

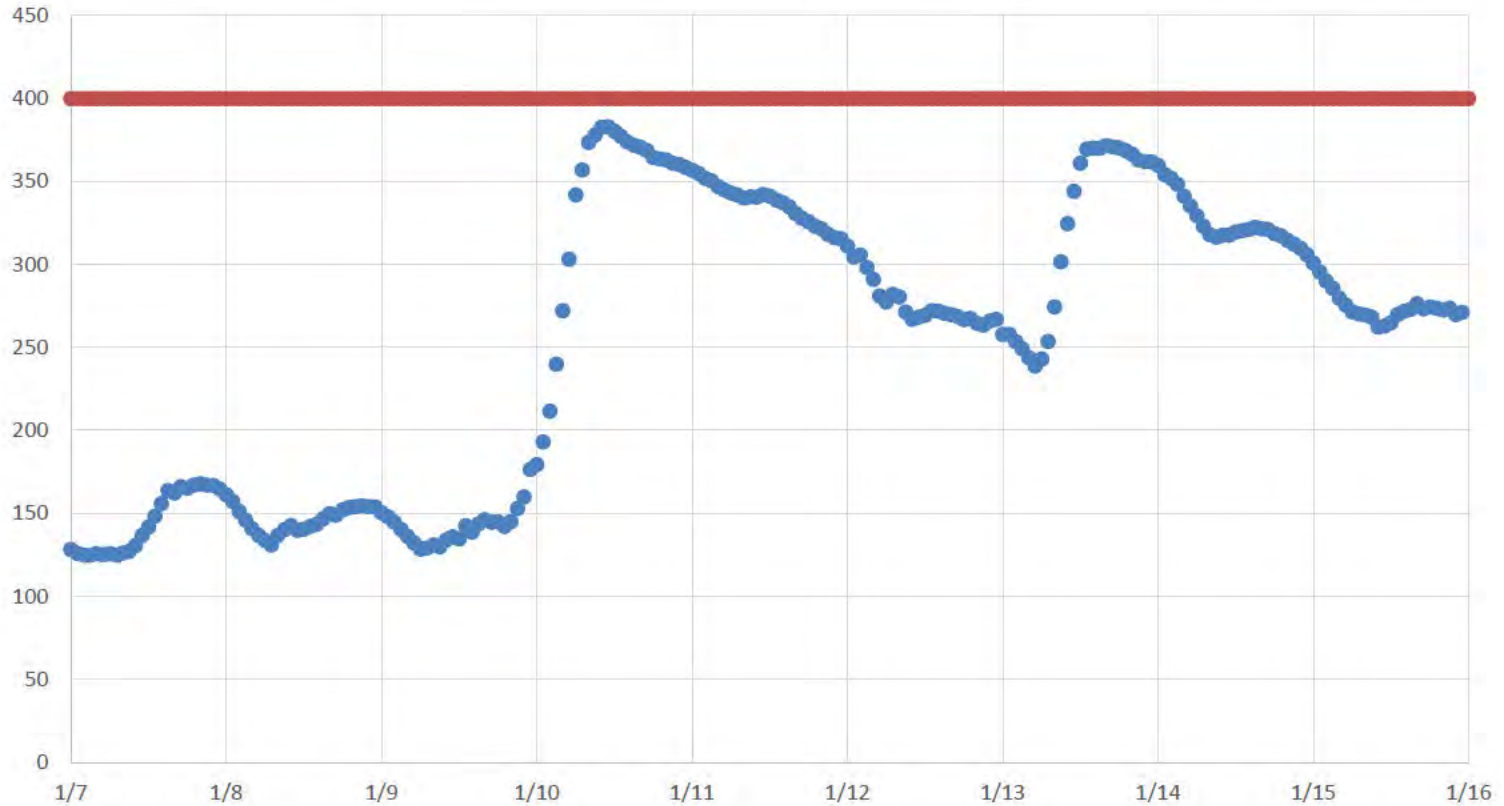


Storm Date	Total Rainfall (Ward St)
December 11 <sup>th</sup>	2.83"
December 17 <sup>th</sup> & 18 <sup>th</sup>	2.96"
January 9 <sup>th</sup> & 10 <sup>th</sup>	3.73" (includes 8" snow melt)
January 13 <sup>th</sup>	1.58"
<b>Total</b>	<b>11.1"</b>



# High flows resulting from back to back storms

South System Flow (MGD)





*Presentation to*

**MWRA Board of Directors**

*Contract 7380  
Wachusett Lower Gatehouse Pipe and  
Boiler Replacement*

January 17, 2024



# Wachusett Reservoir





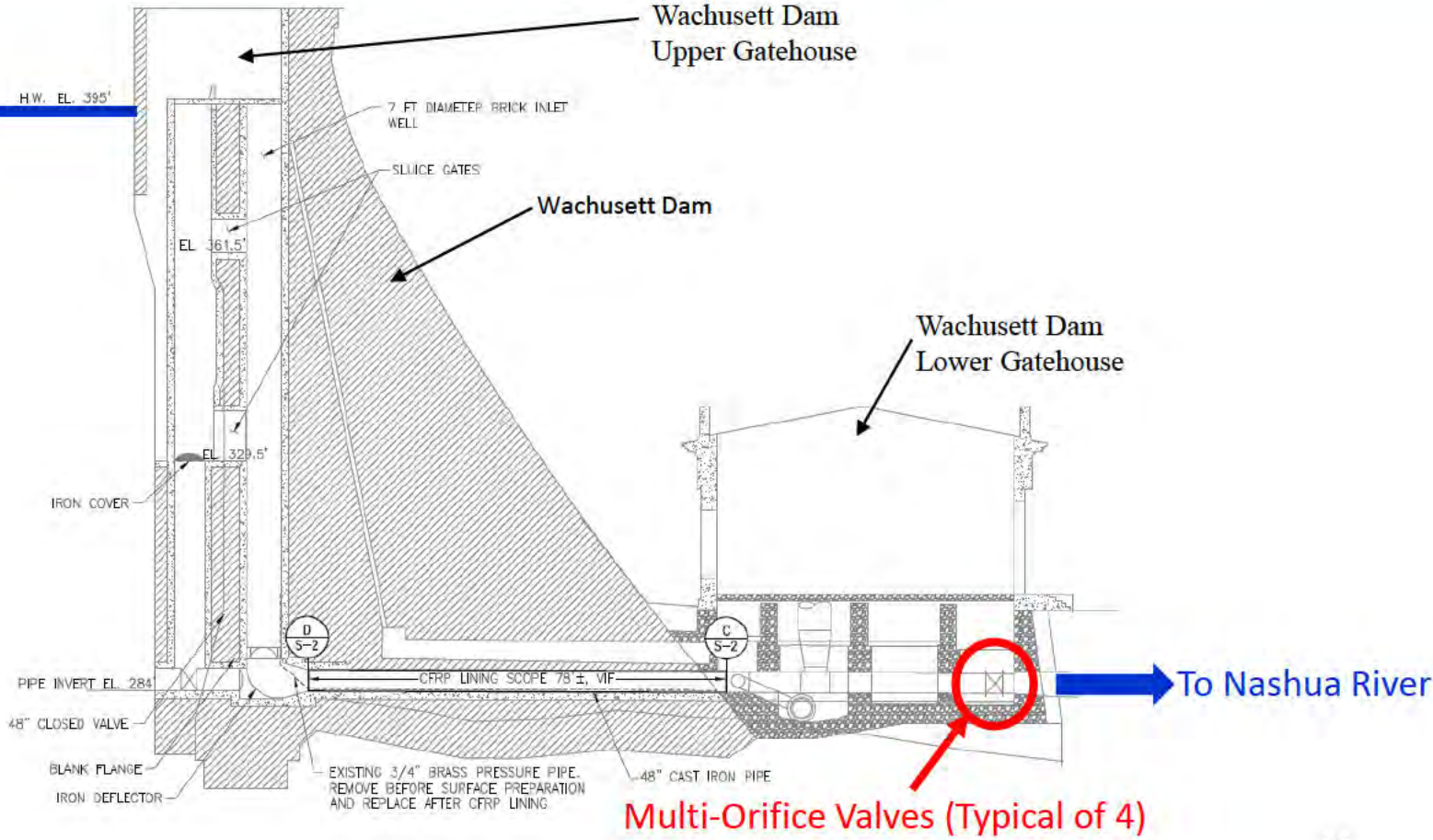
# Wachusett Lower Gatehouse





# Hydraulic Profile at Wachusett Dam

~110-feet





# Existing Wetwell Piping & Valves



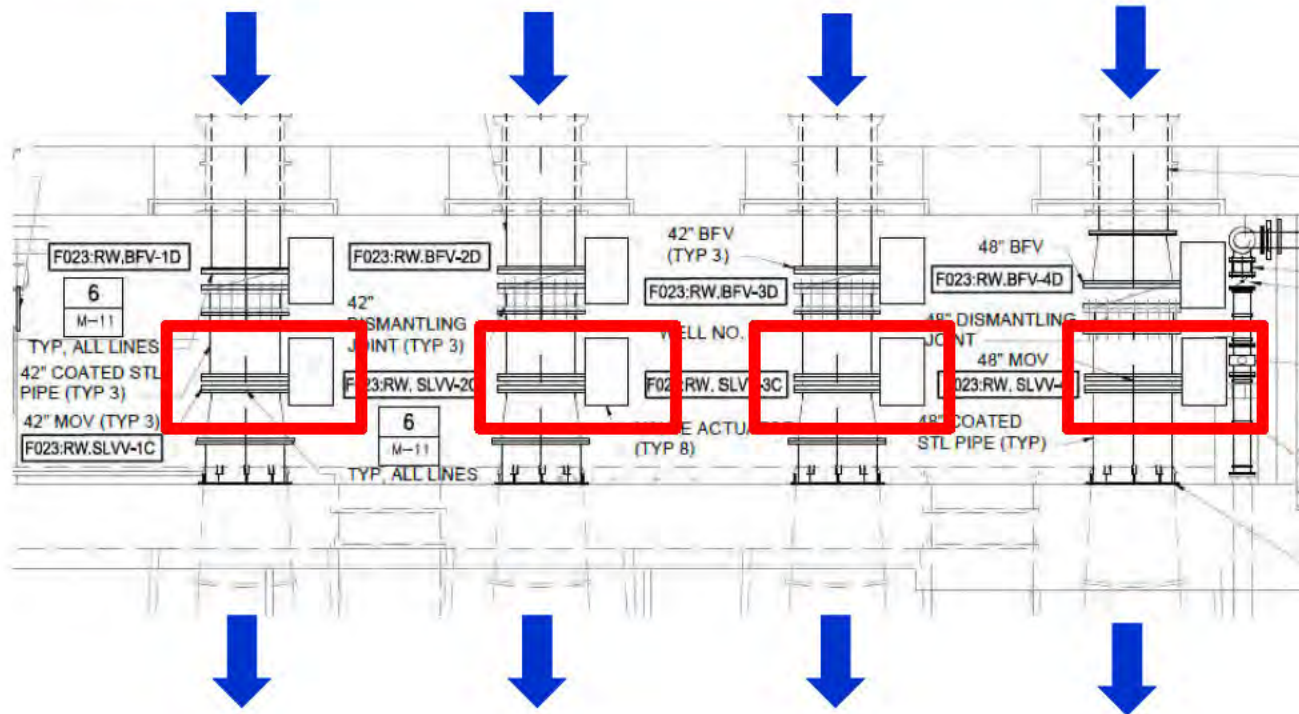
Existing Fixed Orifice Valves (Qty. 6) to Wachusett Aqueduct



Existing Angle Pattern Valve (Qty. 1) to Nashua River



# New Piping Configuration with Multi-Orifice Valves



To Nashua River







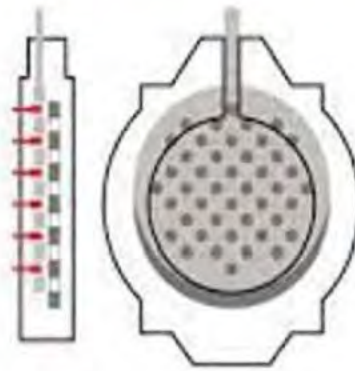
# Multi-Orifice Valve Operation



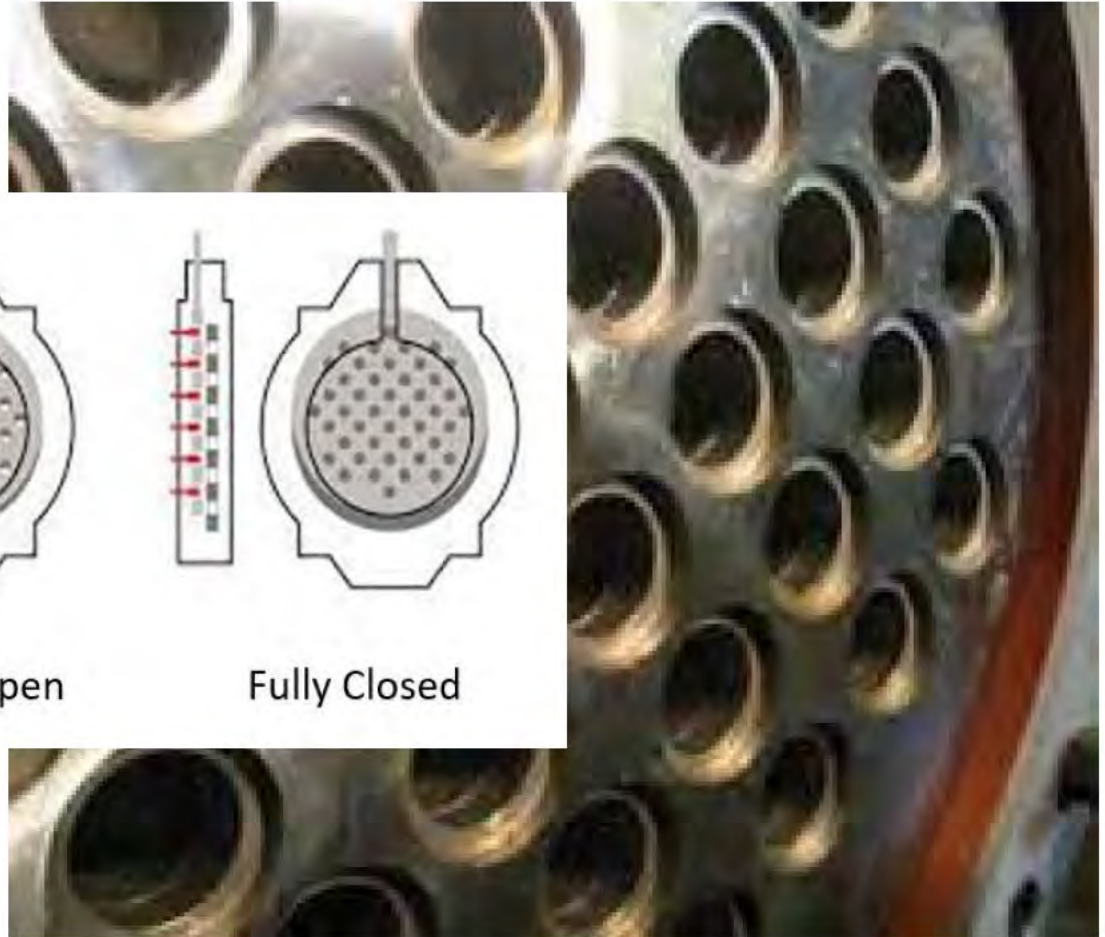
Fully Open



Partially Open



Fully Closed





# Wachusett Lower Gate House Hazardous Material Abatement





# Wachusett Lower Gate House Equalizer Pipe Demolition





*Presentation to*

**MWRA Board of Directors**

*Second Amendments to the MOU/FAA  
with BWSC for Fort Point Channel and  
Mystic/Chelsea Confluence  
CSO Control Projects*

January 17, 2024



# Work under Original MOU/FAA



Location of BOS017

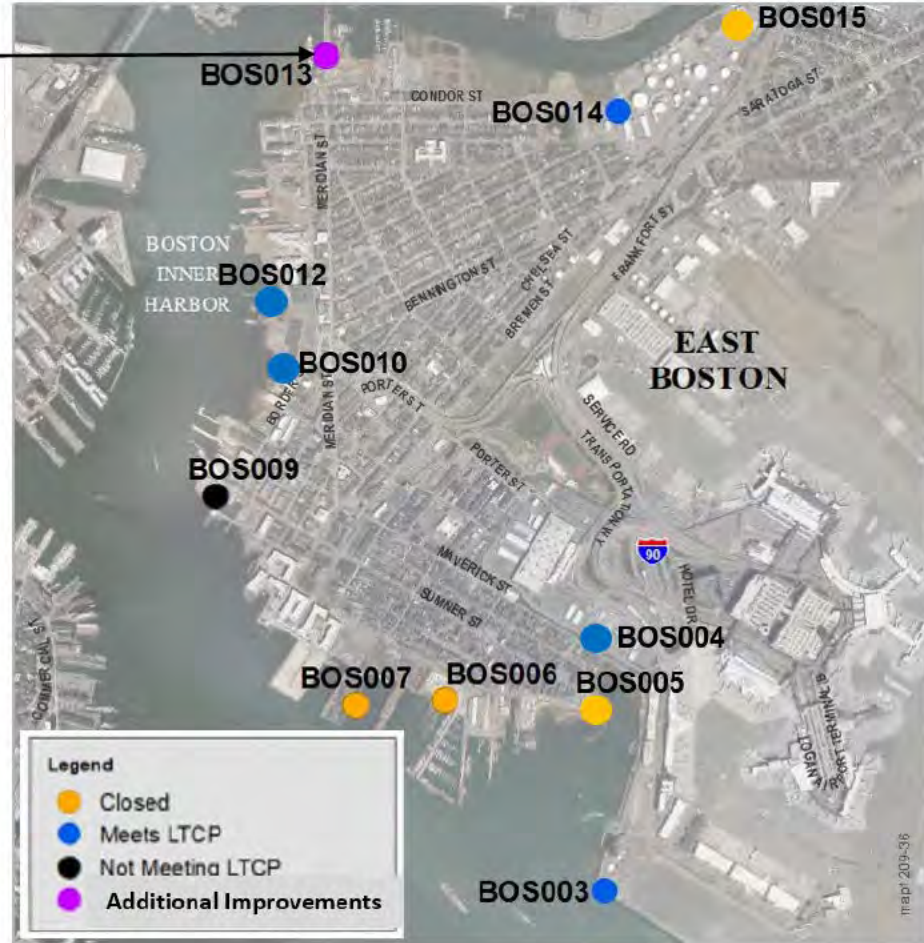


Location of BOS062, BOS065 & BOS070/DBC



# Amendment Work at BOS013

Location of  
BOS013





*Presentation to*

**MWRA Board of Directors**

***FY21-FY25 Strategic Business Plan:  
Annual Update for FY23***

January 17, 2024



***The purpose of the Five Year Plan (and the annual update) is:***

- A tool for identifying and prioritizing strategic initiatives
- Provide transparency to ratepayers
- Measuring progress toward initiatives and/or identify potential road blocks
- Provide a bridge to the long term master plan, the CEB/CIP, and the Orange and Yellow Notebooks



**Massachusetts Water Resources Authority**  
Five-Year Strategic Business Plan  
FY 2021–2025







## Business Plan Guiding Principals

- Public Accountability & Transparency
- Cost-Effective Services
- Collaboration With Internal/External Partner
- System Resilience
- Environmental Stewardship
- Workforce Development
- Diversity, Equity And Inclusion



*The plan articulates goals and initiatives by six strategic areas:*

- Drinking Water Quality and System Performance
- Wastewater Management and System Performance
- Infrastructure Management and Resilience
- Finance and Systems Management
- Diversity, Equity, Inclusion and Workforce Development
- Environmental Sustainability





# Some Highlights from the FY23 Annual Update

- Participated in Water Research Foundation studies on key issues facing our industry
- Completed 248 lead and copper tests from 66 schools and childcare facilities in 31 communities
- Substantial progress on design for Ward and Columbus Park headworks upgrades
- Submitted the EIR on the Metro Water Tunnel Program
- Completed an Environmental Justice Strategy (available on [www.mwra.com](http://www.mwra.com))
- Approved for “EV Make Ready” charging infrastructure program for Chelsea, Southborough, and Deer Island
- Awarded a MADEP grant to pilot installation of heat pumps at two pump stations





*Presentation to*

**MWRA Board of Directors**

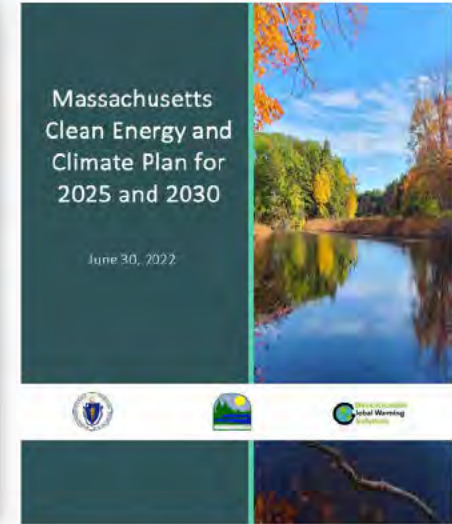
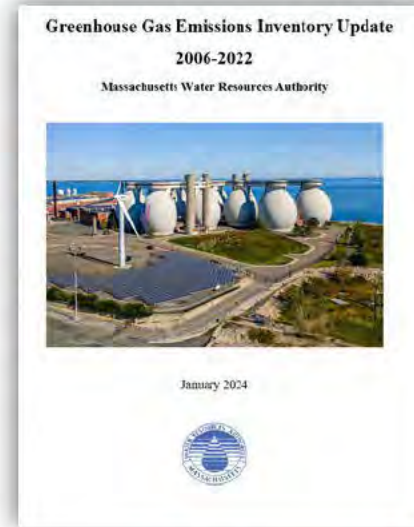
***MWRA Greenhouse Gas (GHG)  
Emissions Inventory for 2022***

January 17, 2024



# MWRA's Commitment to Energy Savings and Emissions Reduction

- Nearly 20 years of emissions reduction - started tracking in 2006
  - Energy efficiency
  - Electrification
  - Renewables
- Released first inventory in 2016
- Guided by State climate goals
- Selected for the 2023 Leading by Example Award

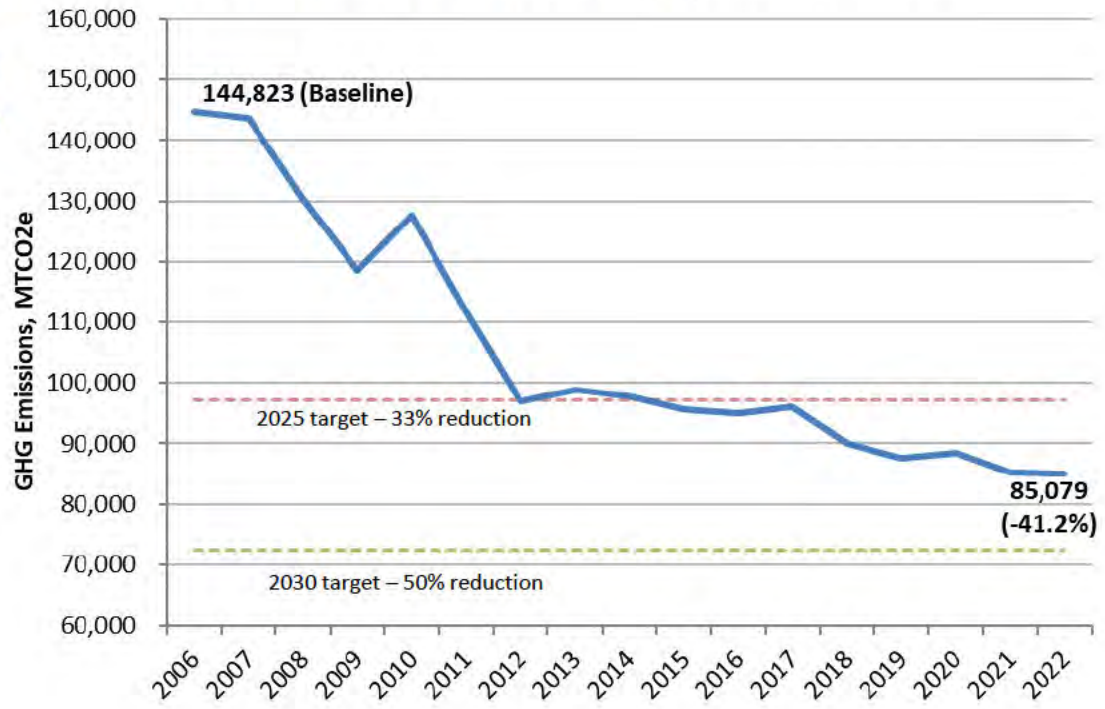




# Major Reductions Aligned with State Targets

- 41% reduction since 2006
  - 60,000 MTCO<sub>2</sub>e = 13,000 vehicles off the road/year
- Already met State 2025 target of 33%
- Emissions will always be dependent on yearly fluctuations in precipitation and flow

GHG Emissions - Metric Tons of CO<sub>2</sub> Equivalent (2006 – 2022)

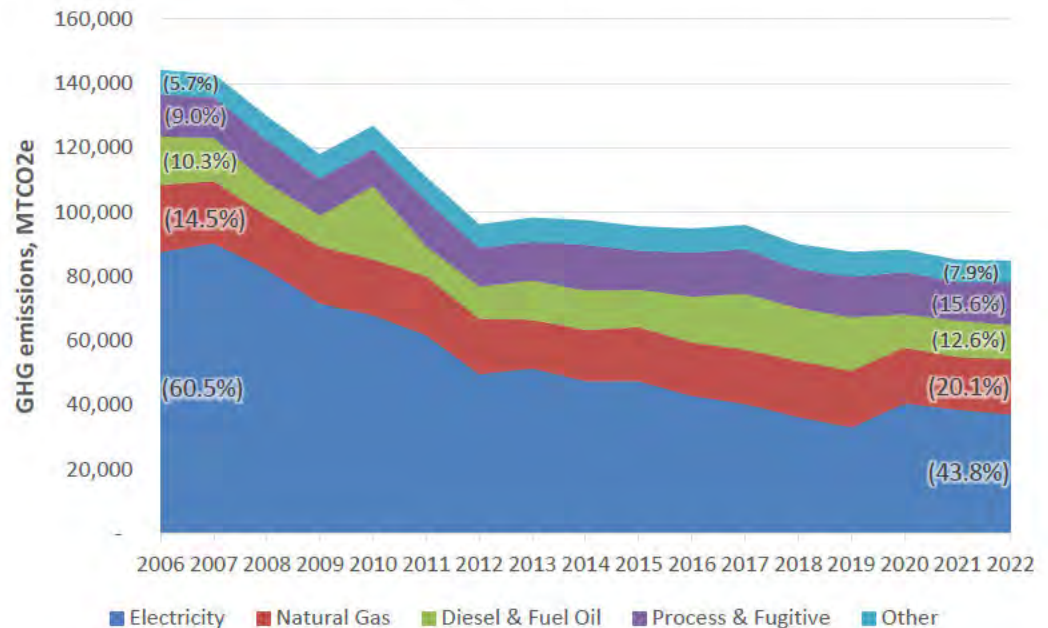




# Four Main Sources of GHG Emissions

- Electricity: 44%
- Natural Gas: 20%
  - Space heating and pelletizing plant
- Process & Fugitive: 16%
  - Methane, nitrous oxide
- Diesel & Fuel Oil: 13%
  - Space heating and emergency generators
- Other: 8%
  - Fleet, digester gas combustion, etc.

MWRA GHG Emission Sources, 2006-2022

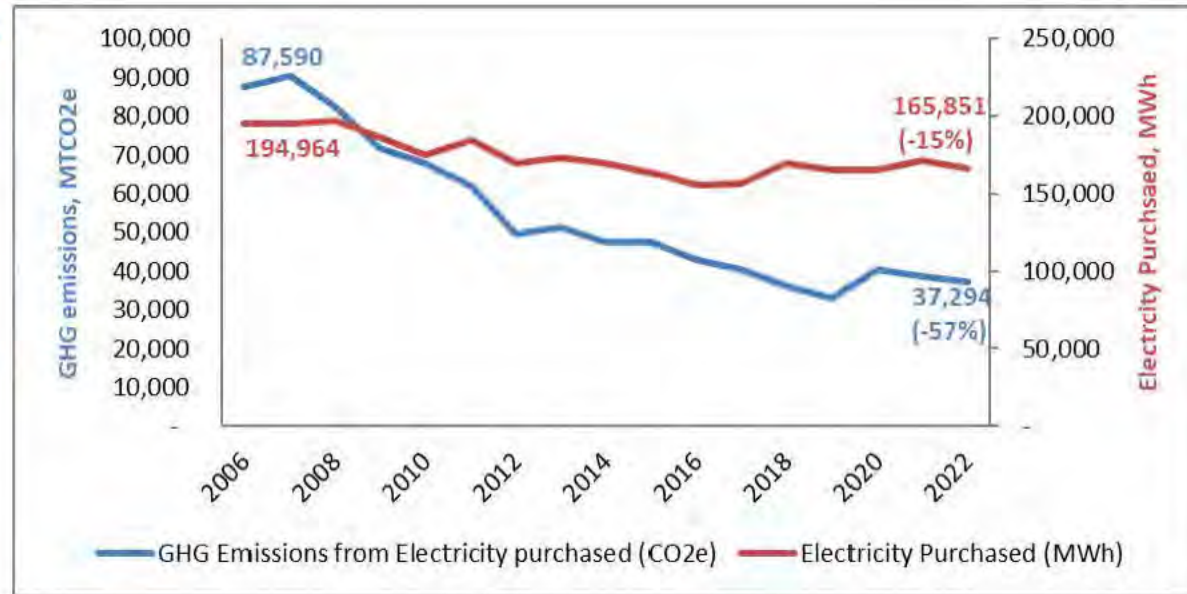




# Majority of Emissions Reductions are Associated with Electricity

- 84% of MWRA's reductions are from electricity
  - Energy efficiency
  - Renewables
  - Greener electric grid amplifies MWRA's efforts
- Continued focus on electrification

MWRA Electricity Purchases and Resulting Emissions



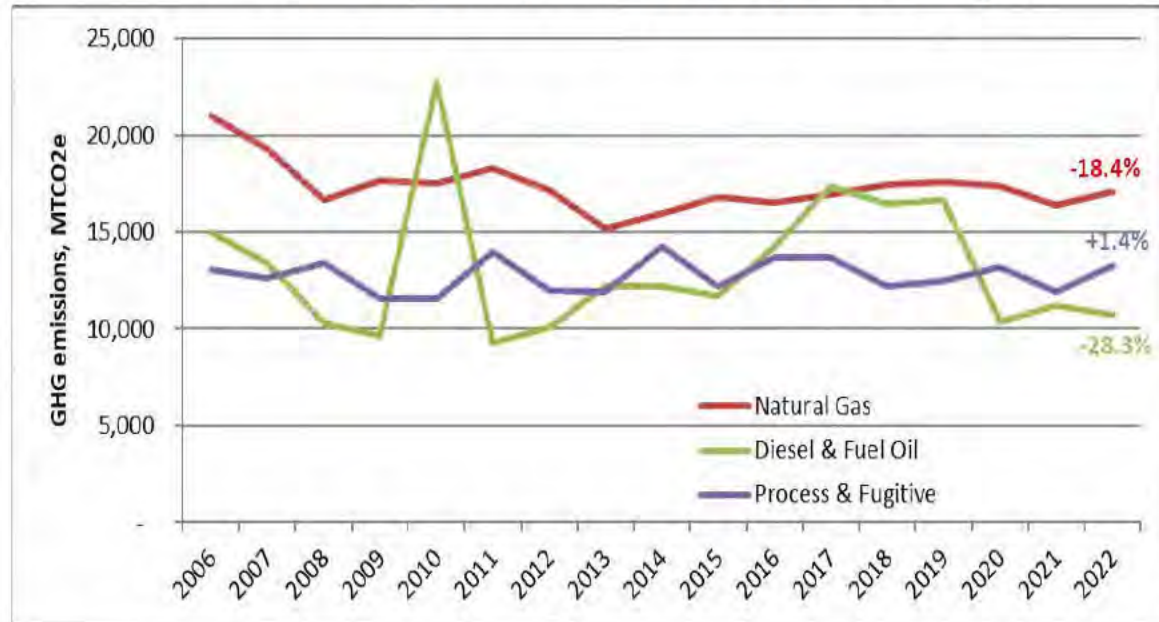




# Varying Rates of Reduction for Other Main Sources

- Natural Gas
  - 18% reduction
  - 80% from pellet plant
- Diesel & Fuel Oil
  - 28% reduction
  - Conversion away from oil for space heating
  - Tied to DI emergency generator use
- Process & Fugitive
  - Static
  - Dependent on population

Emissions from Natural Gas, Diesel & Fuel Oil, Process & Fugitive





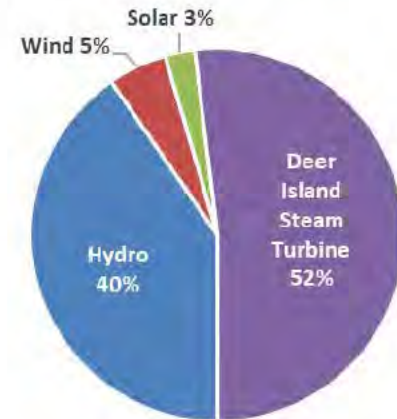
# Renewables Avoid Emissions and Green the Electric Grid

- 66% used onsite, mostly digester gas at DI
  - Provides nearly 20% of MWRA's overall electricity usage
  - Avoided 14,820 MTCO<sub>2</sub>e of emissions in 2022
  - Avoids 5 million gallons of fuel oil
- 34% sold, greening overall electric grid



## Renewable Energy by Source in 2022

2022 Renewable Energy Generation: 54,971 MWh





# Successes and Future Reductions

- Energy Efficiency
  - Lights, pumps, pipe insulation
- Electrification
  - Heat pumps, fleet
- New Combined Heat and Power at Deer Island
  - 15% decrease in total emissions
  - 300,000 gallons less fuel
- Batteries and wastewater heat recovery



Wachusett Aqueduct PS – Geothermal Heat Pump





## Next Steps and Reduction Pathways

- Continue multi-pronged approach
  - Energy efficiency
  - Electrification
  - Renewables
- Explore innovative reduction strategies
- Develop emissions projections and pathways to work to meet the State's 85% reduction/net zero goal by 2050



*Presentation to*

**MWRA Board of Directors**

***MWRA Fiscal Year 2025 Proposed  
Capital Improvement Program***

January 17, 2024



# FY25 Proposed CIP – Baseline Cap vs. FY25 Proposed Cap

		FY24	FY25	FY26	FY27	FY28	FY24-28
FY24-28 Baseline CAP	Projected Expenditures excl. Metro Tunnel	\$288.2	\$357.9	\$313.5	\$349.8	\$349.1	\$1,658.5
	Metropolitan Tunnel	\$14.4	\$25.2	\$23.9	\$23.9	\$78.6	\$166.2
	I/I Program	(42.9)	(41.5)	(27.5)	(28.4)	(34.2)	(174.5)
	Water Loan Program	(14.1)	(10.9)	(5.0)	(2.6)	8.6	(24.0)
	<b>MWRA Spending</b>	<b>\$245.6</b>	<b>\$330.8</b>	<b>\$304.9</b>	<b>\$342.8</b>	<b>\$402.2</b>	<b>\$1,626.3</b>
	Contingency	15.2	21.8	20.7	23.6	31.7	113.0
	Inflation on Unawarded Construction	1.9	8.1	12.2	22.1	36.1	80.4
	Chicopee Valley Aqueduct Projects	(0.3)	(0.5)	0.0	0.0	0.0	(0.8)
	<b>Projected Spending before Adjustment</b>	<b>\$262.4</b>	<b>\$360.2</b>	<b>\$337.8</b>	<b>\$388.5</b>	<b>\$469.9</b>	<b>\$1,818.9</b>
	Spend Rate Adjustment (25%)*	(65.6)	(90.1)	(84.5)	(97.1)	(117.5)	(454.7)
<b>FY24 Final FY24-28 Spending</b>	<b>\$196.8</b>	<b>\$270.2</b>	<b>\$253.4</b>	<b>\$291.4</b>	<b>\$352.5</b>	<b>\$1,364.2</b>	
FY25 Proposed CAP	Projected Expenditures excl. Metro Tunnel	\$251.3	\$354.3	\$331.1	\$350.3	\$398.2	\$1,685.2
	Metropolitan Tunnel	\$12.8	\$23.0	\$37.0	\$39.8	\$67.9	\$180.4
	I/I Program	(31.6)	(48.6)	(29.8)	(28.5)	(34.5)	(173.1)
	Water Loan Program	(52.5)	(10.3)	(2.8)	9.6	14.8	(41.2)
	<b>MWRA Spending</b>	<b>\$180.0</b>	<b>\$318.3</b>	<b>\$335.5</b>	<b>\$371.2</b>	<b>\$446.3</b>	<b>\$1,651.3</b>
	Contingency	10.8	20.5	22.7	25.3	30.8	110.1
	Inflation on Unawarded Construction	0.0	3.2	7.8	16.5	30.6	58.1
	Chicopee Valley Aqueduct Projects	0.0	(0.5)	(0.3)	0.0	0.0	(0.8)
	<b>Projected Spending before Adjustment</b>	<b>\$190.8</b>	<b>\$341.6</b>	<b>\$365.8</b>	<b>\$413.0</b>	<b>\$507.8</b>	<b>\$1,818.9</b>
	Spend Rate Adjustment (25%)*	(47.7)	(85.4)	(91.4)	(103.2)	(126.9)	(454.7)
<b>FY25 Proposed FY24-28 Spending</b>	<b>\$143.1</b>	<b>\$256.2</b>	<b>\$274.3</b>	<b>\$309.7</b>	<b>\$380.8</b>	<b>\$1,364.1</b>	



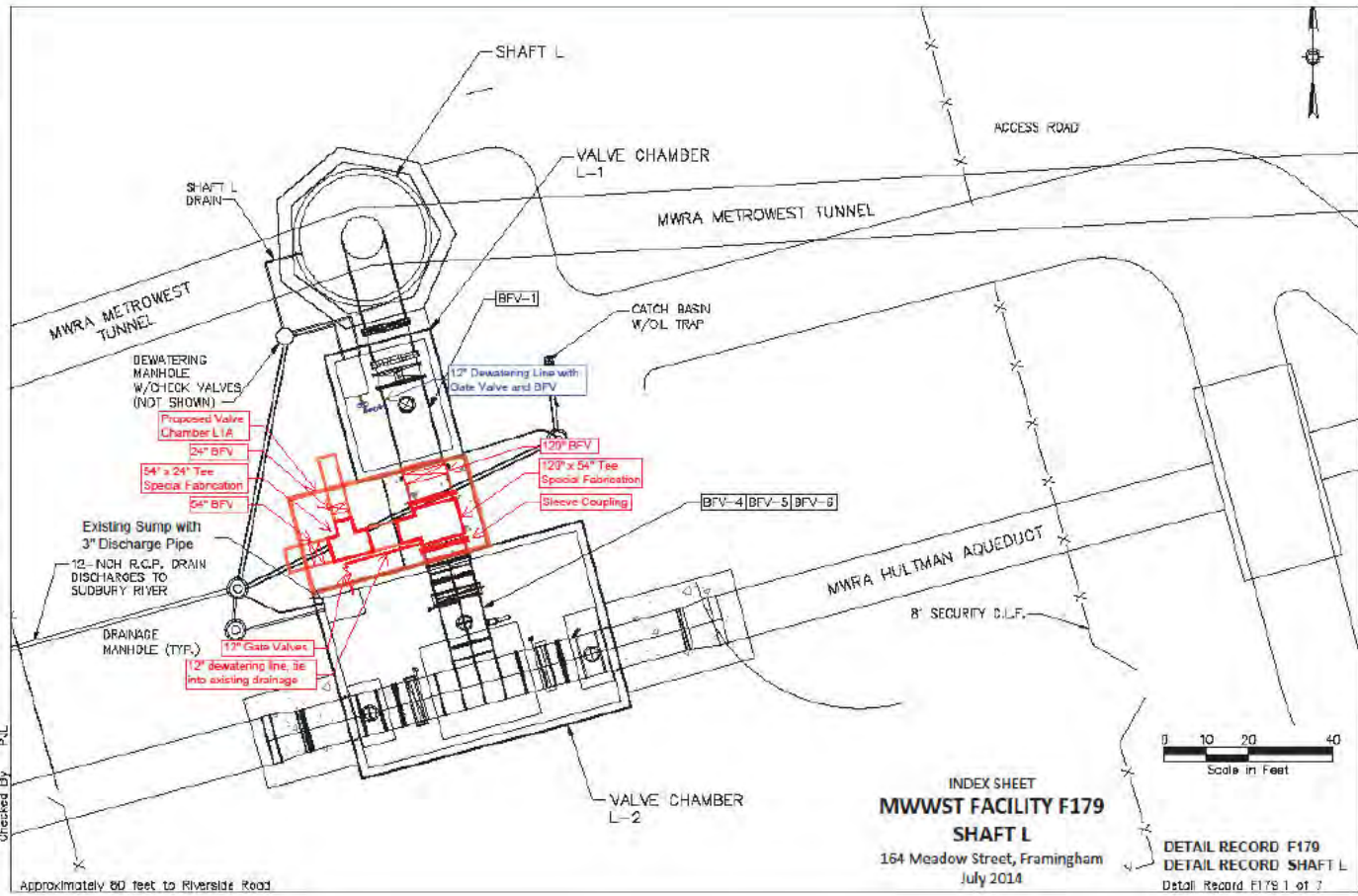
# FY25 Proposed CIP – Top Spending Subphases Excl. Community Loans in FY24-28

Project	Subphase	FY24-FY28 \$s in Millions
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$224.0
Metro Tunnel Redundancy	Final Design/ESDC	70.5
NHS - Revere & Malden Pipelines	CP-1 Section 53 Connection-Construction	55.5
Deer Island Treatment Plant Asset Protection	SSPS VFD Replace Construction	55.5
Facility Asset Protection	Ward St Headworks Construction	44.3
Facility Asset Protection	Prison Point Rehab Repackaged	38.7
Metro Tunnel Redundancy	Admin Legal & Public Outreach	35.5
NIH Redundancy & Storage	NIH Storage - Construction	34.0
Deer Island Treatment Plant Asset Protection	Combined Heat & Power - Construction	33.5
Deer Island Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	31.0
<b>Top 10 Spending Subphases Excl. Community Loans in FY24-28</b>		<b>\$622.5</b>
<b>% of FY24-28 Spending</b>		<b>33.4%</b>
<b>FY24-28 Spending</b>		<b>\$1,865.6</b>



# FY25 Proposed CIP – New Project: Shaft L Interconnection Project

F:\proj\250520 MWRA Hillman Interconnection\00 Construction\005 - 03-MWST Shaft L\2.5 Record\Drawings\01 Detail Record\Sheet L\Sheet L Detail Record.dwg  
Plotted By: CMB  
Checked By: P.L.







# FY25 Proposed CIP – New Project: New Salem Building Design & Construction



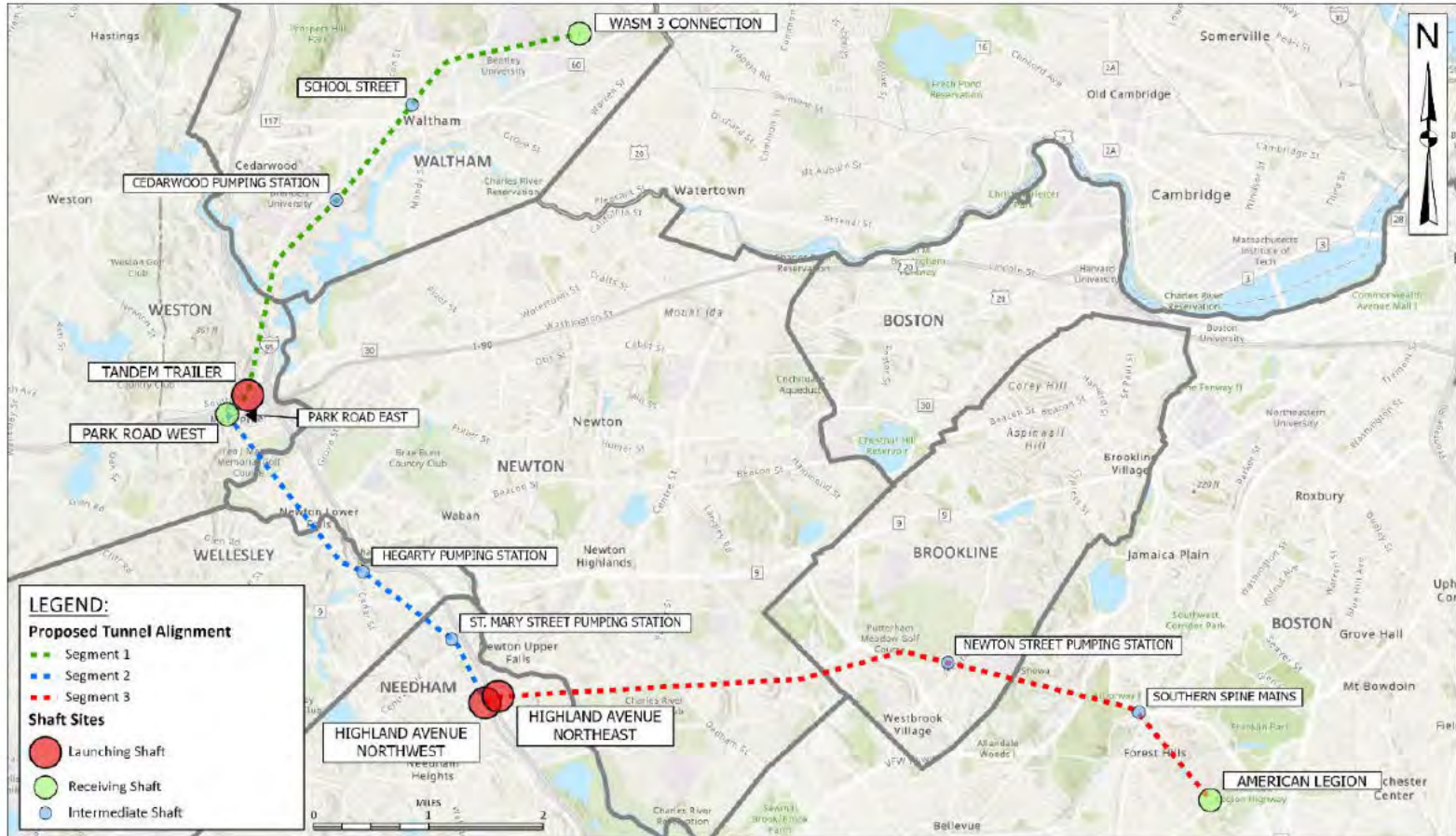


# FY25 Proposed CIP – New Project: High Level Sewer Culverts





# FY25 Proposed CIP – Metropolitan Tunnel Redundancy





## FY25 Proposed CIP – Next Steps

- Board approval to transmit to the Advisory Board for their 60-day minimum comment and review period
- Spring Revisit Process/Provide briefing to Advisory Board staff
- Present FY25 Final CIP to the Board of Directors for approval in June 2024