

MASSACHUSETTS WATER RESOURCES AUTHORITY

# Board of Directors Report

on

## Key Indicators of MWRA Performance

For

**Second Quarter FY2008**

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



Frederick A. Laskey, Executive Director  
Michael J. Hornbrook, Chief Operating Officer  
March 12, 2008

# Board of Directors Report on Key Indicators of MWRA Performance for Second Quarter FY2008

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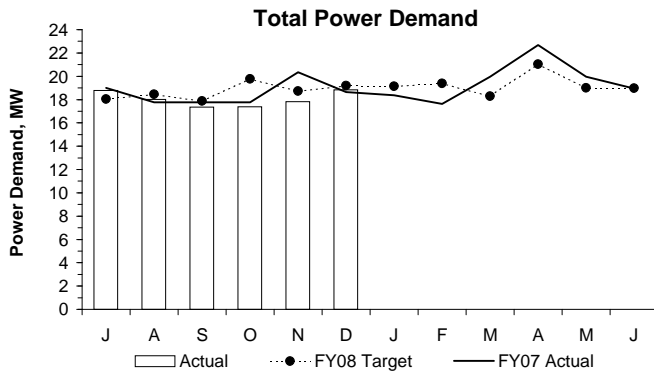
This quarterly report is prepared by MWRA staff to track a variety of MWRA performance measures for routine review by MWRA's board of directors. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for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

Frederick A. Laskey, Executive Director  
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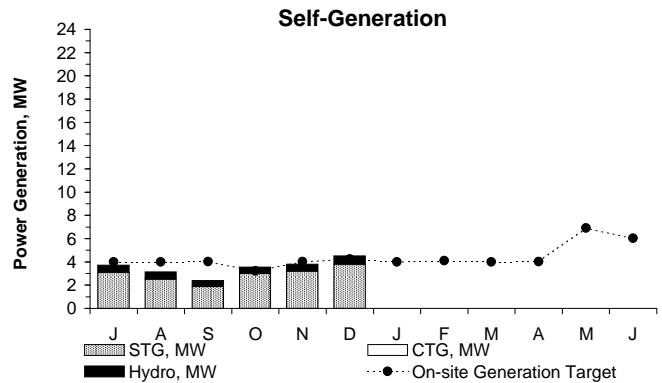
# OPERATIONS AND MAINTENANCE

# Deer Island Operations - Energy

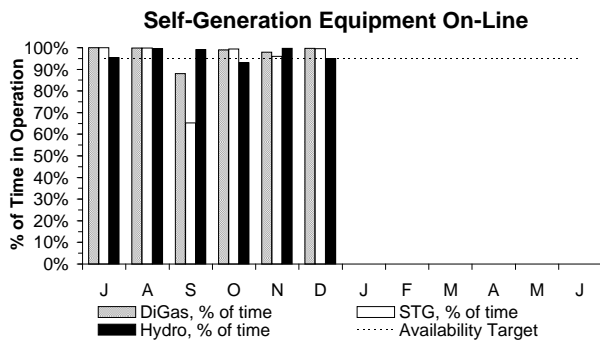
## 2nd Quarter - FY08



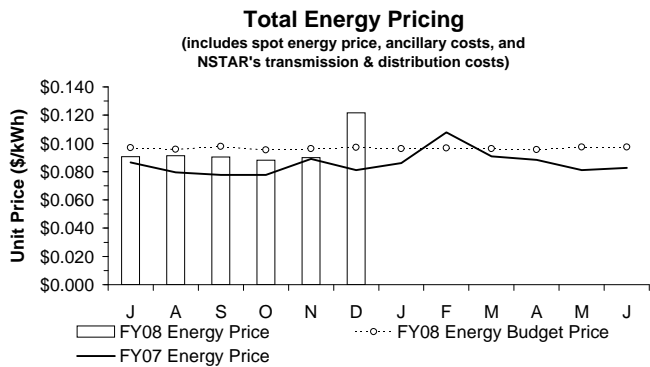
Total Actual Power Demand for the 2nd Quarter was close to the FY08 target level and was comparable (-4%) to the FY07 Actual Total Power Demand for the same period, even though Total Plant Flow was 21% lower than expected and 20% lower than the FY07 Actual Total Plant Flow. The apparent difference between power demand and plant flow is a result of the high power demand needed to operate a second cold box unit in the Cryogenic Facility to support the secondary treatment process in spite of the lower plant flow.



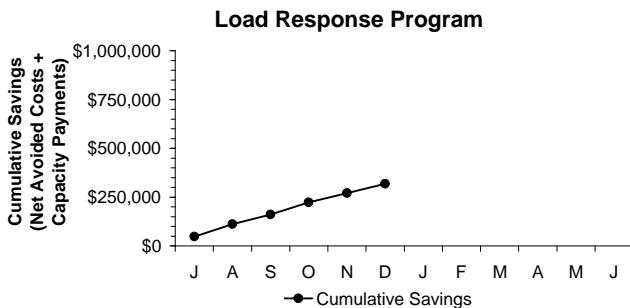
Power generated on-site was similar (+3%) to the FY08 target for the 2nd Quarter as the STG operated at or above its target each month and was 13% higher than the target for the quarter, while the hydro turbine system operated 16% below target for the quarter. The lower-than-expected hydro output was due to lower-than-expected plant flow in the 2nd Quarter. The CTDGs operated for 16.3 hours on 11 days in the 2nd Quarter; two days for maintenance/checkout purposes, four days for "drop load" and "black start" testing, and five days to allow for NSTAR- required annual maintenance. No demand response events were called during the 2nd Quarter.



During October, November, and December of the 2nd Quarter of FY08, the DiGas and STG systems exceeded their availability targets for the month. In October, the Hydro turbine system fell just short of its target (-2%) but met or exceeded its 95% availability target in November and December.

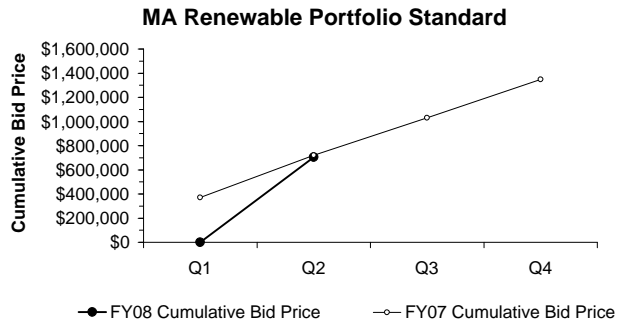


Under the current energy supply contract, all of DI's energy is purchased in real time. The total energy price in the 2nd Quarter was 4% above the FY08 target for the quarter due to higher-than-budgeted spot energy prices in December. The total energy price includes spot energy charge, transmission & distribution charges, and ancillary charges. Please note that the November and December total energy prices are estimates as the invoices have not been received.



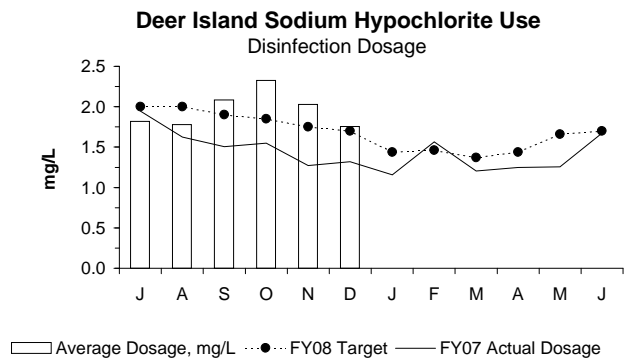
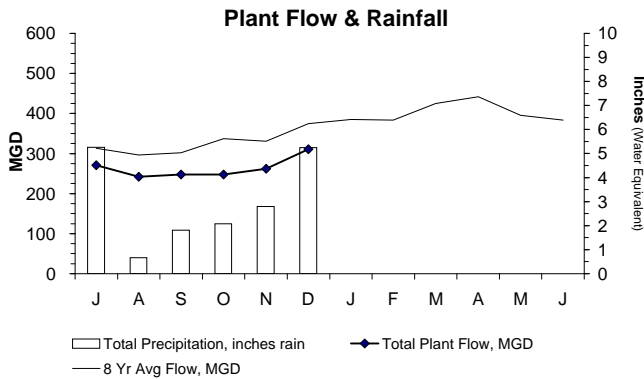
DI did not participate in any demand response events during the 2nd Quarter of FY08 as none were called.

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, MWSRA receives monthly Capacity Payments from ISO-NE. When it runs the CTDGs at ISO-NE's request, Deer Island 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 CTDGs, and the energy payments from ISO-NE. Cumulative savings are the sum of Net Avoided Costs and monthly Capacity Payments.



Bids were awarded in November for the sale of 13,000 Renewable Energy Certificates, for a total value of \$705,500. RPS prices reflect the bid prices on the date that bids are accepted. The cumulative bid price reflects the total value of bids received to date in FY08. No bids were received in October and December (or in the 1st Quarter).

## Deer Island Operations 2nd Quarter - FY08



Total Plant Flow for the 2nd Quarter was 21% lower than the 8-year average flow (273.7 mgd actual vs. 347.4 mgd expected) with precipitation only 5% lower than the 8-yr average for the quarter (10.13 inches actual vs. 10.64 inches expected). Precipitation was 52% lower than expected in October, near target (-3%) in November, but 52% higher than expected in December. Overall plant flow remained lower than expected in December even with the higher precipitation because a large amount of the precipitation came in the form of snow, which contributed little to plant flow.

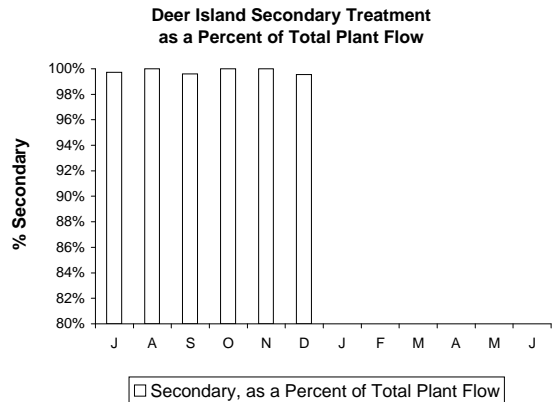
The disinfection dosing rate was 15% higher than the FY08 target for the 2nd Quarter of FY08. However, overall sodium hypochlorite was on target. The higher dosing rate is likely due to the lower-than-expected plant flow. Lower plant flow requires higher dosing as the wastewater is more concentrated.

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

### Secondary Blending Events

| Month        | Count of Blending Events | Count of Blending Events Due to Rain | Count of Blending Events Due to Non-Rain-Related Events | Secondary, as a Percent of Total Plant Flow | Total Hours Blended During Month |
|--------------|--------------------------|--------------------------------------|---|---|----------------------------------|
| J            | 1                        | 1                                    | 0   | 99.7%                                       | 3.20                             |
| A            | 0                        | 0                                    | 0   | 100.0%                                      | 0.00                             |
| S            | 1                        | 1                                    | 0   | 99.6%                                       | 4.91                             |
| O            | 0                        | 0                                    | 0   | 100.0%                                      | 0.0                              |
| N            | 1                        | 1                                    | 0   | 100.0%                                      | 2.2                              |
| D            | 3                        | 2                                    | 1   | 99.6%                                       | 5.73                             |
| J            |                          |                                      |   |   |                                  |
| F            |                          |                                      |   |   |                                  |
| M            |                          |                                      |   |   |                                  |
| A            |                          |                                      |   |   |                                  |
| M            |                          |                                      |   |   |                                  |
| J            |                          |                                      |   |   |                                  |
| <b>Total</b> | <b>6</b>                 | <b>5</b>                             | <b>1</b>  | <b>99.8%</b>                                | <b>16.0</b>                      |

There were a total of four separate blending events during the 2nd Quarter. A rain event on November 3 lasted 2.17 hours and resulted in 0.72 million gallons of flow bypassing secondary treatment. One of the three blending events in December (12/7) was the result of an operational issue during a "black start" test event, which caused a 12-minute bypass of 0.34 million gallons. The other two blending events on December 23-24 occurred during the same rain event and lasted a total of 5.53 hours resulting in 42.9 million gallons of flow bypassing secondary treatment. There were no blending events in October.



Overall, 99.8% of total plant flow to DITP was treated through secondary during the 2nd Quarter, the same percentage of total plant flow that was treated through secondary during the 1st Quarter. The Maximum Secondary Capacity for the entire quarter was 700 mgd, which was set on April 4, 2007.

## Deer Island Operations & Maintenance Report

### Environmental/Pumping:

Precipitation for the 2nd Quarter was comparable to the 8-year historical average for the quarter with a total of 10.13 inches of precipitation falling on 41 days. Heavy snow fell on several days in December including a record-breaking 10.1 inches on December 13, followed by 7.6 inches three days later, and yet another 7.3 inches just four days after that on December 20. Even though precipitation was higher than normal for December, overall total plant flow for the month was still 17% lower than expected because snow has less direct impacts to total plant flow than rain. The snowfall recorded in December was only 0.2 inches shy of the December snowfall record of 27.9 inches set in 1970.

## Deer Island Operations

2nd Quarter - FY08

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

#### **Pumping (continued):**

During the 2nd Quarter, the plant achieved a maximum average hourly flow rate of 1025.8 mgd on December 23 as a result of a rain event that produced 0.49 inches, along with snow melt. Pumping and treatment operations continued without incident through this storm and throughout the entire quarter.

#### **Odor Control:**

The activated carbon media in 15 carbon adsorber units was changed out in the 2nd Quarter as part of routine maintenance. The carbon changeout took place in four of the five Odor Control Facilities and has resulted in improved treatment efficiency. Carbon was changed out in three carbon adsorber units in the North Pumping Odor Control Facility, in two units in the East Odor Control Facility, in six units in the West Odor Control Facility, and in four units in the Residuals Odor Control Facility.

#### **Disinfection:**

The contract work to replace the internal lining in Sodium Hypochlorite Storage Tank 1, which began in June 2007, was completed and the tank was turned over to Operations in October after the new liner passed leak testing and inspection. Tank 1 was filled with sodium hypochlorite on October 31. Liner replacement work in Tank 3, which began in August 2007, was completed and the tank was turned over to Operations near the end of December. Tank 3 will be filled with sodium hypochlorite with the arrival of the next sodium hypochlorite barge delivery scheduled for early January 2008.

#### **Energy:**

"Renewable Portfolio Standard Credits" or RPS Credits - As mentioned earlier, bids were received in November for the sale of 13,000 RPS credits for \$705,500. This was the first RPS sale in FY08.

### Clinton Wastewater Treatment Plant

**Emergency Generator Project:** This project is now complete with the exception of minor punch list items. The generator is now operationally available.

**Soda Ash System Replacement Project:** Progress is impacted by the need to wait for better weather as a temporary liquid system must be installed outside.

**Landfill Closure Plan:** Work is progressing. The property survey has been completed and a draft report is now being prepared by MWRA's Consultant, FS&T. The task order for digester inspection (for cleaning and re-valving/re-piping) is in conceptual design phase.

**Headworks Building:** Staff replaced a motor and break assembly on the bar rack.

**Primary Clarifiers:** Staff replaced the chains and flight attachments in Tank 1 and replaced the gaskets on the skimming trough in Clarifier 1. Staff also fabricated new gasket stops from stainless steel flat stock and lubricated all gears and sprockets.

**Intermediate Lift Station:** Staff installed a new upper bearing assembly on Screw Pump 3 and reconnected the bearing flange to the pump flange with the assistance of a crane from Chelsea. Crews set up staging and welded splash guard around pump then reinstalled the lower bearing covers and replaced the grease fittings and purged the grease. Staff installed new drip oil feeders on Recirculation Pumps 1, 2 & 3. Staff also completed repairs on Intermediate Pump 3 and cleaned the oil reservoir, purged the roller bearings, cleaned the oil lines, replaced the covers, and re-torqued the upper bearing coupling.

**Chemical Building:** Staff removed the rotary airlock on the soda ash feed system to clean out a build-up of hardened soda ash from the vibratory feeder and cleaned the strainers on the flushing water pumps.

**Digester Building:** Staff replaced a broken shear pin on Thickened Sludge Pump 2; changed the oil and filter on the compressor; and repaired a packing gland and re-packed the pump.

**Trickling Filter:** Cleaned the spray nozzles and lubricated the center column.

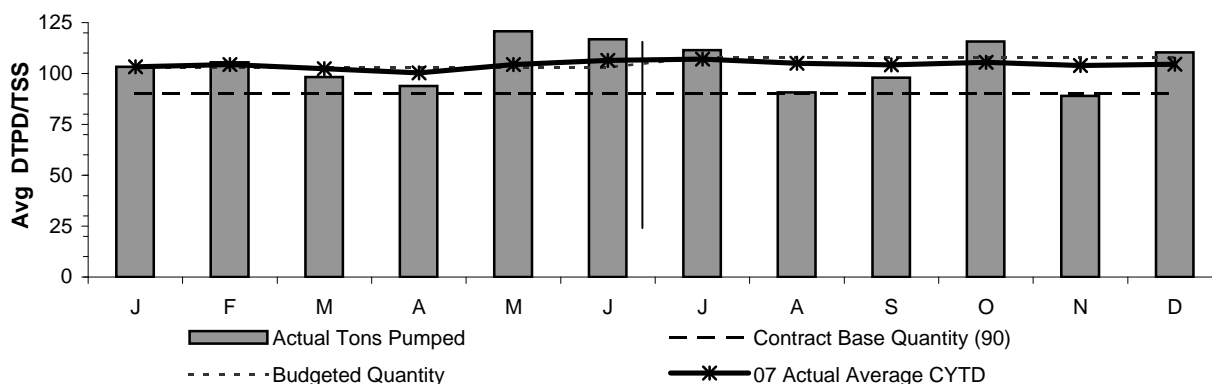
**Final Clarifiers:** Set up staging to inspect the collection trough on Final Clarifier 3; a crack was found in the PVC piping so the old piping was removed and replaced.

# Deer Island Residuals

2nd Quarter - FY08

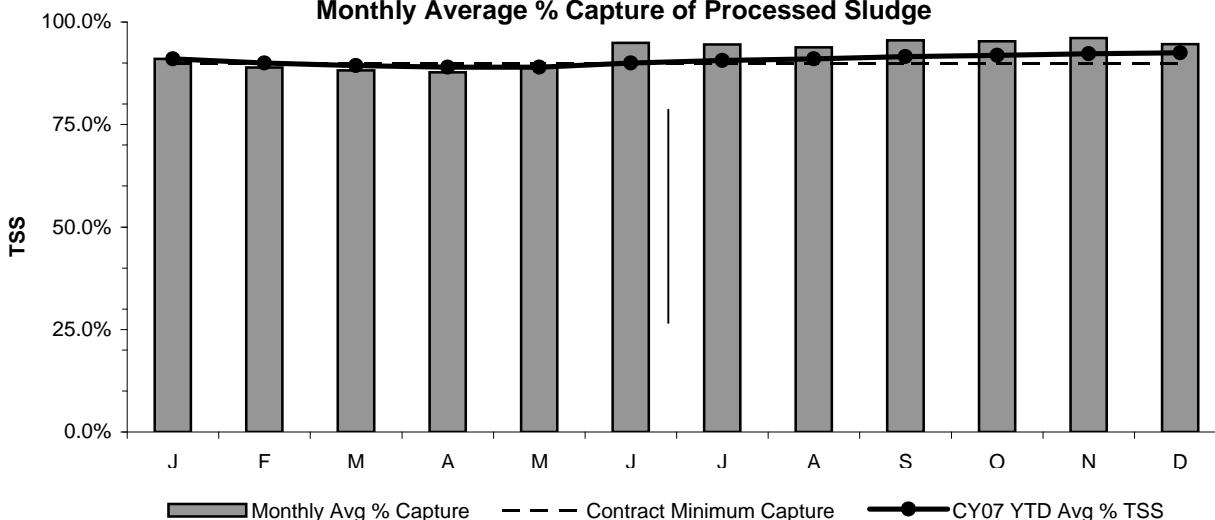
MWRA pays a fixed monthly amount for the calendar year to process up to 90 DTPD/TSS as an annual average. The monthly invoice is based on 90 DTPD/TSS (Dry Tons Per Day/Total Suspended Solids) times 365 days divided by 12 months. At the end of the year, the actual totals are calculated and additional 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 (FY08's budget was 108 DTPD/TSS).

## Sludge Pumped From Deer Island



The average total quantity of pumped sludge for the 2nd Quarter was 105 DTPD, which was lower than the FY08 budget of 108 DTPD. Quantities of pumped sludge were low due to lower than expected flows. Sludge quantities can vary based on flow and changes in sludge inventory, as well as the performance of primary and secondary treatment. Upset conditions can also affect sludge quantities.

## Monthly Average % Capture of Processed Sludge



The daily average percentage capture of solids delivered to the facility continued to be steady. The contract requires NEFCo to capture at least 90% of the solids delivered to the facility.

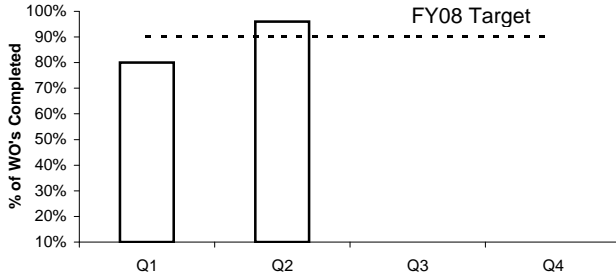
# Deer Island Maintenance

2nd Quarter - FY08

## Productivity Initiatives

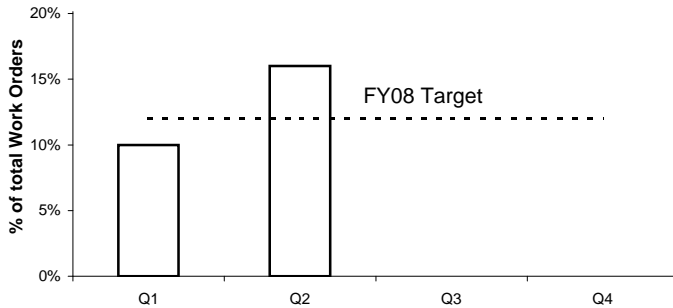
Productivity initiatives include increasing predictive maintenance tasks. Accomplishing this initiative should result in a decrease in the overall maintenance backlog.

### Predictive Maintenance Compliance



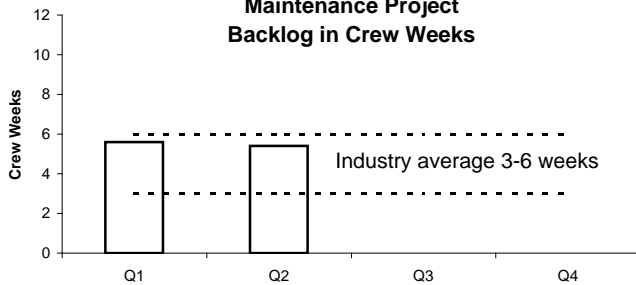
The FY08 goal for predictive maintenance is the completion of 90% of all PdM work orders. Deer Island is moving forward with an aggressive predictive maintenance program. Deer Island achieved the goal in the 2nd Quarter

### Predictive Maintenance



The FY08 goal is to increase PdM work orders to 12% of total work orders. The industry is moving toward increasing predictive maintenance work to reduce down time and better predict when repairs are needed. Deer Island achieved the goal in the 2nd Quarter.

### Maintenance Project Backlog in Crew Weeks

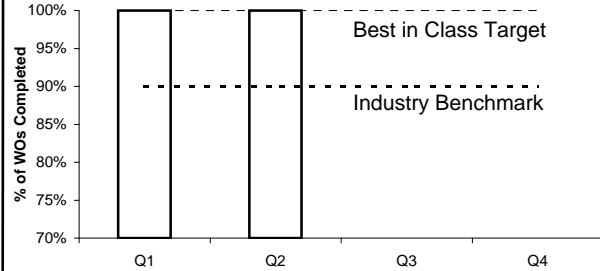


The industry average for maintenance backlog is 3-6 weeks. Deer Islands FY08 goal is to stay within industry average. The backlog is currently being controlled with the use of overtime. There is one medium-voltage electrician, one machinist, and one M&O specialist vacancy.

## Proactive Initiatives

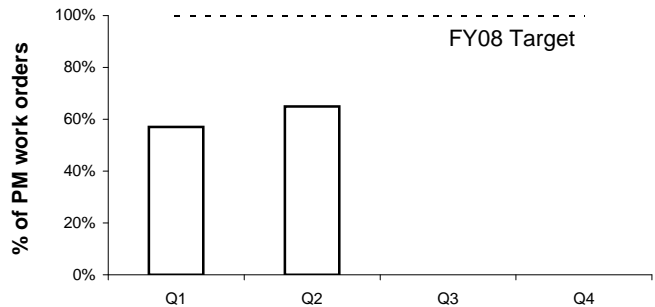
Proactive initiatives include completing 100% of all preventive maintenance tasks and increasing preventive maintenance kitting. These tasks should result in lower maintenance costs for maintenance.

### Preventive Maintenance Compliance



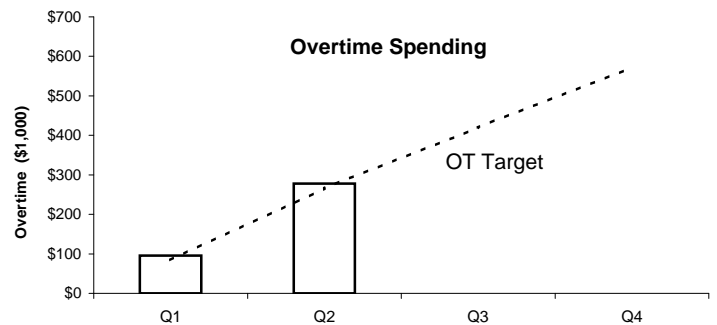
The FY08 goal for preventive maintenance is completion of 100% of all PM work orders from Operations and Maintenance. Deer Island achieved this goal in the 2nd Quarter.

### Preventive Maintenance Kitting



Deer Island's FY08 goal is to kit 100% of all preventive maintenance work orders. 2nd quarter performance is 65%. Planning is now complete for Plumbing PMs. Staff are identifying all PM schedules that do not include materials and will not require kitting.

### Overtime Spending

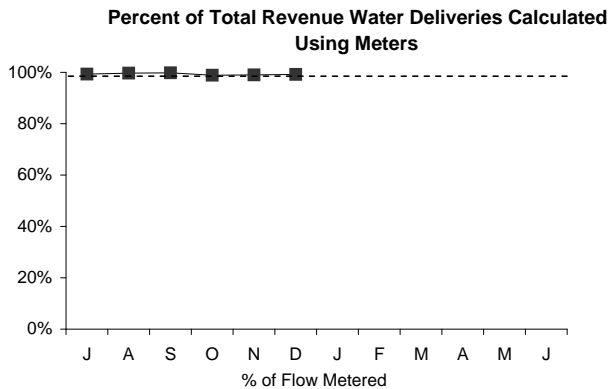


Overtime was on budget for the 2nd Quarter and remains \$12K over budget for the year. The 2nd Quarter's overtime was spent on preparing the residuals systems for cleaning; gathering information for the motor control center electrical survey; and controlling the maintenance created by some staff vacancies.

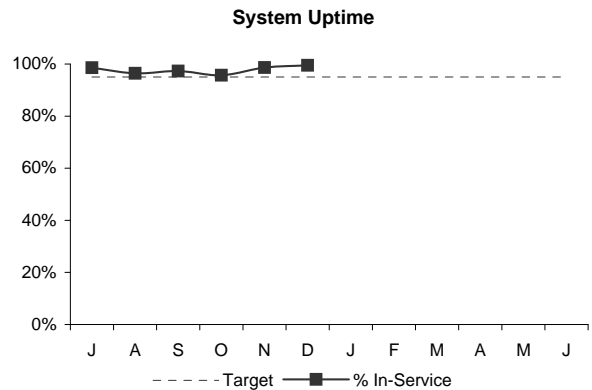


## Operations Division Metering 2nd Quarter - FY08

### WATER METERS



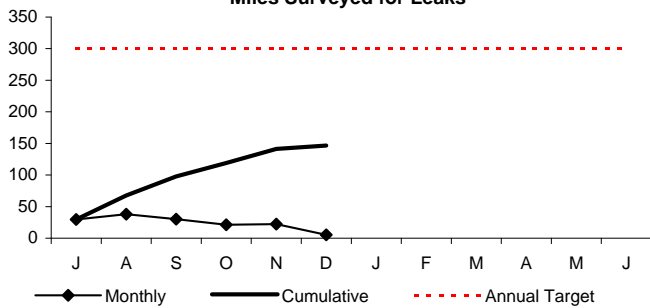
### WASTEWATER METERS



The target for revenue water deliveries calculated using meters is 100%. During the 2nd Quarter, meter actuals accounted for 99.1% of flow. Estimates are generated for meters that are out of service due to instrumentation problems or in-house and/or capital construction projects. The following is the breakdown of estimations:  
In-house/Capital Construction Projects - 0.5%  
Instrumentation Failure - 0.4%

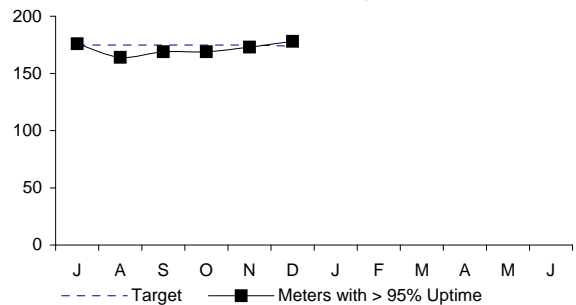
During the second quarter, out of a possible 1,622,112 data points, only 39,114 points were missed resulting in a system-wide up time of 97.6% (target = 95%). Staff continue to work with meter system vendors to improve performance, resolve velocity issues and reduce estimates.

### Miles Surveyed for Leaks



Staff inspected 48.73 miles of MWRA water mains in the 2nd Quarter bringing the total for the fiscal year to 146.6 miles.

### Individual Meter Uptime



Of the 183 revenue meters currently installed, an average of 10 meters experienced down time in excess of the 95% target. For the 2nd Quarter, down time is defined by any individual meter having less than 2,800 data points. Target numbers may vary depending upon the number of meters in service. As construction activities increase (April-November), meters are removed and estimates are generated based on surrounding meters and past performance.

#### Water Distribution System

| Month                | J   | A   | S    | O    | N    | D    | J | F | M | A | M | J |
|----------------------|-----|-----|------|------|------|------|---|---|---|---|---|---|
| Leaks Detected       | 0   | 1   | 0    | 0    | 1    | 0    |   |   |   |   |   |   |
| Leaks Repaired       | 0   | 0   | 1    | 0    | 0    | 1    |   |   |   |   |   |   |
| Backlog              | 0   | 1   | 0    | 0    | 1    | 0    |   |   |   |   |   |   |
| Avg. Lag Time (days) | 0.0 | 8.0 | 34.0 | 34.0 | 29.0 | 30.5 |   |   |   |   |   |   |

One leak was found and repaired in the 2nd Quarter. In December, Pipeline staff repaired the WASM 10 leak found in November. The leak was plugged with the line live so there were no service impacts. The leak backlog for FY08 is currently at zero. The Pipeline Program's goal is to repair all leaks found during the fiscal year.

# Water Distribution System Valves

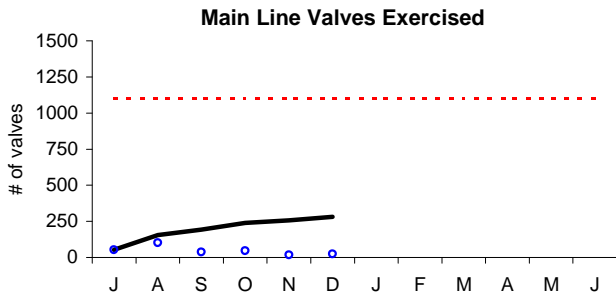
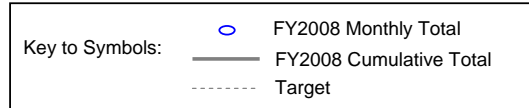
## 2nd Quarter - FY08

### Background

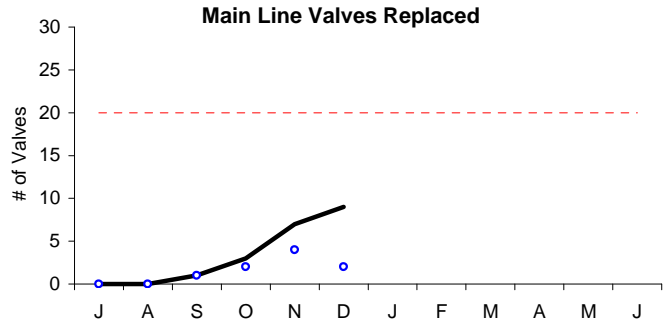
Valves are exercised, rehabilitated, or replaced in order to improve their operating condition. This work occurs year round. Valve replacements occur in roadway locations during the normal construction season, and in off-road locations during the winter season. Valve exercising can occur year round but 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.

Main line and blow-off valves exercising numbers were down this quarter because of the need to redirect staff's efforts on other priorities. Valve staff have had to spend time: rebuilding two control valves (Oak Hill Control Valve and Shaft 9 PRV ); working on major flushing projects to reactivate the long-isolated segments of the Spot Pond East and West Supply Mains on Beacon Street in Brookline; and flushing Sections 4, 5, 6, 11 and 12 NLS Mains in Somerville and Medford. Valve staff were also needed to provide extensive support on major valve replacement projects on NHS Sections 13, 48 and 70, as well as other ongoing CIP projects.

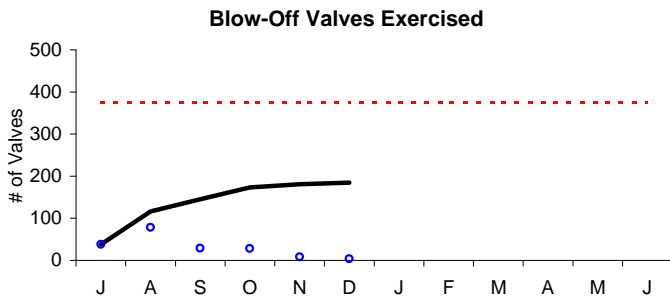
| Type of Valve      | Inventory # | Operable Percentage |              |
|--------------------|-------------|---------------------|--------------|
|                    |             | FY08 to Date        | FY08 Targets |
| Main Line Valves   | 1,265       | 86.6%               | 84%          |
| Blow-Off Valves    | 1,132       | 91.1%               | 94%          |
| Air Release Valves | 1,324       | 90.5%               | 86%          |
| Control Valves     | 51          | 94.0%               | 92%          |



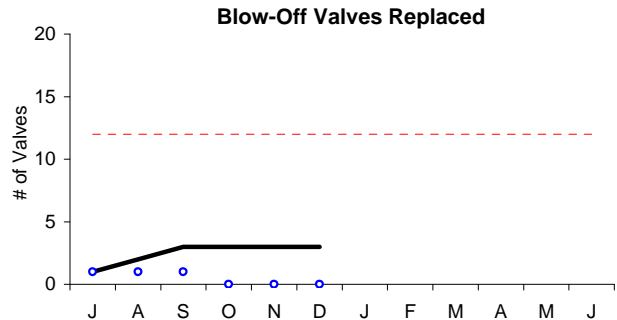
During the 2nd quarter, staff exercised 88 main line valves bringing the total for the fiscal year to 281.



Staff replaced eight main line valves in the 2nd Quarter; this brings the total for the fiscal year to nine.



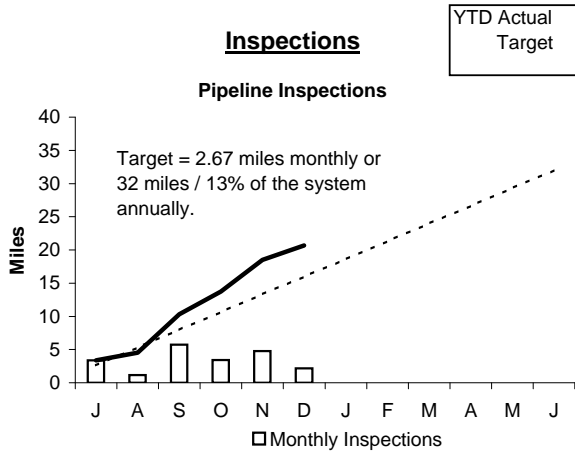
During the second quarter, staff exercised 40 blow-off valves, which brings the total for the fiscal year to 185.



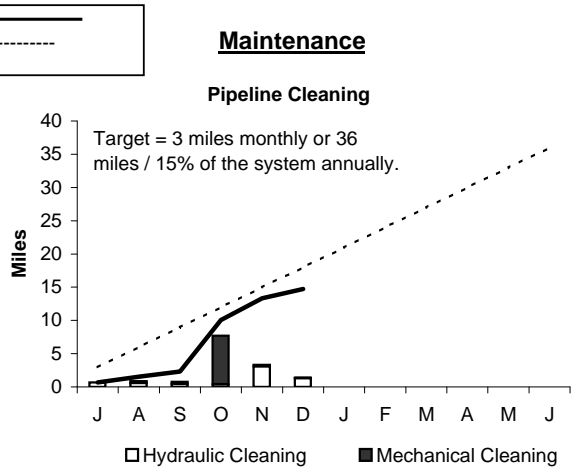
No blow-off valves were replaced this quarter so the total for the fiscal year remains at three.

# Wastewater Pipeline and Structure Inspections and Maintenance

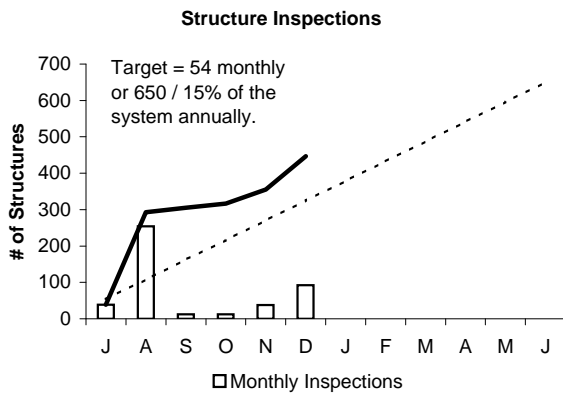
## 2nd Quarter - FY08



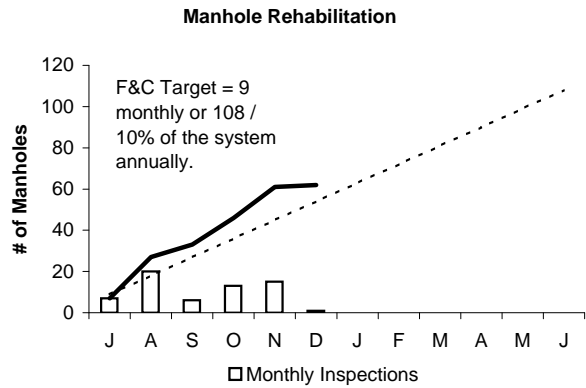
Staff internally inspected 10.38 miles of MWRA sewer pipeline in the 2nd Quarter, bringing the total for the fiscal year to 20.67 miles. Staff also inspected a total of .11 miles of pipeline in Somerville and Wakefield as part of the Community Assistance Program.



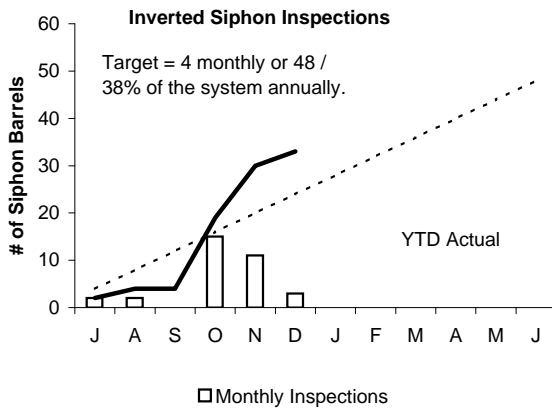
Staff cleaned 12.40 miles of MWRA's sewer system in the 2nd Quarter (14.75 miles to date in FY08) and removed 30.5 cubic yards of grit and debris. MWRA also provided Community Assistance to Everett and Wakefield during the 2nd Quarter.



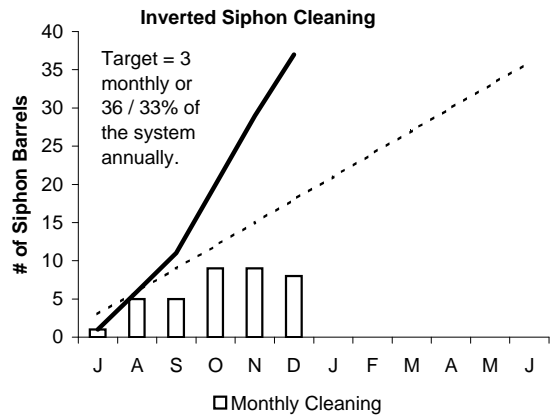
Staff completed 142 structure inspections this quarter, including the 12 CSO structures. This brings the total number of inspections for the fiscal year to 447.



Staff sealed one headhouse structure and repaired or replaced 28 manhole frames and covers in the 2nd Quarter. were repaired or replaced. No manholes were rehabilitated this quarter.

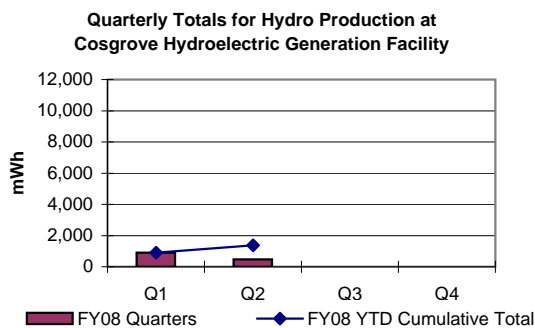


Staff inspected 29 siphon barrels during the 2nd Quarter bringing the total for the fiscal year to 33.

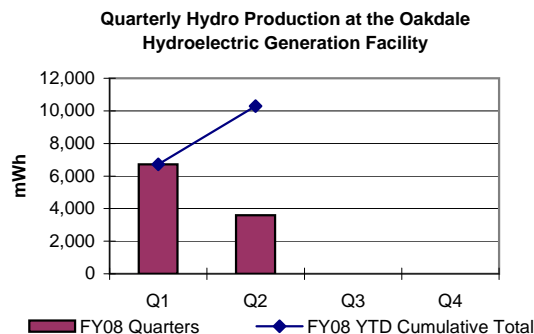


Staff cleaned 26 siphon barrels this quarter, which brings the total for the fiscal year to 37.

## Field Operations Energy Program 2nd Quarter - FY08



In the 2nd Quarter, the Cosgrove Hydroelectric Station generated a net of 467 mWh resulting in revenue of \$25,271. Generation was down slightly from the same quarter last year due to the planned repair of a crest gate from July through December that required a lower elevation in the Wachusett Reservoir. In addition, staff continued to resolve issues with an emergency generator so flows through Cosgrove were kept lower than usual, thereby reducing generation capacity. In previous years, Cosgrove was shut down during half-plant operations but this year, plant staff are trying to keep some flow going through Cosgrove. To date, there have been no problems. Therefore, total generation this year should be higher during the winter months than in previous years.



In the 2nd Quarter, Oakdale's hydroelectric plant generated 3,592 mWh resulting in revenue of \$265,492. Generation was 50% higher than during the same quarter in FY07, because Fall 2007 was drier than the previous Fall and more water was transferred from Quabbin to Wachusett. (Oakdale's operating protocol dictates that power is generated when water is transferred from Quabbin to Wachusett unless conditions result in flows that are in excess of generating capability.)

### Energy Program Highlights

**MWRA Wind Power Consultant:** In the 4th Quarter of 2007, Black & Veatch began work on the wind power consulting services contract. The scope of services required the Consultant to short-list four MWRA facilities with the highest potential for wind power generation and to perform an in-depth wind power site assessment for each of those locations. Thus far, Black & Veatch has determined that the Nut Island Headworks, the Braintree-Weymouth Intermediate Pump Station (IPS), the Carroll Water Treatment Plant, and the Southborough Facility are the most viable facilities for wind power development. MWRA received a design and construction grant totaling \$500,000 from the Massachusetts Technology Council (MTC) for design and construction of a turbine at Nut Island. A public meeting was held at Nut Island in December to present the concept to the community surrounding Nut Island. A lot of issues were raised and are being considered. Black & Veatch is continuing to work on the next phase of the Nut Island turbine, such as interconnection issues, permitting, etc.

**John J. Carroll Water Treatment Plant (CWTP) Photovoltaic Feasibility Study:** A feasibility study was completed for a project to install photovoltaic (solar) panels at the CWTP to generate electricity. Staff submitted a grant application to MTC to obtain \$250,000 for construction. MTC did not award a design and construction grant to MWRA for the Carroll Water Treatment Plant Photovoltaic Feasibility Study but did suggest that there are other grants available, specifically for solar installation.

**Loring Road Hydroelectric Generation Feasibility Study:** MTC awarded a \$50,000 grant to MWRA to conduct a feasibility study for installing a hydroelectric turbine in the Loring Road facility to harness the energy generated when the hydraulic grade line drops approximately 80 feet between Norumbega and Loring Road. The study is in process and depending on the outcome of the feasibility study, MWRA may apply for a design and construction grant from MTC.

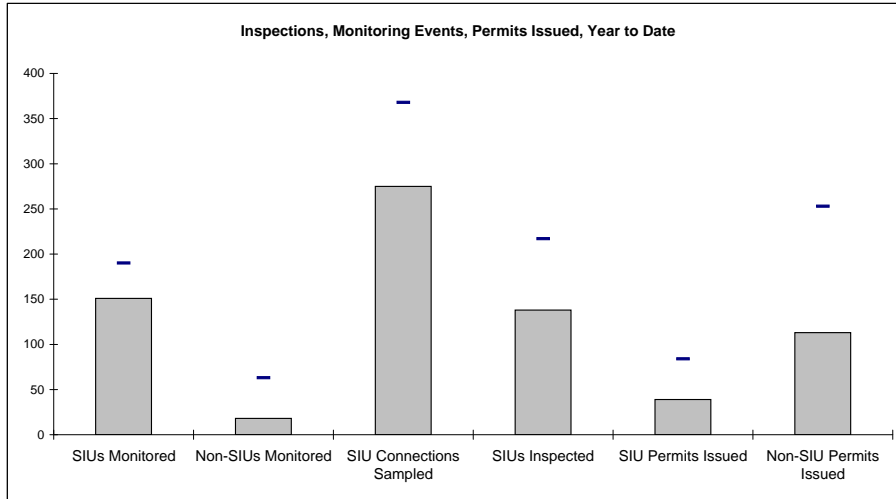
**CWTP Energy Audit:** National Grid (NGRID) is conducting an energy audit of the CWTP. It began in the 2nd Quarter and will continue into the 3rd Quarter. NGRID is funding 50% of the audit cost. In the preliminary phase, NGRID's Contractor, DMI, Inc., visited the plant, investigated energy usage, and made preliminary recommendations for 10 energy conservation measures. These recommendations were reviewed by Operations staff and the Contractor. DMI is performing a more detailed technical and economic analysis of each measure. MWRA will be under no obligation to accept any of the audit recommendations but any equipment recommended, if implemented, will automatically qualify for the utility rebate program.

**CWTP Lighting Audit:** In addition, a lighting audit at the CWTP was conducted during the 1st Quarter and staff are moving forward with implementation of the audit recommendations.

**Chelsea Facility Energy Audit:** NSTAR is conducting an energy audit for the Chelsea Facility. A walk-through will be conducted in January 2008. NSTAR is the energy provider for the Chelsea Facility and will provide automatic rebates for up to 50% of any energy-saving measure implemented as a result of the audit.

# Toxic Reduction and Control

2nd Quarter - FY08



EPA Required Monitoring Events

for FY08: 190  
YTD : 151

Required Non-SIU Monitoring Events

for FY08: 63  
YTD : 18

SIU Connections to be Sampled

For FY08: 368  
YTD: 275

EPA Required SIU Inspections

for FY08: 217  
YTD: 138

SIU Permits due to Expire

In FY08: 84  
YTD: 39

Non-SIU Permits due to Expire

for FY08: 253  
YTD: 113

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

The annual goal is set at the beginning of the fiscal year but it 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.

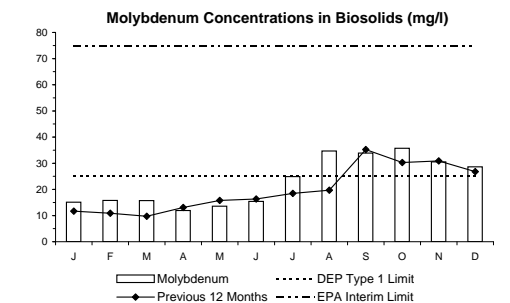
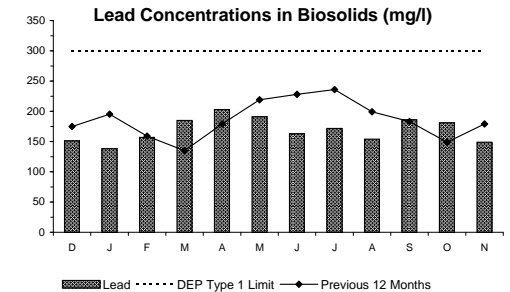
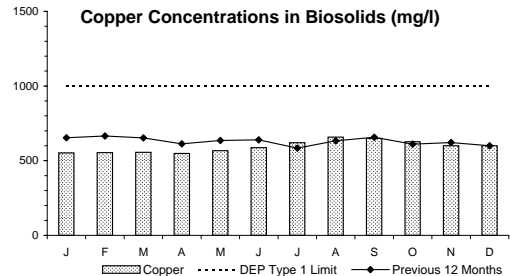
SIU and Non-SIU permits are issued with durations of two to five years, depending on the category of industry, varying the number of permits that expire in a given year.

|       | Number of Days to Issue a Permit |     |            |    |             |    | Total Permits Issued |         |
|-------|----------------------------------|-----|------------|----|-------------|----|----------------------|---------|
|       | 0 to 120                         |     | 121 to 180 |    | 181 or more |    | SIU                  | Non-SIU |
| Jul   | 0                                | 6   | 0          | 1  | 0           | 2  | 0                    | 9       |
| Aug   | 3                                | 8 * | 1          | 2  | 0           | 1  | 4                    | 11      |
| Sep   | 6                                | 9   | 0          | 2  | 0           | 1  | 6                    | 12      |
| Oct   | 8                                | 20  | 2          | 4  | 0           | 1  | 10                   | 25      |
| Nov   | 5                                | 20  | 1          | 2  | 6           | 4  | 12                   | 26      |
| Dec   | 6                                | 33  | 1          | 0  | 0           | 0  | 7                    | 33      |
| Jan   |                                  |     |            |    |             |    | 0                    | 0       |
| Feb   |                                  |     |            |    |             |    | 0                    | 0       |
| Mar   |                                  |     |            |    |             |    | 0                    | 0       |
| Apr   |                                  |     |            |    |             |    | 0                    | 0       |
| May   |                                  |     |            |    |             |    | 0                    | 0       |
| Jun   |                                  |     |            |    |             |    | 0                    | 0       |
| % YTD | 72%                              | 83% | 13%        | 9% | 15%         | 8% | 39                   | 116     |

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

\* TRAC also issued 318 Group Permits to printers and photoprocessors in August 2007.

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. TRAC will continue its voluntary molybdenum reduction program, which has decreased influent loads significantly since 1995.



## Field Operations Highlights 2nd Quarter – FY08

### Western Water Operations & Maintenance

- Carroll Water Treatment Plant (CWTP): The CWTP was transitioned to half-plant operation during the second quarter. Staff completed a variety of maintenance tasks associated with the maintenance availability period for Train A. Ozone diffusers were tested and replaced as needed; the primary and extended contactors were cleaned; the primary contactor hatches were inspected and re-caulked; the contactor rupture disks were replaced; vacuum relief valves received preventive maintenance; the bisulfite diffusers were inspected; the storage tank mud valves were inspected; new sodium hypochlorite diffusers were installed; Mag-meter bypass lines were installed and interior and exterior hatches were sealed. The contractor completed work extending the 30-inch finished water suction line within the A-side storage tank. Staff completed filling, disinfecting and sampling in preparation for activating Train A and isolating Train B at the beginning of the next quarter. Fuji Electric Corporation of America completed repairs to Ozone Generators 2, 3 and 4. Other activities during the quarter included installation of an electrical sub panel and outlets for computers and A.V. equipment in the new Western EOC, repairs to one of the storage tank dewatering pumps and a vendor demonstration of a remotely-operated tank cleaning vacuum.
- Cosgrove Intake and Power Station: Staff installed new actuators on the remaining three sliding sleeve valves. The new actuators replaced the resistive feedback units with optical devices, which will reduce wear on the screw jacks. With the assistance of a contractor, MWRA staff completed an electrical load bank test of the emergency generator to help with troubleshooting a fuel supply problem. Also, a diving contractor completed an underwater inspection of the lower portion of the traveling screens.
- Nash Hill Storage Tanks: With the assistance of the OEM representative, MWRA staff repositioned the gearing within the actuator of Butterfly Valve 7 so that the valve opens and closes properly. The valve became suspect while attempting to isolate Tank 2 to support the CVA redundancy contractor. Staff also completed repairs to the level spreader at the facility. A washed-out section of the inlet pipe was replaced and a new catch basin was installed to prevent the infiltration of fines.
- Sudbury Aqueduct: Staff completed the bridge deck portion of the graffiti removal project at the Waban Arches in Wellesley.
- Chicopee Valley Aqueduct (CVA): Staff continued to assist the CVA redundancy contractor with filling, flushing and activating completed sections during the quarter.

### Metro Water Operations & Maintenance

- Section 27 at Newhall Street in Lynn - Pipeline Replacement: Work began on the first phase, which was the installation of two new valves at the intersection of Newhall and Sagamore Streets. TV Inspection staff assisted with internal inspection of the pipeline. The entire pipeline length will not need to be replaced; shorter, specific lengths will be replaced.
- Sections 14 and 48 - Valve Replacement Work at Highland Avenue in Malden: Work began on test pits and trial hydraulic isolations. Pipeline staff replaced two existing valves. Meter 16 to Malden was isolated and then returned to service after the valves were replaced, which brings the total of main line valves replaced to nine for the first half of the year.
- Section 94 - American Legion Highway: Staff completed the leak repair in September but the main was flushed, disinfected and returned to service on October 23.
- Water Service Leak at Columbus Park Headworks: Water Pipeline staff responded to a leak on the service to the headworks; the site was excavated and the leak repaired.
- Wilmington Water Usage: Wilmington stopped taking water from MWRA's system through Woburn on October 25. Valve staff operated MWRA valves to partially fill the new Wilmington pipeline for the contractor to begin pressure testing.
- Metropolitan Reservoir Boom Deployment Training: Staff participated in boom deployment training with the Emergency Services Unit and Reservoir Operations staff to provide the capability of a first response in the event of a spill in Spot Pond, Fells Open Basin or Chestnut Hill Reservoirs.

**Metro Water  
Operations &  
Maintenance  
(Continued)**

- Dig Safe Pilot Program: MWRA's Dig Safe Pilot Program began in November. The pilot program provides the mark out of MWRA water mains within the City of Chelsea, which has six miles of MWRA main within the city. In November and December, 49 notices were received, four of which were of an emergency nature. A total of nine mark outs were required from the 49 total notices.
- Rebuild Shaft 9 Pressure Reducing Valve (PRV): Valve staff rebuilt one of two PRVs at Shaft 9. The work included installation of a new stainless steel inner bushing, new control piping, and a secondary (fail safe) relief pilot valve.
- WASM 10 Leak Repair: Pipeline staff repaired a WASM 10 leak in December. The leak was plugged with the line live, so there would be no service impacts.
- Isolation of Meter 166 in Quincy: Valve staff isolated a portion of Section 22 and Meter 166 to Quincy on December 3 in support of the Southern Spine construction contract. No water quality complaints were received as a result of the operation.
- Belmont Pump Station Isolation: The PRVs on Section 81 at the Arlington Covered Reservoir were activated on December 19. This allowed for the isolation of the Belmont Pump Station in anticipation of turning it over to the pump station rehabilitation contractor. The PRVs take water from the Northern Extra High (NEH) service area and reduce pressure into the Intermediate High Service Area.

**Wastewater  
Operations &  
Maintenance**

- CSO: SCADA upgrades at Prison Point, Cottage Farm and Somerville Marginal are now completed.
- Pumping: SCADA upgrades at Chelsea Screen House are completed and upgrades at Caruso Pump Station are near completion. A new Gate #3 at Framingham Pump Station has been installed, which will allow staff to perform preventive maintenance tasks by diverting flow through the station and operating the facility on a scheduled basis.
- Technical Inspection: Staff inspected 10.38 miles of MWRA interceptors, 142 structures, and 29 siphon barrels this quarter. Community Assistance was provided to Wakefield and Somerville as staff inspected a total of .11 miles of community sewers.
- Wastewater Pipeline: Staff cleaned 12.4 miles of MWRA interceptors and removed 30.5 yards of debris. Staff also sealed one headhouse structure, repaired or replaced 28 manhole frames and covers, and cleaned 26 siphon barrels. Community Assistance was provided to Wakefield and Everett.

**TRAC**

- Annual Industrial Waste Report: Pursuant to its NPDES Permits for the Deer Island and Clinton Wastewater Treatment Plants, MWRA submitted the 23rd Annual Industrial Waste Report to EPA and DEP
- Annual Significant Industrial User (SIU) Meetings: All SIUs were invited to participate in these annual meetings held by TRAC to provide pretreatment program updates and information to the priority permittees. More than 75 participants toured the Deer Island Wastewater Treatment Plant this year.
- Monitoring: Sampling staff completed the 2007 FES sampling at all six sites along the FES sewer line and at the 15 municipal sites.
- Settlement Agreement between New England Confectionery Company (NECCO) and MWRA: TRAC and NECCO entered into a Settlement Agreement to resolve all issues related to the 9/10/03 Notice/Order, the 12/2/04 Notice/Order and the 12/5/05 \$53,600.00 Penalty Assessment Notice (PAN) and Supplemental Order for violations of MWRA limits for pH, Total Fats, Oil and Grease (FOG) and zinc. The Settlement Agreement requires NECCO to pay a \$36,000 administrative penalty and pay stipulated penalties for a period of two years.
- Settlement Agreement between Conopco, Inc., d/b/a/ Unilever in Framingham and MWRA: TRAC and Conopco, Inc. entered into a Settlement Agreement to resolve all issues raised in four consolidated adjudicatory proceedings related to its appeal of certain terms and deadlines in its Sewer Use Discharge Permit and its appeal of the PANs dated May 9, 2006 and June 5, 2007. Penalties totaling \$701,400 were assessed against Conopco and Conopco agreed to

**TRAC  
(Continued)**

pay the sum of \$600,000 to resolve these assessments in the PANs and an additional \$33,500 penalty for discharge violations.

- EPA Audit: From December 10 through December 13, EPA staff and consultants conducted a Pretreatment Compliance Audit of MWRA's TRAC Program. The auditors reviewed TRAC's Regulations, Standard Operating Procedures, guidelines, and the files of several SIUs. Preliminary findings, delivered verbally at a close-out meeting, indicated that TRAC is following EPA's regulatory requirements as required. The auditors identified some issues with paperwork and record keeping and noted that MWRA needs to update its Sewer Use Regulations to clarify the application of recent changes made to EPA's Pretreatment Regulations. EPA stated that a final report on the audit would be sent to MWRA sometime in March 2008.

**Metro Equipment  
and Facility  
Maintenance**

*Equipment Maintenance Program*

- Nut Island Headworks: Plumbing staff replaced two leaking water valves for the incoming city water line inside the facility. The work was coordinated with the City of Quincy while the City replaced the water meter. There was a scheduled shutdown of the supply water and staff worked quickly to replace the valves without having to shut off the system twice.
- Columbus Park Headworks: Mechanics cleared rags wrapped around the bar racks and caught in the horizontal conveyor screws. The water main entering the building outside the foundation wall ruptured causing full loss of water at this facility. Water Pipeline staff excavated the area at the foundation while Plumbing staff reworked the six-inch piping into the building. Plumbing staff also replaced spray water piping for one of the scrubbers due to excessive leaking.
- Chelsea Headworks: Plumbing staff replaced a 25-foot+ section of overhead grit/ejection piping from Channels 3 and 4, which required rigging. Also, the inlet piping to the grit pods were rotated after substantial wear was detected. This is a Reliability Centered Maintenance or RCM recommendation to increase their life expectancy. Plumbing staff replaced sections of the water service line inside the facility due to corrosion. The piping was replaced and then wrapped with "cosmaline" to protect it and increase life expectancy. Mechanics also cleared rags wrapped around the bar racks and caught in the horizontal conveyor screws.
- Framingham Gate #3: Machine Shop staff assisted the contractor installing the new gravity sluice gate by correcting hole spacing that was slightly off from the bolt pattern. After final installation, Electricians powered up the actuator and set limit controls.
- Service Contract Updates: **Crane Maintenance Service, Contract OP-51** – Change Order was executed to add crane equipment located at Union Park CSO, BOS019 and IPS to the contract. **New Elevator Service Contract for Deer Island Treatment Plant, Contract OP-85** - Contract re-advertised on December 15 and will be bid January 2008. **Fuel Storage Tank Maintenance Service, Contract OP-48** – Testing of cathodic protection systems at various locations in progress. Draft SOP prepared by contractor and distributed for staff review comments. **Air Compressor System Service, Contract OP- 49** – Renewal of certificates of air vessels being coordinated between FM Global and the contractor. **New Hydraulic Service, Contract OP-79** – Bids were opened on 11/15 but were rejected; re-bid scheduled to be opened on 01/03/08. **Boiler and Water Heater Service, Contract OP-63** –The Prison Point Boiler was replaced. Removal of lower section of glycol coils in the scrubbers and replacement of insulation on rooftop piping at Columbus and Ward Street Headworks completed.
- Project Updates: **Nut Island Air Damper Design/Nut Island Air Damper Replacement Contract OP-64** – Air Damper and actuator installation completed. **Chelsea Creek Ductwork Repair and Cleaning** – Contract to improve the existing ductwork to maximize airflow and balancing. Bids were opened on 10/11; contract awarded to Cooling & Heating, Inc. and NTP scheduled for January 2008. **Electrical Testing Contract** – Bids were opened on 11/09 and contract awarded to Infra Red; NTP is pending. **Nut Island Odor Control System Rehabilitation** – An initiative for evaluation and design to upgrade the chemical feed system is underway. Modifications will impact carbon system use and the SCADA system. The chemical feed pumps, piping, and tanks are under review.



**Metro Equipment  
and Facility  
Maintenance  
(Continued)**

*Grounds/Custodial Maintenance*

- Fence Work: Crews removed the gates at the IPS, straightened and reinforced them in the shop, and re-installed them the same day. The Ward Street Headworks' main gate was repaired and re-secured. Crews installed approximately 250 feet of fencing with gates to secure a laydown area for Water Pipeline working on Section 27 in Lynn. Staff completed the fenced-in pipeline inventory stock area in Chelsea.
- Grounds Work: Cottage Farm cleanup was performed in preparation for the Head of the Charles. Grounds work was completed at Loring Road and the Fells Reservoir areas. Significant snow removal completed in December. Easement clearing was completed at Water Pipeline locations, including Sections 24, 85, 87 and 88.
- Nut Island: A Jersey barrier and some chain were installed across the entrance to the pier at Nut Island as a temporary measure until a permanent gate can be installed in the spring. The gate will hopefully minimize vandalism and other problems by keeping vehicles off the pier.

*Facility Maintenance*

- Facility Improvements: Modifications were made to the Intermediate Pumping Station to protect electrical switchgear and panels below the plenum area. The plenum floor was made water tight with epoxy coating. Modifications were made to a leased storage facility in Malden for the winter storage of MWRA vector trucks. The brick above the overhead doors at Ward Street at the dumpster bays was repaired. Facility Specialists installed a new door at the Gillis Pump Station to match the old one, maintaining similar architectural features of the building.
- Operations & Maintenance Support: Shoring was installed for Water Pipeline at Section 70 work in Melrose, along with providing support for replacement of a main line valve in Section 48/14 in Malden. Concrete berms were poured around conduits at Nut Island that were deteriorating in the truck bay area. Roof inspections were conducted at the headworks and at a number water facilities as part of the annual condition assessment. A roof leak was patched at the Shaft 9A Building, with replacement scheduled in the spring.
- Graffiti Removal: Painters removed graffiti at the Deer Island Treatment Plant along the easterly shoreline. Graffiti was also removed from Echo Bridge in Newton and at Nut Island, a reoccurring problem.
- Nut Island: Handicapped parking spaces were painted and signs placed on the apron at the head of the pier, one of several improvements to the pier. Parking bumpers were ordered to complete this project.

**Operations  
Support**

*Emergency Planning*

- Staff continue to participate in an EPA-led initiative to develop Mutual Aid Agreements to expedite emergency response to Hurricane Katrina-type disasters. A draft model agreement for Massachusetts water suppliers, called MA WARN (Water Agency Response Network), which was completed in August with input from MWRA staff, will be broadly circulated to other Massachusetts utilities is expected in the coming months. Staff briefed the Advisory Board on the topic in November. Staff plan to prepare a staff summary to authorize MWRA to enter into the MA WARN agreement in early 2008.
- Staff currently preparing purchase specifications for mobile analytical equipment and water quality sensors as authorized by a recent Department of Homeland Security Grant.

*Operations Engineering*

- Staff continued to provide support on major capital and in-house projects with significant 2nd quarter activity on the Five Water Pump Station rehab project, Phase 6 Valve Rehabilitation, CVA Redundancy Improvements, Section 22 Redundancy and SCADA Implementation. This support included planning for numerous shutdowns and start-ups of rehabilitated facilities.

**Operations  
Support  
(Continued)**

*SCADA*

- Construction of SCADA Improvements is ongoing. Through the 2nd Quarter, controls have been successfully upgraded at 9 of the 11 field sites to the point that site functions are now controllable from the Operations Control Center in Chelsea. Functional Acceptance Tests are scheduled for two other sites. The second construction contract (SCADA Improvements at Headworks) has been advertised and bids will be opened in January 2008. The third (and final) construction contract is still in design.

*Wastewater Metering*

- Throughout the 2nd Quarter, staff continued to work aggressively on reducing erratic velocity issues at some meter sites. Staff continued implementing site-specific solutions from the meter manufacturer's July report and are seeing improved data quality in many sites. This has significantly reduced the need for estimation and data adjustments at former problem sites.
- A staff summary briefing on the wastewater metering system was presented at the November Board meeting. Staff are currently reviewing individual meter performance in preparation for compiling year-end flows.

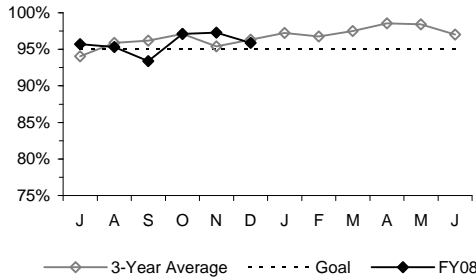
*Water Quality Assurance*

- Staff expanded coliform sampling during the 2nd Quarter to monitor additional locations within CWTP and to monitor effects during treatment process changes.
- Staff prepared data reports and analyses of coliform issues and participated in a review by an Expert Panel in October. The Expert Panel provided opinions on potential courses of action and helped staff finalize a strategy for near-term improvements to mitigate coliform issues.
- Staff helped to develop and implement the annual half-plant operation and cleaning of the ozone contactors and tanks, including sampling of solids and biofilm in normally inaccessible areas.

# Laboratory Services

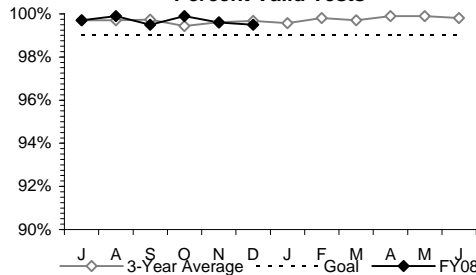
2nd Quarter - FY08

**Percent On-Time Results**



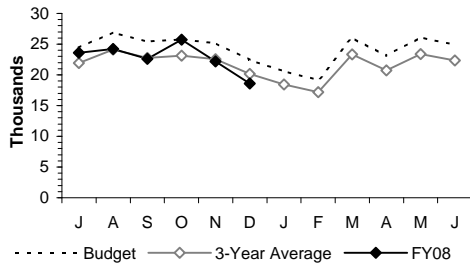
The Percent On-Time measurement was above the 95% goal for all three months of the 2nd Quarter.

**Percent Valid Tests**



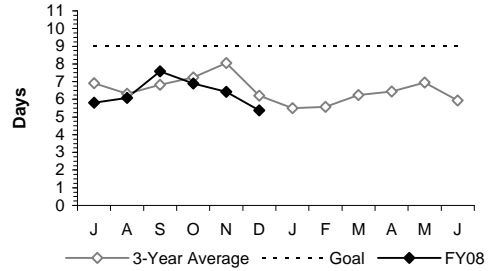
The Percent Valid Tests measurement stayed above the 99% goal for all three months of the 2nd Quarter.

**Tests Completed**



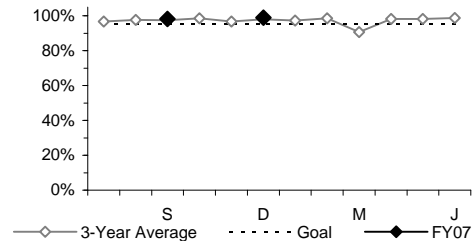
The Tests Completed measurement was below the seasonally-adjusted budget goal for two months this quarter.

**Turnaround Time**



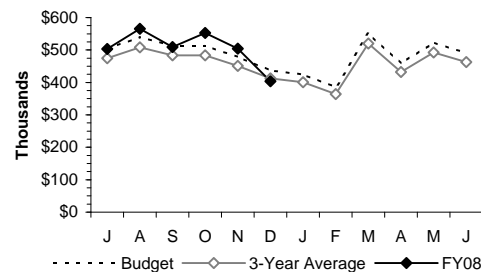
Turnaround Time was faster than the 9-day goal for all three months during the quarter.

**Quarterly Compliance Rating**



A compliance audit of methods and procedures at all five lab locations found good compliance with requirements. Quarterly compliance audits are performed in September, December, March and June.

**Value of Services Rendered**



Value of Services Rendered was above the seasonally-adjusted budget projection for two of the three months this quarter, and remains above the goal fiscal year to date.

**Highlights:** DLS's paper on "False Cyanide Formation during Drinking Water Sample Preservation and Storage" was published in "Environmental Science and Technology". The Orange team continued its SUPERIOR streak on the National Research Council's Intercomparison for Trace Metals.

**LIMS:** Staff have begun working with LabWare, the new LIMS Contractor. Implementation of the new LIMS will take approximately one year. MIS completed changes to the new DEP Total Coliform Rule reporting forms.

**Security:** Staff are participating in the EPA Water Sentinel project, an AWWA Project, "Evaluating Disinfection in a Security Conscious Environment", and the Threat Ensemble Vulnerability Assessment users group. Purchasing field instruments for a mobile laboratory.

**Quality Assurance:** Completed the Quality Assurance Project Plan for the Residuals pellet testing program.

**DITP:** The project to build a room for the new ICP/MS instrument is making good progress with a completion date expected in early 2008. Provided information on testing used web scrubber material for disposal. Tested samples to support investigation of an FRSA tunnel pipe leak.

**Clinton:** Tested samples in support of a process control investigation.

**ENQUAD/DITP/Planning:** Completed annual benthic sediment samples from Mass. Bay. Received and summarized results for two rounds of testing for pharmaceutical and personal care products testing of DITP influent and effluent. Examined different *E. coli* verification procedures to improve DLS's data reliability for next year's harbor monitoring.

**FOD/TRAC:** Tested rush metals and hexavalent chromium samples. Held a coordination meeting with TRAC. Tested and arranged for outside testing of rush samples collected from the Rosemary Brook Siphon.

**FOD/Water Quality Assurance:** Continuing to test additional coliform "profiling" samples from various locations within CWTP including characterization of solids retrieved from Train A after shutdown. Participated in expert panel discussions regarding bacterial issues at CWTP. Tested complaint samples from residences in Somerville and Weston. Tested sodium hypochlorite from Ware Disinfection Facility for metals to assist in a degradation problem.

**Outside Customers:** Reported Reading's lead and copper results to the town. Tested samples to assist with an emergency connection to supply water to Ashland. Received the first round of Woburn's IDSE sampling under the Stage 2 DBP rule. Tested additional bacteria samples from Fort Point Channel for Save the Harbor/Save the Bay.

## **CSO Update**

### **2nd Quarter - FY08**

**North Dorchester Bay Tunnel and Related Facilities:** MWRA continued to make considerable progress with construction of the CSO Storage Tunnel and with design of the related dewatering pump station, force main and remote odor control facility. On October 17, the contractor for the North Dorchester Bay Storage Tunnel commenced excavating with the tunnel boring machine. The tunnel contractor has completed all of the drainage work at Outfall BOS087 and has also completed restoration and improvements at the Moakley Park ball fields that were disturbed during construction activities associated with Outfalls BOS085 and BOS086. Construction of the CSO and stormwater diversion structures and tunnel drop shafts at the other CSO outfalls along North Dorchester Bay is ongoing. MWRA recently received the 90% design plans and specifications for the pumping station, force main and odor control facility related to the storage tunnel. The consultant has designed the new force main along the revised alignment on East Broadway. The consultant completed the geotechnical program for the revised alignment in October and submitted the project's draft Geotechnical and Hazardous Materials Report to MWRA. In addition, the consultant has commenced bathymetric surveys in North Dorchester Bay and internal inspections and core samplings of the CSO outfalls as part of the CSO Outfall Sedimentation Study. The study is intended to develop recommendations for ensuring that the outfalls will remain operationally reliable after the CSO Storage Tunnel is brought on-line and discharges through the outfalls are infrequent.

**East Boston Branch Sewer Relief:** Final construction documents for Contract 6257, the largest of the three construction contracts for this project are due by February 2008. This contract, which is scheduled to commence in June 2008 in compliance with Schedule Seven, involves the installation of approximately 2.5 miles of new interceptor sewers by microtunneling along Border, Condor, East Eagle, Chelsea and Orleans Streets in East Boston. The design consultant is also scheduled to submit the 50% design plans for Contract 6841 in February 2008. This contract involves replacement and upgrade of approximately one mile of sewers in the upstream reaches of the East Boston interceptor system, primarily using pipe-bursting. The third construction contract was completed in 2004 and primarily involved relining approximately one mile of MWRA's East Boston Branch Sewer along Bremen and Chelsea Streets. In parallel with the final design efforts for the microtunneling contract, MWRA has continued to meet with outside agencies to coordinate the work with other projects in the area and to obtain necessary construction permits.

**Brookline Connection and Cottage Farm Overflow Chamber Interconnection and Gate Controls:** MWRA's design consultant submitted the Final Geotechnical and Hazardous Materials Assessment Report in October. The design consultant also submitted the draft 100% design documents in October. MWRA held preliminary meetings with the Cambridge Conservation Commission in October and plans to submit Notices of Intent to the Boston and Cambridge Conservation Commissions in January 2008 for approval of work subject to the Wetlands Protection Act. MWRA has sent copies of the draft 100% design documents to the Department of Conservation and Recreation (DCR) for its review of the work proposed on DCR land at Magazine Park in Cambridge and at Soldier's Field Road in Boston.

**Optimization Study of Prison Point CSO Facility:** MWRA has continued to implement and test improvements to the standard operating procedures at Prison Point CSO facility to minimize the frequency and volume of treated discharges to the Inner Harbor. MWRA has completed the upgrades to the SCADA system and the implementation of control strategies, which MWRA is now testing during wet weather events. MWRA will continue to operate the Prison Point facility in accordance with the recommended plan and will continue to monitor the effects of the new operations on treated discharge volume, dry weather pump discharge volume, and the avoidance of any increase in untreated CSO discharges in hydraulically-related systems. MWRA plans to submit a report on the results of its implementation and testing program to EPA and DEP by April 2008.

**South Dorchester Bay Sewer Separation:** By letter dated October 12, BWSC informed MWRA that it had closed all identified CSO regulators tributary to MWRA's Commercial Point and Fox Point CSO Treatment Facilities following substantial completion of the South Dorchester Bay Sewer Separation project earlier this year. With this confirmation that CSO discharges to these facilities have been eliminated, MWRA took both facilities off-line on November 1. This was accomplished by closing the influent and effluent gates and removing the bypass weirs that were installed when the facilities were originally brought on-line more than 15 years ago. Removing the weirs allows flow to pass through the original outfall conduits that now serve as BWSC storm drains. MWRA notified EPA, DEP and BWSC of its intent to close the facilities by letter on October 19. BWSC is continuing with private inflow source removal (downspout disconnections) in the tributary areas to further reduce stormwater inflow in the sewer system. Since 2006, BWSC has metered flows in the separated sewer system and conducted hydraulic evaluations to verify whether hydraulic performance goals have been met. BWSC has completed its metering program and is evaluating the meter data to determine the effectiveness of its downspout removal program to date.

**Morrissey Boulevard Storm Drain:** A component of the North Dorchester Bay CSO control plan, the Morrissey Boulevard Storm Drain Project, is intended to direct some of the North Dorchester Bay stormwater away from MWRA's CSO Storage Tunnel to maximize the level of stormwater control along South Boston beaches. As previously reported, BWSC has completed the first construction contract, which involved a new diversion chamber that will allow stormwater flows now discharging to South Boston beaches at Outfall BOS087 to be diverted to Savin Hill Cove in storms greater than the 1-year design storm. In smaller storms, the stormwater will be diverted to the North Dorchester Bay CSO Storage Tunnel. During the past quarter, BWSC made initial progress on the second, much larger construction contract, which commenced in September 2007. This contract primarily involves installation of the large storm drain (a 12-foot by 12-foot box conduit) along Morrissey Boulevard from Kosciuszko Circle to a new outlet at Savin Hill Cove. The contract is on schedule for Substantial Completion by June 2009, in compliance with Schedule Seven.

**Reserved Channel Sewer Separation:** Reserved Channel sewer separation is intended to minimize CSO discharges to the Reserved Channel by separating combined sewer systems in adjacent areas of South Boston. Implementation of the recommended sewer separation plan will reduce the number of overflows to the Reserved Channel from as many as 37 to 3 in a typical year. BWSC has substantially completed the data collection phase, including field investigations, internal pipeline inspections, building inspections, geotechnical investigations and flow metering. BWSC expects to receive the preliminary design report from its design consultant in February 2008. The report will define the size, extent and location of new storm drains and sewers necessary to separate the sewers tributary to the four existing CSO outfalls along the Reserved Channel. It will also define the level of stormwater inflow that BWSC must remove from the sewer system to effect the required levels of control at the outfalls. Final design will commence after the preliminary design report is reviewed.

**Bulfinch Triangle Sewer Separation:** The goal of the Bulfinch Triangle Sewer Separation Project is to minimize CSO discharges to the Charles River by separating combined sewer systems in the area of Boston roughly bounded by North Station, Haymarket Station, North Washington Street, Cambridge Street and immediate environs. The recommended sewer separation plan is intended to reduce the number of overflows to the Charles River, reduce overflows to the Prison Point CSO Facility and close Outfall BOS049. Field investigations, building inspections and survey work are substantially complete. BWSC received the final Preliminary Design Report from its design consultant in September and authorized final design activities, which are now underway.

**Brookline Sewer Separation:** This project will separate sewers in several areas of Brookline, totaling 72 acres, where there are remaining combined sewers tributary to MWRA's Charles River Valley Sewer. The project is intended to reduce discharges to the Charles River from the Cottage Farm Facility. The Town of Brookline submitted its preliminary design report to MWRA in late December. The report includes a detailed cost estimate that is substantially higher than the concept plan estimate in MWRA's CIP budget. Much of the higher cost is due to the necessary depth of the new sewers that will be constructed and Brookline's recommendation to use microtunneling. Brookline plans to authorize final design services after review of the report by the Town and MWRA.

**Cambridge/Alewife Brook Sewer Separation:** Due to a wetlands permit appeal previously reported, the City of Cambridge continued to be unable to commence design of either the CAM400 manhole separation project or the interceptor connection and floatables control installations at various Alewife Brook outfalls, which were required by Schedule Seven to start by July 2006. Accordingly, Cambridge was unable to commence construction of the CAM400 manhole separation project and was also unable to commence construction of the CAM004 stormwater outfall and detention basin, both required by Schedule Seven to start by July 2007. DEP issued a final decision closing the administrative appeal process on October 16. However, the appellants have since filed an appeal of that decision in Massachusetts Superior Court, in part, requesting the Court to enjoin the City of Cambridge from taking any action toward construction of any portion of the project until the matters of the appeal are resolved. MWRA and the City of Cambridge are now discussing how best to proceed in light of the November 14 appeal.

**Region-wide Floatables Control:** Several years ago, MWRA and BWSC completed work to control floatables in CSO discharges from the outfalls they own and operate that are not associated with other CSO control projects. **Cambridge Floatables Control:** Cambridge outfalls in this project are limited to four outfalls along the Charles River: CAM007, CAM009, CAM011 and CAM017. Floatables controls at Cambridge's outfalls along the Alewife Brook will be implemented with the projects that comprise the Alewife Brook CSO control plan. In November, the City of Cambridge substantially completed the construction contract to control floatables at the Charles River outfalls in compliance with Schedule Seven. The controls included underflow baffles that were installed at Outfalls CAM007 and CAM017 and the closing of Outfalls CAM009 and CAM011, which Cambridge earlier discovered were nearly blocked with debris. Cambridge intends to monitor system conditions near CAM009 and CAM011 during the next two years to verify no adverse hydraulic effect. With completion of this Cambridge work, Region-wide Floatables Controls are now fully implemented.

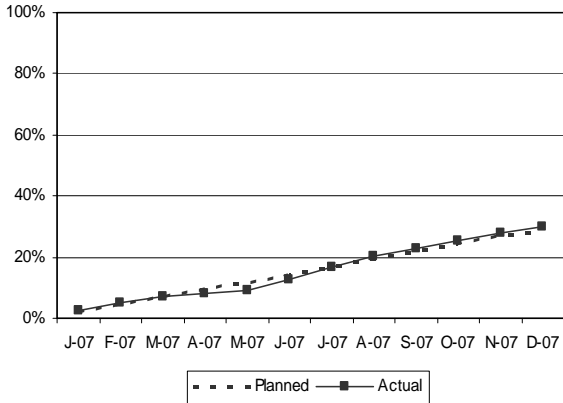
# CONSTRUCTION PROGRAMS

# Projects In Construction - 1

## December 2007

(Progress Percentages based on Construction Expenditures)

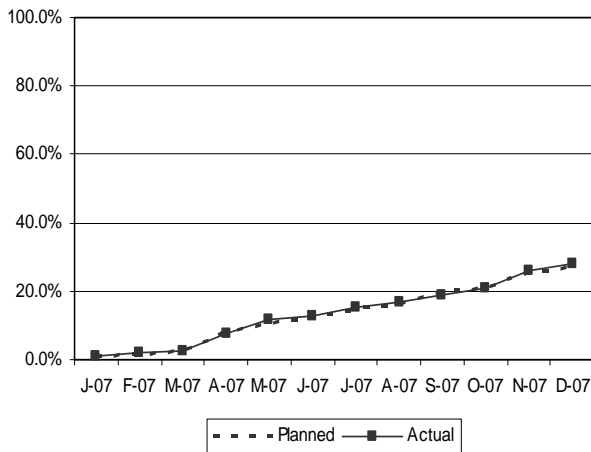
**Blue Hills Covered Storage Design Build Project**  
Progress - December 2007



**Project Summary:** This project includes of a 20 million gallon covered storage facility at the Blue Hills Reservation, providing sufficient distribution storage to the communities of MWRA's Southern High Storage Area.

**Status and Issues:** During December, the contractor continued forming, installing rebar and placing concrete for the walls in Tank 2. The contractor also began forming and installing rebar for the walls at the Valve Vault. The contractor excavated across the Chickatawbut Road and installed all required pipelines. The road was backfilled, repaved and the guardrail was reinstalled. The contractor also took delivery of and installed the base slab and first couple riser sections of the precast Outlet Control Structure.

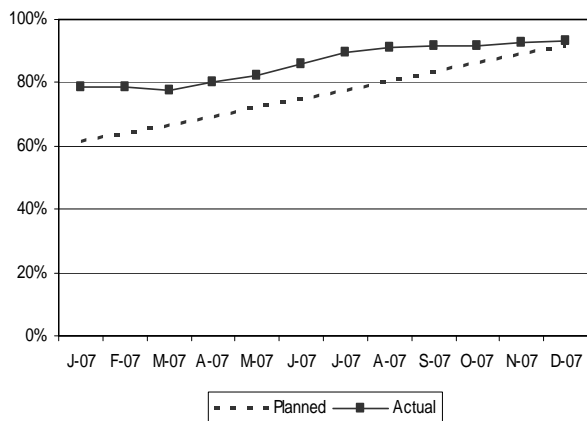
**North Dorchester Bay CSO Tunnel/Shafts**  
Spending - December 2007



**Project Summary:** Construction of 10,872 LF of 17-ft diameter segment lined storage tunnel with 7 diversion structure/drop shafts and associated sewer and drainage separation pipework.

**Status and Issues:** During December, the contractor mined to Sta 6+93. The contractor began commissioning of the construction water treatment plant and completed the installation of the Trailing Gantries underground and restarted mining. The contractor commended the 2<sup>nd</sup> planned outage to reconfigure the shaft bottom to support a two train operation. Mining is scheduled to restart on January 14, 2008. At -085 and -086 the contractor continued diversion structure fitout and continued installing interconnecting hydraulic, power, communications and control utilities. At -087 the contractor completed the restoration of the Bayside Expo pavement and vacated the Bayside construction easement. Schedule performance continues to be ahead of schedule.

**Upper Neponset Valley Sewer**  
Progress - December 2007

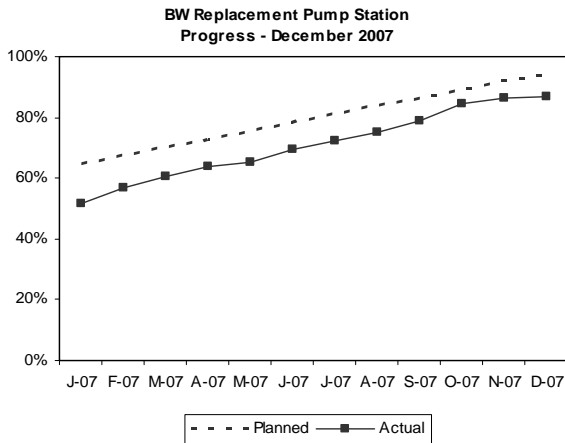


**Project Summary:** This contract will provide 16,500 LF of gravity sewer, installed by cut/cover and pipe jacking along the VFW Parkway.

**Status and Issues:** The contractor completed temporary paving on Charles Park Road and Gardner Street. The contractor began pipe abandonment in St. Joseph's Cemetery. This work includes the construction of bulkheads in the existing sewer and filling the sewer with a modified flowable fill. The contractor also commenced the final pruning of trees along the VFW Parkway based on the DCR post construction review. Expected billings for month will be approximately \$237,086.

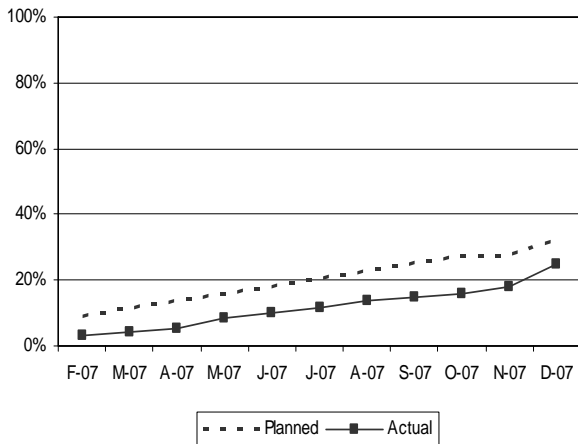
## Projects in Construction - 2 December 2007

(Progress Percentages based on Construction Expenditures)



In December, the contractor completed installation of the copper flashing fascia and soffit, installed drywall at perimeter knee wall in the attic, installed fan EF-2 and dampers in the odor control room, installed the generator silencer drain to sump, sump pump and associated piping in the valve room. The contractor also installed the W-1 water meter and backflow preventer, the fire protection system backflow preventer, the leaching pits and piping for roof drainage, the gas detection sensors at all levels of the pump station, the metering cable from Jewett St. to the transformer, the existing electrical duct banks and the backup control panel CP-1 in the electrical area. The December invoice is expected to be approximately \$545,000 or 3% of the adjusted contract price. National Grid/Verizon has delayed the schedule to complete their pole and wire installation until January 23, 2008. A delayed completion date of April 8, 2008 (36 days) is due to not having the permanent power energized. The contractor is working two shifts to expedite the completion.

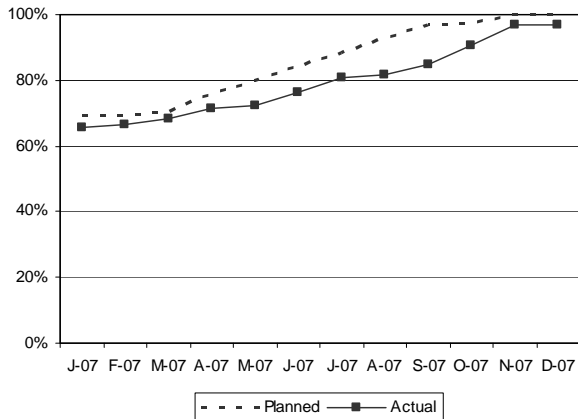
**Rehabilitation of Water Pumping Stations  
Progress - December 2007**



**Project Summary:** This work provides rehabilitation of a series of water pump stations. At the present time, Brattle Court and Hyde Park are the focus of work.

**Status and Issues:** At Brattle Court, the contractor completed installation of section 36 piping through Vault C and up to Meter 58, coring the MCC pad and duct bank entrance, the generator pad extension, and the work to switch bathroom plumbing on to the new sanitary system. The contractor also installed MCC A and B and rotated P-1 and P-3 surge control valves to vertical position. At Hyde Park, the contractor continued Phase 1 electrical demolition, P-1 and P-2 interior piping and the installation of the MCC. The contractor also began installation of conduits for the MCC and VFD's. At Belmont the contractor completed the demolition of tile on the first floor and boiler area and completed the rough-in of the unit heater gas line. The variance between spending and schedule relates to material (pumps, motors, generators and transformers) having been ordered but not yet delivered. Work at the station continues in preparation for these deliveries, at which point the contractor will bring the schedule in line with spending.

**Chicopee Valley Aqueduct Pipeline Redundancy Project  
Progress - December 2007**



**Project Summary:** This project includes construction of redundant pipeline improvements in the Chicopee Valley, providing alternate water supply to the communities of Chicopee, South Hadley Fire District #1 and Wilbraham.

**Status and Issues:** Work continued on the punch list and electrical and instrumentation final connections. The Chicopee connection work at Nash Hill and Holyoke Street are delayed to next spring due to the existing Nash Hill valve problem of not being able to shutdown the existing 36" Chicopee line sufficiently to complete final piping interconnections. A change order is in the process to extend the remaining work to March/April 2008. Expected billings for the month will be approximately \$409,000.



## CIP Expenditures December 2007

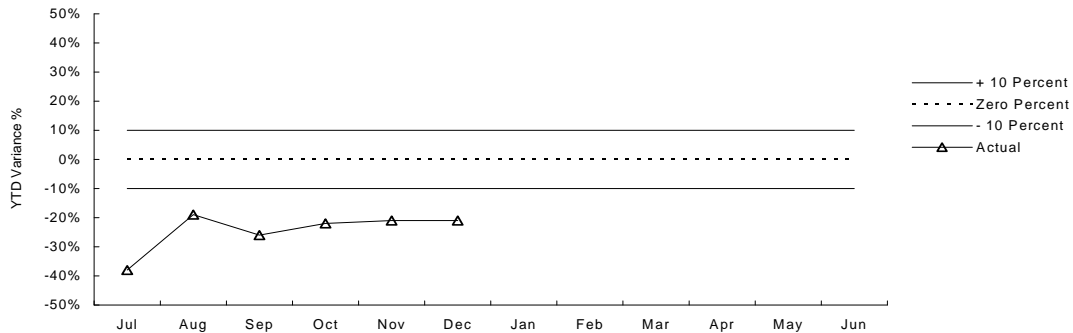
Accurate projections of CIP spending are one measure of effective project management and are important to ensuring that funds are available to support MWRA's capital program.

| FY08 Capital Improvement Program<br>Expenditure Variances through December by Program<br>(\$000) |                                 |                                 |                    |                     |
|--|---------------------------------|---------------------------------|--------------------|---------------------|
| Program  | FY08 Budget Through<br>December | FY08 Actual Through<br>December | Variance<br>Amount | Variance<br>Percent |
| Wastewater   | 61,670                          | 60,355                          | (1,315)            | -2%                 |
| Waterworks   | 36,099                          | 18,037                          | (18,062)           | -50%                |
| Business and<br>Operations Support   | 3,119                           | 1,222                           | (1,897)            | -60%                |
| <b>Total</b>   | <b>\$100,888</b>                | <b>\$79,614</b>                 | <b>(\$21,274)</b>  | <b>-21%</b>         |

Underspending through December within Wastewater is primarily attributable to the original forecasted progress for the North Dorchester Bay Tunnel Project being less than originally anticipated. Progress has increased and will continue to increase through the rest of the fiscal year. Underspending within Waterworks is primarily attributable to the timing of community loans as part of the Local Water Pipeline Improvement Loan Program. Also, timing for Watershed Land purchases.

### CIP Expenditure Variance

*Total FY08 CIP Budget of \$227,943,000.*



### Construction Fund Management

All payments to support the capital program are made from the Construction Fund. Sources of fund revenues 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 1/26/08   | \$130 million |
| Unused capacity under the debt cap:                                    | \$417 million |
| Estimated date for exhausting construction fund without new borrowing: | Mar-08        |
| Estimated date for debt cap increase to support new borrowing:         | FY2009        |
| Commercial paper outstanding:  | \$89 million  |
| Commercial paper capacity:   | \$350 million |
| Budgeted FY08 capital spending*:                                       | \$206 million |
| Projected FY08 grant and SRF receipt:                                  | \$83 million  |

\* Cash based spending is discounted for construction retainage.

# DRINKING WATER QUALITY AND SUPPLY

# Source Water – Microbial Results

2nd Quarter - FY08

## 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 requires that no more than 10% of source water samples prior to disinfection over any six-month period 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 entering the CVA system. MWRA met the six-month running average standard for fecal coliform continuously at this location during the past year.

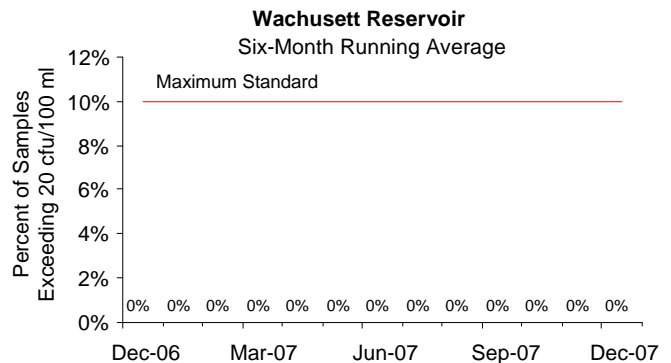
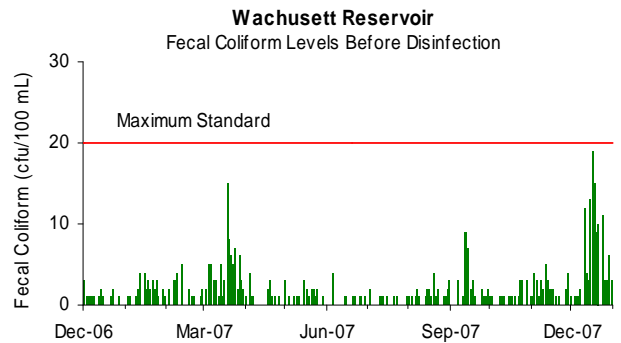
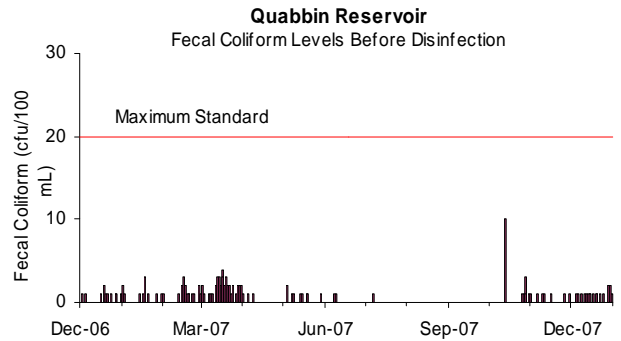
Bird harassment and observation at Quabbin Reservoir was fully implemented on October 29. DCR staff continued activities that included observation and harassment. Boat-based harassment performed from 3:30 P.M. until one hour after dark has been effective in keeping waterfowl away from the area around the CVA intake.

All samples collected during the 2nd Quarter were below 20 cfu/100ml. For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100ml.

### Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled before it enters the MetroWest/Metropolitan Boston systems at the CWTP raw water tap in Marlborough.

All samples collected during the 2nd Quarter were below 20 cfu/100ml. For the current six-month period, 0.0% of the samples exceeded a count of 20 cfu/100ml.



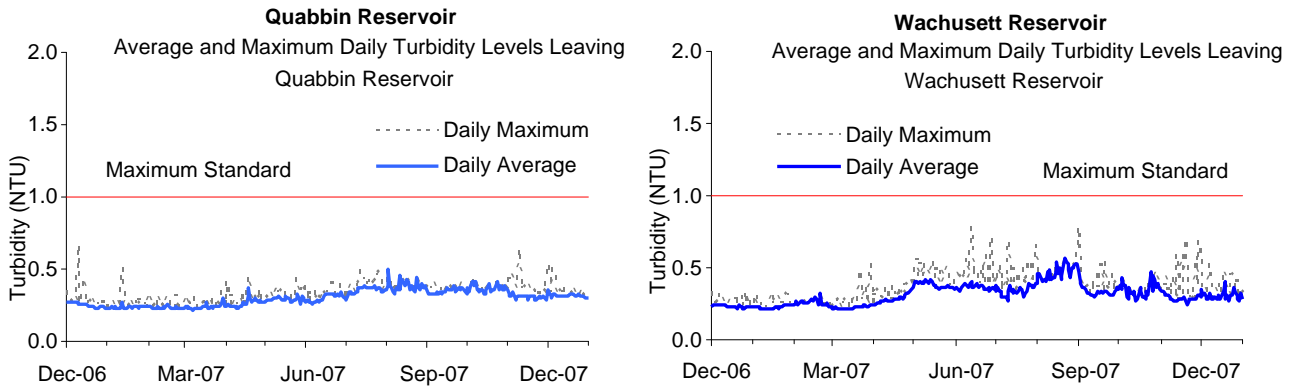
# Source Water – Turbidity

2nd Quarter - FY08

## 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.

Samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. Samples from Wachusett Reservoir are taken at the CWTP inlet (raw water line) before treatment. The Massachusetts Department of Environmental Protection standard for source water turbidity for unfiltered water supply systems is a maximum of 1.0 NTU; the EPA standard is a maximum of 5.0 NTU. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the quarter.

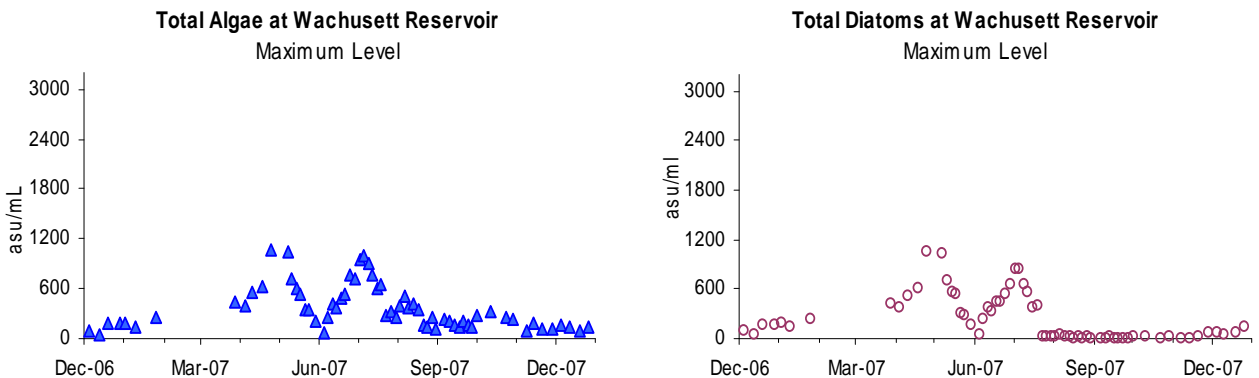


## Source Water – Algae

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

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

Algal levels were low for the 2nd Quarter.



# Treated Water – Disinfection Effectiveness

2nd Quarter - FY08

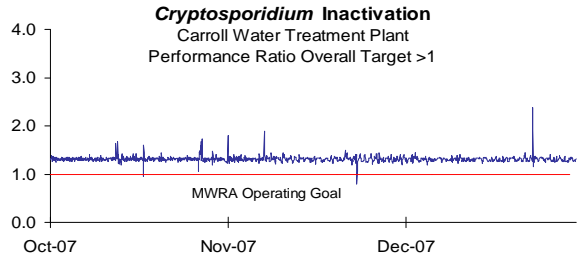
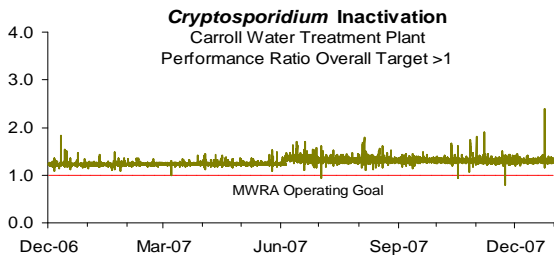
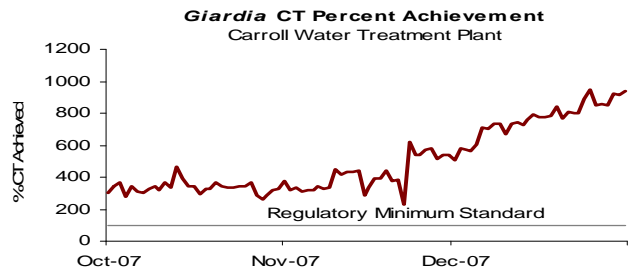
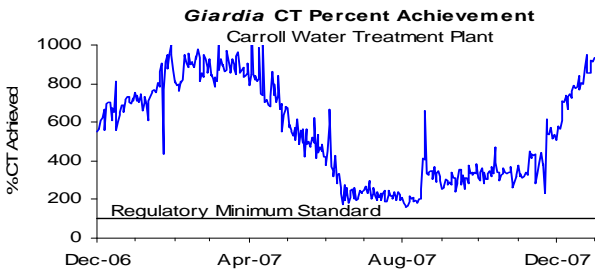
## Background

With the activation of the Carroll Water Treatment Plant (CWTP), MWRA now reports on both regulatory required 99.9% inactivation for *Giardia*, 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.

## Wachusett Reservoir – MetroWest/Metro Boston Supply:

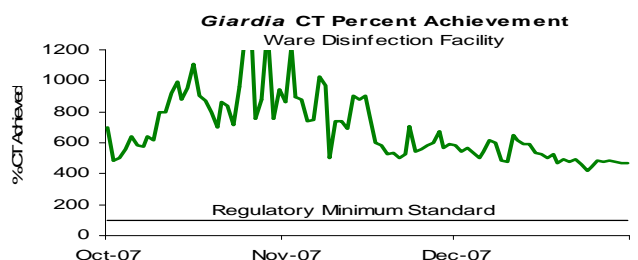
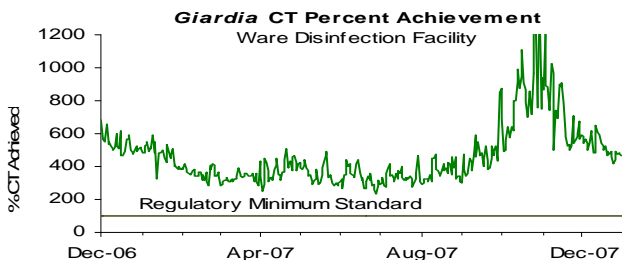
To avoid confusion with the regulatory requirements, inactivation of *Cryptosporidium* is reported as Performance Ratio (PR). A PR of 1 demonstrates inactivation of 99% of *Cryptosporidium* based on site-specific data. CT calculation for *Giardia* is conservative; subsequently, more inactivation occurs than is being reported. Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed.

- On October 17 at 7:45 A.M., both the main and back-up programmable logic controllers (PLCs) for the ozone system failed. This resulted in a loss of ozone feed causing the PR to drop below 1.0 for about one-half hour. PR for *Cryptosporidium* activation is a “voluntary” target. The lowest hourly average was 0.9 (not during max flow). *Giardia* CT was 256% at this time, well above the regulatory requirement. At DEP’s suggestion, MWRA increased the chlorine dose. Extra coliform samples were collected and all samples were clear. The programming fault in the PLCs has been repaired. There were no regulatory violations as a result of this event.
- On November 7, Train A was shut down, isolated, dechlorinated and drained for winter maintenance. On December 26, Train A was refilled and disinfected following American Water Works Association standards. Water quality samples taken on December 31 and January 1 were absent of total coliform. Train A was placed back in service on January 3. During the disinfection and flushing of Train A, partial plant flow was diverted from Train B to Train A. This resulted in a PR spike on December 24 at 8:00 A.M. lasting for a duration of 1.5 hours.
- During half-plant shutdown on November 7, temperature monitoring was moved from the CWTP inlet to the Cosgrove Intake through November 29. The PR dipped below 1 for about one hour on November 23 at approximately 3:00 P.M.
- *Giardia* CT was met each day this quarter. Ozone dose at the CWTP varied between 1.5 to 3.5 mg/L for the quarter.



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

Chlorine dose was lowered to 1.4 mg/L from 1.6 mg/L on October 29. It was lowered again to 1.3 mg/L on November 15 where it remains for December. CT was met each day this quarter, as well as every day for the last fiscal year.

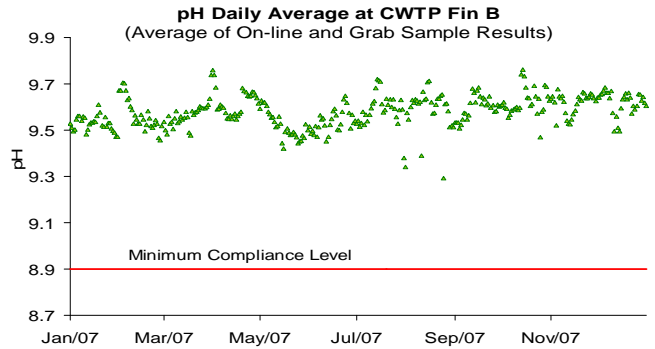
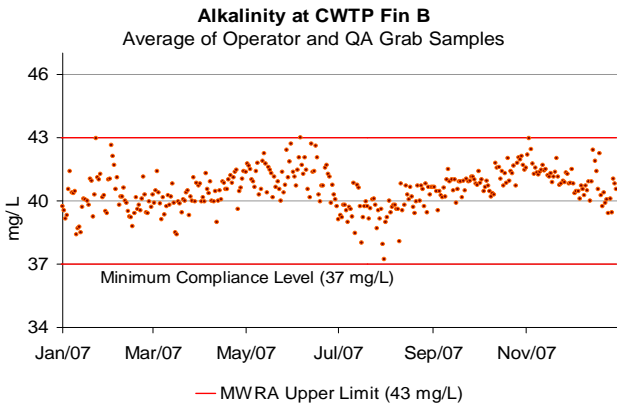


## Treated Water – pH and Alkalinity Compliance

2nd Quarter - FY08

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's target for distribution system pH is 9.3; the target for alkalinity is 40 mg/l. Per DEP requirements, samples from the CWTP Fin B tap have a minimum compliance level of 8.9 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system taps have a minimum compliance level of 8.8 for pH and 37 mg/L for alkalinity. For no more than nine days in a six-month period may results be below these levels. Quality Assurance staff and Operators test pH and alkalinity daily at the CWTP Fin B tap. Distribution system samples are collected in March, June, September, and December.

Distribution system samples were collected on December 11; sample pH ranged from 9.4 to 9.8 and alkalinity ranged from 41 to 43 mg/L. No sample results were below DEP limits for the 2<sup>nd</sup> Quarter.



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

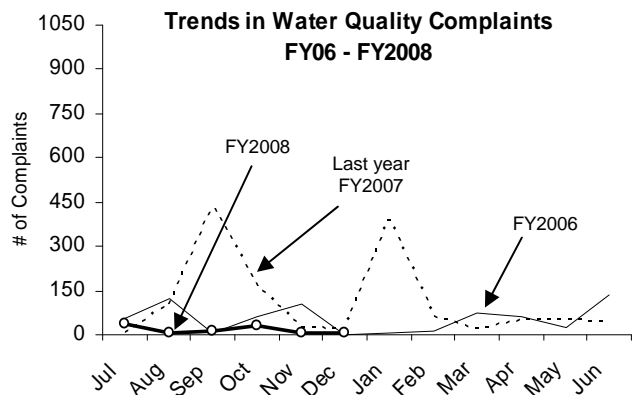
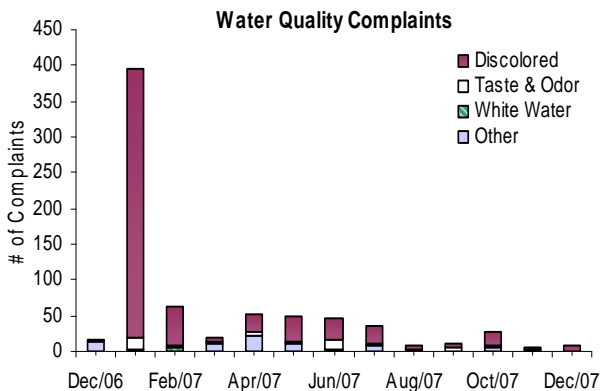
### Background

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. When nuisance algae bloom, such as *Synura* or *Anabaena*, MWRA treats the reservoirs with copper sulfate, an algacide.

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 40 complaints during the 2<sup>nd</sup> Quarter compared to 204 complaints for 2nd Quarter of FY07. Of the FY08 complaints, 29 were "discolored water" complaints; two were for "taste and odor"; three were "white water" complaints, and six fell into the "other" category.



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

2nd Quarter - FY08

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 38 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 140 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 likely bacterial 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. MWRA considers a disinfectant residual of 0.2 mg/L a minimum target level at all points in the distribution system.

## Highlights

In the 2nd Quarter, two of the 5,535 community samples (0.04% system-wide) submitted to MWRA labs for analysis tested positive for coliform; one of 2,185 (0.05%) MWRA samples tested positive for total coliform. No sample tested positive for *E. coli*. Westborough State Hospital did not violate the TCR since only one sample was positive in its system, which collects fewer than 40 samples/month. All 39 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 2.0% of the system samples had 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                           | 178                             | 0 (0%)                        | 0.0%              |                               | 0.63                             | 2.12                             |
| BELMONT                             | 104                             | 0 (0%)                        | 0.0%              |                               | 0.23                             | 2.31                             |
| BOSTON                              | 741                             | 0 (0%)                        | 0.0%              |                               | 1.62                             | 2.48                             |
| BROOKLINE                           | 221                             | 0 (0%)                        | 0.0%              |                               | 1.06                             | 2.47                             |
| CHELSEA                             | 130                             | 0 (0%)                        | 0.0%              |                               | 1.08                             | 2.49                             |
| DEER ISLAND                         | 56                              | 0 (0%)                        | 0.0%              |                               | 1.40                             | 1.86                             |
| EVERETT                             | 130                             | 0 (0%)                        | 0.0%              |                               | 0.60                             | 1.03                             |
| FRAMINGHAM                          | 216                             | 0 (0%)                        | 0.0%              |                               | 0.31                             | 2.43                             |
| LEXINGTON                           | 117                             | 0 (0%)                        | 0.0%              |                               | 0.51                             | 2.61                             |
| LYNNFIELD                           | 18                              | 0 (0%)                        | 0.0%              |                               | 0.53                             | 1.47                             |
| MALDEN                              | 195                             | 0 (0%)                        | 0.0%              |                               | 1.17                             | 1.28                             |
| MARBLEHEAD                          | 72                              | 0 (0%)                        | 0.0%              |                               | 0.24                             | 2.07                             |
| MARLBOROUGH (b)                     | 158                             | 0 (0%)                        | 0.0%              |                               | 0.89                             | 2.30                             |
| MEDFORD                             | 221                             | 0 (0%)                        | 0.0%              |                               | 0.72                             | 2.13                             |
| MELROSE                             | 117                             | 0 (0%)                        | 0.0%              |                               | 0.02                             | 1.01                             |
| MILTON                              | 96                              | 0 (0%)                        | 0.0%              |                               | 1.09                             | 1.87                             |
| NAHANT                              | 30                              | 0 (0%)                        | 0.0%              |                               | 0.07                             | 1.52                             |
| NEEDHAM (b)                         | 111                             | 0 (0%)                        | 0.0%              |                               | 0.04                             | 0.71                             |
| NEWTON                              | 277                             | 0 (0%)                        | 0.0%              |                               | 0.75                             | 2.32                             |
| NORTHBOROUGH                        | 48                              | 0 (0%)                        | 0.0%              |                               | 0.10                             | 1.36                             |
| NORWOOD                             | 108                             | 0 (0%)                        | 0.0%              |                               | 0.02                             | 1.90                             |
| QUINCY                              | 299                             | 0 (0%)                        | 0.0%              |                               | 0.16                             | 2.25                             |
| READING                             | 130                             | 0 (0%)                        | 0.0%              |                               | 0.41                             | 2.18                             |
| REVERE                              | 169                             | 0 (0%)                        | 0.0%              |                               | 0.90                             | 2.21                             |
| SAUGUS                              | 104                             | 0 (0%)                        | 0.0%              |                               | 1.96                             | 2.34                             |
| SOMERVILLE                          | 267                             | 1 (0.37%)                     | 0.0%              | no                            | 0.09                             | 2.27                             |
| SOUTH HADLEY FD1 (c)                | 48                              | 0 (0%)                        | 0.0%              |                               | 0.05                             | 0.33                             |
| SOUTHBOROUGH                        | 31                              | 0 (0%)                        | 0.0%              |                               | 0.12                             | 1.77                             |
| STONEHAM                            | 91                              | 0 (0%)                        | 0.0%              |                               | 0.20                             | 2.16                             |
| SWAMPSCOTT                          | 54                              | 0 (0%)                        | 0.0%              |                               | 0.11                             | 1.55                             |
| WAKEFIELD (b)                       | 143                             | 0 (0%)                        | 0.0%              |                               | 0.65                             | 1.69                             |
| WALTHAM                             | 216                             | 0 (0%)                        | 0.0%              |                               | 0.05                             | 2.16                             |
| WATERTOWN                           | 130                             | 0 (0%)                        | 0.0%              |                               | 0.27                             | 1.99                             |
| WELLESLEY (b)                       | 108                             | 0 (0%)                        | 0.0%              |                               | 0.09                             | 0.62                             |
| WESTBORO HOSPITAL                   | 21                              | 1 (4.76%)                     | 0.0%              | no                            | 0.00                             | 1.41                             |
| WESTON                              | 48                              | 0 (0%)                        | 0.0%              |                               | 1.08                             | 2.41                             |
| WINCHESTER (b)                      | 65                              | 0 (0%)                        | 0.0%              |                               | 0.14                             | 1.36                             |
| WINTHROP                            | 72                              | 0 (0%)                        | 0.0%              |                               | 0.13                             | 1.64                             |
| WOBBURN (b)                         | 195                             | 0 (0%)                        | 0.0%              |                               | 0.10                             | 0.92                             |
| Total:                              | 5535                            | 2 (0.04%)                     |                   |                               |                                  |                                  |
| MASS. WATER RESOURCES AUTHORITY (d) | 2185                            | 1 (0.05%)                     | 0.00%             |                               | 0.1                              | 2.28                             |

(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. Some MWRA TCR sites which are entry points to the community had low chlorine residuals due to various reasons.

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

2nd Quarter - FY08

## Background

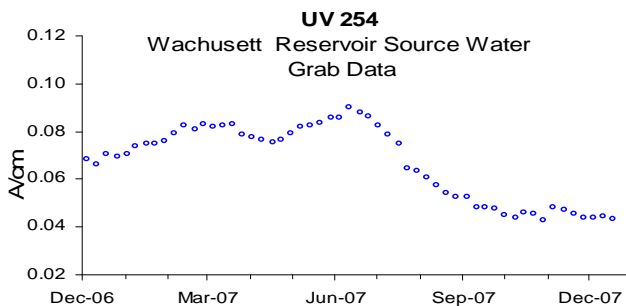
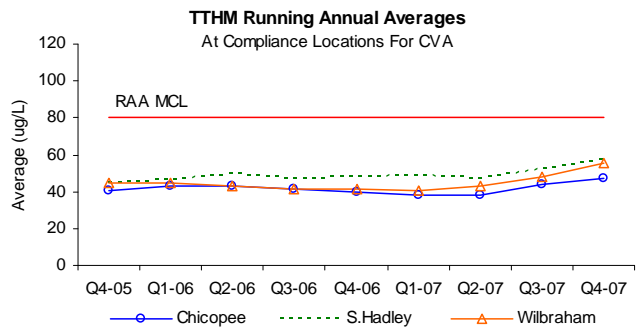
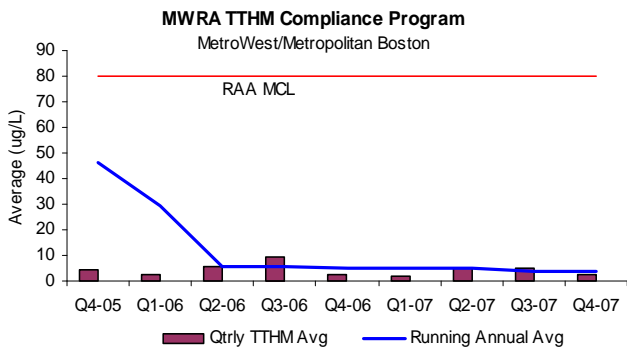
Total Trihalomethanes (TTHMs) are by-products of disinfection treatment with chlorine. Chlorination levels, the presence of organic precursors (measured by UV absorbance), pH levels, the contact time of water with chemicals used for disinfection, and temperature, all affect TTHM levels. TTHMs are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standard is 80 ug/L. Haloacetic Acids (HAAs) are also regulated (RAA is 60 ug/L) but compliance is not of significant concern for MWRA's system (data not shown). The switch from chlorine to ozone for primary disinfection and the consolidation of treatment has lowered DBP formation and made results more uniform. DEP has approved consolidating MetroWest/Metropolitan Boston programs since MWRA now provides fully treated water to both. This change was implemented in July 2005. DEP requires that compliance samples be collected quarterly. MWRA samples more frequently at some locations. 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 the water with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA MCL standard for bromate is 10 ug/L. The current RAA for Bromate = 0.0 ug/L..

## Outcome

The running annual average for TTHMs and HAA5s at compliance locations (represented as the line in the top two graphs below) remained below current standards. HAA5 and TTHM levels at all sampling locations for the MetroWest/Metropolitan Boston communities have declined dramatically since August 2005 following activation of the CWTP, which uses ozone rather than chlorine for primary disinfection. The RAA for TTHMs = 3.6 ug/L. CVA's DBP levels continue to be below current standards. UV-254 levels are currently around 0.04 A/cm.





# Water Supply and Source Water Management

2nd Quarter - FY08

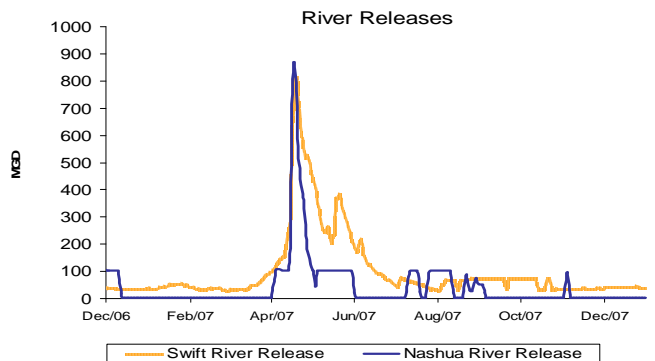
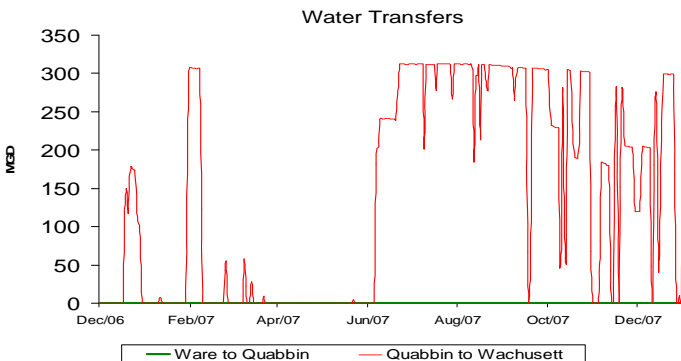
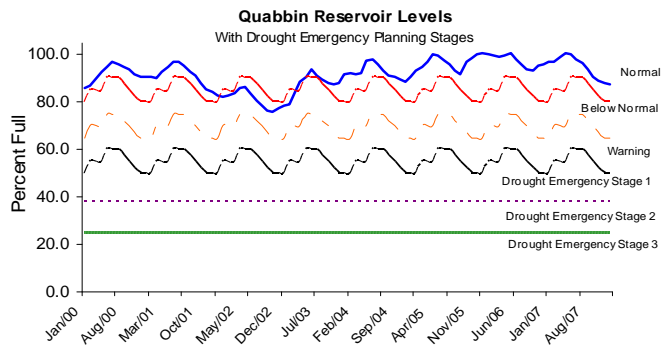
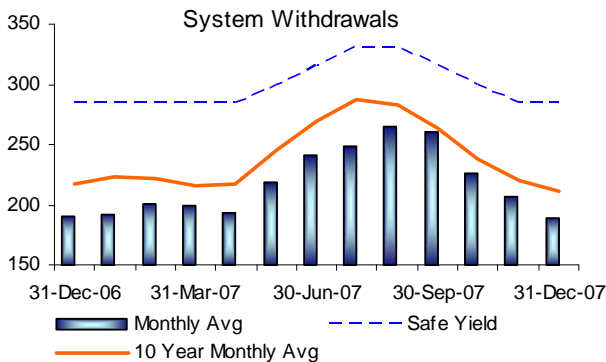
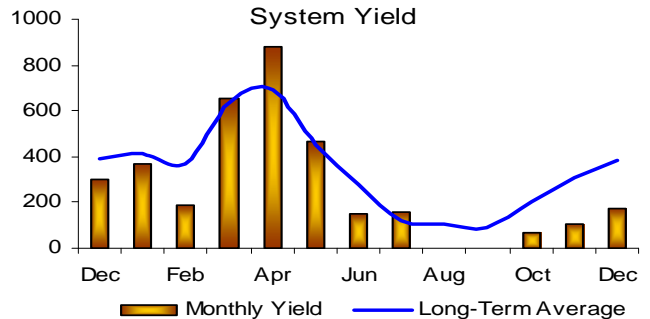
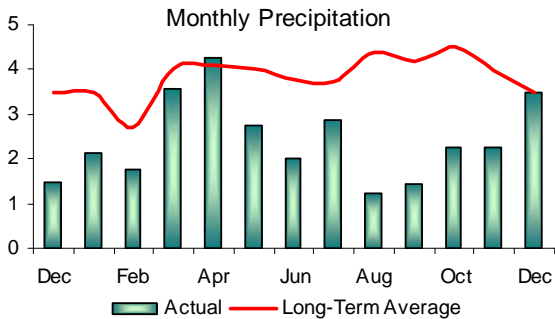
## Background

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 up on implementation of DCR's DEP-approved Watershed Protection Plans.

## Outcome

Quabbin Reservoir was at 87.6% of capacity as of December 31, 2007, 8% lower than December 2006 but within the normal operating range for this period of the year. Precipitation continues to be below the long-term average for the past 12 months except for April and December.

The Wachusett Reservoir elevation was lowered to 388 ft ( $\pm 0.5$  ft) for the period ~May 25 through December 15 to allow for installation of the new spillway crest gates. On December 16, the reservoir elevation was raised from 388 ft to 389 ft ( $\pm 0.5$  ft). Upon successful installation of the crest gates, the reservoir elevation will be returned to the normal operating band of 390-391.5 ft.

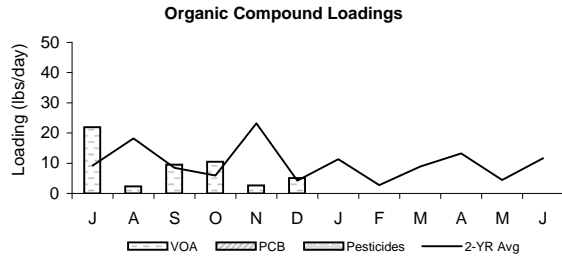
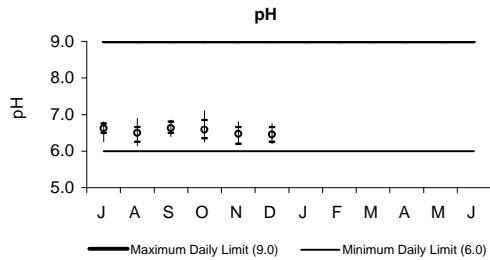


# WASTEWATER QUALITY

**NPDES Permit Compliance: Deer Island Treatment Plant**  
**2nd Quarter - FY08**  
**NPDES Permit Limits**

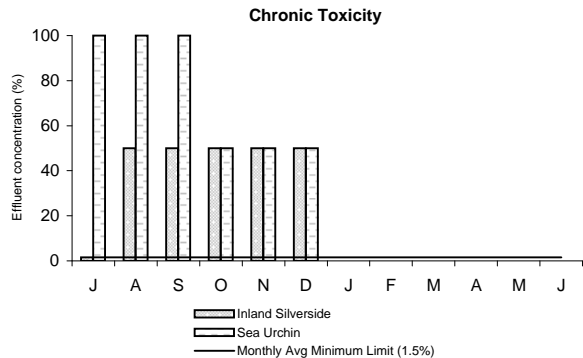
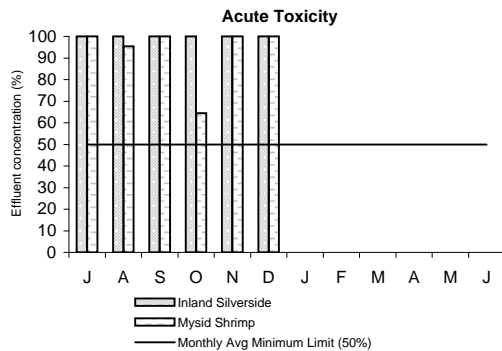
| <i>Effluent Characteristics</i> | <i>Units</i>               | <i>Limits</i> | <i>October</i> | <i>November</i> | <i>December</i> | <i>2nd Quarter Violations</i> | <i>FY08 YTD Violations</i> |   |
|---------------------------------|----------------------------|---------------|----------------|-----------------|-----------------|-------------------------------|----------------------------|---|
| Dry Day Flow:                   | mgd                        | 436           | 311.5          | 302.9           | 299.7           | 0                             | 0                          |   |
| cBOD:                           | Monthly Average            | mg/L          | 4.6            | 4.6             | 6.5             | 0                             | 0                          |   |
|                                 | Weekly Average             | mg/L          | 5.4            | 5.2             | 9.0             | 0                             | 0                          |   |
| TSS:                            | Monthly Average            | mg/L          | 7.2            | 5.5             | 8.7             | 0                             | 0                          |   |
|                                 | Weekly Average             | mg/L          | 8.3            | 7.5             | 14.1            | 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          | 323.2           | 46.9            | 13.8                          | 0                          | 0 |
|                                 | Weekly Geometric Mean      | col/100mL     | 14000          | 43.6            | 18.9            | 7.3                           | 0                          | 0 |
|                                 | % of Samples >14000        | %             | 10             | 0               | 0               | 0                             | 0                          | 0 |
|                                 | Consecutive Samples >14000 | #             | 3              | 0               | 0               | 0                             | 0                          | 0 |
| pH:                             | SU                         | 6.0-9.0       | 6.3-7.1        | 6.2-6.8         | 6.2-6.8         | 0                             | 0                          |   |
| PCB, Aroclors:                  | Monthly Average            | ug/L          | UNDETECTED     |                 |                 | 0                             | 0                          |   |
| Acute Toxicity:                 | Mysid Shrimp               | %             | 50             | >100            | >100            | >100                          | 0                          | 0 |
|                                 | Inland Silverside          | %             | 50             | >100            | >100            | >100                          | 0                          | 0 |
| Chronic Toxicity:               | Sea Urchin                 | %             | 1.5            | 50              | 50              | 50                            | 0                          | 0 |
|                                 | Inland Silverside          | %             | 1.5            | 50              | 50              | 50                            | 0                          | 0 |

To date, there have been no permit violations at the Deer Island Treatment Plant in Fiscal Year 2008.



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 tend to be at the lower pH range. pH measurements for the 2nd quarter were within the daily limits.

An important wastewater component to be monitored in the effluent is organic compounds, including volatile organic acids, pesticides, and polychlorinated biphenyls.



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

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

## NPDES Permit Compliance: Clinton Wastewater Treatment Plant

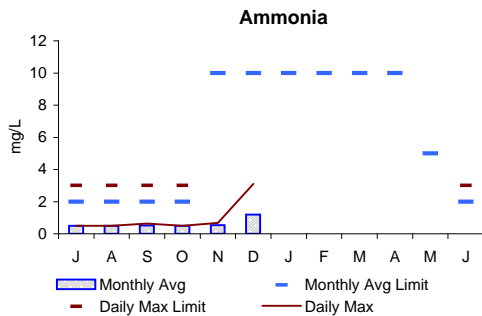
### 2nd Quarter - FY08

#### NPDES Permit Limits

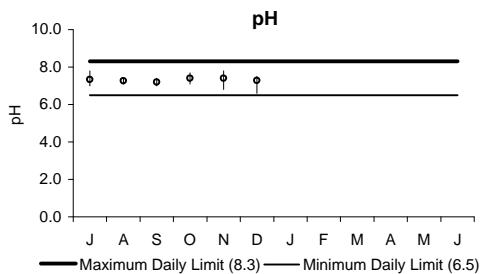
| Effluent Characteristics            |                         | Units     | Limits  | October | November | December | 2nd Quarter Violations | FY08 YTD Violations |
|-------------------------------------|-------------------------|-----------|---------|---------|----------|----------|------------------------|---------------------|
| Flow:                               |                         | mgd       | 3.01    | 3.13    | 2.99     | 2.92     | 1                      | 4                   |
| BOD:                                | Monthly Average:        | mg/L      | 20      | 2.7     | 6.9      | 10.5     | 0                      | 0                   |
|                                     | Weekly Average:         | mg/L      | 20      | 3.0     | 8.2      | 16.3     | 0                      | 0                   |
| TSS:                                | Monthly Average:        | mg/L      | 20      | 3.9     | 6.7      | 9.2      | 0                      | 0                   |
|                                     | Weekly Average:         | mg/L      | 20      | 3.7     | 8.0      | 12.0     | 0                      | 0                   |
| pH:                                 |                         | SU        | 6.5-8.3 | 7.1-7.7 | 6.8-7.8  | 6.6-7.5  | 0                      | 0                   |
| Dissolved Oxygen:                   | Daily Minimum:          | mg/L      | 6       | 6.5     | 8.1      | 6.6      | 0                      | 0                   |
| Fecal Coliform:                     | Daily Geometric Mean:   | col/100mL | 400     | 12      | 36       | 1475     | 2                      | 2                   |
|                                     | Monthly Geometric Mean: | col/100mL | 200     | 3       | 8        | 27       | 0                      | 0                   |
| TCR:                                | Monthly Average:        | ug/L      | 50      | 0       | 0        | 0        | 0                      | 0                   |
|                                     | Daily Maximum:          | ug/L      | 50      | 0       | 0        | 0        | 0                      | 0                   |
| Total Ammonia Nitrogen: 11/1 - 3/31 |                         |           |         |         |          |          |                        |                     |
|                                     | Monthly Average:        | mg/L      | 10.0    | 0.5     | 0.5      | 1.2      | 0                      | 0                   |
|                                     | Daily Maximum:          | mg/L      | 35.2    | 0.5     | 0.7      | 3.1      | 0                      | 0                   |
| Copper:                             | Monthly Average:        | ug/L      | 20      | 8.7     | 9.5      | 9.8      | 0                      | 0                   |
| Phosphorus:                         | May 1 - Oct 31          |           |         |         |          |          |                        |                     |
|                                     | Monthly Average:        | mg/L      | 1.0     | 0.19    | N/A      | N/A      | 0                      | 0                   |
| Acute Toxicity:                     | Daily Minimum:          | %         | 100     | N/A     | N/A      | >100     | 0                      | 0                   |
| Chronic Toxicity:                   | Daily Minimum:          | %         | 62.5    | N/A     | N/A      | 100      | 0                      | 0                   |

There were three permit violations during the 2nd Quarter, one of which was for flow. October's monthly average flow of 3.13 mgd exceeded the permit limit of 3.01 mgd. In addition, on December 22 and 26, a high chlorine demand caused a process upset at the plant, which resulted in a spike in the daily geometric averages for fecal coliform to 1,475 and 453 colonies/100 mL, respectively; the permit limit is 400.

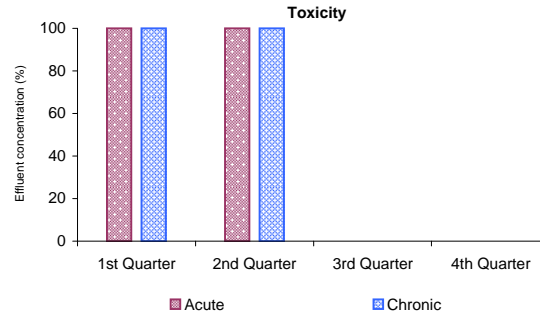
Because of low flow in the receiving water, the permit mandates stringent limits on nutrient discharges. These limits act to prevent eutrophication, or undesirable nutrient enrichment and excessive plant growth, in the receiving water. To meet these limits, nitrification occurs year-round and phosphorus removal is implemented from May 1 - October 31.



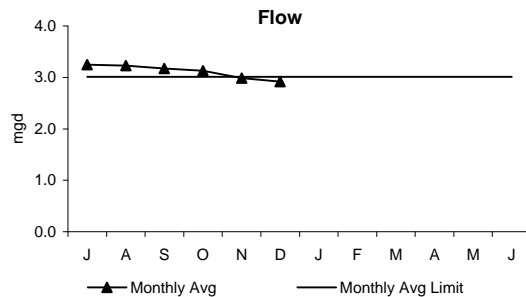
The 2nd Quarter's monthly average and daily maximum concentrations were below permit limits. The monthly average and daily maximum limits for the period of November 1 - March 31 are 10 mg/L and 35.2 mg/L, respectively. Permit limits are most stringent from June-October, when warm weather conditions are most conducive to potential eutrophication.



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



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 100%, respectively. Permit limits were met during the 2nd Quarter.



This graph depicts the average monthly flow, measured in million gallons per day, entering the plant. The average monthly flow in October did not meet the permit limit. However, flows for November and December were below the permit limit.

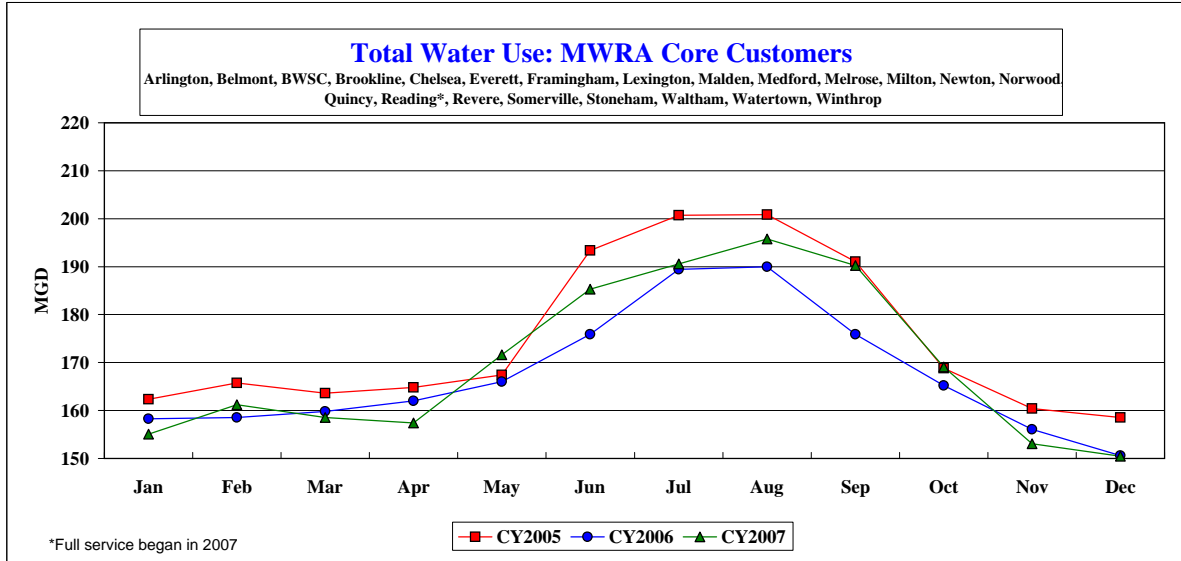
# COMMUNITY FLOWS

## Total Water Use: MWRA Core Customer Communities

| MGD           | Jan     | Feb     | Mar     | Apr     | May     | Jun     | Jul     | Aug     | Sep     | Oct     | Nov     | Dec     | Average |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>CY2005</b> | 162.326 | 165.732 | 163.645 | 164.812 | 167.389 | 193.360 | 200.720 | 200.842 | 191.068 | 168.816 | 160.378 | 158.511 | 174.846 |
| <b>CY2006</b> | 158.305 | 158.563 | 159.814 | 161.991 | 166.013 | 175.903 | 189.446 | 189.942 | 175.866 | 165.227 | 156.078 | 150.623 | 167.385 |
| <b>CY2007</b> | 155.061 | 161.227 | 158.519 | 157.376 | 171.642 | 185.297 | 190.539 | 195.762 | 190.260 | 169.111 | 153.066 | 150.474 | 169.914 |

| MG            | Jan       | Feb       | Mar       | Apr       | May       | Jun       | Jul       | Aug       | Sep       | Oct       | Nov       | Dec       | Total      |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| <b>CY2005</b> | 5,032.111 | 4,640.485 | 5,073.006 | 4,944.356 | 5,189.056 | 5,800.787 | 6,222.313 | 6,226.107 | 5,732.030 | 5,233.310 | 4,811.348 | 4,913.831 | 63,818.740 |
| <b>CY2006</b> | 4,907.441 | 4,439.761 | 4,954.227 | 4,859.730 | 5,146.393 | 5,277.092 | 5,872.840 | 5,888.199 | 5,275.991 | 5,122.038 | 4,682.351 | 4,669.320 | 61,095.384 |
| <b>CY2007</b> | 4,806.893 | 4,514.365 | 4,914.084 | 4,721.268 | 5,320.891 | 5,558.920 | 5,906.704 | 6,068.612 | 5,707.813 | 5,242.433 | 4,591.980 | 4,664.701 | 62,018.663 |

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# How CY2007 Community Wastewater Flows Through Twelve Months Could Effect FY2009 Sewer Assessments <sup>1,2,4</sup>

FY2009 sewer assessments will use a 3-year average of CY2005 to CY07 wastewater flows compared to FY2008 assessments that used a 3-year average of CY2004 to CY2006 wastewater flows.

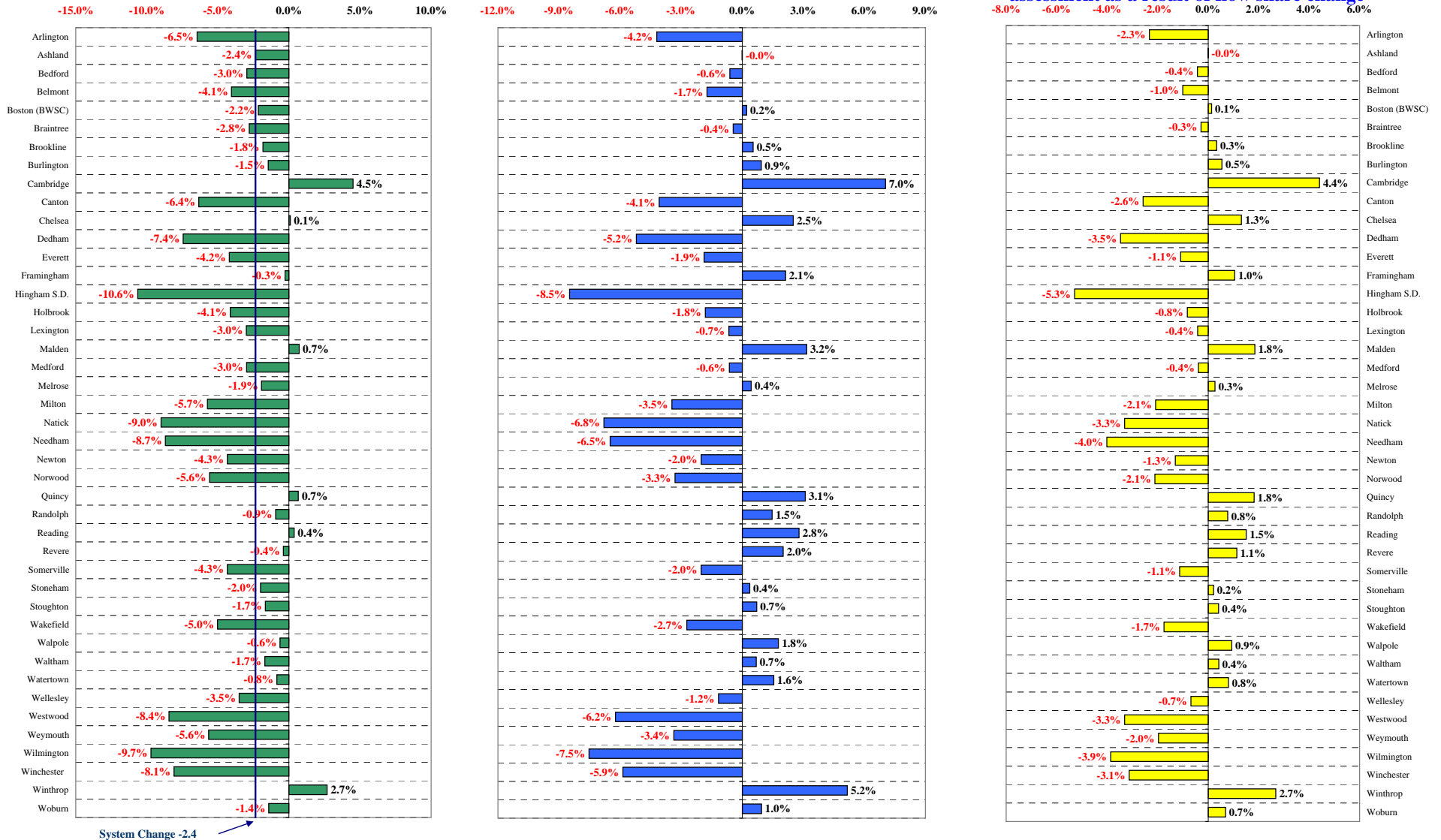
But as MWRA's sewer assessments are a ZERO-SUM calculation, a community's assessment is strongly influenced by the RELATIVE change in CY2005 to CY2007 flow share compared to CY2004 to CY2006 flow share, compared to all other communities in the system.

Changes in flow shares are only a part of the assessment calculation as illustrated by the estimated impact of flow share changes on FY2009 sewer assessments.

Change in community absolute flow

Change in community flow share

Estimated variance from average system assessment as a result of flow share change <sup>3</sup>



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

<sup>2</sup> MWRA's wastewater metering system replacement began in March 2004 and was completed in March 2005. Therefore, wastewater flows for each month during this period are an average of the three prior years. Flow data is preliminary and subject to change pending additional MWRA and community review.

<sup>3</sup> Add this figure to the projected FY2009 system-wide average sewer rate increase of 4.75% (February 2008) to estimate each community's FY2009 sewer assessment change from FY2008..

<sup>4</sup> Based on CY2005 to CY2007 average wastewater flows as of 02/01/08.

## BUSINESS SERVICES

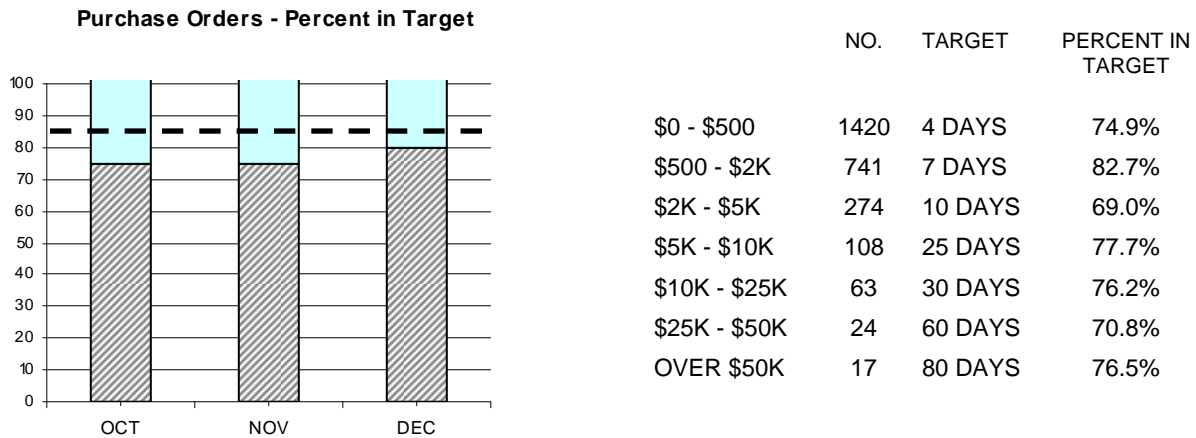


## Procurement: Purchasing and Contracts Second Quarter FY08

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

**Outcome:** Processed 77% of purchase orders within target; Avg. Processing Time was 7.12 days vs. 6.68 days in Qtr 2 of FY07. Processed 72% (23 of 32) contracts within target timeframes; Avg. Processing Time was 106 days vs. 163 days in Qtr 2 of FY07.

### Purchasing



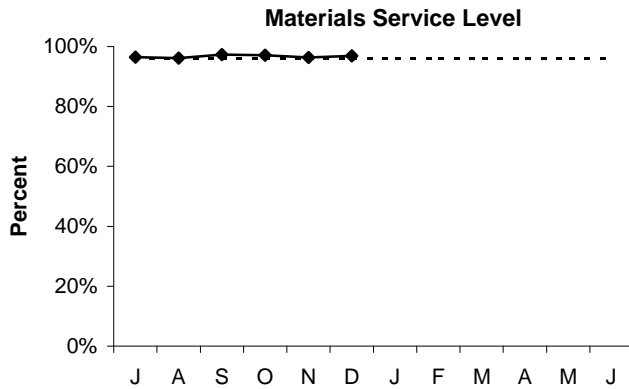
- Purchasing Unit processed 2647 purchase orders, 148 less than the 2795 processed in Qtr 2 of FY07, for a total value of \$9,035,775 vs. a dollar value of \$20,882,451 in Qtr 2 of FY07.
- The target was not achieved for the following reasons: confirmation of pricing and sourcing additional vendors, confirmation of end user requirements, extended negotiations and sourcing additional vendors, changes in specifications, awaiting final design specifications, and numerous addenda and vendor questions.

### Contracts, Change Orders and Amendments

- Procurement processed thirty-two contracts with a value of \$12,204,585 and thirteen amendments with a value of \$615,821.
- Nine contracts were not processed within target timeframes. Reasons include: converting from an evaluation based upon weighted criteria to a low bid process; holding an advertisement to coordinate with the expiration of the existing contract; and procurements with numerous addenda and/or late submission of documents from vendors. One contract was part of the FY08 insurance program and could not be executed until the entire program had been approved. Two contracts were executed within two weeks of target.
- Forty-two 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 2nd quarter FY08 was \$4,739,421 and the value of credit change orders was (\$143,284). The net dollar value of all change orders was \$4,596,137.
- In addition, staff reviewed 113 proposed change orders and 52 draft change orders.

# Materials Management

2nd Quarter, FY08



The service level is the percentage of stock requests filled. The goal is to maintain a service level of 96%. Staff issued 10,960 (96.9%) of the 11,312 items requested in Q1 from the inventory locations for a total dollar value of \$829,829.

## Inventory Value - All Sites

During the first quarter the total value of all inventory (excluding new adds) has been increased by \$220,381 against the July 07 base value. Consumable inventory value (excluding new adds) increased by \$172,374. The FY08 goal is to reduce consumable inventory from the July '07 base level (\$6.67 million) by 2.0% (approximately \$133,411), to \$6.53 million by June 30, 2008.

Newly added items this quarter include split seals, victaulic glass lined materials, gates, tees, steel elbows, fire alarm horn light units, actuators, signal isolators, calibration gas and glyco chemicals for Deer Island Maintenance, Plumbing, Electrical, I&C & HVAC. Items added to stock at the Chelsea warehouse included copier toners, washers and nuts for Maintenance, tie down straps for electrical, leach wipes for TRAC and hazmat brooms for Safety.

Spare parts with a current value of \$6,529,363 (excluding new adds) continue to be reviewed for obsolescence. Surplus efforts are ongoing with the Chelsea, Deer Island and Southboro warehouses for both spare parts and consumables. The Property Pass Program continues its efforts in the safeguarding of PCs, monitors and other MIS equipment. To date over 300 pieces of equipment have been established as inventory items and deployed with MIS to identified staff. In addition, obsolete equipment turned over by MIS and Operations is being recycled, resulting in a monetary return to the MWRA. Tool/equipment audits continue throughout Operations and the process of consolidating and surplus equipment as necessary is ongoing.

| Items                         | Base Value July-07 | Current Value w/o Cumulative New Adds | Reduction / Increase To Base |
|-------------------------------|--------------------|---------------------------------------|------------------------------|
| Total Current Inventory Value | 13,151,938         | 13,372,319                            | 220,381                      |
| Consumable Inventory Value    | 6,670,582          | 6,842,956                             | 172,374                      |
| Spare Parts Inventory Value   | 6,481,356          | 6,529,363                             | 48,007                       |

**Note:**

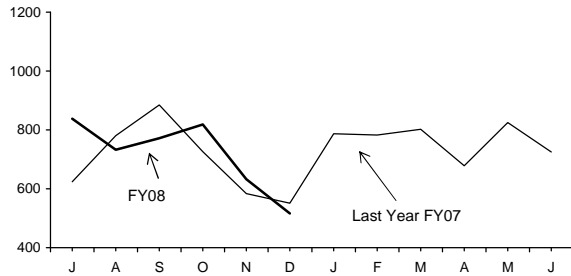
New adds are items added at an inventory location for the first time for the purpose of servicing a group/department to meet their business needs/objectives.

## MIS Program 2nd Quarter FY08

### Operations

#### Highlights:

**Helpline Monthly Call Volume**



#### Performance

Call volume peaked in October and has increased by 3.88% from Q2 last year. The backlog peaked in November and is slightly above the targeted benchmark range. The mix of calls for the quarter do not indicate any major problems.

### Business System Plan

**Cyber Security:** During Q2, the AlertCon status from ISS primarily remained at Level 1 with several brief jumps to Level 2 due to highly critical vulnerabilities in Windows and Internet Explorer. Staff continued to push security fixes to desktops and servers monthly in order to protect against the 1187 newly revealed vulnerabilities during the quarter. At least 15 infected files were quarantined and either repaired or removed from MWRA computers this quarter. Phishing scams reached a new high, with more than 31,000 unique messages identified in October (last month for which data is available) and linked to over 34,000 scam web sites. MWRA's email gateway received 15,615,737 email messages of which it blocked 9,555,084. Additionally, 204,042 spam messages were quarantined in Q2, of which, less than 1% were incorrectly categorized as spam (and sent on to their recipients). Updates to MWRA spam filters continue to catch incoming spam email (accounting for 1.3% of all incoming email messages for the quarter), including "phishing" scams.

| Items                | FY03-07 | FY08 (YTD) | FY08(Q2) | Grand Total |
|----------------------|---------|------------|----------|-------------|
| Bulletins            | 11206   | 1211       | 610      | 12417       |
| Open Items (backlog) | N/A     | N/A        | 253      | N/A         |
| Needing Action       | 2044    | 357        | 211      | 2401        |
| Completed            | 1018    | 89         | 72       | 1107        |
| Suspended            | N/A     | 26         | 10       | N/A         |

- EOC: Completed upgrade to the Deer Island Emergency Operations Center (EOC) including training of Operations staff and management of room functionality/operation. Additionally, completed the build out for the backup EOC at Carroll Water Treatment Plant.
- Verdiem Software Implementation: Staff completed the pilot and installation of Verdiem's energy monitoring software. In a continuing effort to save money, energy and the environment Verdiem's Surveyor software, an energy savings package is designed to monitor your computer for inactivity and place it into a sleep or stand-by mode until the user returns.
- Network Infrastructure: In conjunction with Verizon a new network design was developed based on Verizon's new wide area networking technology that will save the authority \$7,000 per month when completed. The target date for completion is Q4 FY08. Staff also completed the DNS server upgrade project with the deployment of 3 new servers. These servers provide core networking services to MWRA, including logon authentication services and dynamic host configuration services necessary for the clients to operate and access the network.

### Applications/Training

| Area            | Significant Accomplishments   |
|-----------------|---|
| A&F             | Upgraded BSI Tax Factory to version 8.0g and installed regulatory bulletin #065, #070, #071, #072 and #073 on all three Lawson servers to support new tax law requirements. Additionally, upgraded the Munease (tracks Bonds Issued by MWRA) application to version 12.97.  |
| WQ3 DEP Reports | The programming of the remaining two DEP Bacteria reports for MWRA locations were tested and accepted by the user community. In total five new DEP Bacteria Reports have been released into production.   |
| LIMS            | A new Laboratory Information Management System (LIMS) contract was approved and awarded to LabWare, Inc. The new LIMS will be implemented over an 18 month period and will replace the existing legacy system that was implemented in 1994.   |
| LAWSON          | Completed the project plan for Lawson System Foundation (LSF) 9.0.1 upgrade and held initial kickoff meeting with hardware installations starting in December. The Lawson payroll team also supported two union contract settlements by developing and running payroll adjustments reports, troubleshooting problems and supporting payroll and retro check production. |
| Training        | For the quarter, 56 staff attended 17 classes and 6 workshops. Year-to-date, 91 staff have attended 30 classes and 12 workshops. 8% of the workforce have attended at least one class year-to-date. In Q2, the Training and Documentation Team developed a Cyber Safety Brown Bag Presentation that was offered in October.   |

## Legal Matters

### 2nd Quarter FY2008

#### PROJECT ASSISTANCE

##### COURT AND ADMINISTRATIVE ORDERS

- Boston Harbor Litigation and CSO: Drafted letter to the United States and DEP notifying them that CSO outfalls CAM009 and CAM011 will be closed and that no floatables control will be installed at these locations. Reviewed draft stipulation and order and drafted language for proposed supplemental environmental projects for settlement discussions with the United States relative to blending. Filed Quarterly CSO Progress Report and CSO Annual Report with the Court.
- NPDES: Reviewed MWRA's NPDES permit renewal application for the portion of BWSC Permit Number MA0101192 which authorizes CSO discharges from CSO outfall MWR215. Drafted letter notifying the regulators that BWSC closed all of the CSO regulators tributary to Fox Point and Commercial Point CSO treatment facilities and that MWRA will be decommissioning those facilities. Drafted letter seeking to renew the portion of BWSC Permit Number MA0101192 which authorizes CSO discharges from CSO outfall MWR215. Drafted blending notification for blending event which occurred during black start testing.
- Administrative Consent Order (DITP power outages): Submitted semi-annual report to DEP in accordance with the Administrative Consent Order.
- Upper Neponset Valley Relief Sewer: Submitted October, November, and December monthly progress summaries for the Upper Neponset Valley Relief Sewer project to DEP

##### REAL ESTATE AND CONTRACT

- North Dorchester Bay CSO: Met with staff and BWSC concerning terms of license/grant of location for tunnel and in Columbia Road.
- Hultman Aqueduct Interconnections: Prepared grant of temporary easement and access license for Shaft L construction staging area in Framingham. Revised temporary construction easement plan.
- Telecommunications: Reviewed and revised proposed changes to draft permit with T-Mobile for installation of telecom tower at Walnut Hill.
- Fore River Railroad Corporation: Reviewed and revised MBTA draft agreement concerning construction of pedestrian crossing and drainage facilities at FRRC railroad easement.
- Section 97A, East Boston: Reviewed license application with MBTA and draft license agreement. Filed Order of Conditions.
- Northern High Service Pipeline, Section 70: Relocation of Water Main, Shops at Saugus. Met with DCAM and attorneys for Shops at Saugus. Reviewed and revised easement plans. Reviewed and revised grants of permanent easement from Shops at Saugus and DCAM. Reviewed DCAM title abstract and certification.
- Redmond Property, Braintree: Prepared Purchase and Sale Agreement for 425 Pearl Street, Braintree.
- Union Park: Finalized revisions to Amendment No. 2 to MOA with BWSC and obtained executed copies of Amendment No. 1 and Amendment No.2.
- Lancaster Mills: Reviewed statutes and real property interests concerning provision of water to Mills via pipeline.

- 93 Maplewood Street, Malden: Prepared and executed lease for vector truck storage.
- Capen Court, Somerville: Reviewed and approved DCAM documentation (Partial Release of Easement and Grant of Easement, survey plans) prepared for recording in connection with Chapter 237 of the Acts of 2006.
- Advised on warranty and other contract matters for Operations Division and Procurement staff; finalized a settlement agreement with a design consultant; drafted a settlement and release agreement to resolve all claims on construction contract No. 6265; drafted an indemnity agreement for work being performed at Deer Island; finalized the agreement for a pilot program with Dig Safe; negotiated and finalized an MOU with the Department of Public Safety regarding electrical permits and inspections; drafted an MOU for the City of Boston Fire Department to provide tunnel rescue services; reviewed and approved 23 Section 8(m)permits. Recorded various Orders of Conditions, Orders of Taking, Certificates of Compliance, extension permits at various Registries of Deeds for MWRA engineers and staff.

## ENVIRONMENTAL

- Clean Water Act: Clean Water Act/NPDES: Concluded consultation with staff concerning reissuance of NPDES General Permit for Construction Dewatering Activity Discharges in Massachusetts, and the MWRA corresponding obligations.
- Oil Pollution Fees: Advised staff on options for redressing inaccurately charged oil pollution fees in diesel fuel purchases.
- C. 91/Landlocked Tidelands: Analyzed and commented upon for staff the final legislation amending c. 91 and MEPA pertaining to regulation of activities in landlocked tidelands with respect to MWRA activities.
- TRAC: Final Decision for MWRA Docket Nos. 06-02, 06-03, and 07-01 consolidated was issued.

## LABOR, EMPLOYMENT AND ADMINISTRATIVE

### New Matters:

Five demands for arbitration were filed.

### Matters Concluded:

A union confirmed withdrawal of a charge at the Labor Relations Commission.

A union confirmed the resolution/settlement of a demand for arbitration.

A Joint Stipulation of Dismissal With Prejudice was filed in an adjudicatory proceeding.

Received a decision from the Division of Unemployment Assistance in favor of the MWRA.

One demand for arbitration was withdrawn.

## LITIGATION/TRAC

### New Matters:

No new cases were reported in the Second Quarter of FY 2008.

### Significant Developments:

Exelon Edgar LLC, et al. v. MWRA: Following the jury's verdict of \$11 million in early December, 2007 in favor of plaintiffs, which nets out to approximately \$7.85 million of new money over amounts previously paid for takings of Exelon property, MWRA has received motions from plaintiffs to establish the amount of interest and

statutory costs which will become components of a judgment yet to be entered by the court. Plaintiffs' counsel assert that a 15% interest rate should apply in order that they receive "just compensation" for the takings, a rate which would almost double the recovery allowed by the jury. MWRA's counsel and Law Division staff have prepared oppositions to those motions asserting: (i) that plaintiffs failed to adduce evidence during trial that would support a higher interest rate than allowed by statute, that the far lower fluctuating statutory rate of interest governs the matter, and that the statutory rate has previously been upheld by our Supreme Judicial Court, and (ii) that court rules do not provide for costs to be recovered against the Commonwealth in the absence of specific statutory authorization. The Superior Court has scheduled a hearing on these motions for March 6, 2008.

#### Concluded Cases:

Three cases were reported closed during the Second Quarter of FY 2008.

- Sciaba Construction Company v. MWRA: This was the last of the Boston Harbor Project construction cases. Plaintiff sought damages for delays and extra costs allegedly caused by the issuance of four unilateral change orders by MWRA on the "Main 13.8 KV Switchgear, Building and Distribution System and Yard Utilities" contract. The original Contract was in the amount of \$19,846,200.00. The Contract provided for construction of the switchgear building, electrical distribution system, and certain storm drain, water and sewerage utilities for the Deer Island Treatment Plant. The total amount of Sciaba's claim as of September, 2007 including statutory interest was \$3,647,582.33. Following protracted pre-trial discovery, and an unsuccessful attempt by MWRA to obtain summary judgment, the parties in February, 2007 initiated settlement discussions. After a series of offers and counter-offers between the parties, Sciaba on August 17, 2007 made a "last and final" demand of \$595,000.00 to settle all claims in the case. On September 12, 2007, the Board of Directors voted to authorize the Executive Director to settle all claims asserted against MWRA in the case for the total sum of \$595,000.00. Sciaba has executed a Release of all claims asserted in the case, the settlement amount has been paid in full, and a Stipulation of Dismissal with Prejudice has been filed with the Court.
- (Employee) v. MWRA: An Employee filed suit against the MWRA on June 2, 2005 in United States District Court alleging that MWRA discriminated against him on the basis of age and race in violation of the Civil Rights Act of 1991 ("Title VII") and the Age Discrimination in Employment Act ("ADEA"). A Settlement Agreement and Release were drafted and executed on November 15, 2007.
- Donald Greene, et al. v. K.C. Electric Co., et al.: This was a suit by an employee of Shea-Traylor-Healy on the Metro-West Supply Tunnel project. He and his wife sued MWRA, Stone and Webster, Inc. and K.C. Electric, Inc., for injuries suffered as a result of fall from a ladder on June 20, 2002. Mr. Greene received Workmen's Comp., so he did not sue Shea-Traylor-Healy. His lawsuit was predicated on the assertion that KC Electric, the lighting subcontractor on the project, negligently removed lighting from the area where he was working before work was complete, and that Stone and Webster and MWRA negligently failed to respond to employee complaints about the dangerous work conditions that resulted. MWRA had no role in overseeing the safety issue alleged by the plaintiffs and denied any liability. The case was defended by Liberty Mutual, the insurer for the project. The insurance policy covered MWRA as well as the contractors. Liberty Mutual and its lawyers negotiated a settlement with the plaintiffs, with no payment to be made by MWRA. The plaintiff has filed a stipulation of dismissal with prejudice of all defendants, including MWRA and has executed a release to MWRA.

#### Subpoenas:

During the Second Quarter of FY 2008, five subpoenas were received and one subpoena was pending at the end of Second Quarter FY 2008.

#### Public Records:

During the Second quarter of FY 2008, four new public records requests were received and two requests were closed at the end of Second Quarter FY 2008.

**SUMMARY OF PENDING LITIGATION MATTERS**

| <b>TYPE OF CASE/MATTER</b>                          | <b>As of Dec 2007</b> | <b>As of Sept 2007</b> | <b>As of Jun 2007</b> |
|---|-----------------------|------------------------|-----------------------|
| Construction/Contract/Bid Protest (other than BHP)  | 5                     | 5                      | 4                     |
| BHP Claims/Contract Cases                           | 0                     | 1                      | 1                     |
| Tort/Labor/Employment                               | 10                    | 11                     | 13                    |
| Environmental/Regulatory/Other                      | 2                     | 2                      | 2                     |
| Eminent Domain/Real Estate                          | 1                     | 1                      | 1                     |
| <b>total – all defensive cases</b>                  | <b>18</b>             | <b>20</b>              | <b>21</b>             |
| Affirmative Cases:                                  | 1                     | 1                      | 1                     |
| <u>MWRA v. (current employee)</u>                   |                       |                        |                       |
| Other Litigation matters (restraining orders, etc.) | 2                     | 2                      | 2                     |
| <u>MWRA v. (former employee)</u>                    |                       |                        |                       |
| <u>MWRA v. (former employee)</u>                    |                       |                        |                       |
| <b>total – all pending lawsuits</b>                 | <b>21</b>             | <b>23</b>              | <b>24</b>             |
| Significant claims not in suit:                     | 1                     | 1                      | 1                     |
| CDM Walnut Hill                                     |                       |                        |                       |
| Bankruptcy  | 1                     | 1                      | 1                     |
| Wage Garnishment                                    | 5                     | 5                      | 4                     |
| TRAC Appeals  | 5                     | 8                      | 8                     |
| Subpoenas   | 5                     | 3                      | 1                     |
| Public Records Requests                             | 4                     | 18                     | 12                    |
| <b>TOTAL - ALL LITIGATION MATTERS</b>               | <b>42</b>             | <b>59</b>              | <b>51</b>             |

**TRAC**

New Appeals

Three new appeals were received in the 2nd Quarter FY 2008.

- North Suburban Orthopedic Associates, Inc. 07-07
- Offset Prep, Inc. 07-08
- Brigham & Women's Hospital 07-09

Pre-Hearings Held

No pre-hearings were held in the 2<sup>nd</sup> Quarter FY 2008.

Status Conference Held

One status conference was held in 2<sup>nd</sup> Quarter FY 2008.

- Massachusetts Turnpike Authority 07-03

### **Joint Motion to Dismiss**

No cases were dismissed by Joint Motion to Dismiss in the 2<sup>nd</sup> FY 2008.

### **Joint Stipulations of Dismissals**

One case was dismissed by Joint Stipulation after fine was paid in the 2<sup>nd</sup> Quarter FY 2008.

- North Suburban Orthopedic Associates, Inc. 07-07

### **Joint Stipulations of Dismissals – Claims Dismissed**

No cases were dismissed by Joint Stipulations of Dismissal, claims dismissed in the 2<sup>nd</sup> Quarter FY 2008.

### **Hearings Held**

No hearings were held in the 2<sup>nd</sup> Quarter FY 2008.

### **Settlement By Agreement of Parties**

Four cases were settled by Agreement of Parties in 2<sup>nd</sup> Quarter FY 2008.

- TEI Biosciences, Inc. 07-05
- Walgreens, Inc. 07-04
- New England Confectionery Company, 05-12
- Conopco, Inc. d/b/a Unilever; Consolidated cases 06-02, 06-03, 07-01 & 07-06

### **Tentative Decisions Issued**

No Tentative Decisions were issued in 2<sup>nd</sup> Quarter FY 2008.

### **Final Decisions Issued**

No Final Decisions were issued during the 2<sup>nd</sup> Quarter FY 2008.



## Internal & Contract Audit Program 2nd Quarter FY08

### INTERNAL AUDIT PROGRAM

#### Status of Internal Audit Recommendations

Recommendations closed in 2<sup>nd</sup> Quarter: 26

#### Assignments with Recommendations Pending Implementation

| Report Title (date)   | Recommendations<br>Pending Implementation | Closed<br>Recommendations |
|---|---|---------------------------|
| Chemical Delivery Procedures (5/5/04)                       | 1   | 4                         |
| Evaluating Consultant Performance (6/22/04)                 | 1   | 1                         |
| Field Operations Maintenance Management Practices (9/16/05) | 4   | 8                         |
| Accounts Payable Activities (10/11/05)                      | 6   | 6                         |
| Controls Over Gasoline & Diesel Fuel (5/3/06)               | 1   | 15                        |
| Field Crew Practices (11/14/06)                             | <u>1</u>                                  | <u>8</u>                  |
| <b>Total Recommendations</b>                                | <b>14</b>                                 | <b>42</b>                 |

The Internal Audit Department follows up on open recommendations on 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. National surveys of government organizations indicate that on average 82% of audit recommendations are completed. On closed assignments 93% of Internal Audit's recommendations have been implemented.

### CONTRACT AUDIT PROGRAM

#### Number of Reviews Completed and Cost Savings - FY03 to FY08

| Description                       | FY04               | FY05               | FY06               | FY07               | FY08 2Q            | TOTAL              |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| <b>Consultant Reviews</b>         |                    |                    |                    |                    |                    |                    |
| Cost Disclosure Statement Reviews | 78                 | 32                 | 63                 | 43                 | 16                 | 232                |
| Preliminary Field Reviews         | 1                  | 4                  | 6                  | 2                  | 0                  | 13                 |
| Incurred Cost Audits              | 9                  | 9                  | 12                 | 10                 | 4                  | 44                 |
| <b>Contractor Reviews</b>         |                    |                    |                    |                    |                    |                    |
| Construction Labor Burden Reviews | 13                 | 10                 | 8                  | 8                  | 8                  | 47                 |
| Change Order/Claim Audits         | 4                  | 0                  | 0                  | 0                  | 1                  | 5                  |
| Contractor Financial Reviews      | 3                  | 4                  | 0                  | 2                  | 4                  | 13                 |
| <b>Cost Savings</b>               |                    |                    |                    |                    |                    |                    |
| Consultant Cost Savings           | \$779,945          | \$483,968          | \$768,394          | \$358,341          | \$19,230           | \$2,406,483        |
| Contractor/Vendor Cost Savings    | \$900,721          | \$1,551,139        | \$456,968          | \$637,378          | \$1,907,761        | \$5,453,967        |
| Internal Audits                   |                    |                    |                    | \$183,840          |                    | \$183,840          |
| <b>Total Cost Savings</b>         | <b>\$1,680,666</b> | <b>\$2,035,107</b> | <b>\$1,225,362</b> | <b>\$1,179,559</b> | <b>\$1,926,991</b> | <b>\$8,044,290</b> |

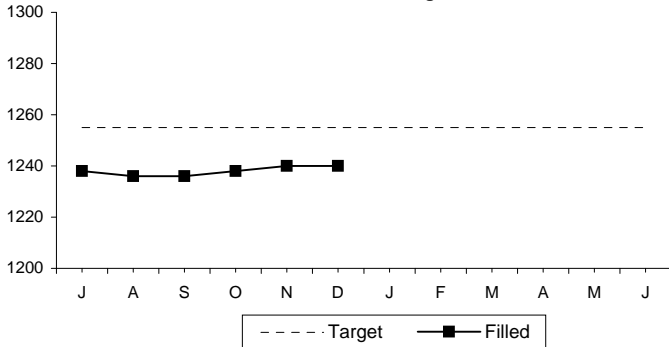
The Internal Audit Department's target is to achieve at least \$1 million in cost savings each year. Cost savings vary each year based upon many factors. In some cases, cost savings for one year may be the result of work in prior years. Commencing in FY07 cost savings will include the dollar impact, if measurable, of internal assignments.

## OTHER MANAGEMENT

# Workforce Management

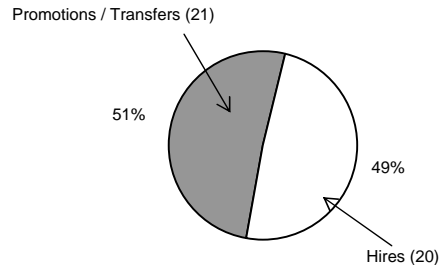
## 2nd Quarter FY08

**Filled Position Tracking**



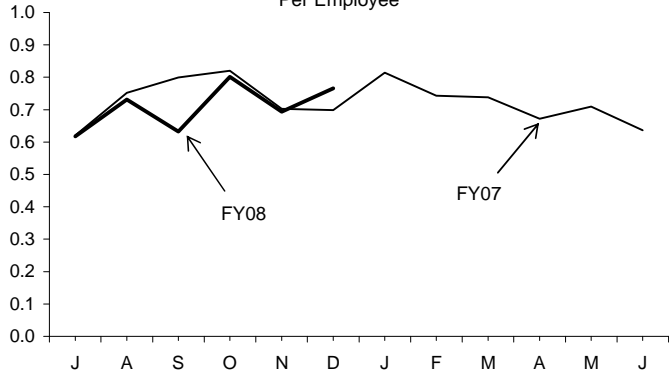
FY08 Target for Filled Positions = 1255  
 Filled Positions as of December 2007 = 1240

**Positions Filled by Hires/Promotions**  
FY08



|      | Pr/Trns  | Hires    | Total |
|------|----------|----------|-------|
| FY05 | 97 (66%) | 49 (34%) | 146   |
| FY06 | 41 (65%) | 22 (35%) | 63    |
| FY07 | 52 (56%) | 41 (44%) | 93    |

**Average Monthly Sick Leave Usage**  
Per Employee



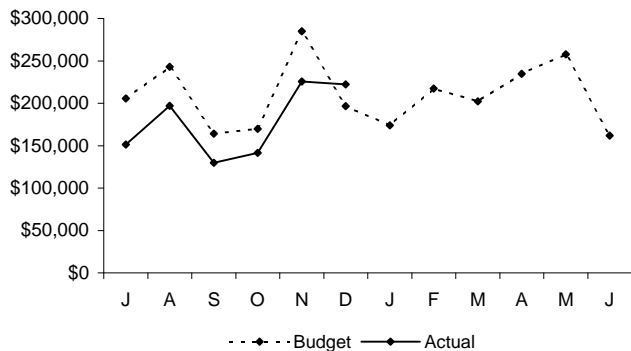
In FY08, the average monthly sick leave usage has decreased 3.45% from the same time last year.

|                 | Number of Employees | YTD         | Annualized Total | Annual FMLA % | FY07        |
|-----------------|---------------------|-------------|------------------|---------------|-------------|
| Law             | 20                  | 3.16        | 6.32             | 8.6%          | 11.17       |
| Planning        | 24                  | 2.50        | 5.00             | 1.6%          | 5.84        |
| Operations      | 961                 | 4.29        | 8.59             | 22.1%         | 8.95        |
| Support         | 197                 | 4.38        | 8.75             | 28.0%         | 7.62        |
| Finance         | 41                  | 4.29        | 8.58             | 13.6%         | 9.58        |
| Executive       | 7                   | 2.36        | 4.71             | 0.0%          | 3.72        |
| <b>MWRA Avg</b> | <b>1250</b>         | <b>4.24</b> | <b>8.48</b>      | <b>22.3%</b>  | <b>8.71</b> |

Percent of sick leave usage attributable to Family and Medical Leave Act (FMLA) leave is 22.3% ending December 31, 2007.

**Field Operations**

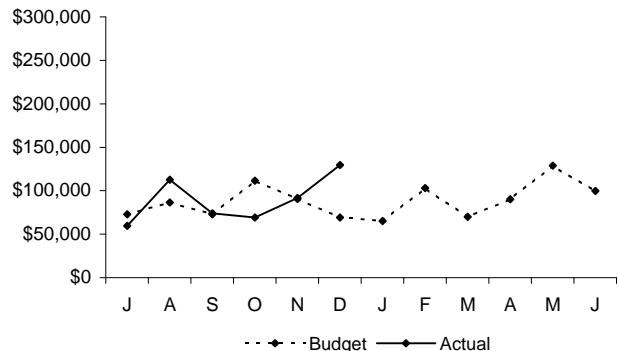
Overtime Expenditure Variance



Field Operations overtime spending in the second quarter was \$61,600 (9.5%) less than budgeted, primarily due to fewer wet weather events than projected.

**Deer Island Treatment Plant**

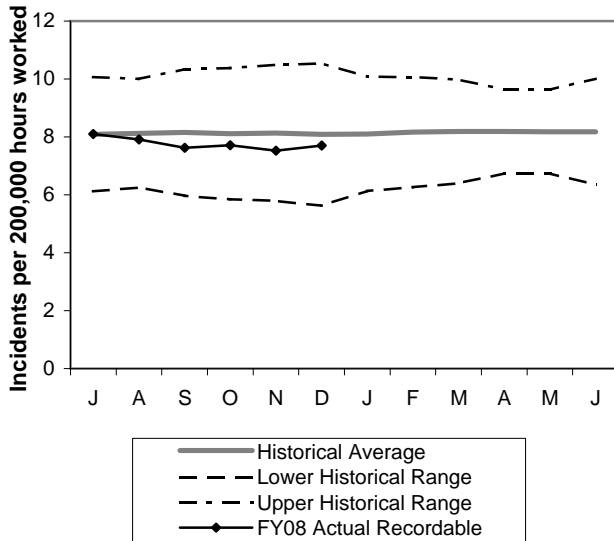
Overtime Expenditure Variance



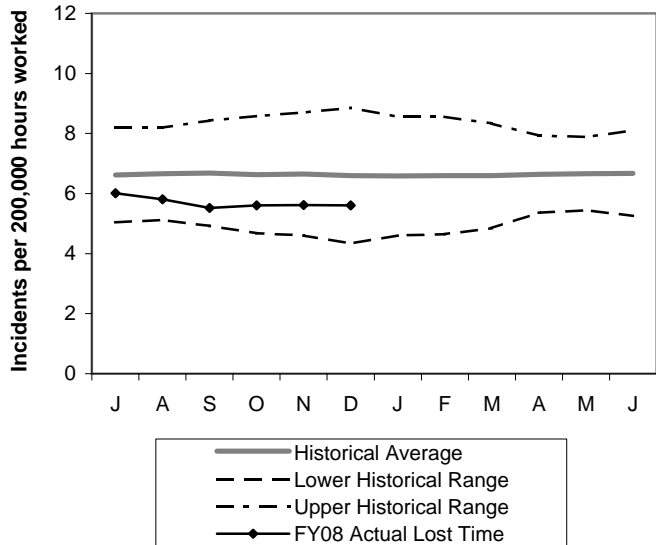
Deer Island overtime spending in the second quarter was \$19,300 (7.1%) greater than budgeted, primarily due to maintenance-related activity in December, including repairing the Residuals systems for cleaning; installing a ferrous feed system to the digesters and sludge transfer system; and gathering information for the motor control center survey.

## Workplace Safety December 2007

### Recordable Injury & Illness Rates



### Lost Time Injury & Illness Rates



- 1 "Recordable" incidents are all work-related deaths and illnesses, and those work-related injuries which result in 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 FY07. The "Upper" and "Lower Historical Ranges" are computed using these same data – adding and subtracting two standard deviations respectively. FY08 actual incident rates can be expected to fall within this historical range.

### Workers Compensation Claims Highlights

|                    | New | Closed | Open Claims |
|--------------------|-----|--------|-------------|
| Lost Time          | 4   | 11     | 43          |
| Medical Only       | 7   | 15     | 18          |
|                    |     |        |             |
|                    | New |        | YTD Returns |
| Light Duty Returns | 4   |        | 6           |

- **Light Duty Returns:**

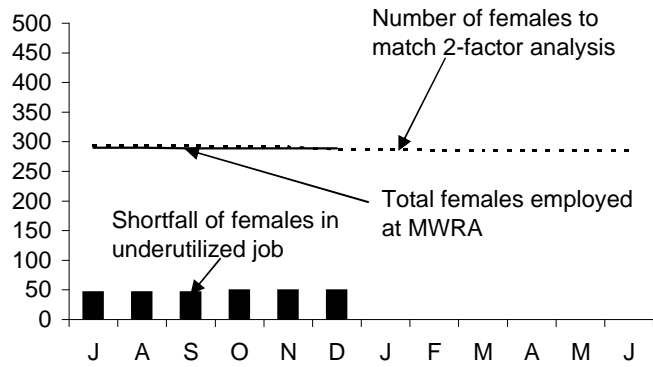
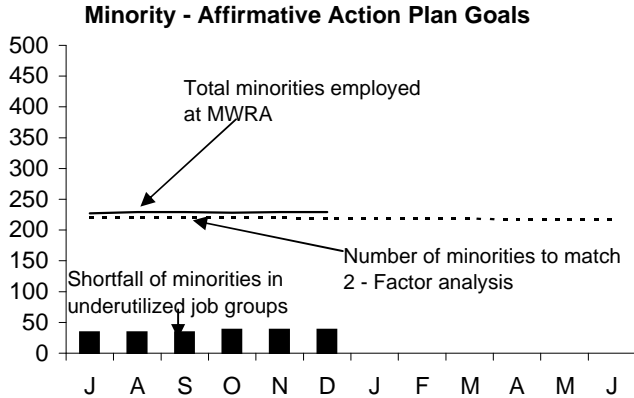
Light Duty Returns: 2 ( last month 3 returns were reported in error. It should have been 2)

3 DITP EE's to own position

1 Metro EE to stock clerk

## MWRA Job Group Representation Quarter 2, FY 2008

### Female - Affirmative Action Plan Goals



### Highlights:

At the end of Q2 FY08, 9 job groups or a total of 38 positions are underutilized by minorities as compared to 8 job groups or a total of 34 at the end of Q2 FY07; for females 9 job groups or a total of 49 positions are underutilized by females as compared to 8 job groups or a total of 46 at the end of Q2 FY07. During Q2, 1 minority was hired and 0 minorities terminated. During this same period, 1 females was hired and 1 female terminated.

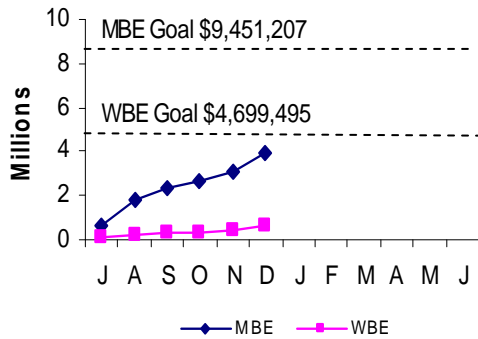
### Underutilized Job Groups - Workforce Representation

| Job Group         | Employees<br>as of<br>12/31/2007 | Minorities<br>as of<br>12/31/2007 | Achievement<br>Level | Minority<br>Over or Under<br>Under utilized | Females<br>As of<br>12/31/2007 | Achievement<br>Level | Female<br>Over or Under<br>Under utilized |
|-------------------|----------------------------------|-----------------------------------|----------------------|---|--------------------------------|----------------------|---|
| Administrator A   | 18                               | 2                                 | 1                    | 1   | 3                              | 5                    | -2  |
| Administrator B   | 25                               | 1                                 | 4                    | -3  | 7                              | 7                    | 0   |
| Clerical A        | 53                               | 24                                | 9                    | 15  | 45                             | 24                   | 21  |
| Clerical B        | 40                               | 7                                 | 11                   | -4  | 16                             | 8                    | 8   |
| Engineer A        | 86                               | 16                                | 16                   | 0   | 13                             | 12                   | 1   |
| Engineer B        | 57                               | 9                                 | 11                   | -2  | 8                              | 16                   | -8  |
| Craft A           | 117                              | 14                                | 22                   | -8  | 0                              | 7                    | -7  |
| Craft B           | 152                              | 28                                | 19                   | 9   | 5                              | 7                    | -2  |
| Laborer           | 59                               | 14                                | 10                   | 4   | 4                              | 3                    | 1   |
| Management A      | 99                               | 18                                | 15                   | 3   | 30                             | 34                   | -4  |
| Management B      | 58                               | 9                                 | 12                   | -3  | 14                             | 28                   | -14                                       |
| Operator A        | 71                               | 6                                 | 7                    | -1  | 3                              | 1                    | 2   |
| Operator B        | 76                               | 9                                 | 16                   | -7  | 3                              | 5                    | -2  |
| Para Professional | 61                               | 10                                | 13                   | -3  | 27                             | 16                   | 11  |
| Professional A    | 38                               | 2                                 | 9                    | -7  | 23                             | 17                   | 6   |
| Professional B    | 182                              | 43                                | 32                   | 11  | 81                             | 77                   | 4   |
| Technical A       | 47                               | 13                                | 9                    | 4   | 3                              | 14                   | -11                                       |
| Technical B       | 14                               | 4                                 | 3                    | 1   | 4                              | 6                    | -2  |
| <b>Total</b>      | <b>1253</b>                      | <b>229</b>                        | <b>219.0</b>         | <b>48/-38</b>                               | <b>289</b>                     | <b>287</b>           | <b>43/-52</b>                             |

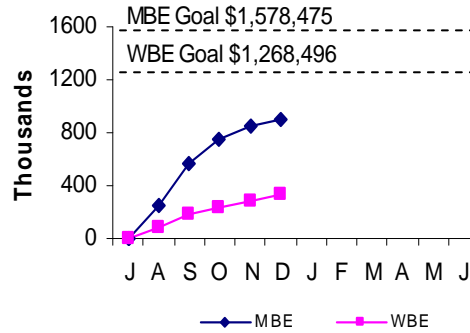
## MBE/WBE Expenditures Second Quarter FY2008

**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 December.

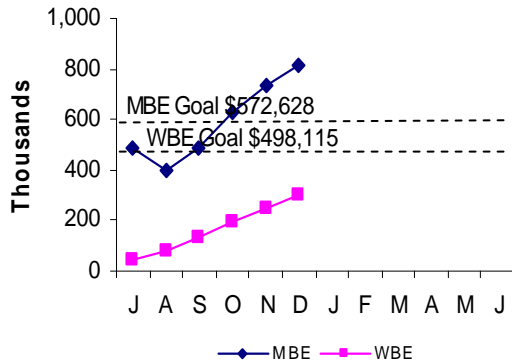
**Construction**



**Professional**



**Goods/Services**



FY08 spending and percentage of goals achieved, as well as FY07 performance are as follows:

|                   | MBE                |                |                    |                | WBE                |                |                    |                |
|-------------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|
|                   | FY08 Year-to-Date  |                | FY07               |                | FY08 Year-to-Date  |                | FY07               |                |
|                   | <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      | 3,923,652          | 41.5%          | 4,303,492          | 55.1%          | 678,938            | 14.4%          | 3,789,881          | 97.6%          |
| Professional Svc. | 897,936            | 56.9%          | 1,602,317          | 117.6%         | 327,333            | 25.8%          | 773,737            | 70.7%          |
| Goods & Svcs.     | <u>814,675</u>     | <u>142.3%</u>  | <u>1,188,886</u>   | <u>164.2%</u>  | <u>300,556</u>     | <u>60.3%</u>   | <u>312,234</u>     | <u>49.6%</u>   |
| <b>Total</b>      | <b>\$5,636,263</b> | <b>48.6%</b>   | <b>\$7,094,695</b> | <b>71.7%</b>   | <b>\$1,306,827</b> | <b>20.2%</b>   | <b>\$4,875,852</b> | <b>86.9%</b>   |

## MWRA FY08 CEB Expenses through December 2007

|                                   | December 2007<br>Year-to-Date |                        |                          |              |                       |               |
|-----------------------------------|-------------------------------|------------------------|--------------------------|--------------|-----------------------|---------------|
|                                   | Period 6 YTD<br>Budget        | Period 6 YTD<br>Actual | Period 6 YTD<br>Variance | %            | FY08<br>Approved      | %<br>Expended |
| <b>EXPENSES</b>                   |                               |                        |                          |              |                       |               |
| WAGES AND SALARIES                | \$ 43,365,950                 | \$ 42,240,972          | \$ (1,124,978)           | -2.6%        | \$ 88,091,461         | 48.0%         |
| OVERTIME                          | 1,913,853                     | 1,768,779              | (145,074)                | -7.6%        | 3,864,290             | 45.8%         |
| FRINGE BENEFITS                   | 8,111,818                     | 7,730,294              | (381,524)                | -4.7%        | 16,271,444            | 47.5%         |
| WORKERS' COMPENSATION             | 694,800                       | 541,098                | (153,702)                | -22.1%       | 1,400,000             | 38.6%         |
| CHEMICALS                         | 4,379,104                     | 4,643,268              | 264,164                  | 6.0%         | 8,702,932             | 53.4%         |
| ENERGY AND UTILITIES              | 12,819,154                    | 11,580,633             | (1,238,521)              | -9.7%        | 26,532,695            | 43.6%         |
| MAINTENANCE                       | 11,901,152                    | 12,476,840             | 575,688                  | 4.8%         | 25,768,810            | 48.4%         |
| TRAINING AND MEETINGS             | 115,439                       | 107,049                | (8,390)                  | -7.3%        | 222,252               | 48.2%         |
| PROFESSIONAL SERVICES             | 3,634,122                     | 3,027,397              | (606,725)                | -16.7%       | 7,869,287             | 38.5%         |
| OTHER MATERIALS                   | 1,707,114                     | 1,741,069              | 33,955                   | 2.0%         | 5,022,858             | 34.7%         |
| OTHER SERVICES                    | 11,724,439                    | 10,913,117             | (811,322)                | -6.9%        | 22,893,395            | 47.7%         |
| <b>TOTAL DIRECT EXPENSES</b>      | <b>\$ 100,366,945</b>         | <b>\$ 96,770,516</b>   | <b>\$ (3,596,429)</b>    | <b>-3.6%</b> | <b>\$ 206,639,424</b> | <b>46.8%</b>  |
| INSURANCE                         | \$ 1,250,002                  | \$ 1,195,434           | \$ (54,568)              | -4.4%        | \$ 2,500,000          | 47.8%         |
| WATERSHED/PILOT                   | 11,603,574                    | 11,688,761             | 85,187                   | 0.7%         | 23,207,147            | 50.4%         |
| BEC <sub>o</sub> PAYMENT          | 2,110,200                     | 2,095,550              | (14,650)                 | -0.7%        | 4,347,200             | 48.2%         |
| MITIGATION                        | 709,612                       | 700,464                | (9,148)                  | -1.3%        | 1,419,223             | 49.4%         |
| ADDITIONS TO RESERVES             | 827,327                       | 827,327                | -                        | 0.0%         | 1,654,655             | 50.0%         |
| RETIREMENT FUND                   | 2,116,664                     | 2,126,907              | 10,243                   | 0.5%         | 4,233,329             | 50.2%         |
| POST EMPLOYEE BENEFITS            | 3,549,448                     | 3,549,450              | 2                        | 0.0%         | 7,098,896             | 50.0%         |
| <b>TOTAL INDIRECT EXPENSES</b>    | <b>\$ 22,166,827</b>          | <b>\$ 22,183,893</b>   | <b>\$ 17,066</b>         | <b>0.1%</b>  | <b>\$ 44,460,450</b>  | <b>49.9%</b>  |
| DEBT SERVICE                      | \$ 163,494,304                | \$ 160,806,496         | \$ (2,687,808)           | -1.6%        | \$ 330,627,700        | 48.6%         |
| DEBT SERVICE ASSISTANCE           | (8,625,000)                   | (8,625,000)            | -                        | 0.0%         | (17,250,000)          | 50.0%         |
| <b>TOTAL DEBT SERVICE</b>         | <b>\$ 154,869,304</b>         | <b>\$ 152,181,496</b>  | <b>\$ (2,687,808)</b>    | <b>-1.7%</b> | <b>\$ 313,377,700</b> | <b>48.6%</b>  |
| <b>TOTAL EXPENSES</b>             | <b>\$ 277,403,076</b>         | <b>\$ 271,135,905</b>  | <b>\$ (6,267,171)</b>    | <b>-2.3%</b> | <b>\$ 564,477,574</b> | <b>48.0%</b>  |
| <b>REVENUE &amp; INCOME</b>       |                               |                        |                          |              |                       |               |
| RATE REVENUE                      | \$ 258,898,916                | \$ 258,898,916         | \$ -                     | 0.0%         | \$ 517,797,832        | 50.0%         |
| OTHER USER CHARGES                | 3,678,076                     | 11,315,779             | 7,637,703                | 207.7%       | 7,565,475             | 149.6%        |
| OTHER REVENUE                     | 3,112,949                     | 4,381,946              | 1,268,997                | 40.8%        | 5,241,223             | 83.6%         |
| INVESTMENT INCOME                 | 17,144,419                    | 18,373,073             | 1,228,654                | 7.2%         | 33,873,044            | 54.2%         |
| <b>TOTAL REVENUE &amp; INCOME</b> | <b>\$ 282,834,360</b>         | <b>\$ 292,969,714</b>  | <b>\$ 10,135,354</b>     | <b>3.6%</b>  | <b>\$ 564,477,574</b> | <b>51.9%</b>  |

Through December 2007, total revenue was \$293 million, \$10.1 million or 3.6% more than budgeted. Total expenses were \$271.1 million, \$6.3 million or 2.3% less than budgeted.

### Expenses –

- **Direct Expenses** through December totaled \$96.8 million, \$3.6 million or 3.6% less than budgeted.
- **Wages and Salaries** are \$1.1 million or 2.6% less than budgeted as a result of lower regular pay due to fewer than budgeted filled positions.
- Overspending for **Chemicals** of \$264,000 is mostly due to higher hydrogen peroxide, ferric chloride and activated carbon offset by lower sodium hypochlorite usage. Some of this overspending is timing.
- **Energy and Utility** expenses are \$1.2 million or 9.7% lower than budgeted mostly due to lower diesel fuel purchases, lower water usage and lower electricity prices.
- **Maintenance** spending overall is \$576,000 or 4.8% more than budgeted. Overspending in both Support and Operations of \$718,000 mostly due to timing, offset by Emergency Preparedness of -\$142,000 lower spending for special equipment materials and services.
- **Professional Services** expense through December is \$607,000 or 16.7% less than budgeted mainly due to underspending for security in Emergency Preparedness Department and lab and testing analysis in ENQUAD.
- **Other Services** is under budget by \$811,000, of which \$570,000 is for sludge pelletization and \$133,000 is for grit and screenings.
- **Indirect Expenses** are \$17,000 more than budgeted due to an overaccrual of watershed expenses in FY07 offset by lower spending for insurance payments/claims and premiums.
- **Debt Service** through December totaled \$152.1 million, \$2.7 million or 1.7% less than budgeted as a result of variable rate savings.

### Revenue and Income –

- **Other User Charges** and **Other Revenue** through December totaled \$15.7 million combined; the majority of the \$8.9 million variance is for Reading entrance fee (\$7.8 million) which was not budgeted, and higher than budgeted receipt for the Renewable Portfolio Standard (RPS) credits related to the Deer Island energy program.
- **Investment Income** through December totaled \$18.3 million, \$1.2 million or 7.2% more than budgeted mostly due to the effect of higher than budgeted variable interest rate.

## Cost of Debt December 2007

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

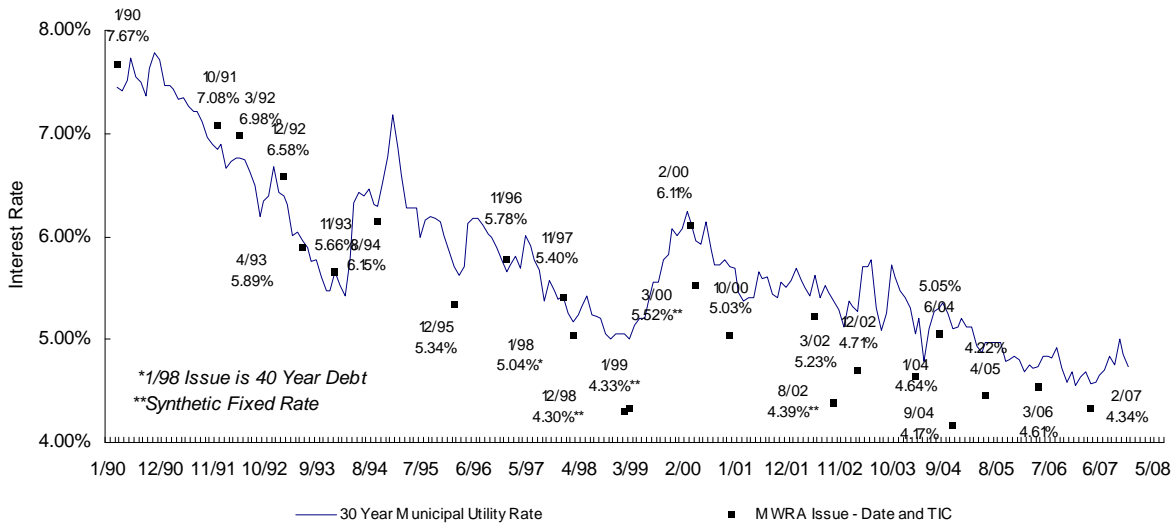
### Average Cost of MWRA Debt

|  |           |
|--|-----------|
| Fixed Debt (\$3,898)                     | 4.67%     |
| Variable Debt (\$699)                    | 3.89%     |
| SRF Debt (\$997)                         | 0.92%     |
| <br>Weighted Average Debt Cost (\$5,594) | <br>3.90% |

### Most Recent Senior Fixed Debt Issue February 2007

|                           |       |
|---------------------------|-------|
| 2007 Series A & B (\$848) | 4.34% |
|---------------------------|-------|

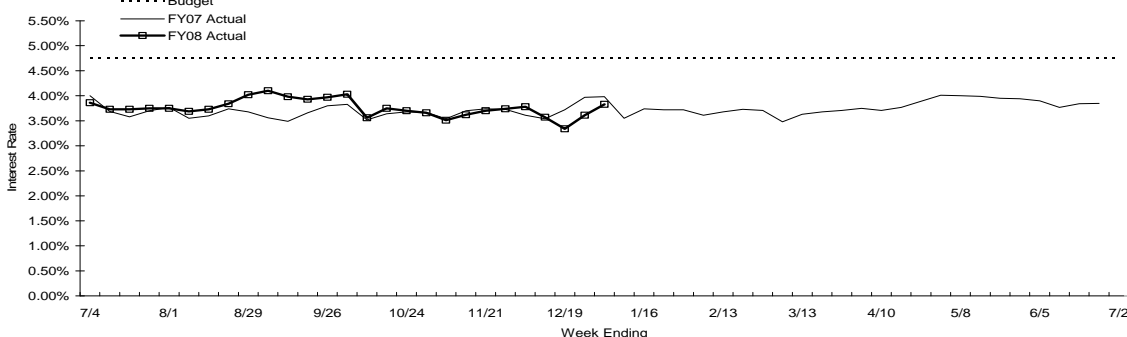
### MWRA Fixed Rate Debt vs. 30 Year Municipal Utility Interest Rate



### Weekly Average Interest Rates vs. Budget

MWRA currently has seven variable rate debt issues with \$699 million outstanding, excluding commercial paper and the seven floating rate issues 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. Short term rates have been relatively constant during fiscal year 2008. 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.

### Weekly Average Interest Rate on MWRA Variable Rate Debt Includes liquidity support and remarketing fees





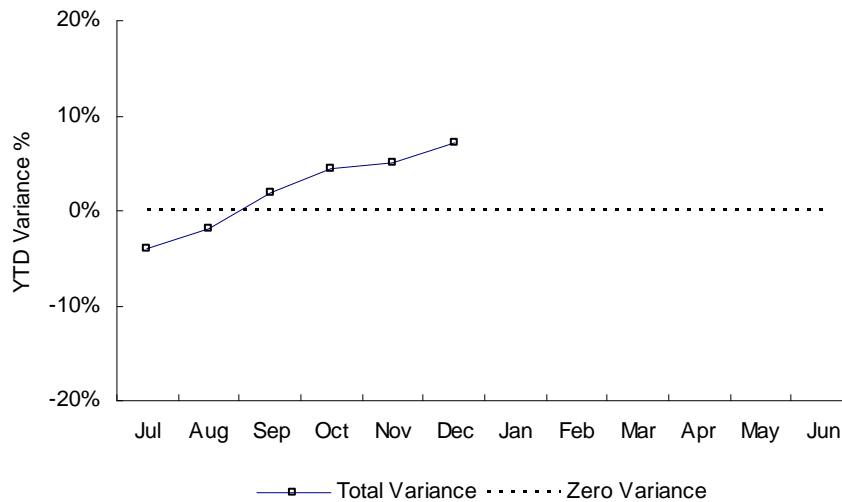
## Investment Income December 2007

Actual interest income varies from budgeted amounts because either fund balances or interest rates are greater or lower than budgeted.

### YTD Investment Income vs Budget (\$000)

| Fund                  | Impact on Investment Income due to Variance in Fund Balances |                        |                |              | Impact on Investment Income due to Variance in Interest Rates |              |                | Combined Impact on Investment Income |              |
|-----------------------|--|------------------------|----------------|--------------|---|--------------|----------------|--------------------------------------|--------------|
|                       | Average Budgeted Balance                                     | Average Actual Balance | Variance       | Impact       | Budget  | Actual       | Impact         | Impact                               | %            |
| Combined Reserves     | \$89,297   | \$89,508               | \$211          | \$10         | 4.99%   | 4.91%        | (\$39)         | (\$29)                               | -1.27%       |
| Construction          | \$94,662   | \$75,535               | (\$19,126)     | (\$436)      | 4.50%   | 5.35%        | \$327          | (\$110)                              | -5.08%       |
| Debt Service          | \$99,257   | \$105,630              | \$6,373        | \$145        | 4.50%   | 5.20%        | \$376          | \$521                                | 23.03%       |
| Debt Service Reserves | \$272,290  | \$274,796              | \$2,507        | \$66         | 5.19%   | 5.16%        | (\$52)         | \$13                                 | 0.18%        |
| Operating             | \$55,650   | \$50,478               | (\$5,172)      | (\$130)      | 4.44%   | 4.69%        | \$76           | (\$54)                               | -4.32%       |
| Revenue               | \$53,385   | \$76,845               | \$23,459       | \$535        | 4.54%   | 5.18%        | \$256          | \$792                                | 64.46%       |
| Redemption            | \$35,410   | \$35,410               | \$0            | \$0          | 4.54%   | 5.07%        | \$95           | \$95                                 | 11.65%       |
| <b>Total</b>          | <b>\$699,950</b>   | <b>\$708,202</b>       | <b>\$8,252</b> | <b>\$189</b> | <b>4.83%</b>  | <b>5.12%</b> | <b>\$1,039</b> | <b>\$1,229</b>                       | <b>7.17%</b> |

### YTD Investment Income Variance



## Rates Management December 2007

Baseline estimates of future rate revenue requirements and household charges are established twice each year in conjunction with preparation of proposed and final budgets.

### MWRA Rate Projections as of December 31, 2007

|  | FY08    | FY09    | FY10    | FY11    | FY12    | FY13    | FY14    | FY15    | FY16    | FY17    | Average FY08-17 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------------|
| Rate Revenue Increase <sup>1</sup>                             | 4.5%    | 5.8%    | 5.8%    | 5.8%    | 5.8%    | 5.8%    | 5.8%    | 4.6%    | 2.7%    | 8.6%    | 5.5%            |
| Average Household Charge Based on 90,000 gal/year <sup>2</sup> | \$1,072 | \$1,132 | \$1,183 | \$1,235 | \$1,314 | \$1,385 | \$1,464 | \$1,537 | \$1,603 | \$1,702 |                 |
| Average Household Charge Based on 61,000 gal/year              | \$726   | \$767   | \$802   | \$837   | \$890   | \$939   | \$992   | \$1,042 | \$1,086 | \$1,153 |                 |

<sup>1</sup> The Commonwealth has included \$23 million for debt service assistance in its budget for FY08. These projections assume MWRA will receive \$17.25 million of the total Commonwealth appropriation in FY08, and similar amounts in FY09 to FY17.

<sup>2</sup> Weighted average for the MWRA Core 21 communities based on the **November 2007** MWRA Advisory Board's annual retail rates survey. Core 21 communities receive 100% MWRA water and sewer service.

### Significant Changes since November 2007: None

Prior year budget surpluses are set aside to offset future rate increases. These funds are held either in the rate stabilization fund or in the bond redemption account.

|                               | FY08  | FY09  | FY10   | FY11   | FY12  | FY13   | FY14  | FY15  | FY16  | FY17  | Total         |
|-------------------------------|-------|-------|--------|--------|-------|--------|-------|-------|-------|-------|---------------|
| Rate Stabilization Withdrawal | \$0.0 | \$5.4 | \$16.8 | \$7.2  | \$5.7 | \$7.2  | \$1.4 | \$0.0 | \$0.0 | \$0.0 | \$43.7        |
| Bond Redemption               | \$0.0 | \$0.0 | \$1.5  | \$26.5 | \$0.0 | \$7.4  | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$35.4        |
| Total                         | \$0.0 | \$5.4 | \$18.3 | \$33.7 | \$5.7 | \$14.6 | \$1.4 | \$0.0 | \$0.0 | \$0.0 | <b>\$79.1</b> |