

MASSACHUSETTS WATER RESOURCES AUTHORITY

# Board of Directors Report

on

## Key Indicators of MWRA Performance

for

Second Quarter FY2012

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director  
Michael J. Hornbrook, Chief Operating Officer  
February 15, 2012

# Board of Directors Report on Key Indicators of MWRA Performance for Second Quarter FY2012

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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.

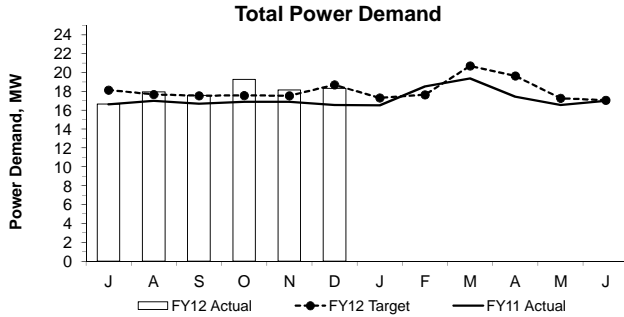
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# OPERATIONS AND MAINTENANCE

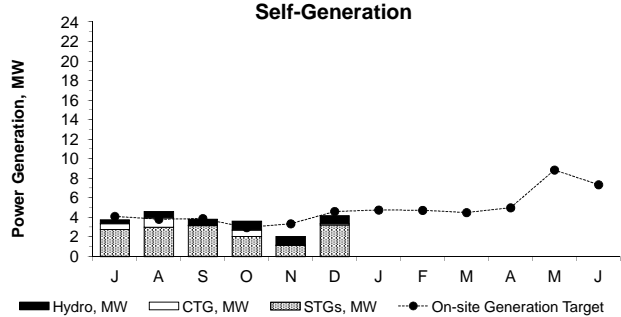
# Deer Island Operations

2nd Quarter - FY12

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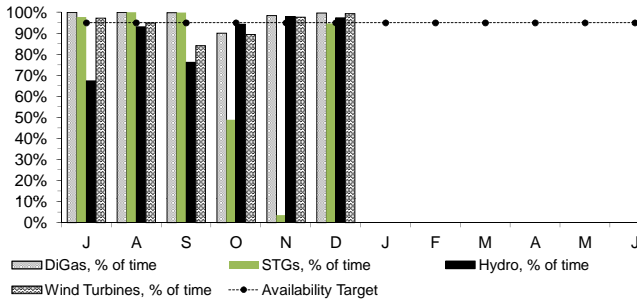


Total Power Demand in the 2nd Quarter was slightly higher (+4%) than the target for the quarter and 11% higher than in FY11 for the same period. During the 2nd Quarter, power demand for pumping alone was 23.5% higher-than-expected due to 23% higher-than-expected Total Plant Flow. Power demand was similar to or slightly higher than target for many of the other treatment processes. Power demand for primary treatment was higher than target due to the higher plant flow, while power demand for secondary treatment was lower than the target due in part to reduced oxygen feed in secondary treatment operations which was a result of ongoing energy optimization studies of the secondary treatment system.



Power generated on-site was on target (-1%) for the 2nd Quarter. Generation by the Hydro Turbines was 44% higher than their target for the quarter, while generation by the STGs, Solar Panels, and Wind Turbines were 17%, 35%, and 5% lower than their targets, respectively. Generation by the STGs was lower-than-expected as the main STG was offline for a period of time due to scheduled annual maintenance in October and to repairs that were necessary as a result of an issue uncovered during this maintenance. The CTGs operated during two storm events this quarter for a total of 26.6 hours (total of 21.6 MW) in parallel with NSTAR to prevent service disruption (during periods with a high potential for power outages) as well as for routine maintenance/checkout purposes. Additionally, DI participated in one (1) demand response test event on December 7. See Maintenance Report following.

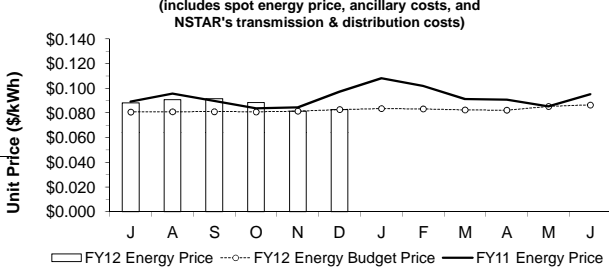
## Self-Generation Equipment On-Line (% of Time in Operation)



The DiGas, Hydro Turbine, and Wind Turbine systems met their 95% Availability Target for the 2nd Quarter, while the availability of the STGs fell to 49%. The primary STG was offline starting October 16 through November 29 due to ongoing repairs to correct a vibration issue that was uncovered during annual maintenance activities in early October. This STG was returned to normal operation on November 30. The Back Pressure STG continued to operate and generate power using the steam from the boilers while the primary STG was unavailable.

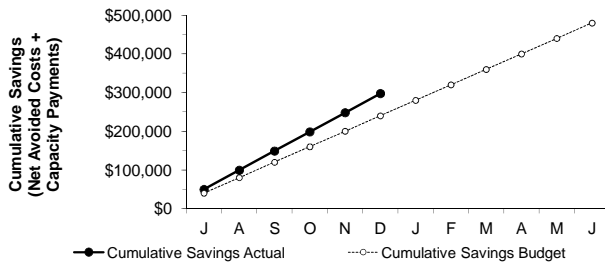
Power generation by the Solar Panels and the Wind Turbines are not included in the graph, due to scale issues. 0.179 MW was generated by the Solar Panels and 0.742 MW was generated by the Wind Turbines in the 2nd Quarter.

## Total Energy Pricing



Under DI's 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. Overall, the total energy price in the 2nd Quarter was 3% higher than the FY12 budget estimate and 5% lower than the 2nd Quarter FY11 actual. The total energy price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges. Please note the November and December total energy prices are estimates as the invoices have not been received. Year-to-date costs are estimated at approximately \$380,693 more than budgeted through the 2nd Quarter of FY12 due to much higher than expected total energy prices in the first four (4) months of FY12 (once the actual total energy prices were available) and also to higher than expected power demand in three (3) of the six (6) months in this fiscal year.

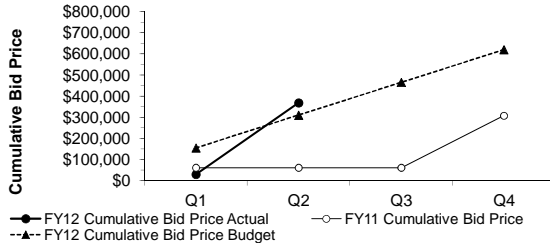
## Load Response Program



DI participated in one (1) demand response test event during the 2nd Quarter on December 7.

Deer Island participates in the ISO-New England Load Response Programs. By agreeing to have its Combustion Turbine Generators available to run and thus relieve the New England energy grid of Deer Island's load during times of high energy demand or high pricing, MWRA receives monthly Capacity Payments from ISO-NE. When it runs the CTGs at ISO-NE's request, MWRA receives energy payments from ISO-NE and also avoids NSTAR transmission and distribution charges. "Net Avoided Cost" is the avoided NSTAR payments offset by the cost of running the CTGs, and the energy payments from ISO-NE. Cumulative savings are the sum of Net Avoided Costs and monthly Capacity Payments - totaling \$297,707 through the 2nd Quarter compared to the budgeted savings of \$239,946.

## MA Renewable Portfolio Standard



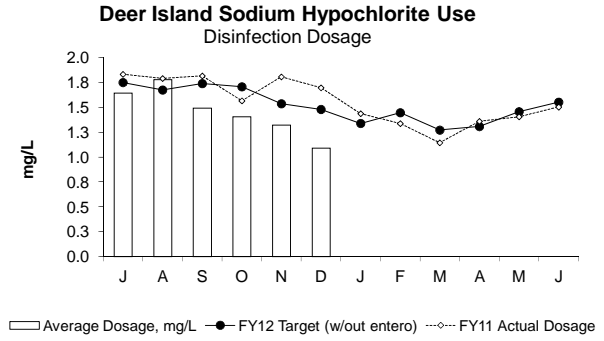
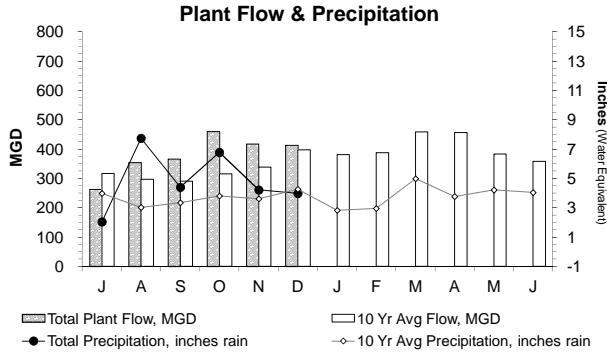
Bids were awarded in the 2nd Quarter for the sale of 67 Solar Renewable Energy Certificates (S-RECs) for a total value of \$30,449 and 14,239 Class I RECs for a total value of \$307,990. The value of the S-RECs is approximately 18 times higher than the current value of Class I RECs (for hydro and wind).

REC prices reflect the bid prices on the date that bids are accepted. Cumulative bid price reflects the total value of bids received to date. The FY12 budgeted cumulative bid estimate through the 2nd Quarter is \$309,732 while the actual bid total is \$367,971.

# Deer Island Operations

2nd Quarter - FY12

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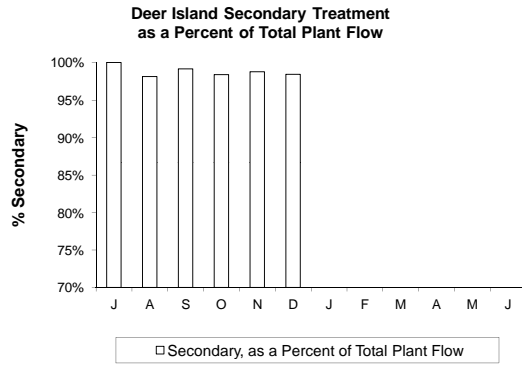
The Total Plant Flow for the 2nd Quarter was 23% higher than target (430.2 MGD actual vs. 350.5 MGD expected) as precipitation was 28% higher than expected for the quarter (14.95 inches actual vs. 11.66 inches expected). Total Plant Flow and precipitation were well above target in both October and November. Total Plant Flow in December was only slightly higher-than-expected even though rainfall was slightly below target as plant flow remained elevated as a result of the high flows and rainfall from the previous two months.

The disinfection dosing rate was 19% lower than the target for the 2nd Quarter. The average dosing rate for the quarter was 1.27 mg/L compared to the target of 1.57 mg/L. Dosing was lower-than-expected due to a lower chlorine demand as a result of the diluted wastewater from the higher plant flows over the last several months.

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	0	0	0	100.0%	0.00
A	7	7	0	98.1%	27.25
S	3	3	0	99.2%	10.25
O	10	10	0	98.4%	43.94
N	5	5	0	98.8%	20.72
D	3	3	0	98.4%	28.35
J					
F					
M					
A					
M					
J					
<b>Total</b>	<b>28</b>	<b>28</b>	<b>0</b>	<b>98.7%</b>	<b>130.5</b>



There were 18 separate secondary blending events during the 2nd Quarter; all due to high plant flows resulting from heavy rain. There were 10 separate blending events in October, five (5) in November, and three (3) in December resulting in a total of 93.02 hours of blending and 583.01 million gallons of primary-only treated flow blended with secondary effluent. Rainfall and thus plant flow were much higher-than-expected in both October and November with many storms triggering blending events. The precipitation in December was slightly lower than expected, but all three (3) events in December were triggered by a single major storm system that produced 2.49 inches of rainfall from December 7 into December 8.

Overall, 98.5% of the total plant flow to DITP received Secondary treatment during the 2nd Quarter of FY12. The Maximum Secondary Capacity for the entire quarter was 700 MGD.

**Secondary permit limits were met at all times during the 2nd Quarter.**

## Deer Island Operations & Maintenance Report

### Environmental/Pumping:

The total precipitation of 14.95 inches for the 2nd Quarter of FY12 was 28% higher than the 10-year average precipitation for the quarter of 11.66 inches. Measureable rain fell on 32 of the 92 days in the quarter. Total precipitation for the 2nd Quarter of FY12 was 43% higher than the FY11 precipitation of 10.47 inches during the same period.

The plant achieved a maximum average hourly flow rate of 1,216.0 MGD on the morning of December 8 as a result of heavy rainfall which began during the overnight hours of December 7. A total of 2.49 inches of precipitation fell from December 7 through December 8. Pumping and treatment operations continued without incident through this storm event, as well as throughout the entire quarter.

## Deer Island Operations

2nd Quarter - FY12

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### Deer Island Operations & Maintenance Report (continued)

#### Secondary Treatment:

Progress on the major Primary and Secondary Clarifier Rehabilitation Project, MWRA contract #6899, continued through the 2nd Quarter. The primary scope of this contract project is to replace all the chains and sprockets in the primary and secondary clarifiers along with some other limited repairs. Rehabilitation work on a total of four (4) primary clarifiers and two (2) secondary clarifiers were completed during this quarter. Additionally, significant progress with the sprocket repairs was achieved with sprocket repairs being completed for 20 primary clarifiers and 32 secondary clarifiers. One (1) primary clarifier and one (1) secondary clarifier were in the process of being rehabilitated at the end of the quarter. The sprocket repairs for one (1) primary clarifier and two (2) secondary clarifiers were also in process. In summary, the rehabilitation work, including sprocket repairs, for nearly all the primary and secondary clarifiers were completed by the end of December and 100% of all the work for this project was completed in early January 2012.

#### Residuals Treatment:

Broken mixers on Module #2 Digester #2 and Digester #4 were replaced one after the other this quarter leaving six (6) active digesters in operation for almost two months of the quarter while one (1) of the two (2) digesters was offline for mixer replacement. DITP returned to seven (7) digester operation again by November 25.

#### Odor Control:

In October, Maintenance staff replaced the mist eliminator in wet chemical scrubber #1 in the East Odor Control Facility that treats the process airflow from the Primary A and B batteries. Chemical precipitate had significantly reduced the effectiveness of the previous mist eliminator and was therefore in need of replacement. The Gravity Thickener odor control portion of the Residuals Odor Control (ROC) Facility was taken offline on October 24 to allow for necessary scheduled maintenance to effect a permanent replacement of several ductwork expansion bands. This maintenance is an ongoing project that began with repairs that were initially started in July 2008. The Gravity Thickener process airflow was restored in the afternoon of October 25.

#### Energy:

The three (3) week annual maintenance at the DITP Thermal Power Plant took place in mid-October. Various maintenance activities on the Steam Turbine Generator (STG), the two Zurn boilers, and the common systems were performed and involved maintenance on various pumps, valves, and instruments throughout the plant. The final week of this maintenance included combustion testing and boiler tuning on both boilers. During this test each boiler operated on digester gas, oil, and a combination of both. Both the STG and the boilers were offline intermittently during the majority of this three (3) week period, except for approximately two (2) days when maintenance was performed on the common system and required a full Thermal Power Plant shutdown.

The project to replace several leaking expansion joints in the DI thermal heat loop, which supplies all the heat to the facilities on-island including the heat to the operating sludge digesters, was completed in November. This project began with the first expansion joint being replaced in August, a second joint was replaced in October, and the final joint was replaced in November. Each expansion joint replacement called for a complete shutdown of the heating loop for two (2) to four (4) days as the steam in the heating loop must be cooled before a significant portion of the loop can be drained to allow for the expansion joint to be changed out.

#### Regulatory:

A representative from Cameron-Cole, a Massachusetts Department of Environmental Protection (MaDEP) approved verification firm, was on-site November 15 to conduct a MaDEP required verification of the DITP Green House Gas (GHG) emissions for the 2010 reports that were submitted to the MaDEP. The representative toured the DITP Power Plant and reviewed selected records, flowmeters, instrumentation, and equipment as part of this verification process.

#### Clinton Wastewater Treatment Plant Operations and Maintenance Report

##### Weather/Flow:

With the above average late summer and early fall precipitation, the plant exceeded the flow limit for the first time in 9 months in October. The flow limit is a 12 month rolling average which has been gradually increasing as a result of much higher than normal rainfall. The permit limit is 3.01 mgd and the current rolling average is 3.41mgd.

##### Phosphorous Removal:

The preliminary design for plant modification to meet the the new phosphorous requirement has begun. The preliminary design will evaluate power requirements, pre or post filter pumping, floc tank sizing.

##### Operations and Maintenance:

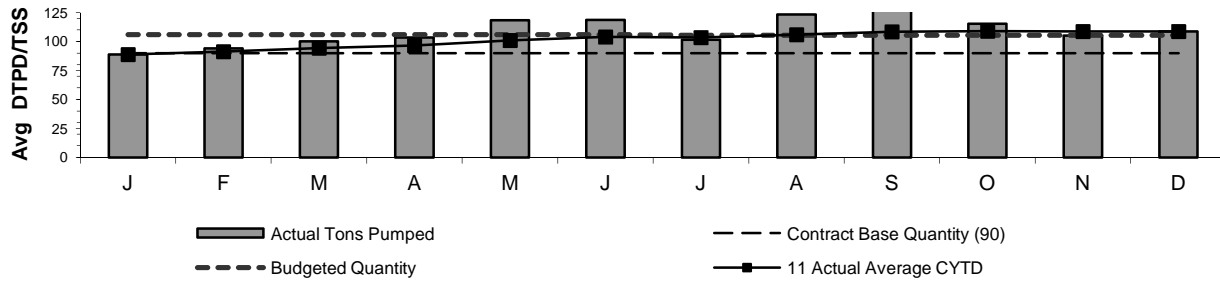
Staff completed all scheduled maintenance work orders this quarter. In addition, staff preformed a number of other maintenance tasks including: cleaned , inspected and replaced broken gasket on check valves on low pressure air blower no.1. Also changed oil and air filter at the headworks, installed new sump pump in lower grit area. replaced solenoid valves on packing gland flushing water lines for primary tank pumps 2 & 3, cleaned blockage from polymer feed and mixer, replaced leaking expansion fitting on sodium hypochlorite tank no.2.

## Deer Island Residuals

2nd Quarter - FY12

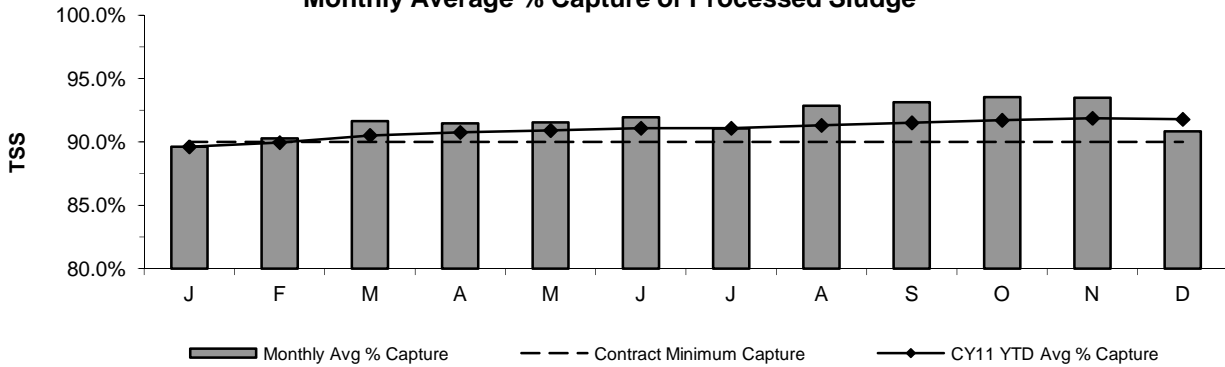
MWRA pays a fixed monthly amount for the calendar year to process up to 90 DTPD/TSS as an annual average. The monthly invoice is based on 90 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional payments are made on any quantity above the base amount. The base quantity of 90 DTPD/TSS was set for the 15-year term of the contract, even though, on average, MWRA processes more than 90 DTPD/TSS each year (FY12's budget is 105.5 DTPD/TSS).

### Sludge Pumped From Deer Island



The average total quantity of sludge pumped in the 2nd Quarter was 109.7 DTPD, which is more than FY12's budget of 105.5 DTPD. The higher quantity is a result of lower destruction of solids due to lower digestion capacity; two digesters were out of service for mixer repairs.

### Monthly Average % Capture of Processed Sludge



The contract requires NEFCo to capture at least 90% of the solids delivered to the Biosolids Processing Facility in Quincy; the solids capture rate for the 2nd Quarter was 92.62%.

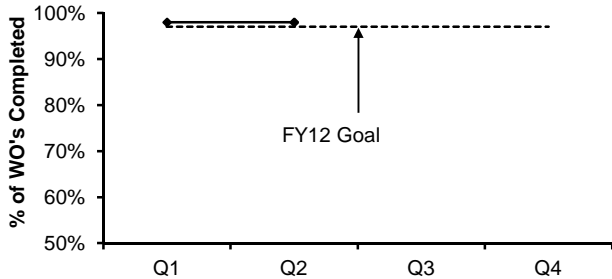
# Deer Island Maintenance

2nd Quarter - FY12

## Productivity Initiatives

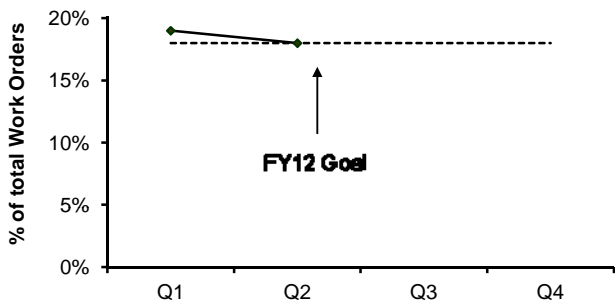
Productivity initiatives include increasing predictive maintenance tasks. Accomplishing this initiative should result in a decrease in the overall maintenance backlog.

### Predictive Maintenance Compliance



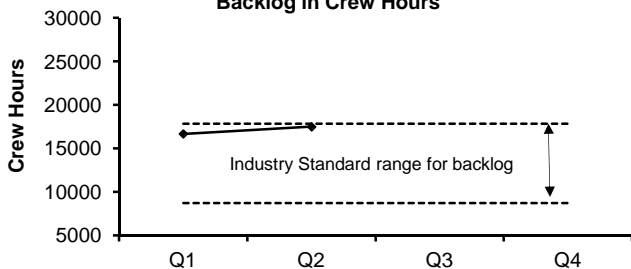
Deer Island is continuing with an aggressive predictive maintenance program. Deer Island's FY12 predictive maintenance goal is completion of 97% of all PdM work orders; Deer Island met this goal as it completed 98% of its PdM work orders this quarter.

### Predictive Maintenance



Deer Island's FY12 goal is to increase PdM work orders to 18% of total work orders. The industry is moving toward increasing predictive maintenance work to reduce down time and to better predict when repairs are needed. DITP met the goal as it completed 18% of total work orders this quarter.

### Maintenance Project Backlog in Crew Hours

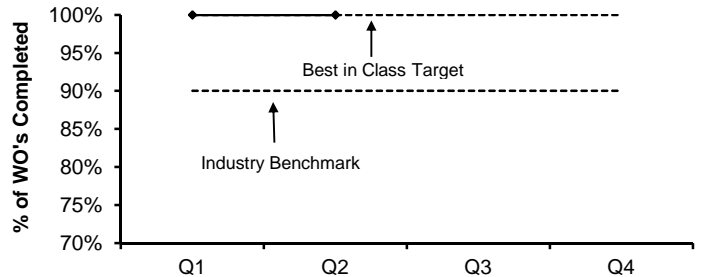


DITP's average backlog this quarter was 17,496 hours. The industry standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours (17,820 hours). Maintenance is currently within the industry benchmark. Management continues to monitor backlog to ensure that all critical equipment and systems are available.

## Proactive Initiatives

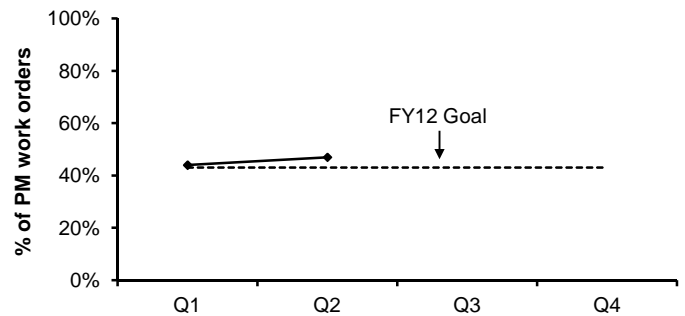
Proactive initiatives include completing 100% of all preventive maintenance tasks and increasing preventive maintenance kitting. These tasks should result in lower maintenance costs.

### Preventive Maintenance Compliance



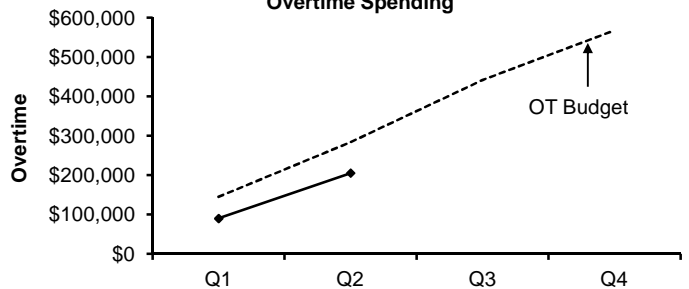
Deer Island's FY12 preventive maintenance goal is completion of 100% of all PM work orders from Operations and Maintenance. DITP met this goal as it completed 100% of PMs this quarter.

### Maintenance Kitting



Deer Island's FY12 maintenance kitting goal is 43%; Deer Island completed 47% of maintenance kitting this quarter. Kitting is staging of parts/materials necessary to complete maintenance work. This has resulted in more wrench time and increased productivity.

### Overtime Spending



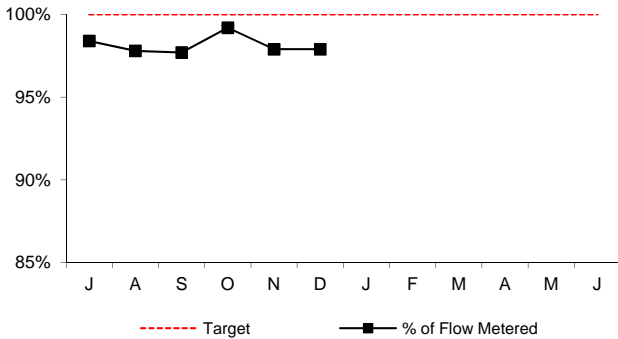
Overtime spending was \$19K under budget for the 2nd Quarter. 2nd Quarter overtime was used for high-flow coverage, support planned boiler outage, 20" valve replacement on hot water line, rebuild Cryogenics compressor 2B, repair odor control heat exchanger, and clarifier work to support Clarifier rehabilitation contract 6899.



# Operations Division Metering 2nd Quarter - FY12

## WATER METERS

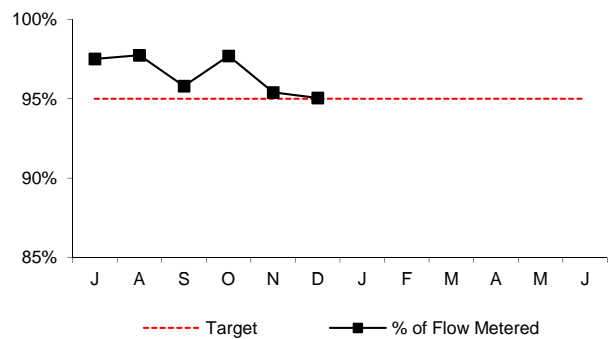
**Percent of Total Revenue Water Deliveries Calculated Using Meters**



The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 2nd Quarter of FY12, meter actuals accounted for 98.3% of flow; only 1.7% of total revenue water deliveries were estimated. The following is the breakdown of estimations:  
 In-house and Capital Construction Projects - 1.2%  
 Instrumentation Failure - 0.5%

## WASTEWATER METERS

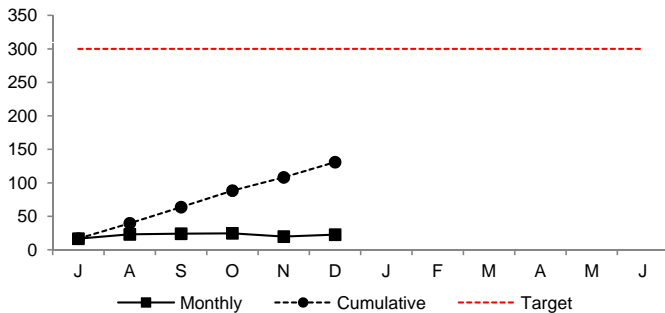
**Percent of Total Wastewater Transport Calculated Using Meters**



The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 2nd Quarter of FY12, meter actuals accounted for 96.1% of flow; 3.9% of wastewater transport was estimated.

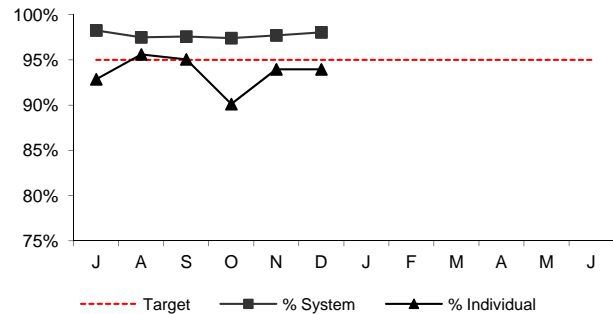
## WATER DISTRIBUTION SYSTEM PIPELINES

**Miles Surveyed for Leaks**



During the 2nd Quarter of FY12, 67.12 miles of water mains were inspected; this brings the YTD total to 130.89.

**% Wastewater Meter Uptime**



During the 2nd Quarter of FY12, out of a possible 1,607,424 data points, only 36,754 points were missed resulting in a system-wide up time of 97.7%. Of the 182 revenue meters installed, on average 13.3 meters/mth. experienced down time greater than the 5% target resulting in a 92.7% individual meter uptime. For the 2nd Quarter of FY12, down time for an individual meter is defined by any individual meter having on average less than 2,796 data points, out of potential 2,944 data points.

Water Distribution System

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	0	0	0	0	0	4						
Leaks Repaired	0	1	0	0	0	4						
Backlog	1	0	0	0	0	0						
Avg. Lag Time	31.0	47.0	47.0	47.0	47.0	13.2						

The first leak repair in FY 12 took 47 days. It was a carryover from FY11. Although minor in nature, it required a coordinated, scheduled isolation of two pipeline sections. The 4 leaks identified in December had much shorter repair times because they were easier to coordinate. As a result the average FY12 repair lag time was reduced to 13.2 days.

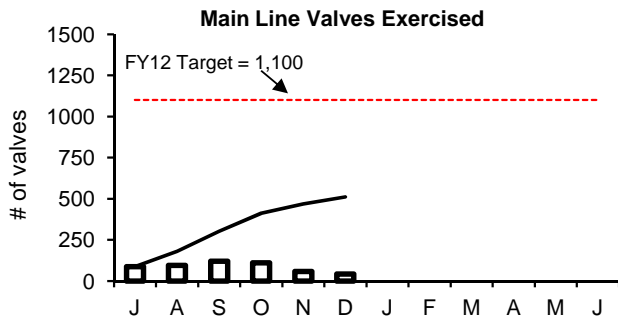
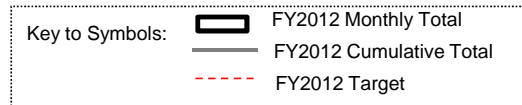
The Pipeline Program's goal is to repair all leaks found during the fiscal year. However, if the goal cannot be reached due to restrictions, isolations, communities, or degree of difficulty, then the goal is to have not more than two leaks outstanding at year's end.

## Water Distribution System Valves 2nd Quarter - FY 12

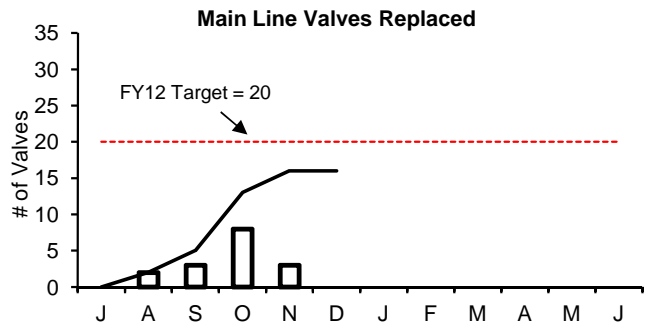
### Background

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.

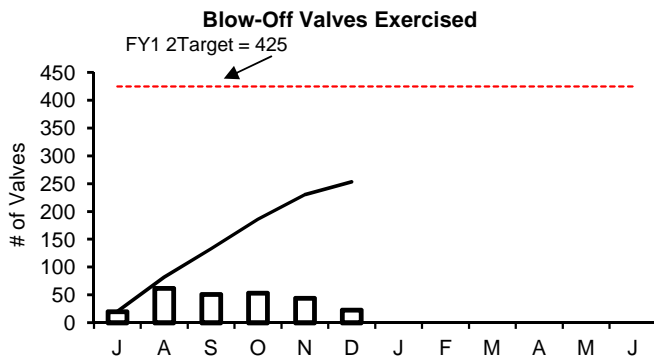
Type of Valve	Inventory #	Operable Percentage	
		FY12 to Date	FY12 Targets
Main Line Valves	2,092	95.5%	92%
Blow-Off Valves	1,206	92.4%	94%
Air Release Valves	1,335	92.0%	92%
Control Valves	48	100.0%	95%



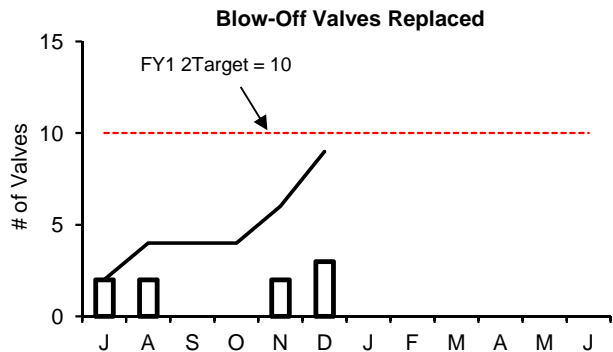
During Q2 of FY12, staff exercised 211 main line valves bringing the total for the fiscal year to 511.



During Q2 of FY12, staff replaced 11 main line valves bringing the total for the fiscal year to 16.



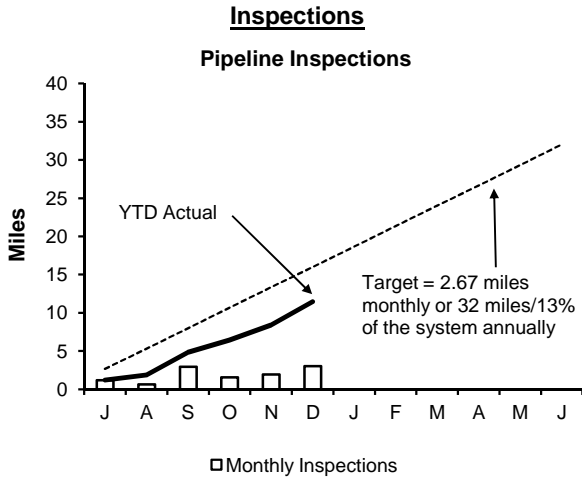
During Q2 of FY12, staff exercised 120 blow-off valves bringing the total for the fiscal year to 253.



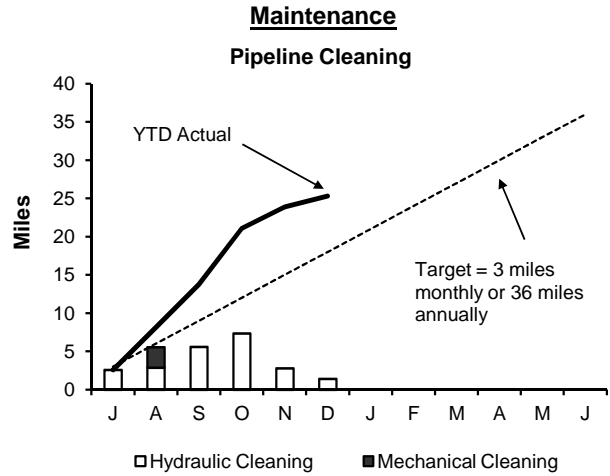
During Q2 of FY12, staff replaced five blow off valves bringing the total for the fiscal year to nine.

# Wastewater Pipeline and Structure Inspections and Maintenance

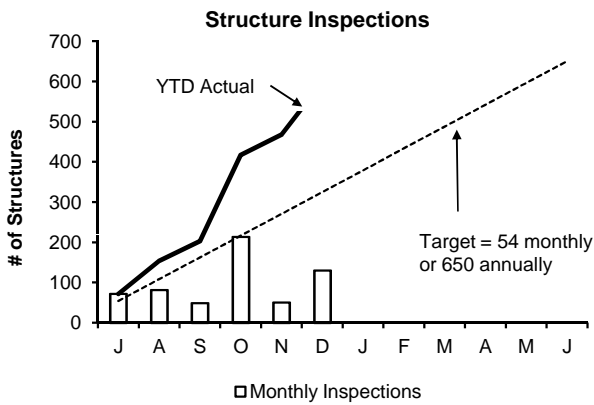
Oranage Notebook 2nd Quarter-FY12



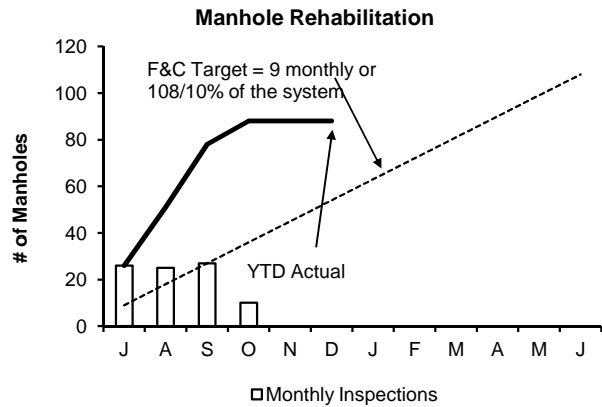
Staff internally inspected 6.62 miles of MWRA sewer pipeline during the 2nd quarter. Community Assistance was provided to the cities of Medford and Somerville, resulting in 0.07 miles.



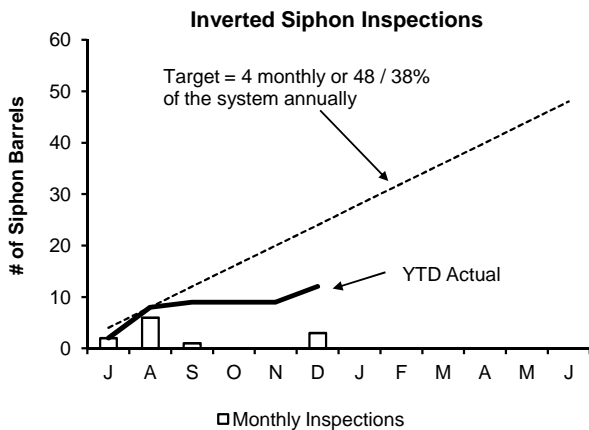
Staff cleaned 11.54 miles of MWRA's sewer system and removed 42.5 yards of grit and debris during the 2nd quarter.



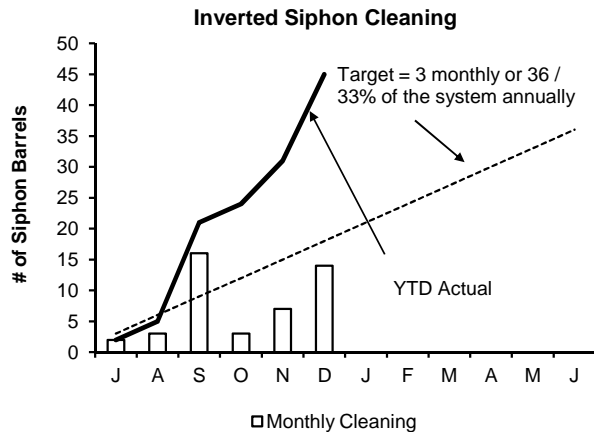
Staff inspected the 36 CSO structures and performed 395 additional manhole/structure inspections during the 2nd quarter.



Staff replaced 10 frames & covers during the 2nd quarter. In November staff have been reassigned to inside masonry projects at water and sewer facilities for the winter months. Outside work will resume in April.



Staff inspected 3 siphon barrels in the 2nd quarter.



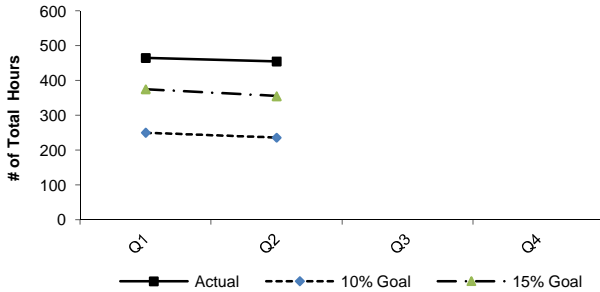
During the 2nd quarter, staff cleaned 24 siphon barrels.

# Field Operations' Metropolitan Equipment & Facility Maintenance

## 2nd Quarter - FY12

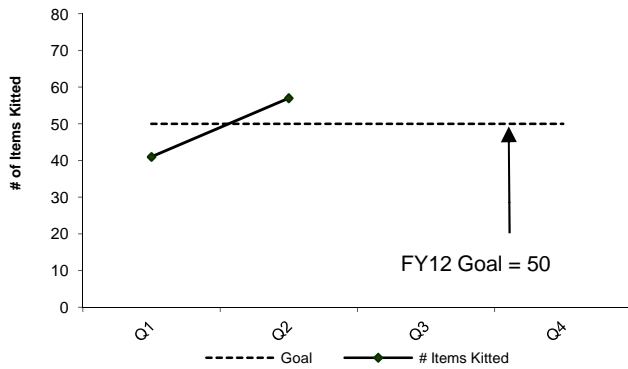
Staff are continuing with several maintenance and productivity initiatives; The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance initiatives.

**Operations Light Maintenance PM Hours**



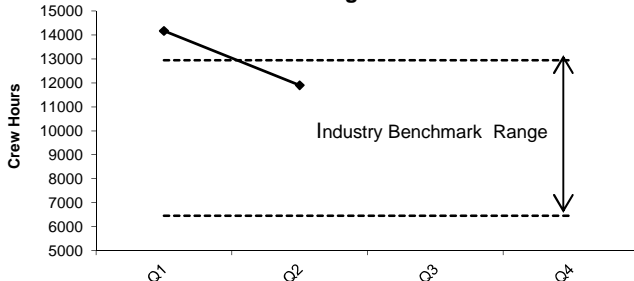
Operations staff averaged 455 hours of preventive maintenance during the 2nd Quarter, an average of 19% of the total PM hours for the 2nd Quarter, which is above the industry benchmark of 10% to 15%.

**Items Kitted Utilizing Maximo**



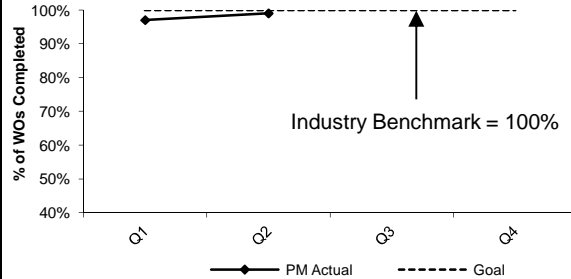
In an effort to more efficiently complete work, maintenance staff and work coordination staff have utilized the Lawson/Maximo interface to better kit stock and non stock material. The goal for FY12 is to "kit" 50 stock and non stock items total per month. An average of 57 items were kitted during the 2nd Quarter

**Maintenance Backlog in Crew Hours**



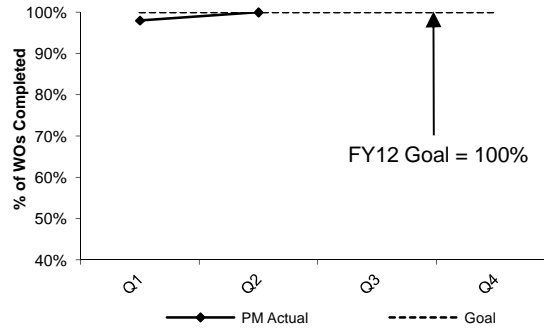
The 2nd Quarter backlog average is 11,907 hours. The Mechanical backlog is above the industry average due to the addition of multiple projects including the Chelsea Screen House Screens, Alewife Screens and Nut Island Conveyor Repairs. Management's goal is to control overtime and still stay within the industry benchmark of 6450 to 12,940 hours.

**Overall Preventive Maintenance**



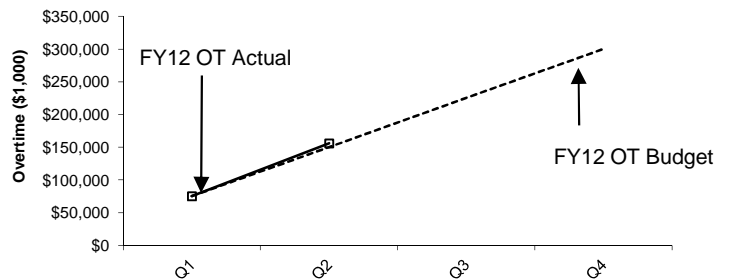
The Field Operations Department (FOD) preventive maintenance goal for FY12 is 100% of all PM work orders. Staff completed an average of 98% of all PM work orders in the 2nd Quarter.

**Operations Light Maintenance % PM Completion**



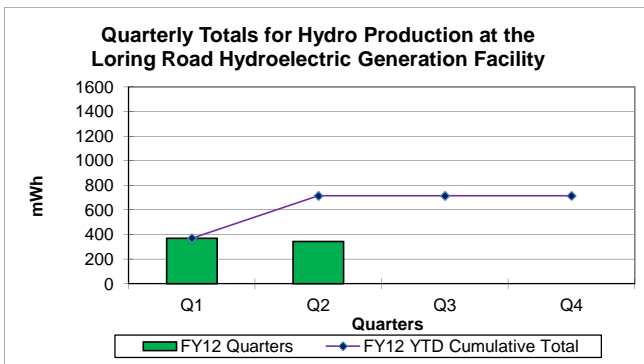
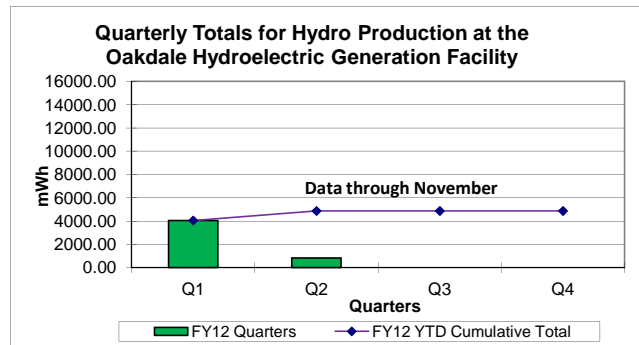
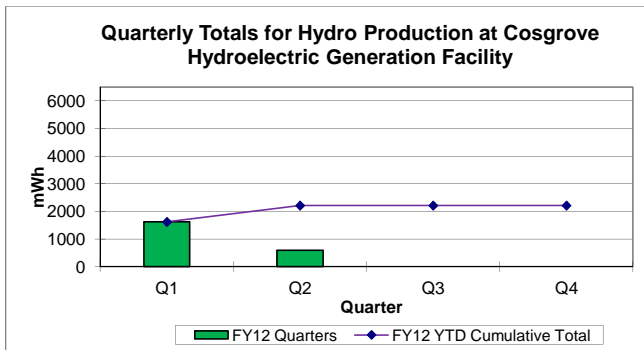
Wastewater Operators complete light maintenance PM's which frees up maintenance staff to perform corrective maintenance. Operations' FY12 PM goal is completion of 100% of all PM work orders assigned. Operations completed an average of 100% of PM work orders in the 2nd Quarter.

**Overtime Spending**



Maintenance overtime was \$5k over budget for the 2nd Quarter. Overtime was used to complete emergency repairs due to a variety of critical operational needs as well as staff coverage during multiple wet-weather events.

## Field Operations Hydroelectric Generation Quarterly Report 2nd Quarter - FY12



In the 2<sup>nd</sup> Quarter, the **Cosgrove Hydroelectric Station** generated a net of 593 MWh; approximately 24% less than was generated during the same quarter in FY11. The revenue generated at Cosgrove in the second quarter was \$24,622, exclusive of Renewable Energy Certificates.

Data is not yet available for December, so the 2<sup>nd</sup> Quarter data is not complete. (Power is generated when water is transferred from Quabbin to Wachusett.)

In the 2<sup>nd</sup> Quarter, the **Loring Road** hydroelectric 200 kW station generated 344 MWh. Power is generated as water conveyed from Norumbega to the Loring Road storage tanks is reduced in pressure and the energy available in this pressure reduction is captured by the new turbine. The facility operates continuously. Some power is consumed on site, with the bulk exported to the grid.

**Southborough:** An audit of the Southborough facility recommended a review of the HVAC system. Staff completed that work and have recommended the installation of an energy management system similar to the one being installed at the Chelsea Facility. Staff are working with NSTAR and its contractor to evaluate the work necessary to implement this project. NSTAR has committed to providing a \$30,000 incentive to this project based on the projected energy savings. This project falls under the requirements of the Green Communities Act since it would be under \$100,000. In addition, NSTAR provided ARRA funds in addition to its own incentive for the installation of energy efficient lighting at the Southborough complex that resulted in the installation of these lights at no cost to the MWRA. This work completed in January 2012.

**Wind Power:** Under the American Recovery and Reinvestment Act for Green Infrastructure projects, MWRA received \$4.75 million in stimulus funding from SRF for a wind turbine at the DeLauri Pump Station. MWRA issued an NTP for design/build of a 370-foot turbine in March 2010. Work was completed by the end of the first quarter, been completed and the turbine is operational. Contractor' and NSTAR acceptance testing was on-going during the 2nd quarter of FY12.

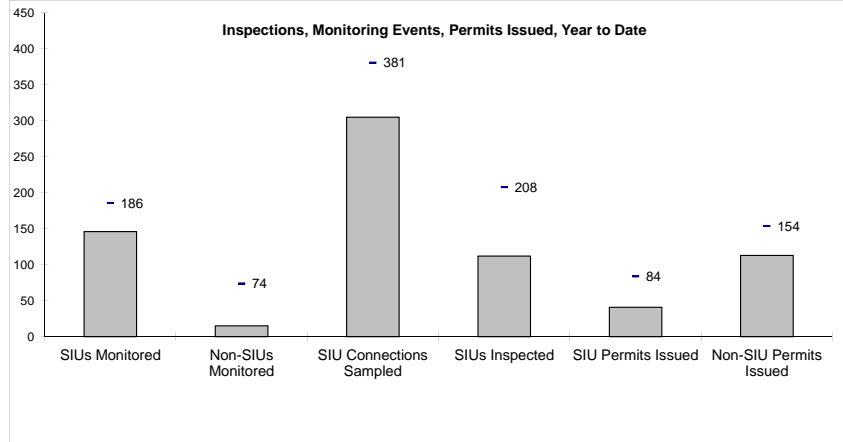
**Chelsea Facility:** The detailed audit of the Chelsea facility recommended installing an Energy Management System for the Admin. Building along with some equipment updates. NSTAR has agreed to provide a \$168,000 incentive to MWRA for the installation of the EMS. The project was bid and a contract was awarded during the second quarter of FY12 and work is scheduled to begin in the third quarter of FY12.

### Energy Audits and Implementation of Audit Recommendations at FOD Facilities:

MWRA staff identified multiple facilities that would benefit from a comprehensive energy audit. Audits of 24 facilities were performed in two phases from FY10 through the first quarter of FY12. The focus of these energy audits were lighting, HVAC, pumps, and motors. Implementation of the audit recommendations began at the end of the 1st Quarter of FY11 and are on-going. Audits of an additional 6 facilities will begin in the second quarter of

# Toxic Reduction and Control

2nd Quarter FY 2012



EPA Required SIU Monitoring Events

for FY12: 186  
YTD: 146

Required Non-SIU Monitoring Events

for FY12: 74  
YTD: 15

SIU Connections to be Sampled

For FY12: 381  
YTD: 305

EPA Required SIU Inspections

for FY12: 208  
YTD: 112

SIU Permits due to Expire

In FY12: 84  
YTD: 41

Non-SIU Permits due to Expire

for FY12: 154  
YTD: 113

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

TRAC's annual monitoring and inspection goals are set at the beginning of each fiscal year but they can fluctuate due to the actual number of SIUs at any given time. During the course of the year, some SIUs do not discharge and cannot be monitored. TRAC's monitoring plan requires one additional sampling event for 40% of the SIUs and two additional sampling events for 10% of the SIUs. TRAC also monitors one-third of the non-SIUs each year. The number of SIUs inspected reflects the total number of facilities that were inspected throughout the year that were determined to be SIUs at some time during the 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.

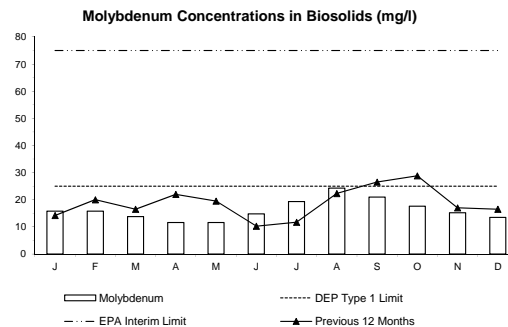
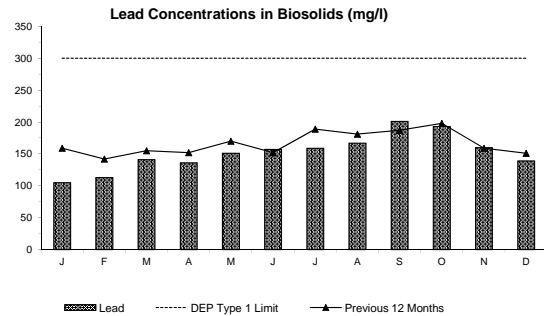
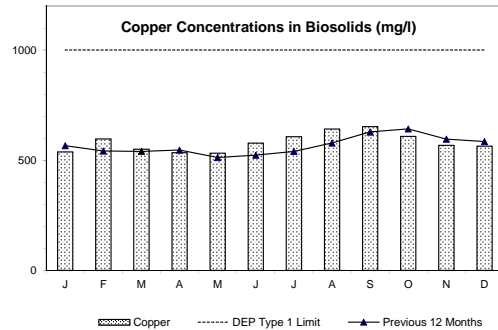
	Number of Days to Issue a Permit						Total Permits Issued	
	0 to 120		121 to 180		181 or more		SIU	Non-SIU
Jul	5	10	0	0	0	0	5	14
Aug	4	13	4	2	0	0	8	20
Sep	2	11	1	2	0	0	3	16
Oct	13	18	0	2	0	0	13	23
Nov	9	20	0	1	0	0	9	22
Dec	2	16	1	2	0	0	3	18
Jan								
Feb								
Mar								
Apr								
May								
Jun								

% YTD	85%	78%	15%	8%	0%	14%	41	113
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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. In December, one SIU permit was issued beyond 120 days because of staff turnover.

Copper, lead, and molybdenum are metals of concern for MWRA as their concentrations in its biosolids have, at times, exceeded regulatory standards for unrestricted use as fertilizer. Cooling tower usage typically causes a seasonal spike in molybdenum concentrations due to the blowdown on large AC systems that use corrosion inhibitors containing molybdenum. Levels drop again following the end of the cooling season. The hotter the season, the higher the spike. TRAC has an ongoing program to persuade cooling tower operators to switch to phosphate-based corrosion inhibitors.

Levels were lower than standards for the quarter.



## Field Operations Highlights – Orange Notebook 2<sup>nd</sup> Quarter – FY12

### Western Water Operations & Maintenance

CWTP: Operations & Maintenance Staff placed the Carroll Water Treatment Plant into half plant operation by isolating Treatment Train “A” in November. As part of the winter maintenance, staff cleaned the primary contactors and the storage tanks, and completed maintenance tasks such as replacing rupture disks and mud valves. The plant stayed in half plant operation for the remainder of the quarter to support work being performed by the UV Contractor. Also, staff supported a rigging contractor with the removal of four gearbox and shaft assemblies in the Post Treatment Building, completing the rapid mixer removal energy project.

Storm Damage: Staff responded to numerous power outages as a result of the late October snow storm. A large number of trees fell along the CVA, Wachusett, Sudbury and Hultman right of ways. Staff completed clearing of the trees by the end of the quarter. Staff repaired six separate storm related breaks of the 2,200 volt high line that feeds the Quabbin Tower from the power station. DCR Staff cleared temporary access paths to support the work. Staff also repaired a 22 kV knife-switch at the electrical substation.

### Metro Water Operations & Maintenance

Incidents: The snow storm of October 29 and 30 created much damage due to downed trees and power lines. The Gillis Pump Station lost power for about 3 hours, however, it ran on its emergency generator and there was no impact to service. Power was lost at the Loring Road Covered Storage Facility from Saturday evening until early Monday evening, was run on an emergency generator, and service remained normal.

Leaks During the Quarter: Leaks were reported and repaired on Bailey Street in Somerville from a leaking blow-off valve bonnet on the Shaft 9B Line; Section 22 at 1147 Adams Street in Boston (Dorchester); and Section 20 on Morton Street on a leaking joint. Water Pipeline Staff repaired a leaking joint on Section 51 on Boston Avenue that was discovered during pressure testing for the Sections 18/50/51 CIP Contract. On December 20, water was reported entering a business at 33 Riverside Avenue in Medford. Section 57 a 48” steel main is located in Riverside Avenue. National Grid responded to the site and pumped out an electric manhole in front of the business, which stopped the water.

Blue Hills Covered Storage Tanks Warranty Inspection: The Blue Hills Tanks were inspected in October, after having been in service for two years. Each tank was independently isolated for leakage testing and both tanks passed. Each tank was then inspected by divers, and found to be in generally good condition, with minor (about 1/8”) sediment on the tank bottom.

Section 47A Conversion to BWSC System: The 8” main (Section 47A) that serves the Community Rowing and DCR Skating Rink on Nonantum Road in Brighton was disconnected from the MWRA system in November and connected to a new 12” water main in the BWSC System.

Water Pipeline Program: Pipeline Staff worked on several projects during the quarter. A 30” gate valve was removed and replaced on Section 78 at the Newton Street Pump Station in Brookline. Installation of the new 4” service connection (including the installation of two new valves) to the LoConte Rink in Medford was completed. Work was completed on installation of approximately 150 feet of 12” water main to replace an existing 8” water main downstream from a Pressure Reducing Valve (PRV) in Waltham. This will provide better water service during the River Road work when WASM 3 is temporarily isolated for the Hultman Aqueduct contractor. Work was completed on the Section 29, Section 64, and NIH redundant pipeline stub on Woodland Road in Stoneham, in front of Gillis Pump Station. The Woodland single lane closure was reestablished to provide work zone safety. Section 64 from Gillis Pump Station to Fells was isolated for the work to occur. Section 13 to Fells remained in service. Five blow-off valve locations were completed during the quarter: two on Section 57 in Medford, one on Section 78 in Brookline and two on Section 47 in Brighton. The blow off on Section 57 at Riverside Avenue at Spring Street was begun during December.

Valve Program: Main Line Valve Exercising was performed at Deer Island and Loring Road and on eleven (11) pipeline sections. Valve Staff disinfected Sections 29 and 64, and assisted the contractors with disinfection and flushing of Sections 20/21/107, Sections 86 and OMM24 and Section 65, and with filling and pressure testing of Section 51 for the CIP contractor. Valve, SCADA, Electrical, and Operations Staff coordinated on the interim gravity operation of the Fells Covered Storage Facility.

**Wastewater Operations & Maintenance**

Emergency Planning and Response Facility Handbook: Operations Staff continue to update and review Integrated Contingency Plans for all wastewater facilities, including emergency notification procedures and emergency action plans.

South Boston CSO Storage Facility and Pump Station: Operations Staff was stationed at the pump station during the month of October to monitor and learn the operation of the pump station and vent the building and diversion structures. They stayed there until mid November when it was then turned over to MWRA Wastewater Operations by the contractor.

SCADA Alarms: Operations Staff worked with SCADA, Process Control and Maintenance Staff to review the top 15 weekly SCADA alarms and to take corrective action to eliminate/rectify the issue causing these alarms in an effort to reduce the overall number of alarms coming into the Wastewater OCC.

Coordination with Construction Projects: Operations Staff continued to coordinate with Construction and the contractors at a number of construction projects including, the Prison Point HVAC/Odor Control Systems Upgrades, Backup Pump Control Project, Somerville Influent Gate Replacement Project, Prison Point Storm Pump and Gear Rehabilitation and the Somerville Marginal Influent Gate and Stop Log Replacement Project

Spill Prevention Control and Countermeasures (SPCC) Inspections: Operations performed SPCC Inspections at Cottage Farm CSO, Prison Point CSO and Braintree Weymouth Pump Station. The DEP required inspections are performed monthly with records placed onsite in the EAP Cabinets and in the Operations Program Manager's Office for reference and recommendation tracking.

Cottage Farm Fuel Oil System Upgrade: Final design is in progress. 100% design documents received and reviewed. Based on consultant review of regulatory requirement to meet area classification in diesel engine and pump rooms, additional combustible gas detectors to be installed. Contract under review by Procurement.

**TRAC**

Annual Permit Charges: TRAC's annual bills to sewer use discharge permit holders were issued on November 17, 2011. The amount invoiced totaled \$2,070,820.00. Permittees had 30 days to pay and/or appeal the charges.

**Metro Equipment and Facility Maintenance**

Headworks Channel Rehabilitation: Channels at the Columbus Park, Ward Street and Chelsea Creeke Headworks were rehabilitated as part of a longer term effort.

Chestnut Hill Underground Pump Station Pump 1: Pump 1 did not start during the quarterly pump test. A failed vibration unit was found and the issue was resolved by the Electricians.

**Operations Support**

Development of ERP Training Programs: Staff continued implementing a comprehensive annual emergency plan training program to comply with DEP requirements. This training is being provided by MWRA Staff and to staff from the MWRA water communities. The community training sessions began in December with the first two modules. Other sessions will extend through the fall of 2012. Then they will be repeated annually in a series of sessions each year.

Wastewater Scaling Factors: Staff had been reviewing unmetred areas in wastewater communities using temporary flow testing. This will enable a review of scaling factors used to adjust meter flows for contributions from unmetred areas. A review of methodology issues is ongoing.

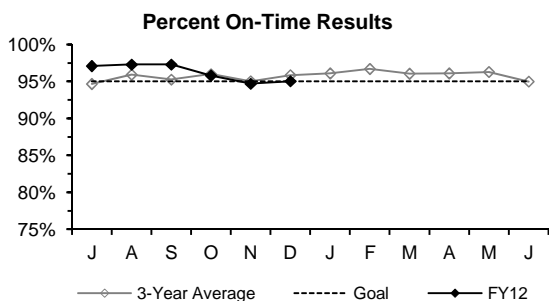
*Water Quality Assurance*

Contaminant Monitoring Systems. Seven units have been installed and made operational via SCADA through December and several more are in progress. Central data collection equipment and its associated server installation were installed in September and are operational. Staff continued implementing the associated data collection network with Verizon field connection of necessary circuits being done site by site. Response SOPs are being developed for alarm response when the system is fully operational.

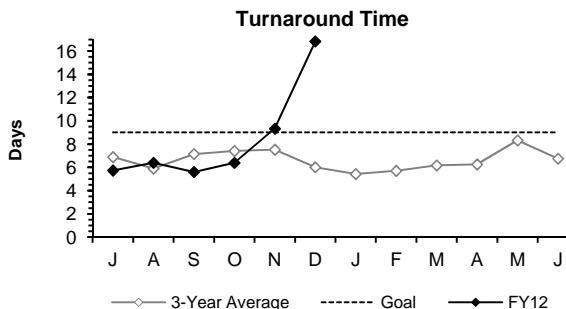


# Laboratory Services

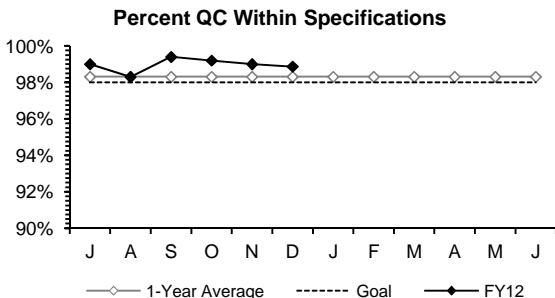
2nd Quarter - FY12



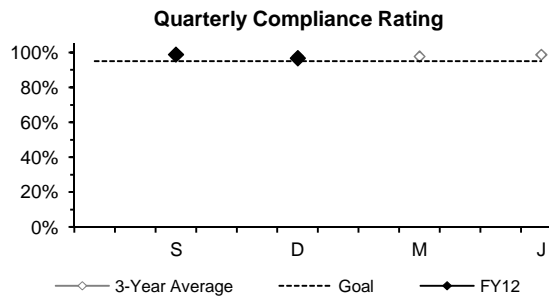
The Percent On-Time measurement met the 95% goal for 2 out of 3 months of the quarter.



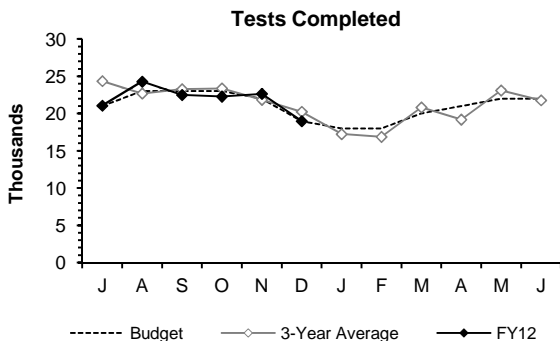
Turnaround Time was slower than the 9-day goal due to completion of two longer-turnaround projects.



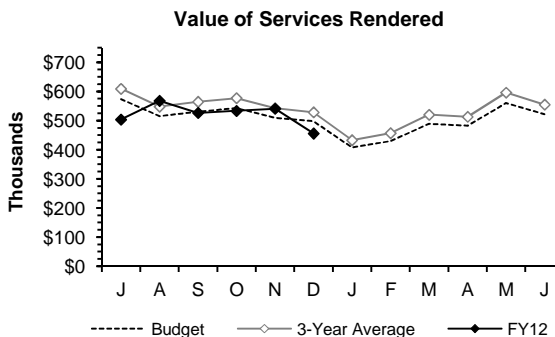
Percent of QC tests meeting specifications stayed above the 98% goal each month of the quarter. The 1-year average is based on the new LIMS results.



An audit of compliance with issues identified in previous audits found good follow through. Compliance audits are performed in September, December, March, and June.



The Tests Completed was slightly below the seasonally adjusted budget goal for the quarter. FY12 will be a transition year for this metric between the old and the new LIMS.



Value of Services Rendered was below the seasonally adjusted budget projection for the quarter. FY12 will be a transition year for this metric between the old and new LIMS.

**Highlights:** Construction work has begun at the Central Lab to replace six chemical fume hoods used to prepare samples for metals testing. The new fume hoods and the lab's casework will be made of polypropylene plastic to prevent samples to be tested for metals from getting contaminated.

**Quality Assurance:** An audit of the Southboro Lab found that same day data entry into the LIMS, the revised bacteria logbook, automatic email notifications, and improved data review procedures are all supporting reliable community notifications of presumptive and confirmed bacteria results. Completed and implemented a revision to the records retention procedures to achieve clarity and consistency.

**Clinton:** Implemented automatic email notifications by LIMS when results exceed warning limits so that interesting results aren't overlooked. This is similar to the approach being used successfully for drinking water bacteria samples.

**DITP:** Conducted a lab tour for scientists attending the Society of Environmental Toxicology and Chemistry (SETAC) meeting. Tested samples for total and suspended solids for three polymer vendor trials.

**ENQUAD:** Completed the annual testing of Mass Bay and Boston Harbor benthic sediment samples.

**TRAC:** Completed an experiment on volatile organic chemicals that showed that acrolein, acrylonitrile were stable but acidification causes problematic 2-chloroethylvinylether to quickly degrade. These results were discussed at the DEP Lab Advisory Committee and the Independent Testing Laboratory Association meetings.

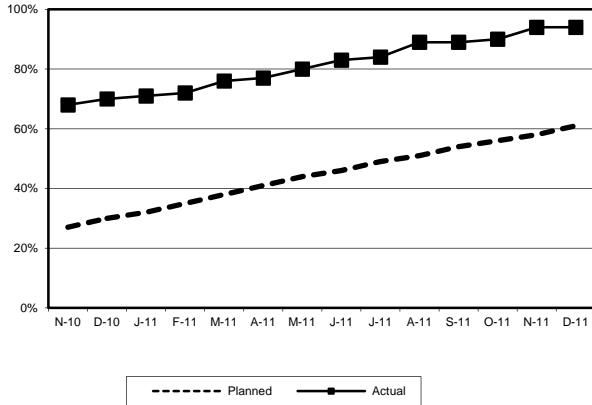
**Water Quality Assurance:** A careful examination of bacteria results from 2,349 treated drinking water samples showed that the Membrane Filtration and the Colilert test for Total Coliforms agreed 99.2% of the time. Based on this we decided to use Colilert for routine tests instead of Membrane Filtration because it is faster, more reliable, and leads to fewer internal and community notifications. Completed the large semiannual set of Lead and Copper Rule samples. The DEP's lab and an outside lab confirmed that a Total Coliform Rule sample for Waltham from October was indeed a false positive for *E. coli*.

**Outside Customers:** The recently implemented DCR/West Boylston wet-weather sampling program of Wachusett tributaries has been going well for both DCR and MWRA.

# CONSTRUCTION PROGRAMS

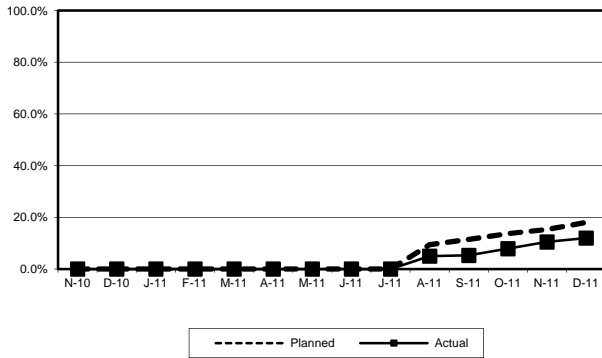
## Projects In Construction – 1 Second Quarter FY12 (Progress Percentages based on Construction Expenditures)

**Southern Spine Water Mains Rehabilitation - Section 107**  
Progress - December 2011



*Project Summary:* This project for Section 107 includes the removal of 17,000-linear feet (lf) of 24-inch water main, installation of 9,400-lf of new 48-inch water main, replacement of three revenue meters, and the cleaning and lining of 1,000-lf of 24-inch & 1,500-lf of 48-inch water main.  
*Status and Issues:* The contractor completed disinfection of Section 21, 107 and portion of 22. The portion of section 22 piping on Washington Street between Flynn Insurance and Medway Street was not disinfected due to a leak that was discovered on the existing piping outside of this contracts limits of work, therefore the disinfection will be completed by MWRA Operations during month of January. The leak that was discovered was repaired by MWRA Operations pipe crew.

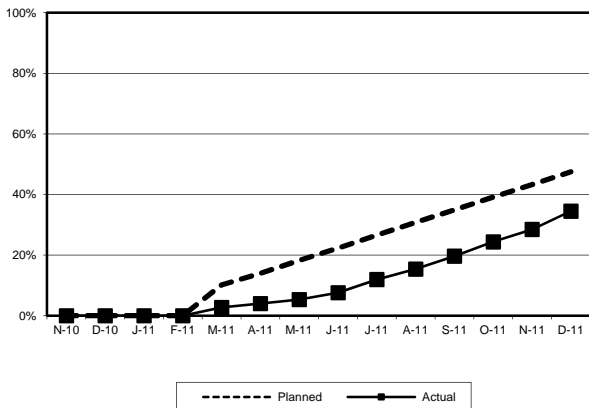
**UV Disinfection Facilities CWTP**  
Progress - December 2011



*Project Summary:* In accordance with the EPA's requirement to have two primary methods of disinfection, the Authority will add an Ultraviolet (UV) light disinfection process at the Carroll Water Treatment Plant, which will render Cryptosporidium inactive.

*Status and Issues:* The contractor completed the relocation of CO2 tank #1 and began the installation of the relocated CO2 fill piping and supports. In addition, the contractor completed the relocation of diffusers and piping in ozone contact chambers 1 & 2. Began the demolition and construction of the new temporary bypass gates and expanded overflow weir beneath PTB at influent/effluent channel, side A. The new 72" and 120" wall thimbles were installed.

**Lynnfield/Saugus Pipelines**  
Progress - December 2011

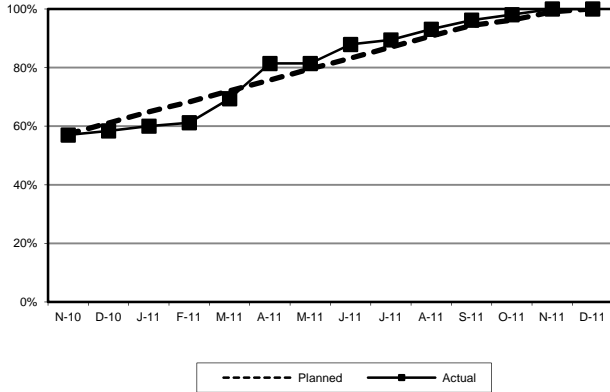


*Project Summary:* Installation of MWRA water mains including 1,800 linear feet of 36-inch pipe and 4,700 feet of 24-inch pipe. Project also includes 6,000 linear feet of 12-inch pipeline for the Town of Saugus. Pipeline construction is located along Route 1 in Saugus.

*Status and Issues:* During the month of December, the contractor installed 0 LF of 12-inch and 280.5 LF of 24-inch pipe on Route 1 South, with year to date totals of 2,452.75 LF and 2,879 LF respectively. The contractor encountered and damaged two Verizon duct-bank's, one of which had been abandoned in place. No service impact resulted from the damage.

## Projects In Construction – 2 Second Quarter FY12 (Progress Percentages based on Construction Expenditures)

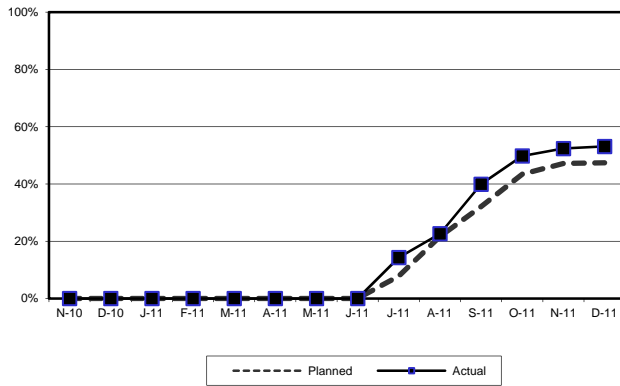
**Section 18, 50 & 51 Rehabilitation in Medford/Somerville  
Progress - December 2011**



*Project Summary:* This project is one of the Shaft 7 to WASM 3 phases (CP-5) and provides for the rehabilitation of valves and 15,000 linear feet of 48, 20 and 16-inch pipe in Medford and Somerville including replacement of revenue Meter 32 in Somerville.

*Status and Issues:* The rehabilitation of section's 18, 50 & 51 was declared substantially complete in November. Beginning next quarter, January 2012, we will begin reporting on the Spot Pond Water Storage Facility Design Build project.

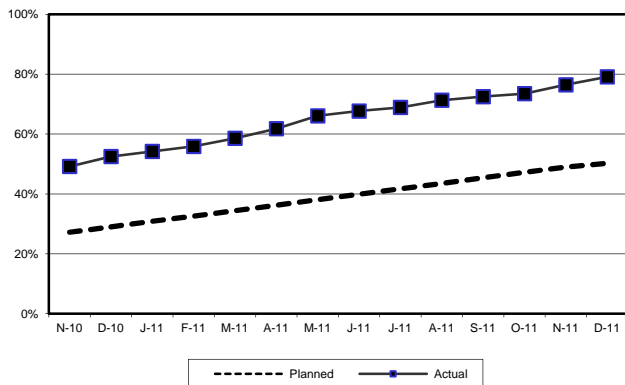
**Phase 7 Valve Replacement  
Progress - December 2011**



*Project Summary:* This project consists of the replacement of 10 blow-off and 10 main line valves and the rehabilitation of various meters throughout the Authority's water distribution system.

*Status and Issues:* Meter 78 activated (near Mt Vernon Restaurant). The winter moratorium will shutdown physical work until April, 2012.

**Hultman Aqueduct Interconnections Project  
Progress - December 2011**



*Project Summary:* This project includes rehabilitation construction to the Hultman Aqueduct to provide redundancy to the MetroWest Tunnel from Southborough to Weston by adding five new MetroWest/Hultman interconnections, two surge relief structures, 13.5 miles of internal rehabilitation and 15 miles of external access work.

*Status and Issues:* During December, the contractor continued: electrical punchlist work at VC-L2, waterproofing VC-5A1, 5A2 and branchline walls, internal punchlist and cleaning 84" and 138" Hultman, and began backfilling the north side of VC-5A2 with flowable fill. The contractor also, continued installation of rebar and forms for VC-5A2 thrust block at tee.

## CSO CONTROL PROGRAM

### 2nd Quarter - FY12

As of December 31, 2011, 29 of the 35 projects in MWRA's Long-Term CSO Control Plan are complete. Four CSO projects are in construction. MWRA plans to commence design of the remaining two projects by April 2012, in compliance with Schedule Seven: Outfall MWR003 Gate and Floatables Control/Rindge Ave. Siphon Relief and Outfall SOM01A Interceptor Connection Relief and Floatables Control, both related to Alewife Brook. Progress of ongoing and planned work to complete the CSO plan is described below.

Project	Court Milestones in Schedule Seven (Shaded milestones are complete.)			Status as of December 31, 2011															
	Commence Design	Commence Construction	Complete Construction																
Brookline Sewer Separation	Nov 06	Nov 08	Jul 13	<p>The \$25.9M Brookline sewer separation project comprises three construction contracts. All work is scheduled to be complete by July 2013, in compliance with Schedule Seven.</p> <p><u>Town of Brookline Sewer Separation Contract 1</u> Brookline attained substantial completion of the \$1.4M first construction contract in January 2010. It involved the installation of 5,658 linear feet of new storm drain.</p> <p><u>Town of Brookline Sewer Separation Contract 2</u> The \$16.5M second construction contract, which Brookline commenced in January 2011, is approximately 55% complete. This contract involves the installation of 3,790 linear feet of storm drain and 1,290 linear feet of sanitary sewer by open trench method and 4,550 linear feet of sanitary sewer by micro-tunneling.</p> <p><u>MWRA Outfall MWR010 Cleaning Contract</u> Staff are reviewing the 100% design submission for the cleaning of CSO Outfall MWR010, intended to ensure that the outfall will have adequate capacity to convey Brookline's separated stormwater to the Charles River, along with CSO discharge from MWRA's Charles River Valley Sewer in extreme storms. Staff plan to issue the NTP for this estimated \$1.1M, 3-month cleaning contract in June 2012.</p>															
Reserved Channel Sewer Separation	Jul 06	May 09	Dec 15	<p>BWSC continues to make progress with five of nine planned construction contracts for the \$62.3 million Reserved Channel Sewer Separation project.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Contract 1 - CSO outfall rehab</td> <td style="width: 15%;">\$4.0M</td> <td style="width: 25%;">Subst. complete</td> </tr> <tr> <td>Contract 2 - sewer separation</td> <td>\$6.9M</td> <td>Subst. complete</td> </tr> <tr> <td>Contract 3A - sewer separation</td> <td>\$9.9M</td> <td>47% complete</td> </tr> <tr> <td>Contract 3B - sewer separation</td> <td>\$10.9M</td> <td>6% complete</td> </tr> <tr> <td>Contract 7 - pavement restoration</td> <td>\$1.2M</td> <td>Subst. complete</td> </tr> </table> <p>BWSC also continues to make progress with remaining project design activities. BWSC plans to issue Notices to Proceed for the remaining four construction contracts - Contract 4 (sewer separation), Contract 5 (sewer cleaning and relining), Contract 6 (downspout disconnections) and Contract 8 (additional final paving) - sequentially through April 2013 and complete all work by December 2015, in compliance with Schedule Seven.</p>	Contract 1 - CSO outfall rehab	\$4.0M	Subst. complete	Contract 2 - sewer separation	\$6.9M	Subst. complete	Contract 3A - sewer separation	\$9.9M	47% complete	Contract 3B - sewer separation	\$10.9M	6% complete	Contract 7 - pavement restoration	\$1.2M	Subst. complete
Contract 1 - CSO outfall rehab	\$4.0M	Subst. complete																	
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Contract 7 - pavement restoration	\$1.2M	Subst. complete																	

Project		Court Milestones in Schedule Seven (Shaded milestones are complete.)			Status as of December 31, 2011
		Commence Design	Commence Construction	Complete Construction	
Cambridge/ Alewife Brook Sewer Separation	CAM004 Outfall and Wetland Basin		Apr 11	Apr 13	Cambridge continues to make progress with construction of the \$16.1 million CAM004 stormwater outfall and wetland basin (\$3.6 million MWRA share), began in April 2011. The contract is approximately 30% complete. Relocations of 8-inch gas line, 36-inch electric bundle, three 4-inch telecommunication conduits and 10-inch water main and 12-inch sewer force main are complete. Contractor has cleared of the 3.4-acre wetland basin area, commenced excavation and constructed the wetland basin outlet structure, and placed the perimeter berm and French drain system. Deeper excavation and shaping of the western portion of the basin has begun. Construction of the new storm drain and associated special structures that will convey separated stormwater flows to the basin continues and the contractor completed initial sections of the box culvert, including the crossing of MBTA's high speed commuter rail tracks and a large concrete stormwater diversion structure. Cambridge plans to complete work in April 2013, in compliance with Schedule Seven.
	CAM004 Sewer Separation	Jan 97	Jul 98	Dec 15	Cambridge completed four initial construction contracts for this project several years ago and plans to award three additional contracts to complete the work. Cambridge recently received the design investigations report from its engineering consultant for the first of the three contracts and plans to award this contract in September 2012, in compliance with Schedule Seven.
			Sep 12		
	MWR003 Gate and Rindge Ave. Siphon	Apr 12	Aug 14	Oct 15	Staff plan to commence design of this \$4.2 million project, which involves localized hydraulic improvements to the Alewife Brook interceptor system, by April 2012, in compliance with Schedule Seven. Staff received design proposals from engineering consultants on January 13, 2012 and plans to seek Board approval to award the contract at the March 14, 2012 Board meeting.
SOM01A Connection Relief and Floatables Control	Sep 13		Jun 14		
<b>Other CSO Related Work</b>					
South Dorchester Bay Sewer Separation Post-Construction Inflow Removal	N/A	N/A	N/A	N/A	BWSC continues to pursue additional stormwater inflow removal (i.e., downspout disconnections) from the sanitary sewer system, to mitigate the remaining risks of sewer system flooding in large storms. BWSC's receipt of its consultant's report on inflow removal recommendations has been delayed to March 2012.
Lower Dorchester Brook Sewer Regulator Relocation and Sewer Separation	N/A	N/A	N/A	N/A	BWSC continues to make progress with its \$6.0M construction contract for Lower Dorchester Brook Sewer CSO Regulator Relocation and Sewer Separation, which is partially funded by MWRA. The work is 82% complete. The project is intended to bring CSO discharges to BWSC's Dorchester Brook Conduit and the Fort Point Channel into conformance with MWRA's long-term CSO control plan. BWSC has installed 340 linear feet of 15-inch and 18-inch-diameter storm drain and has completed construction of special structures and particle separators at Massachusetts Avenue. BWSC has also completed the 25 acres of sewer separation in the contract. BWSC plans to extend the contract term to February 29, 2012, due to weather related delays.

## CIP Expenditures 2<sup>nd</sup> Quarter FY12

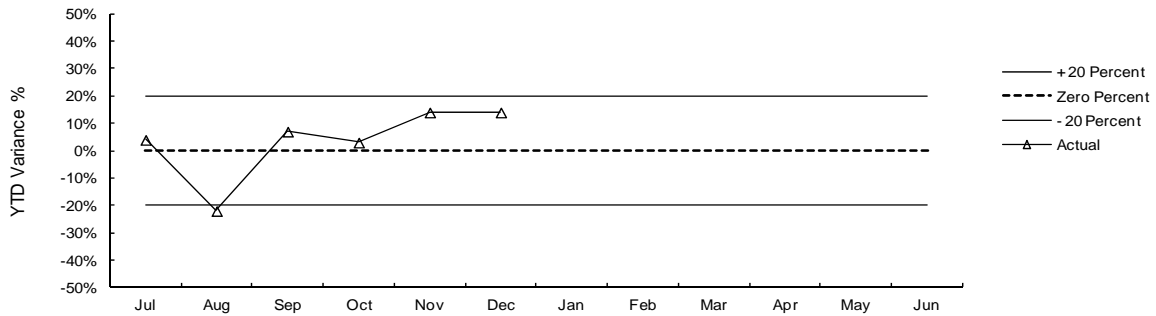
The Year-To-Date variances are highlighted below:

FY12 Capital Improvement Program Expenditure Variances through December by Program (\$000)				
Program	FY12 Budget Through December	FY12 Actual Through December	Variance Amount	Variance Percent
Wastewater	31,750	39,094	7,344	23%
Waterworks	24,448	24,782	334	1%
Business and Operations Support	3,393	4,098	705	20%
<b>Total</b>	<b>\$59,591</b>	<b>\$67,974</b>	<b>8,383</b>	<b>14%</b>

Overspending within Wastewater is due to timing of payment for Brookline Sewer Separation, progress on Section 156 Rehabilitation Design/Build, Primary & Secondary Clarifier Rehabilitation, Cambridge Sewer Separation, greater than budgeted spending on North Dorchester Dewater Pump Station and Sewer work partially due to work being completed in FY12, and greater than anticipated community requests for grants and loans. This was partially offset by less than anticipated CSO land easement expense due to favorable negotiation of temporary easement lease terms, delays for Digester Modules 1 & 2 Pipe Replacement, Reserved Channel and Transformer Replacements. Overspending in Waterworks is due to contractor progress on the Lower Hultman Aqueduct Rehabilitation (CP6A), Reading/Stoneham Interconnections, Dam Safety Modifications and Repairs, CWTP Ancillary Modifications Construction 2, and timing of work for the Lynnfield/Saugus Pipeline Construction 2 project. This was partially offset by timing of community loans and repayments and delay in Spot Pond Storage Facility Design/Build contract.

### CIP Expenditure Variance

*Total FY12 CIP Budget of \$165,497,000.*



### Construction Fund Management

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

Cash Balance 12/24/11	\$90 million
Unused capacity under the debt cap:	\$666 million
Estimated date for exhausting construction fund without new borrowing:	May-12
Estimated date for debt cap increase to support new borrowing:	FY2020
Commercial paper outstanding:	\$144 million
Commercial paper capacity:	\$350 million
Budgeted FY12 capital spending*:	\$157 million
Projected FY10 grant and SRF receipt:	\$13 million

\* Cash based spending is discounted for construction retainage.

# DRINKING WATER QUALITY AND SUPPLY



# Source Water – Microbial Results

2nd Quarter – FY12

## Background

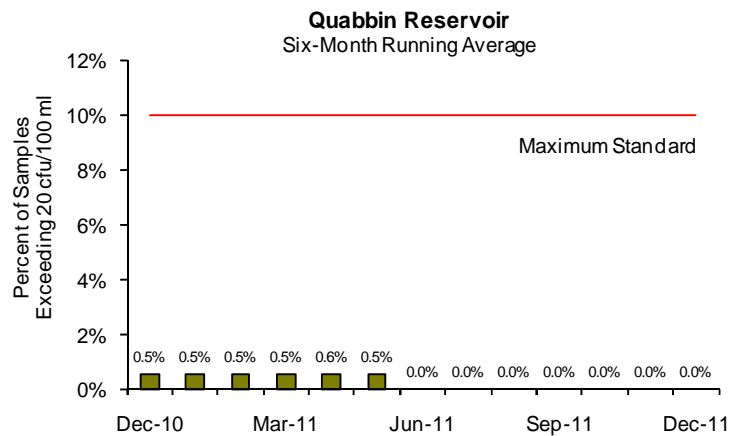
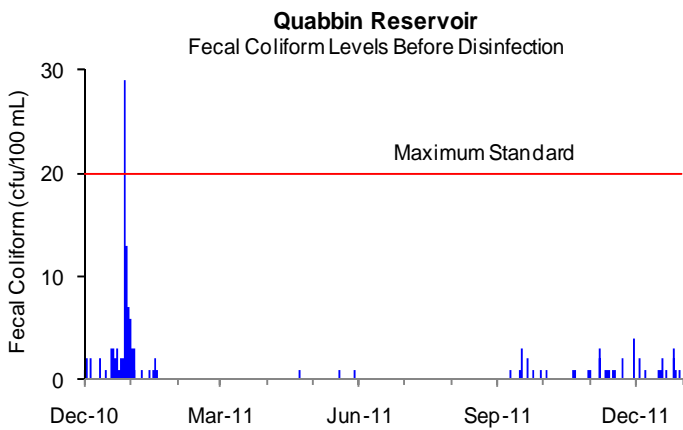
Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal 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 Ware Disinfection Facility (WDF) raw water tap before being treated and entering the CVA system.

All samples collected during the 2nd Quarter were below 20 cfu/100ml.

For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100mL .



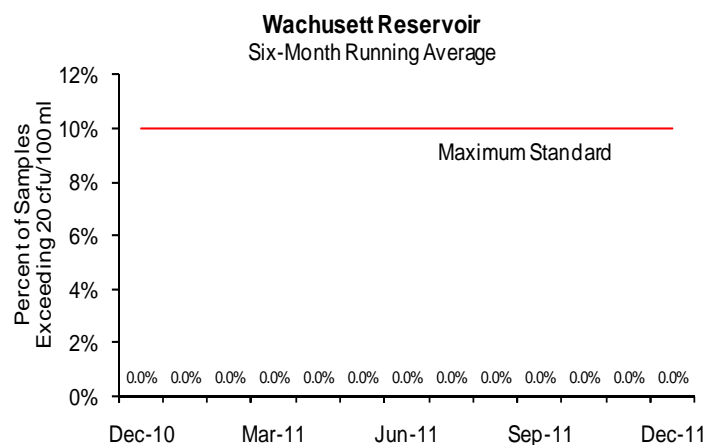
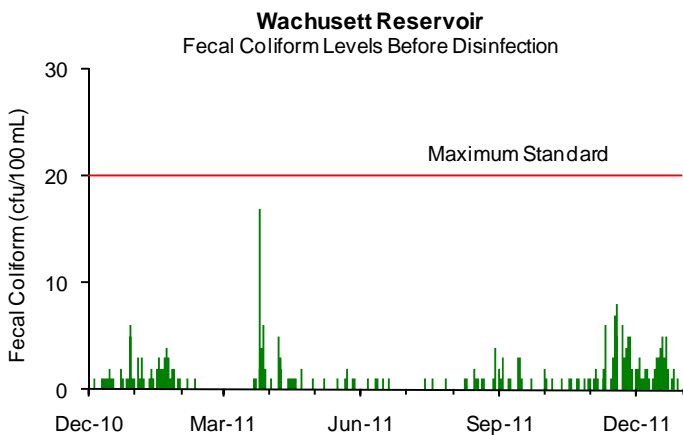
### Sample Site: Wachusett Reservoir

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

Fecal coliform levels tend to increase during the winter because, when water bodies near Wachusett ice over, waterfowl seek open water. Many roost at Wachusett, which tends to freeze later in the year than smaller ponds nearby. DCR has an active bird harassment program to move the birds away from the intake area.

All samples collected during the 2nd Quarter were below 20 cfu/100ml.

For the current six-month period, 0% of the samples exceeded a count of 20 cfu/ 100ml.



# Source Water – Turbidity

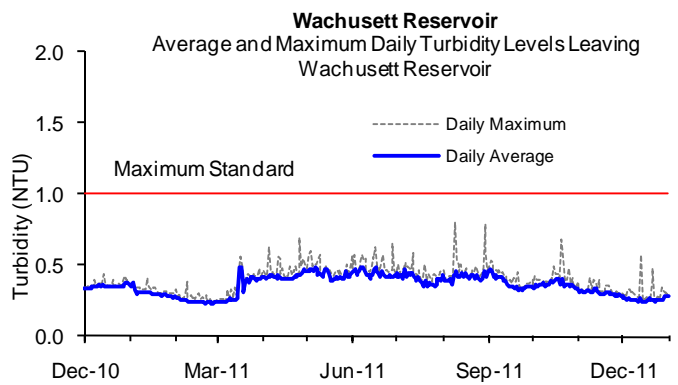
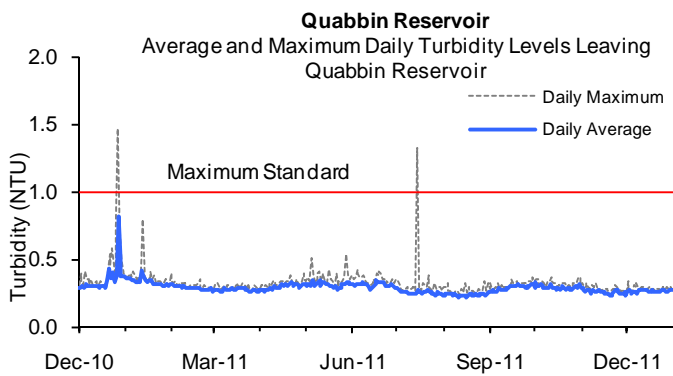
2nd Quarter – FY12

## Background

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 chlorine demand or may protect bacteria from the disinfectant effects of chlorine, thereby, interfering with the disinfectant residual throughout the distribution system.

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

Turbidity of Quabbin Reservoir water is monitored continuously at the Ware Disinfection Facility (WDF) before chlorination. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant before ozonation. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

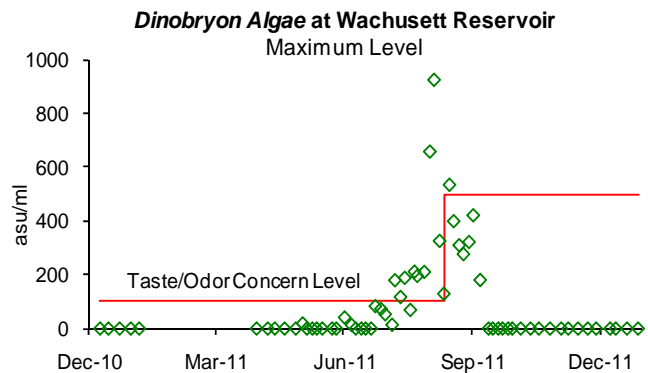
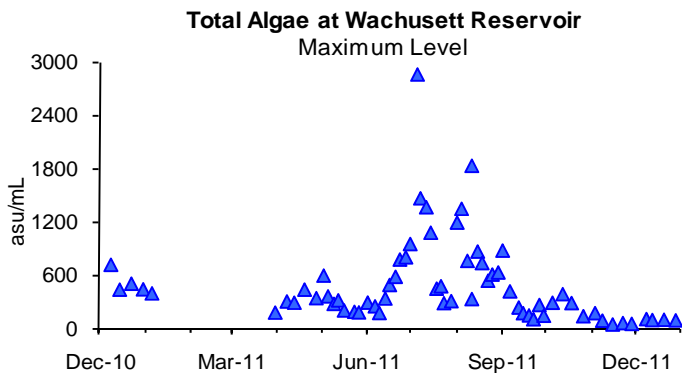


## Source Water – Algae

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 algacide. 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 2nd Quarter, there were no complaints related to algae reported from local water departments.



# Treated Water – Disinfection Effectiveness

2nd Quarter – FY12

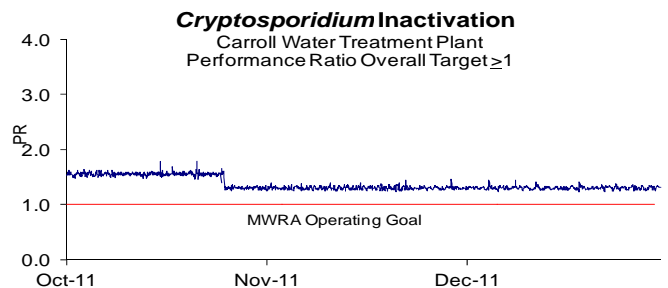
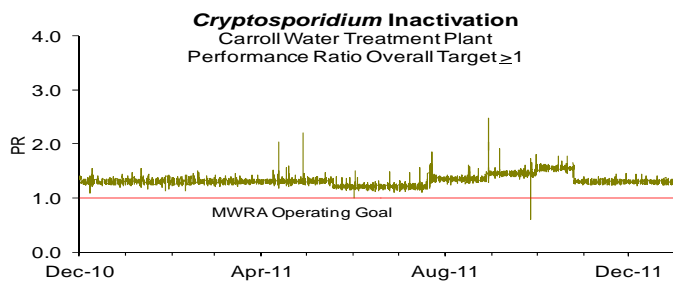
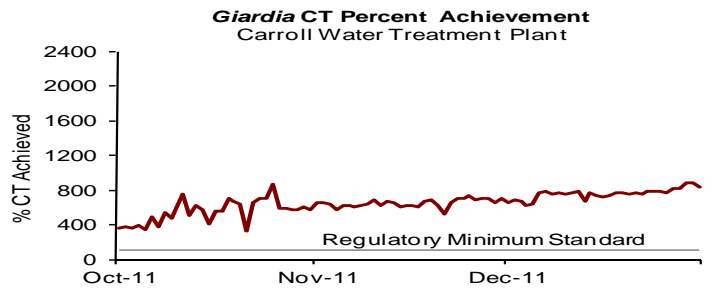
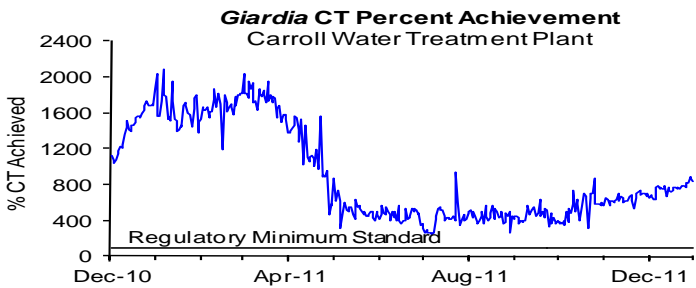
## Background

At the Carroll Water Treatment Plant (CWTP), MWRA reports on both regulatory required 99.9% inactivation for *Giardia* (reported as “CT”), and its voluntary operating goal of 99% inactivation for *Cryptosporidium*. MWRA calculates hourly CT inactivation rates and reports daily CT inactivation rates at maximum flow, as specified by EPA regulations. The concentration (C) of the disinfectant over time (T) yields a measure of the effectiveness of disinfection. CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. The required CT for ozonated water varies with water temperature. Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed. To avoid confusion with regulatory requirements, inactivation of *Cryptosporidium* is reported as Performance Ratio (PR); a PR of 1 demonstrates inactivation of 99% of *Cryptosporidium* based on site-specific data.

### Wachusett Reservoir – MetroWest/Metro Boston Supply:

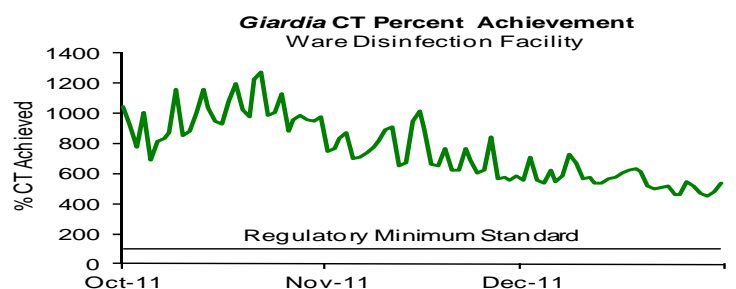
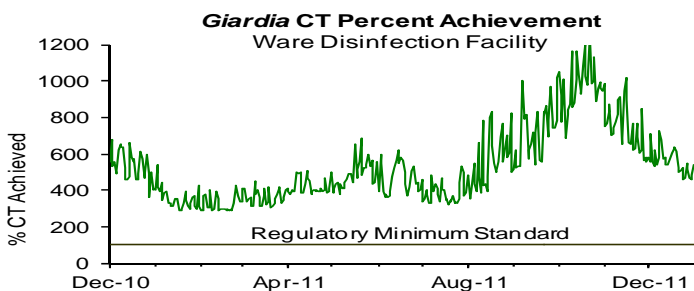
- Ozone dose at the CWTP varied between 2.6 to 4.0 mg/L for the quarter.
- CT was maintained above 100% at all times the plant was providing water into the distribution system this quarter, as well as every day for the last fiscal year; MWRA’s operating goal to meet a PR of 1 was met for every hour of the quarter.
- Carroll Water Treatment Plant is undergoing winter maintenance and UV construction. Train A was removed from service on October 26 and will remain off-line for approximately twelve weeks.
- MWRA has begun construction of a major modification to the Carroll Water Treatment Plant (serving metro Boston and Metro West communities) to add ultra violet light disinfection. During construction, there will be periods of time when MWRA will continue to provide substantially more disinfection than currently required by regulation, but somewhat less than we have been providing. MWRA reports on both the required 3-log (99.9%) inactivation of *Giardia* and the voluntary inactivation of *Cryptosporidium*. As part of this construction project, the UV equipment will be installed within the space of the extended ozone contactors. Thus, the contactors are being removed from service during half plant operations this winter, first the A-side, and then the B. When the extended contactors are no longer available, MWRA will not be able to fully meet our voluntary 2-log (99%) *Cryptosporidium* inactivation target.

The transition to a reduced disinfection target will occur around the beginning of February 2012. This change in treatment was reviewed and approved by the Massachusetts Department of Environmental Protection as part of its permitting for this project.



### Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

CT was maintained above 100% at all times the plant was providing water into the distribution system for the quarter, as well as every day for the last fiscal year. The chlorine dose at Ware Disinfection Facility (WDF) is adjusted in order to achieve MWRA’s target of  $\geq 0.75$  mg/L at Ludlow Monitoring Station. The chlorine dose at WDF varied between 1.5 mg/L to 1.6 mg/L for the quarter.

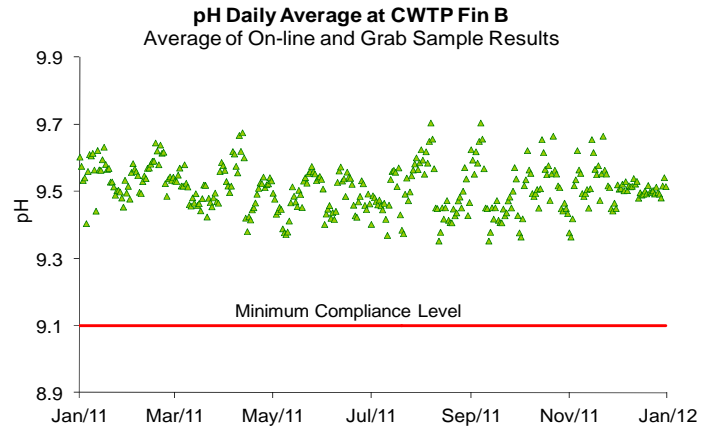
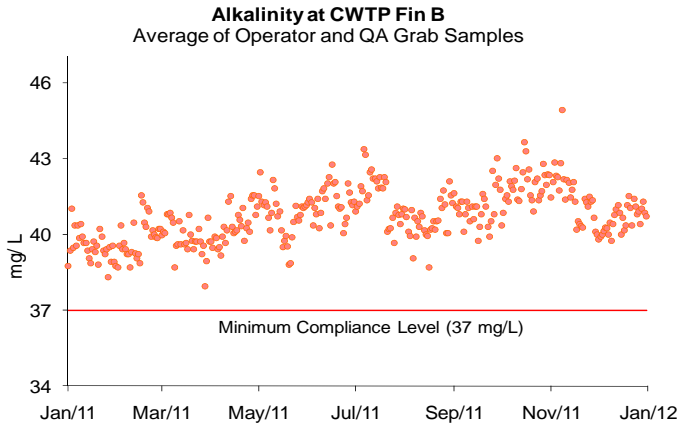


## Treated Water – pH and Alkalinity Compliance

2nd Quarter – FY12

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

Distribution system samples were collected on December 14 and 15, 2011. Distribution system sample pH ranged from 9.1 to 9.6 and alkalinity ranged from 40 to 42 mg/L. No sample results were below DEP limits for this quarter.



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

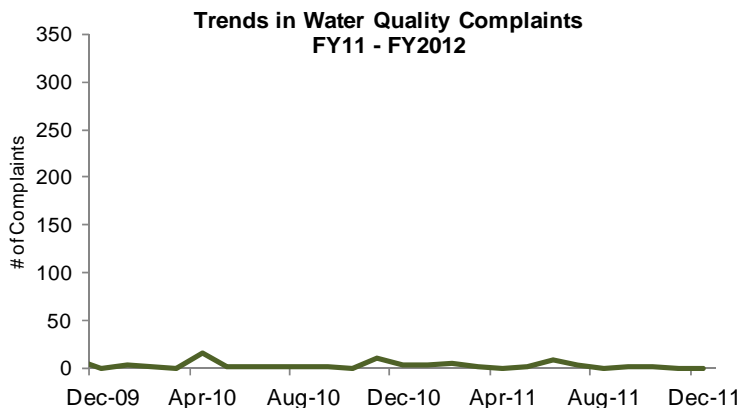
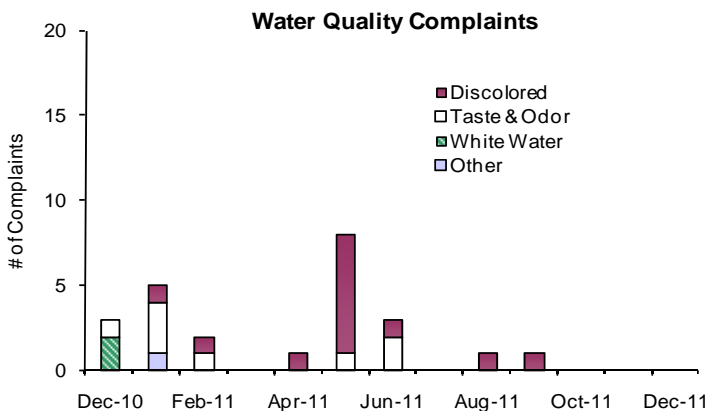
### Background

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.

### Outcome

One community reported 1 discolored water complaint during the quarter (in October) compared to 15 complaints for 2nd Quarter of FY11. There were no complaints during November and December.



# Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program

2nd Quarter – FY12

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 42 systems (including Deer Island and Westborough State Hospital) use MWRA's Laboratory for TCR compliance testing. These systems collect samples for bacteriological analysis and measure water temperature and chlorine residual at the time of collection. The other 10 MWRA customer communities (including Lynn's GE plant) have their samples tested elsewhere and these towns should be contacted directly for their monthly results.

There are 139 sampling locations for which MWRA is required to report TCR results. These locations include a subset of the community TCR locations, as well as sites along MWRA's transmission system, water storage tanks, and pumping stations.

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

*Escherichia coli (E.coli)* is a specific coliform species that is almost always present in fecal material and whose presence indicates potential contamination of fecal origin. If *E.coli* are detected in a drinking water sample, this is considered evidence of a critical public health concern. Additional testing is conducted immediately and joint corrective action by DEP, MWRA, and the community is undertaken. Public notification is required if follow-up tests confirm the presence of *E.coli* or total coliform. A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

## Highlights

In the 2nd Quarter, nine of the 5,789 community samples (0.19% system-wide) submitted to MWRA labs for analysis tested positive for coliform (Boston, Framingham – in October; Revere, Saugus, Swampscott, Watertown, Woburn – in November; Waltham, Westboro SH – in December). Of the 2,030 (0.15%) MWRA samples taken, three tested positive for total coliform. No sample tested positive for *E.coli*. Westboro SH did not violate the TCR since only one sample was positive in their system which collects fewer than 40 samples/ month. All 42 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 5.3% of samples had any results with a disinfectant residual lower than 0.2 mg/L for the quarter.

TCR results by Community						
Town	Samples Tested for Coliform (a)	Total Coliform # (%) Positive	E.coli % Positive	Public Notification Required?	Minimum Chlorine Residual (mg/L)	Average Chlorine Residual (mg/L)
ARLINGTON	168	0 (0%)	0.0%		0.02	1.52
BEDFORD	39	0 (0%)	0.0%		0.00	0.60
BELMONT	104	0 (0%)	0.0%		0.04	1.42
BOSTON	782	1 (0.13%)	0.0%	No	0.24	2.21
BROOKLINE	221	0 (0%)	0.0%		0.01	1.98
CHELSEA	169	0 (0%)	0.0%		0.39	1.74
DEER ISLAND	52	0 (0%)	0.0%		1.15	2.06
EVERETT	130	0 (0%)	0.0%		0.78	1.08
FRAMINGHAM	220	1 (0.45%)	0.0%	No	0.21	1.83
HANSCOM AFB (Bedford) (b)	23	0 (0%)	0.0%		0.02	0.78
LEXINGTON	117	0 (0%)	0.0%		0.71	1.94
LYNNFIELD	18	0 (0%)	0.0%		0.14	0.59
MALDEN	196	0 (0%)	0.0%		1.30	1.48
MARBLEHEAD	72	0 (0%)	0.0%		0.02	1.41
MARLBOROUGH (b)	126	0 (0%)	0.0%		0.04	1.35
MEDFORD	204	0 (0%)	0.0%		0.21	1.66
MELROSE	117	0 (0%)	0.0%		0.01	0.71
MILTON	96	0 (0%)	0.0%		0.87	1.53
NAHANT	30	0 (0%)	0.0%		0.09	1.03
NEEDHAM (b)	123	0 (0%)	0.0%		0.02	0.63
NEWTON	276	0 (0%)	0.0%		0.21	1.78
NORTHBOROUGH	48	0 (0%)	0.0%		0.02	1.12
NORWOOD	108	0 (0%)	0.0%		0.00	1.26
QUINCY	298	0 (0%)	0.0%		0.02	1.54
READING	130	0 (0%)	0.0%		0.00	1.03
REVERE	199	1 (0.50%)	0.0%	No	1.08	1.93
SAUGUS	108	1 (0.93%)	0.0%	No	1.26	1.72
SOMERVILLE	293	0 (0%)	0.0%		0.98	1.87
SOUTH HADLEY FD1 (c)	48	0 (0%)	0.0%		0.05	0.46
SOUTHBOROUGH	30	0 (0%)	0.0%		0.08	1.39
STONEHAM	91	0 (0%)	0.0%		0.21	1.88
SWAMPSCOTT	52	1 (1.92%)	0.0%	No	0.06	1.21
WAKEFIELD (b)	144	0 (0%)	0.0%		0.27	1.25
WALTHAM	222	1 (0.45%)	0.0%	No	0.17	1.74
WATERTOWN	133	1 (0.75%)	0.0%	No	0.59	1.78
WELLESLEY (b)	107	0 (0%)	0.0%		0.01	0.48
WESTBORO HOSPITAL	20	1 (5.00%)	0.0%	No	0.01	0.31
WESTON	48	0 (0%)	0.0%		1.12	2.17
WILMINGTON (b)	86	0 (0%)	0.0%		0.42	1.58
WINCHESTER (b)	65	0 (0%)	0.0%		0.18	1.20
WINTHROP	72	0 (0%)	0.0%		0.23	1.11
WOBURN (b)	204	3 (1.47%)	0.0%	No	0.07	1.03
Total:	5789	11 (0.19%)				
MASS. WATER RESOURCES AUTHORITY (d,e)	2030	3 (0.20%)	0.0%	No	0.01	1.87

(a) The number of samples collected depends on the population served and the number of repeat samples required.

(b) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.

(c) Part of the Chicopee Valley Aqueduct System. Free chlorine system.

(d) MWRA sampling program includes a subset of community TCR sites as well as sites along the transmission system, tanks and pumping stations.

(e) MWRA total coliform and chlorine residual results include data from 125 community pipe locations as described above. In most cases these community results are accurately indicative of MWRA water as it enters the community system; however, some are clearly strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.

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

2nd Quarter – FY12

## Background

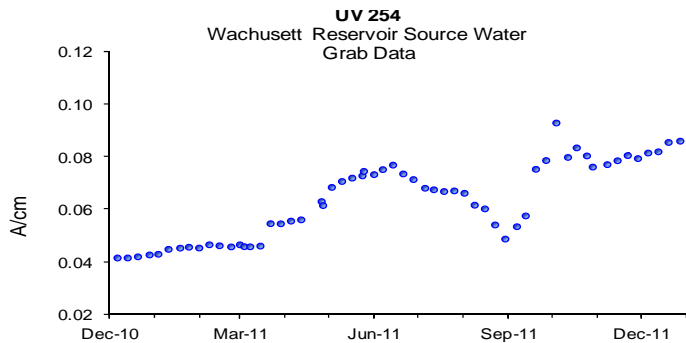
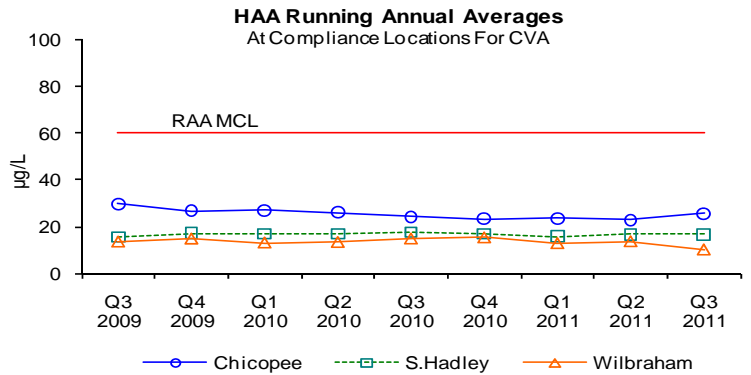
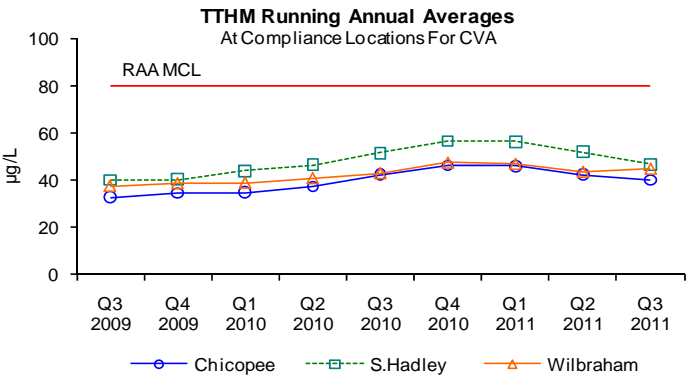
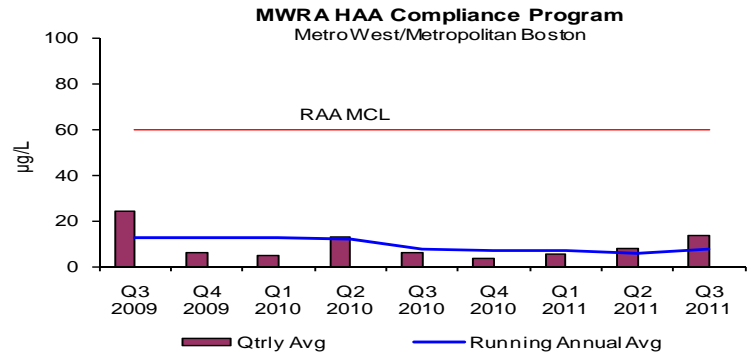
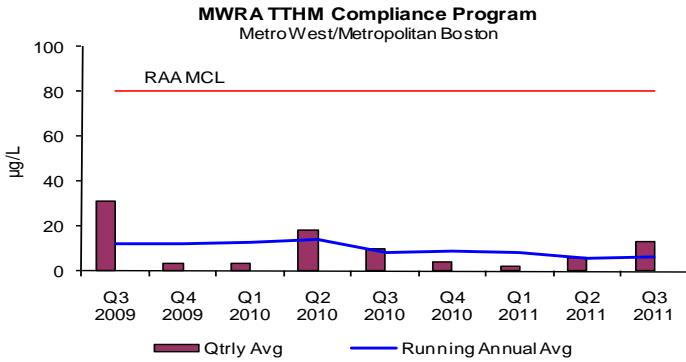
Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standard is 80 ug/L for TTHMs and 60 ug/L for HAA5s. The switch from chlorine to ozone for primary disinfection and the consolidation of treatment has lowered DBP formation and results are now more uniform. DEP requires that compliance samples be collected quarterly. Partially served communities are responsible for their own compliance monitoring and reporting and must be contacted directly for their results.

Absorbance, measured as UV-254, is one measurement of the amount and reactivity of natural organic material in source water. After Hurricane Irene, UV-254 measurements in Wachusett Reservoir rose sharply due to the action of the storm, increased tributary flows and above average fall precipitation. The higher UV-254 levels caused increased ozone and chlorine demand resulting in the need for higher ozone and chlorine doses. There were no impacts on regulatory compliance.

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

## Outcome

The RAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remained below current standards. The RAA for TTHMs = 6.5 ug/L; HAA5s = 7.3 ug/L. CVA's DBP levels continue to be below current standards. The current RAA for Bromate = 0.0 ug/L. UV-254 levels are currently around 0.08 A/cm increasing ozone demand.



# Water Supply and Source Water Management

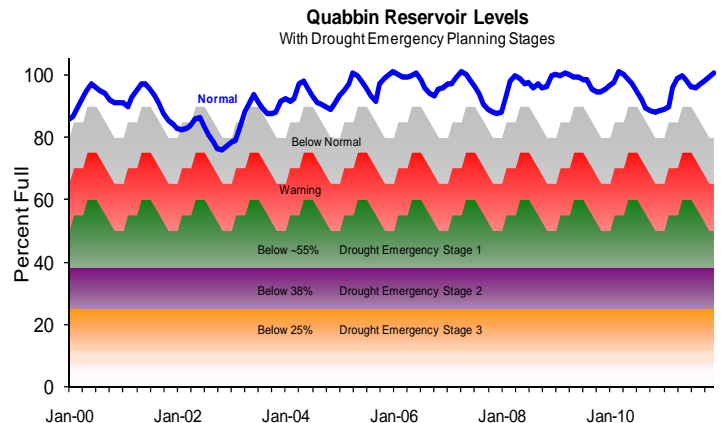
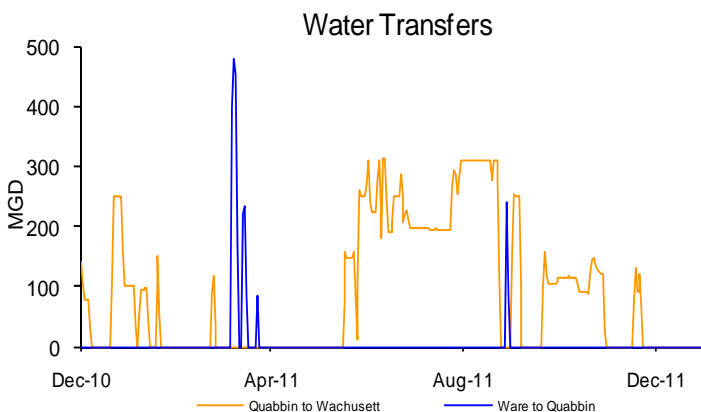
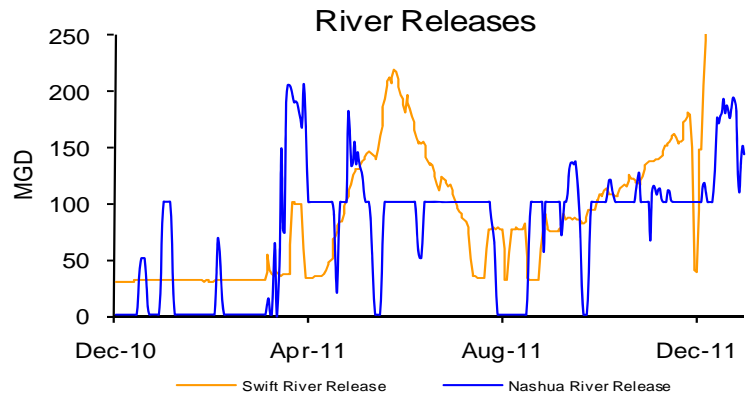
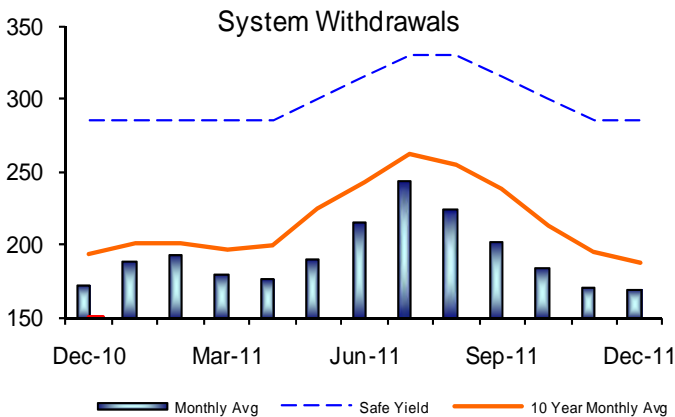
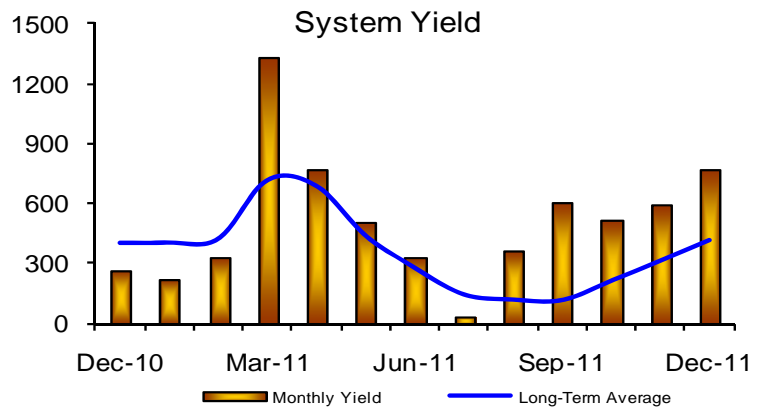
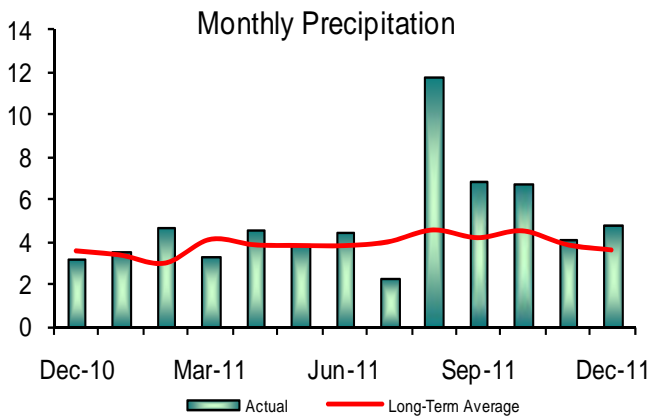
2nd Quarter – FY12

## Background

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

## Outcome

Quabbin Reservoir level remains above the normal operating range for this period of the year. The reservoir was at 100.5% of capacity as of December 31, 2011; a 3.2% increase for the quarter, which represents an increase of more than 13 billion gallons of storage. Precipitation and Yield for the quarter were above long term averages. Monthly withdrawals continue to be below the long-term average.



# WASTEWATER QUALITY

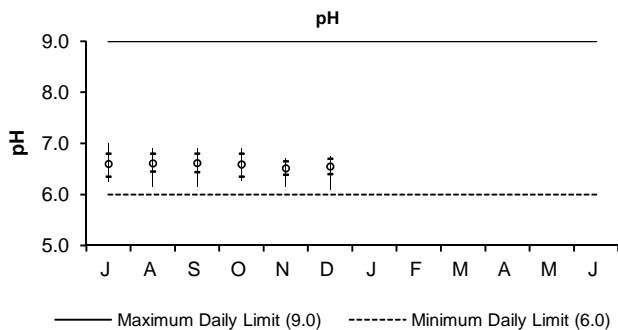


## NPDES Permit Compliance: Deer Island Treatment Plant 2nd Quarter - FY12

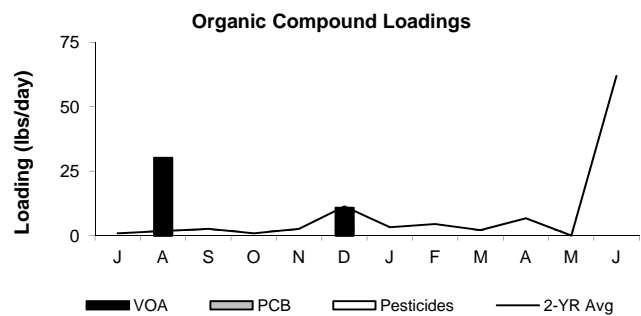
### NPDES Permit Limits

Effluent Characteristics		Units	Limits	October	November	December	2nd Quarter Violations	FY12 YTD Violations
Dry Day Flow:		mgd	436	310.3	317.3	328.0	0	0
cBOD:	Monthly Average	mg/L	25	3.8	4.1	4.0	0	0
	Weekly Average	mg/L	40	4.3	5.4	5.0	0	0
TSS:	Monthly Average	mg/L	30	5.5	5.8	6.0	0	0
	Weekly Average	mg/L	45	5.7	7.5	9.3	0	0
TCR:	Monthly Average	ug/L	456	<40	<40	<40	0	0
	Daily Maximum	ug/L	631	<40	<40	<40	0	0
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	77.6	19.6	47.5	0	0
	Weekly Geometric Mean	col/100mL	14000	25.7	9.4	10.2	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	6.3-6.9	6.2-6.7	6.1-6.8	0	0
PCB, Aroclors: Monthly Average		ug/L	0.000045	UNDETECTED			0	0
Acute Toxicity:	Mysid Shrimp	%	50	>100	>100	>100	0	0
	Inland Silverside	%	50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	1.5	50	100	12.5	0	0
	Inland Silverside	%	1.5	100	100	100	0	0

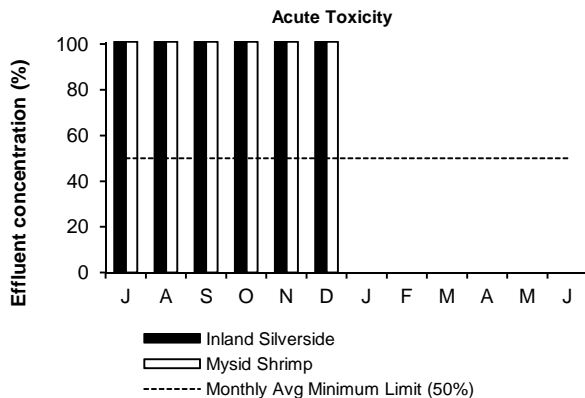
There have been no permit violations in FY12 at the Deer Island Treatment Plant.



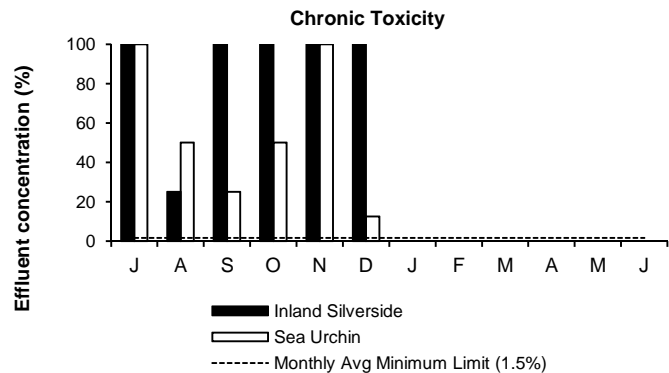
pH is a measure of the alkalinity or acidity of the effluent. Fluctuations in pH do not have an adverse effect on marine environments. Because of the pure oxygen used in the activated sludge reactor, the effluent pH tends to be at the lower pH range. pH measurements for the 2nd Quarter were within the daily permit limits.



An important wastewater component to be monitored in the effluent is organic compounds, including volatile organic acids, pesticides, and polychlorinated biphenyls. The secondary treatment process has significantly reduced organic compound loadings in the effluent stream.



The acute toxicity test simulates the short-term toxic effects of chemicals in wastewater effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. Acute toxicity permit limits were met for the 2nd Quarter for both the inland silverside and mysid shrimp.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet permit limits, a solution of 1.5% effluent and 98.5% dilution water must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 2nd Quarter for both the inland silverside and sea urchin.

**NPDES Permit Compliance: Clinton Wastewater Treatment Plant**  
2nd Quarter - FY12

**NPDES Permit Limits**

Effluent Characteristics	Units	Limits	October	November	December	2nd Quarter	FY12 YTD	
						Violations	Violations	
Flow:	mgd	3.01	3.09	3.25	3.41	3	3	
BOD:	Monthly Average:	mg/L	20	3.2	3.8	5.5	0	0
	Weekly Average:	mg/L	20	3.8	4.1	5.9	0	0
TSS:	Monthly Average:	mg/L	20	3.2	4.1	6.2	0	0
	Weekly Average:	mg/L	20	4.1	4.3	6.5	0	0
pH:	SU	6.5-8.3	7.0-7.7	7.1-7.9	6.9-7.8	0	0	
Dissolved Oxygen:	Daily Minimum:	mg/L	6	8.6	9.4	9.1	0	1
Fecal Coliform:	Daily Geometric Mean:	col/100mL	400	5.5	3.9	4.3	0	0
	Monthly Geometric Mean:	col/100mL	200	2.8	2.3	3.2	0	0
TCR:	Monthly Average:	ug/L	50	0	0	0	0	0
	Daily Maximum:	ug/L	50	0	0	0	0	0
Total Ammonia Nitrogen: 11/1 - 3/31								
	Monthly Average:	mg/L	2.0	0.1	0.1	0.1	0	0
	Daily Maximum:	mg/L	3.0	0.1	0.1	0.1	0	0
Copper:	Monthly Average:	ug/L	20	9.7	11.2	10.1	0	0
Phosphorus: May 1 - Oct 31								
	Monthly Average:	mg/L	1.0	0.38	N/A	N/A	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

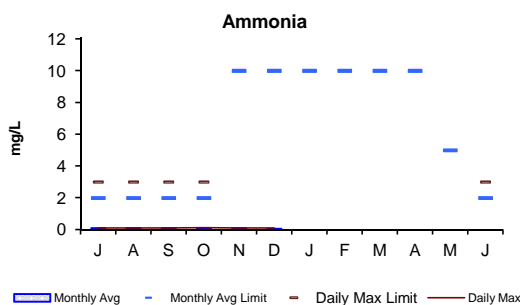
There have been four permit violation in Fiscal Year 2012 at the Clinton Treatment Plant.

**2nd Quarter:**

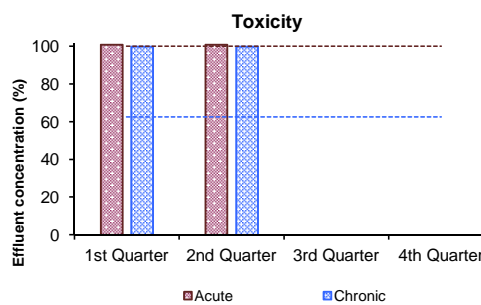
There were three permit violations in the 2nd Quarter of FY12. The monthly average flow limit of 3.01 mgd was exceeded three times during the 2nd Quarter. The official monthly average flow during October, November, and December were 3.09 mgd, 3.25 mgd, and 3.41 mgd, respectively. The high flow rates have historically been attributed to excessive wet weather conditions. The flow is calculated using a 12-month running average.

**1st Quarter:**

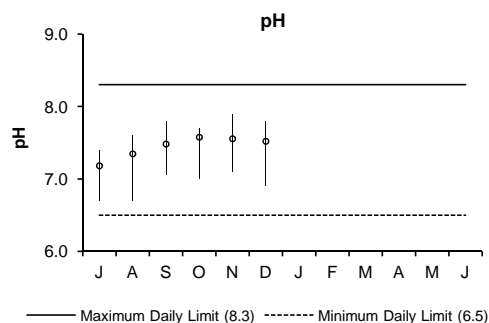
There was one permit violation in the 1st Quarter of FY12. The August 9, 2011 dissolved oxygen result of 5.1 mg/L did not meet the minimum permit limit of 6.0 mg/L. There was no known reason for this violation. The plant process and monitoring parameters were within the normal operating range on August 9 and there were no equipment failures or plant upsets reported during the monitoring period.



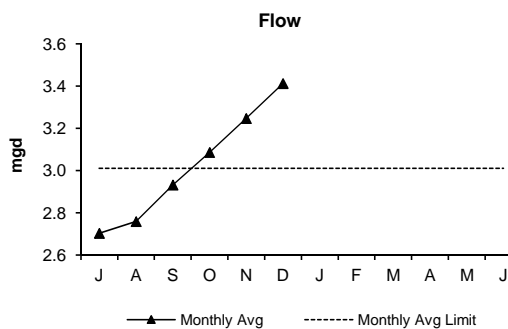
The 2nd Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 2nd Quarter are 10.0 mg/L and 35.2 mg/L, respectively. The permit limits are most stringent from June to October when warm weather conditions are most conducive to potential eutrophication.



Acute and chronic toxicity testing simulates the short- and long-term toxic effects of chemicals in wastewater effluent on aquatic animals. For permit compliance, the effluent concentration that causes mortality to the daphnid in acute and chronic testing must be at least >100% and 62.5%, respectively. Toxicity limits were met during the 2nd Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 2nd Quarter were within the range set by the permit.



The graph depicts the running annual average monthly flow, measured in million gallons per day, entering the plant. The average monthly flows during the 2nd Quarter were above the NPDES permit limit.

# COMMUNITY FLOWS AND PROGRAMS

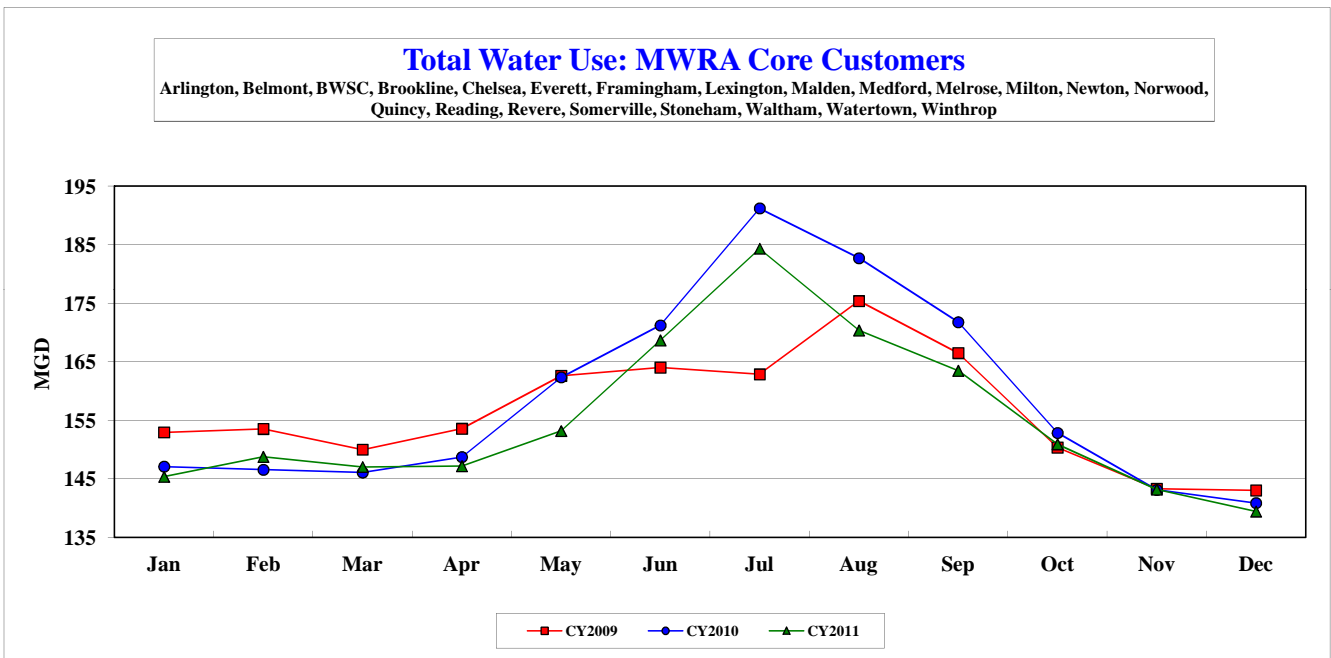
## Water Supplied : MWRA Core Communities

### Second Quarter-FY12

Massachusetts Water Resources Authority  
 Water Supplied: MWRA Core Communities

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
CY2009	152.955	153.548	150.008	153.576	162.628	164.037	162.866	175.388	166.509	150.376	143.335	143.043	156.543
CY2010	147.109	146.572	146.104	148.736	162.362	171.224	191.222	182.708	171.780	152.865	143.132	140.875	158.824
CY2011	145.371	148.785	147.058	147.188	153.188	168.673	184.336	170.378	163.482	150.928	143.205	139.450	155.218

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CY2009	4,741.614	4,299.349	4,650.244	4,607.285	5,041.476	4,921.104	5,048.836	5,437.043	4,995.272	4,661.647	4,300.060	4,434.327	57,138.257
CY2010	4,560.379	4,104.007	4,529.220	4,462.067	5,033.225	5,136.713	5,927.887	5,663.942	5,153.392	4,738.813	4,293.973	4,367.117	57,970.734
CY2011	4,506.504	4,165.977	4,558.797	4,415.643	4,748.836	5,060.182	5,714.425	5,281.711	4,904.458	4,678.774	4,296.158	4,322.945	56,654.411





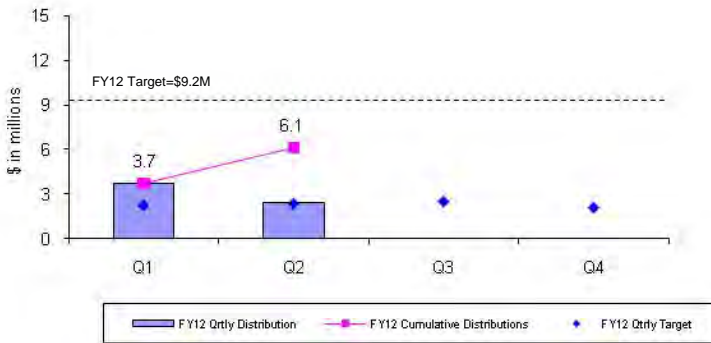
# Community Support Programs

## 2nd Quarter – FY12

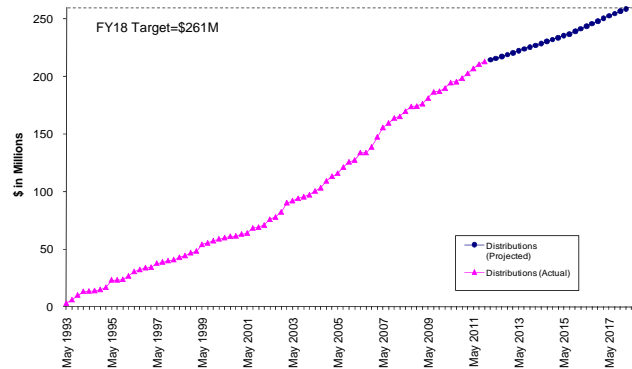
### Infiltration/Inflow Local Financial Assistance Program

MWRA's Infiltration/Inflow (I/I) Local Financial Assistance Program provides \$260.75 million in grants and interest-free loans (average of about \$10 million per year from FY93 through FY18) 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. Interest-free loans are repaid to MWRA over a five-year period beginning one year after distribution of the funds.

**FY12 Quarterly Distributions of Sewer Grant/Loans**



**I/I Local Financial Assistance Program Distribution FY93-FY18**

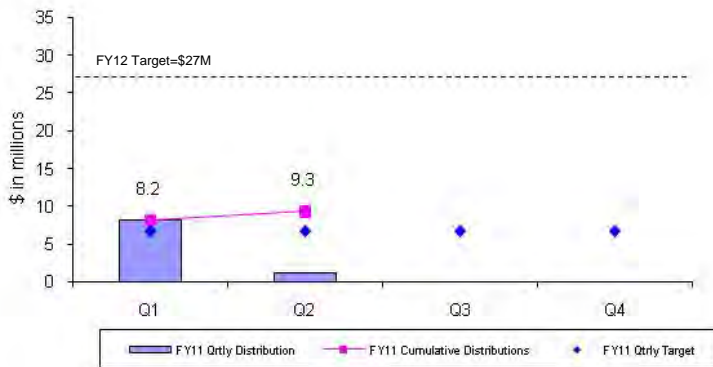


During the 2nd Quarter of FY12, \$2.4 million in financial assistance (45% grants and 55% interest-free loans) was distributed to fund local sewer rehabilitation projects in Braintree, Brookline, Framingham and Weymouth. Total grant/loan distribution for FY12 is \$6.1 million. From FY93 through the 2nd Quarter of FY12, all 43 member sewer communities have participated in the program and more than \$213 million has been distributed to fund 415 local I/I reduction and sewer system rehabilitation projects. Distribution of the remaining funds has been approved through FY18 and community loan repayments will be made through FY23. All scheduled community loan repayments have been made.

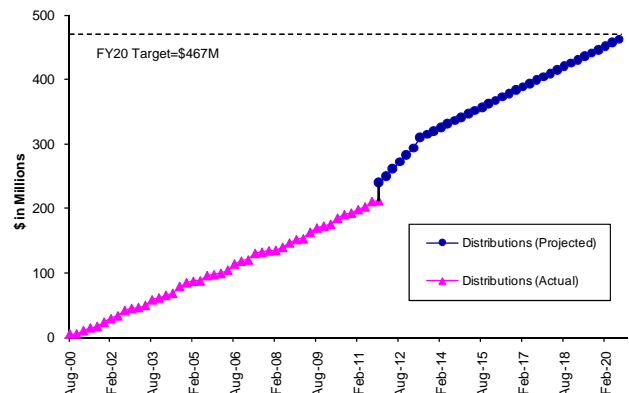
### Water Local Pipeline and Water System Assistance Programs

MWRA's Local Pipeline and Water System Assistance Programs (LPAP and LWSAP) provide \$467 million in interest-free loans (an average of about \$23 million per year from FY01 through FY20) to member water communities to perform water main rehabilitation projects within their locally-owned water distribution systems. Eligible project costs include: water main cleaning/lining, replacement of unlined water mains, lead service replacements, valve, hydrant, water meter, tank work, engineering design, engineering services during construction, etc. MWRA partially-supplied communities receive pro-rated funding allocations based on their percentage use of MWRA water. Interest-free loans are repaid to MWRA over a ten-year period beginning one year after distribution of the funds.

**FY12 Quarterly Distributions of Water Loans**



**Local Pipeline and Water System Assistance Programs Distribution FY01-FY20**

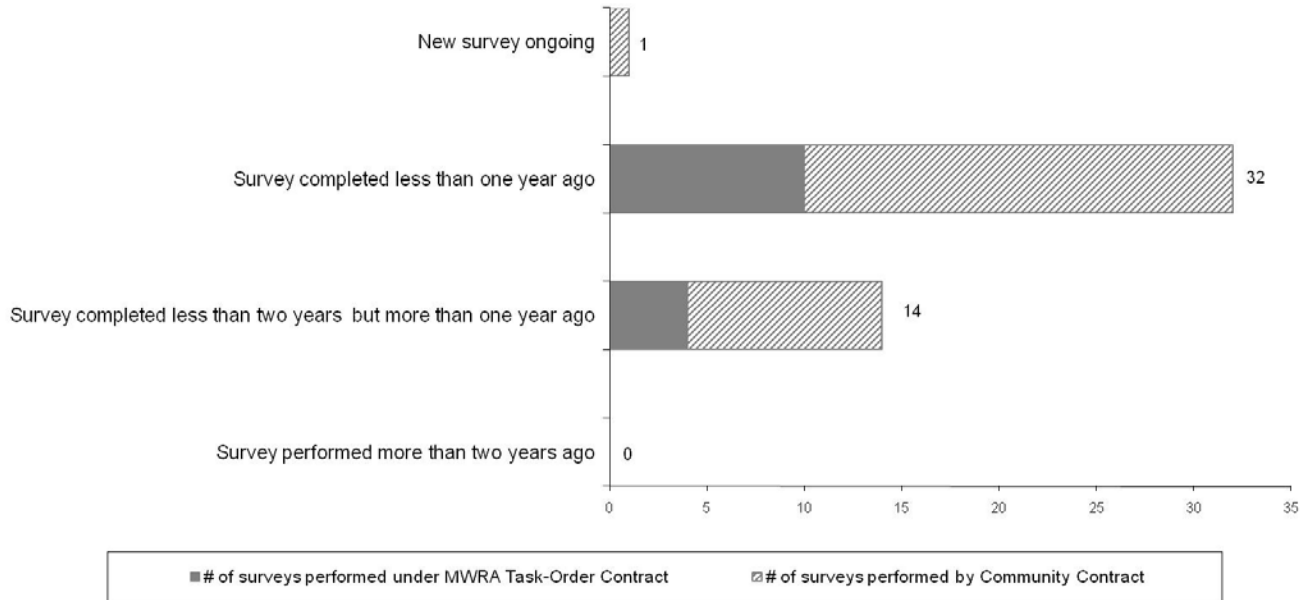


During the 2nd Quarter of FY12, \$1.1 million in interest-free loans was distributed to fund a local water project in Boston. Total loan distribution for FY12 is \$9.3 million. From FY01 through the 2nd Quarter of FY12, more than \$212 million has been distributed to fund 249 local water system rehabilitation projects in 36 MWRA member water communities. Distribution of the remaining funds has been approved through FY20 and community loan repayments will be made through FY30. All scheduled community loan repayments have been made.

## Community Support Programs 2nd Quarter – FY12

### 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 2nd Quarter of FY12, all member water communities were in compliance with MWRA's Leak Detection Regulation.



### Community Water Conservation Outreach

MWRA's Community Water Conservation Program helps to maintain average water demand below the regional water system's safe yield of 300 mgd. Current 5-year average water demand is less than 210 mgd. The local Water Conservation Program includes distribution of water conservation education brochures (indoor and outdoor bill-stuffers) and low-flow water fixtures and related materials (shower heads, faucet aerators, toilet leak detection dye tabs, and instructions), all at no cost to member communities or individual customers. The Program's annual budget is \$25,000 for printing and purchase of materials. Annual distribution targets and totals are provided in the table below.

FY12 DISTRIBUTION	Annual Target	Q1	Q2	Q3	Q4	Annual Total
Educational Brochures	150,000	1,994	4,796			6,790
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	1,945	2,712			4,657
Toilet Leak Detection Dye Tablets	-----	3,683	1,535			5,218

## BUSINESS SERVICES

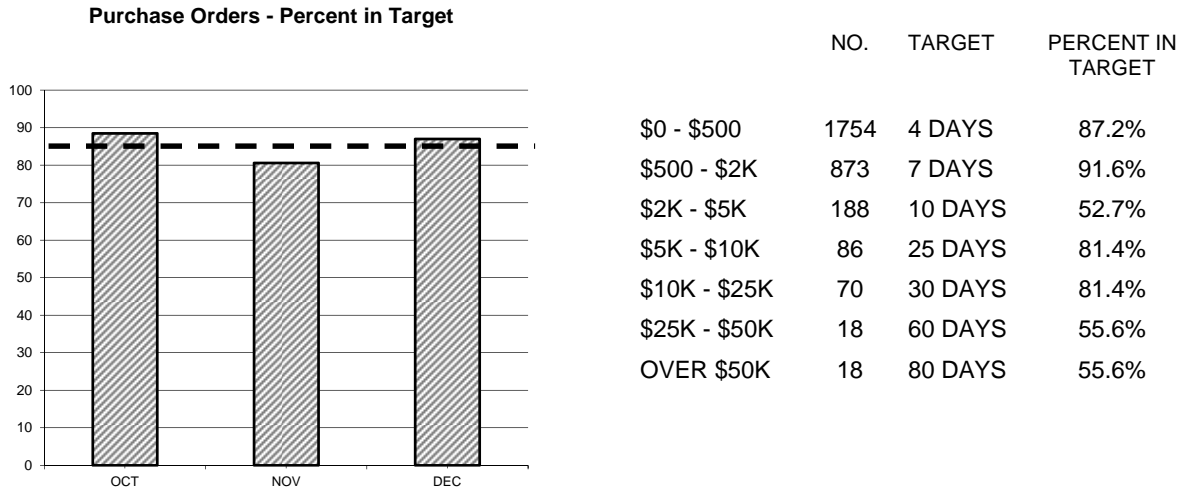


## Procurement: Purchasing and Contracts Second Quarter FY12

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

**Outcome:** Processed 86% of purchase orders within target; Avg. Processing Time was 5.85 days vs. 6.46 days in Qtr 2 of FY11. Processed 75% (18 of 24) contracts within target timeframes; Avg. Processing Time was 174 days vs. 138 days in Qtr 2 of FY11.

### Purchasing

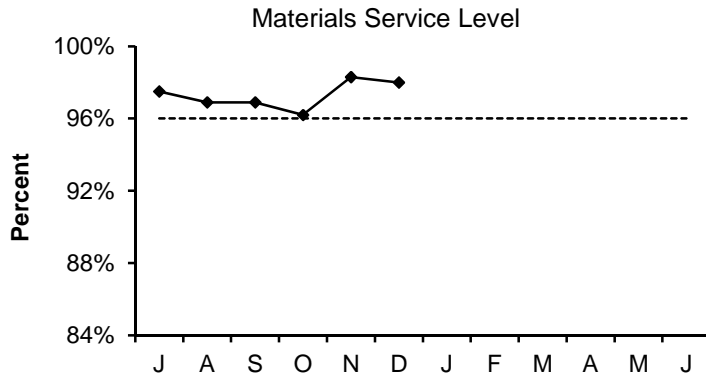


- Purchasing Unit processed 3007 purchase orders, 139 more than the 2868 processed in Qtr 2 of FY11, for a total value of \$8,385,700 vs. a dollar value of \$10,626,676 in Qtr 2 of FY11.
- The target was not achieved for the \$2k - \$5k category due to an extended bid process, vendor sourcing and clarification and confirmation of specifications, the \$5k - \$10k and \$10k - \$25k categories because of delay in specifications and evaluation of end user needs, the \$25k - \$50k category due to an extended bid evaluation and timing of the need for the materials and the over \$50k category because of confirmation of specifications, an extended bid process and timing of the need for the materials..

### Contracts, Change Orders and Amendments

- Six contracts were not processed within target timeframes. Reasons include; timing of the need for the services, resolution of regulatory and scheduling matters, a large and complex contract that required numerous addenda and specification changes; two contracts had delays in vendor submission of documentation, and one contract was an ESDC/RI contract delayed until the start of the construction contract which required those services.
- Procurement processed twenty-four contracts with a value of \$78,863,943 and eleven amendments with a value of \$542,746.
- Forty-three change orders were executed during the period, but some were credit change orders and are recorded as negative numbers. The dollar value of all non-credit change orders during the 2nd quarter FY12 was \$2,471,349 and the value of credit change orders was (\$102,746).
- In addition, staff reviewed 230 proposed change orders and 65 draft change orders.

## Materials Management 2nd Quarter, FY12



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 8,766 (97.6%) of the 8,983 items requested in Q21 from the inventory locations for a total dollar value of \$1,259,927.

### 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 FY12 goal is to reduce consumable inventory from the July '11 base level (\$6.8 million) by 4.0% (approximately \$273,659), to \$6.5 million by June 30, 2012 (see chart below).

Items added to inventory this quarter include:

- Deer Island – seal spare parts kit and actuator for Core; 12V and 6V batteries for Facilities; filters and elements for Power and Pump; wear pump and flow switch for Liquid Train.
- Chelsea – tire pressure sensors, coolant, LED flasher and copper lugs for VMM; ballasts, gaskets, wrenches, eyewash spray, filter and flow control, 75 HP motor and square D switch for Work Order Coordination Group; transducers and analog data link for SCADA.
- Southboro – generator brushes for Maintenance, UPS power supply for Quality Assurance and tarpaulin for Building and Grounds.

Property Pass Program:

- Audits were conducted at Emergency Services Unit, South Maintenance and Operations, Chelsea HVAC, Machine Shop, and SCADA and Carroll Water Treatment Plant during Q2.
- Numerous obsolete computers and scanners have been received into property pass as surplus. Disposition is being handled as part of our ongoing recycling efforts.
- Scrap revenue received to date for the quarter amounted to \$6,359.

Items	Base Value July-11	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	6,841,475	6,418,005	-423,470
Spare Parts Inventory Value	7,057,082	6,976,141	-80,941
<b>Total Inventory Value</b>	<b>13,898,557</b>	<b>13,394,146</b>	<b>-504,411</b>

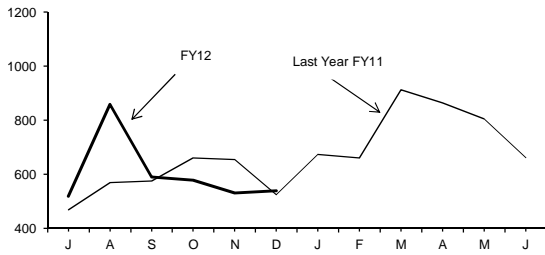
**Note:** New adds are items added at an inventory location for the first time for the purpose of servicing a group/ department to meet their business needs/objectives.

# MIS Program 2nd Quarter FY12

Operations

Highlights:

**Helpline Monthly Call Volume**



**Workload Backlog**



Performance

- Call volume for Q2 peaked in October which results in an increase of 4.72% year to date over FY11. For Q2 the backlog peaked in November and is above the targeted benchmark of 20%.

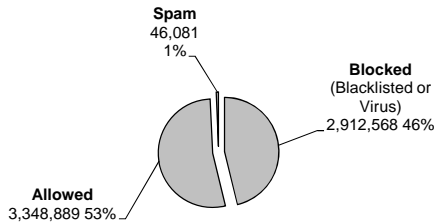
Infrastructure

- MFD: Staff installed 15 new multi-function devices (MFDs) throughout MWRA facilities consolidating services (Print, FAX, Scan, Copier) onto one platform. The rollout replaced 35 pieces of aged equipment for better than a 2:1 equipment reduction.
- NET2020 project (LAN Switch replacement): Staff have installed Local Area Network switch replacements at the following sites Deer Island, CNY, Clinton, Pellet Plant, Nut Island, and CWTP. To date 26 switches have been installed with 43 remaining.

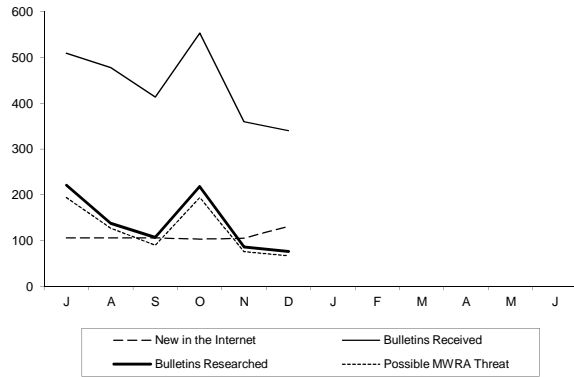
Business System Plan

- Cyber Security: During Q2, staff pushed security fixes and updates to desktops and servers throughout the quarter in order to protect against the 45 vulnerabilities. In addition, 339 new vulnerabilities were discovered throughout the Internet during Q2.
- LANdesk Antivirus quarantined 31 distinct viruses from 26 MWRA computers. MWRA's systems are current with anti-virus providers' signatures for all known malware.

**Emails Received**



**Internet Vulnerabilities**



**Applications/Training/Records Center**

Area	Significant Accomplishments
MWRA 911	Developed an enhancement that allows a pre-recorded audio file to be used as the source of the voice message to community contacts. This enhancement will be rolled out following user testing. Job aids and training materials have been updated.
Lawson Mobile Supply Chain Management (MSCM)	Implemented Lawson Mobile Supply Chain Management at Deer Island warehouse in November. Staff were trained and are using the MSCM handheld and system.
Library & Records Center	The Library completed 57 research requests (102 YTD), added 29 books, distributed 188 periodicals and 2,544 electronically (6,090 YTD) linked articles to staff. The Records Center added 45 boxes (142 YTD), conducted 2 training sessions, and attended 2 Record Conservation Board Meetings. Continued management of Shaft 5 Evidence room access and assets.
IT Training	For the quarter, 24 staff attended 10 classes and 1 workshop. Year-to-date, 103 staff have attended 22 classes and 7 workshops. 7% of the workforce have attended at least one class year-to-date.

# Legal Matters

## 2nd Quarter FY2012

### PROJECT ASSISTANCE

#### COURT AND ADMINISTRATIVE ORDERS

- **Boston Harbor Litigation and CSO:** Submitted annual summary regarding the sewage pumpout boat supplemental environmental project to the United States in accordance with the September 8, 2008 Stipulation and Order in the Boston Harbor case. Submitted annual report to EPA and DEP providing updated information on the landfill sites that NEFCO identified as acceptable landfill sites for use as part its emergency residuals disposal back up plan in accordance with the September 28, 2005 Order in the Boston Harbor case issued pursuant MWRA's Motion to Vacate the Second Long-Term Residuals Management Scheduling Order. Reviewed and filed Compliance and Progress Report and CSO Quarterly Progress Report with Federal District Court.
- **Administrative Order (DITP power outages):** Reviewed and submitted updated semi-annual *Consultant's Deer Island Energy Recommendations Tracking Sheet* to DEP and EPA.
- **NPDES:** Reviewed MWRA's draft nine minimum controls document.

#### REAL ESTATE AND CONTRACT AND OTHER SUPPORT

- **Watershed Protection Restrictions:** Reviewed and commented on the Request for Funding and associated documents for three DCR watershed parcel acquisitions.
- **Licenses: Fore River Shipyard-Conditional Access Agreement:** Drafted a Conditional Access License Agreement for Quirk to access its property from the MWRA gate and access road at the Fore River Shipyard. **Brookline Conduit Cleaning:** Drafted License Agreement for temporary use of property located on the Campus of Boston University during the construction of the project. **Charlestown Pump Station:** Drafted a License for Entry, Indemnification Agreement, and Release for public access event for wind turbine.
- **Low Service Storage Facility - Spot Pond:** Recorded the Order of Conditions obtained from the Stoneham Conservation Commission.
- **Weston Memorandum of Agreement:** Finalized Memorandum of Agreement with the Town of Weston for the use and maintenance of the lands associated with the Weston Reservoir.
- **Miscellaneous:** Reviewed and approved twenty-seven (27) Section 8(m) Permits, and one (1) Direct Connect Permit.

#### ENVIRONMENTAL

- **Clean Air Act (CAA):** Researched and confirmed applicability to MWRA of CAA regulation Subpart ZZZZ, pertaining to emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions.
- **New or Proposed Regulations and New Case Law Review:** Proposed amendments to federal Underground Storage Tanks (UST) Regulations pertaining to training and secondary containment; Final federal NPDES Pesticide General Permit for Point Source Discharges from the Application of Pesticides that leave a residue which will apply to the application of algaecides and other pesticides to control undesirable plant growth and animal populations in drinking water reservoirs, canals, and other waters of the United States; 11<sup>th</sup> Circuit Court of Appeals hearing in *Friends of the Everglades vs. U.S. EPA* involving challenge to EPA's Water Transfers Rule.
- **MWRA Enabling Act/Clean Waters Act/Co-Digestion:** Research/analyzed issues pertaining to anaerobic digestion of certain organic solid wastes with wastewater treatment residuals.
- **State Dam Safety Regulations:** Determined that DCR has discretion to accept alternative standards based on the actual conditions of a specific site.

- **MA. Chapter 21E:** Determined that under certain circumstances local fire departments can seek reimbursement of c. 21E response costs from “responsible parties.”

## **LABOR, EMPLOYMENT AND ADMINISTRATIVE**

### **New Matters**

Four demands for arbitration were filed.

### **Matters Concluded**

Received two arbitrator’s decisions in favor of the MWRA which denied employees working out of title claims.

Settled a pending case concerning the enforceability of an arbitrator’s award that an employee be placed at a specific grade.

Settled an arbitration regarding overtime assignments.

Settled an arbitration regarding the suspension of an employee.

Settled two arbitrations regarding the written warnings to two employees.

## **LITIGATION/TRAC**

### **New Lawsuits**

During the Second Quarter of FY 2012, one new lawsuit was reported.

Citibank, NA, Successor by Merger to Citibank (South Dakota), NA v. (Current employee) and MWRA, Trustee: This is a wage garnishment action for a current MWRA employee for debt collection in the amount of \$13,125.29.

### **Significant Developments**

In Discover Bank v. (current employee), a/k/a and MWRA, Trustee, a wage garnishment action for debt, counsel for plaintiff Discover Bank filed a notice of voluntary dismissal of the action because MWRA challenged the venue.

### **Closed Cases**

Three lawsuits were reported closed during the Second Quarter of FY 2012.

Verizon New England v. MWRA: On or about November 11, 2008, plaintiff Verizon owned and maintained certain underground facilities, consisting of cable and conduit, which were properly and lawfully placed and maintained in the area of Washington and Broad Streets, Lynn, MA. The MWRA while in the process of excavating, allegedly struck and damaged Verizon's underground property. Plaintiff claimed negligence and /or its violations of dig safe laws was the proximate cause of Verizon's damages. Verizon alleged that the damage cost over \$8,000 to repair. MWRA denied any liability, but agreed to settle the matter for \$1,600. On October 24, 2011, the Law Division filed a Stipulation of Dismissal in this action.

Liberty Mutual Insurance Company (as subrogee of Santa Diaz) v. Paul Fino and MWRA: This case involved a claim for property damage arising from a minor car accident on August 27, 2008. MWRA filed a Motion to Dismiss in this matter claiming that the District Court lacked subject matter jurisdiction of this complaint. Upon receipt of the motion, Liberty Mutual withdrew the suit and has not re-filed it.

Edward G. Sawyer Co, Inc. v. Seaver Electric Corp, et al.: This was a construction contract action by Edward G. Sawyer Co., Inc. against Seaver Electric Corp. for monies allegedly owed by Seaver to Sawyer under an Asset Purchase and Contractor Agreement dated July 13, 2005. MWRA was named only as a “reach and apply” defendant, by which Sawyer sought a Court Order requiring MWRA to pay directly to Sawyer any monies which MWRA may eventually be found to owe to Seaver in a related lawsuit in which MWRA is a direct defendant. On October 4, 2011, the principal parties filed a Stipulation of Dismissal with Prejudice, dismissing all claims between them, and also stipulating that all injunctions and trustees process orders be released and attachments dissolved. This terminated all claims and orders against MWRA.

Exelon Edgar, LLC, et al. v. MWRA: The eminent domain claims asserted by NStar and other entities were fully satisfied, following Board approval, by a payment of the sum of \$9.12 million dollars to NStar in exchange for NStar's withdrawal of its motion for a new trial and NStar's execution and delivery of a release and indemnification agreement to MWRA.

**Subpoenas** During the Second Quarter of FY 2012 no new subpoenas were received and three subpoenas were pending at the end of the Second Quarter FY 2012.

**Public Records** During the Second Quarter of FY 2012 nine new public records requests were received and five requests were closed at the end of the Second Quarter FY 2012.

**SUMMARY OF PENDING LITIGATION MATTERS**

<b>TYPE OF CASE/MATTER</b>	<b>As of Dec 2011</b>	<b>As of Sept 2011</b>	<b>As of June 2011</b>
Construction/Contract/Bid Protest (other than BHP)	4	5	4
Tort/Labor/Employment	6	8	8
Environmental/Regulatory/Other	1	1	1
Eminent Domain/Real Estate	2	2	2
<b>Total – all defensive cases</b>	<b>13</b>	<b>16</b>	<b>15</b>
Affirmative Cases: <u>MWRA v. (current employee)</u> <u>MWRA v. J. F. Shea Co., Inc., et al.</u>	2	2	2
Other Litigation matters (restraining orders, etc.)	0	0	0
<b>Total – all pending lawsuits</b>	<b>15</b>	<b>18</b>	<b>17</b>
Significant claims not in suit: <u>Giaquinto/Geico Automobile Accident Claims</u>	2	2	2
Bankruptcy	3	3	4
Wage Garnishment	8	8	9
TRAC/Adjudicatory Appeals	0	1	2
Subpoenas	3	3	3
<b>TOTAL – ALL LITIGATION MATTERS</b>	<b>31</b>	<b>35</b>	<b>37</b>

**TRAC/MISC.**

**New Appeals** No new appeals were received in the 2<sup>nd</sup> Quarter FY 2012.

**Settlement by Agreement of Parties** One case was settled by Agreement of Parties in 2<sup>nd</sup> Quarter FY 2012.  
Zeff Photo Supply; MWRA Docket No. 11-03

**Stipulation of Dismissal** No cases were dismissed by Stipulation of Dismissal.

**Notice of Dismissal Fine paid in full** No cases were dismissed by Notice of Dismissal, fine paid in full.

**Tentative Decisions** No Tentative Decisions were issued in 2<sup>nd</sup> Quarter FY 2012.

**Final Decisions** No Final Decisions were issued during the 2<sup>nd</sup> Quarter FY 2012.

## INTERNAL & CONTRACT AUDIT PROGRAM

### 2nd Quarter FY12

#### Highlights

Financial Administration of the Workers' Compensation Program: The review found a \$92,142 shortfall in the Workers' Compensation Payment Account and an employee that had been overpaid \$5,664 in benefits. The third party administrator has been requested to reconcile the account and recoup the employee's overpayment.

DITP Data Center Access Controls: Recommendations centered on security policy development, access controls, physical security enhancements, and Halon and Inergen fire protection systems training.

#### Status of Open Audit Recommendations (23 recommendations closed in the 2nd quarter)

The Internal Audit Department follows up on open recommendations on a continuous basis. All pending recommendations have target implementation dates. When a recommendation has not been acted on in 48 months the appropriateness of the recommendation is re-evaluated during a subsequent audit. On closed assignments 98% of recommendations have been implemented.

Report Title (date)	Recommendations Pending Implementation	Closed Recommendations
Boston Water & Sewer Commission CSO Financial Assistance Agreement (9/18/09)	1	2
Construction Change Order Pricing (12/31/09)*	4	1
Chelsea Data Center Physical Controls (5/5/10)	1	10
Review of Emergency Action Plans (6/30/10)	1	6
Warehouse Practices (9/30/10)	2	8
Facility Card Access Controls (2/22/11)	3	17
Review of TRAC Operations (5/19/11)	1	5
DITP Data Center Access Controls (10/14/11)	14	8
FRRC Financial and Management Controls (12/14/11)	4	3
Workers' Compensation (12/23/11)	3	1
<b>Total Recommendations</b>	<b>34</b>	<b>61</b>

\*Recommendations involve an updated construction manual with a target completion of Mar 2012.

#### Audit Savings

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

Savings	FY08	FY09	FY10	FY11	FY12 (2Q)	TOTAL
Consultants	\$55,901	\$316,633	\$194,238	\$520,176	\$138,256	\$1,225,204
Contractors & Vendors	\$2,147,311	\$1,262,088	\$599,835	\$3,129,538	\$130,199	\$7,268,971
Internal Audits	\$0	\$438,027	\$206,282	\$152,478	\$169,012	\$965,799
<b>Total</b>	<b>\$2,203,212</b>	<b>\$2,016,748</b>	<b>\$1,000,355</b>	<b>\$3,802,192</b>	<b>\$437,467</b>	<b>\$9,459,974</b>

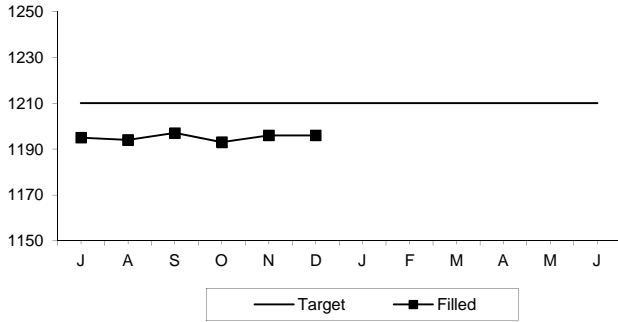
## OTHER MANAGEMENT



# Workforce Management

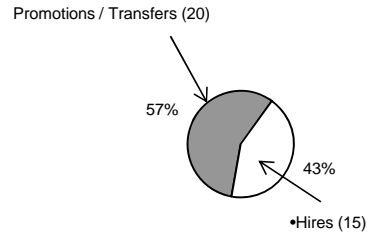
## 2nd Quarter FY12

**Filled Position Tracking**



FY12 Target for Filled Positions = 1210  
 Filled Positions as of December 2011 = 1196

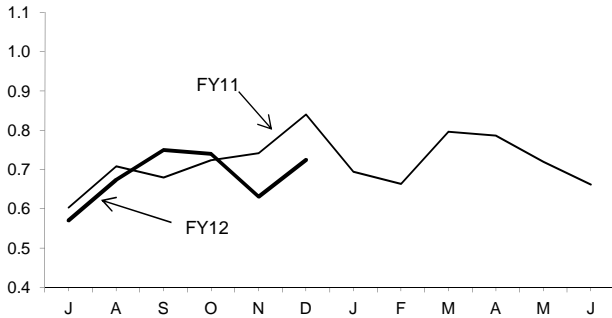
**Positions Filled by Hires/Promotions**  
 FY12-YTD



	Pr/Trns	Hires	Total
FY09	63 (73%)	23 (27%)	86
FY10	66 (76%)	21 (24%)	87
FY11	48 (62%)	30 (38%)	78

In FY12, the average monthly sick leave usage has decreased 4.85% from the same time last year.

**Average Monthly Sick Leave Usage**  
 Per Employee

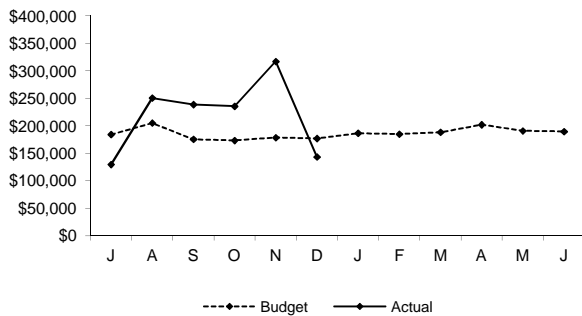


	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY11
A&F	192	3.54	7.09	18.5%	8.01
Aff. Action	7	4.97	9.94	0.0%	7.63
Executive	4	1.52	3.03	0.0%	3.29
Int. Audit	8	2.69	5.37	23.2%	4.47
Law	17	6.23	12.47	41.3%	9.95
OEP	4	1.79	3.58	0.0%	5.74
Operations	935	4.22	8.44	16.9%	8.86
Planning	21	2.50	5.01	20.1%	4.68
Pub. Affs.	13	3.31	6.62	0.0%	8.15
<b>MWRA Avg</b>	<b>1201</b>	<b>4.09</b>	<b>8.17</b>	<b>17.2%</b>	<b>8.64</b>

Percent of sick leave usage attributable to Family and Medical Leave Act (FMLA) leave is 17.2% ending December 31, 2011.

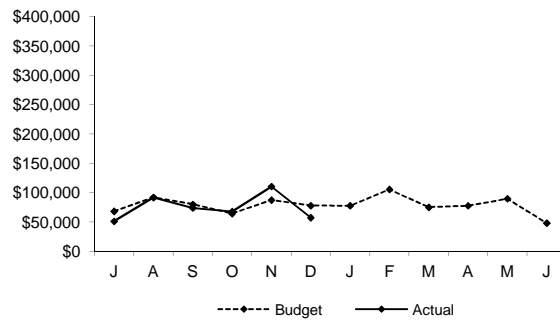
**Field Operations**

Overtime Expenditure Variance



**Deer Island Treatment Plant**

Overtime Expenditure Variance

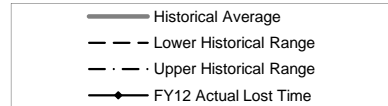
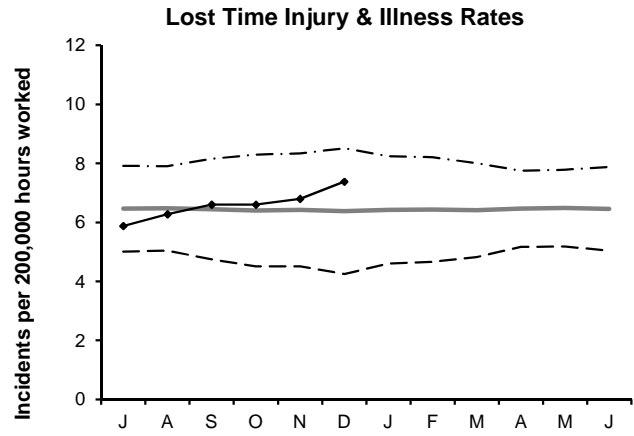
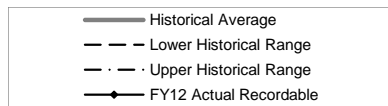
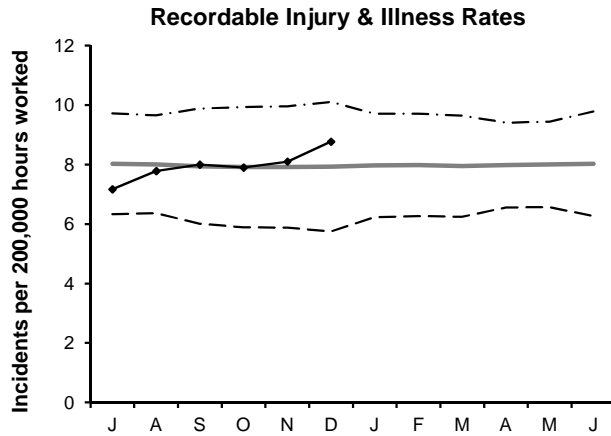


Total overtime through the second quarter for Field Operations was \$1,314,022k, which is \$221k over budget. Emergency overtime was \$722k, which was \$181k over budget. Of that amount, \$215k was for Emergency maintenance, \$153k for rain events, \$143k for emergency operations, and \$134k for rain event pre-staging. Coverage overtime was \$301k, which was \$21k over budget. Vacation coverage was \$167k; sick coverage was \$52k, vacancy in force, \$29k. Planned overtime was \$291k or \$19k over budget. Of that amount \$58k was for planned operations, \$53k each for maintenance work completion and maintenance off hours work, and \$34k for half-plant operations at the JCWTP.

Total overtime through the second quarter for Deer Island was \$452,799k, which is (\$16k) under budget. The variance is mainly attributable to lower than anticipated storm coverage overtime (\$58k) or (1,383) hours, partially offset by increases in Thermal and Operations shift coverage of \$12K and \$29K respectively. Operations was over budget mainly due to several area supervisor and operator vacancies. All Other overtime was \$1K er budget.

## Workplace Safety

2nd Quarter FY12



- 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 FY11. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively. FY12 actual incident rates can be expected to fall within this historical range.

### Workers Compensation Claims Highlights - Second Quarter FY12

	New	Closed	Open Claims
Lost Time	10	8	51
Medical Only	49	52	56
	New		YTD Light Duty Returns
Light Duty Returns	3		4

#### Highlights/Comments:

##### Light Duty returns

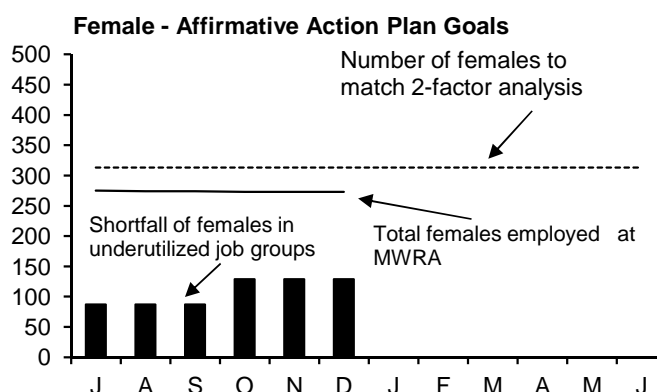
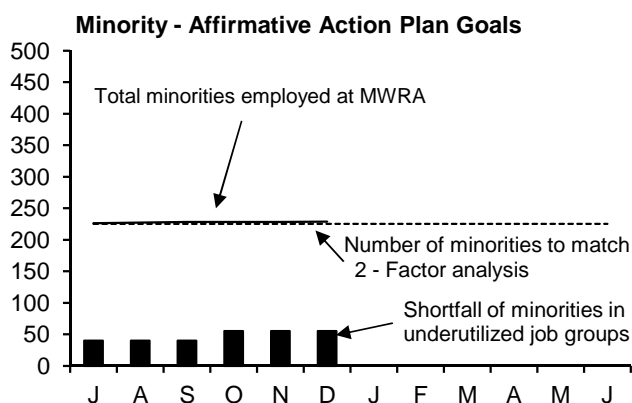
- 1 employee returned to work in a light duty capacity
- 1 employee returned to a light duty assignment by being accommodated in his regular position
- 1 employee returned to light duty for one week and then returned to full duty

##### Regular Duty returns

- 5 employees returned to work, regular duty (including the employee who first returned to LD)

## MWRA Job Group Representation

2nd Quarter FY12



### Highlights:

At the end of Q2, FY12, 7 job groups or a total of 55 positions are underutilized by minorities as compared to 8 job groups or a total of 44 at the end of Q2, FY11. For females 11 job groups or a total of 129 positions are underutilized for Q2, FY12 as compared to 13 job groups or a total of 102 at the end of Q2, FY11. During Q2, 1 minority and 0 females was hired. During this same period, 0 minorities and 0 females terminated.

### Underutilized Job Groups - Workforce Representation

Job Group	Employees	Minorities	Achievement Level	Minority	Females	Achievement Level	Female
	as of 12/31/2011	as of 12/31/2011		Over or Under Under utilized	As of 12/31/2011		Over or Under Under utilized
Administrator A	17	3	2	1	2	5	-3
Administrator B	21	0	3	-3	6	6	0
Clerical A	45	20	11	9	39	10	29
Clerical B	35	9	9	0	16	3	13
Engineer A	81	15	14	1	11	15	-4
Engineer B	51	12	4	8	7	25	-18
Craft A	117	15	21	-6	0	2	-2
Craft B	154	29	26	3	3	10	-7
Laborer	65	15	10	5	5	4	1
Management A	106	17	17	0	33	36	-3
Management B	54	11	11	0	14	26	-12
Operator A	66	5	8	-3	2	4	-2
Operator B	69	7	10	-3	4	3	1
Para Professional	58	11	14	-3	27	27	0
Professional A	36	2	7	-5	22	17	5
Professional B	166	39	71	-32	75	146	-71
Technical A	53	17	10	7	5	10	-5
Technical B	9	2	2	0	2	4	-2
<b>Total</b>	<b>1203</b>	<b>229</b>	<b>250</b>	<b>34/-55</b>	<b>273</b>	<b>353</b>	<b>49/-129</b>

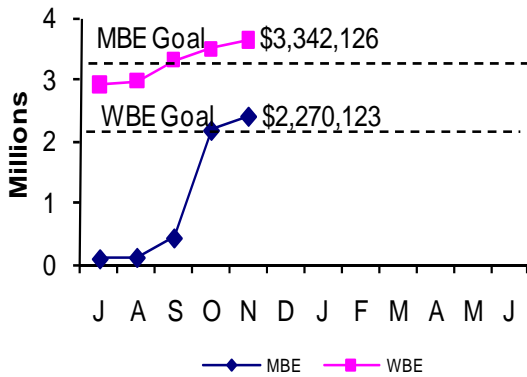
### AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Craft B	Plumber/Pipefitter	1	Ext	0	0	Transfer-W/M
Engineer A	Sr. Civil Eng.	2	Int	0	0	Pending
Engineer B	Proj. Mgr. SCADA Eng.	1	Int	1	0	Promo- B/M
Management A	Proj. Mgr. Mechanical	1	Ext	0	0	Pending
Operator B	Operator	2	Ext	0	0	New Hire-W/M
Professional B	Chemist I	1	Ext	0	0	Promo-W/F
Professional B	Sr. Laboratory Technician	1	Ext	0	0	Pending

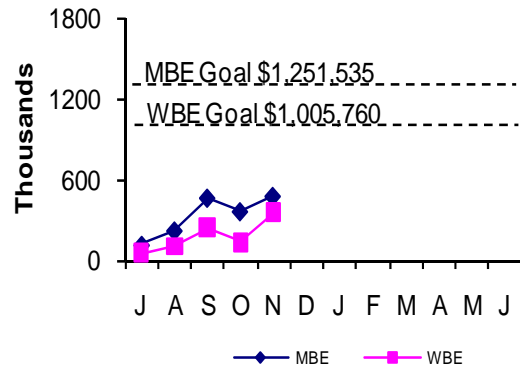
## MBE/WBE Expenditures Second Quarter FY12

**Background:** MBE/WBE targets are determined based on annual MWRA expenditure forecasts in the procurement categories noted below. MBE/WBE percentage goals, resulting from a 2002 Availability Analysis, are applied to the MWRA CIP and CEB expenditure forecasts. As a result of the Availability Analysis, the category of Non-Professional Services is included in Goods/Services. Consistent with contractor reporting requirements, MBE/WBE expenditure data is available through November.

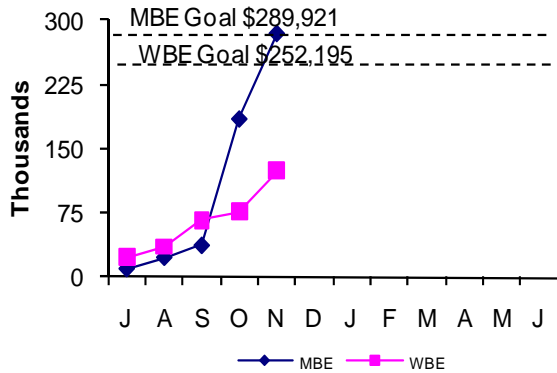
**Construction**



**Professional**



**Goods/Services**



FY12 spending and percentage of goals achieved, as well as FY11 performance are as follows:

	MBE				WBE			
	FY12 Year-to-Date		FY11		FY12 Year-to-Date		FY11	
	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>
Construction	2,401,931	71.9%	6,672,772	129.2%	3,643,649	160.5%	7,871,501	184.8%
Professional Svc.	479,971	38.4%	2,045,576	160.6%	351,664	35.0%	1,212,947	118.3%
Goods & Svcs.	284,199	98.0%	393,060	56.9%	124,712	49.5%	345,590	57.5%
<b>Total</b>	<b>\$3,166,101</b>	<b>64.8%</b>	<b>\$9,111,408</b>	<b>127.8%</b>	<b>\$4,120,025</b>	<b>116.8%</b>	<b>\$9,430,038</b>	<b>160.2%</b>

## MWRA FY12 CEB Expenses through 2<sup>nd</sup> Quarter FY12

	December 2011 Year-to-Date					
	Period 6 YTD Budget	Period 6 YTD Actual	Period 6 YTD Variance	%	FY12 Approved	% Expended
<b>EXPENSES</b>						
WAGES AND SALARIES	\$ 41,802,057	\$ 41,666,203	\$ (135,855)	-0.3%	\$ 90,319,013	46.1%
OVERTIME	1,727,120	1,925,141	198,021	11.5%	3,508,630	54.9%
FRINGE BENEFITS	8,905,380	8,819,029	(86,351)	-1.0%	17,954,076	49.1%
WORKERS' COMPENSATION	1,050,000	771,462	(278,538)	-26.5%	2,100,000	36.7%
CHEMICALS	4,738,510	4,593,201	(145,309)	-3.1%	9,047,275	50.8%
ENERGY AND UTILITIES	10,771,255	11,034,487	263,232	2.4%	22,654,931	48.7%
MAINTENANCE	13,380,032	12,677,724	(702,308)	-5.2%	29,470,020	43.0%
TRAINING AND MEETINGS	97,911	67,950	(29,961)	-30.6%	251,550	27.0%
PROFESSIONAL SERVICES	2,737,485	2,600,673	(136,812)	-5.0%	5,892,441	44.1%
OTHER MATERIALS	1,615,307	1,555,074	(60,233)	-3.7%	4,765,483	32.6%
OTHER SERVICES	11,291,165	11,768,852	477,687	4.2%	23,323,074	50.5%
<b>TOTAL DIRECT EXPENSES</b>	<b>\$ 98,116,222</b>	<b>\$ 97,479,796</b>	<b>\$ (636,427)</b>	<b>-0.6%</b>	<b>\$ 209,286,493</b>	<b>46.6%</b>
INSURANCE	\$ 1,142,935	\$ 904,176	\$ (238,759)	-20.9%	\$ 2,285,870	39.6%
WATERSHED/PILOT	12,788,137	12,651,051	(137,086)	-1.1%	25,576,274	49.5%
BEC <sub>o</sub> PAYMENT	1,882,002	1,810,090	(71,912)	-3.8%	3,965,500	45.6%
MITIGATION	764,350	747,290	(17,060)	-2.2%	1,528,700	48.9%
ADDITIONS TO RESERVES	97,733	97,733	-	0.0%	195,467	50.0%
RETIREMENT FUND	5,488,792	5,511,524	22,732	0.4%	7,340,438	75.1%
POST EMPLOYEE BENEFITS	-	-	-	---	-	---
<b>TOTAL INDIRECT EXPENSES</b>	<b>\$ 22,163,949</b>	<b>\$ 21,721,864</b>	<b>\$ (442,085)</b>	<b>-2.0%</b>	<b>\$ 40,892,249</b>	<b>53.1%</b>
DEBT SERVICE	\$ 179,322,329	\$ 172,662,640	\$ (6,659,689)	-3.7%	\$ 367,979,918	46.9%
DEBT SERVICE ASSISTANCE	(175,000)	(175,000)	-	0.0%	-	---
<b>TOTAL DEBT SERVICE</b>	<b>\$ 179,147,329</b>	<b>\$ 172,487,640</b>	<b>\$ (6,659,689)</b>	<b>-3.7%</b>	<b>\$ 367,979,918</b>	<b>46.9%</b>
<b>TOTAL EXPENSES</b>	<b>\$ 299,427,500</b>	<b>\$ 291,689,300</b>	<b>\$ (7,738,201)</b>	<b>-2.6%</b>	<b>\$ 618,158,660</b>	<b>47.2%</b>
<b>REVENUE &amp; INCOME</b>						
RATE REVENUE	\$ 294,850,000	\$ 294,850,000	\$ -	0.0%	\$ 589,700,000	50.0%
OTHER USER CHARGES	3,297,207	3,377,113	79,906	2.4%	7,142,495	47.3%
OTHER REVENUE	3,170,490	3,550,657	380,167	12.0%	4,872,342	72.9%
RATE STABILIZATION	545,890	545,890	-	0.0%	1,091,780	50.0%
INVESTMENT INCOME	7,589,330	7,572,846	(16,484)	-0.2%	15,352,043	49.3%
<b>TOTAL REVENUE &amp; INCOME</b>	<b>\$ 309,452,917</b>	<b>\$ 309,896,506</b>	<b>\$ 443,589</b>	<b>0.1%</b>	<b>\$ 618,158,660</b>	<b>50.1%</b>

As of December 2011, total revenue was \$309.9 million, \$444,000 more than budget. Total expenses were \$291.7 million, \$7.7 million or 2.6% less than budget, resulting in a net variance of \$8.2 million.

### Expenses –

- **Direct Expenses** are \$97.5 million, \$636,000 or 0.6% less than budget.
- **Maintenance** is \$702,000 or 5.2% less than budget mostly related to services. Services are underspent by \$406,000 and materials are underspent by \$296,000 mostly related to timing due to some project delays.
- **Other Services** are \$478,000 or 4.2% over budget due to Pelletization expenses of \$380,000 for higher sludge quantities due to digester maintenance work, Other Services of \$62,000 for Reservoir operations work, Grit & Screenings of \$58,000, and Police Details of \$49,000 offset by lower spending for Health/Safety of \$39,000 and Space Lease/Rentals of \$35,000.
- **Workers' Compensation** is \$279,000 or 26.5% lower than budget for Compensation Payments of \$331,000 offset by higher Medical Payments of \$64,000.
- **Utilities** are overspent by \$263,000 or 2.4% for Electricity of \$222,000 due to higher pricing and Diesel Fuel of \$36,000 due to pre-purchase at Deer Island, offset by lower spending for Natural Gas of \$111,000.
- **Overtime** is \$198,000 or 11.5% higher than budget mainly in FOD for wet weather response, Tropical Storm Irene, and October snow cleanup.
- **Chemicals** are \$145,000 or 3.1% less than budget due to lower spending for Activated Carbon of \$117,000, Soda Ash of \$95,000, Carbon Dioxide of \$74,000, Hydrofluosilicic Acid of \$57,000, Liquid Oxygen of \$39,000, and Sodium Hydroxide of \$35,000, offset by higher Nitrazyme of \$165,000 for FERS and Sodium Hypochlorite of \$162,000.
- **Professional Services** are \$137,000 or 5.0% under budget due to lower spending for Lab and Testing of \$136,000, Engineering of \$91,000, and Security of \$35,000, offset by higher spending for Other of \$158,000 mainly for timing of the MIS Strategic Plan.
- **Wages and Salaries** are \$136,000 or 0.3% underspent due to less filled positions than budgeted and higher leave balance accrual use offset by unbudgeted retroactive pay adjustments for non-union managers and recently settled contractual agreements for Units 1 and 6.
- **Indirect Expenses** are \$21.7 million, \$442,000 or 2.0% under budget due to lower Insurance claims of \$228,000 and premiums of \$11,000, lower Watershed Reimbursement of \$137,000 due to an FY11 accrual, and lower spending for HEEC Special Projects of \$57,000.
- **Debt Service Expenses** total \$172.5 million, \$6.7 million or 3.7% under budget due to lower variable rate debt and delayed SRF borrowing.

### Revenue and Income –

- **Total Revenue / Income** for December is \$309.9 million, \$444,000 or 0.1% higher than budget and is mainly due to higher non-rate revenue of \$460,000 offset by lower investment income of \$16,000 which is driven by lower rates.

## Cost of Debt 2<sup>nd</sup> Quarter FY12

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

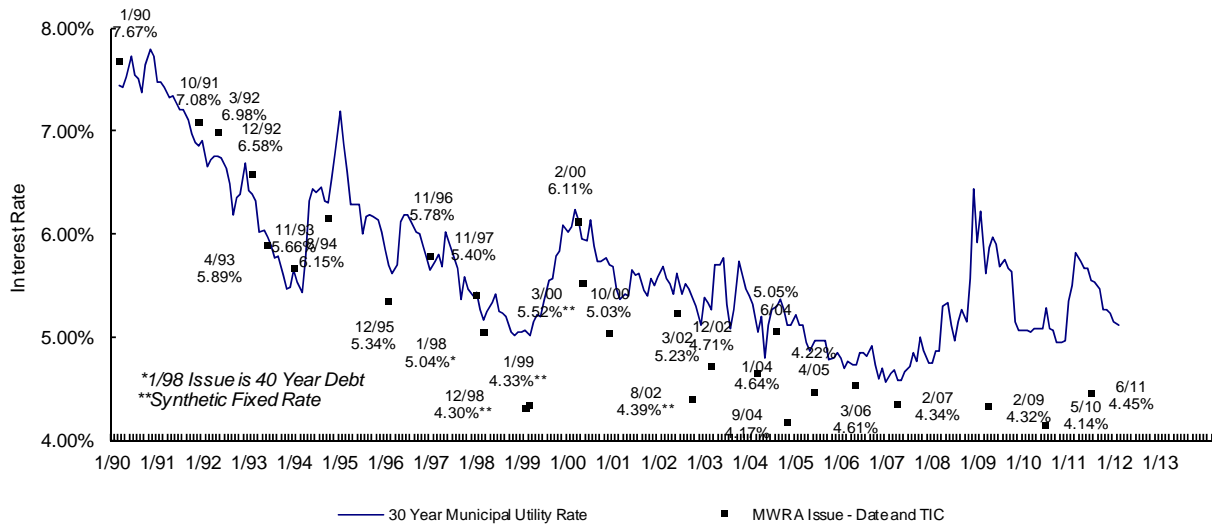
### Average Cost of MWRA Debt

Fixed Debt (\$4,034)	4.48%
Variable Debt (\$589)	0.87%
SRF Debt (\$1,023)	1.07%
Weighted Average Debt Cost (\$5,637)	3.48%

### Most Recent Senior Fixed Debt Issue December 2011

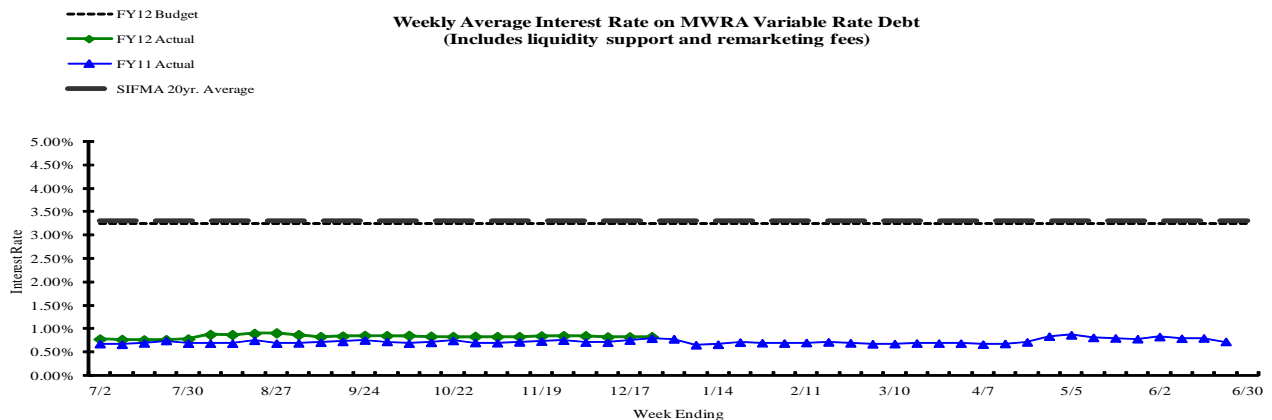
2011 Series C (\$327)	3.95%
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### MWRA Fixed Rate Debt vs. 30 Year Municipal Utility Interest Rate



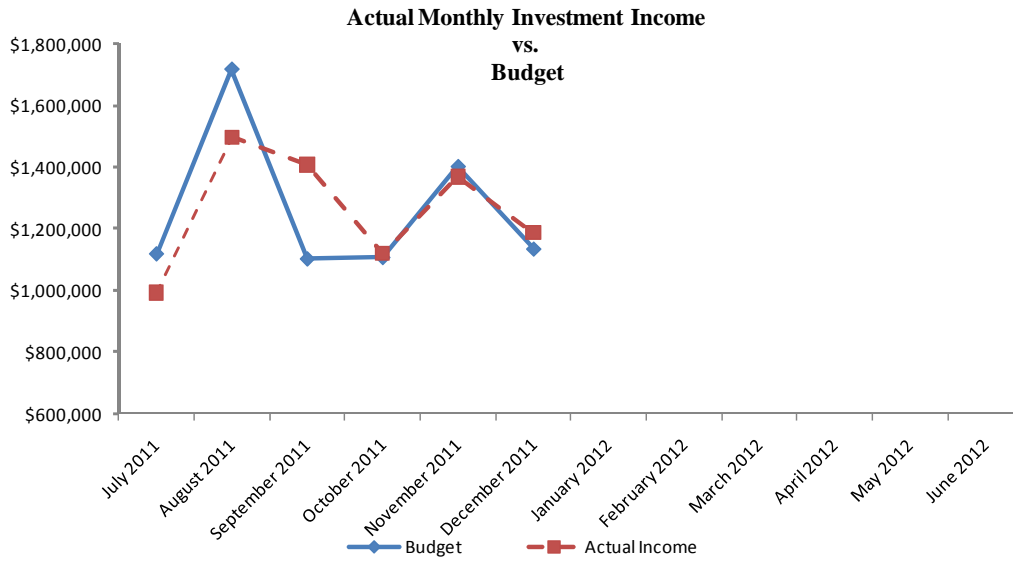
### Weekly Average variable Interest Rates vs. Budget

MWRA currently has nine variable rate debt issues with \$1.2 billion outstanding, excluding commercial paper. Of the nine 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 December, SIFMA rates fluctuated with a high of 0.12% and a low of 0.10%. 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.

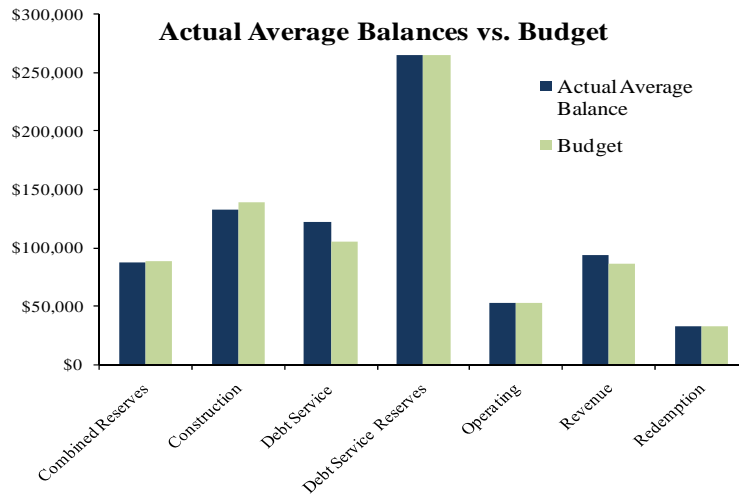


## Investment Income 2<sup>nd</sup> Quarter FY12

The chart provides an overview of actual combined investment income numbers versus the budget projections.



The chart below shows the budgeted average account balances versus the actual average balances through November.



The chart below depicts long term and short term investment balances.

