

MASSACHUSETTS WATER RESOURCES AUTHORITY

# Board of Directors Report

on

## Key Indicators of MWRA Performance

for

First Quarter FY2012

Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director  
Michael J. Hornbrook, Chief Operating Officer  
November 16, 2011

# Board of Directors Report on Key Indicators of MWRA Performance for First 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.

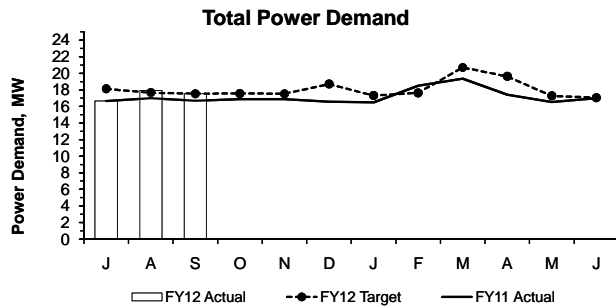
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# OPERATIONS AND MAINTENANCE

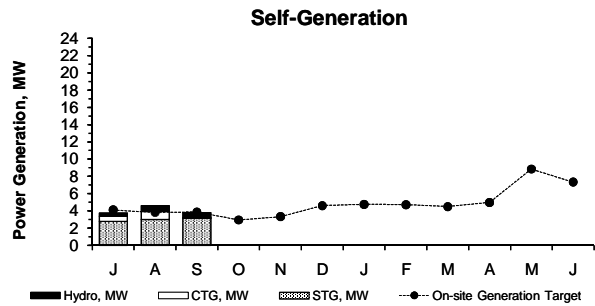
# Deer Island Operations

1st Quarter - FY12

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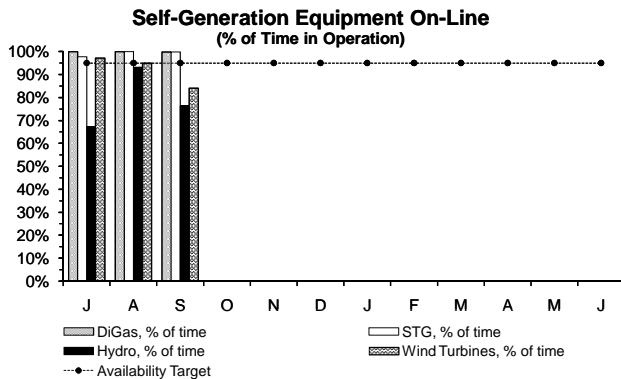


Total Power Demand in the 1st Quarter was similar (-2%) to the target for the quarter and 4% higher than in FY11 for the same period. During the 1st Quarter, power demand for pumping alone was 7% higher than expected due to 9% higher-than-expected Total Plant Flow. Power demand for Secondary treatment, including for cryogenic oxygen production, was 13% lower than the target due in part to reduced oxygen feed in secondary, which was a result of ongoing energy optimization studies of the secondary treatment system. Power demand for all other treatment processes were similar to or lower than expected for the quarter.

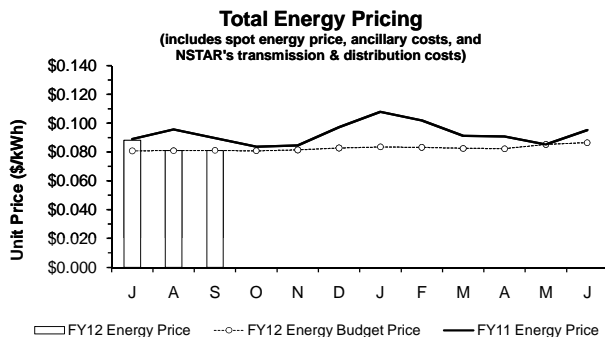


Power generated on-site was 9% higher than target for the 1st Quarter. The higher-than-expected generation was due mostly to much higher-than-expected generation by the CTGs. The CTGs were operated for 30.5 hours in July during high ISO-NE grid demand periods and for a combined 65 hours in August during Hurricane Irene to maintain plant operation during an extreme weather event (instead of operating on NSTAR power). DI did not participate in any demand response events as none were called. Generation by the STG and Solar Panels were 6% and 36% higher than their targets for the quarter, respectively, while generation by the Wind and the Hydro Turbines were 58% and 15% lower than their targets, respectively due to unplanned maintenance.

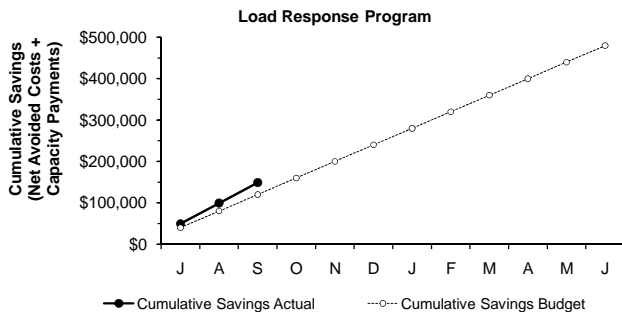
Note: While power generation by the Solar Panels and the Wind Turbines are not included in the graph, 0.376 MW was generated by the Solar Panels and 0.328 MW was generated by the Wind Turbines in the 1st Quarter



The DiGas and STG systems both met their 95% Availability Target for the 1st Quarter, while the availability of the Hydro Turbine system and the Wind Turbines fell to 79% and 92%, respectively. The Hydro Turbine system was off-line for significant portions of time due to sump pump replacement in July and scheduled annual maintenance in September. Wind Turbine availability fell below target mainly due to a faulty contactor on Wind Turbine 2 that had to be replaced by the contractor, which caused this turbine to be offline for seven days in September.

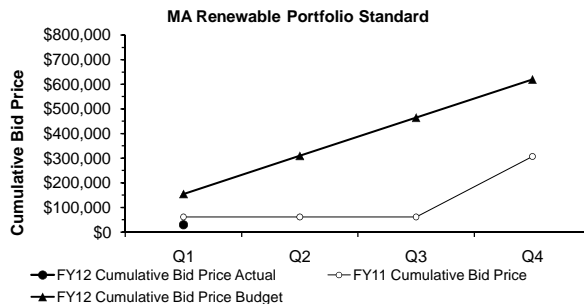


Under DI's energy supply contract, a block portion of DI's energy is a fixed rate and the variable load above the block is purchased in real time. Overall, the total energy price in the 1st Quarter was 3% higher than the FY12 budget estimate and 9% lower than the 1st Quarter FY11 actual. The total energy price includes a fixed block price, spot energy price, transmission & distribution charges, and ancillary charges. Please note the August and September total energy prices are estimates as the invoices have not been received. Year-to-date costs are estimated at approximately \$11,860 less than budgeted through the 1st Quarter of FY12.



DI did not participate in any demand response events during the 1st Quarter as none were called.

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 \$148,853 through the 1st Quarter compared to the budgeted savings of \$119,973.



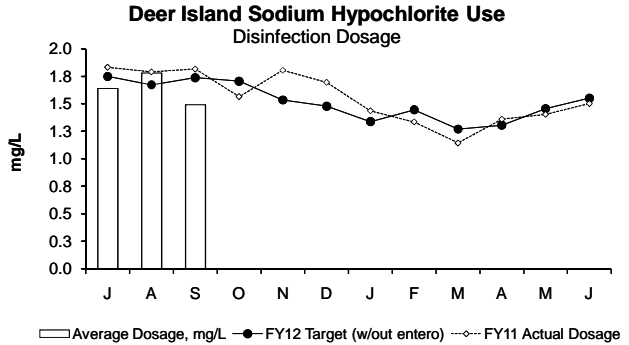
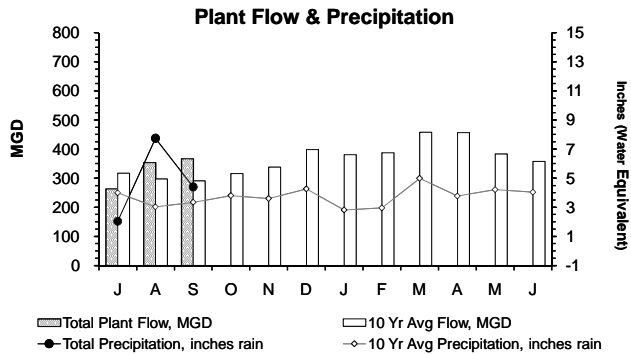
Bids were awarded in August for the sale of 68 Solar Renewable Energy Certificates (S-RECs) for a total value of \$29,532. The value of these S-RECs is approximately 30 times higher than the current value of Class I RECs (for hydro and wind). No bids were received in July or September.

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 1st Quarter is \$154,866 while the actual bid total is \$29,532.

# Deer Island Operations

1st Quarter - FY12

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The Total Plant Flow for the 1st Quarter was 9% higher than the 10-year average flow estimate (327.9 mgd actual vs. 301.4 mgd expected) as precipitation was 37% higher than expected for the quarter (14.18 inches actual vs. 10.35 inches expected). Total Plant Flow and precipitation were below target in July, but significantly higher in both August, due to Hurricane Irene, and in September.

The disinfection dosing rate was within 5% of the target for the 1st Quarter. The average dosing rate for the quarter was 1.64 mg/L compared to the target of 1.72 mg/L.

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

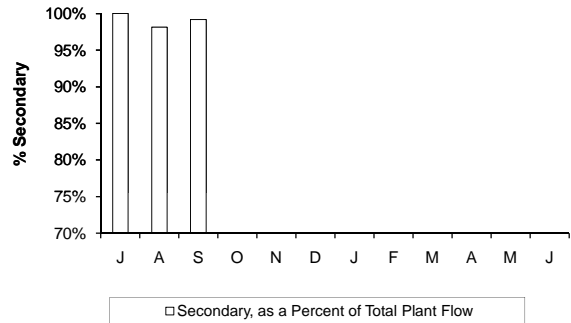
## Secondary Blending Events

Month	Count of Blending Events	Count of Blending Events Due to Rain	Count of Blending Events Due to Non-Rain-Related Events	Secondary, as a Percent of Total Plant Flow	Total Hours Blended During Month
J	0	0	0	100.0%	0.00
A	7	7	0	98.1%	27.25
S	3	3	0	99.2%	10.25
O					
N					
D					
J					
F					
M					
A					
M					
J					
<b>Total</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>99.0%</b>	<b>37.5</b>

There were 10 separate Secondary blending events during the 1st Quarter; all due to high plant flows resulting from heavy rain. There were seven separate blending events in August and three in September resulting in a total of 37.49 hours of blending and 293.7 million gallons of Primary-only treated flow blended with Secondary effluent. Three separate blending events occurred during the weekend of August 27 - 28 as the storm system carrying Hurricane Irene moved through the region. There were no Secondary blending events in July as plant flow never reached the Secondary maximum capacity limit.

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

## Deer Island Secondary Treatment as a Percent of Total Plant Flow



Overall, 99.0% of the total plant flow to DITP received Secondary treatment during the 1st Quarter. The Maximum Secondary Capacity for the entire quarter was 700 mgd.

## Deer Island Operations & Maintenance Report

### Environmental/Pumping:

Measurable rain fell on 35 of the 92 days in the quarter. The plant achieved a maximum average hourly flow rate 1,142.7 mgd on September 8 during a period of heavy rainfall. The passing storms over the three-day period from September 6 through September 8 dropped a total of 2.15 inches of rain. Pumping and treatment operations continued without incident throughout these storm events, as well as, throughout the entire quarter.

### Primary and Secondary Treatment:

Progress on the major Primary and Secondary Clarifier Rehabilitation Project continued through the 1st Quarter. Rehabilitation work was completed on six Primary clarifiers and five Secondary clarifiers this quarter. Additionally, significant progress was made on the sprocket repairs. The rehabilitation work (chain) has been completed on 92% of the clarifiers as of the end of the quarter, and 50% of the sprocket repairs has been completed.

### Regulatory:

Emissions compliance testing on the Secondary Odor Control (SOC) system on DITP was conducted by consultants during the week of August 15. The SOC system treats process air from secondary wastewater treatment process. The Massachusetts Department of Environmental Protection (MaDEP) requires that DITP conduct emissions compliance testing for the various emission units once every five (5) years. For the SOC system, this testing requires the continuous emissions monitoring of the outlet (stack) of the odor control system over a 24-hour period for both Total Reduced Sulfur (TRS) and non-methane hydrocarbons (NMHC). The final report, received from the consultants in September, summarized the test results which show that DITP was in compliance.

# Deer Island Operations

1st Quarter - FY12

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## Deer Island Operations & Maintenance Report (continued)

### Secondary Treatment:

In July and August, staff worked with consultants on a number of energy optimization studies of the Secondary treatment system, including operation of the Cryogenic Oxygen Facility for the activated sludge process. The outcome of these studies will be used to optimize Secondary treatment while still continuing to meet all of DITP's NPDES permit limits. These studies evaluated several approaches for regulating oxygen feed, including the use of the newly installed in-situ dissolved oxygen probes and the use of an aerator vent valve control with deck pressure measurements. The effect of varying aerator mixer operating schemes was also evaluated. A reduction in oxygen feed into the activated sludge process was achieved during the study period. Further work and monitoring will proceed utilizing the knowledge gained from these studies to make future improvements towards oxygen feed regulation.

Essential maintenance was performed and completed on the two flow control gates this quarter. Scheduled maintenance also included replacing the wires in the local control panel and adjusting the control sequence accordingly. Site preparation, rewiring of the panel, and testing of the new control panel were completed over the course of several days in September while minimizing flow control gate down time.

### Residuals Treatment:

Module 2, Digester 4 was taken off line on September 21 to replace a broken mixer and it remained offline for the remainder of the month. (It was returned to service in October once the new mixer was installed).

Contract 7123, Digested Sludge Pump 6 and Flushing Water Pump 8 testing was completed in September. Both pumps were operated through various ranges, and control loop anomalies were addressed to the point where Substantial Completion was declared in September. While there are still some punch list items to be addressed, both pumps appear to perform successfully, allowing robust, relatively quiet, and vibration-free delivery of sludge through the seven-mile force main to the Pelletizing Plant in Quincy, with a more efficient force main flushing practice possible between sludge pumping cycles. Most equipment vendor training had been delivered, and DITP began incorporating the centrifugal sludge pump and the high capacity flushing water pump into normal operational routine in late September.

### Odor Control:

Activated carbon media was changed out for Carbon Adsorber Unit 2 in the North Pumping Odor Control Facility and Unit 3 in the Residuals Odor Control Facility during the 1st Quarter.

### Energy:

Solar Power generation was 2.93% and Wind Turbine generation was 2.55% of the total power generated on-site for the 1st Quarter. Solar power generation includes solar installations on the roof of the Residuals Odor Control Facility, Maintenance/Warehouse, and the Grit Facility, in addition to the solar installation on the ground of the South Parking Lot. Wind Turbine power generation includes generation by the two wind turbines located in the South Parking Lot and intermittent generation during optimization and testing by the FloDesign wind turbine installed near the Hydro Power Plant. Due to the absence of actual historical monthly data, the target generation for the Wind Turbines and for several of the Solar panels are based on annual estimates that are evenly spread over the course of the year. Therefore, monthly variances from target generation are to be expected for all these units for the time being.

CTG operation during high demand periods helps to avoid peak pricing, as well as potentially avoiding the peak hourly demand, which could reduce capacity charges for next year. CTGs operation on July 12 was also to perform testing on the new start-up circuits on each of the CTG units by the Contractor, City Lights Electrical. Testing was performed, under the supervision of the Thermal Power Plant and engineering staff on one unit at a time (approximately two to three hours each unit). This testing was required to field check the new auto- start feature.

As part of the larger Electrical Upgrade 3 Project being performed by City Lights, the bus duct for Substation 5A, which distributes medium-voltage power to the South System Pump Station's VFDs was replaced. This bus duct replacement project began in late June and was completed on schedule by the end of August. No electrical issues related to this work were encountered.

## Clinton Wastewater Treatment Plant Operations & Maintenance Report

### Weather/Flow:

The remnants of Hurricane Irene passed through this quarter leaving behind total rainfall amounts of 10.15 inches; the plant still met the flow limit for the ninth consecutive month. The flow limit is a 12-month rolling average, which has been high as a result of much higher-than-normal rainfall.

### Phosphorous Removal:

The Clinton Plant will have a new requirement for phosphorous removal in its new permit. The treatment technology has been selected after detailed study (disc filters). An RFQ/P to select a designer for the approximately \$3.5 million project is being prepared. MWRA has four years from the date of the permit signing (not yet signed) to meet the requirement.

### Upcoming Projects:

Aeration System Improvements and Redundant Pumps at the Influent and Intermediate Lift Stations project has been advertised; bids for this \$1.7 million construction project are due in November. Also, the Digester Rehabilitation project and the New Influent Gates project have been combined into one construction project. Specifications are being completed.

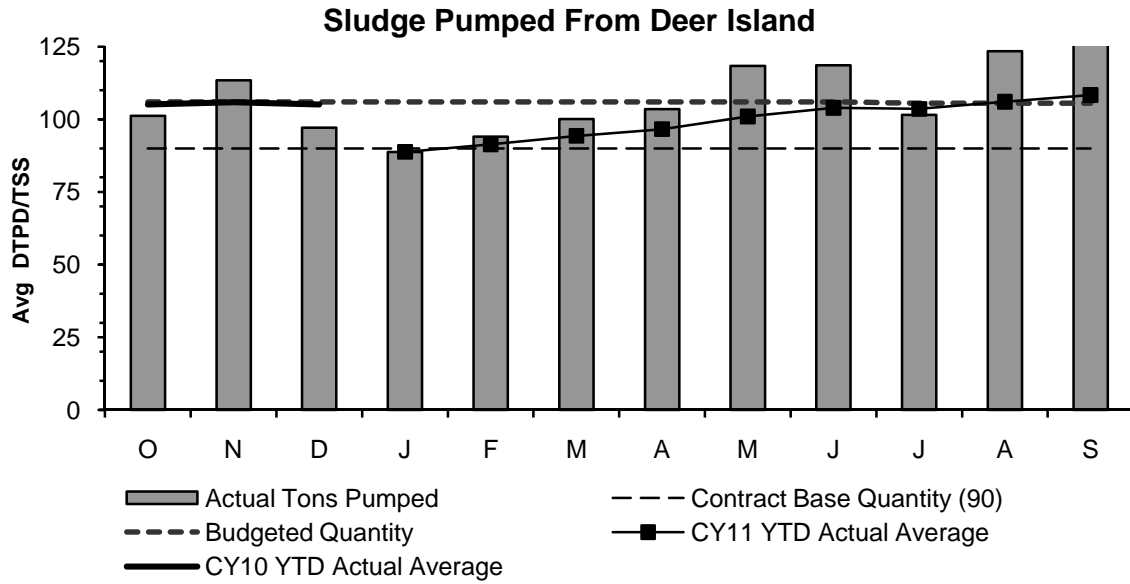
### Operations and Maintenance:

Staff completed all of the plant's scheduled maintenance work orders this quarter. In addition, staff performed a number of other maintenance tasks: *Headworks Building* - greased the grit screw and belt conveyor in the grit room; greased the upper and lower bar rack and cleaned the manual bar rack. *Primary Tanks* - freed up frozen cross collector bearings in Tank 1; greased Tank 2; greased the collectors on Tank 1. *Dewatering Building* - cleaned debris from ball check valves on Plunger Pumps 1 and 2; changed the wiper blades on the spray box for Belt Press 1; replaced packing on Piston Pump 1. *Chemical Building* - completed installation of a variable drive for the new soda ash slurry pump; put new soda ash slurry pump in service; changed the air filter on the low-pressure air blower for the contact chamber; changed oil in the blower; replaced a mechanical seal on the water pump.; removed and cleaned filter bags on the soda ash silo. *Digester Building*: greased and changed the oil on all recirculating pumps; replaced packing on Recirculating Pump. *Other* - installed lower roller bearings on Intermediate Lift Pump 1; changed the oil on the drive gear on the skimming arm on Gravity Thickener 1; placed Tank 3 on line in response to high flows from storm events. *Trickling Filter* - cleaned the spray nozzles and lubricated the center column. *Aeration Basins* - changed the oil on the aerator drive gear boxes for Aerators 1, 3, and 5; and purged grease on motors.

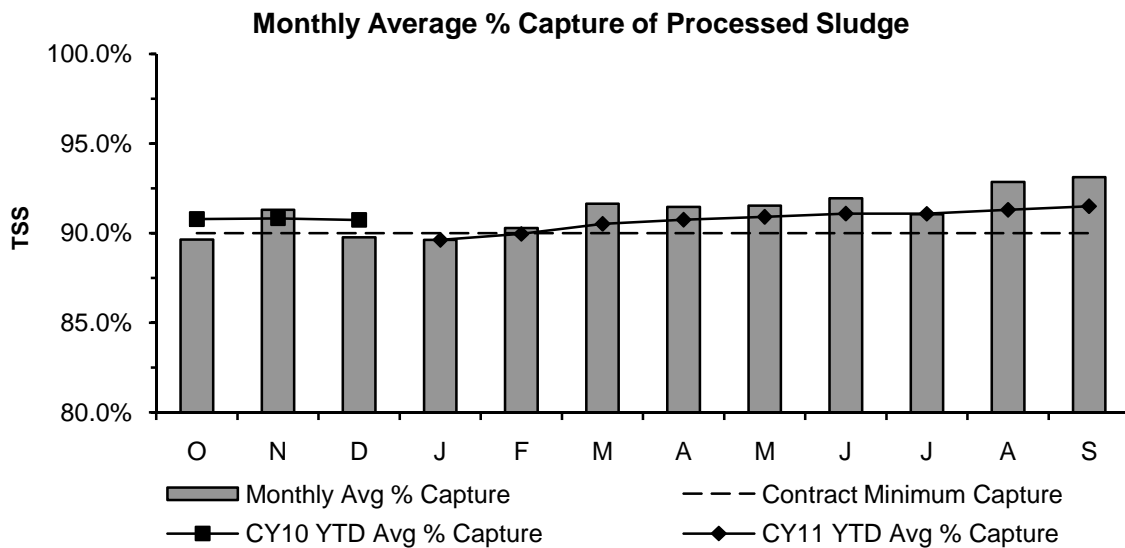
## Deer Island Residuals

1st 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).



The average total quantity of sludge pumped from DITP to FRSA in the 1st Quarter was 117.2 DTPD, which is more than FY12's budgeted monthly average of 105.5 DTPD. The higher quantity is the result of a combination of heavy rain during the quarter and the need to transfer sludge to repair a broken mixer.



The contract requires NEFCo to capture at least 90% of the solids delivered to the Pelletizing Plant at FRSA; the solids capture rate for the 1st Quarter was 92.35%.

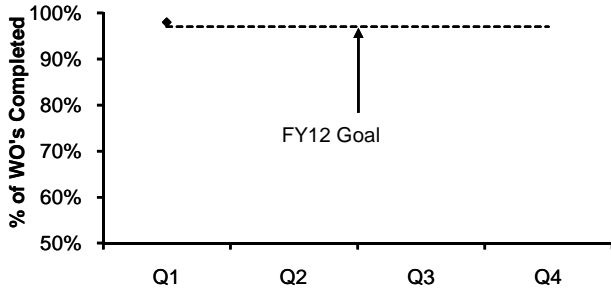
# Deer Island Maintenance

1st Quarter - FY12

## Productivity Initiatives

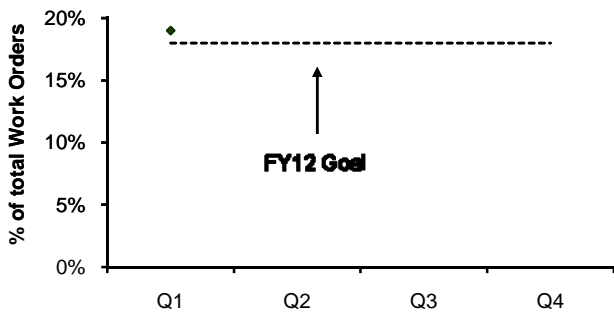
Productivity initiatives include increasing predictive maintenance tasks. Accomplishing this initiative should result in a decrease in the overall maintenance backlog.

### Predictive Maintenance Compliance



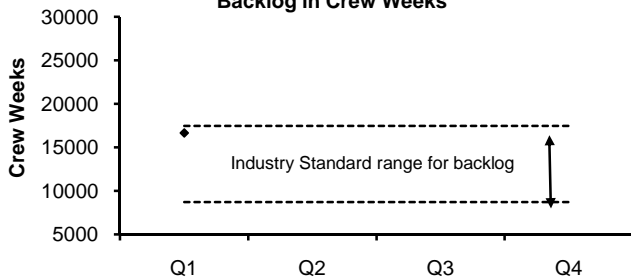
Deer Island is continuing with an aggressive predictive maintenance program. Deer Island's FY12 predictive maintenance goal is completion of 97% of all PdM work orders; Deer Island met this goal as it completed 98% of its PdM work orders this quarter.

### 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 19% of total work orders this quarter.

### Maintenance Project Backlog in Crew Weeks

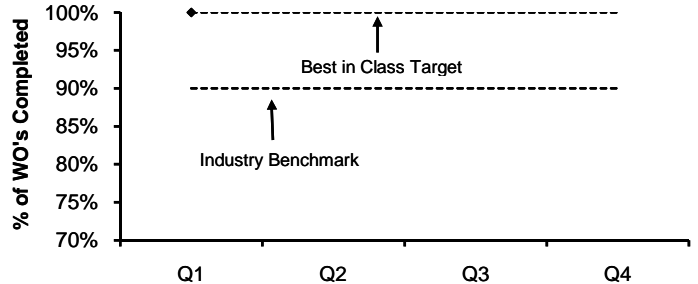


DITP's average backlog this quarter was 16,674 hours. The industry standard for maintenance backlog with 97 staff (currently planned staffing levels) is between 8,730 hours 17,460 hours. Maintenance is currently within the industry benchmark. Management continues to monitor backlog to ensure that all critical equipment and systems are available.

## Proactive Initiatives

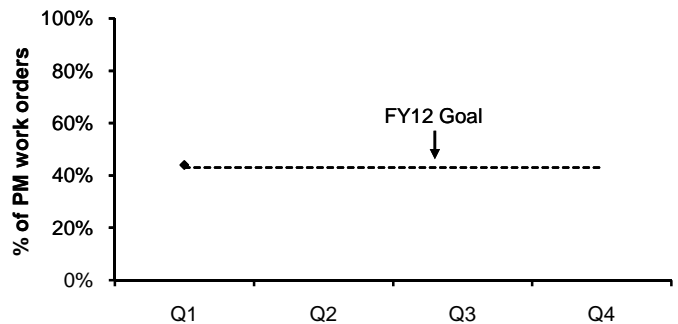
Proactive initiatives include completing 100% of all preventive maintenance tasks and increasing preventive maintenance kitting. These tasks should result in lower maintenance costs.

### Preventive Maintenance Compliance



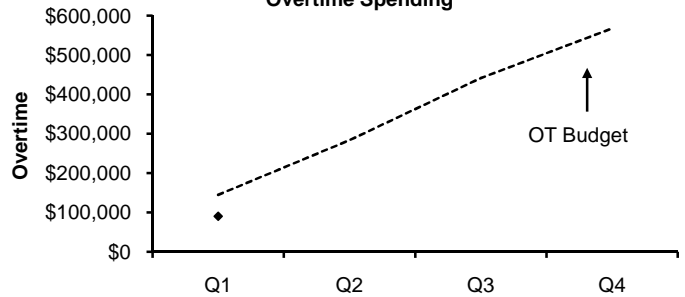
Deer Island's FY12 preventive maintenance goal is completion of 100% of all PM work orders from Operations and Maintenance. DITP met this goal as it completed 100% of PMs this quarter.

### Maintenance Kitting



Deer Island's FY12 maintenance kitting goal is 43%; Deer Island completed 44% 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 \$55K under budget for the 1st Quarter. 1st Quarter overtime was used for high-flow coverage, Hurricane Irene, Hydro Facility sump pump clean up and replacement, grit conveyor belts and roller replacement, and clarifier work. Management continues to limit overtime spending to critical maintenance activities.

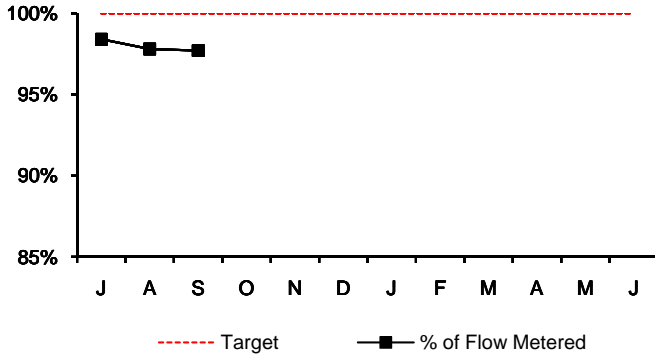


# Operations Division Metering

1st Quarter - FY12

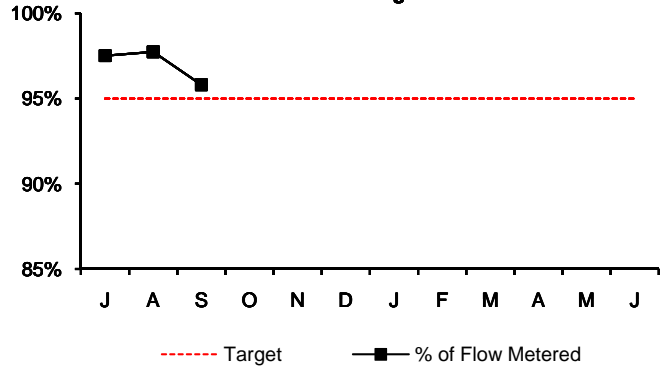
## WATER METERS

Percent of Total Revenue Water Deliveries Calculated Using Meters



## WASTEWATER METERS

Percent of Total Wastewater Transport Calculated Using Meters

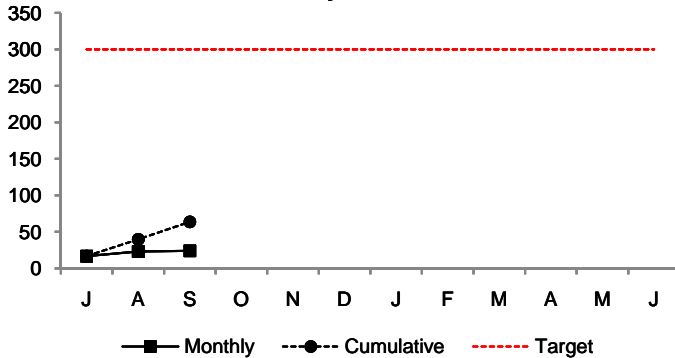


The target for revenue water deliveries calculated using meters is 100%. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and capital construction projects. During the 1st Quarter, meter actuals accounted for 98.0% of flow; only 2.0% of total revenue water deliveries were estimated. The following is the breakdown of estimations:  
In-house and Capital Construction Projects - 1.0%  
Instrumentation Failure - 1.0%

The target for revenue wastewater transport calculated using meters is 95%. Estimates are generated for meters missing data due to instrument failure and/or erratic meter behavior. Estimates are produced using data from previous time periods under similar flow conditions. During the 1st Quarter, meter actuals accounted for 97.0% of flow; 3.0% of wastewater transport was estimated.

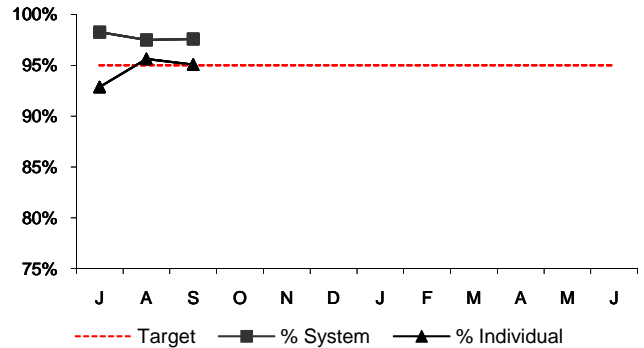
## WATER DISTRIBUTION SYSTEM PIPELINES

Miles Surveyed for Leaks



During the 1st Quarter of FY12, 63.77 miles of water mains were inspected.

% Wastewater Meter Uptime



During the 1st Quarter, out of a possible 1,607,424 data points, only 35,759 points were missed resulting in a system-wide up time of 97.8%. Of the 182 revenue meters installed, on average, 10 meters per month experienced down time greater than the 5% target resulting in a 94.5% individual meter uptime. For the 1st Quarter, down time for an individual meter is defined by any individual meter having less than 8,390 data points.

Water Distribution System

Month	J	A	S	O	N	D	J	F	M	A	M	J
Leaks Detected	0	0	0									
Leaks Repaired	0	1	0									
Backlog	1	0	0									
Avg. Lag Time	31.0	47.0	0.0									

The 47-day average lag time represents the repair of a leak that was carried over from FY11. Although it was minor in nature, staff needed to ensure redundant supply to maintain service, and also coordinate the repair with a valve replacement. Staff repaired this leak on August 16. No new leaks have been detected since.

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.

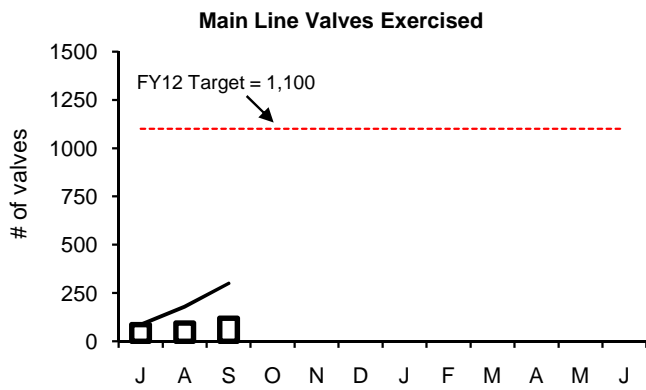
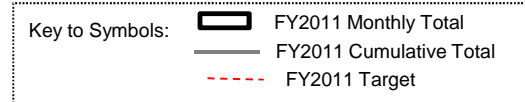
# Water Distribution System Valves

1st Quarter - FY12

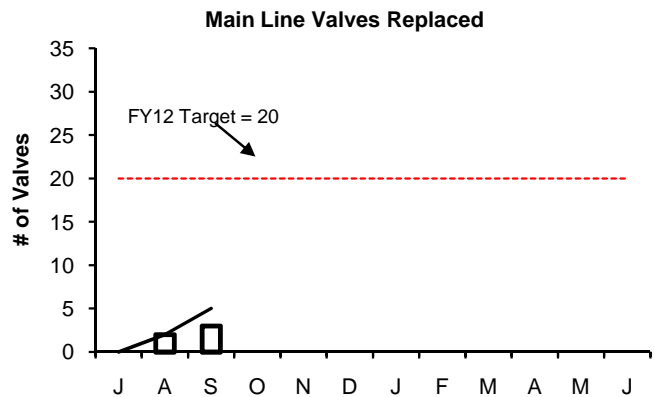
## Background

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.

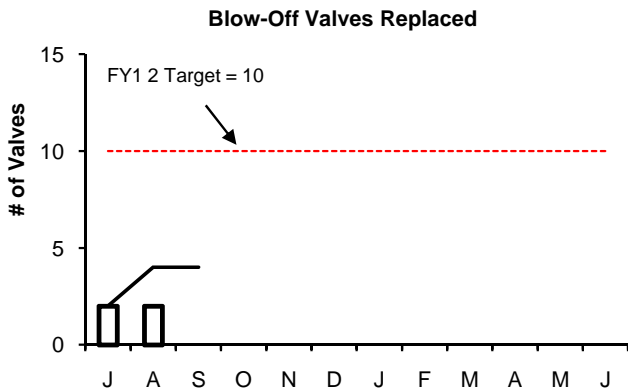
Type of Valve	Inventory #	Operable Percentage	
		FY11 to Date	FY11 Targets
Main Line Valves	2,092	95.8%	92%
Blow-Off Valves	1,206	93.3%	94%
Air Release Valves	1,335	92.3%	92%
Control Valves	48	100.0%	95%



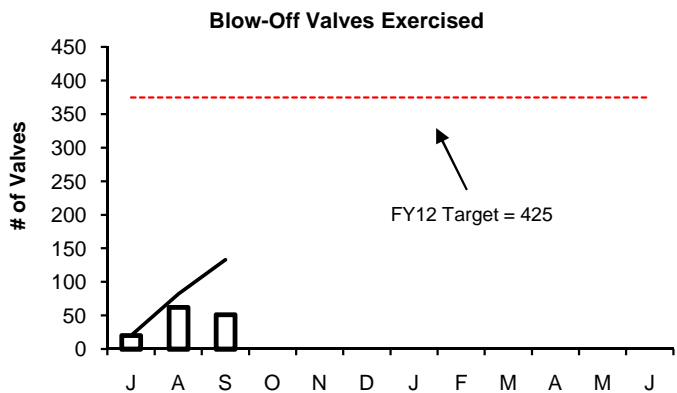
During the 1st Quarter, staff exercised 300 main line valves .



Staff replaced five main line valves during the 1st Quarter.



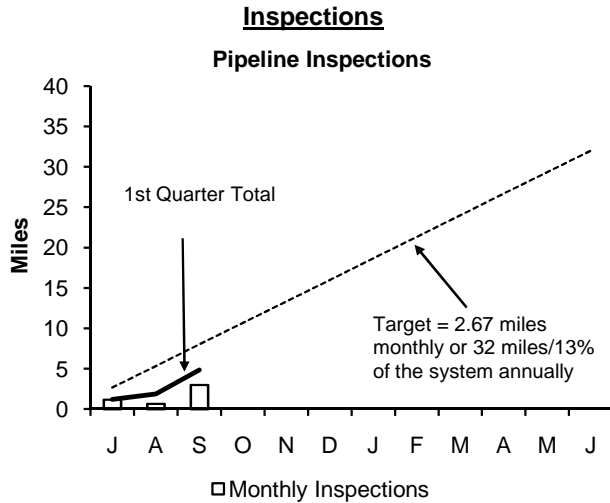
Staff replaced four blow-off valves in the 1st Quarter.



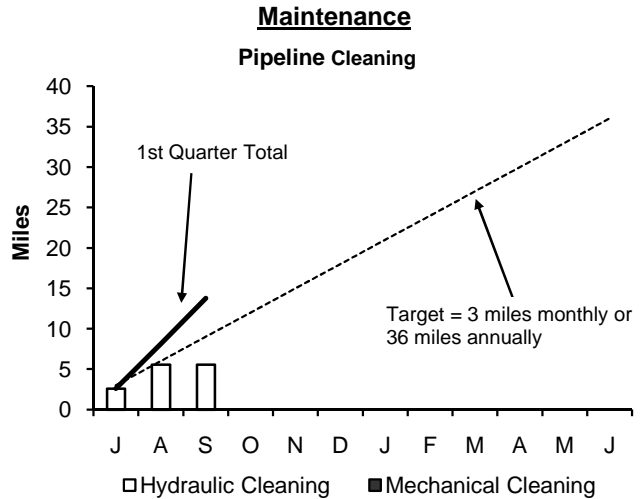
During the 1st Quarter, staff exercised 133 blow-off valves.

# Wastewater Pipeline and Structure Inspections and Maintenance

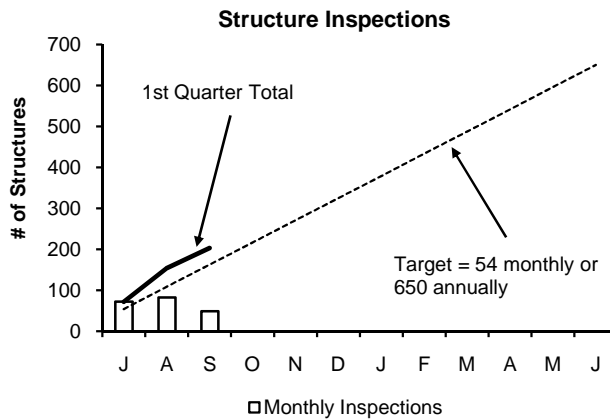
1st Quarter - FY12



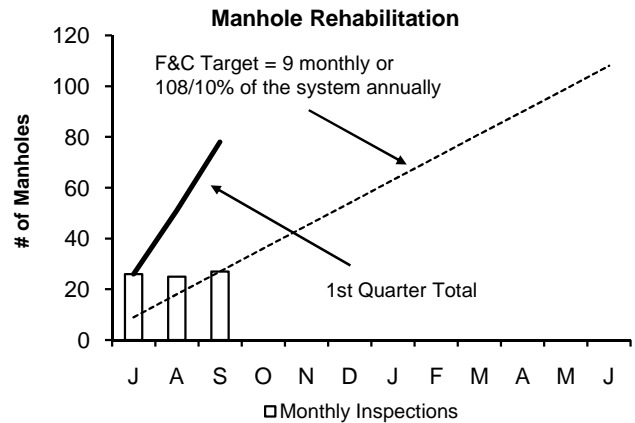
Staff internally inspected 4.86 miles of MWRA sewer pipeline during the 1st Quarter. Community Assistance was provided to the Town of Winthrop and the City of Somerville; staff inspected 4,288 linear feet of 12-inch-diameter sewer this quarter.



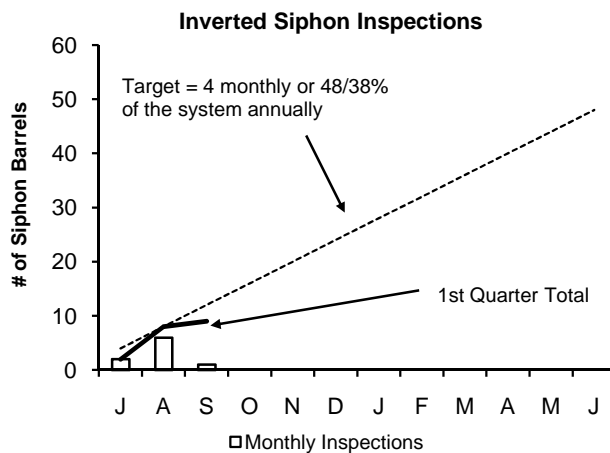
Staff cleaned 13.75 miles of MWRA's sewer system and removed 28 cubic yards of grit and debris during the 1st Quarter. No Community Assistance was provided this quarter.



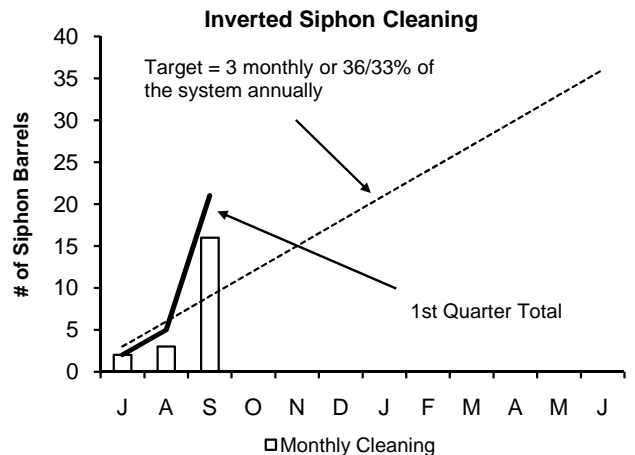
Staff inspected the 12 CSO structures each month during the 1st Quarter (36 inspections) and performed 167 additional manhole/structure inspections, bringing the total for the 1st Quarter to 203.



Staff replaced 78 frames and covers during the 1st Quarter.



Staff inspected nine siphon barrels in the 1st Quarter.

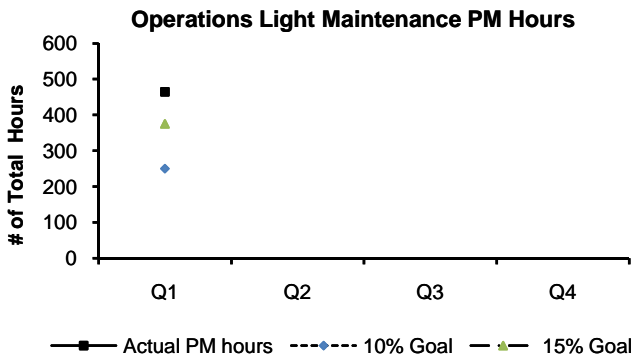


During the 1st Quarter, staff cleaned 21 siphon barrels.

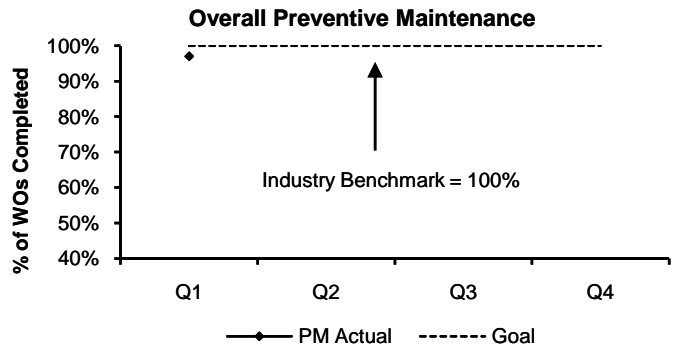
# Field Operations' Metropolitan Equipment & Facility Maintenance

## 1st Quarter - FY12

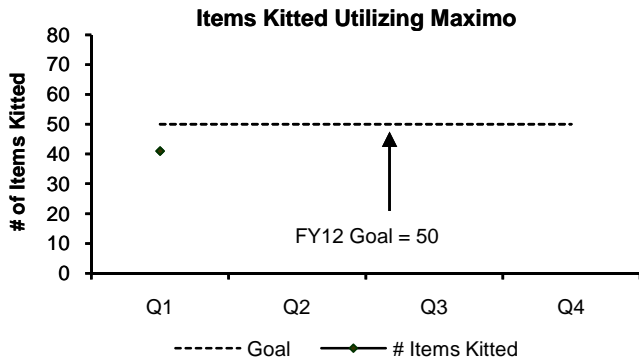
Staff are continuing with several maintenance and productivity initiatives; The Operator PM and kitting initiatives frees up maintenance staff to perform corrective maintenance and project work, thus reducing maintenance spending. Backlog and overtime metrics monitor the success of these maintenance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



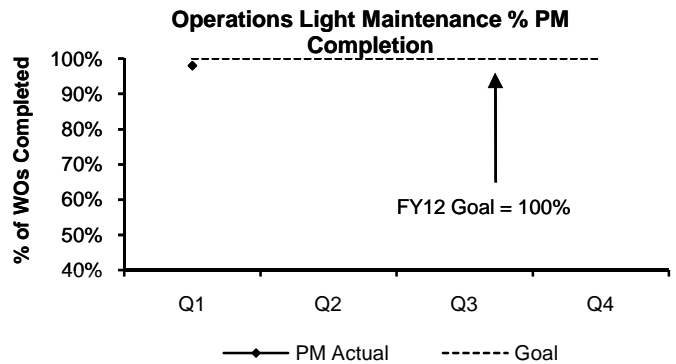
Operations staff averaged 493 hours of preventive maintenance during the 1st Quarter, an average of 20% of the total PM hours for the 1st Quarter, which is above the industry benchmark of 10% to 15%.



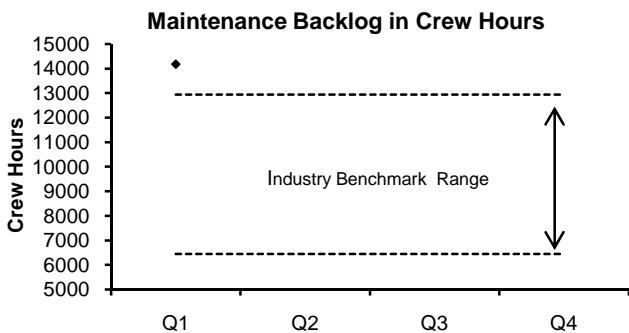
The Field Operations Department (FOD) preventive maintenance goal for FY12 is 100% of all PM work orders. Staff completed an average of 97% of all PM work orders in the 1st Quarter.



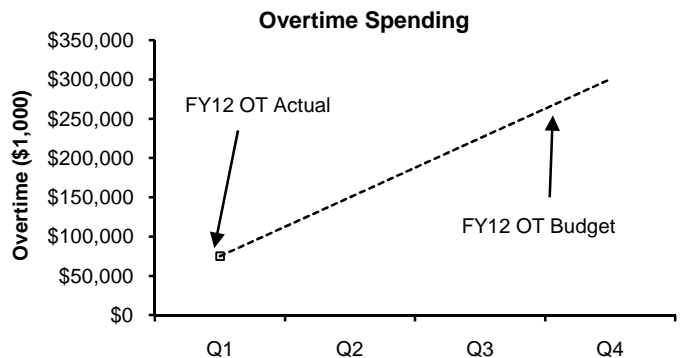
In an effort to more efficiently complete work, maintenance staff and work coordination staff have utilized the Lawson/Maximo interface to better kit stock and non stock material. The goal for FY12 is to "kit" 50 stock and non stock items total per month. An average of 40 items were kitted during this first quarter of this new initiative.



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 98% of PM work orders in the 1st Quarter.



The 1st Quarter backlog average is 14,176 hours. The Electrician's backlog was high due to a shortage of electrical staff (FOD hired an additional Electrician this quarter). Management's goal is to continue to control overtime and still stay within the industry benchmark of 6,450 to 12,940 hours.

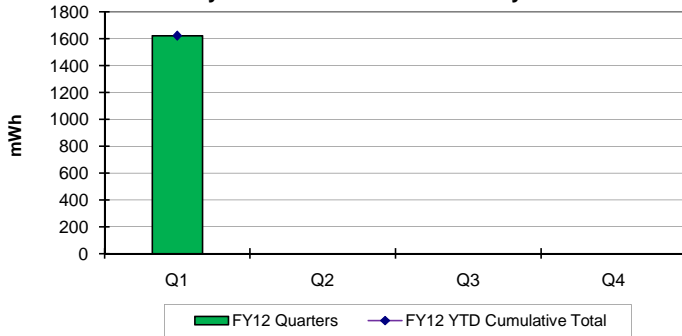


Maintenance overtime was \$705 over budget for the 1st Quarter. Overtime was used to complete emergency repairs due to a variety of critical operational needs as well as staff coverage during multiple wet-weather events.

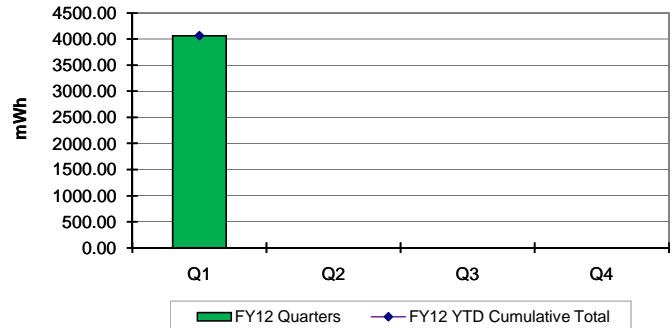
## Field Operations Hydroelectric Generation Quarterly Report

1st Quarter - FY12

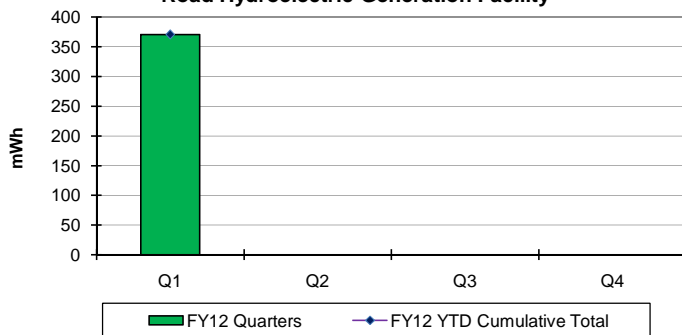
**Quarterly Totals for Hydro Production at Cosgrove Hydroelectric Generation Facility**



**Quarterly Totals for Hydro Production at the Oakdale Hydroelectric Generation Facility**



**Quarterly Totals for Hydro Production at the Loring Road Hydroelectric Generation Facility**



In the 1st Quarter, the **Cosgrove Hydroelectric Station** generated a net of 1,623 MWh; approximately 12% less than was generated during the same quarter in FY11. The revenue generated at Cosgrove in the first quarter was \$84,810, exclusive of Renewable Energy Certificates.

In the 1st Quarter, the **Oakdale Station's** hydroelectric plant generated a net of 4,062 MWh; 34% less power than was generated during the same quarter in FY11. The revenue generated at Oakdale in the 1st Quarter was \$235,200, exclusive of Renewable Energy Certificates. (Power is generated when water is transferred from Quabbin to Wachusett; transfers were limited by higher Wachusett tributary flows that increased the elevation of Wachusett Reservoir.

In the 1st Quarter, the **Loring Road** hydroelectric 200 kW station generated 371 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 and determine the appropriate incentive from NSTAR resulting from 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 has approved incentives for the replacement of existing lighting with energy efficient lighting in four of the buildings at Southborough. That work is expected to be approved and completed by January 2012.

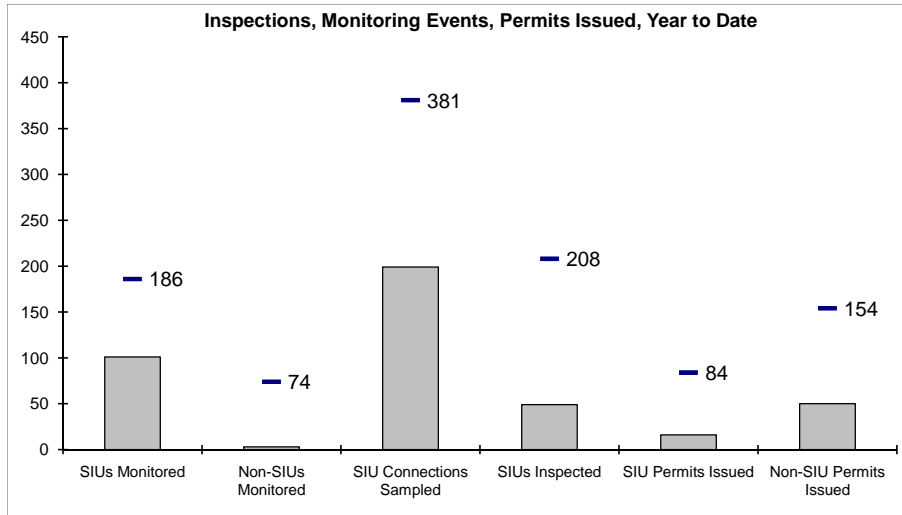
**Wind Power:** Under the American Recovery and Reinvestment Act for Green Infrastructure projects, MWRA received \$4.75 million in stimulus funding from SRF for a wind turbine at the DeLauri Pump Station. MWRA issued an NTP for design/build of a 370-foot turbine in March 2010. Work was completed by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

**Chelsea Facility:** The detailed audit of the Chelsea facility recommended installing an Energy Management System (EMS) for the Admin. Building, along with some equipment updates. Staff are proceeding with this recommendation and are working with NSTAR and its contractor to put together a specifications package that was bid during the 4th Quarter of FY11. Bids were received and evaluated and an NTP date is expected during the 2nd quarter of FY12. NSTAR has agreed to provide a \$168,000 incentive to MWRA for the installation of the EMS. In addition, the energy use of the LED lighting installed in the parking areas at the Chelsea Facility in the 4th Quarter of FY11, has been measured and was shown to be about 60% lower than the energy use of the previous lights.

**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 23 facilities were performed in two phases from FY10 through FY11. 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 FY12.

# Toxic Reduction and Control

1st Quarter - FY12



EPA Required SIU Monitoring Events for FY11: 186  
YTD: 101

Required Non-SIU Monitoring Events for FY11: 74  
YTD: 3

SIU Connections to be Sampled For FY11: 381  
YTD: 199

EPA Required SIU Inspections for FY11: 208  
YTD: 49

SIU Permits due to Expire In FY11: 84  
YTD: 16

Non-SIU Permits due to Expire for FY11: 154  
YTD: 50

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 begins each fiscal year by front-loading SIU monitoring events to ensure we are able to meet the SIU monitoring plan requirements; most Non-SIUs are worked into the schedule later in the fiscal year once we are on track to meet SIU requirements.

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.

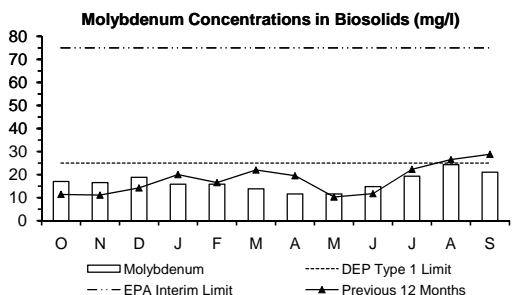
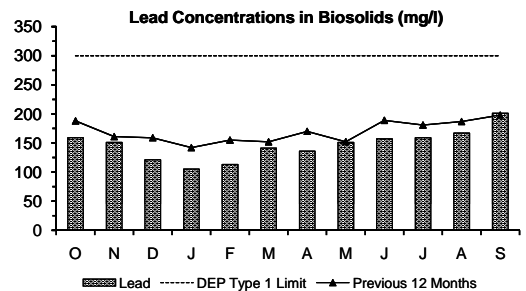
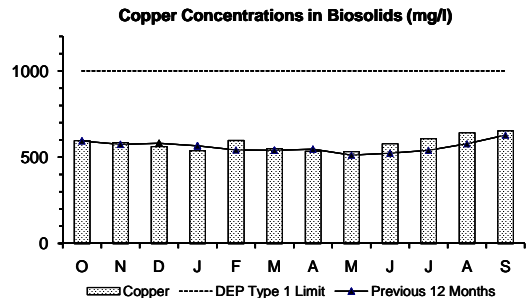
SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

	Number of Days to Issue a Permit						Total Permits Issued	
	0 to 120		121 to 180		181 or more			
	SIU	Non-SIU	SIU	Non-SIU	SIU*	Non-SIU	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								
Nov								
Dec								
Jan								
Feb								
Mar								
Apr								
May								
Jun								
% YTD	69%	68%	31%	8%	0%	24%	16	50

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. No SIU permits were issued beyond 180 days in the 1st Quarter; five SIU permits were issued between 120 and 180 days due to staff workload issues, facility modifications and resulting permit modifications, and permit generation issues in PIMS.

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.

For the past full year, MWRA met DEP's Type 1 Molybdenum limit. Staff are still reviewing MWRA's voluntary program to determine whether or not a regulatory program is needed to control molybdenum levels.



# Field Operations Highlights

## 1st Quarter - FY12

### Western Water Operations & Maintenance

- Carroll Water Treatment Plant: A factory-authorized vendor replaced the actuator on a 72-inch butterfly valve at the effluent side of the main contactors. Staff also installed a conduit and wire at all four contactors as part of an ozone meter relocation project.
- Shaft 5: Staff closed two 60-inch gate valves at Shaft 5 as part of the overall shutdown of the lower Hultman Aqueduct. The shutdown will allow the Hultman Interconnections contractor to build the new 5A-2 Valve Chamber and complete repairs in the lower section of the aqueduct.
- Storm Damage: Staff cleared more than 150 trees that fell during Hurricane Irene along the aqueduct's right of ways and across western facilities' grounds.

### Metro Water Operations & Maintenance

- Canton Boil Water Incident: On Tuesday, September 27, water quality sample results for the Town of Canton indicated e-coli in the town's water system; a "boil water" order was required by Mass DEP and immediately put into effect. MWRA staff from several departments responded. One Mobile Disinfection Unit (MDU) was deployed Tuesday evening, with a second unit deployed on Thursday to add chlorine to the town's water system. Assistance included water quality sampling, water tank inspection, and general hydraulic operational support. The chlorine addition continued through the weekend until late Monday afternoon when sample results allowed the boil water order to be lifted.
- Hurricane Irene: Staff worked in advance, during, and after the hurricane. Blue Hills, Chestnut Hill, Fells and Spot Pond Reservoirs were all lowered in advance of the storm to make sure that there was plenty of freeboard to capture the rain events. Power was lost on Sunday at Blue Hills and Fells Covered Storage Facilities, and the signal to the Prospect Hill tanks was also lost. Both storage facilities operated on their emergency generators and a redundant signal to Prospect Hill allowed for the Lexington Street Pump Station to be manually controlled from the OCC. Power was restored to Blue Hills on Wednesday and to Fells on Friday. The Prospect Hill signal was restored on Friday. Drain valves at the reservoirs were reopened after the storms to drain out some of the water.
- Dig Safe Pilot Program: The Dig Safe Pilot Program continues to function successfully. Brookline, Chelsea and Saugus are included in the program that is related to MWRA pipelines. During the first quarter, MWRA received 595 notices, of which 106 were of an emergency nature; 30 emergency mark outs and 65 regular mark outs were required from the 595 total notices.

### Wastewater Operations & Maintenance

#### *Wastewater Operations*

- South Boston CSO Storage Facility and Pump Station: Operations staff were stationed at the new pump station during the 1st Quarter to monitor and learn the operation of the pump station, vent building and diversion structures. Staff also attended coordination meetings. Staff simulated a power loss to the pumping station to conduct testing. Staff attended the punch list walkthrough meeting and assisted with testing at the vent building. Staff also reviewed portions of the facility manual and provided comments.
- Spill Prevention Control and Countermeasures (SPCC) Inspections: Operations performed SPCC Inspections at Cottage Farm CSO, Prison Point CSO and Braintree-Weymouth Pump Station. These DEP-required inspections are performed monthly with records placed on site in the EAP Cabinets and in the Program Manager's Office for reference and recommendation tracking.
- Facility Audits: Operations Supervisors inspected unstaffed wastewater facilities in August. Audits included, but were not limited to, inspection of pumps, screens, engines, and the overall cleanliness of the facilities.

#### *Process Control*

- Framingham Pump Station Chemical Containment and Monitoring: Maintenance staff installed containment berms that will direct spills to the sewer drain. New leak sensors were purchased and installed; Electricians installed conduit. SCADA staff programmed the PLC. Work is complete; leak detection has been installed and tested correctly.

## TRAC

- Enforcement-Cease and Desist Order to Brigham and Women's Hospital: On July 27, TRAC issued a Cease and Desist Order to Brigham and Women's Hospital (BWH) for discharging excessive levels of mercury into MWRA's sanitary sewer from a permitted sampling location. The facility had entered into a Consent Agreement on December 12, 2008, which required compliance at this location by June 8, 2009. BWH continued to pay stipulated penalties but was unable to achieve lasting compliance. BWH ceased its discharge from the location upon receipt of the order.
- Enforcement - G1 Penalties: TRAC issued 3 Penalty Assessment Notices totaling \$1,500, to companies that failed to submit their annual Compliance Report as required by the Group Permit for Photo Processing and Printing Operations (Group Permit). The due date for filing the Compliance Report was March 31, 2011. Each facility received a penalty in the amount of \$500.00.

## Metro Equipment and Facility Maintenance

### *Equipment Maintenance Program*

- Headworks Projects: Staff from all trades worked jointly on headworks projects this quarter, including sodium hypochlorite tank replacements at Chelsea Creek, grit pod replacements at Ward Street, and incline grit screws at Columbus Park.
- Nut Island Projects: Staff replaced an uninterruptable power supply (UPS) and rebuilt a shuttle conveyor at Nut Island.
- Other Projects: Staff completed multiple other projects this quarter, including a new actuator for Framingham Gate 1; installing conduit and wiring for a new waste oil tank and pump at Prison Point; installing a new, more efficient air handling unit at Alewife; removing and reinstalling a rebuilt pump at Caruso; installing new mechanical pump seals at New Neponset; and repairing a dry weather flow pump at Prison Point.
- Blue Hill/Walnut Hill: Plumbing staff completed the sample piping for Blue Hills and Walnut Hill water quality monitoring units.

### *Grounds Maintenance*

- Tree Removal/Landscaping: Trees were removed at Half Mile Road, Alewife Pump Station, Columbus Park, Brookline, Winchester, Braintree-Weymouth, and High Fells

### *Facility Maintenance*

- Facility Maintenance Projects: Projects this quarter included: installing gas monitoring signs at a number of facilities; erecting and dismantled staging at IPS, Nut Island, Ward Street, and Alewife Pump Station; replacing frames and covers in Cambridge, Melrose, Malden and Winchester; sealing the wet well door at Prison Point; putting mesh over windows at FRSA; repairing stairs at Columbus Park; coring holes for Electricians at Alewife; repairing a containment area at Chelsea Headworks; and preventive maintenance on the doors at Columbus Park, Chelsea Headworks, Ward Street, Framingham Pump Station, Gillis Pump Station, and Hingham.

## Operations Support

### *Operations Engineering*

- Development of ERP Training Programs: Staff continued developing a comprehensive annual emergency plan training program to comply with DEP requirements. This training will be provided for MWRA staff and MWRA water communities. For CY2011, a draft schedule has been prepared and announcements are being drafted for distribution to the communities. This training program will be continued annually.
- Hultman Shutdown: Staff prepared and executed operations plans for the shutdown of the eastern sections of the Hultman Aqueduct to allow the Shaft 5A contractor work to proceed.

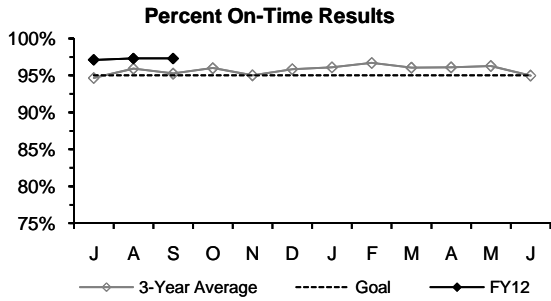
### *Water Quality Assurance*

- Online Water Quality Monitoring: Staff continued updating the water quality monitoring analyzer system; five units have been installed and made operational via SCADA. Central data collection equipment and server were installed in September and are undergoing testing. Staff continued implementing the associated data collection network with Verizon field connection of necessary circuits being performed site by site.

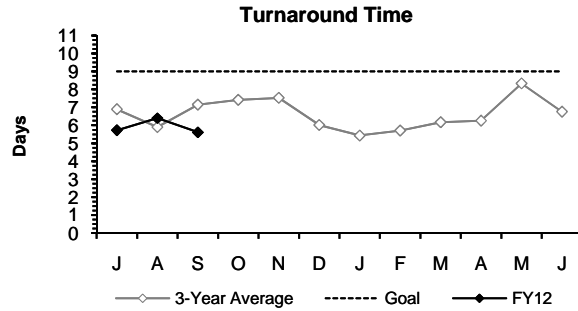


# Laboratory Services

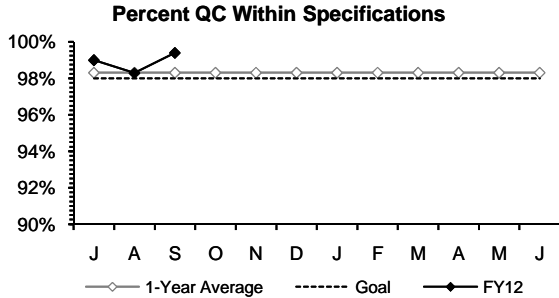
## 1st Quarter - FY12



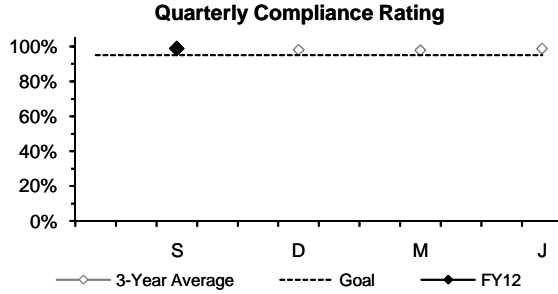
The Percent On-Time measurement met the 95% goal each month during the 1st Quarter.



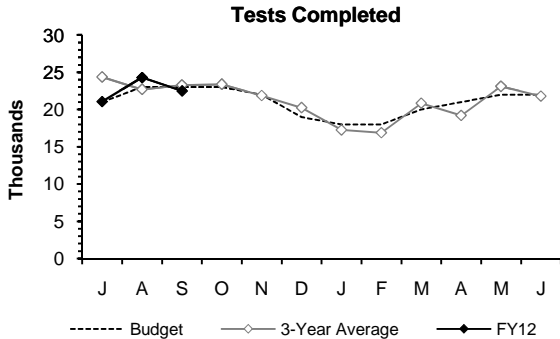
Turnaround Time was faster than the 9-day goal each month this quarter.



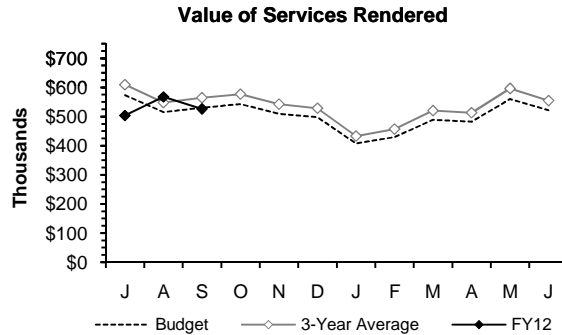
Percent of QC tests meeting specifications stayed above the 98% goal each month of the quarter. The 1-year average is based on the new LIMS results.



An audit of reporting limit verifications found good compliance at each laboratory location. Compliance audits are performed in September, December, March, and June.



The Tests Completed was above or near the seasonally adjusted budget goal each month of the quarter. FY12 will be a transition year for this metric between the old and the new



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

### Highlights:

**Orange Notebook Changes:** This is the 1st Quarter using the new performance reporting metric, "Percent Quality Control Within Specifications." This graph replaces "Percent Valid Tests." This metric is the fraction of all quality control tests that met the defined requirements. It should be more informative because it exclusively focuses on measurement quality rather than things that might have been affected by sample characteristics.

**Quality Assurance:** Passed 410 of 416 annual Proficiency Test parameters on the first try (98.6%). Retests are needed on only six parameters to maintain DEP laboratory certification. Received renewed laboratory certifications for Chelsea, Quabbin, Southborough, and the Central Lab. Examined paper laboratory records retention procedures to ensure that the Lab is complying with state requirements. A September audit of the Southborough Lab by the Q/A Coordinator found that same-day data entry into LIMS, a revised bacteria logbook, automatic e-mail notifications, and improved data review procedures, are all supporting reliable community notifications of presumptive and confirmed bacteria results.

**DITP:** Tested an additional round of Chemical Oxygen Demand (COD) samples as part of a process optimization study.

**ENQUAD:** Presented demonstrations of DLS's sampling boat and field gear at Spectacle Island as part of the Advisory Board's Boston Harbor tour.

**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, MWRA will use Colilert for regular and repeat samples instead of Membrane Filtration because it is faster, more reliable, and leads to fewer internal and community notifications. Provided feedback to DEP on its upgraded eDEP program for electronic reporting of drinking water lab results. Tested additional copper samples to track the effects of Wachusett Reservoir algae treatment.

**Outside Customers:** DCR collected its first set of wet-weather samples for Wachusett tributaries. Tested rush disinfection by-product samples and additional nutrient samples for Reading's nitrification study at the town's expense.

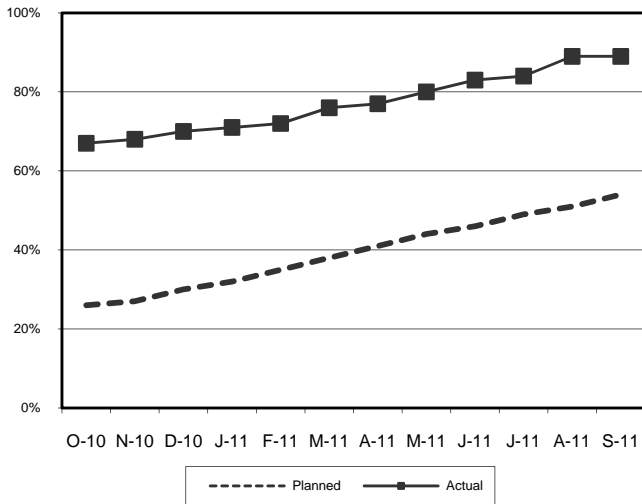
# CONSTRUCTION PROGRAMS

# Projects In Construction – 1

## First Quarter FY12

(Progress Percentages based on Construction Expenditures)

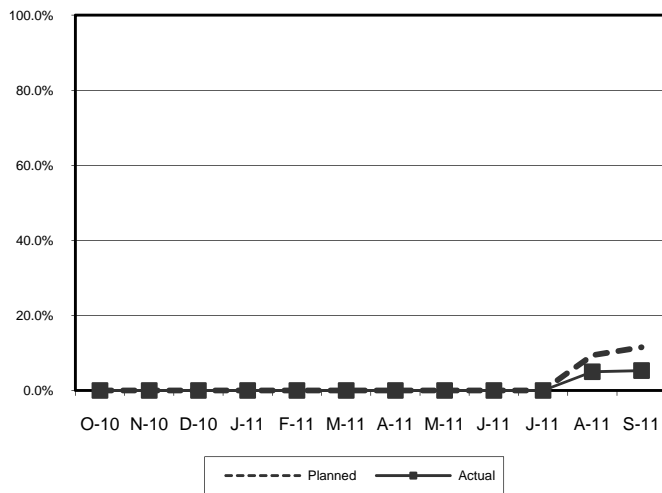
**Southern Spine Water Mains Rehabilitation –  
Section 107 Progress - September 2011**



**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:** RJV completed installation of 24-inch DIP for Section 43 between Section 107 and the intersection of River/Washington Streets, including the installation of blow-off piping and structures. The contractor completed the installation of 9 linear feet of Section 107 48" DIP along with a 48-inch BFV at the interconnection tee to Section 22, marking the end of all section 107 piping installation.

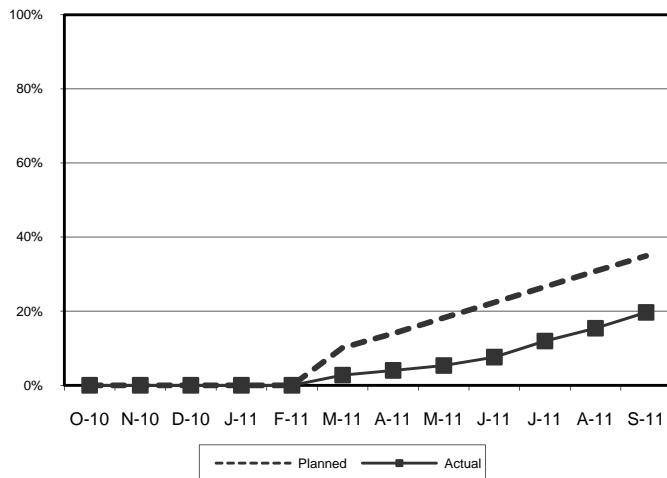
**UV Disinfection Facilities CWTP  
Progress - September 2011**



**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 electrical sub-contractor began construction of duct banks between the existing electrical manhole (EMH) and the new EMH in the roadway east of the PT building. The reinforcement sub-contractor began the installation of rebars. The first section of concrete was placed for duct bank encasement. In addition, the contractor completed coring into the existing EMH's 5A and 5B for the relocation of power feeds for sides A & B.

**Lynnfield/Saugus Pipelines  
Progress - September 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.

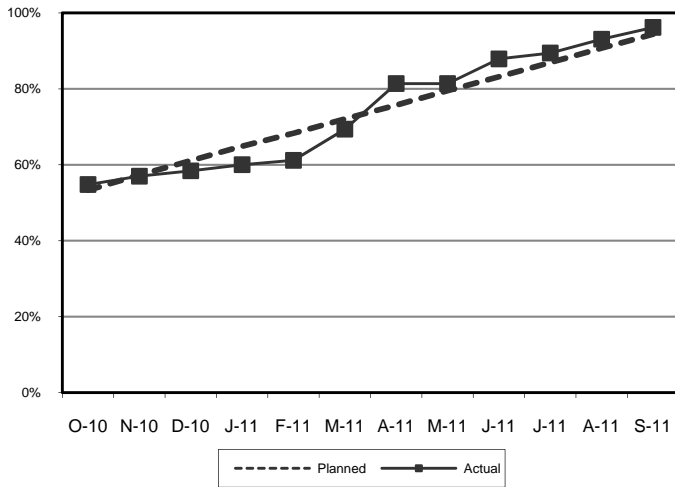
**Status and Issues:** During the month of September, the contractor installed 1,758.25 LF of 12-inch and 1,829.5 LF of 24-inch pipe on Route 1 South. In addition, the contractor drilled a diamond blast pattern in anticipation of blasting on Route 1 South. This is the most difficult location of the alignment, and production has slowed due to the amount of rock excavated. The contractor has obtained both MDOT and Saugus Blasting Permits, but has opted for now to continue to remove the rock by hoe ramming.

## Projects In Construction – 2

### First Quarter FY12

(Progress Percentages based on Construction Expenditures)

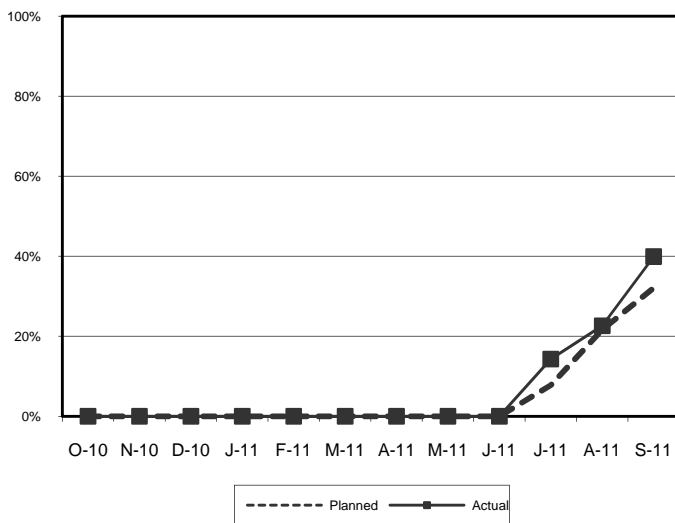
**Section 18, 50 & 51 Rehabilitation in Medford/Somerville**  
Progress - September 2011



**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:** On Section 18, Dow did night work to install a 14" GV at the Somerville side of the meter 32 by-pass connection. Final paving was done at Morton Ave., Harvard St., Winchester St., and Main St. Dow installed a 16" isolation valve and air valve within a manhole, 100 feet of 16" DI pipe, and a tee to connect to Section 65 at the meter 32 by-pass.

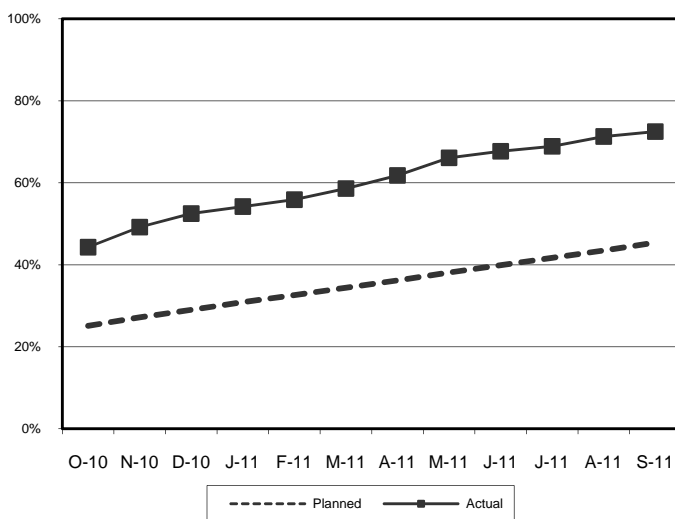
**Phase 7 Valve Replacement**  
Progress - September 2011



**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:** During September, Public Affairs continued to distribute flyers and coordinate with Somerville business owners and residents. Test pits were completed for the Section 66 30" gate valve and meter 78. Also, test pits were completed for the Section 86 blow-off. The meter 78 site was completed and paved during the month.

**Hultman Aqueduct Interconnections Project**  
Progress - September 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 September, the contractor completed backfilling N-3 and began the installation of a new access road. In addition, structural steel, platforms, ladders and stairs were installed at N-3. At the bifurcation site, the installation of the temporary fencing was completed, as well as the removal of two 60" bifurcation valves and connection piping. The contractor completed the demo of the Hultman Aqueduct and continued earth support installation for the new VC-5A2.

# CSO CONTROL PROGRAM

1st Quarter - FY12

As of September 30, 2011, 29 of the 35 projects in MWRA's Long-Term CSO Control Plan are complete, including the North Dorchester Bay (South Boston) CSO Storage Tunnel and Related Facilities project, which MWRA brought into full environmental benefit in May 2011. Four CSO projects are in construction. MWRA plans to commence design of the remaining two projects in April 2012: Outfall MWR003 Gate and Floatables Control/Rindge Ave. Siphon Relief and Outfall SOM01A Interceptor Connection Relief and Floatables Control, both related to Alewife Brook. On July 14, 2011, Judge Stearns accepted MWRA's motion to revise certain Schedule Seven milestones for the Alewife Brook CSO projects.

Project	Court Milestones in Schedule Seven (Shaded milestones are complete.)			Status as of September 30, 2011
	Commence Design	Commence Construction	Complete Construction	
North Dorchester Bay Storage Tunnel and Related Facilities	Aug 97	Aug 06	May 11	Since start-up on May 4, 2011, MWRA has operated the tunnel and related facilities as intended to achieve the full environmental benefits in accordance with the overall \$267 million CSO control plan for North Dorchester Bay and the beaches of South Boston. Through September 2011, the tunnel captured nearly 120 million gallons of CSO and stormwater that would have discharged to the beaches. There has been no CSO discharge to the beaches since tunnel operation began. MWRA closed the stormwater gates to the tunnel, allowing separate stormwater to discharge to the Bay, in only one storm in the period - Hurricane Irene, on August 27-29, 2011.
Brookline Sewer Separation	Nov 06	Nov 08	Jul 13	The Town of Brookline continues to make substantial progress with the second of two construction projects that comprise the \$25.9 million Brookline sewer separation project. As previously reported, Brookline completed the \$1.4 million first construction contract in January 2010. It involved the installation of 5,658 linear feet of storm drain in secondary streets on the north and south sides of Beacon Street. Brookline commenced construction on the \$16.6 million Contract 2 in January 2011. Contract 2 includes 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. The contract involves micro-tunneling large-diameter sewers at significant depths along Beacon and Monmouth Streets; installing and/or rehabilitating smaller-diameter sewers along Beacon, Monmouth, and St. Mary's Streets; installing storm drains along those streets; and converting a large-diameter combined sewer along St. Mary's Street to a storm drain. As part of this project, Brookline will construct several large, special structures that will connect the new town sewers to existing town laterals and to the Authority's interceptor system, including the Charles River Valley Sewer and the South Charles Relief Sewer. The contractor has completed micro-tunneling a 670-foot-long, 57-inch-diameter sewer on Monmouth Street and a 1,375-foot-long, 18-inch-diameter sewer on St. Mary's Street and has installed the earth support system on Beacon Street to construct a structure that will provide a connection to the Authority's South Charles Relief Sewer. The contractor also completed entry and exit pits for a 48-inch-diameter micro-tunneling operation across Beacon Street near Carlton Street. The Town of Brookline expects to complete Contract 2 in advance of the July 2013 milestone.

Project	Court Milestones in Schedule Seven (Shaded milestones are complete.)			Status as of September 30, 2011
	Commence Design	Commence Construction	Complete Construction	
Brookline Sewer Separation (continued)				In the meantime, the Authority is continuing with final design of its plan to clean CSO Outfall MWR010 to ensure that the outfall has adequate capacity to convey Brookline's separated stormwater, as well as existing BWSC stormwater and infrequent CSO discharges from the Authority's Charles River Valley Sewer to the Charles River. The Authority plans to begin the cleaning work in June 2012 and complete the work by August 2012, in advance of the completion of the Brookline sewer separation project.
Reserved Channel Sewer Separation	Jul 06	May 09	Dec 15	<p>BWSC continues to make scheduled progress with the nine planned construction contracts for the \$62.3 million Reserved Channel Sewer Separation project. BWSC reached Substantial Completion of the first construction contract (Contract 2) in December 2010. That contract involved the installation of 8,379 linear feet of storm drain, approximately 3,961 linear feet of minor drain (8-inch-diameter or less), and 3,372 linear feet of sanitary sewer to separate combined sewers in an area of South Boston bounded by East First Street, Farragut Road, Broadway, and M Street. BWSC's contractors are proceeding with the work of four additional contracts awarded late last year or in early 2011, including a \$4.0 million contract (Contract 1) to rehabilitate the four Reserved Channel CSO outfalls to accommodate the stormwater flows removed from the sewer system and to provide long-term structural integrity; a \$9.9 million contract (Contract 3A) to install 8,900 linear feet of storm drain and 2,900 linear feet of sanitary sewer to separate combined sewers in an area tributary to Outfall BOS076, as well as 7,300 linear feet of replacement water main to remove conflicts with the planned storm drains; a \$10.9 million contract (Contract 3B) to install approximately 10,000 linear feet of storm drain and 3,800 linear feet of sanitary sewer to separate the combined sewers in a 66-acre area tributary to outfalls BOS078 and BOS079, as well as 10,800 linear feet of replacement water main to remove conflicts with the planned storm drains (as part of Contract 3B, BWSC's contractor completed work to remove the decommissioned above-grade structures at the end of the outfall pipe at Outfall BOS087 that previously discharged to North Dorchester Bay near the former Bayside Exposition Center, permanently eliminating the possibility of CSO or stormwater discharge to the South Boston beaches from this outfall.); and a \$1.2 million contract (Contract 7), to provide pavement restoration of affected streets.</p> <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>

Project		Court Milestones in Schedule Seven (Shaded milestones are complete)			Status as of September 30, 2011
		Commence Design	Commence Construction	Complete Construction	
Cambridge/ Alewife Brook Sewer Separation	CAM004 Outfall and Wetland Basin (Contract 12)		Apr 11	Apr 13	The City of Cambridge continues to make progress with construction of the \$15.5 million CAM004 stormwater outfall and detention basin (including \$2.4 million MWRA share). Since commencement of work in April 2011, Cambridge's contractor has completed work to establish new river crossings of an 8-inch gas main, a 36-inch electric line, and an 8-inch communications conduit that previously crossed the area of the planned wetland basin. At a nearby location, the contractor has completed construction of a large stormwater diversion structure that will direct stormwater to the basin but also allow stormwater flows to bypass the wetland basin in extreme storms, using a bending weir. A first section of the box culvert that will carry stormwater flows from the structure to the wetland basin is also complete. Adjacent to the bending weir structure, the contractor has commenced construction of a special structure that will allow the new CAM004 storm drain to cross over an Authority interceptor. In addition, the contractor has completed installation of the CAM004 storm drain culvert across MBTA high speed commuter rail tracks. The contractor has also commenced relocating an 18-inch sewer behind 70 Fawcett Street. Finally, the contractor has cleared the 3.4-acre area of the wetland basin and commenced excavation of the basin.
	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 continues to make progress with design activities, expects to receive the design report from its engineering consultant by the end of this year, and plans to award the first of the three remaining construction contracts in September 2012, in compliance with Schedule Seven.
			Sep 12		
	MWR003 Gate and Rindge Ave. Siphon	Apr 12	Aug 14	Oct 15	MWRA plans to commence design of the \$3.7 million project that includes localized modifications of the Alewife Brook interceptor system for CSO control in April 2012, in compliance with Schedule Seven. Staff plan to advertise the RFQ/P by the end of October 2011.
SOM01A Connection Relief and Floatables Control	Apr 12	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	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 expects to receive inflow removal recommendations in early 2012.

Project	Court Milestones in Schedule Seven (Shaded milestones are complete)			Status as of September 30, 2011
	Commence Design	Commence Construction	Complete Construction	
<b>Other CSO Related Work (continued)</b>				
Lower Dorchester Brook Sewer Regulator Relocation and Sewer Separation	N/A	N/A	N/A	BWSC continues to make progress with construction of its \$6.0 million contract for CSO Regulator Relocation and Sewer Separation for Lower Dorchester Brook Sewer Relief, which is partially funded by the Authority. The contract is intended to bring CSO discharges to BWSC's Dorchester Brook Conduit and the Fort Point Channel into conformance with the Authority'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. The benefits of this separation, along with those from the removal of stormwater from an adjacent area of approximately 125 acres separated by BWSC many years ago, will be realized when the CSO regulator is relocated. BWSC has issued change orders to repair and line portions of its interceptors found to be in need of structural repair. Relocation of the CSO regulator is pending completion of the interceptor repairs. BWSC has extended the contract term by three months, to November 2011, due to the change orders.



## CIP Expenditures First Quarter, FY12

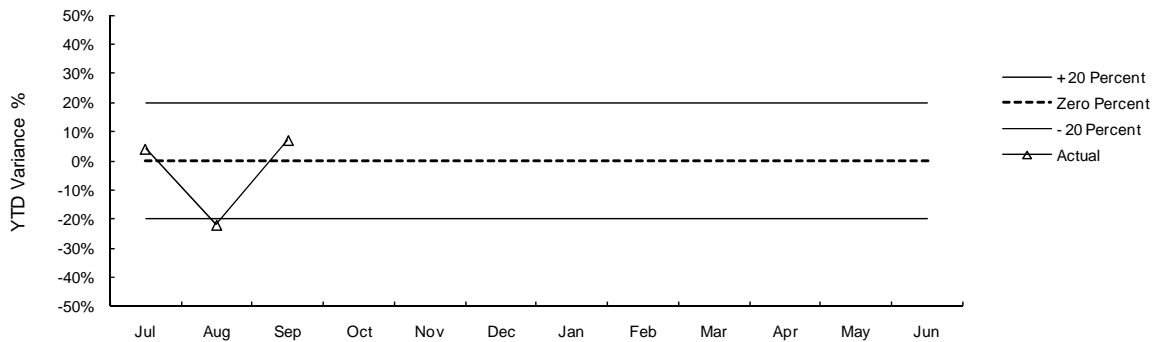
The Year-To-Date variances are highlighted below:

FY12 Capital Improvement Program Expenditure Variances through September by Program (\$000)				
Program	FY12 Budget Through September	FY12 Actual Through September	Variance Amount	Variance Percent
Wastewater	18,795	16,973	(1,822)	-10%
Waterworks	11,987	15,045	3,058	26%
Business and Operations Support	1,932	2,923	991	51%
Total	\$32,713	\$34,941	2,228	7%

Underspending within Wastewater is due to less than anticipated CSO land easement expense due to timing of permanent easement and favorable negotiation of temporary easement lease terms, delays for Reserved Channel and Brookline Sewer Separation projects, and delays in DI Transformer Replacement and Power System Improvements. This was partially offset by requests for community loans and grants being greater than anticipated, progress on the Primary & Secondary Clarifier Rehabilitation, Section 156 Rehabilitation Design/Build, and greater than budgeted spending for Dewater Pump Station & Sewer work expected in FY11 but completed in FY12. Overspending in waterworks is primarily due to contractor progress on the Lower Hultman Aqueduct Rehabilitation (CP6A), CWTP Ancillary Modifications Construction 2, Weston Aqueduct Section 36 Design, and Southern Spine Section 107 Phase 2 projects. This was partially offset by timing of Watershed Land purchases, timing of community repayments and loans, and less than anticipated progress on the Northeast Segment construction 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 9/24/11	\$161 million
Unused capacity under the debt cap:	\$553 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

1st Quarter – FY12

## Background

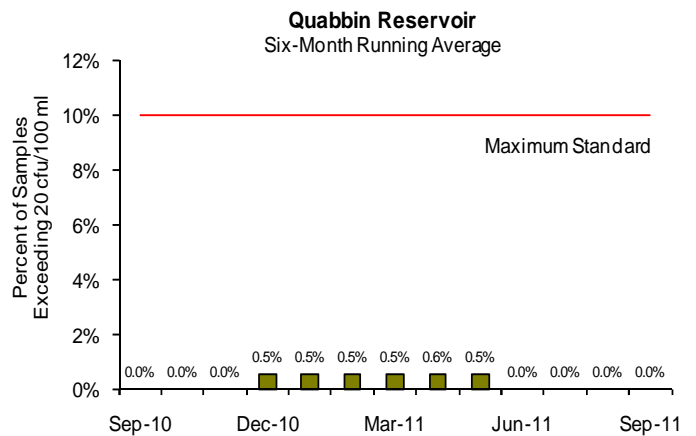
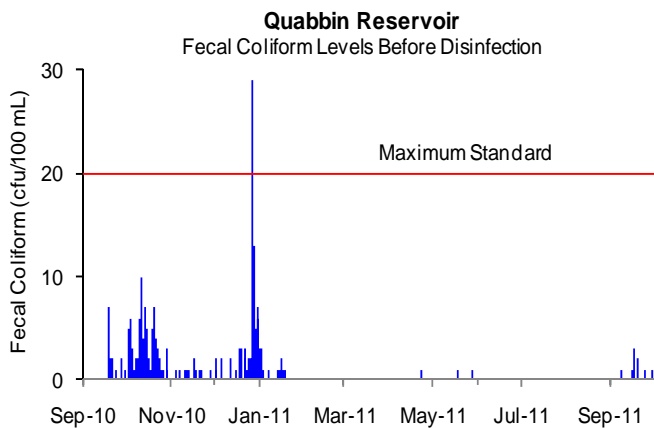
Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. However, fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal 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 1st Quarter were below 20 cfu/100ml.

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



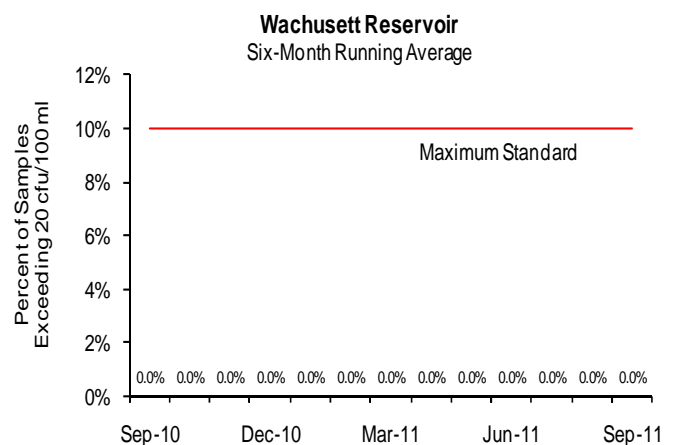
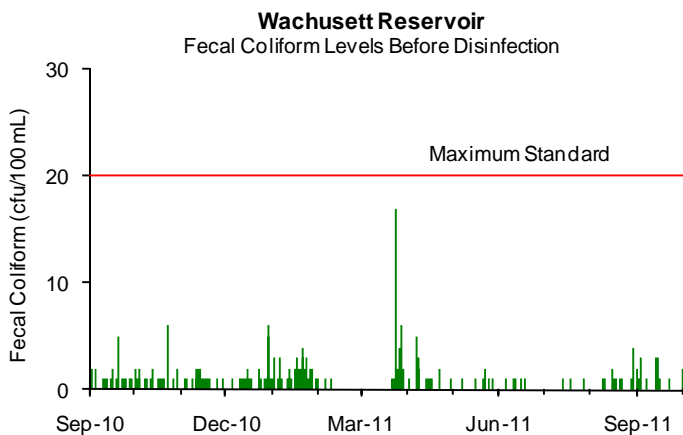
### Sample Site: Wachusett Reservoir

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 1st 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

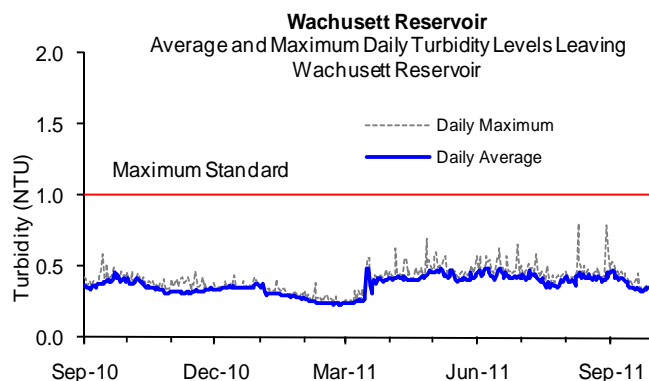
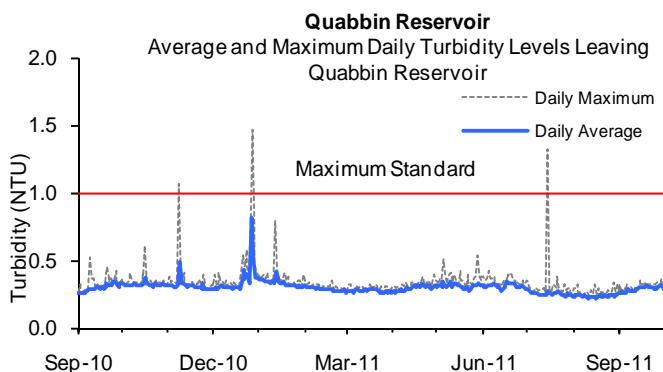
1st Quarter – FY12

## 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.



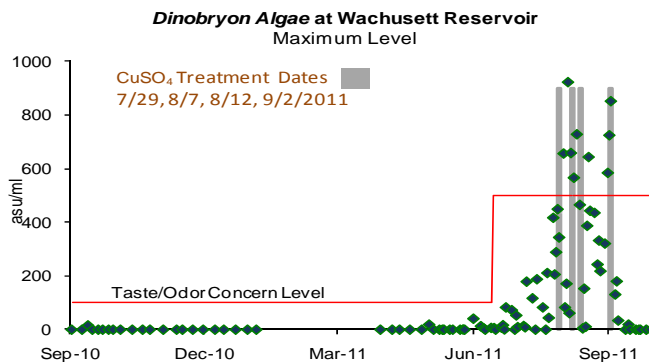
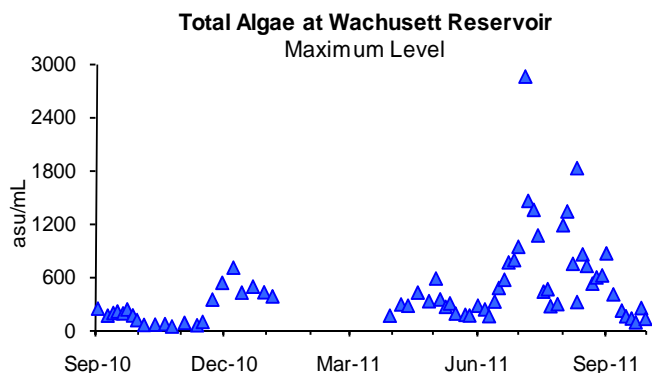
The July 14 turbidity spike was caused by a restart of the sample pumps rather than any actual change in water quality conditions.

## 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 algicide. 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.

The Wachusett Reservoir was treated with copper sulfate four times in the first quarter to control the growth of *Dinobryon* and *Synura*, taste and odor causing algae species. The treatment dates were July 29, August 7 and 12 and September 2. There were no complaints related to algae reported from local water departments.



# Treated Water – Disinfection Effectiveness

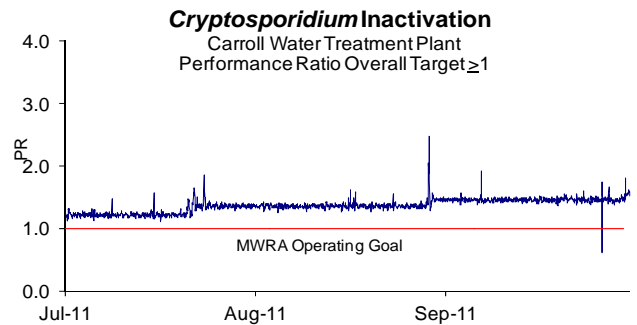
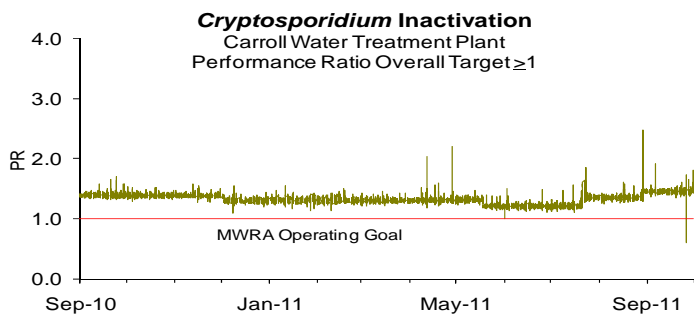
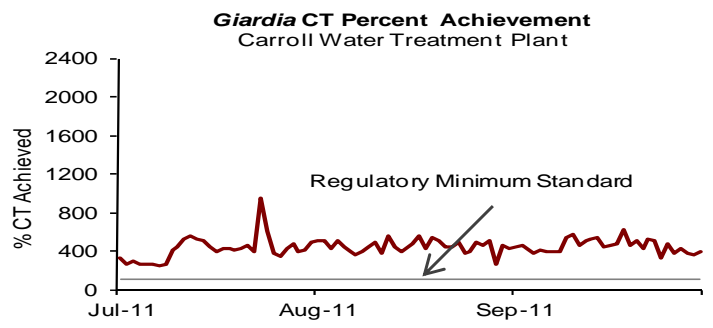
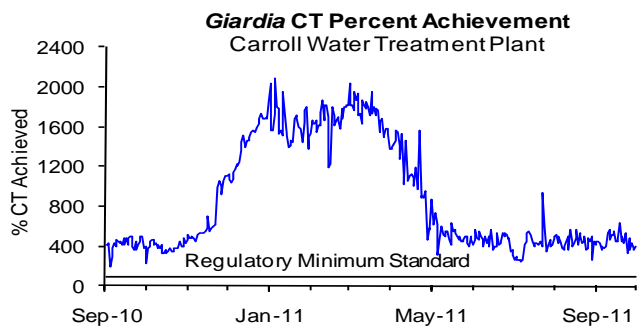
1st Quarter – FY12

## 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.

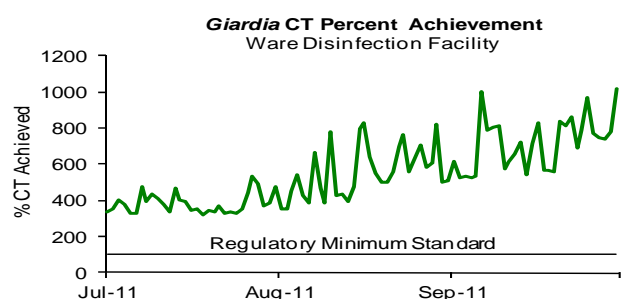
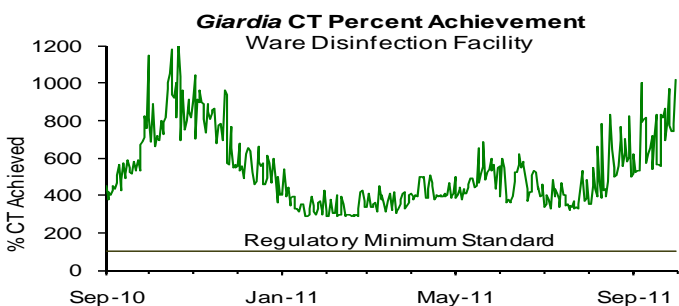
### Wachusett Reservoir – MetroWest/Metro Boston Supply:

- Ozone dose at the CWTP varied between 1.8 to 3.2 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 missed for one hour of the quarter.
- A second GOX (gaseous O<sub>2</sub>) line has been installed at CWTP and during the tie in process there was a pressure swing which caused the ozone generators to shut down on September 26 from 10-11am. Ozone residual dropped in all contactors. PR dipped below 1 briefly, but required CT was met throughout the period. PR is an operating goal, not a regulatory requirement.



### 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 1.4 mg/L to 1.5 mg/L for the quarter.

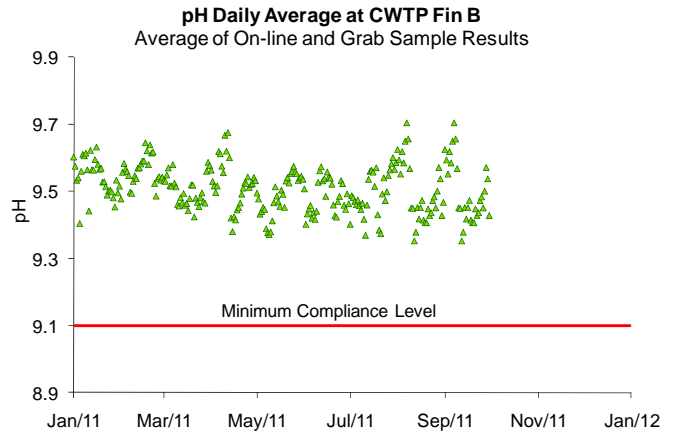
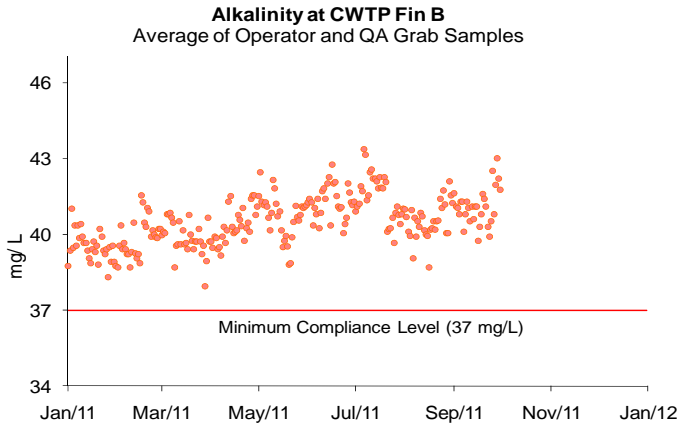


## Treated Water – pH and Alkalinity Compliance

1st 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 September 20 and 21, 2011. Distribution system sample pH ranged from 9.1 to 9.6 and alkalinity ranged from 39 to 43 mg/L. No sample results were below DEP limits for this quarter.



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

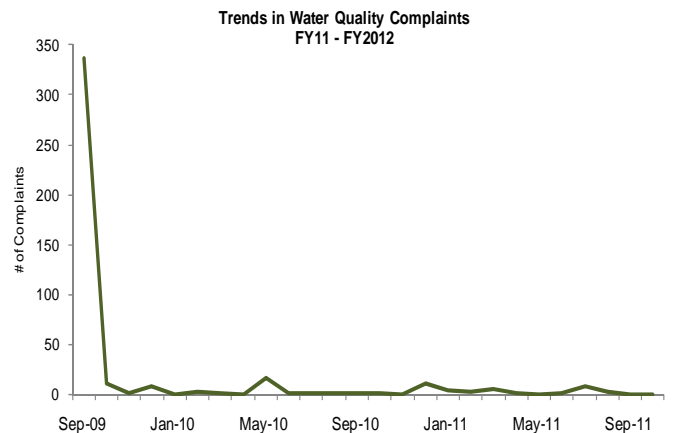
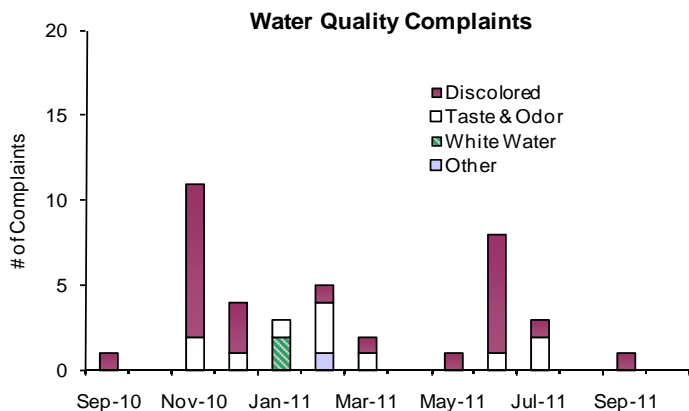
### Background

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

Communities reported 4 complaints during the quarter compared to 5 complaints for 1st Quarter of FY11. Of these complaints, 2 were for "discolored water", and 2 were for "taste and odor".



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

1st Quarter – FY12

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 41 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 1st Quarter, thirteen of the 5,833 community samples (0.22% system-wide) submitted to MWRA labs for analysis tested positive for coliform (Boston, Everett, Melrose, Revere, Woburn – in July; Somerville, Watertown, Winthrop – in August; Waltham, Woburn – in September). Of the 2,197 (0.68%) MWRA samples taken, fifteen tested positive for total coliform. No sample tested positive for *E.coli*. All 41 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 3.4% 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	182	0 (0%)	0.0%		0.05	1.56
BELMONT	104	0 (0%)	0.0%		0.03	1.56
BOSTON	783	1 (0.13%)	0.0%	No	0.10	2.14
BROOKLINE	219	0 (0%)	0.0%		0.02	1.96
CHELSEA	174	0 (0%)	0.0%		0.97	1.89
DEER ISLAND	52	0 (0%)	0.0%		1.70	2.10
EVERETT	159	3 (1.89%)	0.0%	No	0.16	1.11
FRAMINGHAM	216	0 (0%)	0.0%		0.20	1.96
HANSCOM AFB (Bedford) (b)	27	0 (0%)	0.0%		0.04	1.21
LEXINGTON	117	0 (0%)	0.0%		1.02	2.14
LYNNFIELD	18	0 (0%)	0.0%		0.19	0.90
MALDEN	195	0 (0%)	0.0%		1.32	1.47
MARBLEHEAD	72	0 (0%)	0.0%		0.16	1.81
MARLBOROUGH (b)	127	0 (0%)	0.0%		0.92	1.95
MEDFORD	204	0 (0%)	0.0%		0.72	1.76
MELROSE	121	1 (0.83%)	0.0%	No	0.02	0.89
MILTON	96	0 (0%)	0.0%		0.47	1.73
NAHANT	30	0 (0%)	0.0%		0.07	1.28
NEEDHAM (b)	123	0 (0%)	0.0%		0.01	1.09
NEWTON	279	0 (0%)	0.0%		0.28	1.87
NORTHBOROUGH	48	0 (0%)	0.0%		0.04	1.22
NORWOOD	120	0 (0%)	0.0%		0.01	1.31
QUINCY	300	0 (0%)	0.0%		0.04	1.83
READING	133	0 (0%)	0.0%		0.01	1.34
REVERE	201	2 (1.00%)	0.0%	No	1.02	1.83
SAUGUS	104	0 (0%)	0.0%		1.41	1.85
SOMERVILLE	304	1 (0.33%)	0.0%	No	0.94	1.93
SOUTH HADLEY FD1 (c)	48	0 (0%)	0.0%		0.03	0.47
SOUTHBOROUGH	30	0 (0%)	0.0%		0.12	1.82
STONEHAM	91	0 (0%)	0.0%		1.19	2.00
SWAMPSCOTT	48	0 (0%)	0.0%		0.13	1.38
WAKEFIELD (b)	143	0 (0%)	0.0%		0.15	1.33
WALTHAM	232	1 (0.43%)	0.0%	No	0.75	1.99
WATERTOWN	134	1 (0.75%)	0.0%	No	0.38	1.77
WELLESLEY (b)	107	0 (0%)	0.0%		0.06	0.68
WESTBORO HOSPITAL	15	0 (0%)	0.0%		0.01	0.30
WESTON	48	0 (0%)	0.0%		1.12	2.20
WILMINGTON (b)	87	0 (0%)	0.0%		0.29	1.66
WINCHESTER (b)	65	0 (0%)	0.0%		0.08	1.39
WINTHROP	75	1 (1.33%)	0.0%	No	0.33	1.21
WOBURN (b)	202	2 (0.99%)	0.0%	No	0.06	1.14
Total:	5833	13 (0.22%)	0.0%			
MASS. WATER RESOURCES AUTHORITY (d,e)	2197	15 (0.68%)	0.0%	No	0.02	1.89

(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

1st 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 µg/L for TTHMs and 60 µg/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.

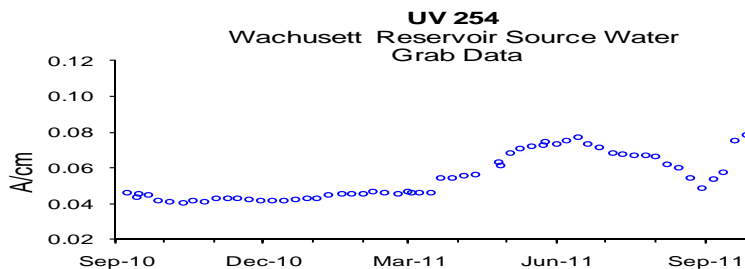
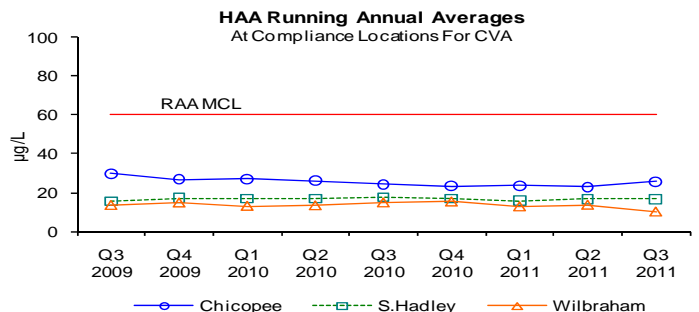
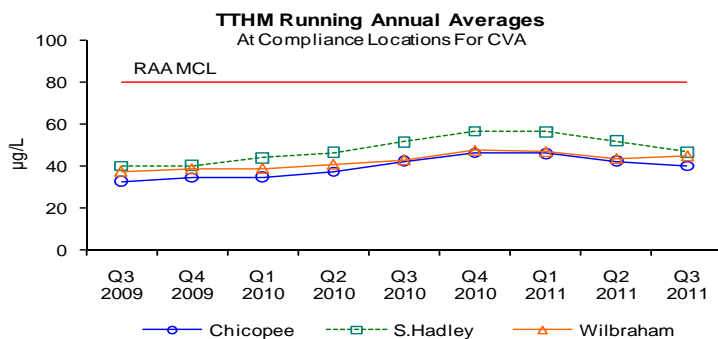
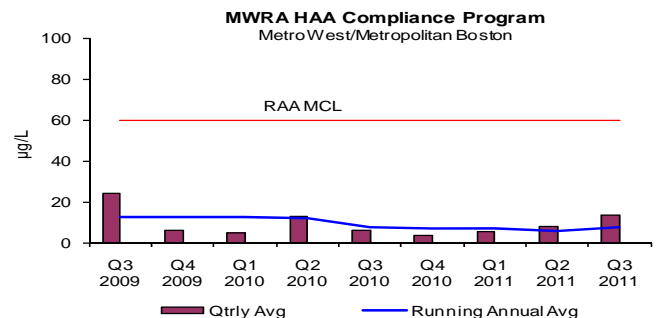
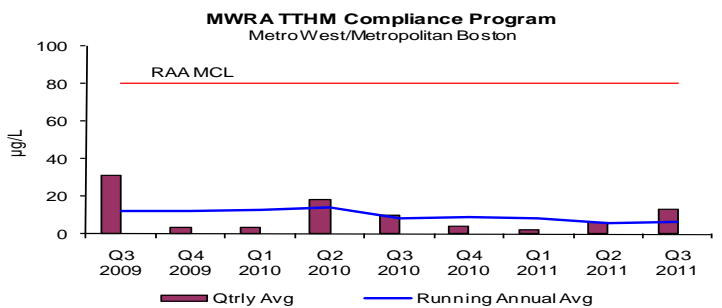
Absorbance, measured as UV-254, is a surrogate measure of reactive organic matter. Regulated DBPs have dropped to very low levels with the CWTP coming on-line. However, UV-254 levels remain useful for estimating ozone dosage and serving as a trigger for Quabbin transfer consideration.

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

## 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 µg/L; HAA5s = 7.3 µg/L. CVA's DBP levels continue to be below current standards. UV-254 levels rose rapidly after Hurricane Irene made landfall August 28 and are currently around 0.08 A/cm. The current RAA for Bromate = 0.0 µg/L.

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 = 5.7 µg/L; HAA5s = 5.5 µg/L. CVA's DBP levels continue to be below current standards. UV-254 levels are currently around 0.07 A/cm. The current RAA for Bromate = 0.0 µg/L.





# Water Supply and Source Water Management

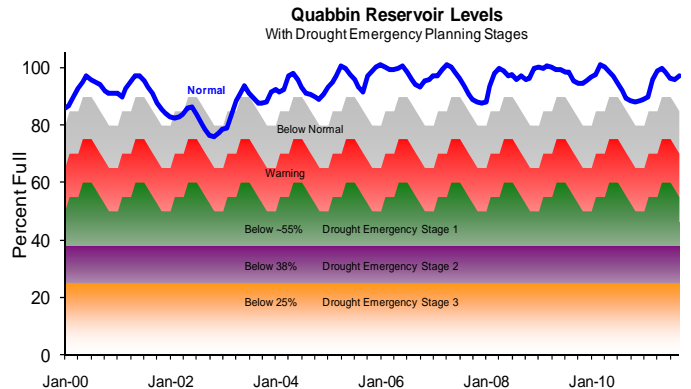
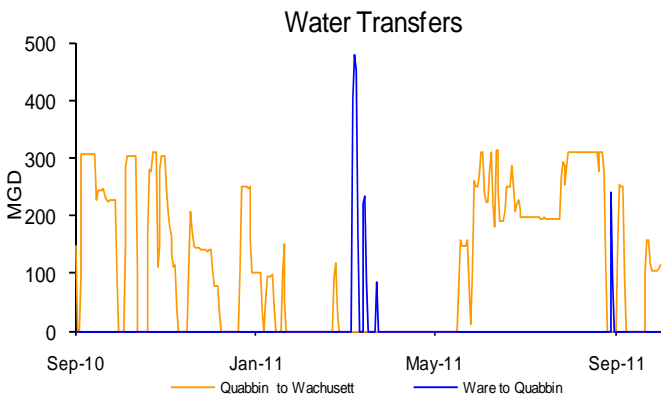
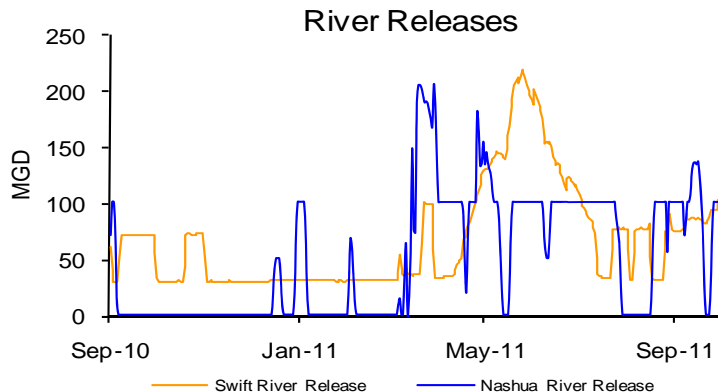
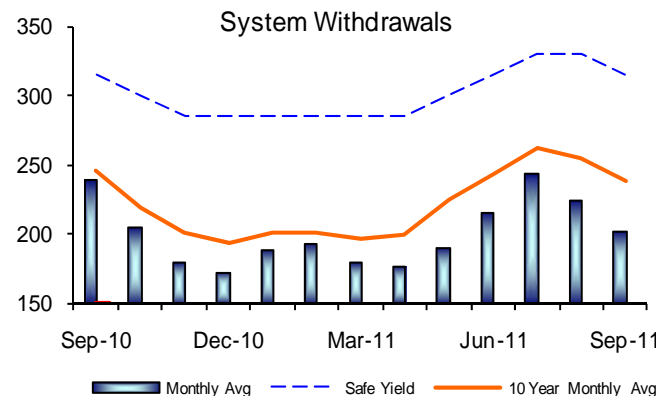
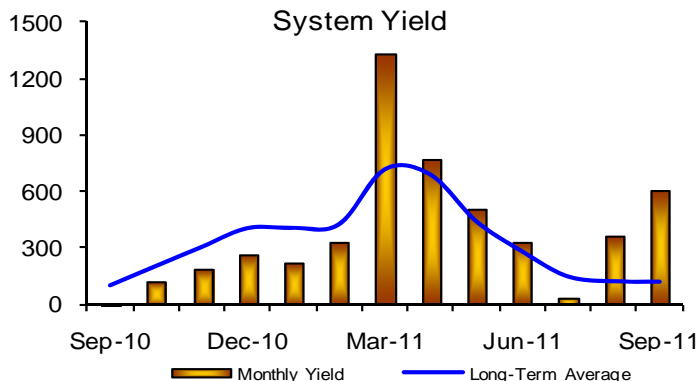
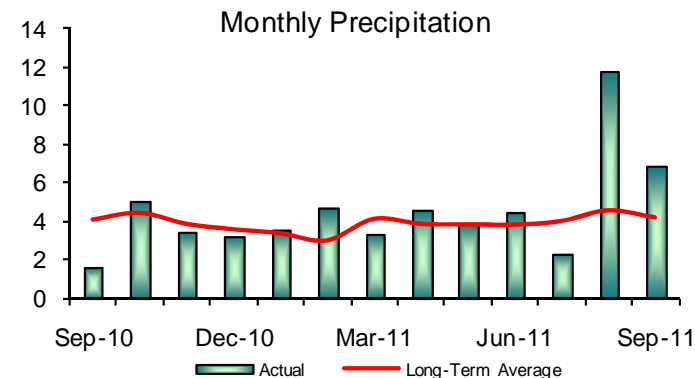
1st Quarter – FY12

## 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 97.2% of capacity as of September 30, 2011; a 1.2% decrease for the quarter, which represents a decrease of more than 5 billion gallons of storage. Precipitation and Yield for the months of August and September were well above their respective long term averages due to Hurricane Irene at the end of August and tropical storm Lee at the beginning of September. Monthly withdrawals continue to be below the long-term average which also contributes to higher storage levels.



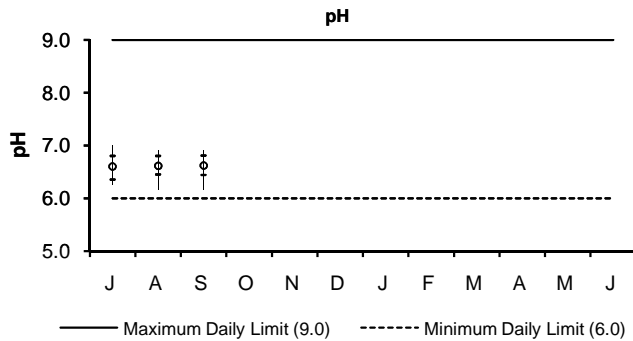
# WASTEWATER QUALITY

**NPDES Permit Compliance: Deer Island Treatment Plant**  
1st Quarter - FY12

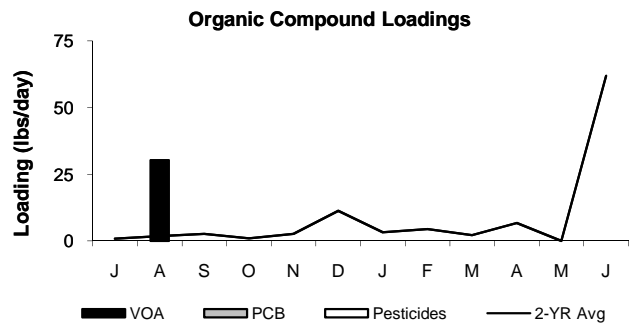
**NPDES Permit Limits**

Effluent Characteristics	Units	Limits	July	August	September	1st Quarter Violations	FY12 YTD Violations	
Dry Day Flow:	mgd	436	285.9	292.9	300.7	0	0	
cBOD:	Monthly Average	mg/L	4.1	4.1	3.4	0	0	
	Weekly Average	mg/L	4.5	6.0	4.1	0	0	
TSS:	Monthly Average	mg/L	5.9	7.2	5.3	0	0	
	Weekly Average	mg/L	7.8	9.4	6.2	0	0	
TCR:	Monthly Average	ug/L	<40	<40	<40	0	0	
	Daily Maximum	ug/L	631	<40	<40	0	0	
Fecal Coliform:	Daily Geometric Mean	col/100mL	14000	31.9	347.0	0	0	
	Weekly Geometric Mean	col/100mL	14000	8.0	11.1	24.7	0	
	% of Samples >14000	%	10	0	0	0	0	
	Consecutive Samples >14000	#	3	0	0	0	0	
pH:	SU	6.0-9.0	6.3-7.0	6.2-6.9	6.2-6.9	0	0	
PCB, Aroclors:	Monthly Average	ug/L	0.000045	UNDETECTED		0	0	
Acute Toxicity:	Mysid Shrimp	%	50	>100	>100	>100	0	0
	Inland Silverside	%	50	>100	>100	>100	0	0
Chronic Toxicity:	Sea Urchin	%	1.5	100	50	25	0	0
	Inland Silverside	%	1.5	100	25	100	0	0

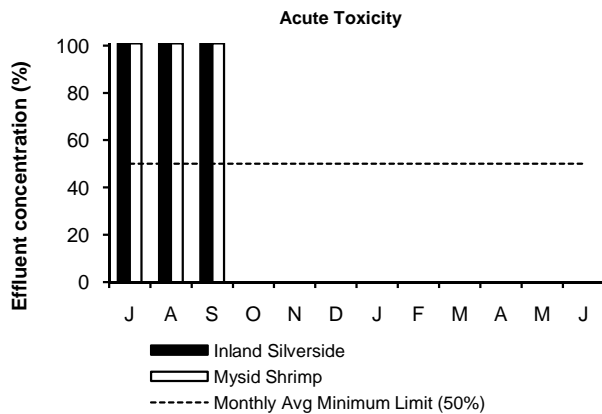
There have been no permit violations in FY12 at the Deer Island Treatment Plant.



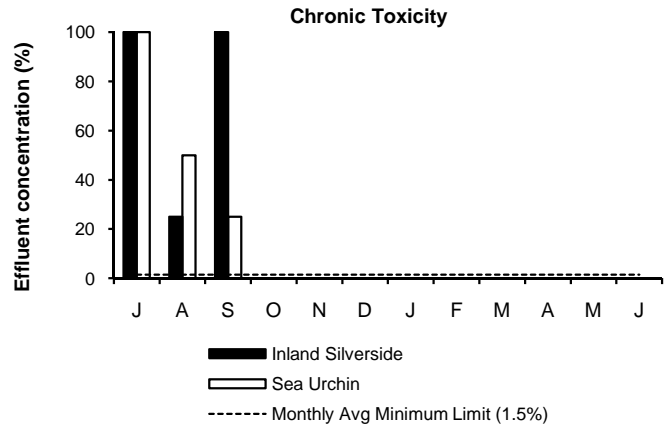
pH is a measure of the alkalinity or acidity of the effluent. Fluctuations in pH do not have an adverse effect on marine environments. Because of the pure oxygen used in the activated sludge reactor, the effluent pH tends to be at the lower pH range. pH measurements for the 1st Quarter were within the 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 1st Quarter for both the inland silverside and mysid shrimp.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in wastewater effluent on marine animals. To meet permit limits, a solution of 1.5% effluent and 98.5% dilution water must show no observed effect on the growth and reproduction of the test species. Chronic toxicity permit limits were met for the 1st Quarter for both the inland silverside and sea urchin.

**NPDES Permit Compliance: Clinton Wastewater Treatment Plant**  
1st Quarter - FY12

**NPDES Permit Limits**

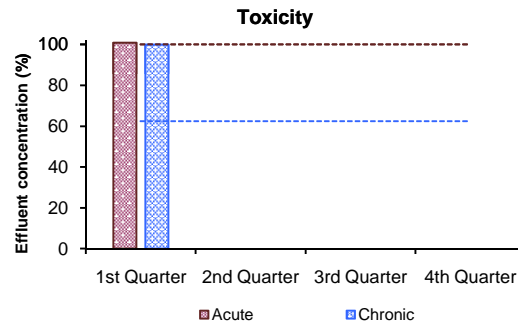
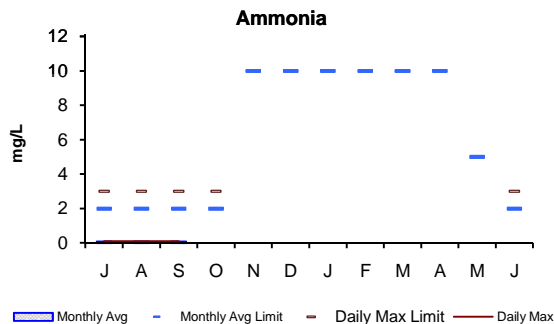
Effluent Characteristics	Units	Limits	July	August	September	1st Quarter Violations	FY12 YTD Violations
Flow:	mgd	3.01	2.70	2.76	2.93	0	0
BOD:	Monthly Average:	mg/L 20	2.6	2.9	2.3	0	0
	Weekly Average:	mg/L 20	2.9	3.5	3.3	0	0
TSS:	Monthly Average:	mg/L 20	4.1	4.2	3.1	0	0
	Weekly Average:	mg/L 20	5.1	5.7	3.8	0	0
pH:	SU	6.5-8.3	6.7-7.4	6.7-7.6	7.1-7.8	0	0
Dissolved Oxygen:	Daily Minimum:	mg/L 6	6.7	5.1	8.0	1	1
Fecal Coliform:	Daily Geometric Mean:	col/100mL 400	12.8	30.2	8.7	0	0
	Monthly Geometric Mean:	col/100mL 200	3.7	3.3	3.7	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: 6/1 - 10/31	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
	Monthly Average:	ug/L 20	7.6	10.6	4.8	0	0
Copper:	Monthly Average:	ug/L 20	7.6	10.6	4.8	0	0
Phosphorus: May 1 - Oct 31	Monthly Average:	mg/L 1.0	N/A	0.4	0.2	0	0
	Daily Minimum:	% 100	*N/A	*N/A	>100	0	0
Chronic Toxicity:	Daily Minimum:	% 62.5	*N/A	*N/A	100	0	0

There has been one permit violation in Fiscal Year 2012 at the Clinton Treatment Plant.

**1st Quarter:**

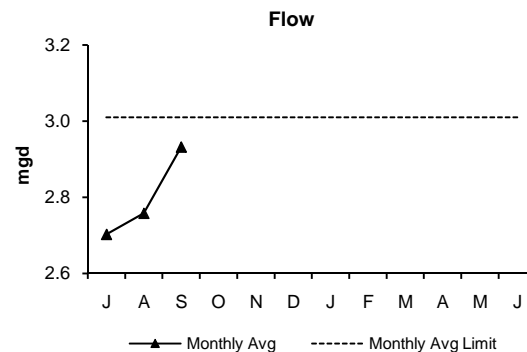
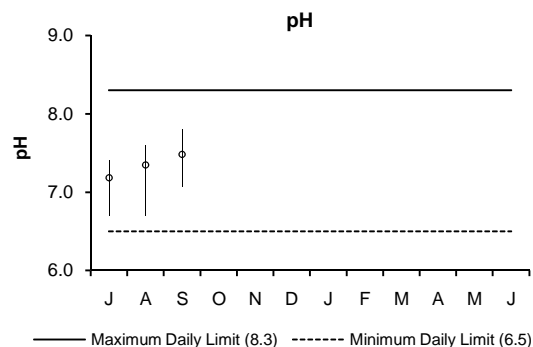
There was one permit violation in the 1st Quarter of FY12. The August 9, 2011 dissolved oxygen result of 5.1 mg/L did not meet the minimum permit limit of 6.0 mg/L. There was no known reason for this violation. The plant process and monitoring parameters were within the normal operating range on August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

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



The 1st Quarter's monthly average and daily maximum concentrations were below the permit limits. The monthly average and daily maximum limits for the 1st Quarter are 2.0 mg/L and 3.0 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 1st Quarter.



pH is a measure of the alkalinity or acidity of the effluent. All daily pH results for the 1st Quarter were within the range set by the permit.

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

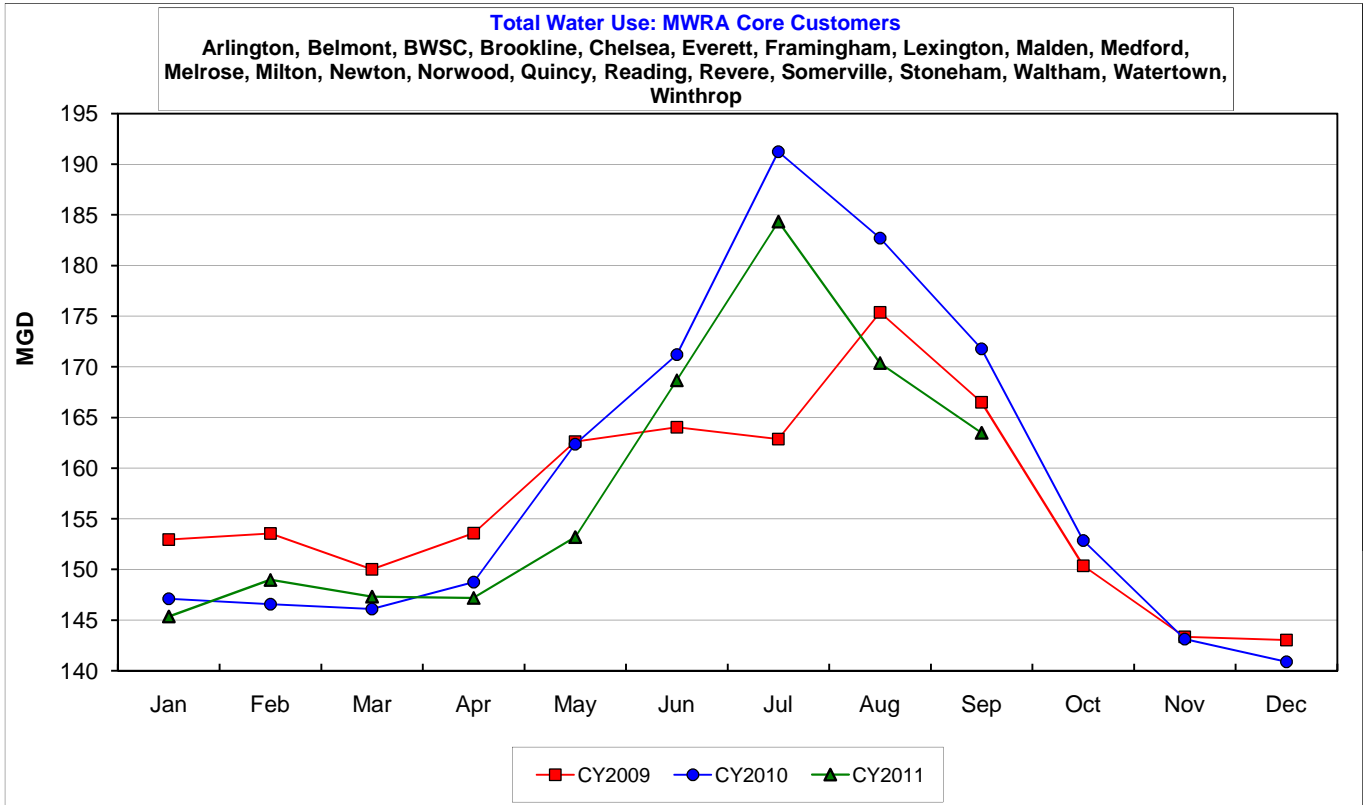
# COMMUNITY FLOWS AND PROGRAMS

## Water Supplied: MWRA Core Communities

1st Quarter - FY12

MGD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
<b>CY2009</b>	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
<b>CY2010</b>	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
<b>CY2011</b>	145.371	148.982	147.314	147.188	153.188	168.673	184.336	170.382	163.481	0.000	0.000	0.000	158.865

MG	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>CY2009</b>	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
<b>CY2010</b>	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
<b>CY2011</b>	4,506.504	4,171.487	4,566.737	4,415.643	4,748.836	5,060.182	5,714.425	5,281.854	4,904.423	0.000	0.000	0.000	43,370.092



Water use for 2011 remained low before tracking upward with the warm and dry weather in the early part of the summer. Usage for September represents a historical low for that month.

**Community Wastewater Flows**  
**1st Quarter - FY12**

DATA NOT AVAILABLE AT TIME OF REPORTING

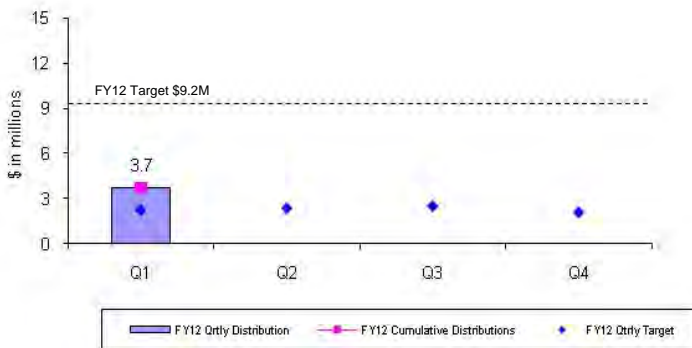
# Community Support Programs

1st Quarter – FY12

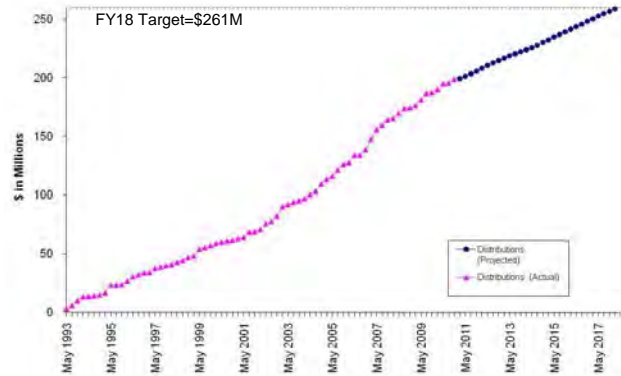
## Infiltration/Inflow Local Financial Assistance Program

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**

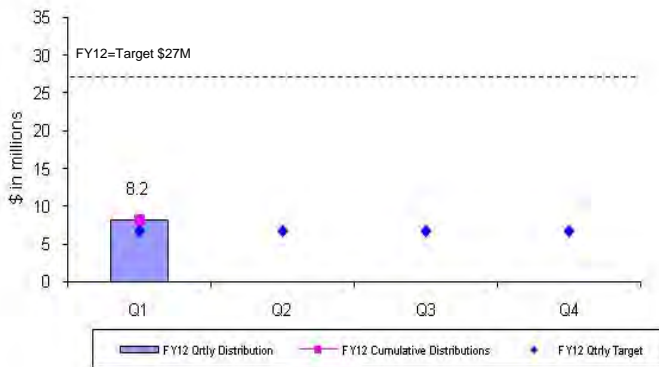


During the 1st Quarter of FY12, \$3.7 million in financial assistance (45% grants and 55% interest-free loans) was distributed to fund local sewer rehabilitation projects in Arlington, Burlington, Newton, Quincy, and Reading. Total grant/loan distribution for FY12 is \$3.7 million. From FY93 through the 1st Quarter of FY12, all 43 member sewer communities have participated in the program and more than \$210 million has been distributed to fund 411 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.

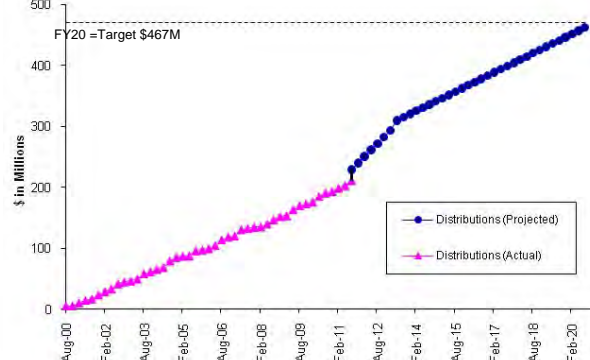
## Water Local Pipeline and Water System Assistance Programs

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 1st Quarter of FY12, \$8.2 million in interest-free loans was distributed to fund local water projects in Arlington, Everett, Nahant, Norwood, Quincy, Reading, Saugus, Stoneham, Swampscott, and Wakefield. Total loan distribution for FY12 is \$8.2 million. From FY01 through the 1st Quarter of FY12, more than \$211 million has been distributed to fund 248 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.

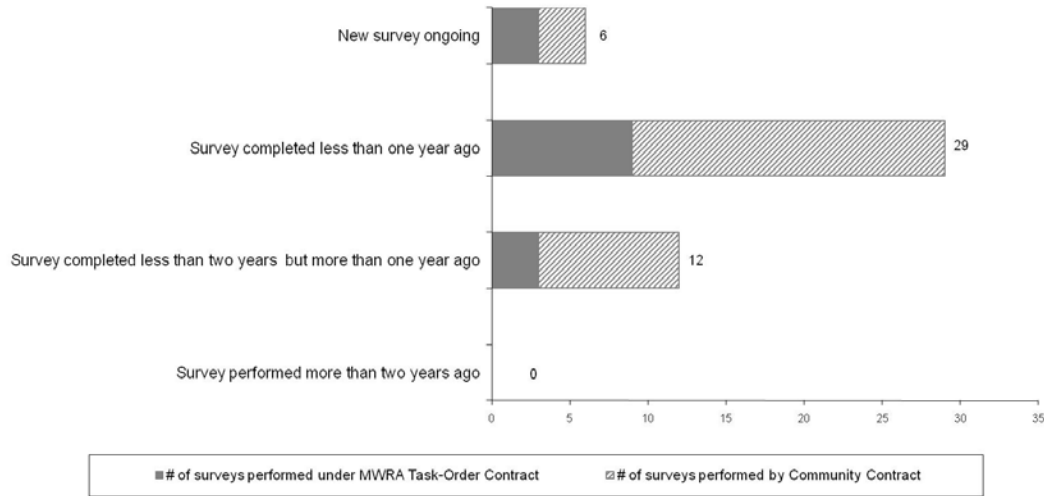


# Community Support Programs

1st 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 1st 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				1,994
Low-Flow Fixtures (showerheads and faucet aerators)	10,000	1,945				1,945
Toilet Leak Detection Dye Tablets	-----	3,683				3,683

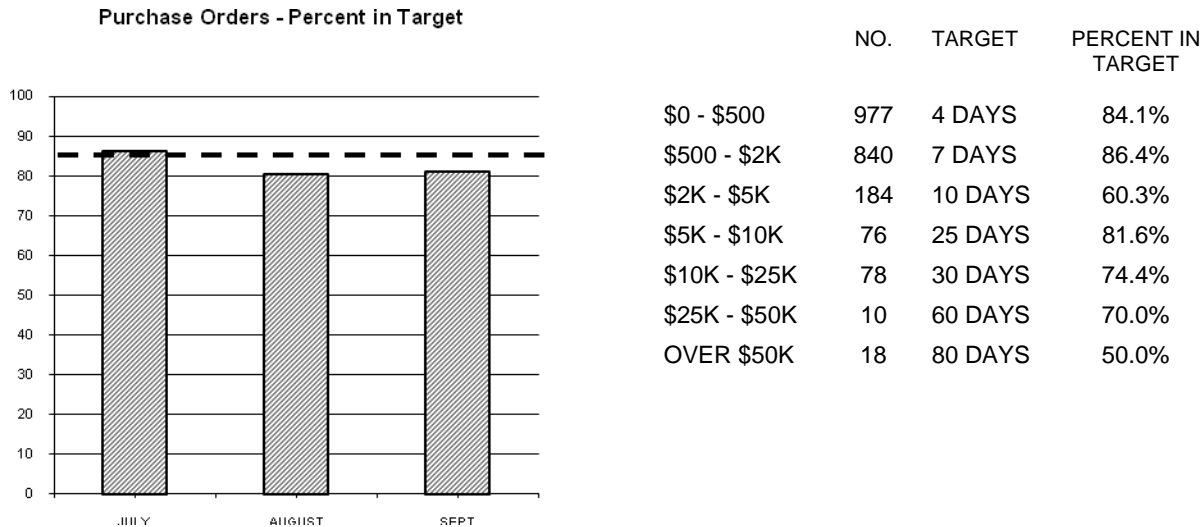
## BUSINESS SERVICES

## Procurement: Purchasing and Contracts First Quarter FY12

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

**Outcome:** Processed 82% of purchase orders within target; Avg. Processing Time was 6.85 days vs. 7.35 days in Qtr 1 of FY11. Processed 73% (22 of 30) contracts within target timeframes; Avg. Processing Time was 151 days vs. 80 days in Qtr 1 of FY11.

### Purchasing

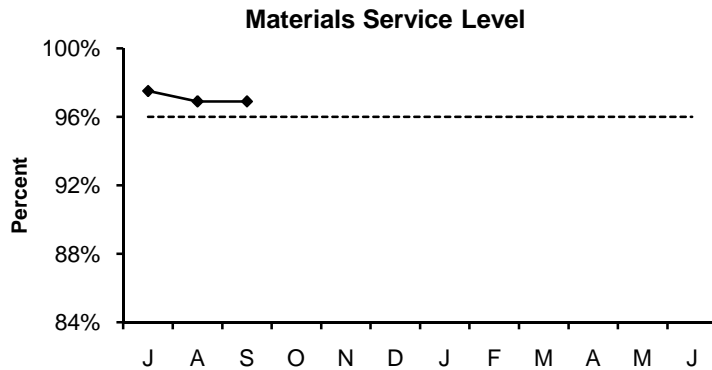


- Purchasing Unit processed 2183 purchase orders, 8 fewer than the 2191 processed in Qtr 1 of FY11, for a total value of \$7,957,347 vs. a dollar value of \$8,688,761 in Qtr 1 of FY11.
- The purchase order-processing target was not achieved for the \$2k - \$5k category due to confirmation of specifications, vendor sourcing and end user evaluation, the \$10k - \$25k category due to re-bids and vendor sourcing, the \$25k - \$50k category because of timing of the need for the service and the over \$50k category because of extended review of bids, revisions to specifications, end user evaluation of contract requirements and a delay in receiving engineering details from the vendor.

### Contracts, Change Orders and Amendments

- Eight contracts were not processed within target timeframes for the following reasons: a delay due to a protest and a re-bid; specification finalization, a comprehensive review of the scope of work, holding contracts until the services were needed, protracted negotiations and delay in submission of documentation by vendors.
- Procurement processed thirty contracts with a value of \$20,548,543 and twelve amendments with a value of \$1,075,172.
- Thirty-five change orders were executed during the period, but several were large balancing change orders at the end of jobs, and are recorded as credits or negative numbers. The dollar value of all non-credit change orders during the 1st quarter FY12 was \$3,329,581 and the value of credit change orders was (\$1,559,298).
- In addition, staff reviewed 153 proposed change orders and 41 draft change orders.

## Materials Management 1st Quarter, FY12



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 7,960 (97.0%) of the 8,203 items requested in Q1 from the inventory locations for a total dollar value of \$1,135,965.

### 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 – clips, couplings and base assembly for Liquid Train; carriage bolts for Facilities; bushings, unions, scum pump shaft and flow transmitter for Residuals.
- Chelsea – gaskets, fuses, grease, magnetic valve, Derian reducer and wing nut for FOD; air filter, exhaust hanger, resistor, brake hose, inverter, calipers and shocks for VMM; solenoid valve, flygt pump, wire, switches and saturation indicator for Work Order Coordination Group.
- Southboro – Ph electrode for Carroll Water Treatment Plant.

Property Pass Program:

- Audits were conducted at Chelsea Carpenters, Leak Detection, Valve Maintenance, Ward Street, Columbus Park, Southboro Machine Shop and Southboro Carpenters during Q1.
- 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 \$4,427.

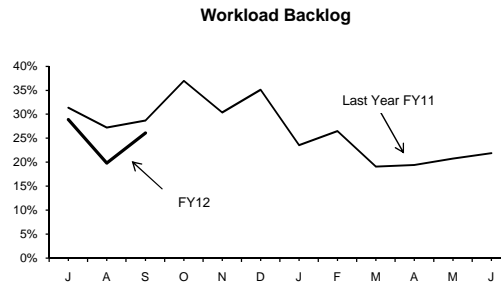
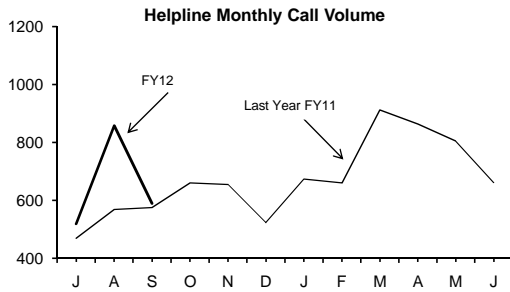
Items	Base Value July-11	Current Value w/o Cumulative New Adds	Reduction / Increase To Base
Consumable Inventory Value	6,841,475	6,547,294	-294,181
Spare Parts Inventory Value	7,057,082	7,103,538	46,456
Total Inventory Value	13,898,557	13,650,832	-247,725

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

## MIS Program 1st Quarter FY12

### Operations

#### Highlights:

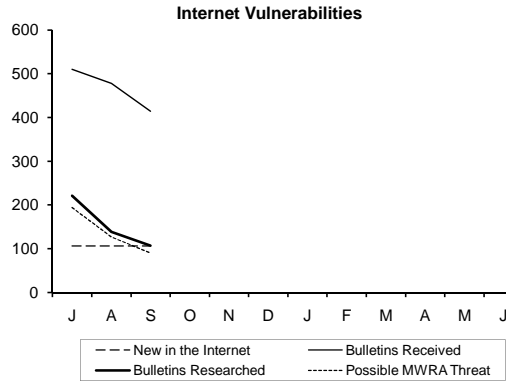
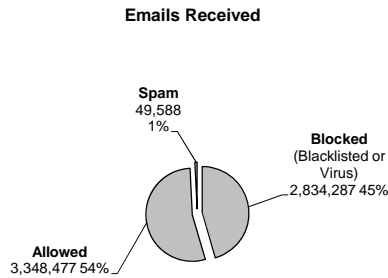


### Performance

- Call volume for Q1 peaked in August and is an increase of 21.95% from Q1 last year. For Q1 the backlog peaked in July and is above the targeted benchmark of 20%.

### Business System Plan

- Cyber Security: During Q1, staff pushed security fixes and updates to desktops and servers throughout the quarter in order to protect against the 55 vulnerabilities. In addition, 318 new vulnerabilities were discovered throughout the Internet during Q1
- LANDesk Antivirus quarantined 23 distinct viruses from 20 MWRA computers. MWRA's systems are current with anti-virus providers' signatures for all known malware.



### Applications/Training/Records Center

Area	Significant Accomplishments
Reverse 911 Interface	User training for the MWRA Reverse 911 interface was conducted and the application was put into production and tested. In addition, a new Emergency Contacts Notification Systems (ENS) Launch page for opening the Community Contacts Database and Reverse 911 applications was developed, shortcuts were installed on the EOC PCs, and job aids were updated and distributed to staff and management. Training also was conducted for Public Affairs staff on the Community Contacts database to prepare for Hurricane Irene.
Lawson Mobile Supply Chain Management (MSCM)	Lawson Mobile Supply Chain Management was implemented at the Chelsea Warehouse on August 23rd. Users and MIS will refine business processes and pursue technical enhancements prior to implementing the application at the Southborough and DI warehouses in Q2.
Dorchester Bay Tunnel Project	Released the "DBRainfall" utility for testing and validation by Operations staff. This utility retrieves a file from a contracted weather service provider that contains predicted rainfall for the Dorchester Bay area for the next 24 hours. The CH2MHill application will use this information for the operation of the new Dorchester Bay Tunnel gate. The DBRainfall utility has also been updated to allow users to view rainfall prediction within the application so it may be used independent of the CH2MHill project.
Topview	Created a new Topview notification service for the Southboro Water Quality department. The new service sends out an email notification when water quality parameters go out of an acceptable operating range. Currently, Shaft N, Shaft W, and CWTP are included in the notification service. Other locations will be added at a future date.
GIS	The viewer has been ported to the production web server in anticipation of a role out. Security will be tested in the development environment within the next month.
Library & Records Center	Supported Hurricane Preparation activities and issued a reminder of responsibilities email to Department Records Managers and Officers (DRMs/DROs). Began Box Disposition review process by sending Divisions/Department reports describing boxes eligible for disposition. The Library responded to 45 research requests using internal and external databases, the internet, and the MWRA collections; provided 64 articles from table of contents and interlibrary loan requests; and provided 3,444 articles electronically through customized Alerts. The Records Center added 97 new boxes, updated DRM/DRO list, conducted 6 Records Management classes for 28 staff, and attended 1 State Records Conservation Board (RCB) meeting.
IT Training	For the quarter, 79 staff attended 12 classes and 6 workshops. 5% of the workforce have attended at least one instructor-led class. Also developed a Lawson Training Module User Guide to support the implementation of the Lawson training module and the retirement of the Pathlore Training registration application.

# Legal Matters

## First Quarter FY12

### PROJECT ASSISTANCE

#### COURT AND ADMINISTRATIVE ORDERS

- **Boston Harbor Litigation and CSO:** Filed motion to amend schedule seven by deleting certain milestones related to the long-term CSO control plan for Alewife Brook and memorandum in support with Court; submitted a revised Schedule Seven consistent with Court allowed motions to amend; filed quarterly compliance and progress report.
- **Administrative Order (Cottage Farm CSO Treatment Facility):** Submitted supplemental environmental project completion report to DEP completing the requirements of the Order.

#### REAL ESTATE AND CONTRACT AND OTHER SUPPORT

- **Watershed Protection Restrictions:** Reviewed and commented on the Funding Request and associated documents for the acquisition of Watershed Preservation Restrictions on the Clark/Scoufopoulos property in Petersham, the Malden Farms, LLC property in West Boylston, and the Wisner property in Holden.
- **Licenses:** Drafted licenses relative to Rehabilitation of Section 156 Interceptor, Southern Spine Distribution Mains Project and for property located in Chelsea; drafted and finalized a Restated License Agreement with FloDesign Wind Turbine Corp.; drafted a base License Agreement for use at DITP for licensees to test their methodologies and technology for improving the efficiency of the treatment process.
- **Low Service Storage Facility – Spot Pond:** Reviewed an SJC decision involving the issue of the ability to exempt a private development proposed for the property next to the Low Service Storage Facility from the environmental process; drafted a side letter to revise the schedule for the operation of the temporary detention basin; reviewed draft Order of Conditions from Stoneham Conservation Commission; drafted side letter obligations regarding the site's storm water management system.
- **Notice of Contract-DITP:** Responded to and made demand upon counsel for a subcontractor to MWRA's Licensee on Deer Island to remove a Notice of Contract; made demand upon Licensee to assume the defense of the Notice of Contract issue.
- **Weston Water Main:** Provided continued attention to matters regarding litigation claims and strategies arising out of the water main break on May 1, 2010 and other litigation strategy issues under the cost recovery lawsuit including Jacobs entities, invitation to settle early and meeting with ESI experts.
- **Miscellaneous:** Reviewed and approved forty-six (46) Section 8(m) Permits, and two (2) Direct Connect Permits.

#### ENVIRONMENTAL

- **Water:** Provided guidance relative to the extent of MWRA's obligation to provide water services, including maintenance of piping, to the Westborough State Hospital.
- **Water/Sewer Rates:** Reviewed and analyzed issues raised by the proposed initiative petition to limit the amount of increase in water/sewer rates to 2½% annually unless municipality authorizes an override.
- **Wetlands Protection Act (WPA):** Researched and advised staff on wetlands issues regarding conservation commissions' enforcement options, and authority to impose conditions and force recordings in the Registry of Deeds on property not owned by the WPA applicant.

### LABOR, EMPLOYMENT AND ADMINISTRATIVE

#### New Matters

Sixteen demands for arbitration were filed.

One charge of prohibited practice was filed at the Division of Labor Relations.

## Matters Concluded

Received an arbitrator's decision in favor of a union that the MWRA violated a collective bargaining agreement when it failed to promote an employee.

Settled an arbitration regarding the recoupment of certain payments to an employee.

## LITIGATION/TRAC

### New Lawsuits

During the First Quarter of FY 2012, two new lawsuits were reported.

Nagy Mikael v. MWRA: This is an action by a Weston property owner, Dr. Nagy Mikael, alleging MWRA breached its obligations under a Memorandum of Agreement between MWRA and the Town of Weston concerning the Metro West Water Supply Tunnel. Plaintiff's property is located at 590 South Avenue, Weston, MA. Plaintiff alleges that his private drinking water well was affected by the construction of the MWWST. Plaintiff alleges that MWRA failed to meet its obligations under the MOA to restore his well, to install a deep rock well, and/or to pay the cost of water provided by a service connection to a municipal water supply. Plaintiff seeks money damages for the cost of municipal water, construction of a new drinking water well, damage to plaintiff's property, landscaping costs, ancillary well restoration costs, plus costs of litigation. Total damages enumerated are \$20,096.25. This case was originally filed in District Court and re-filed in Middlesex Superior Court. The MWRA filed an Answer on September 30, 2011 denying all claims.

Discover Bank v. (Current employee) and MWRA as Trustee: This is a wage garnishment action for a current MWRA employee for student aid debt in the amount of \$8,427.39.

### Significant Developments

(Former MWRA employee) v. MWRA, et al.: Plaintiff filed a complaint filed in Suffolk Superior Court alleging wrongful termination by MWRA. Plaintiff asserted three common law causes of action. Plaintiff alleged the discharge was in violation of public policy and constituted both a breach of the implied covenant of good faith and fair dealing, and breach of an implied contract. Plaintiff also claimed MWRA breached Section 301 of the Labor Management Relations Act. MWRA's Motion to Dismiss was allowed by the Court on June 17, 2011. Plaintiff then filed a Motion for Reconsideration on July 18, 2011 which MWRA opposed.

### Closed Cases

No lawsuits were reported closed during the First Quarter FY 2012.

### Subpoenas

During the First Quarter of FY 2012 four new subpoenas were received and three subpoenas were pending at the end of the First Quarter FY 2012.

### Public Records

During the Fourth Quarter of FY 2012 eight new public records requests were received and four requests were closed at the end of First Quarter FY 2012.

## SUMMARY OF PENDING LITIGATION MATTERS

TYPE OF CASE/MATTER	As of Sept 2011	As of Jun 2011	As of Mar 2011
Construction/Contract/Bid Protest (other than BHP)	5	4	4
Tort/Labor/Employment	8	8	8
Environmental/Regulatory/Other	1	1	1
Eminent Domain/Real Estate	2	2	2
<b>total – all defensive cases</b>	<b>16</b>	<b>15</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>18</b>	<b>17</b>	<b>17</b>

Significant claims not in suit: <u>Giaquinto/Geico Automobile Accident Claims</u>	2	2	2
Bankruptcy	3	4	4
Wage Garnishment	8	9	9
TRAC/Adjudicatory Appeals	1	2	2
Subpoenas	3	3	1
<b>TOTAL – ALL LITIGATION MATTERS</b>	35	37	35

## TRAC/MISC.

### New Appeals:

Two new appeals were received in the 1<sup>st</sup> Quarter FY 2012.

Janel, Inc. d/b/a Scorby's Camera; MWRA Docket No. 11-02

Zeff Photo Supply; MWRA Docket No. 11-03

### Settlement by Agreement of Parties

One case was settled by Agreement of Parties in 1<sup>st</sup> Quarter FY 2012.

Boston Pretzel Bakery; MWRA Docket No. 11-01

### Stipulation of Dismissal

One case was dismissed by Stipulation of Dismissal.

Janel Inc. d/b/a Scorby's Camera; MWRA Docket No. 11-02

### Notice of Dismissal Fine paid in full

One case was dismissed by Notice of Dismissal, fine paid in full.

Steve Connolly Seafood Co., Inc., MWRA Docket No. 10-05

### Tentative Decisions

No Tentative Decisions were issued in 1<sup>st</sup> Quarter FY 2012.

### Final Decisions

No Final Decisions were issued during the 1<sup>st</sup> Quarter FY 2012.



## Internal & Contract Audit Program First Quarter FY12

### Highlight

During the quarter, staff issued a draft report on DITP Data Center access controls, and was in the process of drafting reports on the Fleet Services Department work order, inventory and equipment practices, and the review of internal controls for the administration of the Fore River Railroad Corporation.

Internal Audit also responded to numerous management requests for services, including a request to review a proposal submitted by the landlord of Chelsea facility for the MWRA to purchase the facility, and a request to review the controls used by staff to ensure the prompt release of contract retainage at the completion of a contract.

### Status of Open Audit Recommendations *(5 recommendations closed in the 1st 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)*	5	0
Chelsea Data Center Physical Controls (5/5/10)	1	10
Review of Emergency Action Plans (6/30/10)	3	4
Warehouse Practices (9/30/10)	2	7
Controls of Permalogers, Tools & Equipment (2/14/11)	1	7
Facility Card Access Controls (2/22/11)	5	15
Review of TRAC Operations (5/19/11)	4	2
Review of the Town of Brookline's Compliance with the CSO Financial Assistance Agreement (5/24/11)	<u>3</u>	<u>0</u>
<b>Total Recommendations</b>	<b>25</b>	<b>47</b>

\*Recommendations are associated with an updated construction manual with a target completion of Dec 31, 2011.

### 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.

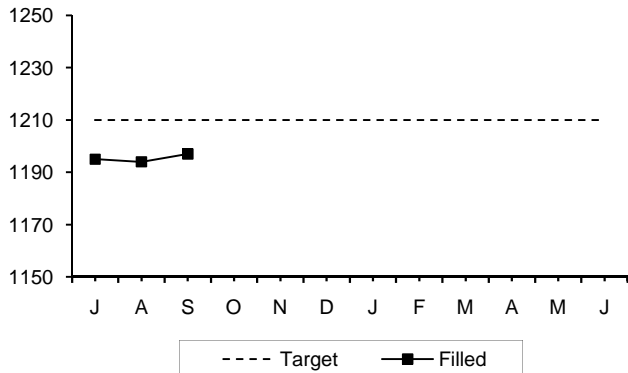
Savings	FY08	FY09	FY10	FY11	FY12 (1Q)	TOTAL
Consultants	\$55,901	\$316,633	\$194,238	\$520,176	\$81,963	\$1,168,911
Contractors & Vendors	\$2,147,311	\$1,262,088	\$599,835	\$3,129,538	\$104,703	\$7,243,475
Internal Audits	\$0	\$438,027	\$206,282	\$152,478	\$35,603	\$832,390
<b>Total</b>	<b>\$2,203,212</b>	<b>\$2,016,748</b>	<b>\$1,000,355</b>	<b>\$3,802,192</b>	<b>\$222,269</b>	<b>\$9,244,776</b>

## OTHER MANAGEMENT

# Workforce Management

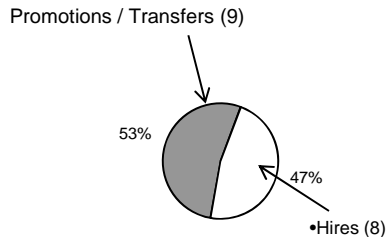
## 1st Quarter FY12

**Filled Position Tracking**



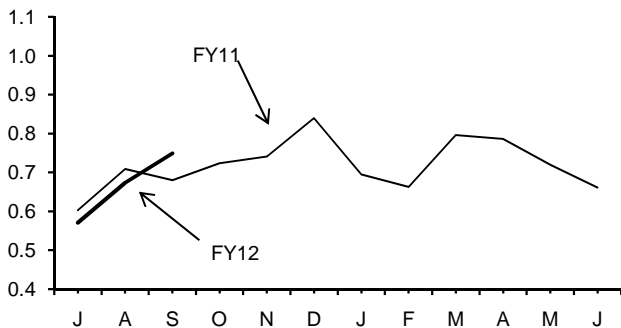
FY12 Target for Filled Positions = 1210  
 Filled Positions as of September 2011 = 1197

**Positions Filled by Hires/Promotions FY12**



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

**Average Monthly Sick Leave Usage Per Employee**



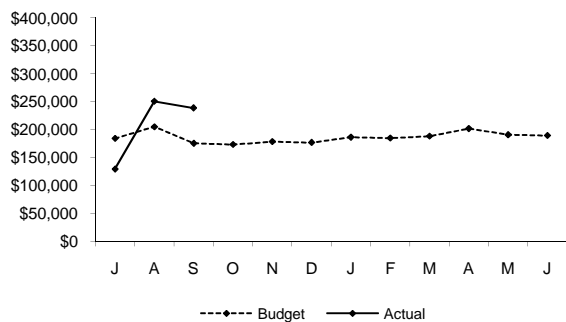
In FY12, the average monthly sick leave usage has increased 0.1% from the same time last year.

	Number of Employees	YTD	Annualized Total	Annual FMLA %	FY11
A&F	192	1.75	7.00	19.3%	8.01
Aff. Action	7	1.94	7.77	0.0%	7.63
Executive	4	0.94	3.77	0.0%	3.29
Int. Audit	8	1.28	5.12	35.5%	4.47
Law	17	3.58	14.32	46.8%	9.95
OEP	4	1.07	4.30	0.0%	5.74
Operations	936	2.05	8.22	16.7%	8.86
Planning	21	1.26	5.03	27.9%	4.68
Pub. Affs.	13	1.46	5.83	0.0%	8.15
<b>MWRA Avg</b>	<b>1202</b>	<b>1.99</b>	<b>7.97</b>	<b>17.7%</b>	<b>8.64</b>

Percent of sick leave usage attributable to Family and Medical Leave Act (FMLA) leave is 17.7% ending September 30, 2011.

**Field Operations**

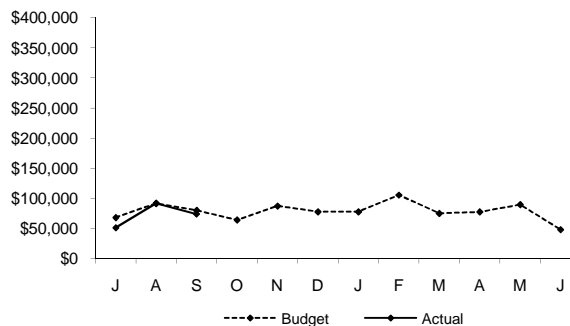
Overtime Expenditure Variance



Field Operations' total overtime expenditure through the 1st Quarter was \$618,517, which was \$54K over budget. Emergency overtime totaled \$352K, which was \$92K over budget. It was used primarily for wet-weather preparation and response for Hurricane Irene. Coverage overtime was \$173K, which was only \$2K over budget. Planned overtime was \$92K or (\$40K) under budget.

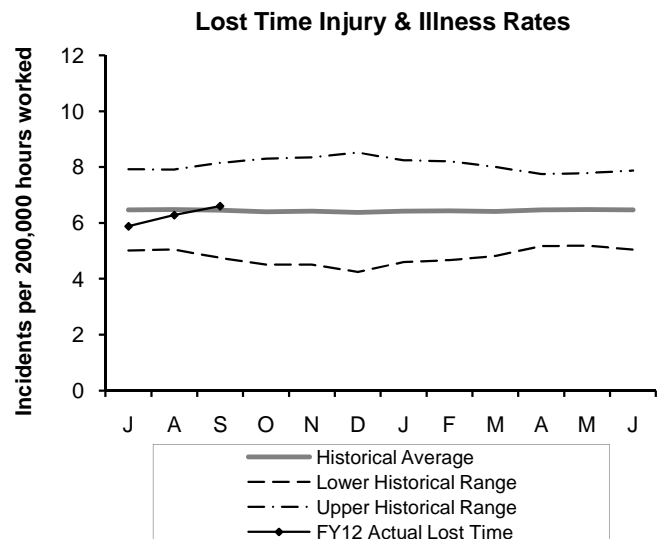
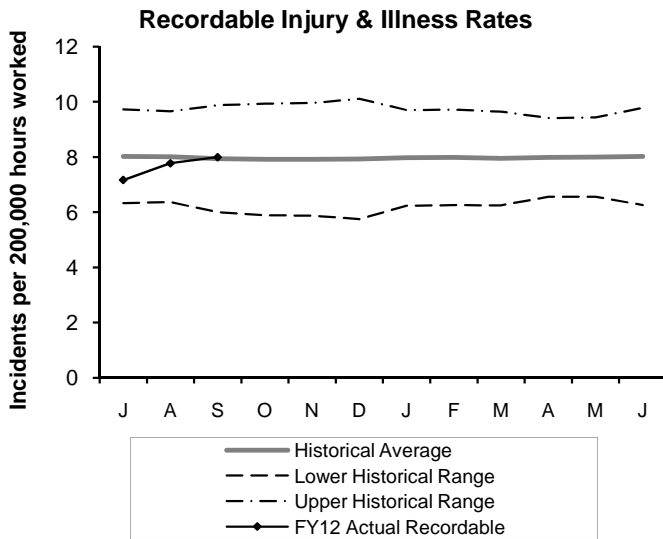
**Deer Island Treatment Plant**

Overtime Expenditure Variance



Deer Island's total overtime expenditure through the 1st Quarter was \$217,004, which was (\$23K) under budget. The under spending was due to lower than anticipated storm coverage requirements on the island (\$38K), and fewer unplanned maintenance activities (\$10K). These items were partially offset by an increase of \$26K in shift coverage requirements.

## Workplace Safety 1st 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 - First Quarter FY12

	New	Closed	Open Claims
Lost Time	11	27	41
Medical Only	45	38	57
	<b>New</b>		<b>YTD Light Duty Returns</b>
Light Duty Returns	1		1

#### Highlights/Comments:

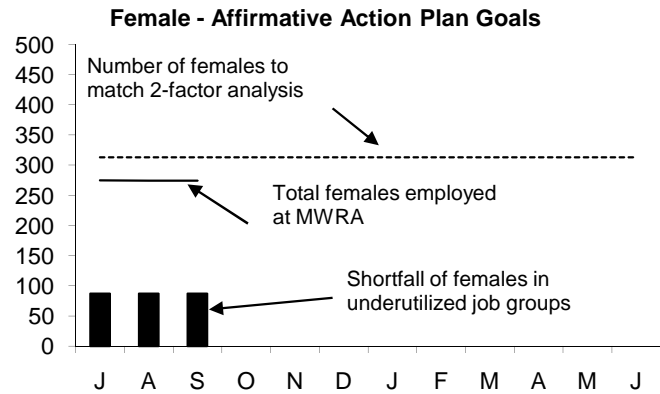
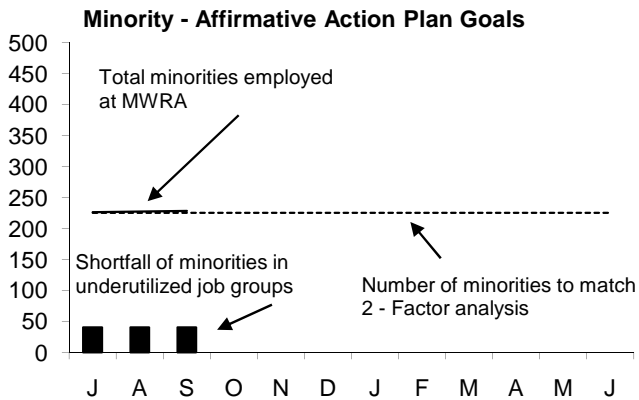
##### Light Duty returns

- 1 employee returned to LD for one week and then went to regular duty

##### Regular Duty returns

- 12 employees returned to their regular positions from IA

## MWRA Job Group Representation First Quarter, FY12



### Highlights:

At the end of Q1 FY12, 8 job groups or a total of 40 positions are underutilized by minorities as compared to 8 job groups or a total of 42 at the end of Q1 FY11; for females 12 job groups or a total of 87 positions are underutilized by females as compared to 13 job groups or a total of 103 at the end of Q1FY11. During Q1, 3 minorities and 1 female was hired. During this same period, 3 minorities and 1 female terminated.

### Underutilized Job Groups - Workforce Representation

Job Group	Employees as of 9/30/2011	Minorities as of 9/30/2011	Achievement Level	Minority Over or Under Under utilized	Females As of 9/30/2011	Achievement Level	Female Over or Under Under utilized
Administrator A	16	3	2	1	2	5	-3
Administrator B	23	0	4	-4	6	6	0
Clerical A	46	21	11	10	40	11	29
Clerical B	34	8	9	-1	16	3	13
Engineer A	82	16	14	2	11	15	-4
Engineer B	50	10	4	6	6	25	-17
Craft A	116	14	21	-7	0	2	-2
Craft B	152	29	25	4	3	10	-7
Laborer	67	17	11	6	5	4	1
Management A	105	17	17	0	33	36	-3
Management B	54	10	11	-1	13	26	-13
Operator A	66	5	8	-3	2	4	-2
Operator B	69	7	10	-3	4	3	1
Para Professional	59	11	25	-14	28	52	-24
Professional A	36	2	9	-7	22	16	6
Professional B	167	40	32	8	76	81	-5
Technical A	53	16	10	6	5	10	-5
Technical B	9	2	2	0	2	4	-2
<b>Total</b>	<b>1204</b>	<b>228</b>	<b>225</b>	<b>43/-40</b>	<b>274</b>	<b>313</b>	<b>50/-87</b>

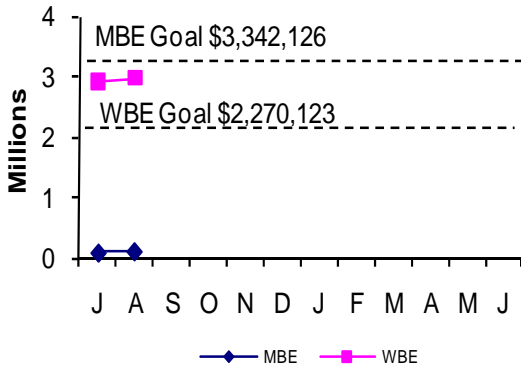
### AACU Candidate Referrals for Underutilized Positions

Job Group	Title	# of Vac	Requisition Int. / Ext.	Promotions/ Transfers	AACU Ref. External	Position Status
Craft A	Unit Supervisor	1	Int	1	0	Promo-W/M
Craft B	Electrician	1	Int/Ext	1	0	Lateral-W/M
Craft B	Heavy Equipment Operator	1	Int/Ext	0	0	Hire-W/M
Engineer A	Proj Eng. Cadd	1	Ext	0	0	Hire-W/M
Management A	Sr. Prog. Mgr. Electrical	1	Int/Ext	0	0	Pending
Management B	Accounts Payable Manager	1	Int	0	0	Pending
Operator B	Operator	1	Ext	0	0	Pending

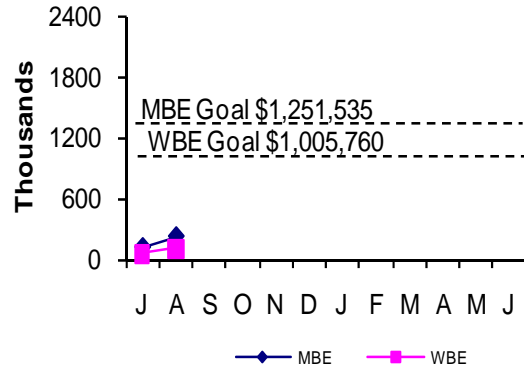
## MBE/WBE Expenditures 1<sup>st</sup> Quarter FY12

**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 August.

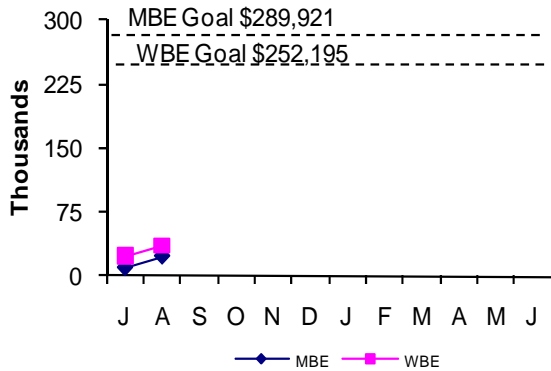
### Construction



### 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	111,740	3.8%	6,672,772	129.2%	2,969,683	130.8%	7,871,501	184.8%
Professional Svc.	223,576	17.9%	2,045,576	160.6%	101,093	10.1%	1,212,947	118.3%
Goods & Svcs.	<u>23,478</u>	<u>8.1%</u>	<u>393,060</u>	<u>56.9%</u>	<u>36,274</u>	<u>14.4%</u>	<u>345,590</u>	<u>57.5%</u>
<b>Total</b>	<b>\$358,794</b>	<b>7.3%</b>	<b>\$9,111,408</b>	<b>127.8%</b>	<b>\$3,107,050</b>	<b>88.1%</b>	<b>\$9,430,038</b>	<b>160.2%</b>

## MWRA FY12 CEB Expenses through First Quarter, FY12

	September 2011 Year-to-Date					
	Period 3 YTD Budget	Period 3 YTD Actual	Period 3 YTD Variance	%	FY12 Approved	% Expended
<b>EXPENSES</b>						
WAGES AND SALARIES	\$ 19,494,423	\$ 19,296,995	\$ (197,428)	-1.0%	\$ 90,319,013	21.4%
OVERTIME	883,987	904,013	20,026	2.3%	3,508,630	25.8%
FRINGE BENEFITS	4,487,356	4,523,690	36,334	0.8%	17,954,076	25.2%
WORKERS' COMPENSATION	525,000	183,797	(341,203)	-65.0%	2,100,000	8.8%
CHEMICALS	2,581,988	2,438,052	(143,936)	-5.6%	9,047,275	26.9%
ENERGY AND UTILITIES	5,326,472	5,386,169	59,697	1.1%	22,654,931	23.8%
MAINTENANCE	5,843,791	5,603,989	(239,802)	-4.1%	29,470,020	19.0%
TRAINING AND MEETINGS	40,559	7,780	(32,779)	-80.8%	251,550	3.1%
PROFESSIONAL SERVICES	1,366,926	1,237,942	(128,984)	-9.4%	5,892,441	21.0%
OTHER MATERIALS	725,422	677,138	(48,284)	-6.7%	4,765,483	14.2%
OTHER SERVICES	5,902,160	5,992,209	90,049	1.5%	23,323,074	25.7%
<b>TOTAL DIRECT EXPENSES</b>	<b>\$ 47,178,084</b>	<b>\$ 46,251,774</b>	<b>\$ (926,311)</b>	<b>-2.0%</b>	<b>\$ 209,286,493</b>	<b>22.1%</b>
INSURANCE	\$ 571,468	\$ 403,212	\$ (168,256)	-29.4%	\$ 2,285,870	17.6%
WATERSHED/PILOT	6,394,068	6,256,984	(137,084)	-2.1%	25,576,274	24.5%
BECo PAYMENT	951,001	910,950	(40,051)	-4.2%	3,965,500	23.0%
MITIGATION	382,175	373,645	(8,530)	-2.2%	1,528,700	24.4%
ADDITIONS TO RESERVES	48,866	48,866	-	0.0%	195,467	25.0%
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>\$ 13,836,370</b>	<b>\$ 13,505,181</b>	<b>\$ (331,189)</b>	<b>-2.4%</b>	<b>\$ 40,892,249</b>	<b>33.0%</b>
DEBT SERVICE	\$ 88,723,603	\$ 85,512,526	\$ (3,211,077)	-3.6%	\$ 367,979,918	23.2%
DEBT SERVICE ASSISTANCE	(87,500)	(87,500)	-	0.0%	-	---
<b>TOTAL DEBT SERVICE</b>	<b>\$ 88,636,103</b>	<b>\$ 85,425,026</b>	<b>\$ (3,211,077)</b>	<b>-3.6%</b>	<b>\$ 367,979,918</b>	<b>23.2%</b>
<b>TOTAL EXPENSES</b>	<b>\$ 149,650,557</b>	<b>\$ 145,181,981</b>	<b>\$ (4,468,577)</b>	<b>-3.0%</b>	<b>\$ 618,158,660</b>	<b>23.5%</b>
<b>REVENUE &amp; INCOME</b>						
RATE REVENUE	\$ 147,425,000	\$ 147,425,000	\$ -	0.0%	\$ 589,700,000	25.0%
OTHER USER CHARGES	1,836,614	1,853,970	17,356	0.9%	7,142,495	26.0%
OTHER REVENUE	634,402	618,189	(16,213)	-2.6%	4,872,342	12.7%
RATE STABILIZATION	272,945	272,945	-	0.0%	1,091,780	25.0%
INVESTMENT INCOME	3,942,497	3,897,401	(45,096)	-1.1%	15,352,043	25.4%
<b>TOTAL REVENUE &amp; INCOME</b>	<b>\$ 154,111,458</b>	<b>\$ 154,067,505</b>	<b>\$ (43,953)</b>	<b>0.0%</b>	<b>\$ 618,158,660</b>	<b>24.9%</b>

As of September 2011, total revenue was \$154.1 million, \$44,000 less than budget. Total expenses were \$145.2 million, \$4.5 million or 3.0% less than budget, resulting in a net variance of \$4.4 million.

Expenses –

- **Direct Expenses** are \$46.3 million, \$926,000 or 2.0% less than budget.
- **Workers' Compensation** is \$341,000 or 65.0% lower than budget for Compensation Payments of \$180,000 and Medical Payments of \$151,000.
- **Maintenance** is \$240,000 or 4.1% underspent mostly related to Maintenance Materials being underspent by \$172,000, and Services by \$68,000.
- **Wages and Salaries** are \$197,000 or 1.0% underspent due to less filled positions than budgeted, higher leave balance accrual use, and more employees out on work related injury or unpaid leave status than anticipated.
- **Chemicals** are \$144,000 or 5.6% less than budget due to lower spending for Activated Carbon of \$75,000, Soda Ash of \$57,000, Liquid Oxygen of \$35,000, Carbon Dioxide of \$33,000, Hydrofluosilicic Acid of \$21,000, Sodium Bisulfite of \$21,000, Sodium Hydroxide of \$21,000 and Other of \$19,000 offset by higher Sodium Hypochlorite of \$75,000 and Nitrazyme of \$56,000 for FERS due to timing.
- **Professional Services** are \$129,000 or 9.4% under budget due to lower spending for Lab and Testing of \$116,000, Engineering of \$66,000, Security of \$23,000, Legal of \$13,000 and Communications of \$10,000 offset by higher spending for Other of \$100,000 mainly due to timing of staffing study.
- **Other Services** are \$90,000 or 1.5% over budget due to higher spending for Pelletization of \$102,000, Grit & Screenings Removal of \$43,000, and Membership/Dues of \$38,000 offset by lower spending for Telephones of \$38,000, Health/Safety of \$29,000, and Other Rentals of \$16,000.
- **Utilities** are overspent by \$60,000 or 1.1% due to higher spending for diesel fuel of \$243,000 due to timing and favorable unit pricing offset by lower spending for Electricity of \$207,000.
- **Other Materials** are \$48,000 or 6.7% under budget due to Other Materials of \$40,000 due to lower need for gravel and Vehicle Expense of \$19,000 offset by higher spending for Computer Hardware of \$27,000.
- **Fringe Benefits** are \$36,000 or 0.8% over budget due to higher Dental Insurance of \$41,000 due to an FY11 accrual issue.
- **Indirect Expenses** are \$13.5 million, \$331,000 or 2.4% under budget due to lower Insurance claims of \$124,000 and premiums of \$45,000, lower Watershed Reimbursement of \$137,000 due to an FY11 accrual issue, and lower spending for HEEC Special Projects of \$40,000.
- **Debt Service Expenses** total \$85.4 million, \$3.2 million or 3.6% under budget due to lower variable rate debt.

Revenue and Income –

- **Total Revenue / Income** for September was \$154.1 million, \$44,000 less than budget due to lower Investment Income of \$45,000 due to lower rates.

## Cost of Debt First 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.

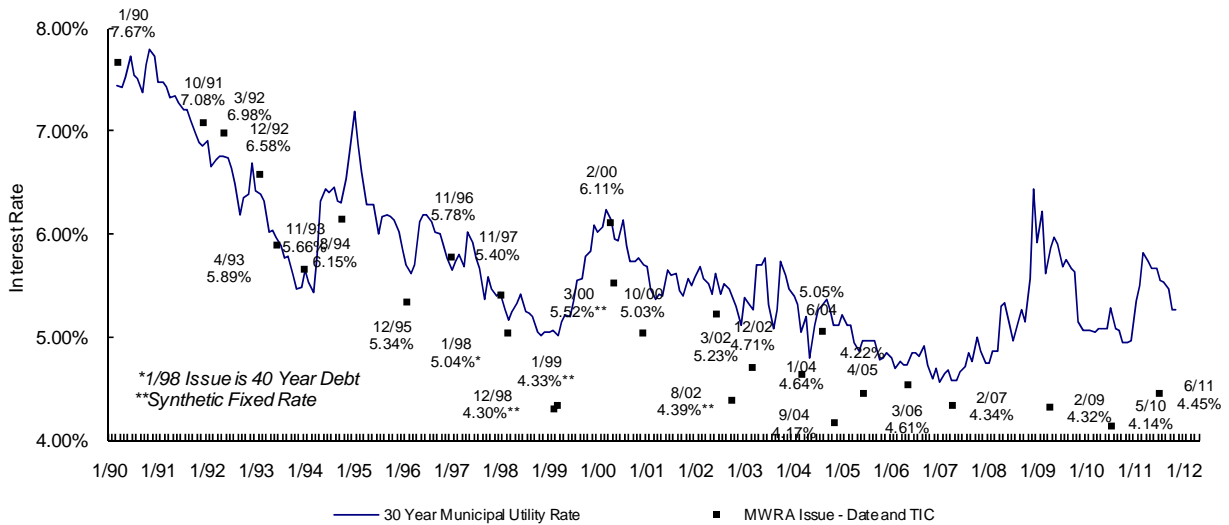
### Average Cost of MWRA Debt

Fixed Debt (\$4,030)	4.55%
Variable Debt (\$589)	0.89%
SRF Debt (\$1,023)	1.07%
<b>Weighted Average Debt Cost (\$5,643)</b>	<b>3.54%</b>

### Most Recent Senior Fixed Debt Issue May 2011

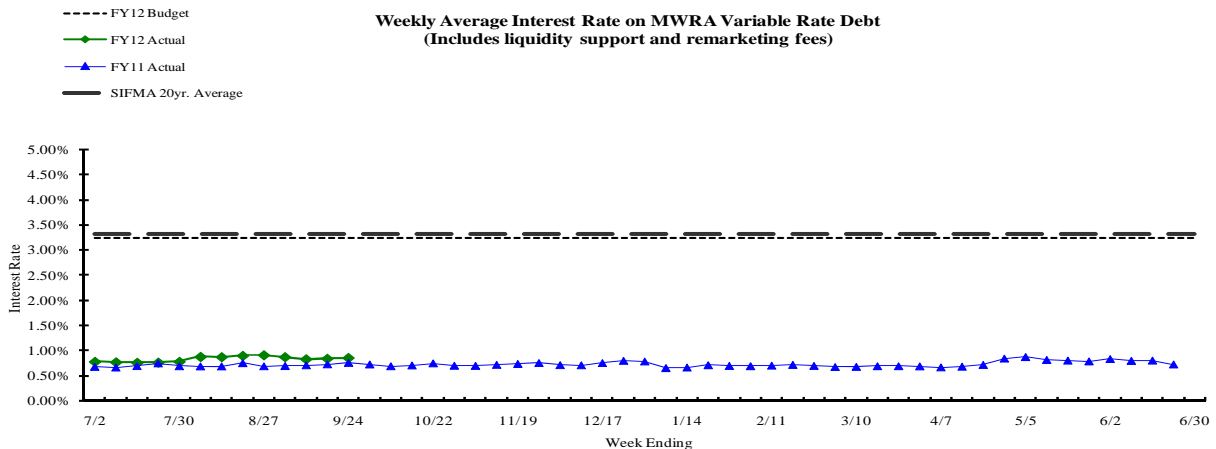
2011 Series B (\$284)	4.45%
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### MWRA Fixed Rate Debt vs. 30 Year Municipal Utility Interest Rate



### Weekly Average variable Interest Rates vs. Budget

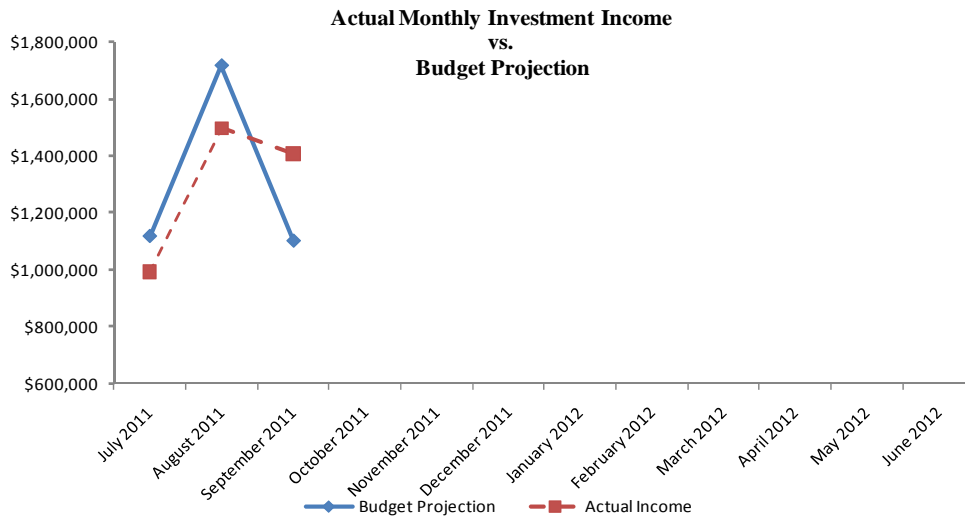
MWRA currently has nine variable rate debt issues with \$1.2 billion outstanding, excluding commercial paper. Of the nine outstanding series, five have portions which have been swapped to fixed rate. Variable rate debt has been less expensive than fixed rate debt in recent years as short-term rates have remained lower than long-term rates on MWRA debt issues. In September, SIFMA rates fluctuated with a high of 0.18% and a low of 0.15%. 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.



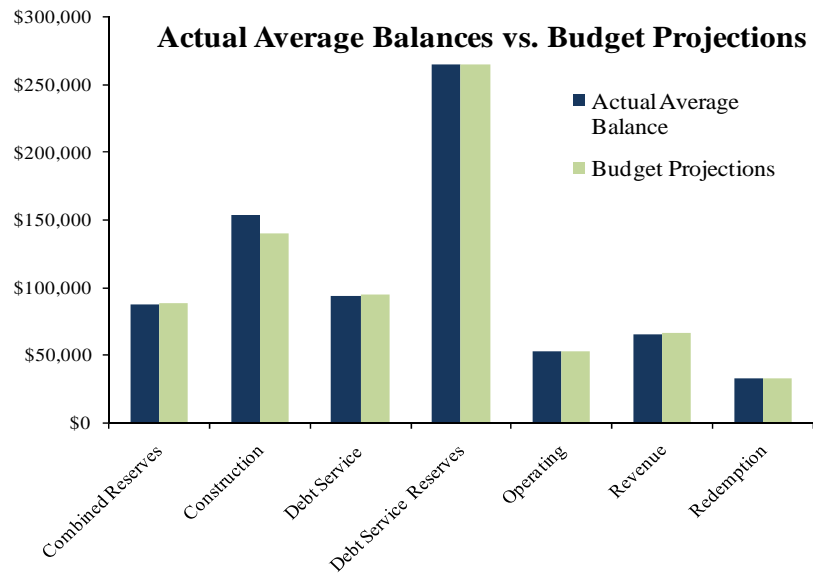


## Investment Income First Quarter, FY12

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 September.



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

