MASSACHUSETTS **W**ATER **R**ESOURCES **A**UTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Fourth Quarter FY2016

Q1	Q2	Q3	Q4

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
September 14, 2016

Board of Directors Report on Key Indicators of MWRA Performance
Fourth Quarter FY2016

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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.

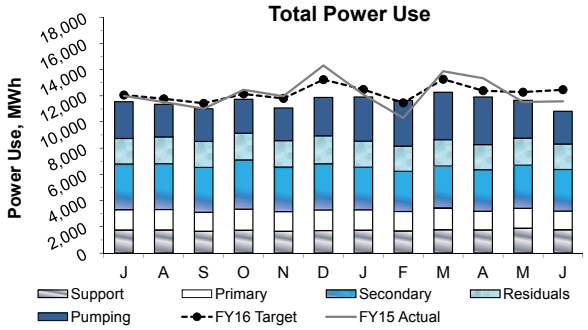
Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer

September 14, 2016

OPERATIONS AND MAINTENANCE

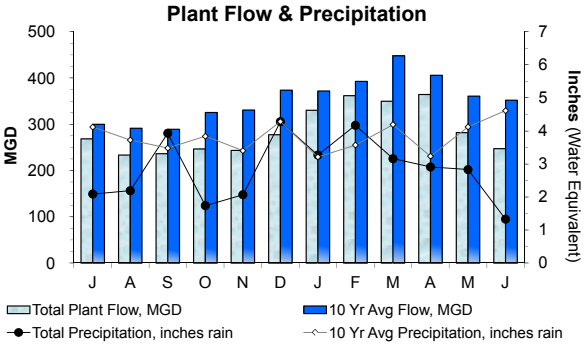
Deer Island Operations

4th Quarter - FY16

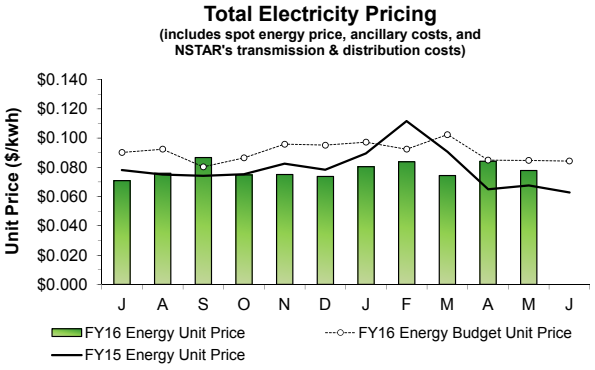


Total power usage in the 4th Quarter was 7.4% below target as Total Plant Flow for the quarter was 11.9% below target with the 3 year average plant flow. Total Power usage for wastewater pumping operations was 17.5% below target in the quarter due to the lower plant flow. **Overall, total power usage in FY16 was 5.4% below target as the 3 year total plant flow average was 11.5% below target.**

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

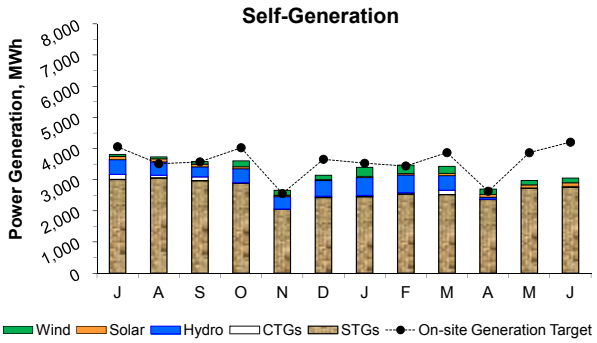


Total Plant Flow for the 4th Quarter was 20.1% below target with the 10 year average plant flow (298.0 MGD actual vs. 373.3 MGD expected) as precipitation for the quarter was 41% lower than target (7.07 inches actual vs. 11.97 inches expected). **Total Plant Flow in FY16 was 18.9% below target as precipitation was 25.8% below target.**



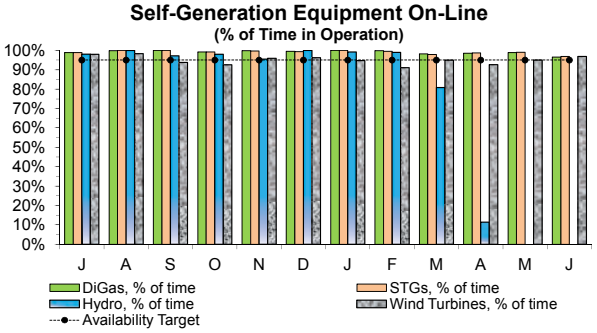
Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The Total Energy Unit Price in the 4th Quarter (actuals for April and May only) was 4.5% lower than the FY16 budget estimate for the same period. The Total Energy Unit Price information for June is not yet available as the complete invoice for this month is still pending receipt and/or review as of reporting time. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges. **The Total Energy Unit Price for FY16 (through May) was 14.4% lower than budgeted.**

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

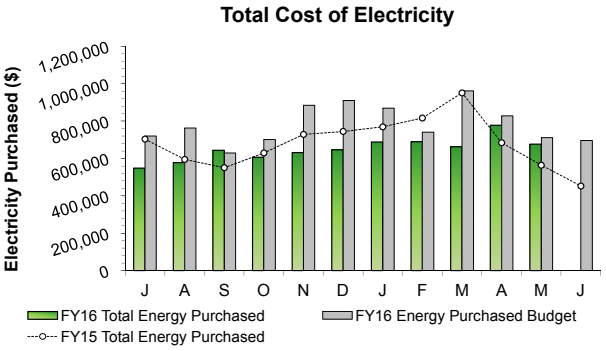


Power generated on-site during the 4th Quarter was 18.4% below target. While generation by the STGs, Wind Turbines, and Solar Panels met or exceeded their target, generation by the CTGs and the Hydro Turbines was below target. The CTGs generated 92% less power than expected during the quarter as the target assumed the CTGs would be operated for several wet weather events, but CTG operation during storms was not needed. The CTGs were however operated for approximately 3.6 hours during the 4th Quarter for a demand response test event on June 15 and for maintenance/checkout purposes. The Hydro Turbines were affected by mechanical issues that left them inoperable for most of the 4th Quarter. **Overall, power generation was 7.8% below target for FY16.**

Note: Power generation data for the Solar Panels and the Wind Turbines may be difficult to see as the amount of power generated is low within the current scale of this graph; a total of 305.1 MWh was generated by the Solar Panels and 462.3 MWh was generated by the Wind Turbines in the 4th Quarter.



The DiGas, STGs, and Wind Turbines met or exceeded the 95% availability target for the 4th Quarter, while the Hydro Turbines were inoperable for most of the Quarter due to electrical and mechanical issues. **Overall in FY16, the DiGas, STGs, and Wind Turbines met or exceeded the 95% availability target, while Hydro Turbine availability was 21.7% below target.**

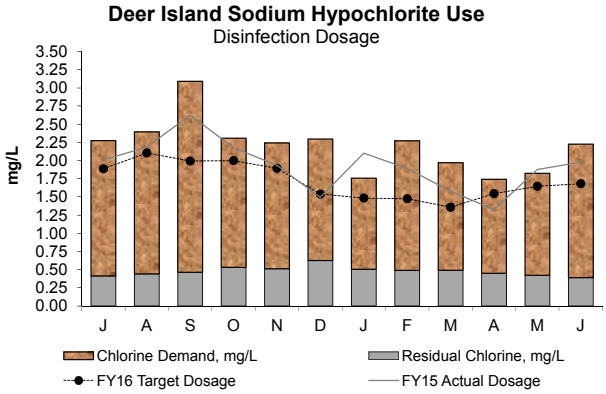


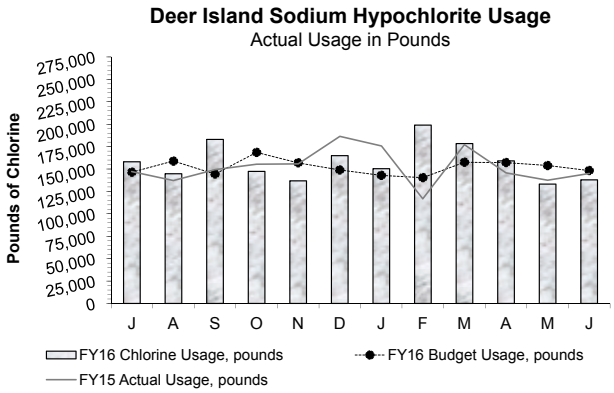
The total cost of Electricity Purchased during the 4th Quarter (actuals for April and May only) was 5.6% lower than budgeted due mainly to lower than expected energy prices in the quarter (as reported), as well as to slightly lower than expected electricity purchased. **Year-to-date Total Cost of Electricity is $1,575,848 (18.1%) lower than budgeted through May as the Total Energy Unit Price and the Total Electricity Purchased are both lower than budgeted by 14.4% and 4.0%.**

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.

Deer Island Operations

4th Quarter - FY16





The disinfection dosing rate in the 4th Quarter was 19% higher than the target. DITP maintained an average disinfection chlorine residual of 0.42 mg/L this quarter with an average dosing rate of 1.93 mg/L (as chlorine demand was 1.51 mg/L). Chlorine dosing was higher than expected due to lower than expected plant flow resulting in a higher chlorine demand. However, actual sodium hypochlorite usage in pounds of chlorine was 6.4% below target this quarter. **Overall in FY16, disinfection dosing was 28% above target and sodium hypochlorite usage in pounds of chlorine was 3.7% above target.**

Please note: The reported chlorine dosing and the hypochlorite usage in pounds is falsely biased high for a portion of February and March due to inacurrately high flow readings from the sodium hypochlorite feed pump in operation. The issue was discovered on March 8 and the pump was taken out of operation for repair.

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

99.7% of all flows were treated at full secondary in the 4th Quarter. There were a total of two (2) separate secondary blending events in the quarter; both due to high plant flows resulting from heavy rain. The two (2) secondary blending events combined produced a total of 9.77 hours of blending and 68.47 Mgal of flow blended with secondary effluent. The Maximum Secondary Capacity for the quarter was 700 MGD.

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	99.8%	3.97
A	0	0	0	100.0%	0.00
S	1	1	0	98.5%	10.63
O	1	1	0	99.96%	1.50
N	0	0	0	100.0%	0.00
D	1	1	0	99.97%	2.46
J	2	2	0	99.5%	8.00
F	2	2	0	99.9%	4.42
M	0	0	0	100.0%	0.00
A	1	1	0	99.4%	8.20
M	1	1	0	99.96%	1.57
J	0	0	0	100.0%	0.00
Total	10	10	0	99.7%	40.75

Overall in FY16, 99.7% of all flows were treated at full secondary. There were a total of 10 separate secondary blending events in FY16, all due to high plant flows resulting from heavy rain. The 10 secondary blending events combined produced a total of 40.75 hours of blending and 264.63 Mgal of flow blended with secondary effluent.

Secondary permit limits were met at all times during the 4th Quarter, as well as during all of FY16.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved a maximum average hourly flow rate of 1,087.9 MGD on the evening of April 7 during a rain event that produced 1.03 inches of precipitation. Overall, Total Plant Flow in the 4th Quarter was 20.1% below the 10 year average plant flow target for the quarter, and 18.9% below target for FY16.

Due to these low flows, several low flow records, post DITP startup (July 1998), were broken this quarter:

Total Plant Flow in May – 282.03 MGD set in May 2016 (previous May record was 283.43 MGD in 2015),
South System Flow in May – 96.47 MGD set in May 2016 (previous May record was 97.39 MGD in 2013).

Total Plant Flow in June – 247.35 MGD in set in June 2016 (previous June record was 271.13 MGD in 1999),
North System Flow in June – 167.30 MGD set in June 2016 (previous June record was 182.06 MGD in 2014),
South System Flow in June – 80.05 MGD set in June 2016 (previous June record was 87.85 MGD in 1999).

The continued low flows also produced a number of fiscal year low flow records as well -

Total Plant Flow – 286.87 MGD set in FY16 (previous fiscal year record was 301.65 MGD in FY14),
North System Flow – 189.08 MGD set in FY16 (previous fiscal year record was 195.22 MGD in FY14),
South System Flow – 97.79 MGD set in FY16 (previous fiscal year record was 97.87 MGD in FY02).

The precipitation in FY16 was the second lowest amount recorded post DITP startup with a total of 33.97 inches of precipitation. The lowest fiscal year total precipitation post startup was 32.41 inches set in FY99.

Deer Island Operations & Maintenance Report (continued)

Environmental/Pumping (continued):
Cleaning of the North Main Pump Station riser shafts occurred between May 9 and May 12. The ten-foot diameter North Metropolitan Relief Tunnel riser shaft yielded approximately 1 cubic yard of material, or one foot of depth, with a disposal weight of 0.65 tons. The eleven-foot diameter Boston Main Drainage Tunnel riser shaft yielded an estimated 14 cubic yards, which included two feet in depth of somewhat drier material, as well as two feet of material pressure washed from the wall, for a total disposal weight of 8.8 tons. Material was disposed utilizing a line item in the grit and screenings hauling and disposal contract. The removal of this floating material reduces the risk of pumping system malfunctions during low flow and pump-down events at the North Main Pump Station.

Primary and Secondary Treatment:
Progress on the major Primary and Secondary Scum Tip Tube Replacement Project continues. The primary scope of this project is to replace 88 of the 96 primary treatment tip tubes, 72 treatment tip tubes in Secondary Batteries A and B, and modification of 36 secondary tip tubes in Secondary Battery C. Construction related to the physical replacement of the tip tubes was completed well ahead of schedule. Performance testing and adjustments to several of the newly installed tip tubes are both currently in progress.

Secondary Treatment:
Annual turnaround maintenance was performed on Train #2 at the Cryogenic Oxygen Facility in April. This turnaround maintenance is performed on roughly half of the components and systems in the Cryo Facility and allows the remaining half of the facility to continue to operate and produce oxygen uninterrupted. The same turnaround maintenance will be performed on Train #1 in the fall.

Flow to Secondary Battery A was suspended on two (2) separate days in June to allow for inspections of the Secondary Battery A scum line due to suspected leaks causing Secondary A effluent to continually leak into the scum line and into the scum collection system. These inspections identified a number of couplings in the common scum line header that had failed due to corrosion, causing openings in the scum line, thereby allowing secondary effluent to continually enter the scum header. Staff are preparing a plan for the future repairs needed for the secondary scum headers.

Odor Control:
Contractors were on DI on April 27 to clean dust and chemical residue from the ductwork that had been identified during inspections in the Residuals Odor Control (ROC) and in the North Pumping Odor Control (NPOC) Facilities in March. Both facilities were shutdown for approximately 4 to 5 hours to allow for this cleaning.

Activated carbon in carbon adsorber unit #3 in the North Pumping Odor Control Facility, units #1, #2, and #3 in the East Odor Control Facility, units #3 and #8 in the West Odor Control Facility, units #1 and #2 in the Secondary Odor Control Facility, and units #2 and #4 in the Residuals Odor Control Facility was replaced during the 4th quarter as part of routine practice to replace spent carbon.

Energy and Thermal Power Plant:
Solar power generation accounted for 3.50% (305.1 MWh) and Wind Turbine generation accounted for 5.30% (462.3 MWh) of the total power generated on-site in the 4th Quarter. Overall, total power generated on-site accounted for 25.4% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 25.2% of Deer Island's total electrical power use for the quarter. **Overall in FY16, total power generated on-site accounted for 28.5% of Deer Island's total power use, and renewable pwer generated on-site accounted for 28.0% of total power use.**

Both Boilers 101 and 201 were taken out of service, one at a time, for a significant burner management system replacement project which involved the replacement of the PLC control system, fuel control valves, and air dampers. Before each boiler could be returned to service, the new control system needed to be fully checked, valve performance tuned, and the boiler test operated in stages to ensure all safety interlocks were functional prior to actual start up. This work was completed in April-May for Boiler 101 and in May-June for Boiler 201.
The scheduled annual overhaul maintenance of CTG-2B began on April 11 and was completed on April 15. CTG-1A remained available for operation during the CTG-2B maintenance and could have been returned to operation within 2 hours had there been a need. Additionally, both CTG units were taken out of service for 18 hours on two (2) separate days in June to allow for the insurance inspector to examine the start-air tank on each unit. The start-air tank on each CTG was inspected and found to be in good condition.

The DITP hot water/heat loop was taken offline from June 6 into the morning of June 9 to allow both DITP Maintenance staff and contractors to make scheduled repairs to the dump condenser and to the hot water/heat loop. A leaking 20 inch expansion joint in a heat loop section located in the Secondary Battery C clarifier gallery was replaced by a contractor. In addition, DITP Maintenance staff utilized the scheduled heat loop downtime to replace several valves on the heat loop. Simultaneously, on June 6, a separate contractor completed the annual dump condenser clean-out. The boiler was returned to operation during the evening of June 6, following the dump condenser work, to restore steam production and steam turbine power generation. The hot water/heat loop was returned to operation on the morning of June 9 following the heat loop expansion joint and valve repair work.
DITP took delivery of 210,000 gallons of #2 fuel oil (a total of 22 tanker trucks) without incident over the course of four days in April. This fuel oil is used for CTG operation, for boiler startup operations, and for supplemental fuel for boiler operation during periods of low or unstable digester gas production.
Daily Wind Turbine generation on May 15 broke the Top 10 List for DITP Wind Turbine generation. The 26,997.17 kWh wind turbine output on May 15 ranks number seven (7) on the Top 10 List. Wind speed averaged 11.4 m/s (25.5 mph) on May 15.

Clinton AWWTP: The rehabilitation of the primary clarifiers and anaerobic digesters is complete.

Instrumentation: Win 911 software was installed on SCADA system and connected to phone line for 24 hour monitoring.

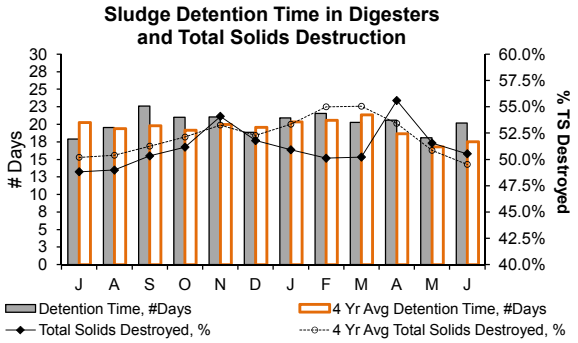
Primary Clarifiers: All work was completed and tanks were filled and tested.

Primary Digester: Started the new Ovivo Linear Motion mixer.

Trickling Filter #2: Machined and installed new sleeve on center column pedestal. A new bronze bearing, thrust bearing and seal kit was installed. The center column and distribution arms were reinstalled and cleaned, repainted and put back in service.
Chemical Building: Replaced return activated sludge pump # 3 with a new motor and pump assembly.

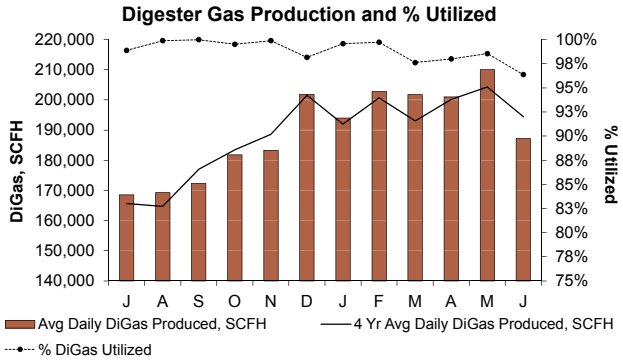
Deer Island Operations and Residuals

4th Quarter - FY16



Total solids (TS) destruction following anaerobic sludge digestion averaged 52.6% during the 4th Quarter, higher than the 4 year average of 51.3% for the same period. The sludge detention time in the digesters of 19.6 days was higher than the 4 year average of 17.6 days as DI operated with an average of 8 digesters during the 4th Quarter. The shifting around of sludge during much of FY16 as a result of various digesters being taken in and out of service for maintenance, impacted overall solids destruction resulting in much lower than expected TS destruction for several months in FY16. The sludge digestion process is a biological process which requires a period of time before returning to stable digestion rates following changes in digester operation. TS destruction appears to have returned to expected levels during the 4th Quarter. **Overall in FY16, TS destruction averaged 51.2%, lower than the 4 year average of 52.2%. Sludge detention time was 20.2 days, similar to the 4 year average of 19.4 days.**

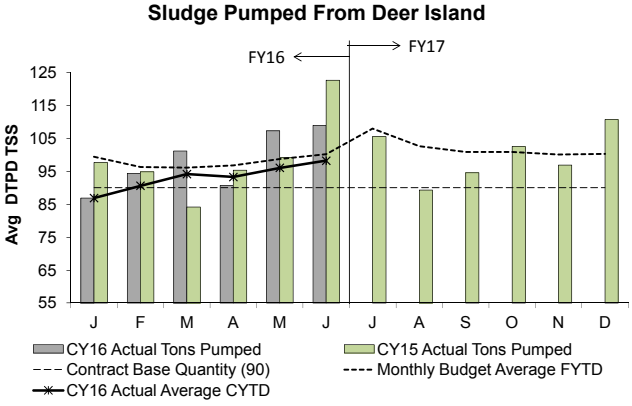
Total solids (TS) destruction is dependent on sludge detention time which is determined by primary and secondary solids production, plant flow, and the number of active digesters in operation. Solids destruction is also significanty impacted by changes in the number of digesters and the resulting shifting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



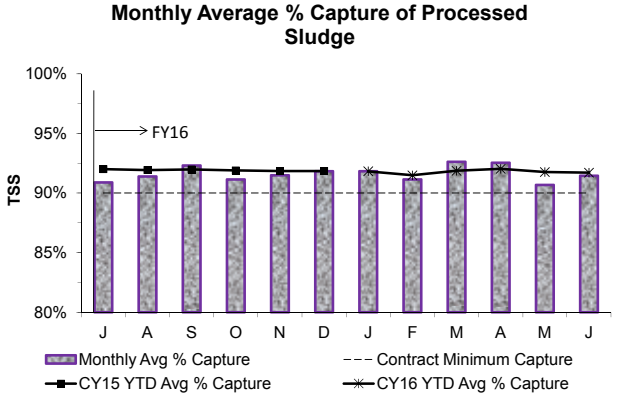
The Avg Daily DiGas Production in the 4th Quarter was on target with the 4 Year Avg Daily DiGas Production for the same period. On average, 97.6% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant. **Overall in FY16, the Avg Daily DiGas Production was also on target (+0.4%), with 98.8% of all the DiGas produced utilized at the Thermal Power Plant.**

Residuals Pellet Plant

MWRA pays a fixed monthly amount for the calendar year to process up to 90 DTPD/TSS as an annual average. The monthly invoice is based on 90 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. The base quantity of 90 DTPD/TSS was set for the 15-year term of the contract, even though, on average, MWRA processes more than 90 DTPD/TSS each year (FY15's budget is 102.9 DTPD/TSS and FY16's budget is 100.2 DTPD/TSS).



The average total quantity of sludge pumped to the Pellet Plant in the 4th Quarter of FY16 was 102.3 DTPD - higher than FY16's average budget of 100.2 DTPD. The slightly higher amount of sludge pumped from Deer Island in the 4th Quarter in comparison to the FY16 budget average is due to higher than average sludge production during late spring, which is typically the period of highest sludge production during the year on Deer Island. **Overall in FY16, the average total amount of sludge pumped from Deer Island was 99.1 DTPD, 1.1% lower than the target of 100.2 DTPD.**

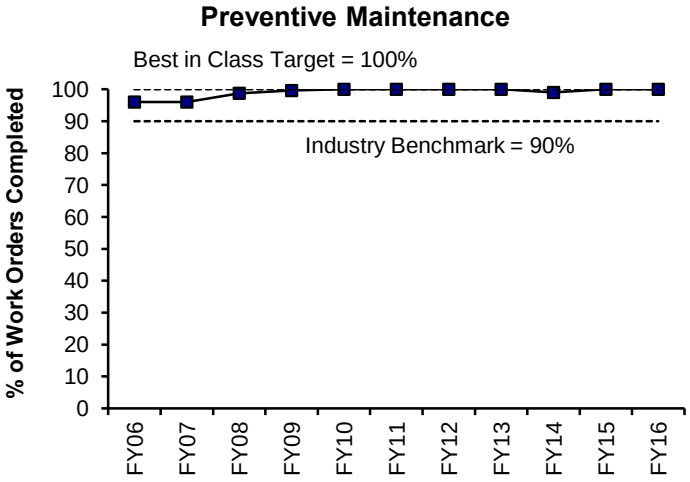


The contract requires NEFCo to capture at least 90% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY16 YTD average capture is 91.71%.

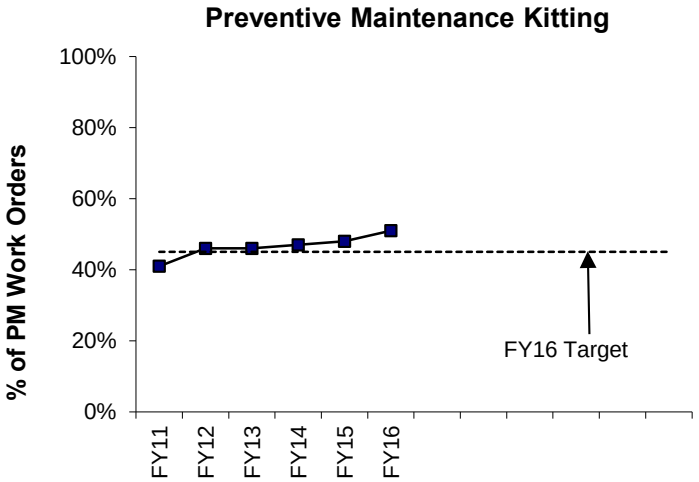
Deer Island Yearly Maintenance Metrics

4th Quarter FY16

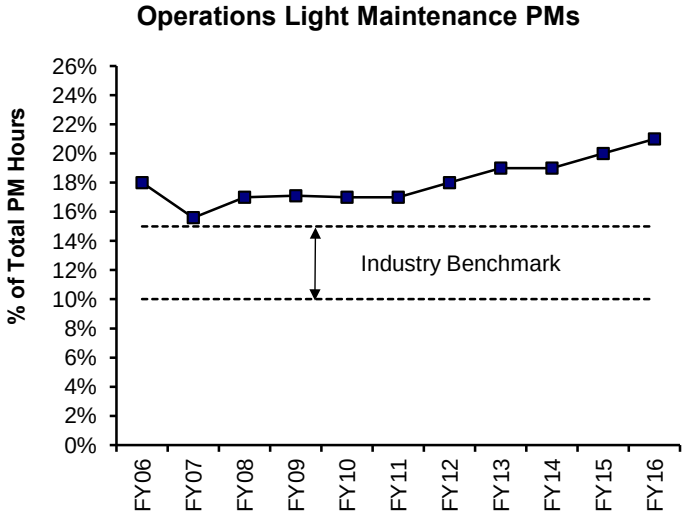
Proactive and Productivity Measures



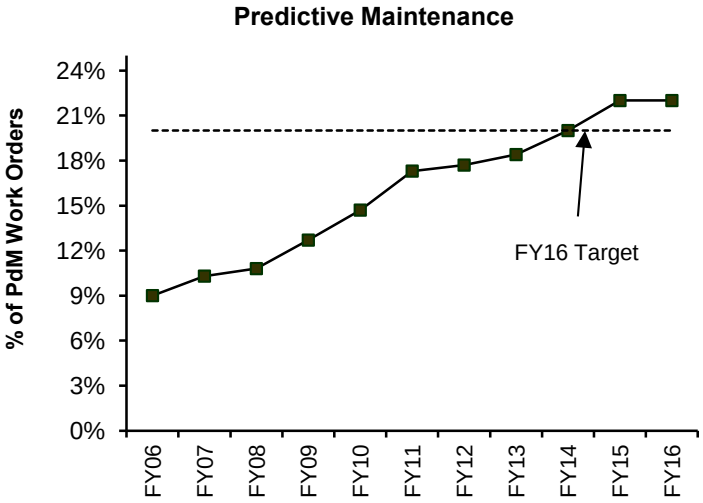
The industry benchmark is 90% for Preventive Maintenance (PM) completion. Upon reaching the 90% goal in FY05, the target goal was increased to the "Best in Class" Target of 100% PM completion. Since then, the percentage of PM work order completion has been at 99% or higher. Reliability-Centered Maintenance (RCM) and PM optimization efforts have continued since FY01. PM completion rate was 99.9% in FY16.



Preventive Maintenance (PM) inventory items were loaded into Maximo to assign spare parts for equipment to PM work orders. DITP reached the PM kitting goal of 100% in FY10. In FY11 a new graph (above) was developed to track kitting of all maintenance work orders in an effort to increase wrench time. Staff continues to fine-tune the process to "kit" all maintenance work orders. Kitting is considered a best practice by maintenance and reliability professionals. It entails staging parts necessary to complete maintenance work. Kitting allows maintenance staff to spend more time "turning the wrench" and less time waiting for parts at the stockroom window. Kitting for FY16 was 51%.



The percentage of preventive maintenance work order hours completed by Operations staff (not maintenance staff) increased from less than 1% in January 2002 to the current level of 21% in FY16. DITP reached the industry benchmark range of 10-15% in April 2003 and has exceeded the goal through FY16. Operations completes approximately 600 PM work orders per month.

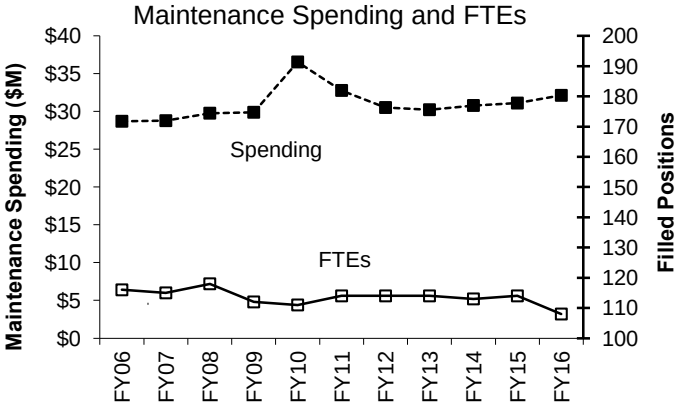


Predictive maintenance has steadily increased from 2% in FY03 to 22% in FY16, surpassing DITP's FY16 goal of 20%. The increase in predictive maintenance was achieved through the expanded use of lubrication, vibration, thermography, and acoustic ultrasonic testing techniques. The Condition Monitoring Group continually reviews and investigates new opportunities and initiatives to expand condition monitoring testing and analysis.

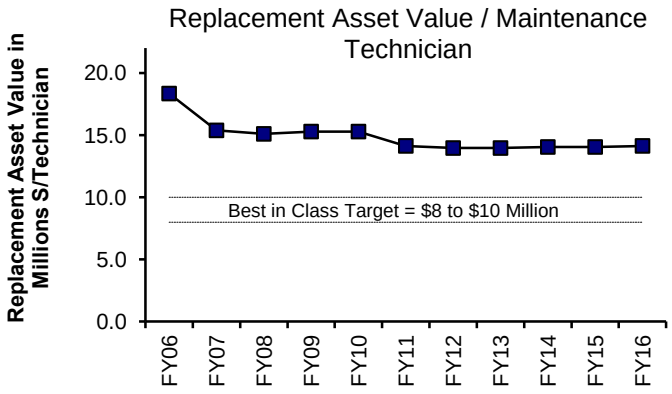
Deer Island Yearly Maintenance Metrics

4th Quarter - FY16

Overall Maintenance Program Measures

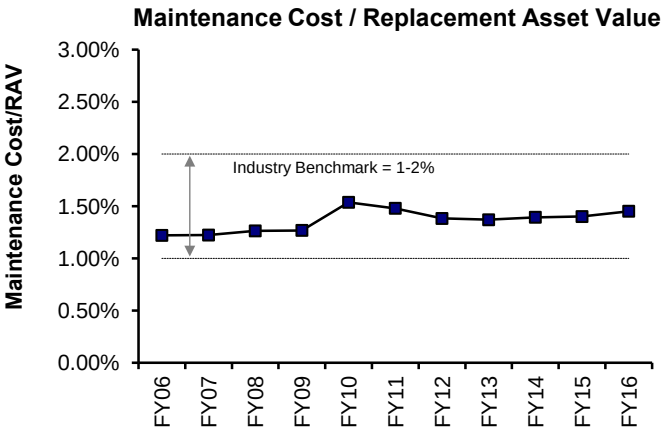


DITP's Maintenance staff is currently at 108 FTE's. Maintenance has been successful in meeting its goals through implementation of numerous maintenance efficiencies including: Operations staff performing light maintenance, cross-functional training and flexibility, and Reliability-Centered Maintenance

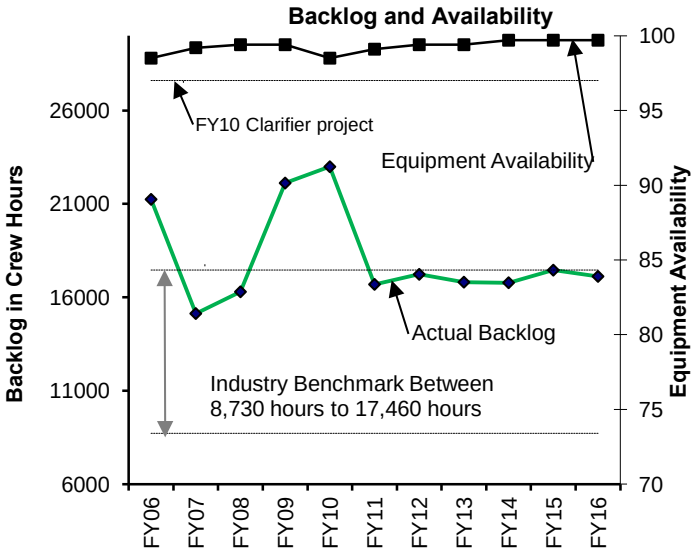


DITP adopted a "best in class" target of $8-$10 Million/Technician for maintenance staffing. Even after a period of downward trending, DITP remains above this Best in Class target range. However, as the plant ages and additional equipment replacements are expected, DITP management will reassess staffing as needed.

The Maintenance Spending graph shows actual annual maintenance spending and large asset replacements (equipment costs only). Maintenance budgeting continues to evaluate plant assets and requirements for replacement of obsolete equipment to ensure the plant operates at maximum efficiency. In FY16, overall spending slightly increased from FY15 due to an increase in CIP Projects. CIP projects during FY16 included: North Main Pump Station and Winthrop Terminal Facility Valve replacement, Secondary Reactor and North Main Pump Station VFD replacement, Electrical equipment upgrades, Cryo Chiller replacement and the Primary/Sedondary Scum Tip-Tube replacement project. The large spike in FY10 and FY11 is attributed to the Clarifier Rehabilitation project ($58M), which was on-going during that period.



The industry benchmark for annual maintenance spending is between 1% to 2% of replacement asset value. The plant's replacement asset value is calculated at approximately $2.4 billion dollars. DITP's current maintenance spending is within the industry benchmark. As the plant ages and equipment replacement is required, spending is expected to increase. DITP Maintenance CEB spending is $11.8 million coupled with CIP spending which funded Electrical Equipment upgrades, North Main Pump Station and Winthrop Terminal Facility Valve replacement, and the Primary/Secondary Scum Tip-Tube replacement projects.



Industry benchmarks are 97% for equipment availability and 8,730 to 17,460 hours for maintenance backlog based on current staffing.

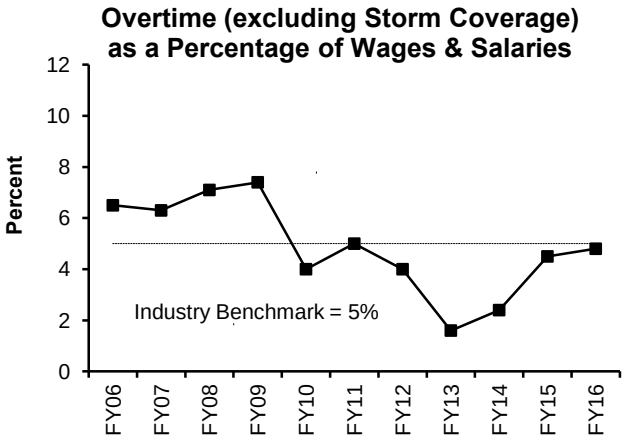
Over the last ten years, equipment availability exceeded that benchmark. In FY16 the availability was 99.7%, the highest availablility attained to date.

Total average backlog for FY16 was 17,119 hours, which is at the top of the industry benchmark. The increase in backlog is attributed to additional HVAC equipment replacements and maintenance vacancies created through numerous retirements. Management continues to prioritize work and closely monitor DITP's backlog.

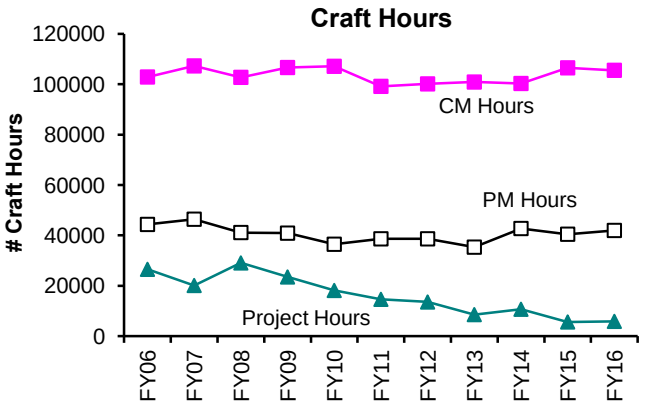
Deer Island Yearly Maintenance Metrics

4th Quarter - FY16

Overall Maintenance Program Measures (cont.)

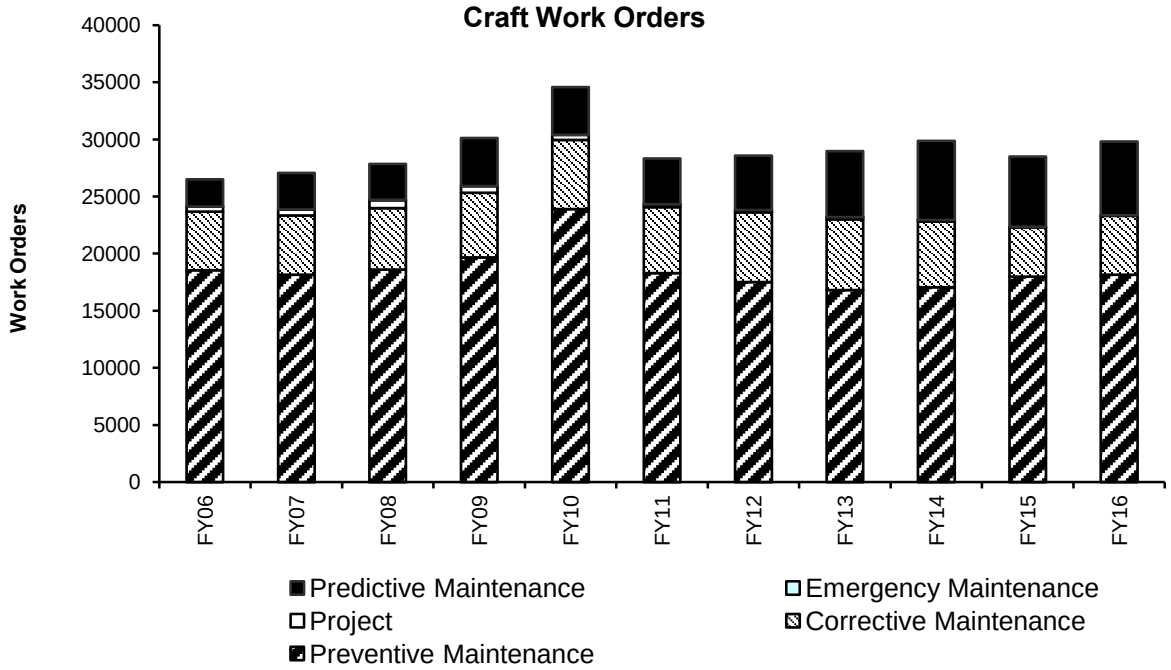


Management continues its effort to keep overtime below the industry benchmark. DITP maintenance overtime was 4.8% for FY16. Management has taken steps to reduce overtime spending by limiting overtime to repair critical equipment and systems only. DITP has been on or under budget from FY09 through FY16. The increase in overtime during the last year was due to plant shutdowns and HVAC equipment replacements.



Continued optimization of the Preventive Maintenance (PM) program through the transfer of some light maintenance tasks from Maintenance to Operations staff (21% of PM hours at the end of FY16), elimination of duplicate work orders, increasing PM frequency due to equipment history and performance and Reliability-Centered Maintenance (RCM) recommendations resulted in a significant decrease of 2,388 hours in maintenance staff PM hours from FY06 to FY16. Corrective Maintenance (CM) hours decreased from last year due to additional large HVAC equipment replacement. Project Maintenance hours remained the same due to a number of CIP projects on-going during FY16.

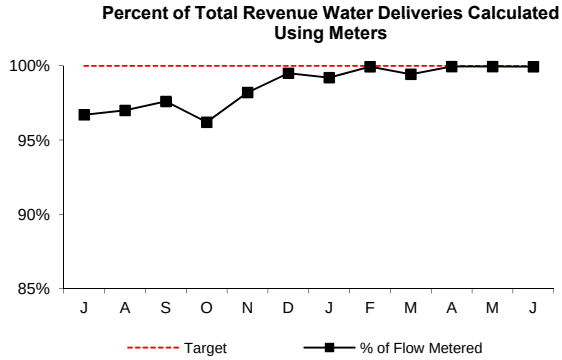
During FY16, the number of work orders increased by 1,484 from the previous year due to the increase in Condition Monitoring Program. While the number of Corrective Maintenance (CM) work orders increased, the overall (CM) hours decreased from last year. The Planning department is streamlining work orders while ensuring all work by various trades are captured on one work order ensuring all costs are available for reporting and/or reimbursement if needed.



Operations Division Metering

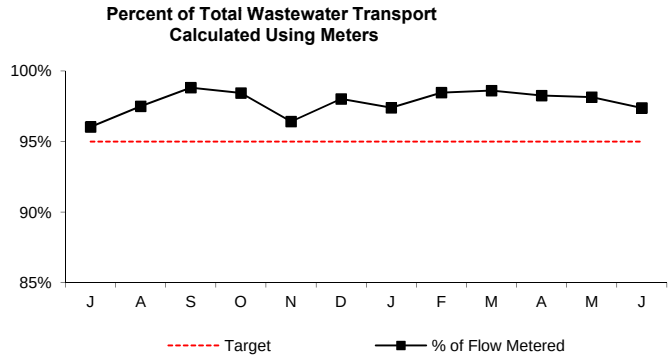
4h Quarter - FY16

WATER METERS



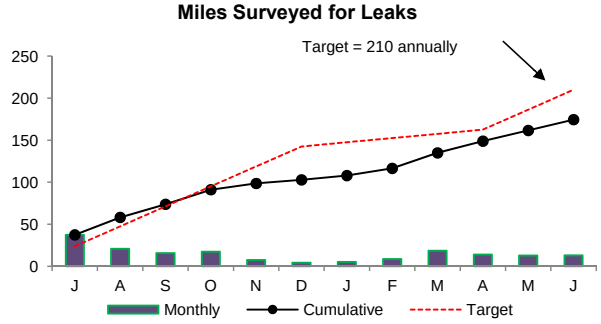
The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 4th Quarter of FY16, meter actuals accounted for 99.95% of flow; only 0.05% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.04%
Instrumentation Failure - 0.01%

WASTEWATER METERS



The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 4th Quarter of FY16, meter actuals accounted for 97.9% of flow, 2.1% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES



During the 4th Quarter of FY16, 39.56 miles of water mains were inspected. The total inspected for the fiscal year to date is 174.49 miles.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	3	3	1	4	0	0	7	4	1	2	2	2
Leaks Repaired	1	4	1	4	3	1	3	4	1	3	3	4
Backlog	10	9	9	9	6	5	9	9	9	8	7	5
Avg. Lag Time	25.7	44.1	59.4	61.1	72.4	82.1	68.8	68.6	75.0	78.4	80.8	81.7

During the 4th Quarter of FY16, six leaks were detected and ten repaired. Five leaks remain unrepaired, of which, four are carried over from FY15. Refer to FY16 Leak Report below for details. Additionally during Q4 community assistance, ranging from individual leak location work to hydrant surveys were conducted in the following cities:

* April - Newton, Medford, Somerville and Malden
* May - Waltham
* June - Malden, Medford, Milton, Newton, Waltham

FY16 Leak Report - 4th Quarter

Date Detected	Location of Leaks	Repaired
5/9/2014	General Edward Bridge, Revere/Lynn	8/31/2015
5/7/2015	West Street, Hyde Park Boston Proper	7/8/2015
8/7/2015	DCR Foss Park Broadway, Somerville	8/7/2015
8/11/2015	Broadway @ Mt Pleasant, Somerville	8/18/2015
7/21/2015	Broad Street @ Union Street, Lynn	8/20/2015
7/1/2015	Fellsway East Ext @ Pond Street, Stoneham	9/2/2015
6/22/2015	825 University Ave., Norwood	10/5/2015
10/6/2015	General Lawrence Bridge, Medford	10/21/2015
10/6/2015	#49 Lynn Street @ Shute Street, Everett	10/28/2015
10/26/2015	Mystic Valley Parkway @ Rte 16, Medford	10/30/2015
9/28/2015	Winthrop Ave. @ Summer Street, Revere	11/5/2015
5/12/2015	129 West Street, Hyde Park	11/10/2015
10/27/2015	Woodland road @ Pond Street, Stoneham	11/23/2015
8/3/2015	630 Squire Rd., Revere	12/30/2015
1/6/2016	644 Pleasant St., Belmont	1/20/2016
1/19/2016	Columbus Park Sewer Station, S. Boston	1/20/2016
1/7/2016	Common St., at Spring St., Watertown	1/25/2016
2/1/2016	376 Revere Beach Parkway, Revere	2/10/2016
1/5/2016	Forest Street @ Summer Street, Arlington	2/11/2016
1/31/2016	Pleasant Street @ Lake Street, Belmont	2/16/2016
2/10/2016	45 Felton Street @ Water Street, Waltham	2/23/2016

Date Detected	Location of Leaks (cont)	Repaired
2/19/2016	Mount Vernon @ Albion Street, Somerville	3/18/2016
3/23/2016	Charles River - Section 80, Weston	4/8/2016
1/28/2016	Charles St., @ Canal St., Malden	4/27/2016
2/22/2016	307-309 Waverly Oaks Rd., Waltham	4/29/2016
4/26/2016	Waverly Oaks Rd., @ Marianne, Waltham	5/9/2016
4/18/2016	Riverside Ave., @ Spring Street, Medford	5/17/2016
5/15/2016	472 Boston Ave., @ College Ave., Medford	5/23/2016
5/4/2016	Mystic Valley Pkwy @ Route 16, Medford	6/7/2016
1/31/2016	215 Pleasant Street, Arlington	6/10/2016
6/7/2016	Morton Street @ American Legion Hgwy, W. Roxbury	6/10/2016
1/6/2016	3642 Washington St., @ Arborway, W. Roxbury	6/27/2016

Date Detected	Location of Leaks/Unrepaired
1/11/2015	Arborway @ St Joseph St., West Roxbury - Working on Traffic plan
6/8/2015	Allandale Rd. @ Grove St., Brookline - Requires a shutdown
6/17/2015	Washington St @ Lower E. Street, Dedham -Requires Night Shutdown
7/16/2015	Captain Robert Cook Dr., Needham - Difficult to isolate -on hold till Winter
6/1/2016	Comm Ave @ Oakland Ave, Newton - can't shut off till Fall-major pipeline

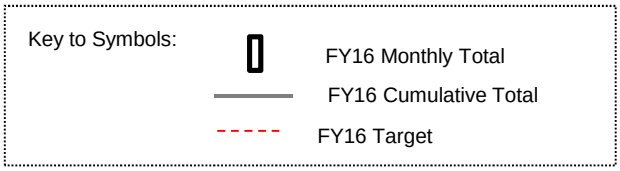
Water Distribution System Valves

4th Quarter - FY 16

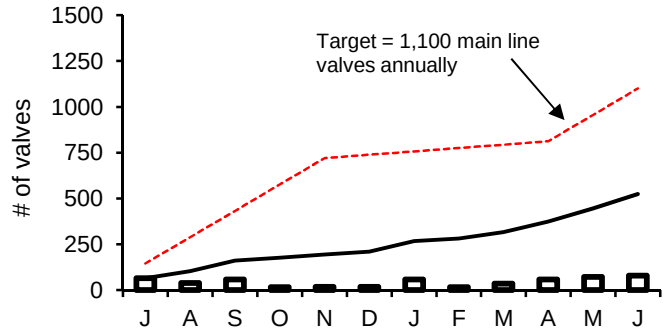
Background

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	
		FY16 to Date	FY16 Targets
Main Line Valves	2,159	96.5%	95%
Blow-Off Valves	1,317	95.2%	95%
Air Release Valves	1,380	93.6%	95%
Control Valves	49	100.0%	95%

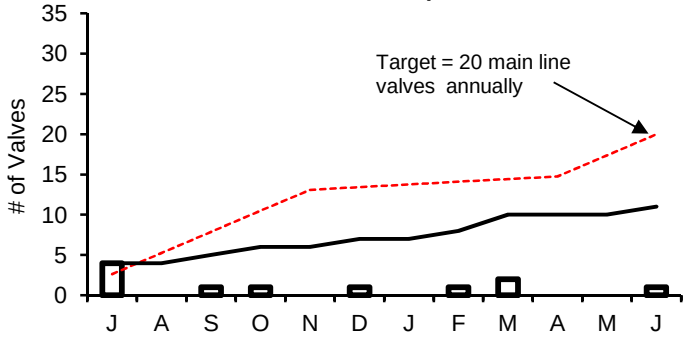


Main Line Valves Exercised



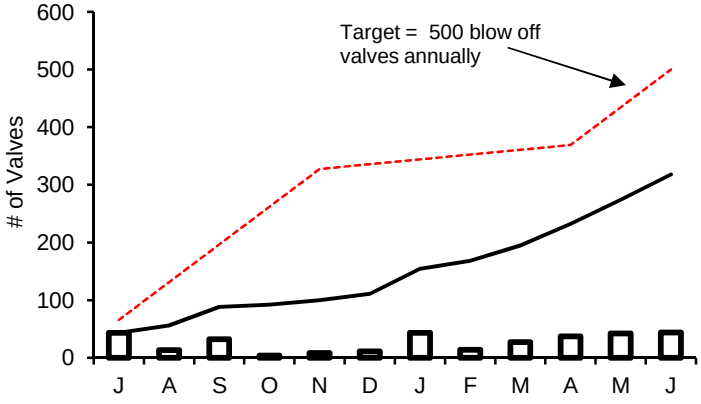
During the 4th Q of FY16, staff exercised 208 main line valves. The total exercised for the fiscal year is 524. Below target due to staffing shortage* and high priority CIP projects.

Main Line Valves Replaced



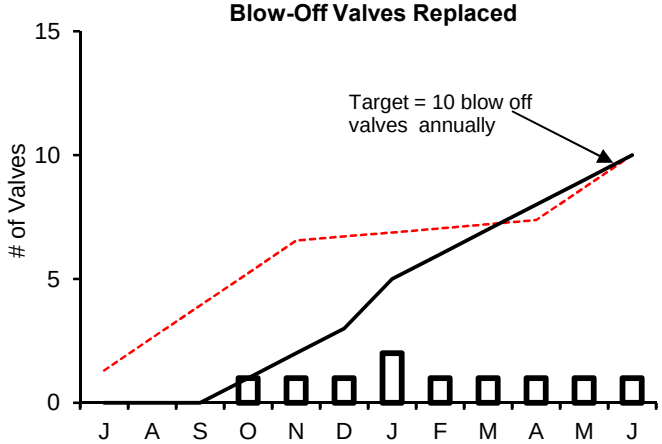
During the 4th Q of FY16, staff replaced one main line valve. The total replaced for the fiscal year is eleven. Year end target not met due to number of leak repairs as well as work on the cathodic protection program.

Blow-Off Valves Exercised



During the 4th Q of FY16, staff exercised 123 blow off valves. The total exercised for the fiscal year is 318. Below target due to staffing shortage* and high priority CIP projects.

Blow-Off Valves Replaced



During the 4th Q of FY16, staff replaced three blow off valves. The total replaced for the fiscal year is ten.

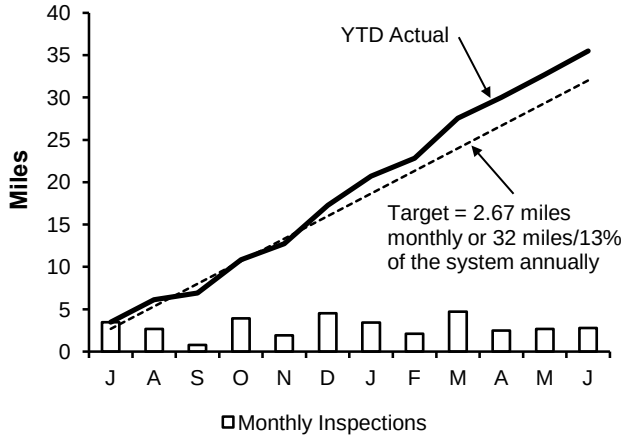
*Three of the four Valve Program Foreman positions have been vacant for part of the past year. One position has remained vacant after a promotion for almost a year. Second Foreman was out from late September through December 2015 due a a non-work related accident. A third position has been vacant since March due to a promotion, and is in the process of being backfilled.

Wastewater Pipeline and Structure Inspections and Maintenance

4th Quarter - FY 16

Inspections

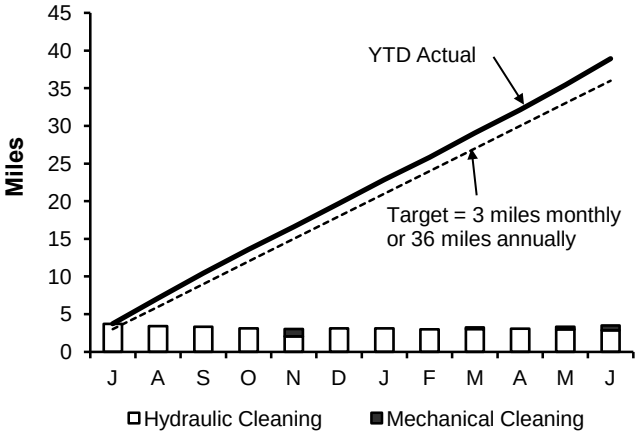
Pipeline Inspections



Staff internally inspected 7.94 miles of MWRA sewer pipeline during this quarter. The year to date total is 35.48 miles. No Community Assistance was provided this quarter.

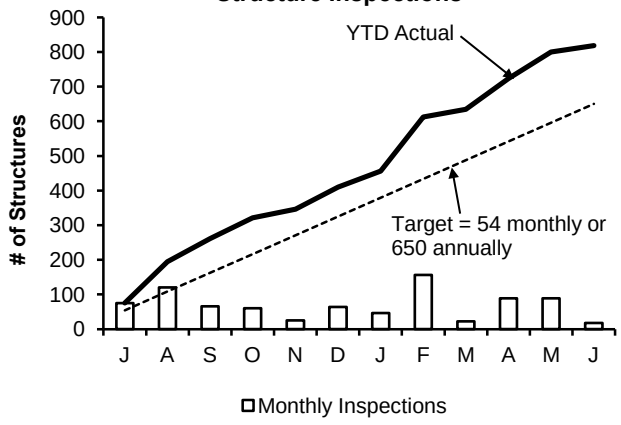
Maintenance

Pipeline Cleaning



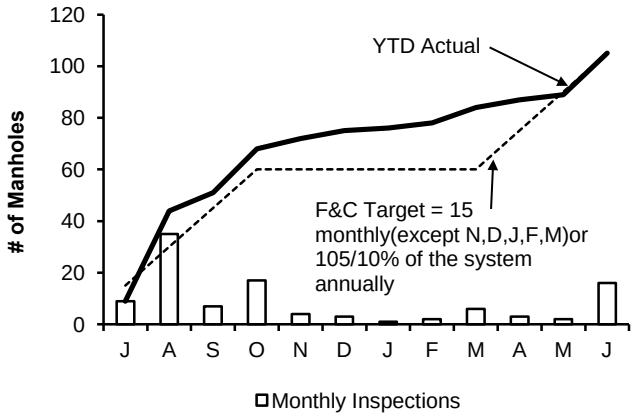
Staff cleaned 8.93 miles of MWRA's sewer system and removed 40 yards of grit and debris during this quarter. The year to date total is 38.94 miles. No Community Assistance was provided this quarter.

Structure Inspections



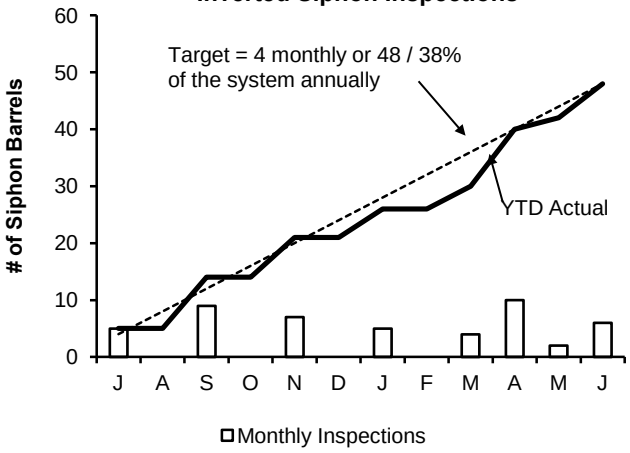
Staff inspected the 36 CSO structures and performed 160 additional manhole/structure inspections during this quarter. The year to date total is 818 inspections.

Manhole Rehabilitation



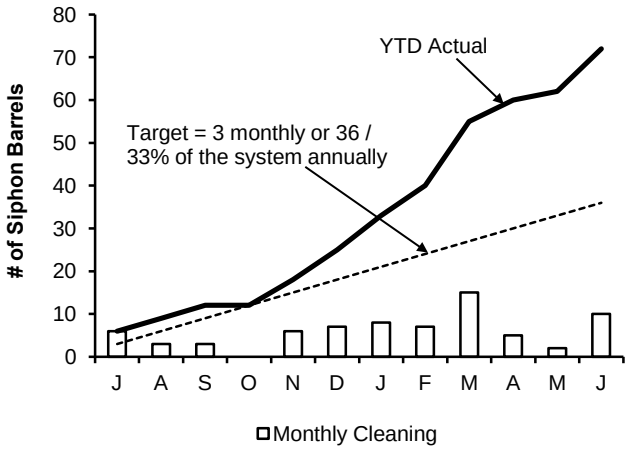
Staff replaced 21 frames & covers during this quarter. The year to date total is 105.

Inverted Siphon Inspections



Staff inspected 18 siphon barrels this quarter. Year to date total is 48 inspections.

Inverted Siphon Cleaning



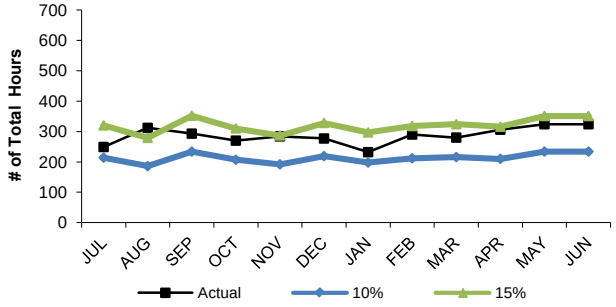
Staff cleaned 17 siphon barrels during this quarter. The year to date total is 72 barrels.

Field Operations' Metropolitan Equipment & Facility Maintenance

4th Quarter - FY16

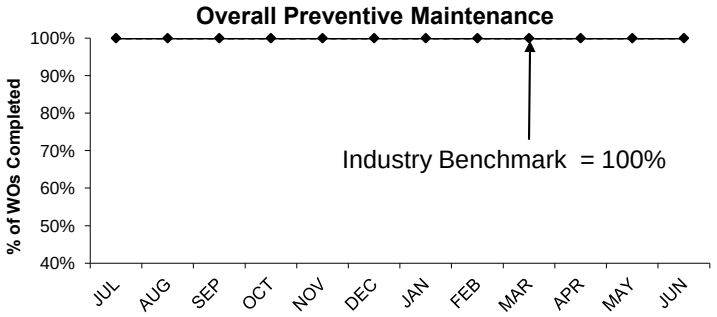
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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

Operations Light Maintenance PM Hours



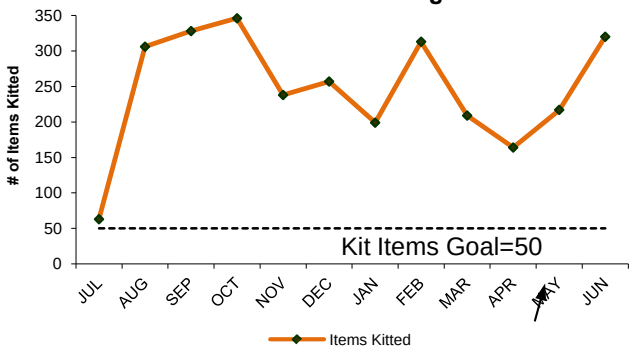
Operations staff averaged 318 hours of preventive maintenance during the 4th Quarter, an average of 14% of the total PM hours for the 4th Quarter, which is within the industry benchmark of 10% to 15%.

Overall Preventive Maintenance



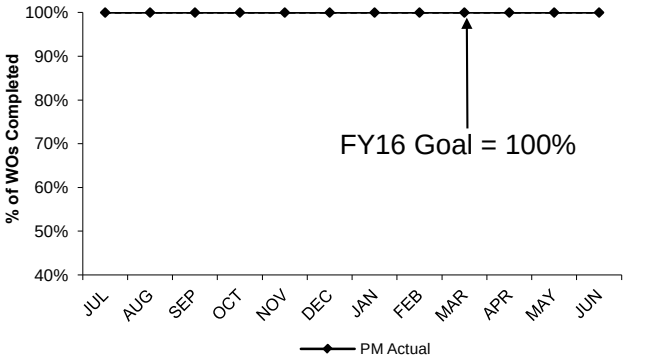
The Field Operations Department (FOD) preventive maintenance goal for FY16 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 4th Quarter.

Items Kitted Utilizing Maximo



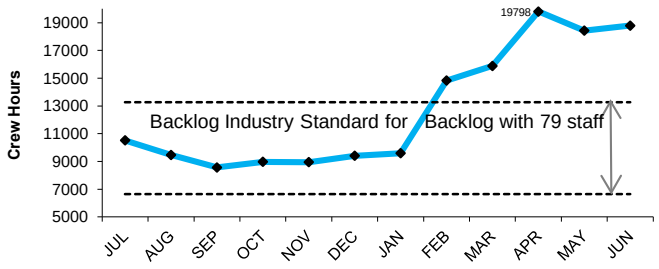
In an effort to more efficiently complete work, maintenance staff and work coordination staff have utilized the Lawson/Maximo interface to better kit stock and non stock material. The goal for FY16 is to "kit" 50 stock and non stock items total per month. An average of 234 items were kitted each month during the 4th Quarter.

Operations Light Maintenance % PM Completion



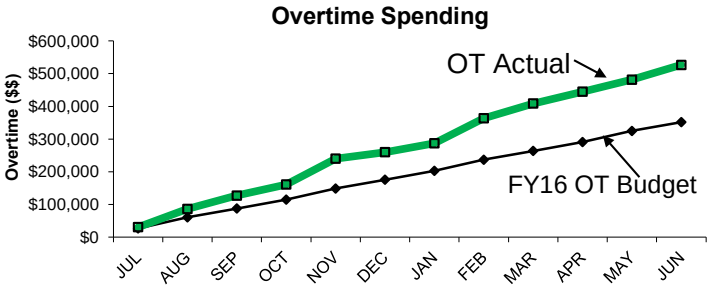
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY16 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 4th Quarter.

Maintenance Backlog in Crew Hours



The 4th Quarter backlog average is 19003 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours. Backlog hours are above the industry benchmark due to the Nut Island Incident response, critical maintenance repairs and staging for wet weather events.

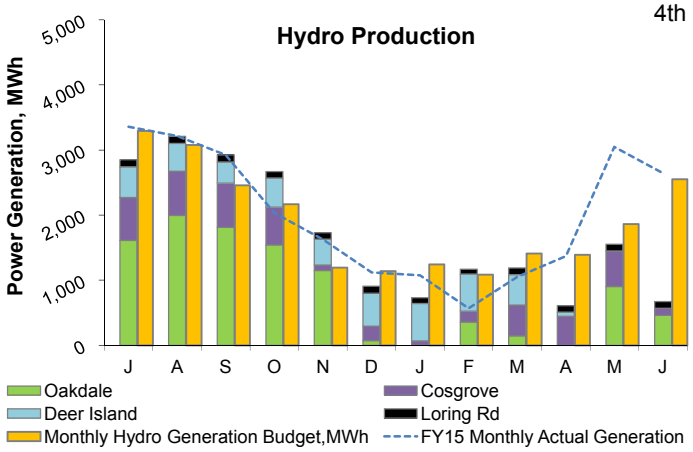
Overtime Spending



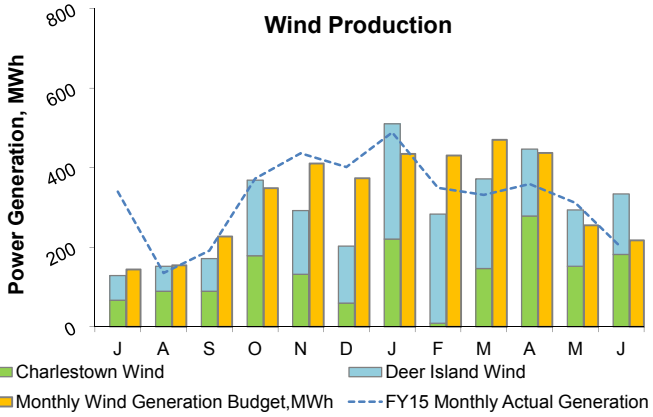
Maintenance overtime was $30k over budget for the 4th Quarter and $175k over budget for FY16. Overtime was used for staging for weather events, critical maintenance repairs, and the Nut Island Incident Response .
The year end total of overtime spending was $527k for FY16.

Renewable Electricity Generation: Savings and Revenue

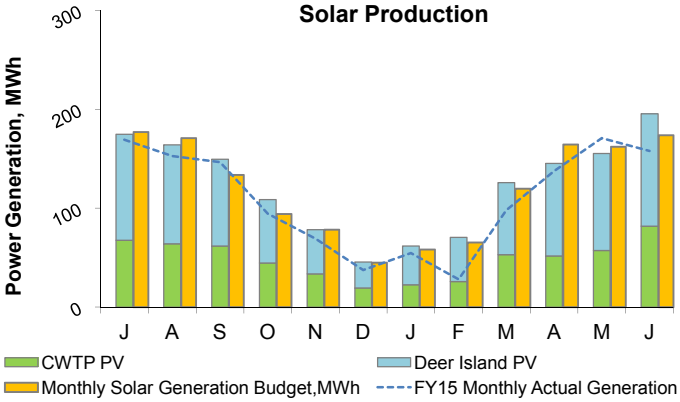
4th Quarter - FY16



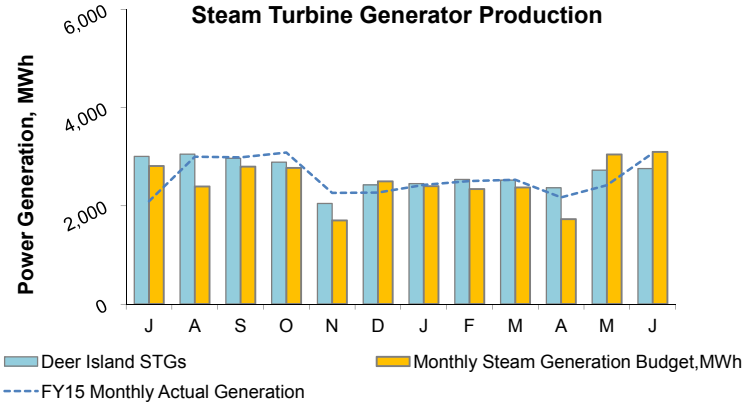
In the 4th Quarter, the renewable energy produced from all hydroelectric facilities totaled 2,837 MWh; 51% below budget[3], due to Deer Island hydro turbines being off-line with mechanical issues, Cosgrove operating at a lower rate for testing, and Oakdale undergoing maintenance work. The total energy produced to date in FY16 is 20,209 MWh; 12% below budget[3]. The total savings and revenue[2] to date in FY16 (actuals through May[1]) is $793,920; 31% below budget[3], partly due to the fact that the actual electricity unit price for Deer Island has been 14% below the budgeted[3] estimate for the same period, and due to Oakdale receiving a 48% on average lower than budget[3] price/kWh for the same period. Oakdale budget is based on a 3-year revenue average (FY12-FY14). The savings and revenue value does not include RPS REC revenue (see next page).



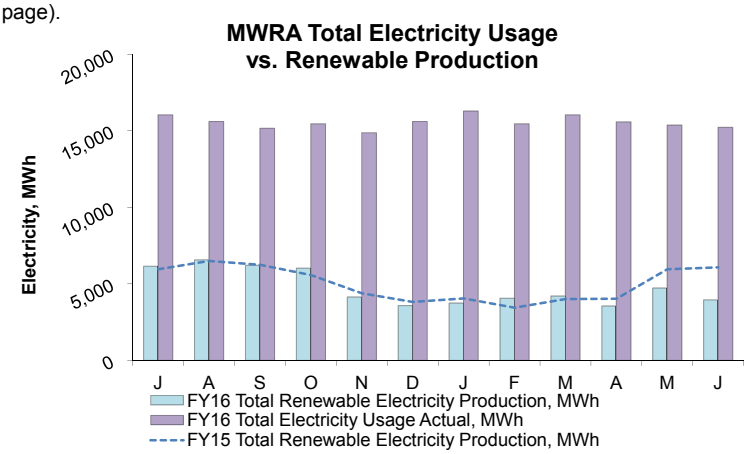
In the 4th Quarter, the renewable energy produced from all wind turbines totaled 1,073 MWh; 18% above budget[3]. The total energy produced to date in FY16 is 3,552 MWh; 9% below budget[3], in part due to Charlestown Wind Turbine undergoing repairs of its main power converter in February. The total savings and revenue[2] to date in FY16 (actuals through May[1]) is $425,995; 11% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

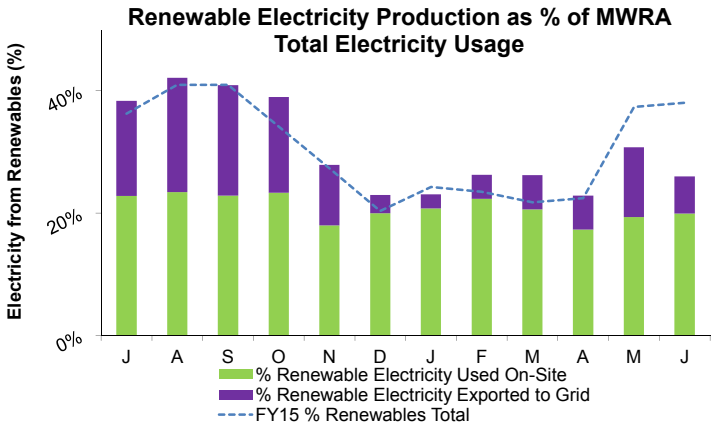


In the 4th Quarter, the renewable energy produced from all solar PV systems totaled 496 MWh; 1% below budget[3]. The total energy produced to date in FY16 is 1,474 MWh; 2% above budget[3]. The total savings and revenue[2] to date in FY16 (actuals through May[1]) is $152,607; 8% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



In the 4th Quarter, the renewable energy produced from all steam turbine generators totaled 7,851 MWh; equal to budget[3]. The total energy produced to date in FY16 is 31,760 MWh; 6% above budget[3]. The total savings and revenue[2] to date in FY16 (actuals through May[1]) is $2,260,163; 7% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).



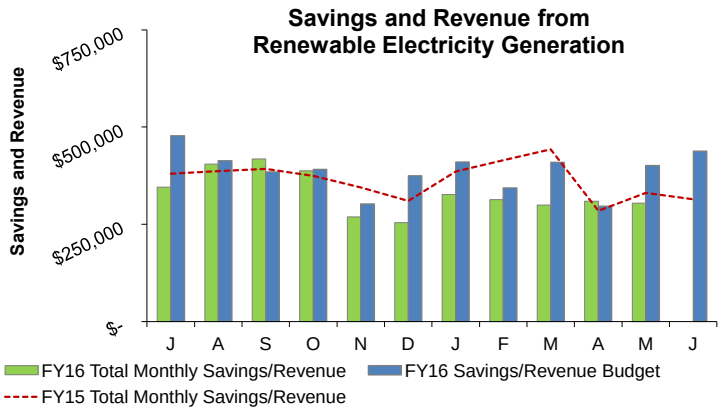


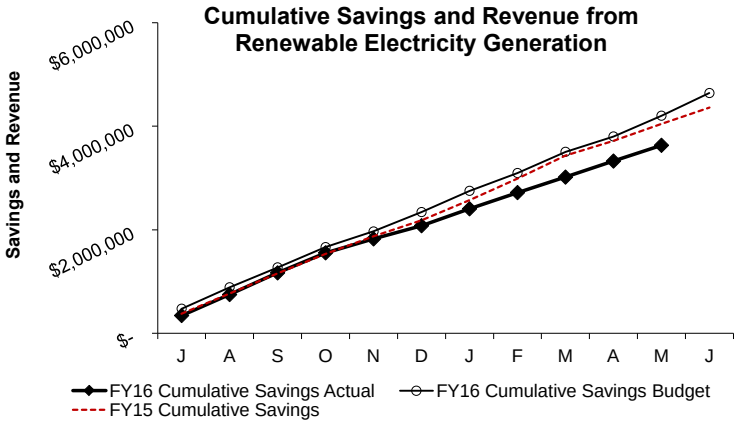
In the 12 months of FY16, MWRA's electricity generation by renewable resources totaled 56,996 MWh. MWRA's total electricity usage was approximately 186,791 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site 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 FY16, green power generation represented approximately 31% 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.

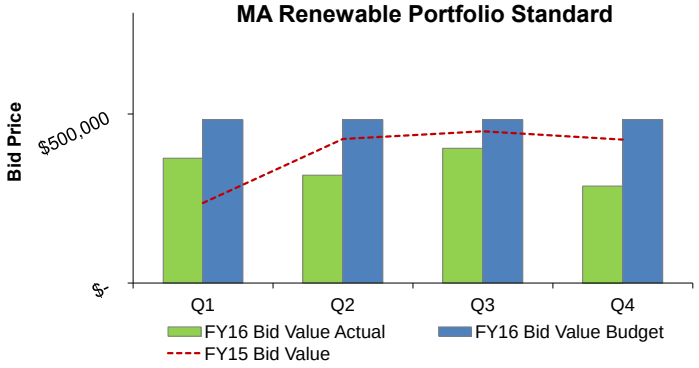
Renewable Electricity Generation: Savings and Revenue

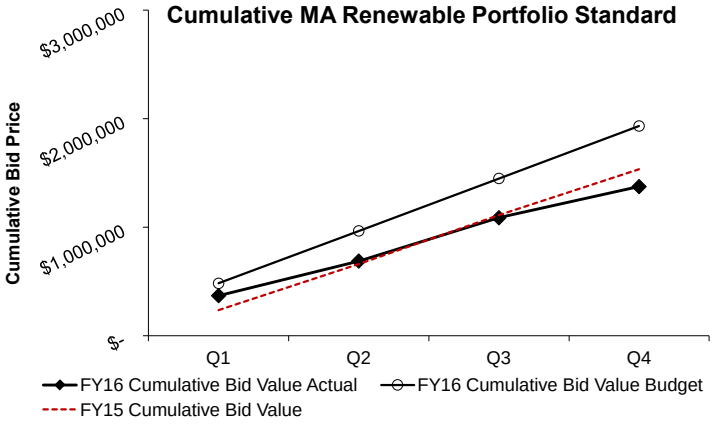
4th Quarter - FY16



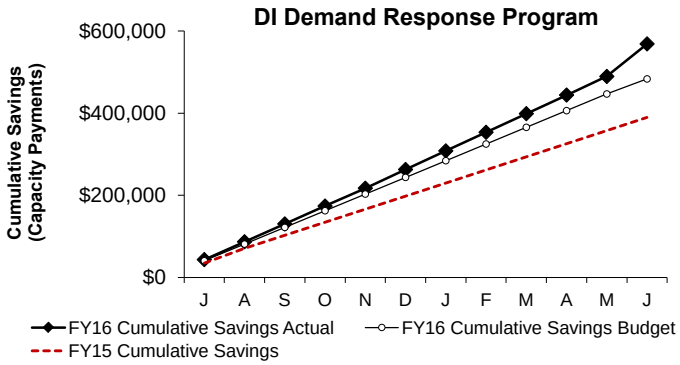


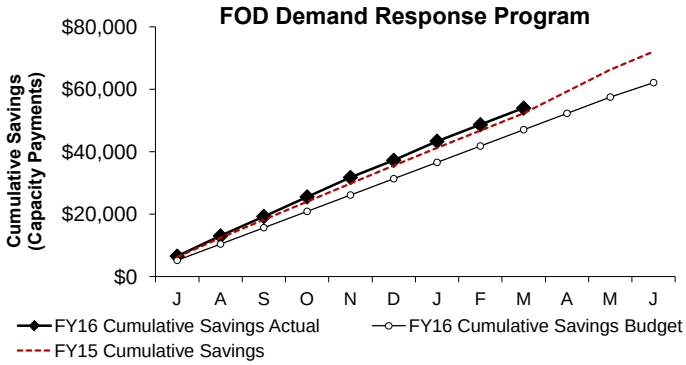
Savings and revenue from MWRA renewable electricity generation in the first 11 months of FY16 (actuals only through May[1]) is $3,632,684; which is 14% below the budget[3], partly due to the fact that the actual electricity unit price for Deer Island has been 14% below the budgeted[3] estimate for the same period. Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).





Bids were awarded during the 4th Quarter[1] from MWRA's renewable energy assets; 6,924 Q4 CY2015 Class I Renewable Energy Certificates (RECs), 4,702 Q4 CY2015 Class II RECs and 45 Q4 CY2015 Solar RECs were sold for a total value of $286,879 RPS revenue; which is 41% below the budget[3] for the quarter. REC values reflect the bid value on the date that bids are accepted, even though the RECs were produced during Q4 of CY2015. Cumulative bid values reflects the total value of bids received to date.



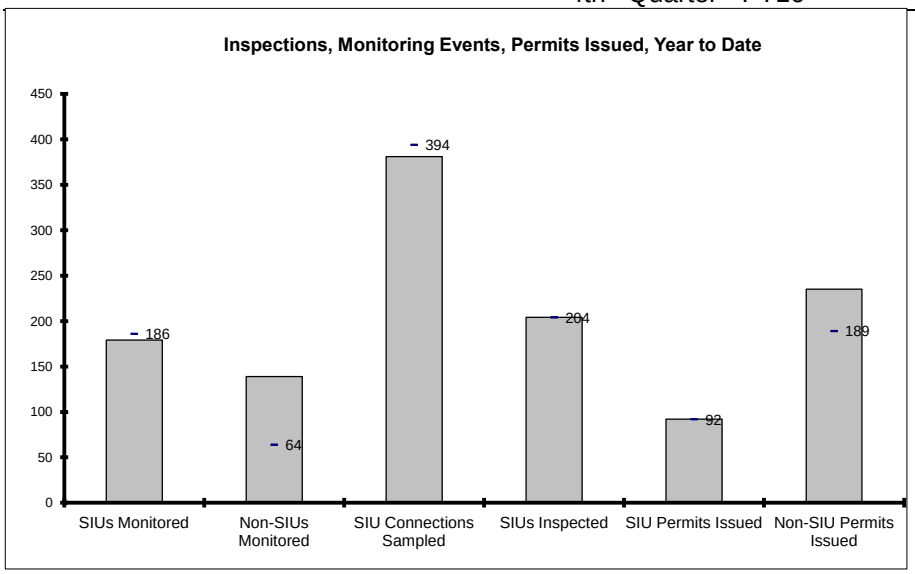


Deer Island, 2 Water, and 4 Wastewater facilites[4] participate in the ISO-New England Demand Response Programs. By agreeing to have its generators available to run and thus relieve the New England energy grid of some of MWRA's load during times of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates back-up generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY16 Cumulative savings (Capacity Payments only) through June[1] total $568,509 for DI and $53,993 for FOD through March[1].
As of June 2016, some of the FOD facilities are no longer eligible to participate in the Demand Response program due to changes in EPA regulations. MWRA is currently investigating the cost to upgrade the generators emissions controls that would allow us to participate. The cost of these upgrades will be compared to the projected revenue in order to decide whether it is cost effective.

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. FOD Facilites include: CWTP, Loring Road, Chelsea Creek, Columbus Park, Ward St., and Nut Island.

Toxic Reduction and Control

4th Quarter - FY16



EPA Required SIU Monitoring Events
for FY16: 186
YTD : **179**

Required Non-SIU Monitoring Events
for FY16: 64
YTD : **139**

SIU Connections to be Sampled
For FY16: 394
YTD: **381**

EPA Required SIU Inspections
for FY16: 204
YTD: **204**

SIU Permits due to Expire
In FY16: 92
YTD: **92**

Non-SIU Permits due to Expire
for FY16: 189
YTD: **235**

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

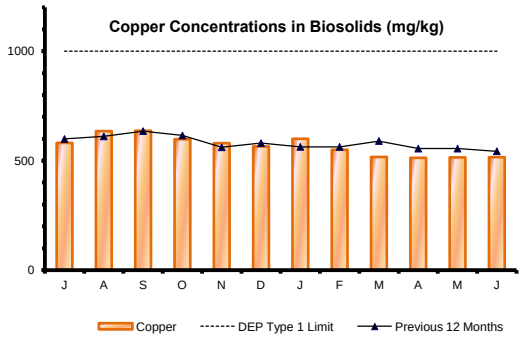
TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge or cease discharge and cannot be monitored. Some discharges were infrequent and were re-categorized as non-SIU resulting in reduced numbers.

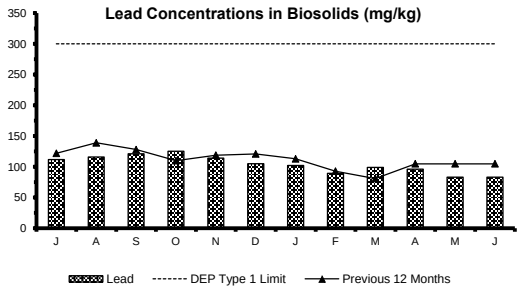
TRAC staff also exceeded the EPA required program goals for monitoring by completing the following # of events: SIU 666 events, nonSIU 232 events, 297 total other events (CSO tanks, CSO NPDES, Carroll water plant, Clinton NPDES and Local limits, Oakdale)

Number of Days to Issue a Permit

	0 to 120		121 to 180		181 or more		Total Permits Issued	
	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU	SIU	Non-SIU
Jul	4	20	1	3	0	0	5	23
Aug	10	11	0	1	0	0	10	12
Sep	7	9	0	0	0	0	7	9
Oct	8	25	0	0	0	1	8	26
Nov	14	20	0	0	0	0	14	20
Dec	6	23	0	1	0	1	6	25
Jan	4	14	0	3	3	0	7	17
Feb	4	17	0	4	0	0	4	21
Mar	9	17	0	0	0	0	9	17
Apr	6	19	0	1	0	2	6	22
May	4	22	0	2	0	1	4	25
Jun	12	17	0	0	0	1	12	18
% YTD	96%	91%	1%	6%	3%	3%	92	235

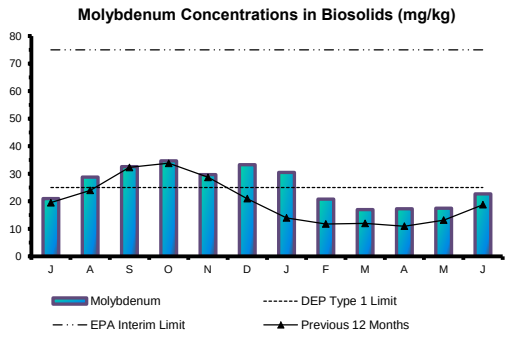
TRAC also monitors one-third of the non-SIUs each year. SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.





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. The first benchmark was acheived for this fiscal year but three SIU permits were issued after the 180-day timeframe. These permits were issued to MassDOT and were delayed by the permit writing staff while EPA drafted their NPDES permits. Their NPDES permits impact TRAC's permits.
In the 4th Quarter of FY16, 87 permits were issued, 22 of which were SIUs. All permits except for 7 non-SIUs were issued in the 120-day timeframe. Three non-SIU permits were issued in the 120-day to 180-day timeframe and four non-SIU permits were issued beyond the180-day period. Late payment of permit fees continue to occur and together with delays due to industry responses, new industry start-up issues and information gathering for the determination of the permit category, some permits were issued late.

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. Cooling tower usage typically causes a seasonal spike in molybdenum concentrations due to the blowdown on large AC systems that use corrosion inhibitors containing molybdenum. Levels drop again following the end of the cooling season, although this is delayed due to biosolids processing time.
TRAC has an ongoing program to persuade cooling tower operators to switch to phosphate-based corrosion inhibitors, but the situation may necessitate considering additional regulatory options. During this 4th quarter of FY16, the level of molybdenum has been below the DEP type 1 Limit but the overall readings for FY16 have been higher than those during FY15. MWRA and its contractor (NEFCO) generally do not distribute product in Massachusetts July to January, under its approval of suitability.



Field Operations Highlights

4th Quarter – FY16

Western Water Operations and Maintenance

- Quabbin Aqueduct Shaft 12 Intake: Operations Staff, in coordination with Engineering and a consultant, performed an underwater ROV Inspection of the Shaft 12-Intake Structure to evaluate the condition of the stop logs, stop shutters and the overall condition of the subsurface structure. This will support the upcoming design of a shutoff device for flow from the Quabbin Reservoir.

- Hultman Aqueduct: Valve Maintenance and Operations Staff completed the reactivation of the lower Hultman Aqueduct from Norumbega to Shaft 5. This section of the aqueduct had been shut down and dewatered to facilitate an interior pipe joint repair. After the repair work was completed, the pipeline was disinfected, pressure tested, flushed and sampled before reactivation.

- Reservoir Operations: Western Maintenance Grounds Staff reported water surfacing from a manhole at the toe of the Sudbury Dam in April. Further evaluation by Reservoir Operations concluded this was part of the dam's Toe Drain System. Wastewater Operations staff performed internal TV Inspection which revealed drain-line blockages due to iron sludge buildup over many years. Wastewater crews jetted the Toe Drain lines restoring functionality and eliminating the overflow.

Metro Water Operations and Maintenance

- Valve Program: Cambridge continued to take water through the quarter, with service in both the MWRA System and Cambridge systems remaining normal. Winchester stopped taking additional water through the MWRA Northern Intermediate High Service area on May 31, as they completed the valve project in their reservoir system. Water was supplied from the Deer Island water system back to the Point Shirley Area of Winthrop for 5 days during water main improvements within the town's system.

- Contract #6438-Cathodic Protection: Coordinated the purchase of cathodic protection equipment and the training of staff. Engineering and Operations are working with the contractor to create a handbook containing SOPs for testing of the Cathodic Protection Test Stations throughout the water system.

Operations Engineering:

GPS Collection Project: The GPS Data Collection Project for Metropolitan Boston continues and several interns returned from winter break. The project is now 80% complete and collection continues this summer.

- 8-M Permit Support Developed the Dewatering and Filling Plan for DOT Casey Overpass pipeline work in Jamaica Plain; Coordinated the activation of Section 57 which allowed Chelsea to complete roadway and drainage work on Everett Avenue. Continued working on plans for dewatering, filling and pressure testing for the Larz Anderson Bridge and Section 10 for DOT work. The west 30-inch main is unable to pass the pressure test. In June, the contractor removed a 30-inch valve thought to be the reason. The valve was cleaned, pressure tested, and reinstalled, but again failed. The contractor continues to look for the problem.

Wastewater Operations & Maintenance -- Wastewater Operations

- Nut Island Fire in Odor Control: In May, Operations Staff attended a meeting regarding the proposed repairs to the facility freight elevator, attended training on how to respond to an odor complaint and attended Coordination Meetings regarding repairs to the Fire Protection System and HVAC Building Management system. In June, both Operations and Maintenance Staff started preparing for the removal of the #4 Fire Pump that was damaged after the fire. Electrical work is still ongoing by Electricians on site.

- Nut Island Headworks Odor Control, HVAC and Energy Management Evaluation Services: Operations Staff continues to assist Engineering with this project. The scope has changed as a result of the fire at Nut Island. Operations Staff reviewed the Draft Evaluation Report and met with Engineering Staff to provide comments and recommendations.

- Upgrades to Chelsea Screen House-Contract: Operations Staff continues to assist Construction Staff with the upgrades to the Chelsea Screen House. Staff provided onsite operational support, reviewed gate testing procedures and attended biweekly meetings in May regarding the construction coordination of this project. Gates #1, 2, 5 and 9 have been installed and tested by the contractor and accepted by Wastewater Operations. Construction is ongoing.

- Alewife Brook Pump Station Rehabilitation: Operations Staff is reviewing the contractor's bypass pump submittal.

- Carbon Replacement-Contract #4203: The activated carbon for the Odor Control System was replaced at the Braintree/Weymouth Replacement Pump Station and the Houghs Neck Lift Station.

Toxics Reduction and Control:

TRAC held its Annual Significant Industrial User Meetings at Deer Island in May. Attendees received 3 TCHs for wastewater license renewals after a tour of the treatment facilities, a presentation by senior TRAC Staff on compliance issues, and a Q&A session.

- In FY16, Compliance Staff issued 104 Notices of Violations, 1 Demand Letter for stipulated penalties, 18 Notices of Noncompliance and 4 Return to Permit Letter. TRAC issued permit fees which was collected and totaled $1,724,373.69.

TRAC met its program required goals in FY16. 100% of all SIU Permits were issued within the 180-day timeframe, with the exception of 3 MASS DOT Permits, that were awaiting EPA processing and thus unable to be completed.

- In FY16, TRAC Staff monitored Septage Receiving Sites 91 times. Staff conducted 3 Septage Hauler Inspections necessary to renew and update Septage Hauler Permits. Staff inspected 415 existing and 105 new gasoline/oil separators.
- In FY16, TRAC Staff met the required program goals for inspections. TRAC Staff conducted 116 Annual SIU Inspections and 409 other inspections. Annual SIU Inspections are required under TRAC's EPA approved Industrial Pretreatment Program. Other inspections include inspections for enforcement, permit renewal, followup, out-of-business facility, group permit audits and survey.
- TRAC issued and/or renewed a total of 327 MWRA Sewer Use Discharge Permits to its sewer users including 235 SIUs and 92 NonSIUs.
- In FY16, TRAC Staff exceeded the EPA required program goals for monitoring by completing: SIU 666 Events, NonSIU 232 Events, 297 total other Events (CSO Tanks, CSO NPDES, Carroll Water Plant, Clinton NPDES and Local limits, Oakdale).

- On March 25, 2016, TRAC responded to Chestnut Hill Reservoir to collect samples from the surface at the reservoir's edge. A concerned college student observed strange yellow outlines around the rocks at the edge of the reservoir and a dead fish. Samples were brought to Deer Island for analysis where it was determined to be very similar to Scots Pine pollen in the water.

Environmental Quality - Water:

- Community Support: Staff provided community sampling assistance to Milton from June 27th-29th, conducting tank and outside sample tap testing for a new water storage tank. Staff provided emergency sampling support on June 10th and 11th to DCR in response to a water quality concern in the Quabbin Reservoir Watershed. At the request of Somerville Water Department, Water Staff provided a Water Quality Complaint Report for tests conducted for a on Perry Street.

- Water Managers gave presentations at the community Emergency Response Plan Training on May 12th. DEP Drinking Water Regulations require Annual Emergency Response Training. MWRA provides annual training to Community Staff.

- Contaminant Monitoring System (CMS) Staff, along with the vendor, installed new mounting systems on Buoys 3 and 4 for crude and refined oil monitoring on May 3rd. Staff completed new mooring locations (input from DCR), and successfully programmed and deployed Buoys 3 and 4 on May 4th-5th.

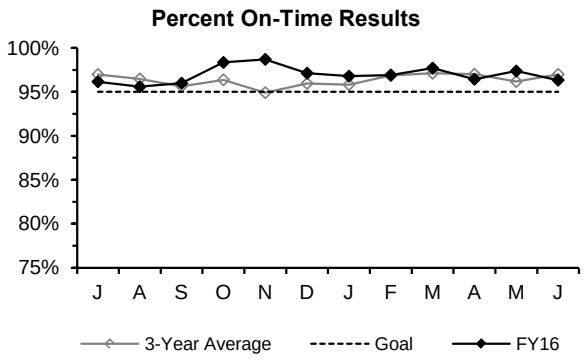
Environmental Quality—Wastewater:

- Ambient Monitoring: The Annual Monitoring Review Workshop, an essential step in the preparation of permit-required monitoring reports, occurred on April 14 with participation from both contract teams. Three more Water Quality Monitoring Surveys and the Annual Flounder Survey were completed this quarter. Due to elevated counts of the red tide phytoplankton species *Alexandrium* fundyense in northern Massachusetts Bay, initiated permit-required weekly red tide surveys, consisting of two surveys in May-June, as A. fundyense abundances dropped to near zero throughout Mass. Bay by June. There was no exceedance of any of the Contingency Plan thresholds tested, red tide, winter/spring chlorophyll, nuisance algae, or flounder liver disease. Completed reports on water quality modeling of Massachusetts Bay and on bacterial water quality monitoring near the Mass Bay outfall.
-
- CSO Receiving Water Monitoring: Regulatory agencies were provided information about the refocused CSO Receiving Water Monitoring Program, which will provide data to understand water quality changes post-storm, while continuing to meet the requirements of the Charles and Alewife/Mystic variances. Receiving water monitoring under the new daily schedule continues.

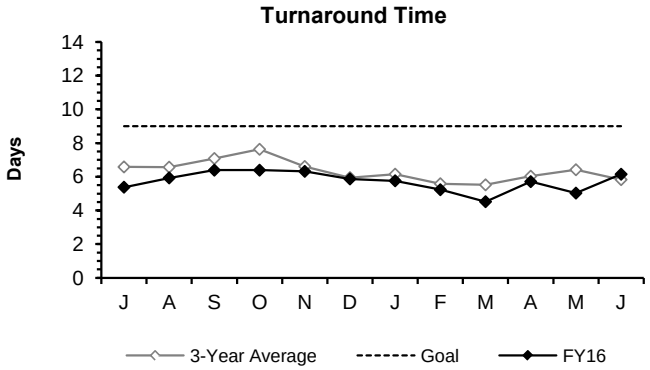
- Harbor/Beach Monitoring: Biweekly monitoring of the harbor and rivers continued through the quarter. With the start of the beach season Memorial Day weekend, staff began posting beach results on the MWRA Website. Hosted presentation of preliminary results from an UMass/Boston Microbial Source Tracking Study, using samples collected near Tenean Beach by DLS Staff in summer 2015.

Laboratory Services

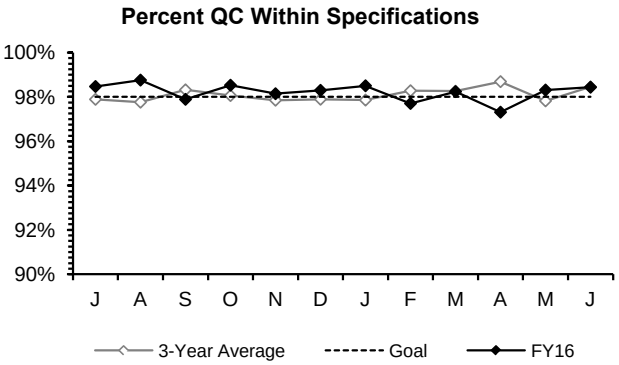
4th Quarter - FY16



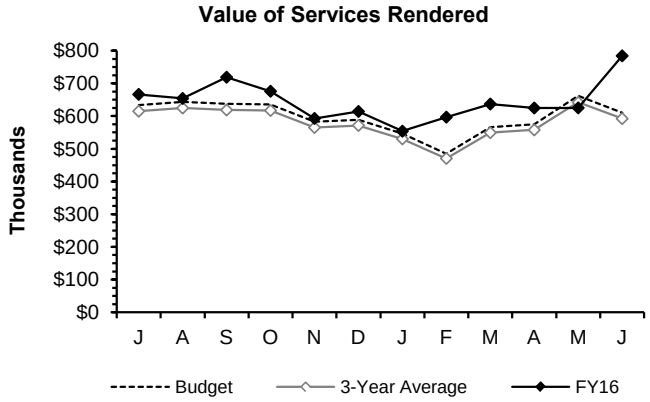
The Percent On-Time measurement was above the 95% goal each month of the Quarter.



Turnaround Time was faster than the 9-day goal each month of the quarter.



Percent of QC tests meeting specifications was above the 98% in-house goal two out of three months of the quarter.



Value of Services Rendered was above the seasonally adjusted budget projection two out of three months of the quarter and above the projection for the fiscal year.

Highlights:
Pesentations were given at the NEWEA Lab Specialty Conference on Lab Ethics and Laboratory Information Management System (LIMS).

Lab Services has met or exceeded its on-time results and turnaround time goals each month for the past 30 months.

Quality Assurance: The five laboratory locations passed 97.5% of the 2016 microbiology Proficiency Test samples on the first try. We have until the end of the calendar year to pass one retest.

Drinking Water: We have increased our capacity to test drinking water samples for lead in support of the schools special project and continue to test lead samples from our communities as quickly as they come in. In the quarter we completed 1,944 lead and copper tests, primarily on school samples, with an average turnaround time of 5 days.

Provided rush turnaround time to test Quabbin Reservoir/Tributary samples over a weekend for a potential water contamination emergency in cooperation with DCR.

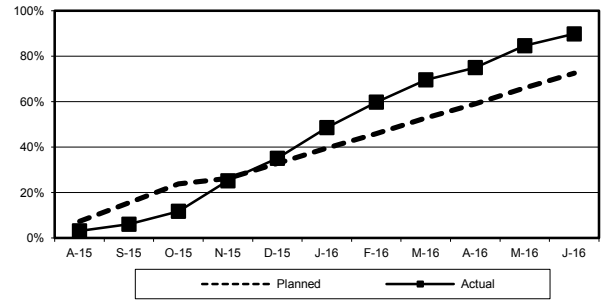
CONSTRUCTION PROGRAMS

Projects In Construction

4th Quarter - FY16

(Progress Percentages based on Construction Expenditures)

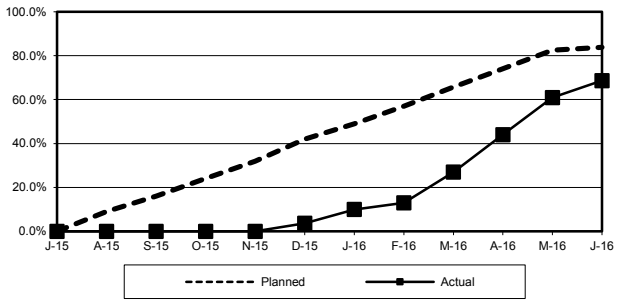
Southborough Water Quality Lab
Progress – June 2016



Project Summary: This project involves the rehabilitation of the Southborough Water Quality Laboratory. The work includes replacement of the roof , windows, doors and flooring, as well as modifications to the electrical, HVAC and fire protection systems.

Status and Issues: As of June, the roof work was approximately 97% complete, acoustical ceiling 96% complete and cabinetry installation 90% complete. The installation of the paving, fire alarm, communications, tile and carpet have all been completed.

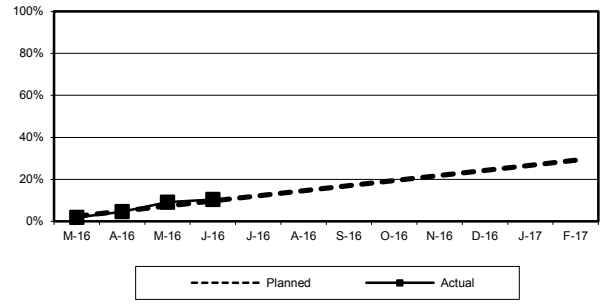
Upgrades to Chelsea Screen House
Progress – June 2016



Project Summary: This project involves the replacement of two dry side screens, seven gates and the rehabilitation of two wet side screens and the addition of two new gates. Also, a SCADA system will be added to the wet side to allow for remote wet weather operation.

Status and Issues: As of June, the Contractor completed the grout demo Screen #3, installed a 66in inflatable plug and installed a bulkhead between the 66in and 54in incoming lines in the channel before Screen's 3&4, after which they removed the demo debris from the Screen #3 channel.

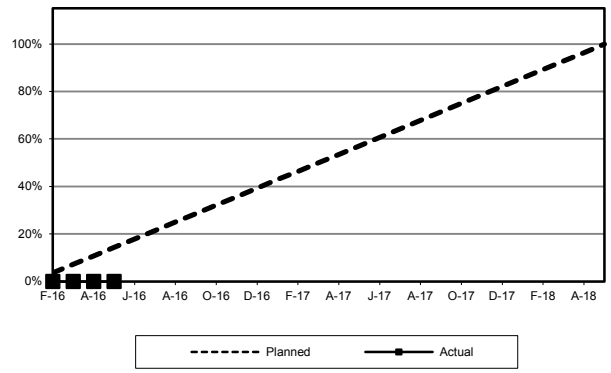
Wachusett Aqueduct Pumping Station
Progress – June 2016



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.

Status and Issues: As of June, the Contractor excavated/transported an additional 7,000 cy of material from the PS site to the DFA for a total of 27,000 cy. The ozone building conduits were installed and the footing for the Guard House foundation was completed.

Alewife Brook Pump Station Rehabilitation
Progress – June 2016

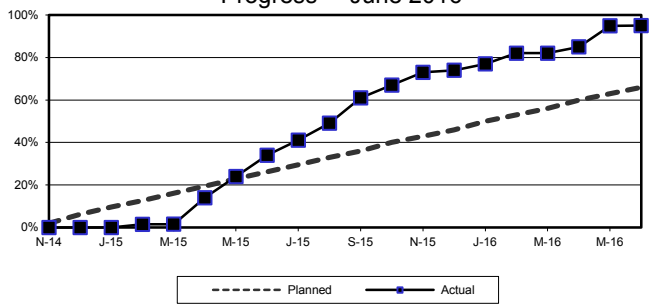


Project Summary: This project involves the replacement of wet-weather pumps, motors, gear drives, VFD's, MCC, screens, sluice gates, standby generator, roof, PLC's and HVAC. Also, the remediation of PCB's and asbestos and the installation of a flow meter on the 66-inch downstream Alewife Brook Conduit.

Status and Issues: As of June, the Contractor continued submitting shop drawings for the project. Also, the vendors and subcontractors continued visiting the site.

Projects In Construction
4th Quarter - FY16
(Progress Percentages based on Construction Expenditures)

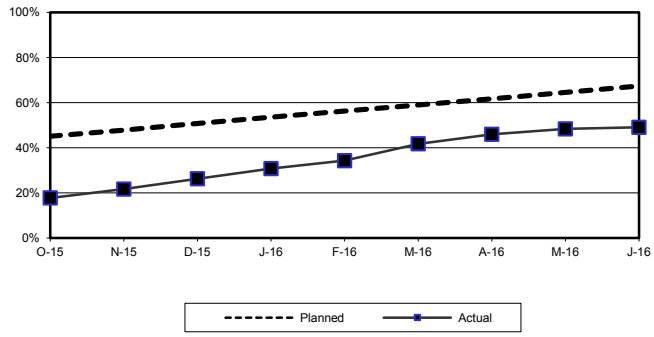
Water Mains: Section 36, W11C and S9-A
Progress – June 2016



Project Summary: This project includes the replacement of Section 36 in Arlington; the installation of a new water main (Section W11C); and the replacement of an inoperable 48-inch butterfly valve on Shaft 9-A pipeline in Medford.

Status and Issues: As of June, the Contractor completed the sidewalk panel restoration. A partial project walkthrough with Operations was completed, with the remainder to be re-scheduled. The Contractor has de-mobilized from the site.

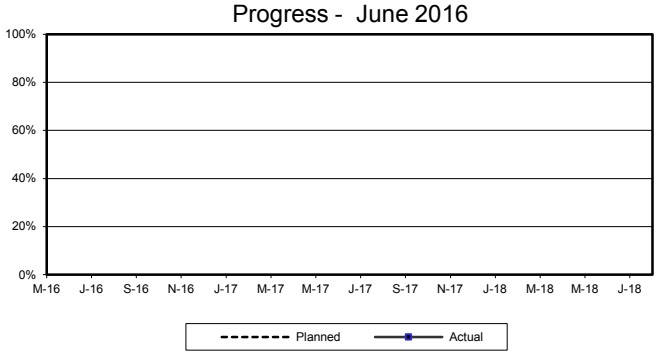
Valves and Piping Replacements
Progress - June 2016



Project Summary: This project involves the replacement of the twenty 60" butterfly valves and ten 60" flow meters in the North Main Pump Station; three 48", twelve 36" plug/check valves, six 30" flow meters and six 30-36" gate valves in the Winthrop Terminal Facility.

Status and Issues: The mechanical subcontractor continued the installation of the temporary trolley rail in the Pretreatment Gallery in preparation of Primary Sludge Line pipe replacement. They also replaced the rusty pipe support beam at the Winthrop Terminal Facility.

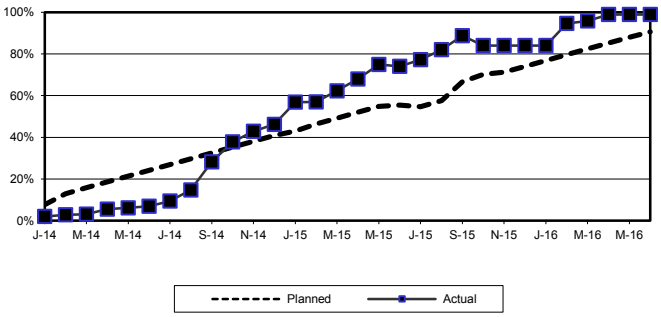
Winthrop Terminal VFD and Motor Replacement
Progress - June 2016



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

Status and Issues: This project was awarded at the April 13th Board of Director's Meeting. Work on this contract has not yet begun.

Primary and Secondary Clarifier Scum Tip Tubes
Progress - June 2016



Project Summary: This project involves the replacement of the existing carbon steel tip tubes with 316 stainless steel in 48 primary and 54 secondary clarifiers to improve reliability and increase longevity.

Status and Issues: The instrumentation work is 98.5% complete. The material for the tube extensions has been received. Approximately 4 out of the 13 units have been installed.

CSO CONTROL PROGRAM

4th Quarter - FY16

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Remaining CSO related capital spending totaling $13 million is scheduled through December 2020. Remaining work includes Cambridge's completion of surface restoration work associated with the Alewife/CAM004 sewer separation contracts, BWSC's removal of additional inflow from its sewers in the South Dorchester Bay sewer separation areas of Dorchester, and the federal court mandated CSO post-construction monitoring and performance assessment (2018-2020).

Project/Item	Status as of June 30, 2016
Reserved Channel Sewer Separation	BWSC attained substantial completion in December 2015, in compliance with Schedule Seven. BWSC continues to prepare as-built plans and close out its engineering and construction contracts. MWRA staff are conducting final eligibility reviews of the construction contracts for this and other CSO projects that were implemented by BWSC with MWRA funding.
South Dorchester Bay Sewer Separation Post-Construction Inflow Removal	As previously reported, BWSC has completed its investigation of alternatives for removing additional stormwater inflow from its Dorchester Interceptor, following the completion of sewer separation and the closing of CSOs several years ago. MWRA's CIP includes $5.4 million for the inflow removal effort, of which approximately $2.7 million has been transferred to the BWSC CSO account to fund related design and construction contracts. Additional funding will follow decisions by BWSC on its recommendations and schedule for removing additional inflow.
Cambridge/Alewife Brook Sewer Separation	The City of Cambridge attained substantial completion and permanently closed Outfall CAM004 in December 2015, in compliance with Schedule Seven. Stormwater removed from the Cambridge and MWRA sewer systems now drains to the Alewife Wetland. Extensive surface restoration work eligible for MWRA funding at a remaining cost of approximately $7 million is currently scheduled to continue through June 2017. Cambridge recently submitted a request for an amendment to the CSO Memorandum of Understanding and Financial Assistance Agreement ("MOU/FAA") that would increase the total award amount by $1.6 million, from $98.7 million to $100.3 million and extend the MOU/FAA term by six months to December 2017 due to construction change orders and Cambridge's necessity to complete its ineligible water main replacement prior to completing CSO-eligible roadway restoration on Huron Avenue.
Extension of Charles River and Alewife Brook/Upper Mystic River CSO Variances	August 2016: DEP issued its Final Determinations extending the CSO variances for the Charles River and the Alewife Brook/Upper Mystic River by three years, to 2019. Pursuant to the CSO agreement MWRA reached with EPA and DEP in 2006, DEP will reissue, and EPA will approve, the CSO variances through 2020. The recent variance extensions include a condition that MWRA submit a draft scope of its court-ordered three-year CSO performance assessment (below) to EPA and DEP by May 1, 2017.
MWRA CSO Performance Assessment	Staff have had preliminary discussions with EPA and DEP and are reviewing the requirements of the EPA National CSO Control Policy, including Guidance on CSO Post-Construction Monitoring, to support the development of an approach and scope for the three-year performance assessment Schedule Seven requires MWRA to conduct in the period 2018-2020. MWRA's FY17 CIP includes funds for the performance assessment.

CIP Expenditures
4th Quarter – FY16

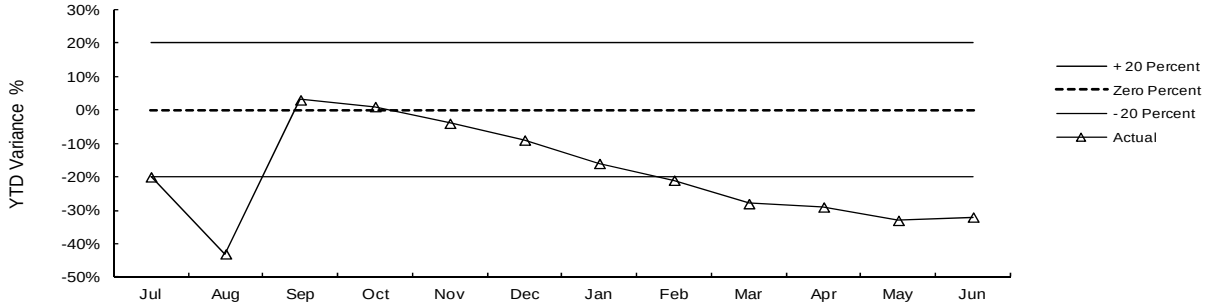
The Year-To-Date variances are highlighted below:

FY16 Capital Improvement Program Expenditure Variances through June by Program ($000)				
Program	FY16 Budget Through June	FY16 Actual Through June	Variance Amount	Variance Percent
Wastewater	88,109	64,185	(23,924)	-27%
Waterworks	43,430	26,725	(16,706)	-39%
Business and Operations Support	8,583	4,235	(4,349)	-51%
Total	$140,123	$95,144	($44,979)	-32%

Underspending within Wastewater is primarily due to updated schedules for Chelsea Creek Upgrades, Alewife Brook Pump Station Rehabilitation, Winthrop Terminal Facility VFD Replacement, Caruso Pump Station Improvements, Gravity Thickener Rehabilitation, Barge Berth & Facility Replacement, Combined Heat & Power Design, less than anticipated community requests for grants and loans, reduction in scope and timing for Electrical Equipment Upgrades, timing of work for North Main Pump Stations VFD Replacements, Digester Sludge Pump Replacement Phase 2, and updated cost estimates for the Reserved Channel Sewer Separation project. This was partially offset by water use charges and updated cost estimates due to unforeseen conditions for Cambridge Sewer Separation and contractor progress on the North Main Pump Station and Winthrop Terminal Facility Butterfly Valve contract. Underspending in Waterworks is primarily due to award less than budget and updated schedules for the Wachusett Aqueduct Pump Station and Section 89/29 Redundancy Phase 1B contracts, timing of Watershed Land purchases, WASM 3 Design due to ongoing redundancy tunnel alternatives review, legal settlement for Carroll Treatment Plant Ultraviolet Construction, and lower than anticipated requests for Local Water System loans. This was partially offset by contractor progress on Section 36/C/S9-A11 Valve and Carroll Water Treatment Plant Existing Facilities Modifications CP-7 contracts.

CIP Expenditure Variance

Total FY16 CIP Budget of $140,498,000.



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 6/30/2016	$117.2 million
Unused capacity under the debt cap:	$1.083 billion
Estimated date for exhausting construction fund without new borrowing:	MAR-17
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity:	$128 million $350 million
Budgeted FY16 capital spending*:	$116 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

4th Quarter – FY16

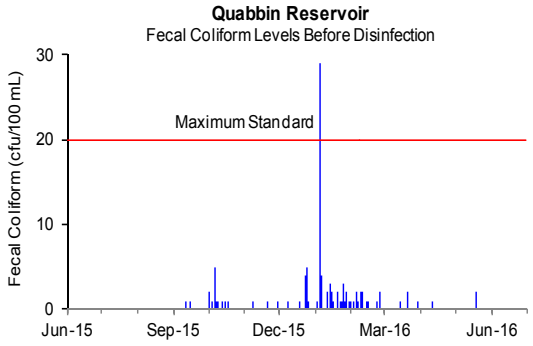
Source Water – Microbial Results

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 (formerly Ware Disinfection Facility) raw water tap before being treated and entering the CVA system.

All samples collected during the 4th Quarter were below 20 cfu/100ml. **For the current six-month period, 0.06% of the samples have exceeded a count of 20 cfu/100mL, compared to the allowable 10%.**

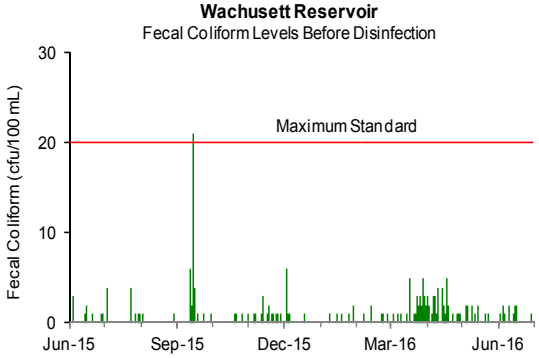


Sample Site: Wachusett Reservoir

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

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

All samples collected during the 4th Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

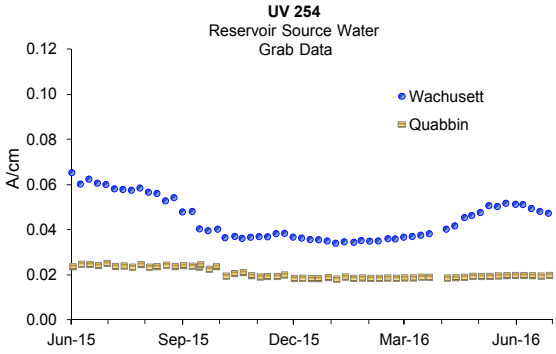


Source Water – UV Absorbance

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 0.020 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.047 A/cm.



Source Water – Turbidity

4th Quarter – FY16

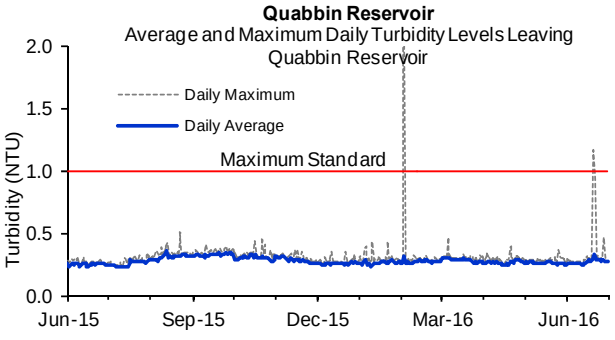
Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may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

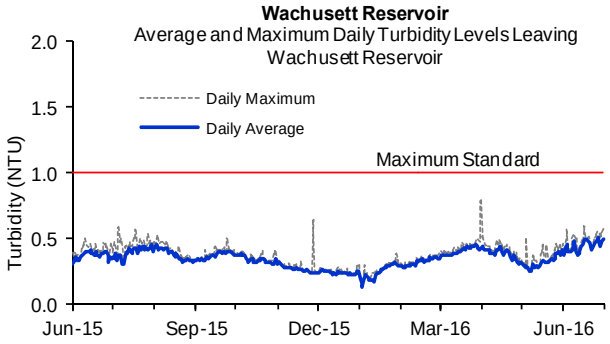
There are two standards for turbidity: all water must be below 5 NTU (Nephelometric Turbidity Units), and water only can be above 1 NTU if it does not interfere with effective disinfection.

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.

•On June 20, valve operations being performed at Winsor Power Station created a short term turbidity spike at BWTF. The online turbidity exceeded 1 NTU for 15 minutes and grab samples confirmed the elevated turbidity. During this event, CT was met, disinfection was maintained, and all daily samples taken at Ludlow Monitoring Station were absent of total coliform. There was no regulatory impact.



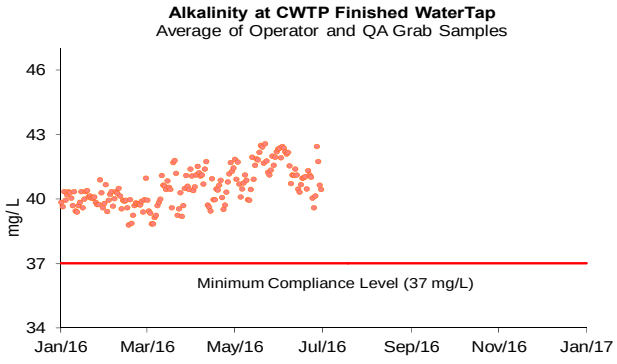


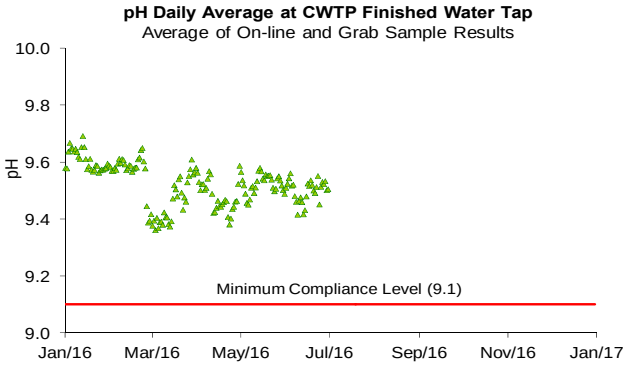
Treated Water – pH and Alkalinity Compliance

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 samples have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system taps 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 June 8 and 9, 2016. Distribution system sample pH ranged from 9.4 to 9.6 and alkalinity ranged from 42 to 44 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

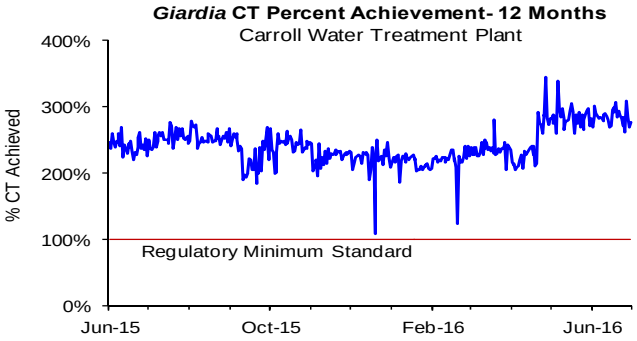
4th Quarter – FY16

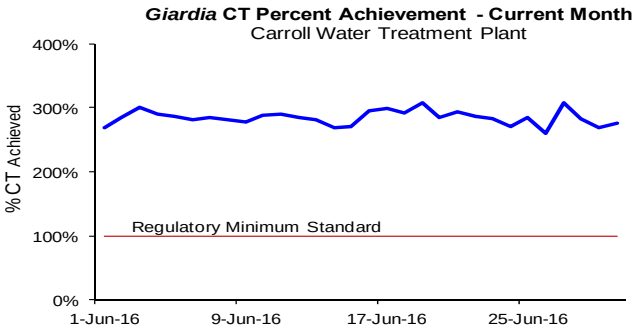
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

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

Wachusett Reservoir – MetroWest/Metro Boston Supply:

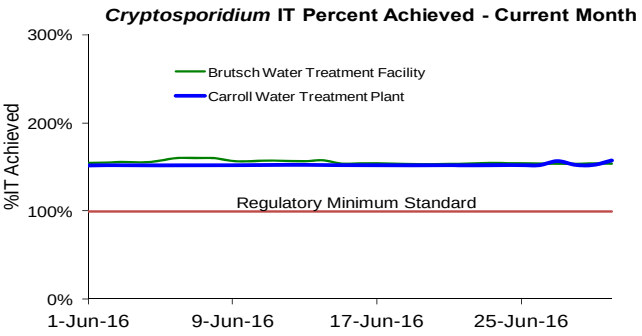
- Ozone dose at the CWTP varied between 1.2 to 1.9 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.
- On May 5 and May 11, CWTP was shut down and restarted for routine maintenance. A small amount of off-spec water was generated during these events.
- On May 30, CWTP staff shut down and restarted the plant when a SCADA control card for the CWTP water pumps failed.
- On June 3, a turbine trip at Cosgrove caused the loss of vacuum in the ozone contactors at the CWTP plant, triggering a shut down and restart of the plant. A small amount of off-spec water was generated during this event.
- There was no regulatory impact during the plant shutdowns and startups.

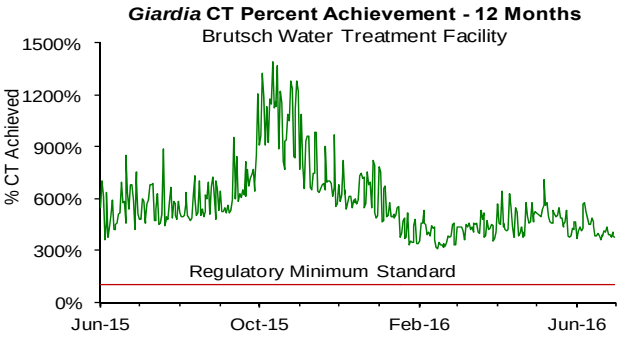


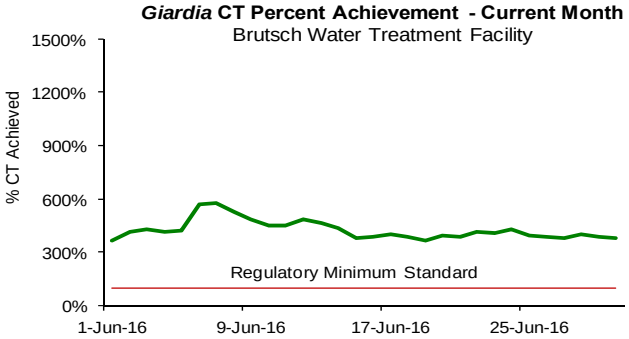


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal (June 1 – October 31) target of ≥1.0 mg/L at Ludlow Monitoring Station.
- The chlorine dose at BWTF ranged from 1.3 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%.







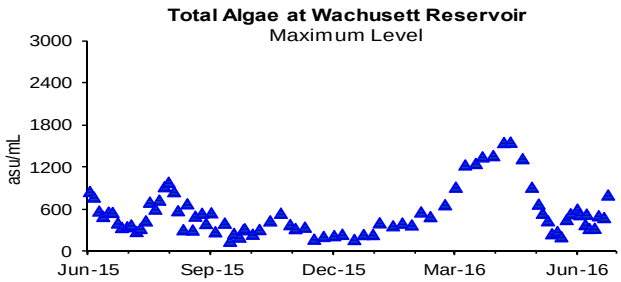
Source Water - Algae

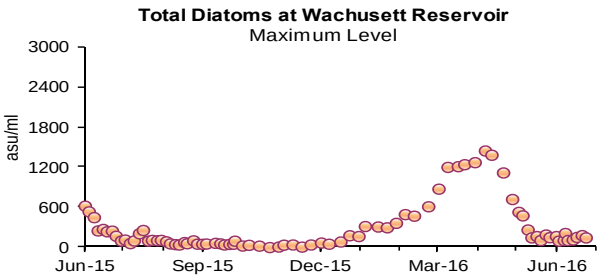
4th Quarter – FY16

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 4th Quarter, nine complaints which may be related to algae were reported from local water departments.





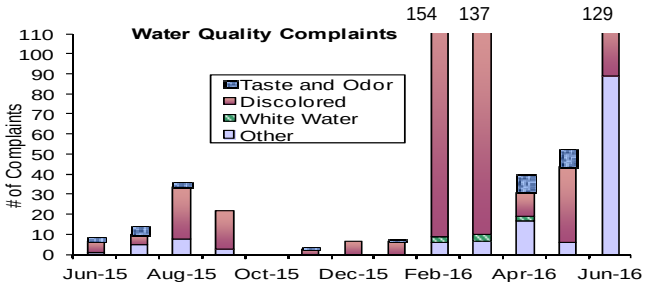
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

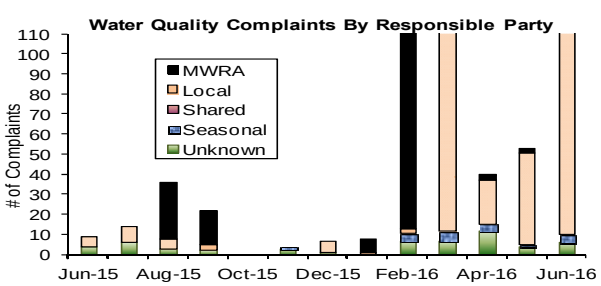
MWRA collects information on water quality complaints that typically fall into four categories: 1.) discoloration due to MWRA or local pipeline work; 2.) taste and odor due to algae blooms in reservoirs or chlorine in the water; 3.) white water caused by changes in pressure or temperature that traps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

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

Communities reported 182 complaints during the quarter compared to 36 complaints for 4th Quarter of FY15. Of these complaints, 71 were for “discolored water” and 16 were for “taste and odor”, and 95 were for “other”. Of these complaints, 164 were local community issues, 2 were MWRA related, 6 were seasonal in nature, and 10 were unknown in origin.

•On May 26, Stoughton reported twelve discolored water complaints due to the local Water Department performing hydrant flushing.
•On June 2, Belmont reported twenty discolored water complaints due to a local main break.
•On June 7, Everett reported eighty no water complaints when the town shut down a local water main to repair a leak. The water main was reactivated shortly afterwards.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

4th Quarter – FY16

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 142 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.

The TCR requires that no more than 5% of all samples in a month may be total coliform positive (or that no more than one sample be positive when less than 40 samples are collected each month). Public notification is required if this standard is exceeded.

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 follow-up tests confirm the presence of *E.coli* or total coliform.

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 4th Quarter, none of the 6,202 community samples submitted to MWRA labs for analysis tested positive for total coliform. None of the 1,998 MWRA samples tested positive for total coliform. No sample tested positive for *E.coli*. Only 0.6% of the samples had a chlorine residuals lower than 0.2 mg/L for the quarter.

			# Coliform Samples (a)	Total Coliform # (%) Positive	E.coli # Positive	Public Notification Required?	Minimum Chlorine Residual (mg/L)	Average Chlorine Residual (mg/L)
MWRA	d	MWRA Locations	388	0 (0%)	0		1.96	2.36
	d	Shared Community/MWRA sites	1610	0 (0%)	0		0.04	2.07
		Total: MWRA	1998	0 (0%)	0		0.04	2.14
Fully Served		ARLINGTON	169	0 (0%)	0		0.03	1.85
		BELMONT	104	0 (0%)	0		0.08	2.02
		BOSTON	780	0 (0%)	0		1.79	2.29
		BROOKLINE	223	0 (0%)	0		0.95	2.06
		CHELSEA	169	0 (0%)	0		1.38	1.95
		DEER ISLAND	52	0 (0%)	0		1.94	2.05
		EVERETT	169	0 (0%)	0		0.15	1.99
		FRAMINGHAM	234	0 (0%)	0		0.54	2.12
		LEXINGTON	117	0 (0%)	0		1.79	2.21
		LYNNFIELD	18	0 (0%)	0		0.75	1.64
		MALDEN	234	0 (0%)	0		0.04	1.99
		MARBLEHEAD	72	0 (0%)	0		0.87	2.02
		MEDFORD	221	0 (0%)	0		1.13	1.87
		MELROSE	117	0 (0%)	0		0.93	1.91
		MILTON	100	0 (0%)	0		0.41	1.94
		NAHANT	30	0 (0%)	0		0.03	1.91
		NEWTON	276	0 (0%)	0		0.38	2.08
		NORTHBOROUGH	48	0 (0%)	0		1.65	2.14
		NORWOOD	99	0 (0%)	0		0.89	2.02
		QUINCY	299	0 (0%)	0		0.38	2.04
		READING	130	0 (0%)	0		0.23	1.83
		REVERE	180	0 (0%)	0		1.58	2.08
		SAUGUS	104	0 (0%)	0		1.36	1.83
		SOMERVILLE	275	0 (0%)	0		1.15	2.09
		SOUTHBOROUGH	30	0 (0%)	0		0.09	1.92
		STONEHAM	91	0 (0%)	0		1.24	2.08
		SWAMPSCOTT	54	0 (0%)	0		1.56	2.02
		WALTHAM	216	0 (0%)	0		1.24	2.09
		WATERTOWN	130	0 (0%)	0		1.09	2.08
		WESTBORO HOSPITAL	15	0 (0%)	0		0.09	0.69
		WESTON	48	0 (0%)	0		1.92	2.31
		WINTHROP	72	0 (0%)	0		0.89	2.01
		Total: Fully Served	*4876*	*0 (0%)*				
CVA & Partially Served	b	BEDFORD	53	0 (0%)	0		0.58	1.86
	b	CANTON	87	0 (0%)	0		0.13	1.15
	b	HANSCOM AFB	27	0 (0%)	0		0.42	2.09
	b	MARLBOROUGH	125	0 (0%)	0		0.70	2.61
	b	NEEDHAM	123	0 (0%)	0		0.11	0.93
	b	PEABODY	234	0 (0%)	0		1.47	2.06
	b	WAKEFIELD	144	0 (0%)	0		0.51	1.62
	b	WELLESLEY	113	0 (0%)	0		0.05	0.85
	b	WILMINGTON	86	0 (0%)	0		1.16	2.02
	b	WINCHESTER	91	0 (0%)	0		0.23	2.11
	b	WOBURN	195	0 (0%)	0		0.03	1.04
	c	SOUTH HADLEY FD1	48	0 (0%)	0		0.11	0.55
		Total: CVA & Partially Served	*1326*	*0 (0%)*				
		Total: Community Samples	*6202*	*0 (0.00%)*				

(a) The number of samples collected depends on the population served and the number of repeat samples required.
(b) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.
(c) Part of the Chicopee Valley Aqueduct System. Free chlorine system.
(d) MWRA total coliform and chlorine residual results include data from 125 community pipe locations as described above. In most cases these community results are accurately indicative of MWRA water as it enters the community system; however, some are clearly strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.

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

4th Quarter – FY16

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

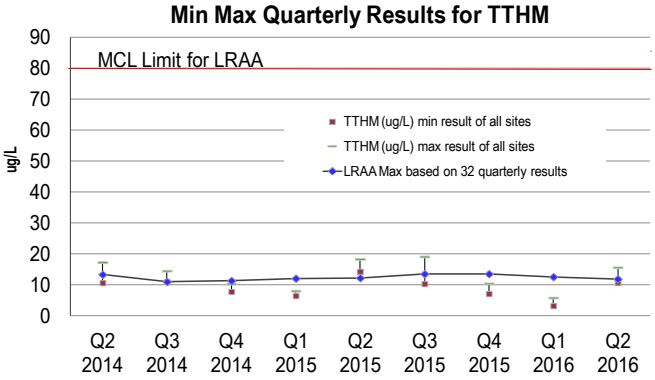
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

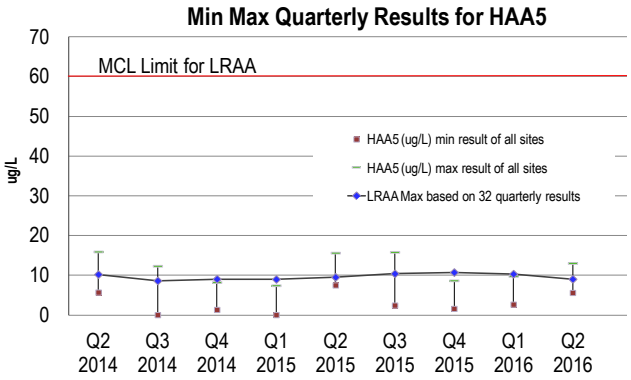
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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

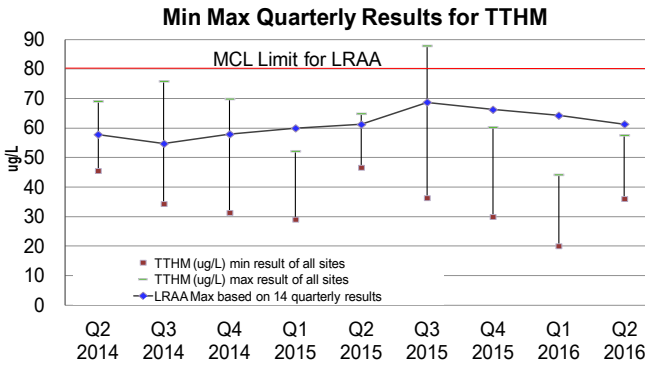
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 11.9 ug/L; HAA5s = 9.0 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

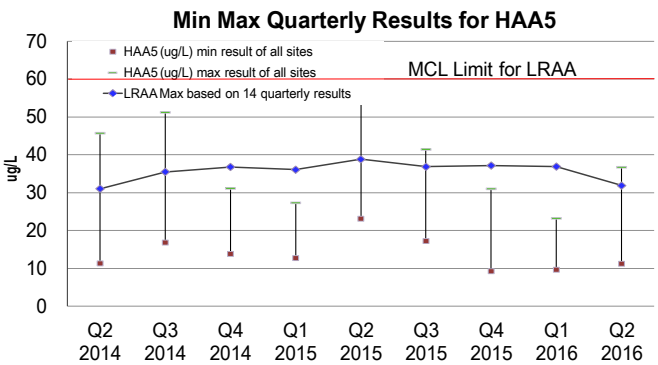
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

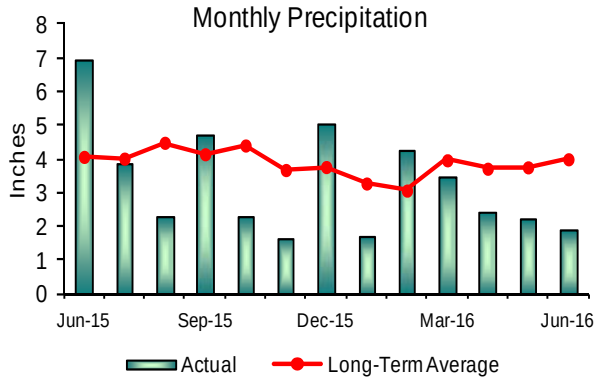
4th Quarter – FY16

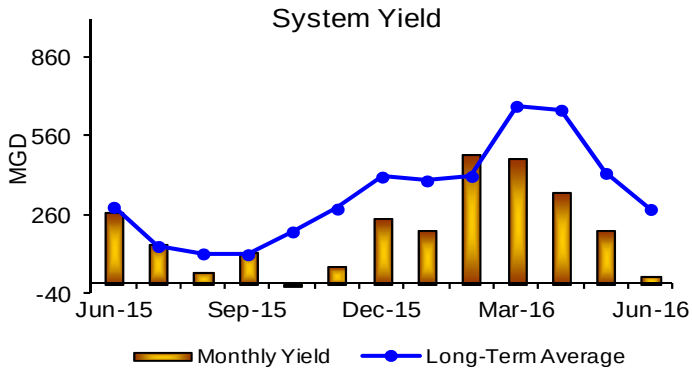
Background

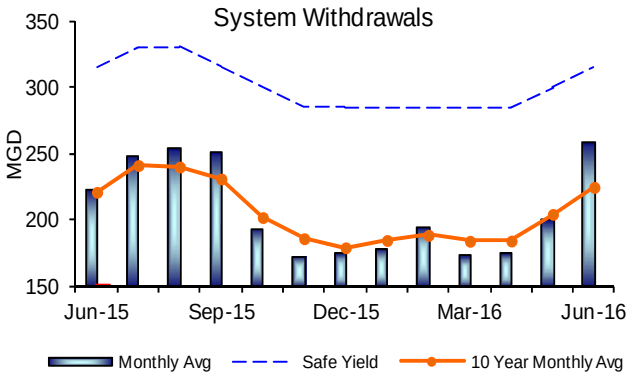
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

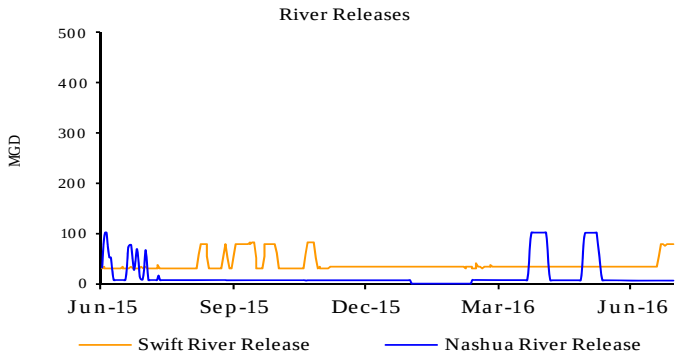
Outcome

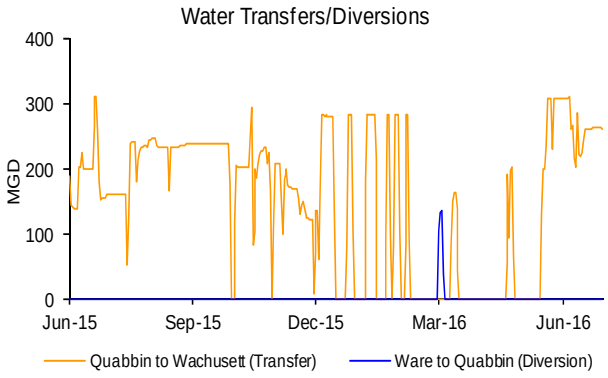
Quabbin Reservoir level remained within the normal operating range for this period of the year. The volume of the Quabbin Reservoir was at 90.2% as of June 30, 2016; a 1.5% decrease for the quarter, which represents a reduction of more than 6.5 billion gallons of storage. Yield and precipitation for the quarter were below quarterly long term averages. System withdrawal continues to be below its long-term average.

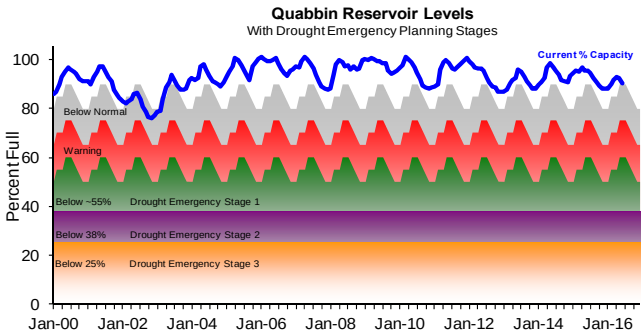












WASTEWATER QUALITY

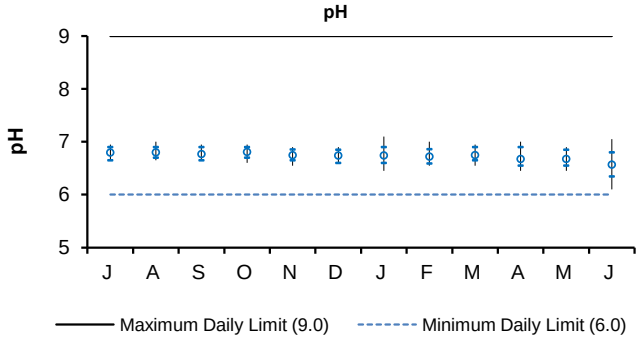
NPDES Permit Compliance: Deer Island Treatment Plant

4th Quarter - FY16

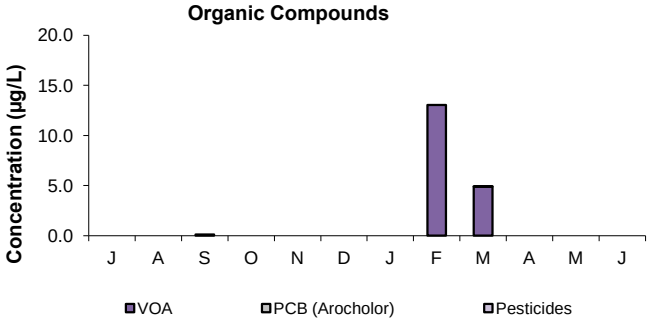
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY16 YTD Violations*
Dry Day Flow:		mgd	436	264.6	263.6	261.1	0	0
cBOD:	Monthly Average	mg/L	25	5.8	4.9	5.5	0	0
	Weekly Average	mg/L	40	6.9	6.0	6.3	0	0
TSS:	Monthly Average	mg/L	30	10.7	7.1	8.9	0	0
	Weekly Average	mg/L	45	13.6	7.1	10.2	0	0
TCR:	Monthly Average	ug/L	456	<40	<40	<40	0	0
	Daily Maximum	ug/L	631	<40	<40	<40	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	6	6	7	0	0
	Weekly Geometric Mean	col/100mL	14000	11	20	14	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	6.5-7.0	6.0-7.0	6.1-7.1	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	100	100	100	0	0
	Inland Silverside	%	≥1.5	50	100	50	0	0

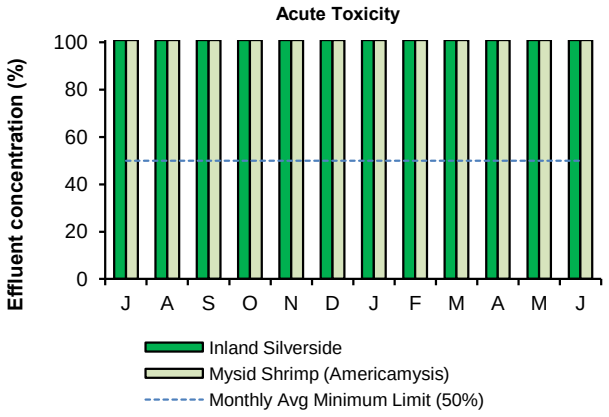
There have been no permit violations in FY16 to date at the Deer Island Treatment Plant.



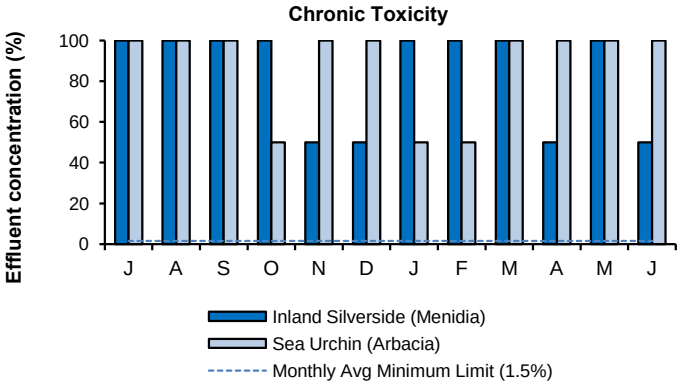
pH is a measure of alkalinity or acidity. Fluctuations in effluent pH are unlikely to impact on marine environments, which have significant buffering capacity. Because of the pure oxygen used in the activated sludge process, effluent pH tends to be at the lower end of the permit-required range. All pH measurements for the 4th Quarter were within the daily permit limits.



An important wastewater component monitored in the effluent is organic compounds, such as volatile organic acids, pesticides, and polychlorinated biphenyls, which are all sampled monthly.
The secondary treatment process significantly reduces organic compounds in the effluent stream. In the 4th Quarter, no organic compounds were detected in the effluent.



The acute toxicity test simulates the short-term toxic effects of chemicals in wastewater effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. Acute toxicity permit limits were met for the 4th Quarter for both the inland silverside and mysid shrimp.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet permit limits, a solution of 1.5% effluent and 98.5% dillution water must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 4th Quarter for both the inland silverside and sea urchin.

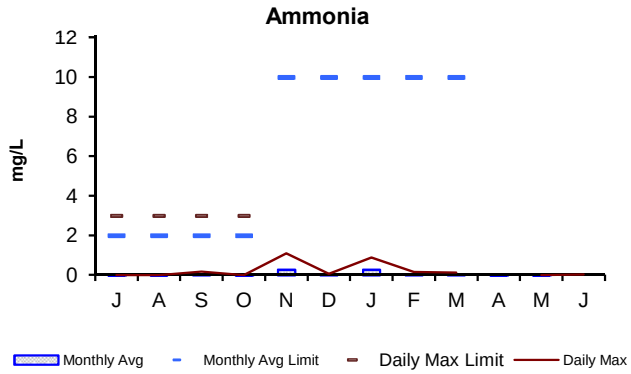
NPDES Permit Compliance: Clinton Wastewater Treatment Plant

4th Quarter - FY16

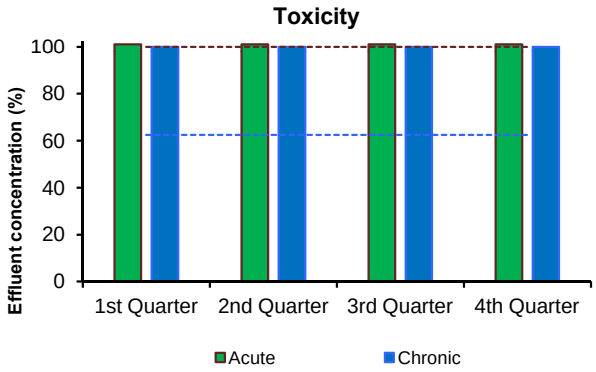
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*April*	*May*	*June*	*4th Quarter Violations*	*FY16 YTD Violations*
Flow:		mgd	3.01	2.56	2.59	2.54	0	0
BOD:	Monthly Average:	mg/L	20	2.5	2.0	1.7	0	0
	Weekly Average:	mg/L	20	3.1	2.3	2.3	0	0
TSS:	Monthly Average:	mg/L	20	4.6	2.7	3.9	0	0
	Weekly Average:	mg/L	20	5.9	4.3	4.2	0	0
pH:		SU	6.5-8.3	7.2-7.5	6.5-7.5	7.2-7.6	0	0
Dissolved Oxygen:	Daily Minimum:	mg/L	6	6.9	7.4	7.5	0	0
Fecal Coliform:	Daily Geometric Mean:	col/100mL	400	5	4	6	0	0
	Monthly Geometric Mean:	col/100mL	200	3	3	3	0	0
TCR:	Monthly Average:	ug/L	50	0	0.0	0.2	0	0
	Daily Maximum:	ug/L	50	6.7	0.0	6.7	0	0
Total Ammonia Nitrogen:	November 1 - March 31							
	Monthly Average:	mg/L	2.0	0.00	0.00	0.01	0	0
	Daily Maximum:	mg/L	3.0	0.00	0.00	0.04	0	0
Copper:	Monthly Average:	ug/L	20	5.8	6.1	9.2	0	0
Phosphorus:	May 1 - Oct 31							
	Monthly Average:	mg/L	1.0	--	0.33	0.38	0	0
Acute Toxicity:	Daily Minimum:	%	≥100	*N/A	*N/A	> 100	0	0
Chronic Toxicity:	Daily Minimum:	%	≥62.5	*N/A	*N/A	100	0	0

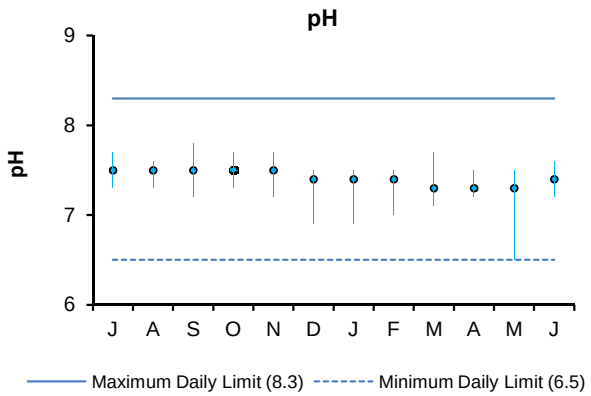
There have been no permit violations in FY16 at the Clinton Treatment Plant.
1st Quarter: There had been no permit violations in the first quarter.
2nd Quarter: There have been no permit violations in the second quarter.
3rd Quarter: There had been no permit violations in the third quarter.
4th Quarter: There have been no permit violations in the fourth quarter.
*Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.



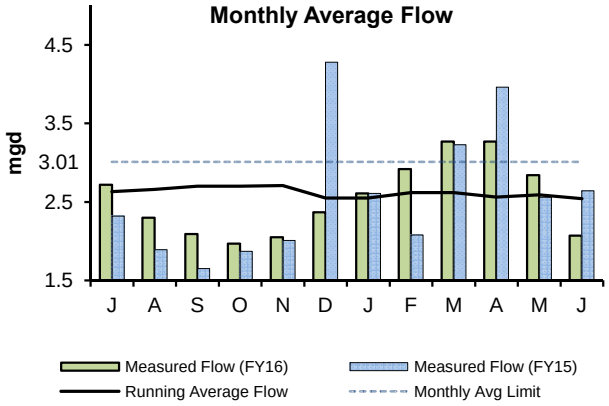
The 4th Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 4th Quarter are 2 mg/L and 3 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



Acute and chronic toxicity testing simulates the short- and long-term toxic effects of chemicals in wastewater effluent on aquatic animals. For permit compliance, the effluent concentration that causes mortality to the daphnid in acute and chronic testing must be at least >100% and 62.5%, respectively. Toxicity limits were met during the 4th Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 4th Quarter were within the range set by the permit.



The graph depicts the running annual average monthly flow, measured in million gallons per day, exiting the plant. April's high flow did not cause the running annual average to exceed permit limits this quarter.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use
MWRA Core Customers
4th Quarter - FY16

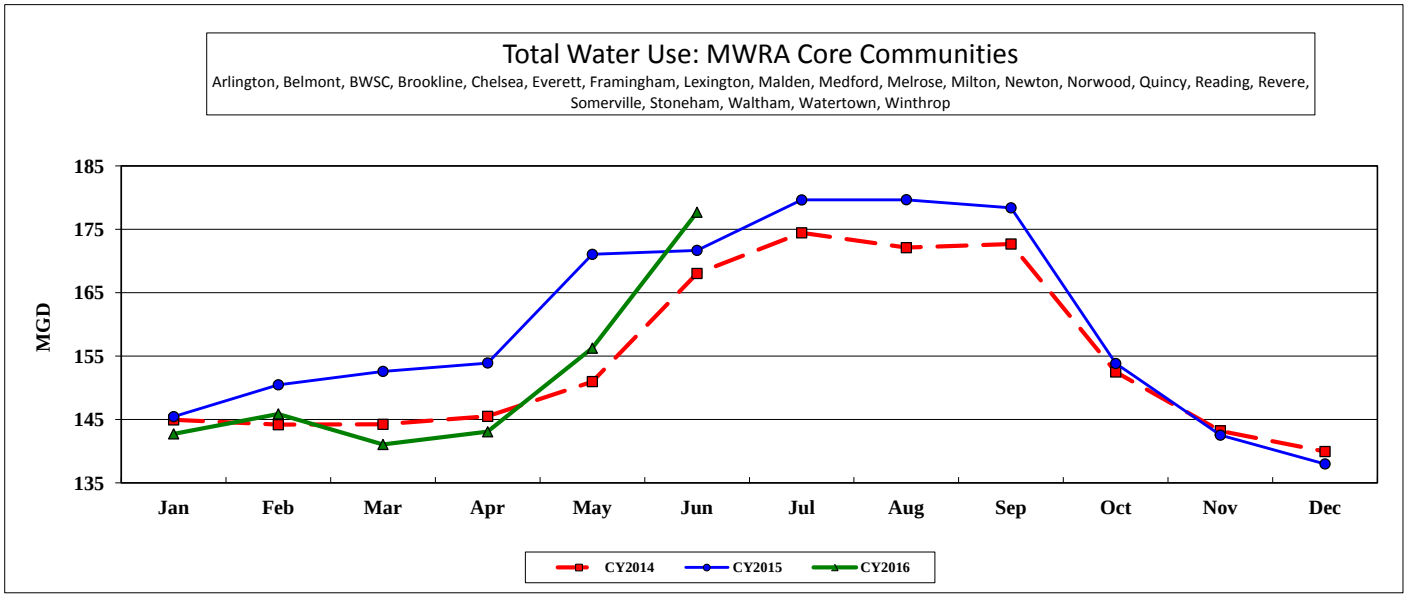
YTD CHANGES (CY16 vs. CY15)
Core Communities Water Supplied
-3.6%

Water Supplied: MWRA Fully Served Core Communities*

* Receive 100% MWRA Water Service

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Average
CY2014	144.952	144.193	144.251	145.510	150.994	168.049	174.461	172.119	172.696	152.513	143.221	139.960	144.474	154.461
CY2015	145.466	150.488	152.603	153.932	171.068	171.693	179.652	179.689	178.407	153.846	142.547	138.005	157.600	159.839
CY2016	142.748	145.901	141.073	143.079	156.265	177.712							151.085	151.085

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Total
CY2014	4,493.498	4,037.400	4,471.778	4,365.293	4,680.819	5,041.483	5,408.299	5,335.689	5,180.887	4,727.900	4,296.634	4,338.762	13,002.676	56,378.442
CY2015	4,509.447	4,213.655	4,730.692	4,617.960	5,303.114	5,150.793	5,569.210	5,570.350	5,352.198	4,769.225	4,276.398	4,278.141	28,525.660	58,341.183
CY2016	4,425.193	4,231.133	4,373.264	4,292.372	4,844.214	5,331.365							27,497.542	27,497.542



The June 2016 Community Water Use Report recently distributed to communities served by the MWRA waterworks systems. Each community's annual water use relative to the system as a whole is the primary factor in allocating the annual water rate revenue requirement to MWRA water communities. Calendar year 2016 water use will be used to allocate the FY18 water utility rate revenue requirement.

June 2016 water supplied of 236.8 mgd (for all revenue generating users) is up 19.2 mgd or 8.8% compared to June 2015. June 2016 water use includes 3.9 mgd provided to the City of Cambridge.

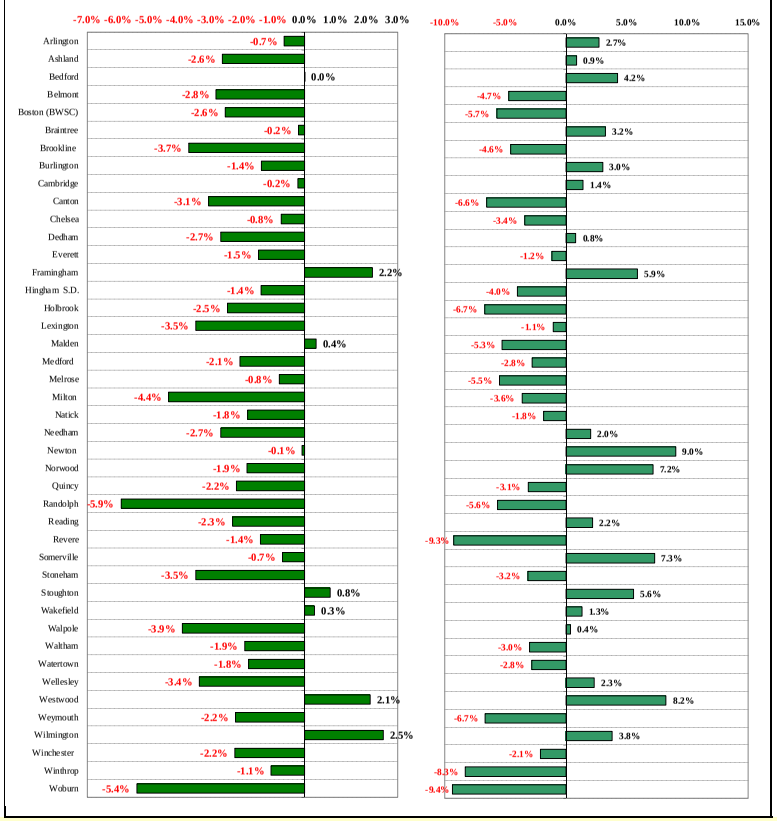
System-wide year to date consumption for (for all revenue generating users) CY16 remains lower than CY15 with 187.1 mgd being supplied to MWRA customers **through June**. This is 3.3 mgd lower than CY15, and is a decrease of 1.8%.

Community Wastewater Flows

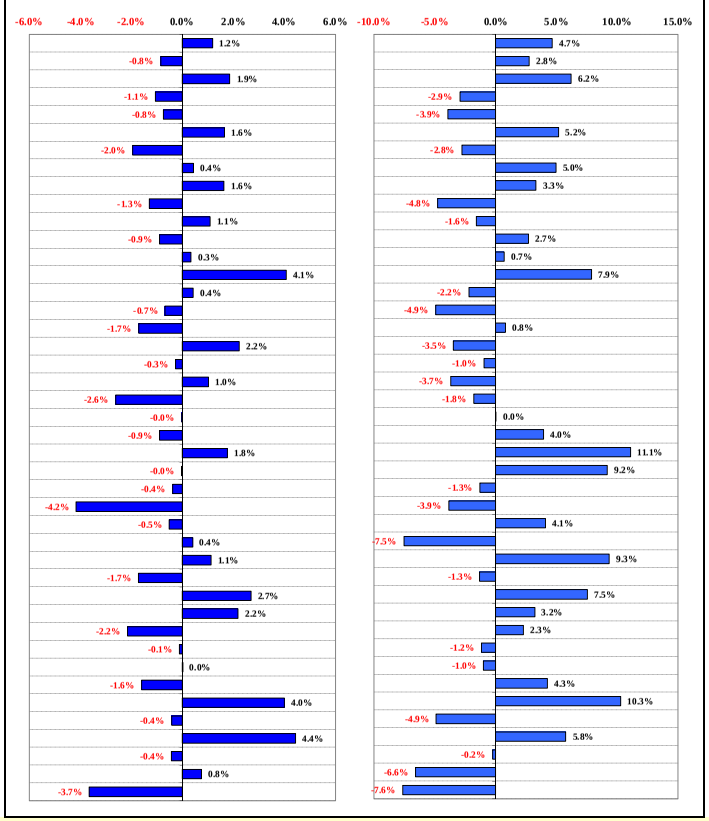
4th Quarter - FY16

How Projected CY2016 Community Wastewater Flows Could Effect FY2018 Sewer Assessments [1,2,3]

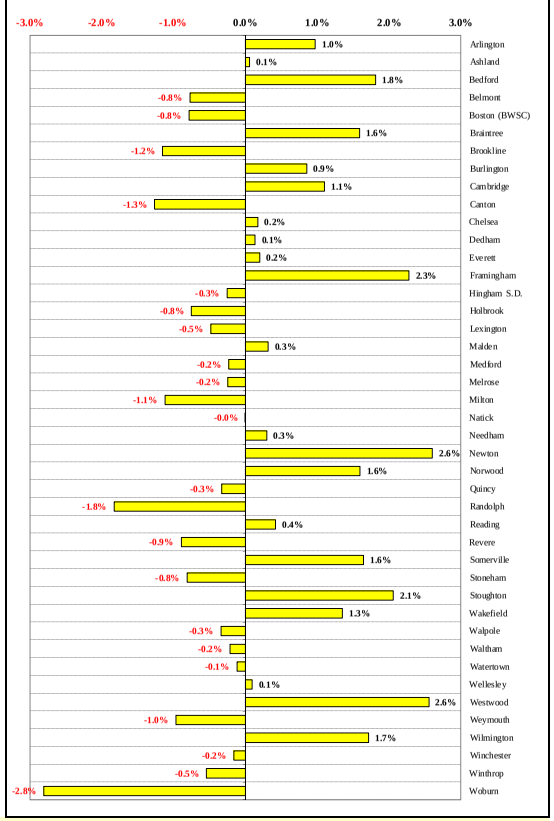
The flow components of FY2018 sewer assessments will be calculated using a 3-year average of CY2014 to CY2016 wastewater flows compared to FY2017 assessments that used a 3-year average of CY2013 to CY2015 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2014 to CY2016 flow share compared to CY2013 to CY2015 flow share, compared to all other communities in the system.



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



Notes:

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

[2] Based on CY2013 to CY2016 average wastewater flows as of 08/05/16. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2013 to June CY2016 wastewater flows based on actual meter data. July to December 2016 flows based on the average of the prior three years.

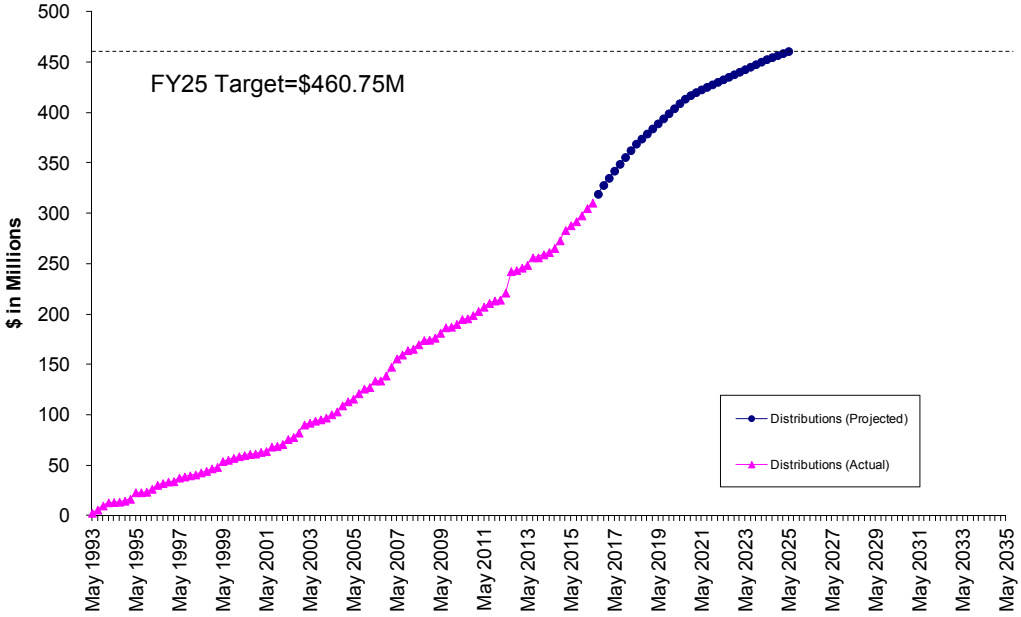
[4] Represents ONLY the impact on the total BASE assessment resulting from the changes in average and maximum wastewater FLOW SHARES.

Community Support Programs
4th Quarter – FY16

Infiltration/Inflow Local Financial Assistance Program

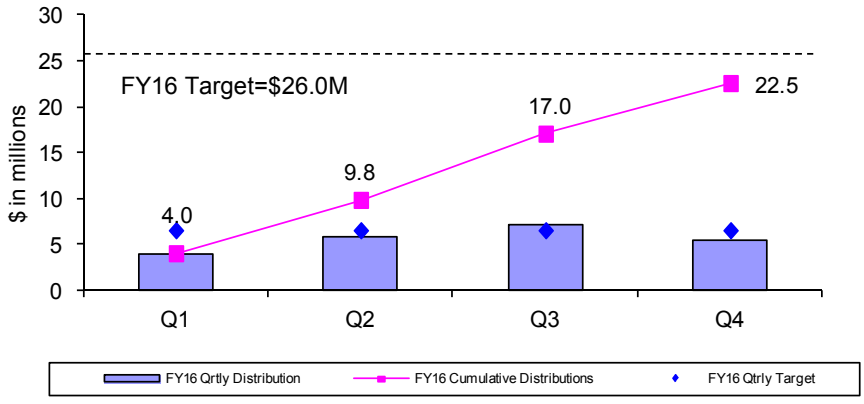
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $460.75 million in grants and interest-free loans (average of about $14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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/55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 and 10 funds (total $160 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period.

I/I Local Financial Assistance Program Distribution FY93-FY25



During the 4th Quarter of FY16, $5.5 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Burlington, Chelsea, Dedham, Milton, Quincy, Westwood and Winthrop. Total grant/loan distribution for FY16 is $22.4 million. From FY93 through the 4th Quarter of FY16, all 43 member sewer communities have participated in the program and more than $310 million has been distributed to fund 508 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY25 and community loan repayments will be made through FY36. All scheduled community loan repayments have been made.

FY16 Quarterly Distributions of Sewer Grant/Loans

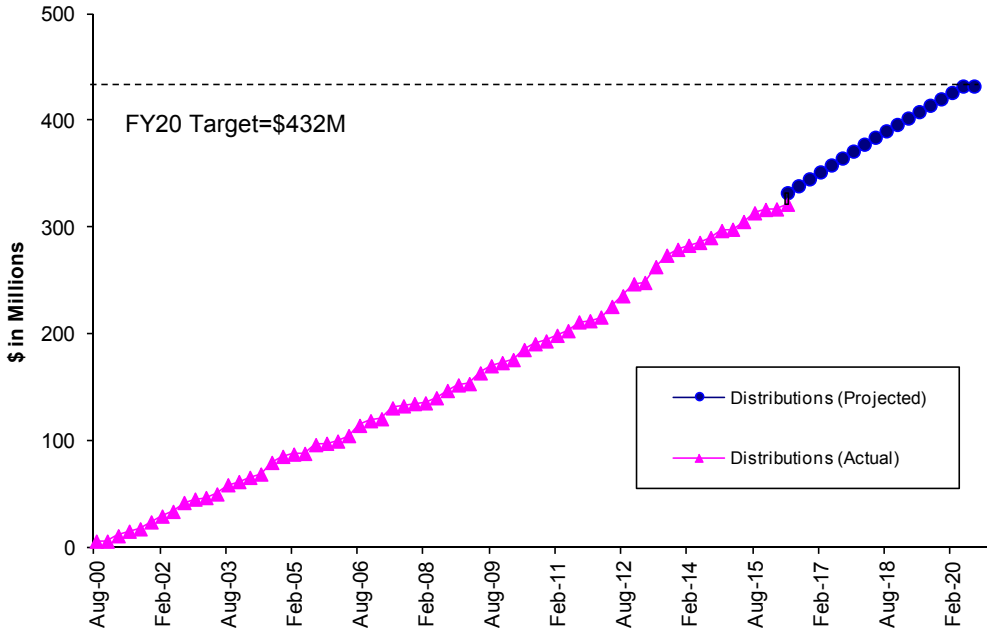


Community Support Programs
4th Quarter – FY16

Water Local Pipeline and Water System Assistance Programs

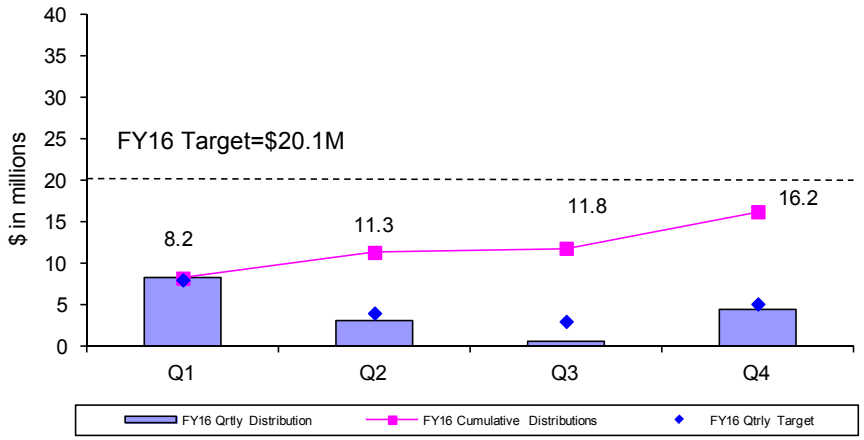
MWRA's Local Pipeline and Water System Assistance Programs (LPAP and LWSAP) provide $432 million in interest-free loans (an average of about $22 million per year from FY01 through FY20) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. 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 - LPAP concluded in FY13 with $222 million in loan distributions. The Phase 2 - LWSAP continues through FY20.

Local Pipeline and Water System Assistance Programs Distribution FY01-FY20



During the 4th Quarter of FY16, $4.4 million in interest-free loans was distributed to fund local water projects in Arlington, Chelsea, Lynnfield, Milton, Quincy and Somerville. Total loan distribution for FY16 is $16.2 million. From FY01 through the 4th Quarter of FY16, more than $322 million has been distributed to fund 366 local water system rehabilitation projects in 38 MWRA member water communities. Distribution of the remaining funds has been approved through FY20 and community loan repayments will be made through FY30. All scheduled community loan repayments have been made.

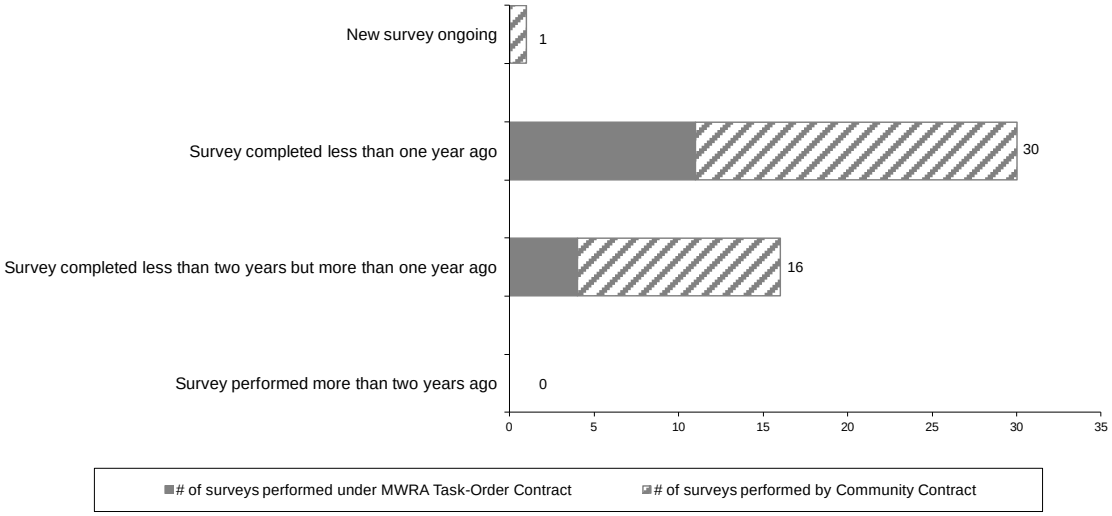
FY16 Quarterly Distributions of Water Loans



Community Support Programs
4th Quarter – FY16

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 4th Quarter of FY16, 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 210 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	1,066	19,283	104,102	3,008	127,459
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,924	2,210	3,158	2,107	10,399
Toilet Leak Detection Dye Tablets	------	1,688	2,446	1,553	1,108	6,795

BUSINESS SERVICES

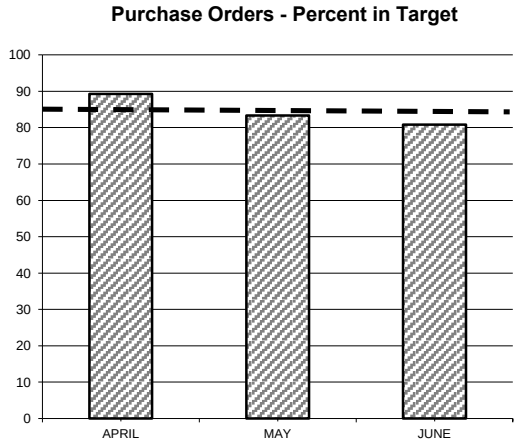
Procurement: Purchasing and Contracts

4th Quarter - FY16

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

Outcome: Processed 84% of purchase orders within target; Average Processing Time was 5.46 days vs. 6.23 days in Qtr 4 of FY15. Processed 80% (12 of 15) of contracts within target timeframes; Average Processing Time was 92 days vs. 74 days in Qtr 4 of FY15.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	927	3 DAYS	71.5%
$500 - $2K	780	7 DAYS	91.9%
$2K - $5K	396	10 DAYS	97.4%
$5K - $10K	74	25 DAYS	89.1%
$10K - $25K	72	30 DAYS	93.0%
$25K - $50K	16	60 DAYS	68.7%
Over $50K	38	90 DAYS	81.5%

The Purchasing Unit processed 2303 purchase orders, 308 less than the 2611 processed in Qtr 4 of FY15 for a total value of $10,425,430 versus a dollar value of $10,878,750 in Qtr 4 of FY15.

The purchase order processing target was not met for the $0 - $500 due to vendor sourcing and the over $25k-$50k due to bid review and staff summary requirements.

Contracts, Change Orders and Amendments

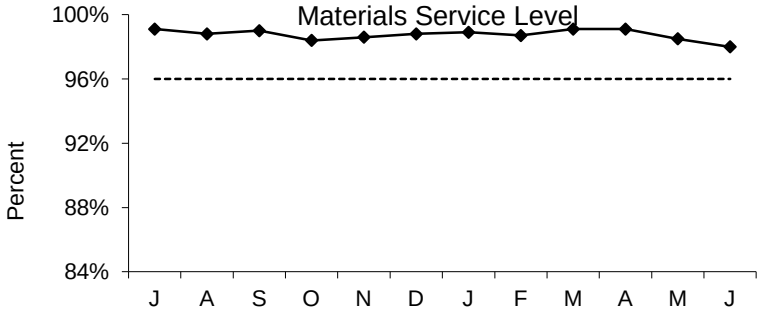
Three contracts were not processed within the target timeframes; one due to specification changes by the project manager, another due to revisions to schedule and compensation tables and the third due to a delay in the receipt of a certificate of authorization by the consultant.

Procurement processed fifteen contracts with a value of $21,331,076 and fourteen amendments with a value of $2,217,709. Twenty three change orders were executed during the period. The dollar value of all non-credit change orders during Q4 FY16 was $2,907,820 and the value of credit change orders was ($557,847).

Staff reviewed 50 proposed change orders and 40 draft change orders.

Materials Management

4th Quarter, FY16



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 8,837 (98.5%) of the 8,973 items requested in Q4 from the inventory locations for a total dollar value of $1,730,550

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 FY16 goal is to reduce consumable inventory from the July '15 base level ($7.6 million) by 2.0% (approximately $154,371), to $7.5 million by June 30, 2016 (see chart below).

Items added to inventory this quarter include:

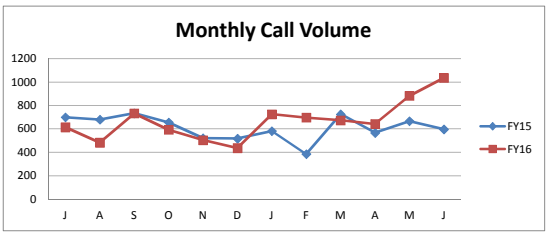
- Deer Island – elbows, couplings, butterfly valves, clamp motor, relay, vfd chiller and transducer for HVAC; grease, pressure release valve, bushings and lithium batteries for Residuals; temperature switch, o2 sensors, wire transmitters and calibration fittings for I&C; calibration gas, PVC tees and cord caps for Liquid Train; fan belts, flow meter and turbine oil for Power & Pump.
- Chelsea – power steering hoses, exhaust pipes, condensers and wiper arms for Fleet Services; solenoid valve, dampeners, fan belts, sump pump, media cones and heater for Work Order Coordination Group; bearings and pump gaskets for Wastewater Operations; copper tubing, labeling tape, motors, controller, transformer and wire tray cables for Maintenance.
- Southboro – clips for Facilities Maintenance; reader glasses and toner for Administration; Lead test kits for Lab.

Property Pass Program:

- Three audits were conducted during Q4.
- Numerous obsolete projectors, laptops, keyboards, printers and monitors have been received into Property Pass as surplus. Disposition is being handled as part of our ongoing recycling efforts.
- Scrap revenue received for Q4 amounted to $8,020. Year to date revenue received amounted to $33,117.
- Revenue received from online auctions held during Q4 amounted to $91,560. Year to date revenue received amounted to $287,691.

Items	Base Value July-15	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory	7,663,973	7,493,366	-108,512
Spare Parts Inventory Value	8,263,059	8,466,045	-378,049
Total Inventory Value	15,927,032	15,959,411	-486,561

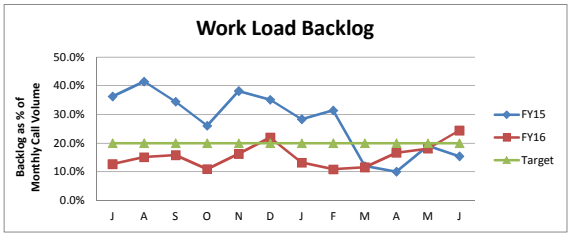
Note: New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

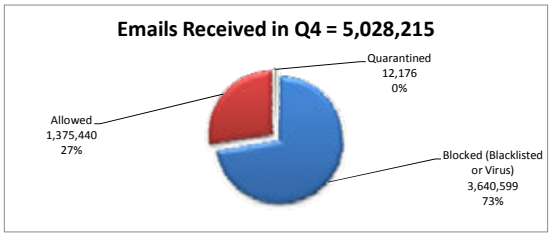


Performance and Backlog

Call Volume: Peaked in June. FY16-Q4 call volume increased by 40% from FY15-Q4 last year.

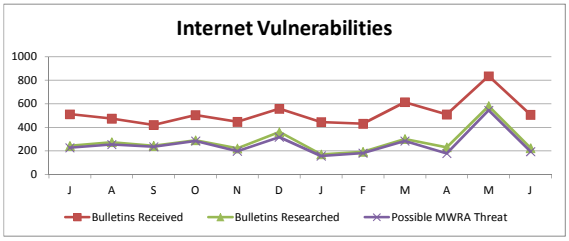
Call Backlog: Peaked in June. FY16-Q4 backlog average is 0.3% below the targeted benchmark of 20%.





Information Security

During Q4, pushed security fixes/updates to desktops/ servers to protect against 187 vulnerabilities. LANDesk Antivirus quarantined 28 distinct viruses from 33 PCs. PCs are current with anti-virus providers' signatures for all known malware.



Infrastructure:

Citrix Mobile Application Design and Development: Citrix infrastructure has been moved out of Proof of Concept and into production. 246 iPhones/iPads are being managed with XenMobile Mobile Device Management. Citrix Receiver is delivering 29 business applications to mobile devices. Sharefile is being used for file transfer with external entities.

Applications/Training/Records Center:

e-Construction Project: A paperless construction administration delivery process that includes: electronic submission of all construction documentation by all stakeholders, electronic document routing/approvals (e-signature), and digital management of all construction documentation in a secure environment allowing distribution to all project stakeholders through mobile devices. MWRA is planning on piloting an e-Construction system on the Chelsea Creek Headworks rehabilitation project to assess tools and functionalities and develop workflows.

Library Catalog Replacement Project (InMagic): Completed all migration tasks from the old catalog to Genie (Administrative module). Installed TextWorks user administrator query/database/publishing tool on library staff PCs. Created a search widget on the library page to search the Massachusetts Library databases and sample RSS feeds using the EPA's water news source.

Talent Acquisition Application: Significant work has been done on the new Talent Acquisition Application of the job application module scheduled to be implemented in Q1. Continued working with Subject Matter Expert and stakeholders to set up user configurations, and email and job templates. User job-aids were developed; users were trained. Participated in a demo of the employee application process for the Union Officers. Modified the new annual Applicant Flow Log report and created documentation on how to export data from ApplicantPro and load it into the reporting database that will run Affirmative Action reports. Conducted demos for Senior and Hiring managers from all sites.

Miscellaneous Lawson Support: 1) Worked with Infor Consulting Services on the triggers that will be used for the Lawson Maximo interfaces. 2) Completed submission of new 1095c electronic file to the IRS. Successfully, performed a dry run for weekly payroll processing using the new Century Bank account numbers. Accounts Payable payments went live 6/28; Payroll will go live 7/5. 3) Supported FY-end tasks such as validating employee health and basic life insurance rate changes effective 6/1. Performed preliminary fiscal year end reports for Federal Government Equal Opportunity and Veterans reports for AACU in preparation for running the first week of July, Tested and installed BSI Tax software cyclical bulletin 10.I on all three Lawson servers. 4) Implemented warehouse window scanning at Southborough.

Information Security Program: New security awareness training launched in April 2016 encompassing 11 training modules to be completed through 12/2016.

Scada/PI Data Diode Project: The replacement of the existing PI interfaces with data diodes is complete. There were a total of three interfaces completed during this project (Eastern Ops., Transport, and Carroll Water Treatment Plant).

Maximo Upgrade Project: Completed the hardware and base software installation of the new Maximo 7.6 server environment on the development, test, and production servers. Completed initial data merge/migration on the development and the test systems.

Library & Records Center: The Library fulfilled 31 (161 YTD) research requests, provided 77 (770 YTD) periodicals, standards, books & reports, and supported 222 (775 YTD) staff online searches. Research topics included blood lead level in children, dam seepage, watershed data mapping, and pipeline redundancy. The Records Center added 136 (337 YTD) boxes, handled 885 boxes YTD, and attended 2 Records Conservation Board Meetings. Trained 15 staff on records management policy. Distributed disposal lists for 4,146 boxes of which 1,709 were released by departments, and forwarded to Law Division for review.

IT Training: For the quarter, 97 staff attended 19 classes. 35% of the workforce has attended at least one class year-to-date. ITIL Foundation training was held. Crystal Reports – Report Design. LANDesk Boot Camp. Everbridge Dispatcher training classes were offered. 14 Security Awareness training sessions held in Chelsea and Deer Island were attended by 115 staff members. Developed new job-aids for new Audio Visual Equipment installed in Chelsea Conference Rooms.

Legal Matters

4th Quarter - FY16

PROJECT ASSISTANCE

COURT AND ADMINISTRATIVE ORDER

- **Boston Harbor Litigation and CSO:** Provided support on a letter to EPA and DEP providing a written description of MWRA's proposed approaches for its three-year performance assessment of its CSO Long-Term Control Plan and implementation of CSO variance requirements for the Alewife Brook/Upper Mystic River and the Lower Charles River/Charles River Basin; Reviewed draft fact sheets for three-year CSO variance extensions for the Alewife Brook/Upper Mystic River and the Lower Charles River/Charles River Basin; reviewed and filed Semi-Annual Compliance and Progress Report.

- **NPDES:** Reviewed letters to EPA and DEP requesting three-year CSO variance extensions for the Alewife Brook/Upper Mystic River and the Lower Charles River/Charles River Basin. Reviewed MWRA's CSO discharge estimates and rainfall analyses for 2015 submittal to EPA and DEP.

- **Residuals:** Drafted comment letter on the Massachusetts Department of Agricultural Resource's new regulations at 330 CMR 31.00 (Plant Nutrient Application Requirements for Agricultural Land and Land Not Used for Agricultural Land) as they relate to the marketing and use of MWRA's biosolids within Massachusetts.

- **Administrative Consent Order (DITP power outages):** Reviewed and submitted updated semi-annual *Consultant's Deer Island Energy Recommendations Tracking Sheet* to DEP and EPA.

REAL ESTATE, CONTRACT AND OTHER SUPPORT

- **Memorandum of Agreement:** Drafted Memorandum of Agreement between the Town of Stoneham and MWRA for MWRA's access to and use of town land adjacent to Stoneham High School for the purpose of supporting and completing construction of MWRA Contracts 7478 and 7067 as part of the Northern Intermediate High Pipeline Project.

- **Public Access:** Drafted public access 8(m) permit for Town of Needham and an amendment to the Town of Wellesley's public access 8(m) permit for use of portions of the Sudbury Aqueduct. Drafted 8(m) permit for the Pine Brook Country Club for use of portions of the Weston Aqueduct in Weston, MA.

- **Cosgrove Hydroelectric Facility:** Sent Notice of Termination of the PPA with NGRID for the Cosgrove Facility to allow MWRA to remain in compliance with the safe harbor provisions of U.S. Treasury regulation 1.141-7(f)(3); finalized and executed a successor PPA.

- **Deer Island:** Drafted Amendment No. 1 to the Restated License Agreement with Ogin, Inc., f/k/a FloDesign Wind Turbine Corp., to extend the term until December 31, 2017.

- **McLaughlin Fish Hatchery:** Completed amendments to existing MOA to document additional $200,000 contribution from MA Fish & Game for the hatchery pipeline project.

- **Licenses:** Provided comments to staff regarding a License Agreement with Inflection Point Solutions, LLC ("IPS") whereby IPS would provide the source code for IPS' software and allow MWRA to modify it to enable MWRA to be compliant with federal reporting requirements; drafted a License with **MaDEP** to allow MaDep to enter MWRA's water supply aqueduct right-of-way located in Northborough and Berlin, Massachusetts, between Whitney Street, Northborough, MA and Belleview Road, Berlin, MA in order to take ground water samples; drafted a license for access over MWRA property on the south and east sides of Building 11 in the Fore River Shipyard.

- **Public Access:** Finalized public access 8(m) permits for: the Town of Needham; an amendment to the Town of Wellesley's public access 8(m) permit for use of portions of the Sudbury Aqueduct; the Town of Wayland for use of portions of the Weston Aqueduct; Babson College and Franklin W. Olin College of Engineering to allow for public access in conjunction with the Town of Needham's 8(m) public access permit.

- **Contract 7335 – Section 4 Webster Avenue Pipeline and Utility Bridge Replacement Project:** Drafted letters to both the construction contractor and the designer reserving MWRA's rights to seek recovery in the event that it is determined that either or both are at fault for the problems which have occurred on the project.

- **Watershed Acquisition:** Reviewed and approved the acquisition in fee of the property of the Deborah Smith Selkow Trust in Sterling, MA. DCR # W-001166.
- **Order of Conditions:** Recorded Order of Conditions DEP No. 297-0383 for Northern Intermediate Pipeline Project in Stoneham, Design Contract 6906.

- **Cross Harbor Cable:** Continued discussions with the U.S. Attorney regarding a draft stipulation for settlement of ACoE's claim of a permit violation for failure to place the cable in the location required by permit.

- **MOA:** Drafted agreement to memorialize amendments to MWRA watershed land acquisition program's debt service payments due to Commonwealth.

MISCELLANEOUS

- Reviewed and approved sixty-five (65) Section 8(m) Permits and two (2) Direct Connect Permits.
- Reviewed and approved a sewer connection agreement (Jancaterino Realty Trust) and a water continuation agreement (Wellesley).

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters
Five demands for arbitration were filed.

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

Matters Concluded
Received an arbitrator's decision in favor of MWRA finding that the MWRA did not violate a collective bargaining agreement when it suspended an employee.

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

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of June 2016	As of March 2016	As of Dec 2015
Construction/Contract/Bid Protest (other than BHP)	5	5	5
Tort/Labor/Employment	1	2	2
Environmental/Regulatory/Other	2	2	1
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	**8**	**9**	**8**
Affirmative cases not in suit:	0	0	0
Other Litigation matters (restraining orders, etc.) MWRA v. Thomas Mercer MWRA v. NSTAR and HEEC	2	2	2
total – all pending lawsuits	**10**	**11**	**10**
Significant claims not in suit:	0	2	2
Bankruptcy	2	2	2
Wage Garnishment	14	14	13
TRAC/Adjudicatory Appeals	2	3	3
Subpoenas	0	0	0
TOTAL – ALL LITIGATION MATTERS	**28**	**32**	**30**

LITIGATION/TRAC

New Matters There are no new lawsuits to report.

Significant Claim Not in Court There are no Significant Claims to report.

Significant Developments

MWRA v. NSTAR and HEEC: Counsel for the parties presented their oral arguments upon Defendants' Motion to Dismiss the Complaint on May 3, 2016. Since that date, MWRA and the Defendants have kept the Court aware of developments in the Mass. Department of Public Utilities tariff proceeding including orders of DPU dated May 5, 2016 and June 3, 2016 which relate in part to issues of DPU's primary jurisdiction. On June 28, 2016, the Superior Court

allowed NStar/HEEC's motion to dismiss (without prejudice) and MWRA has timely appealed that dismissal.

Daniel O'Connell's Sons v. MWRA v. Allied Locke: MWRA prepared motion papers to supplement its counterclaim against Daniel O'Connell's Sons and its Third-Party Claim against Allied Locke. MWRA staff arranged for the delivery of the components involved in the second bull sprocket failure to Altran and arranged for testing in June. Met with Altran staff to discuss results of future analysis of second failed sprocket.

MWRA v. Mosby: Completed recovery of sums owed by former employee.

Matters Concluded

Current Employee) v. MWRA: Plaintiff is a current employee assigned as a machinist to MWRA's Southboro facility. Plaintiff alleged that he was denied a promotion in 2011 to a Unit Supervisor position because of his age which at the time was 59 years. Plaintiff further alleged that he was retaliated against by MWRA when he subsequently complained to his union that he was being discriminated against. He alleged that MWRA refused to interview him for two subsequent 2012 job openings in retaliation for making the internal age discrimination complaint. MWRA filed a Motion for Summary Judgment in September 2015. On March 17, 2016, the Court entered Judgment on MWRA's Motion for Summary Judgment, in favor of MWRA. The Court dismissed Plaintiff's Complaint. Plaintiff had until May 17, 2016, to appeal. No appeal was filed.

Antonio Rosa Claim: The personal injury claim of Antonio Rosa has been settled for the total sum of $25,000. On November 22, 2013, Mr. Rosa was on his bicycle, crossing Griffin Way along Eastern Avenue in Chelsea, when his bicycle and an MWRA vehicle operated by an MWRA employee collided. Mr. Rosa fell from his bicycle and sustained injuries. He received emergency room treatment, treatment from his primary care physician, and approximately six months of chiropractic care. The total settlement included a check issued to East Boston Chiropractic & Rehabilitation Clinic ($4,400) in exchange for a release of the Clinic's medical lien, and a check for the balance ($20,600) to Mr. Rosa and his attorneys.

Mark Poli Claim: Mr. Poli slipped on ice and fell while walking his dog at or about the entrance gate to Nut Island in Quincy on December 31, 2012. Poli allegedly suffered a fractured right leg with hardware implementation and a prolonged absence from work and sent an initial notice of claim made on February 12, 2013. On October 7, 2013, Plaintiff's attorney made a settlement demand in the amount of $275,000. By letter dated October 21, 2013, Risk Management denied Mr. Poli's claim, based on the Recreational Use Statute, G.L. c. 21 §17C. The Statute of Limitations has run as of December 31, 2015, and there was no additional contact from Mr. Poli and/or his attorney. The matter is closed.

Subpoenas

During the Fourth Quarter of FY 2016, no new subpoenas were received and no subpoenas were pending at the end of the Fourth Quarter FY 2016.

Public Records

During the Fourth Quarter of FY 2016, nine public records requests were received and eight public records requests were closed.

TRAC/MISC.

New Appeals

No new cases were received.

Settlement by Agreement of Parties

No cases were **s**ettled by Agreement of Parties in the 4th Quarter FY 2016.

Stipulation of Dismissal

No cases were dismissed by Stipulation of Dismissal, fine waived.

Notice of Dismissal Fine paid in full

No cases were dismissed by Joint Stipulation of Dismissal with Prejudice, fine Paid in full.

Tentative Decisions

No Tentative Decisions were issued in the 4th Quarter FY 2016.

Final Decisions

One Final Decision was issued in the 4th Quarter FY 2016.

School of the Museum of Fine Arts Boston; MWRA Docket No. 15-01

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
4TH Quarter - FY16

Highlights

During the 4th quarter, Internal Audit (IA) completed four construction labor burden reviews and the audit of Fay, Spofford & Thorndike. Completed vendor audits include the Marlboro lease, NEFCo and the 2015 HEEC true-up. A review of the AVL tracking system was performed to verify the AVL status for each vehicle and to ensure all applicable vehicles had an AVL installed. The Maximo work orders system was reviewed to ensure all vehicles with a AVL have a step to reinstall the device after work is performed. IA also prepared a report on a review of the Department of Unemployment Assistance's claims paid for unemployment benefits.

Status of Recommendations

There were 55 recommendations made in FY16. A total of 54 recommendations were closed from prior and current fiscal years.

IA follows-up on open recommendations on a continuous basis. All open recommendations have target dates for implementation. When a recommendation has not been acted on within 48 months, the appropriateness of the recommendation is re-evaluated during a subsequent audit. On closed assignments 98% of recommendations have been implemented.

Report Title (issue dates)	Audit Recommendations		
	Total	Closed	Open
Hardware Equipment Management Report (5/22/13)	36	29	7
Follow-Up Report on Fleet Services Activities (12/31/13)	17	13	4
8(m) Permit Fees (11/17/14)	6	4	2
Records Management (12/5/14)	8	6	2
Unmatched Receipts and Accruals (6/30/15)	10	5	5
Halon Inspections at DITP (9/30/15) & Caruso and DeLauri (12/31/15)	18	14	4
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	25	18	7
Security System Alarms (3/3/16)	3	1	2
AVL Tracking 2016 (5/06/16)	9	*3*	*6*
Total Recommendations	***132***	***93***	***39***

Cost Savings

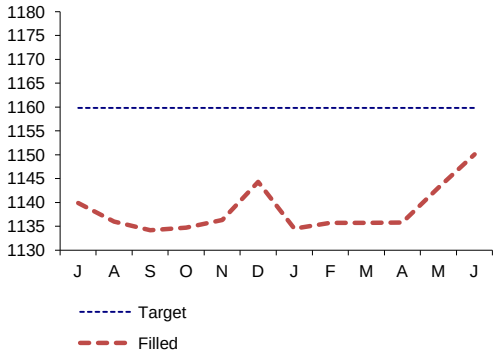
IA's target is to achieve at least $1 million in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of work in prior years.

Cost Savings	FY12	FY13	FY14	FY15	FY16	TOTAL
Consultants	$259,245	$587,314	$294,225	$87,605	$88,312	$1,316,701
Contractors & Vendors	$435,760	$2,153,688	$415,931	$1,146,742	$1,772,422	$5,924,543
Internal Audits	$407,350	$391,083	$923,370	$543,471	$220,929	$2,486,203
Total	**$1,102,355**	**$3,132,085**	**$1,633,526**	**$1,777,818**	**$2,081,663**	**$9,727,447**

OTHER MANAGEMENT

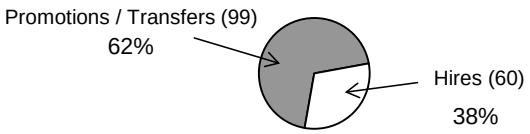
Workforce Management
4th Quarter FY16

FTE Tracking



FY16 Target for FTE's = 1159.8
FTE's as of June 2016 = 1150.1

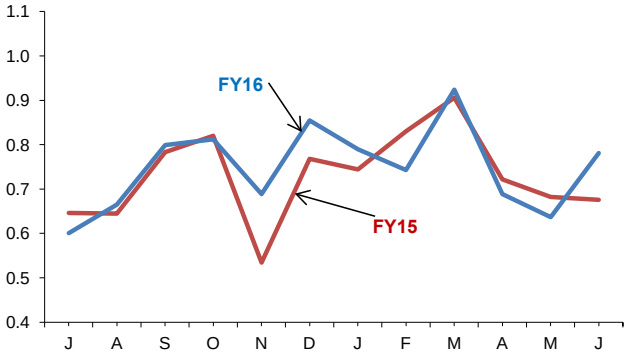
Positions Filled by Hires/Promotions
FY16-YTD



	Pr/Trns	Hires	Total
FY13	82 (64%)	47 (36%)	129
FY14	111 (69%)	51 (31%)	162
FY15	133 (67%)	65 (33%)	198
FY16	99 (62%)	60 (38%)	159

In Q4 of FY16, the average quarterly sick leave usage has increased 1.32% from the same time last year.

Average Monthly Sick Leave Usage
Per Employee

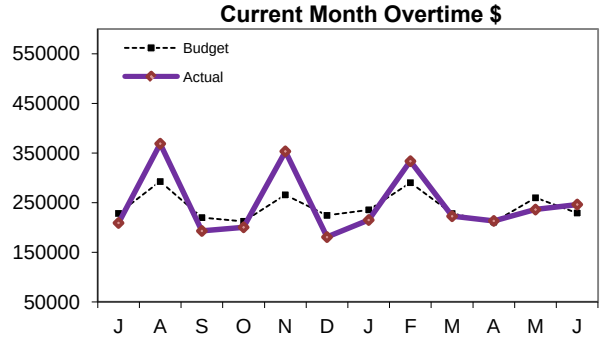


Average monthly sick leave for the 4th Quarter of FY16 increased as compared to the 4th Quarter of FY15 (8.32 to 8.43 days).

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY15
Admin	140	8.31	8.31	21.6%	9.61
Aff. Action	6	8.05	8.05	4.3%	16.89
Executive	5	11.53	11.53	80.1%	7.20
Finance	38	8.95	8.95	32.7%	5.56
Int. Audit	7	4.44	4.44	12.0%	5.56
Law	16	11.41	11.41	25.7%	11.30
OEP	6	6.62	6.62	0.0%	13.28
Operations	937	9.06	9.06	18.4%	8.53
Pub. Affs.	14	9.16	9.16	35.9%	7.26
MWRA Avg	**1169**	**8.98**	**8.98**	**19.7%**	**8.75**

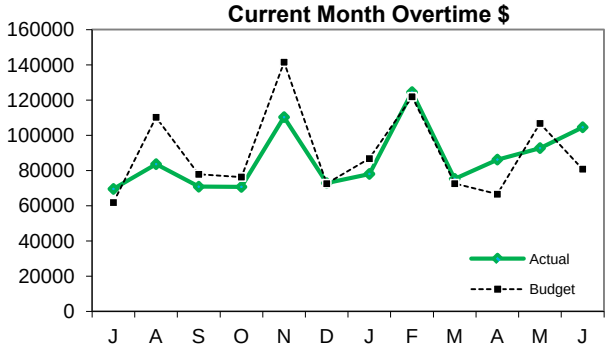
Percent of sick leave usage for FY16, attributable to Family and Medical Leave Act (FMLA) is 19.7% .

Field Operations
Current Month Overtime $



Total Overtime for **Field Operations** for the fourth quarter of FY16 was $694,912 which is ($4k) under budget. Emergency overtime was $260k, which was ($30k) under budget. Emergency maintenance totaled $62k for the quarter, $20k of which was for response to the Nut Island Fire. Coverage overtime was $260k, which was $6k over budget, reflecting the shift coverage requirements for the period. Planned overtime was $288k or $20k over budget, mainly for maintenance off-hours work at $96k, maintenance work completion at $46k, and maintenance major project deadline at $24k. YTD, Field Operations has spent $2,969,600 on overtime which is $85k over budget.

Deer Island Treatment Plant
Current Month Overtime $

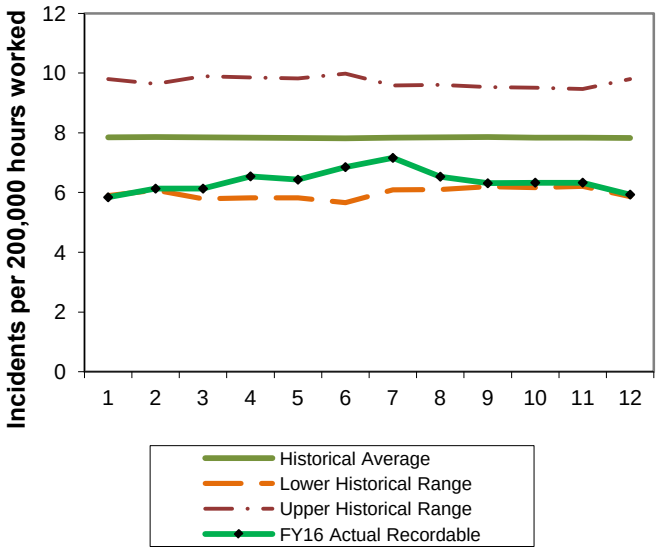


Total Overtime for **Deer Island** for the forth quarter of FY16 was $283,487 which was $29k over budget. Higher than anticipated combination of planned/unplanned overtime, $67K combined with greater than budgeted shift coverage requirements, $23K, are offset in part by less than anticipated storm coverage requirements, ($61K). YTD Deer Island has spent $1,038,986 on overtime, which was ($36K) under budget.

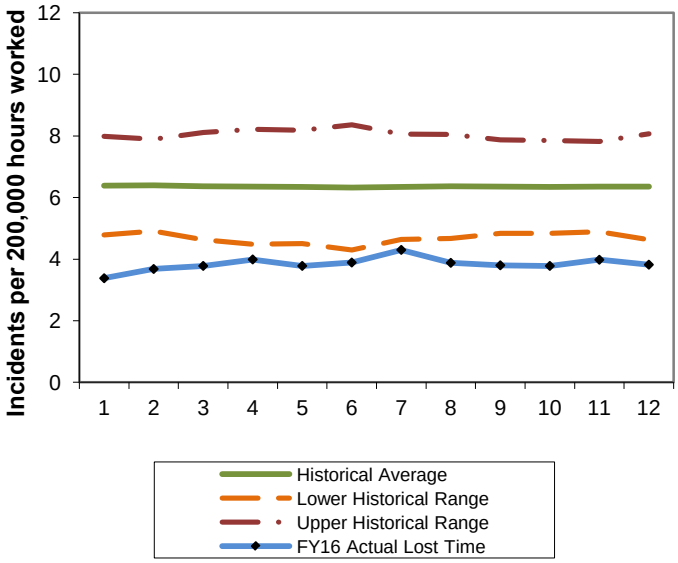
Workplace Safety

4th Quarter FY16

Recordable Injury & Illness Rates



Lost Time Injury & Illness Rates



1 “Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.

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 FY14. The “Upper” and “Lower Historical Ranges” are computed using these same data – adding and subtracting two standard deviations respectively. FY15 actual incident rates can be expected to fall within this historical range.

Workers Compensation Claims Highlights - 4th Quarter FY16

	New	Closed	Open Claims
Lost Time	6	19	57
Medical Only	23	32	15
Report Only	24	24	
	New		
Regular Duty Returns	5		
Light Duty Returns	6		

Highlights/Comments:

Light Duty Returns

April	Two employees returned to light duty from IA
May	Three employees returned to light duty from IA
June	One employee returned to light duty from workers comp

Regular Duty returns

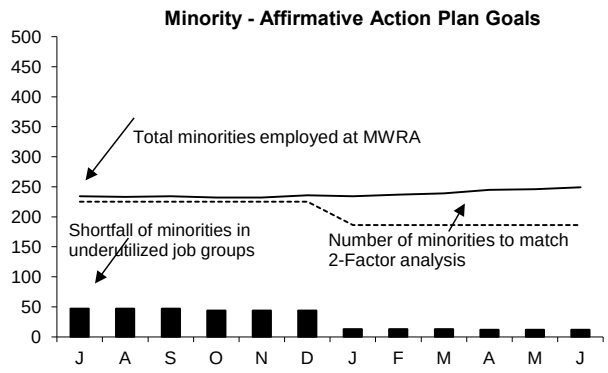
April	Three employees returned to regular duty from IA
May	One employee returned to regular duty from workers comp
June	Two employees returned to regular duty from workers comp

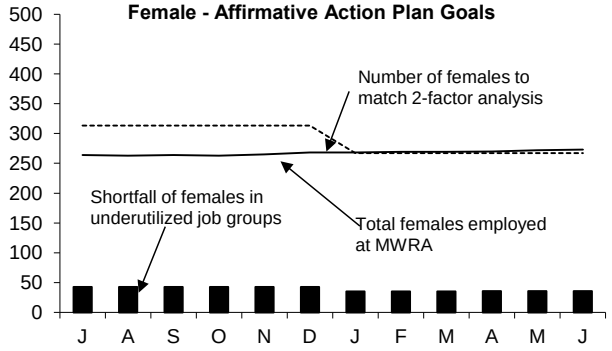
Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would 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

4th Quarter - FY16





Highlights:

At the end of Q4 FY16, 6 job groups or a total of 12 positions are underutilized by minorities as compared to 11 job groups or a total of 52 positions at the end of Q4 FY15; for females 9 job groups or a total of 36 positions are underutilized by females as compared to 11 job groups or a total of 42 positions at the end of Q4FY15. During Q4, 6 minority and 6 female were hired. During this same period 5 minorities and 3 female terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 6/30/2016	Minorities as of 6/30/2016	Achievement Level	Minority Over or Under Underutilized	Females As of 6/30/2016	Achievement Level	Female Over or Under Underutilized
Administrator A	21	2	2	0	7	6	1
Administrator B	22	1	3	-2	2	6	-4
Clerical A	40	15	6	9	34	36	-2
Clerical B	33	7	8	-1	12	17	-5
Engineer A	81	19	13	6	12	11	1
Engineer B	56	17	11	6	11	7	4
Craft A	108	17	14	3	0	6	-6
Craft B	150	30	18	12	3	4	-1
Laborer	69	19	16	3	4	3	1
Management A	99	14	16	-2	37	25	12
Management B	45	9	4	5	11	11	0
Operator A	67	5	10	-5	1	9	-8
Operator B	66	11	2	9	4	1	3
Professional A	32	4	5	-1	21	13	8
Professional B	164	47	35	12	81	67	14
Para Professional	57	17	11	6	27	30	-3
Technical A	54	14	11	3	5	11	-6
Technical B	7	1	2	-1	1	2	-1
Total	**1171**	**249**	**187**	**74/-12**	**273**	**265**	**32/-36**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Craft A	M&O Specialist	1	Int/Ext	1	1	Promo = WM
Craft B	Jr. Instrument Technician	1	Int/Ext	0	1	In Progress
Clerical B	Warehouse Materials Handler	1	Int/Ext	0	1	NH = WM
Engineer A	Program Manager, Chemistry	1	Int/Ext	0	1	NH = BF
Engineer B	Project Manager	1	Int/Ext	0	0	NH = BM
Laborers	OMC Laborer	5	Int/Ext	0	5	(5) NH = WM
Management A	Budget Manager	1	Int/Ext	0	0	NH = WF
Management A	Manager, Operations Administration	1	Int	1	0	Promo = BM
Management A	Deputy Contracts Manager	1	Int/Ext	0	1	In Progress
Management B	Area Manager, CLTP	1	Int	1	0	Transfer = WM
Management B	Network Administrator III	1	Int/Ext	0	1	NH = AM
Professional B	Assistant Finance Manager	1	Int	1	0	Promo = AM
Professional B	Security Services Adminstrator	1	Int/Ext	0	0	NH = WM
Professional B	Systems Administrator III	1	Int/Ext	0	1	In Progress
Professional B	Senior Accountant	1	Int/Ext	0	2	In Progress
Professional B	Library Specialist	1	Int/Ext	0	1	Rehire = WF
Professional B	Sr. Laboratory Technician	1	Int/Ext	0	1	In Progress
ParaProfessional	Helpline Coordinator	1	Int/Ext	0	1	NH = BM
Technical A	Senior Field Service Technician	1	int/Ext	0	0	Vol Demo = WM
Technical A	Communication & Control Technician	1	Int/Ext	0	1	In Progress

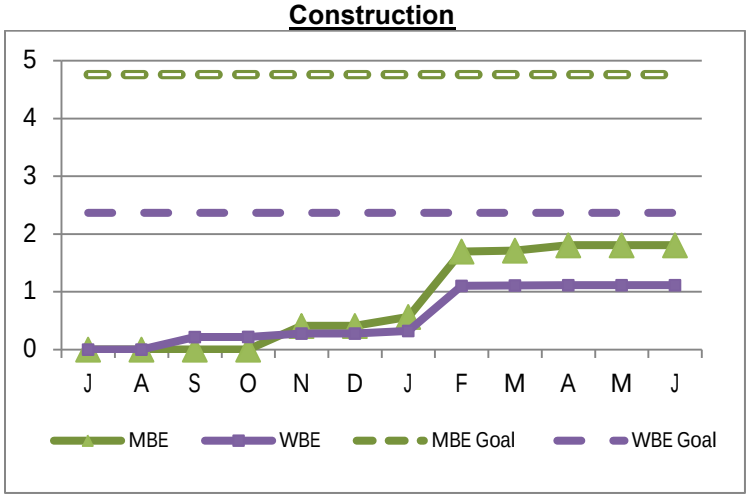
MBE/WBE Expenditures

4th Quarter - FY16

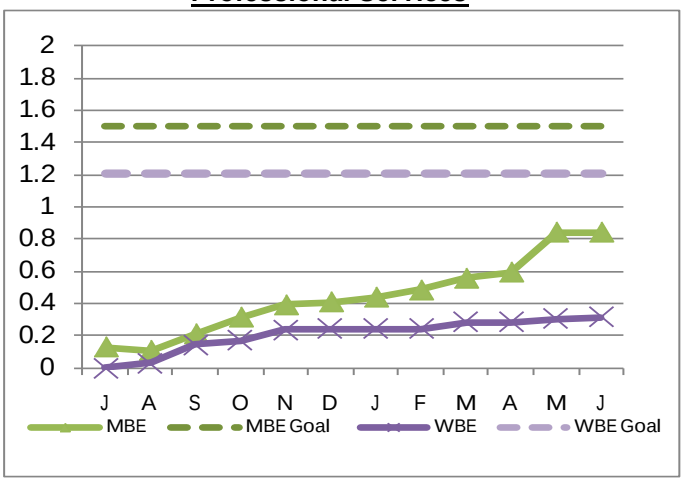
Background: MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY16 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the 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 June.

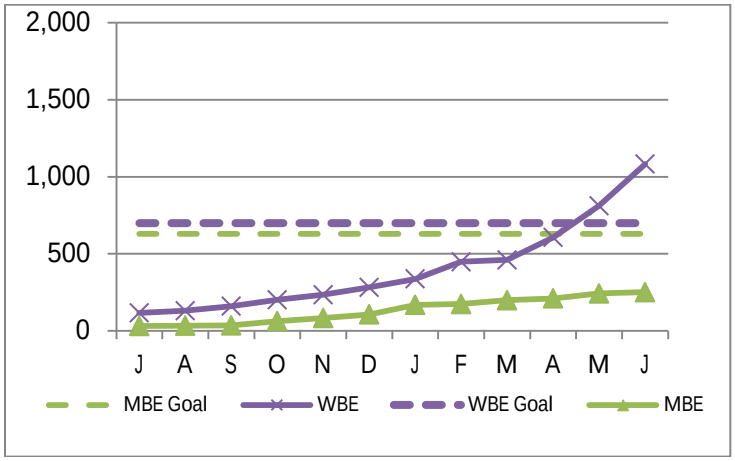
Construction



Professional Services



Goods/Services



FY16 spending and percentage of goals achieved, as well as FY15 performance are as follows:

	MBE				WBE			
	FY16 Year-to-Date		FY15		FY16 Year-to-Date		FY15	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Construction	1,805,604	37.9%	2,314,979	106.5%	1,114,916	47.1%	3,566,302	146.8%
Professional Svc.	828,841	55.3%	633,926	55.4%	314,752	26.1%	345,476	37.6%
Goods & Svcs.	255,324	40.6%	387,847	69.9%	1,124,374	160.7%	870,175	180.3%
Total	2,889,769	41.9%	3,336,752	86.2%	2,554,042	59.8%	4,781,953	124.8%

FY15 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

MWRA FY16 CEB Expenses
4th Quarter - FY16

	JUNE 2016 Year-to-Date					
	Period 12 YTD Budget	Period 12 YTD Actual	Period 12 YTD Variance	%	FY16 Approved	% Expended
EXPENSES						
WAGES AND SALARIES	$ 99,363,168	$ 96,118,427	$ (3,244,741)	-3.3%	$ 99,363,168	96.7%
OVERTIME	4,219,293	4,355,586	136,293	3.2%	4,219,293	103.2%
FRINGE BENEFITS	19,326,756	19,131,139	(195,617)	-1.0%	19,326,756	99.0%
WORKERS' COMPENSATION	2,343,000	2,350,369	7,369	0.3%	2,343,000	100.3%
CHEMICALS	9,790,848	9,297,550	(493,298)	-5.0%	9,790,848	95.0%
ENERGY AND UTILITIES	23,164,822	18,744,867	(4,419,955)	-19.1%	23,164,822	80.9%
MAINTENANCE	28,698,772	30,978,045	2,279,273	7.9%	28,698,772	107.9%
TRAINING AND MEETINGS	413,714	370,752	(42,962)	-10.4%	413,714	89.6%
PROFESSIONAL SERVICES	5,819,611	5,886,715	67,104	1.2%	5,819,611	101.2%
OTHER MATERIALS	6,164,589	6,186,216	21,627	0.4%	6,164,589	100.4%
OTHER SERVICES	23,529,902	22,628,385	(901,517)	-3.8%	23,529,902	96.2%
TOTAL DIRECT EXPENSES	**$ 222,834,475**	**$ 216,048,051**	**$ (6,786,424)**	**-3.0%**	**$ 222,834,475**	**97.0%**
INSURANCE	$ 2,160,797	$ 1,953,053	$ (207,744)	-9.6%	$ 2,160,797	90.4%
WATERSHED/PILOT	28,096,233	59,469,847	31,373,614	111.7%	28,096,233	211.7%
BECo PAYMENT	1,946,157	1,342,141	(604,016)	-31.0%	1,946,157	69.0%
MITIGATION	1,400,000	1,520,000	120,000	8.6%	1,400,000	108.6%
ADDITIONS TO RESERVES	(34,927)	(34,927)	-	0.0%	(34,927)	100.0%
RETIREMENT FUND	8,159,521	8,159,521	-	0.0%	8,159,521	100.0%
POST EMPLOYEE BENEFITS	5,224,848	5,224,848	-	0.0%	5,224,848	100.0%
TOTAL INDIRECT EXPENSES	**$ 46,952,629**	**$ 77,634,483**	**$ 30,681,854**	**65.3%**	**$ 46,952,629**	**165.3%**
STATE REVOLVING FUND	$ 81,876,277	$ 78,131,559	$ (3,744,718)	-4.6%	$ 81,876,277	95.4%
SENIOR DEBT	283,024,431	275,085,817	(7,938,614)	-2.8%	283,024,431	97.2%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	-	(873,804)	(873,804)	---	-	0.0%
CURRENT REVENUE/CAPITAL	11,200,000	11,200,000	-	0.0%	11,200,000	100.0%
SUBORDINATE MWRA DEBT	49,222,442	49,222,442	-	0.0%	49,222,442	100.0%
LOCAL WATER PIPELINE CP	4,149,240	262,498	(3,886,742)	-93.7%	4,149,240	6.3%
CAPITAL LEASE	3,217,060	3,217,060	-	0.0%	3,217,060	100.0%
VARIABLE DEBT	-	(12,873,173)	(12,873,173)	---	-	0.0%
BOND REDEMPTION SAVINGS	-	-	-	---	-	---
DEFEASANCE ACCOUNT	-	-	-	---	-	---
TOTAL DEBT SERVICE	**$ 432,689,450**	**$ 403,372,399**	**$ (29,317,051)**	**-6.8%**	**$ 432,689,450**	**93.2%**
TOTAL EXPENSES	**$ 702,476,554**	**$ 697,054,933**	**$ (5,421,622)**	**-0.8%**	**$ 702,476,554**	**99.2%**
REVENUE & INCOME						
RATE REVENUE	$ 672,440,000	$ 672,440,000	$ -	0.0%	$ 672,440,000	100.0%
OTHER USER CHARGES	8,683,898	8,783,469	99,571	1.1%	8,683,898	101.1%
OTHER REVENUE	12,000,066	15,749,464	3,749,398	31.2%	12,000,066	131.2%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	9,352,590	10,303,841	951,251	10.2%	9,352,590	110.2%
TOTAL REVENUE & INCOME	**$ 702,476,554**	**$ 707,276,774**	**$ 4,800,220**	**0.7%**	**$ 702,476,554**	**100.7%**

As of June 2016 (period 12), total expenses were $697.1 million, $5.4 million or 0.8% lower than budget and total revenue was $707.3 million, $4.8 million or 0.7% higher than budget, for a net variance of $10.2 million.

Direct Expenses are $216.1 million, $6.8 million or 3.0% lower than budget.

- **Utilities** are underspent by $4.4 million or 19.1% due to lower Electricity of $2.4 million mainly due to Deer Island with underspending of $1.8 million for lower commodity and T&D costs, lower plant flows resulted in reduced electricity demand; and an overaccrual at the end of FY15. Additionally, lower diesel prices contributed $1.9 million to the variance.

- **Wages & Salaries** are under budget by $3.2 million or 3.3%. At the end of June the average Full Time Equivalent (FTE) positions were 1,138, 22 positions less than the 1,160 budgeted FTE's.

- **Maintenance** is over budget by $2.3 million or 7.9%, of which $2.5 million is attributed to the Nut Island fire incident and timing of energy efficiency projects.

- **Other Services** spending was lower than budget by $902k or 3.8% due to lower spending of $610k for sludge pelletization services for lower inflation; $127k for Space Lease Rentals for the Chelsea facility lease due to an overpayment of escrow for insurance; $128k for Grit and Screenings disposal services due to lower quantities; and $83k for Other Rentals. Lower spending is offset by higher spending on Telephone Services of $66k associated with new and more SCADA lines and Other Services of $46k for Ward Street Headworks tower demolition.

- **Chemicals** are under budget by $493k or 5.0% due to lower than budgeted spending on Soda Ash of $385k due to lower usage to meet corrosion control targets and timing of deliveries, Sodium Bisulfite of $141k due to lower usage at the CWTP, timing of deliveries at DI and lower flows there. This is partially offset by overspending on Hydrogen Peroxide of $207k due to increased pretreatment of hydrogen sulfide gas in response to lower DI plant flows.

Indirect Expenses of $77.6 million, $30.7 million or 65.5% over budget. In June 2016, the MWRA prepaid $32 million in Watershed debt to the Commonwealth. This prepayment defeased the obligation of the Authority to reimburse the Commonwealth for the debt service associated with the bonds utilized to purchase the land within the Quabbin, Wachusett, and Ware River watersheds.

Debt Service Expenses totaled $403.4 million, which was $29.3 million below budget, reflecting the lower variable rate of $12.9 million and $3.9 million for the commercial paper program. Senior Debt was also under budget by $8.0 million and SRF by $3.7 million. The unbudgeted $873k in Debt Service Assistance received contributed to the underspending.

Revenue / Income through June is $707.3 million, $4.8 million over budget mainly due to higher Non-Rate revenue of $3.8 million due to $562k for TRAC Penalties, $594k and $1.2M from unplanned water purchase from the Cities of Lynn and Cambridge, respectively, $296k for U.S. Treasury rebates, Energy Rebates of $438k, higher surplus equipment sales of $331k, and greater Investment Income of $951k.

Cost of Debt
4th Quarter – FY16

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.

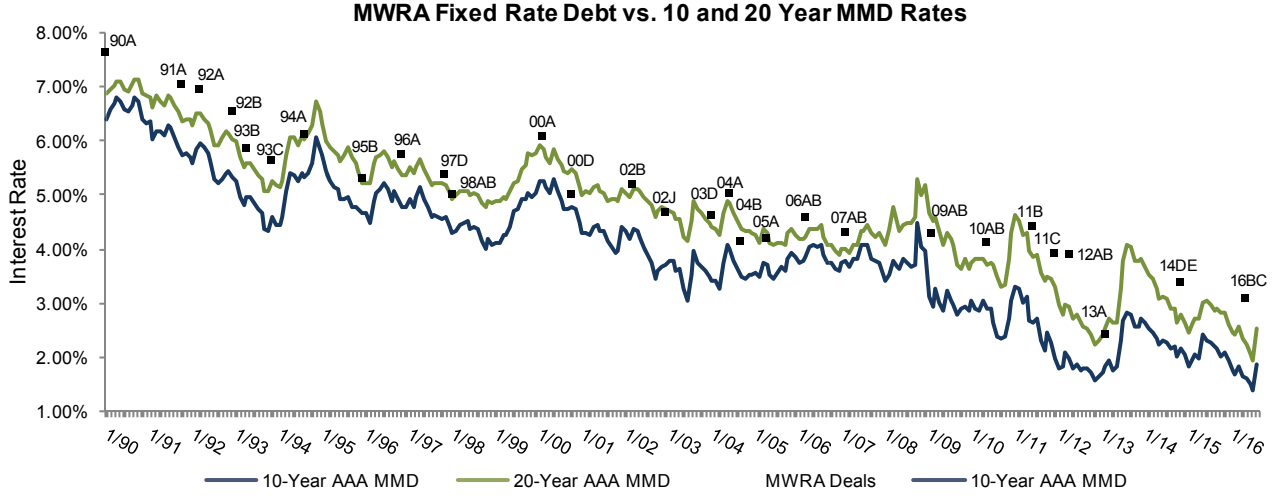
Average Cost of MWRA Debt

Fixed Debt ($3,724)	3.99%
Variable Debt ($484.2)	0.60%
SRF Debt ($1,036)	1.37%
Weighted Average Debt Cost ($5,447)	3.16%

Most Recent Senior Fixed Debt Issue
May 2016

2016 Series B and C ($747.6)	3.12%

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

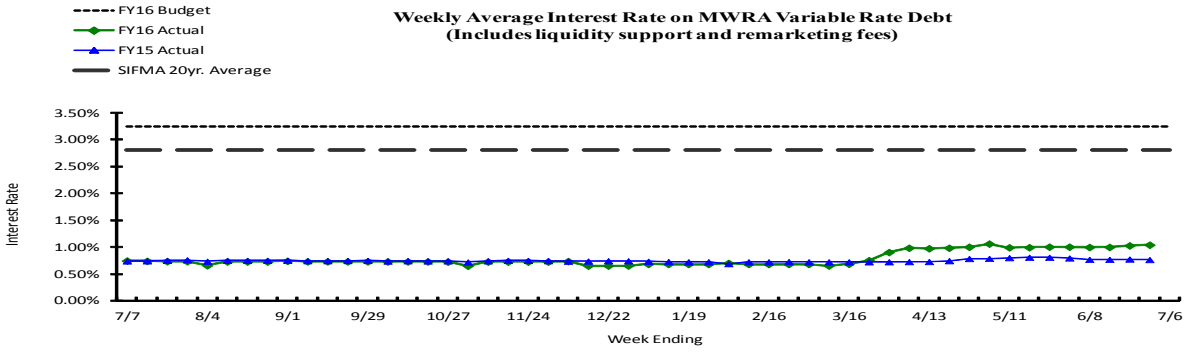


Bond Deal	1991A	1992A	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J
Rate	7.08%	6.98%	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%
Avg Life	19.8 yrs	22.6 yrs	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs

Bond Deal	2003D	2004A	2004B	2005A	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014DEF	2016BC
Rate	4.64%	5.05%	4.17%	4.22%	4.61%	4.34%	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%
Avg Life	18.4 yrs	19.6 yrs	13.5 yrs	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

Weekly Average variable Interest Rates vs. Budget

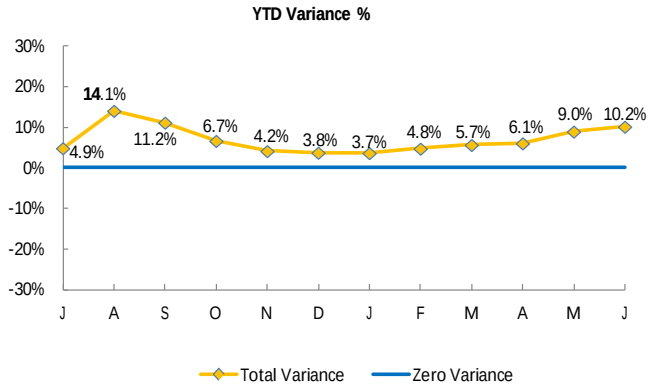
MWRA currently has ten variable rate debt issues with $1.0 billion outstanding, excluding commercial paper. Of the ten outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In June, SIFMA rates ranged from 0.43% to 0.39% 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

4th Quarter - FY16

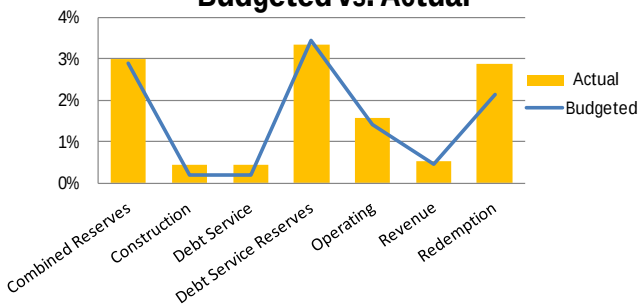
Year To Date



	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	$3	$70	72	4.0%
Construction	($17)	$158	140	96.6%
Debt Service	($1)	$391	390	119.8%
Debt Service Reserves	$36	($28)	8	0.2%
Operating	$26	$67	93	10.9%
Revenue	$29	$22	51	11.3%
Redemption	$3	$194	196	34.9%
Total Variance	$78	$873	$951	10.2%

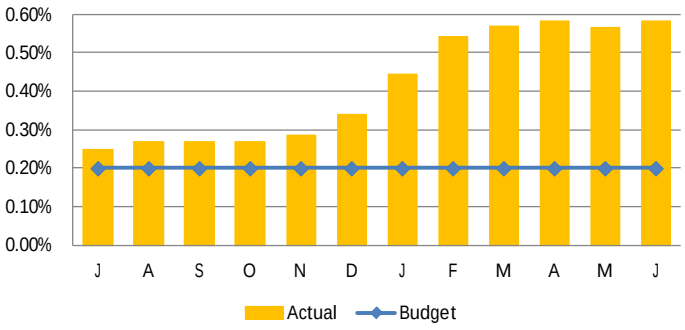
YTD Average Balances Budgeted vs. Actual

YTD Average Interest Rate Budgeted vs. Actual

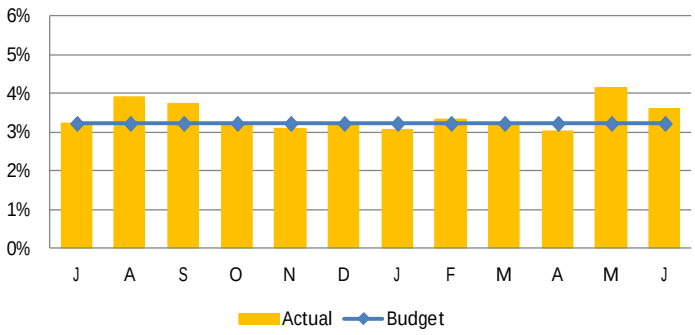


Monthly

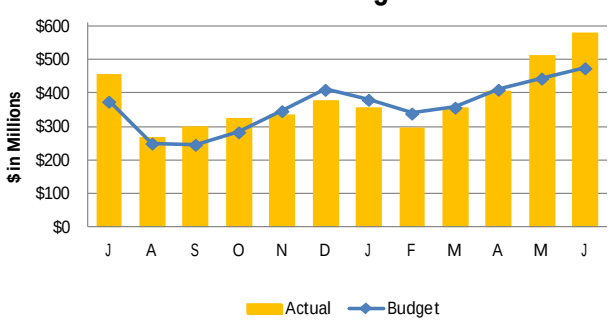
Short-Term Interest Rates



Long-Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances