MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
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ADMINISTRATION, FINANCE & AUDIT COMMITTEE MEETING

Chair: H. Vitale
Vice-Chair: J. Foti
Committee Members:
A. Blackmon
J. Carroll
K. Cotter
A. Pappastergion
B. Peña
J. Walsh

to be held on

Wednesday, November 15, 2017

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: 10:00 a.m.

AGENDA

A. Information

1. Delegated Authority Report – October 2017
2. First Quarter FY18 Orange Notebook
3. FY2018 Financial Update and Summary as of October 2017
4. New Technical Assistance Contracts for As-Needed Resident Engineering/Resident Inspection Services
5. Procedure for Procuring Contract 7581 - Carroll Water Treatment Plant SCADA System Improvements

B. Approvals

1. Dental Insurance

C. Contract Awards

1. Insurance Consultant Services: Kevin F. Donoghue Insurance Advisors Inc. (d/b/a KFDA), Contract F246

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the
Administration, Finance and Audit Committee

October 18, 2017

A meeting of the Administration, Finance and Audit Committee was held on October 18, 2017 at the Authority headquarters in Charlestown. Chairman Vitale presided. Present from the Board were Messrs. Blackmon, Carroll, Cotter, Pappastergion, Peña, and Walsh. Among those present from the Authority staff were Fred Laskey, Steve Remsberg, Michele Gillen, Carolyn Fiore, Carolyn Francisco Murphy, Tom Durkin, Kathy Soni, Louise Miller, Mike Hornbrook, Leo Norton, and Bonnie Hale. The meeting was called to order at 10:20 a.m.

Information

Delegated Authority Report – September 2017

There was question and answer on some of the items on the report.

FY2018 Financial Update and Summary as of September 2017

Staff summarized the report, and there was general discussion and question and answer.

Lancaster Sewer District FY18 Assessment

Staff described the issue resulting in price increases for the Lancaster Sewer District and measures taken to alleviate the increase for this fiscal year.

The meeting adjourned at 10:45 a.m.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Delegated Authority Report – October 2017

COMMITTEE: Administration, Finance & Audit

X INFORMATION
___ VOTE

Linda D'Addario, Admin. Systems Coordinator
Preparer/Title

Michele S. Gillen
Director, Administration

Barbara Aylward, Administrator A & F
Preparer/Title

Carolyn Francisco Murphy
Director of Procurement

RECOMMENDATION:

For information only. Attached is a listing of actions taken by the Executive Director under delegated authority for the period October 1 – 31, 2017.

This report is broken down into three sections:

- Awards of Construction, non-professional and professional services contracts and change orders and amendments in excess of $25,000, including credit change orders and amendments in excess of $25,000;
- Awards of purchase orders in excess of $25,000; and
- Amendments to the Position Control Register, if applicable.

BACKGROUND:

The Board of Directors' Management Policies and Procedures, as amended by the Board's vote on October 14, 2009, delegate authority to the Executive Director to approve the following:

Construction Contract Awards:

Up to $1 million if the award is to the lowest bidder; or up to $500,000 if the award is to other than the lowest bidder.

Change Orders:

Up to 25% of the original contract amount or $250,000, whichever is less, where the change increases the contract amount, and for a term not exceeding an aggregate of six months; and for any amount and for any term, where the change decreases the contract amount. The delegations for cost increases and time can be restored by Board vote.

Professional Service Contract Awards:

Up to $100,000 and one year with a firm; or up to $50,000 and one year with an individual.

Non-Professional Service Contract Awards:

Up to $250,000 if a competitive procurement process has been conducted, or up to $100,000 if a procurement process other than a competitive process has been conducted.

Purchase or Lease of Equipment, Materials or Supplies:

Up to $1 million if the award is to the lowest bidder; or up to $500,000 if the award is to other than the lowest bidder.

Amendments:

Up to 25% of the original contract amount or $250,000, whichever is less, and for a term not exceeding an aggregate of six months.

Amendments to the Position Control Register:

Amendments which result only in a change in cost center.

BUDGET/FISCAL IMPACT:

Recommendations for delegated authority approval include information on the budget/fiscal impact related to the action. For items funded through the capital budget, dollars are measured against the approved capital budget. If the dollars are in excess of the amount authorized in the budget, the amount will be covered within the five-year CIP spending cap. For items funded through the Current Expense Budget, variances are reported monthly and year-end projections are prepared at least twice per year. Staff review all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA budget

CONSTRUCTION/PROFESSIONAL SERVICES DELEGATED AUTHORITY ITEMS OCTOBER 1 - 31, 2017

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMEND/CO	COMPANY	FINANCIAL IMPACT
C-1.	10/02/17	**SECTION 4 WEBSTER AVENUE PIPE AND UTILITY BRIDGE REPLACEMENT** FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: POLICE DETAIL AND TRAFFIC CONTROL, REMOVE AND DISPOSE OF THE BILLBOARD LINE, MARKINGS, MILLING AND PAVING, AND INSTALLATION OF WHEEL CHAIR RAMPS.	7335	6	NEL CORPORATION	($214,413.87)
C-2	10/02/17	**ELEVATOR MAINTENANCE SERVICES AT VARIOUS AUTHORITY FACILITIES** AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR ELEVATOR MAINTENANCE SERVICES AT VARIOUS AUTHORITY FACILITIES FOR A TERM OF 730 CALENDAR DAYS.	OP-356	AWARD	BBE CORPORATION	$250,460.00
C-3.	10/03/17	**BOILER AND WATER HEATER SERVICE** INCREASE ALLOWANCES FOR REPLACEMENT PARTS AND ON-SITE REPAIR SERVICES DURING REGULAR HOURS; EXTEND THE CONTRACT TERM BY 30 CALENDAR DAYS FROM SEPTEMBER 25, 2017 TO OCTOBER 25, 2017.	OP-278	1	COOLING & HEATING SPECIALISTS, INC.	$57,300.00
C-4.	10/04/17	**THERMAL/POWER PLANT FUEL OIL SYSTEM UPGRADE DEER ISLAND TREATMENT PLANT** FURNISH AND INSTALL ADDITIONAL CONDUIT AND CONDUCTORS; FURNISH AND INSTALL NEW PIPING AND VALVES TO THE NEW FUEL OIL SYSTEM; COMPENSATE CONTRACTOR FOR THREE DAYS OF PREMIUM TIME.	7061A	4	J.F. WHITE CONTRACTING CO.	$91,867.53
C-5.	10/12/17	**BRAINTREE/WEYMOUTH IPS AND CHELSEA ADMINISTRATION HVAC UPGRADES** AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR HVAC UPGRADES AT BRAINTREE/WEYMOUTH IPS AND CHELSEA ADMINISTRATION FACILITY FOR A TERM OF 180 CALENDAR DAYS.	OP-347	AWARD	CAM HVAC & CONSTRUCTION, INC.	$556,000.00
C-6.	10/13/17	**MWRA SECTION 80 EMERGENCY REPAIR** FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: TRAFFIC CONTROL, POLICE DETAIL AND UNFORESEEN CONDITIONS OR CIRCUMSTANCES OR NON-SPECIFIED ADDITIONAL WORK.	OP-352	1	R. ZOPPO CORP.	($115,299.51)
C-7.	10/13/17	**CHELSEA CREEK HEADWORKS UPGRADE** SAW CUT THE FLOOR OF THE NEW SWITCHGEAR ROOM; EXCAVATE 8-FEET BELOW GRADE AND FURNISH AND INSTALL A NEW REINFORCED CONCRETE FLOOR; FURNISH AND INSTALL AN INTERIM CONTROL PANEL, INTERCONNECTING CONDUIT AND WIRE; RELOCATE THE NEW COMMUNICATION PANEL IN LIEU OF FURNISHING AND INSTALLING AN INTERIM GAS MONITORING PANEL AND RELOCATE THE EXISTING SLUICE GATE PANEL AND REVISE THE INTERIM GRIT AND SCREENING CROSS OVER PIPING CONFIGURATION.	7161	4	BHD/BEC 2015, A JOINT VENTURE	$237,870.00
C-8.	10/18/17	**SOUTHERN EXTRA HIGH PIPELINE - SECTION 111 (BOSTON)** REMOVE, HANDLE, TRANSPORT AND DISPOSE OF ROCK AND BOULDER EXCAVATION; FURNISH AND INSTALL A NEW 20-INCH DUCTILE IRON BEND.	6454	2	P. GIOIOSO & SONS, INC.	$226,387.33
C-9.	10/18/17	**CHESTNUT HILL RESERVOIR GATEHOUSE NO. 1 REPAIRS** AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR CHESNUT HILL RESERVOIR GATEHOUSE NO. 1 REPAIRS FOR A TERM OF 120 CALENDAR DAYS.	7382	AWARD	T FORD COMPANY, INC.	$781,500.00

PURCHASING DELEGATED AUTHORITY ITEMS OCTOBER 1 - 31, 2017

NO.	DATE OF AWARD	TITLE AND EXPLANATION	CONTRACT	AMENDMENT	COMPANY	FINANCIAL IMPACT
P-1.	10/03/17	**PURCHASE OF LABORATORY SERVICES FOR UCMR4 METAL, PESTICIDES, SVOCS AND ALCOHOLS** AWARD OF A THREE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR LABORATORY TESTING SERVICES FOR UCMR4 METALS, PESTICIDES, SVOCS AND ALCOHOLS FOR THE DEPARTMENT OF LABORATORY TESTING SERVICES.	WRA-4415		EUROFINS EATON ANALYTICAL, INC.	$181,500.00
P-2.	10/04/17	**PURCHASE OF ANNUAL SCADA SOFTWARE MAINTENANCE** AWARD OF A ONE-YEAR SOLE SOURCE PURCHASE ORDER TO THE ORIGINAL MANUFACTURER FOR MAINTENANCE OF SCADA SOFTWARE.			GE INTELLIGENT PLATFORMS, INC.	$147,168.97
P-3.	10/10/17	**PURCHASE OF TEMPORARY FLOW MONITORING AND DATA COLLECTION SERVICES** AWARD OF A ONE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR TEMPORARY FLOW MONITORING AND DATA COLLECTION SERVICES AT VARIOUS MWRA WASTEWATER SITES.	WRA-4420		ADS, LLC	$161,750.00
P-4.	10/12/17	**PURCHASE OF CERTIFIED WATER/WASTEWATER MAINTENANCE TECHNICIAN TRAINING** AWARD OF A SOLE SOURCE PURCHASE ORDER FOR CERTIFIED WATER/WASTEWATER MAINTENANCE TECHNICIAN TRAINING.			INTERNATIONAL MAINTENANCE INSTITUTE	$35,500.00
P-5.	10/18/17	**PURCHASE OF LABORATORY SERVICES FOR UCMR4 HALOACETIC ACIDS** AWARD OF A THREE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR LABORATORY TESTING SERVICES OF UCMR4 HALOACETIC ACIDS FOR THE DEPARTMENT OF LABORATORY SERVICES.	WRA-4417Q		EUROFINS EATON ANALYTICAL, INC.	$36,300.00
P-6.	10/18/17	**PURCHASE OF ANNUAL MAINTENANCE AND SUPPORT OF PORTIA INVESTMENT AND CASH MANAGEMENT SOFTWARE** AWARD OF A ONE-YEAR SOLE SOURCE PURCHASE ORDER TO THE ORIGINAL MANUFACTURER FOR THE ANNUAL MAINTENANCE AND SUPPORT OF PORTIA INVESTMENT AND CASH MANAGEMENT SOFTWARE.			SS&C TECHNOLOGIES, INC	$51,313.41
P-7	10/24/17	**PURCHASE OF FORTY-FIVE BOLTED MANHOLE FRAMES AND COVER ASSEMBLIES** AWARD OF A SOLE SOURCE PURCHASE ORDER FOR FORTY-FIVE BOLTED MANHOLE FRAMES AND COVER ASSEMBLIES.			E.J. USA, INC.	$25,875.00
P-8	10/24/17	**SUPPLY AND DELIVERY OF FERRIC CHLORIDE** AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR SUPPLY AND DELIVERY OF FERRIC CHLORIDE TO THE CLINTON WASTEWATER TREATMENT PLANT.	WRA-4424Q		KEMIRA WATER SOLUTIONS, INC.	$53,625.00
P-9	10/27/17	**PURCHASE OF PRETREATMENT INFORMATION MANAGEMENT SYSTEM TECHNICAL CONSULTANT SERVICES** AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR PRETREATMENT INFORMATION MANAGEMENT SYSTEM TECHNICAL CONSULTANT SERVICES FOR A PERIOD OF 825 BILLABLE HOURS UNDER STATE BLANKET CONTRACT ITS63 CATEGORY 1.	WRA-4419Q		MOTION RECRUITMENT PARTNERS, LLC	$82,500.00

POSITION CONTROL REGISTER (PCR) LOCATION CHANGES OCTOBER 2017

DATE OF CHANGE	POSITION TITLE	CURRENT PCR#	CURRENT COST CENTER	NEW PCR #	NEW COST CENTER	REASON FOR CHANGE
10/14/2017	Facilities Specialist	5410003	Facilities Maintenance - Metro	2910020	Clinton	To meet staffing needs in Clinton
10/14/2017	Jr Engineering Aide	5210057	Operations Administration	8470040	Facilities Management	To meet staffing needs in the Facilities Management Department

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: FY18 First Quarter Orange Notebook

COMMITTEE: Administration, Finance & Audit

X INFORMATION
VOTE

Carolyn M. Fiore, Deputy Chief Operating Officer
Stephen Estes-Smargiassi, Director, Planning & Sustainability
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

For information only. The Board of Directors Report on Key Indicators of MWRA Performance (the Orange Notebook) is prepared at the close of each quarter of the fiscal year.

DISCUSSION:

The Orange Notebook presents performance indicators for operational, financial, workforce, and customer service parameters tracked by MWRA management each month. Significant outcomes for the first quarter are highlighted below.

Water Supply:

There was a marked contrast in water supply metrics between the three months of first quarter of this fiscal year and October. Precipitation for July, August and September in the watersheds was substantially below average, and as a result reservoir yields[1] were below long term averages in each of those months. (Page 26) With similar conditions statewide, state and federal drought officials began to consider whether there would be a return to drought status, with initial public warnings in mid- October.

In the last week of October, conditions changed. For the first time in two years, the watershed region received more rain during a series of storms than the Metropolitan Boston area, with over 8.8 inches of rain at Quabbin Reservoir and 8.3 inches at Wachusett Reservoir. Quabbin rose by over a foot from its low point in mid-October adding over 3 billion gallons of storage; Wachusett rose almost a foot and a half adding one half billion gallons of storage. Quabbin was still rising in early November. Quabbin's elevation was about 2.4 feet above where it was a year ago at the end of October.

[1] Reservoir yield is the amount of water which flows into the reservoirs, less evaporation. It is calculated based on measured withdrawals and releases and changes in storage volume over the month.

The MWRA system is currently in Normal Operating range, and is anticipated to remain there over the winter unless weather patterns change resulting extreme low reservoir yields.

Water Use:

There has also been a substantial change in water use during this calendar year compared to last year. System-wide year to date water consumption by communities has been 19.4 million gallons per day lower than last year, a drop of 9.4 percent. While water demand in 2016 and 2015 was somewhat elevated due to the drought, water use thus far in 2017 appears to be trending below not just the past two years, but lower than the past several years.

Through September, water use system-wide, for all the "core" communities (those that receive both water and sewer service from MWRA) and by fully supplied communities has been below use in 2016, 2015 and 2014 in every month this year, and 11 of 12 months in 2013. Use by partially served communities through September is below 2016 and 2014, and close to 2015 use. (Page 29)

Community Assistance:

Metering staff review community water meter data regularly to alert communities whenever their demand rises unexpectedly, working with them to understand and potentially resolve the increase if it is a major leak not yet surfacing. MWRA leak detection staff will supplement local leak detection resources as needed to locate difficult to detect leaks. Assistance was provided to Arlington, Chelsea, Malden, Medford, Newton, Quincy, Somerville, and Winchester this quarter. (Page 6)

Workforce Management:

Overtime spending at Deer Island during the first quarter has been very close to budget, only six thousand dollars over on a budget of $285,000 (just under 2 percent over). Field Operations (Metro and Western Water, and Metro Wastewater Operations) was over by $196,000 on a budget of $626,000. Coverage overtime was $22,000 under budget. Planned overtime for maintenance off-hours work was over budget by $183,000 to alleviate a project backlog in Water Operations due to staffing vacancies, replacement of manhole frames and covers prior to a community paving job, and crane rigging to hoist replacement HVAC units into place at the Chelsea maintenance facility. Emergency overtime was $342,000, $35,000 over budget primarily due to wet weather response and emergency response for leak repair. (Pages 42, 5 and 9)

Overall, overtime represents around four percent of wages and salaries. (Page 46) Management is reviewing overtime budgeting, spending and authorization.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

On

Key Indicators of MWRA Performance

For

First Quarter FY2018

Q1	Q2	Q3	Q4
■			

Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
November 15, 2017

Board of Directors Report on Key Indicators of MWRA Performance

First Quarter FY18

Table of Contents

Operations and Maintenance

Construction Programs

Drinking Water Quality and Supply

Wastewater Quality

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Business Services

Other Management

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.

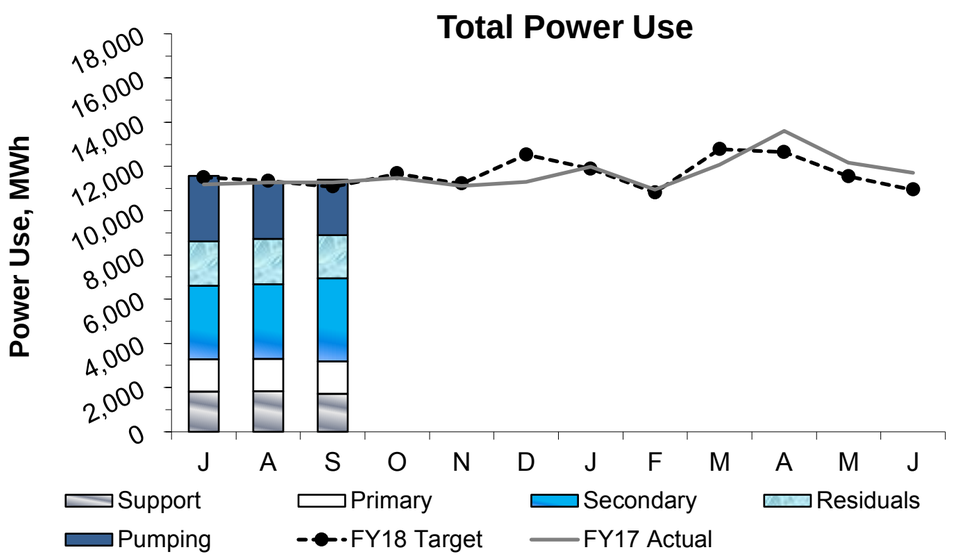
Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer

November 15, 2017

OPERATIONS AND MAINTENANCE

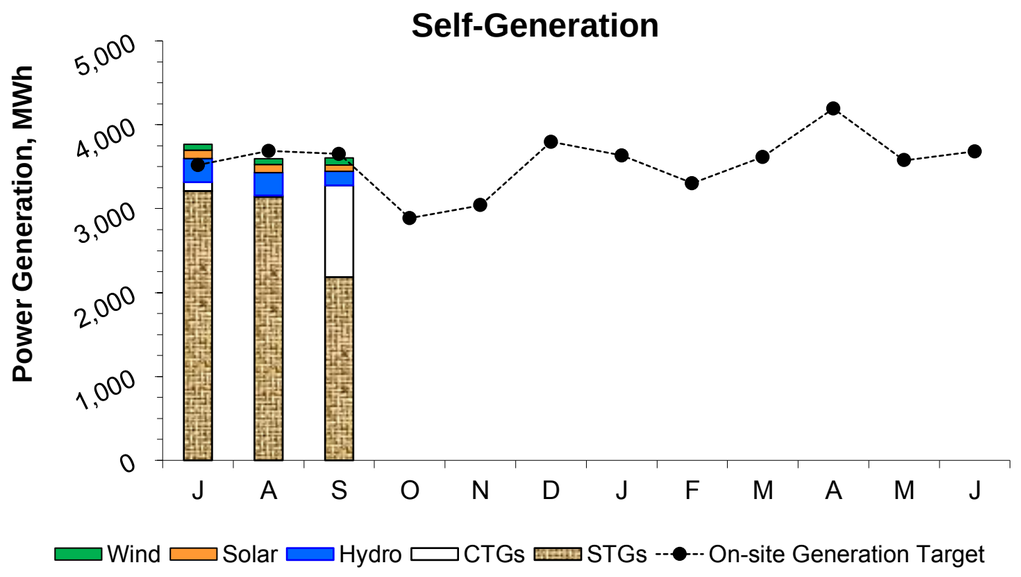
Deer Island Operations

1st Quarter - FY18

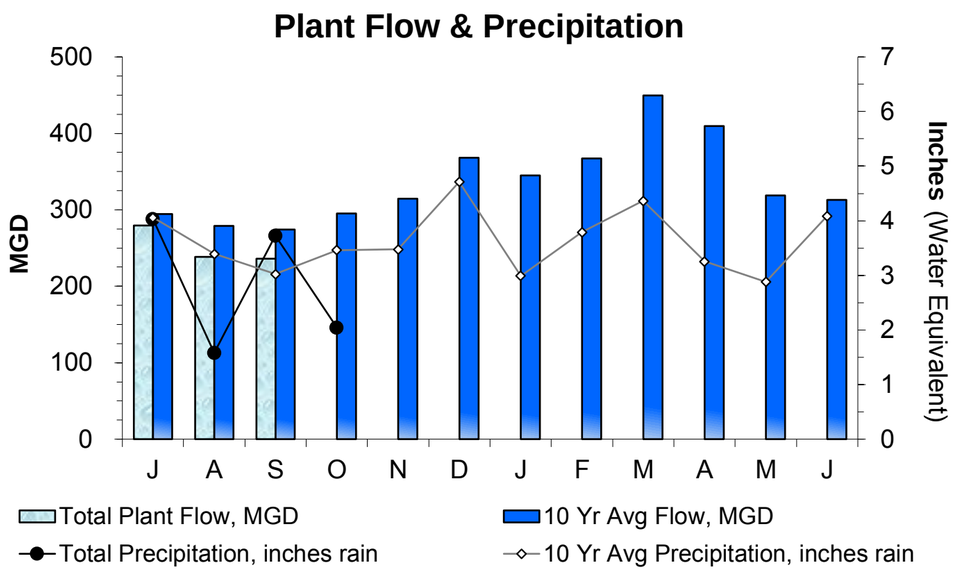


Total power usage in the 1st Quarter was on target (+1.0%) even though Total Plant Flow was 11.0% below target with the 3 year average plant flow. All processes were on or below target this quarter, except for secondary treatment. Due to an increased demand for oxygen during the lower flow summer months, the on-island storage of liquid oxygen needed to be replenished, resulting in a 9.4% variance above targeted energy use in the Cryogenic Oxygen Generation Facility, and a 5.4% increase in overall energy used in secondary treatment.

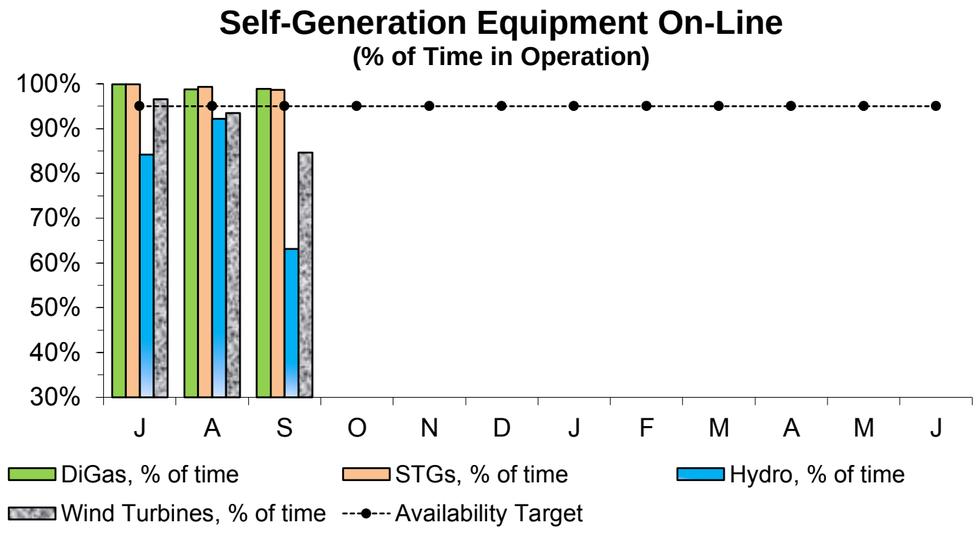
Note: Power usage projections are based on 3 year averages.



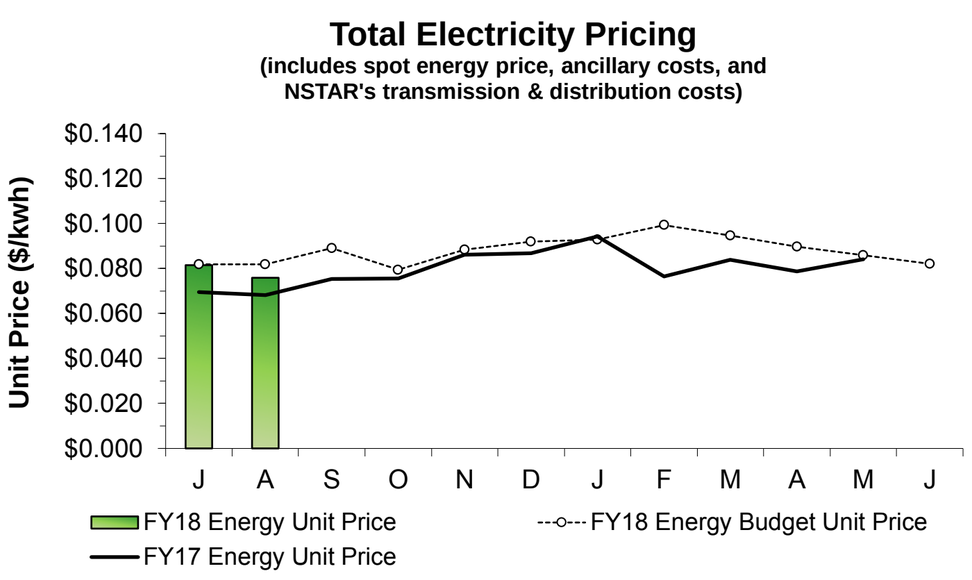
Power generated on-site during the 1st Quarter was on target (+1.0%). Generation by the STGs, CTGs, and Solar met or exceeded their targets. CTG Generation was more than 3 times higher than target due to Eversource maintenance work which required continuous CTG operation for five (5) days in September. Generation by the Hydro Turbines was 33.7% below target as a result of below target plant flow, several mechanical issues, as well as higher tail water levels caused by low plant flow. Wind Turbine generation was 11.0% below target, due to lower generation in July even though wind turbine availability was above target during that month. The average wind speed this July was lower than the historical wind speed for July.



Total Plant Flow for the 1st Quarter was 11.0% below target with the 10 year average plant flow (251.3 MGD actual vs. 282.6 MGD expected) as precipitation for the quarter was 10.8% lower than target (9.34 inches actual vs. 10.47 inches expected).

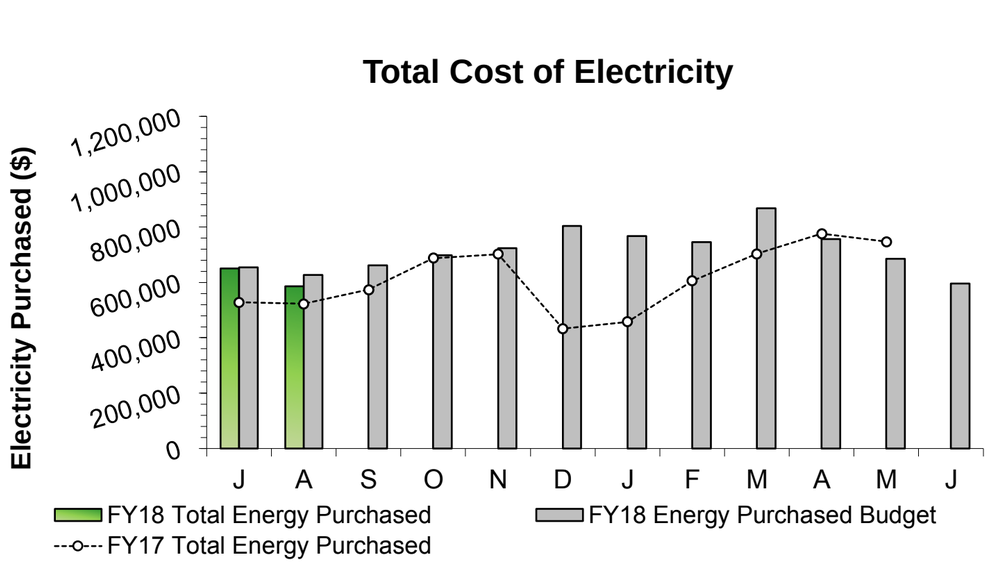


The DiGas system and the STGs exceeded the 95% availability target for the 1st Quarter. Wind Turbine availability fell below target by 3.4% as Turbine #1 was offline for several days for a hydraulic pump repair, as well as for the replacement of the main power cable. The Hydro Turbines fell 20.2% below target due to several mechanical issues, as well as a higher tail water level caused by the infiltration of the outfall with salt water resulting in the turbine tripping offline more readily during periods of high tide.



Under the current energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. The actual Total Energy Unit Price in the 1st Quarter, through August (the most current invoice available) was 3.9% lower than budget. The actual total energy unit price in September is not yet available as the complete invoice has not been received. The Total Energy Unit Price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges.

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

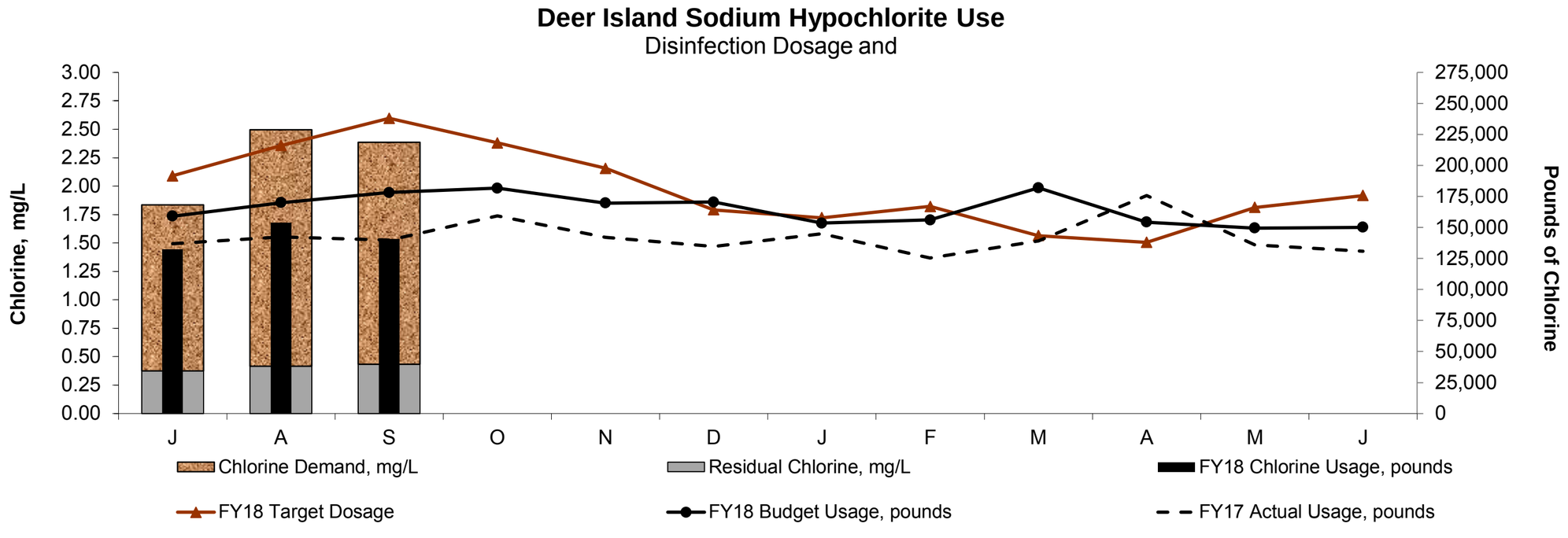


The invoices for the total cost of Electricity Purchased for September hasnot been received as of reporting time. The total cost of Electricity Purchased during the 1st Quarter (July and August data only) was 3.4% lower than budget as the Total Energy Unit Price is lower than budgeted by 3.9%, and the Total Electricity Purchased is on target (+0.4%) through August.

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

Deer Island Operations

1st Quarter - FY18



The disinfection dosing rate in the 1st Quarter was 4.7% below the target. DITP maintained an average disinfection chlorine residual of 0.41 mg/L this quarter with an average dosing rate of 2.24 mg/L (as chlorine demand was 1.83 mg/L). Actual sodium hypochlorite usage in pounds of chlorine was 15.8% below target this quarter due to lower chlorine demand and the lower plant flow.

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

Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	2	2	0	99.5%	7.51
A	0	0	0	100.0%	0.00
S	1	1	0	99.98%	1.36
O					
N					
D					
J					
F					
M					
A					
M					
J					
Total	3	3	0	99.8%	8.88

99.8% of all flows were treated at full secondary during the 1st Quarter. There were a total of three (3) separate secondary blending events; all due to high plant flow resulting from heavy rain. The three (3) combined blending events resulted in a total of 8.88 hours of blending and 47.61 Mgal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

Secondary permit limits were met at all times during the 1st Quarter.

Deer Island Operations & Maintenance Report

Environmental/Pumping:

The plant achieved an instantaneous peak flow rate of 933.6 MGD in the early evening on July 24. This peak flow occurred during a rain event that produced 1.42 inches of precipitation. Overall, Total Plant Flow for Quarter 1 was 11.0% below target with the 10 year average plant flow target for the month.

Essential maintenance and rehabilitation activities involving the replacement of butterfly flow control valves, discharge isolation valves, flow meters, and associated piping for each of the 10 wastewater pumps in the North Main Pump Station (NMPS) and each of the pumps in the Winthrop Terminal Headworks Facility were completed in September. All equipment was original and dated back to the facility upgrades in 1995. Over time, the valves in these facilities have sustained damage from age and wear and needed to be replaced to allow proper isolation of pumps and equipment for maintenance. A total of 45 force main isolation events occurred from September 2015 through September 2017, including eight (8) full NMPS shutdowns, to complete the scope of this project. In September a final north system NMPS shutdown was conducted to allow the contractors to remove all of their temporary equipment.

Deer Island Operations & Maintenance Report (continued)

Environmental/Pumping (continued):
On July 19 and July 26, all south system influent flows were sent to South System Pump Station (SSPS) pumps #5 to #8 (servicing wet well #2) for approximately 12 hours in order to isolate pumps #1 to #4, to allow contractors to complete repairs on the check valve dashpot on SSPS pump #3. Once the work was completed at the end of each day, pumps #1 to #4 were returned to operational status with the exception of pump #3 which was out service from July 19 to July 26. No interruptions in flow occurred during this work.

Secondary Treatment:
Significant essential maintenance work on Secondary Treatment Batteries A, B, and C took place in July and August. The return sludge ("RSL") header isolation valves in the secondary batteries have suffered wear and corrosion damage and were scheduled for replacement. Because the secondary batteries cannot operate without the return sludge header for more than several hours, each battery was removed from service, one at a time, while the associated valves were replaced. Secondary Battery B was the first battery scheduled for this RSL valve replacement work, followed by Secondary Batteries A and C. In addition, the contractor replaced scum system hardware in the effluent channel of Secondary Batteries A and B during their respective shutdowns. Secondary Battery C did not require this work. The contractor worked 24 hours per day to minimize the shutdown of the battery to preserve the microbiology in the Secondary Battery reactors. During each Secondary Battery shut down, the primary effluent flow was treated by the two remaining Secondary Batteries.

Odor Control:
The Residuals Odor Control (ROC) Facility, which is responsible for treating the process airflows from the Primary Gravity Thickeners (GT) and the Secondary Centrifuge Thickeners (CT), was shutdown on August 30 and on September 6. These shutdowns were necessary to allow for scheduled maintenance to remove the fan assembly for Fan 3 and to reconnect the fan assembly to the treatment system following the rebuild of this fan assembly. These airflow shutdowns allowed staff to safely work on this fan without the risk of potential exposure to the process air. Process air was contained within the building during these shutdowns and there were no odor complaints associated with this work.

Energy and Thermal Power Plant:
Overall, total power generated on-site accounted for 32.0% of Deer Island's total power use for the quarter. Renewable power generated on-site (by Solar, Wind, STGs, and Hydro Turbines) accounted for 28.5% of Deer Island's total electrical power use for the quarter.

The annual maintenance at the Thermal Power Plant took place starting on September 24 and continued into October 4. Various maintenance activities on both Steam Turbine Generators (STGs), the two Zurn boilers, and the common systems occurred and involved maintenance on various pumps, valves, and instruments throughout the power plant. On September 24, the main STG were taken out of service for maintenance while Boiler 201 and the BP-STG remained in operation. The BP-STG was operated at maximum capacity to minimize the loss of power generation during this period when the main STG was out of service. Boiler 201 and the BP-STG were then also taken out of service on October 1 (shutdown of the entire Thermal Power Plant) to allow for maintenance on these units and on the common systems including the steam, condensate, and feed water systems. Boiler 101 and the BP-STG were returned to operation during the very early morning of October 4 followed by the operation of the main STG later in the evening.

Regulatory:
Emissions compliance testing for the Residuals Odor Control (ROC) treatment system at DITP was conducted by consultants on June 26 to June 27 and on August 21 to August 22. The ROC system treats combined process air from the Primary Gravity Thickeners (GT) and the Secondary Centrifuge Thickeners (CT). The DITP Air Quality Operating Permit issued by the MA DEP requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years to demonstrate compliance with applicable total reduced sulfur (TRS) and non-methane hydrocarbon (NMHC) emission limits. This testing requires the continuous emissions monitoring of the inlet and outlet of the odor control system over a 24-hour period for TRS at the outlet (stack) of the odor control system and for NMHC at the inlet. All emissions test results show that DITP was in compliance. The final report summarizing the test results was reviewed by staff and submitted to the MA DEP on August 30.

A representative from the MA DEP was on site at the DITP on September 20 for an unannounced (annual) site visit of the treatment plant to review and inspect the plant's wastewater treatment operations and practices. The MA DEP representative was given a comprehensive plant tour covering the entire wastewater and residuals treatment facilities and process areas. Initial communications indicate the inspection had gone well and no issues were raised by the DEP representative.

Clinton AWWTP:
Phosphorus Reduction Facility, Work completed or in progress during the first quarter:

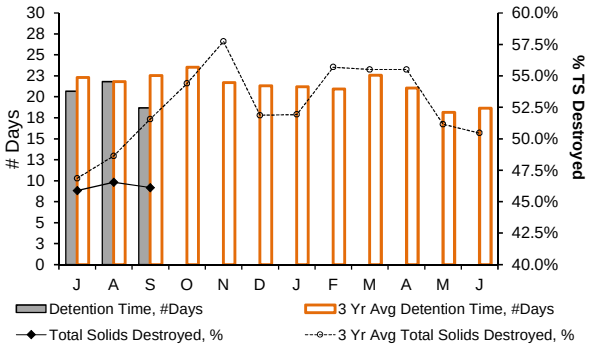
- Construction of diversion structure and slide gate installation. Conducted hydraulic leak testing.
- Completed installation of level sensors in existing tanks.
- Plumbing contractor completed installation of natural gas regulators and meters.
- Existing plant water system was demolished in preparation of the installation of a new system.
- Roof coping, aluminum paneling, door installation, glazing and louver installation was completed.
- Placed pavement at new driveway.
- Contractors installed new air intake fans at Headworks and Dewatering buildings.
- Began wet testing phosphorus reduction facility on September 21, 2017.

On September 21, 2017, Mass. Department of Environmental Protection (MassDEP) conducted a compliance inspection of the Clinton AWWTP. Prior to the inspection, MassDEP toured the newly constructed phosphorus reduction facility and witnessed part of the two day wet test carried out by MWRA, Stantec (design engineer) and WESTech (Disc filter engineers).

Deer Island Operations and Residuals

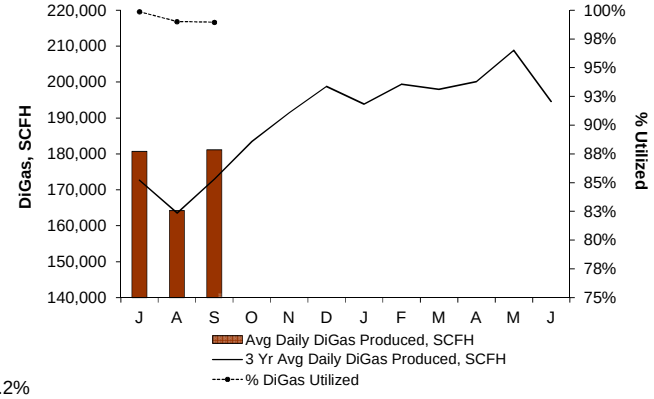
1st Quarter - FY18

Sludge Detention Time in Digesters and Total Solids Destruction



Total solids (TS) destruction following anaerobic sludge digestion averaged 46.2% during the 1st Quarter, 2.8% below target with the 3 year average of 49.0% for the same period, as the sludge detention time in the digesters was 20.4 days. DI operated with an average of 7.8 digesters during the 1st Quarter, on target with the 3 year average. TS destruction is lower than target due to routine maintenance activities rotating through the digesters starting in August which results in the shifting of sludge feed to the remaining online digesters.

Digester Gas Production and % Utilized



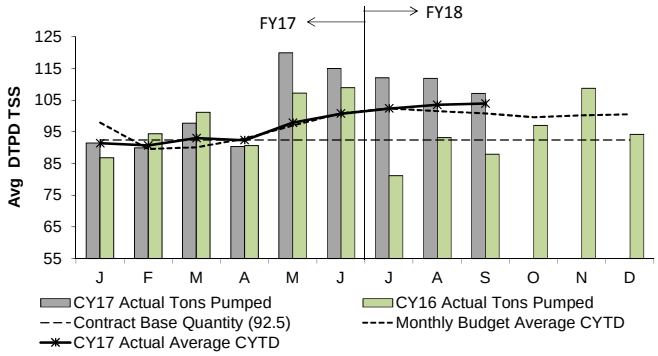
The Avg Daily DiGas Production in the 1st Quarter was 3.3% above target with the 3 Year Avg Daily DiGas Production. On average, 99.3% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant.

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.

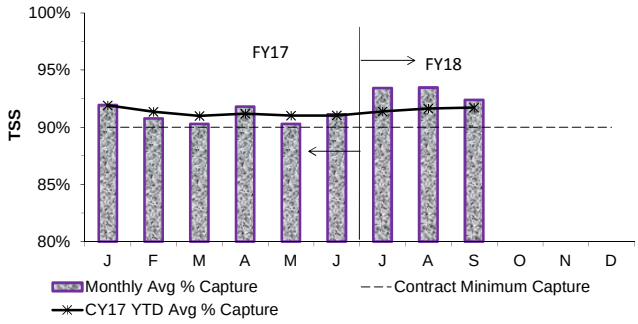
Residuals Pellet Plant

MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. The base quantity of 90.0 DTPD/TSS was changed to 92.5 DTPD/TSS starting on January 1, 2016 with the terms of the new contract. On average, MWRA processes more than 92.5 DTPD/TSS each year (FY17's budget is 100.6 DTPD/TSS and FY18's budget is 99.5 DTPD/TSS).

Sludge Pumped From Deer Island



Monthly Average % Capture of Processed Sludge

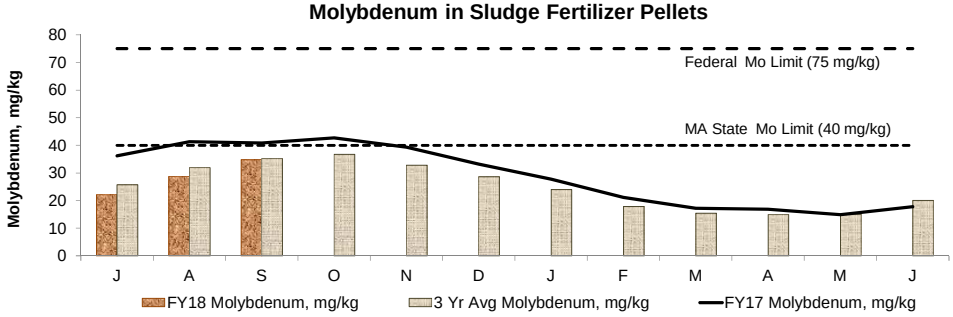


The average total quantity of sludge pumped to the Pellet Plant in the 1st Quarter of FY18 was 110.4 DTPD - above target with the FY18 budget of 100.8 DTPD. More sludge was sent to the Pellet Plant this quarter due to lower solids destruction during anaerobic sludge digestion as a result of digester maintenance activities.

The CY17 average quantity of sludge pumped is 104.0 DTPD - 3.1% above target, compared with the average budget of 100.8 DTPD for the same time period.

The contract requires NEFCo to capture at least 90.0% of the solids delivered to the Biosolids Processing Facility in Quincy. The CY17 to date average capture is 91.73%.

Molybdenum in Sludge Fertilizer Pellets



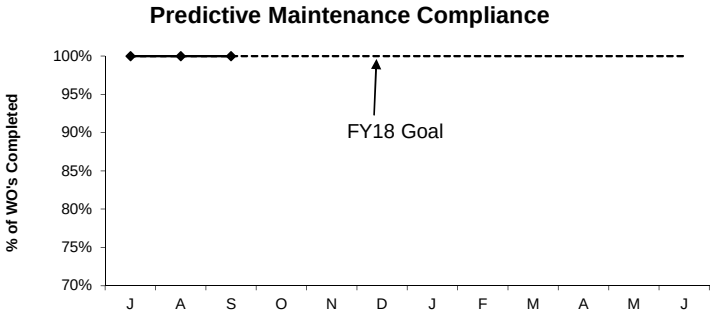
In September 2016, the Massachusetts Type I biosolids standard for molybdenum (Mo) was changed by the MaDEP to 40 mg/kg from the previous standard of 25 mg/kg. This change was approved following a complete technical review and assessment of risk by the Office of Research & Standards. The Federal standard for Mo is 75 mg/kg. Discharge of molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Mo level in the Fore River sludge fertilizer pellets during the 1st Quarter of FY18 averaged 28.5 mg/kg, 8% lower than the 3 year average, 29% below the MA State Limit, and 62% below the Federal Limit.

Deer Island Maintenance

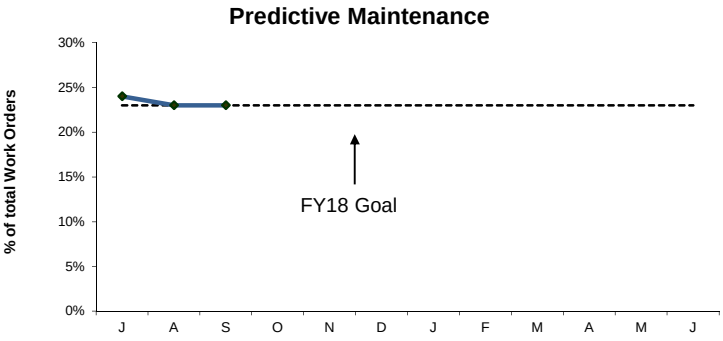
1st Quarter FY18

Productivity Initiatives

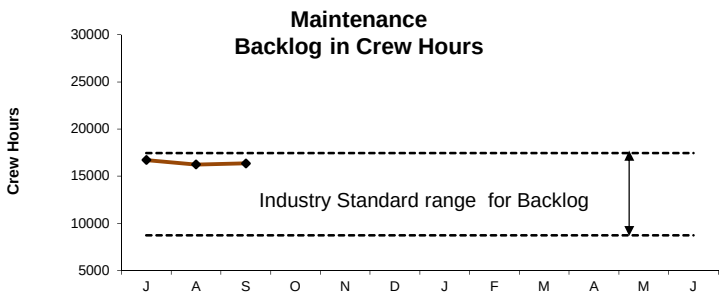
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.



Deer Island's FY18 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.



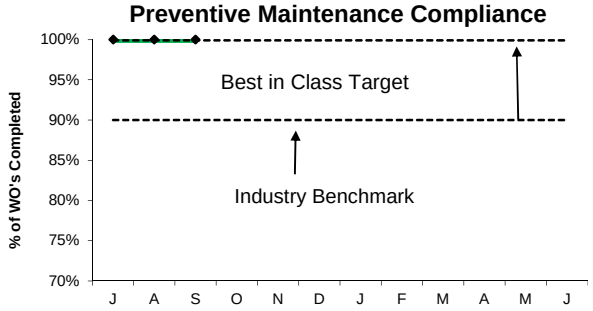
Deer Island's FY18 predictive maintenance goal is 23% of all work orders to be predictive. 23% of all work orders were predictive maintenance this quarter. The industry is moving toward increasing predictive maintenance work to reduce downtime and better predict when repairs are needed.



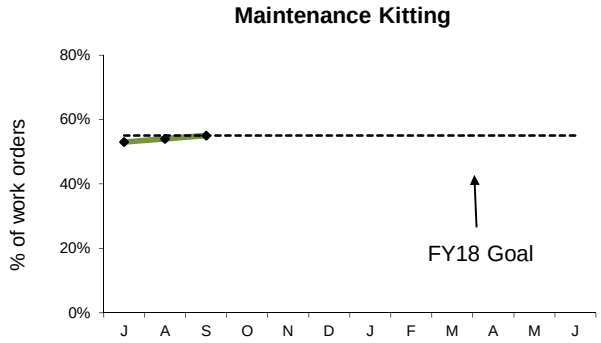
DITP's maintenance backlog at Deer Island is 16,436 hours this quarter. DITP is within the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by three vacancies; two M&O Specialists and a Pipe/Plumber. Management continues to monitor backlog and to ensure all critical systems and equipment are available.

Proactive Initiatives

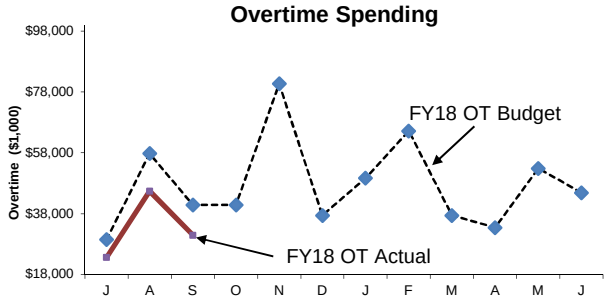
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.



Deer Island's FY18 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.



Deer Island's FY18 maintenance kitting goal is 55% of all work orders to be kitted. 54% of all work orders were kitted this quarter. Kitting is staging of parts or material necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.



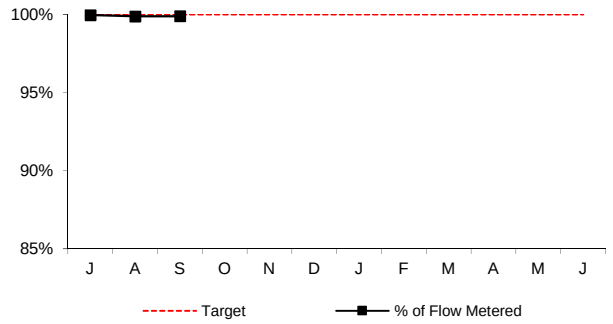
Maintenance overtime was under budget by $41K this quarter and $41k under for the year. Management continues to monitor backlog and to ensure all critical equipment and systems are available. This quarters overtime was predominately used for Storm Coverage/High Flows, Secondary Battery 'B' Valve Replacement Project, Clinton Electrical Upgrade Project and Eversource Cable Outage/Combustion Turbine Start Up Assistance.

Operations Division Metering & Reliability

1st Quarter - FY18

WATER METERS

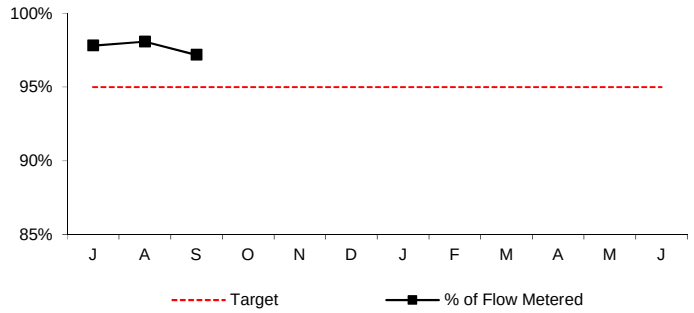
Percent of Total Revenue Water Deliveries Calculated Using Meters



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 1st Quarter of FY18, meter actuals accounted for 99.91% of flow; only 0.09% of total revenue water deliveries were estimated. The following is the breakdown of reasons for estimations:
In-house and Capital Construction Projects - 0.01%
Instrumentation Failure - 0.08%

WASTEWATER METERS

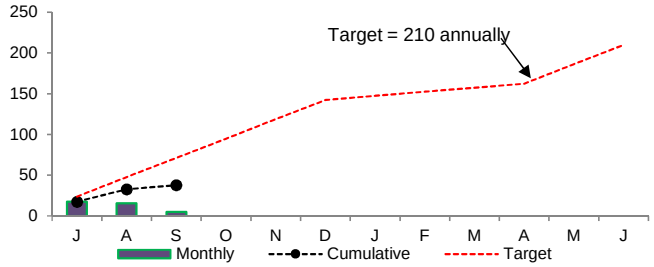
Percent of Total Wastewater Transport Calculated Using Meters



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 1st Quarter of FY18, meter actuals accounted for 97.69% of flow; only 2.31% of wastewater transport was estimated.

WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 1st Quarter of FY18, 37.73 miles of water mains were inspected. Surveyed below target due to staff training and availability. Metering staff provided assistance to Malden, Quincy and Revere on higher than normal water usage.

Leak Backlog Summary

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	4	2	4									
Leaks Repaired	2	1	3									
Backlog	8	9	10									

During the 1st Quarter of FY18, ten new leaks were detected and six were repaired. Refer to Leak Report below. Also, community service ranging from individual leak location to hydrant surveys were conducted for: Arlington, Chelsea, Malden, Medford, Newton, Somerville and Winchester.

FY18 Leak Report as of September 2017

Date Detected	Location of Leaks	Repaired
07/13/17	General Edwards Bridge, Medford	07/26/17
07/28/17	W. Roxbury Parkway, West Roxbury	07/28/17
08/28/17	#425 Riverside Ave., Medford. SEC-57	08/28/17
07/27/17	#1 Woodland Road @ Pond Street, Stoneham	09/01/17
09/15/17	Columbus St., @ Fenno Street, Chelsea	09/18/17
09/28/17	#436 Riverside Ave., Medford. Section-57	09/28/17

Date Detected	Location of Leaks/Unrepaired
06/08/15	Allandale Rd. @ Grove St., Brookline, Sect 78, located acoustically. Not surfacing.
06/17/15	Washington St at East St., Dedham; Sect 77, located acoustically, not surfacing, need redundant SEH pipeline to enable isolation.
07/01/16	241 Forest St. Winchester, Sect 89, leaking blow off valve, not surfacing. Need redundant NIH pipeline to enable isolation.
07/26/16	Reservoir Playground, Cleveland Circle, in softball outfield, Fisher Hill main leaking into drain, not surfacing, need to repair in Winter.
12/04/16	1025 W Roxbury Pkwy, Brookline, Sect 95, located acoustically, not surfacing, leaking blow off valve.
12/04/16	710 Ashland St/Summer St. Lynn, Sect 91, not surfacing. Leaking emergency connection valve between MWRA and LWSC systems. LWSC has difficulty isolating 16" main.
07/20/17	Mystic Valley Parkway, Medford. Not surfacing.
08/13/17	River Road @ Loring Rd, Weston. WASM-4; Not surfacing.
09/24/17	#215 Common Street, Watertown (will be repaired in October)
09/26/17	#1 Bellevue Street, Waltham (will be repaired in October)

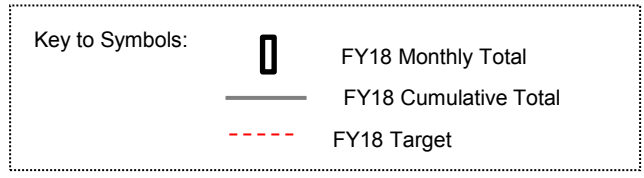
Water Distribution System Valves

1st Quarter - FY18

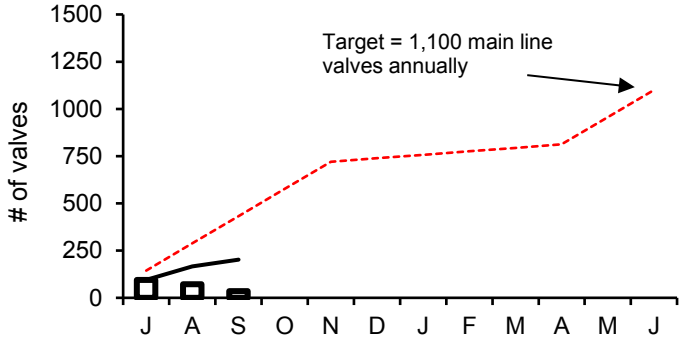
Background

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	
		FY18 to Date	FY18 Targets
Main Line Valves	2,159	98.0%	95%
Blow-Off Valves	1,317	97.6%	95%
Air Release Valves	1,380	94.9%	95%
Control Valves	49	100.0%	95%

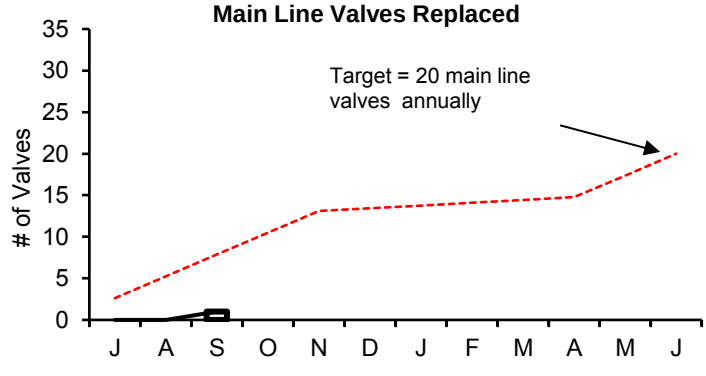


Main Line Valves Exercised



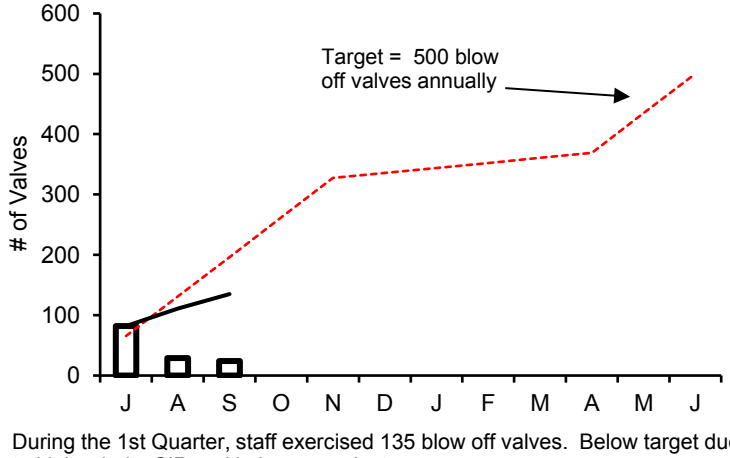
During the 1st Quarter of FY18, staff exercised 202 main line valves. Below target due to high priority CIP and in house projects.

Main Line Valves Replaced



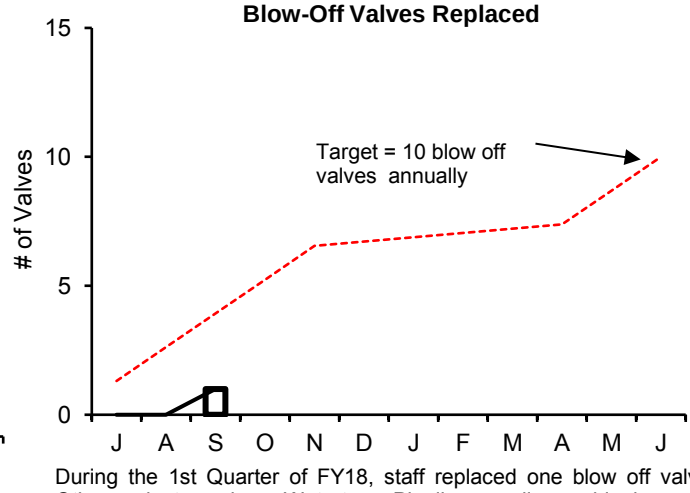
During the 1st Quarter of FY18, staff replaced one main line valve. Other projects such as; Watertown Pipeline coupling and leak repairs are taking priority.

Blow-Off Valves Exercised



During the 1st Quarter, staff exercised 135 blow off valves. Below target due to high priority CIP and in house projects.

Blow-Off Valves Replaced

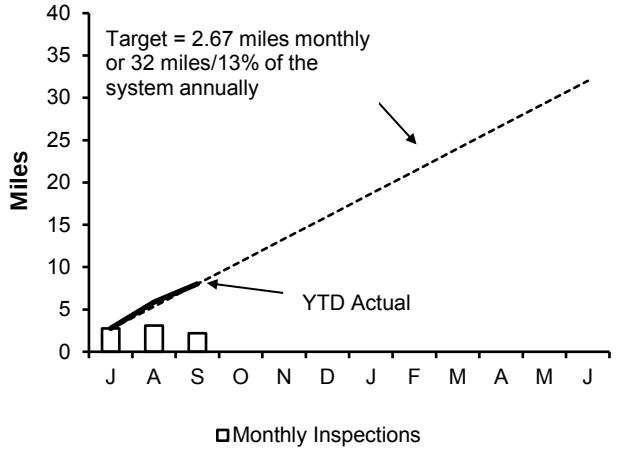


During the 1st Quarter of FY18, staff replaced one blow off valve. Other projects such as; Watertown Pipeline coupling and leak repairs are taking priority.

Wastewater Pipeline and Structure Inspections and Maintenance
1st Quarter - FY 18

Inspections

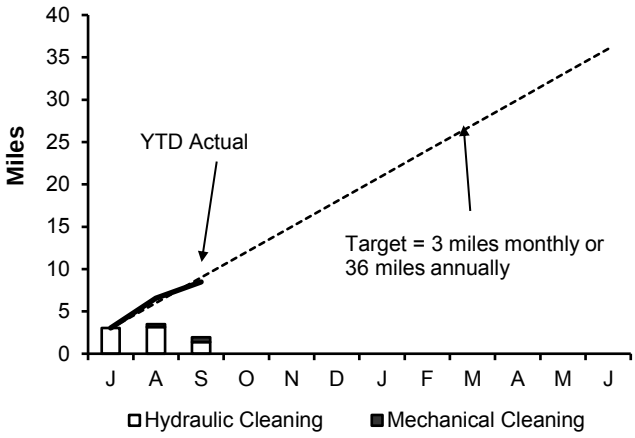
Pipeline Inspections



Staff internally inspected 8.02 miles of MWRA sewer pipeline during the first quarter. Community Assistance was provided to the city of Somerville and Cambridge this quarter. Staff inspected 100'of 24" sewer and 1,000' of 12" sewer respectively.

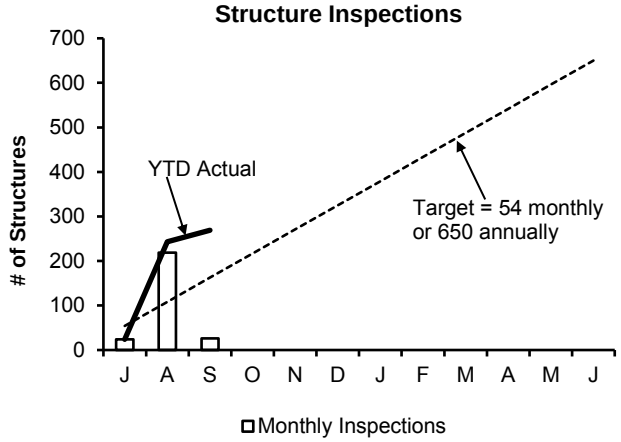
Maintenance

Pipeline Cleaning



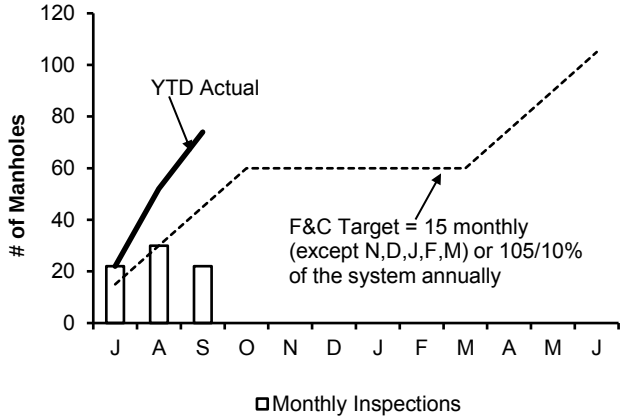
Staff cleaned 8.48 miles of MWRA's sewer system and removed 34 yards of grit and debris during this quarter. No Community Assistance was provided this quarter.

Structure Inspections



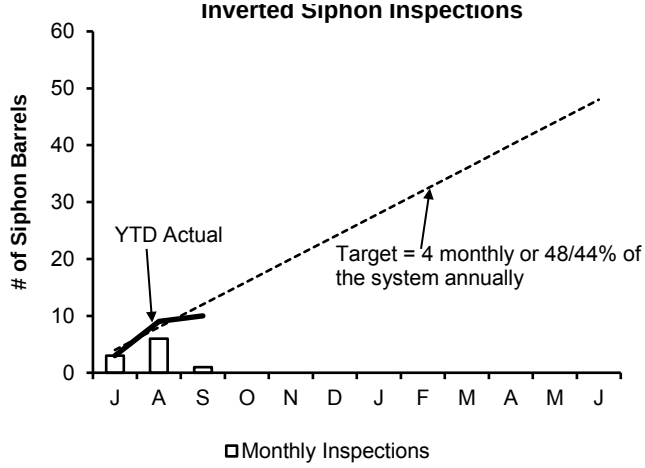
Staff inspected the 36 CSO structures and performed 233 additional manhole/structure inspections during this quarter.

Manhole Rehabilitation



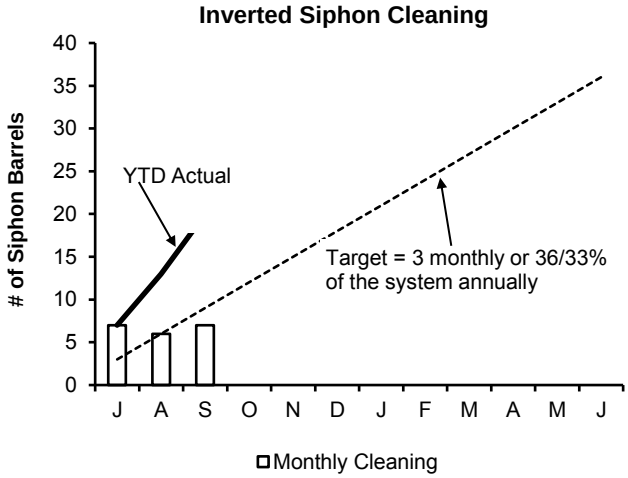
Staff replaced 74 frames & cover during this quarter.

Inverted Siphon Inspections



Staff inspected 10 siphon barrels this quarter.

Inverted Siphon Cleaning

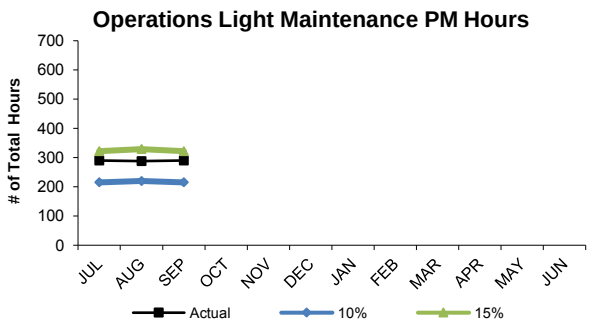


Staff cleaned 20 siphon barrels during this quarter.

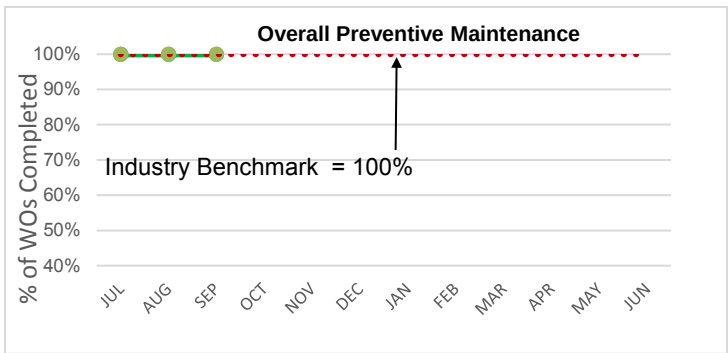
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY18

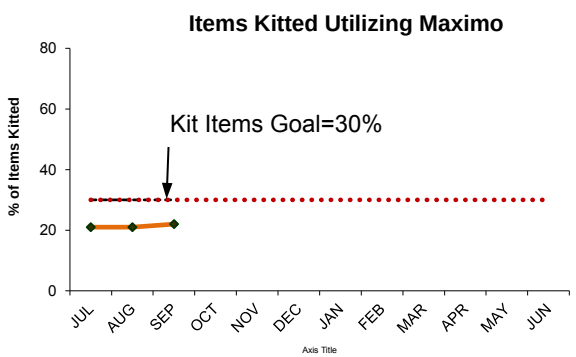
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



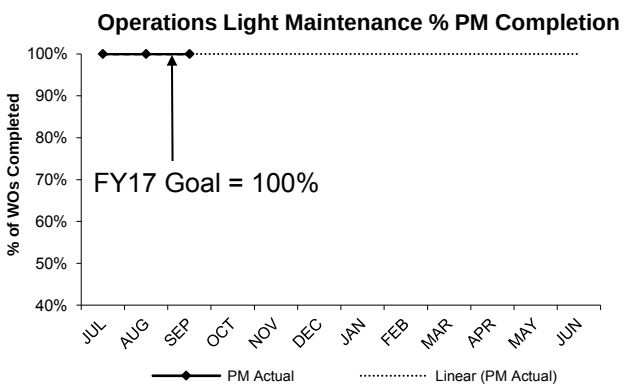
Operations staff averaged 289 hours of preventive maintenance during the 1st Quarter, an average of 14% of the total PM hours for the 1st Quarter, which is within the industry benchmark of 10% to 15%.



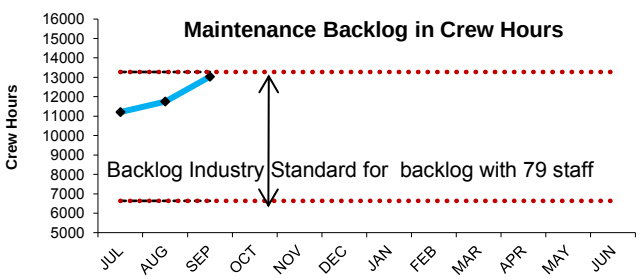
The Field Operations Department (FOD) preventive maintenance goal for FY18 is 100% of all PM work orders. Staff completed an average of 100% of all PM work orders in the 1st Quarter.



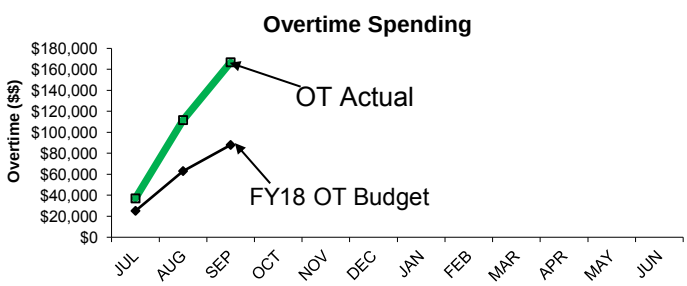
Operation's FY18 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material neccesary to complete maintenance work. In the 1st Quarter, 21% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY18 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 1st Quarter.



The 1st Quarter backlog average is 11998 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.

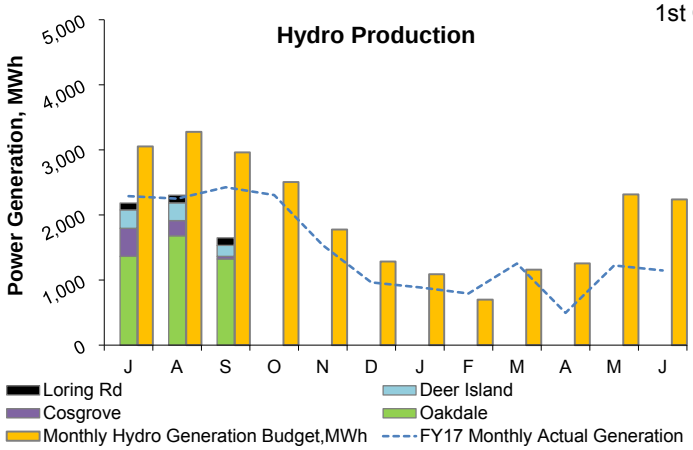


Maintenance overtime was $79k over budget for the 1st Quarter. Overtime was used for critical maintenance repairs.

Renewable Electricity Generation: Savings and Revenue

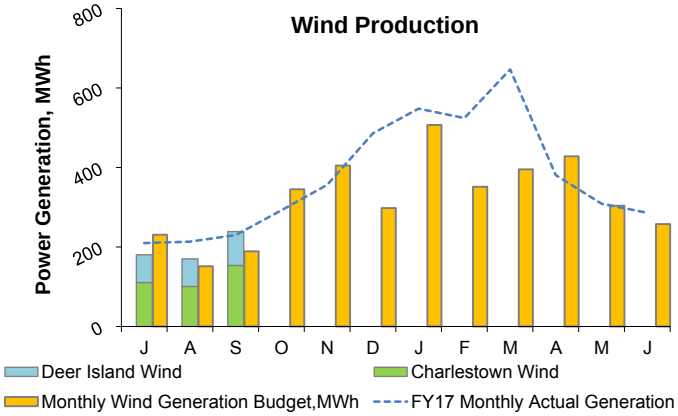
1st Quarter - FY18

Hydro Production



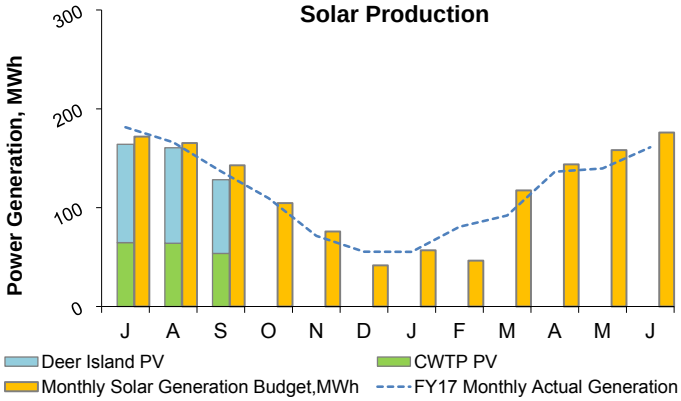
In the first Quarter, the renewable energy recorded as produced from all hydroelectric facilities totaled 6,134 MWh; 34% below budget[3]. This is mostly due to the Cosgrove generation values being highly underestimated by the utility company. The utility data is typically corrected and reconciled in later months of the year. The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $143,546; 50% below budget[3], due to the underestimated Cosgrove generation values from the utility (stated above). The savings and revenue value does not include RPS REC revenue (see next page).

Wind Production



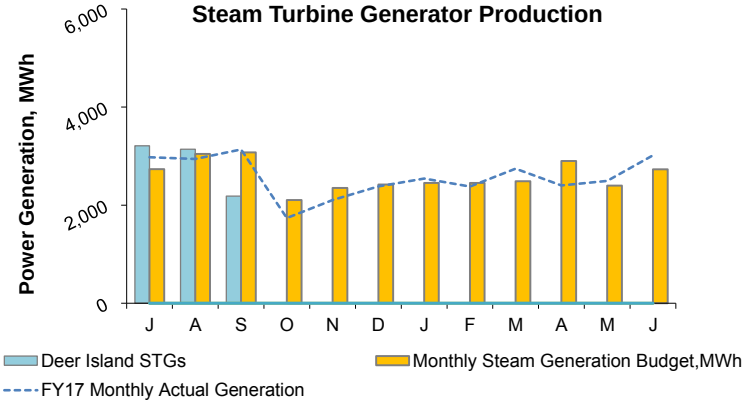
In the first Quarter, the renewable energy produced from all wind turbines totaled 589 MWh; 3% above budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $57,471; 4% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

Solar Production



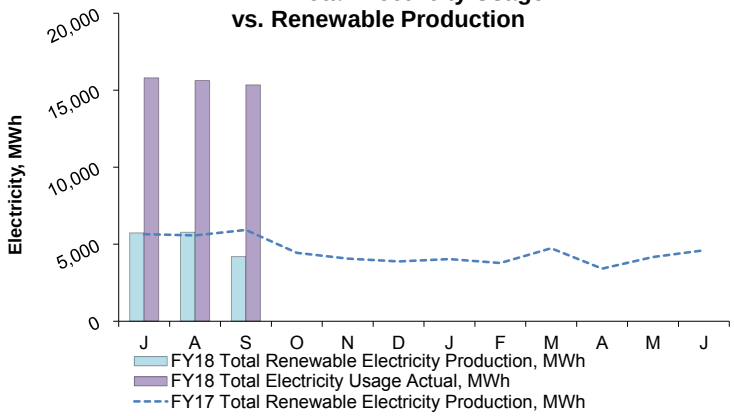
In the first Quarter, the renewable energy produced from all solar PV systems totaled 453 MWh; 6% below budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $36,630; 8% below budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

Steam Turbine Generator Production

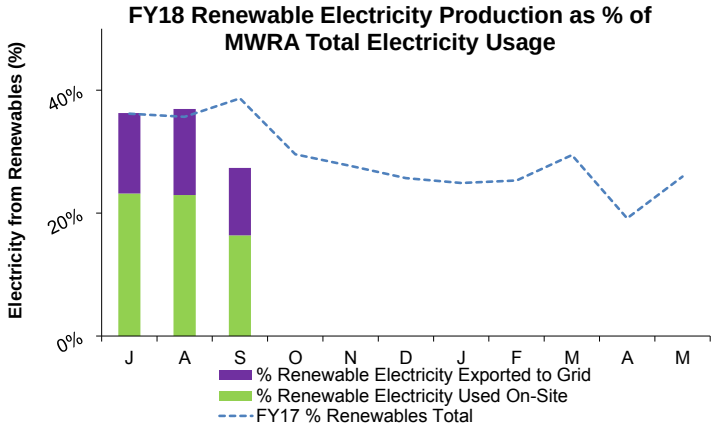


In the first Quarter, the renewable energy produced from all steam turbine generators totaled 8,534 MWh; 4% below budget[3].
The total savings and revenue[2] to date in FY18 (actuals through August[1]) is $499,928; 6% above budget[3]. The savings and revenue value does not include RPS REC revenue (see next page).

MWRA Total Electricity Usage vs. Renewable Production



FY18 Renewable Electricity Production as % of MWRA Total Electricity Usage

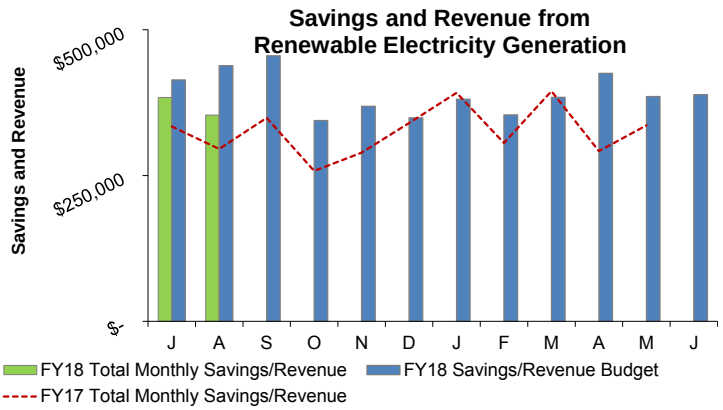


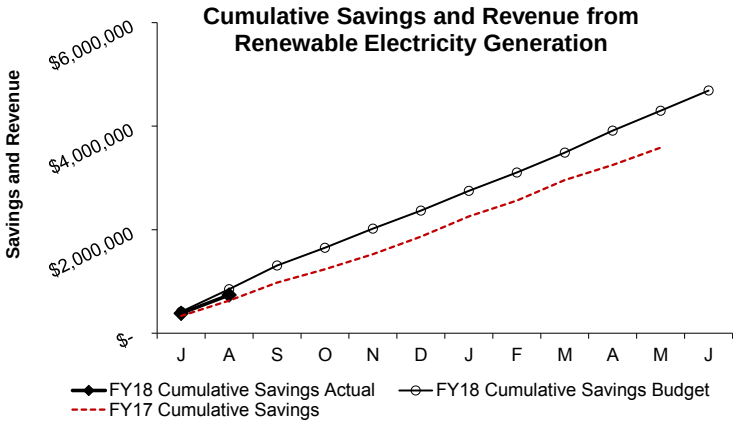
In the first Quarter of FY18, MWRA's electricity generation by renewable resources totaled 15,710 MWh. Cosgrove hydro generation data was underestimated by the utility and will be reconciled in later months; this will be reflected in future reporting. MWRA's total electricity usage was approximately 46,793 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.
In the first Quarter of FY18, green power generation represented approximately 34% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.

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

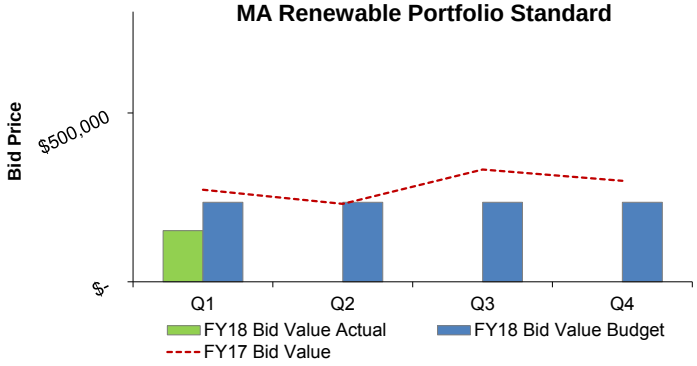
Renewable Electricity Generation: Savings and Revenue

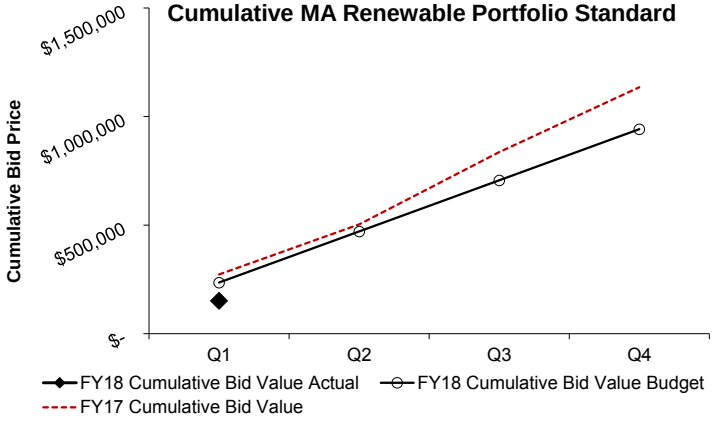
1st Quarter - FY18





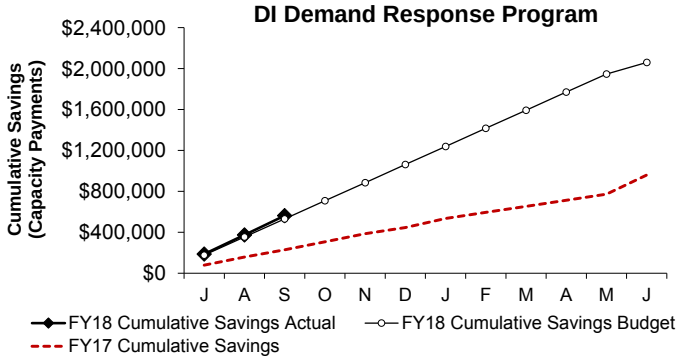
Savings and revenue from MWRA renewable electricity generation in the first 2 months of FY18 (actuals only through August[1]) is $737,575 ; which is 13% below the budget[3], partly due to the Cosgrove hydro generation values being underestimated by the utility (this will be reconciled in later months and will be reflected in future reporting).
Savings and revenue[2] from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs).
The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).

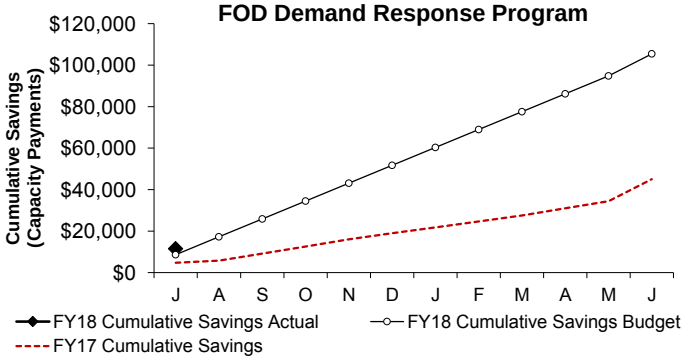




Bids were awarded during the 1st Quarter[1] from MWRA's Class 1 and Solar REC renewable energy assets; 8,449 Q1 CY2017 Class I Renewable Energy Certificates (RECs) and 55 Q1 CY2017 Solar RECs (SRECs) were sold for a total value of $151,291 RPS revenue; which is 36% below budget[3] for the Quarter. 782 Class II RECs were banked during Q1 for future sale.

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



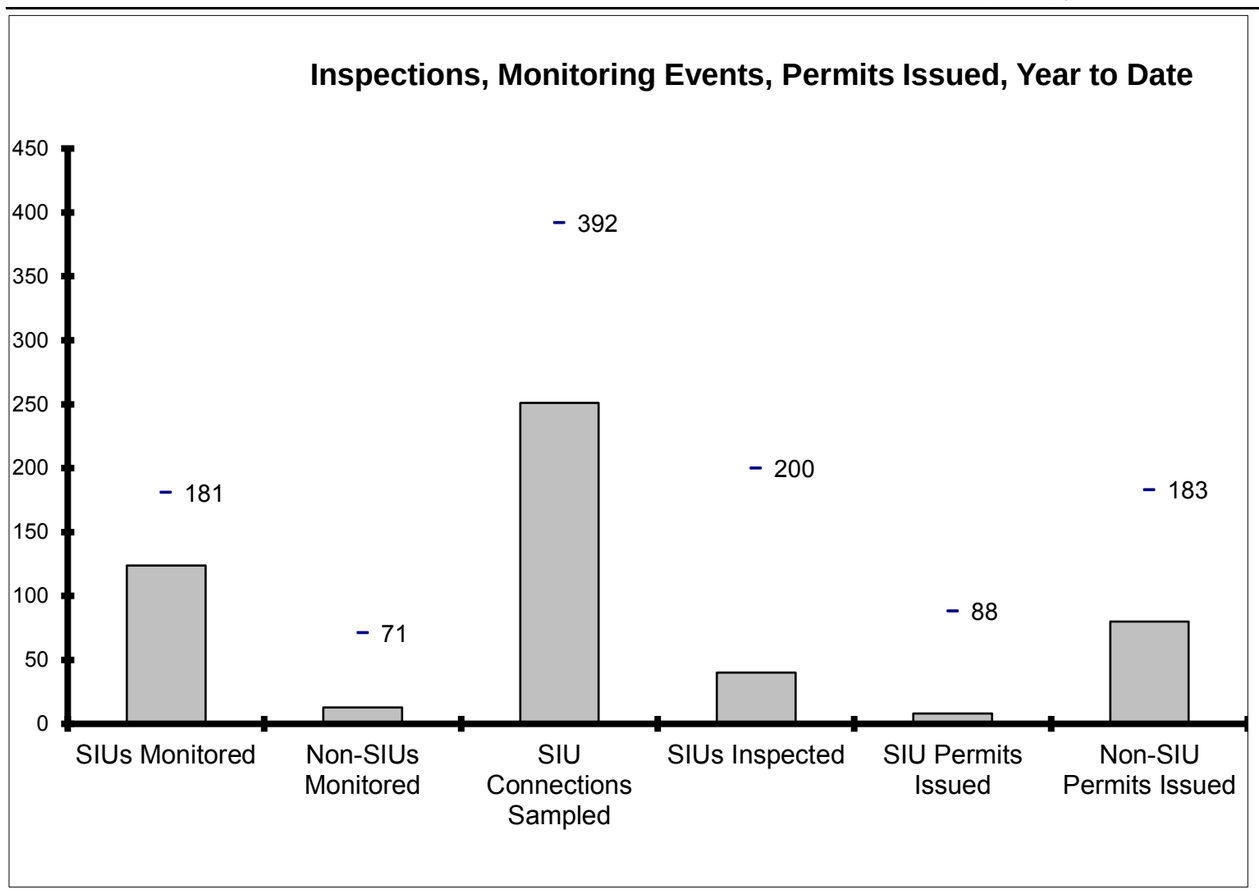


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs[4]. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE.
FY18 Cumulative savings (Capacity Payments only) through September[1] total $562,763 for DI and $11,501 for FOD through July[1].

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

Toxic Reduction and Control

1st Quarter - FY18



EPA Required SIU Monitoring Events
for FY18: 181
YTD : **124**

Required Non-SIU Monitoring Events
for FY18: 71
YTD : **13**

SIU Connections to be Sampled
For FY18: 392
YTD: **251**

EPA Required SIU Inspections
for FY18: 200
YTD: **40**

SIU Permits due to Expire
In FY18: 88
YTD: **8**

Non-SIU Permits due to Expire
for FY18: 183
YTD: **80**

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

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

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	5	15	0	1	0	2	5	18
Aug	1	46	0	5	0	0	1	51
Sep	2	8	0	3	0	0	2	11
Oct							0	0
Nov							0	0
Dec							0	0
Jan							0	0
Feb							0	0
Mar							0	0
Apr							0	0
May							0	0
Jun							0	0
% YTD	100%	86%	0%	11%	0%	3%	8	80

In the 1st Quarter of FY18, eighty-eight permits were issued, eight of which were SIUs. The SIU permits were all issued within 120 days- satisfying the EPA requirement. There were eleven non-SIU permits issued beyond the 120-day timeframe with two of them beyond the 180-day timeframe. Delays ranged from i) waiting for sampling data to determine the permit category, ii) waiting for payment of the permit fees, iii) waiting for approval from the municipality in which the industry was operating or intended to operate, and iv) waiting for construction to be completed, including installation of required equiment to facilitate discharge to the sewer.

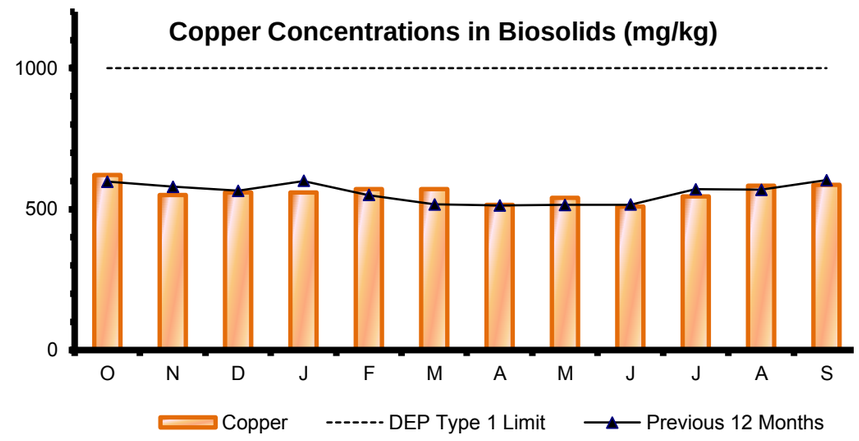
The new Clinton NPDES permit effective March 1, 2017, requires TRAC to issue/renew all industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be an SIU.

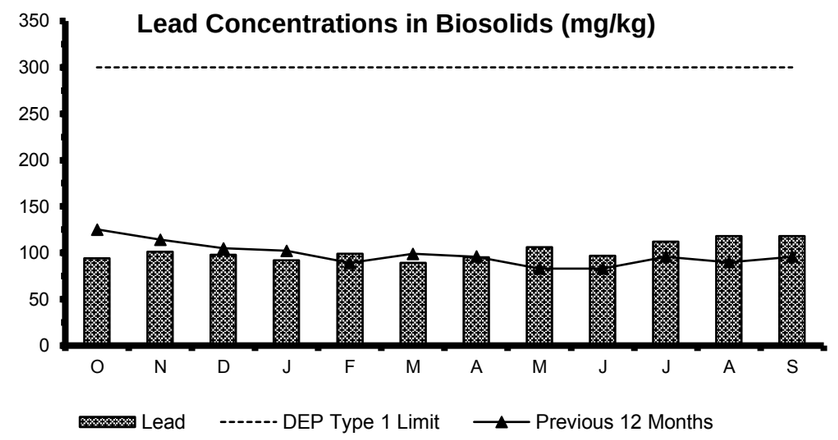
There were no Clinton SIU permits issued during the period.

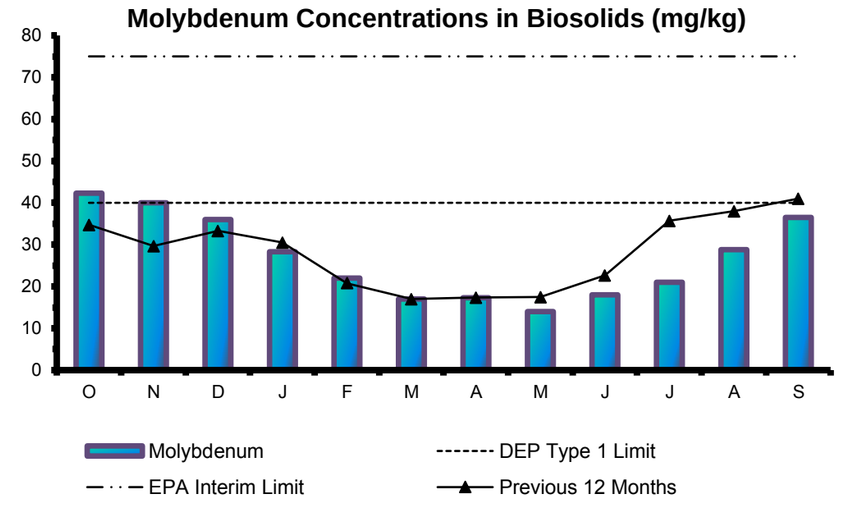
TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge and cannot be monitored

TRAC also monitors one-third of the non-SIUs each year.

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







Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. While the levels are below the DEP Type 1 limit for all three metals, there has been an increase in the lead levels compared with the same period a year ago.

With the September 2016 change in theMassDEP regulations, increasing the molybdenum limits to 40 mg/kg for land use application, the MWRA may more often be able to sell its pellets in-state whereas the previous limits forced several months’ worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms.

In the first three months of this fiscal year, the levels of molybdenum have been below the current DEP limits and even more importantly, below the levels during the same period a year ago. MWRA and its contractor, NEFCO, do not distribute product that does not meet the suitability standards.

Field Operations Highlights
1st Quarter – FY18

Western Water Operations and Maintenance

- Carroll Water Treatment Plant staff participated in the annual demand response drill that requires that the facility be on backup power within 30 minutes of notification. Diving contractor completed the underwater 5-year inspection of the Cosgrove Intake upper and lower intake sluice gates. Staff supported the Traveling Screen Replacement Project at the Winsor Dam Intake. This project replaced both of the traveling screens while keeping the facility.

- Flow tests were performed to determine max flow in the Chicopee Valley Aqueduct based on settings of the Back Pressure Sustaining Valves at Route 21 in Ludlow. These measurements will be utilized to evaluate future flow conditions in the system. Turbine startup and testing was conducted on the Hatchery Supply Line Hydro Turbine in coordination with the hatchery as well as National Grid. These test are necessary for National Grid to accept the power that is generated.

Metro Water Operations and Maintenance

- The Chestnut Hill Emergency Pump Station was run during the early morning hours on September 27th. Three of the four pumps operated well. Pump #2 experienced issues with its Surge Control Valve. The issues are being checked and the pump will be run next quarter.

- WASM 4 Leak on River Road in Weston: While performing routine maintenance on the triple meter vault on River Road, Metering staff heard running water through the concrete chamber wall. This chamber houses three large venturi meters, on WASMs 1, 2 and 4. Leak Detection staff acoustically determined the presence of a leak on the WASM 4 Pipeline. WASM 4 provides service via the Northern High Hydraulic Grade Line to Meter 103 in Watertown, 104 and 105 to Newton, and is the source of water to the Nonantum Road Pressure Reducing Facility in Brighton, the normal source of supply to the Spot Pond Storage Tanks. In order to isolate WASM 4 for the leak repair, several systems changes were necessary, including activating two local PRVs in the Newton water distribution system, and isolating

- Meters 104 and 105. Several attempts were made to activate the Newton PRVs, but they were in need of updated control piping and pilot valves. (The Newton PRVs were repaired and leak repair was completed in early October.)

Operations Engineering

EAP for City, City Extension and the Dorchester Tunnels: Operations Engineering and Planning are currently developing operation plans for the reconfiguration of the system during a tunnel isolation. Training for MWRA staff is scheduled for November.

Water Quality Meetings: Individual meetings are held each month between MWRA Operations Engineering, Planning and Water Quality Assurance and water communities to discuss current DEP Policies, water quality, hydraulics, lead and MWRA Loan Programs. This quarter, staff met: Medford, Somerville, Wakefield, Wilmington, Needham, Wellesley and Weston.

Wastewater Operations & Maintenance

- Nut Island Standard Operating Procedures (SOPs): Operations Staff wrote updated SOPs for putting screening channels and grit vortexes online and offline in remote control (via SCADA) and manual control (local controls). All Operations Staff are being trained on the updated SOPs.

- Back-Up Pump Control: Operations Staff worked with Process Control and SCADA Staff to review and revise Power Loss/Backup Power Pump Control Test Procedures to test backup pump control and ensure proper emergency operation for all wastewater pumping stations. Backup pump control has been tested at Prison Point CSO (dry weather flows only), and the Hayes, DeLauri, Braintree-Weymouth, Hingham, IPS, Hough's Neck, Quincy and Squantum Pump Stations.

Field Operations Highlights
1st Quarter – FY18

- Union Park Facility Generator Fuel Tank: On June 28th, there was an alarm that there was fuel oil in the interstitial space between the primary and secondary containment of the generator fuel oil tank. Staff worked with Woodard & Curran staff to have a temporary tank delivered to the facility, the oil transferred, and the generator tested. Staff are working on a permanent resolution, and have kept Boston Water & Sewer Commission and Woodard & Curran updated on the status.

- Chelsea Creek Headworks Hydrogen Cyanide Incident: On August 8th, the Chelsea and Boston Fire Departments responded to a report of detection of hydrogen cyanide at the Chelsea Creek Headworks. After a thorough investigation, staff are confident that the detection of hydrogen cyanide was, in fact, detection of hydrogen sulfide, a biologically produced byproduct routinely found in wastewater. The incident was covered by major news outlets in the Boston area.

- Tour of South Boston Pump Station for BWSC: Operations Staff conducted a tour for BWSC and Woodard & Curran staff, focused on MWRA's recently installed flood protection. Flood protection will be installed at the Union Park CSO Facility which is operated by Woodard & Curran and jointly managed by the MWRA and BWSC.

TRAC

- On July 20th, TRAC Staff responded to an incident at Ward Street Headworks which received a 30-minute influx of food packages that temporarily blinded the Bar Screens. Staff investigated the tributary interceptors but did not find any residual packages in the lines. The packages were a very specific mix of food products that could be found in secured packaging supplied to prisons. Local facilities were identified and their tributary discharge examined but revealed no connection to Ward Street. Investigations are ongoing.

Environmental Quality-Water

- Throughout the quarter, staff provided onsite sampling and sonde profiling support at the Chestnut Hill Standby Reservoir. In July, efforts focused on monitoring the reservoir during a cyanobacteria bloom. In August, an onsite reservoir assessment and sonde profiling showed improvement in water quality conditions since the cyanobacteria bloom earlier in the summer. In September, sampling was conducted in response to dying yellow perch. Testing results throughout the quarter showed neither detection of algal toxins nor detection of taste and odor compounds.

- In coordination with DEP CERO, staff conducted water quality profiling and sampling at several locations on Sudbury Reservoir on September 26th. Several samples were screened using the Fluid Imaging FlowCam to determine if there was presence of cyanobacteria.

- ENQUAL staff, in coordination with the Reservoir Operations Section and its Contractor, sampled all standby emergency reservoirs in July.

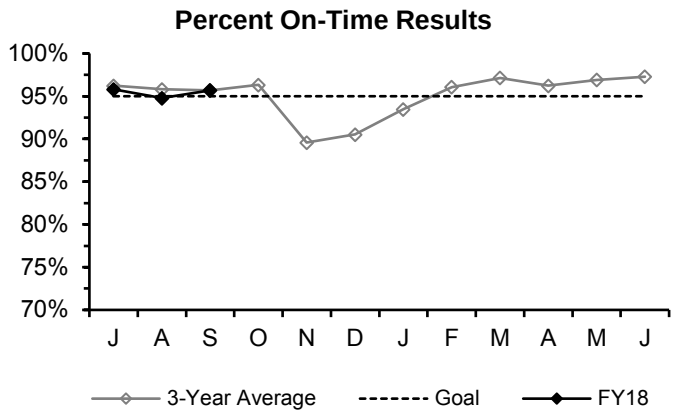
- Staff collected quarterly samples for the Optimum Water Quality Parameters (OWQP) Program on September 6th and 7th, measuring pH and alkalinity at 27 sites across the MWRA service area. All samples met DEP required limits. Staff collected additional samples this quarter for a review of MWRA Corrosion Control Optimization Program.

Environmental Quality-Wastewater

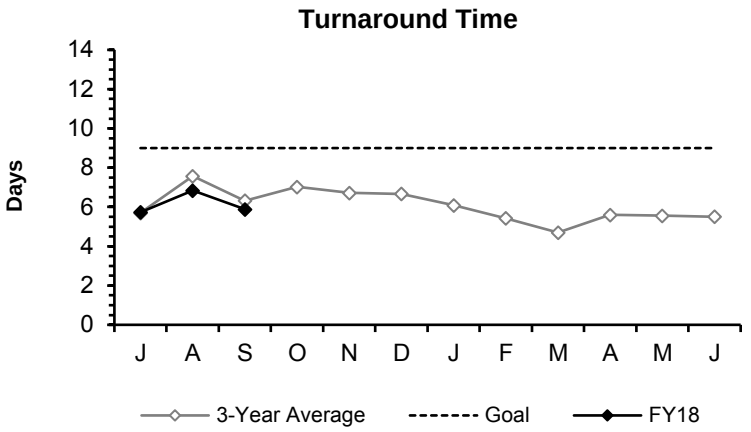
- Harbor/Beach/CSO Monitoring: Submitted 2016 CSO Receiving Water Monitoring Report as required by the variances for the Charles River and Alewife Brook/Upper Mystic River. DCR beach daily results were posted to MWRA.com through Labor Day. Harbor and river monitoring continued including post-storm monitoring of selected weekends.

Laboratory Services

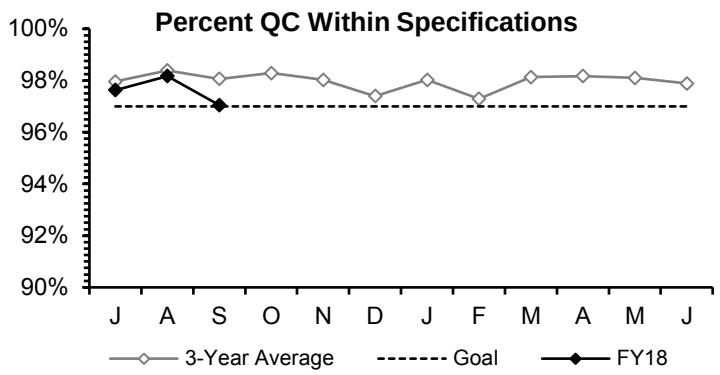
1st Quarter - FY18



The Percent On-Time measurement was above the 95% goal two months of the quarter. All regulatory reporting deadlines were met.

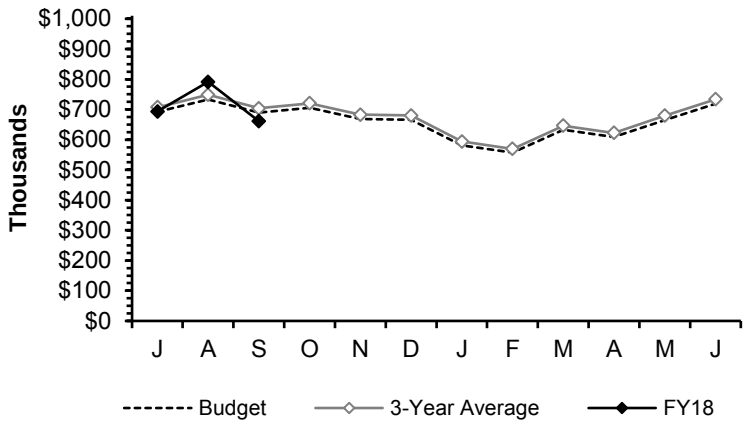


Turnaround Time was faster than the 9-day goal three months of the quarter.



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

Value of Services Rendered



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

Highlights:

Quality Assurance:
On this year's Proficiency Testing samples, required for DEP Certification and the EPA DMR-QA program, we achieved acceptable results on all parameters tested. The quarterly rolling audit was on Data Tracability and found good compliance with procedures. Also, semi-annual supervisor audits on methods and procedures found good compliance and no significant issues. **DITP.** Lab staff briefed DMF and FDA representatives on Mass Bay bacteria sampling and lab testing as part of a DITP tour.

Drinking Water.
In a reponse to the Environmental Laboratory Advisory Board, EPA agreed that cyanide testing in drinking water can be problematic and the required test methods need to be improved to avoid false positives.

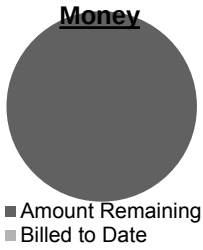
Wastewater Transport.
The Central Lab performed rush testing in support of the Chelsea Creek Headworks "Hydrogen Cyanide" incident.

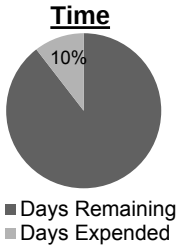
CSO Assessment:
We continued to perform weekend CSO receiving water sampling in the Charles and Mystic Rivers during/after significant wet weather events. This is intended to give additional data for the CSO Assessment to document the recovery of the rivers after it rains. Also, we will begin testing CSO facility influent for bacteria during activations at Cottage Farm and Prison Point as surrogates for untreated CSO discharge.

CONSTRUCTION PROGRAMS

Projects In Construction

1st Quarter– FY18



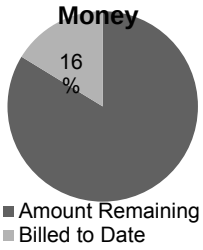


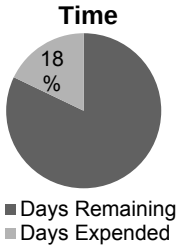
Reading Extension Sewer Rehabilitation

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

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

Status and Issues: The NTP was issued in August and to date no physical work has taken place. The Contractor has been providing submittals which are being reviewed.



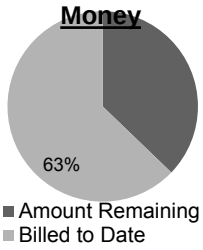


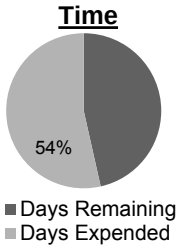
Chelsea Creek Headworks Upgrade

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

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

Status and Issues: As of September, the electrical contractor continued the layout of upcoming work to relocate one of the scrubber VFD's. The painting contractor patched and painted above Channel #4 east end of the bar screen and on the mezzanine.



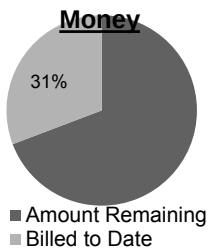


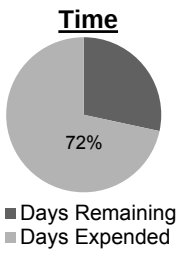
Wachusett Aqueduct Pumping Station

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

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

Status and Issues: As of September, the Contractor installed the metal deck and roof truss system. They secured the 36" pipe train and pedestals associated with Pump's #1 through #7, adjusted the 84" steel piping and installed the bypass at the 84" BFV.





Alewife Brook Pump Station Improvements

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

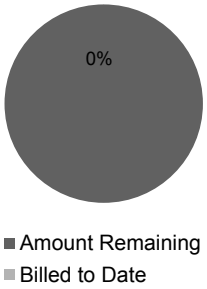
Notice to Proceed: 29-Jan-2016 *Contract Completion: 3*1-May-2018

Status and Issues: As of September the Contractor began fusing the HDPE piping and installed knife gates for the bypass pumping system. The also set the boiler and associated expansion tanks.

Projects In Construction

1st Quarter– FY18

Money



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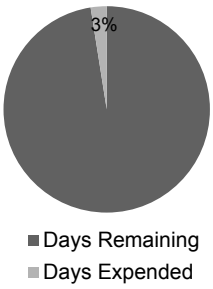


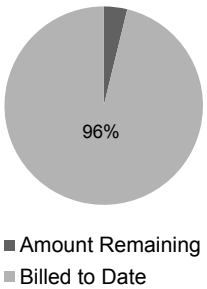
NIH Section 110 - Stoneham

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

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

Status and Issues: The NTP for this project was issued September 5th. Work to date has consisted of the review of submittals.

Money



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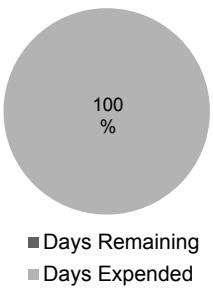


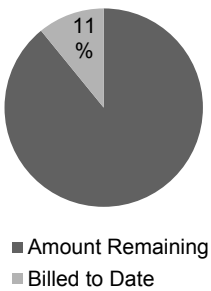
DITP Valves and Piping Replacements

Project Summary: This project involves the replacement of the twenty 60" butterfly valves and ten 60" flow meters in the NMPS; three 48", twelve 36" plug/check valves, six 30" flow meters and six 30-36" gate valves in the WTF.

Notice to Proceed: 23-Jun-2014 *Contract Completion:* 22-Sep-2017

Status and Issues: As of September, the Contractor removed the temporary dewatering system, including the temporary cap with pump suction piping on the North System Tunnel. The Contractor commenced demobilization and began addressing punchlist items.

Money



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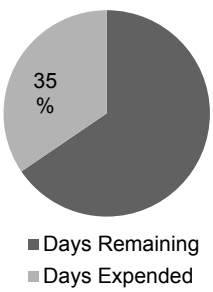


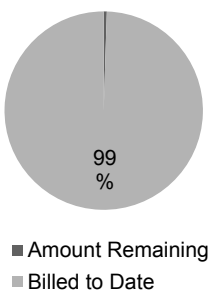
Winthrop Terminal VFD and Motor

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

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

Status and Issues: The Contractor, JFW submitted major equipment submittals. The second transformer was tested in September, with the first VFD/motor to be shop tested in November.

Money



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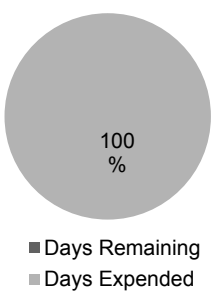


DITP Replacement of Scum Skimmers

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.

Notice to Proceed: 9-Oct-2013 *Contract Completion:* 10-Oct-2016

Status and Issues: This project is complete.

CSO CONTROL PROGRAM
1st Quarter – FY18

All 35 projects in the Long-Term CSO Control Plan are complete, in compliance with Schedule Seven. Of the $910.6 million FY18 CIP budget for the CSO Control Program, approximately $8.4 million remains to be spent through 2021. Remaining work includes Cambridge's completion of surface restoration associated with the Alewife/CAM004 sewer separation contracts ($1.3 million), BWSC's removal of additional inflow from its Dorchester Interceptor system in the South Dorchester Bay sewer separation areas ($3.8 million), the federal court mandated three-year CSO post-construction monitoring and performance assessment, 2018-2020 ($3.0 million) and as-needed technical or regulatory support ($0.3 million).

Project/Item	Status as of September 30, 2017
BWSC Memorandum of Understanding and Financial Assistance Agreement (MOU/FAA)	MWRA staff have completed final eligibility reviews – and MWRA and BWSC have executed final eligibility certifications – for the BWSC construction and ESDC contracts funded through the MOU/FAA since inception in 1996. The MOU/FAA ended on June 30, 2017. Remaining BWSC CSO related work eligible for MWRA funding is limited to the removal of additional stormwater inflow from the BWSC Dorchester Interceptor system. This work has been removed from the MOU/FAA and instead will be funded under a new, separate agreement (see related item, below).
Dorchester Interceptor Inflow Removal	MWRA's CIP and the MOU/FAA with BWSC included $5.4 million for additional inflow removal from the BWSC Dorchester Interceptor system in the South Dorchester Bay Sewer Separation area, of which $1.7 million was transferred to the BWSC MOU/FAA CSO account and $1.6 million of that was withdrawn by BWSC to fund related design and construction work. On May 17, 2017, the MWRA Board of Directors authorized removing the remaining $3.8 million from the BWSC MOU/FAA and instead including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017.
City of Cambridge Memorandum of Understanding and Financial Assistance Agreement	The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven. Extensive surface restoration work eligible for MWRA funding at a remaining award amount of $1.3 million is scheduled to continue through December 2017, followed by six months of final eligibility review, close-out of the Cambridge construction contracts and close-out of the MOU/FAA in June 2018. Staff plan to transfer the funds in the remaining award amount to the City of Cambridge this fall to cover eligible expenses through the remaining term of the MOU/FAA.
MWRA CSO Performance Assessment	The federal court schedule requires MWRA to commence a 3-year assessment of CSO performance by January 2018. MWRA submitted the Scope of Work for the CSO Post-Construction Monitoring Program and Performance Assessment to EPA and DEP on May 1, 2017, and has incorporated EPA and DEP comments into the Scope. On July 1, MWRA advertised the RFQ/P for a professional services contract, Contract 7572, that includes flow metering, hydraulic modeling, water quality evaluations and system performance assessments. Four responsive proposals were received on August 25, 2017, and staff plan to seek Board authorization on October 18, 2017, to award Contract 7572 to the first ranked firm.

CIP Expenditures

1st Quarter – FY18

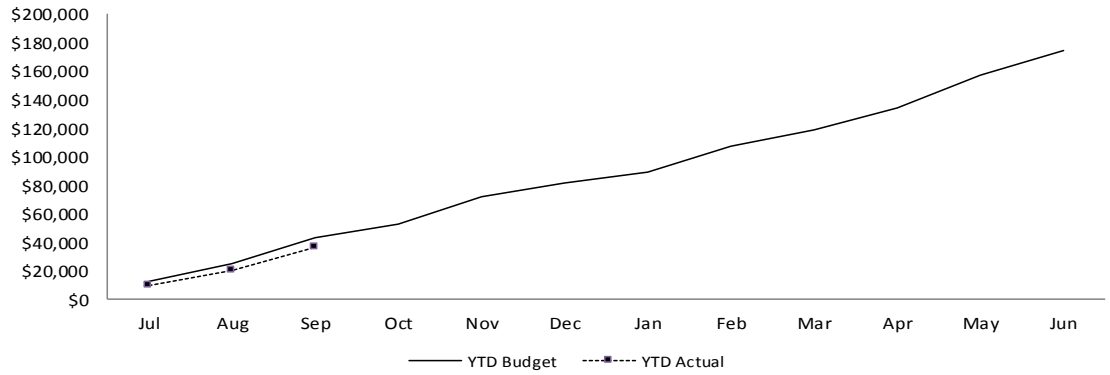
FY18 Capital Improvement Program Expenditure Variances through September by Program ($ in thousands)				
Program	FY18 Budget Through September	FY18 Actual Through September	Variance Amount	Variance Percent
Wastewater	19,573	18,431	(1,142)	-6%
Waterworks	22,214	17,897	(4,317)	-19%
Business and Operations Support	1,404	610	(793)	-57%
Total	$43,191	$36,939	($6,252)	-14%

Project underspending within Wastewater was due to Cambridge Sewer Separation delay in payment for final restoration work, construction delays for the Clinton Phosphorus Reduction contract, as well as work anticipated for FY18 that was completed in FY17 for the North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacements, Digester Sludge Pump Replacement Construction Phase 2, and Deer Island Fuel Oil System Upgrades contracts. This was partially offset by greater than anticipated community requests for grants, progress for the Chelsea Creek Upgrades Construction and Study of Sections 186, 4, 5, and 6 contracts. Project underspending in Waterworks was due to less than anticipated requests for community loans, construction issues related to surge tank installation and pipe testing for the Wachusett Aqueduct Pumping Station Construction, work anticipated in FY18 completed in FY17 for the Northern Intermediate High Section 89/29 Redundancy Phase 1B, delay in Notice to Proceed for Southern Extra High Section 111 Construction 2, partially offset by construction progress for the Northern Intermediate High Phase 1C and Southern Extra High Section 111 Construction 1 contracts, and timing of watershed land purchases.

Budget vs. Actual CIP Expenditures

($ in thousands)

Total FY18 CIP Budget of $174,539



Construction Fund Management

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

Cash Balance as of 9/23/2017	$79.3 million
Unused capacity under the debt cap:	$1.397 billion
Estimated date for exhausting construction fund without new borrowing:	MAY-18
Estimated date for debt cap increase to support new borrowing:	Not anticipated at this time
Commercial paper/Revolving loan outstanding: Commercial paper capacity / Revolving Loan	$178 million $ 350 million
Budgeted FY18 capital spending*:	$160 million

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY18

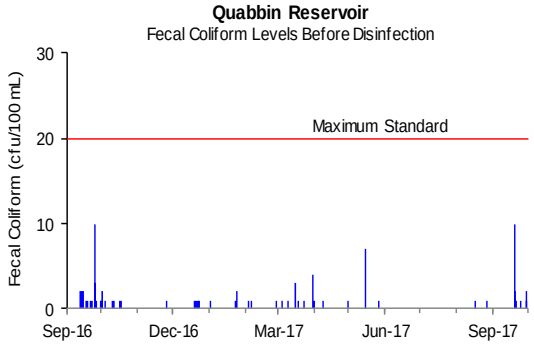
Source Water – Microbial Results

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 1st Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL, compared to the allowable 10%.**

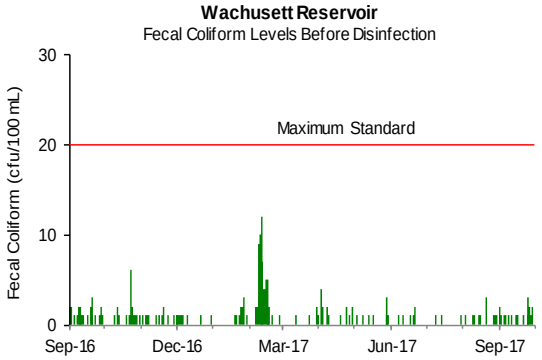


Sample Site: Wachusett Reservoir

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

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

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

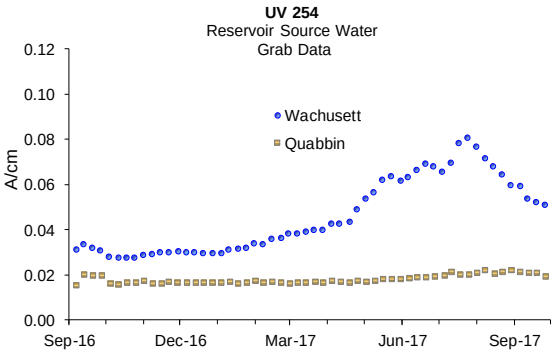


Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.019 A/cm.

Wachusett Reservoir UV-254 levels are currently around 0.051 A/cm.



Source Water – Turbidity

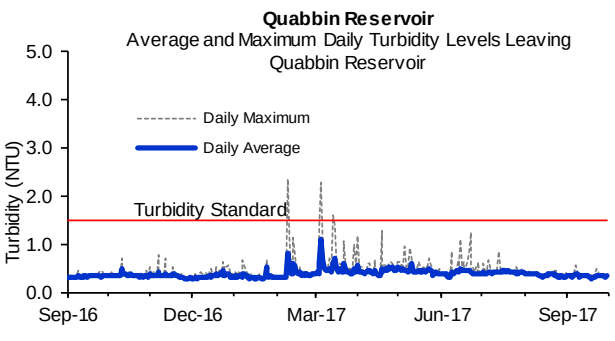
1st Quarter – FY18

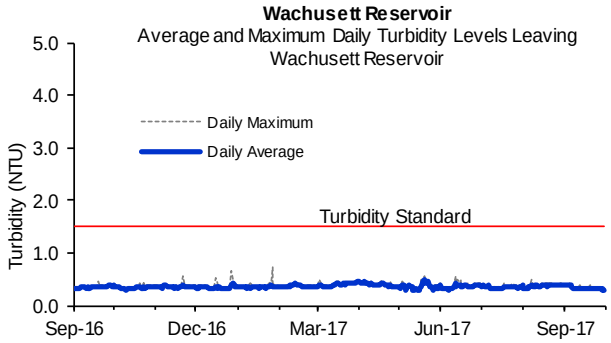
Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher disinfectant demand or may 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.



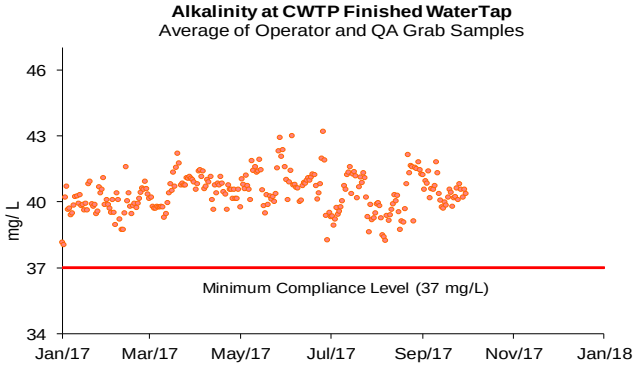


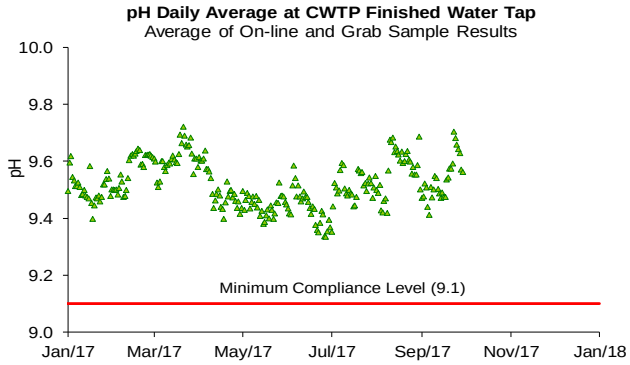
Treated Water – pH and Alkalinity Compliance

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

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

Distribution system samples were collected on September 6 and 7, 2017. Distribution system sample pH ranged from 9.0 to 9.6 and alkalinity ranged from 38 to 42 mg/L. No sample results were below DEP limits for this quarter.





Treated Water – Disinfection Effectiveness

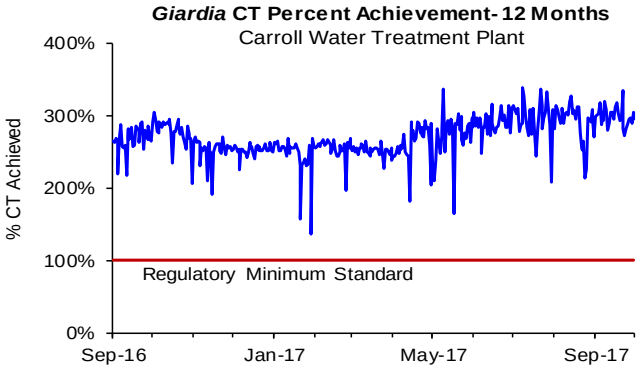
1st Quarter – FY18

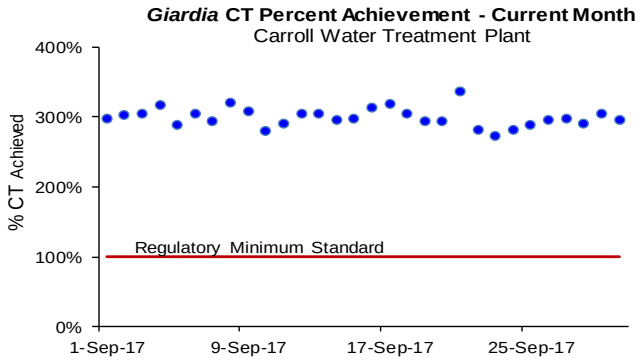
At the Carroll Water Treatment Plant (CWTP), MWRA meets the required 99.9% (3-log) inactivation of *Giardia* using ozone (reported as CT: concentration of disinfectant x contact time) and the required 99% (2-log) inactivation of *Cryptosporidium* using UV (reported as IT: intensity of UV x time). MWRA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

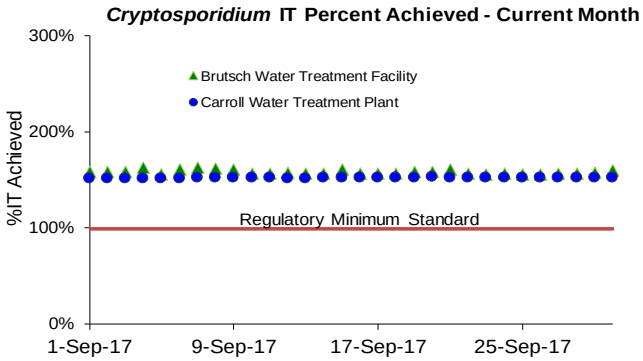
- Ozone dose at the CWTP varied between 1.2 to 2.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.

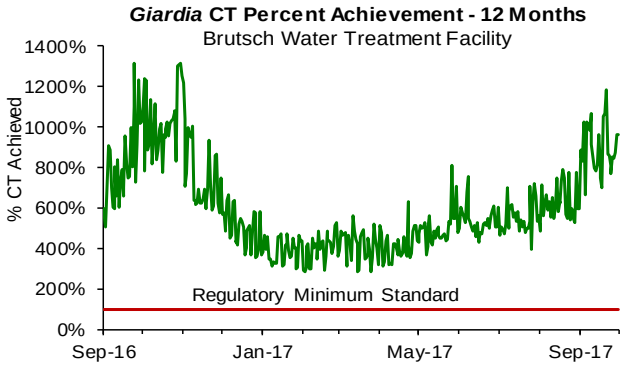


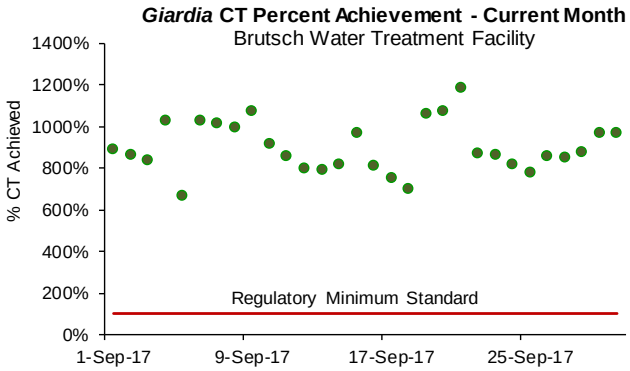


Quabbin Reservoir (CVA Supply) at: Brutsch Water Treatment Facility

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 mg/L (November 01 – May 31) and >1.0 mg/L (June 1– October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF ranged from 1.7 to 1.8 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.







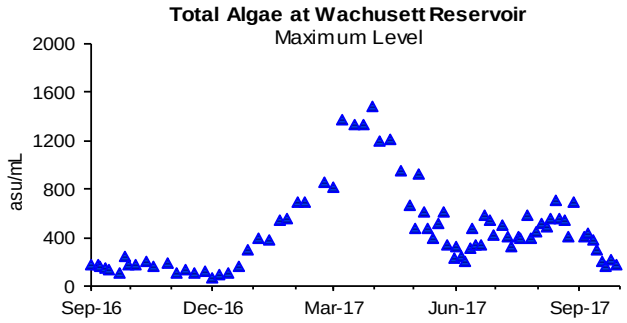
Source Water - Algae

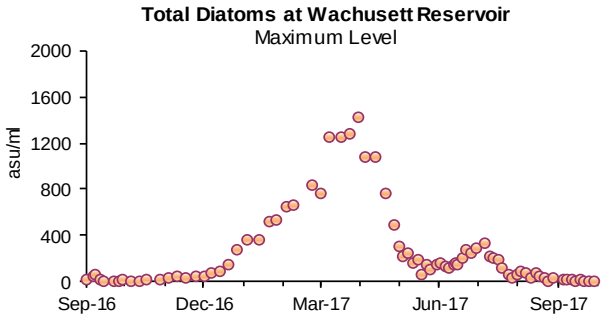
1st Quarter – FY18

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

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

In the 1st Quarter, three complaints which may be related to algae were reported from the local water departments.



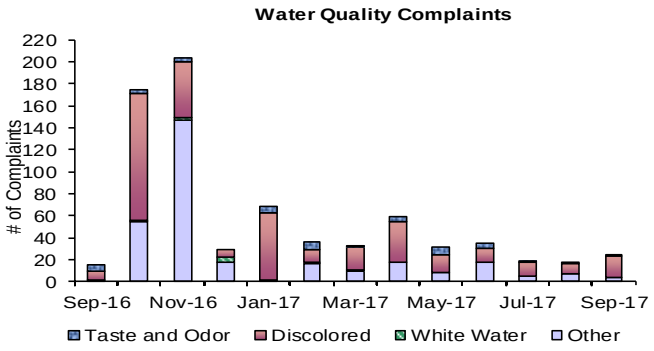


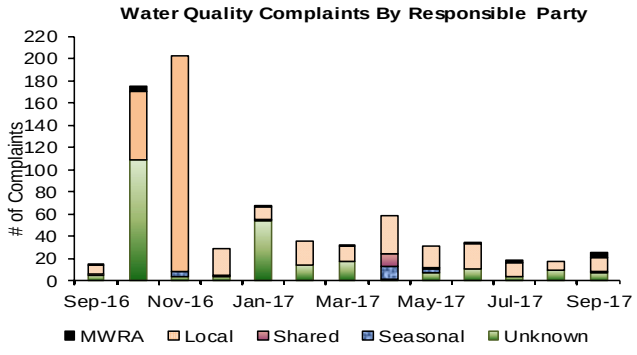
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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

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

Communities reported 61 complaints during the quarter compared to 179 complaints from 1st Quarter of FY17. Of these complaints, 41 were for "discolored water", 4 were for "taste and odor", and 16 were for "other". Of these complaints, 33 were local community issues, 7 were MWRA related, 1 was a community and MWRA shared issue, and 20 were unknown in origin. The complaints were scattered amongst the communities.





Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY18

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

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

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

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

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

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

Highlights

In the 1st Quarter, 66 of the 6,331 community samples submitted to MWRA labs for analysis tested positive for total coliform. Fourteen of the 1,995 MWRA samples tested positive for total coliform. In July, August, and September, Bedford had more than one positive total coliform sample; and therefore, will be required to conduct a Level 2 assessment. In September, Canton had more than one positive total coliform sample; and therefore, will be required to conduct a Level 1 assessment. In September, Somerville had greater than 5.0% of samples that were total coliform positive; and therefore, is required to conduct a Level 1 assessment. No sample tested positive for *E.coli*. Only 3.6% of the samples had a chlorine residual lower than 0.2 mg/L for the quarter. No community violated the TCR.

			# Coliform Samples (a)	Total Coliform # (%) Positive	E.coli # Positive	Assessment Required [e]	Violation [f]	Minimum Chlorine Residual (mg/L)	Average Chlorine Residual (mg/L)
MWRA	d	MWRA Locations	395	6 (1.52%)	0			1.80	2.63
	d	Shared Community/MWRA sites	1600	8 (0.50)	0			0.03	2.06
		Total: MWRA	1995	14 (0.70%)	0			0.03	2.19
Fully Served		ARLINGTON	159	1 (0.63%)	0			0.02	1.67
		BELMONT	104	0 (0%)	0			0.07	1.40
		BOSTON	786	2 (0.25%)	0			0.47	2.17
		BROOKLINE	224	0 (0%)	0			0.18	2.02
		CHELSEA	172	1 (0.58%)	0			1.16	2.42
		DEER ISLAND	52	0 (0%)	0			1.13	2.00
		EVERETT	169	0 (0%)	0			0.21	1.61
		FRAMINGHAM	237	1 (0.42%)	0			0.44	2.07
		LEXINGTON	115	0 (0%)	0			0.48	2.02
		LYNNFIELD	18	0 (0%)	0			0.07	1.01
		MALDEN	243	3 (1.23%)	0			0.03	1.77
		MARBLEHEAD	72	0 (0%)	0			0.86	2.19
		MEDFORD	221	0 (0%)	0			1.28	1.96
		MELROSE	117	0 (0%)	0			0.39	1.51
		MILTON	105	1 (0.95%)	0			0.35	1.86
		NAHANT	30	0 (0%)	0			0.90	1.72
		NEWTON	276	0 (0%)	0			0.10	1.90
		NORTHBOROUGH	48	0 (0%)	0			0.07	1.89
		NORWOOD	99	0 (0%)	0			0.11	1.50
		QUINCY	302	1 (0.33%)	0			0.07	1.41
		READING	133	1 (0.75%)	0			0.05	1.29
		REVERE	183	1 (0.55%)	0			1.12	2.02
		SAUGUS	104	0 (0%)	0			1.35	1.77
		SOMERVILLE	285	8 (2.81%)	0	Level 1	No	0.63	2.15
		SOUTHBOROUGH	30	0 (0%)	0			0.42	2.00
		STONEHAM	91	0 (0%)	0			1.24	2.19
		SWAMPSCOTT	54	0 (0%)	0			0.50	1.51
		WALTHAM	216	0 (0%)	0			0.59	2.18
		WATERTOWN	133	1 (0.75%)	0			0.63	1.91
		WESTBORO HOSPITAL	15	0 (0%)	0			0.08	0.19
		WESTON	45	0 (0%)	0			1.36	2.62
		WINTHROP	75	1 (1.33%)	0			0.02	1.42
		Total: Fully Served	*4913*	*22 (0.45%)*					
CVA & Partially Served	b	BEDFORD	87	25 (28.47%)	0	Level 2	No	0.02	1.34
	b	CANTON	115	11 (9.57%)	0	Level 1	No	0.01	0.84
	b	HANSCOM AFB	33	0 (0%)	0			0.26	1.26
	b	MARLBOROUGH	129	1 (0.78%)	0			0.03	2.34
	b	NEEDHAM	123	0 (0%)	0			0.08	0.81
	b	PEABODY	226	2 (0.88%)	0			0.47	1.74
	b	WAKEFIELD	144	0 (0%)	0			0.89	1.66
	b	WELLESLEY	119	2 (1.68%)	0			0.04	0.91
	b	WILMINGTON	87	0 (0%)	0			0.13	1.70
	b	WINCHESTER	91	0 (0%)	0			0.10	1.72
	b	WOBURN	201	2 (1.00%)	0			0.02	1.08
	c	SOUTH HADLEY FD1	63	1 (1.59%)	0			0.13	0.63
		Total: CVA & Partially Served	*1418*	*44 (3.10%)*					
		Total: Community Samples	*6331*	*66 (1.04%)*					

(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.
(e) The TCR requires an assesment be completed if more than 5% of all samples in a month are total coliform positive (or two or more samples are positive when fewer than 40 samples are collected each month).
(f) Some reasons a violation may occur: the required # of TCR samples is not collected; failure to report; an E.coli MCL violation; coliform treatment technique not followed properly; failure to conduct a level 1 or level 2 assessment within 30 days of trigger.

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

1st Quarter – FY18

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.

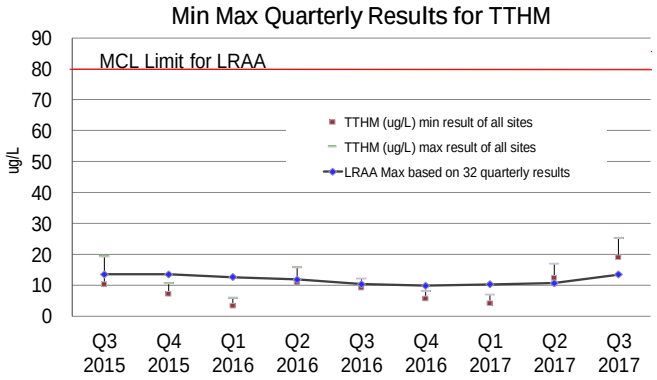
The locational running annual average at each individual sampling location must be below the standard. The charts below show the highest and lowest single values for all sites, and the LRAA of the highest location each quarter.

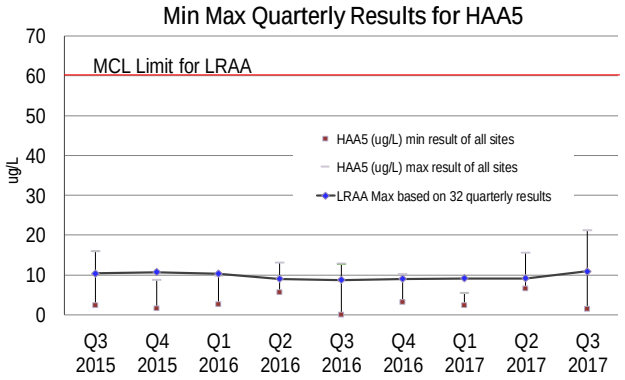
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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.

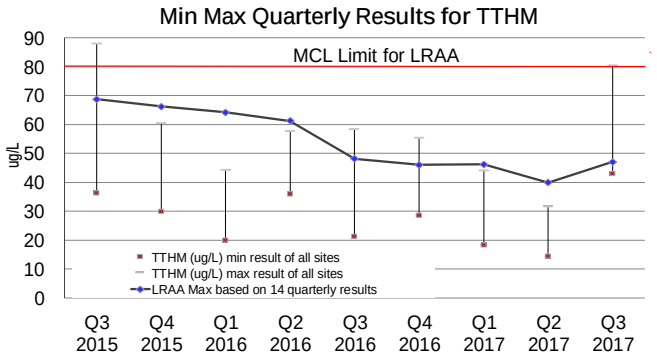
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 13.4 ug/L; HAA5s = 10.9 ug/L. The current RAA for Bromate = 0.0 ug/L. CVA's DBP levels continue to be below current standards.

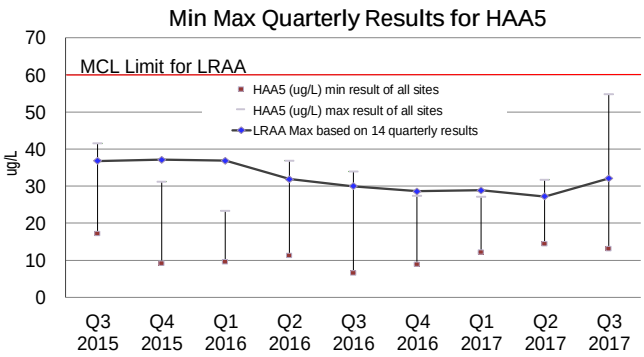
MetroBoston Disinfection By-Products





CVA Disinfection By-Products (Combined Results)





Water Supply and Source Water Management

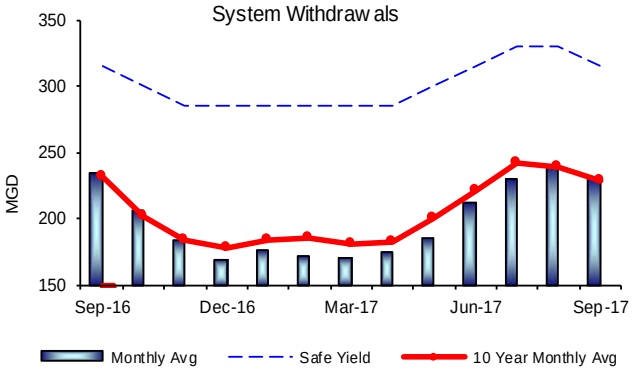
1st Quarter – FY18

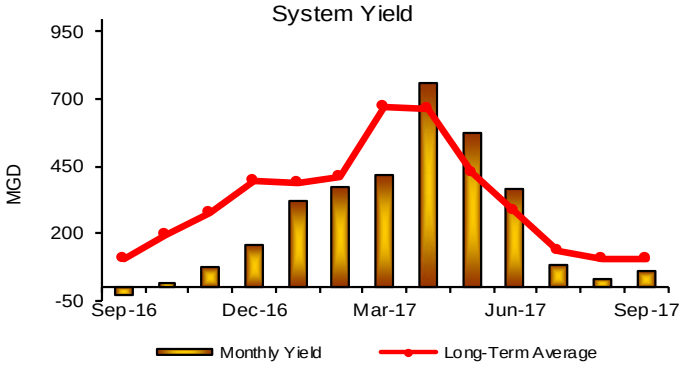
Background

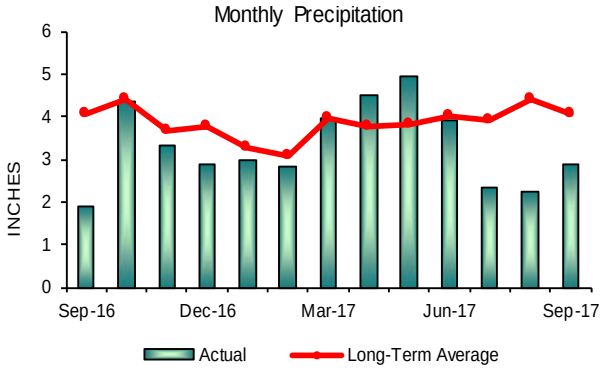
A reliable supply of water in MWRA's reservoirs depends on adequate precipitation during the year and seasonal hydrologic inputs from watersheds that surround the reservoirs. Demand for water typically increases with higher summer temperatures and then decreases as temperatures decline. Quabbin Reservoir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

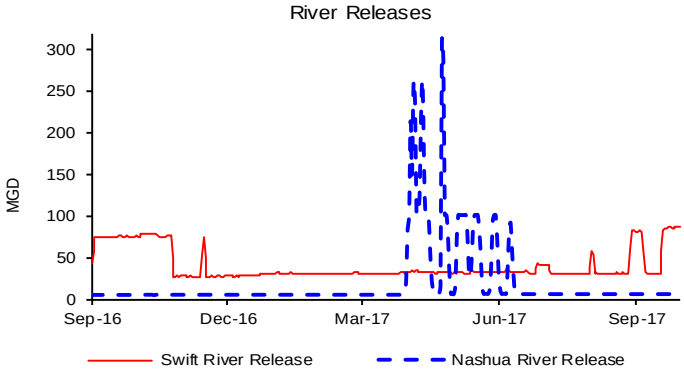
Outcome

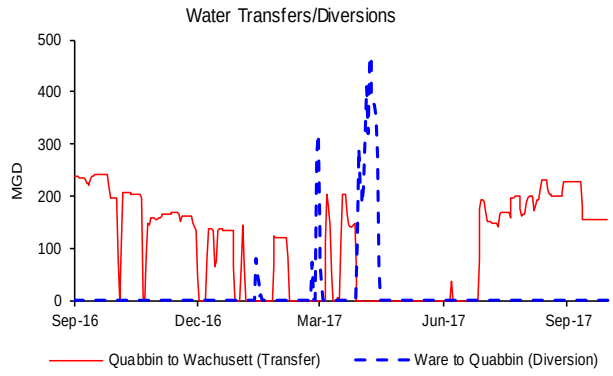
The volume of the Quabbin Reservoir was at 84.5% as of September 30, 2017; a 4.8% decrease for the quarter, which represents a loss of 20.1 billion gallons of storage. Precipitation and Yield for the quarter were below their respective quarterly long term averages. System withdrawal for the quarter was below the 10 year monthly average.

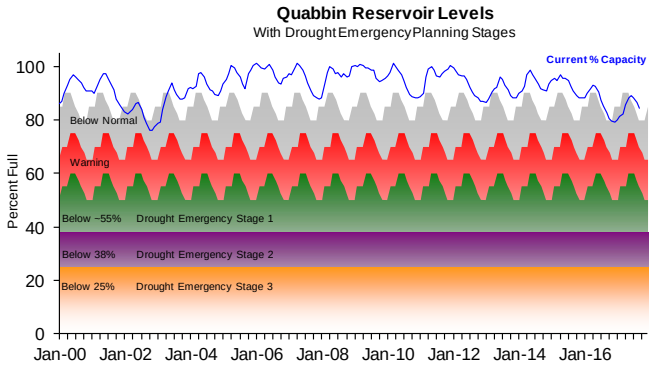












WASTEWATER QUALITY

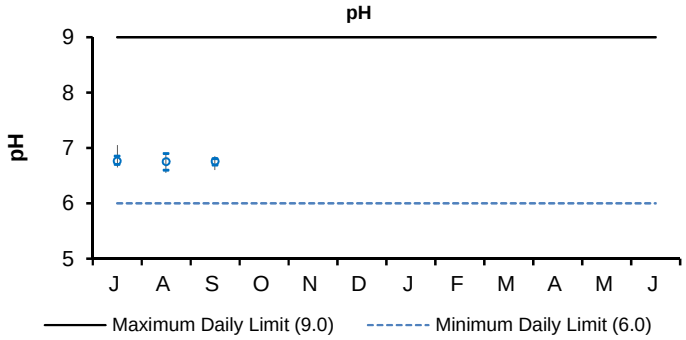
NPDES Permit Compliance: Deer Island Treatment Plant

1st Quarter - FY18

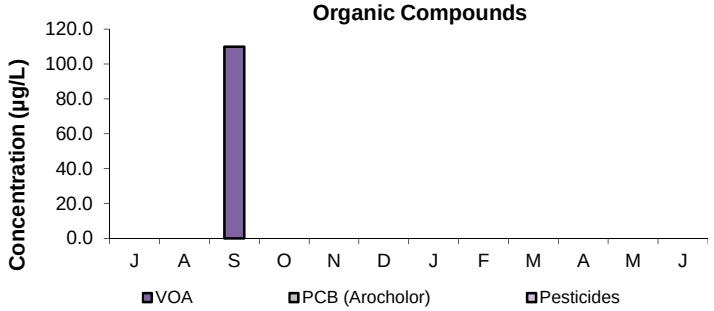
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*1st Quarter Violations*	*FY18 YTD Violations*
Dry Day Flow:		mgd	436	276.7	279.5	281.3	0	0
cBOD:	Monthly Average	mg/L	25	4.2	5.2	4.4	0	0
	Weekly Average	mg/L	40	5.3	5.8	7.0	0	0
TSS:	Monthly Average	mg/L	30	7.9	9.6	6.5	0	0
	Weekly Average	mg/L	45	10.2	12.4	10.9	0	0
TCR:	Monthly Average	ug/L	456	0	0	0	0	0
	Daily Maximum	ug/L	631	0	0	0	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	7	6	7	0	0
	Weekly Geometric Mean	col/100mL	14000	19	10	18	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	6.7-7.1	6.6-6.9	6.6-6.9	0	0
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	≥50	>100	>100	>100	0	0
	Inland Silverside	%	≥50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	≥1.5	50	100	100	0	0
	Inland Silverside	%	≥1.5	100	50	50	0	0

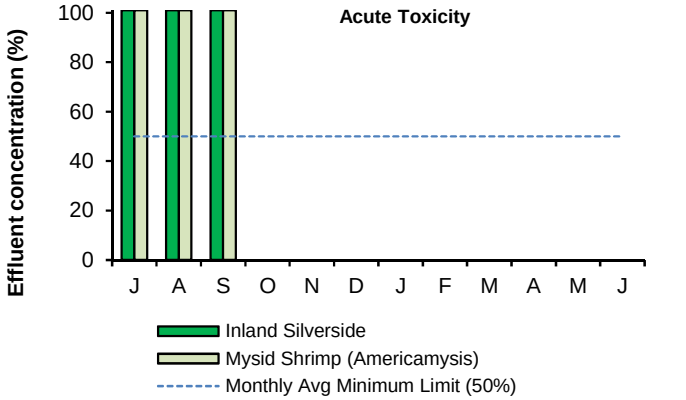
There have been no permit violations in FY18 to date at the Deer Island Treatment Plant (DITP).



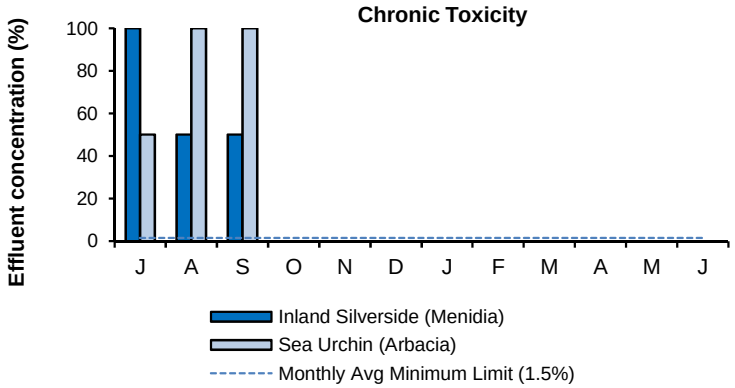
pH is a measure of alkalinity or acidity. Fluctuations in effluent pH are unlikely to impact on marine environments, which have significant buffering capacity. Because of the pure oxygen used in the activated sludge process, effluent pH tends to be at the lower end of the permit-required range. All pH measurements for the 1st Quarter were within the daily permit limits.



An important wastewater component monitored in the effluent is organic compounds, such as volatile organic acids (VOAs), pesticides, and polychlorinated biphenyls, which are all sampled monthly. The secondary treatment process significantly reduces organic compounds in the effluent stream. In the 1st Quarter, some VOAs (acetone and toluene) were detected in the effluent in September. However, VOAs do not have discharge limitations in the DITP NPDES permit; they are to be reported only. Though September had the highest measured VOAs since FY00, DITP has seen similar results before. Looking ahead, results from the October sampling showed the VOAs were again non-detect. All other organic compounds were below the detection limit for the quarter.



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 1st 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 1st Quarter for both the inland silverside and sea urchin.

NPDES Permit Compliance: Clinton Wastewater Treatment Plant

1st Quarter - FY18

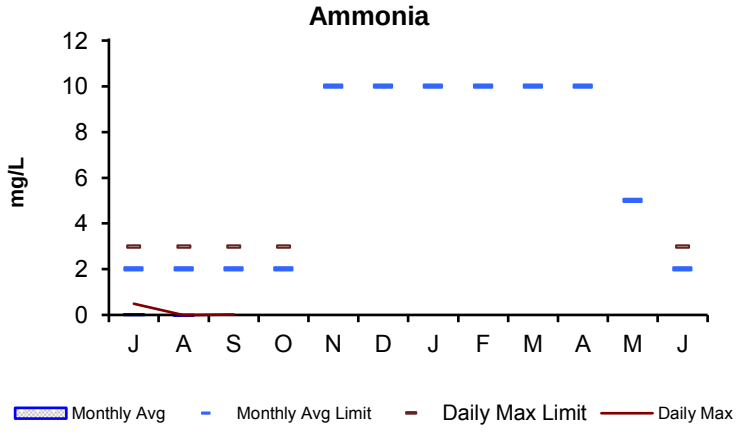
NPDES Permit Limits

Effluent Characteristics		*Units*	*Limits*	*July*	*August*	*September*	*4th Quarter Violations*	*FY18 YTD Violations*
Flow:		mgd	3.01	2.40	2.40	2.42	0	0
BOD:	Monthly Average:	mg/L	20	2.5	3.3	3.4	0	0
	Weekly Average:	mg/L	20	3.9	3.6	3.9	0	0
TSS:	Monthly Average:	mg/L	20	3.1	3.0	3.7	0	0
	Weekly Average:	mg/L	20	5.4	3.5	4.5	0	0
pH:		SU	6.5-8.3	7.4-7.7	7.3-7.7	7.3-7.8	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	7.5	7.4	7.9	0	0
E. Coli:	Daily Geometric Mean:	cfu/100mL	409	15.0	8.7	29.0	0	0
	Monthly Geometric Mean:	cfu/100mL	126	5.6	5.4	6.0	0	0
TCR:	Monthly Average:	ug/L	17.6	0.0	0.0	0.0	0	0
	Daily Maximum:	ug/L	30.4	0.0	0.0	0.0	0	0
Total Ammonia Nitrogen:	June 1st - October 31st							
	Monthly Average:	mg/L	10.0	0.04	0.00	0.01	0	0
	Daily Maximum:	mg/L	35.2	0.50	0.00	0.04	0	0
Copper:	Monthly Average:	ug/L	11.6	10.2	10.1	8.4	0	0
	Daily Maximum:	ug/L	14.0	10.2	10.1	10.0	0	0
Phosphorus:	April 1st - October 31st							
	Monthly Average:	mg/L	1.0	0.57	0.45	0.56	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 FY18 at the Clinton Treatment Plant.
1st Quarter: There were no permit violations in the first quarter.

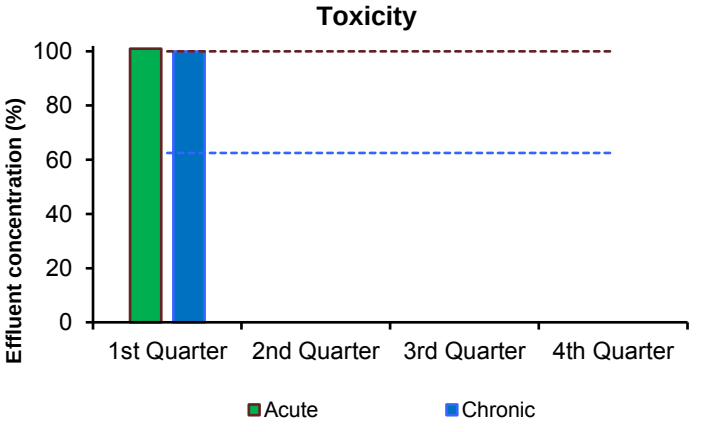
*Toxicity testing at the Clinton Treatment Plant is conducted on a quarterly basis.

Ammonia

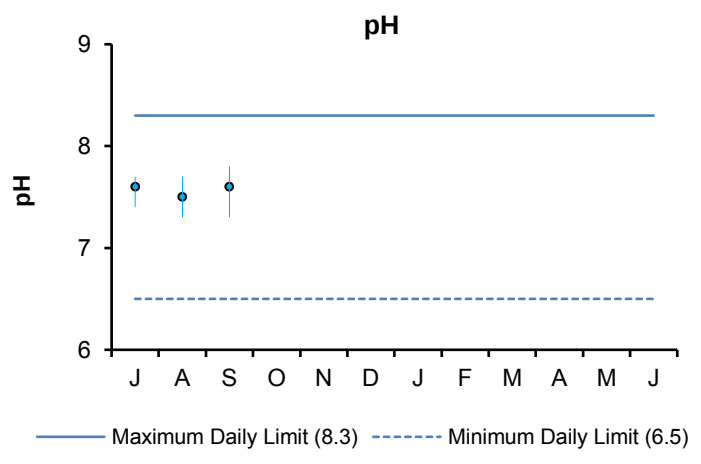


The 4th Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2 mg/L and 3 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.

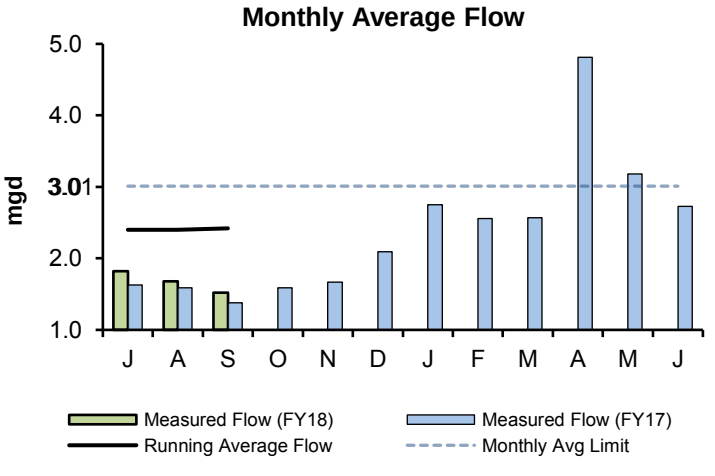
Toxicity



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. There were no violations in the 1st Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 1st 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. The average monthly flows during the first quarter were below the NPDES permit limit.

COMMUNITY FLOWS AND PROGRAMS

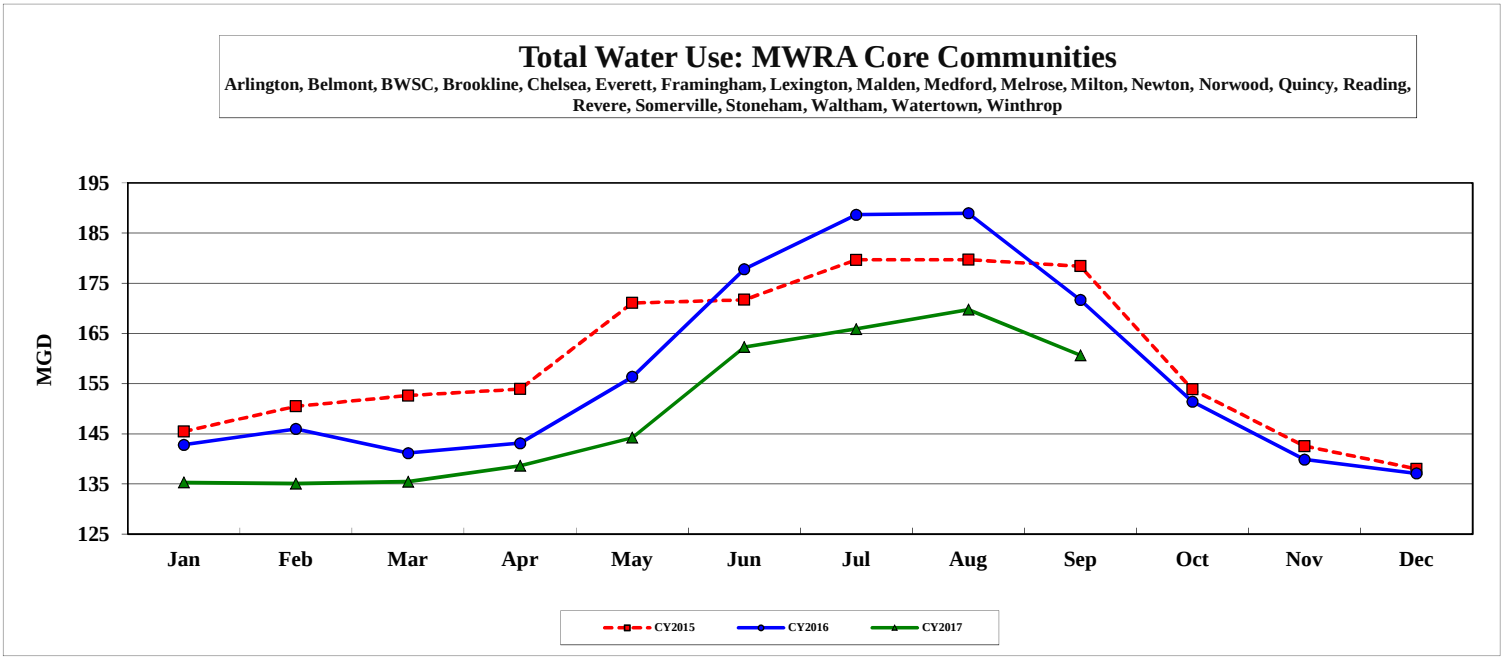
Total Water Use
MWRA Core Customers
1st Quarter - FY18

Water Use: MWRA Fully Served Communities*

*** Receive 100% MWRA Water Service**

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Average	Average
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	159.839	159.839
CY2016	142.802	145.930	141.117	143.104	156.336	177.803	188.652	188.959	171.633	151.405	139.847	137.094	161.905	157.106
CY2017	135.309	135.085	135.461	138.599	144.237	162.273	165.876	169.746	160.650				149.808	149.808

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD Total	Total
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	58,341.183	58,341.183
CY2016	4,426.874	4,231.969	4,374.642	4,293.123	4,846.430	5,334.082	5,848.205	5,857.743	5,148.989	4,693.548	4,195.395	4,249.903	44,362.055	57,500.901
CY2017	4,194.586	3,782.379	4,199.303	4,157.984	4,471.359	4,868.181	5,142.169	5,262.132	4,819.512				40,897.604	40,897.604



The September 2017 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 2017 water use will be used to allocate the FY19 water utility rate revenue requirement.

September 2017 water supplied of 205.8 mgd (for revenue generating users) is down 24.8 mgd or 10.8% compared to September 2016.

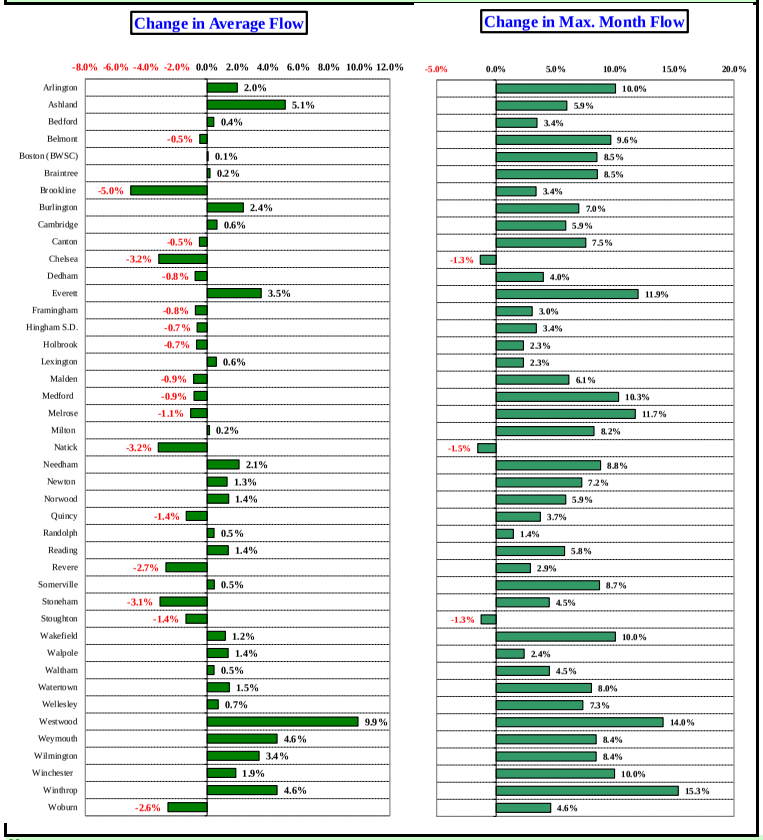
System-wide year to date consumption for CY17 remains lower than CY16 with 186.8 mgd being supplied to MWRA customers **through September**. This is 19.4 mgd lower than CY16, and is a decrease of 9.4%.

Community Wastewater Flows

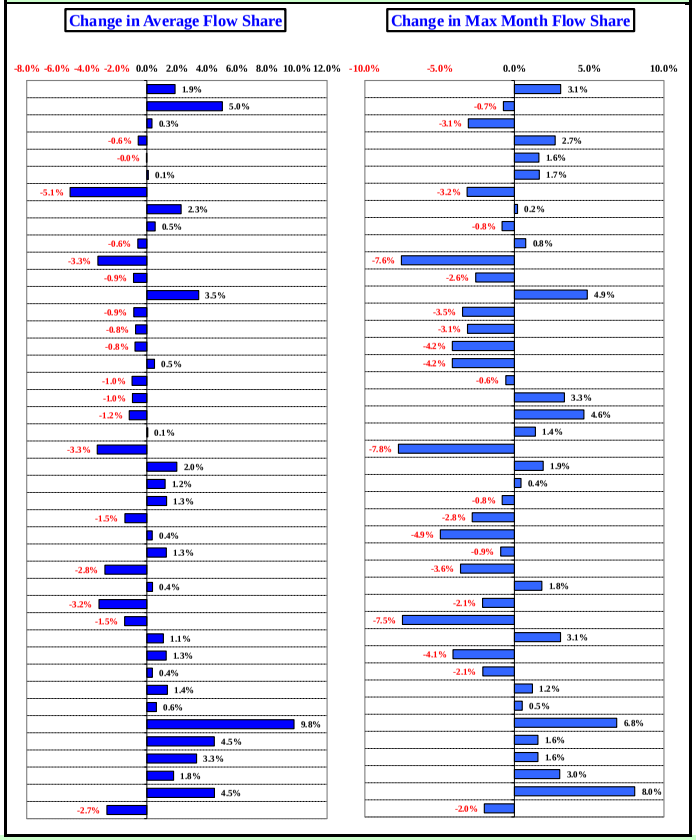
1st Quarter - FY18

How Projected CY2017 Community Wastewater Flows Could Effect FY2019 Sewer Assessments [1,2,3]

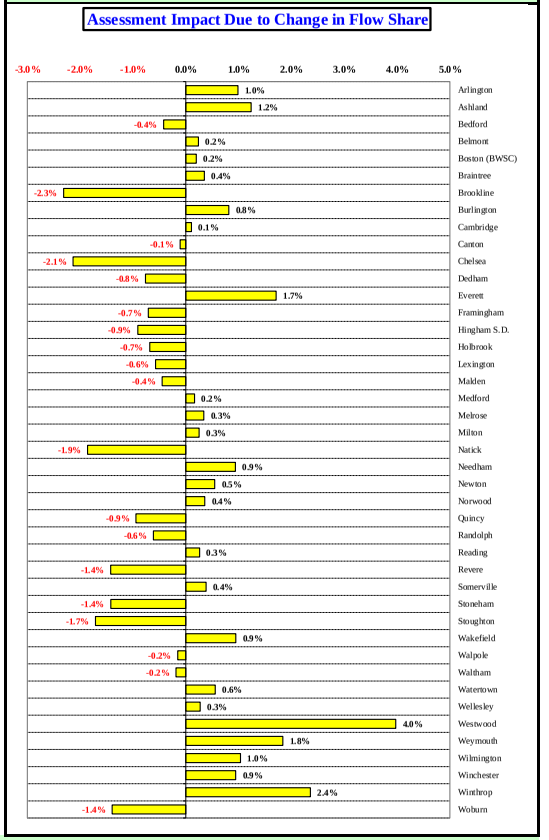
The flow components of FY2019 sewer assessments will be calculated using a 3-year average of CY2015 to CY2017 wastewater flows compared to FY2018 assessments that used a 3-year average of CY2014 to CY2016 wastewater flows.



But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2015 to CY2017 flow share compared to CY2014 to CY2016 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 CY2014 to CY2017 average wastewater flows as of 10/12/17. Flow data is preliminary and subject to change pending additional MWRA and community review.

[3] CY2014 to August CY2017 wastewater flows based on actual meter data. September-December CY2017 based on the average of the three prior years.

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

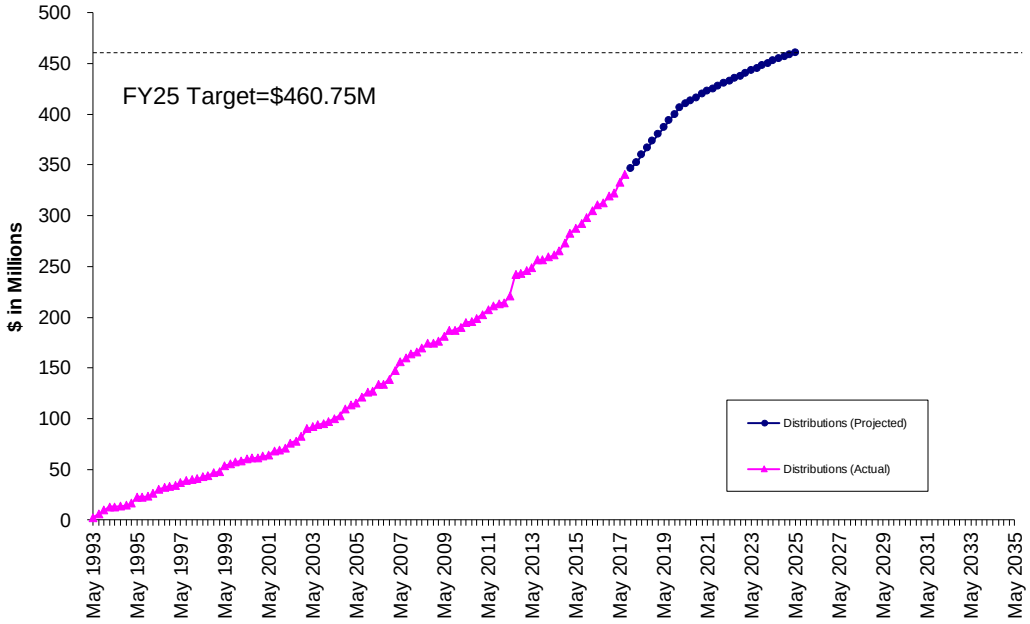
Community Support Programs

1st Quarter – FY18

Infiltration/Inflow Local Financial Assistance Program

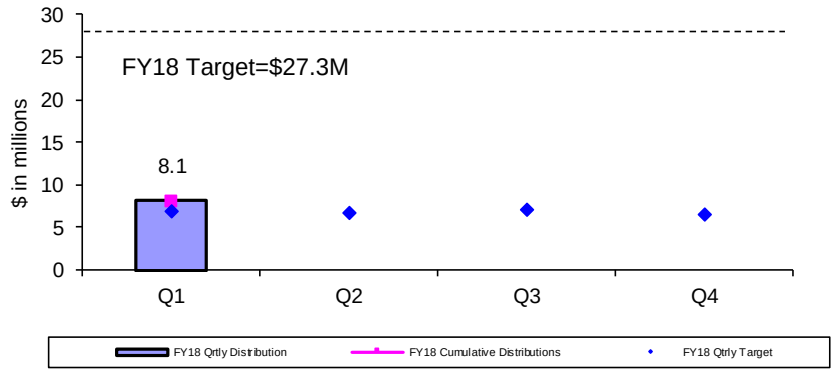
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides $460.75 million in grants and interest-free loans (average of about $14 million per year from FY93 through FY25) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned 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 and 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 1st Quarter of FY18, $8.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Milton, Norwood, Quincy, Reading and Winchester. Total grant/loan distribution for FY18 is $8.1 million. From FY93 through the 1st Quarter of FY18, all 43 member sewer communities have participated in the program and more than $340 million has been distributed to fund 533 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.

FY18 Quarterly Distributions of Sewer Grant/Loans



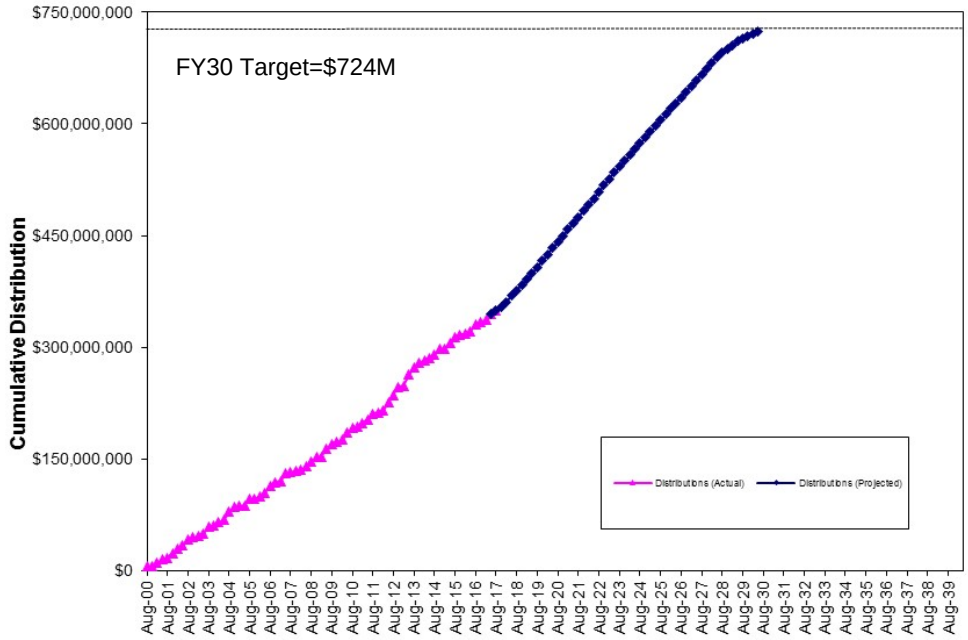
Community Support Programs

1st Quarter – FY18

Local Water System Assistance Program

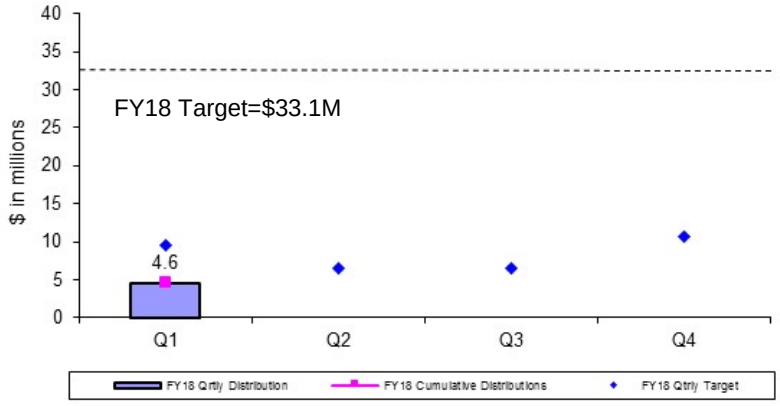
MWRA's Local Water System Assistance Programs (LWSAP) provides $724 million in interest-free loans (an average of about $24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There have been 3 phases: Phase 1 at $222 Million, Phase 2 at $210 Million, and Phase 3 at $292 Million. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds. The Phase 1 water loan program concluded in FY13 with $222 million in loan distributions. The Phase 2 - LWSAP continues distributions through FY23. The Phase 3 Water Loan Program is authorized for distributions FY18 through FY30.

Local Water System Assistance Program Distribution FY01-FY30



During the 1st Quarter of FY18, $4.6 million in interest-free loans was distributed to fund local water projects in Belmont, Medford, Melrose, Norwood and Wilmington. Total loan distribution for FY18 is $4.6 million. From FY01 through the 1st Quarter of FY18, more than $349 million has been distributed to fund 391 local water system rehabilitation projects in 39 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY18 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY18

Lead Service Line Replacement Loan Program

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

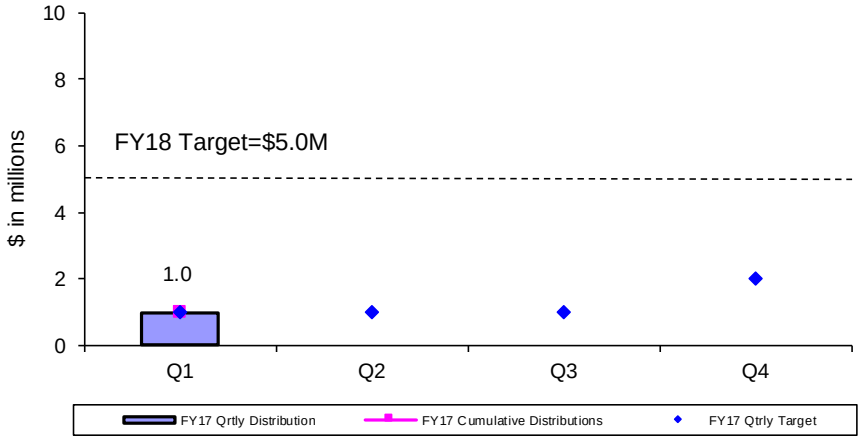
FY17 was the first year of the Lead Service Line Replacement Loan Program. During FY17, MWRA made three Lead Loan Program distributions to Newton for $4.0 Million, Quincy for $1.5 Million, and Winchester for $0.5 Million.

FY18 is the second year of the Lead Loan Program. During the 1st Quarter of FY18, one Lead Loan Program distribution was made to Marlborough for $1.0 Million

Summary of Lead Loans:

Marlborough in FY18	$1.0 Million
Newton in FY17	$4.0 Million
Quincy in FY17	$1.5 Million
Winchester in FY17	$0.5 Million
TOTAL	$7.0 Million

FY18 Quarterly Distributions of Lead Service Line Replacement Loans

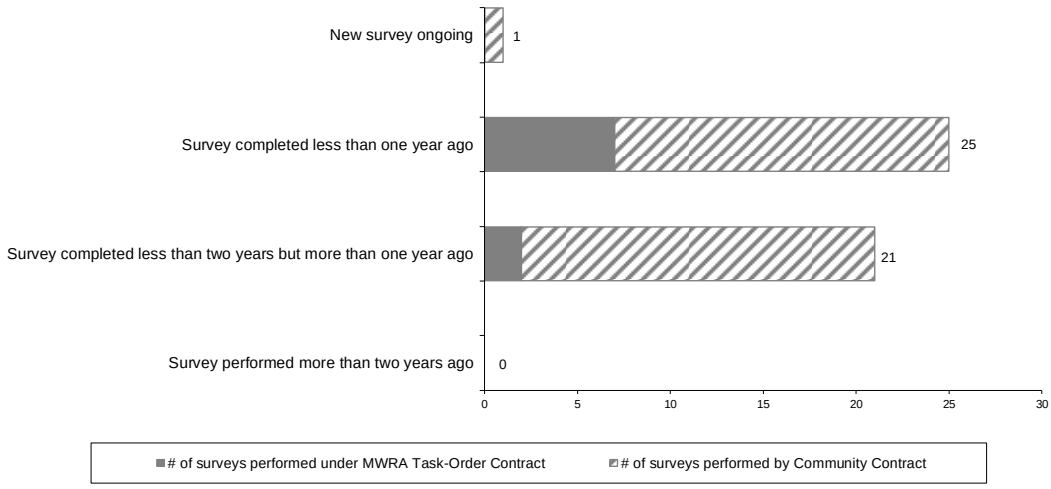


Community Support Programs

1st Quarter – FY18

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA's task order leak detection contract. MWRA's task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 1st Quarter of FY18, all member water communities were in compliance with MWRA's Leak Detection Regulation.



Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 205 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor and outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program's annual budget is $25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below. Distributions of water conservation materials are made based on requests from member communities and individual customers.

	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	100,000	1,770				1,770
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	2,018				2,018
Toilet Leak Detection Dye Tablets	------	6,126				6,126

BUSINESS SERVICES

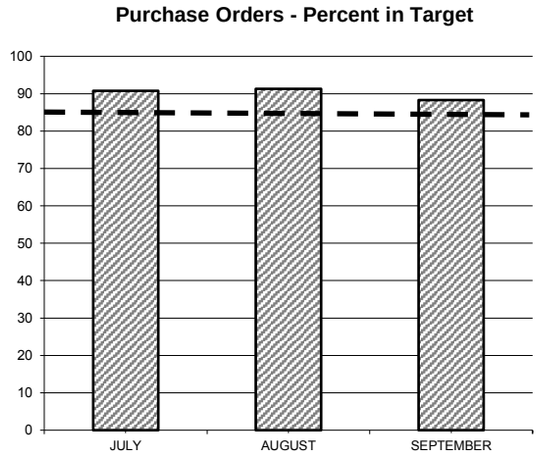
Procurement: Purchasing and Contracts

1st Quarter - FY18

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

Outcome: Processed 89.3% of purchase orders within target; Average Processing Time was 4.68 days vs. 4.69 days in Qtr 1 of FY17. Processed 62% (13 of 21) of contracts within target timeframes; Average Processing Time was 154 days vs. 101 days in Qtr 1 of FY17.

Purchasing



	No.	TARGET	PERCENT IN TARGET
$0 - $500	765	3 DAYS	83.9%
$500 - $2K	716	7 DAYS	93.8%
$2K - $5K	423	10 DAYS	93.1%
$5K - $10K	40	25 DAYS	85.0%
$10K - $25K	47	30 DAYS	87.2%
$25K - $50K	12	60 DAYS	66.6%
Over $50K	18	90 DAYS	77.7%

The Purchasing Unit processed 2021 purchase orders, 74 less than the 1947 processed in Qtr 1 of FY17 for a total value of $7,865,723 versus a dollar value of $2,639,781 in Qtr 1 of FY17.

The purchase order processing target was not met for the $0-$500 category due to item clarification and vendor sourcing; and the $25k- $50k and over $50k categories due to end user approvals and staff summary requirements.

Contracts, Change Orders and Amendments

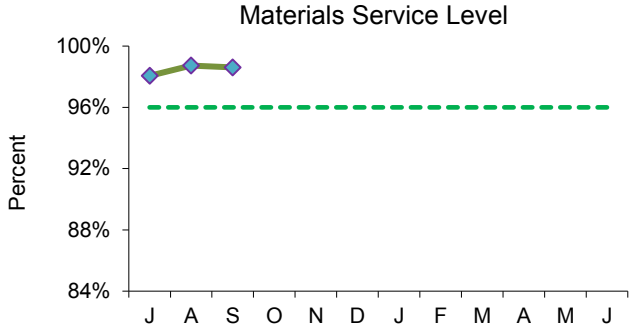
Eight contracts were not processed within the target timeframes. In two cases, the procurement process began in advance of the current contract expiration. The new contracts were in place according to schedule and budget needs. Another contract (Insurance Program Renewal FY18) was delayed due to additional procurement requirements necessary for insurance services. Insurance for all categories of coverage was obtained timely and according to schedule. A fourth contract was delayed due to an extended review of the contractor's qualifications; and another due to the addition and prioritization of an associated contract. A sixth contract was delayed due to compensation table and scope revisions. Another required re-evaluation of the submitted proposals, resulting in a delay of the contract award. The final contract was delayed due to the additional time required to respond to bidder questions, extensive revisions of the contract documents and later than anticipated issuance of third party construction permits.

Procurement processed twenty one contracts with a value of $40,513,676 and nine amendments with a value of $1,020,892. Twenty eight change orders were executed during the period. The dollar value of all non-credit change orders during Q1 FY18 was $3,265,831 and the value of credit change orders was ($586,703).

Staff reviewed 38 proposed change orders and 33 draft change orders.

Materials Management

1st Quarter - FY18



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,035 (98.5%) of the 7,140 items requested in Q1 from the inventory locations for a total dollar value of $958,972.

Inventory Value - All Sites

Inventory goals focus on:

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

The FY18 goal is to reduce consumable inventory from the July '17 base level ($8.29 million) by 2.0% (approximately $165,849), to $8.12 million by June 30, 2018 (see chart below).

Items added to inventory this quarter include:

- Deer Island – thermostats and anti-vibration pads for HVAC; tig torches, plasma torches, drag shields, gouge tips and gouge shields for Welding Shop; locksets for Facilities; elbows, cables, housing brackets and housing for I&C; isolation rings and expansion joints for Liquid Train
- Chelsea – a/c filters, oil filters, fuel filters, gaskets, seals, fuel stabilizers and grease guns for Fleet Services; pump assembly and motor, HVAC timer and limit switches for Work Coordination; stove for warehouse; battery packs for Metering.
- Southboro – v-belts, filter cartridges and couplings for Equipment Maintenance; oil filters for Fleet Services and bearing guides and drive nut wipers for Carroll Water Treatment Plant.

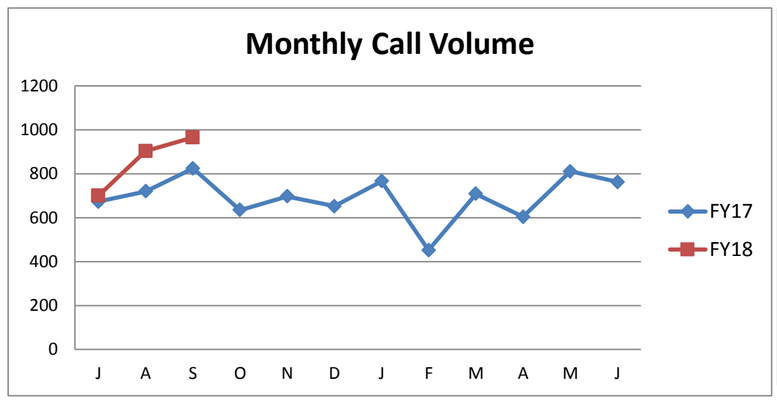
Property Pass Program:

- Five audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to $11,191. Year to date revenue received amounted to $11,191.
- Revenue received from online auctions held during Q1 amounted to $58,390. Year to date revenue received amounted to $58,390.

Items	Base Value July-17	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	8,292,452	8,471,461	179,009
Spare Parts Inventory Value	8,939,710	8,888,063	-51,647
Total Inventory Value	17,232,162	17,359,199	127,037

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

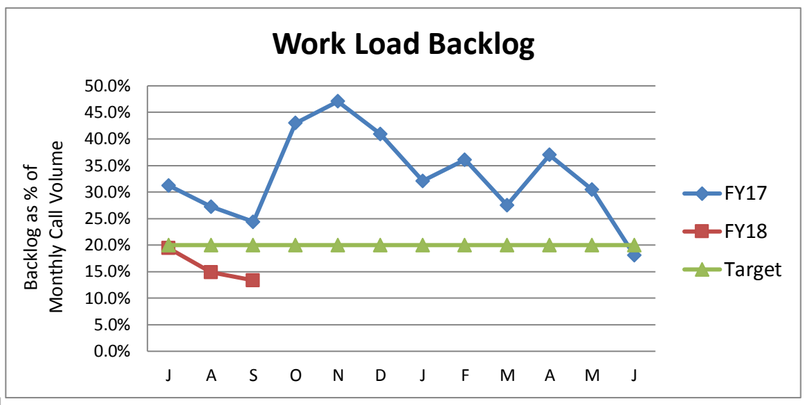
MIS Program
1st Quarter FY18

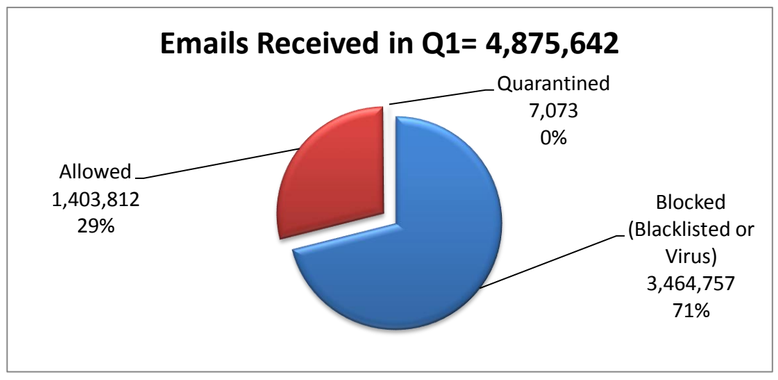


Performance & Backlog

Call Volume: Peaked in September. FY18-Q1 call volume increased by 18% from FY17-Q1.

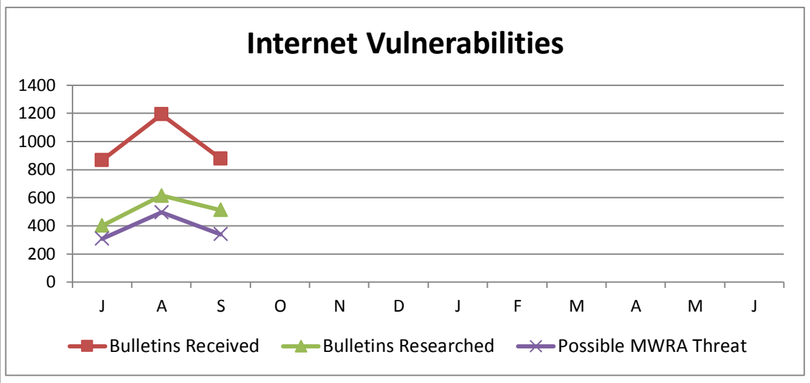
Call Backlog: Peaked in July. FY18-Q1 backlog average is 5% below the targeted benchmark of 20%.





Information Security

In Q1, pushed security fixes/ updates to desktops/servers protecting against 184 vulnerabilities. Landesk Antivirus quarantined 17 distinct viruses from 12 PCs. PCs are current with antivirus signatures for known



Infrastructure:

Office 2016 Upgrade: 91% of staff PCs have been upgraded. Continued supporting the testing of MS Access databases.

Server Virtualization: Completed migration of Management consoles to new hardware. New hardware received to replace individual physical servers with a virtualized host environment in CNY estimated completion date in late November.

Server Backup Solution Replacement: Hardware and software received. Scheduling implementation with vendor. Anticipated start in November.

Information Security Program: 28% of staff has completed the 2017 Security Awareness training; all staff must complete the training by March 2018.

Applications/Library & Records Center/Training:

e-Discovery Project:
Conducted a session with the vendor to configure the application for use at the MWRA. A User Acceptance Test (UAT) Plan was completed and approved. Began user testing using a past legal case as the test scenario. Scheduled a training session in October with Law users and the vendor.

Electronic Content Management (ECM) Project:
Participated in vendor demos of ECM products from two vendors, ranked as leaders by Gartner, to evaluate the products' functions and features and estimated product costs. Key members from the user community also attended the demos. Spoke with customers from several utilities and state agencies to collect feedback on their experiences with the product implementations, use, and vendor support.

Bouy-PI: Existing buoy data collection infrastructure upgraded to latest version of hardware and software. Architecture redesigned to leverage existing MWRA PI system for data storage and visualization.

LIMS:
DEP Auditors audited LIMS system last year provided recommendations to expand Control Chart functionality to include surrogate results for regular samples. Work in response to the audit was broken into two tasks. Task 1 - Control Chart Data Loads is complete. Task 2 - User-defined Specification Limits is in process.

Portia Upgrade: The upgrade to Portia is in production. Portia allows Treasury users to manage fixed investments and tracks interest and holdings on these investments.

Maximo Upgrade: Eleven of the 40 Maximo Crystal reports that were developed in-house have been accepted by users and put into production. The remaining are still being reviewed or have been put on hold.

PIMS:
Installed a new interface that utilizes tables instead of file system for TRAC invoice processing. Installed the Build 10.1.3 in production to resolve fixes to bugs and enhance functionality.

Library & Records Center:
The Library fulfilled 82 research requests, and provided 243 periodicals, standards, books and reports. Research topics included historical Quabbin water quality, aquatic invertebrates, Spot Pond Dam #1 drawings, CVA Redundancy 2008, corrosion control, safety and security, climate change, sea-level rise. The Records Center added 101 boxes, handled 239 boxes, disposed of 5 megabytes of records and attended 1 Records Conservation Board Meeting.

IT Training:
For the quarter, 203 staff attended 24 classes. 16% of the workforce has attended at least one class year-to-date. 155 staff attended the Office 2016 training held in 16 sessions at the Chelsea, Deer Island, Charlestown, Carroll Water Treatment Plant, and Southborough facilities. MAXIMO 7.6 training was offered. Customized quick references for Office 2016 applications for MS Excel, Access, Word, PowerPoint, and Outlook and began offering demos. Developed Lawson Excel Add-Ins application installation instructions for Desktop support or Helpline to use as needed.

Legal Matters
1st Quarter - FY18

PROJECT ASSISTANCE

Court and Administrative Orders:

- **Boston Harbor Litigation and CSO:** Reviewed comments by EPA, DEP, Mystic River Watershed Association, and Charles River Watershed Association on the CSO Post Construction Compliance Monitoring Program Scope of Work which MWRA submitted to DEP on May 1, 2017.

- **Administrative Consent Order (DITP power outages):** Drafted and submitted letter to DEP requesting that it formally close out ACOP-NE-04-1N003-SEP which is related to two DITP power outages in April in 2004.

Real Estate, Contract, Environmental and Other Support:

- **NPDES:** Reviewed and revised letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to CSO permit requirements. Reviewed and revised letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to indicator bacteria limits and dilution at DITP. Drafted letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to blending. Reviewed letter to EPA and DEP supplementing MWRA's application for renewal of its DITP NPDES Permit relating to ambient monitoring and the contingency plan. Reviewed cover letter for Carroll Water Treatment Plant's NPDES permit renewal application.

- **8(m) Permits:** Reviewed and approved sixty-five (65) 8(m) permits and one (1) direct connect permit.

- **Wireless Cell Agreements:** Reviewed and revised final Sprint wireless renewal cell permit agreement related to the installation, operation, maintenance, replacement and removal of communications equipment at MWRA's Turkey Hill water facility and AT&T wireless renewal cell permit agreements related to the installation, operation, maintenance, replacement and removal of communications equipment at MWRA's Turkey Hill and Walnut Hill water facilities.

- **Real Property:** Finalized license for UMass for access to and use of areas at Deer Island Nut Island on the coastal side of the coastal protection and/or seawalls for the purpose of studying the community composition of intertidal communities living on human-engineered shorelines. Drafted cease and desist order for unauthorized use of real property at Brattle Court in Arlington which is under the care, custody, and control of MWRA. Contacted MBTA relative to access by MWRA within its sewer easement on MBTA property in Dorchester to perform work on MWRA's Dorchester Interceptor. Finalized license for Wynn for access to and use of areas at DeLauri Pump Station related to the operation and maintenance of time lapse camera on an adjacent property. Drafted two (2) one day licenses for charitable events at Deer Island. Recorded certificate of compliance for order of conditions DEP 104-0971 related to work in Ware as part of MWRA Contract 7461 – Quabbin Power, Communications, and Security and certificate of compliance for order of conditions DEP 141-0483 related to work in Dedham as part of MWRA Contract 6453 – Southern Extra High Pipeline, Section 111. Drafted license between MWRA and Chelsea Soldier's Home for MWRA's use of a parking area in the event of an emergency. Reviewed and edited letter related to borings by MWRA at Boston Avenue in Medford as part of the WASM3 project.

- **Public Records Request:** Responded to six (6) public records request.

- **Watershed Preservation Restriction:** Reviewed Wachusett Reservoir Watershed Acquisitions W-001055 and W-001056 located at Justice Hill Road in Sterling, MA**.** Reviewed Quabbin Reservoir Watershed Acquisition, W-001178 for two (2) watershed preservation restrictions in Petersham, MA and Quabbin Reservoir Watershed Acquisition, W-001171 for a watershed preservation restriction in Petersham, MA**.**

- **Ogin Assignment for the Benefit of Creditors**: Staff negotiated and completed an agreement with Ogin's successor allowing an inoperable prototype wind turbine on MWRA property to be demolished.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters Two demands for arbitration was filed.

LITIGATION/TRAC --

New Matters There are no New Matters to report.

Significant Claims There are no Significant Claims to report.

Significant Developments

United States v. NSTAR Electric Company, et al., U.S.D.C. Civ. Action No. 16-11470-RGS: On July 12, 2017, a Stipulation and Order was signed by Judge Stearns in this matter staying the claims of the United States asserted on behalf of the Army Corps of Engineers re: Plaintiff's allegations of non-compliance with the Corps' 1989 permit allowing installation of the power cable to Deer Island. Later in July, Judge Stearns issued an order staying all cross-claims of the three defendants pending HEEC's compliance with a schedule to install the new cable and decommission the existing cable. MWRA submitted a letter of support to the Electric Facilities Siting Board in connection with HEEC's petition re: EFSB's lack of jurisdiction over the planned location of the new cable.

A Stipulation of Dismissal was filed in Fall River Electrical Associates Co., Inc. et al. v. Waterline Industries Corporation and MWRA: Suffolk Superior Court Civil Action No. 1584CV02383. This matter involved a 2015 bid protest by plaintiff Fall River Electrical on an MWRA project and was resolved by the Attorney General bid protest unit; dismissal of the court action was more of a formality as Fall River Electrical was ultimately awarded the project and there were no damages for it to claim.

Current Employee v. MWRA: Plaintiff is currently employed as an Environmental Scientist at Southboro. Plaintiff alleges that on February 2012, an arbitrator rendered an award in his favor as to retroactive pay and negotiation of an appropriate pay grade. Plaintiff seeks to confirm the alleged arbitration award and recover alleged lost income. The Complaint served by Plaintiff is devoid of supporting facts and a description of his claims; the summons and complaint are incorrectly headed as a Suffolk Superior Court filing when the case is actually filed in Middlesex County; and the Complaint fails to attach a copy of the alleged arbitration award. The MWRA filed a Motion to Dismiss for Failure to State a Claim on May 18, 2017. On July 31, 2017 the Court allowed MWRA's Motion to Dismiss on the grounds that the employee had no standing to enforce an arbitration award between MWRA and his union. Lastly, the complaint was filed outside the time limits permitted to bring a claim.

During the 1st Quarter of FY 2018, three new subpoenas were received and one subpoena was pending at the end of the 1st Quarter FY 2018.

During the First Quarter of FY 2018, twenty public records requests were received and fourteen public records requests were closed.

SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2017	As of June 2017	As of Mar 2017
Construction/Contract/Bid Protest (other than BHP)	0	0	2
Tort/Labor/Employment	2	3	2
Environmental/Regulatory/Other	2	2	2
Eminent Domain/Real Estate	0	0	0
total – all defensive cases	**4**	**5**	**6**
Other Litigation matters (restraining orders, etc.) MWRA v. Thomas Mercer MWRA v. NSTAR and HEEC	2	2	2
total – all pending lawsuits	**6**	**7**	**8**
Claims not in suit: Joel Chiet Claim Besnick Lalaj and Violeta Lalaj Claim Thang Viet Vu and Oanh Vu Claim	3	3	3
Bankruptcy	2	2	1
Wage Garnishment	15	15	15
TRAC/Adjudicatory Appeals	1	2	3
Subpoenas	1	1	0
TOTAL – ALL LITIGATION MATTERS	**28**	**30**	**30**

TRAC/MISC.

New Appeals: No new TRAC appeals received.

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

Stipulation of Dismissal One TRAC appeal filed a Joint Stipulation of Dismissal on September 29, 2017.
City Fresh Foods, Inc.; MWRA Docket No. 17-03

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

Tentative Decision No Tentative Decisions were issued in the 1st Quarter FY 2018.

Decisions No Final Decisions was issued in the 1st Quarter FY 2018.

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES
1st Quarter FY18

Highlights
During 1st Quarter FY18, Internal Audit (IA) issued reports on the BWSC CSO Financial Assistance Agreement (FAA) for the final period of the agreement and City of Cambridge FAA for 2012 to 2015. Reports were also issued on the NEFCo operations of the Pellet Plant in Quincy and the CNY lease for CY16 operating expenses and FY17 real estate taxes.

IA completed three consultant preliminary reports and six preliminary construction labor burden reviews with contract values totaling $15.2 mill. and $45.9 mill., respectively. A final report on an incurred cost audit was also issued. Management advisory services included the calculations for the FY18 MWRA overhead rate, unemployment compensation review, and continuing support on HEEC.

Status of Recommendations
During 1st Quarter FY18, a total of 12 recommendations from prior fiscal years' audits were closed.

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

Report Title (issue date)	Audit Recommendations		
	Open	Closed	Total
Follow-Up Report on Fleet Services Activities (12/31/13)	1	16	17
Unmatched Receipts and Accruals (6/30/15)	3	7	10
Warehouse Cycle Counts at DITP (11/5/15), Southboro (11/6/15) and Chelsea (12/4/15)	2	23	25
MIS Mobile Equipment Asset Tracking (9/26/16)	1	11	12
Wright Express (WEX) Credit Card Fuel Purchases (11/16/16)	6	7	13
Purchase Card Activity on Deer Island (3/31/17)	4	11	15
Total Recommendations	***17***	***75***	***92***

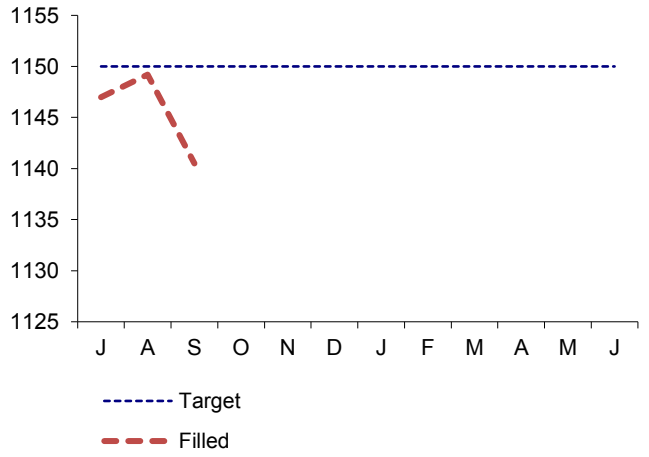
Cost Savings
IA's target is to achieve at least $1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

Cost Savings	FY14	FY15	FY16	FY17	FY18 Q1	TOTAL
Consultants	$294,225	$87,605	$88,312	$272,431	$42,491	$785,064
Contractors & Vendors	$415,931	$1,146,742	$1,772,422	$3,037,712	$692,865	$7,065,672
Internal Audits	$923,370	$543,471	$220,929	$224,178	$45,909	$1,957,857
Total	**$1,633,526**	**$1,777,818**	**$2,081,663**	**$3,534,321**	**$781,265**	**$9,808,593**

OTHER MANAGEMENT

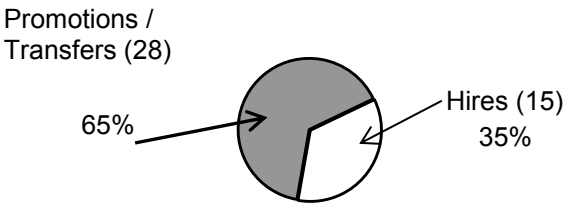
Workforce Management
1st Quarter FY18

FTE Tracking



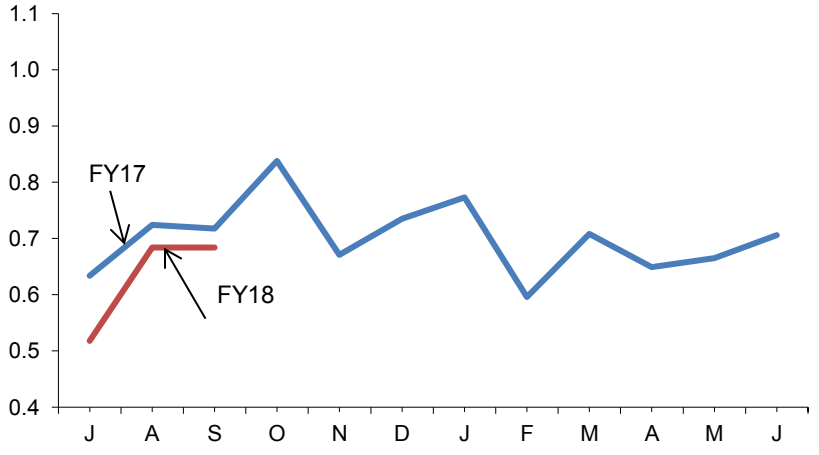
FY18 Target for FTE's = 1150
FTE's as of Sept 2017 = 1140.5

Positions Filled by Hires/Promotions
FY18-YTD



	Pr/Trns	Hires	Total
FY16	99 (62%)	60 (38%)	159
FY17	155 (68%)	72 (32%)	227
FY18-YTD	28 (65%)	15 (35%)	43

Average Monthly Sick Leave Usage
Per Employee



Average monthly sick leave for the 1st Quarter of FY18 decreased as compared to the 1st Quarter of FY17 (7.54 to 8.41 days)

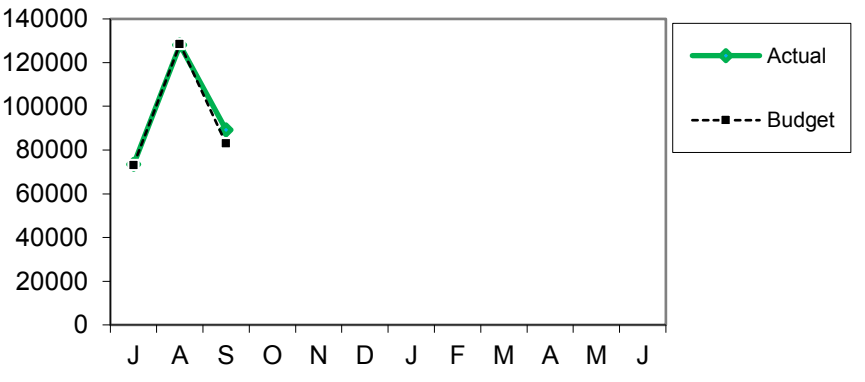
	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY17
Admin	136	1.32	5.29	22.0%	7.75
Aff. Action	6	1.10	4.38	0.0%	6.28
Executive	5	0.59	2.35	0.0%	13.80
Finance	36	1.35	5.40	5.0%	8.50
Int. Audit	7	0.93	3.72	0.0%	6.51
Law	15	1.51	6.05	8.6%	8.98
OEP	8	0.68	2.72	0.0%	5.74
Operations	934	1.74	6.94	17.4%	8.55
Pub. Affs.	14	2.73	10.92	74.7%	6.31
MWRA Avg	**1161**	**1.89**	**7.54**	**18.3%**	**8.42**

Percent of sick leave usage for FY18, attributable to Family and Medical Leave Act (FMLA) is 18.3% .

Field Operations
Current Month Overtime $

Total Overtime for Field Operations for the first quarter of FY 2018 was $822k which is $196k over budget. Planned overtime was $328 or $183k over budget, mainly for maintenance off-hours work to alleviate a project backlog in western ops due to staff vacancies, replacement of manholes in a community prior to a major repaving job, and crane rigging to hoist replacement HVAC units into place at the Chelsea maintenance facility. Emergency overtime was $342k, $35k over budget primarily due to wet weather response and emergency response for leak repair. Coverage overtime was $152k, which was ($22k) under budget, reflecting the month's shift coverage requirements.

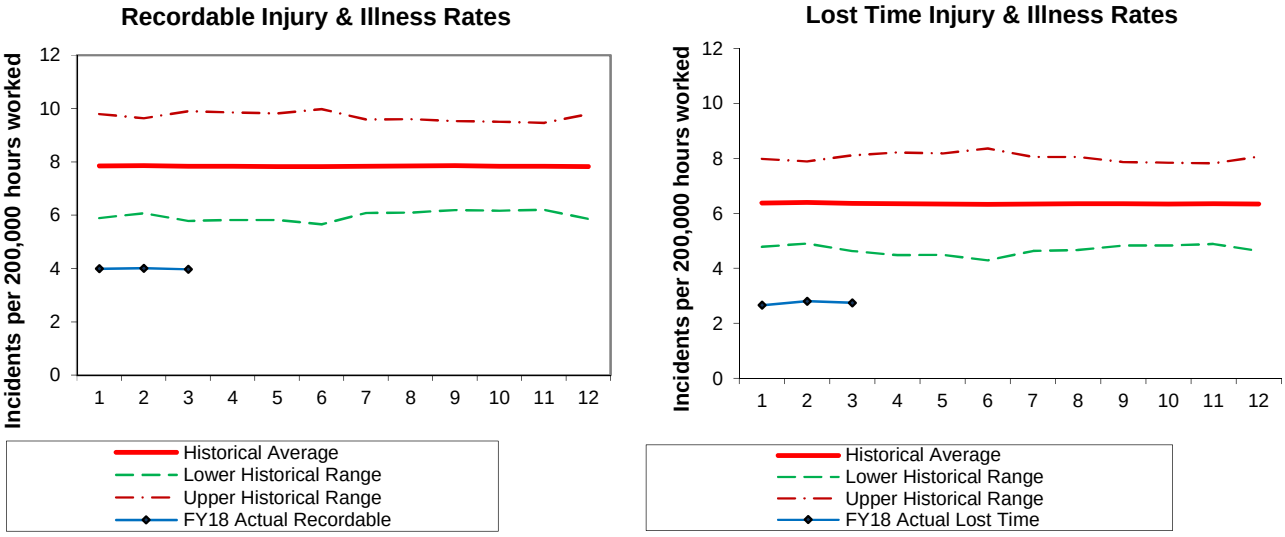
Deer Island Treatment Plant
Current Month Overtime $



Deer Island's total overtime expenditure in the first quarter of FY18 was $291K, which was $6K higher than the budget. Deer Island experienced higher than anticipated shift coverage requirements due a to Thermal Power Plant IA and vacant operator positions,$41k, offset by less than anticipated storm coverage requirements, ($27K) and lower than anticipated planned/unplanned overtime, ($7K). YTD, Deer Island has spent $290,604 on overtime which was $7K over budget.

Workplace Safety

1st Quarter - FY18



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 HIGHLIGHTS

	1st Quarter Information		
	New	Closed	Open Claims
Lost Time	6	12	64
Medical Only	11	21	16
Report Only	35	35	
	QYTD		FYTD
Regular Duty Returns	9		9
Light Duty Returns	2		2

COMMENTS:

Regular Duty Returns

JULY One Employee returned to full duty/no restrictions
AUG Three Employees returned to full duty/no restrictions
SEPT Five Employees returned to full duty/no restrictions

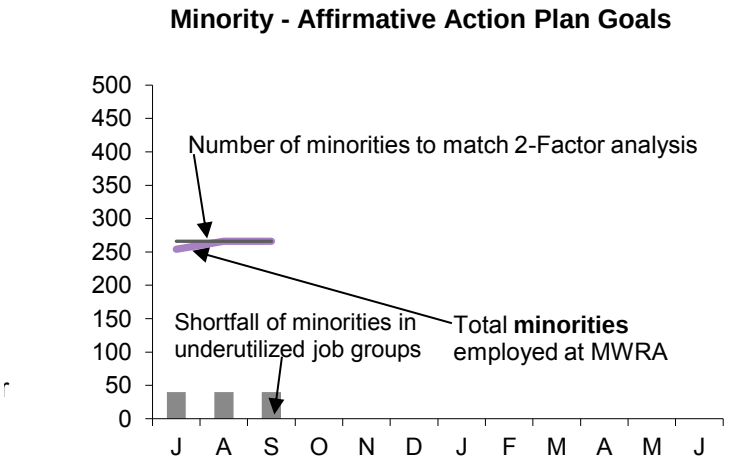
Light Duty Returns

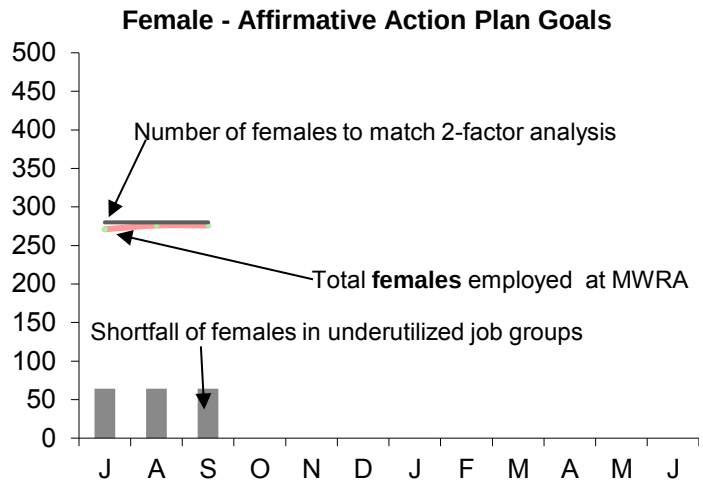
JULY N/A
AUG One employee returned to light duty
SEPT One employee returned to light duty

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

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

MWRA Job Group Representation
1st Quarter - FY18





Highlights:
At the end of Q1 FY18, 7 job groups or a total of 40 positions are underutilized by minorities as compared to 4 job groups or a total of 111 positions at the end of Q1 FY17; for females 10 job groups or a total of 64 positions are underutilized by females as compared to 8 job groups or a total of 31 positions at the end of Q1 FY17. During Q1, 5 minorities and 6 females were hired. During this same period 3 minorities and 6 females terminated.

Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 9/30/2017	Minorities as of 9/30/2017	Achievement Level	Minority Over or Under Underutilized	Females As of 9/30/2017	Achievement Level	Female Over or Under Underutilized
Administrator A	21	2	2	0	7	6	1
Administrator B	21	1	4	-3	3	4	-1
Clerical A	35	13	10	3	30	15	15
Clerical B	27	9	7	2	10	8	2
Engineer A	75	21	17	4	16	15	1
Engineer B	62	18	14	4	14	7	7
Craft A	115	18	27	-9	1	8	-7
Craft B	148	27	33	-6	3	8	-5
Laborer	64	22	14	8	2	3	-1
Management A	98	15	24	-9	36	40	-4
Management B	45	8	7	1	9	5	4
Operator A	69	4	11	-7	1	3	-2
Operator B	63	13	12	1	4	18	-14
Professional A	34	5	8	-3	20	16	4
Professional B	161	46	42	4	80	53	27
Para Professional	61	19	22	-3	30	53	-23
Technical A	52	11	11	0	6	12	-6
Technical B	6	1	1	0	1	2	-1
Total	**1157**	**253**	**266**	**27/-40**	**273**	**276**	**61/-64**

AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/Transfers	AACU Ref. External	Position Status
Administrator B	Assistant Director, Engineering	1	Int/Ext	Int	0	Trans = WM
Administrator B	Manager, Metering & Monitoring	1	Int/Ext	Int	0	Promo = WM
Craft A	Sr. Medium Electric Specialist	1	Int	Int	0	Promo = WM
Craft A	Valve Maintenance Foreman	1	Int/Ext	Int	0	Promo = WM
Craft B	Instrument Technician	1	Int	Int/Ext	0	NH = HM
Craft B	HVAC Specialist	1	Int	Int/Ext	**1**	In Progress
Clerical B	Inventory Control Specialist	1	Int/Ext	Int	0	Trans = WM
Engineer A	Program Manager, Energy Management	1	Int/Ext	Int/Ext	0	NH = WF
Laborers	Buildings and Grounds Supervisor	1	Int/Ext	Int/Ext	0	Promo = WM
Laborers	Supervisor, T&T Operations	1	Int/Ext	Int	0	Promo = WM
Management A	Manager, SCADA & Process Control	1	Int	Int	0	Promo = WM
Management A	Manager, Energy	1	Int/Ext	Int/Ext	0	NH = WM
Operator B	Operator	1	Int/Ext	Int	0	Promo = WM
Professional B	Chemist III	1	Int/Ext	Int	0	Promo = WF
Professional B	Regional Manager (Inspections)	1	Int/Ext	Int	0	Promo = BM
Professional B	Laboratory Supervisor III	1	Int/Ext	Int	0	Promo = WM

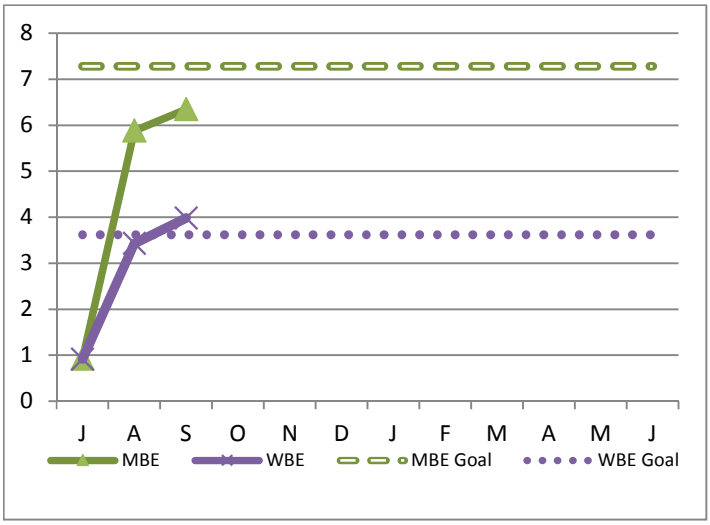
MBE/WBE Expenditures

1st Quarter - FY18

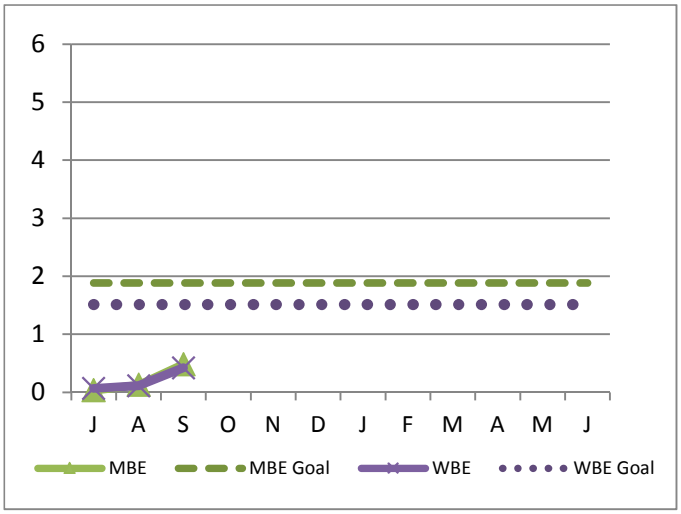
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY18 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

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

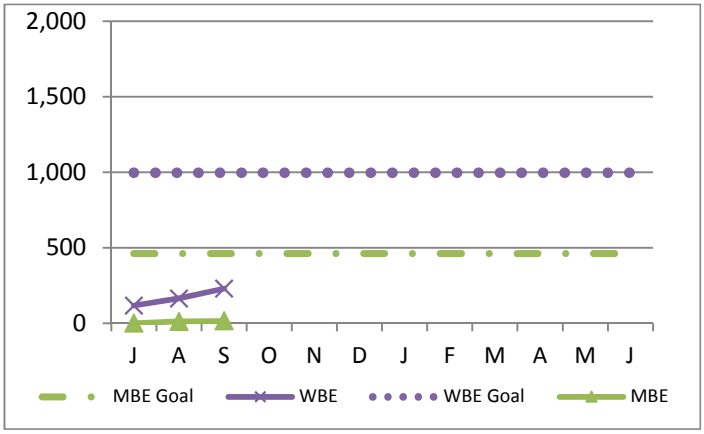
Construction



Professional Services



Goods/Services



FY17 spending and percentage of goals achieved, as well as FY16 performance are as follows:

MBE					WBE			
FY18 YTD		FY17			FY18 YTD		FY17	
Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
6,344,419	87.2%	5,628,738	99.5%	Construction	3,986,079	110.1%	3,690,334	131.3%
484,660	25.7%	920,597	162.8%	Prof Svcs	424,071	28.0%	533,917	117.5%
15,625	3.4%	179,359	29.8%	Goods/Svcs	230,018	23.1%	1,553,214	181.6%
6,844,704	71.1%	6,728,694	98.6%	**Totals**	4,640,168	75.7%	5,777,465	140.2%

FY17 MBE/WBE dollar totals do not include MBE and WBE payments to prime contractors and consultants.

FY18 MBE/WBE dollar totals include F17 MBE/WBE dollars submitted in FY18.

MWRA - CEB Expenses

1st Quarter – FY18

	September 2017 Year-to-Date ($000)					
	Budget	Actual	Variance	%	FY18 Budget	%
EXPENSES						
WAGES AND SALARIES	$ 21,532	$ 21,894	$ 362	1.7%	$104,286	21.0%
OVERTIME	1,003	1,182	180	17.9%	4,111	28.8%
FRINGE BENEFITS	4,810	4,687	(124)	-2.6%	20,998	22.3%
WORKERS' COMPENSATION	581	218	(362)	-62.4%	2,323	9.4%
CHEMICALS	2,888	2,525	(362)	-12.6%	9,837	25.7%
ENERGY AND UTILITIES	4,622	4,575	(47)	-1.0%	21,735	21.1%
MAINTENANCE	6,542	6,488	(54)	-0.8%	32,201	20.1%
TRAINING AND MEETINGS	80	64	(17)	-20.9%	406	15.7%
PROFESSIONAL SERVICES	1,731	1,667	(64)	-3.7%	7,222	23.1%
OTHER MATERIALS	949	973	25	2.6%	6,693	14.5%
OTHER SERVICES	6,055	5,919	(136)	-2.2%	22,765	26.0%
TOTAL DIRECT EXPENSES	**$ 50,794**	**$ 50,194**	**$ (600)**	**-1.2%**	**$232,576**	**21.6%**
INSURANCE	$ 503	$ 415	$ (89)	-17.6%	$ 2,013	20.6%
WATERSHED/PILOT	6,291	6,005	(286)	-4.5%	25,164	23.9%
BECo PAYMENT	239	199	(40)	-16.9%	957	20.8%
MITIGATION	399	394	(6)	-1.4%	1,597	24.7%
ADDITIONS TO RESERVES	205	205	-	0.0%	821	25.0%
RETIREMENT FUND	3,277	3,277	-	0.0%	3,277	100.0%
POST EMPLOYEE BENEFITS	-	-	-	---	5,035	0.0%
TOTAL INDIRECT EXPENSES	**$ 10,916**	**$ 10,495**	**$ (420)**	**-3.9%**	**$ 38,866**	**27.0%**
STATE REVOLVING FUND	$ 20,159	$ 20,159	$ -	0.0%	$ 84,932	23.7%
SENIOR DEBT	65,265	65,265	-	0.0%	264,560	24.7%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	(392)	(392)	-	0.0%	(392)	100.0%
CURRENT REVENUE/CAPITAL	3,300	3,300	-	0.0%	13,200	25.0%
SUBORDINATE MWRA DEBT	20,767	20,767	-	0.0%	85,443	24.3%
LOCAL WATER PIPELINE CP	949	949	-	0.0%	3,795	25.0%
CAPITAL LEASE	804	804	-	0.0%	3,217	25.0%
DEBT PREYAYMENT	-	-	-	---	10,900	0.0%
VARIABLE DEBT	-	(2,042)	(2,042)	---	-	0.0%
HEEC CABLE CAPACITY RES	-	-	-	---	6,532	---
DEFEASANCE ACCOUNT	-	-	-	---	-	---
TOTAL DEBT SERVICE	**$110,853**	**$108,811**	**$ (2,042)**	**-1.8%**	**$472,188**	**23.0%**
TOTAL EXPENSES	**$172,562**	**$169,501**	**$ (3,062)**	**-1.8%**	**$743,630**	**22.8%**
REVENUE & INCOME						
RATE REVENUE	$179,264	$179,264	$ -	0.0%	$717,054	25.0%
OTHER USER CHARGES	2,420	2,409	(11)	-0.5%	9,011	26.7%
OTHER REVENUE	1,252	5,827	4,575	365.3%	7,359	79.2%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	2,266	2,511	245	10.8%	10,206	24.6%
TOTAL REVENUE & INCOME	**$185,201**	**$190,011**	**$ 4,809**	**2.6%**	**$743,630**	**25.6%**

As of September 2017, total expenses are $169.5 million, $3.1 million or 1.8% lower than budget, and total revenue is $190.0 million, $4.8 million or 2.6% over budget, for a net variance of $7.9 million.

Expenses –

Direct Expenses are $50.2 million, $600k or 1.2% below budget.

- **Chemicals** are underspent by $363k or 12.6% under budget due to lower flows at DI and CWTP and timing of deliveries: Sodium Hypochlorite by $152k due to lower flows at DI, Soda Ash by $144k reflecting lower flows and higher natural pH at CWTP, and Activated Carbon by $49k, partially offset by over spending of $158k for Hydrogen Peroxide again due to lower flows.
- **Worker's Compensation** expenses are $362k under budget or 62.4%, primarily due to timing of compensation reserves adjustments and lower medical payments.
- **Wages & Salaries** are over budget by $362k or 1.7%, regular pay was $386k over budget, primarily due to vacation and sick pay leave accrual. After netting out the leave accrual, Regular Pay was $642k under budget. At the end of September, the average Full Time Equivalent (FTE) positions were 1,148, two fewer than the 1,150 FTE's budgeted.
- **Other Services** expenses are $136k, or 2.2%, under budget primarily due to timing of payment of membership dues budgeted in the first quarter but not invoiced yet.
- **Overtime** expenses are $180k over budget or 17.9% due to recent wet weather events and off-hours maintenance.
- **Fringe Benefits** expenses are $124k, or 2.6%, under budget, primarily for lower Health Insurance costs of $78k due to fewer employees and retirees than budgeted participating in health insurance plans, and the shift from family to individual plans.

Indirect Expenses are $10.5 million, $420k under budget or 3.9%. Watershed reimbursement is $286k under budget due to a year-end over accrual, Insurance Claims/Premiums are under budget by $89k, and lower than budgeted HEEC O&M of $40k.

Debt Service Expenses totaled $108.9 million, $2.0 million under budget due to variable rate debt savings of $2.0 million reflecting lower than budgeted interest rates.

Revenue and Income –

Total Revenue / Income is $190.0 million, $4.8 million higher than budget, primarily due to a $4.2 million LIBOR settlement from Baclays Bank PLC. Revenues were also over budget by $245,000 for favorable returns on investment income, $228,000 for the final payment of a class action lawsuit settlement for derivative agreements, $100,000 for revenue attributable to renewable energy credits and energy rebates, and $66,000 for disposal of surplus material.

Cost of Debt
1st Quarter – FY18

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

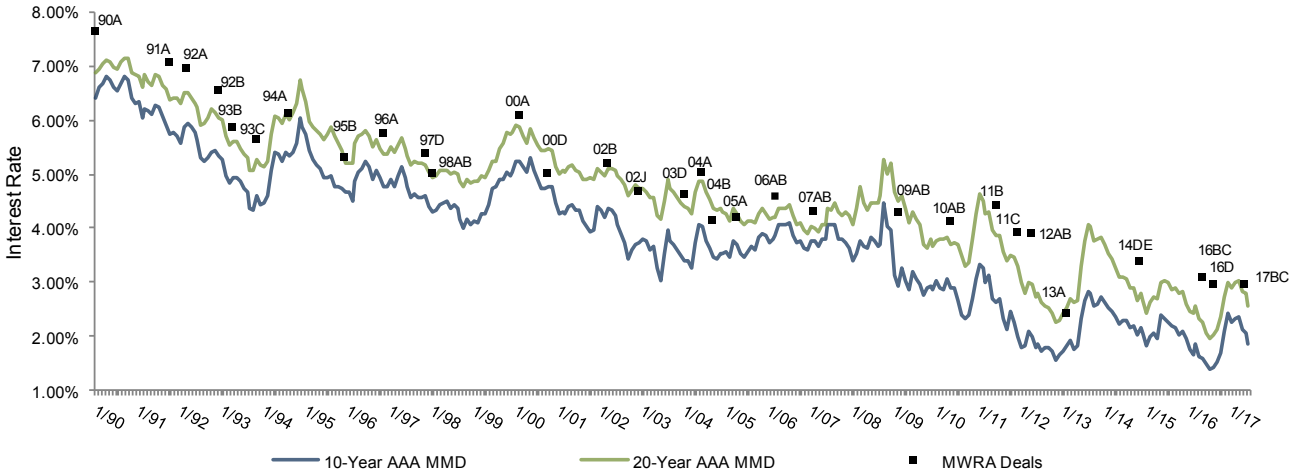
Average Cost of MWRA Debt FYTD

Fixed Debt ($3,511)	3.82%
Variable Debt ($470.9)	1.26%
SRF Debt ($951.0)	1.43%
Weighted Average Debt Cost ($5,093)	3.11%

Most Recent Senior Fixed Debt Issue
May 2017

2017 Series B &C ($322.9)	2.98%

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

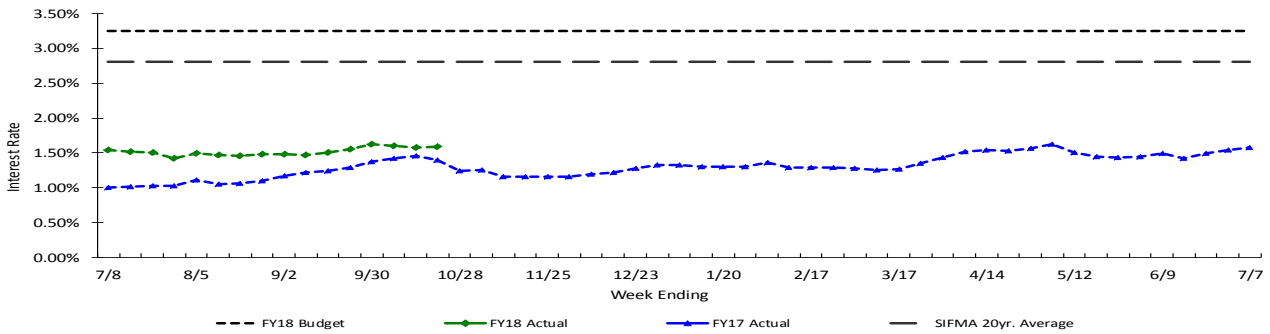


Bond Deal	1992B	1993B	1993C	1994A	1995B	1996A	1997D	1998AB	2000A	2000D	2002B	2002J	2003D	2004A
Rate	6.58%	5.89%	5.66%	6.15%	5.34%	5.78%	5.40%	5.04%	6.11%	5.03%	5.23%	4.71%	4.64%	5.05%
Avg Life	6.3 yrs	19.8 yrs	19.1 yrs	19.5 yrs	20.5 yrs	19.5 yrs	21.6 yrs	24.4 yrs	26.3 yrs	9.8 yrs	19.9 yrs	19.6 yrs	18.4 yrs	19.6 yrs

Bond Deal	2004B	2005A	2006AB	2007AB	2009AB	2010AB	2011B	2011C	2012AB	2013A	2014DEF	2016BC	2016D	2017BC
Rate	4.17%	4.22%	4.61%	4.34%	4.32%	4.14%	4.45%	3.95%	3.93%	2.45%	3.41%	3.12%	2.99%	2.98%
Avg Life	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	18.8yrs	11.2 yrs

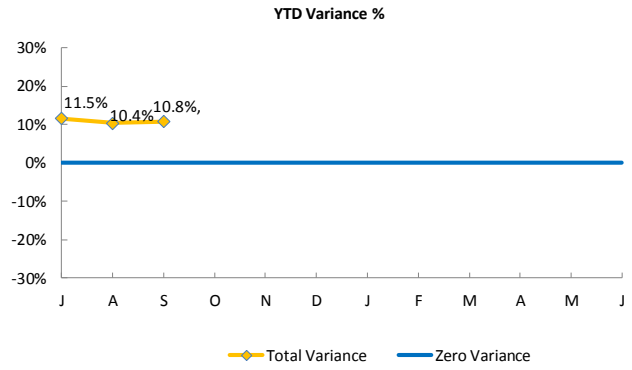
Weekly Average Variable Interest Rates vs. Budget

MWRA currently has ten variable rate debt issues with $835.2 million 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 September, SIFMA rates ranged from a high of 0.94% to a low of 0.78% for the month. MWRA's issuance of variable rate debt, although consistently less expensive in recent years, results in exposure to additional interest rate risk as compared to fixed rate debt.

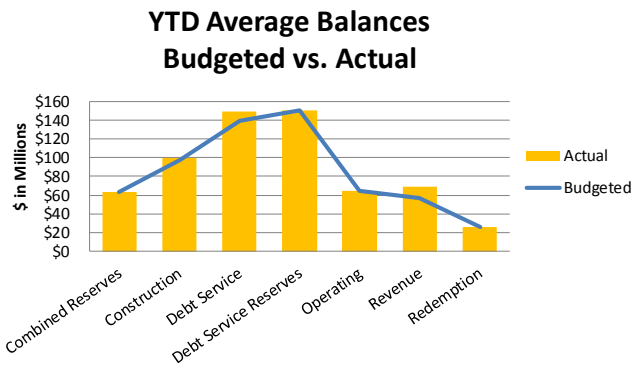


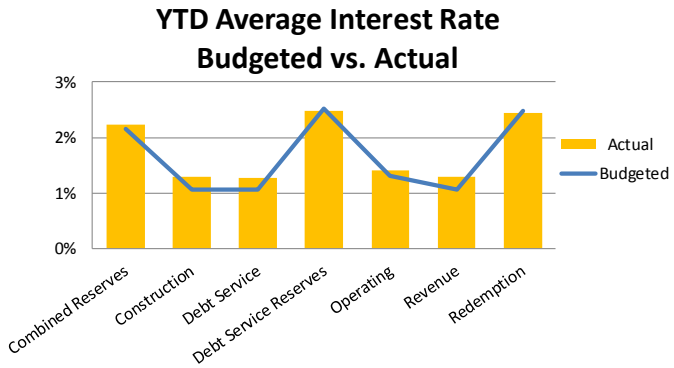
Investment Income
1st Quarter – FY18

Year To Date

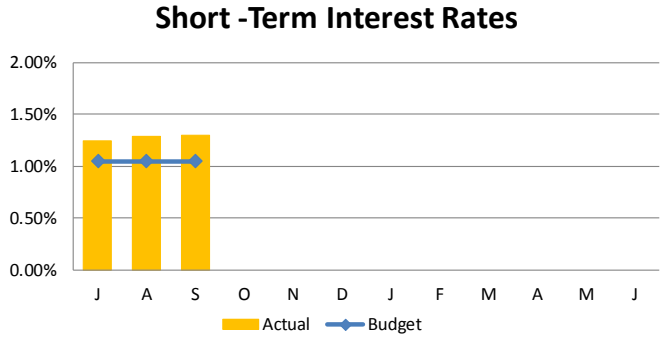


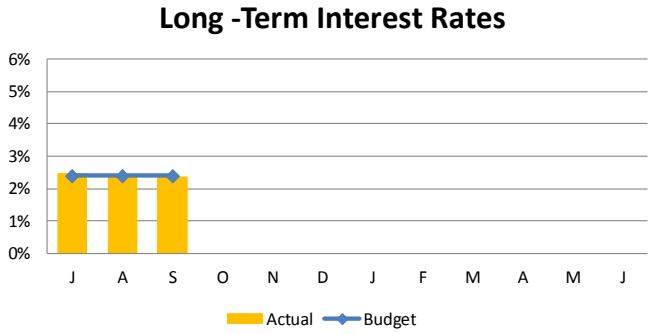
	YTD BUDGET VARIANCE ($000)			
	BALANCES IMPACT	RATES IMPACT	TOTAL	%
Combined Reserves	($0)	$12	11	3.6%
Construction	$5	$54	59	24.7%
Debt Service	$24	$77	101	29.6%
Debt Service Reserves	($1)	($8)	(9)	-1.1%
Operating	($0)	$15	15	7.5%
Revenue	$31	$39	70	50.6%
Redemption	$0	($1)	(1)	-1.0%
Total Variance	$58	$187	$245	10.8%

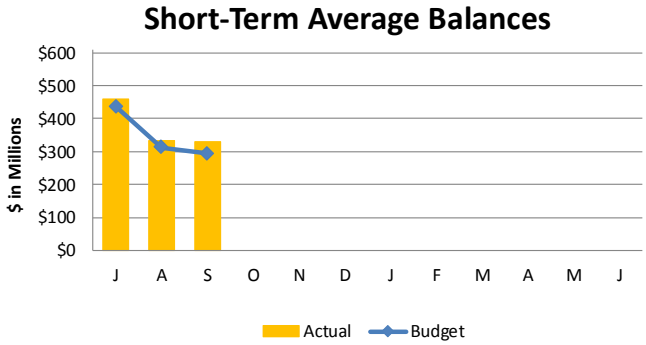


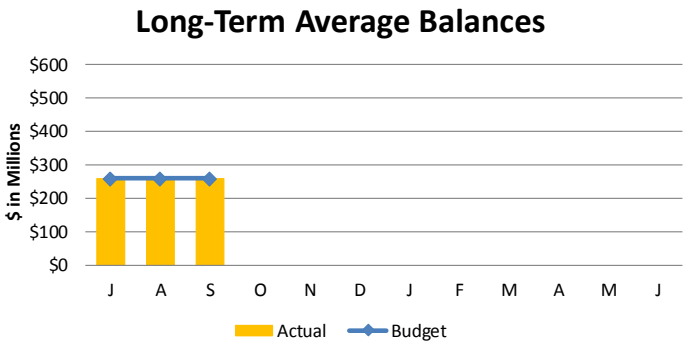


Monthly









STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: FY18 Financial Update and Summary through October

COMMITTEE: Administration, Finance & Audit

X INFORMATION
___ VOTE

Kathy Soni, Budget Director
Louise L. Miller, Budget Manager
Preparer/Title

Thomas J. Durkin
Director, Finance

RECOMMENDATION:

For information only. This staff summary provides the financial results and variance highlights for Fiscal Year 2018 through October, comparing actual spending to the budget.

DISCUSSION:

Total year-to date variance for FY18 is $9.5 million due to lower direct expenses of $1.3 million, lower debt service of $2.6 million, lower indirect expenses of $430,000, and higher revenues of $5.1 million.

FY18 Current Expense Budget

The expense variances for the first quarter of Fiscal Year 2018 by major budget category were:

- Net Lower Direct Expenses of $1.3 million, or 1.9%. Spending was lower for Worker's Compensation, Chemicals, Wages & Salaries, Utilities, Fringe Benefits, and Professional Services. This is offset by higher spending on Maintenance, Overtime, Other Materials, Training & Meetings, and Other Services.

- Lower Debt Service of $2.6 million, or 1.8%, due to favorable short-term interest rates.

- Lower Indirect Expenses of $430,000, or 3.3%, due to lower Watershed reimbursements and Insurance costs.

FY18 Budget and FY18 Actual Year-to-Date Variance by Expenditure Category
(in millions)

	FY18 Budget YTD	FY18 Actual YTD	$ Variance	% Variance
Direct Expenses	$69.4	$68.1	-$1.3	-1.9%
Indirect Expenses	$13.3	$12.8	-$0.4	-3.3%
Debt Service	$145.6	$143.0	-$2.6	-1.8%
Total	**$228.3**	**$223.9**	**-$4.4**	**-1.9%**

Totals may not add due to rounding

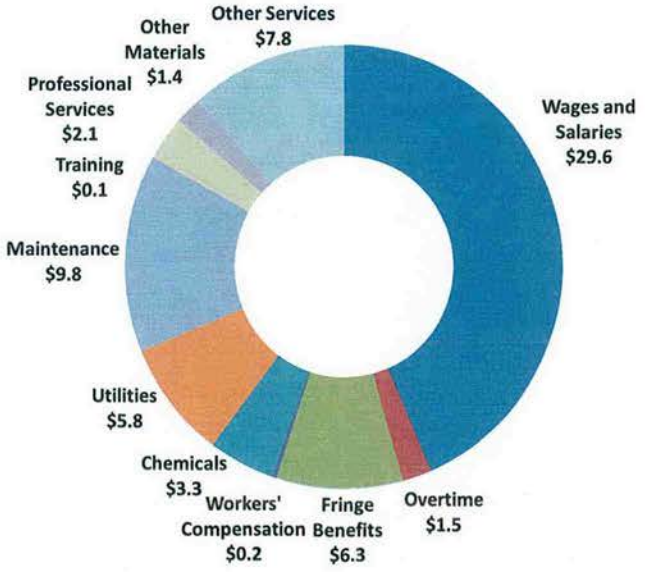
Year-to-date Revenues of $248.2 million were $5.1 million over budget reflecting a $4.2 million receipt from the settlement between various State Attorneys General and Barclays PLC for attempting to manipulate the LIBOR market. LIBOR is a standard financial index used to set the cost of various variable-rate loans. Revenues were also over budget by $346,000 for favorable returns on investment income, $228,000 for the final payment of a class action lawsuit settlement for derivative agreements, $209,000 for revenue attributable to renewable energy credits and energy rebates, and $95,000 for disposal of surplus material.

Please refer to Attachment 1 for a more detailed comparison by line item of the budget variances for the year to date.

Direct Expenses

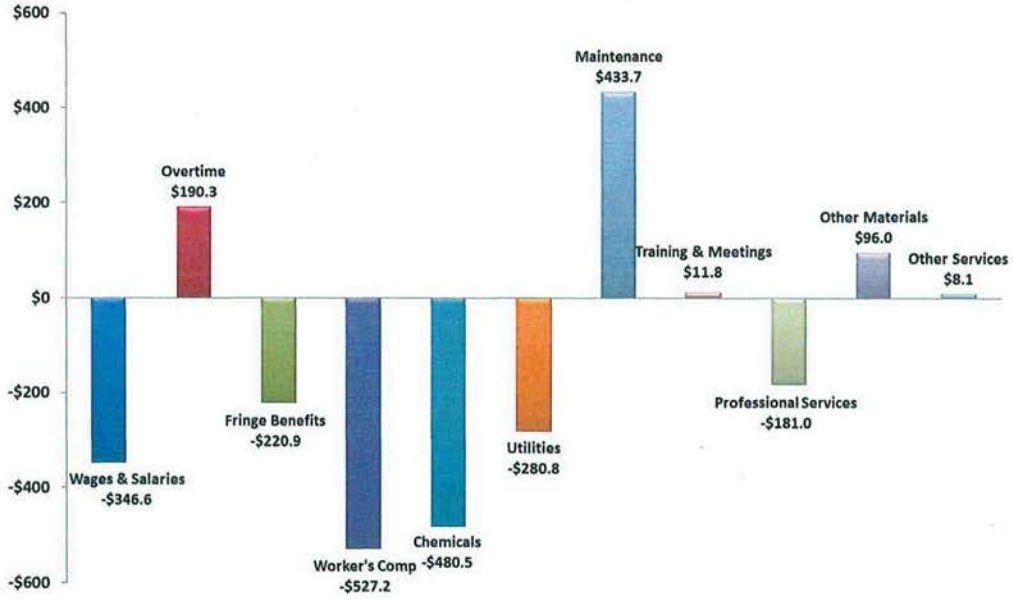
Year-to-date direct expenses totaled $68.1 million, $1.3 million, or 1.9%, less than budgeted.

FY18 Year-to-Date Direct Expenses
(in millions)



Lower than budgeted spending in Worker's Compensation, Chemicals, Wages & Salaries, Utilities, Fringe Benefits, and Professional Services was offset by higher spending for Maintenance, Overtime, Other Materials, Training & Meetings, and Other Services.

FY18 Year-to-Date Direct Expense Variance
(in thousands)



Worker's Compensation

Through October, Worker's Compensation expenses were lower than budget by $527,000, or 68.1%. Indemnity payments and reserves were lower than budget by $358,000 year-to-date primarily as the result of the settlement of one claim, and the resolution of a number of other claims through return to work. Medical payments and reserves were lower than budget by $140,000 for lower medical expenses and a reduction in medical reserves for the same claims. Expense payments and reserves were lower than budget by $28,000 primarily for a reduction in reserves for continuing cases. It should be noted that the Worker's Compensation budget is spread evenly every month during the course of the year and can result in wide monthly variations that cannot be predicted.

Chemicals

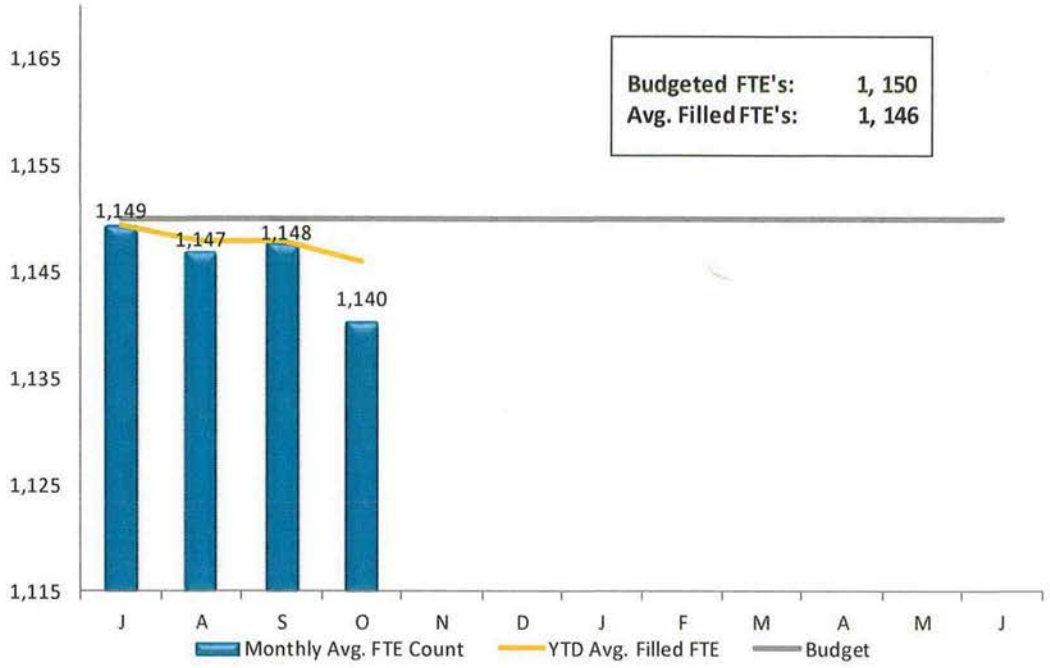
Year-to-date, Chemicals were lower than budget by $481,000 or 12.7%. Underspending for Sodium Hypochlorite of $194,000 primarily at Deer Island Wastewater Treatment Plant (DITP); Soda Ash of $199,000 primarily at John Carroll Water Treatment Plant (Carroll Plant); Activated Carbon of $151,000 at DITP; and Carbon Dioxide of $54,000 at the Carroll Plant. This is offset by over spending on Hydrogen Peroxide of $219,000 at DITP and on Ferric Chloride of $37,000 also at DITP. The variance for Chemicals is the result of lower flows both at DITP and Carroll Plant, 10% and 6% respectively, the quality of the influent at DITP and the water quality at the Carroll Plant. It is important to note that Chemical variances are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries is an important factor. The underspending for Activated Carbon is due to the timing of the change out of carbon beds at DITP later in the year than budgeted.

Wages and Salaries

Wages and Salaries are under budget by $347,000. Regular Pay is under budget by $316,000, however if we net out the impact of $597,000 higher than budgeted "leave balance accruals" the variance is $913,000 under budget. The "leave balance accrual" represents the value of the monthly change of accrued leave time for employees which includes vacation, sick time, holiday pay and compensation time.

Year to date, there have been 4 fewer average FTE's (1,146 versus 1,150 budgeted), lower average new hire salaries versus retirees and the timing of backfilling vacant positions, which has also contributed to Regular Pay being under budget.

FY18 MWRA Full Time Equivalent (FTE) Position Trend



Utilities

Utilities were under budget by $281,000 or 4.6%, primarily due to lower electricity bills for Field Operations facilities and lower water usage at Deer Island Wastewater Treatment Plant and the John J. Carroll Water Treatment Plant.

Fringe Benefits

Fringe Benefit spending was lower than budgeted by $221,000, or 3.4%, primarily for lower Health Insurance costs of $152,000 due to fewer employees and retirees than budgeted participating in health insurance plans, and the shift from family to individual plans.

Professional Services

Professional Services were under budget by $181,000, or 7.8%. Professional Services was underspent in MIS for timing of network, application and design services, in the Law Division for outside legal fees for litigation and expert fees, and in the Finance Division due to timing of need for services. This was offset by overspending in Other Services mainly in the Laboratory Department due to unplanned algae testing for Chestnut Hill Reservoir in response to a blue-green algae bloom, and in Operations Support for additional consulting work on the SCADA Active Directory project.

Maintenance

Maintenance was over budget by $434,000, or 4.6%. There were numerous components to the overspending for Maintenance year-to date, including, installation of explosion proof lighting at the Nut Island Headworks and the Thermal Plant Boiler/STG maintenance at Deer Island which was budgeted in October and November but which was completed in October.

Overtime

Overtime expenses were higher than budgeted by $190,000 or 14.8%, mainly in Water Operations for maintenance and emergency leak repairs and Wastewater Operations for wet weather events. Performed off-hours maintenance work in Field Operations to alleviate project backlogs due to staff vacancies in western water operations, replace manhole covers and frames prior to a major repaving project, and hoist a replacement HVAC unit at the Chelsea facility.

Other Materials

Other Materials were higher than budgeted by $96,000 or 7.5%. A variety of items are over budget including computer hardware in MIS and lab and testing materials at Deer Island due to timing of purchases. There were various items under budget, including Vehicle Expenses for lower than budgeted fuel prices.

Training & Meetings

Training & Meetings expenses were higher than budgeted by $12,000 or 12.7% primarily for emergency response training and hydraulic training for the Field Operations Department and MAXIMO training for Deer Island scheduled for November but completed early.

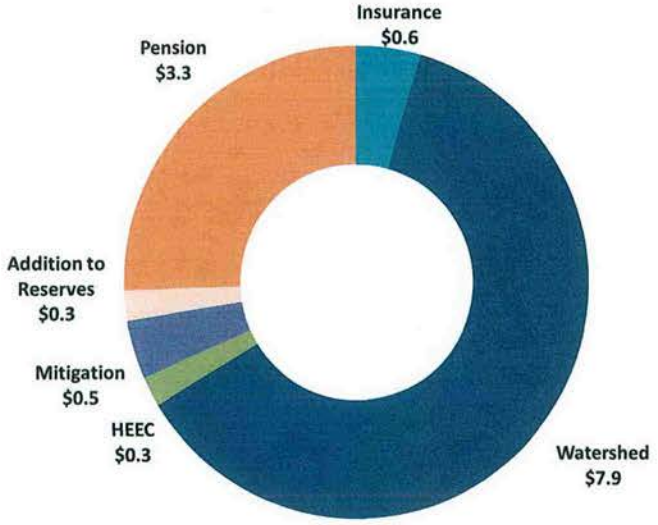
Other Services

Other Services spending was lower than budget by $8,000, or 0.1%, essentially on budget.

Indirect Expenses

Year-to-date Indirect Expenses totaled $12.8 million, $433,000 or 3.3% lower than budgeted, due to lower Watershed costs of $286,000 resulting from an over-accrual in FY17 of Watershed operating expenses; lower than budgeted insurance costs of $92,000 due to lower than budgeted claims of $80,000 and lower than budgeted premiums of $12,000; and lower HEEC charges than budgeted of $48,000 for the existing cross-harbor cable.

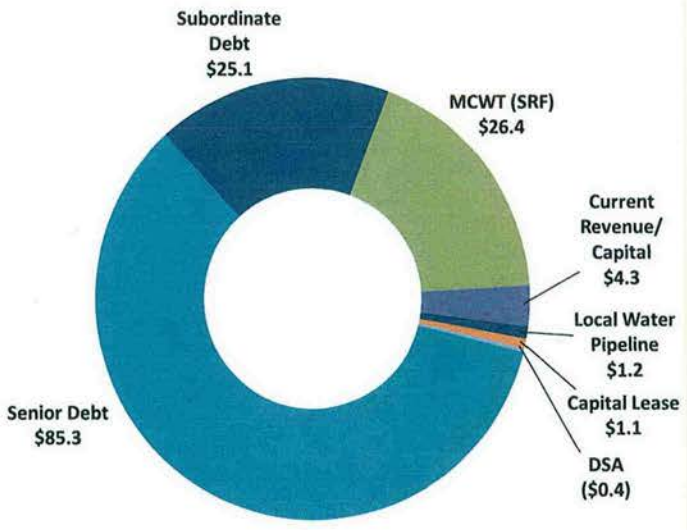
FY18 Year-to-date Indirect Expenses-YTD
(in millions)



Capital Financing

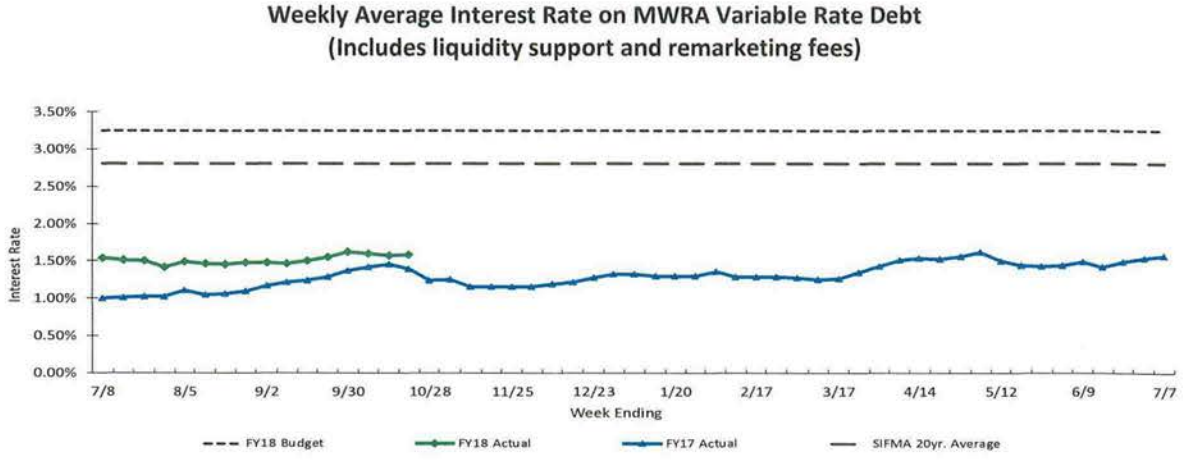
Debt Service expenses include the principal and interest payment for fixed debt, the variable subordinate debt, the Massachusetts Clean Water Trust (SRF) obligation, the commercial paper program for the local water pipeline projects, current revenue for capital, and the Chelsea facility lease payment.

Year-to-date FY18 Capital Finance
(in millions)



Year-to-date Capital Financing expenses for the fiscal year totaled $143.0 million, which was $2.6 million less than budgeted. The entire variance is related to short-term variable rates.

The graph below reflects the FY18 actual variable rate trend by week year-to-date against the FY18 Budget.



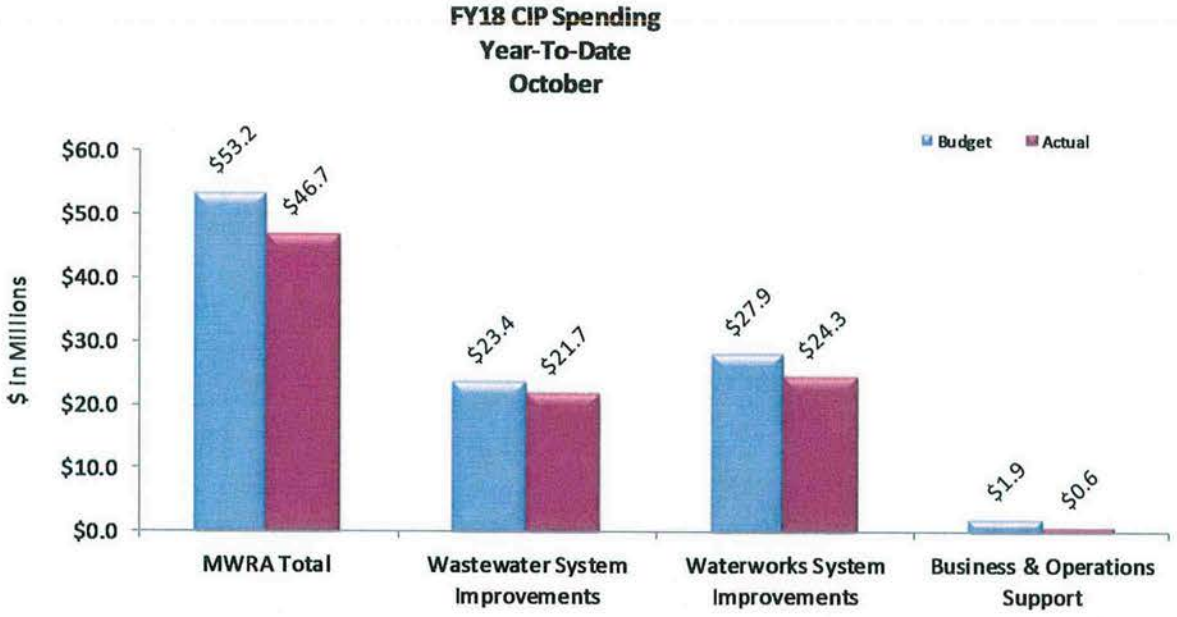
Revenue & Income

Year-to-date Revenues of $248.2 million were $5.1 million over budget reflecting a $4.2 million receipt from the settlement between various State Attorneys General and Barclays PLC for attempting to manipulate the LIBOR market. LIBOR is a standard financial index used to set the cost of various variable-rate loans. Revenues were also over budget by $346,000 for favorable returns on investment income, $228,000 for the final payment of a class action lawsuit settlement for derivative agreements, $209,000 for revenue attributable to renewable energy credits and energy rebates, and $95,000 for disposal of surplus material.

FY18 Capital Improvement Program

Capital expenditures in FY18 total $46.7 million through the end of October, $6.5 million, or 12.3%, under budget.

After accounting for programs which are not directly under MWRA's control, most notably the Inflow and Infiltration (I/I) program, the Local Water Pipeline program, and the community managed Combined Sewer Overflow (CSOs) projects, capital spending totaled $44.2 million, $2.4 million, or 5.1%, under budget.



Overall underspending reflects the underspending of $1.7 million in Wastewater Improvements, $3.6 million in Waterworks Improvements, and $1.2 million in Business and Operations Support.

FY18 Year-to-date Spending by Program:

$ in Millions	Budget	Actuals	$ Var.	% Var.
Wastewater System Improvements				
Interception & Pumping	13.0	13.3	0.3	2.3%
Treatment	6.1	4.3	(1.8)	-28.8%
Residuals	0.0	0.0	0.0	N/A
CSO	1.5	0.0	(1.5)	-99.7%
Other	2.9	4.1	1.2	41.2%
Total Wastewater System Improvements	**$23.4**	**$21.7**	**($1.7)**	**-7.4%**
Waterworks System Improvements				
Drinking Water Quality Improvements	1.1	1.3	0.3	27.6%
Transmission	11.5	10.1	(1.3)	-11.7%
Distribution & Pumping	12.9	14.4	1.5	11.9%
Other	2.5	(1.6)	(4.1)	N/A
Total Waterworks System Improvements	**$27.9**	**$24.3**	**($3.6)**	**-12.8%**
Business & Operations Support	**$1.9**	**$0.6**	**($1.2)**	**-65.7%**
Total MWRA	**$53.2**	**$46.7**	**($6.5)**	**-12.3%**

Totals may not add due to rounding

The main reasons for the project spending variances in order of magnitude are:

Other Waterworks: Net underspending of $4.1 million

- $3.9 million for Local Water System Assistance Program due to less than anticipated community requests for Phase 3 loans.
- $0.1 million for Quabbin Power, Communication & Security – Construction partially due to reimbursement from DCR Office of Watershed Management for work at the boat cove.

Wastewater Treatment: Net underspending of $1.8 million

- $0.7 million for Clinton Phosphorus Reduction Construction due to less than anticipated progress including preliminary testing delays.
- $0.4 million for Digester Sludge Pump Phase 2, $0.3 million for Deer Island Power System Improvements, and $0.2 million for North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacements due to work scheduled for FY18 performed in FY17. Also, less than anticipated progress of $0.2 million for the Clarifier Rehabilitation Phase 2 Design.

Combined Sewer Overflow: Net underspending of $1.5 million

- Underspending of $1.5 million for Cambridge Sewer Separation Project due to timing of transfer of payment for final restoration work. Payment is now expected in November 2017.

Other Wastewater: Net overspending of $1.2 million

- $1.2 million for Community Infiltration/Inflow (I/I) due to greater than anticipated requests for grants and loans.

Water Distribution and Pumping: Net overspending of $1.5 million

- $3.4 million for Section 89/29 Redundancy Phase 1C construction and $0.7 million for SEH Redundancy Pipeline Section 111 Phase 1 construction due to contractor progress.
- The overspending was partially offset by underspending of $0.8 million for SEH Redundancy Section 111 Phase 2 and $0.7 million for Section 89/29 Redundancy Phase 2 due to later than budgeted notice-to proceeds, $0.6 million for Section 89/29 Redundancy Phase 1B due to work scheduled for FY18 performed in FY17, and $0.5 million Section 14 Water Pipe Relocation (Malden) due to delay in commencing pipe installation.

Waterworks Transmission: Net underspending of $1.3 million

- $1.4 million for Wachusett Aqueduct Pump Station Construction due to delay of surge tank installation, pipe pressure testing failure and work expected in FY18 completed in FY17.
- $0.2 million for CVA Motorized Screen Replacement due to work scheduled for FY18 performed in FY17 and balancing credit change order pending.

Interception & Pumping: Net overspending of $0.3 million

- $0.7 million for Chelsea Creek Headworks Upgrades Construction and Construction Administration due to progress on abatement work, $0.3 million on Study of Sections 4, 5, 6, 18 and $0.2 million on Nut Island Odor Control & HVAC Improvements - Design/CA/REI due to consultant progress.
- This overspending was partially offset by $0.3 million on Alewife Brook Pumping Station Construction due to bypass pumping delays and other smaller projects totaling $0.9 million.

Drinking Water Quality Improvements: Net overspending of $0.3 million

- $0.3 million for contractor progress for the Marlborough Maintenance Facility.

Construction Fund Balance

The construction fund balance was $77.5 million as of the end of October. Commercial Paper/Revolving Loan availability was $172.0 million to fund construction projects.

Attachment 1 – Variance Summary October 2018
Attachment 2 – Current Expense Variance Explanations
Attachment 3 – Capital Improvement Program Variance Explanations

ATTACHMENT 1
FY18 Actuals vs. FY18 Budget

	October 2017 Year-to-Date					
	Period 4 YTD Budget	Period 4 YTD Actual	Period 4 YTD Variance	%	FY18 Approved	% Expended
EXPENSES						
WAGES AND SALARIES	$ 29,975,723	$ 29,629,165	$ (346,558)	-1.2%	$ 104,286,370	28.4%
OVERTIME	1,285,976	1,476,231	190,255	14.8%	4,110,637	35.9%
FRINGE BENEFITS	6,544,390	6,323,509	(220,881)	-3.4%	20,997,975	30.1%
WORKERS' COMPENSATION	774,327	247,158	(527,169)	-68.1%	2,322,980	10.6%
CHEMICALS	3,787,275	3,306,765	(480,510)	-12.7%	9,836,933	33.6%
ENERGY AND UTILITIES	6,121,483	5,840,714	(280,769)	-4.6%	21,735,222	26.9%
MAINTENANCE	9,378,952	9,812,607	433,655	4.6%	32,200,785	30.5%
TRAINING AND MEETINGS	92,749	104,538	11,789	12.7%	406,269	25.7%
PROFESSIONAL SERVICES	2,318,590	2,137,600	(180,990)	-7.8%	7,221,622	29.6%
OTHER MATERIALS	1,285,379	1,381,407	96,028	7.5%	6,692,660	20.6%
OTHER SERVICES	7,837,189	7,845,332	8,143	0.1%	22,764,526	34.5%
TOTAL DIRECT EXPENSES	**$ 69,402,033**	**$ 68,105,026**	**$ (1,297,007)**	**-1.9%**	**$ 232,575,979**	**29.3%**
INSURANCE	$ 658,244	$ 566,472	$ (91,772)	-13.9%	$ 2,013,452	28.1%
WATERSHED/PILOT	8,226,694	7,940,876	(285,818)	-3.5%	25,164,006	31.6%
BECo PAYMENT	313,011	265,260	(47,751)	-15.3%	957,445	27.7%
MITIGATION	522,080	514,868	(7,212)	-1.4%	1,596,950	32.2%
ADDITIONS TO RESERVES	268,441	268,441	-	0.0%	821,116	32.7%
RETIREMENT FUND	3,277,369	3,277,369	-	0.0%	3,277,369	100.0%
POST EMPLOYEE BENEFITS	-	-	-	---	5,035,422	0.0%
TOTAL INDIRECT EXPENSES	**$ 13,265,839**	**$ 12,833,286**	**$ (432,553)**	**-3.3%**	**$ 38,865,760**	**33.0%**
STATE REVOLVING FUND	$ 26,362,381	$ 26,362,381	$ -	0.0%	$ 84,931,906	31.0%
SENIOR DEBT	85,346,626	85,346,626	-	0.0%	264,560,267	32.3%
CORD FUND	-	-	-	---	-	---
DEBT SERVICE ASSISTANCE	(391,580)	(391,580)	-	0.0%	(391,580)	100.0%
CURRENT REVENUE/CAPITAL	4,315,385	4,315,385	-	0.0%	13,200,000	32.7%
SUBORDINATE MWRA DEBT	27,702,943	27,702,943	-	0.0%	85,443,447	32.4%
LOCAL WATER PIPELINE CP	1,240,655	1,240,655	-	0.0%	3,794,944	32.7%
CAPITAL LEASE	1,051,731	1,051,731	-	0.0%	3,217,060	32.7%
DEBT PREPAYMENT	-	-	-	---	10,900,000	0.0%
VARIABLE DEBT	-	(2,642,468)	(2,642,468)	---	-	0.0%
HEEC CABLE CAPACITY RESERV	-	-	-	---	6,532,146	---
DEFEASANCE ACCOUNT	-	-	-	---	-	---
TOTAL DEBT SERVICE	**$ 145,628,141**	**$ 142,985,673**	**$ (2,642,468)**	**-1.8%**	**$ 472,188,190**	**30.3%**
TOTAL EXPENSES	**$ 228,296,013**	**$ 223,923,985**	**$ (4,372,028)**	**-1.9%**	**$ 743,629,929**	**30.1%**
REVENUE & INCOME						
RATE REVENUE	$ 234,421,500	$ 234,421,500	$ -	0.0%	$ 717,054,000	32.7%
OTHER USER CHARGES	3,945,486	3,917,105	(28,381)	-0.7%	9,011,070	43.5%
OTHER REVENUE	1,705,657	6,462,770	4,757,113	278.9%	7,359,078	87.8%
RATE STABILIZATION	-	-	-	---	-	---
INVESTMENT INCOME	3,005,107	3,351,228	346,121	11.5%	10,205,781	32.8%
TOTAL REVENUE & INCOME	**$ 243,077,750**	**$ 248,152,603**	**$ 5,074,852**	**2.1%**	**$ 743,629,929**	**33.4%**

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY18 Budget YTD October	FY18 Actuals YTD October	FY18 YTD Actual vs. FY18 Budget		Explanations
			$	%	
Direct Expenses					
Wages & Salaries	29,975,723	29,629,165	(346,558)	-1.2%	Regular Pay is under the budget by $316,000, however if we net out the impact of $597,000 higher than budgeted "leave balance accruals" the variance is $913,000 under budget. The "leave balance accrual" represents the value of the monthly change of accrued leave time for employees which includes vacation, sick time, holiday pay and compensation time. The $913,000 underspending is in part due to 4 fewer average FTE's (1,146 versus 1,150 budgeted), lower average new hire salaries versus retirees and the timing of backfilling vacant positions.
Overtime	1,285,976	1,476,231	190,255	14.8%	Higher spending mainly in Water Operations of $111,000 and Metro Maintenance of $82,700, both for off-hours maintenance, and Wastewater Operations of $24,800 for wet weather events. Some examples of off-hour maintenance work include off-hours work to alleviate a project backlog in western ops due to staff vacancies, replacement of manholes in a community prior to a major repaving job, and crane rigging to hoist replacement HVAC units into place at the Chelsea maintenance facility.
Fringe Benefits	6,544,390	6,323,509	(220,881)	-3.4%	Lower than budget mainly in **Health Insurance** of $152,000, due to fewer than budgeted participating in health insurance plans, and the shift from family to individual plans; and lower **Medicare** payments of $31,000.
Worker's Compensation	774,327	247,158	(527,169)	-68.1%	Underspending due to lower compensation payments of $256,000, medical payments of $140,000 and management costs of $29,000. **Compensation payments** were lower due to a reductions of reserves primarily due to settlement of one claim and lower reserves for claims resolved through return to work. **Medical payments** were lower due to adjustments to reserves for claims resolved through return to work. Management Costs were adjusted as well to reflect resolution of outstanding cases. In October actual spending for the month was $164,000 under budget. It is important to note that spending on this line item can change significantly depending on future claims and severity of cases.

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY18 Budget YTD October	FY18 Actuals YTD October	FY18 YTD Actual vs. FY18 Budget		Explanations
			$	%	
Chemicals	3,787,275	3,306,765	(480,510)	-12.7%	Underspending for **Soda Ash** of $199,000 primarily at JCWTP; **Sodium Hypochlorite** of $194,000 primarily at DITP; **Activated Carbon** of $151,000 at DITP; and **Carbon Dioxide** of $54,000 at JCWTP. This is offset by over spending on **Hydrogen Peroxide** of $219,000 at DITP and on Ferric Chloride of $37,000 also at DITP. The majority of underspending for Chemicals is the result of lower flows both at DITP and JCWTP, 10% and 6% respectively year-to-date and the quality of the influent both at DITP and JCWTP. It is important to note that Chemicals variance are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries in an important factor. For instance, the underspending for Activated Carbon is due to the timing of the change out of carbon beds at DITP later in the year than budgeted.
Utilities	6,121,483	5,840,714	(280,769)	-4.6%	Underspending in **Electricity** of $187,000 primarily in FOD; **Water** of $53,000 primarily at JCWTP and DITP; and Diesel Fuel of $36,000 due to time of deliveries at Wastewater Ops facilities and JCWTP.
Maintenance	9,378,952	9,812,607	433,655	4.6%	Services were overspent by $291,000 and Materials were overspent by $140,000. Overspending in **Plant & Machinery Services** of $600,000 mostly at DITP for Boiler/STG maintenance scheduled for October and November and completed in October; **Plant & Machinery Materials** of $220,000 in part for VFD at B/W IPS scheduled in FY17; **Specialized Equipment Materials** of $108,000 in OEP and Meter Maintenance; **Pipeline Materials** of $67,000 primarily in FOD; and **Electrical Materials** of $53,000 primarily at DITP. Underspending in **Building & Grounds Services** of $253,000for timing of door replacement contract at DITP, for invasive control contract at various reservoirs, and at DITP for grounds keeping contract; **HVAC Materials** of $213,000 at DITP for timing of purchases; **Computer Materials** of $84,000 for an inventory issuance credit; **Building & Grounds Materials** of $78,000 for Water Western Ops, Metro Maintenance and at the Chelsea Facility.

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY18 Budget YTD October	FY18 Actuals YTD October	FY18 YTD Actual vs. FY18 Budget		Explanations
			$	%	
Training & Meetings	92,749	104,538	11,789	12.7%	Overspending primarily in FOD.
Professional Services	2,318,590	2,137,600	(180,990)	-7.8%	**Other Professional Services** was under spent $184,000 primarily in MIS for timing of network, application and design services, Op Admin due to timing of Mystic River Modeling Project, Treasury for timing of financial services, and HR for timing of training services; **Legal Services** was underspent $89,0000 in the Law Division for outside legal fees for litigation and in Human Resources; and **Resident Inspection** of $44,000 related to lower spending on DASH Quality Assurance/Quality Control diver associated with the invasive species control of the water reservoirs. This is offset by higher spending for **Engineering Services** of $93,000 primarily for Active Directory SCADA security services. This project was budgeted in FY17. **Lab & Testing** of $55,000 in DLS for unplanned algae testing for Chestnut Hill Reservoir and ENQUAL for unplanned red tide study.
Other Materials	1,285,379	1,381,407	96,028	7.5%	Higher budgeted spending for **Computer Hardware** of $96,000 in MIS due to timing of purchases; **Postage** of $65,000 due to timing of filling postage meter, and **Lab & Testing Supplies** of $27,000 primarily in Dept. of Lab Services. This is offset by lower spending for **Vehicle Expenses** of $59,000 due to lower prices for fuel than budgeted; and **Health and Safety** of $50,000 primarily at DITP and Op Support.
Other Services	7,837,189	7,845,332	8,143	0.1%	Lower than budgeted spending for **Other Services** of $103,000 for a number of services, including timing of remediation projects managed by RPEM and timing of Technical Assistance for Lead issues; and **Police Details** of $33,000 primarily in Water Pipeline Maintenance and Meter Maintenance. This is offset by higher spending for **Sludge Pelletization** of $97,000 due to higher year to date quantities.
Total Direct Expenses	**69,402,033**	**68,105,026**	**(1,297,007)**	**-1.9%**	

ATTACHMENT 2
Current Expense Variance Explanations

Total MWRA	FY18 Budget YTD October	FY18 Actuals YTD October	FY18 YTD Actual vs. FY18 Budget		Explanations
			$	%	
Indirect Expenses					
Insurance	658,244	566,472	(91,772)	-13.9%	Lower Claims than budgeted of $80,000 and lower premiums of $12,000.
Watershed/PILOT	8,226,694	7,940,876	(285,818)	-3.5%	Lower Watershed Reimbursement of $286,000 due to over accrual at the end of FY17 as compared to the actual amount paid in the first quarter of FY18.
HEEC Payment	313,011	265,260	(47,751)	-15.3%	Lower than budgeted charges for O&M charges for existing HEEC cable.
Mitigation	522,080	514,868	(7,212)	-1.4%	Actual inflation rate was 2.08% vs. 2.5% used for the budget.
Addition to Reserves	268,441	268,441	-	0.0%	
Pension Expense	3,277,369	3,277,369	-	0.0%	
Post Employee Benefits	-	-	-		
Total Indirect Expenses	**13,265,839**	**12,833,286**	**(432,553)**	**-3.3%**	
Debt Service					
Debt Service	146,019,721	143,377,253	(2,642,468)	-1.8%	$2.6 million for lower variable rate than budgeted.
Debt Service Assistance	(391,580)	(391,580)	-	0.0%	
Total Debt Service Expenses	**145,628,141**	**142,985,673**	**(2,642,468)**	**-1.8%**	
Total Expenses	**228,296,013**	**223,923,985**	**(4,372,028)**	**-1.9%**	
Revenue & Income					
Rate Revenue	234,421,500	234,421,500	-	0.0%	
Other User Charges	3,945,486	3,917,105	(28,381)	-0.7%	
Other Revenue	1,705,657	6,462,770	4,757,113	278.9%	$4.4 M for two settlements, $4.2 M receipt for settlement between various State Attorneys General and Barclays PLC for attempting to manipulate the LIBOR market and $228,000 for the final payment of a class action lawsuit settlement for derivative agreements; $210,000 for revenue attributable to renewable energy credits and energy rebates; and $95,000 for disposal of surplus material.
Rate Stabilization	-	-	-		
Investment Income	3,005,107	3,351,228	346,121	11.5%	Investment Income is over budget as result of higher short term rates (1.30% vs.1.05% budget)
Total Revenue	**243,077,750**	**248,152,603**	**5,074,853**	**2.1%**	
Net Revenue in Excess of Expenses	**14,781,737**	**24,228,618**	**9,446,881**		

ATTACHMENT 3
FY18 CIP Year-End Variance Report (000's)

	FY18 Budget YTD October	FY18 Actuals YTD October	YTD Actuals vs. Budget		Explanations
			$	%	
Wastewater					
Interception & Pumping (I&P)	$12,975	$13,268	$293	2.3%	Overspending Chelsea Creek Headworks Upgrades Construction and Construction Administration (CA): $681k (progress on abatement work) Sections 4, 5, 6, 186 - Study: $270k and Nut Island Odor Control & HVAC Improvements - Design/CA/REI: $189k (consultant progress) Offset Underspending Alewife Brook Pump Station Rehab - Construction: $309k (testing of dry weather bypass pumps delayed to early November) Quincy/Hingham PS Fuel Storage Upgrades - Construction: $133k (delay due to some prefabrication work required. Contractor fully mobilizing) Interceptor Renewal 1, Reading Extension Sewer - Construction: $109K (delayed notice-to-proceed. Contractor is mobilizing) Other smaller projects totaling $296k.
Treatment	$6,101	$4,342	($1,759)	-28.8%	Underspending Digested Sludge Pump Replacement - Phase 2: $396k, Power System Improvements - Construction: $288k, and NMPS & WTF Butterfly Valve Replacement: $243k (all for work scheduled for FY18 performed in FY17) Clinton Wastewater Treatment Plant Phosphorus Reduction - Construction: $686k (up to a six-month time extension of time due to delays including preliminary testing) Clarifier Rehab Phase 2 - Design: $156k (delayed pending approval of additional amendments) Other smaller projects totaling $146k Offset Overspending Personnel Dock Rehab: $156k (additional rehab work required)
Residuals	$0	$0	$0	-	
CSO	$1,456	$5	($1,451)	-99.7%	Underspending Cambridge Sewer Separation: $1,453k (timing of final work payment; anticipated in November)
Other Wastewater	$2,876	$4,062	$1,186	41.2%	Overspending I/I Local Financial Assistance: $1,186k (greater than budgeted requests for grants and loans)
Total Wastewater	**$23,409**	**$21,677**	**($1,732)**	**-7.4%**	

ATTACHMENT 3
FY18 CIP Year-End Variance Report (000's)

	FY18 Budget YTD October	FY18 Actuals YTD October	YTD Actuals vs. Budget		Explanations
			$	%	
Waterworks					
Drinking Water Quality Improvements	$1,055	$1,346	$292	27.6%	Overspending CP7 Existing Facilities: $277k (contractor progress on the Marlborough Maintenance Facility)
Transmission	$11,475	$10,137	($1,338)	-11.7%	Underspending Wachusett Aqueduct Pump Station - Construction: $1,445k (delay of surge tank installation and pipe pressure testing failure) CVA Motorized Screens Replacement - Construction: $230k (work scheduled for FY18 performed in FY17) Evaluation of Farm Pond Buildings - Waban Arches: $97k (project is substantially complete and will be less than budgeted) WASM 3 - MEPA - Design/CA/RI: $82k (borings schedule subject to coordination with communities and property owners) Comm. Ave. Pump Station Improvements - Design/CA/RI: $73k (Preliminary Design ran 11 weeks behind schedule. Recovery schedule established to catch up during Final Design phase) Offset Overspending Watershed Land Acquisition: $591k (timing of land purchases)
Distribution & Pumping	$12,886	$14,419	$1,533	11.9%	Overspending NIH Section 89/29 Redundancy Phase 1C: $3,358k, SEH Redundancy Pipeline Section 111 Phase 1 - Construction and CA/RI: $1,004k, and Section 80 Replacement - Construction: $133k (all due to project progress) Offset Underspending SEH Redundancy Pipeline Section 111 Construction 2: $800k (delayed notice to proceed) Sections 89 & 29 Redundancy - Construction Phase 2: $720k (delayed notice-to-proceed. Contractor is in submittals and procuring materials stage) NIH Section 89/29 Redundancy Phase 1B Construction: $645k (work scheduled for FY18 performed in FY17) Section 14 Water Pipe Relocation (Malden): $482k (delay in commencing pipe installation) CP3, Sections 23, 24, 47 Rehab - Final Design/CA/RI: $107k (delay due to coordination of field work to determine pipe condition and establish test pits) Peabody Pipeline - Design/ESDC/REI: $78k (borings took longer than anticipated) Other smaller projects totaling $130k

ATTACHMENT 3
FY18 CIP Year-End Variance Report (000's)

	FY18 Budget YTD October	FY18 Actuals YTD October	YTD Actuals vs. Budget		Explanations
			$	%	
Other Waterworks	$2,498	($1,553)	($4,051)	-	Underspending Local Water System Assistance Program: $3,883k (less than budgeted community requests for Phase 3 loans) Quabbin Power, Communication & Security - Construction: $122k (partially due to reimbursement from DCR Office of Watershed Management for work at boat cove)
Total Waterworks	**$27,913**	**$24,350**	**($3,564)**	**-12.8%**	
Business & Operations Support					
Total Business & Operations Support	**$1,884**	**$646**	**($1,238)**	**-65.7%**	Underspending Security Equipment: $463k (delay in implementing equipment initiatives) MIS Projects: $270k (timing of IT Strategic Plan implementation) Fish Hatchery Pipeline Hydro: $145k (timing of final work. Project is substantially complete)
Total MWRA	**$53,206**	**$46,672**	**($6,533)**	**-12.3%**	

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: New Technical Assistance Contracts for As-Needed Resident Engineering and Resident Inspection

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COMMITTEE: Water Policy & Oversight

X INFORMATION
_____ VOTE

John P. Vetere, Deputy Chief Operating Officer
A. Navanandan, P.E., Chief Engineer
Corinne M. Barrett, Director, Construction
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

Staff are proceeding with a new procurement process for "as-needed" Resident Engineering and Inspection services for the short term during periods when the number of active construction contracts exceeds the number of available Resident Engineer/Resident Inspection staff. Staff will return to the Board to seek authorization to award these contracts.

RECOMMENDATION:

For information only.

DISCUSSION:

MWRA Construction Resident Engineers and/or Inspectors oversee the majority of the Authority's construction contracts to ensure contractors are performing the work in accordance with the plans and specifications. However, there are circumstances when additional Resident Engineers or senior level Resident Engineers with special expertise are required. The need for additional support is dependent on many factors including: scheduling; the number of active construction contracts; and the scope and complexity of the work. In most large projects, the procurement of Resident Engineering/Resident Inspection (RE/RI) services is included in the design engineering contract. However, these services are not required until the design process is completed and the construction contract is awarded. The proposed Technical Assistance Contracts for RE/RI services will not include Engineering Services During Design (ESDC), as these services are normally included in the design engineering contract. Typically, ESDC is provided by the same office staff that worked on the design phase; therefore, they are already familiar with and knowledgeable of the associated construction contract. For efficiency, this is the preferred method to prevent a new consultant from having to learn valuable information accumulated during the history of the project and reproducing design calculations.

In some cases, the Construction Department may have short periods of time when there are more on-going projects than in-house Resident Engineers/ Inspectors can support and oversee. In these situations, additional contract RE/RI staff could supplement the work of in-house inspectors on

an as-needed basis, thereby providing staffing flexibility as project schedules change.

Likewise, a number of engineering design projects are completed in-house or with the use of the as-needed technical assistance contracts. These contracts do not include separate consultant ESDC or RE/RI services. The use of a technical assistance contract for RE/RI services would support these projects as well. ESDC services will be provided by MWRA engineering staff for in-house design contracts and by either MWRA or the consultant on technical assistance design contracts.

The Construction Department currently has twenty-seven open construction contracts, of which eighteen are in the active phase and 9 are in the punch list or closeout phase. A total of 12 of these open contracts are overseen entirely by in-house RE/RI staff. The remaining open projects are overseen either by consultant RE/RI staff or a hybrid of both in-house and consultant RE/RI staff. In the next six months, Engineering & Construction anticipate awarding ten new construction contracts, of which 8 do not have consultant RE/RI services available and will require inspection and oversight by in-house RE/RI staff.

The Construction Department currently has 15 active field inspectors. There are 20 anticipated construction contracts that currently or within the next six months will require an in-house Resident Engineer (no consultant RE/RI services). It is accepted industry practice that each contract in construction have a dedicated field inspector. Therefore, no in-house staff will be available to oversee some of the construction contracts without RE services provided by a consultant.

The current Technical Assistance Engineering Contracts have proven to be a benefit and great resource by providing the needed study, design and engineering services during construction services for numerous construction contracts and in-house maintenance work. Technical Assistance Contracts provide a mechanism to acquire specialized services which would otherwise be secured through a longer, individualized procurement process. Staff recommend this same concept be used for as-needed RE/RI services and are proposing the use of two separate Technical Assistance Contracts for as-needed Resident Engineering and Resident Inspection Services at $750,000 per year for a duration of three years, for a total of $2,250,000 each. Staff expect to commence a competitive procurement process for these services and will return to the Board by April, 2018 for award of these contracts.

BUDGET/ FISCAL IMPACT:

The FY18 CIP does not include specific funding for these services, therefore the cost will be absorbed within the approved budget. Funds for these services have been included in the FY19 CIP.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Procedure for Procuring Contract 7581 Carroll Water Treatment Plant – SCADA System Improvements

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COMMITTEE: Administration, Finance & Audit

__X__ INFORMATION
_____ VOTE

Michele S. Gillen
Director of Administration

David Coppes, Director, Waterworks
Carolyn Francisco Murphy, Director of Procurement
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

For information only.

DISCUSSION:

Contract 7581 includes design and programming services for replacing the original Carroll Plant programmable logic controllers (PLCs) and other Supervisory Control and Data Acquisition (SCADA) system components commissioned in 2005 as part of the original construction. These computer system components are nearing the end of their useful life and/or are becoming obsolete. The system consists of 34 PLCs with thousands of inputs and outputs, interconnected to each other through a fiber optic local area network and the Operations Control Center. Each redundant pair of PLCs controls different processes in the plant; they work in conjunction with each other and with other critical off-site PLCs to control the entire treatment plant and western water transmission and treatment system. This complicated, critical project will require seamless transition to replacement PLCs at the Carroll Plant and associated computer programs in a phased approach without interrupting treatment of water except, possibly, through periodic over-night plant shut downs. All program logic will need to be fully tested and every input and output checked before transition to assure complete and total replication of existing control strategies.

A thorough understanding of the existing Carroll Plant SCADA system is necessary to a consultant's preparation of a complete cost proposal, including level of effort, and development of a comprehensive technical approach and to assuring that no aspect of the existing system is left unaccounted for. Following Department of Homeland Security guidance, the MWRA places a strong emphasis on network and control system security measures including carefully guarding specific information on the architecture of the system, access points, control philosophy and hardware. Among other measures, maintaining tight controls over the dissemination of this information to third parties helps guard against a cybersecurity event which could compromise the

Authority's SCADA system. Most SCADA consultant work to date has included designing and programming specific modules or appendages to that system, without disclosing all of the details of the infrastructure on which it operates.

This project creates a unique situation in which many of those highly security-sensitive details should be shared with outside firms and their subcontractors so that firm's may prepare a comprehensive cost proposal and ultimately perform the services. Absent this detail, consultants proposing on this project would have to make assumptions about the Carroll Plant system and would not be able to offer a truly considered and well-thought out cost proposal and detailed technical approach. Selecting the most qualified firm, with a complete understanding of the challenges, is critical to ensure the Authority's ability to effectively treat water at the plant. Balancing the concern about SCADA system security at the Carroll Plant and the need to provide complete information to proposers has caused staff to consider options to our traditional procurement approach.

Procurement Process

The Authority adheres to best business practices and utilizes a "best value" selection process for procuring design and engineering services. A "best value" process identifies criteria to be evaluated in the selection of a firm, including cost. Under the Authority's procedures, the criteria are weighted and no criterion may be rated higher than cost except as approved by the Executive Director. Consideration under the cost criterion includes level of effort, rates, and responsiveness to cost information requirements. Other criteria typically evaluated include: capacity/qualifications and key personnel; experience/past performance on similar Authority and non-Authority projects; technical approach/organization and management approach; and MBE/WBE participation.

To prepare a detailed cost proposal free of assumptions and conjecture security sensitive information regarding the Carroll Plant's SCADA system should be shared with firms. While disclosure would be conditioned on execution of the Authority's standard External Non-Disclosure Agreement, staff prefer to share this security-sensitive information with as few firms as possible. Mindful of the security concerns at the Carroll Plant, and the desire for a competitive procurement that will result in the selection of the most qualified firm for the project, staff recommended to the Executive Director that the cost criterion by waived in evaluating and ranking proposals. By waiving the cost criterion, the Selection Committee may evaluate and rank proposals based on qualifications-type criteria, which are not dependent on disclosure of security-sensitive SCADA information. These criteria include the firm's capacity to perform the project, qualifications of the firm's key personnel, the firm's experience and performance on similar Authority and non-Authority projects, the firm's organization and management approach, the firm's use of information security controls, the firm's methodology and conceptual technical approach for the project and any MBE/WBE participation.

Following the Selection Committee's evaluation and ranking (and after execution of the Authority's External Non-Disclosure Agreement) the highest ranked firm will be provided the necessary SCADA information and asked to submit a comprehensive cost proposal including rates, fee, level of effort and additional details regarding the firm's technical approach. Staff will then negotiate with the highest first ranked firm, including costs and fee. If staff are unsuccessful in negotiating an acceptable contract with the highest ranked firm, the negotiations will terminate with such firm and commence with the next highest ranked firm following the above procedure for disclosure of the SCADA information and submission of a cost proposal. A staff summary will ultimately be presented to the Board, which will include the details of the Selection Committee's

evaluation and ranking, the outcome of the contract negotiations and a recommendation and request for award.

The Executive Director has the authority to waive any part of the procedures for the procurement of professional services. Given the security-sensitive nature of the Carroll Plant SCADA system, for Contract 7581 the Executive Director has approved staff's request to a waive the Authority's traditional procurement process and procedures and instead utilize this qualifications based selection process. Staff may recommend, on a case-by-case basis, that a qualifications based selection also be utilized on other professional service contracts with cyber security sensitive information.

BUDGET/FISCAL IMPACT:

There are sufficient funds for this contract in the FY18 CIP.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Dental Insurance

COMMITTEE: Administration, Finance and Audit

__ INFORMATION
_X_ VOTE

Karen Gay-Valente, Director, Human Resources
Emily J. Dallman, Manager, Benefits & HRIS
Preparer/Title

Michele S. Gillen
Director, Administration

On September 18, 2013, the Board approved an increase in the annual maximum benefit for dental insurance for managers and certain eligible bargaining union employees from $1,000 to $1,250 to mirror the annual maximum benefit offered by the Commonwealth. On July 1, 2017, the Commonwealth increased the maximum annual benefit for dental insurance for managers from $1,250 to $1,500. Staff are requesting approval to seek pricing for a new dental insurance contract to be effective on or before April 1, 2018, with a $1,500 annual maximum benefit to mirror the benefit offered by the Commonwealth.

RECOMMENDATION:

To authorize the Executive Director to seek prices for a contract for dental insurance for eligible employees with an annual maximum benefit of $1,500 to mirror the benefit offered by the Commonwealth.

BACKGROUND:

MWRA has been providing dental insurance to all non-union employees since July 1, 1985. This benefit also covers a number of union employees who were accreted into collective bargaining units in 1994. The remaining MWRA union employees receive dental coverage through the Health and Welfare funds of their respective unions. This dental insurance contract would maintain the level of coverage currently offered to eligible employees in the areas of diagnostic, preventive, basic and major restorative services to an increased annual maximum benefit of $1,500 as well as limited orthodontic coverage. The increased benefit level will match the annual maximum benefit the Commonwealth offers to its managers.

Staff will be returning to the Board at a future meeting for approval of the contract.

BUDGET/FISCAL IMPACT:

The FY18 Current Expense Budget includes sufficient funding for the new contract.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Insurance Consultant Services - Task Order Contract
Kevin F. Donoghue Insurance Advisor, Inc.
Contract F246

COMMITTEE: Administration, Finance & Audit

___ INFORMATION
_X_ VOTE

Michele S. Gillen
Director, Administration

Paul F. Whelan/Risk Manager
Preparer/Title

Thomas J. Durkin
Director of Finance

RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to select Kevin F. Donoghue Insurance Advisor, Inc. to provide insurance consultant services and to authorize the Executive Director, on behalf of the Authority, to execute a contract in an amount not to exceed $150,000, for a contract term of three years from the Notice to Proceed.

BACKGROUND:

MWRA utilizes various types of insurance programs and strategies to protect against different types of financial exposures. These programs include self-insurance, high-retention insurance policies, reserve funds, risk transfer strategies and broker services. MWRA renews its insurance program on an annual basis by implementing a competitive bid process and also is required to have its insurance reserve fund reviewed for adequacy on a tri-annual basis to satisfy the requirements of MWRA's General Bond Resolution.

This procurement involves the selection of a licensed Insurance Consultant to provide services relating to the various components of MWRA's insurance program on an as-needed task order basis. The Insurance Consultant will serve as an advisor to the MWRA during the annual marketing of the insurance program and provide detailed analysis of proposals received and assist with cost and coverage comparisons. The Insurance Consultant will also be tasked with the tri-annual review and evaluation of the MWRA's Insurance Reserve Fund as required by the General Bond Resolution, which is next scheduled to be performed in fiscal year 2020. The Insurance Consultant will also be available as a resource to the MWRA on an as-needed basis for general insurance matters, including requirements for construction contracts, policy renewals, surety bond issues and market conditions.

DISCUSSION:

Procurement Process

A Selection Committee was formed consisting of five voting members with representatives from Risk Management, Finance, Procurement and Law Division. A one-step request for qualifications/proposals (RFQ/P) was developed with a sample scope of services included. Services provided under the contract will only be performed as-needed on a task by task basis. The criteria established for selection were: Cost (40 points); Qualifications and Key Personnel (30 points); Experience and Past Performance (20 points); and Capacity, Organization, Management and Technical Approach (10 points).

The RFQ/P was advertised in the Boston Herald, Banner Publications, El Mundo, and Goods and Services. Past responses to this RFQ/P have been historically low due to the specialized nature of the subject matter, the limited number of qualified vendors and the task order format of the contract. In an effort to increase awareness and participation in this procurement, staff took additional steps in an attempt to increase the number of proposals. Staff obtained a listing of licensed insurance consultants from the Massachusetts Division of Insurance and directly e-mailed notifications to seven firms performing independent insurance consulting services. Staff also contacted the Massachusetts Society of Licensed Insurance Advisors, a professional society for Insurance Consultants, who notified its members of this RFQ/P.

On October 6, 2017, one proposal was received from the incumbent firm, Kevin F. Donoghue Insurance Advisor, Inc. (KFDA). Staff reached out to five additional firms that had requested a copy of the RFQ/P to learn why they decided not to submit proposals and various responses were provided. Two of the five firms indicated that the scope of services requested were outside their area of expertise. Further research revealed that two other firms are involved in the selling of insurance and as such would not meet the "independent consultant services" provisions of the RFQ/P. The fifth firm did not respond to staff's request for feedback.

The RFQ/P requested that costs be proposed on an annual Singular Hourly Rate (SHR) basis for each Personnel Category for the three-year term. The rates proposed are shown below:

Firm	Personnel Category	Expiring Rates	Proposed SHR 11/17 to 10/18	Proposed SHR 11/18 to 10/19	Proposed SHR 11/19 to 10/20
Kevin F. Donoghue Insurance Advisors (KFDA)	Project Manager/ Senior Consultant	**$185**	$225	$225	$225
	Consultant	**$150**	$175	$175	$175

The proposed rates by KFDA are fixed for the entire three-year term with no escalation from year to year. However, the rates proposed in each category reflect a significant increase (22% and 17%)

from the rates under the expiring contract. The expiring rates have been in effect and held steady by KFDA for the past ten years with no increases. Staff requested that KFDA provide an additional statement with regard to the proposed rate increases. KFDA outlined the various reasons why it could no longer hold its rates steady including increases in consultant salaries and overhead costs. Risk Management staff surveyed two Massachusetts public agencies that make use of similar services and contacted professionals in the insurance field, to obtain a benchmark for current market rates for insurance consultant services. Staff determined that the rates proposed by KFDA are very reasonable and fall within the lower range of the current market pricing.

The Selection Committee concluded that KFDA had significant relevant experience and possesses the qualifications and capacity to provide the Authority's anticipated insurance advisory services. References provided were contacted and found to be satisfactory. Risk Management staff reported favorable past experience and performance with this vendor utilizing the same personnel proposed for this contract. Therefore, the Selection Committee recommends that this contract be awarded to Kevin F. Donoghue Insurance Advisor, Inc. in an amount not to exceed $150,000 for a term of three years.

BUDGET/FISCAL IMPACT:

Sufficient funds are included in the FY18 CEB to support this contract. Future CEB requests will include funding for this contract.

MBE/WBE PARTICIPATION:

Due to the specialized nature of this work, there were no MBE or WBE participation requirements established for this contract.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

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WASTEWATER POLICY & OVERSIGHT COMMITTEE MEETING

Chair: P. Flanagan
Vice-Chair: J. Walsh
Committee Members:
A. Blackmon
J. Carroll
J. Foti
A. Pappastergion
B. Peña
H. Vitale

to be held on

Wednesday, November 15, 2017

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following AF&A Comm.

AGENDA

A. Information

1. Progress of Cambridge-Implemented CSO Projects and Projected Financial Assistance through June 2018

B. Approvals

1. Approval of New Member of the Wastewater Advisory Committee

C. Contract Awards

1. Supply and Delivery of Ferrous Chloride to Deer Island Treatment Plant: Kemira Water Solutions, Inc., Bid WRA-4425

D. Contract Amendments/Change Orders

1. Clinton Wastewater Treatment Plant Phosphorus Reduction Design, Construction Administration and Resident Engineering Services: Stantec Consulting Services, Inc., Contract 7377, Amendment 4

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the
Wastewater Policy and Oversight Committee

October 18, 2017

A meeting of the Wastewater Policy and Oversight Committee was held on October 18, 2017 at the Authority headquarters in Charlestown. Vice-Chairman Walsh presided. Present from the Board were Messrs. Blackmon, Carroll, Cotter, Pappastergion, Peña, and Vitale. Among those present from the Authority staff were Fred Laskey, Steve Remsberg, Carolyn Fiore, John Riccio, Betsy Reilly, Mike Hornbrook, Dave Kubiak, Jeremy Hall, Dave Duest, Nava Navanandan, Margery Johnson, John Vetere, Marty McGowan, Cori Barrett, and Bonnie Hale. The meeting was called to order at 10:45 a.m.

Information

MWRA Industrial Waste Report #33: Industrial Pretreatment Program Annual Report to EPA for FY17

Staff reviewed the report and there was general discussion and question and answer. Among the items discussed was consideration of reviewing the fee structure of the Program and possibly increasing the percentage of costs recovered.

2016 Deer Island Outfall Monitoring Overview

Staff gave a presentation outlining the 2016 monitoring results. There was general discussion and question and answer.

Contract Awards

*CSO Post-Construction Monitoring and Performance Assessment: AECOM Technical Services, Inc., Contract 7572

Staff gave a presentation on the work to be performed under this contract. The Committee recommended approval of the contract award (ref. agenda item B.1).

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* Approved as recommended at October 18, 2017 Board of Directors meeting.

Contract Amendments/Change Orders

*Supply and Delivery of Polymer to the Deer Island Treatment Plant: BASF Corp., Bid WRA-4115, Amendment 1

Staff summarized the details of Amendment 1, and the Committee recommended approval (ref. agenda item C.1).

*Remote Headworks Upgrades: Arcadis U.S., Inc., Contract 7206, Amendment 5

Staff summarized the amendment. Mr. Pappastergion noted that the staff summary did not include the percentage of amendments relative to the total price of the contract as it usually does, and requested that that information always be included for amendments and change orders. The Committee recommended approval of Amendment 5 (ref. agenda item C.2).

*Chelsea Creek Headworks Upgrade: BHD/BEC JV 2015, A Joint Venture, Contract 7161, Change Order 5

Staff gave a presentation on the project and the work to be performed under this change order. The Committee recommended approval of Change Order 5 (ref. agenda item C.3).

The meeting adjourned at 11:50 a.m.

* Approved as recommended at October 18, 2017 Board of Directors meeting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Progress of Cambridge-Implemented CSO Projects and Projected Financial Assistance through June 2018

COMMITTEE: Wastewater Policy & Oversight

X INFORMATION
___ VOTE

A. Navanandan, P.E., Chief Engineer
David A. Kubiak, P.E., Sr. Program Manager
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

While Cambridge completed the last of the federal court mandated CSO control work in December 2015 in compliance with Schedule Seven, it more recently attained substantial completion of eligible road, sidewalk and other surface restoration work in the CAM004 sewer separation area and is proceeding to close-out its construction contracts. Staff will conduct final eligibility reviews of the Cambridge contracts toward ending the CSO Memorandum of Understanding and Financial Assistance Agreement on June 30, 2018.

RECOMMENDATION:

For information only. This staff summary presents the status of the projects in the Long-Term CSO Control Plan that are funded in part by MWRA and implemented by the City of Cambridge. Staff plan to transfer $1,254,551 into the City of Cambridge CSO account to cover MWRA's cost share of eligible work through June 30, 2018. This transfer will bring the total amount of MWRA funds transferred into the Cambridge CSO account to $100,045,603, which amount plus accumulated interest in the CSO account also used by Cambridge to cover eligible costs, equals the total award amount of the CSO Memorandum of Understanding and Financial Assistance Agreement.

DISCUSSION:

Pursuant to the terms of the CSO Memorandum of Understanding and Financial Assistance Agreement ("MOU" and "FAA"), Cambridge is responsible for implementing four of the six projects that comprise the MWRA's long-term control plan for Alewife Brook, as well as a project Cambridge completed in 2007 that eliminated CSO discharges or provided floatables control for remaining discharges at the City's CSO outfalls along the Charles River (see Table 1 on page 2). The MOU and FAA were originally executed in 1996, and the total award amount in the agreements through Amendment 13, executed on January 26, 2017, is $100,178,755.

CAM004 Sewer Separation Progress

Of the four Alewife Brook CSO projects implemented by Cambridge, the CAM004 Sewer Separation project is the only project with remaining eligible work and costs. While Cambridge completed all of the federal court mandated CSO control work by December 2015 in compliance with Schedule Seven, it has continued to perform road, sidewalk and other surface restoration work in the CAM004 project area, including Huron and Concord Avenues and intersecting streets. Work performed in the last six months in the Cambridge Contract 8B and Contract 9 areas included street restorations and final paving (including porous pavement), curb and sidewalk installations, plantings/landscaping (including bio-basins) and replacement of traffic signals. Cambridge's contractors' recently attained substantial completion of all contracts.

Table 1: Alewife Brook CSO Control Plan Projects

Project	Cambridge Contract	Benefit	Status of Court-Ordered Work
CAM004 Stormwater Outfall and Wetland Basin	12	Convey stormwater flows to wetland system for attenuation and treatment.	Completed Apr 2013
CAM004 Sewer Separation	8A, 8B, 9 & Concord Lane	Remove large quantities of stormwater from the sewer system; Close Outfall CAM004.	Completed Dec 2015
CAM400 Manhole Separation	4/13	Remove stormwater from the sewer system; eliminate CSO at Outfall CAM400.	Completed Mar 2011
Interceptor Connection Relief and Floatables Control at CAM002 and CAM401B and Floatables Control at CAM001		Upgrade connections between Cambridge and MWRA systems to provide relief; add floatables control.	Completed Oct 2010
MWR003 Control Gate and Rindge Ave. Siphon Relief	MWRA Contracts	Optimize hydraulic conveyance; minimize overflows while controlling system flooding in large storms.	Completed Oct 2015
Interconnection Relief and Floatables Control at Outfall SOM01A		Upgrade connection and provide floatables control	Completed Dec 2013

MWRA Oversight and Financial Assistance

The FAA establishes eligible and ineligible costs. Generally, all reasonable force account and contract costs incurred by Cambridge as a direct result of implementing the CSO projects are funded by MWRA. Cambridge has funded a total of over $20 million of otherwise eligible cost for the completed Alewife Wetland and the CAM004 Sewer Separation project, pursuant to agreements reached in past negotiations. The FAA calls for MWRA to disburse grant funds to Cambridge semiannually, based on a detailed, documented estimate of work progress and eligible costs for each projected six-month period. MWRA's review and acceptance of the spending estimate is required prior to disbursement of funds to the Cambridge CSO account.

Staff continue to review amendments and change orders to Cambridge's engineering and construction contracts. Staff also maintain regular contact with Cambridge Department of Public Works, hold monthly coordination meetings, and routinely review the progress of the Cambridge

projects and expenditures. Cambridge submits semi-annual reports that describe actual work progress and expenditures (force account and contract-related) for each project.

MWRA's Internal Audit Department reviews Cambridge's compliance with the terms and conditions of the FAA. The latest audit, completed in July 2017, reviewed whether force account costs claimed by the City for years 2012 through 2015 were supported by the records of the City and were eligible for MWRA funding under the terms of the FAA.

Funding and Eligible Expenditures through September 2017

Cambridge pays the eligible costs of the project from a general city account and periodically reimburses its general account from the CSO account into which MWRA transfers funds. Since execution of the MOU and FAA in 1996, MWRA has transferred a total of $98,791,052 to Cambridge's CSO account to cover eligible design and construction costs through September 2017. In addition, the FAA allows Cambridge to use accumulated interest in the account to fund eligible costs.

The estimated eligible cost incurred by Cambridge from MOU/FAA inception through September 2017 is $99,343,710. Cambridge's eligible work and cost in the period April through September 2017 exceeded its projection and the MWRA transfer amount for that period. The estimated available balance in the Cambridge CSO account as of the end of September 2017 is ($491,505), which is net $133,153 interest earned through September 2017.

MWRA Funding through June 2018

Cambridge recently submitted a projected work progress report with an estimate of eligible contract and force account spending for the period October 2017 through June 2018. Over this period, Cambridge's contractors will complete remaining work and Cambridge will close out the engineering services and construction contracts (CAM004 sewer separation construction contracts 8B, 9 and Concord Lane) as well as support MWRA's final eligibility reviews toward closing out the MOU and FAA.

Staff closely monitor Cambridge's spending and regularly coordinate with Cambridge staff to ensure that spending (and the work) remain on schedule. The MOU/FAA schedule calls for all construction work to be complete by December 2017. The MOU and FAA terms end on June 30, 2018.

Staff plan to transfer $1,254,551 into the Cambridge CSO account to cover remaining authorized eligible costs through June 2018. This transfer amount covers the estimated $419,505 negative balance in the CSO account as of September 30, 2017, and an estimated cost of $835,046 for eligible work in the period October 2017 through June 2018. This is the last scheduled transfer of MWRA funds to the Cambridge CSO account.

BUDGET/FISCAL IMPACT:

The FY18 CIP includes $100,045,604 for design and construction of the Cambridge CSO projects. Amendment 13, executed on January 24, 2017 increased the total award amount of the MOU and

FAA with the City of Cambridge to $100,178,755. The difference between these amounts is accumulated account interest used by Cambridge to cover some of the eligible cost.

MBE/WBE PARTICIPATION:

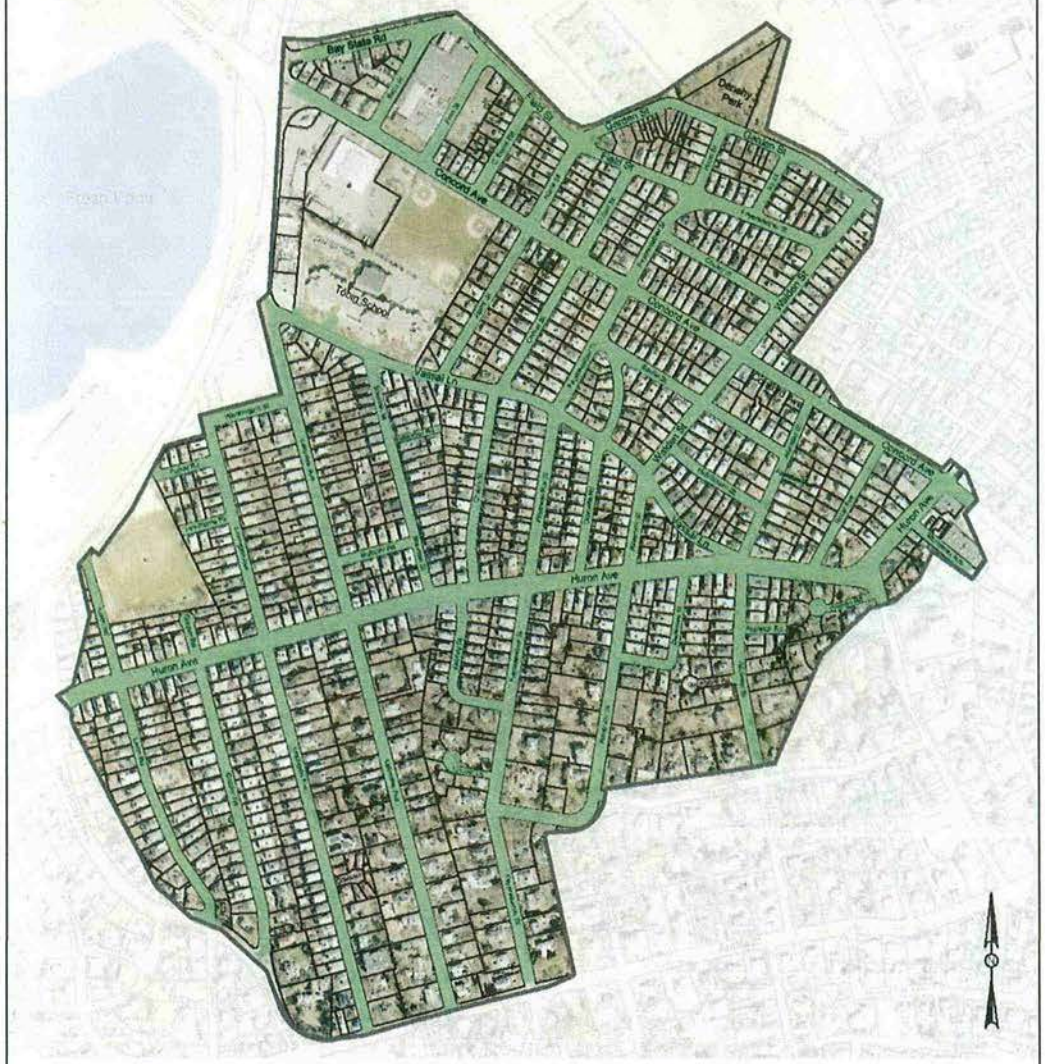
In accordance with the MOU, MBE and WBE participation in the Cambridge Sewer Separation and Floatable Controls projects will comply with DEP requirements and City of Cambridge policy.

ATTACHMENT:

Attachment 1 – Map of CAM004 Sewer Separation surface restoration work, substantially complete as of September 2017.

Attachment 1

CAM 004 SEWER SEPARATION, STORMWATER MANAGEMENT, AND SURFACE IMPROVEMENTS PROJECT



PROJECT STATUS
SEPTEMBER 2017
UPDATED: 11/1/17

Legend

- WORK SUBSTANTIALLY COMPLETE
- FINAL PAVING TO BE COMPLETED
- SUBSTANTIAL ROADWAY AND SIDEWALK REMAINING
- CAM 004 PROJECT AREA

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Approval of One New Member of the Wastewater Advisory Committee

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COMMITTEE: Wastewater Policy & Oversight

____ INFORMATION
_X_ VOTE

Wendy Leo, Senior Program Manager
Preparer/Title

Sean Navin
Director, Intergovernmental Affairs

RECOMMENDATION:

To approve the addition of one new member, Mr. Philip G. Ashcroft, to the Wastewater Advisory Committee.

DISCUSSION:

In addition to the critical oversight functions of the Advisory Board, many of MWRA's policy decisions are made with advice and support from two standing citizens' advisory committees, the Water Supply Citizens Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC).

The Wastewater Advisory Committee was created in 1990 to offer independent recommendations on wastewater programs and policies; it is a successor to the Facilities Planning Citizen Advisory Committee, which was established during the planning of the new Deer Island Treatment Plant. WAC's members include citizen advocates, representatives from the Metropolitan Area Planning Council, watershed associations, the engineering and business communities, environmental law, and the science and education fields. The Advisory Board has historically appointed a member as well.

WAC elects its chairman and employs an Executive Director (selected by WAC's membership with the concurrence and approval of MWRA's Public Affairs Department). WAC's current chairman is Craig Allen and WAC's current Executive Director is Andreae Downs.

The WAC Contract provides that WAC shall have a maximum of twenty members approved by MWRA's Board of Directors; the Contract prohibits alternates or designees.

The proposed new member, Mr. Ashcroft, is the chair of the New England Water Innovation Network and serves on other industry boards as well as providing consulting services. He was formerly employed for several years at Veolia Water North America and Veolia Water in the

United Kingdom. With his long distinguished career in the water industry, Mr. Ashcroft will be a valuable addition to the committee.

The current thirteen members on WAC are: Mary Adelstein, citizen advocate; Craig Allen, Commonwealth Research Group, Inc. (chair); Adriana Cillo, Boston Water and Sewer Commission; Wayne Chouinard, Town of Arlington DPW; Zhanna Davidovitz, Massachusetts Institute of Technology; Karen Golmer, Massachusetts Institute of Technology; Stephen Greene, Howland-Greene Consultants; James Guiod, MWRA Advisory Board; Taber Keally, Neponset River Watershed Association; Karen Lachmayr, Harvard University (vice chair); Beth Miller, independent engineer; Martin Pillsbury, Metropolitan Area Planning Council; Dan Winograd, Woodard & Curran.

In accordance with the current Agreement, WAC unanimously nominated Mr. Ashcroft for membership at its last meeting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Supply and Delivery of Ferrous Chloride to the Deer Island Treatment Plant
Kemira Water Solutions, Inc.
Bid WRA-4425

COMMITTEE: Wastewater Policy & Oversight

____ INFORMATION
_X_ VOTE

Michele S. Gillen
Director of Administration

David Duest, Director, DIWWTP
Carolyn Francisco Murphy, Director of Procurement
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To approve the award of Purchase Order Contract WRA-4425, a one-year contract for the supply and delivery of ferrous chloride to the Deer Island Treatment Plant, to the lowest responsive bidder, Kemira Water Solutions, Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said purchase order contract in an amount not to exceed $1,490,000 for a period of one year, from January 1, 2018 through December 31, 2018.

DISCUSSION:

The operational performance of Deer Island's digesters has been hampered in the past by the build-up of struvite in the overflow piping, which results in constricted flow (as shown in the picture to the right). Struvite, a by-product of anaerobic sludge digestion, is a crystalized compound that coats the interior surfaces of pipelines and valves. To address this problem, staff have implemented aggressive operational and maintenance initiatives including chemical treatment and on-going specialized cleaning. Operations staff have been using ferrous chloride to reduce struvite formation in the digested sludge since 1998.

Currently, Deer Island uses between four and eight truckloads of ferrous chloride per week as part of its ongoing struvite prevention program and staff estimate that approximately 2,000,000 pounds

of ferrous chloride will be needed during the one-year contract period. These estimates were used for bidding purposes only and for comparison of bids. MWRA will only pay for product delivered and received.

Procurement Process

Bid WRA-4425 was advertised in the following publications: Boston Herald, Central Register, Goods & Services Bulletin, El Mundo, and Banner Publications. In addition, bids were made available for public downloading on MWRA's e-procurement system (Event 3102) and seven potential bidders were solicited through the e-Portal.

On October 3, 2017, Event 3102 closed with the following results:

Vendor	Unit Bid Price		Total Bid
Kemira Water Solutions, Inc.	**$0.745 per dry pound X 2,000,000**	**=**	**$1,490,000**
Borden & Remington Corp.	$0.8826 per dry pound X 2,000,000	=	$1,765,200

Bid WRA-4425 was structured as a one-year contract similar to the existing contract, also with Kemira Water Solutions, Inc., which expires on December 31, 2017. Under the current contract, MWRA is paying a fixed unit price of $0.50 per dry pound of iron for an annual cost of $1,000,000. Compared to the existing contract, the cost has increased by $0.245 per dry pound of iron (a 49% increase over the last contract). The not to exceed amount of the contract is not a firm commitment of cost or a guarantee of purchase to the vendor; MWRA will only pay for product delivered and received.

Hydrochloric acid is a key ingredient in the production of ferrous chloride. This year's significant price increase, according to Kemira Water Solutions, Inc. is a direct result of a surge in hydrochloric acid prices during the past year. Since the start of summer 2017, hydrochloric acid prices have been on the rise due to a thinly supplied market. Plant outages caused by Hurricane Harvey have also contributed to these price increases. Market indicators suggest additional price hikes are likely after January 1, 2018.

Staff have reviewed Kemira Water Solutions, Inc.'s bid and have determined that it meets all of the requirements of the bid specifications. Therefore, staff recommend the award of this one-year purchase order contract to Kemira Water Solutions, Inc. as the lowest responsive bidder.

BUDGET/FISCAL IMPACT:

Additional costs for Ferrous Chloride in FY18 will be absorbed in the Operations Division Budget. Appropriate funding for this contract and for this chemical will be included in the Proposed FY19 Current Expense Budget.

MBE/WBE PARTICIPATION:

Kemira Water Solutions, Inc. is not a certified Minority- or Women-owned business.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Clinton Wastewater Treatment Plant Phosphorus Reduction Facility
Design, Construction Administration and Resident Engineering Services
Stantec Consulting Services, Inc.
Contract 7377, Amendment 4

COMMITTEE: Wastewater Policy & Oversight

____ INFORMATION
__X__ VOTE

Milan A. Horbaczewski, P.E., Program Manager
A. Navanandan, P.E., Chief Engineer
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Amendment 4 to Contract 7377, Clinton Wastewater Treatment Plant Phosphorus Reduction, Design, Construction Administration and Resident Engineering Services with Stantec Consulting Services, Inc., to increase the contract amount by $249,645.48, from $1,389,371.30 to $1,639,016.78, and increase the contract term by 172 calendar days from September 22, 2018 to March 13, 2019.

BACKGROUND:

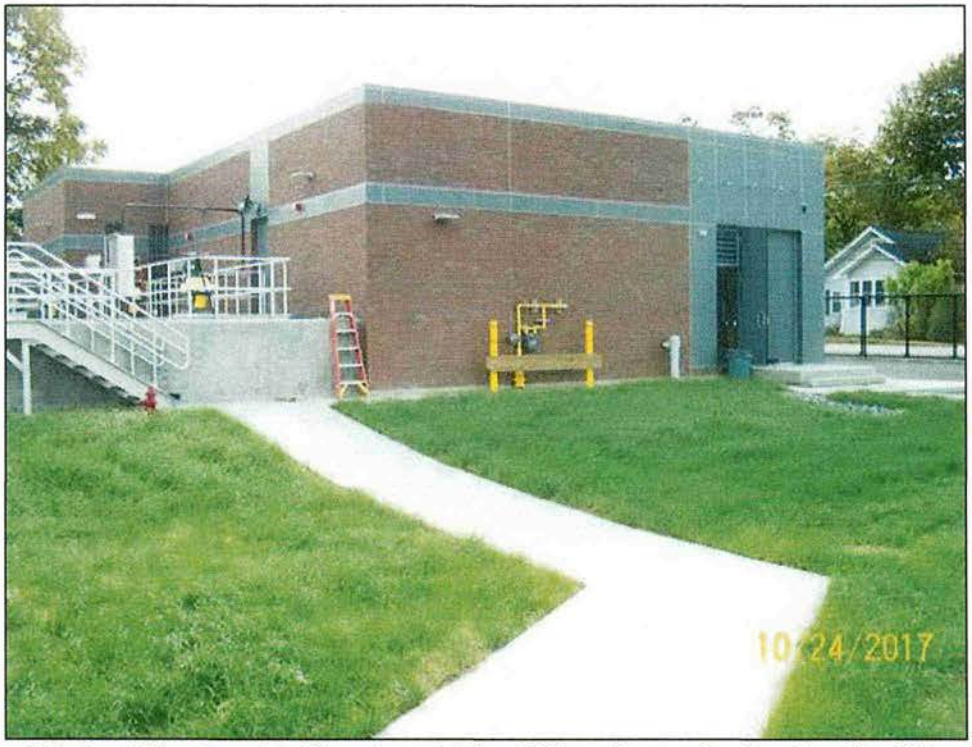
On October 16, 2013, the Board approved the award of Contract 7377 to Fay, Spofford & Thorndike, LLC, now Stantec Consulting Services, Inc., to provide design, construction administration, and resident engineering services for the Clinton Wastewater Treatment Plant Phosphorus Reduction Facility. The project provides enhanced phosphorus reduction at the Clinton Plant to comply with the stricter phosphorus limits in the recently issued National Pollutant Discharge Elimination System (NPDES) permit renewal.

On February 10, 2016, the Board approved the award of Construction Contract 7411 to Daniel O'Connell's Sons, Inc. and a Notice to Proceed for construction was issued on March 22, 2016. Operational testing and start-up of the facility is currently ongoing.

DISCUSSION:

Amendment 1 increased design services to add investigation and design for oil to natural gas conversion and for replacement of the existing chlorine analyzer; Amendment 2 extended the contract term by 86 days to increase for the design duration and add design services, including technical coordination with National Grid and the state plumbing inspector associated with the oil to natural gas conversion, modifications to the construction contract documents after the 90% submission, and additional permitting assistance; and Amendment 3 increased the level of effort

of construction administration services to review an additional 113 contractor submittals, beyond the 200 submittals included in the original contract.



Clinton Wastewater Treatment Plant Phosphorus Reduction Facility

This Amendment

Amendment 4 would increase the contract term by six months and increase the contract amount by $249,645.48.

Time Extension

The Contractor for construction Contract 7411 originally scheduled its 60-day functional and performance testing of the phosphorus reduction equipment system well ahead of the contract's substantial completion date of September 13, 2017. To date, the contractor has not been able to successfully conduct the testing, due to late arrival of some of the Contractor's purchased equipment, delays in completing electrical and instrumentation wiring by a subcontractor, and performance problems with some of the WesTech phosphorus reduction equipment. Due to equipment performance problems during low flow and recent high flows, which the contractor and vendor WesTech are attempting to resolve, there is no firm schedule yet for restarting the 60-day testing. Based on an understanding of the ongoing problems, staff conservatively estimate an up to six-month delay in the contractor's attainment of substantial completion.

To ensure continuation of engineering oversight of the corrective actions, functional and performance testing and completion of other contractor requirements, staff recommend that the construction administration and resident engineering services of Contract 7377 be extended by

approximately six months to March 2019. This, in turn, would extend the Contract 7377 term (maintaining 1-year warranty certification), from September 22, 2018, to March 13, 2019.

The budget increase in this amendment associated with the six-month extension may be offset by future construction contract cost recovery action.

Construction Administration Services $161,257.48

Project Administration Services. An increase in the budget for Project Administration Services is necessary to continue Stantec's administration of the contract through the additional up to six months of contractor work and testing to attain substantial completion. The additional cost for these services is $16,320.00.

Construction Advice/Interpretation/Clarification. To date, Stantec has exceeded the assumed level of effort in the daily coordination and correspondence with MWRA and the contractor to interpret, clarify and enforce the construction contract specifications, due to contractor delays and equipment performance problems over the past six months. Additional engineering effort by Stantec is also needed to respond to the State Plumbing Inspector's requests for additional details and design calculations related to the switching over of the existing boilers from fuel oil to natural gas in the Headworks and Dewatering buildings, the installation of a dual gas burner for methane gas usage in the Digester Building, and provision of carbon monoxide detectors in each building as required by the switchover to natural gas. The additional cost for these services is $44,880.40, of which $27,103.20 is associated with the six-month extension.

Contractor Submittals. The contract initially included the review and processing of 200 contractor submittals. Amendment 3 increased this total by an additional 113 submittals. Stantec has surpassed the increased amount by 89 submittals, and an additional 48 submittals are estimated to need review and processing during the six-month extension. The cost for Stantec review and processing of the additional 137 submittals is $48,883.00.

On-Site Meetings/Inspections/Observations. The contract includes bi-monthly on-site meetings of the contractor, MWRA staff and Stantec personnel. However, when construction and equipment problems arose this past summer as the project approached the construction contract's substantial completion date, weekly meetings became necessary. Additional on-site meetings and site visits will be held through the six-month extension. The cost for these additional site meetings and inspections is $13,550.24.

Facility Manual. The contract includes preparation of a facility manual for the new phosphorus reduction facility and any upgraded components. The interface of the existing systems and new facility components, such as the bi-sulfite pump panels, digester gas boiler and generator "kirk key" operational sequence (trapped "kirk key" interlocking utilizes locks and keys for sequential control of equipment to ensure safe access), will require descriptive additions to the facility manuals. The cost to include these additions to the facility manual, which was not accounted for in earlier amendments, is $12,439.20.

Start-Up. Due primarily to phosphorus reduction equipment testing problems mentioned earlier and delays incurred by the electrical subcontractor, start-up of the new phosphorus reduction

facility and associated systems has not proceeded in a continuous manner and caused a number of attempted start-ups. Contract 7377 anticipated a comprehensive start-up of the entire phosphorus removal system, but individual component start-ups have been required to achieve an operational system. Unanticipated low influent flow conditions (0.6 MGD compared to plant's historical daily average flow of 3.1 MGD) have required additional investigation of low flow pumping requirements, adjustments to the backwash system, and coordination of plant flow effluent with the hypochlorite dosing system. The heating systems transferred to natural gas and the dual burner for the digester building boiler have required additional start-ups of gas trains for boilers and meetings with State Plumbing Inspector to resolve outstanding questions. The cost associated of these additional services is $25,184.64.

Disc Filter Process Equipment in New Phosphorus Reduction Facility

Amendment 4 also includes an increase in Resident Engineering Services.

Resident Engineering Services	$88,388.00

The construction contract extension of six months will necessitate the continuation of resident engineering services to maintain continuity and project oversight through completion and closeout. The cost of these continued services is $88,388.00.

All of the above increases the contract amount by $249,645.48.

CONTRACT SUMMARY:

	AMOUNT	TIME	DATED
Original Contract:	$1,144,465.23	1,700 Days	11/1/13
Amendment 1*:	$68,394.35	0 Days	2/2/15
Amendment 2*:	$107,424.72	86 Days	2/2/17
Amendment 3*:	$69,087.00	0 Days	6/8/17
Amendment 4:	$249,645.48	172 Days	Pending
Adjusted Contract Amount:	$1,639,016.78	1,958 Days	

*Approved under delegated authority

Amendments 1 through 4 increase the total contract amount by 43%.

BUDGET/FISCAL IMPACT:

The FY18 CIP includes a budget of $1,419,371 for Contract 7377. Including this amendment for $249,645.48, the adjusted contract amount will be $1,639,016.78. The difference will be covered in the FY18 CIP.

MBE/WBE PARTICIPATION:

The minimum MBE and WBE participation requirements established for this contract are 0% and 5.9%, respectively, and will be unchanged by this amendment.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
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WATER POLICY AND OVERSIGHT COMMITTEE MEETING

Chair: A. Blackmon
Vice-Chair: B. Peña
Committee Members:
J. Carroll
J. Foti
A. Pappastergion
H. Vitale
J. Walsh
J. Wolowicz

to be held on

Wednesday, November 15, 2017

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following Wastewater Comm.

AGENDA

A. Information

1. Update on Lead and Copper Rule Compliance – Fall 2017 and Update of Local and National Activities

B. Contract Amendments/Change Orders

1. Southern Extra High Pipeline – Section 111 (Boston): P. Gioioso and Sons, Inc., Contract 6454, Change Order 3

2. Wachusett Aqueduct Pumping Station: BHD/BEC JV 2015, A Joint Venture, Contract 7157, Change Order 25

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the
Water Policy and Oversight Committee

October 18, 2017

A meeting of the Water Policy and Oversight Committee was held on October 18, 2017 at the Authority headquarters in Charlestown. Chairman Blackmon presided. Present from the Board were Messrs. Carroll, Cotter, Pappastergion, Peña, Vitale, and Walsh. Among those present from the Authority staff were Fred Laskey, Steve Remsberg, Dave Coppes, John Gregoire, Cori Barrett, Jerry Sheehan, and Bonnie Hale. The meeting was called to order at 11:50 a.m.

Information

Update on MWRA Aquatic Invasive Plants Control Activities

Staff gave a presentation on aquatic plants control activities in various MWRA locations.

Progress on Northern Intermediate High and Southern Extra High Pipeline Redundancy Projects

Staff gave a presentation on the progress of the above pipeline projects.

Contract Amendments/Change Orders

*Northern Intermediate High Section 110 – Reading and Woburn: Albanese D&S, Inc., Contract 7471, Change Order 12

Staff described the project and the work to be performed under the change order. The Committee recommended approval of Change Order 12 (ref. agenda item B.1).

The meeting adjourned at 12:15 p.m.

* Approved as recommended at October 18, 2017 Board of Directors meeting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Update on Lead and Copper Rule Compliance – Fall 2017
And Update of Local and National Activities

COMMITTEE: Water Policy & Oversight

X INFORMATION
___ VOTE

Joshua Das, Project Manager, Public Health
Carl Leone, Senior Program Manager
Stephen Estes-Smargiassi, Director, Planning and Sustainability
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

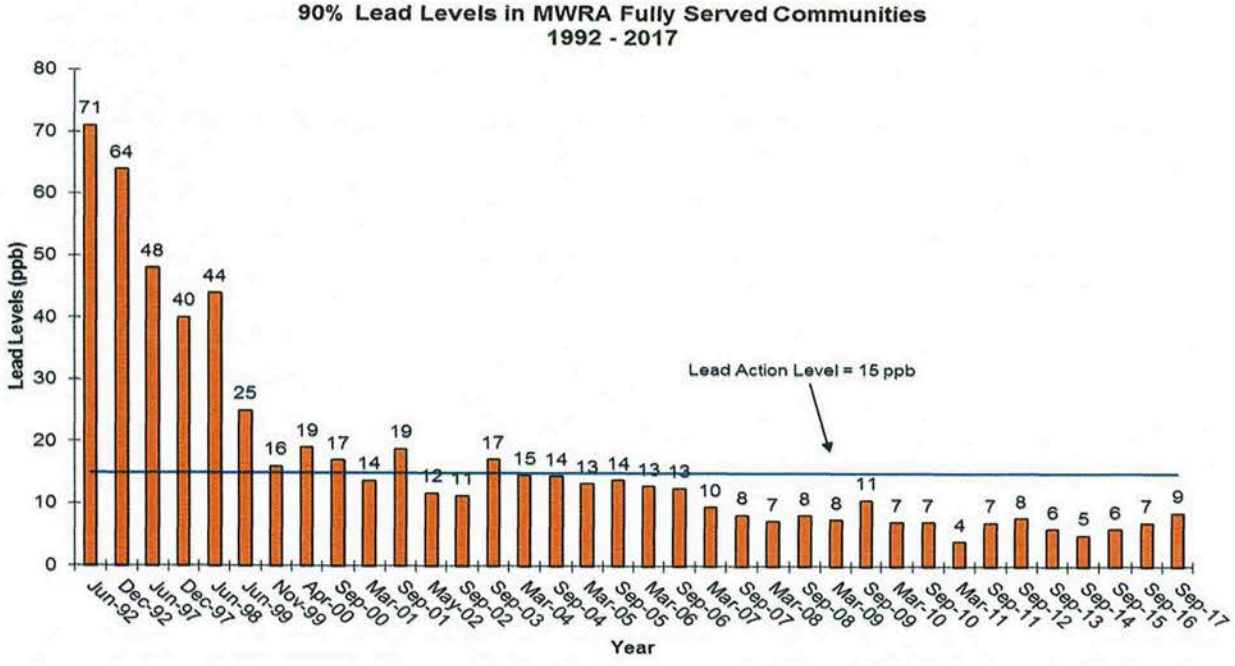
MWRA system-wide lead levels in the September 2017 sampling round were below the Action Level of 15 parts per billion (ppb) again for the 22nd consecutive sampling round. MWRA system-wide 90th percentile value for calendar year 2017 is 8.6 ppb. Four communities were individually above the Lead Action Level. MWRA continues to meet the copper standard.

RECOMMENDATION:

For information only.

DISCUSSION:

MWRA and its member communities conducted the calendar year 2017 sampling round beginning in September 2017. The 90th percentile value for the system as a whole was 8.6 parts per billion (ppb), which is below the Lead Action Level of 15 ppb.



Under EPA's Lead and Copper Rule, each year MWRA and every fully-supplied community must collect and test tap water in a sample of homes[1] that are likely to have high lead levels. These are usually homes with lead services or lead solder. EPA requires that nine out of ten of the sampled homes must have lead levels at or below the Action Level of 15 ppb.

Starting in 2012, MWRA's fully supplied communities were only required to sample for lead and copper once per year, as long as their 90th percentile results are below the Action Level. A community that exceeds can return to once-per-year sampling after it has two consecutive sampling rounds under the Action Level. In September 2016, two communities, Malden and Quincy, were above the Action Level. Both were below the Action Level in the March 2017 sampling round, but Quincy was once again above in this September 2017 sampling round, and will need to sample twice in 2018.

Quincy was over the Action Level this round despite making substantial progress on a lead service line removal program. The sampling plans for each community must include lead service lines or lead lined service lines, if any are still remaining. Quincy has removed most of its lead service lines, but still have lead lined service lines remaining. Two of these sites were over the Action Level and caused Quincy to exceed the Action Level. These two sites have already had their service lines replaced and will not be included in the next sampling round.

Three other communities, Medford, Melrose and Winthrop, were also above the Action Level in the September 2017 sampling round, and will need to sample twice in 2018. Malden was under for both rounds, and will be back to one sampling round in 2018.

Massachusetts Department of Environmental Protection (DEP) has had extensive interactions with all four communities with regard to fulfilling the requirements of the Lead and Copper Rule. All four communities have been notified and will be required to meet education requirements, including mailing lead education brochures, and will be required to meet lead service line replacement requirements set by DEP. All four communities have been over the Action Level before, so they have experience successfully working with DEP on meeting the requirements of the Lead and Copper Rule. MWRA provides the educational brochures, and staff have offered assistance in working with DEP on the education requirements and service line documentation.

Under the LCR, each community is also required to collect samples from two schools or childcare facilities. As discussed under the school program update below, all school testing results are uploaded to DEP's on-line school database and MWRA staff immediately contact any community that had a school above the Action Level.

MWRA has already formally transmitted these results to DEP. The results were also transmitted to the communities, and, through them, to every individual homeowner or school that collected a sample for the program. MWRA staff has directly contacted communities with schools above the Action Level or any individual homeowners with very high or unusual results.

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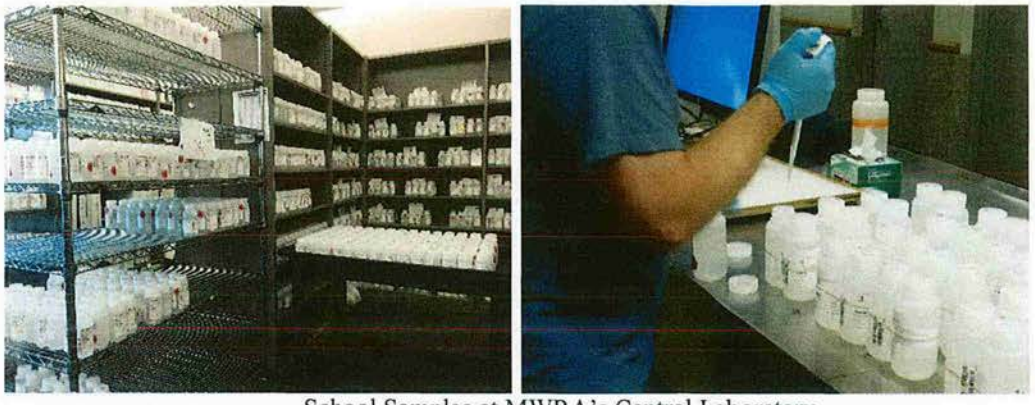
[1] In most communities, 15 homes are sampled; the exceptions are Boston, which collects 25 samples, and Lynnfield and Nahant, which collect 10 samples. A total of at least 450 samples are collected.

Update on School Testing Program

MWRA has been working with MWRA communities on testing school fixtures used for drinking or cooking. DEP created a technical assistance and laboratory analysis program to test schools throughout the state, and MWRA offered lab services in parallel with the DEP program. From April 2016 through the end of October 2017, MWRA's Laboratory performed 32,226 tests on samples from 320 schools in 36 different MWRA communities. Approximately 4.7 percent of all lead samples were above the Action Level. 125 of the 320 schools had one or more sample test over the Action Level. All communities and schools with elevated levels have been contacted and technical assistance materials provided. Results from all schools across the state that have been tested have been posted by DEP on-line, and a link to this site is on MWRA's website. Most communities also have had local outreach efforts.



School Samples at MWRA's Central Laboratory

As reported to the Board earlier this year, school systems used the information collected to take remedial action at locations where sampling indicated elevated lead levels. These remedial actions included shutting off or removing fixtures (particularly where they were not needed or required, such as individual sinks in classrooms), replacing older fixtures which were contributing excessive lead with new lead-free ones, using bottled water until other actions could be taken, labeling bathroom sinks as for handwashing only, and developing flushing programs to clear stagnant water from plumbing within walls until extensive plumbing alterations can be undertaken.

While MWRA community school sample data did identify many locations which required remedial action, results from MWRA communities were somewhat better than statewide numbers from the DEP program, likely indicating that MWRA corrosion control is providing substantial benefit at reducing lead corrosivity.

The first round of the DEP Program is complete, a report was published on the results, and DEP announced another round of sampling assistance earlier in October. MWRA sent information on school sampling to local water and school officials right after DEP announced its program, again offering free laboratory services to our communities. The number of samples the MWRA laboratory received over the summer was much less than the peak in Fall 2016, but is expected to increase as DEP and MWRA promote the second round of sampling. DEP's recommendation is that all locations used for drinking or cooking be tested, and that repeat sampling be conducted on one-third of locations each year so that no location is sampled less than every three years, in line with the national guidance contained in the Lead Contamination and Control Act (LCCA) which governs lead control efforts in

schools. Communities may also want to prioritize buildings with the most vulnerable younger children or which had a higher incidence of elevated sample results.

Staff continue to work with DEP at assuring that all data collected on lead levels is provided to the public, and at collaborating with DEP in considering appropriate outreach and testing approaches for other locations where children might be exposed to elevated lead levels such as playgrounds and childcare facilities. (Only the larger "early education centers" were included in DEP's initial program.)

Review of Corrosion Control Technology

EPA released a new guidance document on the evaluation of optimum corrosion control treatment to state primacy agencies in 2016. At DEP's request, MWRA staff are in the process of reviewing MWRA's historical water quality data and the most recent science on corrosion control. Staff discussed the preliminary results with DEP at a regular DEP/EPA/MWRA drinking water coordination meeting earlier in October, and will provide DEP with a written document by the end of the calendar year. Staff's preliminary conclusions are that MWRA's corrosion control treatment is working well, that water quality is stable, and that changes in treatment are both not warranted and potentially counter-productive. Further, permanent long-term improvements in reducing the potential for lead exposures will come from the Lead Service Line Loan Replacement Program that the Board approved in 2016.

Update on Lead Service Line Replacement Loan Program

In March 2016, the Board approved an enhancement to the Local Water System Assistance Program to provide up to $100 million in 10-year, zero-interest loans to communities solely for efforts to fully replace lead service lines, and approved the Program Guidelines for the Lead Loan Program in May. Each community can develop its own program, tailored to its local circumstances.

Through November 2017, MWRA has made five financial assistance distributions for a total of $7.2 million under the Lead Loan Program:

• Newton in FY17	$4.0 million
• Quincy in FY17	$1.5 million
• Winchester in FY17	$0.5 million
• Marlborough in FY18	$1.0 million
• Revere in FY18	$0.2 million
Total	$7.2 million

The Quincy program is well underway, and has received good participation as the City is funding 100 percent of the work, including removal of the portion of the lead service line on private property. Having made substantial progress on removing all lead service lines, Quincy has moved to replacing lead-lined steel service lines. The Newton program is also underway and includes a 10-year, zero-interest loan to homeowners for the private portion. The Marlborough program includes full funding for the private portion similar to the Quincy program. Winchester is still working on the program management stage of its project. In November 2017, Revere received $195,000 for a design and oversight of a project to replace 282 full lead service lines. The funding for the associated construction project will come from the Drinking Water State Revolving Fund.

Somerville has submitted an application for a $1.2 million Lead Loan which is awaiting local authorization. Winthrop has submitted an application for a $0.2 million Lead Loan to initiate a multi-phase program and is planning a second application in 2018. Some additional communities have expressed interest in the program for later in FY18 or in FY19. Future EPA requirements may stimulate lead service line removal work over the next few years.

MWRA's goal in providing financial assistance to member communities is to improve local water systems so that the high quality water MWRA delivers can make it all the way to the consumer's tap. The presence of a lead service line connecting a home to the main in the street can lead to elevated lead levels in tap water, especially if that water sits stagnant for an extended period. MWRA's stable water quality and effective corrosion control treatment reduce the risk that a lead service line will cause elevated lead levels, and measured lead levels in high risk homes have decreased by 90 percent since corrosion control was brought on-line in 1996. However, the risk of elevated levels remains as long as lead service lines are in use.

MWRA staff have been active in working with a national group called the Lead Service Line Replacement Collaborative, which is a voluntary collaborative effort of over two dozen water, environmental health and community advocacy groups. While these groups typically do not work together, they are collaborating effectively with a goal of accelerating local efforts toward full lead service line replacement. The Collaborative has launched an extensive web site. MWRA and community efforts are already highlighted, and staff will be contributing additional materials and case studies from regional lead service line programs.

A link to the Collaborative's website is included on MWRA's website, and it has been highlighted in DEP's periodic newsletter to public water suppliers.

Update on MWRA Coordination with MDPH on Testing Homes

Massachusetts Department of Public Health (MDPH) has now moved ahead with its partnership with MWRA to sample for lead in the tap water at homes where a child has an elevated lead blood level, and identify if there is a lead service line. Very few lead poisoning prevention programs around the country have collected information on lead in water levels.

MWRA staff assisted in training for the MDPH field staff that visit homes, and coordinated how to perform the sampling. Sample bottles, appropriate chain of custody forms, as well as boxes with return postage were provided to MDPH staff. Residents are provided educational information about the potential for lead in water, as well as actions they can take to reduce levels.

Samples began to arrive in early October 2016, and to date 67 households with a child having elevated lead blood levels have returned samples with 2 samples at each household. So far, all of the test results have been below the Action Level, and all but one of the samples was below 10 ppb. 65 percent of homes had both sample results less than the detection level of 1 ppb. MWRA reports the results back to MDPH as they are analyzed which then provides the results to the residents, preserving the required confidentiality under federal health privacy laws.

MWRA and MDPH staff continue to coordinate on the program, and anticipate an increased number of samples as MDPH will be expanding the definition of "elevated blood lead level" later this year.

Lead Forum:

Staff conducted a regional forum for local water department staff on lead issues in late June, including regulatory updates, current scientific findings, results of school testing, and updates on lead service line replacement programs. Speakers included staff from MWRA, local communities in the midst of lead service line programs, DEP and MDPH. The forum was well received, particularly the direct experience of community staff. MWRA staff are considering when it would be appropriate to conduct another one, likely as additional communities undertake lead service line replacement programs and have results and recommendations to share.

Revisions to the Lead and Copper Rule:

There has been little formal movement on EPA's continuing work to revise the Lead and Copper Rule since the last update to the Board in February. In addition to the recommendations of the National Drinking Water Advisory Council (previously described to the Board), EPA has received extensive comments from Congressional committees and other groups investigating the Flint situation, as well as many comments from the public and other interested parties. In October 2016, EPA issued a White Paper providing an overview of the issues and approaches they are considering as they draft the revisions. The White Paper provided few specifics beyond what had already been discussed in the National Drinking Water Advisory Council (NDWAC) recommendations. In October 2017, EPA released a peer review of approaches to developing a "Health–Based Benchmark" which could be used identify sample results which are high enough to immediately require local health officials be notified, as recommended in the NDWAC report.

MWRA staff will continue to track EPA's efforts, evaluating their potential impact on MWRA and MWRA communities, and will be actively involved along with the water professional associations in commenting as appropriate.

BUDGET /FISCAL IMPACT:

MWRA began modern effective corrosion control treatment to reduce lead and copper levels at the tap in 1997. MWRA's corrosion control treatment involves raising the pH and alkalinity to the water to provide a stable, non-corrosive product, reducing the potential for both lead and copper to leach from customer's home plumbing. The current annual cost for corrosion control is approximately $3.5 million ($3.2 million in soda ash costs, and $0.3 million in carbon dioxide costs.)

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Southern Extra High Pipeline - Section 111 (Boston)
P. Gioioso and Sons, Inc.
Contract 6454, Change Order 3

COMMITTEE: Water Policy & Oversight

___ INFORMATION
_X_ VOTE

Terrence Flynn, P.E., Construction Coordinator
Corinne M. Barrett, Director, Construction
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 3 to Contract 6454, Southern Extra High Pipeline - Section 111 (Boston), for an amount not to exceed $78,353.57 increasing the contract amount from $12,366,345.79 to $12,444,699.36, with no increase in contract term.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 6454 in an amount not to exceed the aggregate of $250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

DISCUSSION:

MWRA's Southern Extra High service area includes Canton, Dedham, Norwood, Stoughton, Westwood, portions of Brookline and Milton, and the Roslindale and West Roxbury sections of Boston. The five communities in the southern portion of the service area (Canton, Norwood, Dedham, Westwood, and Stoughton) are served by a single 36-inch diameter transmission main (Section 77), which is five miles long. Canton and Stoughton are served by a branch (Section 88) off of Section 77. Although several of these communities are partially supplied by MWRA, the loss of Section 77 would result in a rapid loss of service in Norwood and Canton, and potential water restrictions for Stoughton and Dedham/Westwood. Correction of this deficiency has been assigned a Priority One in MWRA's Water Master Plan due to the potential critical threat to public health that could result from a failure in this single transmission main.

On November 14, 2012, staff presented to the Board an evaluation of alternatives and a recommendation to proceed with a 5.4-mile redundant pipeline alternative from the Bellevue Water Storage Tanks in West Roxbury through Dedham to Westwood where the proposed pipeline would interconnect with existing pipeline Section 77 near the Route 95 East Street Rotary.

Contract 6454, Section 111, which is the subject of this staff summary, is the first of three main pipeline construction contracts and consists of 11,000 linear feet of 36-inch water main all which is primarily located within DCR's Stony Brook Reservation in Boston.

This Change Order

Change Order 3 consists of the following four items:

Furnish and Install a Solid Sleeve and Revise Piping — Not to Exceed $36,000.00

Solid Sleeve at the Section 77 Tap

The contract documents require the Contractor to install a new tapping valve and vault in order to complete the connection of the new 36-inch Section 111 to the 36-inch Section 77 water main, adjacent to West Roxbury Parkway. When the pipe was excavated to install the tapping sleeve and vault, it was determined that the existing Section 77 is located approximately 1-foot closer to the edge of the roadway than shown on the existing record drawings. Additionally, excavation to existing nearby Section 74 revealed the water main to be lower than depicted on the record drawings, requiring Section 111 to be installed roughly 2-feet lower than shown on the contract drawings as it crossed under Section 74. In order to connect the new work to existing Section 77, the piping configuration of the 30-inch connection piece must be revised to accommodate the limited space and grade differences. This change order is to furnish and install a new 30-inch solid sleeve and revise the piping to shift the new sleeve to within the tapping sleeve valve vault to fit the connection into the limited space at the Section 77 tie-in.

The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to an amount not to exceed $36,000 for this additional work with no increase in contract term. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

Furnish and Install a 36-inch Ductile Iron 11.25 Degree Bend — $17,394.98

Additional Bend

The contract documents require the Contractor to install a new gate valve and an air valve manhole with a single 11.25-degree bend at end of the newly installed pipeline on Dedham Parkway. However, a second bend is required to allow the pipe to be level at the two structures and connect to a pipe which is specified to be installed under the next construction contract (Contract 7504). As specified, the pipe would have to be installed at a sloped angle through the air valve structure to be able to retain five feet of cover over the pipe at the connection to Contract 7504. The pipe

should be installed level through the manhole in order for the air valve to operate properly. This additional bend is more labor intensive than the specified straight pipe because it must be inserted between two fixed elevation manholes. Also, multiple short pieces of 36-inch pipe are now required to complete the connection.

The approved PCO for this item has been identified by MWRA staff as a design omission. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of $17,394.98 for this additional work with no increase in contract term. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

Furnish and Install a 24-inch Ductile Iron 11.25-degree Bend $13,317.64

The contract documents require the Contractor to install a new 24-inch ductile iron tee and valves on a portion of the existing 24-inch Section 42 water main adjacent to the West Roxbury Parkway. When the Section 42 pipe was excavated to complete this new connection, it was determined that the pipe had been installed with a 24-inch ductile iron deflected (USIFLEX-type) joint, and at a different slope, than depicted on the record drawings. In order to connect the new 36-inch Section 111 to the existing 24-inch Section 42, an additional 24-inch 11.25-degree bend is required.

Tie in at Section 42

The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of $13,317.64 for this additional work with no increase in contract term. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

Remove and Replace Vitrified Clay Drain Pipe with PVC Drain Pipe $11,640.95

Drain removed and replaced

The contract documents do not require the Contractor to remove or replace drains. However, at numerous locations the Contractor has encountered 12-inch vitrified clay drains that were either damaged by the Contractor's excavation or they conflict with the elevation along the alignment. These drains were not identified on the Contract Drawings. DCR staff are requiring that the drains be removed and replaced with PVC pipe.

The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of $11,640.95 for this additional work with no increase in contract term. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

CONTRACT SUMMARY:

	Amount	Time	Dated
Original Contract:	$11,770,000.00	780 Days	06/16/16
Change Orders:			
Change Order 1	$369,958.46	0 Days	08/24/17
Change Order 2	$226,387.33	0 Days	Pending
Change Order 3	$78,353.57	0 Days	Pending
Total of Change Orders:	$674,699.36	0 Days	
Adjusted Contract:	$12,444,699.36	780 Days	

*Approved under delegated authority

If Change Order 3 is approved, the cumulative value of all change orders to this contract will be $674,699.36 or 5.73% of the original contract amount. Work on this contract is approximately 89% complete.

BUDGET/FISCAL IMPACT:

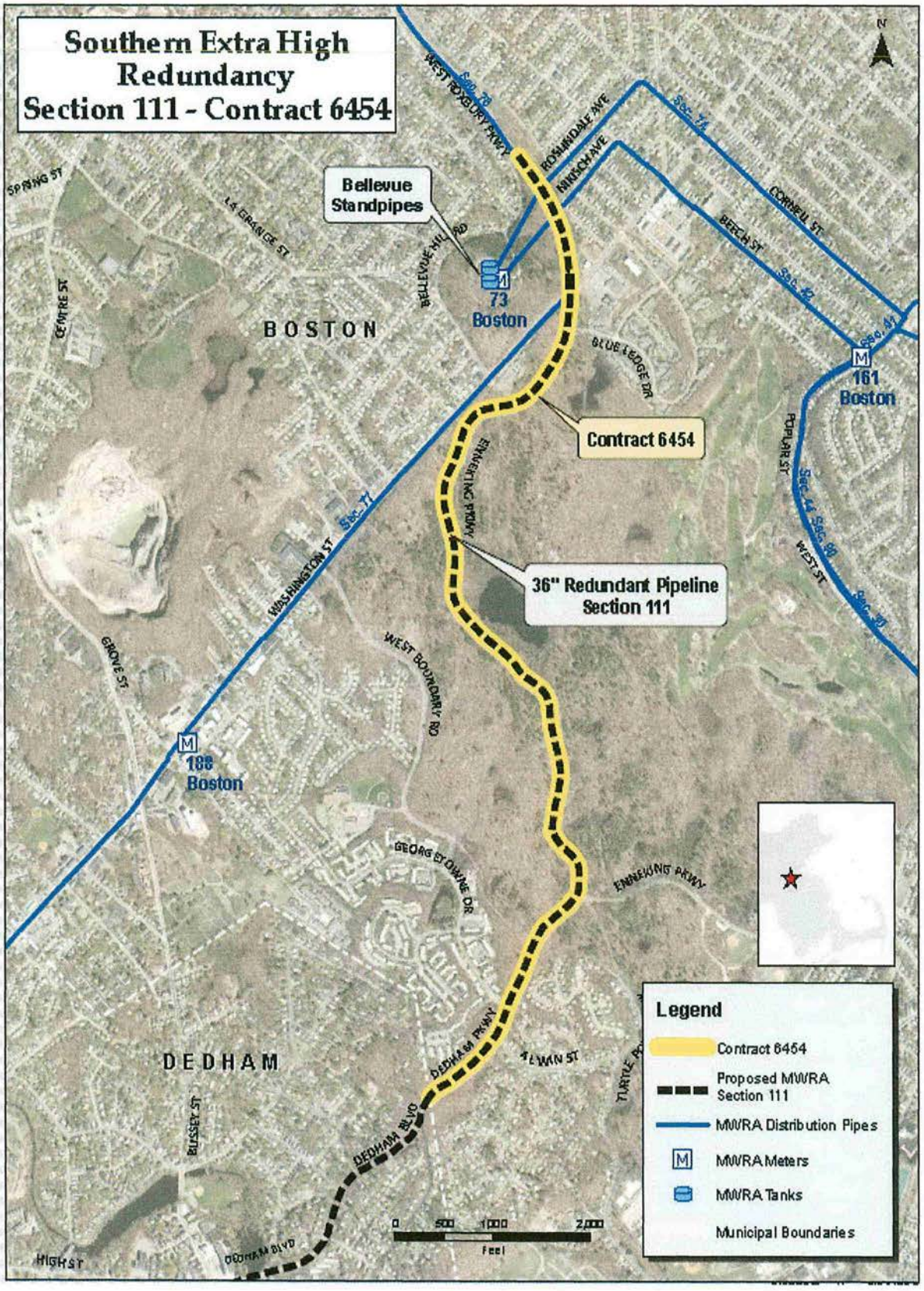
The FY18 CIP includes a budget of $11,795,000 for contract 6454. Including this change order for $78,353.57, the adjusted subphase total is $12,444,699.36 or $649,699.36 over budget. This amount will be covered within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The D/MBE and WBE participation requirements for this project were established at 3.4% and 3.8%, respectively.

ATTACHMENT:

Figure 1: Section 111 – Southern Extra High Redundancy


Southern Extra High Redundancy Section 111 - Contract 6454
Bellevue Standpipes
73 Boston
161 Boston
188 Boston
Contract 6454
36" Redundant Pipeline Section 111
BOSTON
DEDHAM
WEST ROXBURY PKWY
ROSLINDALE AVE
HINSCHAW
CORNELL ST
BEECH ST
POPLAR ST
WEST ST
SPRING ST
LA GRANGE ST
CENTRE ST
BELLEVUE HILL RD
BLUE LEDGE DR
ENNEKING PKWY
WASHINGTON ST
GROVE ST
WEST BOUNDARY RD
GEORGETOWNE DR
DEDHAM PKWY
ALWIN ST
BUSSEY ST
DEDHAM BLVD
HIGH ST
Sec. 78
Sec. 74
Sec. 42
Sec. 41
Sec. 77
Sec. 44
Sec. 80
Sec. 81
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0 500 1000 2000
Feet
Legend
Contract 6454
Proposed MWRA Section 111
MWRA Distribution Pipes
MWRA Meters
MWRA Tanks
Municipal Boundaries

W B.2
IV C.3
11/15/17

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Wachusett Aqueduct Pumping Station
BHD/BEC JV 2015, A Joint Venture
Contract 7157, Change Order 25

COMMITTEE: Water Policy and Oversight

___ INFORMATION
_X_ VOTE

Vincent Spada, Construction Coordinator
Corinne M. Barrett, Director, Construction
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 25 to Contract 7157, Wachusett Aqueduct Pumping Station, with BHD/BEC JV 2015, A Joint Venture, for a lump sum amount of $290,963.00, increasing the contract amount from $48,425,470.29 to $48,716,433.29, with no increase in contract term.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7157 in an amount not to exceed the aggregate of $250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

DISCUSSION:

The water transmission system between Wachusett Reservoir and the John J. Carroll Water Treatment Plant consists of the Cosgrove Tunnel and the Wachusett Aqueduct. The Cosgrove Tunnel provides the primary raw water supply to the Carroll Plant and the Wachusett Aqueduct is an emergency back-up. Although rehabilitation of the Wachusett Aqueduct in 2003 allowed its use for a short winter duration so that the Cosgrove Tunnel could be connected to the Carroll Plant, it is limited in its flow capacity and it cannot meet the grade line requirements of the Plant in the event of an emergency. Since the Wachusett Aqueduct operates at a lower hydraulic grade line than the Cosgrove Tunnel, water cannot flow from it into the Plant's ozone contactors without pumping. If the Wachusett Aqueduct were needed in an emergency, the Carroll Plant would have to be shut down and temporary chlorination facilities would have to be installed at the Wachusett Reservoir-end of the aqueduct to provide disinfection.

Once completed, this new pumping station will allow the Wachusett Aqueduct to provide redundancy for the Cosgrove Tunnel. Completion of the Hultman Aqueduct rehabilitation and interconnections project provided redundancy for the MetroWest Water Supply Tunnel. Together, these projects will provide water transmission redundancy from Wachusett Reservoir to the metropolitan tunnel system.

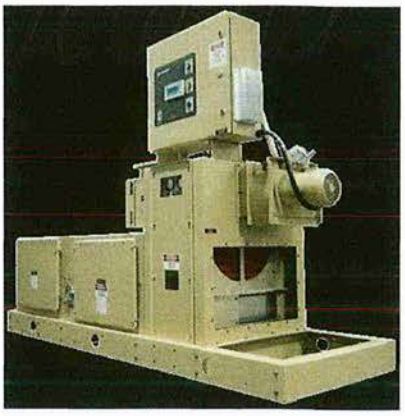
This Change Order

Change Order 25 consists of the following two items:

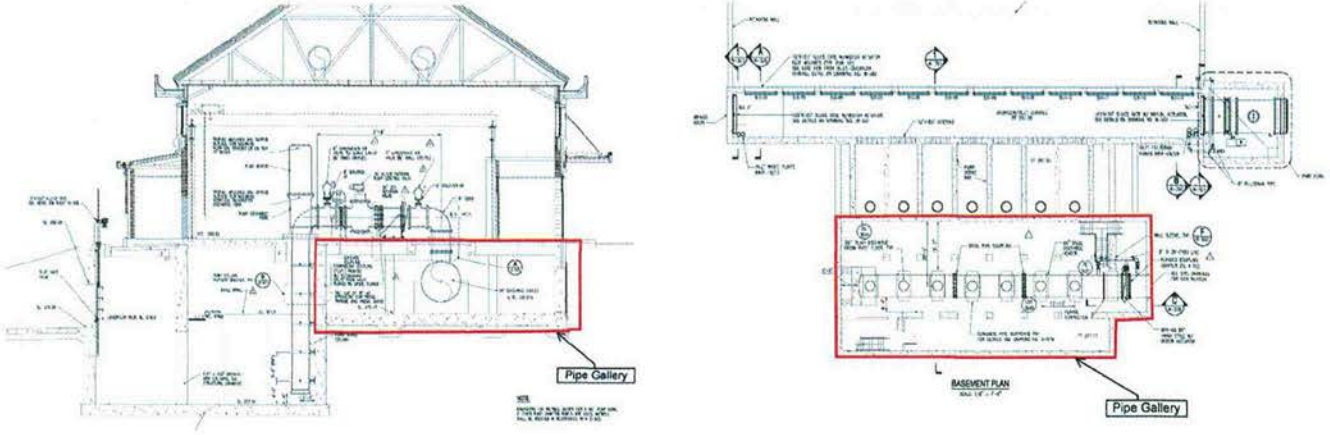
Pipe Gallery Dehumidification $184,456

The contract documents require the Contractor to furnish and install a refrigerant type dehumidifier system to service the pipe gallery room of the Wachusett Aqueduct Pumping Station. The refrigerant type dehumidifier system is commonly used and typically specified for use in similar applications. Recent operating experience with the Carroll Plant Ultraviolet Room dehumidification system has shown that the as-bid dehumidifiers in the pumping station pipe gallery should be changed. The Design Engineer evaluated alternatives and selected a desiccant-type system to replace the refrigerant type dehumidifier.

The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of $184,456 for this additional work with no increase in contract term. The work has not begun.



Desiccant Dehumidifier



Pipe Gallery Layout

Design for Power Fluctuation Ride-Through Capability $106,507

MCC Installation

After the Wachusett Aqueduct Pumping Station bid opening, staff at the Carroll Plant began taking note of minor fluctuations in power levels from the utility company. Staff observed that power fluctuations lasting only milliseconds caused some equipment shutdown, requiring manual re-start. Following this observation, MWRA now believes that the Motor Control Center (MCC) specified power backup to the water supply pump operation will also be susceptible to shut down with a minor power fluctuation. A shut down of the water supply pumps would require individual startup of each of the six pumps, one at a time. This would take about one hour before the water supply pumps are all on line and supplying the needed water flow rate to the treatment plant, which is unacceptable. Also, it is unknown how many times per day a power fluctuation may occur. To prevent this, a DC battery circuit will be installed in each MCC to provide ride through power capability during minor power fluctuations to maintain pump operation. In conjunction with this, the pump control valves control panels will each be provided with uninterruptable power supply.

The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of $106,507 for this additional work with no increase in contract term. The Contractor proceeded with this work at its own risk in order to proceed with the remainder of the contract work.

CONTRACT SUMMARY:

	Amount	Time	Dated
Original Contract:	$47,011,000.00	1,260 Days	03/01/16
Change Orders:			
Change Order 1*	($1,500,000.00)	(180) Days	07/25/16
Change Order 2*	$14,766.00	0 Days	10/26/16
Change Order 3*	$24,822.00	0 Days	11/16/16
Change Order 4*	$199,629.92	0 Days	12/12/16
Change Order 5	$328,039.00	0 Days	12/23/16
Change Order 6*	$23,202.00	0 Days	01/18/17
Change Order 7*	$24,533.12	0 Days	02/06/17
Change Order 8*	$189,495.00	0 Days	03/06/17
Change Order 9	$100,079.80	0 Days	03/23/17
Change Order 10*	$24,521.45	0 Days	04/03/17
Change Order 11*	$24,455.00	0 Days	04/12/17
Change Order 12*	$24,659.00	0 Days	04/19/17
Change Order 13*	$22,491.00	0 Days	05/03/17
Change Order 14*	$19,515.00	0 Days	05/22/17
Change Order 15	$306,664.00	0 Days	06/12/17

Change Order 16*	$200,000.00	0 Days	07/24/17
Change Order 17*	$23,350.00	0 Days	07/27/17
Change Order 18	$608,007.00	0 Days	07/27/17
Change Order 19*	$19,866.00	0 Days	08/14/17
Change Order 20*	$222,828.00	0 Days	10/04/17
Change Order 21	$285,385.00	0 Days	10/04/17
Change Order 22*	$19,436.00	0 Days	10/24/17
Change Order 23*	$24,888.00	0 Days	10/30/17
Change Order 24*	$183,838.00	0 Days	Pending
Change Order 25	$290,963.00	0 Days	Pending
Total of Change Orders:	$1,705,433.29	(180) Days	
Adjusted Contract:	$48,716,433.29	1,080 Days	

*Approved under delegated authority

If Change Order 25 is approved, the cumulative total value of all change orders to this contract will be $1,705,433.29 or 3.6% of the original contract amount. Work on this contract is 65% complete.

BUDGET/FISCAL IMPACT:

The FY18 CIP includes a budget of $47,159,267 for Contract 7157. Including this change order for a lump sum amount of $290,963, the adjusted sub phase total will be $48,716,433.29 or $1,557,166.29 over budget. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The MBE/WBE participation requirements for this project were established at 3.4% and 3.8%, respectively.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

PERSONNEL & COMPENSATION COMMITTEE MEETING

Chair: J. Wolowicz
Vice-Chair: K. Cotter
Committee Members:
J. Carroll
P. Flanagan
J. Foti
A. Pappastergion
H. Vitale
J. Walsh

to be held on

Wednesday, November 15, 2017

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: Immediately following Water Comm.

AGENDA

A. Approvals

1. Appointment of Program Manager, SCADA
2. Appointment of Senior Monitoring and Control Engineer, SCADA

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the
Personnel and Compensation Committee

October 18, 2017

A meeting of the Personnel and Compensation Committee was held on October 18, 2017 at the Authority headquarters in Charlestown. Vice-Chair Cotter presided. Present from the Board were Messrs. Blackmon, Carroll, Pappastergion, Peña, Vitale, and Walsh. Among those present from the Authority staff were Fred Laskey, Steve Remsberg, Michele Gillen, Karen Gay-Valente, and Bonnie Hale. The meeting was called to order at 12:15 p.m.

Information

Pregnant Workers Fairness Act

Staff described the recently-adopted legislation and its provisions.

Approvals

*Revision to Management Policy for Staff Appointments

Staff described the proposal to revise the policy, which was last updated in 2007, to increase the salary level threshold required for Board approval of staff appointments from $85,000 to $100,000. Mr. Blackmon suggested that staff look at using some type of automatic percentage formula instead of having to periodically come back to the Board to change the dollar threshold upwards,. The Committee recommended that the item be postponed pending staff's further review (ref. agenda item B.1).

*PCR Amendments – October 2017

The Committee recommended approval of amendments to the Position Control Register (ref. agenda item B.2).

*Appointment of Director, Environmental and Regulatory Affairs

The Committee recommended approval of the appointment of Ms. Bethany A. Card (ref. agenda item B.3).

*Appointment of Librarian and Records Manager, MIS Department

The Committee recommended approval of the appointment of Mr. Patrick Thistle (ref. agenda item B.4).

The meeting adjourned at 12:25 p.m.

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* Postponed at October 18, 2017 Board of Directors meeting.

** Approved as recommended at October 18, 2017 Board of Directors meeting.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Appointment of Program Manager, SCADA

COMMITTEE: Personnel & Compensation

____ INFORMATION
_X_ VOTE

Karen Gay-Valente, Director, Human Resources
John Vetere, Deputy Chief Operating Officer
Gus Serino, Manager, SCADA & Process Control
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To approve the appointment of David Goyette, to the position of Program Manager, SCADA (Unit 9, Grade 29), at an annual salary of $ 110,228.55, commencing on a date to be determined by the Executive Director.

DISCUSSION:

MWRA's SCADA system provides monitoring and/or control of approximately 100 water and wastewater transport facilities across MWRA's service area. SCADA engineers and technicians are responsible for SCADA system operation, maintenance and security, include maintenance and configuration of field instrumentation, programmable logic controllers (PLCs), human-machine interface PCs, network and security equipment. SCADA staff also support several MWRA departments including Maintenance, Engineering, Construction and Water Quality.

The position of Program Manager, SCADA was recently moved from the SCADA Technicians group into the SCADA Engineering group to support the increased workload requirements of the SCADA engineering staff. The position reports to the Senior Program Manager, SCADA. The Program Manager, SCADA is responsible for the East SCADA Engineering group, which includes all the metropolitan water and wastewater facilities, as well as multiple water metering sites used for monitoring system conditions.

Selection Process

The position of Program Manager, SCADA was posted internally and six candidates applied, three of which were determined to have met the minimum qualifications. The Director, Metropolitan Water Operations, the Manager, SCADA and Process Control, and a representative of MWRA's Affirmative Action and Compliance Unit interviewed the three candidates. Upon completion of the interviews, it was determined that Mr. David Goyette was the best candidate to fill the position based on his experience and education.

Mr. Goyette has more than 17 years of experience building, troubleshooting, and improving upon MWRA's SCADA system. Mr. Goyette began his career at MWRA in 2000 as a Senior Monitoring and Control Engineer. In 2003, Mr. Goyette was promoted to Project Manager, SCADA. Since that time he has been instrumental in building and maintaining MWRA's SCADA system with specific focus on the Metropolitan Water System. For six years prior to coming to MWRA, Mr. Goyette performed SCADA implementation work at various water and wastewater municipalities in his role as Project Engineer for Integrated Controls and Computer Systems, Inc.

Mr. Goyette has served as a member of the Massachusetts Air National Guard since 2009 in the role of Client Systems, Air Force Computer Networking Specialist. In that role, he is responsible for sustaining, troubleshooting, administrating, and repairing data and network devices for Air Force service members. This experience adds to Mr. Goyette's diverse skills and background.

Mr. Goyette has a Bachelor of Science in Electrical Engineering from the University of Massachusetts, Dartmouth. He also maintains an Engineer in Training registration, a MA Grade 4 Water Distribution Operator License, a Grade 4 Water Treatment License and a Comptia SECURITY+ & A+ Certification.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the Operations Division's FY18 Current Expense Budget to fund this position.

ATTACHMENTS:

Resume & Cover Letter of Mr. David Goyette
Position Description
Organization Chart

David Goyette

Program Manager, SCADA (Engineering)

SCADA Engineer offering 19 years of experience in all aspects of SCADA applications.

Core competencies and professional strengths include:

- Project Management
- SCADA Security
- Ladder Logic Programming
- HMI Programming
- SCADA database and data collection
- Personnel Oversight
- Security Compliance
- Cross-functional Collaborations
- Process Improvements
- Project Documentation
- Budget Development
- Project Scheduling
- Systems Validation
- Customer Service
- Report Preparation
- Water/Wastewater

Bachelor of Science Electrical Engineering Technology

Registered Engineer in Training (EIT)

Intellution iFIX Advanced HMI/SCADA & GE Fanuc VBA with iFIX Training

Studio 5000 Logix Designer Level 3 Project Development

Fundaments of Cisco Router Configuration

Massachusetts Licenses-Grade 4 Water Treatment, Grade 4 Water Distribution, Driver's License

Grade IV Wastewater Collection System certification

FCC General Radio Operators License (GROL)

Comptia SECURITY+ & A+ Certification

Confined Space Trained

SELECTED ACCOMPLISHMENTS

- Contaminant Monitoring System (CMS) - The S::CAN instrument does not have the desired capability to fill sample tanks or continuous monitoring. System validation documentation and multiple group coordination resulted in a SCADA system providing the Quality Assurance group continuous monitoring of water quality parameters at 20 sites with sample capability as well as PI data for analysis.
- Water East 5 Pump Station Rehabilitation Project- Vendor submittals were inaccurate and/or incomplete. I assumed a leadership role during the design submittal review process. This resulted in a product that would not only meet their needs but provide them with flexible control strategies to minimize the impact of signal failures and deliver modes of operation that would maintain water quality.
- Water East 5 Pump Station Rehabilitation Project- SCADA network security was in direct conflict with vendor access. In order to maintain the security of the existing network I managed router and firewall configuration to provide the vendor with a separate network to grant the access required to perform their work without compromising the existing system. This network configuration and close coordination with MIS allowed new data collection as each pump station began testing instead of waiting weeks or months until the systems were merged.
- Water East 5 Pump Station Rehabilitation Project- Different SCADA implementation in the East and Western SCADA systems created maintenance issues. Coordinated with SCADA west for consistency in SCADA standards. Utilized the rehabilitation project to migrate to a consistent SCADA platform.

PROFESSIONAL EXPERIENCE

Aug. 2003 – Present – Project Manager of Supervisory Control and Data Acquisition (SCADA) Massachusetts Water Resource Authority (MWRA) – Chelsea MA. Below are two samples of the numerous projects that I was able to contribute to during this time.

- Fire Flow Bypass Valve Exercise and Monitoring Project – The Existing fire flow valve control design did not record whether the fire flow bypass valves moved during their weekly exercise. If a problem with the valve occurred, it would have to wait until the meter technician's routine maintenance visit to be noticed. Close coordination with the SCADA Technician and Meter Technician groups allowed a retrofit for all the fire flow bypass valves with recorded position indication through the existing telog. A control strategy was developed and implemented for all the Rockwell Micro PLC's.
- Arlington Covered Storage PRV – The antiquated PRV controller that connects the Storage tank to a higher pressure service area failed just before it would be needed to support taking the Pump Station supply out of service for rehabilitation. A new control strategy was developed and implemented into the existing SCADA equipment by myself and the Senior Monitor and Control Engineer. Close coordination with pipeline maintenance and SCADA technicians allowed the project startup to be fast tracked so the construction could continue without delay.

Jun. 2010 – Present – Client Systems, Air Force computer networking specialist

- Electrostatic Discharge Program (ESD) Developed program and trained more than 70 personnel.
- Sustain, troubleshoot, administrate and repair standard voice, data, video network, and cryptographic client devices in accordance with Air force and Local policies.
- Comply with Service Level Agreements.
- Support new facility construction while simultaneously supporting interim facility.

Jun. 2000 – Aug. 2003 – Senior Monitoring and Control Engineer MWRA – Chestnut Hill & Chelsea MA. Below is a sample of the numerous projects that I was able to contribute to during this time.

- Simultaneous Pumping with rapid tank cycle at the Spring Street and Brattle Court Pump Stations for Turkey Hill Tank- During summer months the water quality at Turkey Hill Tank would deteriorate to the point that the tank would be taken out of service. Removing the tank from service and placing back into service is time consuming. Developed and implemented logic with a HMI selectable control strategy that would allow users a configurable staggered start and stop of both pump stations and multiple pumps at each as the conditions required. This would fill the service area at the same time and shut off at the same time keeping the water fresh in the tank. Since implementing the modification Turkey Hill tank has not come out of service due to water quality.

Feb. 1994 – May 2000 – Project Engineer – Integrated Controls & Computer Systems (ICCS) Swansea & Fall River, MA In 1998 Woodard & Curran Acquired ICCS. Contributed as a Project Engineer to more than 30 projects in various roles. Below are two examples.

- 1999 to 2000 Lead Field Engineer providing consulting and implementation services to Woonsocket Regional Waste Water Facility. Provided control system evaluation and resolution plan. The effort required documenting the system through field I/O checkout, hardware evaluation, and software evaluation. The resolution plan involved considering the operator interviews, management interviews and control system capabilities.

PROFESSIONAL EXPERIENCE continued

- 1996 to 2000 Lead Field Engineer providing construction services for the South Essex Sewage District wastewater treatment plant upgrade. The original primary treatment plant upgrade included the addition of secondary treatment with a design flow of 130 MGD. The Upgrade included new Instrumentation and a new SCADA system for the entire plant. The SCADA system consisted of 13 local control panels communicating on a redundant backbone using Ethernet protocol.

Sep. 1992 – Feb. 1994 – Computer Technician - Central Computing Services, University of Massachusetts Dartmouth. Assisted two Senior Technicians in maintaining all University computers and networks. Implemented upgrade and relocation procedures, including delivery, installation and setup.

Feb. 1991 – Jan. 1992 – Project Engineer - Process Control Industries, Inc., Taunton, MA. Assisted Senior Engineer in the software design for the operation of a Stephan Mixer. Implemented the software design and simulation. Conducted dry testing in preparation for production start-up. Proofread and edited functional specifications regarding the operation for technical content. Technical support and service for the PCI D-1200 Systems. Assembled work stations and control panels.

EDUCATION AND TRAINING

Nov. 2009 – Present – Massachusetts Air National Guard 102/ISS Client Systems initial training through 7 level, CompTIA A+ Certification, CompTIA Security+ Certification, Air University-Airman Leadership School, awarded 7-Skill level (Craftsmen), Air University- Non Commissioned Officer Academy.

Licenses:

- Registered Engineer in Training (E.I.T.)
- Grade 4 Water Distribution Operator
- Grade 4 Water Treatment Operator
- FCC General Radio Operators License
- Driver's License

Training Certificates:

- Studio 5000 Logix Design Level 3 Developer
- Effective Interpersonal Communications (ACP)(Public Sector Workforce Cert.)
- Control Engineering MWRA MIS Department
- OSHA 10-hour Construction Safety
- Electrical Safety Low and High Voltage
- Intellution iFIX Advanced Training (254)
- Intellution Using VBA with iFIX
- ISA Grounding, Noise & Powering of Instrumentation
- Comptia SECURITY+ & A+ Certification
- Dealing with Difficult Behaviors (ACP)(Public Sector Workforce Cert.)
- MWRA Lockout/Tagout PIP
- CPR/AED/First Aid
- MWRA Confined Space Trained
- CompuMaster Cisco Router Training
- Electricity for Non-electricians
- Wastewater Collection Systems Operator Grade IV

Sept. 1988 – May 1994 – BS Electrical Engineering - University of Massachusetts Dartmouth, MA

MWRA
POSITION DESCRIPTION

POSITION: Program Manager, SCADA (Engineering)

DIVISION: Operations

DEPARTMENT: Operations Support/Metering & Monitoring

BASIC PURPOSE:

Provides supervision and technical support for the Authority's Supervisory Control and Data Acquisition (SCADA) security, networking, process data interfacing with management information systems, and all software control and monitoring aspects of the SCADA system. Is required to be on-call for emergencies twenty-four (24) hours a day, seven (7) days a week.

SUPERVISION RECEIVED:

Works under the general supervision of the Senior Program Manager, SCADA.

SUPERVISION EXERCISED:

Exercises general supervision of SCADA Project Managers and Senior Monitoring & Control Engineers.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Manages and supervises the design, installation and maintenance of SCADA security including: 1) installing security patches and upgrades to all SCADA PC operating systems, firewalls, security software, and routers; 2) maintaining password controls on SCADA PCs and PLCs; 3) maintaining rules on security devices and software, and monitoring security logs.

- Manages and supervises the design, installation and maintenance of the Water and Wastewater SCADA networks for PCs and PLCs.

- Manages and supervises the design, installation and maintenance of the SCADA interface to the Authority's management information system including: 1) managing tags and data collection; 2) maintaining data historian interface servers; and 3) coordinating with MIS staff.

- Coordinates extensively with the other Program Manager SCADA Engineering to make sure that the eastern and western systems remain uniform and that new initiatives are mutually agreed upon.

- Manages and supervises SCADA personnel in the enhancement, expansion and maintenance of all software aspects of the Authority's SCADA system. This includes: 1) enhancing PLC and

HMI programs as needed; 2) overseeing the programming, testing and start-up work of consultants and integrators; 3) insuring strict compliance with software backup schedules; and 4) upgrading the HMI software to more recent releases as needed.

- Supervises the in-house design and installation of new and modified monitoring and control systems including preparation of project scope and P&ID drawing through user interview, the PLC and HMI programming, testing, startup, documentation and training.

- Manages and supervises advanced corrective maintenance of SCADA equipment and systems.

- Prepares technical specifications and budget estimates for SCADA equipment and systems.

- Participates in the development of SCADA standards. Reviews consultant and in-house staff design for conformance to SCADA standards.

- Prepares written and computer generated reports. Oversees daily work schedules of system maintenance and enhancement.

- Manages the creation and maintenance of up to date records and documentation on SCADA network, PC, PLC and security installations.

- Oversees the management of the SCADA tag databases and the coordination of any necessary changes.

- Motivates, assists and trains staff in the development and troubleshooting of SCADA hardware and software.

- Monitors and reports on staff productivity and utilization. Recommends and institutes improvements on same.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

(A) Four (4) year college program in Electronic/Electrical Engineering or a related field; and

(B) Seven (7) to nine (9) years experience in the design, installation, operation and maintenance of SCADA systems of which three (3) to five (5) years should be in a supervisory capacity and four (4) of which should be in a water or wastewater related industry; and

(C) Five (5) to seven (7) years of ladder logic and HMI programming experience.

(D) Any equivalent combination of education and experience.

Necessary Knowledge, Skills and Abilities:

(A) Working knowledge of cyber security as it relates to SCADA systems.

(B) Thorough working knowledge of Ethernet, routers, switches, servers, firewalls, personal computers and Windows 7.

(C) Working knowledge of EIA RS-232, RS-422, RS-485, V.35, X.25, and other communications signaling standards and protocols.

(D) Ability to test and troubleshoot to the component level using a variety of electronic test equipment as well as computer driven diagnostics.

(E) Familiarity with both waterworks and wastewater treatment and distribution/collection systems.

(F) Thorough knowledge of electrical/electronic wiring practices.

(G) Demonstrated ability to plan, organize, direct, train and assign duties to subordinates.

(H) Demonstrated interpersonal, written and verbal communication skills.

(I) Working knowledge of AutoCad or equivalent CAD design program, spreadsheet and database programs.

SPECIAL REQUIREMENTS:

Vendor training certification in at least one of the following disciplines: HMI Software, PLC Programming Software, MSCE or Cisco.

A valid Massachusetts Grade II Drinking Water Distribution or Treatment license or a Grade II Wastewater Collection System certification, or a Grade III Wastewater Treatment Plant license or the ability to obtain one of the above within six (6) months.

A valid Massachusetts Drivers License required.

Ability to obtain a FCC General Radiotelephone Operators License within six (6) months.

Successful completion of Confined Space training with MWRA certification within six (6) months of employment.

Security certification such as CISSP or GIAC required within six (6) months of employment.

TOOLS AND EQUIPMENT USED:

Electronic test equipment, computers, PLCs, hand tools, climbing and fall retrieval equipment, mobile radio, etc.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools, or controls and reach with hands and arms. The employee occasionally is required to sit, stand and walk. The employee is frequently required to climb or balance; stoop, kneel, crouch, or crawl; taste or smell.

The employee must frequently lift and/or move up to 10 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision, distance, color vision, peripheral vision, depth perception, and the ability to adjust focus.

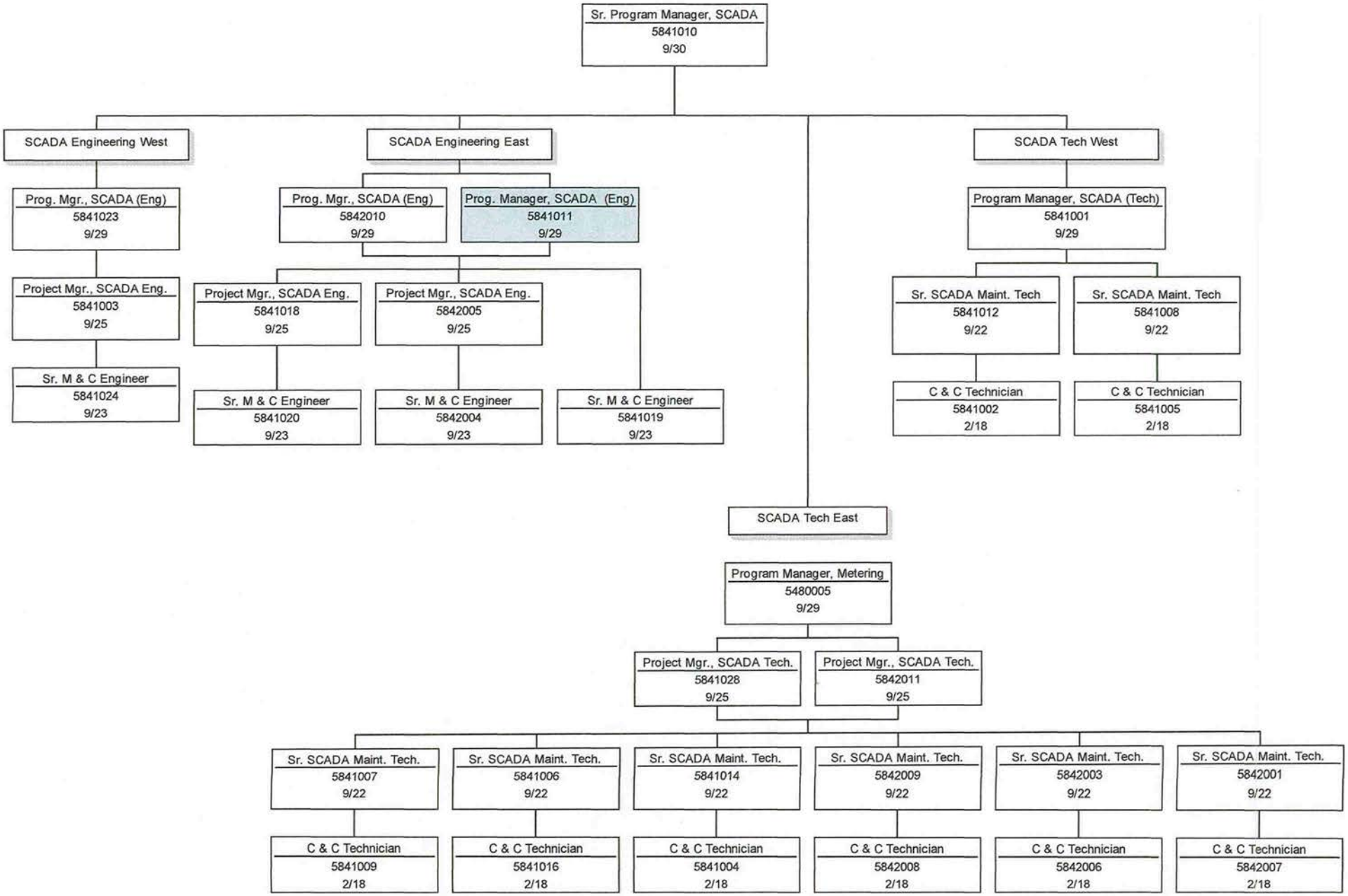
WORK ENVIRONMENT:

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee regularly works in an office environment. The employee occasionally works in outside weather conditions. The employee occasionally works near moving mechanical parts and is occasionally exposed to wet and/or humid conditions and vibration. The employee occasionally works in high, precarious places and is occasionally exposed to fumes or airborne particles, toxic or caustic chemicals, and risk of electrical shock.
The noise level in the work environment is usually loud in field settings, and moderately quiet in office settings.

SCADA Maintenance

November 2017



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 15, 2017
SUBJECT: Appointment of Senior Monitoring and Control Engineer, SCADA

COMMITTEE: Personnel & Compensation

____ INFORMATION
_X_ VOTE

Karen Gay-Valente, Director, Human Resources
John Vetere, Deputy Chief Operating Officer
Gus Serino, Manager, SCADA & Process Control
Preparer/Title

Michael J. Hornbrook
Chief Operating Officer

RECOMMENDATION:

To approve the appointment of Carl Chin, to the position of Senior Monitoring and Control Engineer, SCADA Engineering (Unit 9, Grade 23), at an annual salary of $94,428.89, commencing on a date to be determined by the Executive Director.

DISCUSSION:

MWRA's SCADA system provides monitoring and/or control of approximately 100 water and wastewater transport facilities across MWRA's service area. SCADA engineers and technicians are responsible for SCADA system operation, maintenance and security, including maintenance and configuration of field instrumentation, programmable logic controllers (PLCs), human-machine interface PCs, network and security equipment. SCADA staff also support several MWRA departments including Maintenance, Engineering, Construction and Water Quality.

The position of Senior Monitoring and Control Engineer, SCADA, became vacant in September 2017 with the retirement of the incumbent and reports to the Project Manager, SCADA Engineering. The position is responsible for maintaining the MWRA's Water and Wastewater SCADA system with specific tasks including the programming, configuration, and maintenance of Programmable Logic Controllers (PLC), Human Machine Interfaces (HMI), and computer networking and security devices. The Senior Monitoring and Control Engineer, SCADA is also responsible for supporting the day to day SCADA related needs of Operations, ENQUAL, Engineering and Construction, as well as, providing technical troubleshooting of water and wastewater processes.

Selection Process

The Senior Monitoring and Control Engineer, SCADA Engineering was posted internally and five candidates applied, all of whom met the minimum qualifications for the position. The Manager, SCADA & Process Control, the Program Manager, SCADA and a representative from the Affirmative Action and Compliance unit interviewed the five candidates. Mr. Carl Chin was

selected as the most qualified candidate for the position based upon his knowledge, experience and education.

Mr. Chin has 27 years of experience at MWRA working with instrumentation and control systems in Metering and SCADA. Mr. Chin began working at MWRA in 1990 as an Instrumentation Technician and was later promoted to a Senior Instrumentation Technician in 2004, Communications and Control Technician in 2005, and Senior SCADA Maintenance Technician in 2010. In his time as a Senior SCADA Technician, Mr. Chin was instrumental on projects such as the Gillis Pump Station VFD Upgrade and Hingham Pump Station Isolation Gate Installation.

Mr. Chin has a B.S. in Electronic Engineering, an FCC General Radiotelephone Operator License, an International Society of Automation Certified Control Systems certification, a Grade 2 Wastewater Collections System Operator License, and has taken several computer courses in hardware, software and networking.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the Operations Division's FY18 Current Expense Budget to fund this position.

ATTACHMENTS:

Resume of Mr. Carl Chin
Position Description
Organization Chart

CARL K. CHIN

WORK EXPERIENCE:

Massachusetts Water Resources Authority **1990-Present**

SR. SCADA TECHNICIAN **2010 to Present**

- 10 plus years hands on experience in wiring, testing, and troubleshooting of telemetry, instrumentations and controls equipment for MWRA Water and Wastewater SCADA Systems.
- Oversees Contractors installations of SCADA instrumentation and control equipment.
- Work with SCADA Managers and Engineers as a team to resolve instrumentation and control strategies issues.
- Partners with Engineers to update alarm logic and change or program new points to the PLC and HMI.
- Partners with Engineers to install, troubleshoot and connect communications equipment such as: routers, switches and firewall for SCADA communications network.
- Participate in start-ups and testing phases of MWRA instrumentation and control SCADA system enhancement projects.
- Builds, install and test SCADA instrumentations and controls panels.
- Installs, troubleshoots, test and configures SCADA instrumentations and controls equipment.
- Installs and terminates fiber optics cabling for communications networks.
- Leads and train a team of C & C Technicians in the development, installation, enhancement and maintenance of the SCADA control and monitoring system.
- Assigns work schedules to C & C Technicians, maintains and updates set of records and documentations on all MWRA facilities.

COMMUNICATIONS & CONTROL SYSTEMS TECHNICIAN **2006 to 2010**

- Participates in the development, installation and maintenance of the Authority's Supervisory Control and Data Acquisition (SCADA) system.
- Performs precision calibration and maintenance on primary instrumentation devices utilized for the control and operation of SCADA controlled and monitored water facilities.
- Installs, troubleshoot, test and configure CSU/DSU modems, DGH's and AGM's transceivers.
- Utilizes FIREBERD BER tester to confirm the integrity of communication lines.
- Works with the Telephone Company to install, repair, troubleshoot and test communication lines along with other telemetry vendors to resolve technical issues encountered out in the field.
- Assist in the installation, troubleshooting and configuration of spread spectrum MDS and Devar's data radios in the HF and UHF spectrum along with installing and servicing transmission lines, antennas and dehydrator units.

SENIOR INSTRUMENTATION TECHNICIAN **2004 to 2006**

- Supervises crew of Instrumentation Technician's in-field installations, troubleshooting, repairs, maintenance and calibrations of electronics instrumentation equipment.
- Examines and provides solutions to problems encountered by Instrumentation Technicians during a corrective maintenance assignment, such as how to properly replace defective instruments, test individual instruments and circuitry to ensure the entire instrumentation system is functioning properly.
- Analyze data and charts to isolate malfunctioning instrumentations at metering sites and to verify the instrumentation system is functioning properly after a preventive maintenance assignment.
- Instruct Technicians to fabricate, troubleshoot, install and test instrumentation panels for fire-flow meters.
- Maintains and updates Excel spread sheet of corrective maintenance assignments for metering projects.
- Documents completed work assignments, instruments and parts utilized, time spent on each work site and fills trouble report forms when instrumentation equipment are in poor condition that needs to be repair or replace.
- Follows all MWRA safety policies and procedures to ensure a safe work environment.

INSTRUMENTATION TECHNICIAN **1990 to 2004**

- Participates in a preventive maintenance program for the Authority's metering and monitoring system.
- Performs confined space entries for the purpose of in-field installations, troubleshooting, repairs, maintenance and calibrations of electronics instrumentation equipment.
- Monitors and troubleshoots malfunctioning instruments and recommends repair or replacement.
- Fabricates, troubleshoots, installs and tests instrumentation panels for fire-flow meters.
- Maintains and equips vehicle with all the necessary parts and equipment needed to complete work assignments.

EDUCATION: **Wentworth Institute of Technology**
Bachelor of Science Degree in
Electronic Engineering Technology

CERTIFICATIONS: **ISA'S Certified Communications and Control System Technician (CCST)**
FCC-General Radiotelephone Operator License
Productivity Improvement Program Certification (PIP)
Grade 2 Wastewater Collection Systems Operator License

MWRA
POSITION DESCRIPTION

POSITION: Senior Monitoring and Control Engineer

DIVISION: Operations

DEPARTMENT: Operations Support

BASIC PURPOSE:

Participates in the design, development, operation and maintenance of the Authority's Water and Wastewater Supervisory Control and Data Acquisition (SCADA) systems. Required to be on-call for emergencies 24 hours a day, 7 days a week.

SUPERVISION RECEIVED:

Works under the general supervision of the Project Manager, SCADA Engineering.

SUPERVISION EXERCISED:

May exercise close supervision of technical and support staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Designs, develops, installs and troubleshoots control logic for programmable logic controllers (PLCs) and control system software.
- Designs, develops, installs and troubleshoots Human Machine Interface (HMI) software.
- Assists with the installation, maintenance and troubleshooting of the SCADA network and SCADA PCs.
- Insures in-house and consultant compliance with the SCADA Standards.
- Assists with the installation, maintenance and monitoring of SCADA security systems.
- Assists in the training of staff on the monitoring and control systems.
- Updates records and documentation on SCADA network, PC and PLC installations.
- Assists in the management of SCADA databases and coordinates any necessary changes.

- Maintains SCADA data backups through local node collection and networked archive collection systems.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

(A) A Bachelor of Science degree in Electronic/Electrical engineering or in a closely related field; and

(B) Five (5) years experience in the design, installation, operation and maintenance of process control systems of which a minimum of two (2) years related to water or wastewater industry; or

(C) Any equivalent combination of education and experience.

Necessary Knowledge, Skills and Abilities:

(A) Working knowledge of ladder logic and HMI programming.

(B) Thorough knowledge of PCs, Windows operating systems, Ethernet, network equipment, spreadsheet, and database software

(C) Ability to troubleshoot to the component level utilizing a variety of electronic test equipment as well as computer driven diagnostics.

(D) Familiarity with water distribution and treatment systems or wastewater collection and treatment systems.

(E) Thorough understanding of water and wastewater instrumentation.

(F) Thorough knowledge of electrical/electronic wiring practices.

(G) Familiarity with CAD program.

(H) Demonstrated ability to plan and organize projects, and direct and train others.

(I) Demonstrated interpersonal, written and verbal communication skills.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License.

Any level of a valid Massachusetts Water Distribution License, Water Treatment License, Wastewater Operator's License or Wastewater Collection System Certification or the ability to obtain within six (6) months.

Ability to pass the Confined Space Entry Training within six months.

TOOLS AND EQUIPMENT USED:

Metering oscilloscopes, signal generator, personal computer, including word processing and other software, hand tools, mobile radio, copy and fax machines.

PHYSICAL DEMANDS:

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to use hands to finger, handle, feel or operate objects, tools or controls and reach with hands and arms. The employee is regularly required to walk, sit, climb or balance; stoop, kneel, crouch or crawl.

The employee must frequently lift and/or move up to 10 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities, required by this job include close vision, distance vision, color vision, depth perception and the ability to adjust focus.

WORK ENVIRONMENT:

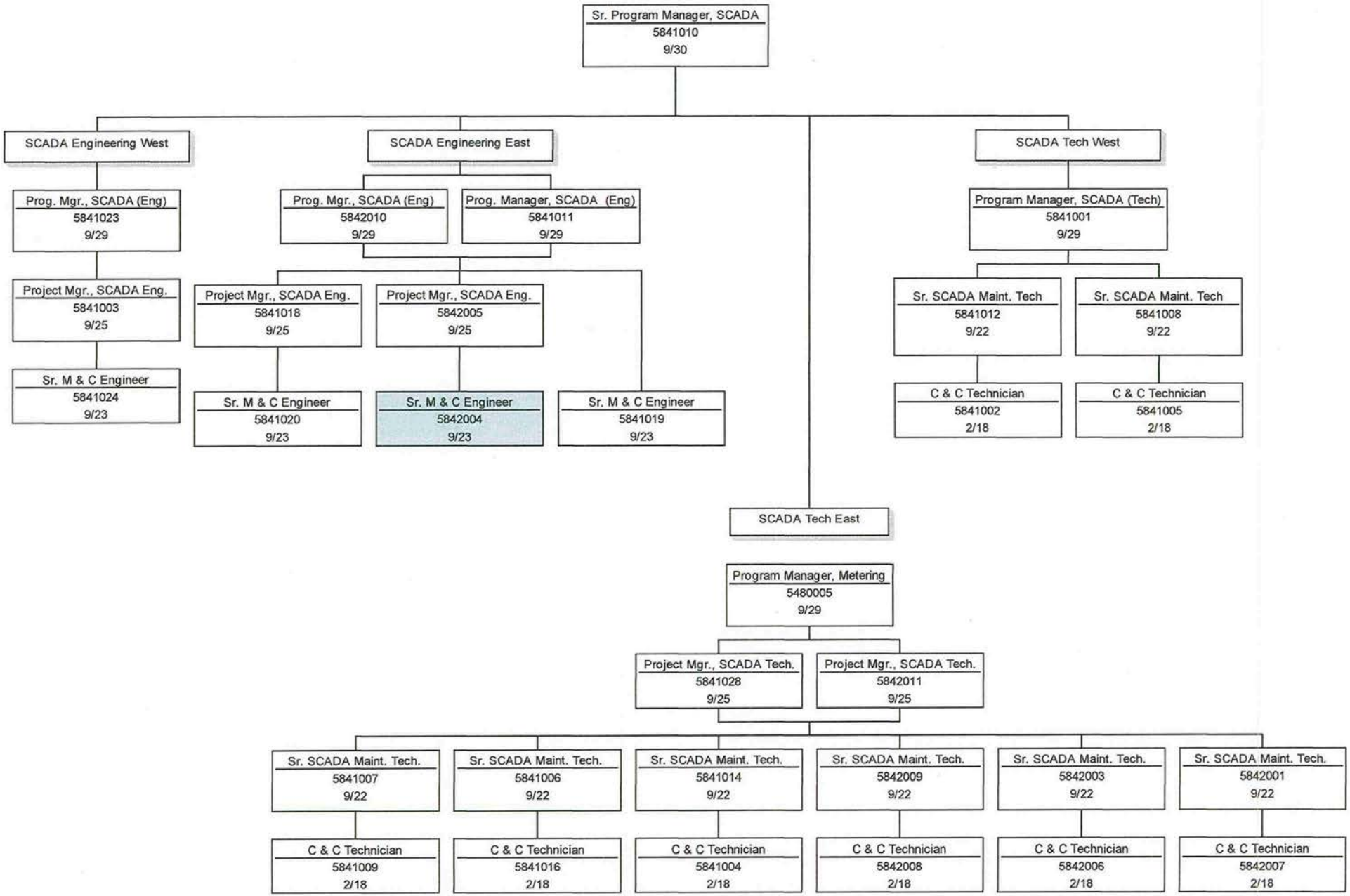
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job.

While performing the duties of this job, the employee occasionally works in outside weather conditions. The employee frequently works near moving mechanical parts and is occasionally exposed to wet and/or humid conditions and vibration. The employee occasionally works in high, precarious places and is occasionally exposed to fumes or airborne particles, toxic or caustic chemicals and risk of electrical shock.

The noise level in the work environment is usually loud in field settings and moderately quiet in office settings.

SCADA Maintenance

November 2017



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
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BOARD OF DIRECTORS' MEETING

to be held on

Wednesday, November 15, 2017

Location: 100 First Avenue, 2nd Floor
Charlestown Navy Yard
Boston, MA 02129

Time: 1:00 p.m.

AGENDA

I. **APPROVAL OF MINUTES**

II. **REPORT OF THE CHAIR**

III. **REPORT OF THE EXECUTIVE DIRECTOR**

IV. **BOARD ACTIONS**

A. **Approvals**

1. Dental Insurance (ref. AF&A B.1)
2. Approval of New Member of the Wastewater Advisory Committee (ref. WW B.1)
3. Appointment of Program Manager, SCADA (ref. P&C A.1)
4. Appointment of Senior Monitoring and Control Engineer, SCADA (ref. P&C A.2)

B. **Contract Awards**

1. Insurance Consultant Services: Kevin F. Donoghue Insurance Advisors Inc. (d/b/a KFDA), Contract F246 (ref. AF&A C.1)

2. Supply and Delivery of Ferrous Chloride to Deer Island Treatment Plant: Kemira Water Solutions, Inc., Bid WRA-4425 (ref. WW C.1)

C. **Contract Amendments/Change Orders**

1. Clinton Wastewater Treatment Plant Phosphorus Reduction Design, Construction Administration and Resident Engineering Services: Stantec Consulting Services, Inc., Contract 7377, Amendment 4 (ref. WW D.1)

2. Southern Extra High Pipeline – Section 111 (Boston): P. Gioioso and Sons, Inc., Contract 6454, Change Order 3 (ref. W B.1)

3. Wachusett Aqueduct Pumping Station: BHD/BEC JV 2015, A Joint Venture, Contract 7157, Change Order 25 (ref. W B.2)

V. **CORRESPONDENCE TO THE BOARD**

VI. **OTHER BUSINESS**

VII. **EXECUTIVE SESSION**

A. Release of Executive Session Minutes

B. Litigation:

1. Authorization to Consolidate Into a Single Master Engagement Several Existing Foley Hoag, LLP Engagements for Representation of MWRA Before the MA Department of Public Utilities

2. DaPrato v. MWRA: Substitution of Outside Trial Counsel

VIII. **ADJOURNMENT**

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Board of Directors

October 18, 2017

A meeting of the Board of Directors of the Massachusetts Water Resources Authority was held on October 18, 2017 at the Authority headquarters in Charlestown. Vice-Chair Carroll presided. Present from the Board were Messrs. Blackmon, Cotter, Pappastergion, Peña, Vitale and Walsh. Ms. Wolowicz and Messrs. Beaton, Flanagan and Foti were absent. Among those present from the Authority staff were Frederick Laskey, Executive Director, Steven Remsberg, General Counsel, Michael Hornbrook, Chief Operating Officer, Thomas Durkin, Director of Finance, Michele Gillen, Director of Administration, and Bonnie Hale, Assistant Secretary. The meeting was called to order at 1:05 p.m.

APPROVAL OF MINUTES

Upon a motion duly made and seconded, it was

Voted to approve the minutes of the Board of Directors meeting of September 20, 2017, as presented and filed with the records of the meeting.

REPORT OF THE EXECUTIVE DIRECTOR

Mr. Laskey reported on various matters, noting that the hydro-turbine at the Brutsch facility was on–line and producing electricity and that an event would be scheduled to commemorate the completion of the hatchery pipeline project.

APPROVALS

Revision to Management Policy for Staff Appointments

Subsequent to comments and discussion at the Administration, Finance and Audit Committee, consideration of this item was postponed.

PCR Amendments – October 2017

Upon a motion duly made and seconded, it was

Voted to approve amendments to the Position Control Register, as presented and filed with the records of the meeting.

Appointment of Director, Environmental and Regulatory Affairs

Upon a motion duly made and seconded, it was

Voted to approve the Executive Director's recommendation to appoint Ms. Bethany A. Card to the position of Director, Environmental and Regulatory Affairs (Non-Union, Grade 16) in the Operations Administration Department, at an annual salary of $142,500, commencing on a date to be determined by the Executive Director.

Appointment of Librarian and Records Manager, MIS Department

Upon a motion duly made and seconded, it was

Voted to approve the Executive Director's recommendation to appoint Mr. Patrick Thistle to the position of Librarian and Records Manager (Unit 6, Grade 11), MIS Department, at an annual salary of $92,416.35 commencing on a date determined by the Executive Director.

CONTRACT AWARDS

CSO Post-Construction Monitoring and Performance Assessment: AECOM Technical Services, Inc., Contract 7572

Upon a motion duly made and seconded, it was

Voted to approve the recommendation of the Consultant Selection Committee to select AECOM Technical Services, Inc. to provide consulting services to the Authority for CSO Post-Construction Monitoring and Performance Assessment and to authorize the Executive Director, on behalf of the Authority, to execute and deliver Contract 7572 with AECOM Technical Services, Inc. in an amount not to exceed $2,924,295.09, for a term of 1,246 calendar days from the Notice to Proceed.

CONTRACT AMENDMENTS/CHANGE ORDERS

Supply and Delivery of Polymer to the Deer Island Treatment Plant: BASF Corp., Bid WRA-4115, Amendment 1

Upon a motion duly made and seconded, it was

Voted to authorize the Executive Director, on behalf of the Authority, to approve Amendment 1 to exercise the option to renew and to increase the amount of WRA-4115 with BASF Corporation, Supply and Delivery of Polymer to the Deer Island Treatment Plant, in the amount of $693,900, and to extend the term by two years to February 28, 2020.

Remote Headworks Upgrades: Arcadis U.S., Inc., Contract 7206, Amendment 5

Upon a motion duly made and seconded, it was

Voted to authorize the Executive Director, on behalf of the Authority, to approve Amendment 5 to increase the amount of Contract 7206 with Arcadis U.S., Inc., Remote Headworks Upgrade, in the amount of $846,000, with no increase in contract term.

Chelsea Creek Headworks Upgrade: BHD/BEC JV 2015, A Joint Venture, Contract 7161, Change Order 5

Upon a motion duly made and seconded, it was

Voted to authorize the Executive Director, on behalf of the Authority, to approve Change Order 5 to increase the amount of Contract 7161 with BHD/BEC 2015, A Joint Venture, Chelsea Creek Headworks Upgrade, in an amount not to exceed $440,000.00, with no increase in contract term; further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7161 in amounts not to exceed the aggregate of $250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

Northern Intermediate High Section 110 – Reading and Woburn: Albanese D&S, Inc., Contract 7471, Change Order 12 (ref. W B.1)

Upon a motion duly made and seconded, it was

Voted to authorize the Executive Director, on behalf of the Authority, to approve Change Order 12 to increase the amount of Contract 7471 with Albanese D&S, Inc., Northern Intermediate High Section 110 - Reading and Woburn, for a lump sum amount of $661,177.96, with no increase in contract term; further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7471 in amounts not to exceed the aggregate of $250,000, in accordance with the Management Policies and Procedures of the Board of Directors.

EXECUTIVE SESSION

It was moved to enter executive session to discuss litigation, security and real estate.

Upon a motion duly made and seconded, it was, upon a roll call vote in which the members were recorded as follows:

Yes	No	Abstain
Blackmon		
Cotter		
Pappastergion		
Peña		
Vitale		
Walsh		
Carroll		

Voted to enter executive session for the purpose of discussing strategy with respect to litigation and to consider the purchase, exchange, lease or value of real property, in that such discussions may have a detrimental effect on the litigating and negotiating positions of the Authority, and to consider the deployment of security personnel or devices, or strategies with respect to security.

It was stated that the meeting would return to open session solely for the consideration of adjournment.

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EXECUTIVE SESSION

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The meeting returned to open session at 2:05 p.m. and adjourned.