



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

to be held on

Wednesday, November 14, 2018

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

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

Time: 10:00 a.m.

AGENDA

A. Information

1. Update on Alewife Brook Pumping Station Rehabilitation

B. Contract Amendments/Change Orders

1. Chelsea Creek Headworks Upgrade, BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 22

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Wastewater Policy and Oversight Committee

October 17, 2018

A meeting of the Wastewater Policy and Oversight Committee was held on October 17, 2018 at the Authority headquarters in Charlestown. Committee Vice Chair Walsh presided. Present from the Board were Messrs. Carroll, Foti, Pappastergion, Peña, and Vitale. Messrs. Cotter and Flanagan and Ms. Wolowicz were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Richard Adams, John Colbert, David Duest, Carolyn Fiore, Margery Johnson, Kenneth Keay, Betsy Reiley, Patrick Smith, Rebecca Weidman and Kristin MacDougall. The meeting was called to order at 10:49 a.m.

Information

MWRA Industrial Waste Report #34, Industrial Pretreatment Program Annual Report to EPA for FY2018

Staff provided an overview of report highlights. There was general discussion and questions and answers. (Messrs. Carroll and Foti temporarily left and returned to the meeting during discussion.)

2017 Deer Island Outfall Monitoring Overview

Staff made a presentation highlighting Deer Island outfall monitoring results for 2017. There was general discussion and questions and answers.

Contract Awards

* Thermal and Hydro Power Plant Maintenance, Deer Island Treatment Plant: IPC Lydon, LLC, Contract S578

Staff made a presentation summarizing the scope and benefits of the proposed contract.

The Committee recommended approval (ref. WW B.1.)

* Committee recommendation approved by the Board on October 17, 2018

* Supply and Delivery of Ferric Chloride to the Deer Island Treatment Plant: Kemira Water Solutions, Inc., Bid WRA-4564

There was brief discussion and questions and answers.

The Committee recommended approval (ref. WW B.2.)

* Braintree-Weymouth Pump Station Improvements, Design and Engineering Services During Construction: Wright-Pierce, Contract 7435

Staff made a presentation summarizing the scope and benefits of the proposed contract. There was general discussion and questions and answers.

The Committee recommended approval (ref. WW B.3.)

Contract Amendments/Change Orders

* Remote Headworks Upgrade: Arcadis U.S., Inc., Contract 7206, Amendment 6

Staff made a presentation on the project status and the scope and benefits of the proposed amendment. There was brief discussion and questions and answers.

The Committee recommended approval (ref. WW C.1.)

The meeting adjourned at 12:04 p.m.

* Committee recommendation approved by the Board on October 17, 2018

STAFF SUMMARY

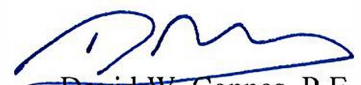
TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Alewife Brook Pump Station Rehabilitation
Barletta Engineering Corporation
Contract 6797, Construction Update



COMMITTEE: Wastewater Policy & Oversight

X INFORMATION
 VOTE

Corinne M. Barrett, Director, Construction
Jami Walsh, P.E., Construction Coordinator
Preparer/Title



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For Information only. A presentation on this topic will be made by staff at the meeting.

DISCUSSION:

The Alewife Brook Pump Station in Somerville, constructed in 1951, receives wastewater from portions of Arlington, Belmont, Cambridge, Medford, and Somerville. All flow is pumped to the North Metropolitan and North Metropolitan Relief Sewers, and ultimately conveyed to Deer Island for treatment. On July 15, 2015, the Board approved the award of Contract 6797 to Barletta Engineering Corporation. The project includes: replacement of wet-weather pumps, motors, gear drives, variable frequency drives, motor control center, influent screens, sluice gates, standby generator, roof, programmable logic controller, air handling and air conditioning units; remediation of PCB-containing paints; remediation of asbestos-containing roofing and insulation materials; installation of a flow meter on the 66-inch downstream Alewife Brook Conduit; flood control measures; and energy efficiency improvements.

The construction work is approximately 85% complete. The work performed to date includes, new flood protection measures, installation/maintenance/operation of bypass pumping system, PCB remediation, asbestos remediation, new asphalt shingle roof, two new screens, two new sewage grinders, three new wet weather pumps, electrical work, plumbing work, HVAC work, and painting.

The project is currently in the testing phase. Dry check out of all of the equipment has been completed. Recent weather events presented staff with an opportunity to check out the larger wet weather pumps and conduct performance testing.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Chelsea Creek Headworks Upgrade
BHD/BEC 2015, A Joint Venture
Contract 7161, Change Order 22



COMMITTEE: Wastewater Policy & Oversight

 INFORMATION
 X VOTE

Martin E. McGowan, Construction Coordinator
Corinne M. Barrett, Director, Construction
Preparer/Title



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 22 to Contract 7161, Chelsea Creek Headworks Upgrade, with BHD/BEC 2015, A Joint Venture, for an amount not to exceed \$182,792.00, increasing the contract amount from \$79,954,968.46 to \$80,137,760.46, 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 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 Chelsea Creek Headworks is one of three remote headworks facilities that provides preliminary treatment and flow control of the wastewater from MWRA's Northern Service Area before reaching the Deer Island Treatment Plant. Preliminary treatment at the headworks facilities includes grit and screenings removal, which prevents excessive wear and maintenance of equipment at the North Main Pump Station, and protects the cross harbor tunnels from filling with debris. The Chelsea Creek Headworks was constructed in the 1960s and received its last significant upgrade in 1987.

This project is the first of the complete upgrades to the three headworks facilities and includes automation of the screenings collection and solids conveyance system, allowing the facility to be unstaffed during dry weather flows. The following items are being replaced:

- grit collector systems;
- existing climber screens with catenary screens;

- influent and effluent sluice gates;
- the gates' hydraulic operating system with electric gate actuators;
- HVAC systems will be upgraded;
- a new carbon adsorber odor control system is being installed and redundancy is being added to both systems;
- ancillary systems including the emergency generator, fuel oil tank, and transformer are being replaced;
- instrumentation and control systems are being upgraded;
- the communications tower is being replaced and a communications building is being added;
- abatement of hazardous building materials including paint containing PCBs, flood protection measures to protect the facility to the 100-year flood elevation plus 2.5 feet, and upgrades to meet current code requirements for egress, plumbing, electrical; and,
- fire suppression.

This Change Order

Change Order 22 consists of the following three items:

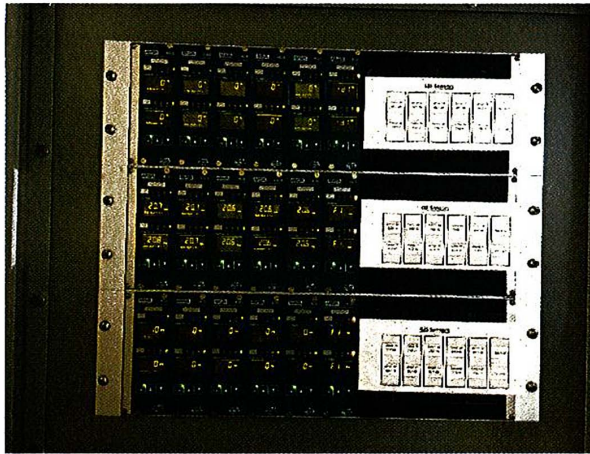
Accelerate Commissioning of the New Gas Monitoring System;
Perform Bi-monthly Calibrations and Replace Sensors

Not to exceed \$125,000

The Contractor is required to furnish and install a gas monitoring system to replace the existing system at the Chelsea Creek Headworks. The system includes sensors that continuously monitor gas concentrations for oxygen, hydrogen sulfide and combustible gases throughout the process areas of the facility where the potential for hazardous gas concentrations exist. There are 11 locations throughout the facility with each gas type for a total of 33 sensors. Whenever a hazardous gas concentration is detected from one or more of these sensors, horns and strobes alert personnel to evacuate the process areas until the hazardous condition has cleared.

Since commencement of the contract, the existing gas monitoring system has been determined to be unreliable, and past its useful life. Replacement parts and components have become obsolete and are no longer readily available. Recent component failures have resulted in some areas of the facility not being fully monitored by the existing gas monitoring system. As a temporary measure, portable gas monitoring stations were positioned in these areas to provide the necessary coverage to ensure safety to staff and construction personnel. In order to prevent future component failures that require temporary measures, the Contractor was directed to accelerate the installation and commissioning of the new gas monitoring system. The new gas monitoring system was not scheduled to be commissioned until the end of the project when the fourth process channel was placed in service. By re-sequencing the new gas monitoring system earlier in the project, the Contractor must provide temporary electrical and SCADA connections to the new gas monitoring control panel until the permanent electrical and SCADA systems are available. The new control panel must also be re-wired to communicate with the existing SCADA system.

The Contractor will also be responsible for bi-monthly calibrations of all 33 gas sensors until Substantial Completion. The oxygen and hydrogen sulfide gas sensors have a limited useful life that is typically 12 months to 18 months. Gas concentrations, dust, and moisture can affect the useful life of these sensors; they will be tested regularly to assure they are working as required by performing these calibrations. It is anticipated that the 22 sensors for oxygen and hydrogen sulfide will require one replacement during the remaining construction period. This work would have otherwise been completed by MWRA under an existing gas monitoring maintenance contract. At the conclusion of the project when all construction activities are completed, all 33 sensors will be replaced to provide the MWRA with a new and fully operable gas monitoring system as originally intended.



New Gas Monitoring Control Panel



Gas Sensors Located on Operating Floor

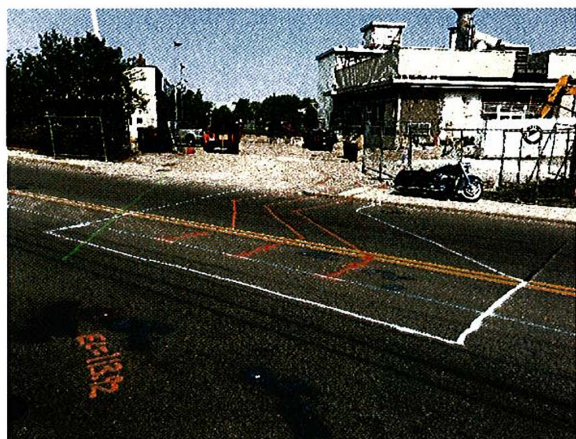
The approved PCO for this item has been identified by MWRA staff as an unforeseen condition. MWRA staff, the Consultant, and the Contractor have agreed to an amount not to exceed \$125,000 for this additional work with no increase in contract term. Staff and the Contractor are currently negotiating the final lump sum cost of this item. The Contractor proceeded with this work at its own risk in order to continue with the remainder of the contract work.

Chelsea Water Service Connection Modifications

\$30,642

The Contractor is required to furnish and install three new service connections from the City of Chelsea's 10-inch water main on Marginal Street to the Chelsea Creek Headworks. These new service connections include a 6-inch fire protection, 4-inch potable water and a 6-inch hydrant connection. During design, the City of Chelsea indicated they require two gate valves on each service connection for isolation. The first set of isolation gate valves were to be located near the 10-inch main in the middle of Marginal Street. The second set of gate valves were to be located on the sidewalk at the property line. The set of valves on the sidewalk will allow the City of Chelsea to quickly isolate the lines in the event of an emergency without having to work in the middle of Marginal Street which is a busy street and located on a dangerous curve.

After commencement of the contract, it was realized that the design only indicated one set of gate valves in the sidewalk and not near the 10-inch main in the street. To correct this omission, the Contractor will furnish and install a second set of gate valves and gate boxes as required by the City of Chelsea during the design. Additionally, conflicts were identified in the routing of the three new service connections. The City of Chelsea's 10-inch water main and the MWRA's Section 37 are installed at the same elevation. The depth of both of these water mains was known and should have been accounted for in the design. Making these crossings would require either going over or under the existing 36-inch main. The profiles did not show either of these options. To avoid this conflict, the new service connections were relocated approximately 40-feet to the south. These new connection points increased the overall length of pipe and required additional fittings to avoid other utilities located on the Chelsea Creek Headworks site.



Rerouting new water services to avoid existing utilities



Backflow Preventer and water for new domestic service

A second conflict was identified where the 4-inch domestic water and 6-inch fire protection services enter the building. Each of these services requires its own backflow preventer assembly and were in conflict with each other. To eliminate this conflict, the 6-inch fire protection line was extended approximately 20-feet to an open space inside the facility. The new alignment of these service connections requires the Contractor to furnish and install an additional 18 linear feet of 4-inch ductile iron pipe and 36 linear feet of 6-inch ductile iron pipe and fittings. Lastly, the City of Chelsea requested that all trench backfill materials be replaced with flowable fill up to the pavement subgrade. This section of road includes numerous utilities in close proximity to the new water lines. Flowable fill will provide the full compaction needed to eliminate any pipe and roadway settlement, which could not be accomplished via mechanical means. Therefore, in lieu of mechanical compaction, the Contractor is required to remove and dispose of existing materials and furnish and install 74 cubic yards of flowable fill between all utilities up to the pavement subgrade, in all trenches associated with the new water services.

The approved PCO for this item has been identified by MWRA staff as omission/error/unforeseen. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of \$30,642 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 Breakers and Fuses and Increase the
Conduit and Wiring Sizing for Split Air Conditioning Units

\$27,150

The Contractor is required to furnish and install split air conditioning systems for select rooms at the Chelsea Creek Headworks. These rooms include electric, VFD and control rooms which have equipment that generate heat or have sensitive instrumentation that require controlled temperatures. A split air conditioning system is comprised of an indoor fan coil unit located in each room and an outdoor air-cooled condensing unit located on the roof of the building. After commencement of the contract and during coordination of the electrical and HVAC installations, it was discovered that the Electrical Filed Subcontractor's drawings did not correctly indicate the wiring required for the specified air conditioning systems being furnished and installed, by the HVAC Filed Subcontractor. The units must be wired as a pair and connected to each other. The electrical drawings incorrectly indicated the units being wired individually. To correct this error, the Electrical Filed Subcontractor must furnish and install breakers and fuses sized for the increased electrical load to run both pieces of equipment, as well as, increase the conduit and wiring sizing to meet the Electrical Code.

The approved PCO for this item has been identified by MWRA staff as a design error. MWRA staff, the Consultant, and the Contractor have agreed to a lump sum amount of \$27,150 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:

| | <u>Amount</u> | <u>Time</u> | <u>Dated</u> |
|--------------------|-----------------|-------------|--------------|
| Original Contract: | \$72,859,000.00 | 1,460 Days | 11/22/16 |
| Change Orders: | | | |
| Change Order 1 | \$252,512.00 | 0 Days | 06/29/17 |
| Change Order 2* | \$208,431.00 | 0 Days | 07/24/17 |
| Change Order 3 | \$1,129,740.20 | 0 Days | 07/24/17 |
| Change Order 4* | \$237,870.00 | 0 Days | 10/18/17 |
| Change Order 5 | \$304,036.26 | 0 Days | 12/21/17 |
| Change Order 6* | \$207,226.00 | 0 Days | 01/26/18 |
| Change Order 7 | \$1,278,783.00 | 0 Days | 02/07/18 |
| Change Order 8 | \$937,267.00 | 0 Days | 02/22/18 |
| Change Order 9 | \$17,321.00 | 0 Days | 04/03/18 |
| Change Order 10* | \$20,879.00 | 0 Days | 04/11/18 |
| Change Order 11* | \$200,000.00 | 0 Days | 05/18/18 |
| Change Order 12 | \$1,000,000.00 | 0 Days | 05/31/18 |
| Change Order 13* | \$129,783.00 | 0 Days | 06/12/18 |
| Change Order 14 | \$500,000.00 | 0 Days | 06/28/18 |
| Change Order 15* | \$24,634.00 | 0 Days | 08/20/18 |
| Change Order 16* | \$21,584.00 | 0 Days | 08/24/18 |
| Change Order 17* | \$109,065.00 | 0 Days | 09/13/18 |
| Change Order 18 | \$395,742.00 | 0 Days | 09/28/18 |
| Change Order 19* | \$18,351.00 | 0 Days | 10/26/18 |
| Change Order 20* | \$20,123.00 | 0 Days | 11/06/18 |
| Change Order 21* | \$82,621.00 | 0 Days | Pending |

| | | | |
|-------------------------|---------------------|---------------|---------|
| Change Order 22 | <u>\$182,792.00</u> | <u>0 Days</u> | Pending |
| Total of Change Orders: | \$7,278,760.46 | 0 Days | |
| Adjusted Contract: | \$80,137,760.46 | 1,460 Days | |

*Approved under delegated authority

If Change Order 22 is approved, the cumulative value of all change orders to this contract will be \$7,278,760.46 or 9.99% of the original contract amount. Work on this contract is approximately 47% complete.

BUDGET/FISCAL IMPACT:

The FY19 Capital Improvement Program budget includes \$80,520,000 for Contract 7161. Including this change order for \$182,792, the adjusted subphase total is \$80,137,760.46.

MBE/WBE PARTICIPATION:

The MBE/WBE participation requirements for this project were established at 3.4% and 3.8%, respectively. The Contractor has been notified that these requirements are still expected to be met.



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WATER POLICY & OVERSIGHT COMMITTEE MEETING

to be held on

Wednesday, November 14, 2018

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

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

Time: Immediately following Wastewater Committee

AGENDA

A. Information

1. Update on Aqueduct Trails Program (presentation)
2. Update on Lead and Copper Rule Compliance
3. Wachusett Reservoir Lower Gatehouse Pipe Break

B. Contract Awards

1. Technical Consulting Services to Implement Upgrades to the Water Quality Reporting System: Overture Partners, LLC, Bid WRA-4572Q, State Contract ITS63 Cat 2b

C. Contract Amendments/Change Orders

1. Northern Intermediate High Section 110 – Stoneham, Albanese D&S Inc., Contract 7067, Change Order 3

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Water Policy and Oversight Committee

October 17, 2018

A meeting of the Water Policy and Oversight Committee was held on October 17, 2018 at the Authority headquarters in Charlestown. Committee Vice Chair Peña presided. Present from the Board were Messrs. Carroll, Foti, Pappastergion, Vitale and Walsh. Messrs. Cotter and Flanagan and Ms. Wolowicz were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Corinne Barrett, Fred Brandon, Mark Johnson, Bethany Card, Terrance Flynn, Kathleen Murtagh, and Kristin MacDougall. The meeting was called to order at 12:05 p.m.

Approvals

*** Update on the Consultant Support Structure for the Metropolitan Tunnel Redundancy Program**

Staff made a presentation on the scope and benefits of a proposed RFQ/P and RFQ-RFP for consultant support services. There was general discussion and questions and answers.

The committee recommended approval (ref. W A.1.)

Information

Dedham-Westwood Water District Update

Staff gave an update on Dedham-Westwood Water District's water supply agreement and water use. There was brief discussion and question and answers.

Contract Awards

*** Supply and Delivery of Soda Ash to the John J. Carroll Water Treatment Plant: Ciner Wyoming LLC, Bid WRA-4559**

* Committee recommendation approved by the Board on October 17, 2018

The Committee recommended approval (ref. W C.1.)

Contract Amendments/Change Orders

* Southern Extra High Pipeline – Section 111 (Boston): P. Gioioso and Sons, Inc., Contract 6454, Change Order 5

The Committee recommended approval (ref. W D.1.)

* Western Operations Marlborough Maintenance Facility: E. A. Colangeli Construction Co., Inc., Contract 6650B, Change Order 16

Staff gave a verbal update on the project. There was brief discussion and questions and answers.

The Committee recommended approval (ref. W D.2.)

The meeting adjourned at 12:21 p.m.

* Committee recommendation approved by the Board on October 17, 2018

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Update on Lead and Copper Rule Compliance – Fall 2018



COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE

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


David W. Cooper, P.E.
Chief Operating Officer

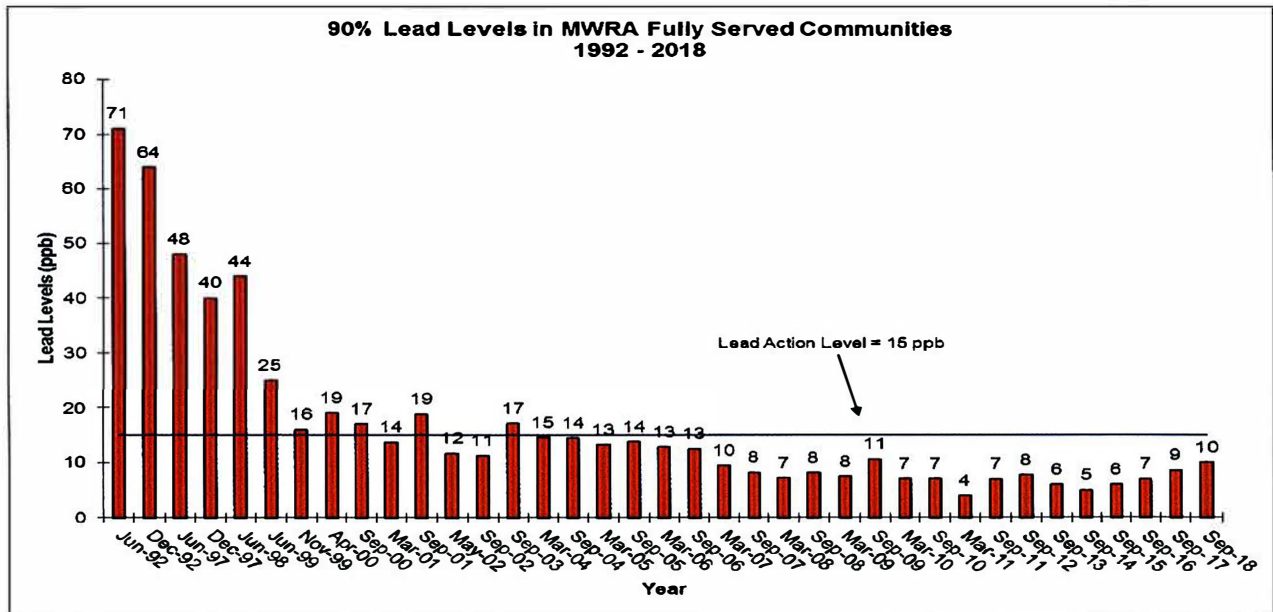
MWRA system-wide 90th percentile lead levels in the September 2018 sampling round was 9.7 ppb, below the Action Level of 15 parts per billion (ppb) again for the 23rd consecutive sampling round. This result was an increase over last year's level and represents the fourth consecutive year with an increase, raising staff's level of concern as to what might be causing these changes. Staff are looking at the sample locations and system metrics to determine if any changes in dosing or other treatment processes might result in improvements. Three communities were individually above the Lead Action Level as compared with four in 2017. MWRA continues to meet the copper standard.

RECOMMENDATION:

For information only.

DISCUSSION:

MWRA and its communities conducted the calendar year 2018 sampling round beginning in September 2018. The 90th percentile value for the system as a whole was 9.7 parts per billion (ppb), which is below the Lead Action Level of 15 ppb, but the highest level since 2009.



Under EPA's Lead and Copper Rule (LCR), each year MWRA and every fully-supplied community must collect and test tap water in a sample of homes¹ *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 2017, four communities: Medford, Melrose, Quincy, and Winthrop were above the Action Level. All four were below the Action Level in the March 2018 sampling round, but Medford, Quincy, and Winthrop were once again above in this September 2018 sampling round. They will need to sample twice in 2019.

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

Under the LCR, each community is also required to collect samples from two schools or daycare facilities. MWRA staff immediately contact any community that had a school above the Action Level. Three communities had one school test above the Action Level as part of the LCR testing, and each one was notified. All school data is available on DEP's online school database that includes over 30,000 school test results from MWRA communities. A link to the DEP school testing database is available on the MWRA webpage.

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

Analysis of Lead Levels with Source Water Parameters

To further understand how lead levels vary from year to year and location to location, MWRA staff are in the process of investigating several factors that might affect corrosion. Source water factors including UV-254 levels (a measure of naturally occurring organic carbon), conductivity, temperature, and sulfate and chloride levels, and distribution system factors including nitrification, pH level, and alkalinity are being considered. Another factor may be the change in sampling locations, and the requirement to use wide-mouth sample bottles (and thus fill at a higher, potentially scouring flow rate). Over the past two years, DEP has worked with communities to update their sampling pools, emphasizing the requirement to sample at homes with lead service lines. This has resulted in testing many homes not previously tested.

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.

Revisions to the Lead and Copper Rule:

EPA has once again signaled that the revisions to the Lead and Copper Rule are taking longer than anticipated. In an October meeting, EPA staff indicated that the draft rule would not be out in the spring of 2019, but later in the year. MWRA staff will continue to track EPA's efforts, evaluating their potential impact on MWRA and MWRA communities, and will continue to be actively involved along with the water professional associations in commenting as appropriate.

In the absence of Federal action on the LCR, individual states are taking various actions. For example, recently, Michigan issued new state regulations, requiring full replacement of all lead service lines statewide by 2040, and lowering the Action Level to 12 ppb. Ohio added additional strict requirements on prompt reporting of lead results, requiring inventory and disclosure of any lead service lines and requirements for risk mitigation measures, including the provision of filters, during lead service line replacements or work on water main connected to lead service lines. California recently expanded its mandate that schools be tested for lead to include larger child care facilities.

Several large cities have proposed aggressive lead service line replacement programs. For example, in October, driven by a lawsuit filed by the Natural Resources Defense Council (NRDC) a national environmental advocacy group, Newark New Jersey, announced an eight-year program to replace the estimated 15,000 lead services (about 40% of all services) within the city. A new interactive map provides locations of all known lead service lines, and the city's web site provides information and a way for a property owner to indicate they have a lead service line. While the city asserts that the property owner owns all of the lead service on both public and private property, Newark plans to use state funds to pay for all but a maximum of \$1,000 which the property owner will need to pay. The city has also agreed to immediately provide filters to all properties with a lead service line.

As discussed in staff's July update to the Board on lead, the issue of Denver corrosion control treatment decision being overridden by their state regulator and being required to add phosphate treatment by 2020, continues. Discussions related to litigation and alternative approaches are still on-going in Denver; however, that situation has further elevated the challenges of utilizing orthophosphates such as higher costs that will be placed on wastewater treatment facilities to remove the excess phosphorus, and potential environmental issues in receiving waters. Many utilities across the country have raised issues with this one-size-fits all approach. Locally, MassDEP has suggested that use of orthophosphates may be a potential solution to elevated lead levels in drinking water. MWRA is concerned about unintended consequences and would prefer for now to focus on lead service line replacements and other controls before committing to chemical additions.

Staff have been working with Providence RI, where lead levels increased after what was expected to be a treatment optimization to reduce lead levels. Providence still hasn't resolved the problem after several years, and is currently doing a neighborhood scale pilot of modified treatment, under the oversight of EPA, the Rhode Island Department of Public Health and a national expert panel. MWRA staff are participating in the review of their data to see if their pilot with orthophosphate and a higher than typical pH is successful at reducing lead levels with no adverse impacts to the distribution system. Changes to wastewater treatment are anticipated if Providence goes full scale with phosphate addition.

Congress did include some funding for lead related activities in American's Water Infrastructure Act of 2018 passed in October. The act includes \$25 million each year between FY2019 and 2021

for voluntary school and childcare testing and \$5 million each year from FY2019 to 2021 for replacement of school fountains. Staff will track whatever grant program EPA develops to distribute these funds, and will alert MWRA communities when the program is available.

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 annual average cost for corrosion control is approximately \$3.9 million (\$3.6 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 14, 2018
SUBJECT: Wachusett Dam Lower Gatehouse Pipe Break



COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE

William G. Sullivan, P.E., Sr. Program Manager
Bradley J. Palmer, Manager, Transmission and Treatment
Mark H. Johnson, P.E., Director, Waterworks
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only.

DISCUSSION:

The water transmission system between the 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 and the Wachusett Aqueduct is an emergency back-up that supplies water to the plant via the new Wachusett Aqueduct Pump Station which is nearing completion. Water is conveyed thru piping in the lower gate house, and flows to the Wachusett Aqueduct. Water also flows thru the lower gatehouse to the Nashua River.

The Wachusett Reservoir and Aqueduct were constructed between 1897 and 1905. The Wachusett Aqueduct was rehabilitated in 2002. A substantial portion of the piping in the lower gatehouse was also replaced in 2002 during the construction of the Carroll Water Treatment Plant. The new piping included new control valves to improve the conveyance of water from the reservoir to the aqueduct. Unfortunately, a piece of the piping that was not replaced in 2002 has failed during the testing of the Wachusett Aqueduct Pump Station.

The series of tests before that must be undertaken before final acceptance involves flowing large volumes of water (as much as 240 mgd) through the lower gatehouse and the aqueduct. Some of the piping in the lower gatehouse is original cast iron pipe over 100 years old. This piping has been exposed to a variety of flow rates and volumes to move water down the aqueduct to the pump station. Some tests were run at night while water demand was low, in case the treatment plant was knocked off line. On October 18, 2018, the day after night-time testing had occurred, staff noted significantly less water flowing through the aqueduct open channel immediately adjacent to the pump station. The lack of water was traced back to the lower gate house where a 48-inch cast iron pipe had failed, with water relieving through the gatehouse to the river.

The photo below was taken when the lower gate house break was discovered. Flow to the lower gatehouse was stopped via remote closure of valves in the upper gatehouse.



There are four pipelines within the lower gatehouse. The break was determined to be on the “tee” and the reducer in Line 2, as shown below.



Pump station testing was suspended to allow investigation of the pipe failure. Site visits by MWRA, Stantec, and Barletta staff occurred during the following days. It was determined that two of the lines could be isolated from the rest and still allow continuation of testing, up to a flow rate of 200 mgd.

The third line has a broken gate valve, which prevents it from being used. The fourth line can be used to send water to the river, if needed.

The feed to the fountain, which is normally used to meet minimum river releases, is inoperable due to a connection to the broken section of pipe. Flow to the river is currently being controlled over the dam with the hydraulically actuated crest gate installed in 2008.




An interim repair plan has been developed in the event the remaining cast iron pipe fails in either line that can currently supply the pump station. The pump station contractor has purchased the blind flanges necessary to make the interim repair if required. A long-term repair plan for the lower gate house piping is being finalized.

Another aspect of testing the new pump station relies on the four existing 2,000kW emergency generators at the treatment plant. All four of these generators are needed to supply full power to the plant and the pump station at maximum flow, and one of the generator bearings has failed. Repeated attempts over the summer under the generator service contract to repair and rebuild the bearings were unsuccessful due to repeated electrical shorts in the windings of the rotor. It has been determined that the generator component of the unit will need to be replaced (the diesel engine unit is in good working condition). The design of the replacement generator is complete and a contract has been advertised for bid. The other three generators are adequate to power the treatment plant and the pump station up to 200 mgd.

BUDGET/FISCAL IMPACTS:

The FY2019 CIP includes a budget of \$1.6 million for design and \$4.0 million for construction to rehabilitate the Wachusett Gatehouse/Bastion Loswer Gatehouse to replace the valves and pipes, repair the leaking roof, and repair/seal the masonry and degraded windows and doors.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Technical Consulting Services to Implement Upgrades to the Water Quality Reporting System
Overture Partners, LLC
Bid WRA-4572Q, State Contract ITS63 Cat 2b

COMMITTEE: Water Policy & Oversight

 INFORMATION

 X VOTE



Michele S. Gillen

Director of Administration

Carolyn M. Fiore, Deputy Chief Operating Officer
Russell J. Murray, Jr., MIS Director
Betsy Reilley, Ph.D., Director, Environmental Quality
Douglas J. Rice, Director of Procurement
Preparer/Title



David W. Coppes, P.E.

Chief Operating Officer

RECOMMENDATION:

To approve the award of Purchase Order Contract WRA-4572Q for technical consulting services to implement upgrades to the Water Quality Reporting System, to the lowest responsive bidder, Overture Partners, LLC, and to authorize the Executive Director to execute said purchase order contract in an amount not to exceed \$309,248.96 under State Contract ITS63 Cat2b, for a term not to exceed two years.

DISCUSSION:

In 2014, the Water Quality Reporting System (WQRS) was developed, configured and integrated using the AQUARIUS product for MWRA source data including PI, Telog, Operator Logs, LIMS (laboratory information management system), and other data streams. The reporting system consists of monthly reports to meet the Massachusetts Department of Environmental Protection and the United States Environmental Protection Agency regulatory reporting requirements for the Carroll Water Treatment Plant and the Brutsch Water Treatment Facility. These compliance reports include disinfection effectiveness (Contact Time and Intensity Time reports for Ozone, Ultraviolet and chlorine disinfection).

After working with the system for three years, staff identified enhancements to the software that would improve work flow, data management, and regulatory reporting efficiency. However, staff determined that AQUARIUS had released an upgrade to its software and that the system should be upgraded prior to the development and implementation of any enhancements. In 2017, under Bid WRA-4308Q, the AQUARIUS software was upgraded from version 3.3 to 3.10 and the associated database was updated to the latest supported version.

Once the version upgrade was completed, a scope of work was developed to meet previously identified data management needs. Completing these enhancements now will increase the reliability, management, and robustness of required DEP reporting and allow for a much longer usable lifetime of the system. Under this proposed contract, the vendor will provide staff with the direct technical expertise necessary to implement modifications and improvements to the database.

These improvements include:

- Elimination of manual data import through automated processes;
- Ability to import data from multiple existing data sources (PI, TELOG, Operator logs);
- Standardization for organizing and naming AQUARIUS time series data;
- Better data handling capability to reduce potential errors;
- Accessibility for various MWRA operating systems and mobile devices;
- Creation of a web-based graphical user interface for administrative tasks (importing or changing data) to be completed more efficiently;
- Logging of database changes to provide transaction traceability; and,
- Archiving of WQRS reports and files to improve system response time.

Other deliverables in this procurement include documentation, technical and end-user training, and 225 hours of on-call technical support services.

Procurement Process:

Under Bid WRA-4572Q, utilizing MWRA's e-procurement system (Event 3546), staff directly solicited the three vendors listed on State Contract ITS63 Cat2b, which provides for staff augmentation services.

On October 12, 2018, Event 3546 closed with the following result:

| Vendor | Resource | Bid Amount |
|-------------------------------|-----------------------------------|----------------------|
| Overture Partners, LLC | Riverside Technology, Inc. | \$279,248.96* |

*Bidders were instructed to enter \$30,000 on Line 2 of the Bid Event to cover an allowance for special support services and unforeseen requirements. Overture Partners, LLC neglected to do so.

Staff contacted the two vendors who did not bid, but received no response. The selected vendor, Overture Partners, LLC, provided a resource (Riverside Technology, Inc) possessing all of the qualifications necessary to complete the work. Riverside Technology, Inc. brings a solid proven track record for implementing several WQRS projects involving installation, upgrades, configuration and data migration. Their years of experience in this field make them an excellent candidate for this project.

Staff have reviewed Overture Partners, LLC's bid and have determined that it meets all of the requirements of the bid specifications and the cost is appropriate for the scope of work. Therefore,

staff recommend the award of this purchase order to Overture Partners, LLC as the lowest responsive bidder.

BUDGET/FISCAL IMPACT:

Sufficient funding is available in the FY2019 Capital Improvement Budget.

MBE/WBE PARTICIPATION:

Overture Partners, LLC is a certified Minority- or Women-owned Business.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Northern Intermediate High Section 110 – Stoneham
Albanese D&S Inc.
Contract 7067, Change Order 3



COMMITTEE: Water Policy and Oversight

 INFORMATION
 X VOTE

Corinne M. Barrett, Director, Construction
Jeremiah Sheehan, Construction Coordinator
Preparer/Title



David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to approve Change Order 3 to Contract 7067, Northern Intermediate High Section 110 Stoneham, with Albanese D&S Inc., for an amount not to exceed \$283,500, increasing the contract amount from \$23,107,300 to \$23,390,800, with no increase in contract term.

Further, to authorize the Executive Director to approve additional change orders as may be needed to Contract 7067 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 Northern Intermediate High (NIH) service area provides water to the communities of Reading, Stoneham, Wakefield, Wilmington, Winchester, and Woburn through a single 48-inch pipeline, which is fed by the Gillis Pump Station, at Spot Pond in Stoneham. Although some of these communities are partially served by MWRA, the loss of this single transmission main would result in a rapid loss of service in Reading, Stoneham and Woburn, and potential water restrictions in Wakefield, Wilmington and Winchester.

The existing main pipeline that serves this area (Section 89) is a three-mile-long, four-foot diameter, pre-stressed concrete cylinder pipe (PCCP) transmission main with limited redundancy other than the low-capacity, century-old Section 29 that parallels its route for a short distance. Due to the lack of redundancy, Section 89 cannot be taken out of service for inspection or for repairs. The project goal is to design and construct a new pipeline that will provide redundancy to the community meters so that Section 89 can be removed from service for inspection and rehabilitation. Under Contract 7067, or Contract 4, the Contractor is excavating and installing

13,215 linear feet of 48-inch water transmission main connecting to previous MWRA construction contracts in the Town of Stoneham as shown on the attached map.

This Change Order

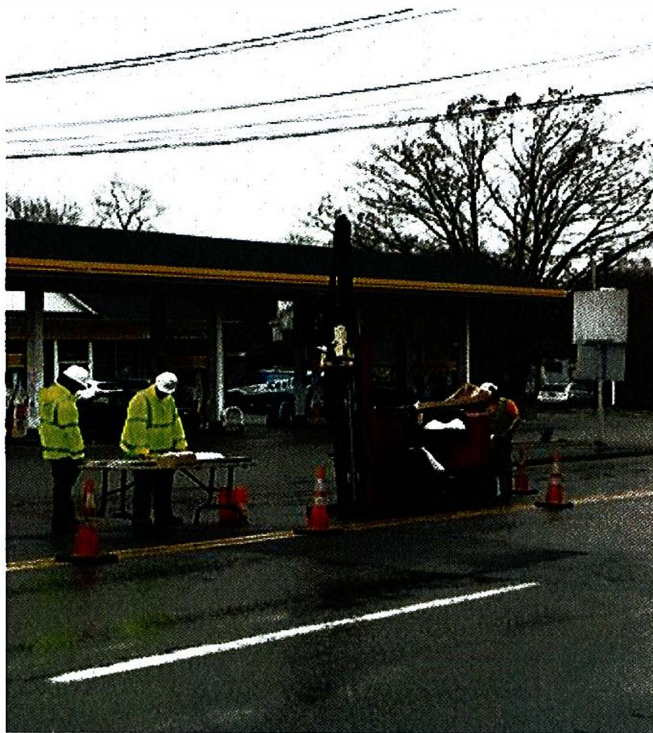
Change Order 3 consists of the following two items:

Test, Remove, Handle, Transport and Dispose of Additional 2,750 tons of Group IA Excavated Material to Unlined Landfill Not-to-Exceed \$129,937.50

The contract documents included quantities of Group IA, IB and II hazardous materials (disposal at unlined facility, lined facility, or asphalt batch facility, respectively) for testing, removal, handling, transporting and disposal as appropriate for each classification. Further, the contract required the Contractor to include a unit price for each class of material in the Schedule of Values. During design, the geotechnical soil sampling program was restricted from performing soil boring and sampling for the entire length of the Department of Conservation and Recreation (DCR) parkway from Station 0+00 to 60+00. For the purposes of estimating, the design engineer searched the Massachusetts Environmental website for any known contaminated soil along Woodland Road and was unable to locate any previous contamination reports. For this reason, the design engineer based the contract quantities on assumptions on soil characterization and disposal requirements between Station 0+00 to 60+00. Subsequently, the DCR rescinded any restrictions and allowed the Contractor to perform pre-characterization soil borings along the DCR roadway.

The contract documents included 500 tons of Group IA excavated materials for which the Contractor bid a unit price of \$19.00 per ton. Based on the Contractor's pre-characterization of the

soils along the pipeline route, the estimated quantity of Group IA contaminated soil is 3,250 tons resulting in an estimated overrun of 2,750 tons.



Taking soil probes along pipeline route

The contract states it is estimated that Group IA and Group IB material exists in the quantities specified, but considering the uncertainty of availability of Massachusetts landfills accepting Group IA and IB material the Contractor's price should include disposal out of state. While the Contractor must maintain the unit prices for the original estimated quantity, the Contractor may be entitled to an equitable adjustment in the unit price for the additional quantities if such substantially deviates from the specified quantity. Typically, a landfill only accepts a certain quantity per day that is directly used for cover. When a landfill accepts a large additional quantity of contaminated soil the additional cost per ton escalates as the

revised cost for testing, removal, handling, transporting and disposal to an unlined landfill for an estimated quantity overrun of 2,750 tons is \$47.25 per ton, for an amount not to exceed \$129,937.50.

The approved PCO for this item has been identified by staff as an overrun in quantities. MWRA staff, the Consultant, and the Contractor have agreed to an amount not to exceed \$129,937.50 for this additional work with no increase in contract term.

Test, Remove, Handle, Transport and Dispose of Additional 2,250 tons of Group II Excavated Material to Asphalt Batch Recycling Not-to-Exceed \$153,562.50

The contract documents also included testing, removal, handling, transport and disposal of 2,000 tons of Group IB and 500 tons of Group II contaminated soil. For the Group II excavated materials, the Contractor carried a unit price of \$29.25 per ton in the Schedule of Values. However, the Contractor's subsequent pre-characterization of the soils concluded an estimated total quantity of 2,750 tons of Group II contaminated soil and zero tons of Group IB. This results in an estimated overrun of 2,250 tons for Group II contaminated soil and an underrun of Group IB contaminated soil. A credit change order for the Group IB underrun will be processed in the future after confirmation of the pre-characterization and completion of the pipeline.

The contract contains the same language for Group II material as in Group 1A material above stating if the actual quantity of any class of materials varies from the assumed quantity, the Contract Price will be adjusted by change order. The Contractor's revised cost for testing, removal, handling, transporting and disposal to an asphalt batch recycling facility for an estimated quantity overrun of 2,250 tons is \$68.25 per ton, for a not to exceed amount of \$153,562.50.

The approved PCO for this item has been identified by staff as an overrun in quantities. MWRA staff, the Consultant, and the Contractor have agreed to an amount not to exceed \$153,562.50 for this additional work with no increase in contract term.



Soil Boring along DCR- Woodland Road

CONTRACT SUMMARY:

| | <u>Amount</u> | <u>Time</u> | <u>Dated</u> |
|-------------------------|---------------------|---------------|--------------|
| Original Contract: | \$22,737,300.00 | 1,000 Days | 07/31/17 |
| Change Orders: | | | |
| Change Order 1* | \$20,000.00 | 0 Days | 07/31/18 |
| Change Order 2 | \$350,000.00 | 0 Days | 07/31/18 |
| Change Order 3 | <u>\$283,500.00</u> | <u>0 Days</u> | Pending |
| Total of Change Orders: | \$653,500.00 | 0 Days | |
| Adjusted Contract: | \$23,390,800.00 | 1,000 Days | |

*Approved under delegated authority

If Change Order 3 is approved, the cumulative value of all change orders to this contract will be \$653,500.00 or 2.87% of the original contract amount. Work on this contract is approximately 34% complete.

BUDGET/FISCAL IMPACT:

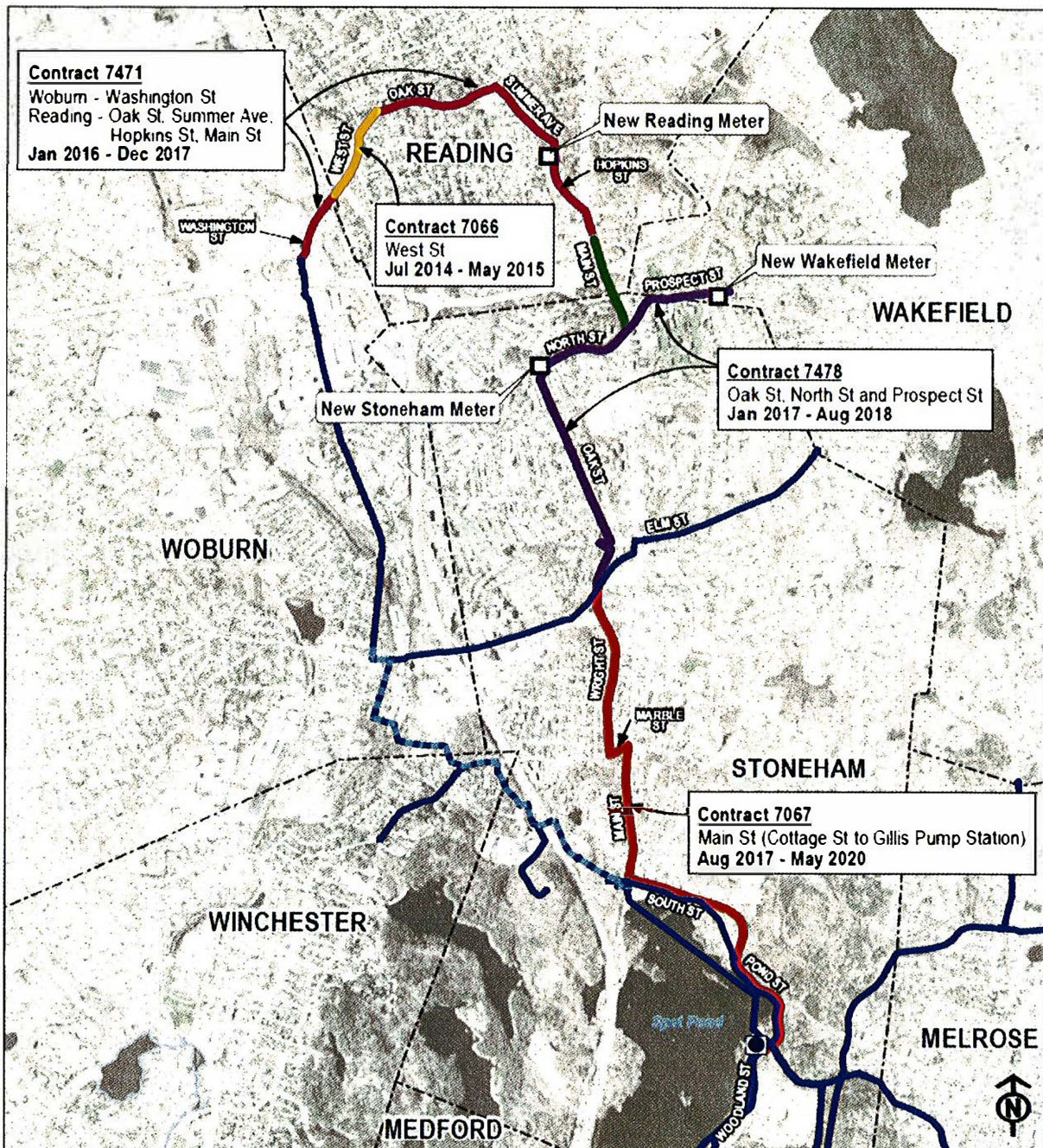
The FY19 Capital Improvement Program budget includes \$22,737,300 for Contract 7067. Including this change order for \$283,500, the adjusted subphase total is \$23,390,800 or \$653,500 over budget. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The MBE/WBE participation requirements for this project were established at 7.24% and 3.6%, respectively. The Contractor has been notified that these requirements are still expected to be met.

ATTACHMENTS:

Northern Intermediate High Redundant Pipeline Project



Contract 7471
 Woburn - Washington St
 Reading - Oak St, Summer Ave,
 Hopkins St, Main St
 Jan 2016 - Dec 2017

Contract 7066
 West St
 Jul 2014 - May 2015

Contract 7478
 Oak St, North St and Prospect St
 Jan 2017 - Aug 2018

Contract 7067
 Main St (Cottage St to Gillis Pump Station)
 Aug 2017 - May 2020

MASSACHUSETTS WATER RESOURCES AUTHORITY
Attachment A
Northern Intermediate High
Redundant Pipeline Project, Route Overview

- Contract 7471
- Contract 7478
- Contract 7067
- Contract 7066
- Short-Term Improvements
- MWRA Mains
- Class IV PCCP
- New Meter Locations

0 1,000 2,000 4,000 Feet



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

to be held on

Wednesday, November 14, 2018

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

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

Time: Immediately following Water Committee

AGENDA

A. Approvals

1. PCR Amendments – November 2018
2. Appointment of Business Systems Analyst III, MIS Department
3. Appointment of Budget Manager, Finance Division
4. Appointment of Manager, Finance and Administration, Operations Division

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Personnel and Compensation Committee

October 17, 2018

A meeting of the Personnel and Compensation Committee was held on October 17, 2018 at the Authority headquarters in Charlestown. Committee member Mr. Foti presided. Present from the Board were Messrs. Carroll, Pappastergion, Peña, Vitale and Walsh. Messrs. Cotter and Flanagan and Ms. Wolowicz were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Thomas Durkin, Michele Gillen, Andrea Murphy, Patterson Riley and Kristin MacDougall. The meeting was called to order at 12:22 p.m.

Information

Update on Massachusetts Equal Pay Act

The Committee recommended that this informational item be moved to the Board of Directors Meeting agenda.

Approvals

* PCR Amendments – October, 2018

Staff recommended changes to the Position Control Register, including four positions in the Finance Division to accurately reflect the nature of the job duties and one position in the Operations Division amendment to address staffing needs.

The Committee recommended approval (ref. P&C B.1.)

* Appointment of Deputy Contracts Manager, Procurement

The Committee recommended approval (ref. P&C B.2.)

The meeting adjourned at 12:24 p.m.

* Committee recommendation approved by the Board on October 17, 2018

STAFF SUMMARY

TO: Board of Director
FROM: Frederick A Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: November PCR Amendments



COMMITTEE: Personnel and Compensation


Andrea Murphy, Director of Human Resources
Preparer/Title

 INFORMATION

 X . VOTE

Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve amendments to the Position Control Register (PCR) included in the attached chart.

DISCUSSION:

The Position Control Register lists all positions of the Authority, filled and vacant. It is updated as changes occur and it is published at the end of each month. Any changes to positions during the year are proposed as amendments to the PCR. All amendments to the PCR must be approved by the Personnel Committee of the Board of Directors. All amendments resulting in an upgrade of a position by more than one grade level, and/or an amendment which creates a position increasing annual cost by \$10,000 or more, must be approved by the Board of Directors after review by the Personnel and Compensation Committee.

November PCR Amendments

The two PCR changes include one position in the Administration Division to accurately reflect the nature of the job duties. The Operations Division amendment reflects changing one position to accurately reflect the nature of the job duties.

The amendments are:

Administration Division Organizational Change

1. Title change to one filled position in the MIS Department, Administration Division from Database Analyst/Programmer, Unit 6, Grade 11, to System Analyst/Programmer III, Unit 6, Grade 11 to provide consistent titles and duties for staff doing similar work.

Operations Organizational Change

1. Title change to a filled position in the Deer Island Process Control PICS department, Operations Division, from Project Manager Residuals, Unit 9, Grade 25, to Project Manager, PICs, Unit 9, Grade 25 to more accurately reflect the responsibilities of the position.

These amendments require approval by the Personnel and Compensation Committee.

BUDGET/FISCAL IMPACT:

The annualized budget impact of this PCR amendment is \$0.

ATTACHMENTS:

Old Job Descriptions
New Job Descriptions

**MASSACHUSETTS WATER RESOURCES AUTHORITY
POSITION CONTROL REGISTER AMENDMENTS
FISCAL YEAR 2019**

PCR AMENDMENTS REQUIRING PERSONNEL & COMPENSATION COMMITTEE APPROVAL - November 14, 2018

| Number | Current | V/F | Type | Current Title | UN | GR | Amended Title | UN | GR | Current/Budget | Estimated | | Estimated Annual | | Reason For Amendment |
|--|---------|-----|------|--------------------------------|----------|----|-----------------------------------|----|----|----------------|------------------|-----------|------------------|-----|--|
| | PCR # | | | | | | | | | Salary | New Salary | \$ Impact | \$ | \$ | |
| P8 | 8610060 | F | T | Database Analyst/Programmer | 6 | 11 | System Analyst/ Programmer III | 6 | 11 | \$103,540 | \$103,540 | \$103,540 | \$0 | \$0 | To provide consistent titles and duties for staff doing similar work and align the titles with industry standards. |
| P9 | 2938521 | F | T | Project Manager, Residuals | 9 | 25 | Project Manager, PICS | 9 | 25 | \$107,348 | \$107,348 | \$107,348 | \$0 | \$0 | This is a title change to accurately reflect the responsibilities of the position. |
| PERSONNEL & COMP COMMITTEE TOTAL= | | | | | 2 | | | | | | SUBTOTAL: | \$0 | - | \$0 | |

PCR AMENDMENTS REQUIRING BOARD APPROVAL - November 14, 2018

| Number | Current | V/F | Type | Current Title | UN | GR | Amended Title | UN | GR | Current/Budget | Estimated | | Estimated Annual | | Reason For Amendment |
|----------------------|---------|-----|------|---------------|----------|----|---------------|----|----|----------------|-------------------------------|-----------|------------------|-----|-------------------------|
| | PCR # | | | | | | | | | Salary | New Salary | \$ Impact | \$ | \$ | |
| BOARD TOTAL = | | | | | 0 | | | | | | SUBTOTAL: | \$0 | - | \$0 | |
| GRAND TOTAL = | | | | | 2 | | | | | | TOTAL ESTIMATED COSTS: | \$0 | - | \$0 | |

**MWRA
POSITION DESCRIPTION**

OLD

POSITION: Database Analyst Programmer

PCR#:

DIVISION: Administration & Finance

DEPARTMENT: MIS

BASIC PURPOSE:

Primary technical lead in support of assigned applications including, senior level programming, systems project management, application maintenance and database integrity. Defines and develops new functionality, database structures, application interfaces and the critically shared data elements through a comprehensive understanding of the MWRA's business functions.

SUPERVISION RECEIVED:

Works under the general supervision of the Data Resources Manager.

SUPERVISION EXERCISED:

Exercises close supervision of assigned project staff and technical resources.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Assures the quality and integrity of the production version of assigned applications in compliance with SDM and Change Control Procedures.
- Manages new release and maintenance support activities provided by the assigned applications vendor.
- Identifies new business functions and defines information technology solutions to address the new functions.
- Defines the logical and physical organization of assigned application related data which support targeted business functions.

- Develops database definition and program code required to implement new modules, reports, and interfaces with other systems.
- Coordinates and executes quality assurance and system acceptance procedures.
- Validates the content of data structures for data security and data accuracy.
- Manages assigned technical staff resources and combined user and MIS implementation task forces.
- Analyzes and specifies the operational requirements of assigned applications.
- Participates in the identification and evaluation of the storage medium organization techniques and access methods.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four- (4) year college program in computer science or related field. Advance degree preferred; and
- (B) Six (6) to eight (8) years of experience with assigned systems and/or environmental software, preferably with vendor supplied packages. Expertise in minicomputer/server application and database programming; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of information system design and programming.
- (B) Proficiency with the following required: 3rd and 4th generation languages, Oracle Developer, and OPEN VMS.
- (C) Proficiency with the following preferred: Beckman Lab Manager, Access; Maintenance Management Systems, Unix or NT; Workflow Management Systems, GIS and/or

Engineering/scientific tools.

- (D) Demonstrated experience in project management techniques and the ability to establish effective relationships with users.

SPECIAL REQUIREMENTS:

None.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, 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 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 frequently is required to sit and talk or hear. The employee is occasionally required to walk; stand; climb or balance; stoop, kneel, crouch, or crawl; taste or smell.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work 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 various field settings and in an office environment.

The noise level is moderately loud in the field settings and moderately quiet in the office setting.

March, 2001

MWRA
POSITION DESCRIPTION

NEW

POSITION: Systems Analyst/Programmer III

PCR#:

DIVISION: Administration & Finance

DEPARTMENT: Management Information System (MIS)

BASIC PURPOSE:

This position is responsible for analyzing, designing, developing, testing, implementing and maintaining software applications. This position is also responsible for the post implementation support including incident, performance, capacity, continuity and problem management activities. The Systems Analyst/Programmer III is responsible for the preparation, and maintenance of system documentation to be used by the IT staff and user community.

The Systems Analyst/Programmer III also serves as a team lead for assigned projects, maintains and upgrades project plans and schedules and ensures IT testing is scheduled and documented

SUPERVISION RECEIVED:

Works under the general supervision of the group supervisor. On specific IT projects may be supervised by a team lead or project manager.

SUPERVISION EXERCISED:

Exercises supervision of assigned vendor resources and IT project team.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

Application Development

- Reviews application design prior to buy or build decision to ensure service levels can be met and recommend any performance enhancements prior to implementation
- Codes, configures, implements, maintains and supports, new and upgrades to software applications (in-house and third party software) and interfaces to ensure processes and functionality of the applications comply with the organization's requirements, processes and standards.

- Develops and maintains technical documentation for applications as follows:
 - Design Model - Description of the system design. Comprised of a variety of work products, potentially including a deployment model, an object model, a physical data model (PDM), a security threat model, a system overview document, and a user interface model.
 - Source Code – The program code for the system.
 - Regression Test Suite - Collection of test cases, and the code to run them in the appropriate order. The regression test suite will include a wide range of tests, including acceptance tests, unit tests, system tests, etc.
 - Installation Scripts - Code for installing the system into pre- and post-production environments.
 - Release Notes - Summarize the things to know pertaining to the current release of the system.
 - Operations Procedure - Procedures and supporting information to operate the system once it is in production including continuity and disaster recovery procedures.
 - Support Reference- Used by support staff, such as trouble shooting guides, contact information for the development team, which enables them to support end users
- Responsible for developing a release package for all systems changes when transitioning to the production environments.

Post Implementation Support

- Supports the resolution of incidents and problems with software application functionality.
- Researches and corrects problems with the system applications code during production processing in an efficient and timely manner ensuring system recovery and integrity.
- Is available to execute and carry out IT Continuity and Disaster Recovery Plans
- Is a Technical Member of the Change Advisory Board (CAB) as needed.
- Serves as team lead for assigned projects and updates/maintains project plans and schedules as required.

Mentoring & Professionalism

- Maintains professional interaction with the application development staff, user and extended IT community (i.e. project teams) to ensure adequate system functionality, promote team participation and encourage user confidence in the Application Development Staff's quality of service.
- Provides assistance to Systems Analysts/Programmer I and II personnel ensuring that all technical design work, coding and testing are done in a manner that meets or exceeds design and testing requirements and standards.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college program in management science, engineering management, computer science or related fields; and
- (B) Five (5) to seven (7) years experience supporting enterprise wide applications as well as tier two applications.
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Extensive knowledge of programming languages, troubleshooting techniques, database structures, triggers and procedures, application server platforms, middleware and operating systems.
- (B) Knowledge of the following is desirable: MS .Net, J2EE, Crystal Reporting, ORACLE 11g, SQL Server and PL/SQL.
- (C) Analytical and interpersonal skills
- (D) Written and oral communication skills.

SPECIAL REQUIREMENTS:

- Information Technology Infrastructure Library (ITIL) Foundation Certification is required or the ability to obtain within one year.
- Formal training or certification in programming methodologies and System Development Life Cycle methodologies is required or the ability to obtain within one year.
- Microsoft Certified Solutions Developer (MCSD) or equivalent is required or the ability to obtain within one year of scheduled training.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, 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 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 frequently is required to sit and talk or hear. The employee is occasionally required to walk and stand.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

WORK ENVIRONMENT:

The work 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 various field settings and in an office environment. The employee regularly works near moving mechanical parts, and is occasionally exposed to risk of vibration.

The noise level in the work environment is very loud in field settings, moderately loud at other work locations and moderately quiet at office settings.

November 2018

**MWRA
POSITION DESCRIPTION**

OLD

POSITION: Project Manager, Residuals

PCR#:

DIVISION: Operations

DEPARTMENT: Residuals Management

BASIC PURPOSE:

Oversees, coordinates and manages design and construction related projects at the Authority's bio-solids processing plant with particular emphasis on cost reduction through process optimization.

SUPERVISION RECEIVED:

Works under the supervision of the Director of Residuals Management.

SUPERVISION EXERCISED:

None.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Develops scope of services for wastewater residual projects to meet Authority needs.
- Participates in consultant selection procedures and contract negotiation.
- Manages and coordinates issues between the MWRA design consultant, construction contractor, and plant operations contractor that arise from the design and construction of expanded facilities at the MWRA bio-solids processing facility.
- Participates in the conceptual design and preparation of RFQs/RFPs and RFBs for professional and non-professional services and supplies related to Residuals processing and disposal in order to lower processing costs.
- Prepares budget and schedules.
- Supervises, manages and oversees the work of professional engineering consultants under contract to the MWRA for quality of outputs, budget and schedule compliance and

NU14

conformance to contract terms.

- Manages and oversees special projects including the MWRA fertilizer distribution and sales program, MWRA polymer selection and procurement and other projects aimed at reducing Authority processing costs.

SECONDARY DUTIES:

- Performs other duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college degree in civil engineering; and
- (B) Six (6) or more years of work experience in the area of wastewater management, design and operation. Particular experience in bio-solids processing preferred; or
- (C) Any equivalent combination of education and/or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of the principles and practices of civil engineering.
- (B) Understanding of engineering design, facilities planning, environmental review, and contract operation of public facilities.
- (C) Excellent written and oral communication skills required.

SPECIAL REQUIREMENTS:

A valid Massachusetts Class D Motor Vehicle Operators License.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computer including word processing and other software, copy and fax machine.

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 frequently is required to stand and talk or hear. The employee is occasionally required to walk; sit; climb or balance; stoop, kneel, crouch, or crawl; taste or smell.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or occasionally lift and/or move up to 100 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 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.

August, 1999

**MWRA
POSITION DESCRIPTION**

NEW

POSITION: Project Manager, PICS

PCR#:

DIVISION: Operations

DEPARTMENT: Deer Island, Process Engineering and Control

BASIC PURPOSE:

Provides technical support to Operations and has overall project management responsibility for a variety of wastewater treatment process control/optimization initiatives. Projects include system support for the Process Instrumentation and Control System (PICS), on Deer Island. The PICS system is a very large distributed control system.

SUPERVISION RECEIVED:

Works under the general supervision of a Program Manager, Process Control.

SUPERVISION EXERCISED:

May include close supervision of Project Engineer(s), contract DCS maintenance staff and/or interns.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Conducts process control studies with the objective of identifying process and/or equipment modifications which would improve process performance, including chemical and/or energy use optimization initiatives. Manages the implementation of modifications as directed.
- Designs, configures, tests, tunes, and documents new PICS control logic and console graphics. Coordinates PICS project activities with Engineering, Operations, Maintenance, engineering consultants and other DITP groups as required.
- Assists with check out and start-up of new process control equipment and systems. Performs field investigations and recommends solutions to process control problems that arise during plant operation.
- Assists in the determination of operating capability and associated performance criteria for existing and proposed wastewater processes.

- Performs analysis of user needs and initiates modifications to controls and operator graphics. Provides training to Deer Island staff on the operation of PICS workstations as required.
- Monitors the performance of PICS hardware and software. Identifies problems, advises supervisor, and implements solutions.
- Reviews the plans, specification, control logic and graphics submitted by control system vendors and consultants for proposed engineering modifications.
- Identifies, troubleshoots and resolves problems between PICS and Plant Systems concerning the Plant Information (PI) systems. Provides support as required for Permits and Reporting.
- Oversees the activities of assigned Project Engineers, contract employees and interns. Evaluates assigned employees performance according to MWRA procedures.

SECONDARY DUTIES:

- Provides on-call emergency and routine assistance to support group objectives.
- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college program in engineering or a related technical field;
- (B) Five (5) to seven (7) years experience with distributed control system design, (preferably ABB INFI-90 with Composer EWS) configuration, check out and start-up, including factory testing and field engineering in a wastewater, power, or process environment; and
- (C) Experience with wastewater treatment plant operations and with large facility startup procedures; or
- (D) Any equivalent combination of education and/or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Experience in interpreting Process and Instrument Diagrams, Logic Diagrams and Mechanical Diagrams.
- (B) Excellent interpersonal, oral and written communication skills.

- (C) Knowledge of real-time computer control system operation and programming.
- (D) Computer fluency to include the use of MS Word, Excel, Access and other related PC-based software.

SPECIAL REQUIREMENTS:

A valid Class D Massachusetts Motor Vehicle Operators license or equivalent.

A Massachusetts Grade 6 Wastewater Operators license or ability to obtain within one (1) year.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computer including word processing and other software, copy and fax machine.

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 frequently is required to sit and talk or hear. The employee is occasionally required to walk; stand; 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 vision, depth perception, peripheral vision 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 frequently 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 an office setting.

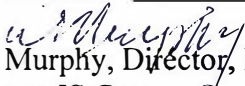
November 2018

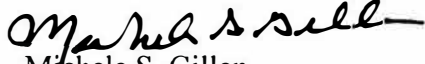
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Appointment of Business Systems Analyst III, MIS Department

COMMITTEE: Personnel and Compensation

 INFORMATION
 X VOTE


Andrea Murphy, Director, Human Resources
Joe Barrett, IS Custom Support Manager
Russell J. Murray, Jr., MIS Director
Preparer/Title


Michele S. Gillen
Director of Administration

RECOMMENDATION:

To approve the appointment of Mr. Patrick Li to the position of Business Systems Analyst III (Unit 6, Grade 12), in the MIS Department, at an annual salary of \$113,864.09, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The position of MIS Business Systems Analyst III became vacant upon the retirement of the incumbent. Organizationally, this position reports to the Program Manager in the MIS Custom Support group.

The Business Systems Analyst III works with all MWRA divisions and departments to assess, develop and implement IT application needs and requirements to support their operational and business needs. The Business Systems Analyst III serves as the primary liaison between the IT development team and the end users to ensure work processes are documented and understood, enhanced or revised as appropriate, and translated into IT system/application requirements used to develop or procure technology-based solutions. Responsibilities include working with MWRA staff to understand business needs and to identify appropriate technology improvements and solutions to satisfy those needs, and to improve operational efficiencies. This position takes the lead in implementation of these projects.

Selection Process

The position was posted internally. Two candidates applied and were referred for interviews. The Manager, MIS Custom Support and the Manager of Operations Support interviewed both candidates and determined that Mr. Li was the most qualified candidate based on his experience, knowledge, skills and education.

Mr. Li has 24 years of experience at MWRA in several positions with increasing and diverse technical responsibilities. He began working at MWRA in 1994 as a Training Specialist. In 1996, Mr. Li was promoted to IT Development Specialist and in 1998, he was promoted to Programmer Analyst II. He has held the position of Senior Systems Analyst since 2000.

While at MWRA Mr. Li has led a number of important application improvement projects. Mr. Li has successfully assisted in the design implementation and support of applications for Field Operations, TRAC, Law, the Library and the Records Center. These applications have provided operational efficiencies and improved productivity. He has outstanding analytical and written communications skills, and a proven record of identifying business process improvements and identifying application configurations that support their implementation. In addition, having been a trainer, course developer, application designer and developer, and administrator during his career at the MWRA, Mr. Li has developed an excellent set of technical skills and interdepartmental relationships that will be beneficial to this position.

Mr. Li's Business Analyst training includes, Business Analysis Essentials, Business Analysis Requirements Development, Documentation and Management, and attendance and participation at several annual Project Summit/Business Analysts Conferences. He possesses an Information Technology Infrastructure Library Foundation Certification (required for the position), as well as formal training on System Development Life Cycle and Project Management. In addition, he has taken Information Mapping Methodology® training and has applied the documentation methodology it to the technical and user documentation he has prepared.

Mr. Li graduated from Northeastern University with a Bachelor of Science Degree in Industrial Engineering and Information Systems.

BUDGET/FISCAL IMPACT:

There are sufficient funds for this position in the FY2019 Current Expense Budget.

ATTACHMENTS:

Resume of Patrick Li
Position Description
Organization Chart

Patrick Li

| | | |
|----------------------|--|-------------------|
| Objective | To improve the efficiency of MWRA business processes by identifying MWRA stakeholders' business needs; developing well defined requirements and making recommendations on IT solutions that address these business needs. | |
| Education | Bachelor of Science Degree – Industrial Engineering & Information Systems Northeastern University, Boston, Massachusetts | 1994 |
| Employment | Massachusetts Water Resources Authority | |
| | <i>Senior Systems Analyst</i> | 2000 - Present |
| | <ul style="list-style-type: none"> • Identify business process problems and goals, and propose changes in requirements and designs of processes. • Elicit and collaborate stakeholders to gather business process requirements. • Produce System Development Life Cycle artifacts such as use case, project request, requirement document, and project charter. • Validate requirements throughout the life cycle of the projects. • Research, evaluate and made recommendations on selecting commercial off-the-shelf solutions. • Developed and deployed automated console applications that work with vendors' XML based API web services. • Developed, deployed, and maintained web applications that replaced the functions of paper-based business processes. • Developed, implemented, and maintained client- server based Permit Tracking application for the TRAC department. | |
| | <i>Programmer Analyst II</i> | 1998 - 2000 |
| | <ul style="list-style-type: none"> • Developed MS Office Server Extension templates for generating Waterworks reports. • Maintained and updated MS Access Permit Tracking stand-alone database application used by 25 users in the TRAC department. • Develop proposals, project plans, and system documentations for IT projects. | |
| | <i>IS Development Specialist</i> | 1996 - 1998 |
| | <ul style="list-style-type: none"> • Developed training materials for advanced level MS Office classes. • Install, support, and maintain commercial off-the-shelf application. | |
| | <i>MIS Training Specialist</i> | 1994 - 1996 |
| | <ul style="list-style-type: none"> • Developed training materials and job aids for MS Office training classes. Delivered MIS training classes and custom workshops to employees. | |
| Skills | <ul style="list-style-type: none"> • Microsoft Visual Studio .NET • Microsoft SQL Server programming and maintenance • Microsoft Office Professional programming and macros | |
| Certification | ITIL® Foundation Examination – PEOPLECERT | 2016 |
| Training | <ul style="list-style-type: none"> • Business Analysis Requirements Development, Documentation, and Management – IIBA • Business Analysis Essentials – New Horizon • Effective Reports, Proposals & Memos – Information Mapping Inc. • Developing Procedures, Policies & Documentation – Information Mapping Inc. | |

MWRA POSITION DESCRIPTION

POSITION: Business Systems Analyst III
DIVISION: Administration
DEPARTMENT: Management Information System (MIS)

BASIC PURPOSE:

The Business Systems Analyst III works with business unit staff to understand business processes and to document and prioritize user requirements and functional specifications for new and existing systems that support the organizational needs. Serves as the conduit between the development team and the rest of the organization. Facilitates communications to expeditiously translate business requirements to help develop technical specifications as well as translate technical specification into language accessible to user and management audiences. Communicates and consults with end users or management to provide information regarding the costs and ramifications of the decisions made.

Evaluates MWRA application and business workflows, identifies improvements, documents requirements, prototyping, quality assurance and makes recommendations on how business processes can be improved through better implementation of technology. Identifies stake holders and develops Requirements Development Work Plans.

In addition, the Business Systems Analyst III will serve as Business Systems Analyst team lead and will update and maintain Business Systems Analysis specific project plans and schedules.

SUPERVISION RECEIVED:

Works under the general supervision of the Manager II, Business Systems Analysis

SUPERVISION EXERCISED:

Exercises supervision of assigned vendor resources and IT project team.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Use proven business analysis methodologies and elicitation techniques to:
 - Gather and document business, functional and technical requirements from business leaders, end users, and vendors for new and upgraded software applications (in-house and third party software).
 - Document project scope and vision documents.

- Support Quality Assurance/Quality Control activities including developing functional and user test acceptance test plans in conjunction with IT and user stakeholders.
- Research new approaches to improve business and system processes and develop reports and/or proposals for new or enhanced solutions.
- Identify and document documents gaps between the current as-is and recommended to-be processes.
- Collaborate with IT Department engineering staff contractors and vendors to support development of technical specification for appropriate system infrastructure hardware and software.
- Research, design, and test interfaces between existing and new system applications and platforms to produce seamless integration that complies with business requirements.
- Maintain professional interaction with the IT staff and user community to ensure adequate system functionality, promote team participation and encourage user confidence in the applications staff quality of service.
- Develop and maintains design documentation, report requirements and test plans of applications throughout the design process.
- Support user acceptance testing and release management activities.
- Coordinate vendor access and resources as assigned.
- Documents and communicates issues and risks.
- Develops and maintains Business Systems Analyst functional unit's business continuity documentation as appropriate.
- Maintains professional interaction with the Business Systems Analyst staff, user and extended IT community (i.e. project teams) to ensure adequate system functionality, promotes team participation and encourages user confidence in the IT Department's quality of service.
- Conducts stakeholder analyses by gathering and assessing information to determine whose interests should be taken into account for each project. Based on this analysis, identifies the stake holders for each project.
 - Develops Requirements Work Plan.
 - Manages Issue & Risk Lists as assigned.

- Coordinates project team testing and user acceptance testing for assigned projects ensuring testing is formalized, adheres to department standards and best practices.

SECONDARY DUTIES:

Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college program in management science, engineering management, computer science or related fields; and
- (B) Five (5) to seven (7) years experience gathering functional requirements, analyzing and accurately documenting requirements specifications, workflow diagrams, data flow diagrams, etc. to effectively communicate needs to internal and external development teams and/or developing and testing prototypes.
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- A) Formal training or certification on methodologies/frameworks for business systems analysis, project management, software development and IT Service Management such as:
 - Rapid Application Development SDLC methodologies such as Agile.
 - Project Management concepts and tools.
- (B) Analytical and interpersonal skills.
- (C) Written and oral communication skills.
- (D) Knowledge of the following is desirable: MS Project, MS Visio, MS .Net, J2EE, Crystal Reporting, ORACLE, SQL Server and PL/SQL.

SPECIAL REQUIREMENTS:

Information Technology Infrastructure Library (ITIL) Foundation Certification is required or the ability to obtain within 6 months.

International Institute of Business Analysis (IIBA) Certification or formal IIBA Training or the ability to obtain within one year.

TOOLS AND EQUIPMENT USED:

Office equipment as normally associated with the use of telephone, personal computers including word processing and other software, 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 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 frequently is required to sit and talk or hear. The employee is occasionally required to walk and stand.

The employee must frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and color vision, and the ability to adjust focus.

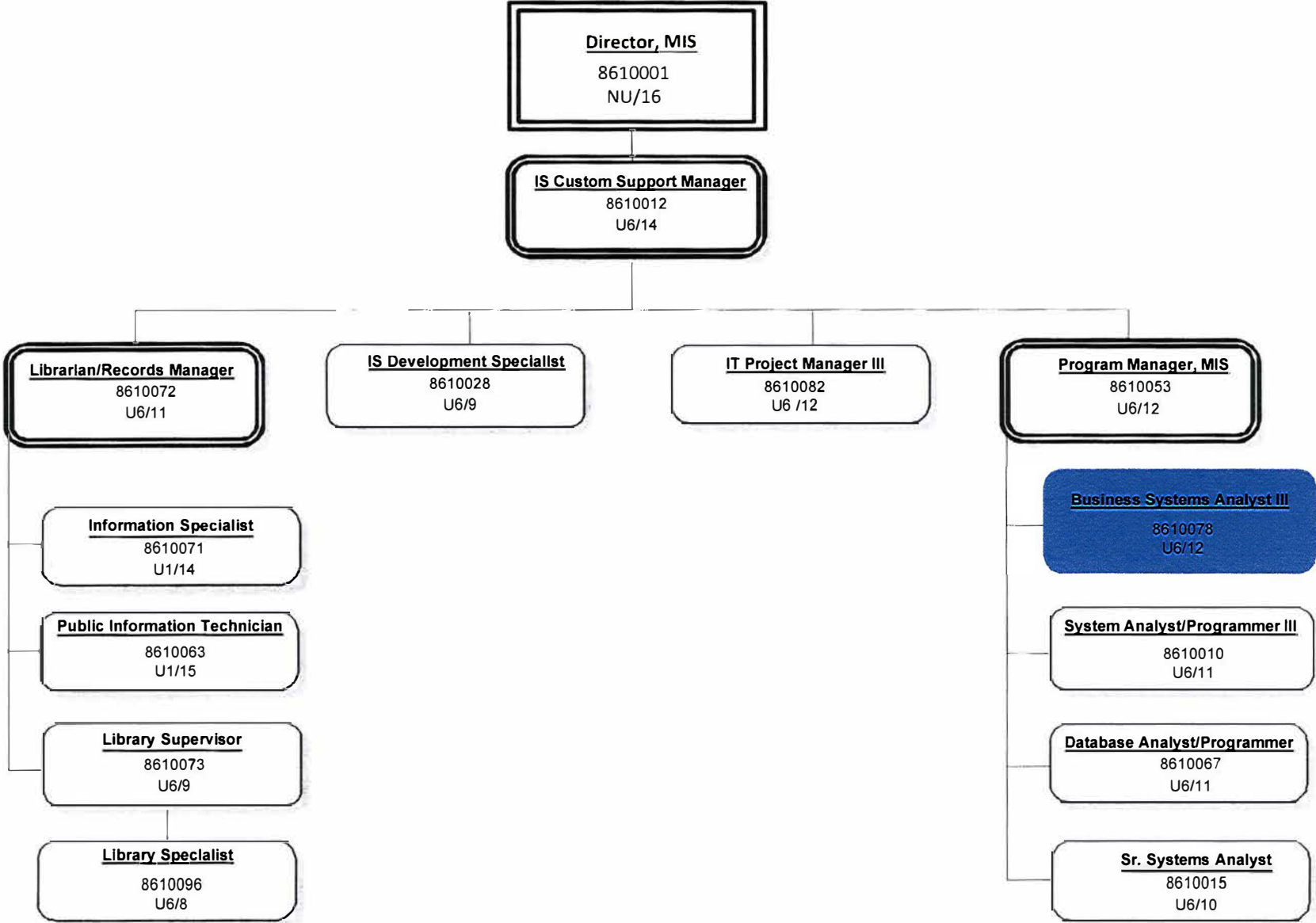
WORK ENVIRONMENT:

The work 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 various field settings and in an office environment. The employee regularly works near moving mechanical parts, and is occasionally exposed to risk of vibration.

The noise level in the work environment is very loud in field settings, moderately loud at other work locations and moderately quiet at office settings.

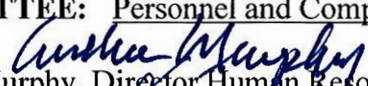
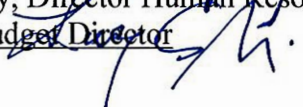
Administration
MIS Department
November 2018



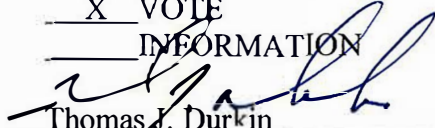
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Appointment of Budget Manager, Finance Division

COMMITTEE: Personnel and Compensation


Andrea Murphy, Director Human Resources

Kathy Soni, Budget Director
Preparer/Title

X VOTE
INFORMATION


Thomas J. Durkin
Director of Finance

RECOMMENDATION:

To approve the appointment of Mr. Michael Cole, Jr. to the position of Budget Manager, Finance Division (Non-Union, Grade 14) at an annual salary of \$117,300, commencing on a date to be determined by the Executive Director.

DISCUSSION:

The Budget Manager works closely with all Divisions and staff, and directs the development of the annual Current Expense Budget and Capital Improvement Program, including development and management of the budget process, formulation of recommendations for the allocation of resources to meet objectives, production of budget documents, and preparing briefings to the Board of Directors on actual results.

The Budget Manager plays an important role in managing relationships with the Advisory Board and other external constituencies. The Budget Manager supervises two Assistant Finance Managers, and two Senior Financial Analysts, and reports directly to the Budget Director.

Selection Process

This position was posted internally and externally. Fifteen candidates applied for the position, all external. Six qualified candidates were referred to be interviewed. The Director of Finance, Budget Director, and Special Assistant for Affirmative Action interviewed all six candidates and determined that Mr. Michael Cole was the most qualified candidate to fill this position based on his combination of experience, abilities, knowledge and education.

Mr. Cole has 15 years of experience in Finance and Administration primarily in the healthcare sector and has most recently served for six years in a management role. He currently is the Finance Manager at Winchester Hospital. In his current role, he manages all aspects of the budget development process including the establishment, tracking, analyzing and reporting financial performance. He is managing four analysts, and assisted with the implementation of a new Oracle financial reporting system. He assists the Executive Director of Winchester Hospital

in coordination of the annual capital and operating budgets. Prior to his current position, he worked at Newton-Wellesley Hospital, most recently as a Business Manager but held positions of increasing responsibility starting as a Budget Analyst.

Mr. Cole distinguished himself among the candidates with his knowledge and understanding of financial and business practices. He provided relevant examples of his experience in managing financial work and demonstrated his understanding of the role of finance in a complex organization.

Mr. Cole has a Bachelor of Science Degree in Business Administration with a major in Finance from Northeastern University.

BUDGET/FISCAL IMPACT:

There are sufficient funds in the FY19 CEB for this position.

ATTACHMENTS:

Mr. Michael Cole's Resume
Position Description
Rates and Budgets Department Organization Chart

Michael J. Cole, Jr.

Professional Summary

Financial Manager with extensive healthcare experience and a diverse skill set. Goal-oriented professional with strong technical skills, ability to multi-task effectively, and excellent communication and interpersonal skills.

Skills

- Financial Reporting
- Data Analytics
- Budgeting and Forecasting
- Accounting
- Process Improvement
- Physician Contracting and Compensation
- Project Management
- Healthcare Operations
- Employee Management

Experience

Winchester Hospital

Finance Manager, Physician Services

Winchester, MA

5/2015-Current

- Oversee development, tracking, analyzing, and reporting of financial and statistical performance for Winchester Physician Associates (25 practices)
- Manage and oversee team of analysts and support staff (4 FTEs)
- Provide financial support to approximately 100 providers as well as practice administrative/support staff
- Assist Executive Director in coordination of annual capital and operating budgets (\$40M)
- Financial liaison between Winchester Hospital Finance, WPA Finance, and Lahey Health Finance
- Assisted with the implementation/rollout of a new financial reporting system for WPA – Oracle Business Intelligence Application
- Calculate and manage monthly provider incentives based on financial performance and productivity
- Ad hoc analysis to support clinical operations

Newton-Wellesley Hospital

Business Manager, Ambulatory Services

Newton, MA

7/2012-5/2015

- Managed finances and operations for both inpatient and outpatient departments within Medicine, Pediatrics, Psychiatry, and Surgery (24 cost centers)
- Managed and oversaw Practice Managers and administrative staff for assigned areas (4 FTEs)
- Provided support to 250 providers and administrative/support staff
- Member of the MD compensation committee
- Monitored and communicated MD productivity results to physician and hospital leaders
- Assisted with the development and implementation of a new compensation plan for the Hospitalist Service

- Developed business plans pertaining to the acquisition of a new provider or service
- Provided integral support to Chairs, Chiefs, and CMO
- Administrative contact for MGH and BWH collaborative programs

Newton-Wellesley Hospital
Interim Physician Contract Specialist

Newton, MA
7/2013-12/2013

- Managed contract process and work with Medical Staff, CMO, and Department Chairs/Chiefs to on-board new providers
- Drafted employment and professional services agreements
- Managed contract payments and conducted financial performance analysis

Newton-Wellesley Hospital
Senior Budget Analyst
Budget Analyst

Newton, MA
8/2008-7/2012
2/2006-8/2008

- Assisted in coordinating the annual operating budget process (\$450M)
- Prepared monthly financial and statistical results for hospital leadership
- Supported hospital leadership regarding operating/capital budgets, variance analysis, and reporting
- Ad hoc analyses to support clinical operations
- Assisted Budget Director in coordinating annual capital budget process
- Developed process for electronic capital budget submitting and reporting
- Maintained capital database, analyzed spending, and generated reports for management
- Developed reports targeting OT/expense reduction initiatives
- Assisted in the development/rollout of Finance Leaders Lab
- Provided support to Operations Management with Action OI and the Nursing Balanced Scorecard
- Contributing member of the PHS Visions OMS Team, as well as the NWH Products Committee
- Implemented a standard quarterly process for tracking and reporting bed utilization statistics
- Managed physician time study process and prepared data for cost report submission
- Assisted with annual cost report submission

Lahey Clinic
Staff Accountant

Burlington, MA
11/2004-2/2006

- Maintained asset management system
- Analyzed capital spending and generate reports for management
- Managed capital spending on \$90M building expansion project
- Managed the year-end physical inventory process
- Monitored the monthly inventory counts
- Maintained inter-department relationships for inventory control
- Reconciled general ledger accounts relating to capital and inventory

State Street Corporation
Fund Accountant

Boston, MA
8/2003-11/2004

- Responsible for day-to-day accounting of assigned mutual funds
- Prepared and reconciled daily trial balances
- Tracked and analyzed fund activity
- Calculated and reviewed daily net asset value of funds

Software

- Microsoft Office Suite
- PeopleSoft Financials/HRMS
- Business Objects Planning
- Hyperion Planning
- Cognos Operating/Capital Management
- Oracle Business Intelligence Application
- Kronos Workforce Central
- Epic
- athenaNet
- Soarian Financials
- Meditech
- Document Direct
- DocuAnalyzer

Accomplishments

- Partners In Excellence Award Recipient, 2006 and 2012
- Partners Clinical Process Improvement Leadership Program (CPIP) Graduate, 2014

Education

Northeastern University
Bachelor of Science in Business Administration
Major in Finance

Boston, MA
June, 2003

**MWRA
POSITION DESCRIPTION**

POSITION: Budget Manager

PCR#: 4410011

DIVISION: Finance

DEPARTMENT: Rates and Budget

BASIC PURPOSE:

Directs development and monitoring of the MWRA's Current Expense Budget (CEB) and Capital Improvement Program and Budget (CIP).

SUPERVISION RECEIVED:

Works under the general supervision of the Director, Rates and Budget.

SUPERVISION EXERCISED:

Supervises assigned budget staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Directs development of annual MWRA Current Expense Budget and Capital Improvement Program and Budget (CIP), including development and management of budget processes, formulation of recommendations for the allocation of resources to meet objectives, and production of proposed and final budget documents.
- As part of the CEB, coordinates development of annual performance measures and targets based on measures included in the monthly Yellow Notebook and the quarterly Orange Notebook.
- Directs CEB variance reporting and analysis, CIP project performance monitoring and reporting, and preparation of expense and revenue projections. Participates in the development of monitoring systems.
- Prepares reports on CEB and CIP performance and variances for MWRA management and the Board of Directors.
- Manages computerized, multi-module budget entry and reporting database systems (Hyperion and CAPSTAN).

- Manages relationships with external constituencies as they review MWRA's CEB and CIP.
- Manages relationships with division directors and staff in the development and monitoring of the CEB and CIP.
- Directs and supervises financial analyses on various aspects of MWRA operations.
- Participates in preparing for collective bargaining and hears Step One grievances.
- Other duties and tasks as required.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four (4) year college degree in planning, accounting, business administration, or a related field. Graduate degree in related field preferred; and
- (B) Seven (7) to nine (9) years of experience in budgeting, program analysis, and management analysis, preferably in the public sector, of which at least three (3) years is in a supervisory capacity; or
- (C) Any equivalent combination of education and experience.

Necessary Knowledge, Skills, and Abilities:

- (A) Extensive knowledge of and experience with PC spreadsheet programs, word processing programs, model function and design, graphics applications, database development and queries, use of the Internet as a resource/research tool, and interface with other computer applications.
- (B) Knowledge of budgetary and accounting principles.
- (C) Demonstrated skills in planning, analysis, budgeting and problem solving.
- (D) Excellent oral and written communications skills are required.

SPECIAL REQUIREMENTS:

None.

TOOLS AND EQUIPMENT USED:

Office machines as normally associated with the use of telephone, personal computer including word processing and other software, copy machine, and fax machine.

PHYSICAL DEMANDS:

The physical demands described 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 sit and talk or hear. The employee is frequently required to use hands to finger, handle, or operate objects, including office equipment and controls, and reach with hands and arms. The employee is occasionally required to stand and walk.

There are no requirements that weight be lifted or force be exerted in performing the duties of this job. Specific vision abilities required by this job include close vision and the ability to adjust focus.

WORK ENVIRONMENT:

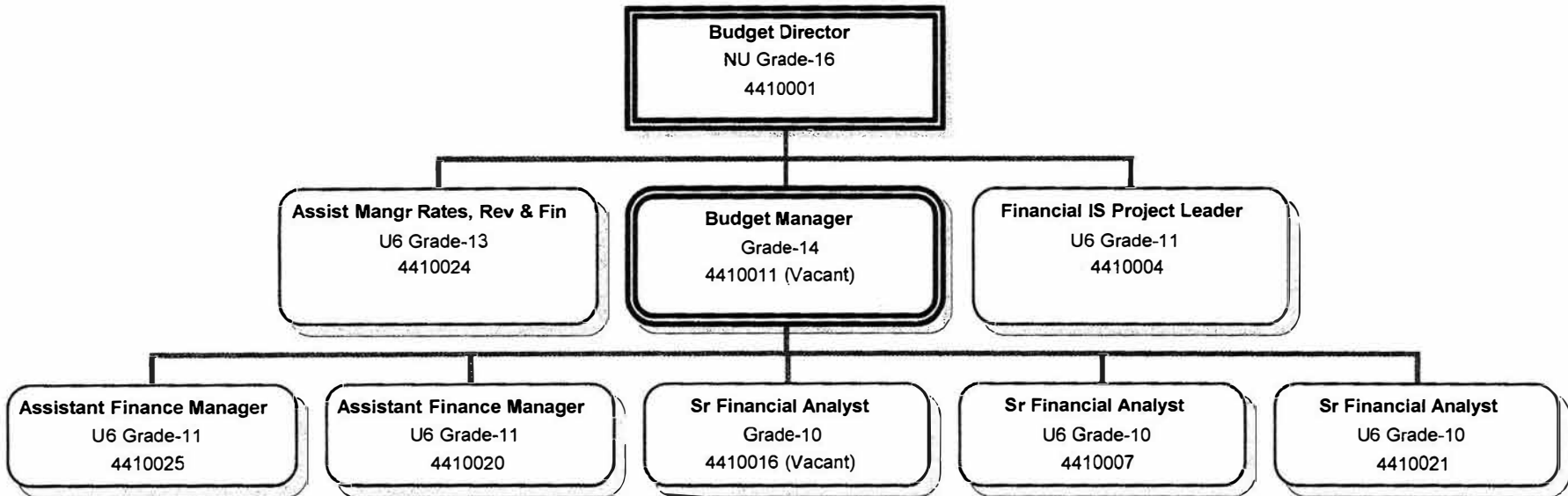
The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. While performing the duties of this job the employee regularly works in an office environment.

The noise level in the work environment is moderately quiet.

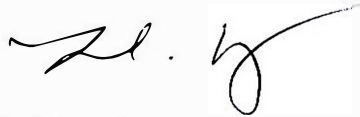
June 2004

Rates & Budget Department

November 2018




STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Appointment of Manager, Finance and Administration
Operations Division

COMMITTEE: Personnel & Compensation

INFORMATION
 VOTE

Andrea Murphy, Director, Human Resources
Dede Vittori, Manager of Finance, Operations Division
David F. Duest, Director, DIWWTP
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To approve the appointment of Mr. Christopher Lam to the position of Manager, Finance and Administration (Unit 6, Grade 12), at an annual salary of \$113,864.09 commencing on a date to be determined by the Executive Director.

DISCUSSION:

In anticipation of an impending retirement, the position of Manager, Administration and Finance was created and authorized by the Board of Directors in July 2018 to allow for overlap and training.

The Manager, Finance and Administration reports to the Manager, Finance in the Operations Division, and manages the financial and administrative needs of the Deer Island Treatment Plant. This position is responsible for budget development and tracking, cost accounting systems, payroll, and administrative coordination functions for the Deer Island Treatment Plant, Residuals Operations and the Clinton Advanced Wastewater Treatment Plant. The position will oversee assigned budget/accounting staff, and will coordinate with approximately 25 managers, recommending allocation of resources to meet department objectives.

Selection Process:

MWRA posted the position of Manager, Finance and Administration internally and externally. Eighteen candidates applied for the position and eight candidates were referred to division: two internal candidates and six external candidates. Two external candidates cancelled their interviews resulting in six candidates being interviewed for the position by the Deer Island Treatment Plant Director, Manager of Finance, and Manager of Operations Support. The hiring committee determined that Mr. Lam is the best candidate for the position based on his qualifications and

experience.

Mr. Lam has more than 26 years of financial experience at MWRA as an Auditor, Accountant, Analyst, Senior Analyst, and more recently as an Assistant Finance Manager. He has been promoted several times to positions of increasing responsibility and has performed well as he progressed. He has a wide breadth of experience with the MWRA's finance function at various organizational levels and with different processes (audit, CEB, CIP, and capital project accounting). During his MWRA career, Mr. Lam has demonstrated his competency in his financial staff roles and has earned respect for his diligence and knowledge of MWRA's operations and financial functions.

While at MWRA, Mr. Lam has served as lead on the budget and accounting processes at the project, department, and agency levels. These roles required him to provide direction to other staff in numerous departments, coordinate tasks, and review work products. He also has 13 years of experience outside of MWRA as a shift supervisor in a retail environment where he directly supervised teams of more than 10 employees. Mr. Lam has a BS in Business/Accounting from the University of Massachusetts in Boston.

BUDGET/FISCAL IMPACT:

There are sufficient funds for this position in the FY19 Current Expense Budget.

ATTACHMENTS:

Resume of Christopher Lam
Position Description
Organization Chart

CHRISTOPHER LAM

PROFESSIONAL EXPERIENCE:

Assistant Finance Manager

April 2016 – Present

Senior Financial Analyst

May 2015 – April 2016

Massachusetts Water Resources Authority

Boston, Massachusetts

- Assist with the coordination and development of a \$768 million expense budget, performance objectives, and measurement tools as part of the Current Expense Budget Process.
- Review budget submittals and make recommendations for appropriate funding levels for the various divisions.
- Analyze budget and program performance data and prepare monthly financial staff summary on budgetary performance and variances.
- Review and track Division of Watershed Management Trust budget, which the Massachusetts Water Resources Authority funds.
- Perform ad-hoc analysis on various components of the budget.

Senior Analyst, CSO

January 2011 – May 2015

Massachusetts Water Resources Authority

Boston, Massachusetts

- Ongoing and historical review and reconciliation of over \$400 million of MWRA funds transferred to three combined sewer overflow (CSO) member communities to fund eligible sewer separation work.
- Review and processing of semi-annual community requests for financial assistance transfers, including preparation of staff summaries and coordination of payments.
- Preparation and processing of community Memorandum of Understanding/Financial Assistance Agreement amendments.
- Support of Internal Audit reviews, coordination with Internal Audit staff, and response to audit recommendations.
- Preparation of Capital Improvement Budget, variance explanations, and related analysis of funds for the three CSO communities.
- Preparations of quarterly CSO court reports and quarterly management tracking reports.
- Preparations and coordination of Annual CSO Report.

Senior Financial Analyst

May 1998 – December 2010

Massachusetts Water Resources Authority

Boston, Massachusetts

- Assisted with the development of a \$67 million expense budget, performance objectives, and measurement tools for assigned program as part of the Current Expense Budget Process.
- Developed recommendations for appropriate funding levels and performance objectives for assigned programs.
- Analyzed budget and program performance data and prepare reports on budgetary performance and variance, progress toward achieving objectives, and other special financial and performance areas.
- Reviewed, processed and tracked invoices against the two electricity supply contracts.
- Prepared monthly accruals.

Senior Capital Improvement Program Analyst

January 1998 – May 1998

Capital Improvement Program/Life Cycle Analysis Analyst

May 1994 – January 1998

Massachusetts Water Resources Authority

Boston, Massachusetts

- Assisted in the development of the Waterworks Division's Capital Improvement Program Budget and Planning Department's Current Expense Budget.
- Tracked the schedules, budget, and expenditures for over 50 Waterworks capital projects.
- Prepared various budgetary and status reports for the division.

- Performed liaison functions to the Budget Department and the divisional staff.

Retirement Accountant

February 1994 - May 1994

Massachusetts Water Resources Authority

Boston, Massachusetts

- Performed general accounting duties per the Public Employee Retirement Administration Accounting Manual.
- Reconciled various bank statements, accounts, and reports.
- Posted transactions to the General Journal, General Ledger, and Cash Disbursements and Receipts.
- Assisted in the preparation of the annual report.

Staff Auditor

June 1993 - May 1994

Massachusetts Water Resources Authority

Boston, Massachusetts

- Prepared formal written reports of audit results, recommendations, and responses.
- Reviewed consultant's payments to assure compliance with contractual terms and conditions.
- Conducted audit work in accordance with audit program.
- Field Supervisor of three interns for a special quality control program.
- Prepared and maintained summary spreadsheets of field data collected for the quality control program.

Internal Audit Intern

March 1992 - June 1993

Massachusetts Water Resources Authority

Boston, Massachusetts

- Performed desk reviews of documentation related to the audit of contract payments.
- Reviewed CPA consultant billings to assure compliance with contractual terms and conditions, and initiated appropriate adjustments.
- Maintained and prepared weekly, monthly, and quarterly financial, budget, and performance reports.
- Participated in the design of a time tracking spreadsheet to ensure unit's objectives were achieved.

Shift Supervisor

November 1986 – June 2009

CVS Pharmacy

Melrose, Massachusetts

- Managed the store and staff when the manager and assistant manager were off duty.
- Counted down registers and prepare deposits for transfer to the bank.
- Provided customer services for merchandise exchange and returns.
- Supervised and assisted with delivers and the stocking of merchandise.

EDUCATION:

UNIVERSITY OF MASSACHUSETTS AT BOSTON

College of Management

Bachelor of Science Degree in Management, September 1993

Concentration: Accounting

COMPUTER KNOWLEDGE: MS Excel, MS Word, Hyperion Pillar, Lawson Financial System

VOLUNTEER WORK: Board Member for Boston Chinatown Neighborhood Center (2007-2015)

**MWRA
POSITION DESCRIPTION**

POSITION: Manager, Finance & Administration

DIVISION: Operations

BASIC PURPOSE:

Manages all CEB and CIP budgeting, payroll, and accounting functions for assigned department(s) within the Operations Division.

SUPERVISION RECEIVED:

Works under the general supervision of the Manager, Finance, with a matrix reporting relationship to the Director, DIWWTP.

SUPERVISION EXERCISED:

Exercises close supervision of budget and administrative staff.

ESSENTIAL DUTIES AND RESPONSIBILITIES:

- Manages budget development process. Develops budget process, supervises budget staff, coordinates with approximately 25 managers, and recommends allocation of resources to meet department objectives. Acts as liaison with division budget staff, Budget Department staff, Treasury Department staff, and Advisory Board staff.
- Manages and carries out assigned department's CIP budget process, and helps to facilitate communication on project planning between department staff, Engineering & Construction staff, and/or Capital Engineering staff.
- Manages the process of developing Rates Planning Estimates by determining the CEB Impact of capital projects.
- Manages payroll process for the department including timesheet and check distribution, collection, and review. Makes sure that timesheet policies and procedures are properly followed.
- Manages staff performing accounting and administrative coordination functions such as accruals, Accounts Payable, travel requests, general ledger monitoring, etc.
- Manages the department's financial control mechanisms to ensure spending is within budget and that cost controls measures are implemented when possible. Manages CEB & CIP

variance reporting.

- Manages tracking of OT, sick time, personnel, utilities, communication, vehicle, chemical and fuel use data.
- Works with Work Coordination staff to ensure that purchases are coded correctly in accordance with the department's budget and sub cost center structure.
- Reviews all major purchases to make sure they fit within the department budget constraints.
- Manages and prepares financial analyses.
- Develops improved financial systems and databases for cost tracking and analysis.
- Manages or contributes to special projects such as LCCAs, staffing analyses, facility moves, etc.
- Performs management functions such as performance evaluations, interviews, staff development, workload planning.
- Manages data tracking and recordkeeping systems for administration & finance functions within the department.

SECONDARY DUTIES:

- Performs related duties as required.

MINIMUM QUALIFICATIONS:

Education and Experience:

- (A) A four- (4) year college program in public/business administration or a related field. Advanced degree preferred; and
- (B) Six (6) to eight (8) years of experience in planning, financial analysis and accounting preferably in the public sector; or
- (C) Any equivalent combination of education or experience.

Necessary Knowledge, Skills and Abilities:

- (A) Knowledge of budgetary planning, financial analysis and accounting.
- (B) Demonstrated effectiveness at facilitating major processes that involve coordinating with

people across all levels of an organization.

- (C) Ability to supervise staff.
- (D) Excellent analytical, facilitation, oral and written communication skills.
- (E) Good understanding of computer systems. Adeptness with Excel and Word, and knowledge of Access. Knowledge of MWRA's budget system preferred.

SPECIAL REQUIREMENTS:

None

TOOLS AND EQUIPMENT USED:

Office machines as normally associated, with the use of telephone, personal computer including word processing and other software, copy and fax machine.

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 sit, talk or hear. The employee is regularly required to use hands to finger, handle, feel or operate objects, including office equipment, or controls and reach with hands and arms. The employee frequently is required to stand and walk.

There are no requirements that weight be lifted or force be exerted in the performance of this job. Specific vision abilities required by this job include close vision, and the ability to adjust focus.

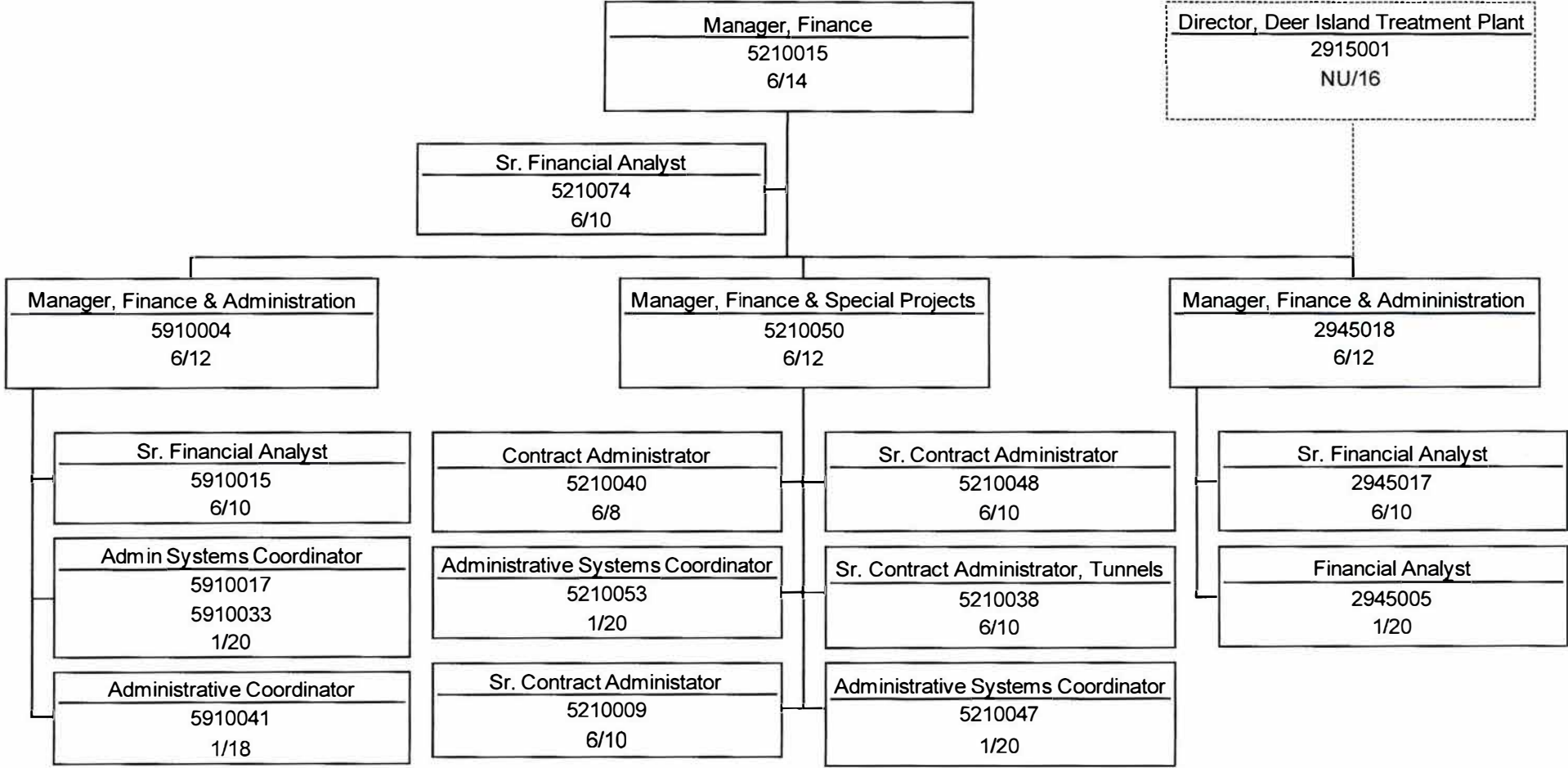
WORK ENVIRONMENT:

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 noise level in the work environment is usually a moderately quiet office setting.

July 2018

Operations Division - Finance & Administration Staff
November 2018





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

ADMINISTRATION, FINANCE & AUDIT COMMITTEE MEETING

to be held on

Wednesday, November 14, 2018

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

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

Time: Immediately following Personnel Committee

AGENDA

A. Information

1. Internal Audit Department Activities Report – FY2018
2. FY2019 First Quarter Orange Notebook
3. Delegated Authority Report – October 2018
4. FY2019 Financial Update and Summary as of October 2018

B. Approvals

1. Approval of Seventy-Ninth Supplemental Bond Resolution
2. Memoranda of Understanding Between MWRA and Eversource, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies), and National Grid

C. Contract Awards

1. Purchase of New Desktop Computers, Imaging and Deployment Services: Hub Technical Services LLC, Bid WRA-4586Q, State Contract #ITC47

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the

Administration, Finance and Audit Committee

October 17, 2018

A meeting of the Administration, Finance and Audit Committee was held on October 17, 2018 at the Authority headquarters in Charlestown. Committee Chair Vitale presided. Present from the Board were Messrs. Carroll, Foti, Pappastergion, Peña and Walsh. Messrs. Cotter and Flanagan and Ms. Wolowicz were absent. Among those present from the Authority staff were Frederick Laskey, Carolyn Francisco Murphy, David Coppes, Carolyn Fiore, Thomas Durkin, Michele Gillen, Stephen Cullen, Denise Breitenicher, Douglas Rice, Kathy Soni, and Kristin MacDougall. The meeting was called to order at 10:20 a.m.

Information

Delegated Authority Report – September 2018

Staff provided an update on delegated authority actions taken in September 2018. There was general discussion and questions and answers.

FY2016-FY2020 Strategic Business Plan: Annual Update for FY2018

Staff made a presentation reviewing MWRA's FY2018 accomplishments in meeting business plan priorities and goals. Messrs. Vitale and Foti gave a positive feedback on the report. Mr. Foti suggested that the document could highlight achievements more prominently.

FY19 Financial Update and Summary as of September 2018

Staff provided an update on FY2019 financial results and variance highlights through September 2018. There was general discussion and questions and answers.

The meeting adjourned at 10:48 a.m.

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Internal Audit Department Activities Report – 2018



COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE

Brian A. Rozowsky, Director, Internal Audit
Preparer/Title

RECOMMENDATION:

For information only. Internal Audit presents annually to the Board the results of completed assignments and the status of active and planned assignments. Every quarter, Internal Audit utilizes the Orange Notebook to briefly discuss recently issued reports and to report on the status of open audit recommendations and cost savings. This Staff Summary includes a discussion of activities since Internal Audit's last report to the Board in September 2017.

DISCUSSION:

In FY2018, a total dollar savings of \$1.65 million was recognized from 55 assignments, including internal audits, management advisory services, consultant incurred cost audits, consultant preliminary reviews, construction labor burden reviews, the true-up and review of HEEC billings and contract negotiation support.

Internal Audit's goal is to provide sufficient audit coverage to give reasonable assurance that internal management controls are functioning as intended and that only reasonable, allowable and allocable costs are paid to consultants, contractors and vendors. Audit coverage is provided through performance audits that analyze and evaluate MWRA programs and activities to determine if they are being carried out effectively and efficiently, compliance audits that focus on adherence to MWRA policies and procedures, contractual requirements, rules or regulations and management advisory services.

The development of the Annual Audit Plan is based on Internal Audit's risk assessment of program and management controls, as well as input from MWRA senior managers and the Advisory Board. The actual scheduling and completion of audit assignments depends on staff availability, which can be impacted by control issues needing immediate attention or by unscheduled special requests for management advisory services.

Attachment 1 lists assignments completed since Internal Audit's last report to the Board, assignments currently in process and additional assignments planned to commence in FY2019.

Internal Audits and Management Advisory Services

Uniform Debit Card Program

MWRA established a Uniform Debit Card Program in 2013 to provide eligible employees a convenient way to purchase safety boots and work pants that was previously provided through a voucher program. In FY2017, 902 employees were issued debit cards for a total of \$237,575.

The objective of the audit was to determine compliance with existing policies and procedures and good business practices. The period reviewed was from September 30, 2016 to August 9, 2017.

Recommendations included the development of a more comprehensive policy, correcting coding, reviewing the accuracy of the upload list each year, determining the need to reload cards with no activity and improving the segregation of duties. Three of the six recommendations have been closed. Staff are working to implement the remaining three.

Overtime Practices and Timesheet Review

Management is responsible for ensuring that overtime in each work group is allocated fairly and supported by appropriate documentation such that procedures and rules are being followed.

Internal Audit conducted a review of overtime practices of various departments. The objective was to determine if department procedures and rules were being adhered to and if overtime charges recorded on timesheets were properly documented and approved. Internal Audit also reviewed controls over the timesheet approval system.

Recommendations included developing written policies and procedures for overtime, requiring documentation and advance approvals in writing for overtime work, maintaining an overtime tracking schedule and other timesheet related changes. Fourteen of the sixteen recommendations had been closed at the completion of the review. The remaining two are in the process of being implemented.

Unemployment Compensation

The Commonwealth of Massachusetts administers the unemployment insurance program. MWRA is billed by the Department of Unemployment Assistance on a monthly basis for amounts paid to former workers.

Internal Audit routinely reviews the monthly claims, on behalf of Human Resources, and checks them for accuracy. During FY2017, MWRA paid a total of \$48,396.60 in unemployment claims. The overall unemployment effective rate based on payroll is very low.

Two claimants were found to have been overpaid \$15,513 for which no credits have yet been received. The Law Division is working with Human Resources on these matters.

Police Details

MWRA pays for police details on various capital projects and for maintenance activities managed by various MWRA departments.

Internal Audit reviewed the procedures and controls over police detail payments to ensure payments are only made for valid expenses and that procedures are in place to ensure the police detail was supported by their attendance at the appropriate location.

Based on the review, procedures and controls were found to be adequate to ensure that MWRA only pays for valid police details.

BWSC CSO Financial Assistance Agreement

The Boston Water and Sewer Commission (BWSC) entered into a Memorandum of Understanding (MOU) and Financial Assistance Agreement (FAA) with the MWRA to fund Combined Sewer Overflow (CSO) projects required by the Federal Court Order in the Boston Harbor Case. The MOU/FAA terminated on June 30, 2017.

Internal Audit conducts periodic reviews to validate that the payments to BWSC have been deposited into the account from which withdrawals may be made for eligible design and construction costs and staff time (force account charges).

In FY2018, a true-up and final review of BWSC CY2017 payments was computed and, subsequent to the audit, BWSC withdrew the eligible CY2017 force account costs. After the final true-up, \$573,069.61 was refunded to the MWRA.

City of Cambridge CSO Financial Assistance Agreement

The City of Cambridge also entered into a Memorandum of Understanding and Financial Assistance Agreement with the MWRA to fund CSO projects required by the Federal Court Order in the Boston Harbor Case. The MOU/FAA terminated on June 30, 2017.

Internal Audit conducts periodic reviews to validate that the payments to Cambridge have been deposited into an account from which withdrawals may be made for eligible design and construction costs and staff time (force account charges).

In FY2018, a review of Cambridge's CY2012 to 2015 force account charges claimed was performed resulting in savings of \$284,287 due to reductions in actual hours worked, different pay rates and fringe benefits and a proportion of force account costs not being eligible for reimbursement.

Chelsea Lease Agreement

MWRA has a 30-year lease agreement for the facility in Chelsea that expires on May 31, 2032. The payment amount is based on a predetermined rental plus actual real estate taxes and insurances.

Internal Audit reviewed the lease rental payments for FY2017 which were correctly paid. Amounts for real estate taxes and insurances are deposited into separate escrow accounts to pay the expenses as they come due. The audit finding revealed that the balance in the insurance escrow account was considered excessive and \$28,200 is being reduced against future payments in twelve equal monthly instalments.

Charlestown Navy Yard Lease Agreement

MWRA has a 10-year lease agreement for the office space in the Navy Yard that expires on May 31, 2023. The payment is based on a predetermined rental plus the increase over a base for both real estate taxes and operating expenses. In addition, MWRA reimburses the landlord for certain leasehold improvements.

Internal Audit reviewed the payments for CY2016 and real estate taxes for FY2017 to determine compliance with the terms of the agreement. Savings of \$9,199 was realized from a reduction in operating expenses.

Other Management Advisory Services

Annually, Internal Audit provides management advisory services that include calculating MWRA's fringe and indirect cost rates, verifying unemployment benefit calculations, and providing support and review services to the Fore River Railroad Corporation (FRRC). Internal Audit also assists AACU in compiling costs reported for MBE/WBE and co-ordinates the MWRA's Policies and Procedures and Signature Authority forms.

In FY2018, numerous other management advisory services were also performed by Internal Audit that included an analysis of the proposed WR rate used to bill electricity on Deer Island and a review of MWRA's controls over employee expense reimbursements. Internal Audit also performed numerous vendor financial capability reviews and analyses in support of Procurement. Internal Audit reviewed the procedures and controls over the issuance of task orders under allowance tasks on professional service contracts, made recommendations which were immediately instituted.

In FY2018, the annual savings resulting from internal audits and management advisory services (other than those mentioned above) totaled \$644,363.

Contract Audits and Related Reviews

In FY2018, savings of \$588,196 was recognized from the following contract audit and related assignments:

Consultant Incurred Cost Audits

An incurred cost audit determines that billed labor costs are supported by the consultant's time reports and project cost records, other direct costs are supported by valid payments, final indirect costs have been calculated in accordance with the contract, and that final indirect cost rates have been properly applied to labor billings. The extent of fieldwork required to complete an assignment is based on a risk assessment that starts with an invoice analysis and a review of a consultant's annual cost disclosure submittal. The fieldwork is usually conducted at the consultant's office, but may be reduced to a desk review to verify that costs billed were supported.

In FY2018, seven incurred cost audits were completed for total contract costs of \$7.2 million. These include Hazen & Sawyer, CDM Smith, Keville, Bryant Associates and Dewberry. A total of \$34,784 was recovered.

Consultant Preliminary Reviews

When a new contract is awarded for more than \$1 million, Internal Audit performs a consultant preliminary review to determine that proposed direct labor, indirect costs, other direct costs or multipliers/comprehensive hourly rates are supported, and notifies Procurement and the Project Manager of any issues, including any unsupported proposed costs that might be available for re-allocation to another cost element.

In FY2018, six consultant preliminary reviews were completed with a total value of \$25.9 million. A total of \$83,998 in unsupported proposed costs was identified for potential reallocation.

Consultant Disclosure Statements/ Annual Indirect Cost Rate Reviews

Internal Audit reviews and accepts provisional indirect cost rates proposed by consultants for billing both new and active contracts. Professional service consultants are required to annually submit a Cost Disclosure Statement (CDS) and an indirect cost rate for the firm's recently completed fiscal year. Internal Audit reviews and approves provisional indirect cost rates which are reported to Project Managers and Procurement as a reference source for reviewing invoices and pricing contracts and amendments. During FY2018, thirty annual rate letters following Internal Audit's review and approval were sent to consultants.

Construction Labor Burden Rate Reviews

A construction labor burden review establishes provisional labor burden rates to be used in the pricing of future change orders. Typical adjustments to contractor proposed rates include the application of effective versus statutory Federal and State unemployment tax rates, applying appropriate experience modifications and other adjustments to workers compensation rates, and determination of the basis for general liability and umbrella insurances and bond premium.

In FY2018, eight labor burden rate reviews were completed with an estimated \$455,287 in cost savings.

Harbor Electric Energy Company 2017 True-Up and Billings

The purpose of this assignment was to verify the capacity charge calculation and operations and maintenance charges billed by the Harbor Electric Energy Company (HEEC) under the terms of the Department of Public Utility tariff for CY2017. The DPU tariff is based on a capacity charge calculation using a complex formula to determine the annual payment for the use of the cross-harbor cable. Included in the tariff are O&M charges that include labor costs, materials needed to maintain the cable and insurances for the cable.

In FY2018, savings of \$91,395 were recognized from billing adjustments and disallowed costs included in O&M charges. In addition, Internal Audit provided financial analysis support to staff in the preliminary tariff filings by HEEC relating to the new cross-harbor electrical cable.

Pelletizing Plant - NEFCo

Internal Audit conducted reviews of the NEFCo contract from 2014 through 2017 with the objective being to determine that the correct pricing was used to compute monthly charges for

pelletizing, pricing of quantities in excess of the contracted amount and fee for capital work. All invoices were correctly priced and paid according to the contract terms.

In addition, a compilation of the financial results of NEFCo's operation of the MWRA pellet plant was prepared for MWRA management. All the required contract deliverables were submitted by NEFCo or were available at the facility. The pricing for the base quantity (90 dry tons per day in 2015, then 92.5 dry tons starting in 2016) and the excess quantities were correctly applied and computed, as well as for the capital expenditure bid amount in 2015. The insurance certificates were all up to date with documentation in the files maintained by Risk Management. In addition, the average MWRA cost per dry ton for the four years 2012 to 2015 was \$397 compared to \$352 for 2016 and 2017, resulting in 11.3% in savings.

Construction - Change Orders and Prevailing Wages

Change Orders

Internal Audit was asked to review the labor burden rates claimed on change orders for five contractors, that resulted in savings of \$13,372.

Prevailing Wage Audit

MWRA contracts require contractors to pay their employees a prevailing wage rate that is stipulated in the contract depending on the location and nature of the work. Certified payroll reports document the contractors' representation of the prevailing wage rates actually paid. Included in the prevailing wage rate is the actual wages plus health and welfare and pension contributions paid by the contractor.

Internal Audit selected a sample of seven active construction contracts to ensure compliance with the prevailing wage rates.

A few employees were found to have been paid slightly less than the prevailing wage rates and the contractors were notified to correct the shortfall.

Other Audits

Other assignments include a review of purchases made from Interline Brands to determine the reasonableness of pricing for janitorial and cleaning supplies. A recommendation was made to develop blanket purchasing contracts to ensure MWRA receives the best pricing available, increase buyer efficiency and would require competitive bids.

A review of the Allied Universal Security (Allied) contract was performed to determine that they were paid in accordance with the bid pricing and that their employees were paid the minimum wage rates required by the contract. The results of the review identified a number of employees who were paid less than the minimum rates. Allied was advised to correct the shortfall and pay the employees the required differences.

ATTACHMENT:

Status of Internal Audit Assignments FY2018 and FY2019

Status of Internal Audit Assignments FY2018 and FY2019

COMPLETEDDate IN PROCESS & PLANNED TO START IN FY2019**Internal Audit/Management Advisory Services**

| | | | |
|---------|--|--------|-------------------------------------|
| 16-1-06 | Cambridge FAA Force Account | Jul-17 | Inventory Management Procedures |
| 18-1-02 | BWSC FAA 2017 (Final) | Aug-17 | Vendor Master File Review |
| 18-1-04 | Unemployment Compensation | Nov-17 | Purchase Card Usage |
| 16-4-04 | Uniform Debit Card Program | Mar-18 | Treasury Controls |
| 18-1-05 | DITP Electricity WR Rate | Apr-18 | Cambridge FAA Force Account |
| 17-1-04 | Metering & Maintenance | May-18 | Vehicle Fuel Use & Mileage Tracking |
| 18-1-06 | Police Details | May-18 | Unemployment Compensation |
| 18-4-02 | Prevailing Wage | May-18 | Bay State Fertilizer |
| 18-4-03 | Time Sheet Approval Process | Jun-18 | MIS Access and Logical Controls |
| 18-1-03 | Vehicle Manufacturers Maintenance Schedule | Jun-18 | Records Management |

Reviews of Agreements and Contracts

| | | | |
|---------|---------------------------|--------|--------------------|
| 18-9-01 | CNY Lease 2016 | Sep-17 | Chelsea Lease 2017 |
| 17-9-06 | Allied Universal Security | Oct-17 | CNY Lease 2017 |
| 18-9-02 | Chelsea Lease 2016 | Nov-17 | HEEC 2018 True-up |
| 18-9-03 | Interline Brands | Mar-18 | |
| 18-9-05 | HEEC 2017 True-up | May-18 | |
| 17-9-07 | NEFCo | Jun-18 | |

Consultant Incurred Cost Audits

| | | | |
|---------|----------------------|--------|---|
| 17-7-13 | Hazen & Sawyer | Sep-17 | AECOM |
| 17-7-14 | CDM Smith | Oct-17 | Kleinfelder |
| 16-7-14 | Keville | Nov-17 | Stantec |
| 17-7-16 | Bryant | Nov-17 | Arcadis |
| 18-7-03 | Overland Engineering | Nov-17 | Aztec Technologies |
| 17-7-17 | GZA GeoEnvironmental | Jan-18 | Brown & Caldwell |
| 18-7-06 | Dewberry | May-18 | Green International Affiliates SAR Engineering |

Consultant Preliminary Reviews (Over \$1 mill)

| | | | |
|---------|---|--------|--|
| 17-7-21 | Nut Island Odor & HVAC (7517) Hazen & Sawyer | Jul-17 | Low Service Pressure Valves (7575) \$2.8M |
| 17-7-19 | Peabody Pipeline (6895) CDM Smith | Aug-17 | JJCWTP Task Order (7543 & 7544) \$1M each |
| 17-7-20 | Water Sect. 57, Sewer Sect. 19,20,21 (7540) W&S | Aug-17 | Headworks/Shafts (7237) \$1.4M |
| 18-7-02 | Wastewater Meter System (6739) RJN | Oct-17 | As Needed REI (7629 & 7630) \$1.5M each |
| 18-7-05 | CSO Performance Assessment (7572) AECOM | Nov-17 | Braintree/Weymouth Improvements (7435) \$2.1M |
| 18-7-08 | Section 89 & 29 Rehab (7116) Stantec | Apr-18 | As Needed CA/REI (7498 & 7604) \$2.5M each |
| | | | Chestnut Hill Emergency Pump Station (7574) \$6.7M |
| | | | Section 53 & 99 Connections (7485) \$4.8M |
| | | | Replacement Sections 25,75,59,60 (6955) \$4.2M |
| | | | Deer Island HVAC (7094) \$2M |
| | | | Metro Program Support Services (7655) \$13.6M |
| | | | Siphon Structure (6224) \$1.6M |
| | | | Section 56 Saugus (7454) \$1.5M |
| | | | Section 22N Facility Plan/EIR (7155) \$1.3M |
| | | | DI South System VFD Replacement (7126) \$4.5M |
| | | | Steel Tanks Improvements (6832) \$2.1M |
| | | | Clarifier Rehabilitation Phase 2 (7397) \$3M |
| | | | Remote Headworks & DI Shafts (7237) \$1.4M |

Status of Internal Audit Assignments FY2018 and FY2019

COMPLETED**Date****IN PROCESS & PLANNED TO START IN FY2019**

Construction Labor Burden Rate Reviews (Over \$1 mill)

| | | | |
|---------|---|--------|---|
| 18-8-01 | SEH Redundancy & Storage 2 (7504) Gioioso | Jul-17 | Main Line Adjustment (FRR32) \$2.4M |
| 17-8-10 | Section 14 Malden (6957) Albanese | Aug-17 | Deer Island Gravity Thickeners Rehab (7428) \$19.6M |
| 18-8-02 | NIH Phase 2 (7067) Albanese D&S | Aug-17 | Painting Bellevue 2 & Turkey Hill (7634) \$4M |
| 18-8-03 | Prison Point Suction & Discharge (7459) A&W | Feb-18 | Deer Island Water Tank Painting (7601) \$4.1M |
| 18-8-04 | Delauri Pumping Station (7361) DOC | Mar-18 | Residuals Facilities Upgrade (7153) \$8.6M |
| 18-8-05 | Chelsea Creek Headworks (7161) JAJ | Mar-18 | Deer Island Gas Protection Replacement (7167) \$1M |
| 18-8-07 | SEH Redundancy & Storage 3 (7505) RJV | May-18 | Deer Island HVAC (7110) \$40.2M |
| 18-8-06 | Deer Island Gravity Thickeners Rehab (7428) Walsh | Jun-18 | Residuals Facilities Piping Relocation (7173) \$3M |
| | | | Thermal & Hydro (S578) \$8M |
| | | | DI Clarifier Rehabilitation, Phase 2 (7395) \$135M |
| | | | Nut Island Odor Control/HVAC (7548) \$39.9M |
| | | | Clinton Screw Valves & Pump (7372) \$2.5M |
| | | | Sec. 56 Pipe Demolition (7536) \$1.9M |
| | | | Comm Ave Pump Station (7524) \$7M |
| | | | Deer Island MCC & Switch Gear (7420) \$10.6M |
| | | | Dorchester Interceptor Sewer (7279) \$5.6M |
| | | | Sec. 23,24,47 New Connecting Mains CP3 (6392) \$14.3M |
| | | | DI Chemical Tank & Digester Pipe (7449) \$8M |
| | | | Fuel Oil Tank Replacement Ph 1 (7554) \$1.4M |

STAFF SUMMARY


TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: FY19 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


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only. The Quarterly 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.

Deer Island Maintenance

During the discussion of the Fourth Quarter Orange Notebook in September, Board members had questions about some of the Deer Island maintenance metrics. In responding to questions about whether all preventative maintenance work orders should be kitted, staff described how the percentage of work orders kitted has increased over time, and how the target had been raised over time. After the Board meeting, staff realized that while the answers were correct, and the text in the Orange Notebook was correct, the axis labels on the charts were incorrect. Once staff had achieved the goal of kitting 100 percent of preventative maintenance work orders in 2010, the targets were raised to be a percentage of all work orders. In FY11, the charts were altered to include all work orders, not just the preventative or predicative ones, but unfortunately, the axis labels were not changed, leading to confusion. Staff will provide a brief presentation on progress on maintenance metrics over time.

Precipitation and Reservoir Storage

The Quabbin Reservoir watershed experienced 20.67 inches of rain during the First Quarter, while Wachusett had 16.8 inches, both above average for this time of year. Quabbin Reservoir storage increased by about 4.7 billion gallons as the reservoir rose almost a full foot, ending the quarter several inches short of spilling. Quabbin did begin to spill on October 12, the first time since a brief period of spilling in April and May in 2015. The increase in Quabbin storage is more

noteworthy, when considering that to maintain water quality, 21 billion gallons of the higher quality Quabbin water was transferred to Wachusett Reservoir. To maintain Wachusett Reservoir in its normal narrow operating band, MWRA released 6.7 billion gallons to the Nashua River as well as transferred 1.5 billion gallons to Sudbury Reservoir during testing of the Wachusett Aqueduct Pump Station. (See Page 26)

Deer Island Wastewater Flows

Precipitation within the service area was above average, but significantly lower than in the watersheds, a different pattern than experienced over the past several years, and particularly during the drought. Wastewater flow at the Deer Island Wastewater Treatment Plant was just slightly above average compared to the past 10 years (275.3 million gallons per day (mgd) vs. 273.7 mgd) (see Page 1) Four rain storms resulted in flows requiring blending for a total of 16.8 hours of blending. Over the quarter, 99.6 percent of flow received full secondary treatment, and secondary permit limits were met at all times during the quarter. (See Page 2)

Investment Income

At the end of the first quarter, investment income was over budget by \$358,000 due to higher than budgeted short-term rates. Short-term rates were budgeted at 1.75 percent. Actual through September was 43 basis points higher at 2.18 percent. The Federal Reserve Bank raised rates by 25 basis points in June to a range of 1.75 to 2 percent and then again in September to a range of 2 to 2.25 percent. Long-term rates and average fund balances did not have significant budget variances in the first quarter of FY19. (See page 48 for charts which provide detail on the impacts of interest rates and fund balances.)

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

First Quarter FY2019

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



Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 14, 2018

Board of Directors Report on Key Indicators of MWRA Performance

1st Quarter FY19

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This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for internal management use and is subject to correction and clarification.

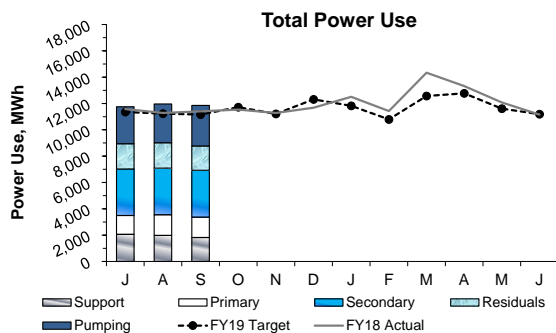
Frederick A. Laskey, Executive Director
David Coppes, Chief Operating Officer
November 14, 2018

OPERATIONS AND MAINTENANCE

Deer Island Operations

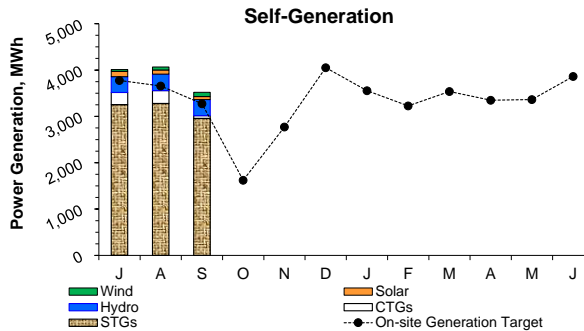
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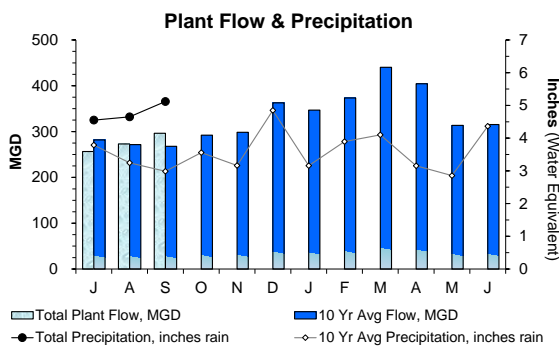


Total power usage in the 1st Quarter was 5.4% above target as Total Plant Flow was 15.8% above target with the 3 year average plant flow. Power used for wastewater pumping was 15.2% higher than target due to the higher plant flow, and usage in the secondary activated sludge treatment process, including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

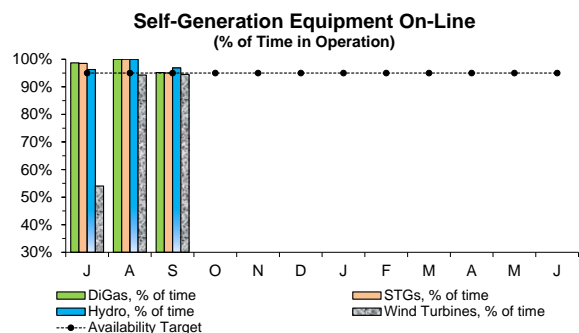
Note: Power usage projections are based on 3 year averages.



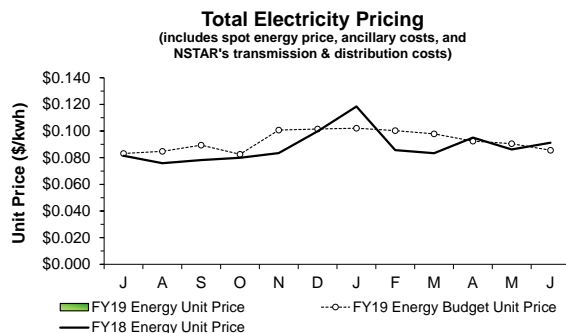
Power generated on-site during the 1st Quarter was 8.3% above target. Power generated by the STGs, Hydro Turbines, and CTGs all exceeded their target by 6.9%, 14.3%, and 59.6%, respectively. Generation by the Solar Panels was 5.0% below target. Wind Turbine generation was 25.0% below target due to failed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



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

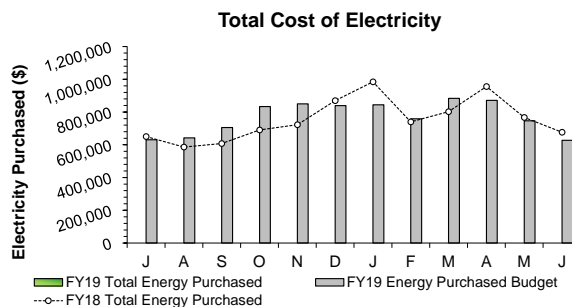


The DiGas system, STGs, and Hydro Turbines all exceeded the 95% availability target for the 1st Quarter. Wind Turbine availability fell 28.6% below target due to failed electrical components which left Wind Turbine #2 out of service from April 17 through July 25. Also, there were brief outages caused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



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

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



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

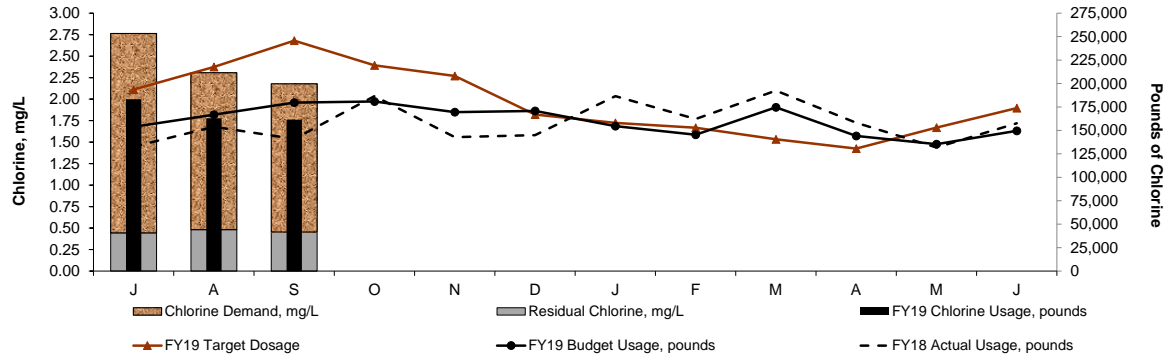
Note: Only the actual energy prices are reported. Therefore, the dataset lags by three (3) months due to the timing of invoice receipt and review.

Deer Island Operations

1st Quarter - FY19

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Deer Island Sodium Hypochlorite Use



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

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

Secondary Blending Events

| Month | Count of Blending Events | Count of Blending Events Due to Rain | Count of Blending Events Due to Non-Rain-Related Events | Secondary, as a Percent of Total Plant Flow | Total Hours Blended During Month |
|--------------|--------------------------|--------------------------------------|---|---|----------------------------------|
| J | 1 | 1 | 0 | 99.5% | 6.02 |
| A | 1 | 1 | 0 | 99.9% | 2.96 |
| S | 2 | 2 | 0 | 99.4% | 7.81 |
| O | 0 | 0 | 0 | | |
| N | 0 | 0 | 0 | | |
| D | 0 | 0 | 0 | | |
| J | 0 | 0 | 0 | | |
| F | 0 | 0 | 0 | | |
| M | 0 | 0 | 0 | | |
| A | 0 | 0 | 0 | | |
| M | 0 | 0 | 0 | | |
| J | 0 | 0 | 0 | | |
| Total | 4 | 4 | 0 | 99.6% | 16.79 |

99.6% of all flows were treated at full secondary during the 1st Quarter. There were four (4) secondary blending events this quarter, all due to high plant flow resulting from heavy rain. These blending events resulted in a total of 16.79 hours of blending and 105.14 MGal of primary-only treated effluent with secondary effluent. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

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

Deer Island Operations & Maintenance Report

Environmental/Pumping:

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

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

Primary Treatment:

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

Deer Island Operations

1st Quarter - FY19

Page 3 of 4

Deer Island Operations & Maintenance Report (continued)

Residuals:

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

Energy and Thermal Power Plant:

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

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

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

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

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

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

Regulatory:

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

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

Clinton AWWTP:

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

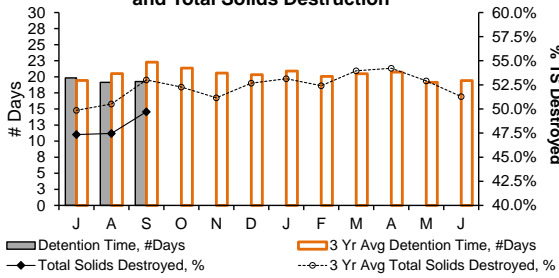
Phosphorus Reduction Facility - Work completed or in progress during the 1st Quarter-FY19:
Contractor has completed Optimization testing of the phosphorus removal disc filters.

Deer Island Operations and Residuals

1st Quarter - FY19

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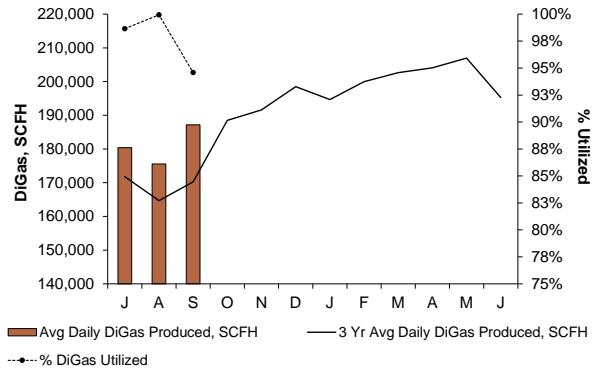
Sludge Detention Time in Digesters and Total Solids Destruction



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

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

Digester Gas Production and % Utilized

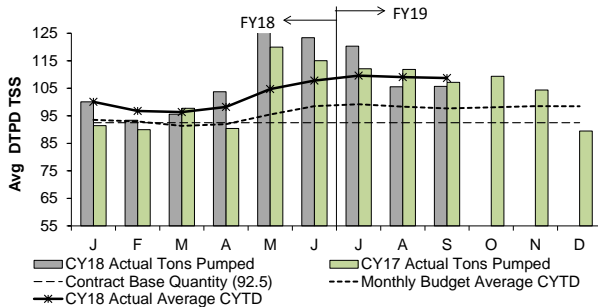


The Avg Daily DiGas Production in the 1st Quarter was 7.2% above target with the 3 Year Avg Daily DiGas Production. On average, 97.7% of all the DiGas produced in the quarter was utilized at the Thermal Power Plant. Only 94.6% of the DiGas produced in September was utilized due to a 31 hour Thermal Power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

Residuals Pellet Plant

New England Fertilizer Company (NEFCO) operates the MWRA Biosolids Processing Facility (BPF) in Quincy under contract. MWRA pays a fixed monthly amount for the calendar year to process up to 92.5 DTPD/TSS as an annual average. The monthly invoice is based on 92.5 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. On average, MWRA processes more than 92.5 DTPD/TSS each year (FY18's budget is 99.5 DTPD/TSS and FY19's budget is 98.9 DTPD/TSS).

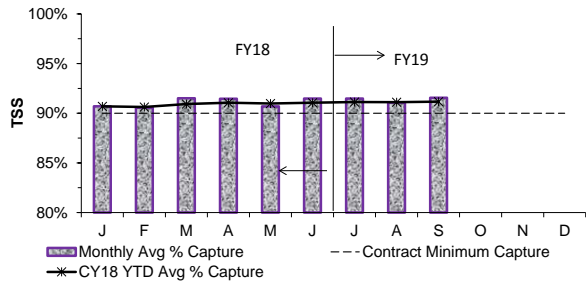
Sludge Pumped From Deer Island



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

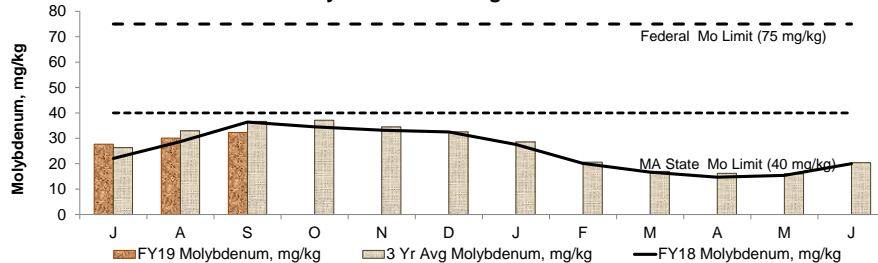
The CY18 average quantity of sludge pumped through September is 108.7 DTPD - 11.3% above target, compared with the CY18 average budget of 97.7 DTPD for the same time period.

Monthly Average % Capture of Processed Sludge



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

Molybdenum in Sludge Fertilizer Pellets



Copper, lead, and molybdenum (Mo) are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Molybdenum-based cooling tower water is a significant source of Mo in the sludge fertilizer pellets. The Federal standard for Mo is 75 mg/kg. In 2016, Massachusetts Type I biosolids standard for molybdenum was changed to 40 mg/kg from the previous standard of 25 mg/kg. This has allowed MWRA to sell its pellets in-state for land application whereas the previous limits forced several months' worth of pellets to be shipped out of state. This made it an impractical source of fertilizer for local Massachusetts farms since NEFCO does not distribute product that does not meet the suitability standards.

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

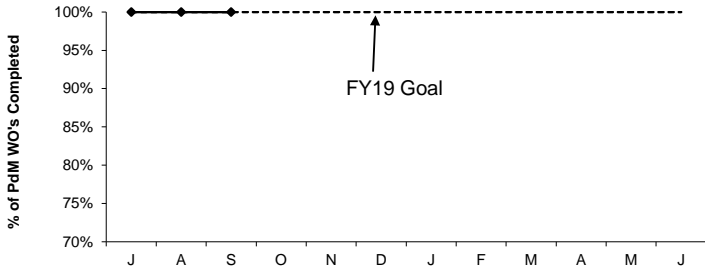
Deer Island Maintenance

1st Quarter FY19

Productivity Initiatives

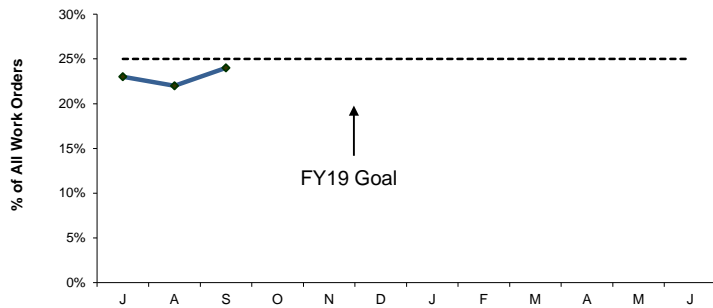
Productivity initiatives include increasing predictive maintenance compliance and increasing PdM work orders. Accomplishing these initiatives should result in a decrease in overall maintenance backlog.

Predictive Maintenance Compliance



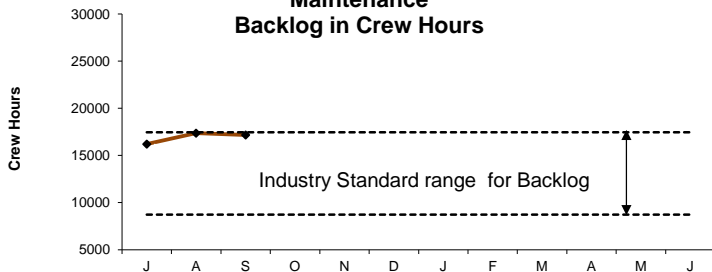
Deer Island's FY19 predictive maintenance goal is 100%. DITP completed 100% of all PdM work orders this quarter. DITP is continuing with an aggressive predictive maintenance program.

Predictive Maintenance



Deer Island's increased FY19 predictive maintenance goal is 25% of all work orders to be predictive. 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.

Maintenance Backlog in Crew Hours

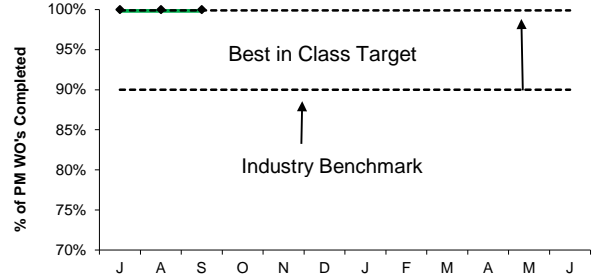


DITP's maintenance backlog at Deer Island is 17,184 hours this quarter. DITP is at the upper end of the industry average for backlog. The industry Standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours and 17,460 hours. Backlog is affected by three vacancies;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

Proactive Initiatives

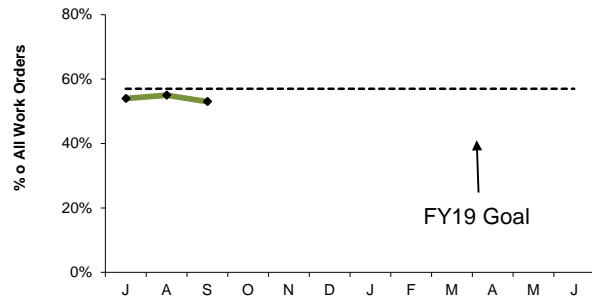
Proactive initiatives include completing 100% of all preventative maintenance tasks and increasing preventative maintenance kitting. These tasks should result in lower maintenance costs.

Preventive Maintenance Compliance



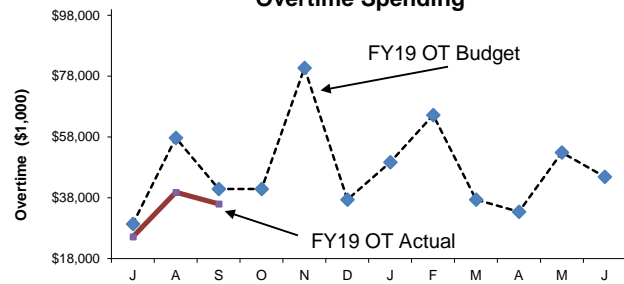
Deer Island's FY19 preventative maintenance goal is 100% completion of all work orders from Operations and Maintenance. DITP completed 100% of all PM work orders this quarter.

Maintenance Kitting



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

Overtime Spending



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

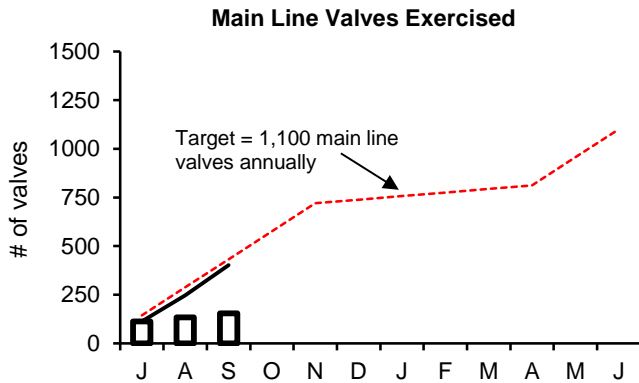
Water Distribution System Valves

1st Quarter - FY19

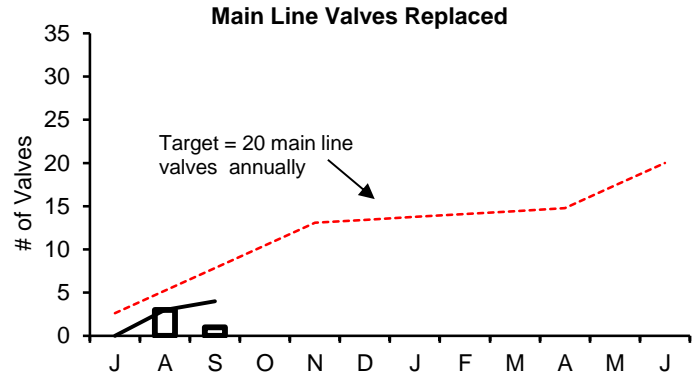
Background

Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but is often displaced during the construction season. This is due to the fact that a large number of construction contracts involving rehabilitation, replacement, or new installation of water lines, requires valve staff to operate valves and assist with disinfection, dechlorination, pressure-testing, and final acceptance. Valve exercising can also be impacted due to limited redundancy in the water system; valve exercising cannot be performed in areas where there is only one source of water to the community meters or flow disruptions will occur.

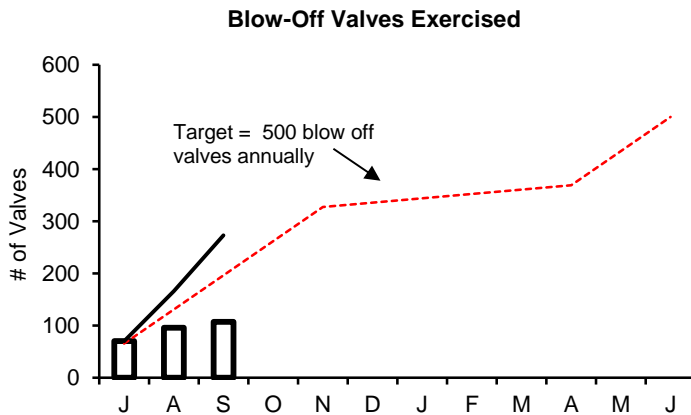
| Type of Valve | Inventory # | Operable Percentage | |
|--------------------|-------------|---------------------|--------------|
| | | FY19 to Date | FY19 Targets |
| Main Line Valves | 2,159 | 96.5% | 95% |
| Blow-Off Valves | 1,317 | 98.1% | 95% |
| Air Release Valves | 1,380 | 94.9% | 95% |
| Control Valves | 49 | 100.0% | 95% |



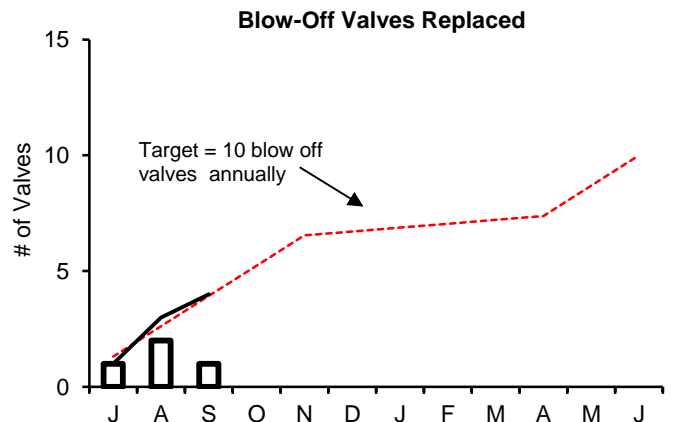
During the 1st Quarter of FY19, staff exercised 402 main line valves.



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



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



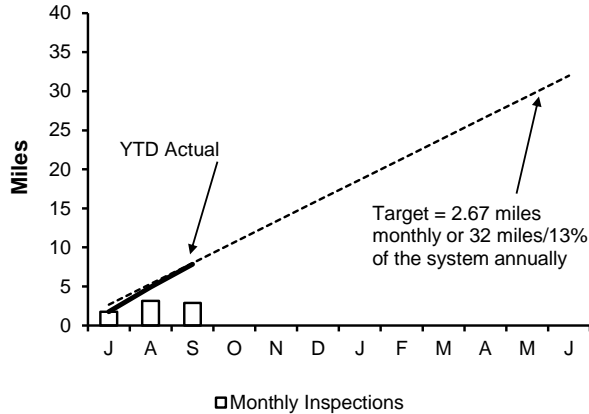
During the 1st Quarter of FY19, staff replaced four blow off valves.

Wastewater Pipeline and Structure Inspections and Maintenance

ONB 1st Quarter - FY 19

Inspections

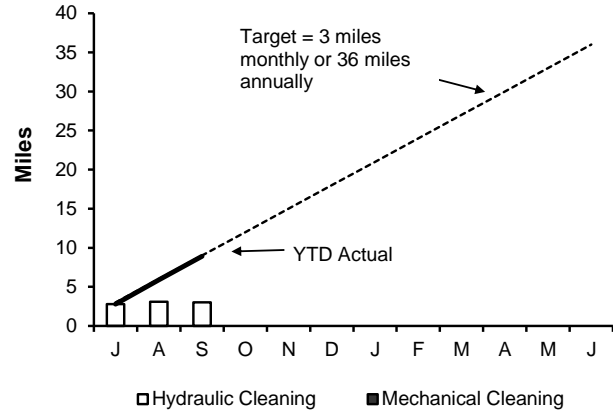
Pipeline Inspections



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

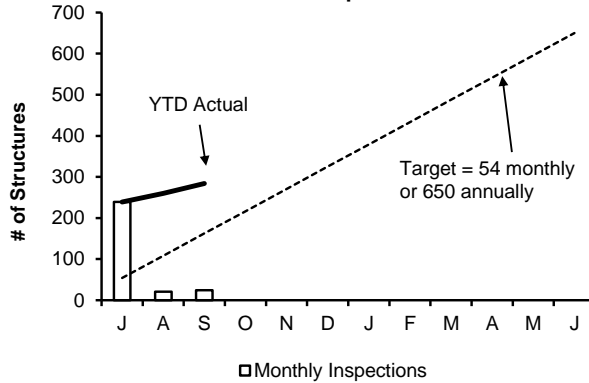
Maintenance

Pipeline Cleaning



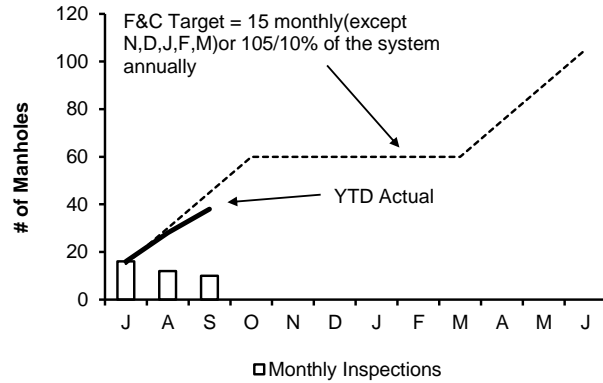
Staff cleaned 8.91 miles of MWRA's sewer system and removed 23 yards of grit and debris during this quarter. The year to date total is 8.91 miles. No Community Assistance was provided this quarter.

Structure Inspections



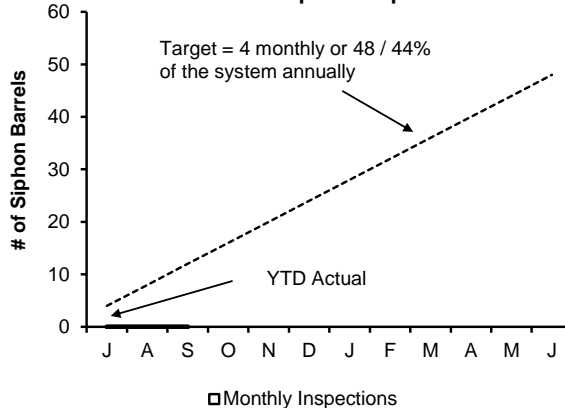
Staff inspected the 36 CSO structures and performed 284 additional manhole/structure inspections during this quarter. The year to date total is 284 inspections.

Manhole Rehabilitation



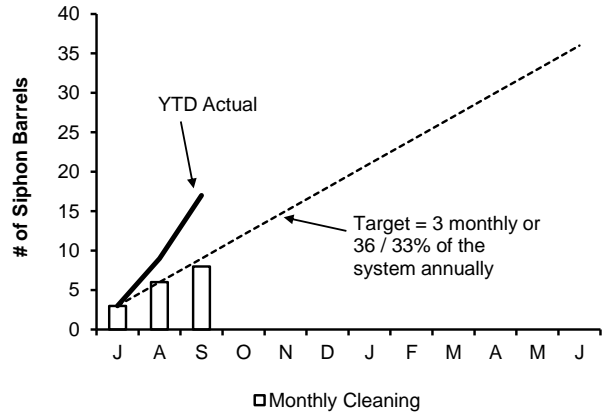
Staff replaced 38 frame & cover during this quarter. The year to date total is 38.

Inverted Siphon Inspections



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

Inverted Siphon Cleaning

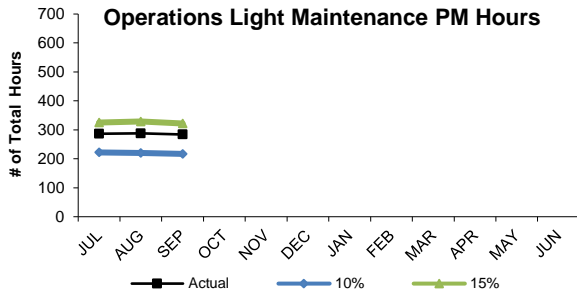


Staff cleaned 17 siphon barrels during this quarter. Year to date total is 17.

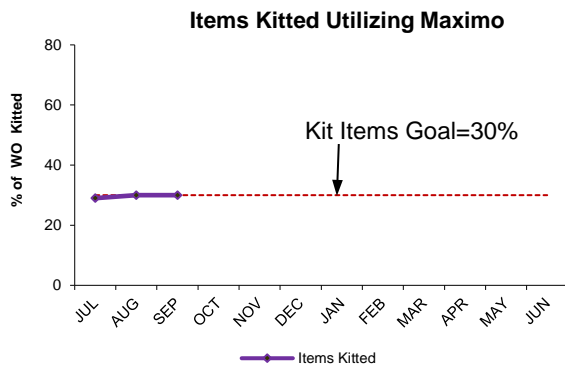
Field Operations' Metropolitan Equipment & Facility Maintenance

1st Quarter - FY19

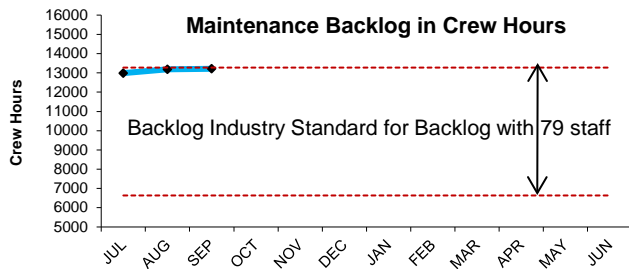
Several maintenance and productivity initiatives are in progress. The goal for the Overall PM completion and the Operator PM completion was raised to 100% for Fiscal Year 2010. The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus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



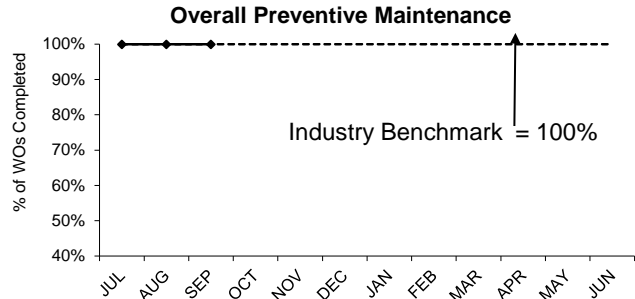
Operations staff averaged 286 hours of preventive maintenance during the 1st Quarter, an average of 14% of the total PM hours for the 1st Quarter, which is within the industry benchmark of 10% to 15%.



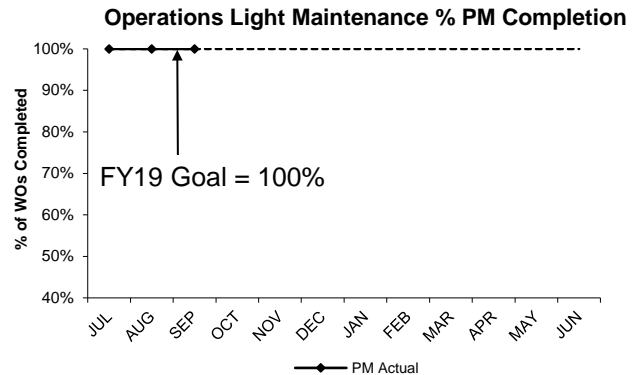
Operation's FY19 maintenance kitting goal has been set at 30% of all work orders to be kitted. Kitting is the staging of parts or material necessary to complete maintenance work. In the 1st Quarter, 30% of all applicable work orders were kitted. This resulted in more wrench time and increased productivity.



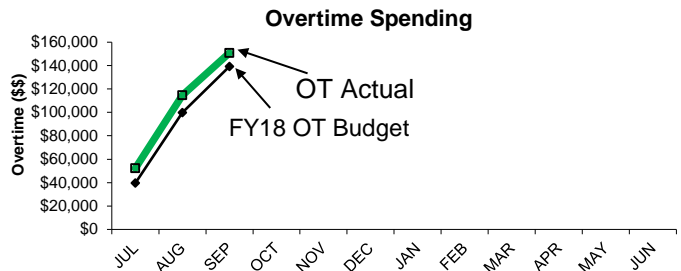
The 1st Quarter backlog average is 13129 hours. Management's goal is to continue to control overtime and still stay within the industry benchmark of 6636 to 13275 hours.



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



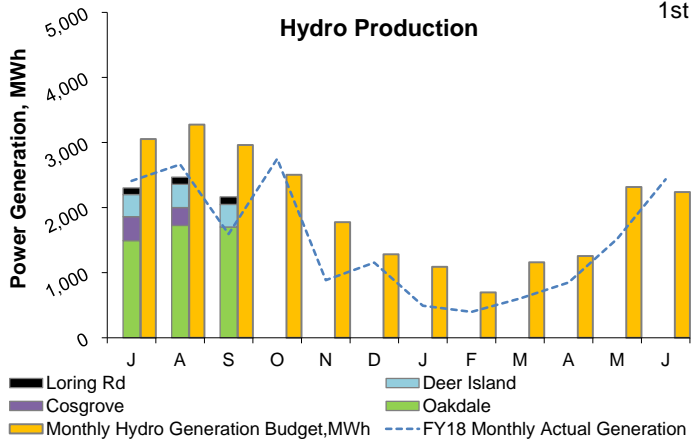
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY19 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 1st Quarter.



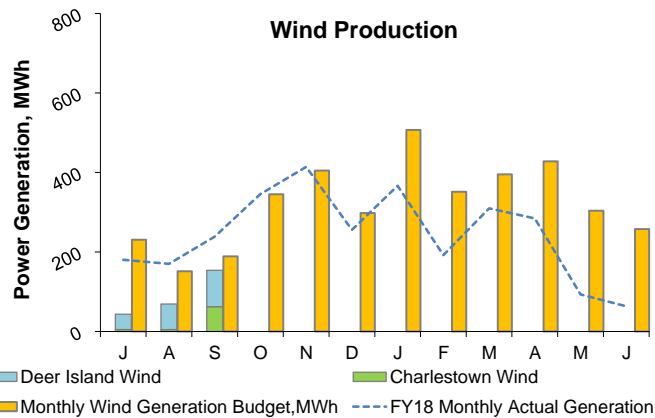
Maintenance overtime was \$12k over budget for the 1st Quarter. Overtime was used for critical maintenance repairs.

Renewable Electricity Generation: Savings and Revenue

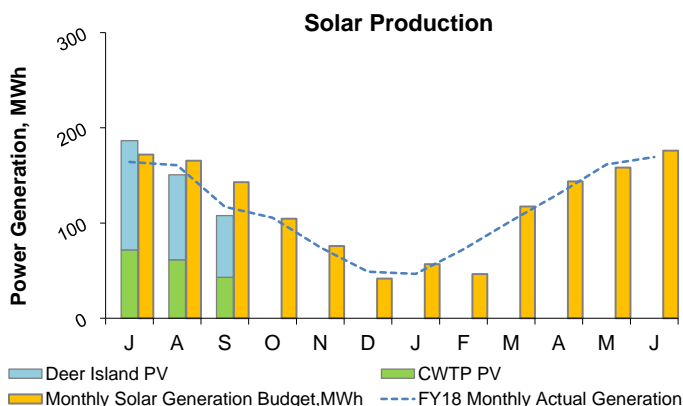
1st Quarter - FY19



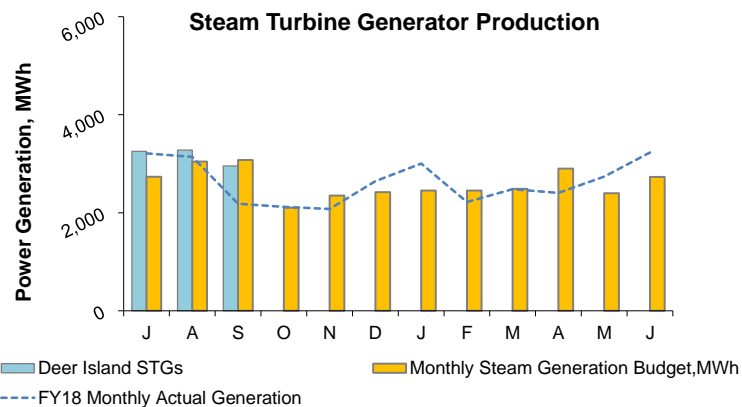
In the 1st quarter, the renewable energy produced from all hydro turbines totaled 6,936 MWh; 17% below budget³ primarily due to Cosgrove generation values having been underestimated by the utility company. The utility data for Cosgrove is typically corrected and reconciled in later months of the year. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



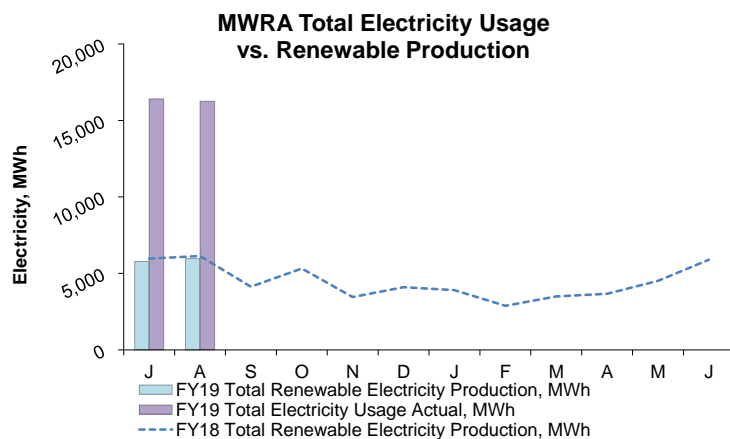
In the 1st quarter, the renewable energy produced from all wind turbines totaled 267 MWh; 55% below budget³; mostly due to Charlestown Wind generation values being underestimated by the utility company. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



In the 1st quarter, the renewable energy produced from all solar PV systems totaled 445 MWh; 7% below budget³. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

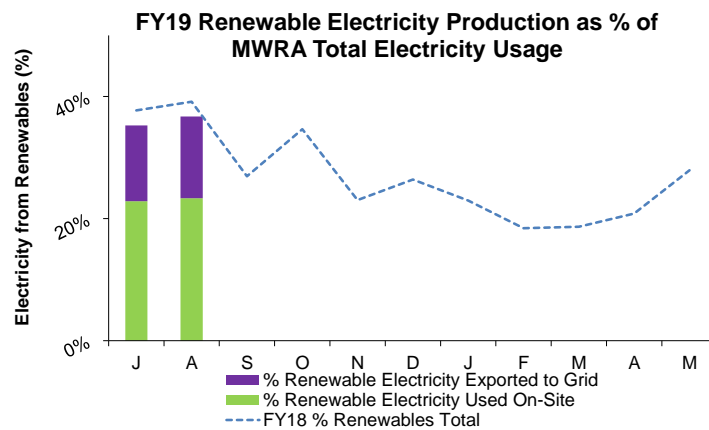


In the 1st quarter, the renewable energy produced from all steam turbine generators totaled 9,487 MWh; 7% above budget³. Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.



In the first 2 months of FY19, MWRA's electricity generation by renewable resources totaled 11,753 MWh. MWRA's total electricity usage was approximately 32,666 MWh. The MWRA total electricity usage is the sum of all electricity purchased for Deer Island and FOD plus electricity produced and used on-site at these facilities. Approximately 99% of FOD electrical accounts are accounted for by actual billing statements; minor accounts that are not tracked on a monthly basis such as meters and cathodic protection systems are estimated based on this year's budget.

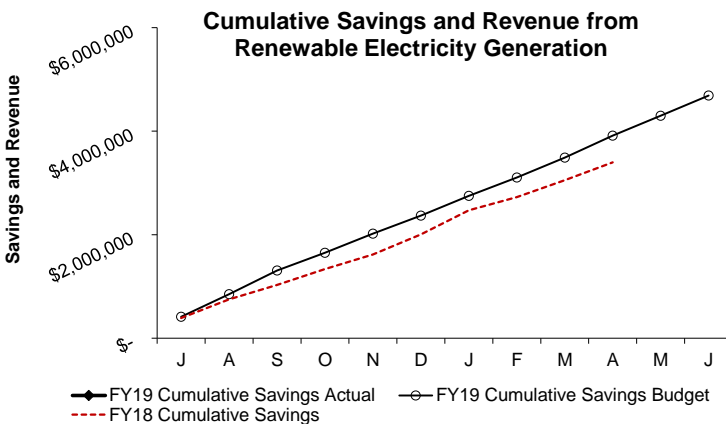
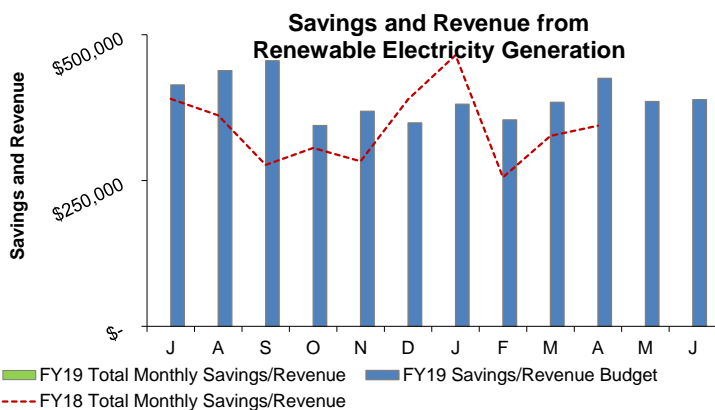
In the first 2 months of FY19, green power generation represented approximately 36% of total electricity usage. All renewable electricity generated on DI is used on-site (this accounts for more than 50% of MWRA renewable generation). Almost all renewable electricity generated off-DI is exported to the grid.



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

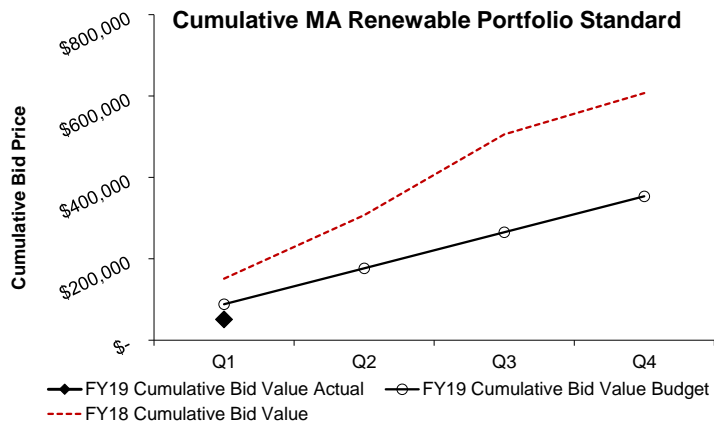
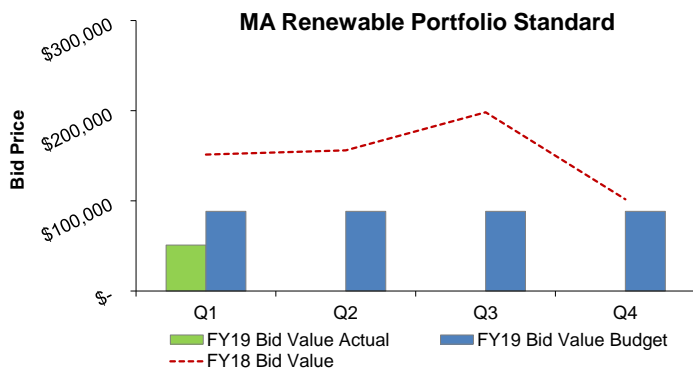
Renewable Electricity Generation: Savings and Revenue

1st Quarter - FY19



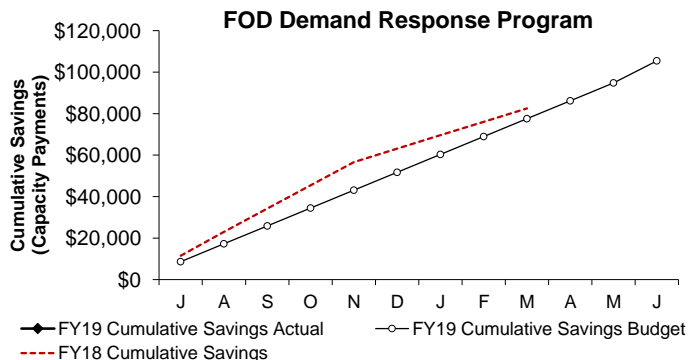
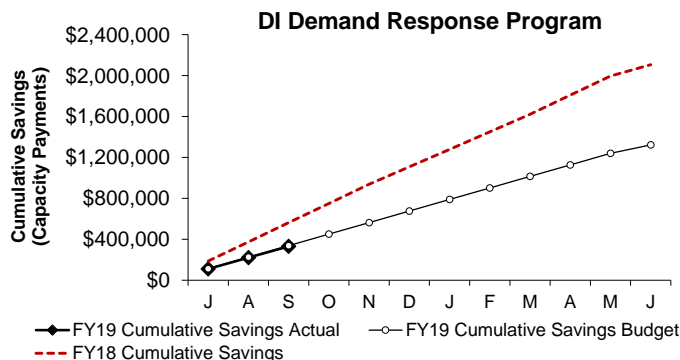
Savings and revenue data during the 1st Quarter is not yet available as the complete invoices for July, August, and September are still pending receipt and/or review as of reporting time.

Savings and revenue² from all renewable energy sources include wind turbines, hydroelectric generators, solar panels, and steam turbines (DI). This includes savings and revenue due to electricity generation (does not include avoided fuel costs and RPS RECs). The use of DITP digester gas as a fuel source provides the benefit of both electricity generation from the steam turbine generators, and provides thermal value for heating the plant, equivalent to approximately 5 million gallons of fuel oil per year (not included in charts above).



Bids were awarded during the 1st Quarter¹ from MWRA's Class 1 and Solar REC renewable energy assets; 6,520 Q1 CY2018 Class I Renewable Energy Certificates (RECs) and 51 Q1 CY2018 Solar RECs (SRECs) were sold for a total value of \$51,009 RPS revenue; which is 42% below budget³ for the Quarter. This is mainly due to Class I market prices being 49% below budget for the Quarter. 399 Class II RECs were banked during Q1 for future sale.

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

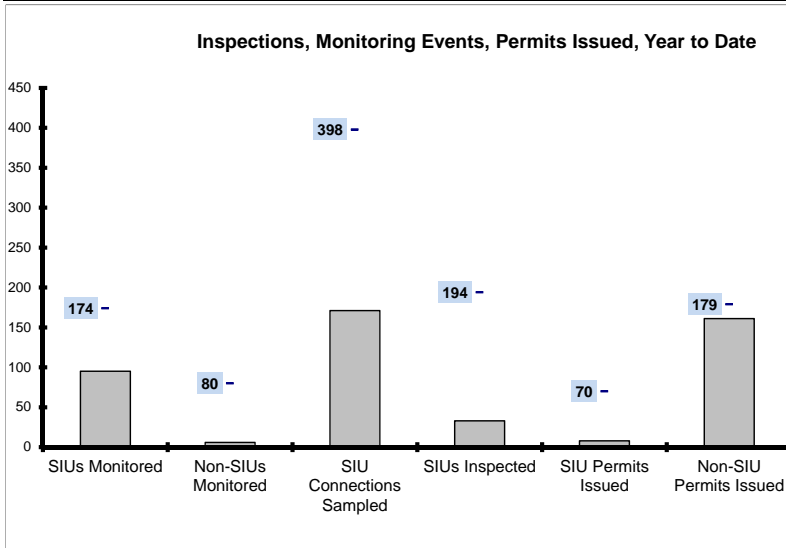


Currently Deer Island, JCWTP, and Loring Rd participate in the ISO-New England Demand Response Programs⁴. By agreeing to reduce demand and operate the facility generators to help reduce the ISO New England grid demand during periods of high energy demand, MWRA receives monthly Capacity Payments from ISO-NE. When MWRA operates the generators during an ISO-NE called event, MWRA also receives energy payments from ISO-NE. FY19 Cumulative savings (Capacity Payments only) total \$330,722 for Deer Island. Payments for FOD are still pending receipt as of 1st quarter reporting time.

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

Toxic Reduction and Control

1ST Quarter - FY19



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

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

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

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

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

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

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

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs. Monitoring of SIUs and Non-SIUs is dynamic for several reasons including: newly permitted facilities, sample site changes within the year requiring a permit change, non-discharging industries, a partial sample event is counted as an event even though not enough sample was taken due to the discharge rate at the time, increased inspections leading to permit category changes requiring additional monitoring events.

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

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

| | | | | | | | | |
|-------|-----|-----|-----|----|-----|----|---|-----|
| % YTD | 63% | 91% | 13% | 2% | 25% | 6% | 8 | 161 |
|-------|-----|-----|-----|----|-----|----|---|-----|

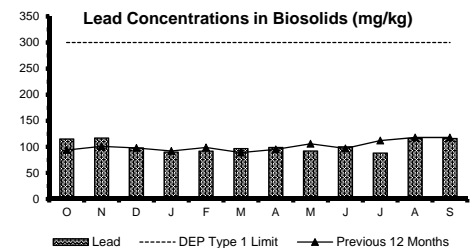
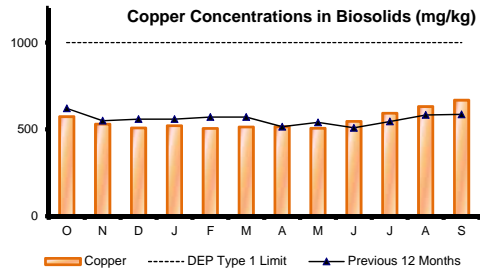
In the 1st Quarter of FY19, one hundred and sixty-nine permits were issued, eight of which were SIUs. Among the permits issued in August were one hundred and fifteen non-SIU permits, representing the timely renewal of the majority of permits falling under the Group Permit for Food Processing Operations.

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

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

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

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



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

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

Field Operations Highlights

1st Quarter – FY19

Western Water Operations and Maintenance

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

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

Metro Water Operations and Maintenance

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

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

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

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

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

Operations Engineering

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

Wastewater Operations & Maintenance

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

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

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

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

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

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

TRAC

Compliance and Enforcement

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

Field Operations Highlights

1st Quarter – FY19

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

Inspections and Permitting

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

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

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

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

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

Monitoring

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

Environmental Quality-Water

Algae: MWRA and DCR continued monitoring for nuisance taste and odor algae. Water quality buoy data at three in-reservoir stations was used to help monitor water quality. Staff performed routine algal

toxin sampling and testing for both Quabbin & Wachusett systems, and in conjunction with Western and Eastern Operations, began weekly cyanobacteria inspections at standby reservoirs.

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

Community Support: Staff provided sampling and testing assistance to Bedford, Malden, Framingham, Stoneham, and Waltham. Staff also reviewed and submitted comments on two community Revised Total Coliform Rule Level 2 Assessments.

On September 12th staff deployed the S:CAN Mobile Trailer at the Emergency Response Plan Training for BWSC. On September 21st staff trained drinking water samplers from Marlborough, Malden and Winthrop, focusing on sample tap inspections, sampling technique, and chlorine residual testing.

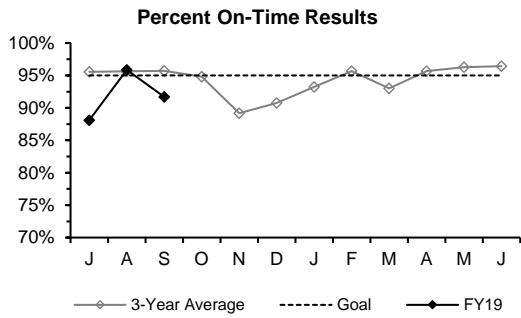
Contaminant Monitoring System (CMS): Staff completed the fit-out of the S::CAN mobile trailer with a Telog wireless system in August. On September 13th, staff deployed the trailer to the Wachusett Aqueduct Pump Station to assist with turbidity monitoring, and to test the transfer and storage of data.

Environmental Quality-Wastewater

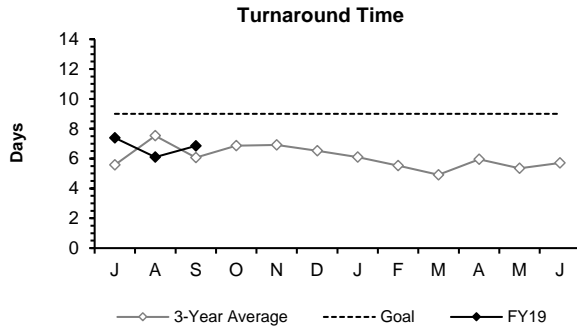
Ambient Monitoring: Working with a subcommittee of the regulator's Outfall Monitoring Science Advisory Panel (OMSAP), set the date (November 13, 2018) and agenda for a workshop to review the questions on which the monitoring is based. Received results from flounder liver health monitoring; flounder caught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

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

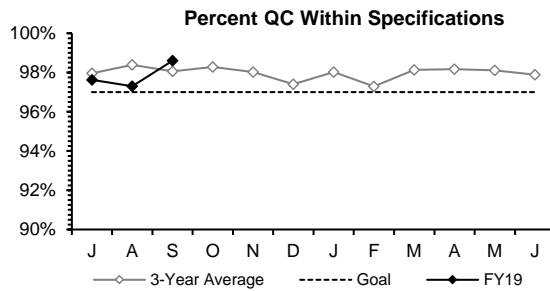
Laboratory Services 1st Quarter - FY19



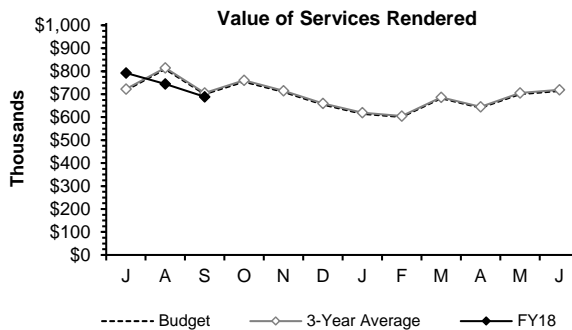
The Percent On-Time measurement was below the 95% goal for two months of the quarter, due to staff turnover, and time spent training new staff. Regulatory reporting deadlines were met.



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



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



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

Highlights:

Retirement:

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

CSO Assessment:

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

Communities:

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

Lead Testing:

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

Mobile Lab:

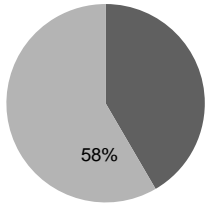
Participated in a joint drill at JJCWTP with the Army National Guard Civil Support Team.

CONSTRUCTION PROGRAMS

Projects In Construction

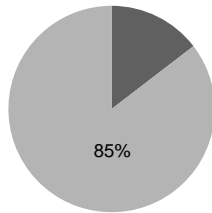
1st Quarter – FY19

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

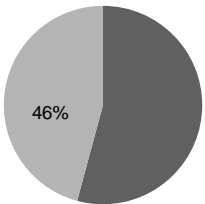
Reading Extension Sewer Rehabilitation

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

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

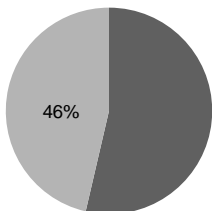
Status and Issues: During September, the Contractor completed the grouting and installation of a cured in place spot repair at 100 Maple Street. They also developed a list of repairs for observed infiltration defects, with the final list still in discussion.

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

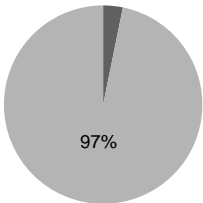
Chelsea Creek Headworks Upgrade

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

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

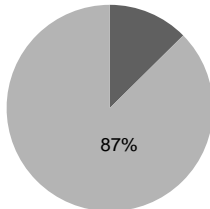
Status and Issues: As of September, the Contractor placed concrete for the carbon adsorbers and fan foundations. They backfilled and installed the odor control condensate drain, excavated for the piles for the new communication tower foundation. The plumbing contractor installed 2" process air and 1"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

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

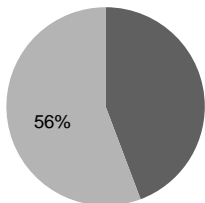
Wachusett Aqueduct Pumping Station

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

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

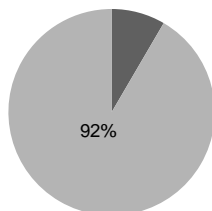
Status and Issues: As of September, the Contractor filled the channel and flushed and filled wells #1 through #7 with water from the Wachusett Aqueduct, for Witness Function Acceptance Testing (WFAT). They backfilled, graded and seed loamed at the east and west detention basins.

Money



- Amount Remaining
- Billed to Date

Time



- Days Remaining
- Days Expended

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.

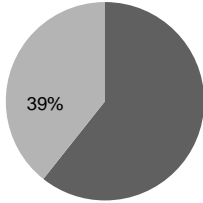
Notice to Proceed: 29-Jan-2016 **Contract Completion:** 27-Nov-2018

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

Projects In Construction

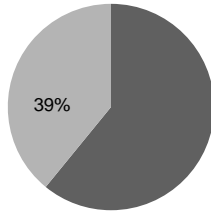
1st Quarter – FY19

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

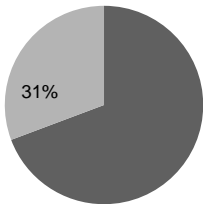
NIH Section 110 - Stoneham

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

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

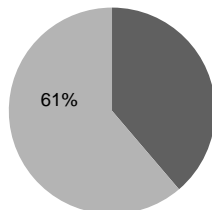
Status and Issues: As of September, the Contractor removed 2045-CY of ledge along Pond Street, Main Street and Wright Street, after which they installed 1098-LF of 48" DIP water main.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

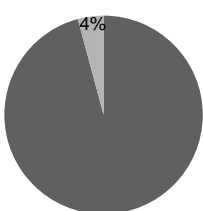
Winthrop Terminal VFD and Motor

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

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

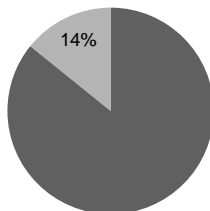
Status and Issues: VFD/Motor No 2 testing on-going. Troubleshooting Vibration issue with Motor No 6.

Money



■ Amount Remaining
■ Billed to Date

Time



■ Days Remaining
■ Days Expended

Gravity Thickener Rehabilitation

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

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

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

CSO CONTROL PROGRAM

1st Quarter – FY19

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

| Project/Item | Status as of September 30, 2018 |
|--|--|
| BWSC Dorchester Interceptor Inflow Removal | MWRA's CIP and the MOU/FAA with BWSC included \$5.4 million for additional inflow removal from the BWSC Dorchester Interceptor system in the South Dorchester Bay Sewer Separation area, of which \$1.7 million was transferred to the BWSC MOU/FAA CSO account and \$1.6 million of that was withdrawn by BWSC to fund related design and construction work. On May 17, 2017, MWRA's Board of Directors authorized removing the remaining \$3.8 million from the BWSC MOU/FAA (which ended on June 30, 2017) and including this funding amount in a separate, 4-year financial assistance agreement with BWSC effective July 1, 2017. The new agreement limits MWRA financial assistance to reimbursement of the eligible costs of BWSC construction work reviewed and approved by MWRA, up to \$3.8 million. BWSC continues to perform sewer system evaluations that will support its construction project recommendations. |
| City of Cambridge Memorandum of Understanding and Financial Assistance Agreement | The City of Cambridge attained substantial completion of its last project, CAM004 Sewer Separation, in December 2015 in compliance with Schedule Seven, and attained substantial completion of related surface restoration work by the end of 2017. MWRA made a final transfer of funds to the Cambridge CSO account in December 2017, in the amount of \$1,254,551, to cover eligible costs through June 30, 2018, when the 22 year-old, \$100.2 million MOU/FAA ended. Cambridge continues to support ongoing MWRA final eligibility reviews and final reconciliation of the MOU/FAA costs. |
| MWRA CSO Performance Assessment | MWRA issued the Notice to Proceed with the contract for CSO Post-Construction Monitoring and Performance Assessment to AECOM Technical Services, Inc., in November 2017. The contract includes CSO inspections, overflow metering, hydraulic modeling, system performance assessments and water quality compliance assessments culminating in the submission of a report verifying attainment of court-ordered levels of CSO control to EPA and DEP in December 2020, in compliance with the last milestone in Schedule Seven. AECOM submitted a draft semi-annual CSO discharge and performance assessment report at the end of September which includes rainfall summaries and analyses, CSO meter data, metered CSO discharge quantifications, model predicted CSO discharges and related evaluations for storms in the period April through June 2018. The report is undergoing MWRA review and is expected to be finalized and published this November. In the meantime, MWRA staff continue to collect water quality data in CSO affected waters for eventual analysis by AECOM relative to compliance with water quality standards. |

CIP Expenditures

1st Quarter – FY19

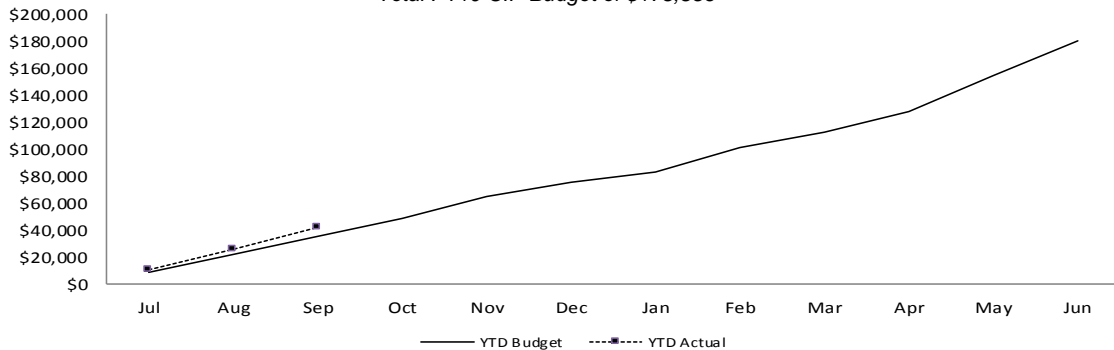
| FY19 Capital Improvement Program Expenditure Variances through September by Program (\$ in thousands) | | | | |
|---|-------------------------------|-------------------------------|-----------------|------------------|
| Program | FY19 Budget Through September | FY19 Actual Through September | Variance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

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

Budget vs. Actual CIP Expenditures

(\$ in thousands)

Total FY19 CIP Budget of \$178,856



Construction Fund Management

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

| | |
|--|------------------------------|
| Cash Balance as of 9/29/2018 | \$110.0 million |
| Unused capacity under the debt cap: | \$1.483 billion |
| Estimated date for exhausting construction fund without new borrowing: | MAY-19 |
| Estimated date for debt cap increase to support new borrowing: | Not anticipated at this time |
| Commercial paper/Revolving loan outstanding: | \$128 million |
| Commercial paper capacity / Revolving Loan | \$350 million |
| Budgeted FY19 capital spending*: | \$188 million |

* Cash based spending is discounted for construction retainage.

DRINKING WATER QUALITY AND SUPPLY

Source Water – Microbial Results and UV Absorbance

1st Quarter – FY19

Source Water – Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal tract of mammals. They act as indicators of possible fecal contamination. The Surface Water Treatment Rule for unfiltered water supplies allows for no more than 10% of source water samples prior to disinfection over any six-month period to have more than 20 fecal coliforms per 100mL.

Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the William A. Brutsch Water Treatment Facility raw water tap before being treated and entering the CVA system.

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

Sample Site: Wachusett Reservoir

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

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

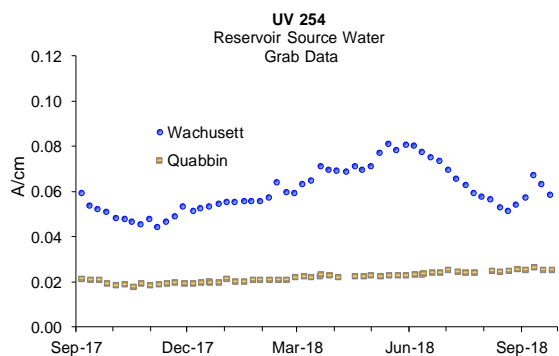
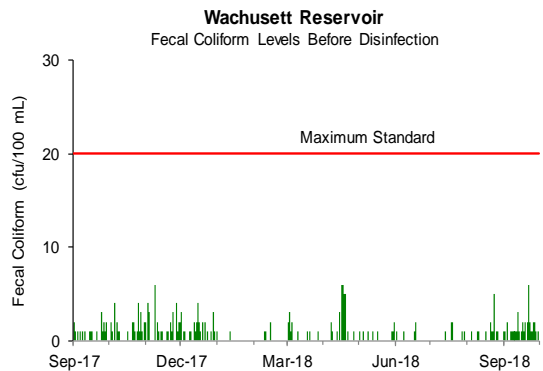
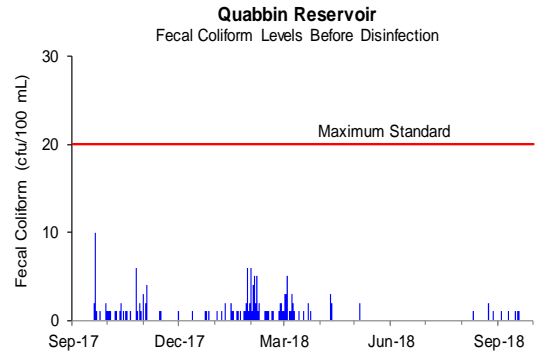
All samples collected during the 1st Quarter were below 20 cfu/100ml. **For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100mL.**

Source Water – UV Absorbance

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

Quabbin Reservoir UV-254 levels are currently around 0.026 A/cm.

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



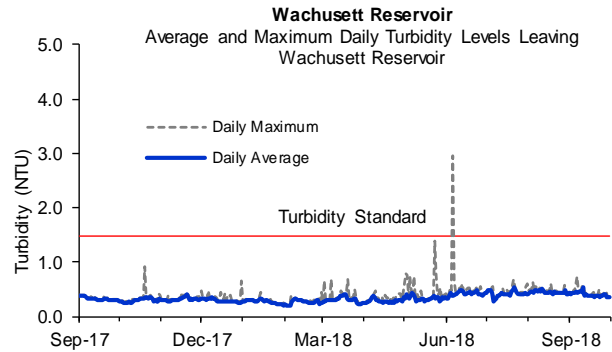
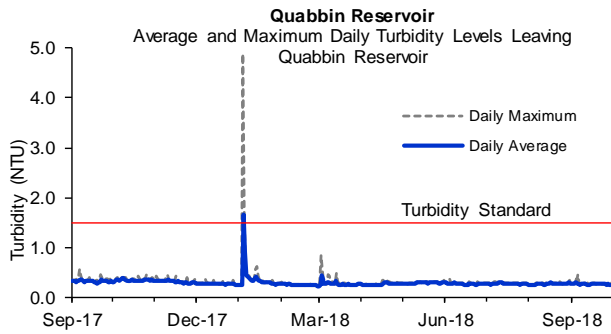
Source Water – Turbidity

1st Quarter – FY19

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

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

Turbidity of Quabbin Reservoir water is monitored continuously at the Brutsch Water Treatment Facility (BWTF) before UV and chlorine disinfection. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation and UV disinfection. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

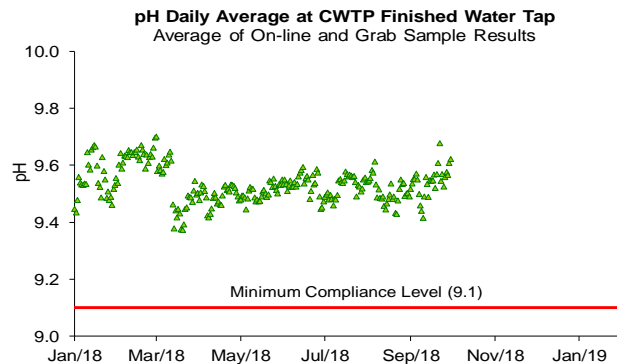
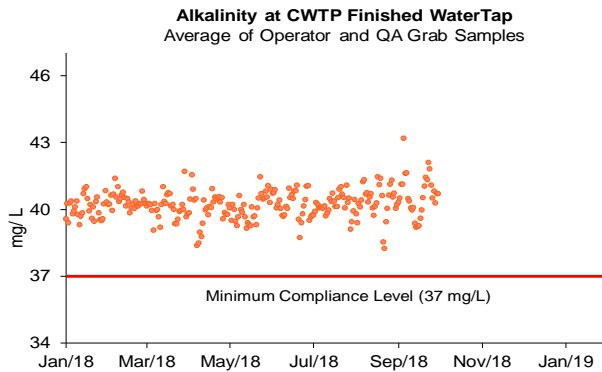


Treated Water – pH and Alkalinity Compliance

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

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

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



Treated Water – Disinfection Effectiveness

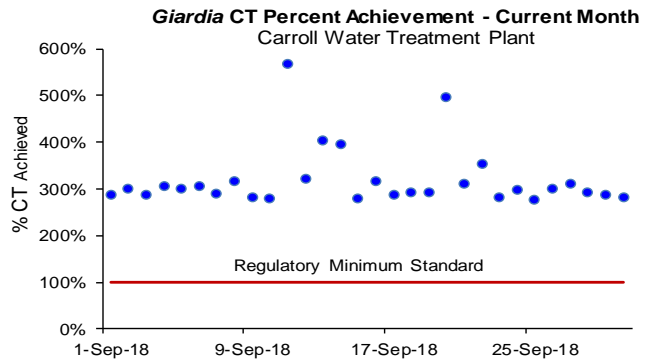
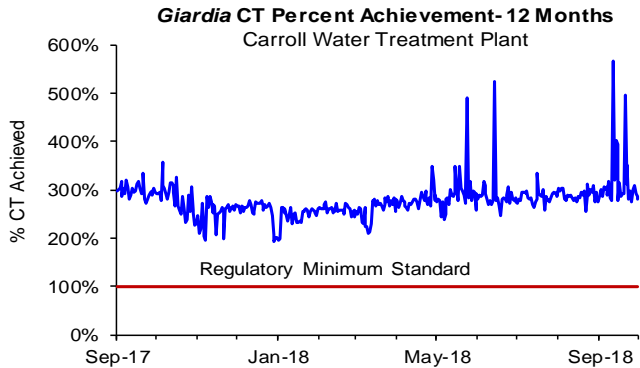
1st Quarter – FY19

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

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

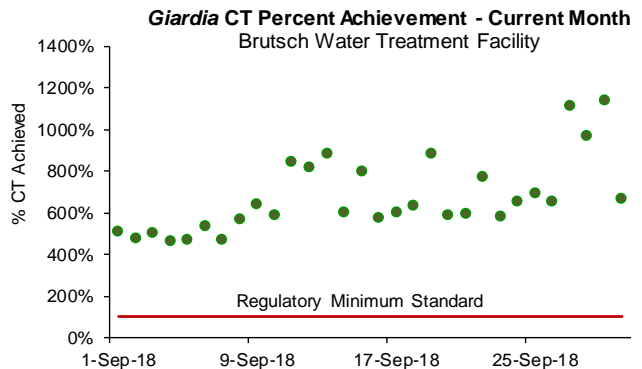
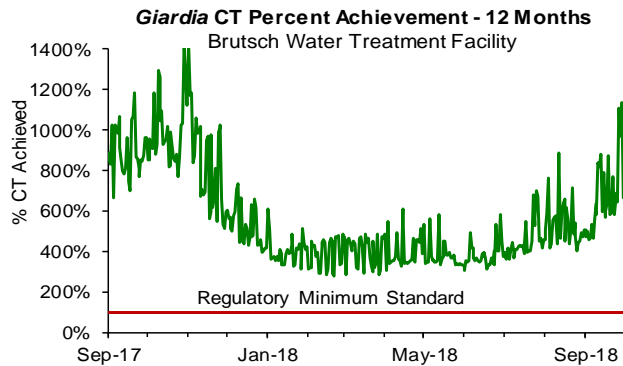
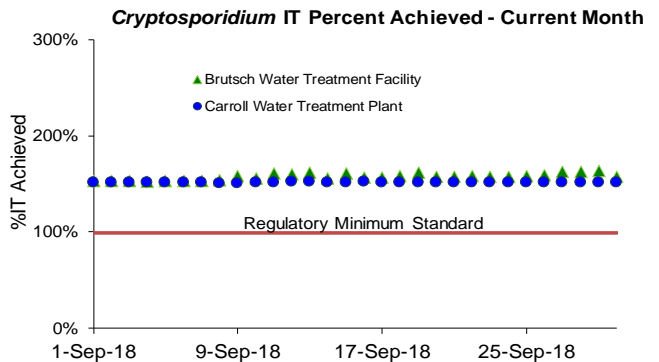
Wachusett Reservoir – MetroWest/Metro Boston Supply:

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



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

- The chlorine dose at BWTF is adjusted in order to achieve MWRA's seasonal target of >0.75 mg/L (November 01 – May 31) and >1.0 mg/L (June 1– October 31) at Ludlow Monitoring Station.
- The chlorine dose at BWTF varied between 1.7 to 1.9 mg/L for the quarter.
- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter.
- *Cryptosporidium* IT was maintained above 100% during the month. Off-spec water was less than 5%.



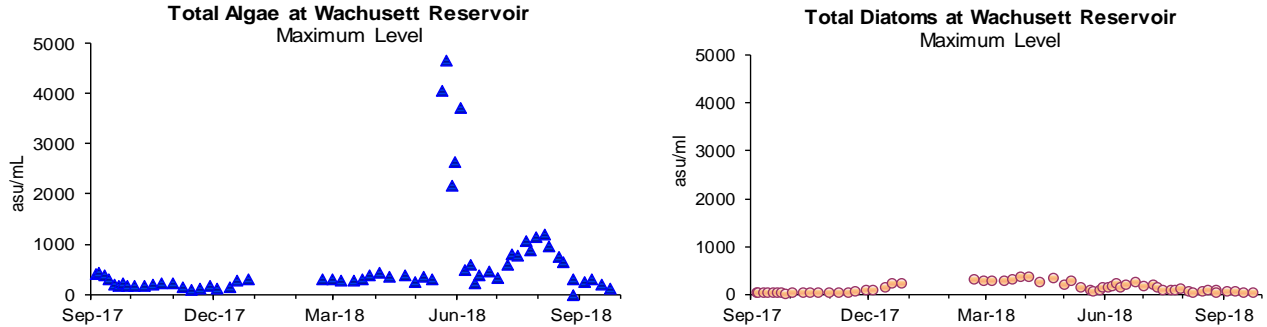
Source Water - Algae

1st Quarter – FY19

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

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

In the 1st Quarter, no complaints which may be related to algae were reported from the local water departments.



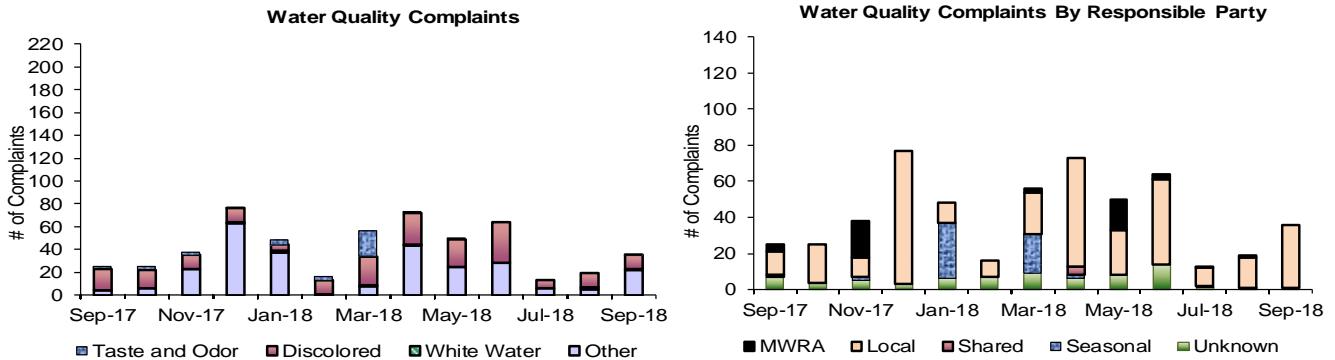
Drinking Water Quality Customer Complaints: Taste, Odor, or Appearance

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

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

Communities reported 68 complaints during the quarter compared to 61 complaints from 1st Quarter of FY18. Of these complaints, 31 were for "discolored water", 1 was for "taste and odor", 3 were for "white water", and 33 were for "other". Of these complaints, 62 were local community issues, 2 were MWRA related, 2 were seasonal in nature, and 2 were unknown in origin.

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



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

1st Quarter – FY19

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

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

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

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

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

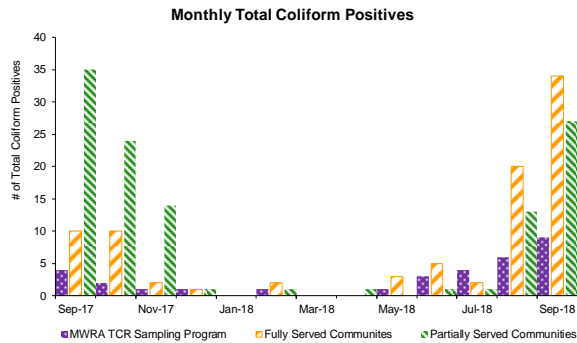
A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlights

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

NOTES:

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



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

Chlorine Residuals in Fully Served Communities

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

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

1st Quarter – FY19

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

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

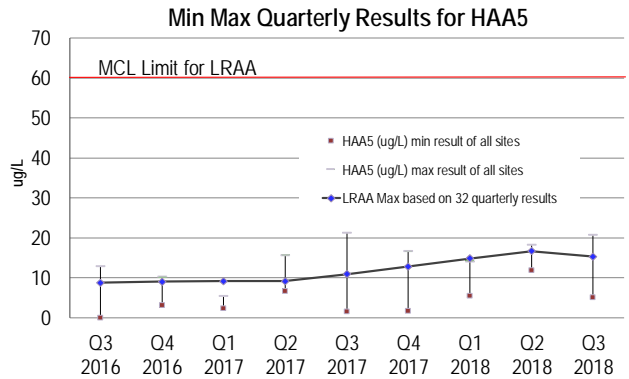
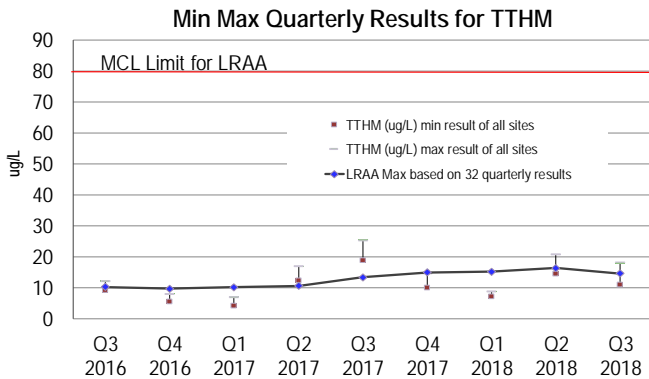
Partially served and CVA communities are responsible for their own compliance monitoring and reporting, and must be contacted directly for their individual results. The chart below combines all three CVA communities data (Chicopee, Wilbraham and South Hadley FD1).

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

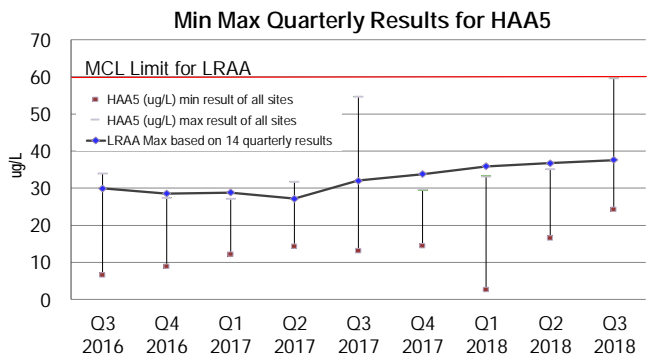
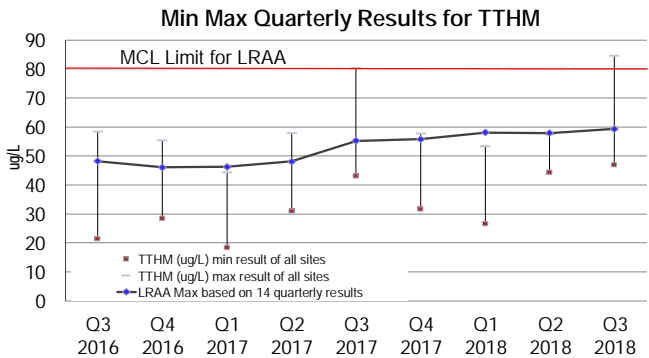
The LRAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The Max LRAA in the quarter for TTHMs = 14.6 µg/L; HAA5s = 15.3 µg/L. The current RAA for Bromate = 0.0 µg/L. CVA's DBP levels continue to be below current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

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

MetroBoston Disinfection By-Products



CVA Disinfection By-Products (Combined Results)



Water Supply and Source Water Management

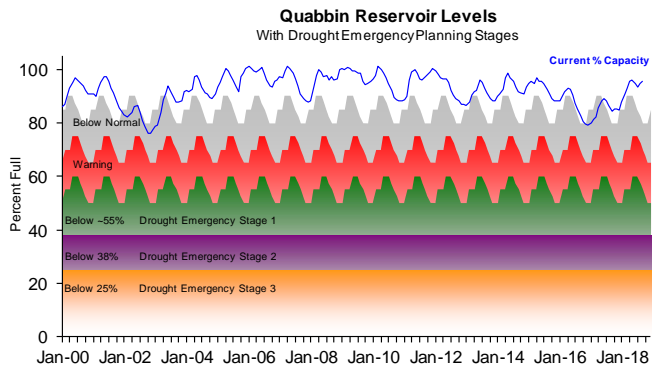
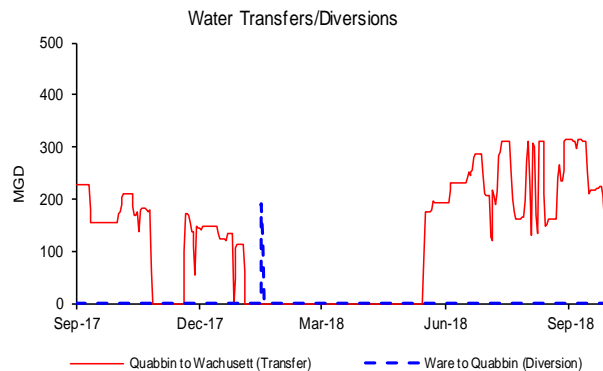
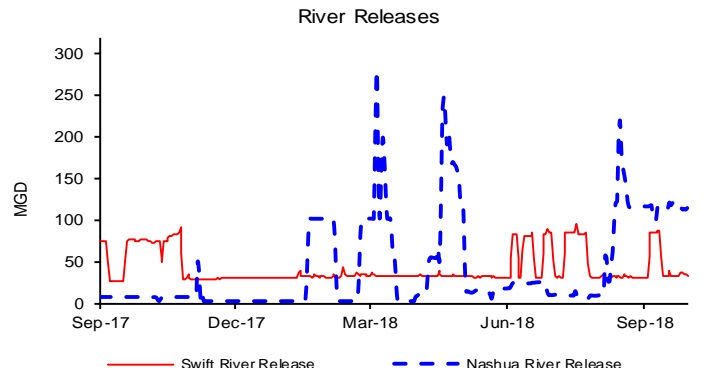
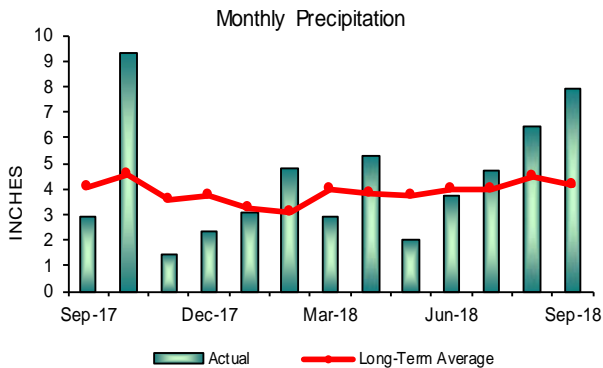
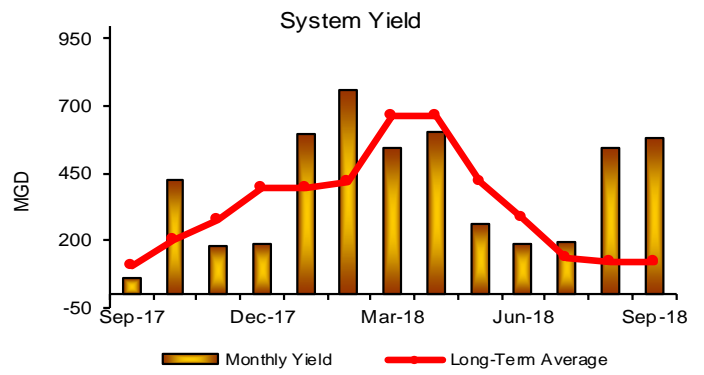
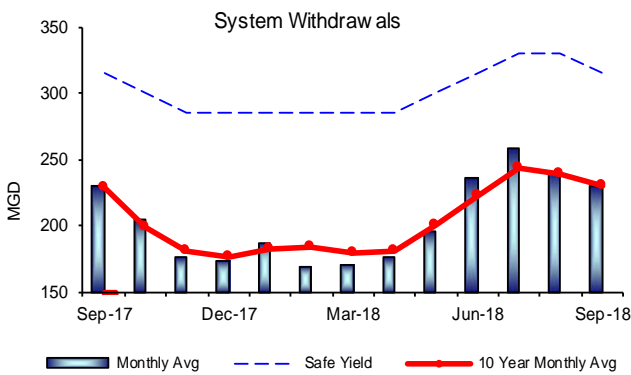
1st Quarter – FY19

Background

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

Outcome

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



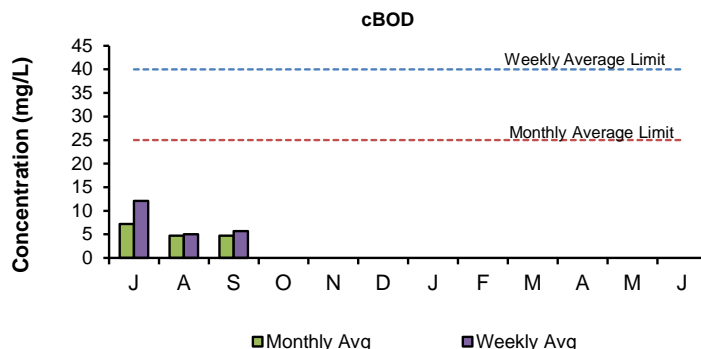
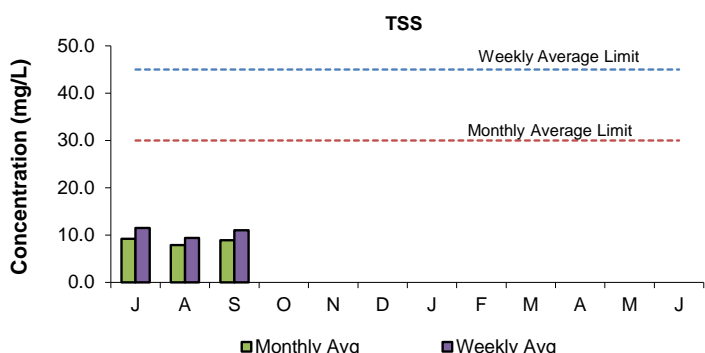
WASTEWATER QUALITY

NPDES Permit Compliance: Deer Island Treatment Plant 1st Quarter - FY19

NPDES Permit Limits

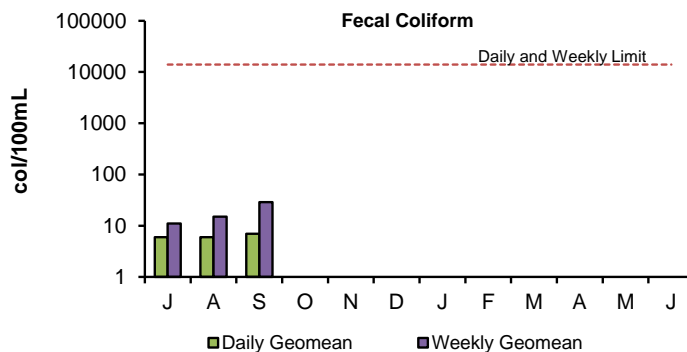
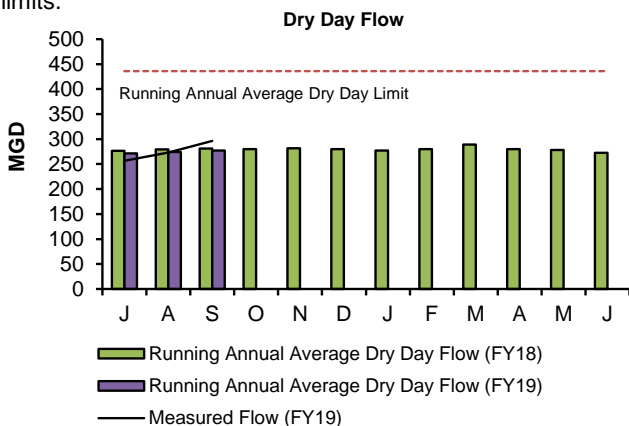
| Effluent Characteristics | | Units | Limits | July | August | September | 1st Quarter Violations | FY19 YTD Violations |
|------------------------------------|----------------------------|-----------|----------|------------|---------|-----------|------------------------|---------------------|
| Dry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

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



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

Carbonaceous Biochemical Oxygen Demand (cBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in the environment. All cBOD measurements for the 1st Quarter were within permit limits.



Running Annual Average Dry Day Flow is the average of all dry weather influent flows over the previous 365 days. The Dry Day Flow for the 1st Quarter was well below the permit limit of 436 MGD.

Fecal Coliform is an indicator for the possible presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating many forms of disease-causing microorganisms. In the 1st Quarter, all permit conditions for fecal coliform were met.

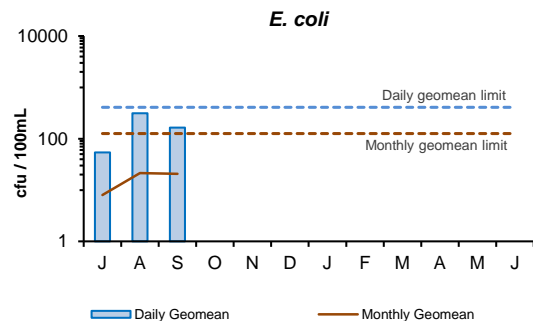
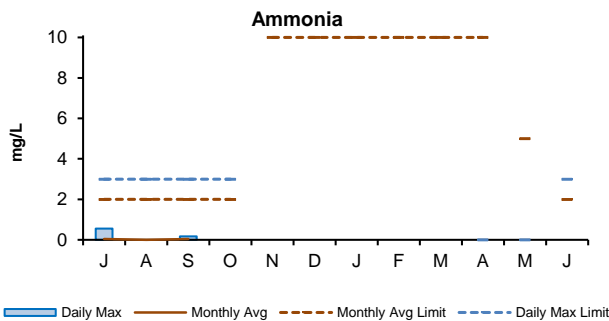
NPDES Permit Compliance: Clinton Wastewater Treatment Plant
1st Quarter - FY19

NPDES Permit Limits

| Effluent Characteristics | | Units | Limits | July | August | September | 4th Quarter Violations | FY19 YTD Violations |
|--|---------------------------|-----------|---------|------|--------|-----------|------------------------|---------------------|
| Flow: | 12-month Rolling Average: | mgd | 3.01 | 2.51 | 2.61 | 2.73 | 0 | 0 |
| BOD: | Monthly Average: | mg/L | 20 | 2.5 | 1.7 | 1.4 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 3.8 | 1.8 | 1.8 | 0 | 0 |
| TSS: | Monthly Average: | mg/L | 20 | 4.3 | 5.3 | 5.5 | 0 | 0 |
| | Weekly Average: | mg/L | 20 | 4.8 | 9.3 | 7.7 | 0 | 0 |
| pH: | | SU | 6.5-8.3 | 0.00 | 0.00 | 0.00 | 0 | 0 |
| Dissolved Oxygen: | Daily Average Minimum: | mg/L | 6 | 7.4 | 7.0 | 7.7 | 0 | 0 |
| E. Coli: | Monthly Geometric Mean: | cfu/100mL | 126 | 8.0 | 21.4 | 20.6 | 0 | 0 |
| | Daily Geometric Mean: | cfu/100mL | 409 | 54.0 | 314.6 | 164.0 | 0 | 0 |
| TCR: | Monthly Average: | ug/L | 17.6 | 0.0 | 0.0 | 0.2 | 0 | 0 |
| | Daily Maximum: | ug/L | 30.4 | 0.0 | 0.0 | 6.7 | 0 | 0 |
| Copper: | Monthly Average: | ug/L | 11.6 | 10.7 | 11.0 | 10.2 | 1 | 2 |
| | Daily Maximum: | ug/L | 14.0 | 10.7 | 13.5 | 11.8 | 0 | 0 |
| Total Ammonia Nitrogen: June 1st - October 31st | Monthly Average: | mg/L | 2.0 | 0.04 | 0.00 | 0.03 | 0 | 0 |
| | Daily Maximum: | mg/L | 3.0 | 0.55 | 0.00 | 0.17 | 0 | 0 |
| Total Phosphorus: April 1st - October 31st | Monthly Average: | mg/L | 1.0* | 0.33 | 0.17 | 0.17 | 0 | 0 |
| | Daily Maximum: | mg/L | RPT* | 0.69 | 0.54 | 0.28 | 0 | 0 |
| Acute Toxicity*: | Daily Minimum: | % | ≥100 | N/A | N/A | >100 | 0 | 0 |
| Chronic Toxicity*: | Daily Minimum: | % | ≥62.5 | N/A | N/A | 100 | 0 | 0 |

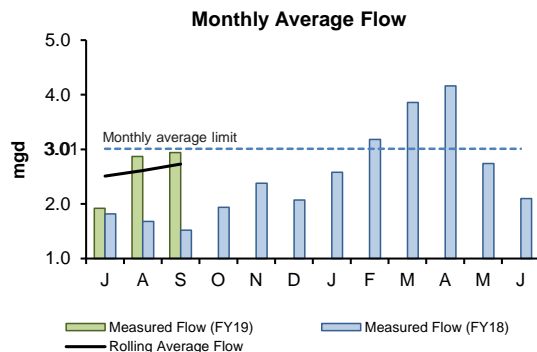
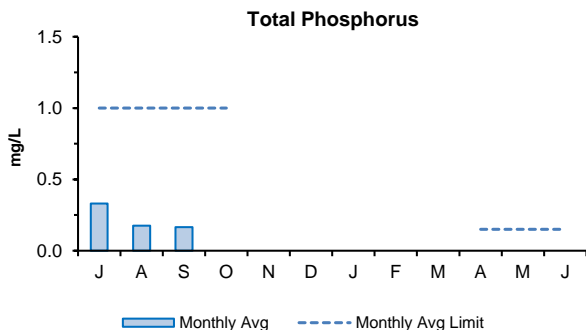
There have been no permit violations in FY19 at the Clinton Treatment Plant.
1st Quarter: There were no permit violations in the first quarter.

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



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

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



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

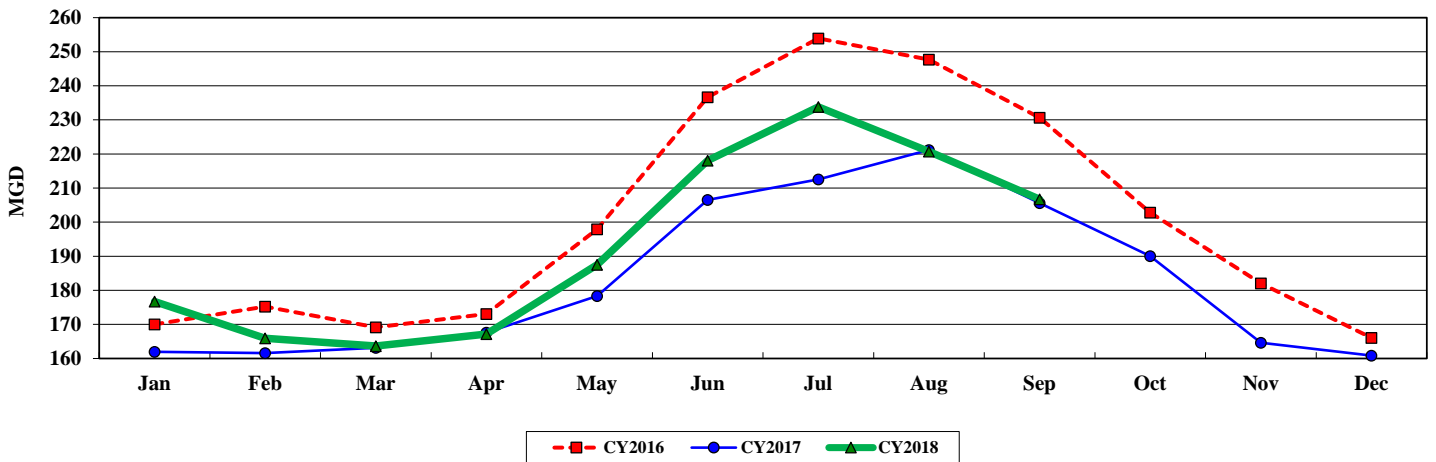
The graph depicts the rolling annual average monthly flow, measured in million gallons per day, exiting the plant. The average monthly flows during the 1st Quarter were below the NPDES permit limit.

COMMUNITY FLOWS AND PROGRAMS

Total Water Use

1st Quarter - FY19

MWRA Water Supplied: All Revenue Customers



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

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

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

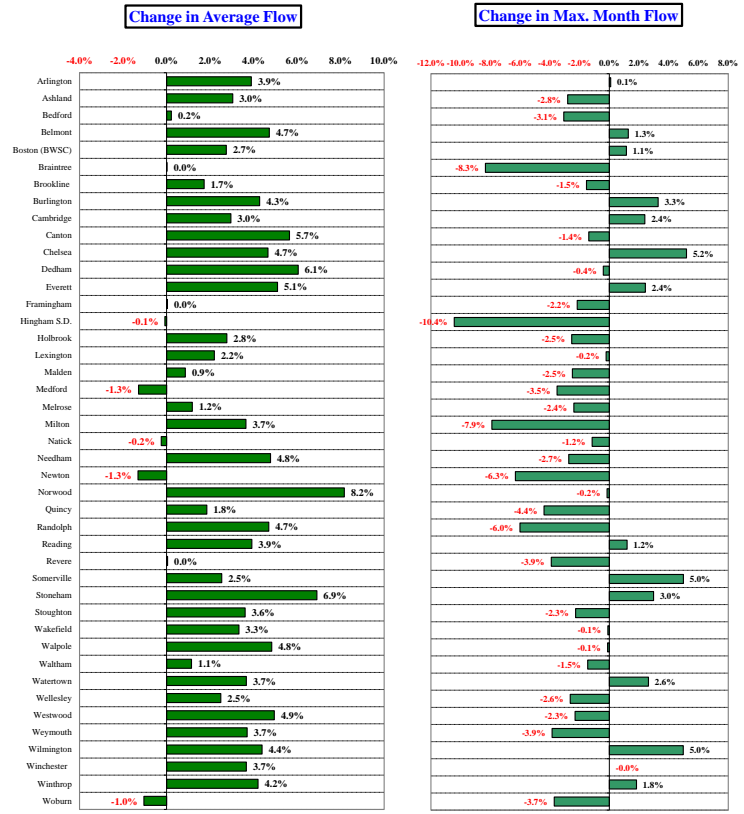
September 2018 water supplied of 206.7 mgd (for revenue generating users) is up 1.1 mgd or 0.5% compared to September 2017. System-wide year to date consumption for CY18 remains higher than CY17 with 193.6 mgd being supplied to MWRA customers through September. This is 6.9 mgd higher than CY17, and is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

Community Wastewater Flows

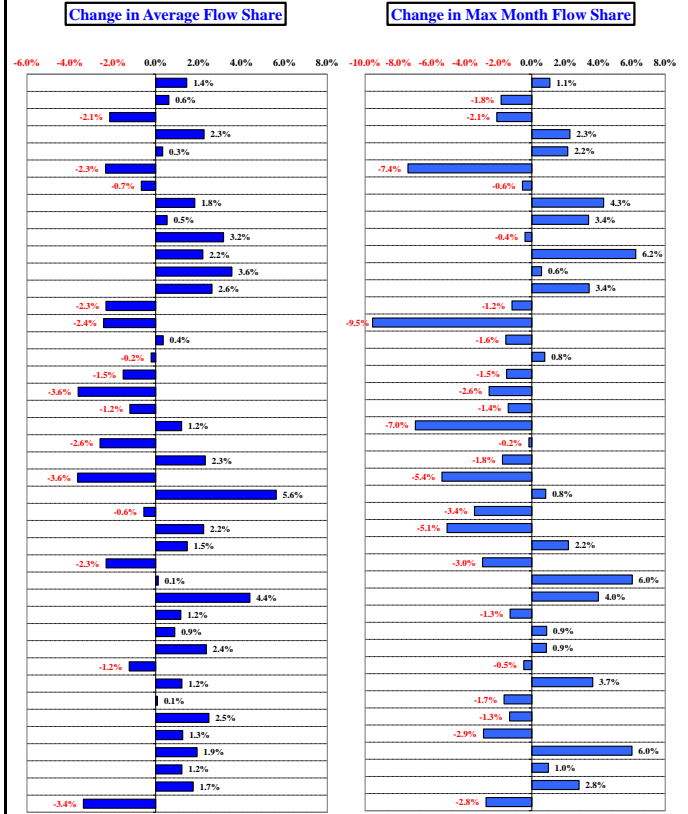
1st Quarter - FY19

How Projected CY2018 Community Wastewater Flows Could Effect FY2020 Sewer Assessments ^{1,2,3}

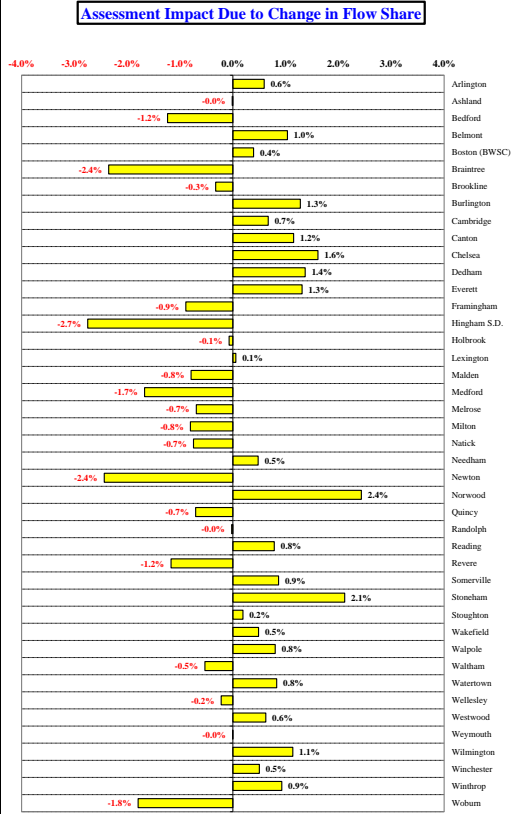
The flow components of FY2020 sewer assessments will be calculated using a 3-year average of CY2016 to CY2018 wastewater flows compared to FY2019 assessments that used a 3-year average of CY2015 to CY2017 wastewater flows.



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



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



Notes:
¹ MWRA uses a 3-year flow average to calculate sewer assessments. Three-year averaging smoothes the impact of year-to-year changes in community flow share, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.
² Based on CY2015 to CY2018 average wastewater flows as of 10/17/18. Flow data is preliminary and subject to change pending additional MWRA and community review.
³ CY2015 to CY2017 wastewater flows based on actual meter data. CY2018 flows based on actual meter data for January to August, and project flows for September to December.
⁴ Represents **ONLY** the impact on the total BASE assessment resulting from the changes in average and maximum wastewater **FLOW SHARES**.

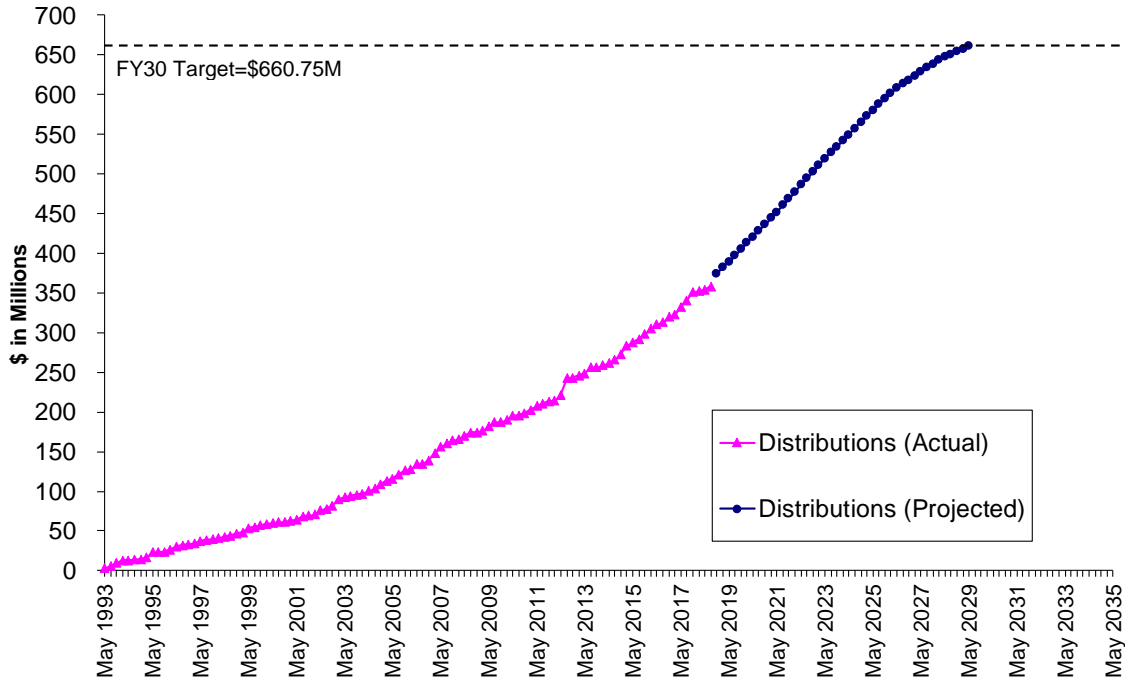
Community Support Programs

1st Quarter – FY19

Infiltration/Inflow Local Financial Assistance Program

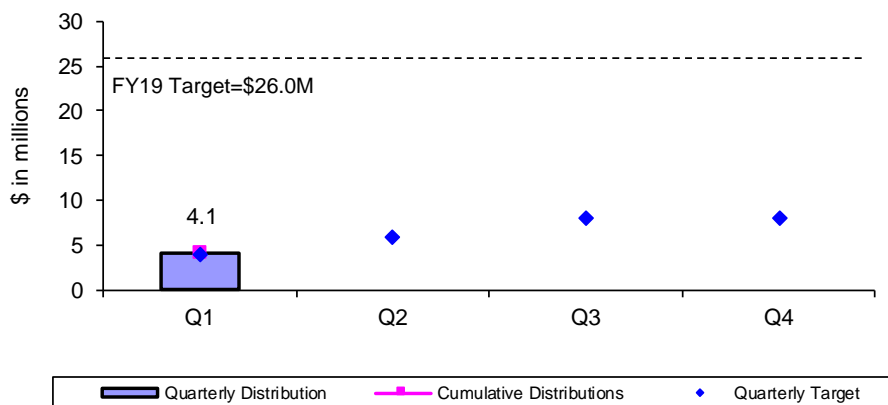
MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$660.75 million in grants and interest-free loans (average of about \$18 million per year from FY93 through FY30) to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Eligible project costs include: sewer rehabilitation construction, pipeline replacement, removal of public and private inflow sources, I/I reduction planning, engineering design, engineering services during construction, etc. I/I Local Financial Assistance Program funds are allocated to member sewer communities based on their percent share of MWRA's wholesale sewer charge. Phase 1-8 funds (total \$300.75 million) were distributed as 45% grants and 55% loans with interest-free loans repaid to MWRA over a five-year period. Phase 9 through 12 funds (total \$360 million) are distributed as 75% grants and 25% loans with interest-free loans repaid to MWRA over a ten-year period. An additional future Phase 13 providing \$100 million in loan only funds is not yet included in this report.

I/I Local Financial Assistance Program Distribution FY93-FY30



During the 1st Quarter of FY19, \$4.1 million in financial assistance (grants and interest-free loans) was distributed to fund local sewer rehabilitation projects in Boston, Milton, Natick and Weymouth. Total grant/loan distribution for FY19 is \$4.1 million. From FY93 through the 1st Quarter of FY19, all 43 member sewer communities have participated in the program and more than \$358 million has been distributed to fund 549 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY19 Quarterly Distributions of Sewer Grant/Loans



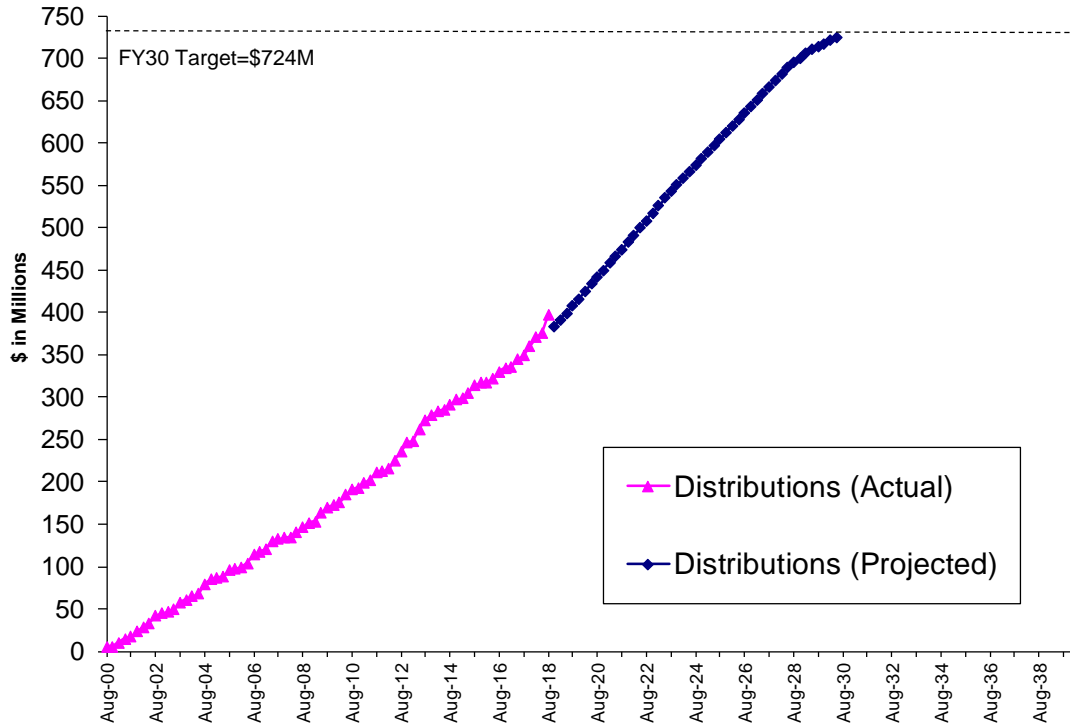
Community Support Programs

1st Quarter – FY19

Local Water System Assistance Program

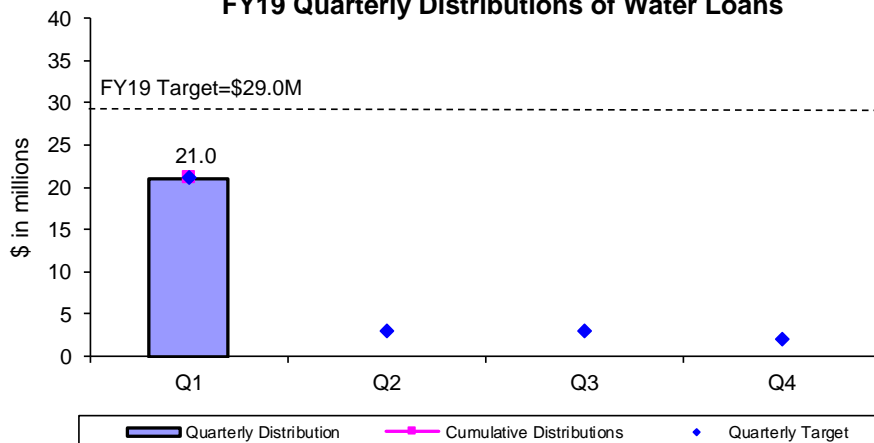
MWRA's Local Water System Assistance Programs (LWSAP) provides \$724 million in interest-free loans (an average of about \$24 million per year from FY01 through FY30) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. There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

Local Water System Assistance Program Distribution FY01-FY30



During the 1st Quarter of FY19, \$21.0 million in interest-free loans was distributed to fund local water projects in Belmont, Boston, Melrose, Milton, Norwood, Quincy, Revere, Somerville and Wakefield. Total loan distribution for FY19 is \$21.0 million. From FY01 through the 1st Quarter of FY19, more than \$396 million has been distributed to fund 418 local water system rehabilitation projects in 42 MWRA member water communities. Distribution of the remaining funds has been approved through FY30 and community loan repayments will be made through FY40. All scheduled community loan repayments have been made.

FY19 Quarterly Distributions of Water Loans



Community Support Programs

1st Quarter – FY19

Lead Service Line Replacement Loan Program

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

FY17 was the first year of the Lead Service Line Replacement Loan Program. During FY17, MWRA made three Lead Loan Program distributions as noted in the Table below.

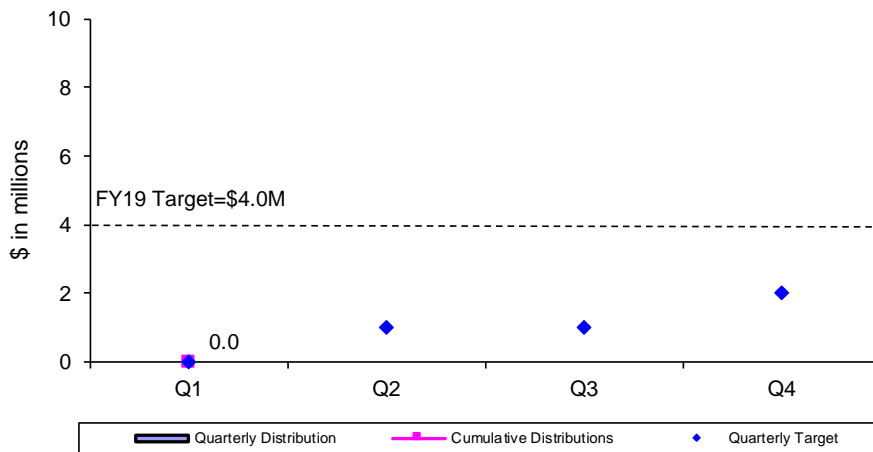
FY18 was the second year of the Lead Loan Program. During FY18, MWRA made five Lead Loan Program distributions as noted in the table below.

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

Summary of Lead Loans:

| | |
|---------------------------|----------------------|
| Needham in FY18 | \$1.0 Million |
| Winchester in FY18 | \$0.5 Million |
| Revere in FY18 | \$0.2 Million |
| Winthrop in FY18 | \$0.3 Million |
| Marlborough in FY18 | \$1.0 Million |
| Newton in FY17 | \$4.0 Million |
| Quincy in FY17 | \$1.5 Million |
| <u>Winchester in FY17</u> | <u>\$0.5 Million</u> |
| TOTAL | \$9.0 Million |

FY19 Quarterly Distributions of Lead Service Line Replacement Loans

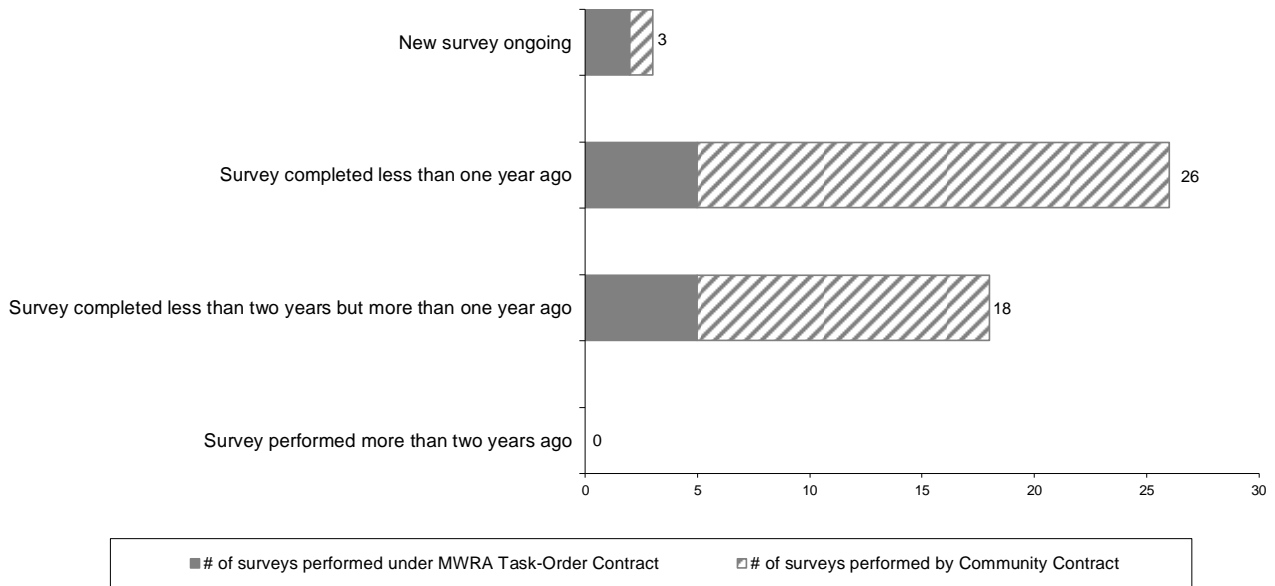


Community Support Programs

1st Quarter – FY19

Community Water System Leak Detection

To ensure member water communities identify and repair leaks in locally-owned distribution systems, MWRA developed leak detection regulations that went into effect in July 1991. Communities purchasing water from MWRA are required to complete a leak detection survey of their entire distribution system at least once every two years. Communities can accomplish the survey using their own contractors or municipal crews; or alternatively, using MWRA’s task order leak detection contract. MWRA’s task order contract provides leak detection services at a reasonable cost that has been competitively procured (3-year, low-bid contract) taking advantage of the large volume of work anticipated throughout the regional system. Leak detection services performed under the task order contract are paid for by MWRA and the costs are billed to the community the following year. During the 1st Quarter of FY19, all member water communities were in compliance with MWRA’s Leak Detection Regulation.



Community Water Conservation Outreach

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

| | Annual Target | Q1 | Q2 | Q3 | Q4 | Annual Total |
|---|---------------|--------|----|----|----|--------------|
| Educational Brochures | 100,000 | 690 | | | | 690 |
| Low-Flow Fixtures (showerheads and faucet aerators) | 10,000 | 1,738 | | | | 1,738 |
| Toilet Leak Detection Dye Tablets | ----- | 15,202 | | | | 15,202 |

BUSINESS SERVICES

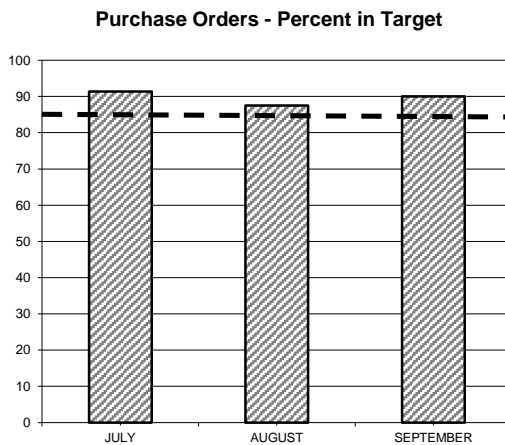
Procurement: Purchasing and Contracts

1st Quarter - FY19

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

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

Purchasing



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

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

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

Contracts, Change Orders and Amendments

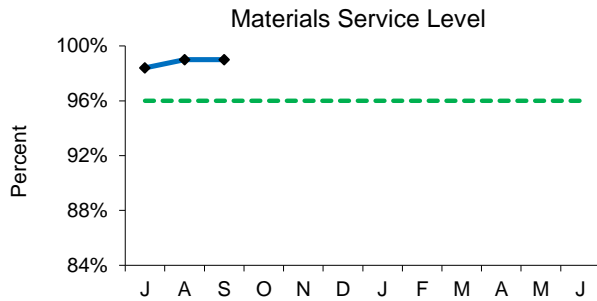
Seven contracts were not processed within the target timeframes. For two related contracts, the procurement process began in advance of the need for the services and the contract effective date was delayed by two days from the target timeframes to allow for the predecessor contracts to expire. The new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

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

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

Materials Management

1st Quarter - FY19



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

Inventory Value - All Sites

Inventory goals focus on:

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

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

Items added to inventory this quarter include:

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

Property Pass Program:

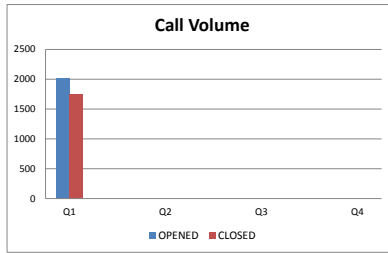
- Five audits were conducted during Q1.
- Scrap revenue received for Q1 amounted to \$10,839. Year to date revenue received amounted to \$10,839.
- Revenue received from online auctions held during Q1 amounted to \$132,768. Year to date revenue received amounted to \$132,768.

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

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

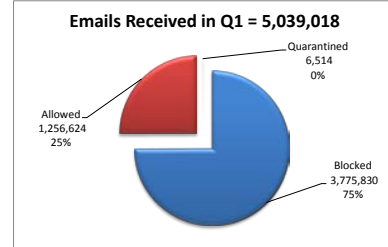
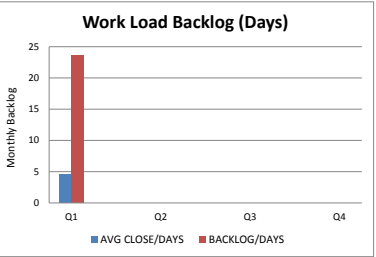
MIS Program

1st Quarter FY19



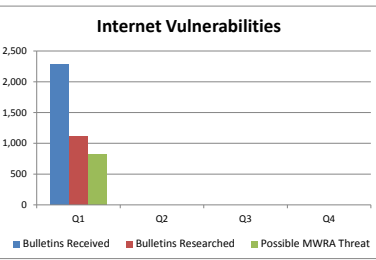
Performance & Backlog for Q1

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



Information Security for Q1

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



Infrastructure:

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

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

Audio/Visual Upgrades:

Product evaluations conducted. Initial upgrades to encompass four conference rooms.

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

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

AutoCad Upgrade: Completed.

Branch Office VPN Hardware Replacement: Completed.

Applications/Library & Records Center/Training:

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

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

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

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

PIMS: Updated reports to accommodate new EPA test method requirements.

PIMS CROMERR: Application development work is complete. MIS and TRAC team testing to identify any gaps in functionality and meet compliance requirements.

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

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

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

Legal Matters

1st Quarter - FY19

PROJECT ASSISTANCE

Real Estate, Contract, Environmental and Other Support:

- **8(m) Permits:** Reviewed fifty-three (53) 8(m) permits.
- **Real Property:** Drafted and finalized draft lease for procurement of storage space for records center. Drafted license for the use of certain Columbus Park Headworks land for a dog recreational area. Drafted and finalized Memorandum of Understanding by and between MWRA, Langwood Commons, LLC, and Alta Langwood, LLC regarding the mutual future release of certain easements on their respective adjoining parcels of land. Reviewed MWRA's Sudbury Aqueduct property rights adjacent to 969 Chestnut Street in Newton. Recorded affidavit required by MA Architectural Access Board relative to construction activities at the Prison Point CSO facility. Recorded Order of Conditions DEP 038-044 for MWRA water project in Lynn. Recorded Order of Conditions DEP 061-0719 for MWRA project in Revere. Reviewed MWRA lease for records center in Marlborough. Drafted two one-day licenses for use of a certain Deer Island land for two non-profit groups' walk/run events.
- **Public Records:** During the 1st Quarter of FY 2019, 110 public records requests were received and 117 public records requests were closed.

LABOR, EMPLOYMENT AND ADMINISTRATIVE

New Matters

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

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

LITIGATION/CLAIMS

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

New lawsuits/claims

(cont.):

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

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

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

Significant Developments

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

Closed Cases/Claims:

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

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

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

SUMMARY OF PENDING LITIGATION MATTERS

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

TRAC/MISC.

New Appeals: No new TRAC Appeals.

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

Stipulation of Dismissal No Joint Stipulation of Dismissals filed.

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

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

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

INTERNAL AUDIT AND CONTRACT AUDIT ACTIVITIES

1st Quarter - FY19

Highlights

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

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

Status of Recommendations

During FY19, two recommendations were closed from prior fiscal years' audits.

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

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

Cost Savings

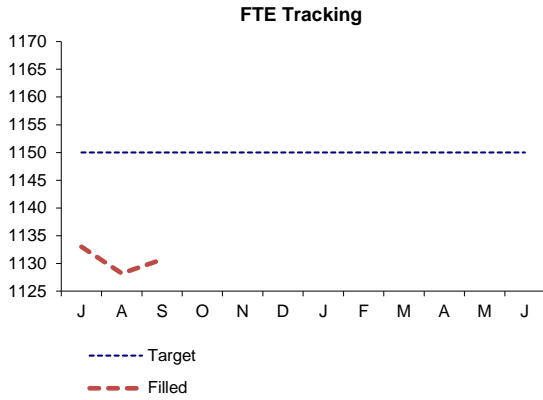
IA's target is to achieve at least \$1,000,000 in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of prior years' audits.

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

OTHER MANAGEMENT

Workforce Management

1st Quarter - FY19



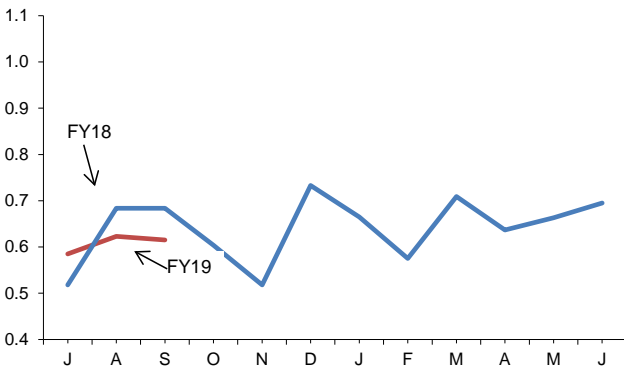
FY19 Target for FTE's = 1150
 FTE's as of Sept 2018 = 1130.7



Position Filled by Hires/Promos & Transfer for YTD FY19

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

Average Monthly Sick Leave Usage Per Employee

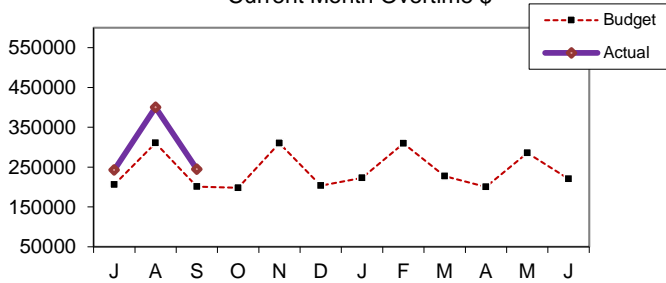


Average monthly sick leave for the 1st Quarter of FY19 decreased as compared to the 1st Quarter of FY18 (7.68 to 7.29 days)

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

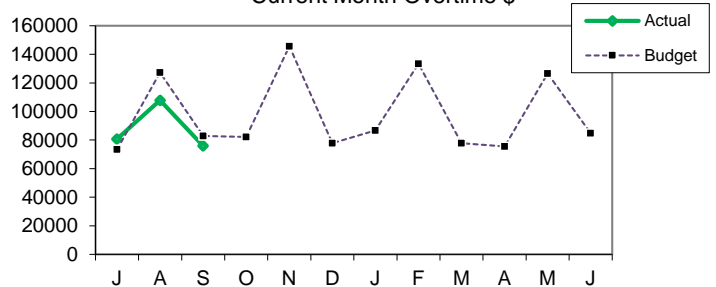
Percent of sick leave usage for FY19, attributable to Family and Medical Leave Act (FMLA) is 12.9% .

Field Operations Current Month Overtime \$



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

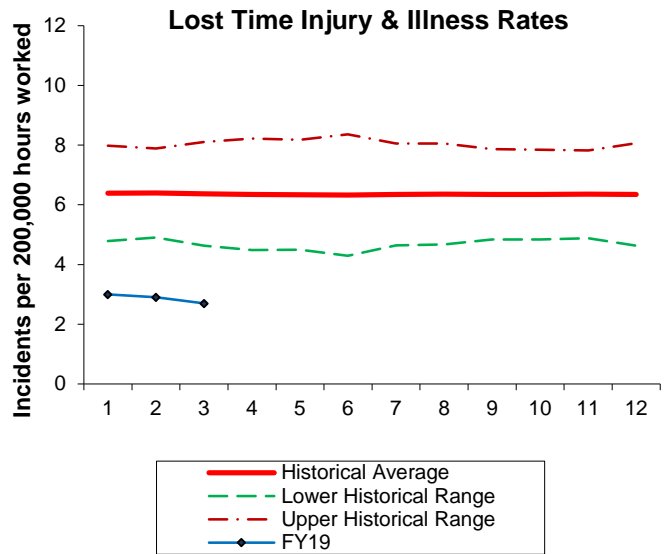
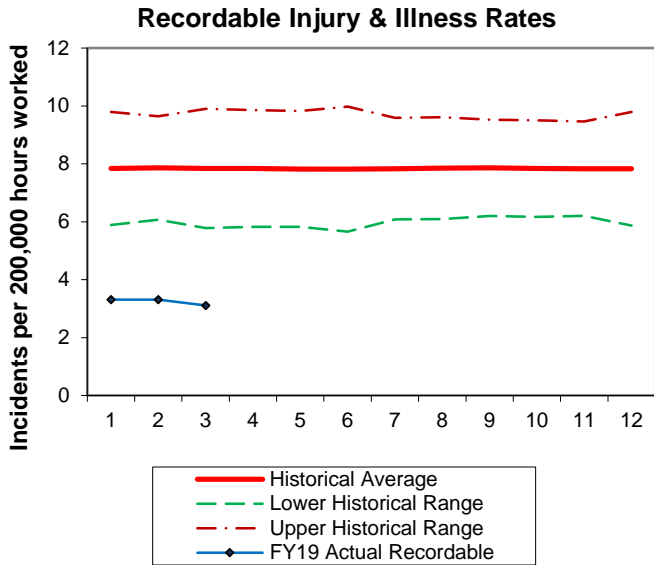
Deer Island Treatment Plant Current Month Overtime \$



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

Workplace Safety

1st Quarter - FY19



- 1 "Recordable" incidents are all work-related injuries and illnesses which result in death, loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.
- 2 "Lost-time" incidents, a subset of the recordable incidents, are only those incidents resulting in any days away from work, days of restricted work activity or both - beyond the first day of injury or onset of illness.
- 3 The "Historical Average" is computed using the actual MWRA monthly incident rates for FY99 through FY18. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively.

WORKERS COMPENSATION HIGHLIGHTS

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

COMMENTS:

Regular Duty Returns

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

Light Duty Returns

- JULY** N/A
- AUG** N/A
- SEPT** N/A

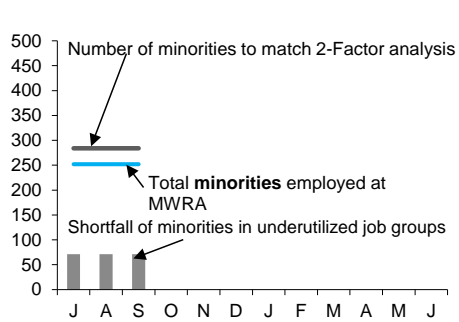
Note: Claims may initially be counted in one category and changed to another category at a later date. Examples include a medical treatment only claim (no lost time from work) but the employee may require surgery at a later date resulting in the claim becoming a lost time claim. At that time we would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

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

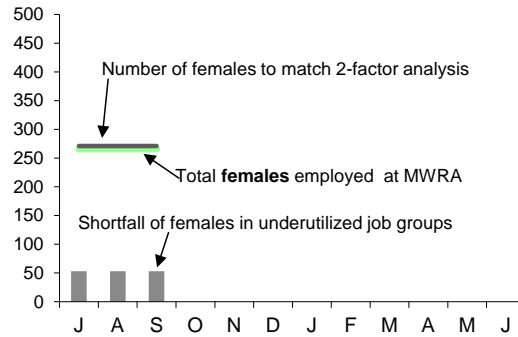
MWRA Job Group Representation

1st Quarter - FY19

Minority - Affirmative Action Plan Goals



Female - Affirmative Action Plan Goals



Highlights:

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

Underutilized Job Groups - Workforce Representation

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

AACU Candidate Referrals for Underutilized Positions

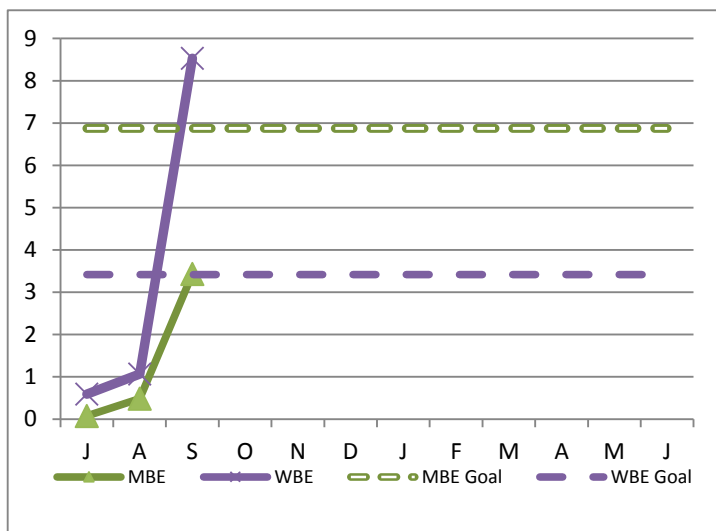
| Job Group | Title | # of Vac | Requisition Int. / Ext. | Int. Promotions / Transfers | AACU Ref. External | Position Status |
|------------------|---------------------------------------|----------|-------------------------|-----------------------------|--------------------|------------------|
| Administrative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

MBE/WBE Expenditures 1st Quarter - FY19

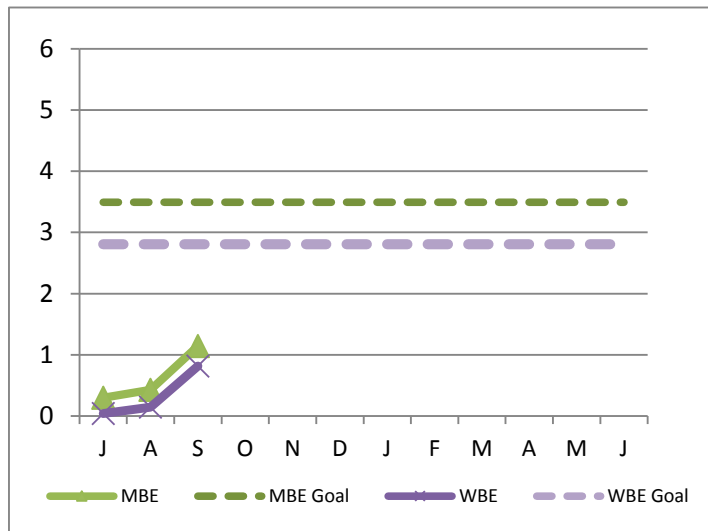
MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. The goals for FY19 are based on 85% of the total construction and 75% of the total professional projected spending for the year. Certain projects have been excluded from the goals as they have no MBE/WBE spending goals.

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

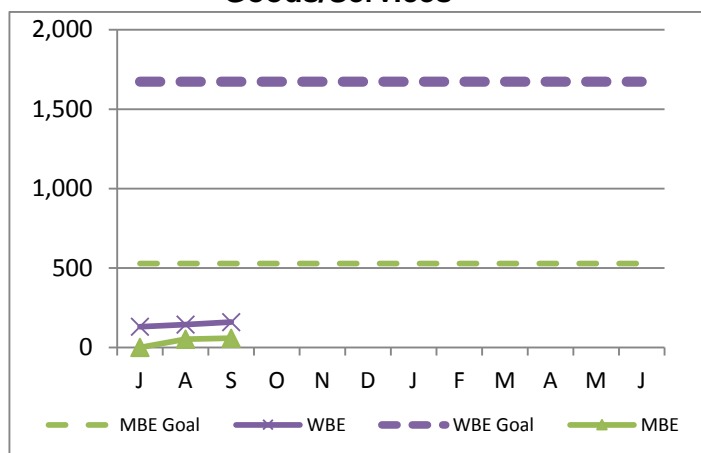
Construction



Professional Services



Goods/Services



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

MBE

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

WBE

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

Construction
Prof Svcs
Goods/Svcs
Totals

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

MWRA FY19 - CEB Expenses

1st Quarter – FY19

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

Expenses –

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

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

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

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

Revenue and Income –

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

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

Cost of Debt 1st Quarter – FY19

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

Average Cost of MWRA Debt FYTD

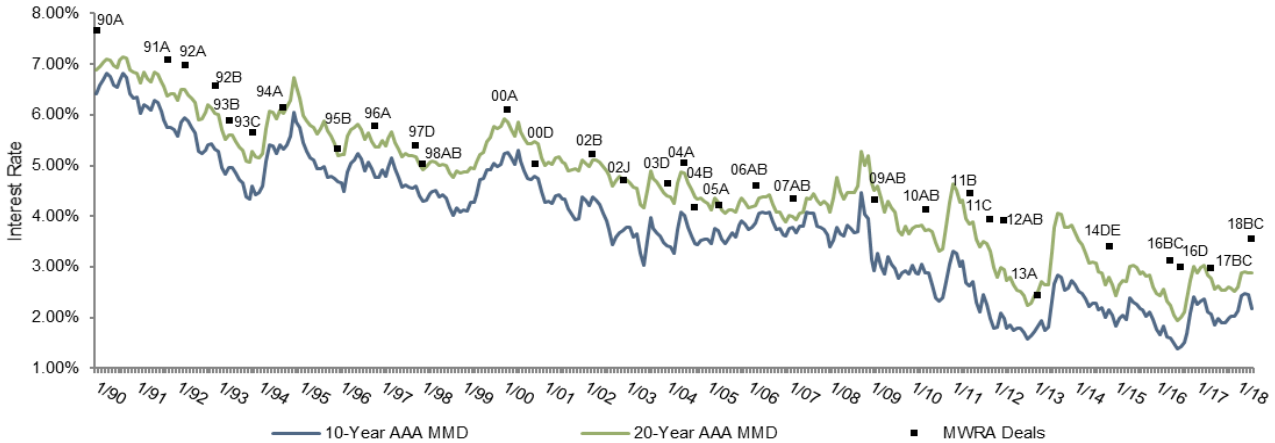
| | |
|---------------------------------|-------|
| Fixed Debt (\$3,437 billion) | 3.77% |
| Variable Debt (\$418.9 million) | 1.95% |
| SRF Debt (\$935.7 million) | 1.48% |

Weighted Average Debt Cost (\$4,791 billion) 3.17%

Most Recent Senior Fixed Debt Issue May 2018

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

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

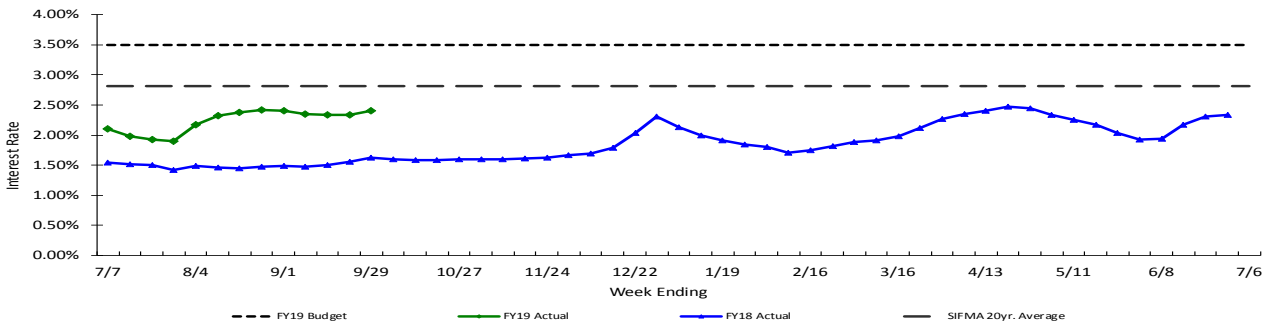


| Bond Deal | 1993B | 1993C | 1994A | 1995B | 1996A | 1997D | 1998AB | 2000A | 2000D | 2002B | 2002J | 2003D | 2004A | 2004B |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|
| Rate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

| Bond Deal | 2005A | 2006AB | 2007AB | 2009AB | 2010AB | 2011B | 2011C | 2012AB | 2013A | 2014DEF | 2016BC | 2016D | 2017BC | 2018BC |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|
| Rate | 4.22% | 4.61% | 4.34% | 4.32% | 4.14% | 4.45% | 3.95% | 3.93% | 2.45% | 3.41% | 3.12% | 2.99% | 2.98% | 3.56% |
| Avg Life | 18.4 yrs | 25.9 yrs | 24.4 yrs | 15.4 yrs | 16.4 yrs | 18.8 yrs | 16.5 yrs | 17.9 yrs | 9.9 yrs | 15.1 yrs | 17.4 yrs | 18.8 yrs | 11.2 yrs | 11.7 yrs |

Weekly Average Variable Interest Rates vs. Budget

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

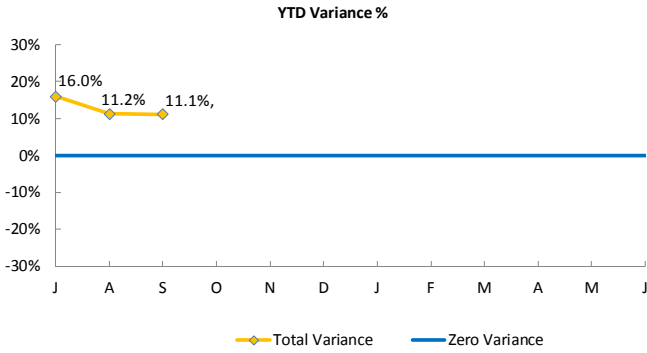


been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In September, SIFMA rates ranged from a high of 1.56% to a low of 1.48% for the month. MWRA's issuance of variable rate debt, although consistently less expensive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

Investment Income

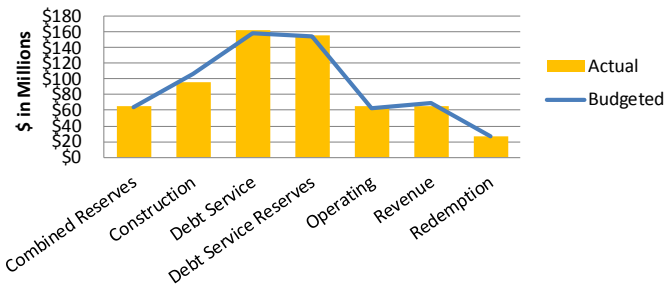
1st Quarter – FY19

Year To Date

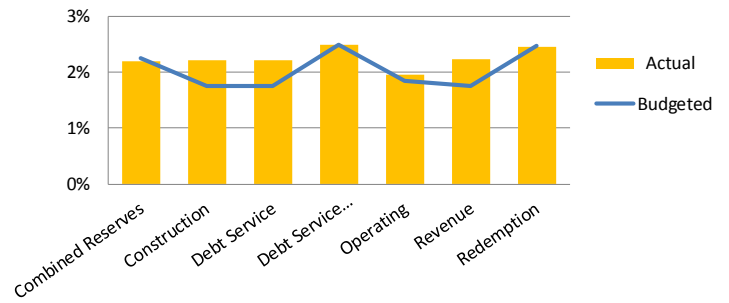


| | YTD BUDGET VARIANCE | | | |
|-----------------------|---------------------|--------------|--------------|--------------|
| | (\$000) | | | |
| | BALANCES IMPACT | RATES IMPACT | TOTAL | % |
| Combined Reserves | \$8 | (\$8) | 0 | 0.0% |
| Construction | (\$48) | \$111 | 63 | 13.5% |
| Debt Service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

YTD Average Balances Budgeted vs. Actual

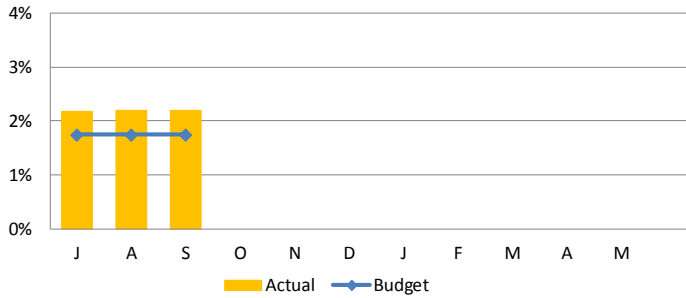


YTD Average Interest Rate Budgeted vs. Actual

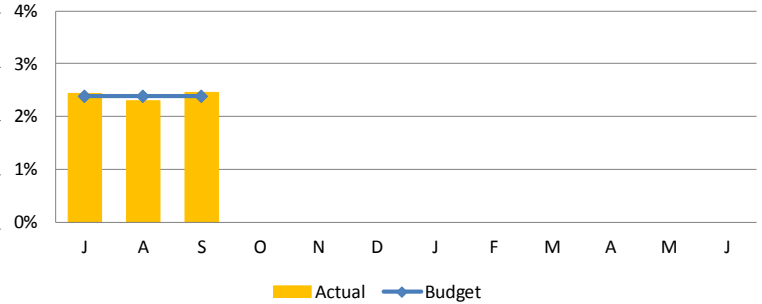


Monthly

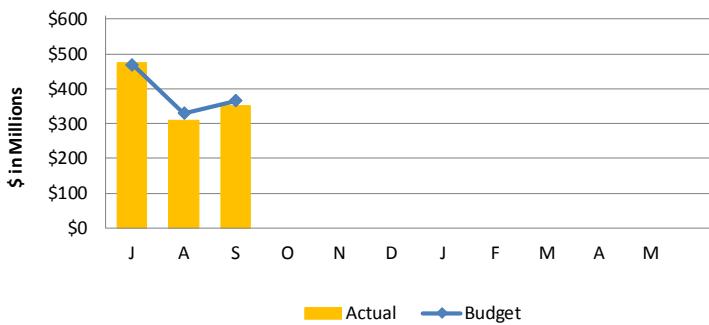
Short -Term Interest Rates



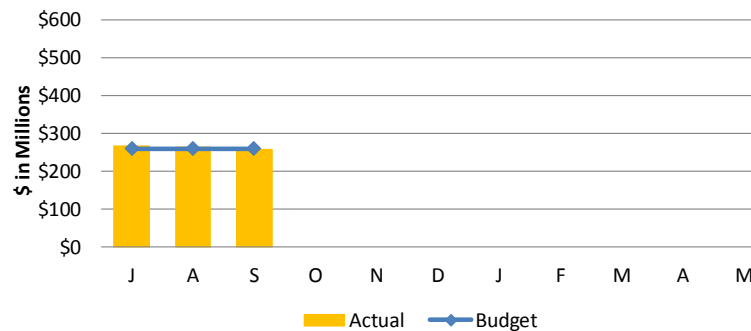
Long -Term Interest Rates



Short-Term Average Balances



Long-Term Average Balances



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: November 14, 2018
SUBJECT: Delegated Authority Report – October 2018



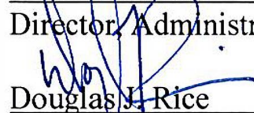
COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE

Linda D'Addario, Admin. Systems Coordinator
Barbara Aylward, Administrator A & F
Preparer/Title



Director, Administration


Douglas J. Rice

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, 2018.

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 February 21, 2018, 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.

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.

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, 2018

| NO. | DATE OF AWARD | TITLE AND EXPLANATION | CONTRACT | AMEND/CO | COMPANY | FINANCIAL IMPACT |
|------|---------------|--|----------|----------|--------------------------------------|------------------|
| C-1. | 10/10/18 | CATHODIC PROTECTION REPLACEMENT, SHAFT E AND SHAFT L AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR CATHODIC PROTECTION REPLACEMENT, SHAFT E AND SHAFT L FOR A TERM OF 231 CALENDAR DAYS. | 6440 | AWARD | CORRTECH, INC. | \$893,500.00 |
| C-2. | 10/12/18 | NORTHERN INTERMEDIATE HIGH SECTION 110 - READING AND WOBURN FURNISH AND INSTALL A 36-INCH MECHANICAL JOINT GATE VALVE MANHOLE; FURNISH, INSTALL AND CONNECT A TEMPORARY BYPASS WATER MAIN CONNECTION TO PROVIDE A CONTINUOUS WATER SUPPLY TO THE TOWN OF READING DURING CONSTRUCTION. RELOCATE A TOWN OF WOBURN WATER LINE; RELOCATE A 36-INCH FLANGED GATE VALVE AND VALVE VAULT. SAW CUT 2- FEET OF WALL AROUND THE PERIMETER. | 7471 | 20 | ALBANESE D&S, INC. | \$168,559.45 |
| C-3. | 10/18/18 | FIRE PROTECTION SPRINKLER SYSTEM SERVICE FINAL BALANCING CHANGE ORDER TO DECREASE THE FOLLOWING BID ITEMS TO REFLECT ACTUAL QUANTITIES USED: ON-SITE TESTING OF FIRE PROTECTION SPRINKLER SYSTEM, ON-SITE NON-EMERGENCY AND EMERGENCY REPAIR SERVICE ON FIRE PROTECTION SPRINKLER, REPLACEMENT PARTS AND MARK-UP. | OP-285 | 3 | WILLIAM M. COLLINS CO., INC. | (\$45,968.58) |
| C-4. | 10/23/18 | CRANE MAINTENANCE SERVICE AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR CRANE MAINTENANCE SERVICE FOR A TERM OF 730 CALENDAR DAYS. | OP-370 | AWARD | SAFEWAY OVERHEAD CRANE SERVICE, INC. | \$215,480.00 |
| C-5. | 10/26/18 | HVAC BUILDING AUTOMATION AND HVAC UNIT REPLACEMENT PRELIMINARY DESIGN, FINAL DESIGN AND ESDC DEER ISLAND TREATMENT PLANT DUE TO THE COMPLEXITY OF CONTRACT 7110 DRAWINGS AND SPECIFICATIONS ADDITIONAL LEVEL OF EFFORT IS NEEDED TO PROVIDE CLARIFICATION AND/OR INFORMATION TO QUESTIONS REQUESTED BY POTENTIAL BIDDERS. | 7111 | 1 | ARCADIS U.S., INC. | \$30,000.00 |
| C-6. | 10/26/18 | INSTRUMENTATION SYSTEMS SERVICES AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR INSTRUMENTATION SYSTEMS SERVICES FOR A TERM OF 730 CALENDAR DAYS. | OP-371 | AWARD | APOLLO SAFETY, INC. | \$175,750.00 |
| C-7. | 10/30/18 | UNION PARK PUMP STATION FUEL STORAGE UPGRADE AWARD OF A CONTRACT TO THE LOWEST RESPONSIVE BIDDER FOR UNION PARK PUMP STATION FUEL STORAGE UPGRADE FOR A TERM OF 180 CALENDAR DAYS. | OP-374 | AWARD | NRC EAST ENVIRONMENTAL SERVICES | \$203,800.00 |

PURCHASING DELEGATED AUTHORITY ITEMS OCTOBER 1 - 31, 2018

| NO. | DATE OF AWARD | TITLE AND EXPLANATION | CONTRACT | AMENDMEN | COMPANY | FINANCIAL IMPACT |
|------|---------------|--|-----------|----------|--|------------------|
| P-1. | 10/01/18 | MAINTENANCE AND SUPPORT FOR SAP BUSINESSOBJECTS' BUSINESS INTELLIGENCE SUITE AWARD OF A ONE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR SAP BUSINESSOBJECTS' BUSINESS INTELLIGENCE SUITE. | WRA-4568Q | | CARASOFT TECHNOLOGY CORP. | \$45,213.86 |
| P-2 | 10/01/18 | PURCHASE OF DISTRIBUTED ANTENNA SYSTEM EQUIPMENT AND UPGRADE SERVICES AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR DISTRIBUTED ANTENNA SYSTEM EQUIPMENT AND UPGRADE SERVICES FOR THE DEER ISLAND TREATMENT PLANT. | WRA-4562 | | CYBER COMMUNICATIONS SOLUTIONS, INC. | \$182,895.60 |
| P-3 | 10/10/18 | MAINTENANCE AND SUPPORT, AND IMPLEMENTATION SERVICES AWARD OF A FOUR-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR FIVE COMMVAULT DATA PROTECTION ADVANCED LICENSES. | WRA-4575Q | | SHI INTERNATIONAL CORP. | \$52,519.40 |
| P-4 | 10/12/18 | PURCHASE OF 195 LED REPLACEMENT EMERGENCY LIGHTING FIXTURES AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 195 REPLACEMENT EMERGENCY LIGHTING FIXTURES FOR THE DEER ISLAND TREATMENT PLANT. | WRA-4557 | | FASTENAL COMPANY | \$48,310.80 |
| P-5 | 10/12/18 | PURCHASE OF VARIOUS PLUMBING SUPPLIES AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR VARIOUS PLUMBING SUPPLIES FOR THE WASH DOWN DETENTION TANKS AT PRISON POINT CSO FACILITY. | WRA-4548 | | FW WEBB COMPANY | \$110,405.68 |
| P-6 | 10/12/18 | SUPPLY AND DELIVERY OF GRAVEL BORROW AWARD OF A ONE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR THE SUPPLY AND DELIVERY OF GRAVEL BORROW FOR THE CLINTON ADVANCED WASTEWATER TREATMENT PLANT'S LANDFILL. | WRA-4571 | | PLANET EARTH MATERIALS | \$186,890.00 |
| P-7 | 10/12/18 | PURCHASE OF TEMPORARY FLOW MONITORING AND DATA COLLECTION AWARD OF A ONE-YEAR PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR TEMPORARY FLOW MONITORING AND DATA COLLECTION AT VARIOUS MWRA WASTEWATER SITES. | WRA-4574 | | ADS, LLC | \$153,647.50 |
| P-8 | 10/18/18 | PURCHASE OF FIFTEEN ELECTRIC BURDEN CARRIERS AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR FIFTEEN ELECTRIC BURDEN CARRIERS FOR THE DEER ISLAND TREATMENT PLANT. | WRA-4560 | | BRODIE TOYOTA-LIFT | \$140,175.00 |
| P-9 | 10/25/18 | SUPPLY AND DELIVERY OF DRY POLYMER AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR THE SUPPLY AND DELIVERY OF DRY POLYMER FOR THE CLINTON WASTEWATER TREATMENT PLANT. | WRA-4591Q | | ATLANTIC COAST POLYMERS, INC. | \$26,320.00 |
| P-10 | 10/25/18 | PURCHASE OF ONE INFOWATER SUITE LICENSE AND ONE-YEAR OF SUPPORT AWARD OF A SOLE-SOURCE PURCHASE ORDER FOR ONE INFOWATER SUITE LICENSE AND ONE YEAR OF SUPPORT. | | | INNOVYZE, INC. | \$31,215.00 |
| P-11 | 10/25/18 | PURCHASE OF ONE NORWALK GAS COMPRESSOR AWARD OF A SOLE-SOURCE PURCHASE ORDER TO REBUILD ONE NORWALK GAS COMPRESSOR FOR THE DEER ISLAND TREATMENT PLANT. | | | NORWALK COMPRESSOR CO. | \$31,268.96 |
| P-12 | 10/25/18 | PURCHASE OF ONE 30KVA UNINTERRUPTIBLE POWER SUPPLY UNIT AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR ONE 30KVA UNINTERRUPTIBLE POWER SUPPLY UNIT FOR THE DEER ISLAND TREATMENT PLANT. | WRA-4563 | | WESCO DISTRIBUTION, INC. | \$66,430.00 |
| P-13 | 10/26/18 | PURCHASE OF 84 ALLEN BRADLEY 24-VOLT POWER SUPPLIES AWARD OF A PURCHASE ORDER TO THE LOWEST RESPONSIVE BIDDER FOR 84 ALLEN BRADLEY 24-VOLT POWER SUPPLIES FOR SCADA MONITORING CONTROL POWER. | WRA-4593Q | | NORTHEAST ELECTRICAL DISTRIBUTORS, INC. | \$35,910.76 |
| P-14 | 10/30/18 | SUPPLY AND DELIVERY OF FERRIC CHLORIDE AWARD OF A ONE-YEAR PURCHASE ORDER CONTRACT FOR THE SUPPLY AND DELIVERY OF FERRIC CHLORIDE TO THE CLINTON WASTEWATER TREATMENT PLANT. | WRA-4588 | | BORDEN & REMINGTON CORPORATION | \$87,237.00 |

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: FY19 Financial Update and Summary Through October 2018

COMMITTEE: Administration, Finance & Audit

Kathy Soni, Budget Director
Preparer/Title

INFORMATION
 VOTE


Thomas J. Durkin
Director, Finance

RECOMMENDATION:

For information only. This staff summary provides the financial results and variance highlights for Fiscal Year 2019 through October 2018, comparing actual spending to the budget.

DISCUSSION:

The total Year-to-Date variance for the FY19 CEB is \$6.4 million, due to lower direct expenses of \$2.6 million, indirect expenses of \$504,000, and debt service costs of \$2.6 million; and higher revenue of \$647,000.

FY19 Current Expense Budget

The CEB expense variances through October 2018 by major budget category were:

- Net Lower Direct Expenses of \$2.6 million, or 3.4% under budget. Spending was lower for Wages & Salaries, Maintenance, Professional Services, Worker's Compensation, Fringe Benefits, and Chemicals. This is offset by higher spending on Utilities, Overtime, Other Services, Training & Meetings, and Other Materials.
- Lower Indirect Expenses of \$504,000, or 2.8%, due to lower expenses for the low voltage switchgear upgrades related to the HEEC cable, lower Watershed reimbursements due to a 2018 year-end over accrual, and lower claim spending for Insurance.
- Lower Debt spending of \$2.6 million, or 1.7% due to favorable short-term interest rates, and favorable impact of lower than estimated borrowing cost for the State Revolving Fund.

FY19 Budget and FY19 Actual Year-to-Date Variance by Expenditure Category
(in millions)

| | FY19 Budget YTD | FY19 Actual YTD | \$ Variance | % Variance |
|-------------------|----------------------------|----------------------------|--------------------|-------------------|
| Direct Expenses | \$75.3 | \$72.8 | -\$2.6 | -3.4% |
| Indirect Expenses | \$17.9 | \$17.4 | -\$0.5 | -2.8% |
| Capital Financing | \$152.1 | \$149.5 | -\$2.6 | -1.7% |
| Total | \$245.3 | \$239.6 | -\$5.7 | -2.3% |

Totals may not add due to rounding

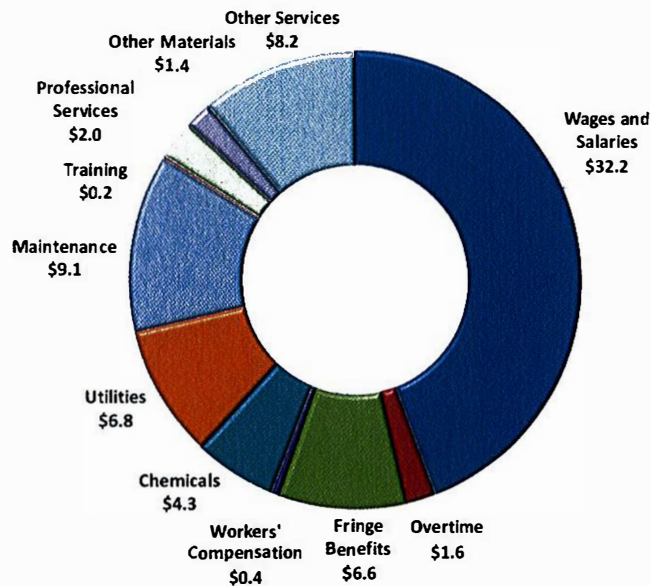
Total Revenues of \$251.8 million were \$647,000, or 0.3% over budget. The majority of the variance is pertaining to the favorable short term rates for investment income.

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

Direct Expenses

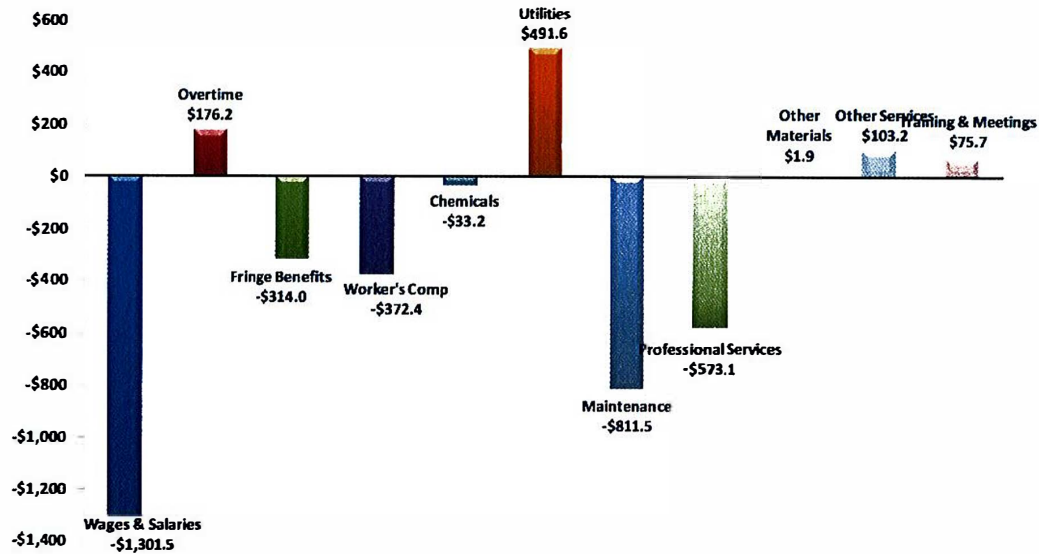
Year-to-date direct expenses totaled \$72.8 million, \$2.6 million, or 3.4%, less than budgeted.

FY19 Year-to-Date Direct Expenses
(in millions)



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

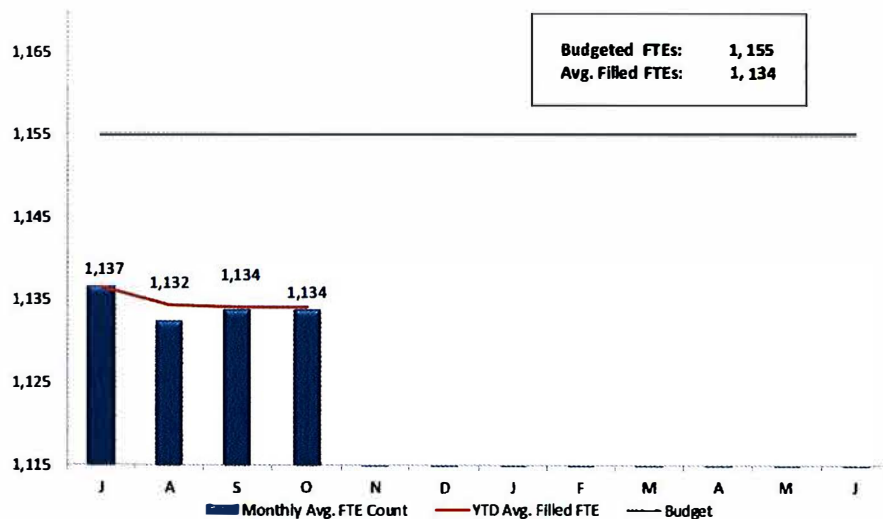
**FY19 Year-to-Date Direct Expense Variance
(in thousands)**



Wages and Salaries

Wages and Salaries are under budget by \$1.3 million, or 3.9%. Year to date, there have been 21 fewer average FTEs (1,134 versus 1,155 budget), lower average new hire salaries versus retirees' as well as the timing of backfilling vacant positions, and lower leave balance accruals contributed to Regular Pay being under budget.

FY19 MWRA Full Time Equivalent (FTE) Position Trend



Maintenance

Maintenance was under budget by \$812,000 or 8.2%. While there were numerous components to the underspending for Maintenance year-to-date, the largest cause for the under spending was the timing of boiler/steam turbine generator (STG) work at DITP planned for October but now scheduled for November.

Professional Services

Professional Services were under budget by \$573,000, or 22.3%. The overall underspending year-to-date is due to Engineering Services in Operations and Other Professional Services in Operations, Human Resources, Law and Finance.

Worker's Compensation

Worker's Compensation expenses were lower than budget by \$372,000, or 46.1%. The lower expenses were primarily due to lower medical payments and net reserve changes of \$174,000, lower compensation payments and net reserve changes of \$163,000, and administrative expenses of \$36,000.

Fringe Benefits

Fringe Benefit spending was lower than budgeted by \$314,000, or 4.5%, primarily for lower Health Insurance costs of \$288,000 due to fewer employees and retirees than budgeted participating in health insurance plans, and the ratio change of employee contribution and change from family to individual plans, which are less expensive.

Chemicals

Chemicals were lower than budget by \$33,000, or 0.8%. The majority of the variance for Chemicals was the result of lower Soda Ash costs at Carroll Plant and lower Hydrogen at Deer Island. This is offset by unanticipated spending to replace Activated Carbon at Nut Island Headworks and Braintree/Weymouth Intermediate Pump Station. Deer Island flows are 0.5% greater than the budget and the Carroll Plant flows are 4% less than budgeted.

Utilities

Utilities were overspent by \$492,000, or 7.7%. Electricity overspending is \$380,000 primarily at Deer Island. Diesel fuel overspending is \$112,000 for timing of deliveries primarily in Wastewater Operations.

Overtime

Overtime expenses were higher than budgeted by \$176,000, or 12.6%. The overspending for the fiscal year was mainly in Wastewater Operations for wet weather events.

Other Services

Other Services were over budget by \$103,000 or 1.3%. The main area of over spending was for Sludge Pelletization of \$362,000 due to higher year-to-date quantities. This was offset by lower spending in Telephones of \$133,000 associated with telephone and data lines in MIS and FOD, and Other Services of \$103,000 for a number of services, including timing of Technical Assistance for Lead issues, and timing of remediation projects managed by Real Property/Environmental Management.

Training & Meetings

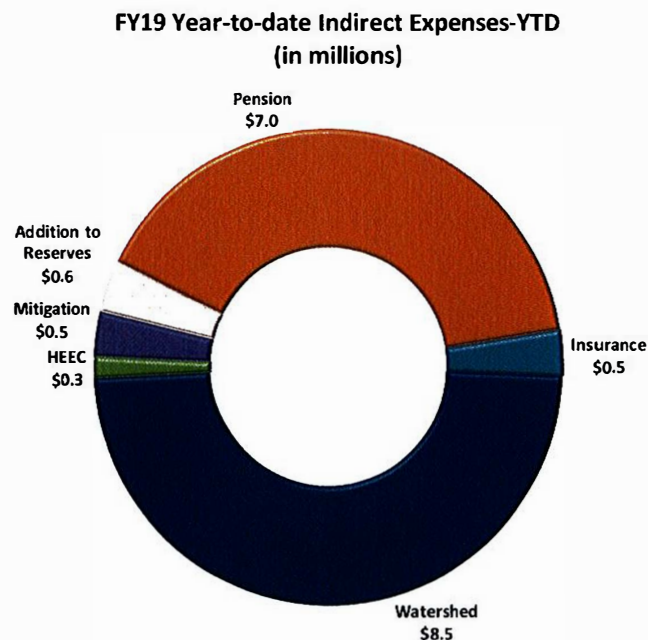
Training & Meetings expenses were higher than budgeted by \$76,000, or 73.0% in Operations and MIS due to timing.

Other Materials

Other Materials were less than budgeted by \$2,000 or 0.1%.

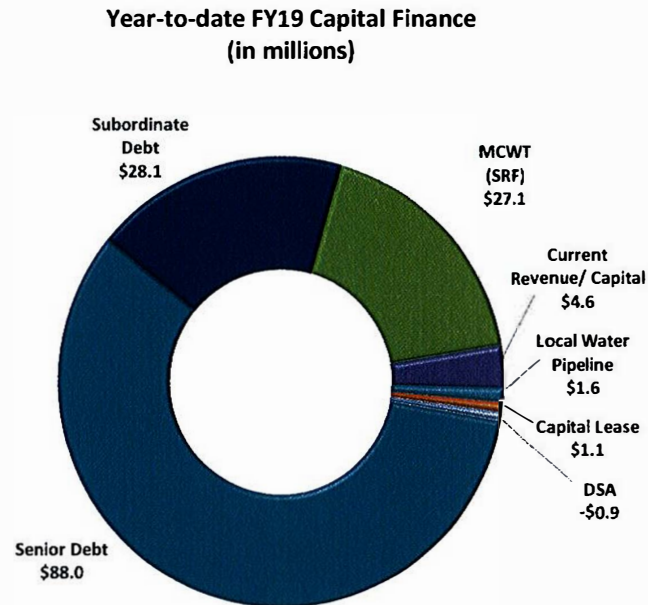
Indirect Expenses

Year-to-date Indirect Expenses totaled \$17.4 million, which is \$504,000 or 2.8% under budget. There are variances within the lines that comprise Indirect Expenses, including lower HEEC cable costs, Watershed costs, and Insurance costs. HEEC charges are under budget by \$205,000 for the low voltage switchgear upgrades, Watershed costs are lower than budget by \$154,000 due to an over-accrual at the end of FY18 of Watershed operating expenses. Insurance costs are lower than budget by \$145,000 for lower claims of \$113,000 and lower premiums of \$32,000.



Capital Financing

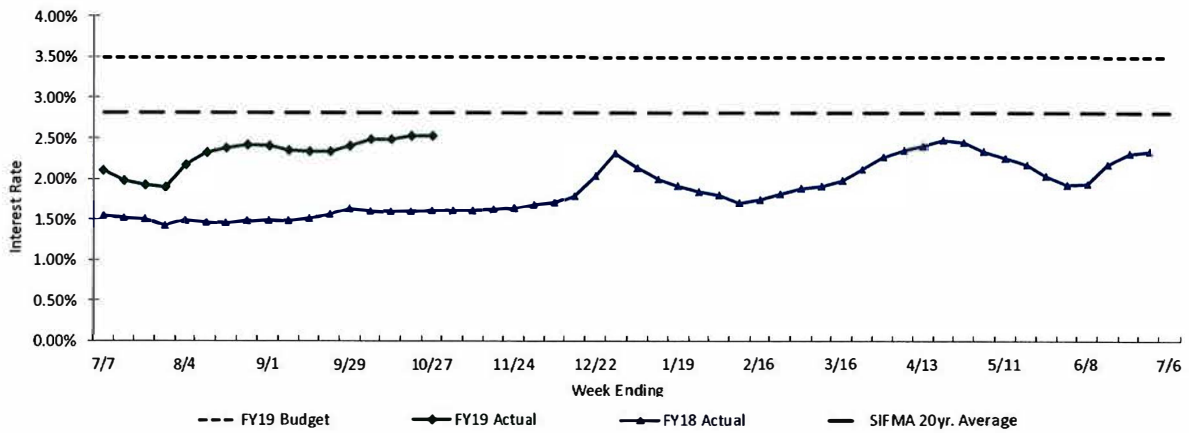
Capital Financing expenses include the principal and interest payments for fixed debt, the variable subordinate debt, the Massachusetts Clean Water Trust (SRF) obligation, the commercial paper program for the local water pipeline projects, current revenue for capital, and the Chelsea facility lease payment.



Year-to-date Capital Financing expenses for FY19 totaled \$149.5 million, which was under budget by \$2.6 million, or 1.7%. The variance is primarily attributed to favorable short-term variable rates.

The graph on the following page reflects the FY19 actual variable rate trend by week year-to-date against the FY19 Budget.

**Weekly Average Interest Rate on MWRA Variable Rate Debt
(Includes liquidity support and remarketing fees)**



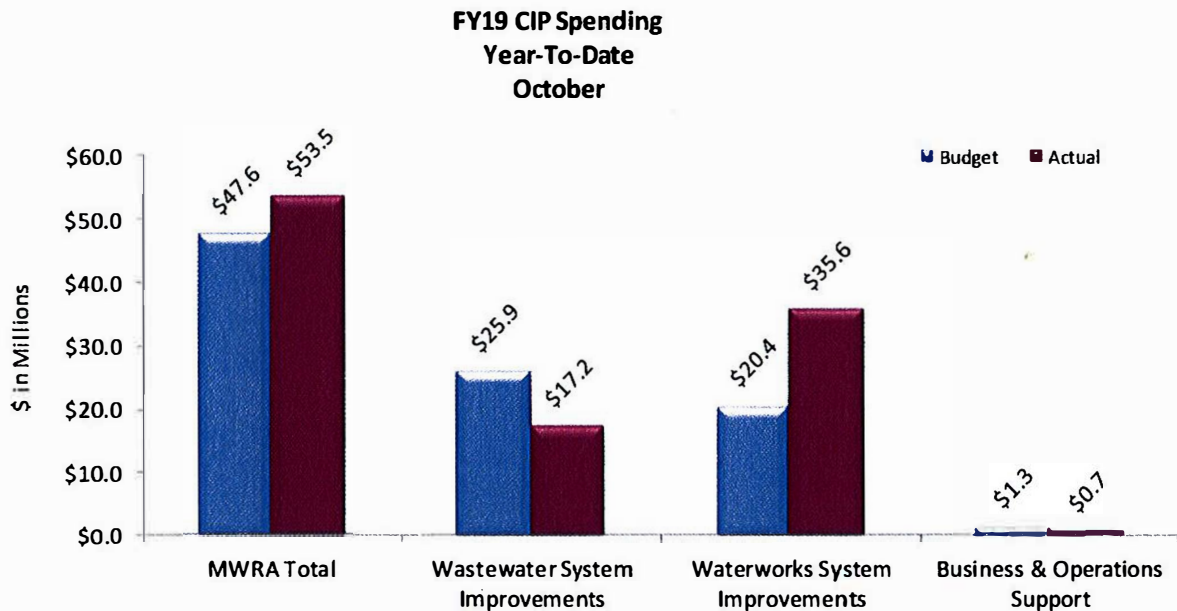
Revenue & Income

Year-to-date Revenues of \$251.8 million were \$647,000, or 0.3% over budget. Investment income was over budget \$531,000 for favorable returns on investment income (average short-term rates were higher than budgeted: 2.21% vs. 1.75%). In addition, income from disposal of equipment was \$162,000 higher than budget, \$70,000 higher for TRAC permit fees, and higher Miscellaneous Revenue of \$74,000. However, Energy Revenue was lower than budget by \$231,000 due to lower Renewable Portfolio credits of \$86,000, and Demand Response payments of \$86,000.

FY19 Capital Improvement Program

Capital expenditures in Fiscal Year 2019 through October total \$42.4 million, \$7.1 million, or 12.5%, over budget.

After accounting for programs which are not directly under MWRA's control, most notably the Inflow and Infiltration (I/I) grant/loan program, the Local Water Pipeline loan program, and the community managed Combined Sewer Overflow (CSOs) projects, capital spending totaled \$37.9 million, \$4.6 million, or 10.8%, under budget.



Overall CIP spending reflects the overspending of \$15.2 million in Waterworks Improvements, and underspending of \$8.6 million in Wastewater Improvements, and \$0.6 million in Business and Operations Support. Major variances in Waterworks are primarily due to greater than anticipated community requests for loans and contractor progress on the Northern Intermediate High Section 89 & 29 Construction Phase 2 and Wachusett Pump Station, partially offset by delays in Southern Extra High (SEH) Section 111 Construction 2 due to ledge encountered and delay in notice to proceed for SEH Construction 3.

Wastewater variances are primarily due to less than anticipated community requests for grants and loans for the Infiltration/Inflow (I/I) Local Financial Assistance Program, construction delays for the Chelsea Creek Headworks Upgrades due to odor control foundation and Channel 1 work, Somerville Marginal In-System Storage project due to delay in Somerville construction award, Winthrop Terminal Facility VFD Replacement due to motor commissioning testing issue, Alewife Brook Pump Station Rehabilitation due to timing of final work, and DeLauri Pump Station Screens and Security due to delay in delivery of screens, partially offset by initial progress for the Gravity Thickener Rehabilitation contract.

FY19 Budget and FY19 Actual Year-to-Date Variance by Program
(in millions)

| \$ in Millions | Budget | Actuals | \$ Var. | % Var. |
|---|---------------|---------------|----------------|---------------|
| Wastewater System Improvements | | | | |
| Interception & Pumping | 16.5 | 11.7 | (4.8) | -29.1% |
| Treatment | 2.6 | 2.5 | (0.1) | -5.1% |
| Residuals | 0.3 | 0.4 | 0.1 | 38.7% |
| CSO | 1.8 | 0.4 | (1.4) | -79.6% |
| Other | 4.6 | 2.2 | (2.4) | -52.1% |
| Total Wastewater System Improvements | \$25.9 | \$17.2 | (\$8.6) | -33.4% |
| Waterworks System Improvements | | | | |
| Drinking Water Quality Improvements | 0.7 | 0.4 | (0.3) | -41.0% |
| Transmission | 4.6 | 5.8 | 1.2 | 25.3% |
| Distribution & Pumping | 13.4 | 15.6 | 2.2 | 16.4% |
| Other | 1.7 | 13.8 | 12.1 | 713.5% |
| Total Waterworks System Improvements | \$20.4 | \$35.6 | \$15.2 | 74.7% |
| Business & Operations Support | \$1.3 | \$0.7 | (\$0.6) | -47.9% |
| Total MWRA | \$47.6 | \$53.5 | \$5.9 | 12.5% |

Totals may not add due to rounding

FY19 Year-to-date Spending by Program:

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

Other Waterworks: Net overspending of \$12.1 million

- \$13.0 million for the Local Water System Assistance Program due to greater loan requests than anticipated, partially offset by \$0.7 million for Bellevue 2 and Turkey Hill Painting/Improvements contract being awarded less than budget.

Interception & Pumping: Net underspending of \$4.8 million

- \$3.5 million for Chelsea Creek Upgrades Construction due to delays with odor control foundation and Channel 1 work.
- \$0.8 million for Alewife Brook Pump Station Construction due to timing of final work.
- \$0.4 million for DeLauri Pump Station Screens and Security due to delay in screen delivery.
- \$0.2 million for Wastewater Metering Planning/Study/Design due to additional time needed to obtain temporary meter data.
- \$0.2 million for Nut Island Odor Control and HVAC Design due to delay in completion of design documents.
- This underspending was partially offset by overspending of \$0.3 million for Prison Point Piping Rehabilitation for work scheduled for FY18 but completed in FY19.

Other Wastewater: Net underspending of \$2.4 million

- \$2.4 million for Community Infiltration/Inflow (I/I) due to less than budgeted requests for grants and loans.

Water Distribution and Pumping: Net overspending of \$2.2 million

- Overspending of \$2.8 million for NIH Section 89 & 29 Phase 2 Construction, \$0.3 million for Section 89/29 Redundancy Phase 1C Construction due to contractor progress, and \$0.3 million for NIH Section 89 & 29 Replacement Design, and \$0.3 million for Section 50 & 57 Water and Sections 21/20/19 Sewer Design due to consultant progress of work.
- This overspending was partially offset by \$0.7 million for SEH Section 111 Construction 2 due to delay as a result of ledge encountered and \$0.6 million for SEH Construction 3 due to delay in notice to proceed, and \$0.2 million for Section 14 Water Main Relocation (Malden) due to timing of final work.

Combined Sewer Overflow: Net underspending of \$1.4 million

- \$1.4 million for Somerville Marginal In-System Storage due to City of Somerville construction award was delayed.

Waterworks Transmission: Net overspending of \$1.2 million

- \$1.2 million for Wachusett Aqueduct Pump Station Construction due to contractor progress, \$0.4 million for Rosemary Brook Building Repair for FY18 work invoiced in FY19, and \$0.4 million for timing of Watershed Land purchases.
- This overspending was partially offset by underspending of \$0.2 million for WASM 3 MEPA/Design/CA/RI for test pit work that was delayed, and \$0.2 million for Maintenance Garage/Wash Bay/Storage Building for schedule delay, and \$0.1 million for Commonwealth Avenue Pump Station Design Construction Administration/Resident Inspection due to timing of work.

Business & Operations Support: Net underspending of \$0.6 million

- \$0.4 million for As-Needed Technical Assistance due to timing of task order work and \$0.2 million for Maximo Upgrade due to timing of final work.

Drinking Water Quality Improvements: Net underspending of \$0.3 million

- \$0.1 million for the Marlborough Maintenance Facility due to work scheduled in FY19 completed in FY18.

Wastewater Treatment: Net underspending of \$0.1 million

- Deer Island: \$0.9 million for Winthrop Terminal Facility VFD Replacement Construction due to motor commissioning testing problem, \$0.3 million for Radio Repeater System Upgrade 1 due to delay in award, partially offset by overspending of \$1.1 million for Gravity Thickener Rehabilitation due to earlier progress than originally anticipated.

Residuals: Net overspending of \$0.1 million

- Overspending of \$0.1 million for Sludge Tank & Silo Coating due to work scheduled for FY18 completed in FY19.

Construction Fund Balance

The construction fund balance was \$101.0 million as of the end of October. Commercial Paper/Revolving Loan availability was \$222.0 million to fund construction projects.

ATTACHMENTS:

Attachment 1 – Variance Summary October 2018

Attachment 2 – Current Expense Variance Explanations

Attachment 3 – Capital Improvement Program Variance Explanations

ATTACHMENT 1
FY19 Actuals vs. FY19 Budget

| | October 2018 Year-to-Date | | | | |
|-----------------------------------|------------------------------|------------------------|--------------------------|--------------|-----------------------|
| | Period 4 YTD Budget | Period 4 YTD Actual | Period 4 YTD Variance | % | FY19 Approved |
| | EXPENSES | | | | |
| WAGES AND SALARIES | \$ 33,518,286 | \$ 32,216,781 | \$ (1,301,505) | -3.9% | \$ 107,032,021 |
| OVERTIME | 1,396,769 | 1,572,957 | 176,188 | 12.6% | 4,447,554 |
| FRINGE BENEFITS | 6,902,837 | 6,588,818 | (314,019) | -4.5% | 21,173,571 |
| WORKERS' COMPENSATION | 807,536 | 435,090 | (372,446) | -46.1% | 2,422,609 |
| CHEMICALS | 4,306,108 | 4,272,922 | (33,186) | -0.8% | 10,830,452 |
| ENERGY AND UTILITIES | 6,350,162 | 6,841,808 | 491,646 | 7.7% | 22,868,632 |
| MAINTENANCE | 9,935,185 | 9,123,668 | (811,517) | -8.2% | 32,258,727 |
| TRAINING AND MEETINGS | 103,655 | 179,358 | 75,703 | 73.0% | 455,770 |
| PROFESSIONAL SERVICES | 2,567,253 | 1,994,126 | (573,127) | -22.3% | 7,675,976 |
| OTHER MATERIALS | 1,378,979 | 1,380,869 | 1,890 | 0.1% | 7,381,098 |
| OTHER SERVICES | 8,052,562 | 8,155,756 | 103,194 | 1.3% | 23,065,411 |
| TOTAL DIRECT EXPENSES | \$ 75,319,332 | \$ 72,762,153 | \$ (2,557,180) | -3.4% | \$ 239,611,821 |
| INSURANCE | \$ 686,231 | \$ 541,122 | \$ (145,109) | -21.1% | \$ 2,099,064 |
| WATERSHED/PILOT | 8,632,871 | 8,479,172 | (153,699) | -1.8% | 26,406,427 |
| HEEC PAYMENT | 462,272 | 257,363 | (204,909) | -44.3% | 1,386,832 |
| MITIGATION | 527,739 | 527,739 | - | 0.0% | 1,614,262 |
| ADDITIONS TO RESERVES | 615,204 | 615,204 | - | 0.0% | 1,881,797 |
| RETIREMENT FUND | 7,000,000 | 7,000,000 | - | 0.0% | 7,000,000 |
| POST EMPLOYEE BENEFITS | - | - | - | --- | 5,574,152 |
| TOTAL INDIRECT EXPENSES | \$ 17,924,317 | \$ 17,420,601 | \$ (503,716) | -2.8% | \$ 45,962,534 |
| STATE REVOLVING FUND | \$ 27,211,755 | \$ 27,052,029 | \$ (159,726) | -0.6% | \$ 89,380,363 |
| SENIOR DEBT | 87,986,109 | 87,986,109 | - | 0.0% | 272,633,982 |
| CORD FUND | - | - | - | --- | - |
| DEBT SERVICE ASSISTANCE | (944,726) | (944,726) | - | 0.0% | (944,726) |
| CURRENT REVENUE/CAPITAL | 4,642,305 | 4,642,305 | - | 0.0% | 14,199,991 |
| SUBORDINATE M/WRA DEBT | 30,597,700 | 30,597,700 | - | 0.0% | 92,032,292 |
| LOCAL WATER PIPELINE CP | 1,553,014 | 1,553,014 | - | 0.0% | 4,750,396 |
| CAPITAL LEASE | 1,051,731 | 1,051,731 | - | 0.0% | 3,217,060 |
| DEBT PREPAYMENT | - | - | - | --- | 7,100,000 |
| VARIABLE DEBT | - | (2,475,942) | (2,475,942) | --- | - |
| HEEC CABLE CAPACITY RESERV | - | - | - | --- | - |
| DEFEASANCE ACCOUNT | - | - | - | --- | - |
| TOTAL DEBT SERVICE | \$ 152,097,888 | \$ 149,462,220 | \$ (2,635,668) | -1.7% | \$ 482,369,358 |
| TOTAL EXPENSES | \$ 245,341,537 | \$ 239,644,974 | \$ (5,696,564) | -2.3% | \$ 767,943,713 |
| REVENUE & INCOME | | | | | |
| RATE REVENUE | \$ 241,609,950 | \$ 241,609,950 | \$ - | 0.0% | \$ 739,042,200 |
| OTHER USER CHARGES | 3,975,681 | 4,007,920 | 32,239 | 0.8% | 9,328,768 |
| OTHER REVENUE | 1,275,901 | 1,360,406 | 84,505 | 6.6% | 6,013,635 |
| RATE STABILIZATION | - | - | - | --- | - |
| INVESTMENT INCOME | 4,248,680 | 4,779,357 | 530,677 | 12.5% | 13,559,110 |
| TOTAL REVENUE & INCOME | \$ 251,110,212 | \$ 251,757,633 | \$ 647,422 | 0.3% | \$ 767,943,713 |

ATTACHMENT 2
Current Expense Variance Explanations

| Total MWRA | FY19 Budget YTD October | FY19 Actuals YTD October | FY19 YTD Actual vs. FY19 Budget | | Explanations |
|------------------------|----------------------------|-----------------------------|------------------------------------|--------|---|
| | | | \$ | % | |
| Direct Expenses | | | | | |
| Wages & Salaries | 33,518,286 | 32,216,781 | (1,301,505) | -3.9% | Wages and Salaries are under budget by \$1.3 million. Year to date, there have been 21 fewer average FTEs (1,134 versus 1,155 budget), lower average new hire salaries versus retirees, the timing of backfilling vacant positions, and lower leave balance accruals contributed to Regular Pay being under budget. |
| Overtime | 1,396,769 | 1,572,957 | 176,188 | 12.6% | Higher spending mainly in Wastewater Operations of \$173,000 for wet weather events. |
| Fringe Benefits | 6,902,837 | 6,588,818 | (314,019) | -4.5% | Lower than budget mainly in Health Insurance of \$288,000, due to fewer than budgeted participants in health insurance plans, increased contribution by external new hires vs. lower contribution rates of staff retiring, and the shift from family to individual plans which are less expensive. |
| Worker's Compensation | 807,536 | 435,090 | (372,446) | -46.1% | The lower expenses were primarily due to reductions in Medical payments and reserves of \$174,000, Compensation payments and reserves of \$163,000, and Administrative Expenses of \$36,000. Due to the uncertainties of when spending will happen, the budget is spread evenly through out the year. |
| Chemicals | 4,306,108 | 4,272,922 | (33,186) | -0.8% | Underspending in Soda Ash of \$160,000 at CWTP and Clinton; and Hydrogen Peroxide of \$121,000 at DITP. This is offset by overspending for Activated Carbon of \$158,000 for the unbudgeted replacement of carbon at Nut Island Headworks and Braintree Weymouth IPS for odor control, Sodium Bisulfite of \$60,000 at DITP and Wastewater Ops. DITP flows are 0.5% higher than the budget and CWTP flows are 6% less than the budget through October. It is important to note that Chemicals variances are also based on deliveries which in general reflect the usage patterns. However, the timing of deliveries is an important factor. |

ATTACHMENT 2
Current Expense Variance Explanations

| Total MWRA | FY19 Budget YTD October | FY19 Actuals YTD October | FY19 YTD Actual vs. FY19 Budget | | Explanations |
|-----------------------|----------------------------|-----------------------------|------------------------------------|--------|--|
| | | | \$ | % | |
| Utilities | 6,350,162 | 6,841,808 | 491,646 | 7.7% | Overspending in Electricity of \$380,000 primarily at DITP and Diesel Fuel of \$112,000 primarily in Wastewater Ops due to timing of deliveries. |
| Maintenance | 9,935,185 | 9,123,668 | (811,517) | -8.2% | Services were underspent by \$1.1 million and Materials were overspent by \$275,000. Underspending in Plant & Machinery Services of \$552,000 due to timing of boiler/steam turbine generator (STG) annual maintenance now schedule for November; Building & Grounds Services of \$372,000 in FOD primarily for timing of the fuel storage tank replacement at Union Park CSO facility and invasives control at the reservoirs; and Specialized Equipment Services of \$116,000 in DITP for timing of PICS upgrade, and OEP for Authority wide security system maintenance contract. Overspending in Specialized Equipment Materials of \$159,000 primarily in FOD for Prison Point wash-down system piping. (54700 is overspent by \$85k but it looks to be a number of items \$10k or less. |
| Training & Meetings | 103,655 | 179,358 | 75,703 | 73.0% | Overspending in Operations at FOD and Engineering, and MIS. |
| Professional Services | 2,567,253 | 1,994,126 | (573,127) | -22.3% | Underspending in Engineering Services of \$219,000 in Operations primarily at Reservoir Ops for timing of dam asset maintenance plans and DITP for timing of biosolids exemptions included in MDAR Regulation 330 CMR 31.00study of MWRA pellets; Other Professional Services of \$172,000 in Operations, HR for Training and the Pay Equity Study, Law, and Finance; Legal Services of \$77,000 in Law and HR; Lab & Testing Analysis of \$54,000 in EnQual Wastewater and Lab Services; and Computer System Consultants of \$54,000 in MIS. |

ATTACHMENT 2
Current Expense Variance Explanations

| Total MWRA | FY19 Budget YTD October | FY19 Actuals YTD October | FY19 YTD Actual vs. FY19 Budget | | Explanations |
|------------------------------|----------------------------|-----------------------------|------------------------------------|--------------|--|
| | | | \$ | % | |
| Other Materials | 1,378,979 | 1,380,869 | 1,890 | 0.1% | Higher than budgeted spending in Computer Hardware of \$55,000 in MIS; Work Clothes of \$46,000 in Operations; and Lab & Testing Supplies of \$41,000 in Laboratory Services. This was offset by lower than budgeted spending for Equipment/Furniture of \$63,000 in Operations for timing of water quality equipment; and Other Materials of \$61,000 in Clinton for gravel and Residuals for plastic bags for fertilizer; and Vehicle Expense of \$19,000 in Fleet Services for lower gasoline prices offset by higher diesel fuel prices. |
| Other Services | 8,052,562 | 8,155,756 | 103,194 | 1.3% | Higher than budgeted spending for Sludge Pelletization of \$362,000 due to higher year to date quantities related to Struvite control and the gravity thickener emergency repairs. This is offset by lower spending for Telephone/Data Services of \$133,000 in MIS and FOD; Other Services of \$103,000 for a number of services, including timing of Technical Assistance for Lead issues in Planning, remediation projects managed by Real Property/Environmental Management, and the switch from renting modems to purchasing them for the Contaminant Monitoring System in Water Quality Assurance; and Membership/Dues/Subscriptions of \$83,000 in Operations due too timing. |
| Total Direct Expenses | 75,319,332 | 72,762,153 | (2,557,179) | -3.4% | |
| Indirect Expenses | | | | | |
| Insurance | 686,231 | 541,122 | (145,109) | -21.1% | Lower claims than budgeted of \$113,000 and premiums of \$32,000. |
| Watershed/PILOT | 8,632,871 | 8,479,172 | (153,699) | -1.8% | Lower Watershed Reimbursement of \$154,000 million due to over accrual at the end of FY18 as compared to the actual amount paid in the first quarter of FY19. |
| HEEC Payment | 462,272 | 257,363 | (204,909) | -44.3% | Lower than budgeted spending on special projects related to the HEEC cable. |
| Mitigation | 527,739 | 527,740 | 1 | 0.0% | |
| Addition to Reserves | 615,204 | 615,204 | - | 0.0% | |
| Pension Expense | 7,000,000 | 7,000,000 | - | 0.0% | |
| Post Employee Benefits | - | - | - | | |

ATTACHMENT 2
Current Expense Variance Explanations

| Total MWRA | FY19 Budget YTD October | FY19 Actuals YTD October | FY19 YTD Actual vs. FY19 Budget | | Explanations |
|--|----------------------------|-----------------------------|------------------------------------|--------------|---|
| | | | \$ | % | |
| Total Indirect Expenses | 17,924,317 | 17,420,601 | (503,716) | -2.8% | |
| Debt Service | | | | | |
| Debt Service | 153,042,614 | 150,406,946 | (2,635,668) | -1.7% | \$2.5 million for lower than budgeted variable rate, and a combination of lower cost of borrowing and assumed versus actual borrowing terms for SRF funds. |
| Debt Service Assistance | (944,726) | (944,726) | - | 0.0% | |
| Total Debt Service Expenses | 152,097,888 | 149,462,220 | (2,635,668) | -1.7% | |
| Total Expenses | | | | | |
| Total Expenses | 245,341,537 | 239,644,974 | (5,696,563) | -2.3% | |
| Revenue & Income | | | | | |
| Rate Revenue | 241,609,950 | 241,609,950 | - | 0.0% | Higher DITP water costs of \$53,000. \$162,000 for disposal of surplus materials, \$70,000 for timing on TRAC permit fees received and \$37,000 unanticipated Cambridge water usage. This is offset by lower energy revenue received of \$231,000. |
| Other User Charges | 3,975,681 | 4,007,920 | 32,239 | 0.8% | |
| Other Revenue | 1,275,901 | 1,360,406 | 84,505 | 6.6% | |
| Investment Income | 4,248,680 | 4,779,357 | 530,677 | 12.5% | Investment Income is over budget mostly due to short term rates higher than budget (2.21% vs.1.75% budget). |
| Total Revenue | 251,110,212 | 251,757,633 | 647,421 | 0.3% | |
| Net Revenue in Excess of Expenses | 5,768,675 | 12,112,659 | 6,343,984 | | |

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

| | FY19 Budget YTD October | FY19 Actuals YTD October | YTD Actuals vs. Budget | | Explanations |
|---------------------------------|-------------------------------|--------------------------------|------------------------|---------------|--|
| | | | \$ | % | |
| Wastewater | | | | | |
| Interception & Pumping (I&P) | \$16,505 | \$11,706 | (\$4,799) | -29.1% | <u>Underspending</u> Chelsea Creek Headworks Upgrades - Construction and REI: \$3.5M (due to Channel 1 and odor control foundation delays) Alewife Brook Pump Station Rehab - Construction: \$772k (due to timing of final work) DeLauri Pump Station Screens and Security: \$393k (delay in delivery of screens) Nut Island Odor Control & HVAC Design/CA/REI: \$214k (delay in completion of design documents) Wastewater Meter System Planning/Study/Design: \$211k (due to additional time for acquisition of metering data) <u>Offset Overspending</u> Prison Point Pipeline Rehabilitation - Design/CA/RI: \$262k (work scheduled for FY18 performed in FY19) |
| Treatment | \$2,592 | \$2,460 | (\$131) | -5.1% | <u>Underspending</u> Radio Repeater System Upgrades - Phase 1: \$250k (award less than budgeted) WTF VFD Replacement - Construction: \$915k (due to motor commissioning testing problem) <u>Offset Overspending</u> Gravity Thickener Rehab: \$1.1M (contractor progress) |
| Residuals | \$324 | \$449 | \$125 | 38.7% | <u>Overspending</u> Sludge Tank & Silo Coating: \$125k (due to work scheduled for FY18 completed in FY19) |
| CSO | \$1,791 | \$365 | (\$1,426) | -79.6% | <u>Underspending</u> Somerville Marginal In-System Storage: \$1.4M (Somerville construction schedule change) |
| Other Wastewater | \$4,642 | \$2,225 | (\$2,418) | -52.1% | <u>Underspending</u> I/I Local Financial Assistance: \$2.4M (less than budgeted requests for grants and loans) |
| Total Wastewater | \$25,853 | \$17,205 | (\$8,648) | -33.4% | |

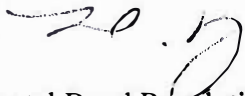
**ATTACHMENT 3
FY18 CIP Year-End Variance Report (000's)**

| | FY19 Budget YTD October | FY19 Actuals YTD October | YTD Actuals vs. Budget | | Explanations |
|-------------------------------------|-------------------------------|--------------------------------|------------------------|--------------|---|
| | | | \$ | % | |
| Waterworks | | | | | |
| Drinking Water Quality Improvements | \$663 | \$391 | (\$272) | -41.0% | <u>Underspending</u> Marlborough Maintenance Facility: \$119k (Timing of remaining work. Contract is substantially complete.) Miscellaneous contracts totaling \$153k |
| Transmission | \$4,601 | \$5,763 | \$1,162 | 25.3% | <u>Overspending</u> Wachusett Aqueduct Pump Station - Construction: \$1.2M (due to project progress) Rosemary Brook Siphon Building Repair: \$386k (timing of final payment) Watershed Land Acquisition: \$386k (timing of land purchases) <u>Offset Underspending</u> Maintenance Garage/Wash Bay/Storage Building: \$225k (schedule delay) WASM 3 - MEPA/Design/CA/RI: \$204k (test pits work delayed) Commonwealth Avenue Pump Station Improvements - Design/CA/RI: \$136k (timing of work) Miscellaneous contracts totaling \$245k. |
| Distribution & Pumping | \$13,421 | \$15,628 | \$2,207 | 16.4% | <u>Overspending</u> NIH Section 89/29 Redundancy Phase 1B and 1C and Phase 2 : \$3.2M, Section 89/29 Replacement - Design: \$216k, Sections 50 & 57 Water & 19/20/21 Sewer Rehab - Design/ESDC: \$285k (all due to project progress) <u>Offset Underspending</u> SEH Redundancy Pipeline Section 111 - Construction 2: \$650k (due to delay as a result of ledge encountered) SEH Redundancy Pipeline Section 111 - Construction 3: \$589k (due to delay in notice to proceed) Section 14 Water Pipe Relocation (Malden): \$180k (work scheduled for FY19 performed in FY18) |
| Other Waterworks | \$1,701 | \$13,835 | \$12,134 | - | <u>Overspending</u> Local Water Pipeline Financial Assistance Program: \$13.0M (greater than budgeted requests for loans) <u>Offset Underspending</u> Bellevue II & Turkey Hill Water Tanks Repainting: \$665k (award less than budgeted) |
| Total Waterworks | \$20,385 | \$35,617 | \$15,232 | 74.7% | |

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



| | FY19 Budget YTD October | FY19 Actuals YTD October | YTD Actuals vs. Budget | | Explanations |
|--|-------------------------------|--------------------------------|------------------------|--------|---|
| | | | \$ | % | |
| Business & Operations Support | | | | | |
| Total Business & Operations Support | \$1,328 | \$692 | (\$636) | -47.9% | <u>Underspending</u> As-Needed Technical Assistance: \$389k (due to timing of task order work) MIS Projects: \$239k (timing of final MAXIMO Upgrade work) |
| Total MWRA | \$47,567 | \$53,514 | \$5,947 | 12.5% | |

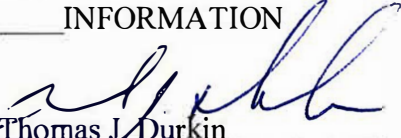
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Approval of the Seventy-Ninth Supplemental Bond Resolution

COMMITTEE: Administration, Finance & Audit

X VOTE
INFORMATION

Matthew R. Horan, Treasurer 
Sean R. Cordy, Sr. Financial Analyst 
Preparer/Title


Thomas J. Durkin
Director, Finance

RECOMMENDATION:

To adopt the Seventy-Ninth Supplemental Resolution authorizing the issuance of up to \$55,000,000 of Massachusetts Water Resources Authority Subordinated General Revenue Bonds and the supporting issuance resolution.

DISCUSSION:

The Massachusetts Clean Water Trust (“Trust”) provides subsidized financing for water and wastewater capital projects to Massachusetts governmental entities. MWRA annually submits new projects to the Massachusetts Department of Environmental Protection to be considered for inclusion on the Clean and Drinking Water Intended Use Plans. New and previously approved carry-over projects that are included on an Intended Use Plan are eligible to receive financing through the Trust. Historically, MWRA has drawn down its funding at the same time Trust was closing its long-term bond transaction. This arrangement assisted the Trust in accessing its federal funding and prevented stress on the Trust’s available funds given MWRA’s relatively large draws.

While MWRA typically only seeks funding on an annual basis, many of the Trust’s other borrowers periodically seek interim financing between the yearly long-term borrowing. The Trust uses its available cash to fund these interim loans. During the last several years, the Trust has discussed with MWRA staff switching from one annual funding to a periodic schedule similar to other borrowers. However, given the constraints on available cash and the size of the funding request, both the MWRA and the Trust have continued to utilize only the long-term borrowings for reimbursement. The timing of the Trust’s long-term borrowings has varied from year to year based on its financing needs, and as a result, the eligibility period for invoices MWRA will utilize for reimbursement has changed. While these timing changes have not impacted MWRA’s ability to receive its annual share of funds, it could cause an impact in the future.

Currently MWRA has approximately \$52.5 million in expenses which are eligible for reimbursement from the Trust. Based on a discussion with staff at the Trust, MWRA should be able utilize an interim loan to draw these funds. Under this structure, MWRA will enter into interest free interim loans with Trust. Once a sufficient amount of funds has been drawn by

MWRA and other communities, the Trust will issue long-term debt to permanently finance the loans. At that time, MWRA will enter into the standard long-term loans with the Trust as part of its Pool 22 borrowing. The total amount MWRA will borrow under the Trust's Pool 22 borrowing will not change, just the timing of when the funds are received.

In Fiscal Year 2019, MWRA anticipates receiving up to \$55 million in new, low-interest loans from the Trust to fund several water and wastewater projects. The loans will have a 20-year maturity at a fixed interest rate of 2.15%, including the Trust administrative fee of 0.15%. The Trust also charges a loan origination fee of \$5.50 per \$1,000 to cover its costs of issuance.


In order to move ahead with the Pool 22 interim and permanent borrowing, the Trust requires that all borrowers sign loan commitment documents which indicate that they have the authorization to borrow these funds. Once the documents are completed, MWRA will begin drawing funds. While this new structure will allow MWRA to access the interest free funds sooner, it may make budgeting for the debt service costs associated with the permanent financing less certain. MWRA is required by its General Bond Resolution to make monthly principal and interest deposits to the debt service accounts for these bonds. Since MWRA is required to budget the funds for anticipated principal and interest payments, shifts in timing of the permanent financing will change when deposits are required and may reduce budgeted debt service expenses.

MWRA expects to receive reimbursements for projects including: The Wachusett Aqueduct Pump Station, Alewife Brook Pumping Station, Southern Extra High Redundancy, Chelsea Creek Headworks Upgrades, and Reading Extension Sewer Interceptor Renewal.

BUDGET/FISCAL IMPACT:

There are sufficient funds available in the FY19 CEB to pay the debt service costs associated with these borrowings.

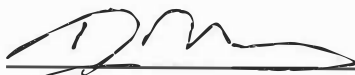
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Memoranda of Understanding Between MWRA and Eversource, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies), and National Grid

COMMITTEE: Administration, Finance & Audit

INFORMATION
 VOTE

Carolyn M. Fiore, Deputy Chief Operating Officer
Michael McDonald, Manager, Energy
Denise Breiteneicher, Prog. Manager, Energy & Env. Mgmt.
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

Staff have coordinated with both of its electric utilities, Eversource/Northeast Utilities and National Grid, to develop Memoranda of Understanding (MOUs) for energy efficiency undertakings. The proposed MOUs are agreements that allow MWRA to obtain rebates from the utilities for implementing energy efficiency projects. The MOUs will also support the identification and implementation of energy efficiency opportunities throughout MWRA's day-to-day operations and construction programs. This will be the second 3-year MOU with Eversource and the first with National Grid. Under the first MOU with Eversource, MWRA met its target of saving 17.9M kWh over three years resulting in \$1.7 million in cumulative savings and incentives of \$3.4 million.

RECOMMENDATION:

To authorize the Executive Director, on behalf of the Authority, to execute non-binding Memoranda of Understanding with Eversource Electric Company, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies, collectively referred to as Eversource) and National Grid, substantially in the forms attached hereto.

DISCUSSION:

Both Eversource and National Grid (NGRID) have a mandate to partner with customers who are interested in undertaking energy efficiency programs in a comprehensive manner. From Eversource's and NGRID's viewpoint, investing in energy efficiency enables them to reduce electric infrastructure expenditures and reduce emissions, an objective shared by MWRA. Further, per the Green Communities Act of 2008, Eversource and NGRID (and other Massachusetts electric utilities) are required to "...provide for the acquisition of all available energy efficiency and demand reduction measures that are cost effective or less expensive than supply." The utilities established an energy efficiency goal with the Massachusetts Department of Public Utilities for a 2.8% per year reduction in annual electricity usage across its entire portfolio of customers.

MWRA's operating protocols and objectives to use resources efficiently, respond appropriately to climate change, reduce the environmental impact of its daily operations, and lead by example in the Commonwealth's sustainability initiatives are well aligned with these utilities' obligations to reduce their electricity usage. Similarly, the MOUs continue MWRA's tradition of aggressively pursuing financial assistance.

Deer Island and a number of smaller water and wastewater facilities are in Eversource's Eastern and Western managed electric service areas. Facilities such as the Nut Island Headworks, the Carroll Water Treatment Plant, and the Clinton Wastewater Treatment Plant are in NGRID's electrical service area. The proposed MOUs are non-binding agreements that establish a goal of approximately 3% savings in electricity use each year due to energy efficiency projects.

The MOUs will do the following:

- Require development of an annual list of energy efficiency projects that MWRA plans to pursue with the utilities' financial assistance. Many of the energy efficiency projects MWRA has undertaken to this point have addressed the "low-hanging fruit," such as lighting, HVAC, and building controls. Going forward, MWRA has discussed with both utilities that it will be looking not only at these types of projects, but also at more process-related projects, such as improving efficiency of pumps and motors, as well as those that MWRA is undertaking for asset protection and rehabilitation needs that will also incorporate energy efficiency elements.
- Establish a minimum for what Eversource and NGRID will pay MWRA per kilowatt hour (kWh) saved for each approved energy efficiency project.
 - Eversource: The minimum price per kWh saved will be \$0.325, which is a one-time reimbursement to MWRA. Under the previous MOU with Eversource, MWRA received \$0.30/per kWh.
 - NGRID: The minimum price per kWh saved will be \$0.30 for projects with expected savings of less than 1 million kWh, and \$0.33 for projects with expected savings of over 1 million kWh.
- Encourage MWRA to provide detailed information to Eversource and NGRID on all projects for which funding will be sought, and in turn, Eversource and NGRID will review each individual project prior to committing funding to a project. Once the utilities have reviewed and approved an energy project, they are then committed to funding it.
- Present MWRA's intention to conduct additional energy efficiency performance assessments and audits, and to partner with Eversource and NGRID to identify additional best management practices and energy efficiency measures through energy audits and studies. Per the MOUs, the utilities will work with MWRA staff to develop energy conservation specifications for planned replacement of equipment, new construction, and major renovation. In addition, Eversource and NGRID will review MWRA design and construction bid documents for energy efficiency opportunities. Together, these measures form a comprehensive strategy to capture potential energy savings in MWRA's Capital Improvement Program.

In addition, the NGRID MOU includes language that offers NGRID's assistance and support for innovative or renewable energy projects that lead to energy savings and environmental benefits.

The MOUs are non-binding in that they may be terminated for any reason, with the exception that once each utility has reviewed and approved an energy efficiency project, the incentive price per kWh in the agreement will be honored.

BUDGET/FISCAL IMPACT:

The energy efficiency projects undertaken under these MOUs will be included in the CEB and CIP budgets, respectively, consistent with their size and costs. For every kWh reduced by MWRA in the Eversource areas, MWRA will be receiving \$0.325 per kWh saved. Under the NGRID MOU, MWRA will receive \$0.30 per kWh reduction for projects under 1,000,000 kWh saved annually and \$0.33 per kWh for projects over 1,000,000 kWh saved annually.

ATTACHMENT:

Draft Memorandum of Understanding with Eversource
Draft Memorandum of Understanding with NGRID

**Memorandum of Understanding
By and Between
Eversource and the Massachusetts Water Resources Authority**

This Memorandum of Understanding (“MOU”) memorializes the understanding of Eversource and the Massachusetts Water Resources Authority (“MWRA”) (collectively the “Parties”) with respect to certain energy efficiency undertakings, as set forth below.

Eversource is interested in partnering with customers who are interested in committing to a plan and program of energy efficiency actions that are larger and more comprehensive than the norm. In order to build upon the success of an MOU between the Parties for the three-year period 2014-2016, Eversource and MWRA are entering into this new non-binding MOU that sets forth the understandings of the Parties as to certain actions and commitments that each of the Parties will endeavor to undertake over a three-year period as described below.

Under this MOU, MWRA anticipates that it will implement and construct a multitude of energy conservation measures and programs that will receive incentives from Eversource, as set forth below. Eversource will endeavor to provide MWRA with an incentive payment based on an annual rate per kWh saved of \$.325/kWh (stated in table below, termed “Eversource Electric Portfolio”), inclusive of pilots, studies, publicity, etc. and other costs and expenses of all energy efficiency and conservation projects within Eversource’s electric service territory. Eversource will also endeavor to provide MWRA with an incentive payment based on an annual rate per therm saved of \$2.00/therm for proposed energy conservation measures associated with replacing oil-fired boilers with condensing gas boilers, and any other gas conservation measures within Eversource’s gas service territory.

MWRA and Eversource will jointly shape the program. They will determine measures that demonstrate consistency with the program’s goal. Table 1 summarizes the MOU annual goals. MWRA will continue to conduct audits to identify energy conservation projects that MWRA plans to pursue with Eversource’s financial assistance as part of MWRA’s Current Expense Budget. In addition, MWRA will identify energy efficiency projects that can be completed as part of larger Capital Improvement Projects and for which Eversource financial assistance will also be sought.

| TABLE 1 THREE-YEAR STRUCTURE | | | | |
|--|-------------|-------------|-------------|-------------|
| | 2019 | 2020 | 2021 | Total |
| MWRA Estimated Annual kWh saved* | 3,555,000 | 3,448,350 | 3,344,900 | 10,348,250 |
| Eversource Electric Portfolio (payment by EVERSOURCE per projected annual kWh saved) | \$0.325 | \$0.325 | \$0.325 | |
| EVERSOURCE Electrical Investment By Year (\$) | \$1,635,300 | \$1,586,241 | \$1,538,654 | \$4,760,195 |

*kWh savings are estimates: when available, annual kWh savings are based on audits or detailed evaluations; other annual kWh savings are estimated based on more general reviews. Actual kWh savings may vary and will be refined as detailed evaluations are performed. kWh savings represent the re-occurring annual savings that are associated with the projects implemented in CY17, CY18, and CY19.

The Parties understand that modifications to schedule, MWRA investment, the lists of projects, and estimated kWh savings may occur, and that Table 1 as well as a list of proposed projects will be updated at least annually.

MWRA will endeavor to accomplish the following:

- MWRA will strive to implement 3,555,000 kWh reduction in the first calendar year (2019, implement 3,448,350 kWh reduction in calendar year 2020, and implement 3,344,900 kWh in calendar year 2021. These goals are based on the List of Projects in Attachment 1, and MWRA's goal to implement projects that will reduce energy use by 3% annually.
- MWRA will seek to undertake performance assessment and additional energy audits to identify any additional best management practices and equipment upgrades approvable for energy efficiency incentives that may be undertaken at MWRA facilities. MWRA will seek Eversource's input.
- As new construction or renovation or retrofit of existing facilities is undertaken, energy conservation and efficiency will be integrated into design to the extent practical and goals for energy efficiency will be included in design contracts and construction scope of work. At project start and at various design milestones, MWRA will seek Eversource's participation and review, when feasible.
- MWRA will seek Eversource incentives for projects including, but not limited to, the following: HVAC upgrades and retrofits, controls and energy management systems, material and equipment selection, LED lighting upgrades, process changes that require new investments, special technologies that provide energy savings, and building design as applicable.
- MWRA will provide Eversource all required information and documentation for projects for which Eversource incentives are sought, with the understanding that Eversource may review each individual project prior to committing funding to that project.

Eversource will endeavor to accomplish the following:

- Work with MWRA staff to develop energy conservation specifications for planned replacement of equipment, new construction, and major renovation.
- Work with MWRA staff and MWRA consultants to help ensure energy efficiency is incorporated into design by Eversource's review of design and construction bid documents for energy efficiency opportunities
- Work with the MWRA and third party consultants to perform Technical Assistance studies in order to identify energy savings opportunities at MWRA facilities
- Review proposed MWRA energy conservation projects for cost-effectiveness. Protocols will be established to streamline review and approval of projects at appropriate points, including inspection and documentation of existing conditions, and review of energy saving calculations. Eversource will issue a pre-approval letter for projects meeting Eversource's criteria and the goals of this MOU. The pre-approval letter will state Eversource Portfolio Rate. If Eversource

does not approve a project or finds the project ineligible for the fixed portfolio incentive, an explanation will be provided. Eversource may also conduct post-construction inspections after the projects are implemented.

- Provide fixed portfolio incentives (see Table 1) for lifetime kWh savings equal to or greater than those identified in Table 1 for energy conservation measures that include, but are not limited to the following: lighting improvements and LED upgrades, HVAC modifications and upgrades, energy management systems, control and process efficiency modifications that require MWRA investments, pump and motor evaluation and replacement, specialized technologies that bring energy savings, and building insulation and weatherization.
- To the extent authorized by M.G.L., c.25A, §14, make available Eversource's procurement services, providing MWRA access to a choice of consultants under contract to Eversource and to vendors under contract through a competitive bid to allow quick ramp up.
- Assist MWRA in developing an energy conservation educational effort and determine how education of MWRA facilities managers and general staff might play a role in increasing energy efficiency. Provide training programs for MWRA staff and operators to help MWRA staff identify opportunities for energy efficiency or energy conservation projects.
- Make detailed electrical use data for 15 minute intervals (where available) available to MWRA when requested to help MWRA identify opportunities to reduce peak demand.
- Account Executive and Program Manager Support – will provide preferred support through the following team:

Mark F. Rooney, Account Executive
Steve Grattan, Program Manager

- Pay the full amount of the incentives set forth in the table above for completed projects. Payment of incentives will occur once documentation is provided that a project has been implemented.
- Make a good faith commitment to provide future funding for additional MWRA future projects beyond those included in the current project list.

The Parties agree that either party may terminate this MOU for any reason upon ten (10) days prior written notice. The Parties agree that if either party terminates this MOU, any and all energy efficiency projects for which Eversource has issued a pre-approval letter will be honored under the pay structure of this MOU. The Parties further acknowledge that with the exception of energy efficiency projects for which Eversource has issued a pre-approval letter and Eversource's commitments there under, neither this MOU, nor its acceptance, constitutes a legally binding or enforceable agreement of either MWRA or Eversource.

Massachusetts Water Resources Authority

EVERSOURCE Electric Company,
EVERSOURCE Gas Company, and
Western Massachusetts Electric
Company each d/b/a Eversource
Energy

Frederick A. Laskey
Executive Director

Tilak Subrahmanian
Vice President, Energy Efficiency

Strategic Energy Management Plan
Memorandum of Understanding
Between National Grid and Massachusetts Water Resources Authority

1. OVERVIEW

National Grid and the Massachusetts Water Resources Authority (“MWRA”) are entering into this non-binding Strategic Energy Management Plan (“SEMP”) Memorandum of Understanding (“MOU”) that sets forth the understandings of the parties as they relate to a mutual commitment to an energy and sustainability vision over a period of three years, starting January 1, 2019 to December 31, 2021. The SEMP will track to performance targets outlined within this MOU.

SEMP Vision

- Establish a special offering of integrated technical, financial, and operational support by National Grid, (referred to as “Program Administrator” or “PA”) to the MWRA’s portfolio of existing and new facilities.
- Engage the appropriate levels of decision makers at the MWRA, to understand their financial and social motivations for energy and sustainability related capital spending, and channel this initiative to support activities to help achieve those policy goals.
- Use PA programs to reduce annual utility spending, improve operations, reduce maintenance costs, improve human comfort and health, and provide positive environmental impact to the MWRA and its member communities.
- Work closely to provide any marketing support to highlight the MWRA’s mission to promote environmental stewardship and status as a leader in energy management and sustainability practices.

During the development of this SEMP, the parties will have named implementation teams, and begun to define and implement cost-effective projects needed to achieve mutual goals. As both parties have worked together to set quantifiable targets and stated milestones, they agree to:

- Continue to collaborate to identify a pipeline of projects to meet goals throughout the term of the MOU.
- Establish Key Performance Indicators (“KPIs”) that will indicate MOU progress, in conjunction with the MWRA’s commitment to energy, greenhouse gas and/or carbon footprint reduction goals.
- Develop a Dashboard to visually track and report progress towards these goals based on KPIs.

Energy Efficiency Program Solutions

National Grid will designate an Energy Solutions Team to provide comprehensive energy management support for the MWRA with a Team Lead assigned as the primary source of communication through the SEMP. The Team Lead will assist the MWRA team to effectively and efficiently meet the energy savings and sustainability goals, including assessing infrastructure, improving the efficiency of operations, and integrating appropriate technologies.

New Energy or Sustainability Solutions

As new programs develop that could help support the SEMP vision of this agreement, the Energy Solutions Team will engage the team at the MWRA. Depending on interest level and applicability, the teams will jointly assess and mutually agree to any other offerings for inclusion in the SEMP. These offerings might include, but are not limited to, electric vehicle charging infrastructure and awareness, demand response program, renewable energy & energy storage support, employee energy engagement programs, facility staff

training/education, and Natural Gas conversion projects that lead to energy savings and environmental benefits.

Governance

An Energy Solutions Team with representatives from the MWRA and National Grid are expected to work together to deliver the goals of this MOU. The current members for the MWRA & National Grid committed to these teams are attached (Appendix A).

- The Energy Solutions Team will meet quarterly to set overall vision and policy, execute program agreements, and to track MOU progress. The team may also use this time to re-assess the following, as needed: MOU goals, incentive and cost structure, the existing process for delivering programs, or the addition of new programs or services.
- It is anticipated members of the Energy Solutions Team will meet more frequently, as-needed, to manage day-to-day issues, develop and maintain an active pipeline of prioritized projects, expedite projects where possible, and to monitor the MOU progress.

2. ENERGY EFFICIENCY PLAN

National Grid and the MWRA have jointly established an annual goal to achieve a 3 percent annual electric energy reduction across existing MWRA sites located in the National Grid territory (Appendix B). As a strategic partner to the MWRA, National Grid will offer the technical services and financial incentives shown below to achieve this ambitious energy savings goal.

Savings Goals

National Grid team has worked with the MWRA team to develop the following annual energy savings target goals for the three-year MOU term:

| Year | Annual kWh Savings Target ¹ | Estimated Electric Incentive ² | Annual Electric Savings ³ |
|--------------|--|---|--------------------------------------|
| 1 | 600,000 | \$180,000 | \$90,000 |
| 2 | 600,000 | \$180,000 | \$90,000 |
| 3 | 600,000 | \$180,000 | \$90,000 |
| TOTAL | 1,800,000 | \$540,000 | \$270,000 |

Notes:

1. Based on MWRA & National Grid goal-setting discussions
2. Annual incentive based on targeted kWh savings
3. Annual Savings based on a rate of \$0.15/kWh

National Grid Resource Commitment

National Grid will endeavor to provide the MWRA with incentives for electric savings based on the tiered approach (below) for the term of the MOU, which will be calculated on a fixed amount per annual kWh

saved for cost-effective projects.¹²³ National Grid will issue a binding agreement in the form of an official and signed offer letter for each cost-effective project. Payment will be issued at the completion of each approved project, based on energy savings that the PA can claim, which may not equal total savings realized by the MWRA.

Electric Savings Tiered Incentive Package (Incentive Rate Reset annually)

| MOU Tier | Annual Savings level | Enhanced Incentive Rate |
|-----------------|----------------------|-------------------------|
| 1 st | 0 to 1,000,000 kWh | \$0.30/kWh |
| 2 nd | > 1,000,000 kWh | \$0.33/kWh |

Illustrative Example

The below hypothetical example shows expected incentives based on achieved savings for a three (3) year term. Note that actual incentives will depend on realized savings.

| Year | Achieved kWh Savings | Tier 1 Incentive | Tier 2 Incentive | Total Incentives |
|--------------|----------------------|------------------|------------------|------------------|
| 1 | 500,000 | \$150,000 | \$0 | \$150,000 |
| 2 | 1,000,000 | \$300,000 | \$0 | \$300,000 |
| 3 | 1,500,000 | \$300,000 | \$165,000 | \$465,000 |
| TOTAL | 3,000,000 | \$750,000 | \$165,000 | \$915,000 |

Technical Services

National Grid will share 50% of the cost of all third-party Technical Services, including unbiased audit of energy savings, project scoping, and technical assistance services, up to a maximum of \$50,000 per year, or a total of \$150,000 over the three (3) year term of the SEMP.³ National Grid’s Technical Services Team will manage all PA provided technical support and third party vendor utilization required to achieve the target goals. The Technical Services Team will assign funding on a project-by-project basis, and provide each project’s funding level to the MWRA prior to contracting any services.

MWRA Resource Commitment

As discussed between the National Grid and MWRA teams in the discovery planning phase, the MWRA is subject to all applicable procurement and public construction laws and MWRA rules and procedures. MWRA will need to adhere to these provisions in order to pursue those projects deemed as cost-effective, and toward achieving the energy savings goals of this MOU.

3. AGREEMENT

The parties acknowledge that they will continue good faith negotiations but that neither party shall be obligated to make any expenditure. The parties further acknowledge that neither this MOU, nor its acceptance, constitutes a legally binding or enforceable agreement of either the MWRA or National Grid. Either party may terminate this

¹ Incentive amounts are subject to constraints based on project cost, the PA’s cost screening process, and do not exceed 100% of the project cost.

² The technical services and incentive amounts for energy efficient new construction building projects or advanced technology projects, such as combined heat & power (CHP), are unique in nature and are to be negotiated outside the terms of this MOU.

³ Savings from Prescriptive measures shall be paid at applicable Prescriptive incentive levels and will apply towards Savings Goals and Enhanced Incentive levels.

MOU for any reason or no reason upon thirty (30) days prior written notice. The parties agree that if National Grid terminates this MOU, any and all approved energy efficiency projects with an official, signed offer letter under this initiative will be honored under the pay structure of this MOU.

The parties further agree that no party will, without the prior written consent of all the parties hereto, make any official public statement, media announcement or any publicity of this MOU or any matters described or contemplated herein.

This MOU shall be effective upon the signature of the MWRA and National Grid authorized officials. It shall be in force for Energy Efficiency Projects completed from January 1, 2019 to December 31, 2021. The MWRA and National Grid indicate agreement with this MOU by their signatures.

Massachusetts Water Resources Authority

National Grid

Signature

Signature

Name

Name

Title

Title

Date

Date

Appendix A

Energy Solutions Team

| | Name | Role |
|---|-----------------------|--|
| 1 | Roy (Chuck) Norden | NGRID – EE Commercial Sales |
| 2 | Eric Szulak* | NGRID – Strategic Accounts Partner |
| 3 | Andrea Moshier | NGRID – Technical Services |
| 4 | TBD | NGRID – TA Vendors (as applicable) |
| 5 | | |
| 6 | Denise Breiteneicher* | MWRA – Program Manager, Energy & Environmental |
| 7 | | |
| 8 | Jonathan Sycamore | MWRA – Senior Financial Analyst |
| 9 | Mike McDonald | MWRA – Energy Manager |

*Team Leads

The National Grid Roles are defined here:

- **EE Commercial Sales** – this team member will be responsible for managing the Energy Efficiency process with the MWRA to ensure projects are developed & implemented to meet the Energy Efficiency Solutions Plan Savings targets
- **Technical Services** – this team member will be responsible for efficiently managing all technical services required to maintain an active pipeline of projects that meet Energy Efficiency Solutions Plan Savings targets, including the technical services budget, selection & management of third-party Technical Assistance Vendors and the internal NGRID technical support required for the Sales process
- **Strategic Accounts Partnerships** – this team member will be responsible for coordinating the MOU, keeping the implementation process active & on point with overall SEMP objectives, tracking performance & reporting results, and coordinating with efforts by any other Program Administrators

Note: National Grid team members may be required from other groups, depending on the product menu developed for the MWRA.

The MWRA Roles are defined here:

- **Program Managers** – The MWRA Program Managers, with input from the Energy Manager, will be responsible for developing and implementing the energy efficiency projects for the MWRA to be completed under this MOU.
- **Senior Financial Analyst** – This team member will be responsible for performance assessment and financial analysis assistance.

Appendix B

MWRA Electric Accounts – National Grid Territory

| Account # | Location Address | Location City | Yearly Usage | Usage Units |
|------------|-----------------------------|---------------|--------------|-------------|
| 6543173008 | 0 WORCESTER RD | BARRE | | kWH |
| 2799593009 | 0 ISLAND AVE | QUINCY | | kWH |
| 8954832009 | 0 BURGIN-GLENDALE RD | QUINCY | 0 | kWH |
| 5048584000 | 0 BALLARD ST | SAUGUS | 0 | kWH |
| 5233526009 | 325 FRANK-P-BENNETT HWY | MALDEN | 0 | kWH |
| 1571799008 | 316 CLIFTON ST | MALDEN | 0 | kWH |
| 7745811006 | 1 SUPERIOR ST APT M149 | LYNN | 0 | kWH |
| 5975258000 | 510 QUARRY ST | QUINCY | 0 | kWH |
| 3968857000 | 0 FURNACE-BROOK PKWY | QUINCY | 3 | kWH |
| 3953379008 | 0 LORING RD | BARRE | 7 | kWH |
| 2834815004 | 41 VERONA ST APT M168 | LYNN | 15 | kWH |
| 9029353007 | 0 LIBERTY AVE | REVERE | 18 | kWH |
| | 0 CNTRL-WALNUT ST APT | | | |
| 5048518006 | M198 | SAUGUS | 20 | kWH |
| 7691259003 | 621 LYNN-FELLS PKWY | MELROSE | 32 | kWH |
| 2741177008 | 118 MEDFORD ST APT M20 | MALDEN | 38 | kWH |
| 1573068006 | 0 WINTER-WASH ST | MALDEN | 46 | kWH |
| 8790822005 | 0 WALNUT-ELM ST APT 185 | SAUGUS | 47 | kWH |
| 340496004 | 311 MEDFORD ST APT M20 | MALDEN | 53 | kWH |
| 4116264007 | 7 COLUMBIA ST | SWAMPSCOTT | 55 | kWH |
| 8992889002 | 13A ESSEX ST APT M150 | LYNN | 62 | kWH |
| 3970925004 | 498 ADAMS ST | QUINCY | 67 | kWH |
| 3970996003 | 0 COPELAND ST | QUINCY | 84 | kWH |
| 6516922004 | 1865 REVERE-BEACH PKWY | EVERETT | 142 | kWH |
| 298472009 | 72 WINTHROP ST | EVERETT | 143 | kWH |
| 300655001 | 30 SPRING ST | EVERETT | 149 | kWH |
| 1537005003 | 56 HANCOCK ST APT 13 | EVERETT | 170 | kWH |
| 7618509002 | 410 WINTHROP AVE | REVERE | 186 | kWH |
| 2816050005 | 145 WASHINGTON ST | MALDEN | 189 | kWH |
| 4026562009 | 1 WOODLAWN ST APT 119 | EVERETT | 197 | kWH |
| 6461178009 | 0 ADAMS ST | QUINCY | 200 | kWH |
| 4061917006 | 0 FELLS AVE | MEDFORD | 247 | kWH |
| 1481036007 | 0 WORCESTER RD | BARRE | 254 | kWH |
| 7782257002 | 0 CARY AVE | REVERE | 257 | kWH |
| 8973433008 | 130 HIGH ST APT M25 | MALDEN | 273 | kWH |
| 7543059004 | 607 LINCOLN AVE | SAUGUS | 277 | kWH |
| 2780555028 | 142 BOSTON ST APT 201 | EVERETT | 285 | kWH |
| 4061794003 | 578 EASTERN AVE | MALDEN | 293 | kWH |
| 4402762014 | 10 BROADWAY | SAUGUS | 330 | kWH |
| 144183004 | 152 TAFTS AVE | WINTHROP | 335 | kWH |
| 7542930000 | 0 COR-RT-1-ESSEX-ST APT 174 | SAUGUS | 342 | kWH |
| 1555269005 | 243 PROSPECT AVE | REVERE | 344 | kWH |
| 1573113006 | 1737 REVERE-BEACH PKWY | EVERETT | 540 | kWH |
| 7761428001 | 33 APPLETON ST | EVERETT | 710 | kWH |
| 6444656004 | 0 WESTERN AVE | LYNN | 1100 | kWH |

| | | | | |
|------------|--------------------|--------------|-------------------|------------|
| 2610296003 | 0 LYNN-FELLS-MAIN | SAUGUS | 1100 | kWH |
| 3892463001 | 0 SALEM ST | MALDEN | 1100 | kWH |
| 184138001 | 0 GOVERNORS AVE | MEDFORD | 1192 | kWH |
| 9046605000 | 0 WESTERN AVE | LYNN | 1200 | kWH |
| 9046201002 | 0 COREY ST | EVERETT | 1200 | kWH |
| 7799286022 | 192 APPLETON ST | EVERETT | 1200 | kWH |
| 7799522005 | 0 NEW-OCEAN-ESTRN | LYNN | 1200 | kWH |
| 2782308009 | 0 PRESCOTT ST | RUTLAND | 2035 | kWH |
| 266090000 | 0 S MEADOW RD | CLINTON | 2048 | kWH |
| 7788176015 | 0 CEDAR-HILL RD | MARLBOROUGH | 2247 | kWH |
| 8849595024 | 437 WHITNEY ST | NORTHBOROUGH | 4184 | kWH |
| 8793849017 | 0 CENTRAL ST | SOUTHBOROUGH | 5985 | kWH |
| 340543008 | 0 CAUSEWAY | NAHANT | 7017 | kWH |
| 380922010 | 292 CEDAR-HILL RD | MARLBOROUGH | 9016 | kWH |
| 2725365017 | 0 WORCESTER RD | SOUTH BARRE | 11363 | kWH |
| 377292021 | 100 DEVIR ST | MALDEN | 16267 | kWH |
| 5124528002 | 0 REVERE ST | WINTHROP | 16639 | kWH |
| 6485347024 | 0 SKYLINE DR | CLINTON | 20013 | kWH |
| 1310069018 | 0 BOSTON RD | SOUTHBOROUGH | 21734 | kWH |
| 6486658008 | 516 WILSON ST | CLINTON | 30660 | kWH |
| 1610926032 | 34 SAINT-MARTIN DR | MARLBOROUGH | 37400 | kWH |
| 3971479029 | 0 WORCESTER RD | SOUTH BARRE | 39549 | kWH |
| 303867021 | 0 ISLAND AVE | QUINCY | 49628 | kWH |
| 3993358029 | 301 BOYLSTON ST | CLINTON | 93500 | kWH |
| 3993521031 | 1 CHICKATAWBUT RD | QUINCY | 134340 | kWH |
| 1611228008 | 88 DANVELO DR | MARLBOROUGH | 150000 | kWH |
| 6560653023 | 485 WARE RD | BELCHERTOWN | 150200 | kWH |
| 5314354021 | 1 POWER-STATION RD | BELCHERTOWN | 153600 | kWH |
| 2854574022 | 0 NEWLAND ST | NORTH QUINCY | 210000 | kWH |
| 7549388013 | 735 BELCHERTOWN RD | WARE | 298700 | kWH |
| 3768415017 | 0 FENNO ST | WOLLASTON | 433400 | kWH |
| 9012967019 | 27 KILBY ST | QUINCY | 663180 | kWH |
| 3973115000 | 677 HIGH ST | CLINTON | 1356400 | kWH |
| 6375283002 | 50 BRIDGE ST | WEYMOUTH | 2165800 | kWH |
| 1538080000 | 147 SEA AVE | QUINCY | 3659600 | kWH |
| 7819334021 | 84 D'Angelo Drive | Marlboro | 10900000 | kwh |
| | | | 20,660,207 | kwh |

Strategic Energy Management Plan Memorandum of Understanding

Between National Grid and Massachusetts Water Resources Authority

1. OVERVIEW

National Grid and the Massachusetts Water Resources Authority (“MWRA”) are entering into this non-binding Strategic Energy Management Plan (“SEMP”) Memorandum of Understanding (“MOU”) that sets forth the understandings of the parties as they relate to a mutual commitment to an energy and sustainability vision over a period of three years, starting January 1, 2019 to December 31, 2021. The SEMP will track to performance targets outlined within this MOU.

SEMP Vision

- Establish a special offering of integrated technical, financial, and operational support by National Grid, (referred to as “Program Administrator” or “PA”) to the MWRA’s portfolio of existing and new facilities.
- Engage the appropriate levels of decision makers at the MWRA, to understand their financial and social motivations for energy and sustainability related capital spending, and channel this initiative to support activities to help achieve those policy goals.
- Use PA programs to reduce annual utility spending, improve operations, reduce maintenance costs, improve human comfort and health, and provide positive environmental impact to the MWRA and its member communities.
- Work closely to provide any marketing support to highlight the MWRA’s mission to promote environmental stewardship and status as a leader in energy management and sustainability practices.

During the development of this SEMP, the parties will have named implementation teams, and begun to define and implement cost-effective projects needed to achieve mutual goals. As both parties have worked together to set quantifiable targets and stated milestones, they agree to:

- Continue to collaborate to identify a pipeline of projects to meet goals throughout the term of the MOU.
- Establish Key Performance Indicators (“KPIs”) that will indicate MOU progress, in conjunction with the MWRA’s commitment to energy, greenhouse gas and/or carbon footprint reduction goals.
- Develop a Dashboard to visually track and report progress towards these goals based on KPIs.

Energy Efficiency Program Solutions

National Grid will designate an Energy Solutions Team to provide comprehensive energy management support for the MWRA with a Team Lead assigned as the primary source of communication through the SEMP. The Team Lead will assist the MWRA team to effectively and efficiently meet the energy savings and sustainability goals, including assessing infrastructure, improving the efficiency of operations, and integrating appropriate technologies.

New Energy or Sustainability Solutions

As new programs develop that could help support the SEMP vision of this agreement, the Energy Solutions Team will engage the team at the MWRA. Depending on interest level and applicability, the teams will jointly assess and mutually agree to any other offerings for inclusion in the SEMP. These

offerings might include, but are not limited to, electric vehicle charging infrastructure and awareness, demand response program, renewable energy & energy storage support, employee energy engagement programs, facility staff training/education, and Natural Gas conversion projects that lead to energy savings and environmental benefits.

Governance

An Energy Solutions Team with representatives from the MWRA and National Grid are expected to work together to deliver the goals of this MOU. The current members for the MWRA & National Grid committed to these teams are attached (Appendix A).

- The Energy Solutions Team will meet quarterly to set overall vision and policy, execute program agreements, and to track MOU progress. The team may also use this time to re-assess the following, as needed: MOU goals, incentive and cost structure, the existing process for delivering programs, or the addition of new programs or services.
- It is anticipated members of the Energy Solutions Team will meet more frequently, as-needed, to manage day-to-day issues, develop and maintain an active pipeline of prioritized projects, expedite projects where possible, and to monitor the MOU progress.

2. ENERGY EFFICIENCY PLAN

National Grid and the MWRA have jointly established an annual goal to achieve a 3 percent annual electric energy reduction across existing MWRA sites located in the National Grid territory (Appendix B). As a strategic partner to the MWRA, National Grid will offer the technical services and financial incentives shown below to achieve this ambitious energy savings goal.

Savings Goals

National Grid team has worked with the MWRA team to develop the following annual energy savings target goals for the three-year MOU term:

| Year | Annual kWh Savings Target ¹ | Estimated Electric Incentive ² | Annual Electric Savings ³ |
|--------------|--|---|--------------------------------------|
| 1 | 600,000 | \$180,000 | \$90,000 |
| 2 | 600,000 | \$180,000 | \$90,000 |
| 3 | 600,000 | \$180,000 | \$90,000 |
| TOTAL | 1,800,000 | \$540,000 | \$270,000 |

Notes:

1. Based on MWRA & National Grid goal-setting discussions
2. Annual incentive based on targeted kWh savings
3. Annual Savings based on a rate of \$0.15/kWh

National Grid Resource Commitment

National Grid will endeavor to provide the MWRA with incentives for electric savings based on the tiered approach (below) for the term of the MOU, which will be calculated on a fixed amount

per annual kWh saved for cost-effective projects.¹²³ National Grid will issue a binding agreement in the form of an official and signed offer letter for each cost-effective project. Payment will be issued at the completion of each approved project, based on energy savings that the PA can claim, which may not equal total savings realized by the MWRA.

Electric Savings Tiered Incentive Package (Incentive Rate Reset annually)

| MOU Tier | Annual Savings level | Enhanced Incentive Rate |
|-----------------|----------------------|-------------------------|
| 1 st | 0 to 1,000,000 kWh | \$0.30/kWh |
| 2 nd | > 1,000,000 kWh | \$0.33/kWh |

Illustrative Example

The below hypothetical example shows expected incentives based on achieved savings for a three (3) year term. Note that actual incentives will depend on realized savings.

| Year | Achieved kWh Savings | Tier 1 Incentive | Tier 2 Incentive | Total Incentives |
|--------------|----------------------|------------------|------------------|------------------|
| 1 | 500,000 | \$150,000 | \$0 | \$150,000 |
| 2 | 1,000,000 | \$300,000 | \$0 | \$300,000 |
| 3 | 1,500,000 | \$300,000 | \$165,000 | \$465,000 |
| TOTAL | 3,000,000 | \$750,000 | \$165,000 | \$915,000 |

Technical Services

National Grid will share 50% of the cost of all third-party Technical Services, including unbiased audit of energy savings, project scoping, and technical assistance services, up to a maximum of \$50,000 per year, or a total of \$150,000 over the three (3) year term of the SEMP.³ National Grid’s Technical Services Team will manage all PA provided technical support and third party vendor utilization required to achieve the target goals. The Technical Services Team will assign funding on a project-by-project basis, and provide each project’s funding level to the MWRA prior to contracting any services.

MWRA Resource Commitment

As discussed between the National Grid and MWRA teams in the discovery planning phase, the MWRA is subject to all applicable procurement and public construction laws and MWRA rules and procedures. MWRA will need to adhere to these provisions in order to pursue those projects deemed as cost-effective, and toward achieving the energy savings goals of this MOU.

¹ Incentive amounts are subject to constraints based on project cost, the PA’s cost screening process, and do not exceed 100% of the project cost.

² The technical services and incentive amounts for energy efficient new construction building projects or advanced technology projects, such as combined heat & power (CHP), are unique in nature and are to be negotiated outside the terms of this MOU.

³ Savings from Prescriptive measures shall be paid at applicable Prescriptive incentive levels and will apply towards Savings Goals and Enhanced Incentive levels.

3. AGREEMENT

The parties acknowledge that they will continue good faith negotiations but that neither party shall be obligated to make any expenditure. The parties further acknowledge that neither this MOU, nor its acceptance, constitutes a legally binding or enforceable agreement of either the MWRA or National Grid. Either party may terminate this MOU for any reason or no reason upon thirty (30) days prior written notice. The parties agree that if National Grid terminates this MOU, any and all approved energy efficiency projects with an official, signed offer letter under this initiative will be honored under the pay structure of this MOU.

The parties further agree that no party will, without the prior written consent of all the parties hereto, make any official public statement, media announcement or any publicity of this MOU or any matters described or contemplated herein.

This MOU shall be effective upon the signature of the MWRA and National Grid authorized officials. It shall be in force for Energy Efficiency Projects completed from January 1, 2019 to December 31, 2021. The MWRA and National Grid indicate agreement with this MOU by their signatures.

Massachusetts Water Resources Authority

National Grid

Signature

Signature

Name

Name

Title

Title

Date

Date

Appendix A

Energy Solutions Team

| | Name | Role |
|---|-----------------------|--|
| 1 | Roy (Chuck) Norden | NGRID – EE Commercial Sales |
| 2 | Eric Szulak* | NGRID – Strategic Accounts Partner |
| 3 | Andrea Moshier | NGRID – Technical Services |
| 4 | TBD | NGRID – TA Vendors (as applicable) |
| 5 | | |
| 6 | Denise Breiteneicher* | MWRA – Program Manager, Energy & Environmental |
| 7 | | |
| 8 | Jonathan Sycamore | MWRA – Senior Financial Analyst |
| 9 | Mike McDonald | MWRA – Energy Manager |

*Team Leads

The National Grid Roles are defined here:

- **EE Commercial Sales** – this team member will be responsible for managing the Energy Efficiency process with the MWRA to ensure projects are developed & implemented to meet the Energy Efficiency Solutions Plan Savings targets
- **Technical Services** – this team member will be responsible for efficiently managing all technical services required to maintain an active pipeline of projects that meet Energy Efficiency Solutions Plan Savings targets, including the technical services budget, selection & management of third-party Technical Assistance Vendors and the internal NGRID technical support required for the Sales process
- **Strategic Accounts Partnerships** – this team member will be responsible for coordinating the MOU, keeping the implementation process active & on point with overall SEMP objectives, tracking performance & reporting results, and coordinating with efforts by any other Program Administrators

Note: National Grid team members may be required from other groups, depending on the product menu developed for the MWRA.

The MWRA Roles are defined here:

- **Program Managers** – The MWRA Program Managers, with input from the Energy Manager, will be responsible for developing and implementing the energy efficiency projects for the MWRA to be completed under this MOU.
- **Senior Financial Analyst** – This team member will be responsible for performance assessment and financial analysis assistance.


Appendix B

MWRA Electric Accounts – National Grid Territory

| Account # | Location Address | Location City | Yearly Usage | Usage Units |
|------------|-------------------------|---------------|--------------|-------------|
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| 2799593009 | 0 ISLAND AVE | QUINCY | | kWH |
| 8954832009 | 0 BURGIN-GLENDALE RD | QUINCY | 0 | kWH |
| 5048584000 | 0 BALLARD ST | SAUGUS | 0 | kWH |
| 5233526009 | 325 FRANK-P-BENNETT HWY | MALDEN | 0 | kWH |
| 1571799008 | 316 CLIFTON ST | MALDEN | 0 | kWH |
| 7745811006 | 1 SUPERIOR ST APT M149 | LYNN | 0 | kWH |
| 5975258000 | 510 QUARRY ST | QUINCY | 0 | kWH |
| 3968857000 | 0 FURNACE-BROOK PKWY | QUINCY | 3 | kWH |
| 3953379008 | 0 LORING RD | BARRE | 7 | kWH |
| 2834815004 | 41 VERONA ST APT M168 | LYNN | 15 | kWH |
| 9029353007 | 0 LIBERTY AVE | REVERE | 18 | kWH |
| | 0 CNTRL-WALNUT ST APT | | | |
| 5048518006 | M198 | SAUGUS | 20 | kWH |
| 7691259003 | 621 LYNN-FELLS PKWY | MELROSE | 32 | kWH |
| 2741177008 | 118 MEDFORD ST APT M20 | MALDEN | 38 | kWH |
| 1573068006 | 0 WINTER-WASH ST | MALDEN | 46 | kWH |
| 8790822005 | 0 WALNUT-ELM ST APT 185 | SAUGUS | 47 | kWH |
| 340496004 | 311 MEDFORD ST APT M20 | MALDEN | 53 | kWH |
| 4116264007 | 7 COLUMBIA ST | SWAMPSCOTT | 55 | kWH |
| 8992889002 | 13A ESSEX ST APT M150 | LYNN | 62 | kWH |
| 3970925004 | 498 ADAMS ST | QUINCY | 67 | kWH |
| 3970996003 | 0 COPELAND ST | QUINCY | 84 | kWH |
| 6516922004 | 1865 REVERE-BEACH PKWY | EVERETT | 142 | kWH |
| 298472009 | 72 WINTHROP ST | EVERETT | 143 | kWH |
| 300655001 | 30 SPRING ST | EVERETT | 149 | kWH |
| 1537005003 | 56 HANCOCK ST APT 13 | EVERETT | 170 | kWH |
| 7618509002 | 410 WINTHROP AVE | REVERE | 186 | kWH |
| 2816050005 | 145 WASHINGTON ST | MALDEN | 189 | kWH |
| 4026562009 | 1 WOODLAWN ST APT 119 | EVERETT | 197 | kWH |
| 6461178009 | 0 ADAMS ST | QUINCY | 200 | kWH |
| 4061917006 | 0 FELLS AVE | MEDFORD | 247 | kWH |
| 1481036007 | 0 WORCESTER RD | BARRE | 254 | kWH |
| 7782257002 | 0 CARY AVE | REVERE | 257 | kWH |
| 8973433008 | 130 HIGH ST APT M25 | MALDEN | 273 | kWH |
| 7543059004 | 607 LINCOLN AVE | SAUGUS | 277 | kWH |
| 2780555028 | 142 BOSTON ST APT 201 | EVERETT | 285 | kWH |
| 4061794003 | 578 EASTERN AVE | MALDEN | 293 | kWH |
| 4402762014 | 10 BROADWAY | SAUGUS | 330 | kWH |
| 144183004 | 152 TAFTS AVE | WINTHROP | 335 | kWH |

| | | | | |
|------------|-----------------------------|--------------|-------------------|------------|
| 7542930000 | 0 COR-RT-1-ESSEX-ST APT 174 | SAUGUS | 342 | kWH |
| 1555269005 | 243 PROSPECT AVE | REVERE | 344 | kWH |
| 1573113006 | 1737 REVERE-BEACH PKWY | EVERETT | 540 | kWH |
| 7761428001 | 33 APPLETON ST | EVERETT | 710 | kWH |
| 6444656004 | 0 WESTERN AVE | LYNN | 1100 | kWH |
| 2610296003 | 0 LYNN-FELLS-MAIN | SAUGUS | 1100 | kWH |
| 3892463001 | 0 SALEM ST | MALDEN | 1100 | kWH |
| 184138001 | 0 GOVERNORS AVE | MEDFORD | 1192 | kWH |
| 9046605000 | 0 WESTERN AVE | LYNN | 1200 | kWH |
| 9046201002 | 0 COREY ST | EVERETT | 1200 | kWH |
| 7799286022 | 192 APPLETON ST | EVERETT | 1200 | kWH |
| 7799522005 | 0 NEW-OCEAN-ESTRN | LYNN | 1200 | kWH |
| 2782308009 | 0 PRESCOTT ST | RUTLAND | 2035 | kWH |
| 266090000 | 0 S MEADOW RD | CLINTON | 2048 | kWH |
| 7788176015 | 0 CEDAR-HILL RD | MARLBOROUGH | 2247 | kWH |
| 8849595024 | 437 WHITNEY ST | NORTHBOROUGH | 4184 | kWH |
| 8793849017 | 0 CENTRAL ST | SOUTHBOROUGH | 5985 | kWH |
| 340543008 | 0 CAUSEWAY | NAHANT | 7017 | kWH |
| 380922010 | 292 CEDAR-HILL RD | MARLBOROUGH | 9016 | kWH |
| 2725365017 | 0 WORCESTER RD | SOUTH BARRE | 11363 | kWH |
| 377292021 | 100 DEVIR ST | MALDEN | 16267 | kWH |
| 5124528002 | 0 REVERE ST | WINTHROP | 16639 | kWH |
| 6485347024 | 0 SKYLINE DR | CLINTON | 20013 | kWH |
| 1310069018 | 0 BOSTON RD | SOUTHBOROUGH | 21734 | kWH |
| 6486658008 | 516 WILSON ST | CLINTON | 30660 | kWH |
| 1610926032 | 34 SAINT-MARTIN DR | MARLBOROUGH | 37400 | kWH |
| 3971479029 | 0 WORCESTER RD | SOUTH BARRE | 39549 | kWH |
| 303867021 | 0 ISLAND AVE | QUINCY | 49628 | kWH |
| 3993358029 | 301 BOYLSTON ST | CLINTON | 93500 | kWH |
| 3993521031 | 1 CHICKATAWBUT RD | QUINCY | 134340 | kWH |
| 1611228008 | 88 DANVELO DR | MARLBOROUGH | 150000 | kWH |
| 6560653023 | 485 WARE RD | BELCHERTOWN | 150200 | kWH |
| 5314354021 | 1 POWER-STATION RD | BELCHERTOWN | 153600 | kWH |
| 2854574022 | 0 NEWLAND ST | NORTH QUINCY | 210000 | kWH |
| 7549388013 | 735 BELCHERTOWN RD | WARE | 298700 | kWH |
| 3768415017 | 0 FENNO ST | WOLLASTON | 433400 | kWH |
| 9012967019 | 27 KILBY ST | QUINCY | 663180 | kWH |
| 3973115000 | 677 HIGH ST | CLINTON | 1356400 | kWH |
| 6375283002 | 50 BRIDGE ST | WEYMOUTH | 2165800 | kWH |
| 1538080000 | 147 SEA AVE | QUINCY | 3659600 | kWH |
| 7819334021 | 84 D'Angelo Drive | Marlboro | 10900000 | kwh |
| | | | 20,660,207 | kwh |

STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 14, 2018
SUBJECT: Purchase of New Desktop Computers, Imaging and Deployment Services
Hub Technical Services LLC
Bid WRA-4586Q, State Contract #ITC47

COMMITTEE: Administration, Finance, & Audit

 INFORMATION
 X VOTE

Russell J. Murray, Jr., MIS Director
Douglas J. Rice, Director of Procurement
Preparer/Title


Michele S. Gillen
Director, Administration

RECOMMENDATION:

To approve the award of a purchase order for the purchase of 902 standard HP EliteDesk 800 desktop computers, 52 high performance HP Z2 Mini desktop computers, and imaging and deployment services to the lowest responsive bidder under Bid WRA-4586Q, Hub Technical Services LLC, and authorize the Executive Director to execute said purchase order in the bid amount of \$1,260,579.56 under State Contract ITC47.

DISCUSSION:

MWRA has an installed base of 1,240 desktop computers, of which 154 are specialized or shared and used to support business functions such as SCADA, PICS, Security and AutoCad/GIS. Currently, MWRA uses Microsoft Windows 7 as its standard operating system on desktop computers, laptops and some tablets. Microsoft will discontinue support for Windows 7 in January 2020. In preparation for this event, staff have proposed a hardware refresh of all desktops four years and older. These desktops are located at all MWRA sites. Each new desktop computer will be configured with Windows 10 to ensure there is no lapse in support from Microsoft. Windows 10 provides enhanced management, new features and security updates, and will be supported through 2025. Replacing these older PCs will support a more homogeneous environment simplifying support, and minimizing downtime and failures. Those PCs not being replaced are less than four years old, will support Windows 10 and the operating systems will be upgraded as part of this purchase.

In April 2018, 50 desktops with Windows 10 were purchased to allow MIS staff to start the transition to the new Windows 10 environment, test Windows 10, and identify and address any issues in advance of the agency-wide rollout.

This procurement contains two different desktop models: the EliteDesk 800 for standard administrative use and the AutoCad-certified Z2 Mini for AutoCad users that require high-end graphics capabilities. In addition to the desktop computers, the vendor will perform pre-deployment and deployment services, including an assessment of the current hardware and software environment, deployment of new software, and imaging and migration of data. The vendor will also provide support and troubleshooting during the rollout, and follow surplus procedures which include the removal and destruction of the old hard drives. Deployment is expected to take no more than four months from the Notice to Proceed date.

Procurement Process:

Under Bid WRA-4586Q, utilizing MWRA's e-procurement system (Event 3588), Purchasing staff solicited 14 vendors listed on State Contract ITC47, which provides for the purchase of IT hardware and services.

On October 26, 2018, Event 3588 closed with the following results:

| VENDOR | BID AMOUNT |
|-----------------------------------|-----------------------|
| CDW Government LLC | \$1,245,014.50 |
| Hub Technical Services LLC | \$1,260,579.56 |
| SHI International Corp | \$1,261,419.00 |

Staff reviewed the bid submitted by CDW Government, LLC and determined that it was non-responsive. CDW failed to provide the specified equipment required in the bid specifications. Specifically, the configuration of the 52 AutoCad Z2 Minis required an Intel Xeon E3 - 1245v6 processor. CDW proposed a lesser quality Z2 Mini that contained only an Intel Xeon E3 - 1225V6.

Staff have reviewed the bid by Hub Technical Services and determined that it meets all the requirements of the bid specifications. Therefore, staff recommend the award of this purchase order to Hub Technical Services LLC as the lowest responsive bidder.

BUDGET/FISCAL IMPACT:

There are sufficient funds for this purchase included in the FY19 Current Expense Budget.

MBE/WBE PARTICIPATION:

Hub Technical Services, LLC is not a certified Minority- or Women-owned business.



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

BOARD OF DIRECTORS' MEETING

Chair: M. Beaton
Vice-Chair: J. Carroll
Secretary: A. Pappastergion
Board Members:
K. Cotter
P. Flanagan
J. Foti
B. Peña
H. Vitale
J. Walsh
J. Wolowicz

to be held on

Wednesday, November 14, 2018

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. PCR Amendments – November 2018 (ref. P&C A.1)
 2. Appointment of Business Systems Analyst III, MIS Department (ref. P&C A.2)
 3. Appointment of Budget Manager, Finance Division (ref. P&C A.3)
 4. Appointment of Manager, Finance and Administration, Operations Division (ref. P&C A.4)
 5. Approval of Seventy-Ninth Supplemental Bond Resolution (ref. AF&A B.1)
 6. Memoranda of Understanding Between MWRA and Eversource, Eversource Gas Company and Western Massachusetts Electric Company (Northeast Utilities Companies), and National Grid (ref. AF&A B.2)

B. Contract Awards

1. Technical Consulting Services to Implement Upgrades to the Water Quality Reporting System: Overture Partners, LLC, Bid WRA-4572Q, State Contract ITS63 Cat 2b (ref. W B.1)
2. Purchase of New Desktop Computers, Imaging and Deployment Services: Hub Technical Services LLC, Bid WRA-4586Q, State Contract #ITC47 (ref. AF&A C.1)

C. Contract Amendments/Change Orders

1. Chelsea Creek Headworks Upgrade, BHD/BEC 2015, A Joint Venture, Contract 7161, Change Order 22 (ref. WW B.1)
2. Northern Intermediate High Section 110 – Stoneham, Albanese D&S Inc., Contract 7067, Change Order 3 (ref. W C.1)

V. OTHER BUSINESS

VI. CORRESPONDENCE TO THE BOARD

VII. EXECUTIVE SESSION

VIII. ADJOURNMENT

MASSACHUSETTS WATER RESOURCES AUTHORITY

Meeting of the Board of Directors

October 17, 2018

A meeting of the Board of Directors of the Massachusetts Water Resources Authority was held on Wednesday, October 17 at the Authority headquarters in Charlestown. Vice Chair Carroll presided. Present from the Board were Messrs. Foti, Pappastergion, Peña, Vitale and Walsh. Chair Beaton, Messrs. Cotter and Flanagan and Ms. Wolowicz were absent. Among those present from the Authority staff were Frederick Laskey, Executive Director, Carolyn Francisco Murphy, General Counsel, David Coppes, Chief Operating Officer, Carolyn Fiore, Deputy Chief Operating Officer, Thomas Durkin, Director of Finance, Michele Gillen, Director of Administration, Andrea Murphy, Human Resources, Patterson Riley, Affirmative Action, Robert Donnelly, Operations Support, Ria Convery, Assistant Secretary, and Kristin MacDougall, Assistant to the Board of Directors. The meeting was called to order at 1:08 p.m.

APPROVAL OF SEPTEMBER 19, 2018 MINUTES

Upon a motion duly made and seconded, it was

Voted: to approve the minutes of the Board of Directors' meeting of September 19, 2018 as presented and filed with the records of the meeting.

REPORT OF THE EXECUTIVE DIRECTOR

Mr. Laskey announced that MWRA received awards from the Association of Metropolitan Water Agencies and US EPA Region 1, and recognized staff for their contributions. He also provided an updated personnel statistics, noting that 76% of hires are internal promotions. Mr. Laskey gave brief updates on the Wachusett Aqueduct Pump Station, Quabbin Reservoir levels, the Bellevue Tank and the Deer Island cable construction.

APPROVALS

Update on the Consultant Support Structure for the Metropolitan Tunnel Redundancy Program

Upon a motion duly made and seconded, it was

Voted: To approve staff's recommendation to prepare and issue an RFQ/P for Program Support Services and an RFQ followed by an RFP for

Preliminary Design/Geotechnical/MEPA review services to support the Metropolitan Tunnel Redundancy Program.

PCR Amendments for October 2018

Upon a motion duly made and seconded, it was

Voted: to approve amendments to the Position Control Register (PCR) for October 2018 as presented and filed with the records of the meeting.

Appointment of Deputy Contracts Manager, Procurement

Upon a motion duly made and seconded, it was

Voted: to approve the appointment of Mr. Jesse Daly to the position of Deputy Contracts Manager, Administration Division (Unit 6, Grade 13) at an annual salary of \$117,774.18 commencing on a date to be determined by the Executive Director.

CONTRACT AWARDS

Thermal and Hydro Power Plant Maintenance, Deer Island Treatment Plant: IPC Lydon, LLC Contract S578

Upon a motion duly made and seconded, it was

Voted: to approve the award of Contract S578, Thermal and Hydro Power Plant Maintenance, Deer Island Treatment Plant, to the lowest responsible and eligible bidder, IPC Lydon, LLC, and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the bid amount of \$7,961,150 for a contract term of 730 calendar days from the Notice to Proceed.

Supply and Delivery of Ferric Chloride to the Deer Island Treatment Plant: Kemira Water Solutions, Inc. Bid WRA-4564

Upon a motion duly made and seconded, it was

Voted: to approve the award of Purchase Order Contract WRA-4564 for the supply and delivery of ferric 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 \$1,840,000 for a period of one year, from January 1, 2019 through December 31, 2019.

Braintree-Weymouth Pump Station Improvements, Design and Engineering Services During Construction: Wright-Pierce, Contract 7435

Upon a motion duly made and seconded, it was

Voted: to approve the recommendation of the Consultant Selection Committee to select Wright-Pierce to provide Braintree-Weymouth Pump Station Improvements Project Design and Engineering Services During Construction, and to authorize the Executive Director, on behalf of the Authority, to execute and deliver Contract 7435 with Wright-Pierce in an amount not to exceed \$2,085,169.83 for a term of sixty months from the Notice to Proceed.

CONTRACT AMENDMENTS/CHANGE ORDERS

Remote Headworks Upgrade: Arcadis U.S., Inc., Contract 7206, Amendment 6

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to approve Amendment 6 to Contract 7206, Remote Headworks Upgrade, with Arcadis U.S., Inc., increasing the contract amount by \$683,000, from \$9,632,831 to \$10,315,831, with no increase in contract term.

Southern Extra High Pipeline – Section 111 (Boston): P. Gioioso and Sons, Inc., Contract 6454, 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 Contract 6454, Southern Extra High Pipeline - Section 111 (Boston), for a lump sum amount of \$79,716.72, increasing the contract amount from \$12,671,214.71 to \$12,750,931.43, 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 \$75,000, in accordance with the Management Policies and Procedures of the Board of Directors.

Western Operations Marlborough Maintenance Facility: E. A. Colangeli Construction Co., Inc., Contract 6650B, Change Order 16

Upon a motion duly made and seconded, it was

Voted: to authorize the Executive Director, on behalf of the Authority, to approve Change Order 16 to Contract 6650B, Western Operations Marlborough Maintenance Facility, with E. A. Colangeli Construction Co., Inc., for a lump sum amount of \$31,213.00, increasing the contract amount from \$3,663,938.06 to \$3,695,151.06, with no increase in contract term.

OTHER BUSINESS

Update on Massachusetts Equal Pay Act

Staff provided an overview of the Massachusetts Equal Pay Act and the status of MWRA's compliance efforts. There was brief discussion and questions and answers.

The meeting adjourned at 1:23 p.m.

Approved: November 14, 2018

Attest:

Andrew M. Pappastergion, Secretary