Update on Lead and Copper

July 18, 2018
90th Percentile Lead Levels in MWRA Communities: 1992 - 2017

- 1991: New EPA Rule
- 1996: Corrosion Control Complete
- 1996-1998: Initial Start-up
- 1999-2005: Stepwise Optimization
- 2005 - on: Carroll WTP in operation with Optimum Water Quality Parameters
Blood Lead Levels Trends – US and Massachusetts

National BLL Levels: 1976-2014

Mass BLL Levels: 2001-2015
Blood Lead Concentrations Considered Harmful by the CDC

In 2012, the CDC eliminated the term, "blood lead level of concern" and declared there is no safe level of lead in children's blood.
Free laboratory services to local schools
328 Schools in 37 communities
4.7% above Action Level

Work with local health officials regarding child care facilities
Contacted Medford, Melrose, Quincy and Winthrop

All 41 licensed child care facilities in Medford contacted, first samples received this week
In planning stage with Melrose health and water departments
Corrosion Control Treatment Issues

- Concern regarding “one-size-fits-all” approach to corrosion control
- Potential for water quality, environmental and other unintended consequences

- Denver required to add orthophosphate against their own technical recommendation
- Water and wastewater agencies and river advocates have sued the state

- MA DEP ordered Ashland to add phosphate to MWRA water to match local treatment
Lead Loan Program: $9 Million in Distributions to Date

- Quincy: $1.5 million in FY17
- Winchester: $500,000 in FY17
- Newton: $4.0 million in FY17
- Marlborough: $1.0 million in FY18
- Revere: $195,000 in FY18
- Winthrop: $284,000 in FY18
- Needham: $1.0 million in FY18
- Winchester: $500,000 in FY18 (second phase)
Accomplishments on Construction Contracts

- Northern Intermediate High Pipeline
- Wachusett Aqueduct Pumping Station
- Clinton Phosphorus Reduction Facility

July 18, 2018
Installation of 36-inch pipe along West Street (in Historic district)
Northern Intermediate High Pipeline - 7066

- Installation of 36-inch water pipe underneath Rt. 93
- Installation of 36-inch water pipe at Reading - Woburn town line
- Sedimentation Controls for dewatering at West & Oak Streets
Installation of new 36-inch Butterfly Valve at West and Oak Streets

Pre-assembly of water piping for installation at future meter site at Louanis Street
Very snowy winter postponed construction until spring
Northern Intermediate High Pipeline - 7471

Temporary By-pass

Thrust Blocks
Installation of 12-inch Temporary Pipe  
Installation of 36-inch Pipe, Oak Street
Meter 83 Leach Park

Chlorine injection, Woburn
Northern Intermediate High Pipeline - 7471

Drywell for valve vault

Drain line
Northern Intermediate High Pipeline - 7471

Handicap Ramp

Sidewalks and Curbing on Oak Street
Northern Intermediate High Pipeline - 7478

Ledge

Installation Temporary Water Main Bypass on Oak Street
Installed 48-inch Water Main, North St.

Installed 48-inch Water Main, Oak St. & Myopia St.
Northern Intermediate High Pipeline - 7478

Installation of 24-inch Main, Cottage Street

Install 36-inch Water Main, Summer Ave.
Northern Intermediate High Pipeline - 7478

Install of new Meter 96 in Wakefield

CIPP Liner Installation Stoneham Sewer, Oak Street
Install TOS Water Main, Cottage Street
Installation of Water Mains: Montvale Ave. and Wright Street
Northern Intermediate High Pipeline - 7067

Main Street Pre-drill Ledge

Temporary Water Bypass
Foundation and Earth Support
Roof and Masonry Work
Wachusett Aqueduct Pumping Station

Pump Installation
Wachusett Aqueduct Pumping Station

Forebay and Overflow Area
Clinton Treatment Plant Phosphorus Reduction Facility

Concrete Pour
Clinton Treatment Plant Phosphorus Reduction Facility

Structure from High Street
DISC Filter – Close up
DISC Filter Control Panels Mounted
Clinton Treatment Plant Phosphorus Reduction Facility

New Diversion Structure poured
Clinton Treatment Plant Phosphorus Reduction Facility

Disc Filter Media Installed
Electrical Room
Bellevue 2 Tank and Turkey Hill Steel Water Tanks Painting
Contract 7634

July 18, 2018
3.7 Million Gallon Bellevue 2 Water Storage Tank, Boston
Existing Conditions at Bellevue 2

Tank Exterior

Overflow Piping and Vent

Tank Bottom and Foundation
2 Million Gallon Turkey Hill Water Storage Tank, Arlington
Existing Conditions at Turkey Hill

Tank Exterior

Tank Bottom

Tank Foundation
Scope of Work

- Erect scaffolding to temporarily support the relocated antennas
- Prepare existing surfaces using abrasive blast cleaning methods
- Paint all exterior and interior surface
- Structural repairs to pitted areas
- Concrete Repairs to the base of the tanks
- Install the interior anode components of a cathodic protection system
## Procurement

- Bids Opened June 27, 2018

<table>
<thead>
<tr>
<th>BIDDERS</th>
<th>BID AMOUNT</th>
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<tbody>
<tr>
<td>Worldwide Industries Corp.</td>
<td>$3,962,463.00</td>
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<td>Utility Service Co., Inc.</td>
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<td>Amstar of WNY, Inc.</td>
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<td>Atlas Painting and Sheeting Co.</td>
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<td>Allied Painting, Inc.</td>
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<td>Engineer’s Estimate</td>
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<tr>
<td>Southern Road &amp; Bridge, LLC</td>
<td>$6,988,943.42</td>
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<tr>
<td>Abhe &amp; Svoboda, Inc.</td>
<td>$7,624,640.00</td>
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Weston Aqueduct Supply Main 3: Design, Construction Administration and Resident Inspection Services
Contract 6539, Amendment 1

July 18, 2018
Weston Aqueduct Supply Main 3 - Location

- 10 miles long, from Weston to Medford
- 6.6 miles of 60-inch
- 3.4 miles 56-inch, unlined steel pipe
- Installed in 1926, 1927 and 1933
- Supplies 250,000 customers
- Supplies Waltham, Belmont, Arlington, Lexington, Watertown, Bedford and Winchester
- Key pipeline in the Metro Tunnel Interim Emergency Supply Plan
Original Scope of Services

- Design, Construction Administration, Resident Engineering/Inspection
  - Replace 7.3 miles of 56-in and 60-in pipe with 72-in pipe
  - Rehabilitate 2.7 miles of 56-in and 60-in pipe
Project Team

- Stantec (Prime)
  - Preliminary Design
  - Final Design: Construction Package 3, Waltham
- CDM Smith
  - Geotechnical Design
  - Final Design: Construction Package 2, Belmont
  - Resident Inspection: all contracts
- Green International
  - Survey and Base Mapping
  - Final Design: Construction Package 1, Arlington/Medford
  - Resident Inspection: all contracts
- Mott MacDonald
  - Trenchless Technologies
• Notice To Proceed Issued: July 2013
• Contract End Date: October 2026 (13 years 3 months duration)
• Total Contract Amount: $15,482,620
• Total Spent to Date ≈ $2,000,000
Work Completed to Date

- Evaluation of 72-inch Pipe Replacement Alternatives
- Evaluation of Tunnel Options
- Base Mapping
- Geotechnical Field Testing Program
- Preliminary Design
Original Project and Sequence of Work

7.3 Miles Replacement
2.7 Miles Rehabilitation
Proposed Project and Sequence of Work (Amendment 1)

3.3 Miles Replacement
6.7 Miles Rehabilitation
Scope Changes

• Change from primarily pipe replacement to primarily pipe rehabilitation
  – Replace 3.3 miles of pipe at existing diameter instead of 7.3 miles of larger pipe
  – Rehabilitate 6.7 miles of pipe instead of 2.7 miles

• Initiate design activities 3.5 years later than original schedule

• Compress Preliminary Design and overlap with Final Design

• Extend Contract Duration by 8 months
Amendment 1: Cost Changes

Cost reduction due to scope change ($674,632)

Cost escalation due to 3.5 year delay in beginning design $594,274

Cost of 8 month contract extension period (labor, overhead, profit) $110,568

Net Increase in Contract Amount $30,210
### Project Schedule Changes

#### Figure 3. WASM 3 Original and Revised Project Schedule
**Amendment No. 1**

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<tr>
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<td>Final Design</td>
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<td>Construction Admin &amp; RE/RI (3 Construction Packages)</td>
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**Original Contract Schedule**

**Amendment 1 Schedule**
Massachusetts Water Resources Authority

Wachusett Aqueduct Pumping Station Construction
BHD/BEC JV 15, A Joint Venture
Contract 7157, Change Order 39

July 18, 2018
Construction Update

• Pumps Tested

• SCADA Testing Underway

• Tentative Look Ahead Schedule:
  – Station Reliability Testing Likely Complete by September
  – Substantial Completion Anticipated in December 2018
Change Order 39 – Forebay Rip Rap
Air Release Structure

• Location based on plant record drawings
• Existing utilities were in conflict
• Redesign consolidated two proposed structures into one
• New location on opposite side of roadway
<table>
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<tr>
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<th>Amount</th>
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<tr>
<td>Air Release Structure</td>
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<tr>
<td>ForeBay Rip Rap</td>
<td>$360,299</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$508,549</strong></td>
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New HEEC 115kV Line
MWRA Quarterly Update Meeting

June 27, 2018
Agenda

- Project Route Review
- **Project Progress**
  - Permitting
  - Procurement
  - Easements
  - Schedule
  - Construction in Progress
- **Project Accounting**
  - Cost to Date
- **Project Risk**
Permitting

- Boston Conservation Commission permit – received
- DEP 401 Water Quality permit - received
- USACE 404/408 permit – received
- Chapter 91 license – received
- CZM Consistency review - received
- FAA – permit – received

- All permits received for cable installation.
- Permit amendments maybe required for clay and rock removal
- Cable removal permit application process will start in July
Procurement

- Cable installation and manufacturing
  - Caldwell Marine - installer, Prysmian - cable manufacturer
- Land conduit installation
  - McCourt Construction
- HDD installation - pending
  - Preferred contractor chosen
- Station 132 equipment Mitsubishi
- Station 385 equipment contract pending
Easements

* Massport
  * MOU executed
  * Easement executed

* King Terminal
  * Easement agreement terms have been reached, documents in draft

* Deer Island
  * License agreement - pending
  * No fee
Project Progress

Schedule

* Marine pre pass – June 27, 2018 – July 5, 2018
* Clay/Rock removal – September 2018
* HDD drill – August 2018 – November 2018
* Conduit Installation – April 2018 – December 2018
* STA 132 Installation - August 2018 – November 2018
* STA 385 Installation – January 2019 – April 2019
* Cable Installation – March 2019 – June 2019
* Cable Energized – July 2019 – August 2019
* Cable removal – December 2019 – January 2020
Construction In Progress

* 3 manholes installed in Conley Terminal
* Approximately 600 ft of trench excavated
* Approximately 300 ft pipe installed
* Pre pass barge mobilized to MA from NY
* Pre pass surveys completed for eel grass and winter flounder mitigation requirements
* Pre pass start June 27, 2018
## Project Accounting

### Cost to Date

| Description          | Total 2017 | Total 2018 | Total  
<table>
<thead>
<tr>
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<tr>
<td>Materials</td>
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<td>Contracts</td>
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<tr>
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<td>Allocations</td>
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<td>Other (easements)</td>
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<td><strong>Total</strong></td>
<td><strong>$11M</strong></td>
<td><strong>$3.5M</strong></td>
<td><strong>$14.5M</strong></td>
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</table>

**Total project budget is $115.6M**
Removal of Clay and Rock - Volume of rock

Permit amendments needed for removal – turnaround of permit amendments with environmental agencies

Want to work outside of the TOY restriction and work in summer/fall months, to minimize downtime from weather

HDD bore hole
- Maintaining bore hole – geotechnical data taken, data is point data.

Cable delivery
- Maintain cable delivery date - working with overseas company.