602 | 162.602 |

| MG | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD Total | Annual Total |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--------------|
| CY2017 | 5,022.12 | 4,526.82 | 5,058.94 | 5,030.27 | 5,530.20 | 6,198.09 | 6,590.45 | 6,858.38 | 6,169.23 | 5,893.58 | 4,940.18 | 4,988.37 | 14,607.87 | 66,806.63 |
| CY2018 | 5,468.19 | 4,646.32 | 5,072.79 | 5,016.09 | 5,813.16 | 6,542.25 | 7,249.11 | 6,842.47 | 6,201.58 | 5,530.52 | 4,895.65 | 4,888.56 | 15,187.30 | 68,166.70 |
| CY2019 | 5,034.17 | 4,578.96 | 5,021.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,634.16 | 162.60 |

Calendar year 2019 water use will be used to allocate the FY21 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.

Through March year to date water use for revenue generating users totaled 162.6 mgd, and is 6.1 mgd or

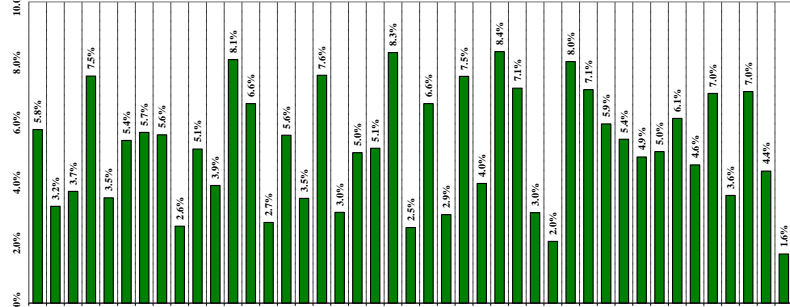
Community Wastewater Flows

3rd Quarter - FY19

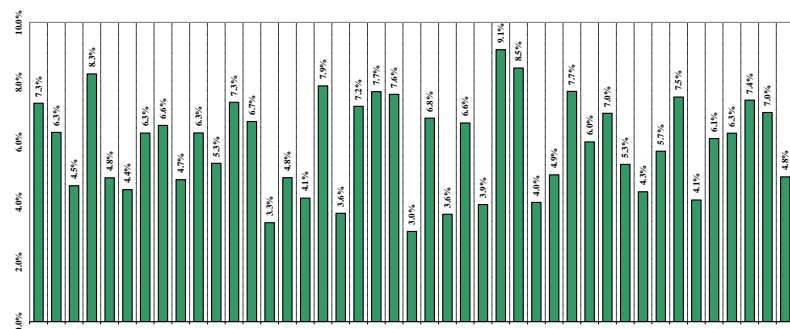
How Projected CY2019 Community Wastewater Flows Could Effect FY2021 Sewer Assessments 1,2,3

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

Change in Average Flow

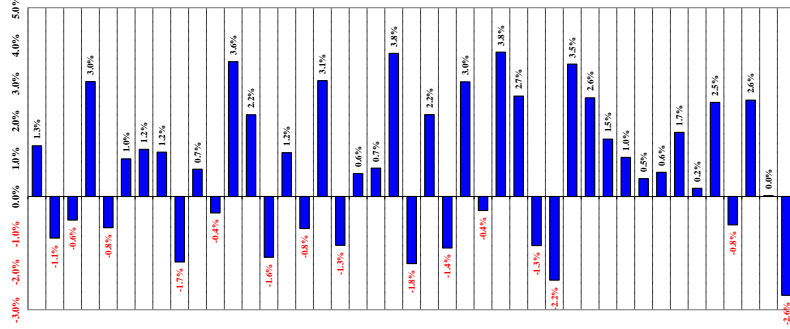


Change in Max. Month Flow

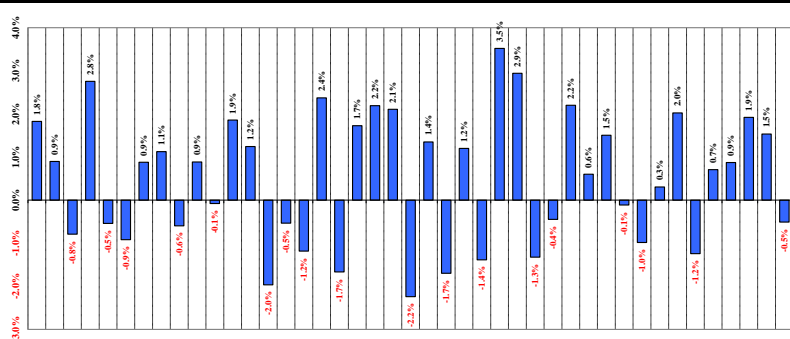


But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2019 flow share compared to CY2016 to CY2018 flow share, compared to all other communities in the system.

Change in Average Flow Share

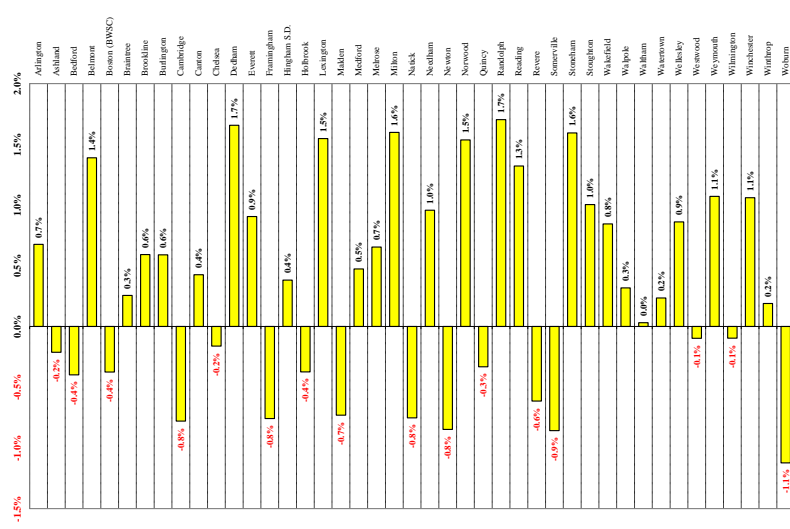


Change in Max Month Flow Share



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

Assessment Impact Due to Change in Flow Share



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 flow share.
 2 Based on CY2016 to CY2019 average wastewater flows as of 04/08/19. Flow data is preliminary and subject to change pending additional MWRA and community review.
 3 CY2016 to CY2018 wastewater flows based on actual meter data for January to February, and project flows for March to December.
 4 Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

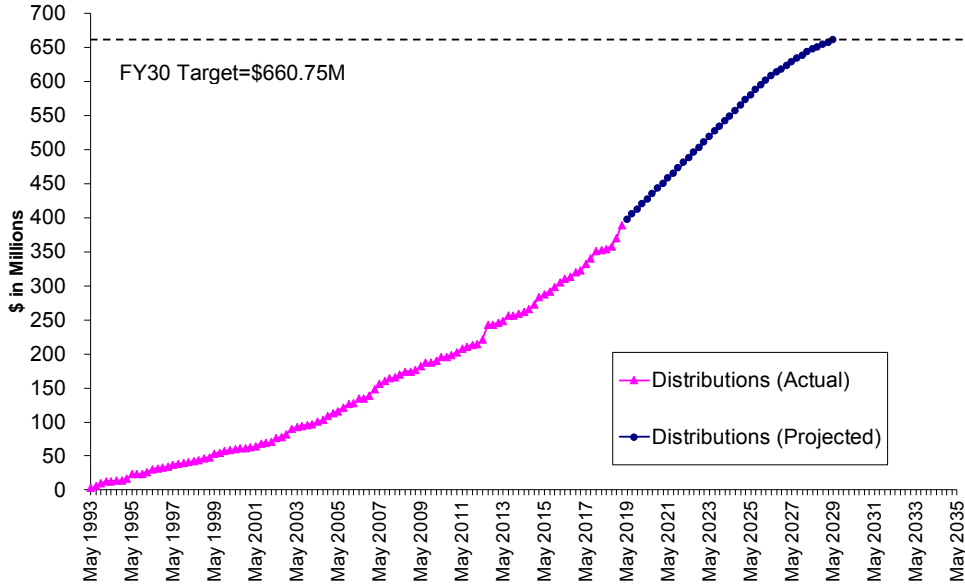
Community Support Programs

3rd Quarter – FY19

Infiltration/Inflow Local Financial Assistance Program

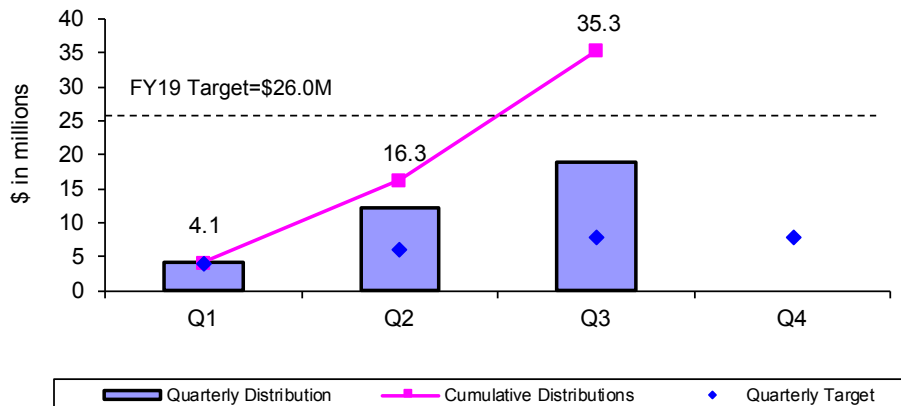
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$660.75 million in grants and interest-free loans (average of about \$18 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 3rd Quarter of FY19, \$19.0 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Braintree, Cambridge, Framingham, Melrose, Stoneham, Watertown, Winthrop and Woburn. Total grant/loan distribution for FY19 is \$35.3 million. From FY93 through the 3rd Quarter of FY19, all 43 member sewer communities have participated in the program and \$390 million has been distributed to fund 565 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



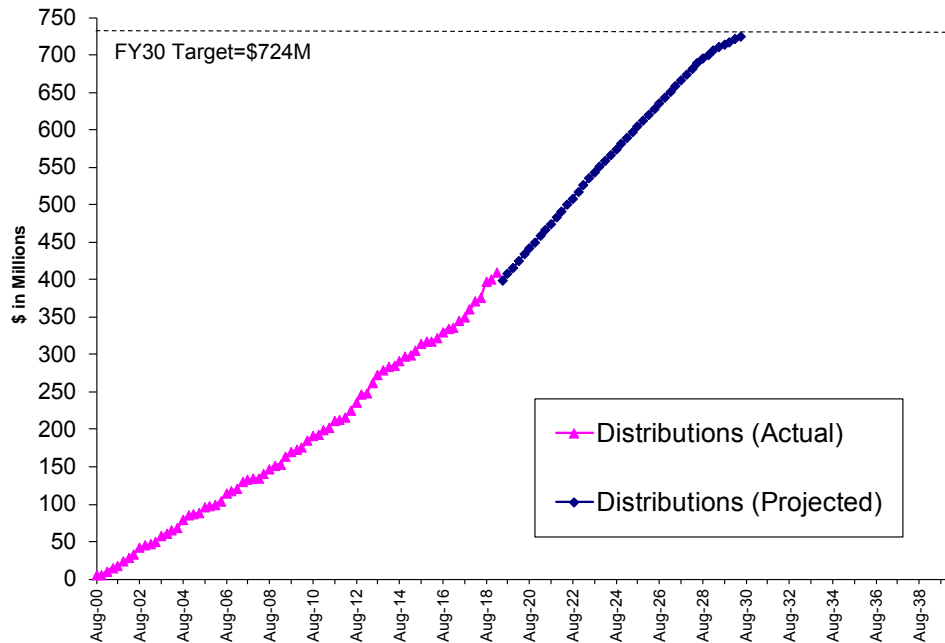
Community Support Programs

3rd Quarter – FY19

Local Water System Assistance Program

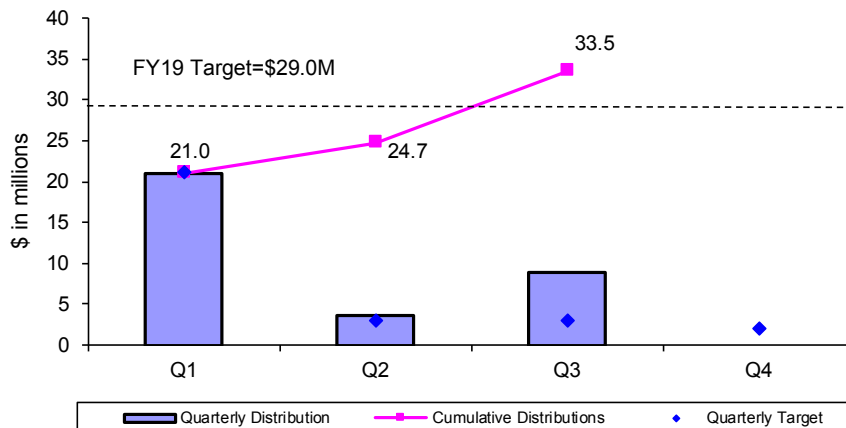
MWRA's Local Water System Assistance Programs (LWSAP) provides \$724 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There 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 3rd Quarter of FY19, \$8.8 million in interest-free loans was distributed to fund local water projects in Framingham, Lynnfield, Revere and Watertown. Total loan distribution for FY19 is \$33.5 million. From FY01 through the 3rd Quarter of FY19, \$409 million has been distributed to fund 446 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

3rd 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.

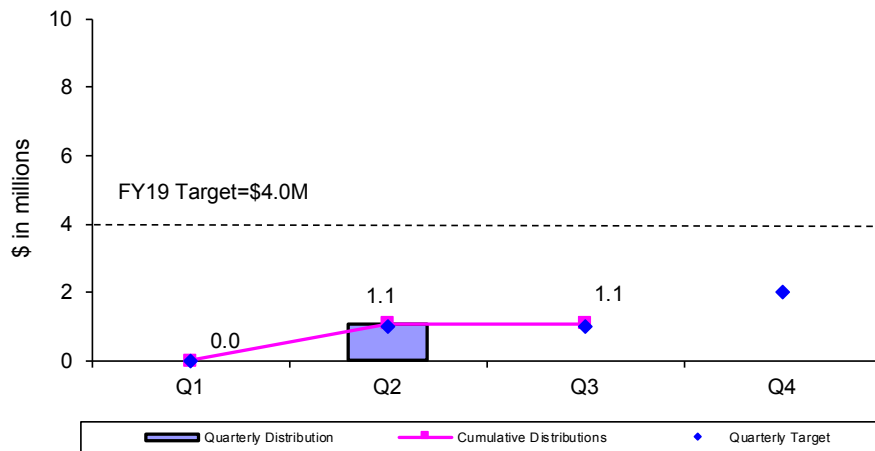
FY18 was the second year of the Lead Loan Program. During FY18, MWRA made five Lead Loan Program distributions as noted in the table below.

FY19 is the third year of the Lead Loan Program. Two Lead Loans were made during the second quarter of FY19: \$100,000 to Chelsea and \$1.0 Million to Everett. No lead loans were made in the third quarter of FY19.

Summary of Lead Loans:

| | |
|---------------------|-----------------------|
| Chelsea in FY19 | \$0.1 Million |
| Everett in FY19 | \$1.0 Million |
| Needham in FY18 | \$1.0 Million |
| Winchester in FY18 | \$0.5 Million |
| Revere in FY18 | \$0.2 Million |
| Winthrop in FY18 | \$0.3 Million |
| Marlborough in FY18 | \$1.0 Million |
| Newton in FY17 | \$4.0 Million |
| Quincy in FY17 | \$1.5 Million |
| Winchester in FY17 | \$0.5 Million |
| TOTAL | \$10.1 Million |

FY19 Quarterly Distributions of Lead Service Line Replacement Loans

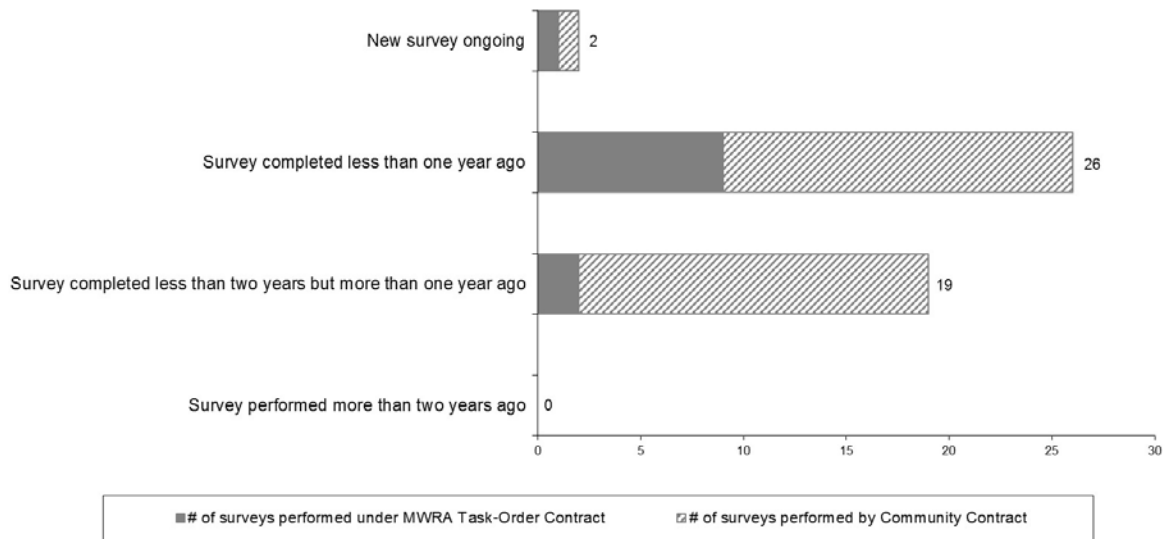


Community Support Programs

3rd 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 3rd 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 | 10,753 | 61,917 | | 73,360 |
| Low-Flow Fixtures (showerheads and faucet aerators) | 10,000 | 1,738 | 1,635 | 3,042 | | 6,415 |
| Toilet Leak Detection Dye Tablets | ----- | 15,202 | 352 | 5,008 | | 20,562 |

BUSINESS SERVICES

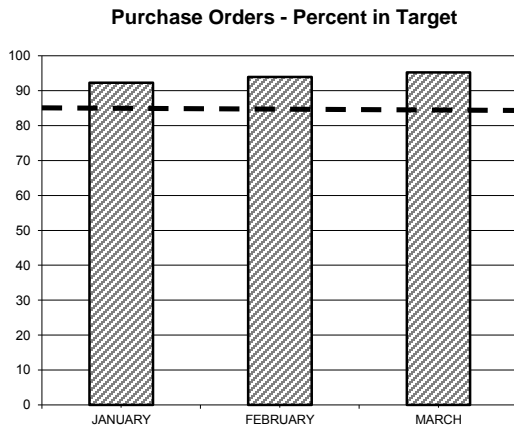
Procurement: Purchasing and Contracts

Third Quarter - FY19

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

Outcome: Processed 94% of purchase orders within target; Average Processing Time was 4.63 days vs. 4.92 days in Qtr 3 of FY18. Processed 69% (9 of 12) of contracts within target timeframes; Average Processing Time was 146 days vs. 119 days in Qtr 3 of FY18.

Purchasing



| | No. | TARGET | PERCENT IN TARGET |
|---------------|-----|---------|-------------------|
| \$0 - \$500 | 574 | 3 DAYS | 90.5% |
| \$500 - \$2K | 696 | 7 DAYS | 95.4% |
| \$2K - \$5K | 484 | 10 DAYS | 97.3% |
| \$5K - \$10K | 78 | 25 DAYS | 93.5% |
| \$10K - \$25K | 59 | 30 DAYS | 81.3% |
| \$25K - \$50K | 14 | 60 DAYS | 78.5% |
| Over \$50K | 28 | 90 DAYS | 96.4% |

The Purchasing Unit processed 1933 purchase orders, 47 less than the 1980 processed in Qtr 3 of FY18 for a total value of \$8,926,753 versus a dollar value of \$10,080,673 in Qtr 3 of FY18.

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

Contracts, Change Orders and Amendments

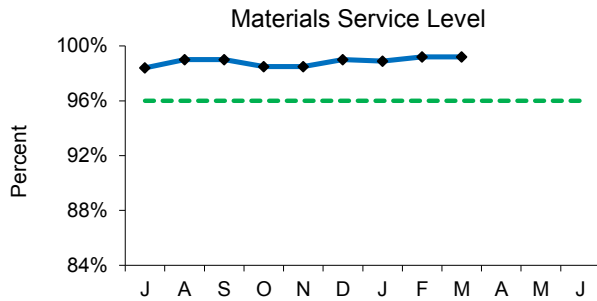
Three contracts were not processed within the target timeframes. One contract was delayed due to decisions regarding the type of procurement process to use. Once determined, the development of the scope took longer than anticipated and the RFQ/P was re-issued twice due to minimal responses. In addition, vetting and security clearances were required. Another contract was delayed due to staff retirement and re-assignment. Also, a portion of the contract had to be re-bid (electrical) and approval of the award was required by the Department of Environmental Protection due to funding by the State Revolving Fund, resulting in further delays. The final contract required special Division of Capital Asset Management and Maintenance (DCAMM) certification from Contractors. This special certification process took substantially longer than anticipated. However, this allowed for increased competition with contractors who possessed the requisite experience to perform the work.

Procurement processed twelve contracts with a value of \$28,529,202 and nine amendments with a value of \$893,507. Twenty four change orders were executed during the period. The dollar value of all non-credit change orders during Q3 FY19 was \$2,535,323 and the value of credit change orders was (\$83,393).

Staff reviewed 48 proposed change orders and 33 draft change orders.

Materials Management

3rd Quarter - FY19



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,985 (99.1%) of the 8,058 items requested in Q3 from the inventory locations for a total dollar value of \$1,627,508.

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 FY19 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 –sealing compound, circuit breakers, racking screws, relays, cord caps, relay overloads, swing valves, cable jumpers and cable sensors for Electric Shop; card rack, current/volt alarms, flowmeters, connectors, transmitters, vibration monitor and signal modules for I&C; unions, sheaves, batteries, solenoid valves and solenoid coils for HVAC; flex couplings, and filters for Power and Pump; actuator for Liquid Train.
- Chelsea – sample probes and sample probe repair kits for Safety; v-belts, blower kits, filters and circulating pump for Work Coordination; filters, gaskets, rotors, brake pads, oil filters, idler arms, and exhaust sensors for Fleet Services; free ammonia, total chlorine and free chlorine for Enquad;
- Southboro – toners for Administration; valve repair kit for plumbing shop; PH electrode for Water Quality Assurance; buckets for Facilities Maintenance.

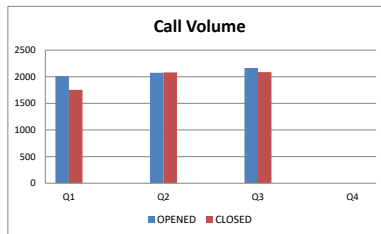
Property Pass Program:

- Seven audits were conducted during Q3.
- Scrap revenue received for Q3 amounted to \$15,516. Year to date revenue received amounted to \$35,812.
- Revenue received from online auctions held during Q3 amounted to \$43,136. Year to date revenue received amounted to \$357,260.

| Items | Base Value July-18 | Current Value w/o Cumulative New Adds | Reduction / Increase To Base |
|--------------------------------|-----------------------|--|------------------------------------|
| Consumable Inventory Value | 8,401,259 | 8,246,390 | -154,869 |
| Spare Parts Inventory Value | 8,884,367 | 9,025,417 | 141,050 |
| Total Inventory Value | 17,285,626 | 17,271,807 | -13,819 |

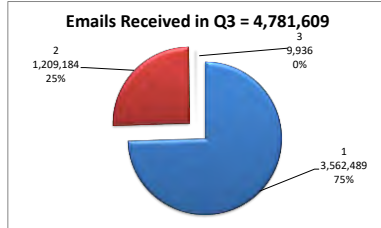
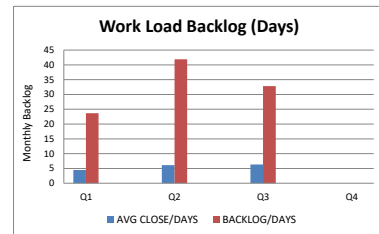
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

MIS Program 3rd Quarter FY19



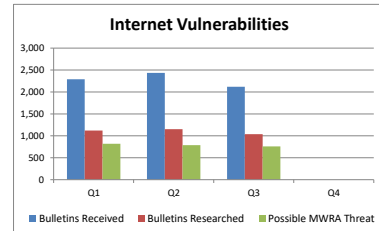
Performance & Backlog for Q3

- 96.44% of open calls were closed.
- Call closure averaged 6.4 days.
- Priority 1 & 2 Service Level Agreements (SLA) were not met because of priorities and delayed closure. Workarounds provided.



Information Security for Q2

- In Q3, pushed security fixes/updates to desktops/servers protecting against 505 vulnerabilities.
- McAfee quarantined 3 distinct viruses from 3 PCs. PCs are current with antivirus signatures for known malware.



Infrastructure:

Desktop Refresh: Three production images finalized. As a pilot, rolled out 16 new PC's into production. Chelsea will be the first site for rollouts beginning April 8th.

Windows 10 Print Servers: Completed implementation and testing.

Audio/Visual Upgrades: Chelsea Muster Room has been completed. CNY Boardroom upgrade is being procured. Designs are being reviewed for balance of conference rooms.

External Facing Server Hardware Replacement: Continue to test communications over private wireless.

Router Replacement: Seven of eleven sites are completed. Remaining four are being scheduled in April.

Network Switch Upgrades: Completed.

iPhone Upgrades: Completed 66% of iPhone 8 upgrades.

Applications/Library & Records Center/Training:

Enterprise Content Management (ECM)/e-Construction: Continued working on business process workflows and/or use case documentation of existing E&C Department processes. Presented a PowerPoint presentation to the Senior E&C and Tunnel Redundancy Managers showing a conceptual management dashboard design and refined requirements. The current list of 47 use cases and 86 workflows is 83% complete. 21 related databases have been identified 91% have been documented.

Contracts Management: Began meeting regularly with users to design the configuration for Professional Services Contracts. Began reviewing legacy Contract Management System with users to identify remaining contract types not implemented in the Infor/Lawson system including Professional Service Contracts and No-bid contracts. Started working on requirements for Bid Tab changes to support Professional Services and testing various options.

Application Custom Development: Deployed 25 in-house web applications that were developed using .NET Framework version 2.0. They have been upgraded to version 4.7 for maintaining Microsoft support, taking advantage of new features and improved web application performance.

GIS: A new Future Pipes layer was added that displays planned pipe locations. Added six new fields for the Planning Department to be able to capture water pressure zone information related to each sample location. Applied an ESRI security patch to ArcGIS preventing a vulnerability that allowed ordinary authenticated users to elevate their permissions.

LIMS/ELN: To support MWRA marketing fertilizer pellets outside of Massachusetts, the Corrective Action Report (C.A.R) template was updated. This update satisfies the National Environmental Laboratory Accreditation Program (NELAP) requirements.

PIMS: Upgraded PIMS production database to Oracle 11g on Oracle Data Appliance (ODA), Two associated unsupported Windows, OS version 2003, servers were retired.

Maximo-Crystal Reports: The Rutland Holden report, used by Field Operations (FOD) to bill the towns of Rutland and Holden, had a feature added to make accessing detailed billing information easier. The new feature enables MWRA staff to verify all billable activity as the work is completed. This on-demand feature eliminates the need to wait for the final billing report.

Library & Records Center: Library: Fulfilled 18 research requests, acquired 12 new books, loaned 188 books and reports, provided 10 articles and 9 new standards. The MWRA Library Portal supported 593 end-user searches. Research topics included Dorchester and City Tunnels Geotechnical data, horizontal directional drilling, and historic Brookline sewer construction.

Record Center (RC): added 126 new boxes, handled 258 total boxes, fulfilled 11 rush requested, scanned/mailed 110 pages, shredded 15 sixty-five gallon bins of confidential documents and inventoried 900 geo-samples. Searches included boring logs and geo mapping. RC manager attended 3 RCB meeting and taught 3 records management classes.

IT Training: For the quarter, 49 staff attended 10 classes. 17% of the workforce have attended at least one class year-to-date. A Windows 10 presentation was developed highlighting some important interface differences and new features. Job-aids and handouts were developed and published for Searching Messages in Outlook, File Management – Best Practices, Setting Default Line Spacing, and Adding a Printer.

Legal Matters

3rd Quarter - FY19

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed sixty-three (63) 8(m) permits.
- **Real Property:** Reviewed Wachusett Watershed Fee Acquisition, W-001209, related to the Hulick Property on South Nelson Road in Sterling, MA, Quabbin Watershed Preservation Restriction, W-001198, related to the Pope property on New Salem Road in Petersham, MA, Quabbin Watershed Preservation Restriction, W-001199, related to the Clark property on Amidon Drive in Petersham, MA, and Wachusett Watershed Preservation Restriction, W-001205, related to the Cranson property on South Nelson Road in Sterling, MA. Reviewed plans for proposed temporary and permanent easements from MBTA for MWRA Section 111 redundant 36-inch pipeline through Boston, Dedham, and Westwood (MWRA Contract No.7505) located at MBTA Dedham Corporate Station, Allied Drive. Reviewed DCR license and drafted two licenses and two temporary easement documents for Dorchester Interceptor Sewer Rehabilitation (MWRA Contract No. 7279) located at Baker Square Condominium, Rite Aid, Extra Space Properties, the Cedar Grove Cemetery, and DCR property in Dorchester, MA. Reviewed MWRA property rights for MWRA Section 613 (Neponset Valley Sewer) and Section 676 (Neponset Valley Force Main) located at 777 Dedham street in Canton, MA. Reviewed MWRA property rights related to Chestnut Hill Emergency Pump Station. Reviewed MWRA property rights in the area of the Ball Square MBTA station in Somerville. Recorded Extension Permit for Order of Conditions DEP File No. 297-0383 related to MWRA Project No. 7067 – NIH Pipeline in Stoneham. Recorded Certificate of Compliance at Middlesex South Registry of Deeds for Order of Conditions DEP 270-0647 for work in Reading, MA related to MWRA Contract 7471. Recorded Certificates of Compliance for Orders of Conditions in Braintree related to work on the Fore River Railroad. Drafted 4th Amendment to J. F. White License for use of MWRA Cleverly Court property located in Quincy. Reviewed T-Mobile wireless agreement for Turkey Hill water tank in Arlington, MA. Reviewed and revised letters to wireless companies relative to the relocation of their equipment on water tanks to facilitate the painting of the water tanks.
- **Environmental:** Reviewed MA land application of sludge and septage regulations related to labeling of product that contains molybdenum.
- **Loring Road Hydro – Federal Incentive.** Assisted with securing U.S. Department of Energy grant funding for the Authority’s Loring Road Hydroelectric facility for energy produced during calendar year 2017.
- **Loring Road Hydro and Brutch Hydro Facilities – Transfer to Commonwealth’s Small Hydroelectric Net Metering Program.** Assisted with the transfer of the Loring Road and Brutch hydroelectric facilities from the “Qualifying Facility” rate for energy to the Commonwealth’s Small Hydroelectric Net Metering program. Enrollment in the Net Metering program provides for a higher compensation amount to the Authority for the energy produced by these hydroelectric facilities.

- **Public Records Requests:** During the third quarter of FY 2019, one hundred and forty-six (146) public records requests were received and one hundred and thirty-seven (137) public records request were closed.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

One demand for arbitration was filed.

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

A union filed a Charge of Prohibited Practice at the Division of Labor Relations alleging the MWRA did not bargain in good faith with respect to a reclassification of an employee.

Matters Concluded

Received a dismissal from the MCAD for lack of probable cause of a charge of discrimination on the basis of age, gender and race.

Received a Department of Unemployment Assistance decision in favor of MWRA denying claimant unemployment benefits, which was upheld by the Board of Review on the claimant's appeal.

LITIGATION/CLAIMS

New lawsuits/claims: Law Offices of Burton J. Hass v. MWRA, Frederick A. Laskey, et al: Suffolk Superior Court, C.A. No. 1984-CV-634H: Plaintiff law firm seeks attorney's fees in connection with its representation of a former employee whose application for disability retirement benefits to the MWRA Employee Retirement Board was denied. On appeal, the Division of Administrative Law Appeals reversed the denial, and the employee was paid retroactive benefits by the Retirement Board in accordance with M.G.L. Chapter 32. MWRA has moved to dismiss the Complaint on the grounds that: (1) MWRA and Mr. Laskey are not proper parties to the action; and (2) Plaintiff has no viable cause of action to recover its fees under the statute.

Significant Developments

DaPrato v. MWRA: C.A. No. 2015 CV 3687 D: On February 7, 2019, MWRA filed a reply brief for the SJC's consideration. In advance of oral argument scheduled to take place on April 4, 2019, the New England Legal Foundation and Associated Industries of Massachusetts jointly filed with the SJC an amicus brief in support of MWRA.

Closed Cases/Claims: No cases or claims have closed.

Subpoenas

During the Third Quarter of FY 2019, two subpoenas were received and no subpoenas were pending at the end of the Third Quarter FY 2019.

Wage Garnishments

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

SUMMARY OF PENDING LITIGATION MATTERS

| TYPE OF CASE/MATTER | As of March 2019 | As of Dec 2018 | As of Sept 2018 |
|---|-------------------------|-----------------------|------------------------|
| Construction/Contract/Bid Protest (other than BHP) | 3 | 3 | 2 |
| Tort/Labor/Employment | 5 | 4 | 5 |
| Environmental/Regulatory/Other | 2 | 2 | 2 |
| Eminent Domain/Real Estate | 0 | 0 | 0 |
| Total | 10 | 9 | 9 |
| Other Litigation matters (restraining orders, etc.) | 1 | 1 | 2 |
| Total – all pending lawsuits | 11 | 10 | 11 |
| Claims not in suit: | 1 | 1 | 2 |
| Bankruptcy | 0 | 0 | 0 |
| Wage Garnishment | 4 | 4 | 4 |
| TRAC/Adjudicatory Appeals | 1 | 1 | 1 |
| Subpoenas | 0 | 1 | 1 |
| TOTAL – ALL LITIGATION MATTERS | 17 | 17 | 19 |

TRAC/MISC.**New Appeals:**

There is one new appeal:
Howard Johnsons Hotel - Quincy (Giri Hotels)
MWRA Docket No. 19-01

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 Notices of Dismissal, Fine Paid in Full.

Tentative or Final Decisions

There are no Tentative or Final Decisions issued in the 3rd Quarter FY 2019.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES 3rd Quarter - FY19

Highlights

During the 3rd quarter FY19, IA completed a review of Apollo Safety's contract to determine if monthly invoices and supporting documentation comply with the contract requirements. Recommendations included strengthening controls over required vendor documentation, obtaining authorized signature approvals, and reconciling the vendor's daily job work orders to the monthly invoice. IA also completed a review of the Bay State Fertilizer program with recommendations that included additional invoicing and reconciliation of quantities sold and on hand, as well as the financial results of the program for FY15 to FY18. IA also completed 3 consultant preliminary reviews, 2 incurred cost audits and a construction labor burden review.

Status of Recommendations

During FY19, 13 recommendations were closed of which 6 are from prior fiscal years' audits.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been implemented within 48 months, the appropriateness of the recommendation is re-evaluated.

All Open Recommendations Pending Implementation – Aging Between 0 and 48 Months

| Report Title (issue date) | Audit Recommendations | | |
|--|-----------------------|-----------|-----------|
| | Open | Closed | Total |
| MIS Mobile Equipment Asset Tracking (9/26/16) | 1 | 11 | 12 |
| Wright Express (WEX) Credit Card Fuel Purchases (11/16/16) | 1 | 12 | 13 |
| Purchase Card Activity on Deer Island (3/31/17) | 2 | 13 | 15 |
| Review of Uniform Debit Card Program (3/30/18) | 2 | 4 | 6 |
| Review of MWRA Procedures on Payments for Police Details (5/23/18) | 1 | 0 | 1 |
| Overtime & Timesheet Review (6/30/18) | 2 | 14 | 16 |
| Fleet Services Process Review (6/30/18) | 4 | 1 | 5 |
| Fuel Use & Mileage Tracking (12/31/18) | 7 | 1 | 8 |
| Apollo Safety Review (3/19/19) | 8 | 5 | 13 |
| Total Recommendations | 28 | 61 | 89 |

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.

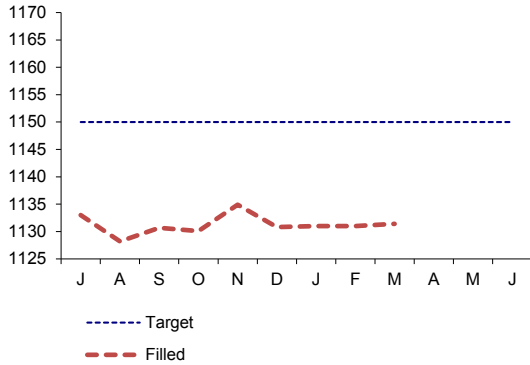
| Cost Savings | FY15 | FY16 | FY17 | FY18 | FY19 Q3 | TOTAL |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| Consultants | \$87,605 | \$88,312 | \$272,431 | \$118,782 | \$111,727 | \$678,857 |
| Contractors & Vendors | \$1,146,742 | \$1,772,422 | \$3,037,712 | \$1,323,156 | \$3,328,791 | \$10,608,823 |
| Internal Audits | \$543,471 | \$220,929 | \$224,178 | \$204,202 | \$159,108 | \$1,351,888 |
| Total | \$1,777,818 | \$2,081,663 | \$3,534,321 | \$1,646,140 | \$3,599,626 | \$12,639,568 |

OTHER MANAGEMENT

Workforce Management

3rd Quarter - FY19

FTE Tracking



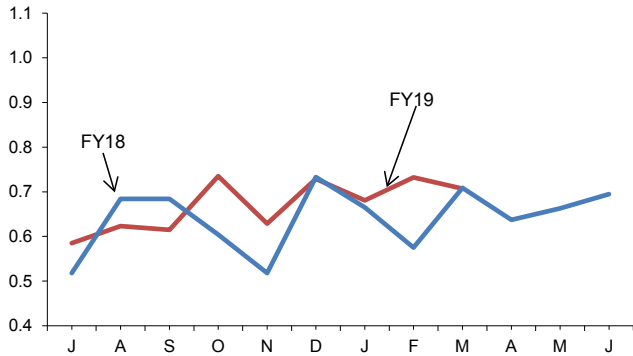
FY19 Target for FTE's = 1150
 FTE's as of MAR 2019 = 1131.4
 Tunnel Redunancy as of MAR 2019 = 6.0



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 | 96 (64%) | 53 (36%) | 149 |

Average Monthly Sick Leave Usage Per Employee

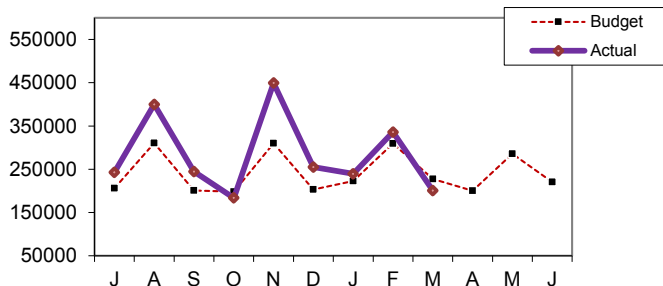


Average monthly sick leave for the 3rd Quarter of FY19 increased as compared to the 3rd Quarter of FY18 (7.83 to 7.68)

| | Number of Employees | YTD | Annualized Total | Annual FMLA % | FY18 |
|-----------------|---------------------|-------------|------------------|---------------|------------|
| Admin | 138 | 6.12 | 8.17 | 15.7% | 6.6 |
| Aff. Action | 6 | 5.33 | 7.10 | 0.8% | 7.1 |
| Executive | 4 | 5.33 | 2.43 | 22.4% | 3.3 |
| Finance | 34 | 5.12 | 6.82 | 0.0% | 6.1 |
| Int. Audit | 6 | 3.12 | 4.16 | 3.3% | 4.9 |
| Law | 14 | 5.64 | 7.52 | 9.2% | 6.9 |
| OEP | 7 | 3.53 | 4.70 | 70.1% | 3.6 |
| Operations | 925 | 6.14 | 8.19 | 15.4% | 7.7 |
| Tunnel Red | 6 | 6.78 | 9.05 | 73.4% | 0 |
| Pub. Affs. | 11 | 3.30 | 4.40 | 15.5% | 10.4 |
| MWRA Avg | 1151 | 1.34 | 8.05 | 15.5% | 7.7 |

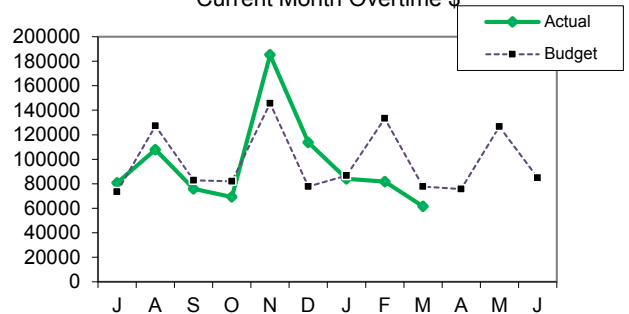
Percent of sick leave usage for FY19, attributable to Family and Medical Leave Act (FMLA) is 15.5% .

Field Operations Current Month Overtime \$



Total Overtime for Field Operations for the third quarter of 2019 was \$774,696 which is \$15k over budget. Emergency overtime was \$357k, which was (\$59k) under budget. Rain events totaled \$158k, Snow Removal was \$121k, emergency maintenance was \$28k. Coverage overtime was \$199k, which was \$53k over budget, reflecting the month's shift coverage requirements. Planned overtime was \$219k or \$21k over budget, approximately \$27k of which was for training for Chelsea Creek and Alewife stations. Maintenance off hours work was \$38k, maintenance work completion at \$28k. YTD, FOD has spent \$2,550,551 on overtime which is \$362k over budget.

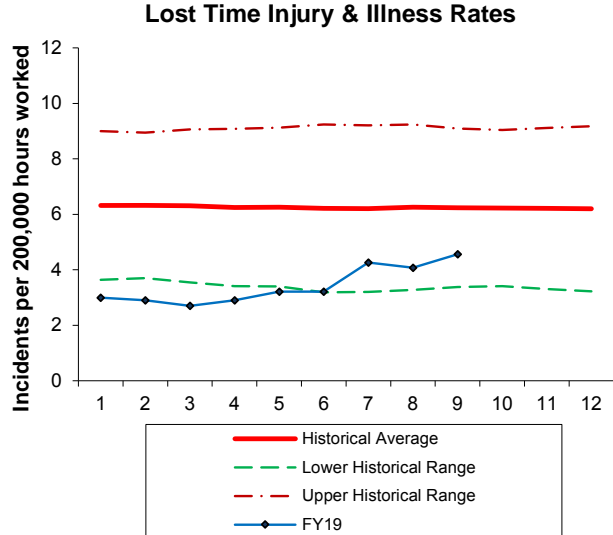
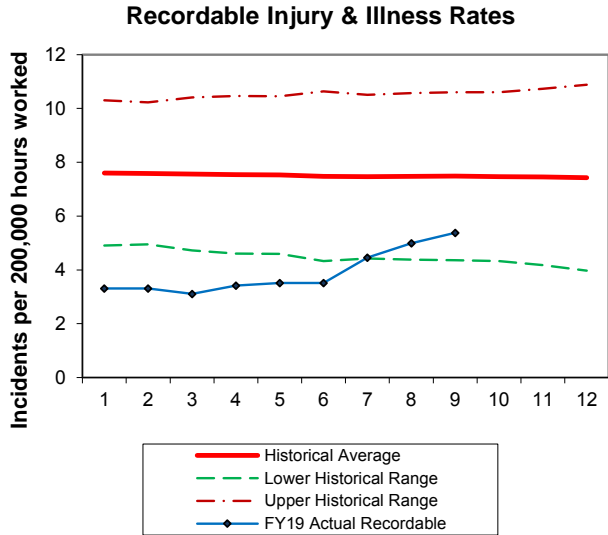
Deer Island Treatment Plant Current Month Overtime \$



Deer Island's total overtime expenditure for the third quarter was \$227,350, which was (\$71k) or 23.7% under budget for the month. During the third quarter Deer Island experienced lower than anticipated planned/unplanned overtime of (\$60k), and shift coverage of (\$11k). Storm coverage was virtually on budget for the third quarter. YTD Deer Island's overtime spending is \$859,877 which is (\$27k) or 3.1% under budget mostly due to lower planned/unplanned overtime of (\$189k), offset by higher spending for storm coverage of \$148k primarily in November and December

Workplace Safety

3rd 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

| | 3rd Quarter Information | | Open Claims |
|----------------------|-------------------------|--------|-------------|
| | New | Closed | |
| Lost Time | 15 | 15 | 64 |
| Medical Only | 15 | 22 | 21 |
| Report Only | 18 | 18 | |
| | QYTD | | FYTD |
| Regular Duty Returns | 13 | | 28 |
| Light Duty Returns | 0 | | 0 |

COMMENTS:

Regular Duty Returns

- JAN** 5 Employee returned to full duty/no restrictions
- FEB** 4 Employees returned to full duty/no restrictions
- MAR** 4 Employee returned to full duty/no restrictions

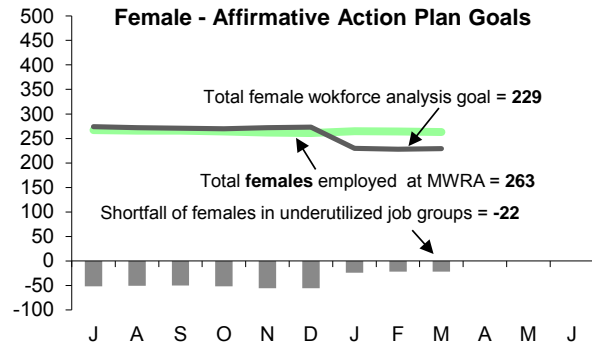
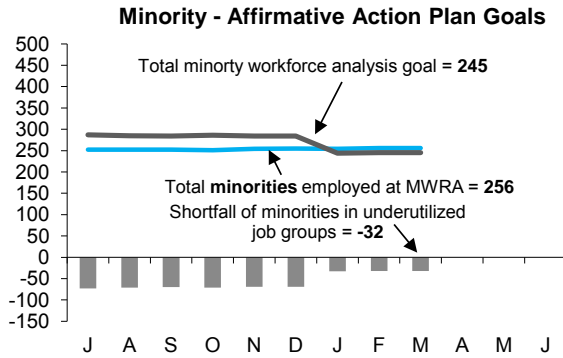
Light Duty Returns

- JAN** N/A
- FEB** N/A
- MAR** N/A

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

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

MWRA Job Group Representation 3rd Quarter - FY19



Highlights:

At the end of Q3 FY19, 7 job groups or a total of 32 positions are underutilized by minorities as compared to 9 job groups for a total of 44 positions at the end of Q3 FY18; for females 6 job groups or a total of 22 positions are underutilized females as compared to 7 job groups or a total of 62 positions at the end of Q3 FY18. During Q3, 4 minorities and 6 females were hired. During this same period 2 minorities and 3 females were terminated.

Underutilized Job Groups - Workforce Representation

| Job Group | Employees as of 3/31/2019 | Minorities as of 3/31/2019 | Achievement Level | Minority Over or Under Underutilized | Females As of 3/31/2019 | Achievement Level | Female Over or Under Underutilized |
|-------------------|---------------------------|----------------------------|-------------------|--------------------------------------|-------------------------|-------------------|------------------------------------|
| Administrator A | 25 | 2 | 3 | -1 | 10 | 7 | 3 |
| Administrator B | 24 | 1 | 4 | -3 | 7 | 5 | 2 |
| Clerical A | 31 | 12 | 7 | 5 | 26 | 20 | 6 |
| Clerical B | 26 | 8 | 6 | 2 | 8 | 10 | -2 |
| Engineer A | 77 | 28 | 16 | 12 | 17 | 18 | -1 |
| Engineer B | 62 | 17 | 14 | 3 | 13 | 12 | 1 |
| Craft A | 118 | 20 | 23 | -3 | 0 | 3 | -3 |
| Craft B | 145 | 21 | 28 | -7 | 2 | 7 | -5 |
| Laborer | 70 | 20 | 16 | 4 | 3 | 3 | 0 |
| Management A | 95 | 18 | 23 | -5 | 30 | 37 | -7 |
| Management B | 43 | 9 | 9 | 0 | 10 | 5 | 5 |
| Operator A | 62 | 3 | 12 | -9 | 1 | 1 | 0 |
| Operator B | 69 | 18 | 11 | 7 | 4 | 1 | 3 |
| Professional A | 29 | 3 | 7 | -4 | 18 | 14 | 4 |
| Professional B | 159 | 43 | 42 | 1 | 79 | 59 | 20 |
| Para Professional | 55 | 16 | 11 | 5 | 27 | 15 | 12 |
| Technical A | 53 | 14 | 12 | 2 | 7 | 11 | -4 |
| Technical B | 7 | 3 | 1 | 2 | 1 | 1 | 0 |
| Total | 1150 | 256 | 245 | 43/-32 | 263 | 229 | 56/-22 |

AACU Candidate Referrals for Underutilized Positions

| Job Group | Title | # of Vac | Requisition Int. / Ext. | Promotions/Transfers | AACU Ref. External | Position Status |
|------------------|--|----------|-------------------------|----------------------|--------------------|-------------------|
| Administrative B | Director, Metro (Ops & Maintenance) | 1 | Int | 1 | 0 | Promo =WM |
| Administrative B | Director, Wastewater Ops & Maint. | 1 | Int | 1 | 0 | Promo =WM |
| Craft A | WSS Foreman | 1 | Int | 1 | 0 | Promo =WM |
| Craft A | M & O Specialist | 1 | Ext | 1 | 1 | Promo =WM |
| Craft B | Instrument Technician | 1 | Int | 1 | 0 | Promo =BM |
| Craft B | Instrumentation Specialist | 1 | Ext | 1 | 0 | Promo =WM |
| Engineer A | Program Manager, Data Management | 1 | Ext | 0 | 0 | NH = |
| Engineer A | Program Manager, Meter & Data Eng. | 1 | Ext | 0 | 0 | NH =WM |
| Laborer | Building and Grounds Worker | 2 | Ext | 0 | 0 | 2NH =(BM) (WM) |
| Laborer | OMC Laborer | 1 | Ext | 0 | 0 | NH =WM |
| Management A | Deputy Contracts Manager | 1 | Ext | 0 | 0 | NH =WM |
| Management A | Sr. Program Manager | 1 | Int/Ext | 1 | 0 | Promo =BF |
| Management A | Manager, Employment | 1 | Int | 1 | 0 | Promo =BF |
| Management A | Warehouse Manager | 1 | Int | 1 | 0 | Promo =WM |
| Management A | Program Manager, Water Quality | 1 | Int | 1 | 0 | Promo =TM |
| Management B | Assistant Contracts Manager | 1 | Ext | 1 | 0 | Promo =BF |
| ParaProfessional | TIC Clerk | 1 | Int/Ext | 1 | 1 | NH =WM |
| Operator A | Area Supervisor | 2 | Int/Ext | 1 | 0 | LT =(WM) NH =(WM) |
| Operator A | Sr & Transmission & Treatment Operator | 2 | Int/Ext | 2 | 0 | Promo =(HM) (WM) |
| Operator B | Operations Supervisor-Clinton AWWTP | 1 | Int | 1 | 0 | Promo =WM |

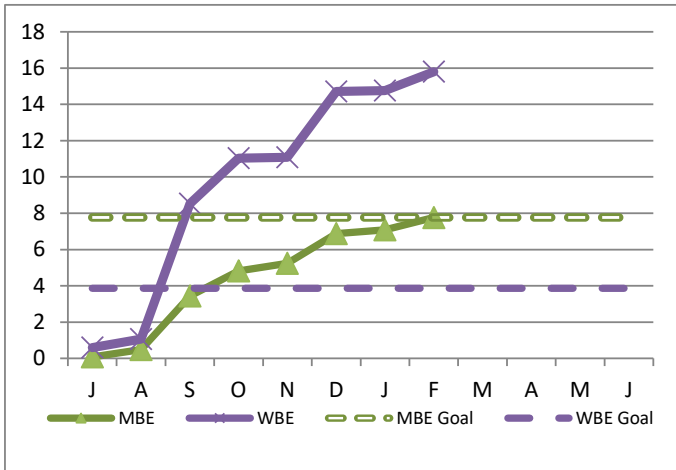
MBE/WBE Expenditures

3rd Quarter - FY19

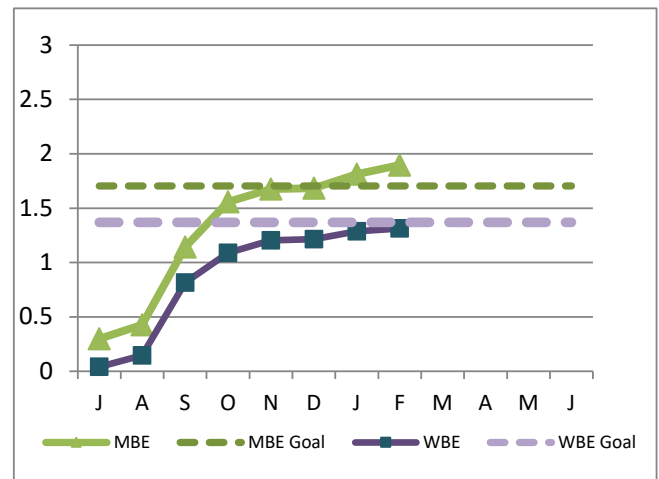
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY19 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they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

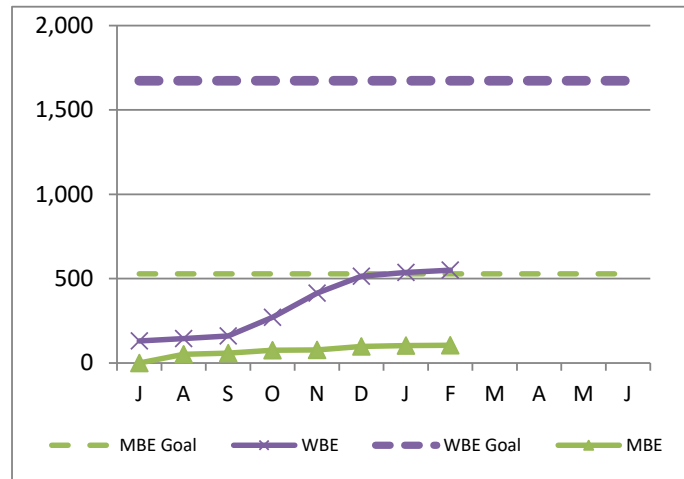
Construction (millions \$)



Professional Services (millions \$)



Goods/Services (Thousands \$)



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

| MBE | | | |
|------------|---------|------------|---------|
| FY19 YTD | | FY18 | |
| Amount | Percent | Amount | Percent |
| 8,613,161 | 110.9% | 12,337,140 | 169.4% |
| 2,033,037 | 119.3% | 1,680,583 | 89.2% |
| 121,855 | 23.1% | 183,744 | 39.8% |
| 10,768,053 | 107.7% | 14,201,467 | 298.4% |

| WBE | | | |
|------------|---------|------------|---------|
| FY19 YTD | | FY18 | |
| Amount | Percent | Amount | Percent |
| 16,825,812 | 435.7% | 15,875,719 | 438.4% |
| 1,332,436 | 97.3% | 1,196,643 | 79.0% |
| 632,717 | 37.8% | 786,485 | 78.9% |
| 18,790,965 | 272.1% | 17,858,847 | 596.3% |

Construction
Prof Svcs
Goods/Svcs
Totals

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

MWRA - CEB Expenses

3rd Quarter – FY19

As of March 2019, total expenses are \$554.3 million, \$4.9 million or 0.9% lower than budget, and total revenue is \$578.7 million, \$2.8 million or 0.5% over budget, for a net variance of \$7.7 million.

Expenses –

Direct Expenses are \$170.1 million, \$4.4 million or 2.5% under budget.

- **Wages & Salaries** are under budget by \$3.5 million or 4.5%. Regular pay is \$3.5 million under budget, due to lower head count, and timing of backfilling positions. At the end of March, the average Full Time Equivalent (FTE) positions was 1,135, twenty fewer than the 1,155 FTE's budgeted.
- **Utilities** expenses are \$1.3 million or 7.7% over budget due to overspending of \$1.2M on electricity primarily at Deer Island, \$732k, reflecting a new contract retroactive to November 2018.
- **Ongoing Maintenance** expense \$1.2 million under budget or 5.3%, reflecting the timing of projects.
- **Professional Services** expense \$1.1 million under budget or 20.5%, primarily due to under spending for Other Professional Services, Engineering Services, and Lab Testing & Analysis of \$394k, 212k, and \$181k, respectively. Additionally, Computer System Consulting was \$247k under budget while Legal expenses were under budget by \$163k.
- **Fringe Benefits** expenses are \$721k or 4.6% under budget reflecting lower health insurance cost of \$678k again due to lower head count.
- **Other Materials** expenses are \$787k or 18.5% under budget reflecting delayed spending on computer hardware of \$873k and lower spending on equipment & furniture of \$251k. Computer hardware purchases have been delayed.

- **Other Services** expenses are \$754k or 4.4% over budget reflecting higher processing volume at pelletization plant of \$1.1 million, partially offset by lowering spending on Telephone Services of \$236k.

- **Overtime** expenses are \$433k or 12.9% over budget due to wet weather events.

Indirect Expenses are \$31.6 million, \$468k or 1.5% under budget reflecting lower than budgeted Watershed Reimbursement of \$239k and lower HEEC related charge due to delay of the low voltage switchgear upgrade project of \$463k partially offset by increased HEEC Capacity charges of \$230k.

Debt Service Expenses totaled \$352.6 million. Budgeted expenses in debt service have been accrued in a defeasance account.

Revenue and Income –

Total Revenue and Income is \$578.7 million, \$2.8 million higher than budget, primarily due to greater than budgeted investment income reflecting higher returns of \$2.1 million and Disposal of Equipment \$396k, and Miscellaneous Revenue \$169k over budget.

| | March 2019 Year-to-Date | | | |
|-----------------------------------|----------------------------|------------------------|--------------------------|--------------|
| | Period 9 YTD Budget | Period 9 YTD Actual | Period 9 YTD Variance | % |
| EXPENSES | | | | |
| WAGES AND SALARIES | \$ 78,629,796 | \$ 75,128,632 | \$ (3,501,164) | -4.5% |
| OVERTIME | 3,359,399 | 3,792,488 | 433,089 | 12.9% |
| FRINGE BENEFITS | 15,577,183 | 14,855,936 | (721,247) | -4.6% |
| WORKERS' COMPENSATION | 1,816,957 | 1,957,403 | 140,446 | 7.7% |
| CHEMICALS | 7,989,766 | 8,295,445 | 305,679 | 3.8% |
| ENERGY AND UTILITIES | 16,890,625 | 18,191,484 | 1,300,859 | 7.7% |
| MAINTENANCE | 22,984,226 | 21,775,115 | (1,209,111) | -5.3% |
| TRAINING AND MEETINGS | 340,099 | 359,688 | 19,589 | 5.8% |
| PROFESSIONAL SERVICES | 5,477,127 | 4,356,738 | (1,120,389) | -20.5% |
| OTHER MATERIALS | 4,254,868 | 3,467,696 | (787,172) | -18.5% |
| OTHER SERVICES | 17,130,868 | 17,884,849 | 753,981 | 4.4% |
| TOTAL DIRECT EXPENSES | \$ 174,450,914 | \$ 170,065,474 | \$ (4,385,437) | -2.5% |
| INSURANCE | \$ 1,574,294 | \$ 1,577,605 | \$ 3,311 | 0.2% |
| WATERSHED/PILOT | 19,804,820 | 19,566,035 | (238,785) | -1.2% |
| HEEC PAYMENT | 1,040,122 | 807,420 | (232,702) | -22.4% |
| MITIGATION | 1,210,696 | 1,210,696 | - | 0.0% |
| ADDITIONS TO RESERVES | 1,411,351 | 1,411,351 | - | 0.0% |
| RETIREMENT FUND | 7,000,000 | 7,000,000 | - | 0.0% |
| POST EMPLOYEE BENEFITS | - | - | - | --- |
| TOTAL INDIRECT EXPENSES | \$ 32,041,283 | \$ 31,573,108 | \$ (468,176) | -1.5% |
| STATE REVOLVING FUND | \$ 64,600,419 | \$ 62,991,084 | \$ (1,609,335) | -2.5% |
| SENIOR DEBT | 203,282,304 | 203,282,304 | - | 0.0% |
| DEBT SERVICE ASSISTANCE | (944,726) | (944,726) | - | 0.0% |
| CURRENT REVENUE/CAPITAL | 10,649,994 | 10,649,994 | - | 0.0% |
| SUBORDINATE MWRA DEBT | 69,060,609 | 69,060,609 | - | 0.0% |
| LOCAL WATER PIPELINE CP | 3,562,797 | 3,562,797 | - | 0.0% |
| CAPITAL LEASE | 2,412,795 | 2,412,795 | - | 0.0% |
| DEBT PREPAYMENT | - | - | - | --- |
| VARIABLE DEBT | - | (5,529,876) | (5,529,876) | --- |
| DEFEASANCE ACCOUNT | - | 7,139,211 | 7,139,211 | --- |
| TOTAL DEBT SERVICE | \$ 352,624,192 | \$ 352,624,192 | \$ - | 0.0% |
| TOTAL EXPENSES | \$ 559,116,389 | \$ 554,262,774 | \$ (4,853,613) | -0.9% |
| REVENUE & INCOME | | | | |
| RATE REVENUE | \$ 554,281,650 | \$ 554,281,650 | \$ - | 0.0% |
| OTHER USER CHARGES | 6,804,314 | 6,889,897 | 85,583 | 1.3% |
| OTHER REVENUE | 5,009,021 | 5,644,492 | 635,471 | 12.7% |
| RATE STABILIZATION | - | - | - | --- |
| INVESTMENT INCOME | 9,786,619 | 11,881,071 | 2,094,452 | 21.4% |
| TOTAL REVENUE & INCOME | \$ 575,881,604 | \$ 578,697,110 | \$ 2,815,506 | 0.5% |

Cost of Debt

3rd 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

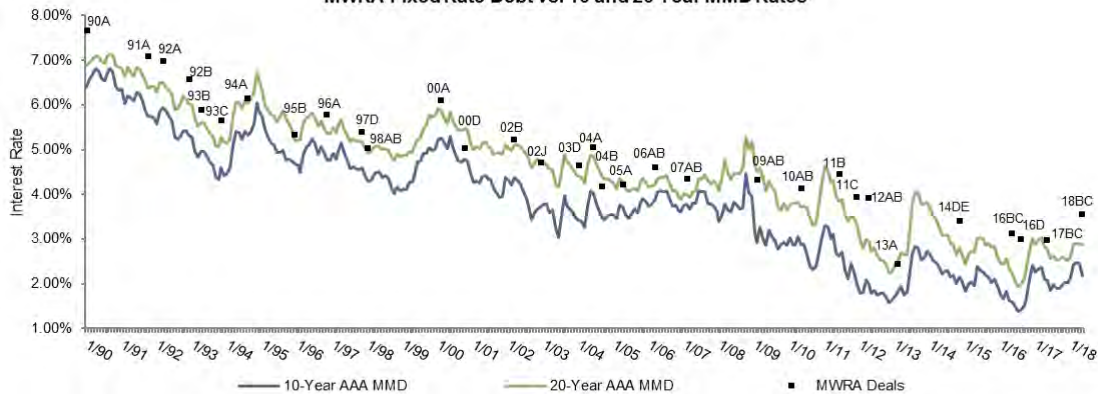
| | |
|---------------------------------|-------|
| Fixed Debt (\$3.40 billion) | 3.77% |
| Variable Debt (\$418.9 million) | 2.07% |
| SRF Debt (\$979.9 million) | 1.51% |

Weighted Average Debt Cost (\$4,755 billion) 3.16%

Most Recent Senior Fixed Debt Issue May 2018

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

MWRA Fixed Rate Debt vs. 10 and 20 Year MMD Rates

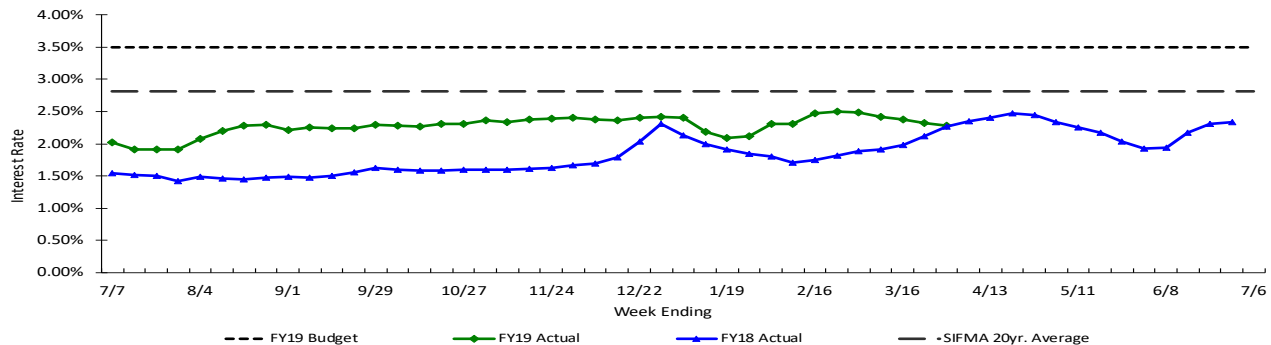


| | | | | | | | | | | | | | | |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|
| Bond Deal | 1993B | 1993C | 1994A | 1995B | 1996A | 1997D | 1998AB | 2000A | 2000D | 2002B | 2002J | 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 | 18.8 yrs | 11.2 yrs | 11.7 yrs |

Weekly Average Variable Interest Rates vs. Budget

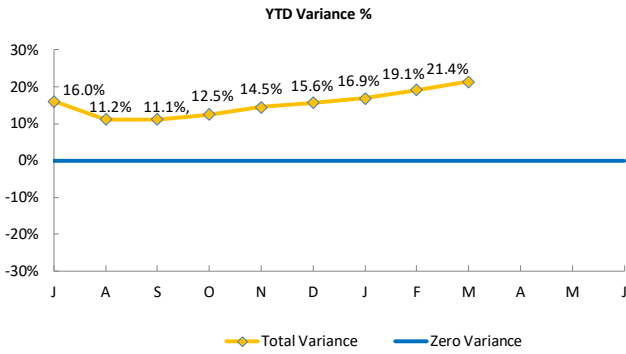
MWRA currently has eleven variable rate debt issues with \$782.2 million outstanding, excluding commercial paper. Of the eleven outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In February, SIFMA rates ranged from a high of 1.74% to a low of 1.50% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.



Investment Income

3rd Quarter – FY19

Year To Date



| | YTD BUDGET VARIANCE | | | |
|-----------------------|---------------------|----------------|----------------|--------------|
| | (\$000) | | | |
| | BALANCES IMPACT | RATES IMPACT | TOTAL | % |
| Combined Reserves | \$17 | \$6 | 23 | 2.1% |
| Construction | (\$15) | \$409 | 394 | 35.5% |
| Debt Service | \$35 | \$852 | 887 | 41.3% |
| Debt Service Reserves | \$3 | \$114 | 117 | 4.1% |
| Operating | \$34 | \$145 | 179 | 19.9% |
| Revenue | \$2 | \$488 | 490 | 41.0% |
| Redemption | \$0 | \$3 | 3 | 0.7% |
| Total Variance | \$76 | \$2,018 | \$2,094 | 21.4% |

YTD Average Balances Budgeted vs. Actual

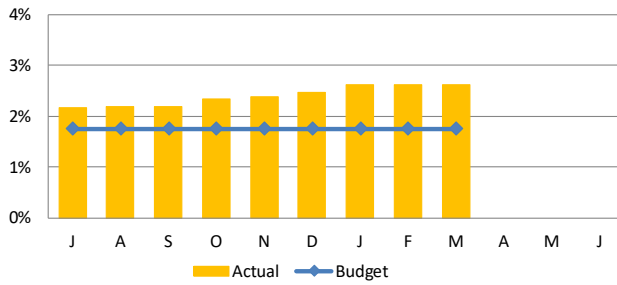


YTD Average Interest Rate Budgeted vs. Actual

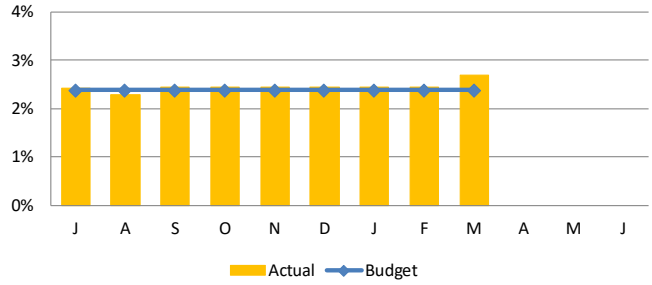


Monthly

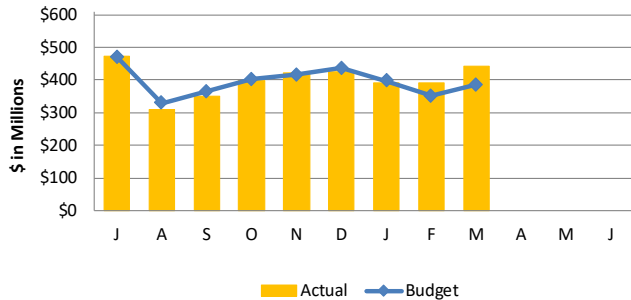
Short -Term Interest Rates



Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances

