EBC Evening Program

Update on Developments at the Massachusetts Water Resources Authority
Welcome

Daniel K. Moon

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Welcome to Foley Hoag LLP

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Update from the Massachusetts Water Resources Authority

Fred Laskey

Executive Director
Massachusetts Water Resources Authority
Update on Developments at MWRA

Frederick A. Laskey
Executive Director

November 14, 2018
About MWRA
• MWRA provides wholesale water and wastewater services to over 2.5 million customers in 61 communities

• On average, MWRA delivers an average of 200 million gallons per day to its water customers

• MWRA collects and treats an average of 350 million gallons of wastewater per day, with a peak capacity of 1.2 billion gallons
Make-Up of MWRA Service Area

- 51 communities that get water service – over 6,000 miles of water pipes
- 43 communities that get sewer service
- Of those, 30 get both water and sewer
  - 39 Towns
  - 20 Cities
  - 1 Fire District
  - 37 Boards of Selectmen
  - 20 Mayors
  - 3 Council Presidents
A Little Perspective
Violation Of The Clean Water Act

• In 1982 and 1983, civil suits were filed against the MDC and other state agencies claiming that the Massachusetts Clean Waters Act had been violated as a result of discharges of untreated and partially treated sewage from Nut and Deer Islands
Two Obsolete Wastewater Treatment Plants
Raw Sewage Pouring Into Boston Harbor Daily
THE HARBOR.
Dramatic Improvements In Water Quality – Even In Wet Weather

Average Enterococcus counts in Boston Harbor in wet weather

The lighter the blue, the better
Deer Island Received Its 5th Platinum Award

No permit violations for 11 years in a row!
Charles River Gets High Marks

• In its latest annual report card, the EPA has given the Charles River a grade of A- for water quality
Boston Now Has Some Of The Cleanest Urban Beaches In The Country

The Boston Globe

Michael Levenson - Globe Staff | May 23, 2015

Report gives Boston-area beaches high marks

Says Boston region’s waters are cleaner than Waikiki’s

88 percent of the time in 2014.

On the national stage, the report found South Boston’s beaches had cleaner water than the beaches in Virginia Beach, Va., Coney Island, N.Y., Santa Monica Beach, Calif., and, yes, Waikiki and South Beach. The finding was based on comparable water quality testing data taken between 2012 and 2014 by local officials in those states and then reported to the Environmental Protection Agency.

“These beaches [in the Boston-area], from best to worst, are significantly better than they were 20 years ago, and they’re significantly better than most of the urban beaches in the country,” said Bruce Berman, director of strategy, communications and programs at Save the Harbor/Save the Bay. “We should be really proud.”
Boston’s Waterfront Is The Region’s Fastest Growing Zip Code
The Challenges Ahead:
Workforce Management
The Replacements

- **Dave Coppes**, Chief Operating Officer
- **Carolyn Fiore**, Deputy Chief Operating Officer
- **Kathy Murtagh**, Director, Tunnel Redundancy
- **Beth Card**, Director of Environmental and Regulatory Affairs
- **Fred Brandon**, Manager, Design and Construction, Tunnel Redundancy
- **John Colbert**, Acting Chief Engineer
- **Brian Kubaska**, Assistant Director of Engineering
- **Carolyn Francisco Murphy**, General Counsel
- **Michael Altieri**, Associate General Counsel
- **Meghan McNamara**, Associate General Counsel
- **Andrea Murphy**, Director of Human Resources
- **Doug Rice**, Director of Procurement
- **Mark Johnson**, Director of Waterworks
- **Steve Cullen**, Director of Wastewater
- **Rebecca Weidman**, Director of TRAC
- **Steve Rhode**, Director of Laboratory Services
- **Michael McDonald**, Manager, Energy
- **Matt Dam**, Manager Occupational Health and Safety
- **Imad Sandakly**, Manager Training and Development
Most Vacancies Filled By Internal Promotions

Positions Filled By Hires/Promotions
FY18-YTD

<table>
<thead>
<tr>
<th>Year</th>
<th>Prom./Transf.</th>
<th>Hires</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY13</td>
<td>82 (64%)</td>
<td>47 (36%)</td>
<td>129</td>
</tr>
<tr>
<td>FY14</td>
<td>111 (69%)</td>
<td>51 (31%)</td>
<td>162</td>
</tr>
<tr>
<td>FY15</td>
<td>133 (67%)</td>
<td>65 (33%)</td>
<td>198</td>
</tr>
<tr>
<td>FY16</td>
<td>99 (62%)</td>
<td>60 (38%)</td>
<td>159</td>
</tr>
<tr>
<td>FY17</td>
<td>150 (70%)</td>
<td>72 (32%)</td>
<td>222</td>
</tr>
<tr>
<td>FY18</td>
<td><strong>118 (61%)</strong></td>
<td><strong>74 (39%)</strong></td>
<td><strong>192</strong></td>
</tr>
</tbody>
</table>
Without Entry Level Positions, There Are Even More

**FY18 Positions Filled by Hires/Promos & Transfers**

<table>
<thead>
<tr>
<th></th>
<th>HIRES</th>
<th>PROMO/TRANSERS</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>FY18</td>
<td>42 (24%)</td>
<td>133 (76%)</td>
<td>175</td>
</tr>
<tr>
<td>FY17</td>
<td>42 (24%)</td>
<td>99 (70%)</td>
<td>141</td>
</tr>
<tr>
<td>FY16</td>
<td>40 (21%)</td>
<td>155 (79%)</td>
<td>195</td>
</tr>
<tr>
<td>FY15</td>
<td>44 (27%)</td>
<td>118 (73%)</td>
<td>162</td>
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**Entry Level Titles:**
- Building & Grounds Worker
- OMC Laborer
- Staff Engineer
- Sr. Lab Technician
Water System Expansion
Six Communities Have Joined The MWRA Water System

STOUGHTON
BEDFORD
Renewable Energy
And We Love Being Green!

- Of our $40 million annual energy budget, $22 million comes from renewable sources
• About 85% of the water is delivered by gravity
Solar Power
Methane Utilization At Deer Island

• 98% of methane is utilized to make heat and electricity
Deer Island Combined Heat and Power Alternative Study

Estimated cost: $830,000
RFP Date: May 2018
Water System Redundancy
Progress on Water System Redundancy

1. Chicopee Valley Aqueduct - 2007 Improvements
2. Quabbin Aqueduct - Inspection planned
3. Cosgrove Tunnel / Wachusett Aqueduct - Project underway
5. Metropolitan Tunnels - Planning underway
• Existing NIH Piping

• NIH Phase 1 work completed May 2018

• NIH Phase 2 work completed September 2018
Southern Extra High Redundancy Project

- Contract 1 – complete
- Contract 2 - 40% complete
- Contract 3 - getting under way
Testing Nearing Completion
Condition of Metropolitan Tunnel System

• Tunnel system:
  – Concrete-lined deep rock tunnels
  – Steel and concrete vertical shafts
  – Surface pipe, valves and appurtenances

• Little maintenance required for tunnels and shafts. **Little risk of failure.**

• Pipe, valves and appurtenances need maintenance, replacement, rehabilitation
Valve Reliability Concern

• Valves that don’t work
Valve Reliability Concern

- Valves we can’t exercise
To provide redundancy for Metropolitan Tunnels which deliver water to 60% of the system

- $1.54 billion
- Project duration 2018 – 2039
## Upcoming Tunnel-Related Projects

<table>
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<tr>
<th>Project Description</th>
<th>Start Date</th>
<th>Budget</th>
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<tbody>
<tr>
<td>Chestnut Hill Emergency Pump Station</td>
<td>July 2018</td>
<td>$6.7 million</td>
</tr>
<tr>
<td>Tunnel Conceptual Design/ EIR</td>
<td>October 2018</td>
<td>$9 million</td>
</tr>
<tr>
<td>Shafts 5 and 9 Building Improvements</td>
<td>January 2019</td>
<td>$683,000</td>
</tr>
<tr>
<td>Section 101, Waltham Section Design</td>
<td>April 2019</td>
<td>$3 million</td>
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Cost Criteria Weight is on a Downward Trend
• MWRA continues to put less emphasis on cost criteria in design procurements. Over the last few years:

  – In FY16, 50% were not awarded to the lowest cost proposer
  
  – In FY17, 60% were not awarded to the lowest bidder
  
  – In FY18, 75% were not awarded to the lowest bidder
Preparing for Climate Change
Preparing for Climate Change: Drinking Water System Is In Good Shape

• Quabbin Reservoir, Belchertown
  – 65 miles west of Boston
  – Elevation 528 feet

• Wachusett Reservoir, Clinton
  – 35 miles west of Boston
  – Elevation 395 feet

• Water treatment plant is in Marlborough

• 85% of water delivered by gravity

• Lowest elevation of a water tank is 192 feet above sea level
On The Wastewater Side, Sea Level Rise Was Anticipated In The Design of Deer Island Treatment Plant

- Deer Island plant fully protected
  - 100-year flood
  - 1.9-foot sea level rise
  - Wave runup of 14 feet on east side and 2 feet on west side

- On-site power plant ensures uninterrupted power supply

- Nut Island headworks in Quincy similarly designed for sea level rise
21 of MWRA Coastal Sewer Facilities Are Within 15 Feet Of Mean Sea Level
MWRA’s Strategy

• Short-term
  • At-risk buildings are being fitted with temporary flood barrier

• Long-term
  • Facility rehabilitation on a 20-year cycle
  • Future rehabilitation contracts will include protection measures

• But we may have to speed things up...
In the 1890s, buildings reflected the high esteem in which water was held
1848: Water Celebration On Boston Common
1897: Wachusett Aqueduct
1898: Rosemary Brook Siphon
1899: Chestnut Hill High Service Pump Station
1899: Sudbury Aqueduct Terminal Chamber
1900: Chestnut Hill Low Service Pump Station
But After WWII, Highways Were King
And Water Was All But Forgotten
The Mass Pike Interchange Took The Area For The Second Barrel
And the buildings got more utilitarian...
1969: Cosgrove Intake
1971: Cottage Farm CSO Facility
1967: Ward Street Headworks
1967: Chelsea Creek Headworks
1991: Commercial Point CSO Facility
We’ve tried to bring some of that sense of pride back into these critical facilities
2003: Squantum Pumping Station
2005: Intermediate Pumping Station
2005: Carroll Water Treatment Plant
Open Discussion

Keynote Speaker
Fred Laskey, MWRA

Moderator
David Young, CDM Smith