Massachusetts Water Resources Authority

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Second Quarter FY2014

Frederick A. Lasskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
February 12, 2014
Deer Island Operations: Self-Generation

Self-Generation

Power Generation, MWh

- Hydro
- CTGs
- STGs

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

- DiGas, % of time
- STGs, % of time
- Hydro, % of time
- Wind Turbines, % of time
- Availability Target
Deer Island: Plant Flow & Precipitation

Plant Flow & Precipitation

- Total Plant Flow, MGD
- 12 Yr Avg Flow, MGD
- Total Precipitation, inches rain
- 12 Yr Avg Precipitation, inches rain
Toxic Reduction and Control

Molybdenum Concentrations in Biosolids (mg/l)

- DEP Type 1 Limit
- EPA Interim Limit
- Previous 12 Months
Treated Water: Disinfection Effectiveness
Giardia CT & Cryptosporidium Inactivation

**Giardia CT Percent Achievement**
Carroll Water Treatment Plant

**Cryptosporidium Inactivation**
Carroll Water Treatment Plant

**Regulatory Minimum Standard**

**MWRA Operating Goal**

**Minimum Hourly Crypto Log Inactivation**
CWTP Date: [Graphic showing log inactivation values]
Water Supply and Source Water Management

Monthly Precipitation

- Actual
- Long-Term Average

System Yield

- Monthly Yield
- Long-Term Average

Quabbin Reservoir Levels
With Drought Emergency Planning Stages

- Normal
- Below Normal
- Warning
- Below ~55% Drought Emergency Stage 1
- Below 38% Drought Emergency Stage 2
- Below 25% Drought Emergency Stage 3

Percent Full
Water Distribution System Pipelines

Miles Surveyed for Leaks

Water Distribution System

<table>
<thead>
<tr>
<th>Month</th>
<th>J</th>
<th>A</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
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<tbody>
<tr>
<td>Leaks Detected</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Leaks Repaired</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Backlog</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Avg. Lag Time</td>
<td>1.0</td>
<td>20.0</td>
<td>27.3</td>
<td>13.7</td>
<td>15.3</td>
<td>16.4</td>
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Combined Sewer Overflow Control Plan

Alewife Brook Wetland, Cambridge

DRAFT
Annual Progress Report 2013
February 2014
Three CSO projects completed:

- Brookline Sewer Separation
- CAM004 Stormwater Outfall and Wetland ("Alewife Brook Wetland")
- SOM01A Interceptor Connection Upgrade and Floatables Control

Total completed projects: 32 of 35 in the Long-Term Control Plan

CAM004 Sewer Separation (Cambridge)

- All three major contracts are now in construction.
- On schedule for completion by Dec 2015 court milestone.

Reserved Channel Sewer Separation (BWSC)

- All major contracts are complete or >75% complete.
- Two smaller contracts to be awarded soon.
- On schedule for completion by Dec 2015 court milestone.
2013 CSO Progress Highlights

- MWR003 Gate/Floatables Control and Rindge Ave. Siphon Relief (MWRA)
  - 100% design; Construction NTP by the August 2014 court milestone

In 2013: 21,172 linear feet (4.0 miles) of storm drain and sanitary sewer were installed in Boston, Brookline and Cambridge

Since 1996: 450,000 linear feet (85 miles) of storm drain and sanitary sewer have been installed under the CSO Control Plan
Completion of Brookline Sewer Separation – April 2013

Schedule Seven Milestone: July 2014

- 71 acres separated
- 9,450 ft (1.8 miles) of new storm drain
- 5,840 ft (1.1 miles) of new sewer

Removed stormwater from MWRA system to lower CSO discharges to the Charles River Basin, primarily at MWRA’s Cottage Farm facility

Brookline contracts: $23.9 M

MWRA outfall contract: $1.1 M

Total cost: $25.0 M
September 2012: MWRA completes the cleaning of Outfall MWR010

April 2013: Brookline removes steel overflow plate in Outfall MWR010

December 2013: Brookline completes surface restoration
Alewife Stormwater Outfall and Wetland Basin
Construction Cost $17.8M     MWRA Share $5.3M

Construction start: April 2011
Construction complete: April 2013
Alewife Brook Stormwater Outfall and Wetland Basin

4-ft by 8-ft Stormwater Conduit Outfall

Stormwater Outfall to the Forebay

Installation of 42-inch drain on East Second Street

Oxbow extension of the Little River
Alewife Brook CSO Control Plan
$97.2 million MWRA share (Cambridge’s share $20.5 million)

City of Cambridge
- Interceptor Connection(s) Relief and Floatables Controls (2010)
- CAM400 Common Manhole Separation (2011)
- CAM004 Stormwater Outfall and Wetland (2013)
- CAM004 Sewer Separation (2015)

MWRA
- SOM01A Interceptor Connection Upgrade and Floatables Control (2013)
- MWR003 Gate/Floatables Control and Rindge Ave. Siphon Relief (2015)
MWRA Alewife Brook CSO Improvements
$3.8M  Design and Construction

<table>
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<tr>
<th>Project</th>
<th>Commence Design</th>
<th>Commence Construction</th>
<th>Complete Construction</th>
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<tbody>
<tr>
<td>Outfall SOM01A Interceptor Connection and Floatables Control</td>
<td>Apr 12</td>
<td>Sep 13</td>
<td>Dec 13</td>
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<tr>
<td>Outfall MWR003 Gate and Floatables Control and Rindge Ave. Siphon Relief</td>
<td>Apr 12</td>
<td>Aug 14</td>
<td>Oct 15</td>
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SOM01A Interceptor Connection and Floatables Control

Underflow baffle (floatables control)
Behind existing overflow weir

Modified connection to MWRA interceptor
Reserved Channel Sewer Separation Progress

Total Projected MWRA Cost: $68.6 million

- Contracts 1, 2, 3A and 7 are complete
- Contracts 3B and 4 (sewer separation) are well underway
- Contract 8 (final paving) is ongoing
- Contracts 5 (sewer lining) and 6 (downspouts) to be awarded soon
Reserved Channel Sewer Separation Construction

**Contract 3B: 90% Complete**

- Installation of 42-inch drain on East Second Street
- Construction of drain manhole at K and E. 2nd streets

**Contract 4: 75% Complete**

- Installation of 30-inch drain on I Street
- Installation of 36-inch drain on E Street

Contract 3B: 90% Complete

Installation of 42-inch drain on East Second Street

Construction of drain manhole at K and E. 2nd streets

Contract 4: 75% Complete

Installation of 30-inch drain on I Street

Installation of 36-inch drain on E Street
CSO Control Plan Budget and Spending

Proposed FY15 CIP: $893.9 M

Projected Cost: $896.4 M

Spent in 2013: $26.3 M

Spent through 2013: $844.3 M

Remaining to be spent: $52.1 M (2014-2020)
Long-Term Control Plan Achievements To Date

- 32 of 35 projects in the CSO plan are complete
- 2 projects are in construction
- Last project moves to construction in August 2014
- 37 of 84 CSO outfalls are closed or 25-year control (5 NDB)
- Average annual CSO volume reduced 85%
  (3.3 BG in 1988 to 0.50 BG today)
- 88% of the remaining volume is treated at MWRA’s four CSO facilities

Goal is 0.40 B gallons with 93% treated
Long-Term Control Plan Achievements To Date

Total Annual Overflow Volume CSOs

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume (billion Gallonm)</th>
<th>Treated</th>
<th>Untreated</th>
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<tbody>
<tr>
<td>1988</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>0.44</td>
<td></td>
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<tr>
<td>2015</td>
<td>0.38</td>
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Total 3.3
Oxygen Generation Facility Services, Deer Island Treatment Plant
Cryogenic Oxygen Production is Critical to DITP Permit Compliance

- “Cryo” Generates 130 dtpd 97% Pure Oxygen from 1 of 2 process trains
- Oxygen is Used in Secondary Activated Sludge Process
- “Cryo” is a significant Energy User with hundreds of instruments
  - 17.6 M kWh annually (11.4% of DITP’s total Energy Demand)