



*Presentation to*

**MWRA Board of Directors**

*Energy and Sustainability  
Program Overview*

July 23, 2025



# Energy Efficiency – What We've Done



## Decarbonization Standard Procedures

Date of Original Issuance: 3/27/2014

Latest Revision: 3/27/2024

Contacts: Denise Breitenreiner, Christian Murphy, Kristen Patneade

Reviewed by Deputy COO: Rebecca Weidman Date: 3/27/2024

Reviewed by Procurement: Douglas Date: 3/27/24



BWRPS Jockey Pump



Pipe Insulation



Variable Frequency Drives



Lighting Improvements

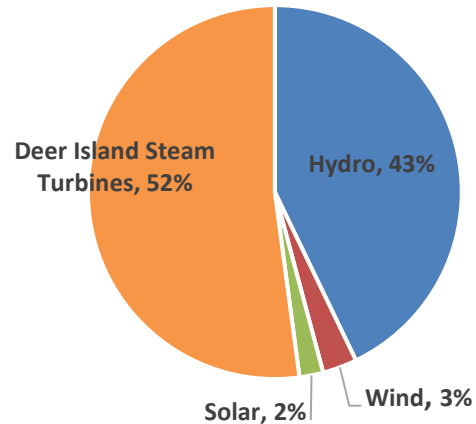


# Renewable Energy – What We've Done

- DITP Steam Turbine Generators
- 6 Solar Installations
- 5 Hydro Power Sites
- 2 Wind Turbine Sites

Using biomass, wind, solar, and hydroelectric, MWRA generated about 58 million kWh in FY24, at a value of nearly **\$8 million** in avoided purchased energy costs.

FY24 Renewable Energy Generation







# Existing Solar Insights

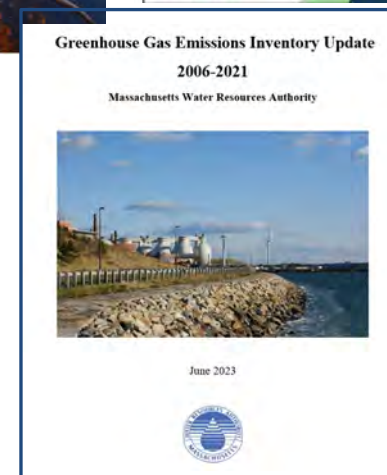
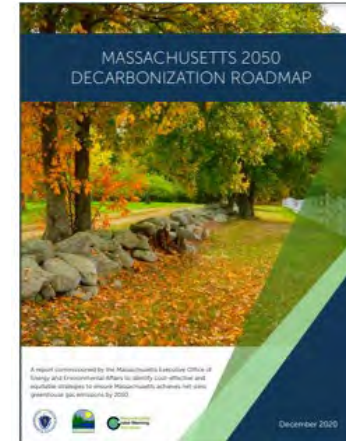
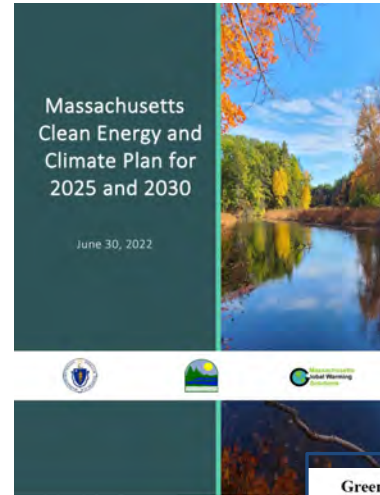
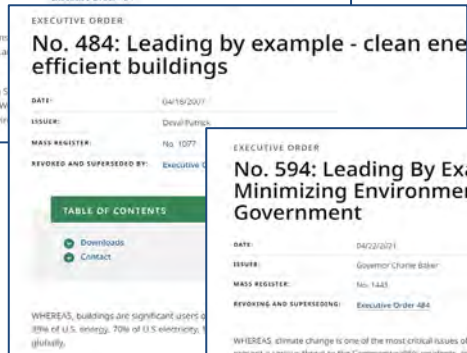
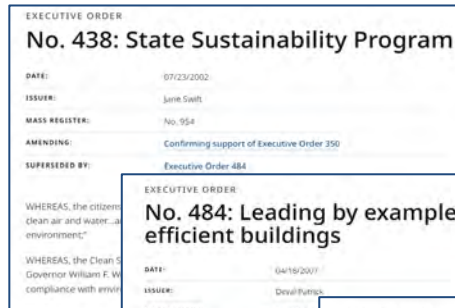
- Inverters
  - OEM Support Challenging
  - New Design Standards
- Panels
  - No Replacement Options
  - Increased Panel Efficiency
- Maintenance Contract Consideration
- Solar Repair Grant Program
- Repair vs Decommission and Replacement





# Energy Management Drivers

- State Climate Goals
- Executive Orders
- Environmental agency
- Fiscal responsibility





- **Status**

- Conducting heat loop analysis
- Met w. DEP/EPA April 2025
- Developing building space allocations and aesthetics
- Performing equipment market survey and conceptual layout
- Analyzing economics and energy performance

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# MassDEP Climate Mitigation Trust Grant

## PROJECT SUMMARY

The Massachusetts Department of Environmental Protection (“MassDEP”) shall contribute **twenty million dollars (\$20,000,000.00)**, via a Best Value Grant (“BVG”) from the Commonwealth of Massachusetts Climate Protection and Mitigation Expendable Trust (“Trust”) in support of Climate Mitigation and GHG Emission Reduction Projects (collectively the “Program” or “Programs”) at MWRA facilities or properties. The Program shall include two components: **(1) Building Electrification projects; (2) Renewable Energy projects.**

- Fully Executed – October 2024
- Grant duration – 5 yrs w/ 1 yr extension option
- Proposed Project List
  - DITP Canopy and Roof Solar
  - Norumbega Solar
  - DITP Wind Turbine Replacement
  - Building Electrification





- Canopy and roof mount options
- Procurement - PowerOptions Solar Program (Ch 164 § 137)
- Letter of Intent signed Feb 2025 - Non-binding commitment to negotiate in good faith
- Project Kick-off - April 2025
- Subsurface Exploration – July 2025







# Deer Island Wind

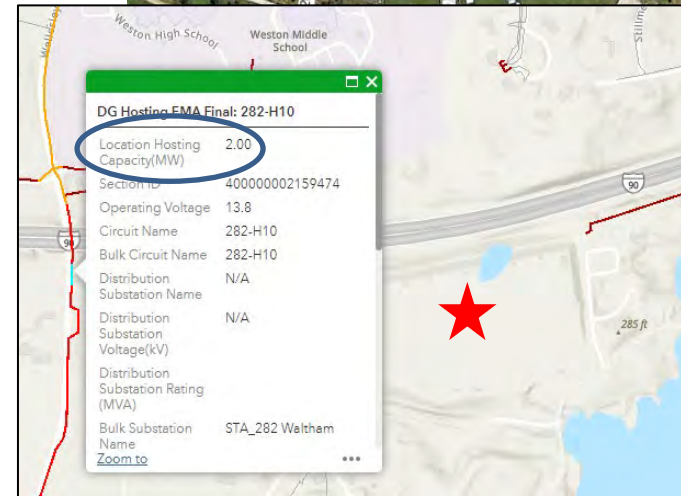
- Design, Purchase, Install
  - Refurbished nacelle and blades
  - New tower, wiring and controls
  - Proprietary turbine purchase
  - Existing foundation
- Estimated Cost
  - Total - ~\$3.8M
  - *Does not include any potential tariff related cost increases*
- Foundation structural assessment (anchor ping test) – no issues found
- Bid – summer 2025
- Construction Completion – late FY26/early FY27
- *Schedule could be pushed out 6+ mos depending on turbine availability*





# Norumbega Solar

- ~4-5MW -> \$8-12M
- HB 4967 (Ch 179 of acts of 1997)
  - Signed by Governor Aug 2024
  - “Section 7. The land ..... for the construction of: (a) the Norumbega reservoir covered water storage tank ...or (b) a solar photovoltaic system...”
  - Pre-approval received from DEP Water Supply Protection in 2021
- Reviewing Procurement Options
- **Interconnection Challenges**

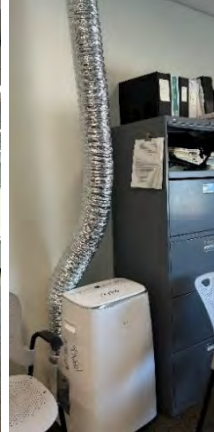
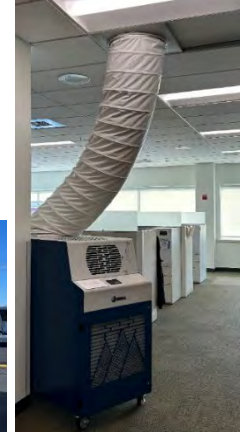




# Building Electrification – Administrative Buildings

## Chelsea Administration Building

- Replacement of 19 existing gas-fired RTUs with heat pump system
- Approximate Cost - \$3M
- History
  - Ch25A 11C procurement May 2025 - No bids
  - DCAMM single project limit & design-build requirements - limiting factors
- Interim Plans
  - Commercial size portable AC units
  - Office AC units for areas along windows
- Next Procurement
  - Design to proceed through Task Order contract
  - C. 149 purchase and installation



## Norumbega Headquarters

- Replacement of existing oil-fired heating system with heat pump system
- Work substantially completed Mar 2025
- Project Cost - \$164k
  - Reimbursed through Climate Mitigation Trust Grant







# Building Electrification – Water and Wastewater Facilities

## Takeaways

- Wastewater Classified Areas = Higher Costs
  - Explosion proof heat pump equipment - up to 10x more expensive
  - Require 100% outside air
    - Larger tonnage heat pumps
    - Potentially less efficient
    - Noise considerations in congested areas
    - Need more space – MWRA space often limited
- Most efficient design (GHG reduction and cost) may include combination of technologies
  - Heat Pumps
  - Electric Resistance Heaters
  - Gas-fired Boiler for back-up



## Other Facility Electrification Audits

- Hough's Neck Pump Station
- Quantum Pump Station
- Quincy Pump Station
- Braintree Weymouth RPS
- Belmont Pump Station
- Arlington Pump Station
- Clinton WWTP



# Clean Transportation

- **Utility EV Make Ready Programs**
  - Funding all appropriated. No new projects.
  - **Chelsea** (funded) - Expected completion fall 2025
- **Other funding**
  - MA DEP EVIP
  - DOER LBE Fleet EV Charging Grant Program
- **Southborough**
  - Received DOER LBE Fleet EV grant - 100% reimbursed - \$169.6k
- **Deer Island and Carroll WTP**
  - In planning phase
- **Employee Charging Policy**
  - Reviewing software agreements
  - Finalizing price proposal
- **Fleet Electrification Assessment**
  - No cost to MWRA
  - Expected fall 2025





## DITP Large-Scale Battery Energy Storage Feasibility Study

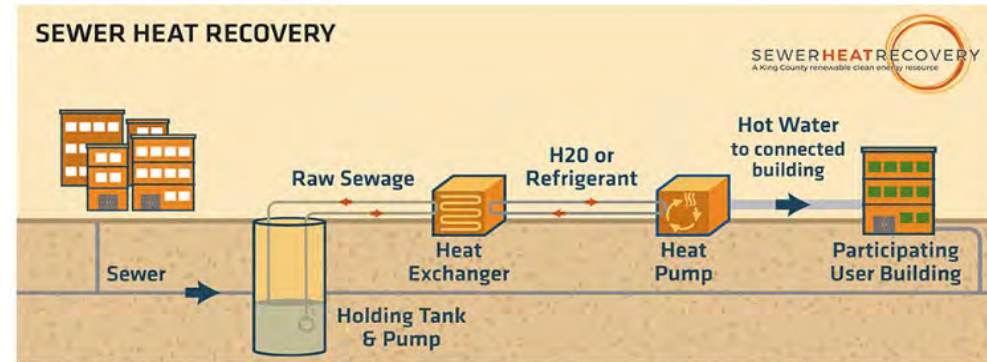
- Technical Viability for Various Use Cases
- Increase Operational Resiliency
- Financial Advantage
- Greenhouse Gas Emissions Reduction

## Wastewater Energy Recovery

- MWRA Facilities
  - MWRA Policy for external use of wastewater
- Pilot opportunities thru MassDEP program

## Eversource BESS Pilot

- Chelsea Admin & Brattle Court Pump Station
  - Demand Cost Reduction
  - Grid Peak Reduction Revenue



Wastewater Heat Recovery schematic (image from King County)





# Questions?







*Presentation to*

**MWRA Board of Directors**

***Deer Island Treatment Plant  
Clarifier Rehabilitation, Phase II  
Change Order 2***

July 23, 2025





- Construction includes the replacement/rehabilitation of the following items:
  - Primary and Secondary clarifier influent, effluent, and dewatering gates
  - Influent channel aerations systems
  - Concrete and coating remediation



# Contract Status

- Primary Channels (total of 4 channels)
  - Replacement of aeration system and isolation valves/gates **Complete**
- Primary Tanks (total of 48 tanks)
  - First four tanks under construction **Nearly Complete**
    - Several sequential stages of concrete remediation work
    - Replacement of scum/sludge collection equipment
  - Note: Contractor is limited to four tanks to ensure plant can meet NPDES permit requirements and treat to capacity



## Contract Status (continued):

- Secondary Clarifier Tanks (54 tanks)
  - First four tanks **Complete**
    - Replacement of Scum/Sludge equipment
    - No Concrete remediation and coating work
  - Note: Contractor is limited to three tanks at a time
- Secondary Clarifier Channels (total of three) **Not started yet**
  - Replacement of aeration system and isolation valves/gates





Concrete Cleaning (hydro blast)



Exposed Rebar





Applying Concrete Resurfacer



Troweling Concrete





Concrete Resurfacer Completed



Applying Epoxy Coating



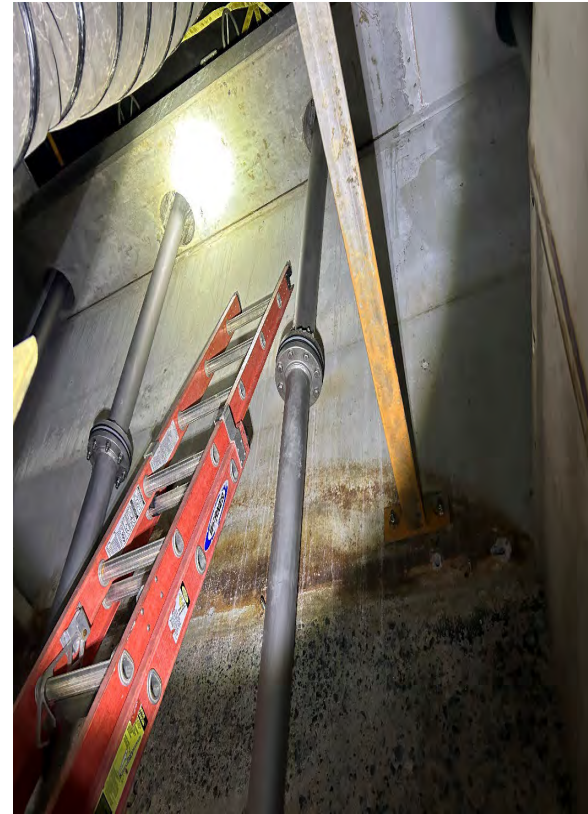
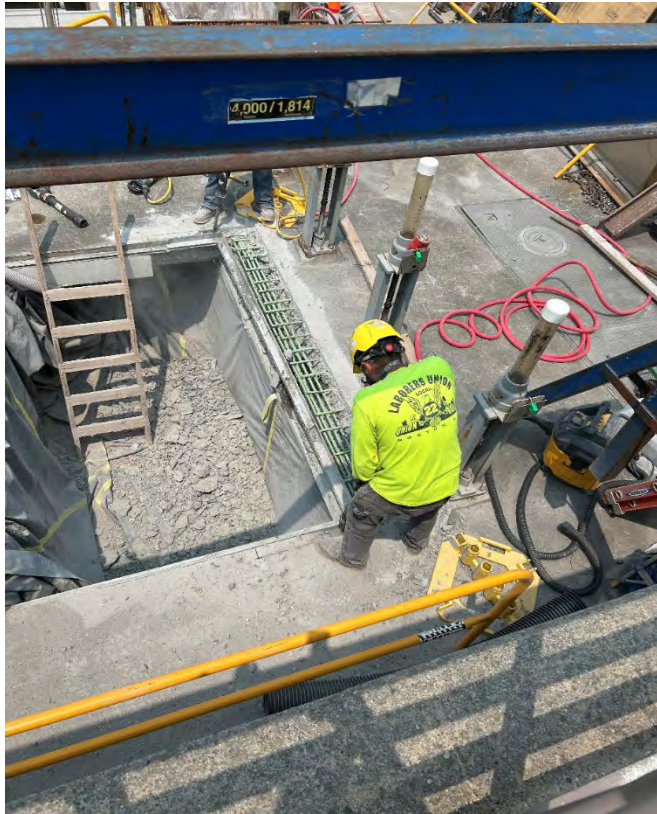
Spark Testing



## Proposed CO No 2:

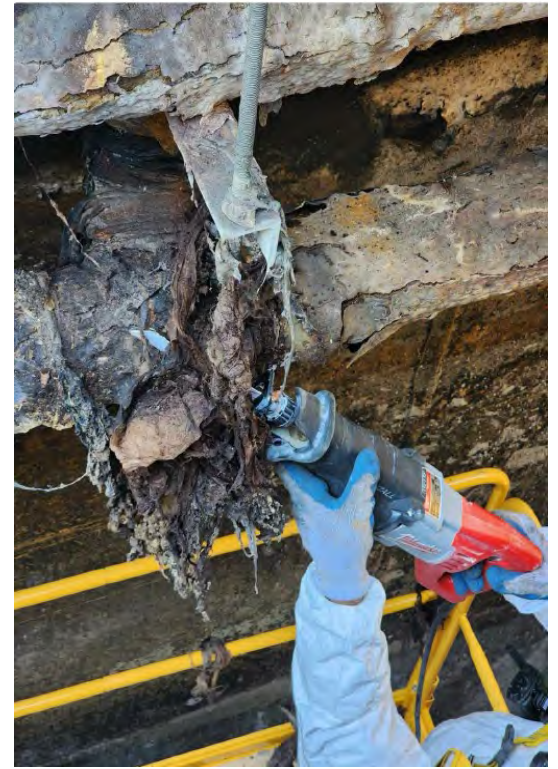
- Extend existing concrete slabs (108 locations) to support isolation valves
- Increase rag removal allowance
- Amount/ Time Increase: Not to Exceed \$6,956,606 + 209 days
  - Contract will increase from \$289,595,007.12 to \$296,551,613.12 or 2.4%
- Authorize the Executive Director to approve additional change orders not to exceed \$1,000,000 and 180 days





Concrete Support System (Change Order No 2)





Rag Removal Allowance (Change Order No 2)





*Presentation to*

**MWRA Board of Directors**

***Deer Island Treatment Plant Clarifier Rehab, Phase II  
Design/Engineering Services During Construction  
Amendment 4***

July 23, 2025





## Contract Scope:

- Provide Design, Bidding and Engineering Services During Construction
- Note: Performed most REI with in-house staff
- Design includes the replacement/rehabilitation of:
  - Primary and Secondary clarifier influent, effluent, and dewatering gates
  - Influent channel aerations systems
  - Concrete and coating remediation



## Construction Related Issues:

- Submittals review to date (525 submittals, 110 RFIs)
- Glass lining manufacturing issues
- Drive chain manufacturing issue-required redesigned
- Cast 316 Stainless vs fabricated corrosion (under investigation)
- Secondary Knife Gate concrete supports (108 locations, design error)
- Primary Clarifier concrete and coating issues



Concrete Support Field Conditions



New Concrete Supports for Isolation Gates



# Construction Issues requiring REI specialty services:

- First four Primary Tanks  
Construction Nearly Complete
- No uniformity with existing concrete corrosion
  - Each tank required extensive specialty inspection







Linabond/Concrete Interface



Unexpected Depth of Rebar





Ceiling Expansion Joint Failures



Deep Concrete Repairs



Linabond Issues



Expansion/Water stop Issues





## Amendment No 4 Request:

- Increase Contract term of 18 months
  - Increase in equipment lead times (7 months) during Contract 7395 Bid Phase
  - Contract 7395 CO No 1 (3 months) for additional clarifier drains, secondary bypass gate rehab and minor electrical conduit modifications
  - Contract 7395 CO No 2 (8 months) for concrete supports \*pending
- Additional funding requested due to the increase of Submittals and Requests for Information (from 500 to 700 and from 150 to 200, respectively)
- Additional funding requested due to the need for REI related to Specialty Corrosion Inspection services (beyond Staff expertise)





## Amendment No 4 Request:

- Requesting a contract increase of \$1,612,070
  - \$625k for construction related issues
  - \$987k for specialty inspection service





*Presentation to*

**MWRA Board of Directors**

***Hayes Pump Station Rehabilitation  
Contract 7162, Amendment 4***

July 23, 2025



# Hayes Pump Station Location







# Proposed Contract 7162, Amendment 4

Tasks	Original Contract + Amendments 1 - 3	Amendment 4	New Total
1 – Project Administration	\$307,764.91	\$7,428.69	\$315,193.62
2 - Design	\$775,982.38	\$0.00	\$775,982.38
3 - ESDC	\$972,003.93	\$475,375.61	\$1,447,379.54
4 - Allowance	\$275,000.00	\$100,000.00	\$375,000.00
Total	\$2,330,751.23	\$582,804.30	\$2,913,555.54



## Proposed Contract 7162, Amendment 4

- Extend contract duration by 3 months to cover longer than anticipated bid phase
- Provide additional budget for the following ESDC services:
  - Longer construction duration
  - Increased number of submittals/RFIs/PCOs and COs and technical support
  - Provide start-up services for interim bypass pumping system
  - Technical Assistance Allowance
  - Provide escalation for contract extension
- Authorize the Executive Director to approve additional amendments not to exceed \$500,000 and 12 months



# Hayes Pump Station Construction









*Presentation to*

**MWRA Board of Directors**

***8(m) Permitting Update***

July 23, 2025



# 8(m) Flyer



## WHEN DO YOU NEED AN MWRA 8(m) PERMIT?

If any work is located in or near an MWRA easement or interest held property, an 8(m) Construction Permit will likely be required.

### Why are 8(m) Permits Necessary?

- 8(m) permits help protect MWRA infrastructure by avoiding accidents that would greatly impact those within your community and beyond.
- Permits are issued to an entity in order to build, construct, excavate, or cross within or near an easement or other interest held property.

### Who Needs to Apply for an MWRA Construction 8(m) Permit?

- Everyone, including Municipalities, Residents, Businesses, Developers, and Utility Companies, who are planning to conduct work within a street, easement, or other location that MWRA infrastructure is located.
- Communities not served by the MWRA, but have MWRA pipelines or other assets, need an 8(m) permit, too.

### Dos & Don'ts:

- Do - Contact the MWRA for help locating its pipes.
- Don't - Dig without an MWRA Construction 8(m) Permit.
- Do - Apply for a permit at least 60 days prior to the start of work.
- Don't - Store materials or use the area above MWRA pipelines as a staging area.
- Do - Visit [MWRA.com](http://MWRA.com) for additional information.

### 8(m) Permit Questions & Requests for a Mark Out:

- Please contact [ralph.francesconi@mwra.com](mailto:ralph.francesconi@mwra.com) for water infrastructure assistance.
- Please contact [kevin.mckenna@mwra.com](mailto:kevin.mckenna@mwra.com) for wastewater infrastructure assistance.







## MWRA 8M Permit Contact Survey

### Community Information

Please provide basic details about your community and your contact information so we can follow up if needed.

---

#### Community Name

#### Your Name

First

Last

Enter your full name.

#### Your Title



Unpermitted removal of thrust block to fit gas line.

Found during leak investigation.



# Encroaching MWRA Line



## Permitted

- Location of line not as permitted
- Failure to notify MWRA of proceeding

MWRA inspectors drove by and stopped work. Location was moved.

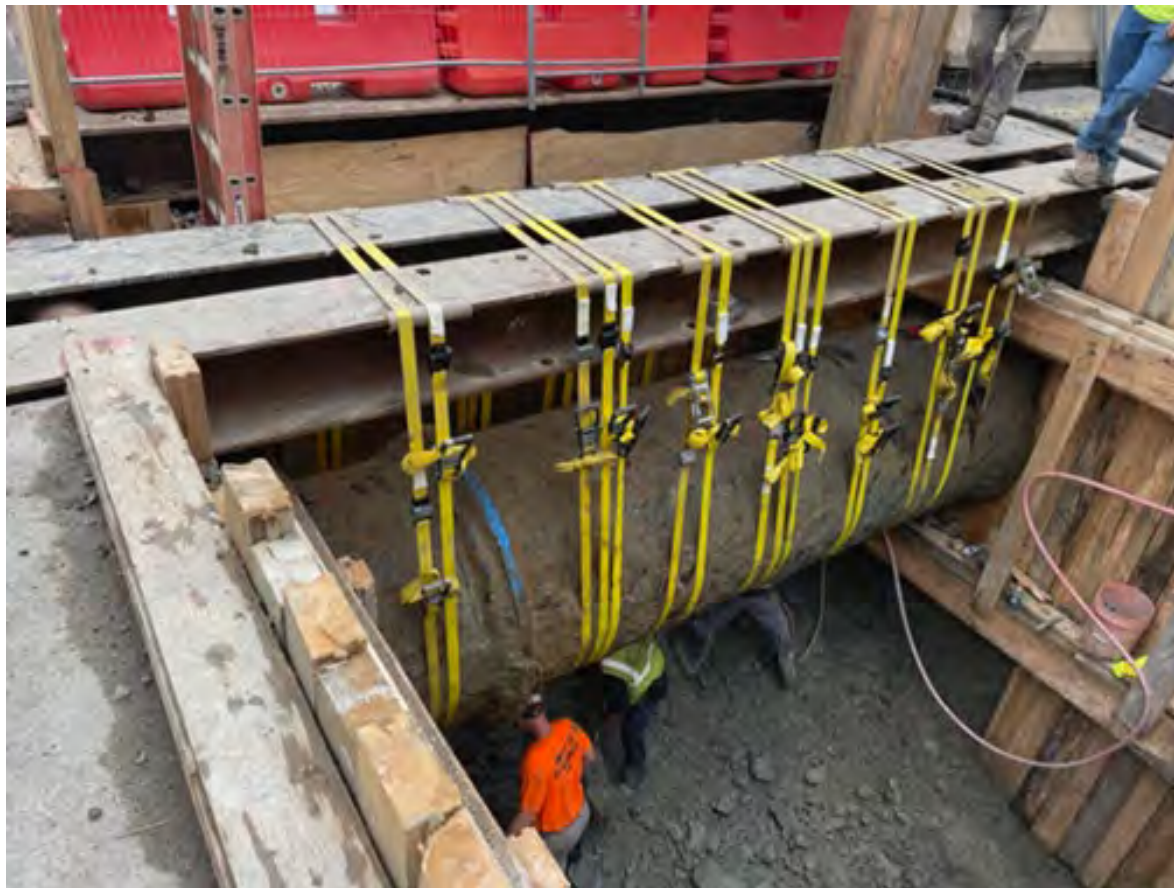




## Mark out of boring location



- Contractor drawn box for boring location
- MWRA inspector requested a more exact location
- MWRA inspector cleared and clearly marked approved location



Proper support of an MWRA water main to eliminate movement while hand digging underneath



## Culvert passing over MWRA water main



Town, utility contractor and MWRA working together to divert and repair a culvert crossing over MWRA water main







*Presentation to*

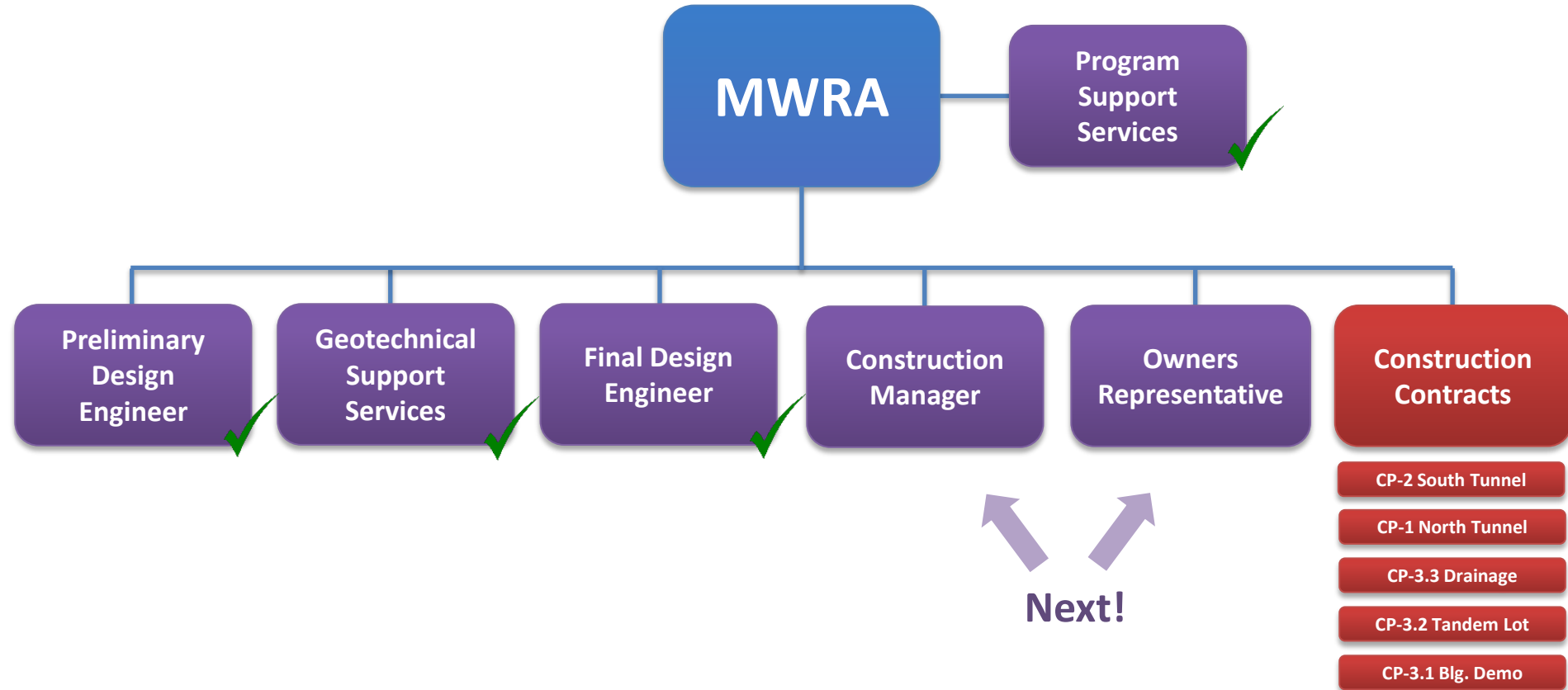
**MWRA Board of Directors**

***Tunnel Program Look Ahead***

July 23, 2025

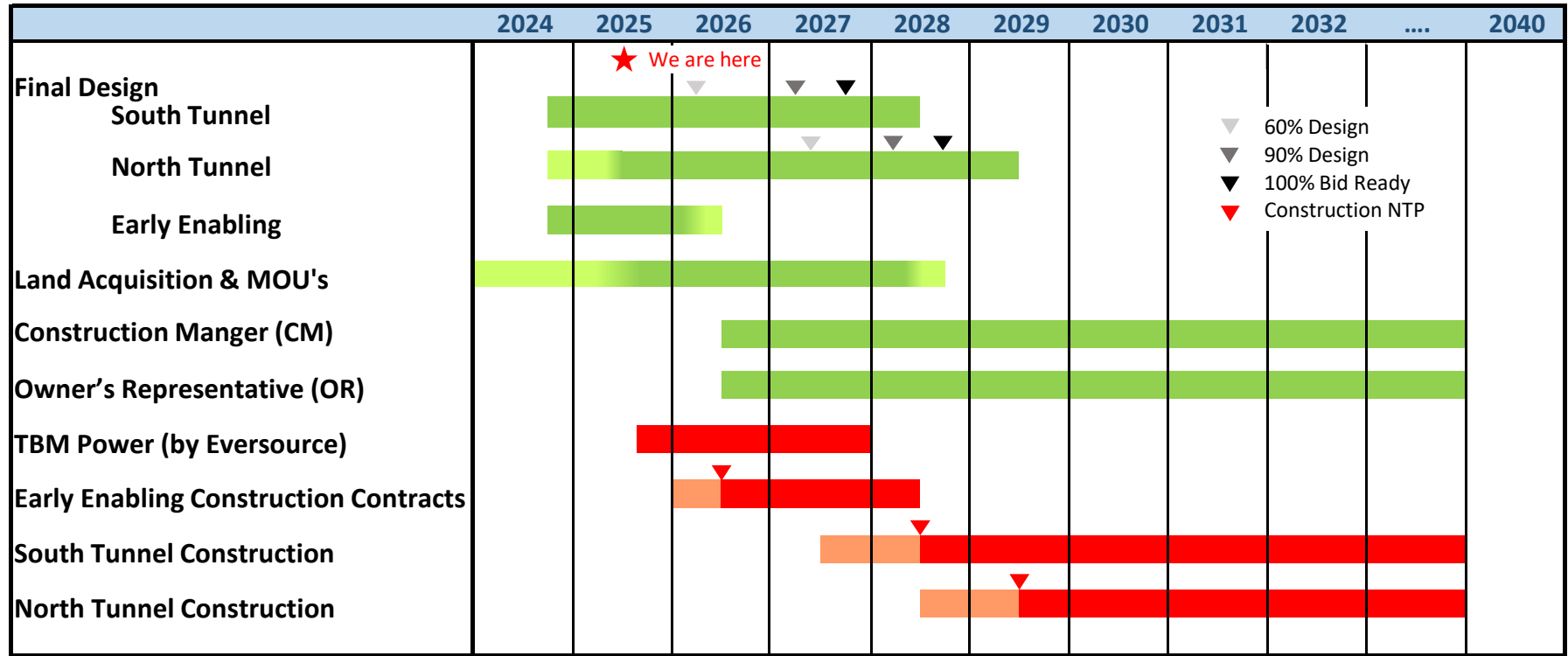


# Tunnel Program Organization





# Tunnel Program Schedule







# Construction Management Services (Contract No. 7356)

## Anticipated Scope of Services:

- Project Management
- Pre-Construction Support
  - Constructability Review
  - Cost Estimating and Scheduling Support
  - Safety Program Development
  - Value Engineering
- Construction Contract Administration
- Resident Engineer/Inspection Services
- Other Field Services
  - Independent Quality Assurance
  - Safety Program Compliance
  - Environmental Compliance & Site Control

## FY26 CIP:

- \$151.1M
- 2026 – 2038

## Planned Procurement Schedule:

- RFQ issued – July 2025
- RFP issued – October 2025
- NTP – April 2026





# Owner's Representative

## Mass General Law (MGL) Chapter 30, Section 39M1/2

### **Anticipated Scope of Services:**

- Peer review of engineering elements
- Oversight of cost recovery and value engineering
- Filing annual reports
- Independent of the designer, contractor, or subcontractor involved in the Tunnel Program (including CM)

### **FY26 CIP:**

- \$6.3M
- 2026 – 2038

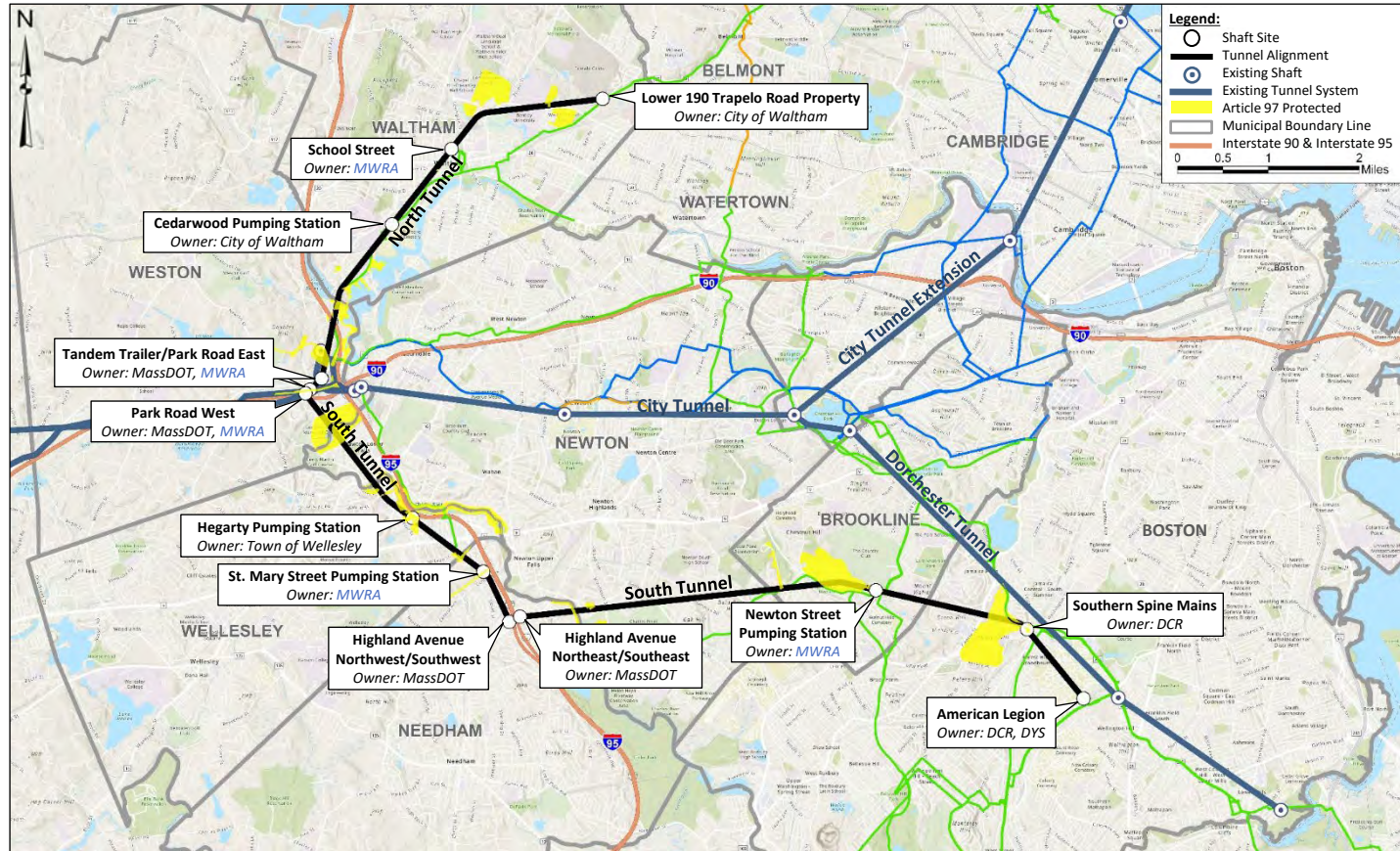
### **Planned Procurement Schedule:**

- RFQ/P issued – December 2025
- NTP – May 2026



# Shaft Site Locations and Land Acquisition

- 13 shaft sites -
  - MWRA owns 3 shaft sites & has partial control of 2 shaft sites
  - Acquisition for 2 shaft sites require Article 97 Legislation
- Pipeline easements - ~6,000 lin ft
- Subterranean easements - ~600 individual properties
- Land acquisitions will be presented to the Board for approval









*Presentation to*

**MWRA Board of Directors**

***John J. Carroll Water Treatment Plant  
Technical Assistance Consulting Services  
Contracts 8130 & 8131***

July 23, 2025



# Example JJCWTP Technical Assistance Task Order



- Design replacement of Wachusett Dam outlet pipe structural lining and replacement of piping/valves in the Lower Gatehouse
- Construction Cost \$19,333,573





# Example JJCWTP Technical Assistance Task Order



- Design of new parapet wall cap repairs and safety railings
- Construction cost \$1,350,000





# JJCWTP Technical Assistance Contracts 8130 & 8131 Procurement

Proposer	Cost Exercise	Points	Ranking
Hazen and Sawyer, P.C.	\$1,866,352.00	434	1
CDM Smith Inc.	\$1,812,486.00	410	2
Jacobs Engineering Group	\$1,775,746.84	368	3
Stantec Consulting Services, Inc.	\$1,832,133.10	329	4







*Presentation to*

**MWRA Board of Directors**

***Contract 7457  
Section 101 Pipeline Extension  
Change Order 14***

July 23, 2025



# 7457: Section 101 Pipeline Extension Drain Crossing at Lexington Town Line







# 7457: Section 101 Pipeline Extension Drain Crossing at Lexington Town Line







# 7457: Section 101 Pipeline Extension Pavement Disturbance on Lexington Street







# 7457: Section 101 Pipeline Extension Trench Pavement on Lexington Street







# 7457: Section 101 Pipeline Extension Full Width Mill & Overlay Pavement on Lexington Street (Phase 1)



