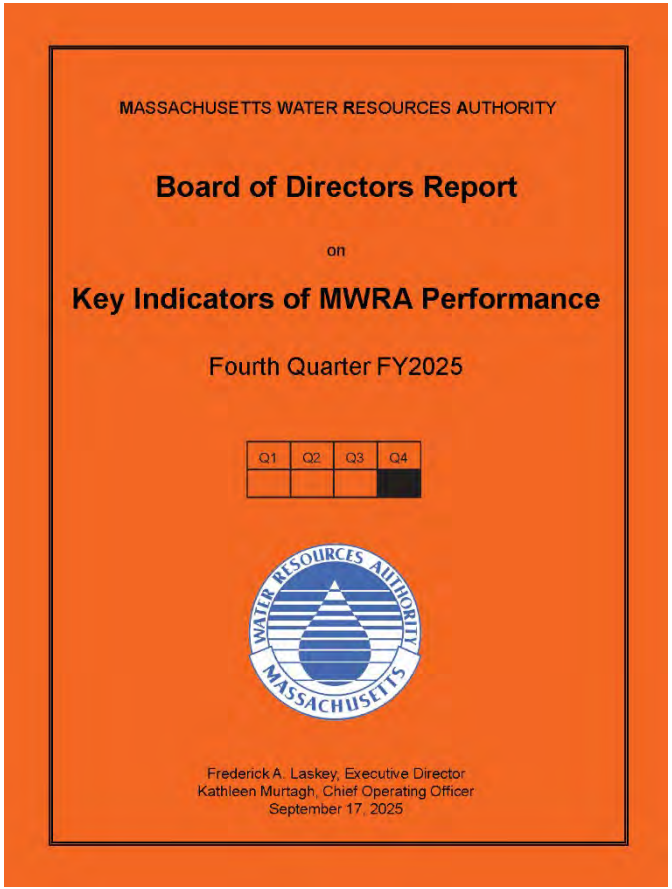
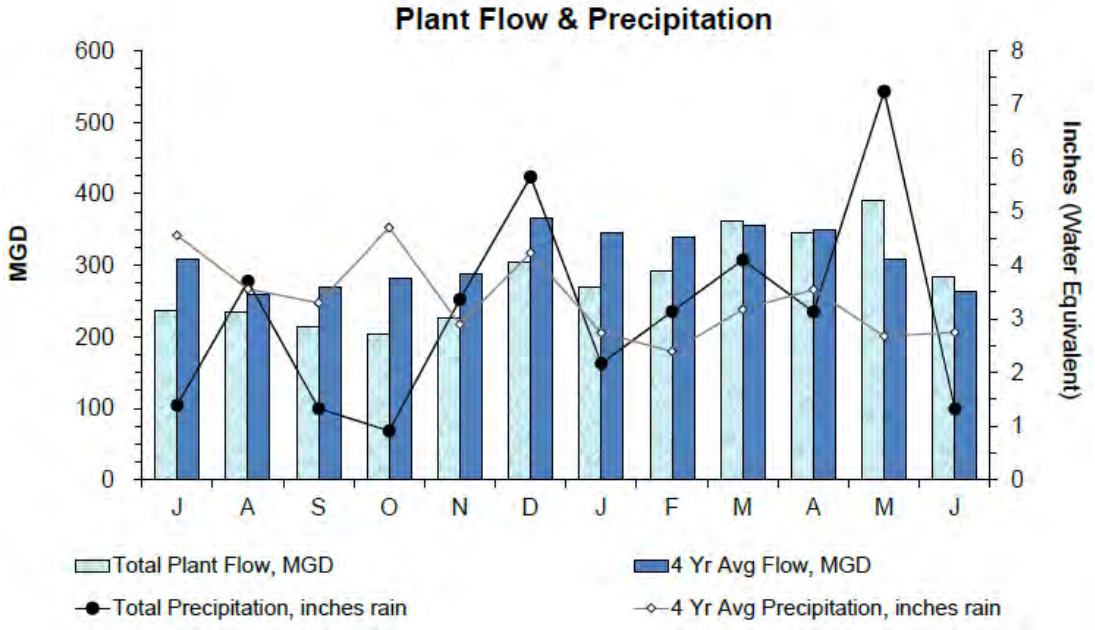
FY25 Fourth Quarter Orange Notebook Highlights

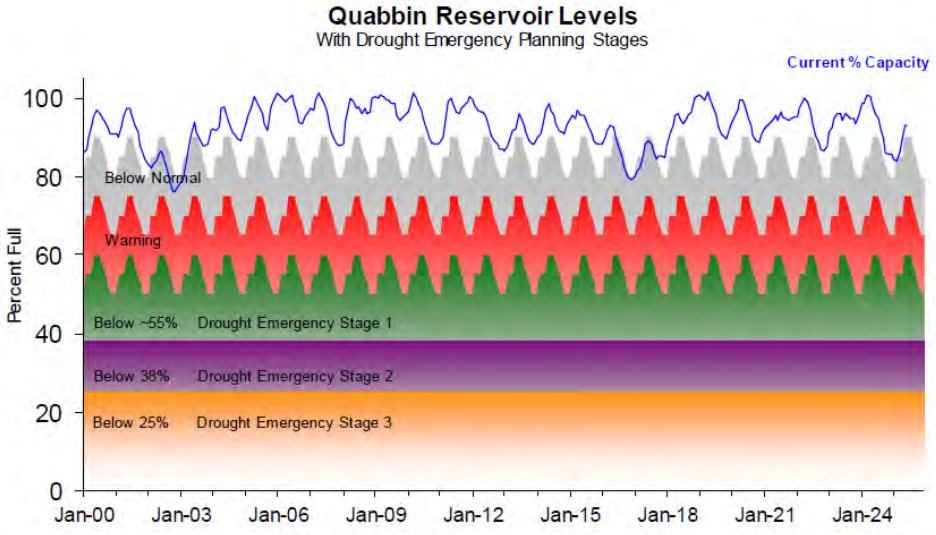


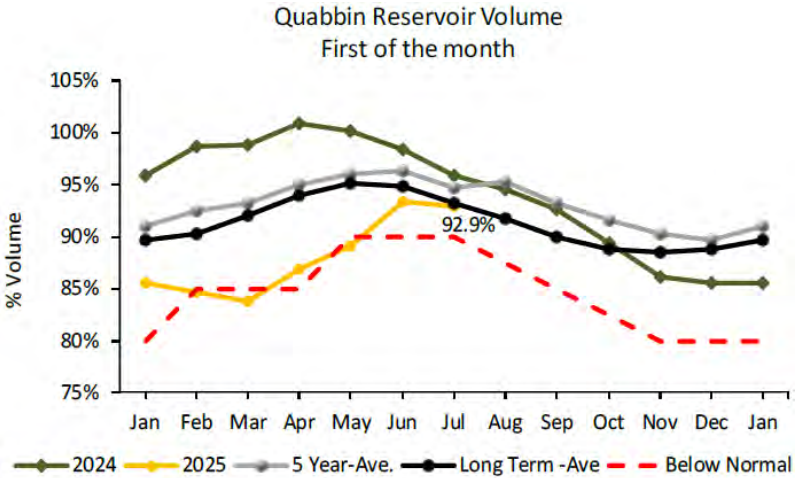
Precipitation and Deer Island flows above average



- Precipitation for Q4 was 30.4% above 4-yr average
- Deer Island flow for Q4 was 11% above average
- Plant flows were below average for every period of FY25 until March
- Annual flow for FY25 was 9.8% below target while precipitation was 7.6% below average.

Temporary Easing of Regional Drought Conditions

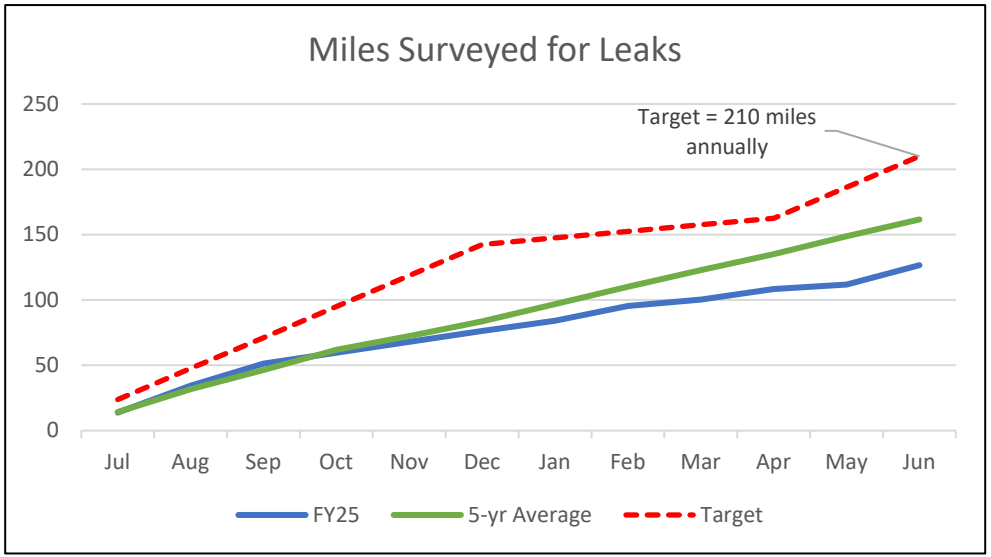




- Quabbin volume increased by 9.3%, remaining in normal operating range except for several days at the beginning of May

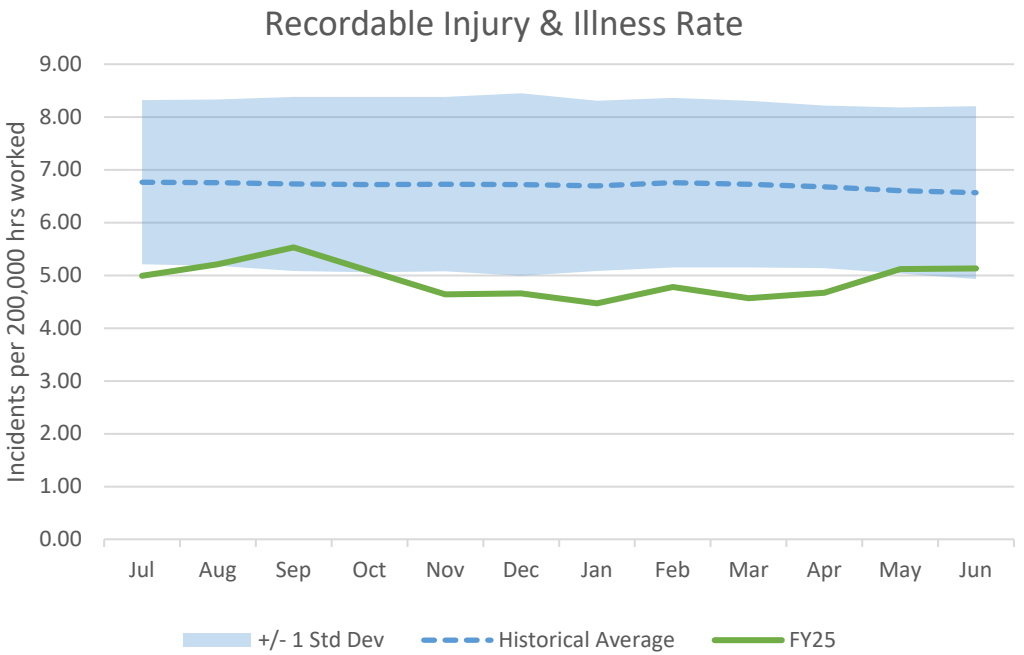
Staffing impacts water pipeline leak surveys

- Miles of water pipeline leak surveys have declined every year since FY22, and in FY25 were 40% below the target of 210 miles
- FY25 total was 22% below the 5-yr average
- 5-yr average is 23% below the 210 miles target



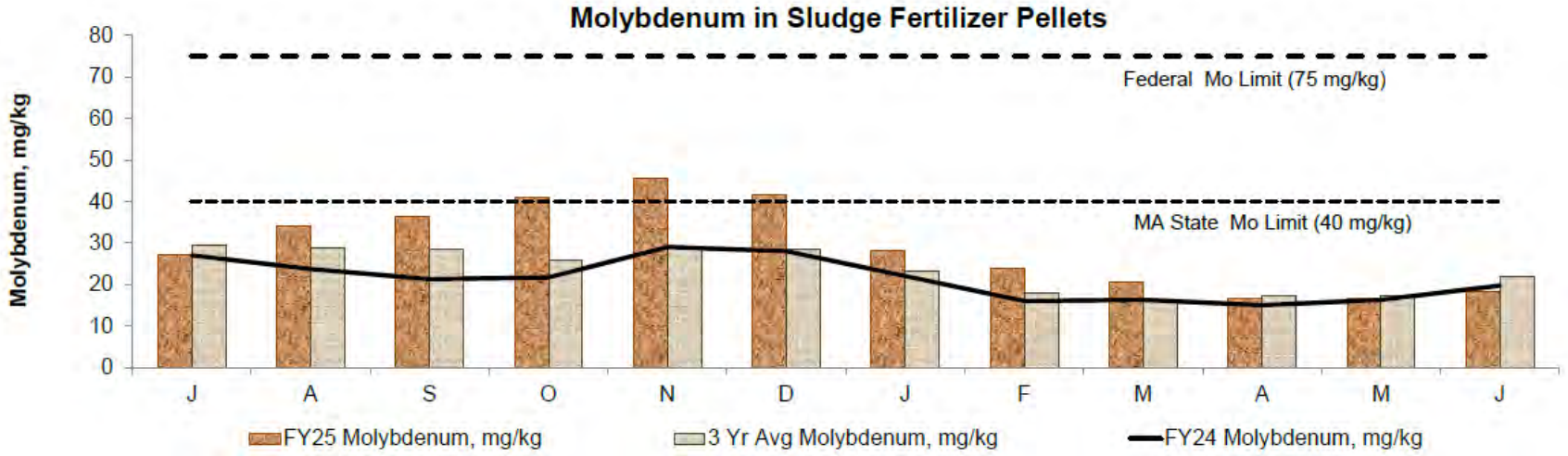
Workplace Injuries/Illnesses Below Historical Averages

- 12-month rolling recordable rate remained around 5 incidents per 200,000 hrs worked – roughly one standard deviation below the 20-yr historical average



Molybdenum in Biosolids

- Molybdenum (Mo) levels in fertilizer pellets in (17.2 mg/kg) remained within MA land application limits (40 mg/kg), and remained well below federal limit (75 mg/kg)




WATER RESOURCES AUTHORITY
MASSACHUSETTS

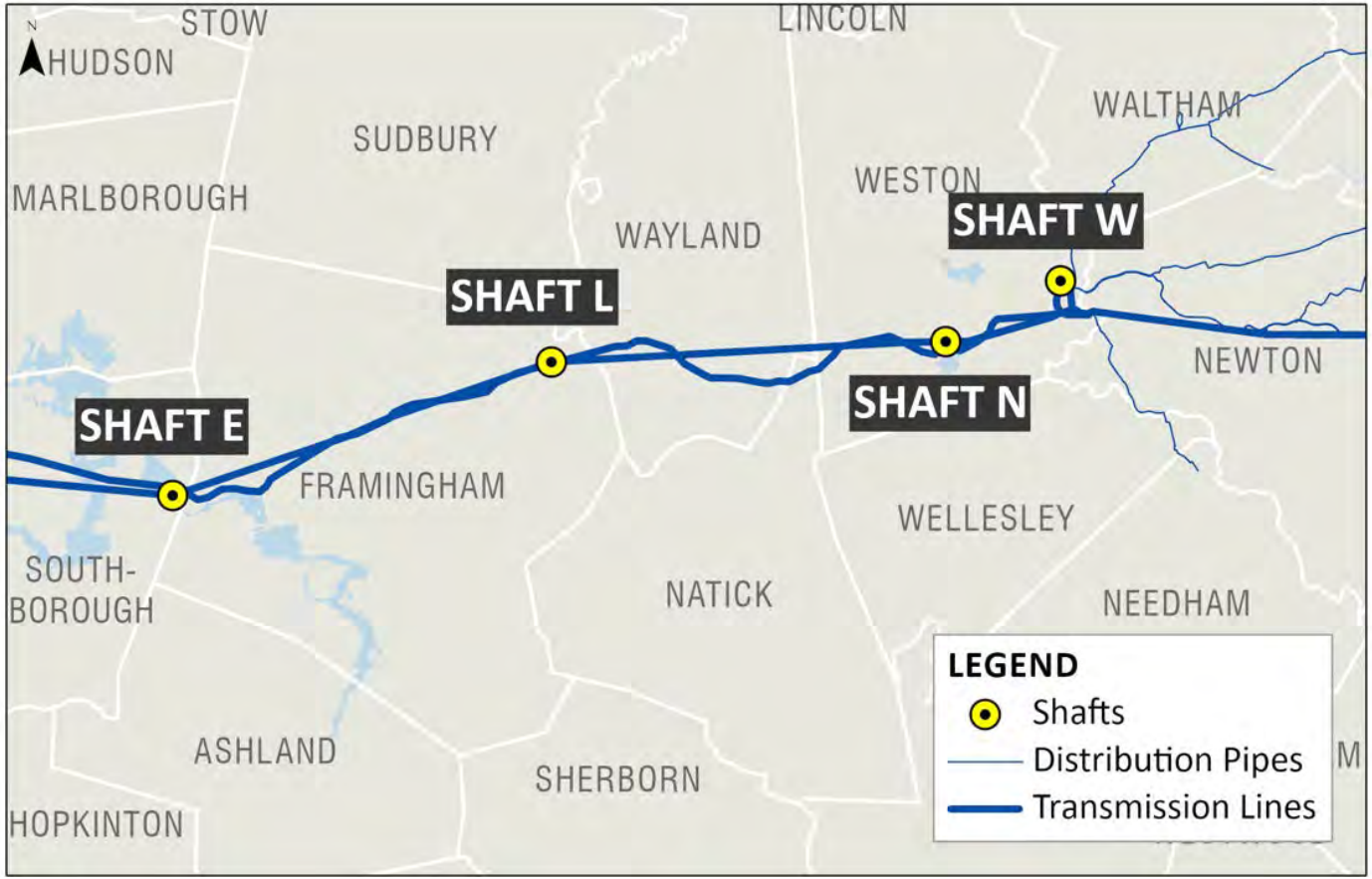
Presentation to

MWRA Board of Directors

Cathodic Protection System Improvements
Shafts E, L, N and W
Contract 6439

September 17, 2025

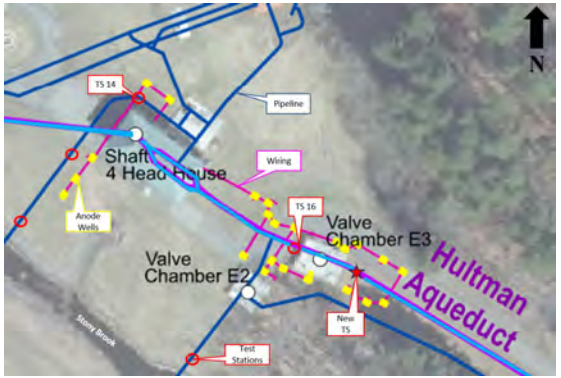
Project Locations



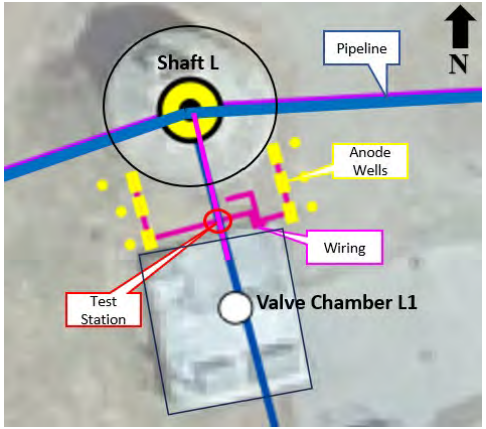
Contract 6439 Cathodic Protection Work

Shafts E & L – Supplemental Systems

Shaft E:

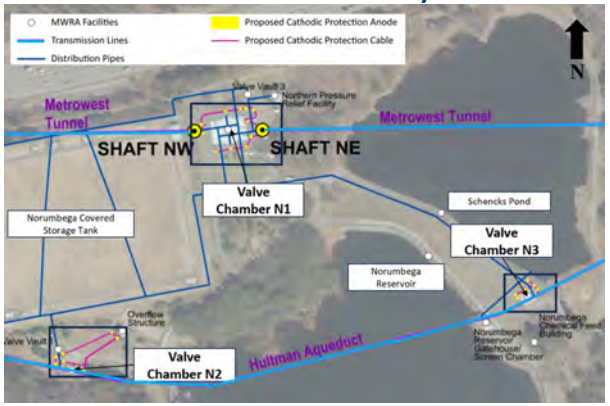


Shaft L:

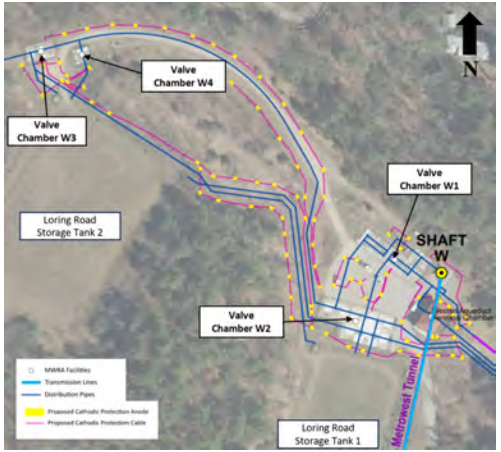


Shafts N & W – New Systems

Shaft N:



Shaft W:



Procurement Results

Contractor	Bid Amount
Engineer's Estimate	*$6,728,000*
CorrTech, Inc.	**$7,324,782**

- Construction Contract duration 30 months
- Staff recommends award to CorrTech, Inc.


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Presentation to

MWRA Board of Directors

Dam Safety Compliance and Consulting Services – Repairs and ESDC
GZA GeoEnvironmental, Inc.
Contract 7614, Amendment 4

September 17, 2025

Completed:
North Dike Overtopping 7614 design (7615 Construction)

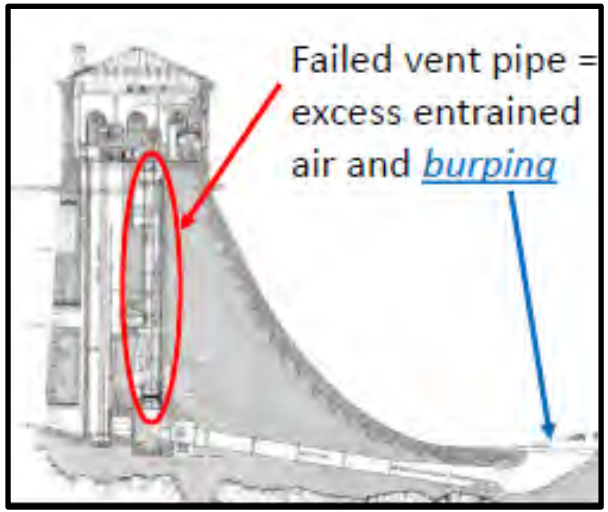
Completed:
North Dike Instrumentation 7614 design (W327 Construction)

Completed:
Sudbury Dam Spillway 7614 design (7615A Construction)

Completed: Masonry repointing and weephole restoration

Weep tubes restored

Bellmouth outlet “burping”

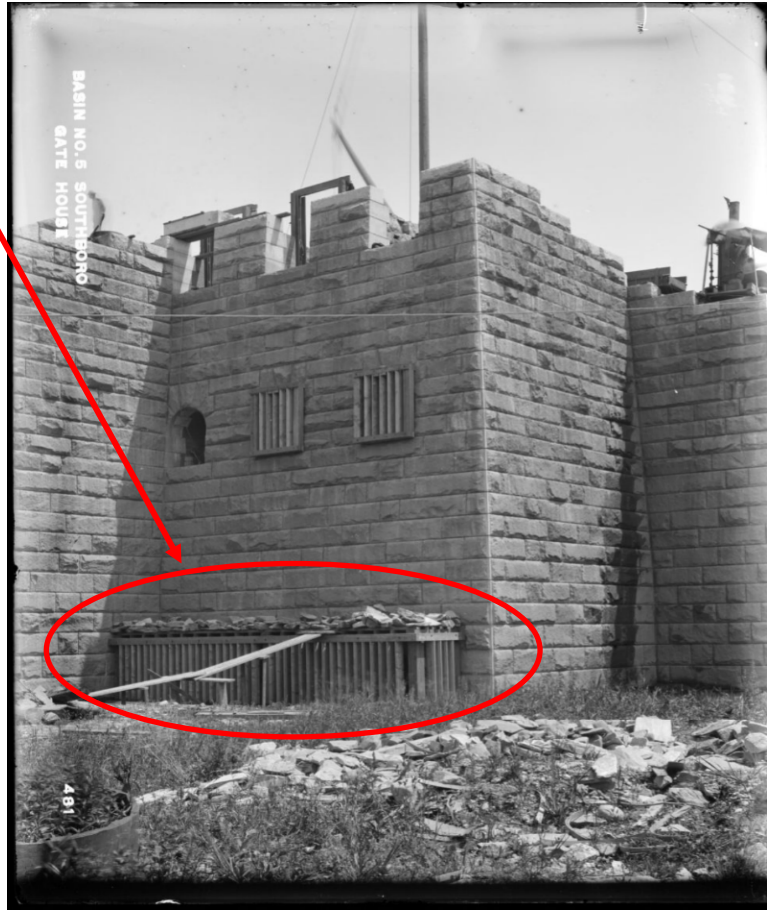


Completed: Wet Well Vent

Completed: Deflector Plate

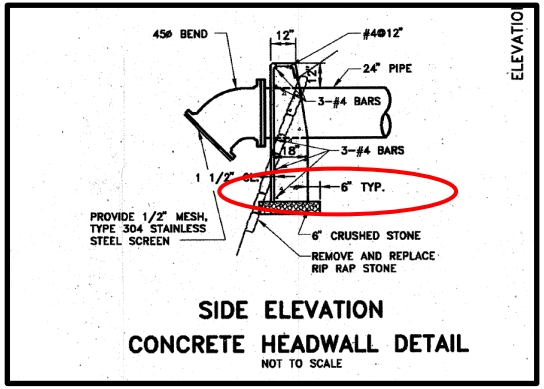
Diver wet well opening inspection reveals unforeseen issue

Cut stones debris piled on top of wood scaffolding platform up against GH ext.

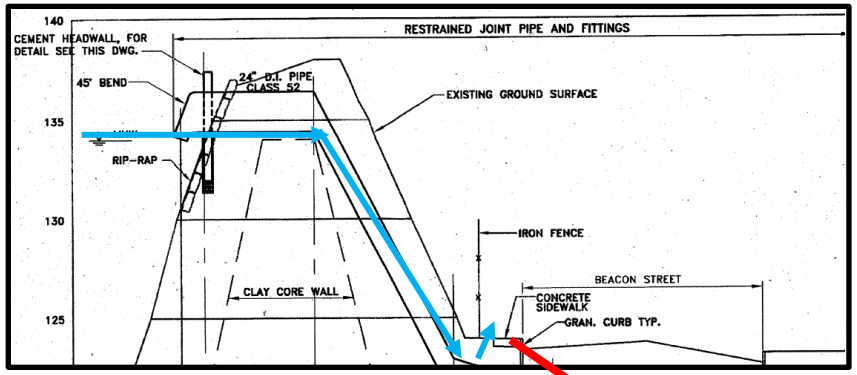


Completed: Removal of Upstream Gatehouse Debris

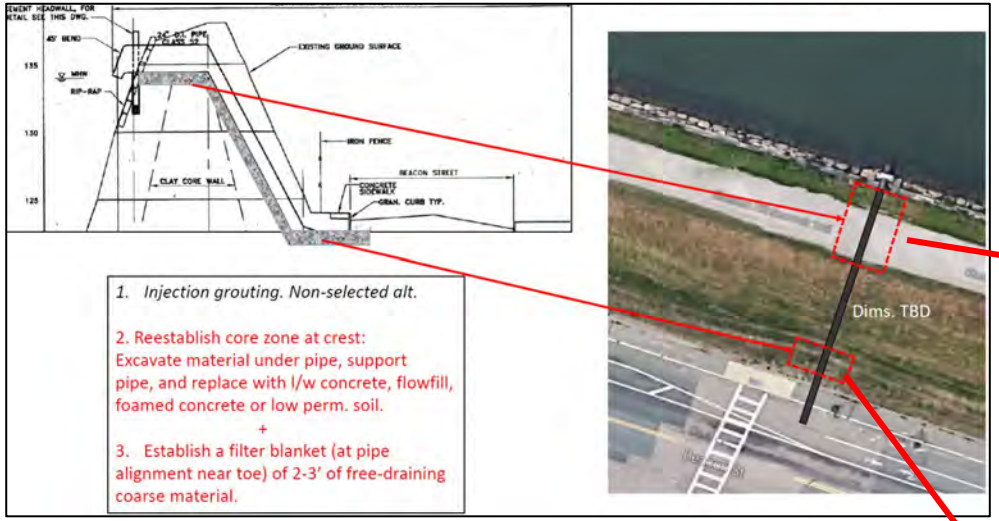
Completed:
Chestnut Hill Dam Emergency Seepage Repair 7614 design



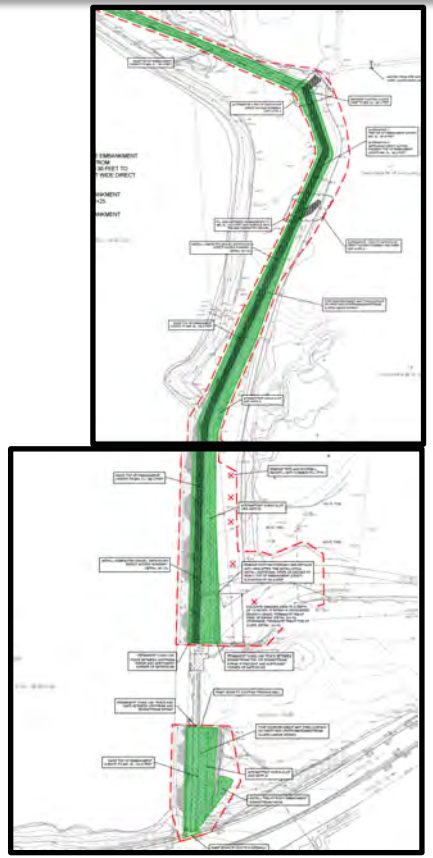
Seepage mechanism: Seepage flow path along crushed stone

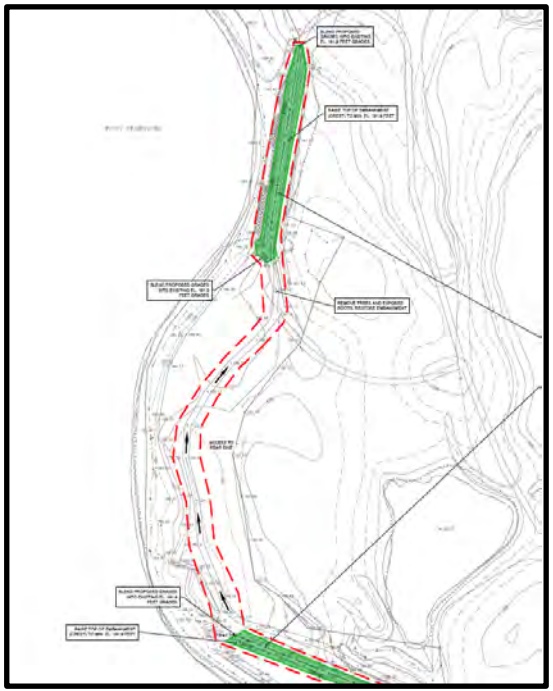


Completed: Chestnut Hill Dam Emergency Seepage Repair 7614 design (in-house Construction Metro-O&M)



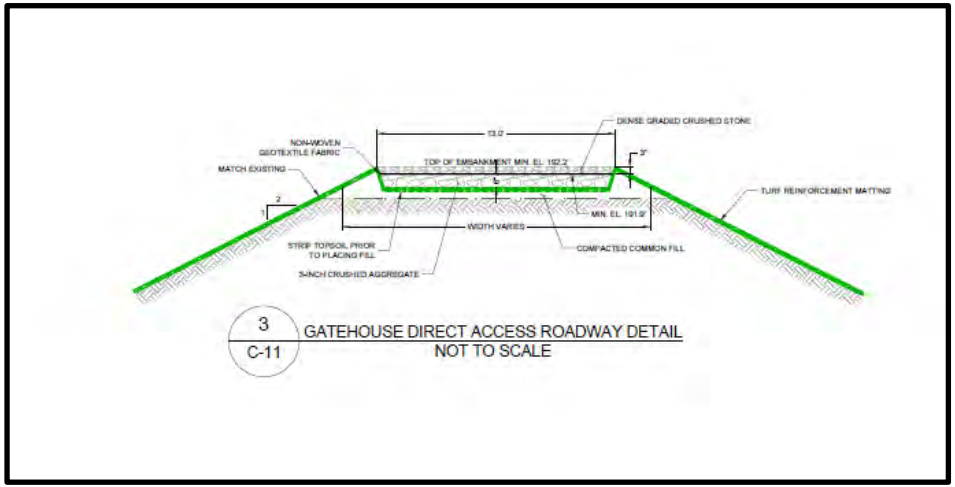
Completed:
Foss Dam and Rear Dike Overtopping Protections Design





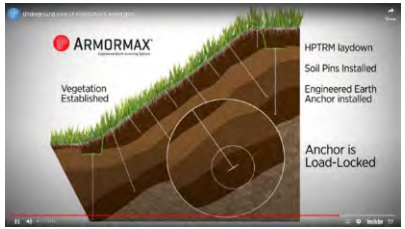
Embankment raising up to 1.4’, add TRM, crest width narrowed.

Completed: 7614 Foss Dam Overtopping Protections Design



Example of overtopping of earthen dam, Forest Lake, Columbia, S.C., on Oct. 4, 2015

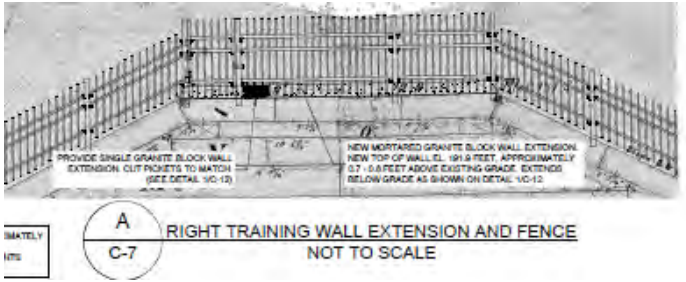
Turf Reinforcement Matting (TRM)



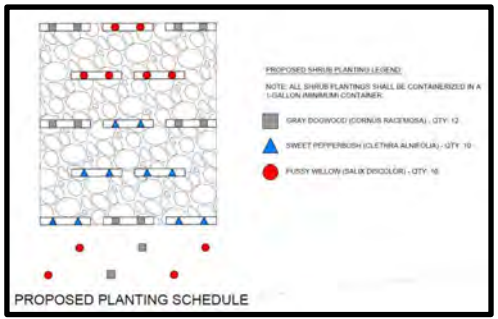
7614 Amendment 4 Work:
Foss Dam Overtopping Protections Design

Training walls do not currently have fencing to prevent falls into the spillway area and outlet channel

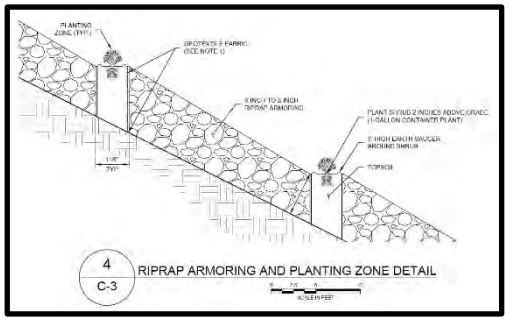
Concrete deficiencies found on the upstream spillway apron



7614 Amendment 4 Work- River Road Slope Repair Design

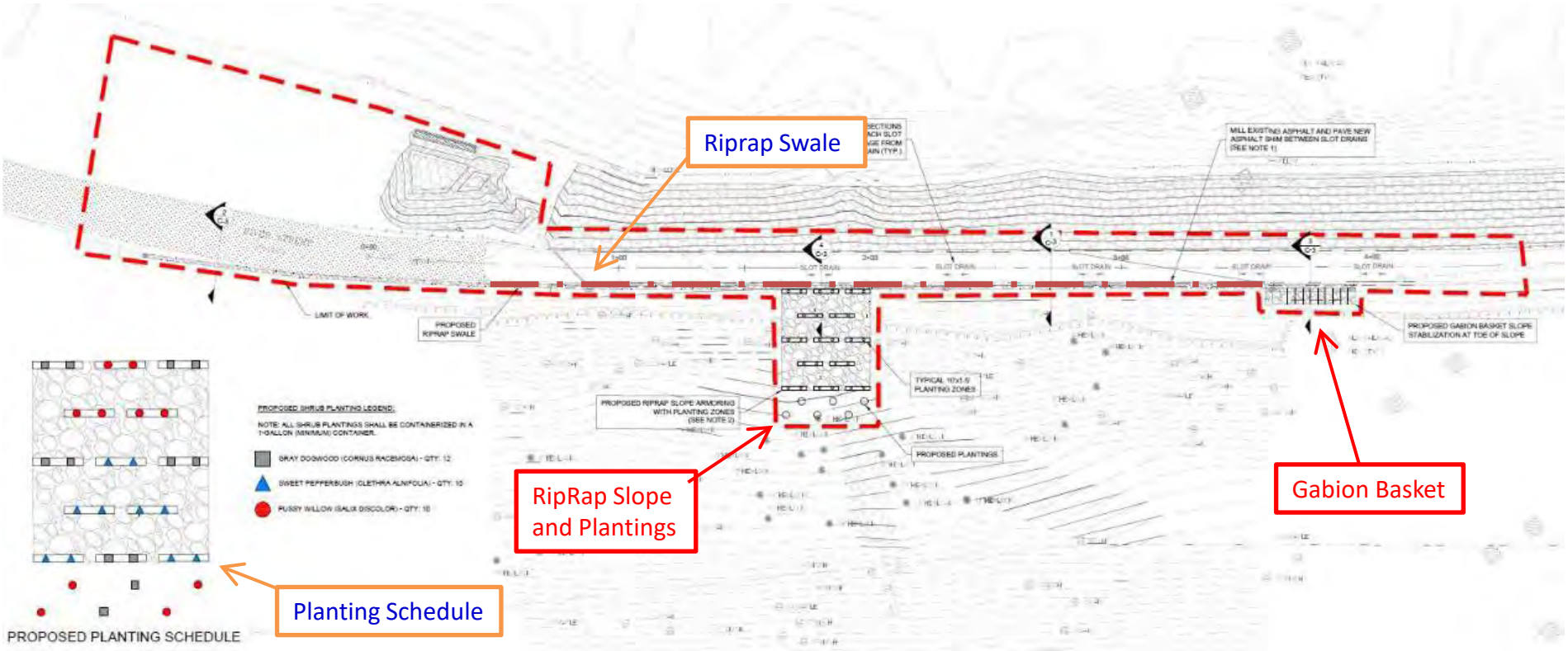


PROPOSED PLANTING SCHEDULE



RIPRAP ARMORING AND PLANTING ZONE DETAIL

7614 Amendment 4 Work: River Road – Repair Plan Design



7614 Amendment 4 Cost and Time

- Additional $25,100 for added design to accommodate recent dam safety inspection findings for construction, as well as added efforts to comply with Conservation Commission on River Road slope repair.

- Duration: Extends contract by 24 months from October 1, 2025 – October 1, 2027 to accommodate construction on both projects.


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Presentation to

MWRA Board of Directors

Quinapoxet Dam Removal Design, Permitting and Engineering Services During Construction
SRL International Corporation
Contract 7347, Amendment 3

September 17, 2025

Quinapoxet Dam Removal November 2024

Restored Quinapoxet River looking downstream

Restored Quinapoxet River looking upstream

Quinapoxet River Restoration Day 09.10.25

PRESS RELEASE

Healey-Driscoll Administration Celebrates the Restoration of the Quinapoxet River

"Restoring waterways like the Quinapoxet has real, lasting benefits, including cleaner water, healthier wildlife, and more places for people to hike, paddle and fish," said **EEA Secretary Rebecca Tepper.** "This restoration project is a great example of the kind of dam removals we need across Massachusetts. That's why we proposed the Mass Ready Act – to remove and replace aging infrastructure and protect the water and wildlife our communities depend on."

"Restoring the Quinapoxet River and improving the immediate area around it had long been in development because of the many benefits the project had to offer," said **MWRA Executive Director Fred Laskey.** "I am proud of the great work, expertise, and leadership by so many to advance this project and bring it to fruition. While we honor and appreciate the dam's once critical function within the water system, I am excited to see this area gain in popularity with the increased access to the natural world."

7347 Vegetation Restoration
Live Stakes – US ACE 404 Permit Compliance

US ACE 404 Permit: Post construction monitoring – 3-year period to assess:

- River channel geomorphic changes
- Vegetation take and survival
- Presence of invasives species
- Contingency allowance for invasive species removal

7347 Amendment 3 Work: River channel restoration UA ACE 404 Permit compliance monitoring

This Amendment:

- Additional $148,000 for US Army Corps of Engineers 404 Permit Compliance for 3-year post construction monitoring
- Duration: Extends contract by 36 months from April 1, 2026 to April 1, 2029


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Presentation to

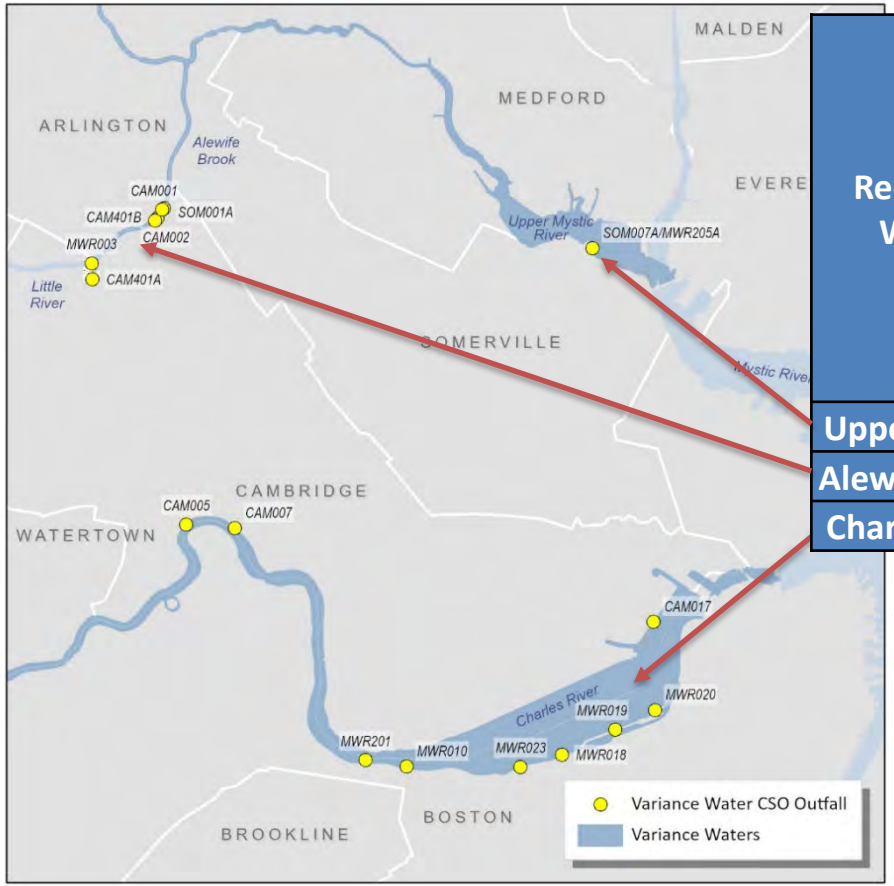
MWRA Board of Directors

Progress on Development of Updated Combined Sewer Overflow Control Plan

September 17, 2025

Variance Water CSOs

Open CSOs within Variance Water



Receiving Water	Hydraulic Model Predictions						
	Activation Frequency		CSO Discharge Volume (MG)				
	Prior TY	2050 TY	Prior TY	2050 TY	2050 Largest Storm in TY	2050 5-year Storm	2050 25-year Storm
Upper Mystic	2	8	1.3	29.3	10.5	17.4	27.2
Alewife Brook	8	13	9.9	20.9	4.84	20.9	40.1
Charles River	3	6	7.9	38.4	16.6	65.5	120.6

Considering Climate Change Impacts

- 2050 Planning Year
- Larger more intense storm events
- Larger CSO volumes expected

Four Levels of Control Being Evaluated

Receiving Water	Hydraulic Model Predictions				
	Activation Frequency	CSO Discharge Volume (MG)			
	2050 TY	2050 TY	2050 Largest Storm in TY	2050 5- year Storm	2050 25-year Storm
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Significantly reducing CSO discharges from those predicted to occur in a 2050 Typical Year ("**Breakpoint / Limited CSO in 2050 Typical Year**")

Four Levels of Control Being Evaluated

Receiving Water	Hydraulic Model Predictions				
	Activation Frequency	CSO Discharge Volume (MG)			
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Significantly reducing CSO discharges from those predicted to occur in a 2050 Typical Year ("**Breakpoint / Limited CSO in 2050 Typical Year**")

No CSO in a 2050 Typical Year ("**2050 Typical Year**")

Four Levels of Control Being Evaluated

Receiving Water	Hydraulic Model Predictions				
	Activation Frequency	CSO Discharge Volume (MG)			
	2050 TY	2050 TY	2050 Largest Storm in TY	2050 5- year Storm	2050 25-year Storm
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Significantly reducing CSO discharges from those predicted to occur in a 2050 Typical Year ("**Breakpoint / Limited CSO in 2050 Typical Year**")

No CSO in a 2050 Typical Year ("**2050 Typical Year**")

No CSO in a 2050 5-year, 24-hour design storm ("**2050 5-year**")

Four Levels of Control Being Evaluated

Receiving Water	Hydraulic Model Predictions				
	Activation Frequency	CSO Discharge Volume (MG)			
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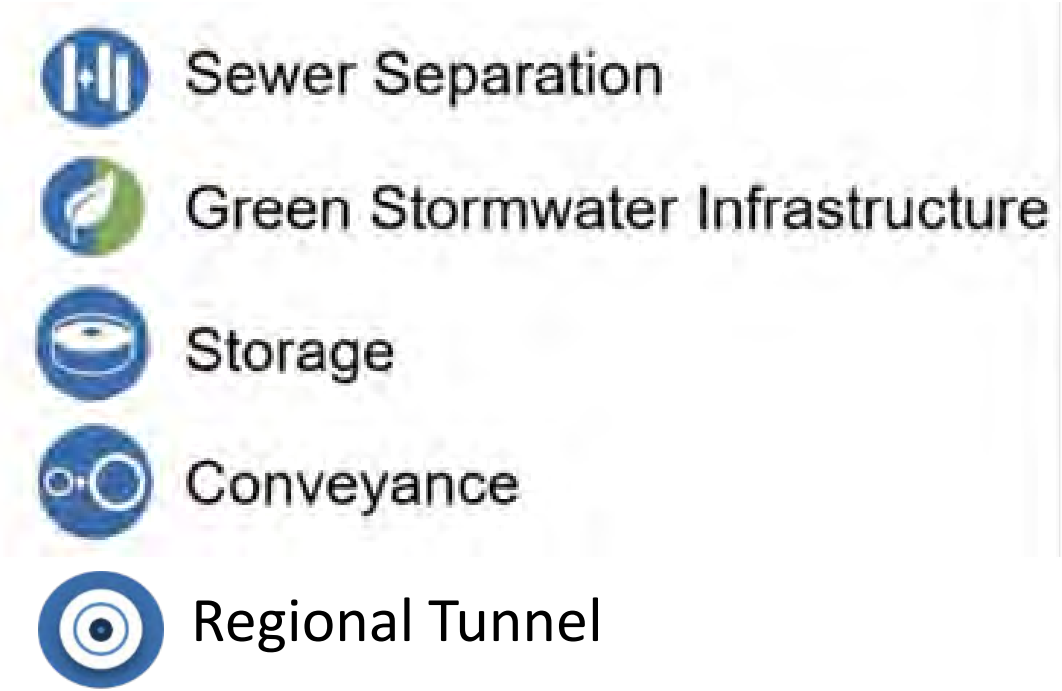
Significantly reducing CSO discharges from those predicted to occur in a 2050 Typical Year ("**Breakpoint / Limited CSO in 2050 Typical Year**")

No CSO in a 2050 Typical Year ("**2050 Typical Year**")

No CSO in a 2050 5-year, 24-hour design storm ("**2050 5-year**")

No CSO in a 2050 25-year, 24-hour design storm ("**2050 25-year**")

General Components of an Alternative



Summary of Alternatives

Alewife Brook: 6 outfalls (1 MWRA)

Breakpoint 2050 TY	2 Alternatives
2050 TY	6 Alternatives
2050 5-Year/25-Year	4 Alternatives (2 each)

Upper Mystic River: 1 outfall (jointly owned MWRA/Somerville)

Breakpoint 2050 TY	2 Alternatives
2050 TY	4 Alternatives
2050 5-Year/25-Year	6 Alternatives (3 each)

Lower Charles River: 9 outfalls (6 MWRA)

Breakpoint 2050 TY	2 Alternatives
2050 TY	7 Alternatives
2050 5-Year/25-Year	4 Alternatives (2 each)

Alternative Evaluation: Key Considerations

- Water Quality Impact
  - Modeling shows limited improvement in meeting Water Quality Standards with further CSO reduction
  - Discharges from some outfalls are already treated

- Constructable/Implementable
  - Deep tanks, close to river
  - Large scale sewer separation
  - Large diameter tunnels
  - Land acquisition/availability

- Community Impacts/Disruption
  - Construction duration and scale of project
  - Traffic impacts, road closures
  - Trucking, 24/7 construction

Alternative Evaluation: Key Considerations, cont'd

- Cost/Value
  - Conceptual capital cost of alternative
  - Allocation of cost among entities
  - Benefit achieved for the cost

- Timeline to CSO Reduction
  - Overall project duration
  - Components completed early

Alternatives

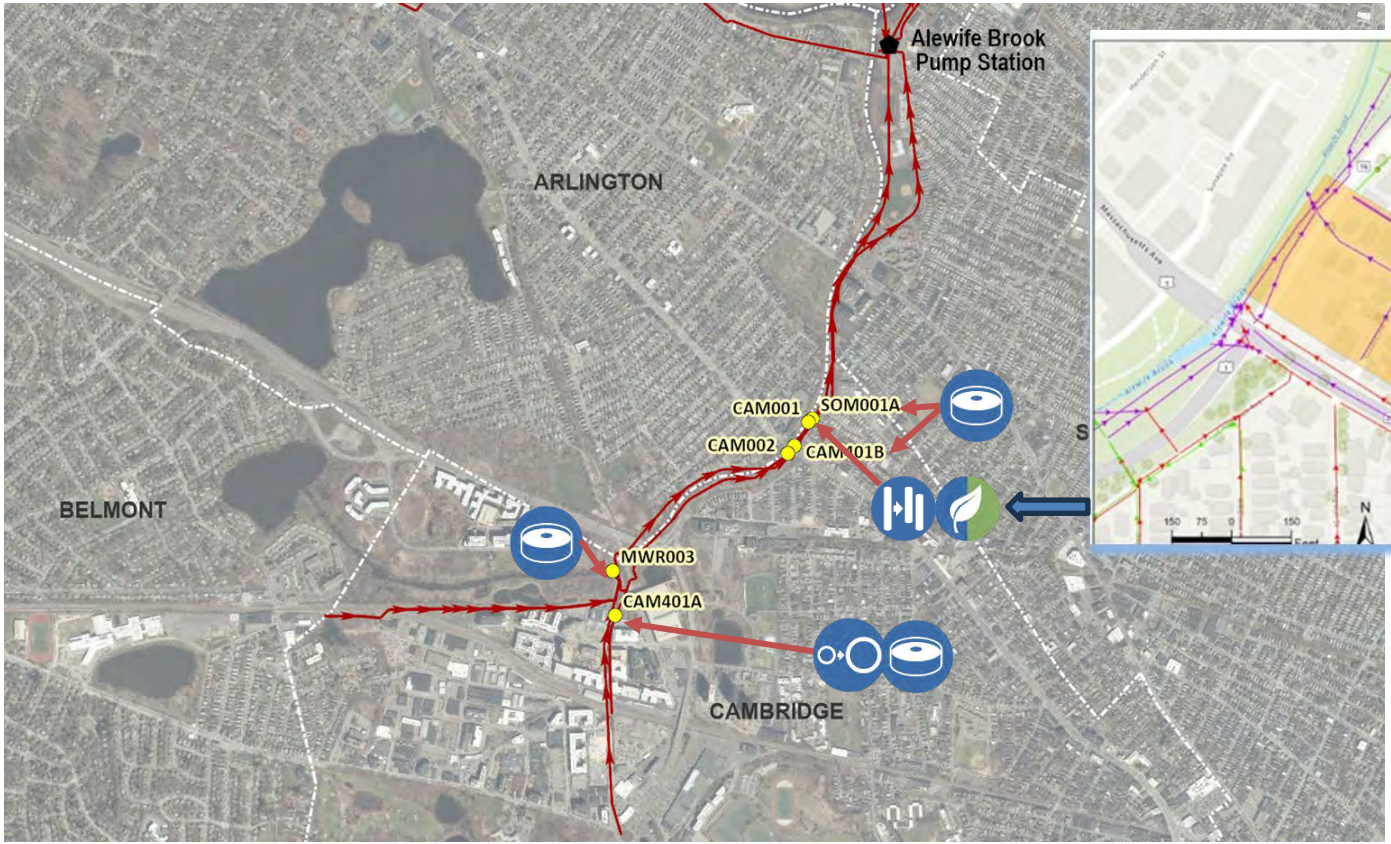
Alewife Brook 2050 Typical Year (TY) Alternatives

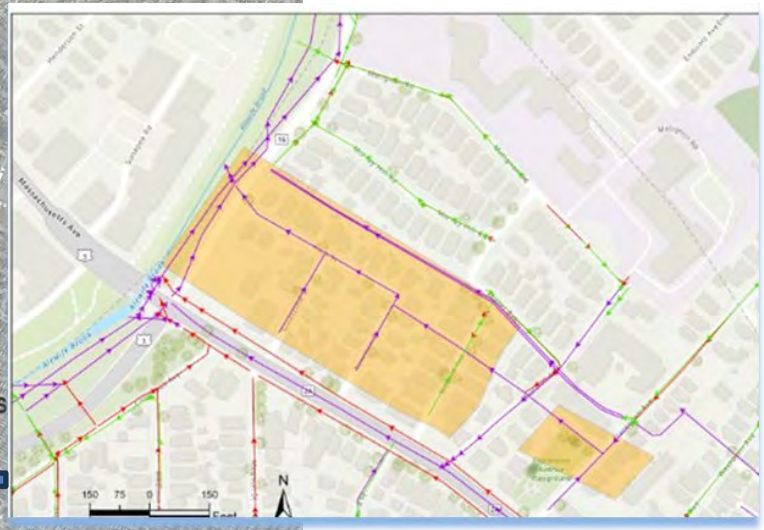
Control Level	Alternative Name	Combined Sewer Overflow Outfalls						Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
		CAM001	CAM002	CAM401A	CAM401B	MWR003	SOM001A		
0 CSOs 2050 TY	AB – Integrated Alternative	No action	No action	Storage Tank 2.1 MG	Storage Tank 0.4 MG	Storage Tank 0.5 MG (160' x 50' x 15' sidewater depth)	264 acres sewer separation inline storage with throttles	31	$710 - $1,180
0 CSOs 2050 TY	AB – Hybrid Alternative 1	8 acres sewer separation	No action	Conveyance + Storage Tank 1.5 MG	Included w/ SOM001A project	Storage Tank 1.4 MG (225' x 85' x 15' sidewater depth)	100 acres sewer separation with wetland in Davis Square Microtunnel 1.3 MG (2,900 LF, 9 ft dia.) to store CAM401B and SOM001A	20	$350 -$ 580
0 CSOs 2050 TY	AB – Hybrid Alternative 2	Same as above	No action	Same as above	Included w/ SOM001A project	Storage Tank 1.5 MG (230' x 90' x 15' sidewater depth)	Microtunnel 2.3 MG (5,400 ft. and 9 ft. dia.) to store CAM401B and SOM001A	15	$200 - $340
0 CSOs 2050 TY	AB – Tunnel Alternative	Tunnel 4.9 MG (7,600 LF, 11 ft. dia.) with dewatering pump station (aboveground), odor control Conduit (4,500 ft., 6 ft. dia.) to convey CAM401A overflow to drop shaft at MWR003						15 - 20	$440 - $740
0 CSOs 2050 TY	AB – Tunnel Alternative + GSI	Same as Tunnel Alternative + GSI						20	$460 - $770
0 CSOs 2050 TY (minimum)	Sewer Separation	560 acres (SOM) + 438 acres (CAM) + Treatment + Flow Attenuation						>50	$1,140 – $1,900

Alewife Brook Sample Alternative

- Sewer Separation
- Green Stormwater Infrastructure
- Storage
- Conveyance
- **Regional Tunnel**

Alewife Brook Sample Alternative: Sewer Separation

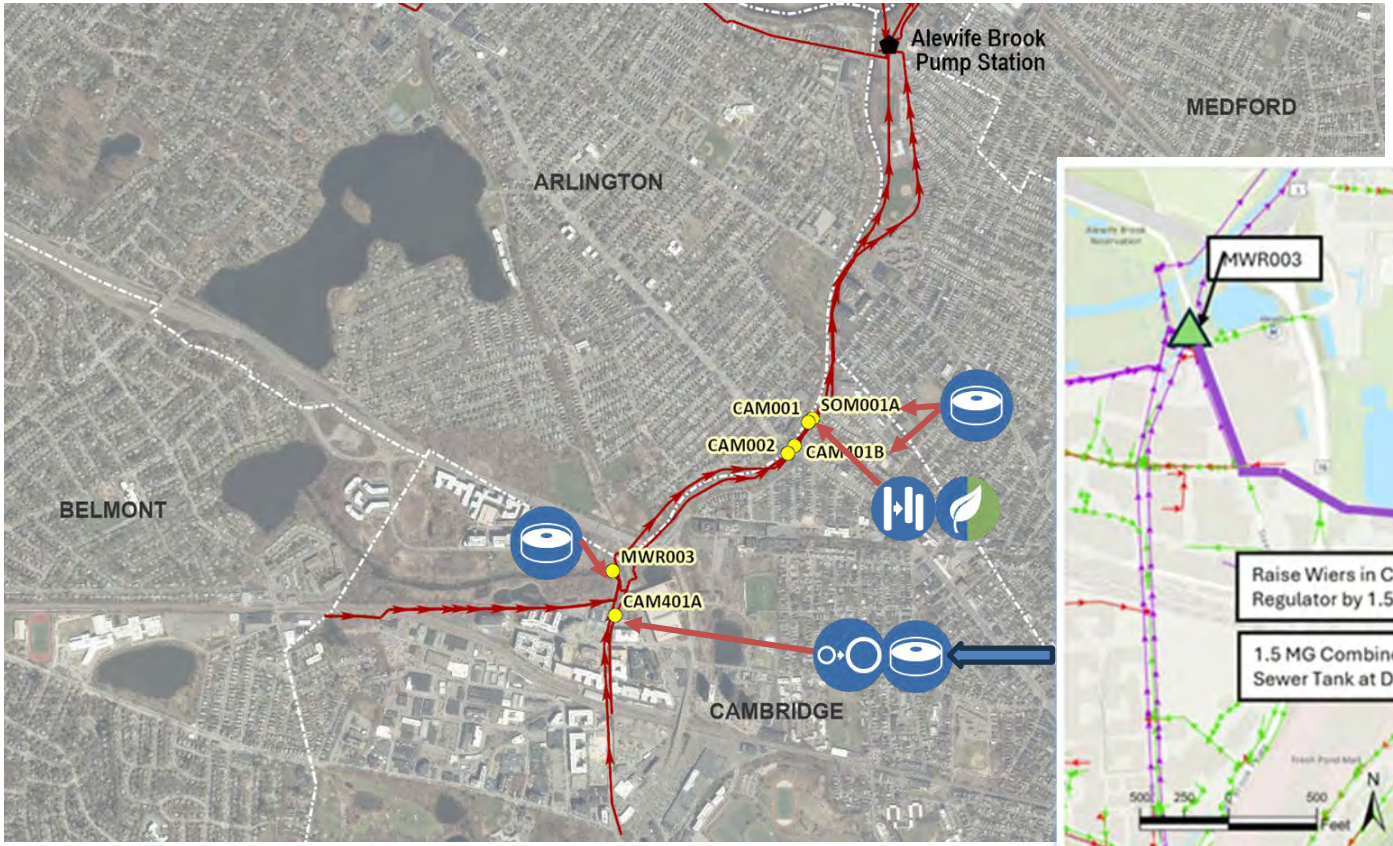


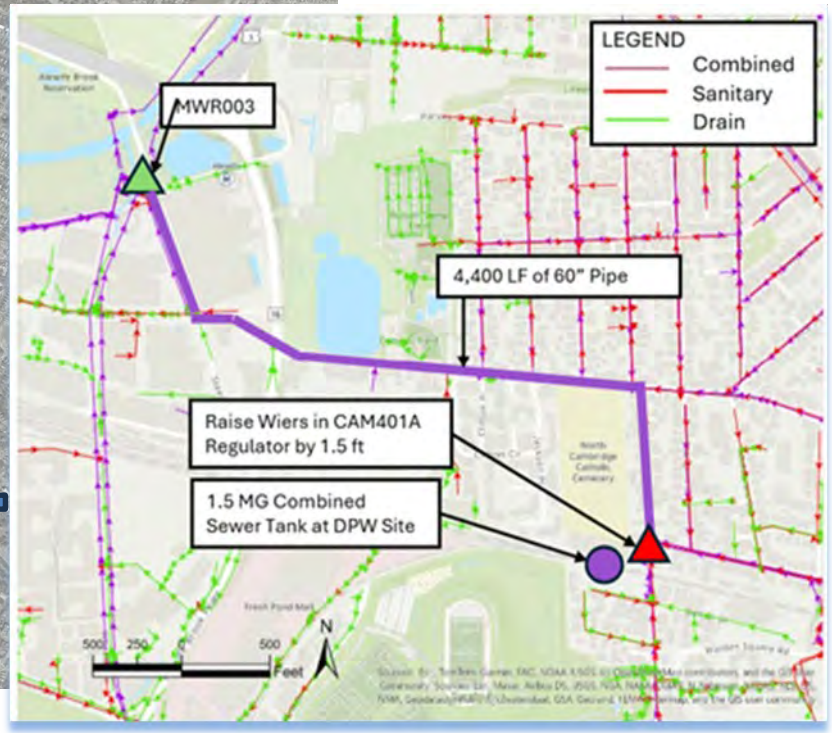


- Sewer Separation
- Green Stormwater Infrastructure
- Storage
- Conveyance
- **Regional Tunnel**

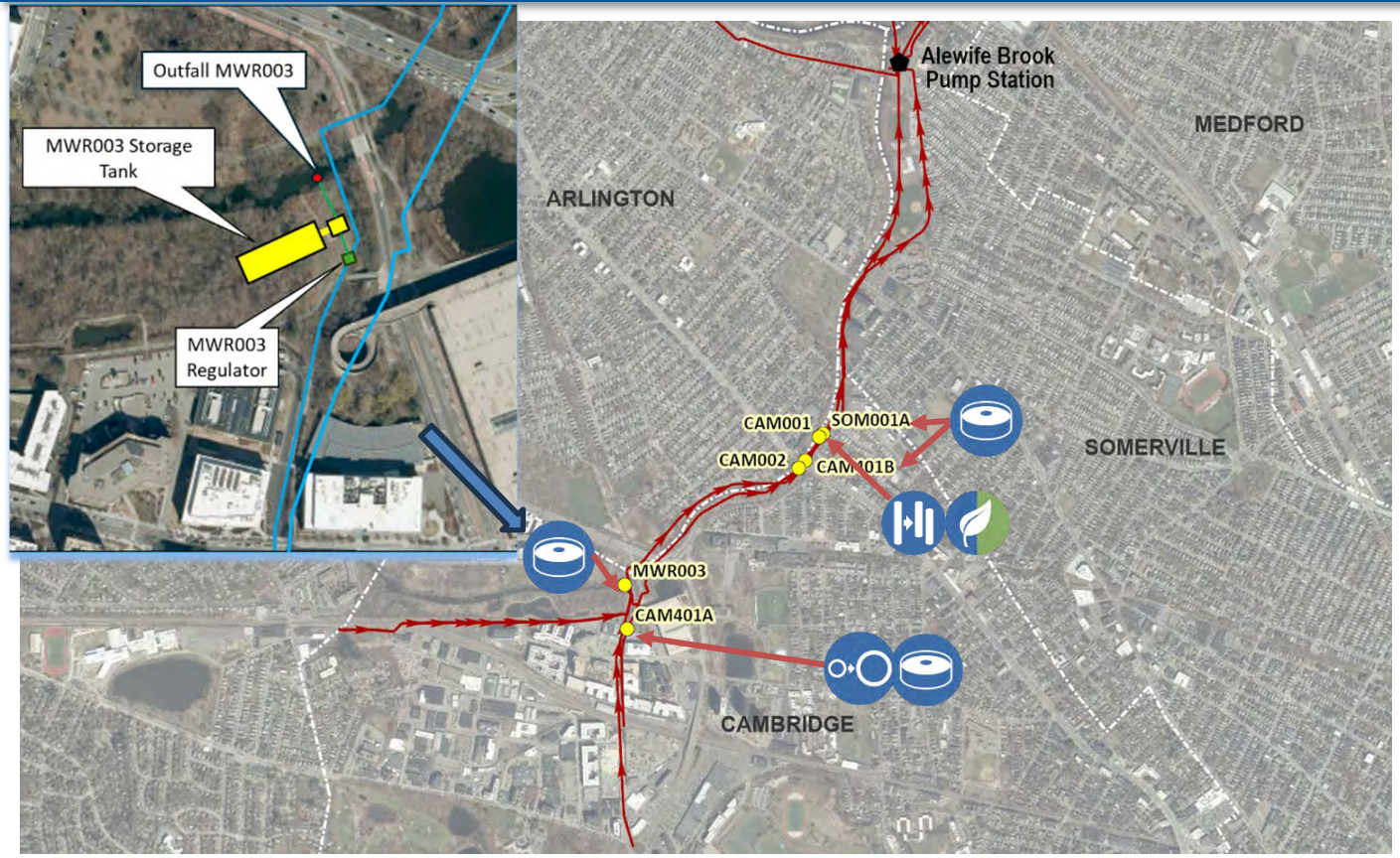
Alewife Brook Sample Alternative: Microtunnel Storage

Alewife Brook Sample Alternative: Conveyance & Storage Tank





Alewife Brook Sample Alternative: Storage Tank

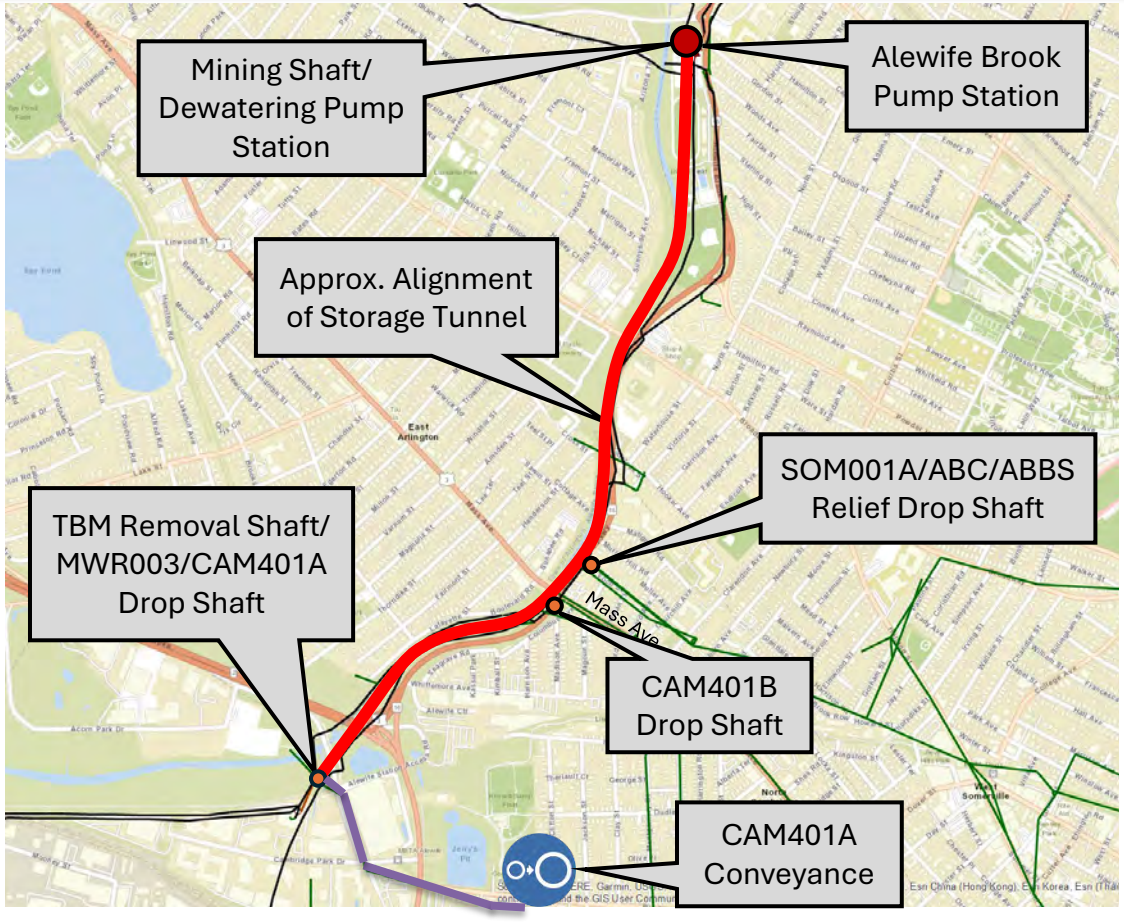


Alewife Brook 2050 Typical Year (TY) Alternatives

Control Level	Alternative Name	Combined Sewer Overflow Outfalls						Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
		CAM001	CAM002	CAM401A	CAM401B	MWR003	SOM001A		
0 CSOs 2050 TY	AB – Integrated Alternative	No action	No action	Storage Tank 2.1 MG	Storage Tank 0.4 MG	Storage Tank 0.5 MG (160' x 50' x 15' sidewater depth)	264 acres sewer separation inline storage with throttles	31	$710 - $1,180
0 CSOs 2050 TY	AB – Hybrid Alternative 1	8 acres sewer separation	No action	Conveyance + Storage Tank 1.5 MG	Included w/ SOM001A project	Storage Tank 1.4 MG (225' x 85' x 15' sidewater depth)	100 acres sewer separation with wetland in Davis Square)' Microtunnel 1.3 MG (2,900 LF, 9 ft dia.) to store CAM401B and SOM001A	20	$350 -$ 580
0 CSOs 2050 TY	AB – Hybrid Alternative 2	Same as above	No action	Same as above	Included w/ SOM001A project	Storage Tank 1.5 MG (230' x 90' x 15' sidewater depth)	Microtunnel 2.3 MG (5,400 ft. and 9 ft. dia.) to store CAM401B and SOM001A	15	$200 - $340
0 CSOs 2050 TY	AB – Tunnel Alternative	Tunnel 4.9 MG (7,600 LF, 11 ft. dia.) with dewatering pump station (aboveground), odor control Conduit (4,500 ft., 6 ft. dia.) to convey CAM401A overflow to drop shaft at MWR003						15 - 20	$440 - $740
0 CSOs 2050 TY	AB – Tunnel Alternative + GSI	Same as Tunnel Alternative + GSI						20	$460 - $770
0 CSOs 2050 TY (minimum)	Sewer Separation	560 acres (SOM) + 438 acres (CAM) + Treatment + Flow Attenuation						>50	$1,140 – $1,900

Alewife Brook Sample Alternative: Regional Tunnel

Control	Tunnel Diameter (ft.)	Volume (MG)
2050 TY	11	4.9
2050 – 5 year	22	20.6
2050 – 25 year	32	41.6



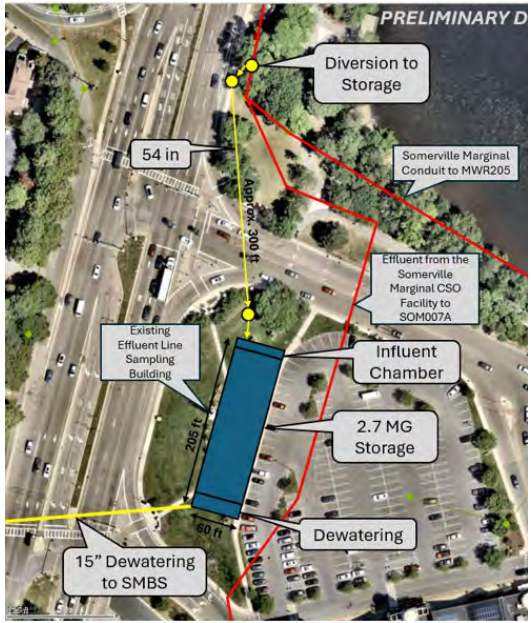
Upper Mystic River 2050 Typical Year (TY) Alternatives

Control Level	Alternative Name	Combined Sewer Overflow Outfalls SOM007A / MWR205A	Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
0 CSOs 2050 TY	MR – Integrated Alternative	366 acres of sewer separation Storage Tank 4.0 MG (205' x 82' x 40')	20	$400 - $670
0 CSOs 2050 TY	MR – Hybrid Alternative	95 acres of sewer separation Storage Tank 7.4 MG (205' x 120' x 50')	5 – 7	$190 - $310
0 CSOs 2050 TY	MR – Storage Alternative	Storage Tank 10.5 MG (205' x 165' x 50')	5 – 7	$120 - $190
0 CSOs 2050 TY	MR – Storage Alternative + GSI	Storage Tank 9.4 MG (205' x 150 x 50') + GSI	5 – 7	$120 - $200

Notes (apply to all alternatives):

1. Estimated duration is the approximate time period for construction and timeline to full CSO reduction benefit for each alternative. Some alternatives include the potential for earlier partial benefits
2. Preliminary estimated cost is a planning level capital cost estimate that is not escalated to mid point of construction. Land acquisition and extensive permitting costs are not included.

Upper Mystic Storage Tanks



2050 Breakpoint TY – 2.7 MG
(2 Activations/6.8MG of 29.3MG Remaining)

2050 TY – 7.4 MG

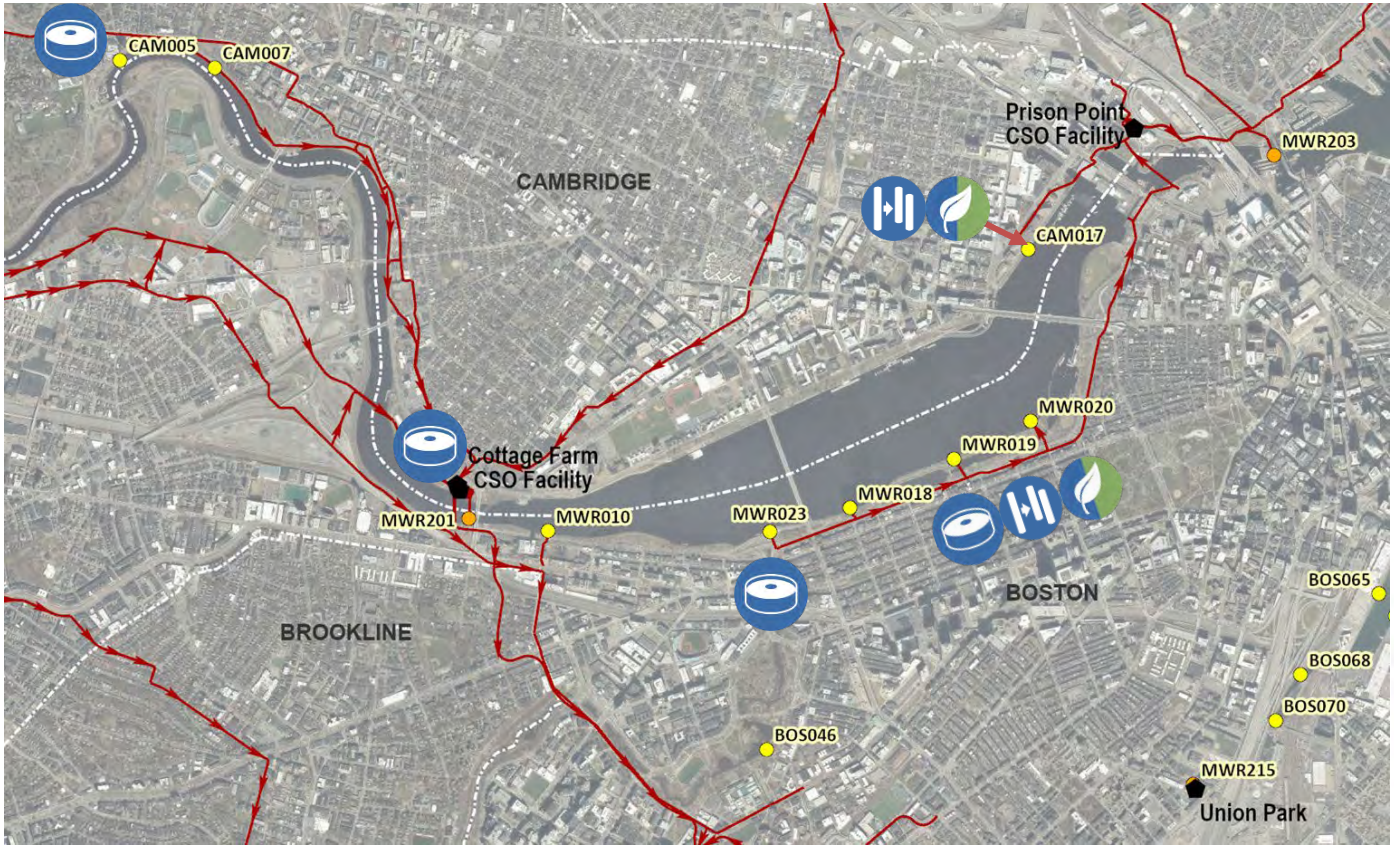
2050 25-yr – 14.2 MG

These scenarios all include 95 acres of sewer separation

Charles River 2050 Typical Year (TY) Alternatives

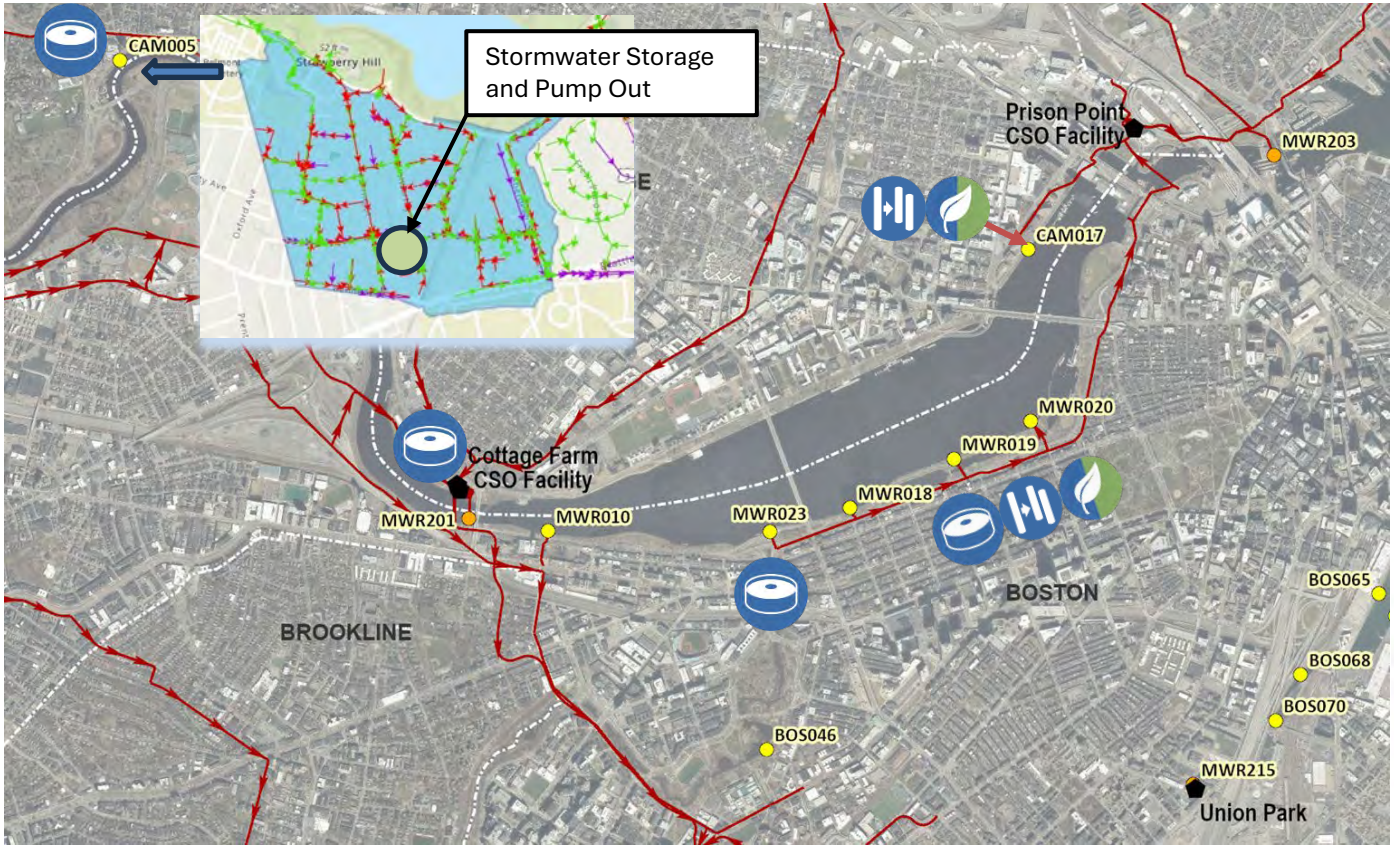
Control Level	Alternative Name	Combined Sewer Overflow Outfalls						Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
		CAM005	CAM017	MWR018-020	MWR023	MWR010	MWR201		
0 CSOs in 2050 TY	CR – Integrated Alternative	Stormwater Storage Tank with Underflow Restrictions 2.5 MG	CSO Storage Tank 0.6 MG	MWR018-020 included in MWR201	Storage Box Conduits 0.08 MG at RE046-381 0.16 MG at RE046-100	No Action	Tunnel 17.2 MG (11,700 LF, 17' dia.) to store MWR201 and MWR018-020	15	$770 – $1,280
0 CSOs in 2050 TY	CR – Hybrid Alternative 1	Same as above	80-acre sewer separation	Same as above	Same as above	Same as above	Same as above	15	$810 – $1,350
0 CSOs in 2050 TY	CR – Hybrid Alternative 2	Same as above	Same as above	204 acres partial sewer separation Microtunnel 1.73 MG (3,800 LF, 9 ft dia.)	Same as above	Same as above	Storage Tank 10.2 MG (305' x 150' x 40' sidewater depth)	25	$440 - $740
0 CSOs in 2050 TY	CR – Hybrid Alternative 3	Same as above	Same as above	366 acres partial sewer separation	Same as above	Same as above	Storage Tank 10.1 MG (300' x 150' x 40' sidewater depth)	30	$400 - $670
0 CSOs in 2050 TY	CR – Tunnel	Tunnel 17.8 MG (23,700 LF, 12' dia.) with dewatering pump station and odor control MWR023 Storage Box Conduits (same as other alternatives)						15-20	$1,000 – $1,660
0 CSOs in 2050 TY	CR – Tunnel + GSI	Tunnel 17.1 MG (23,700 LF, 12' dia.) with dewatering pump station and odor control MWR023 storage (same as other alternatives) + 74 impervious acres GSI						15-20	$1,060 – $1,760
0 CSOs in 2050 TY (min)	CR – Sewer Separation	481 acres (BOS) + 1231 acres (CAM) + 1101 acres (SOM) for SS + treatment 695 acres (BOS) + 930 acres (CAM) for conveyance + treatment						>50	$2,280 – $3,800

Charles River Sample Alternative



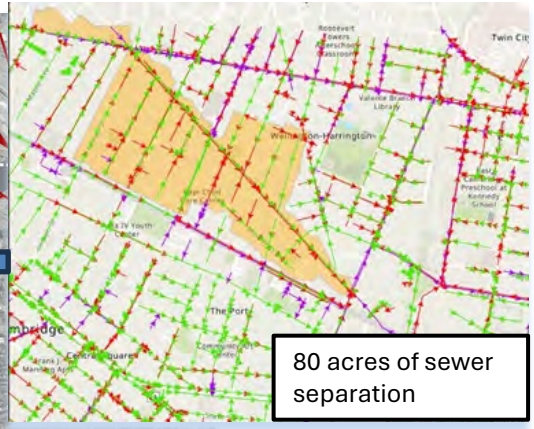
- Sewer Separation
- Green Stormwater Infrastructure
- Storage
- Conveyance
- **Regional Tunnel**

Charles River Sample Alternative: Storage Tank



- Sewer Separation
- Green Stormwater Infrastructure
- Storage
- Conveyance
- **Regional Tunnel**

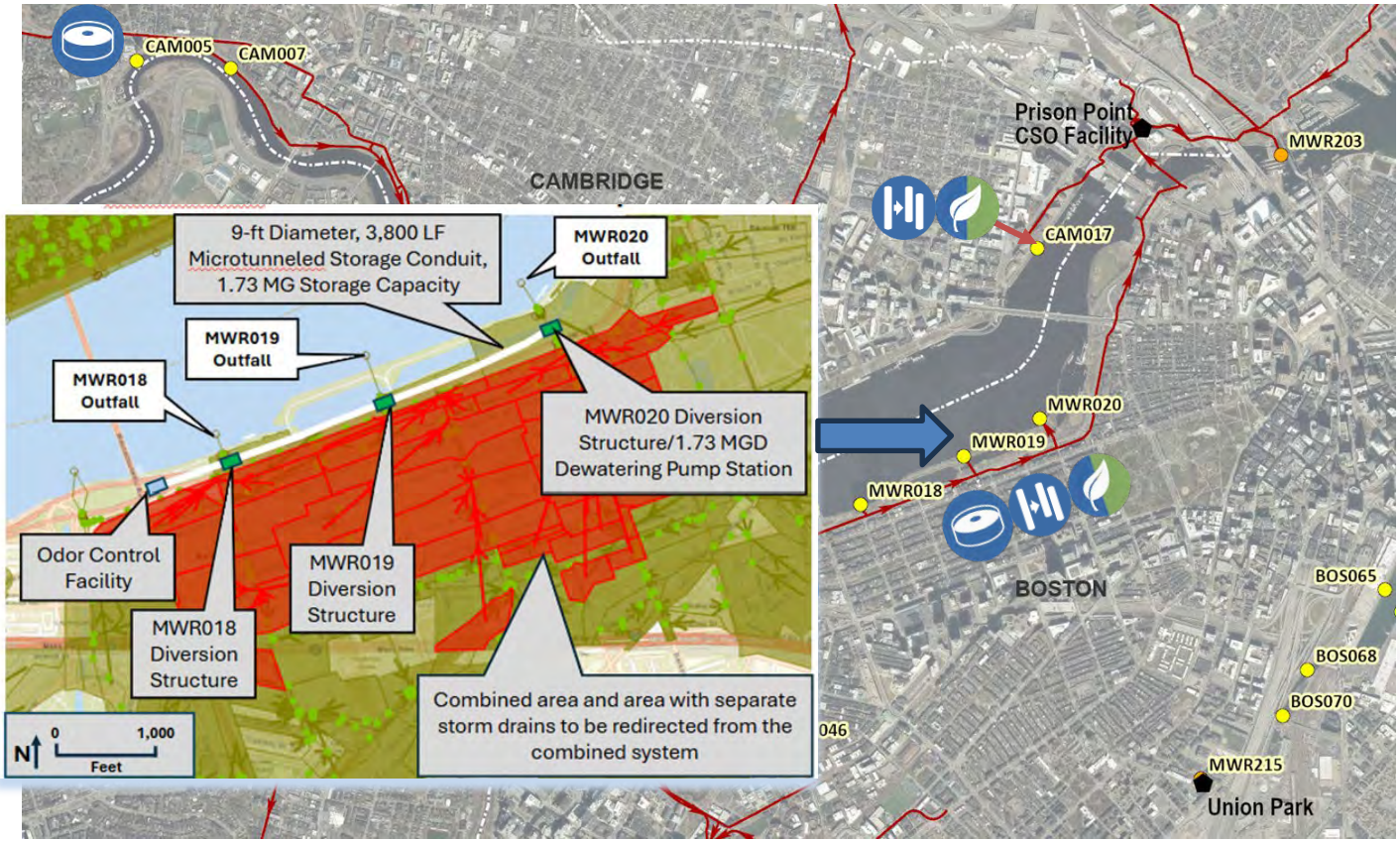
Charles River Sample Alternative: Sewer Separation



80 acres of sewer separation

- Sewer Separation
- Green Stormwater Infrastructure
- Storage
- Conveyance
- **Regional Tunnel**

Charles River Sample Alternative: Partial Sewer Separation and Microtunnel



Sewer Separation

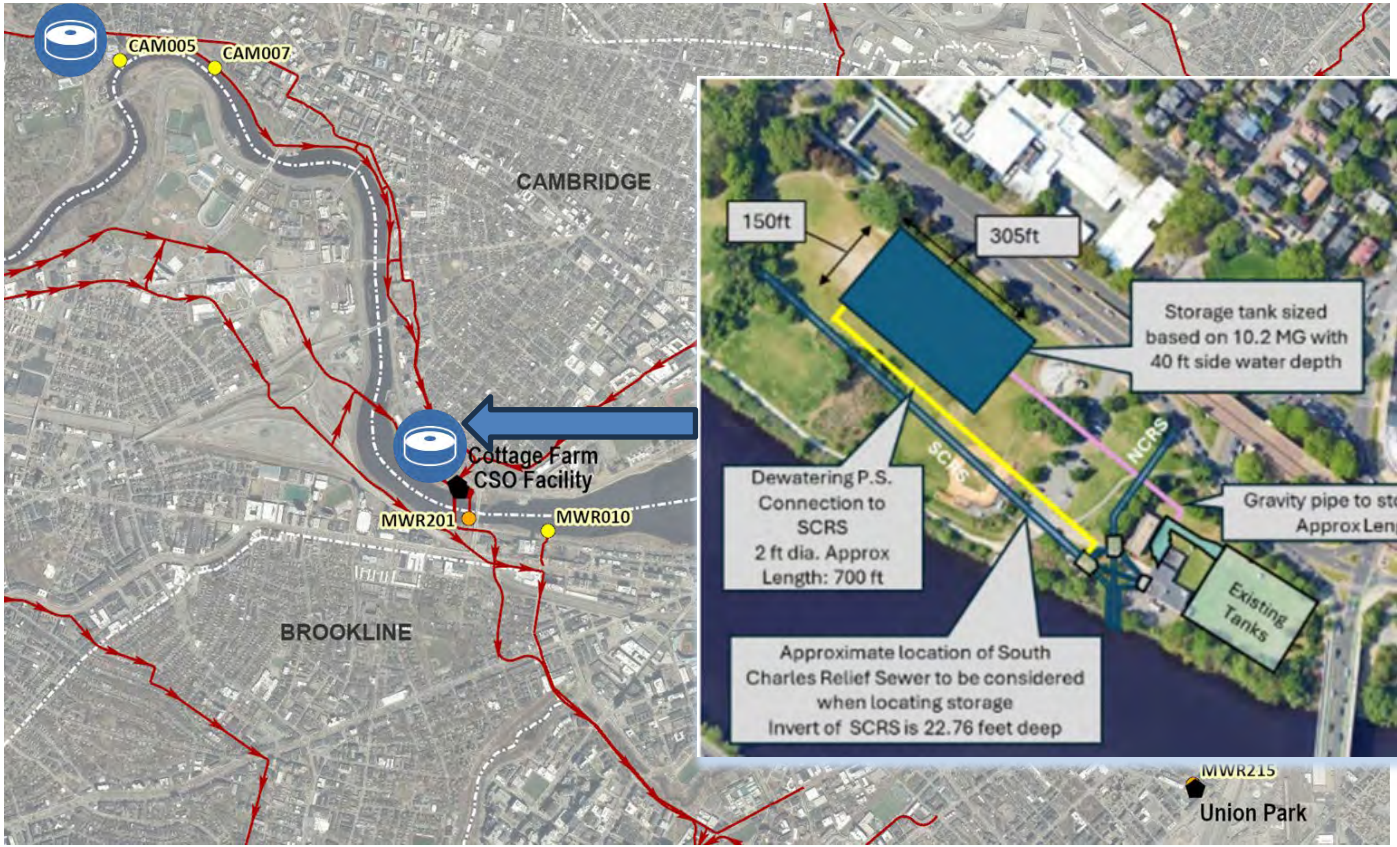
Green Stormwater Infrastructure

Storage

Conveyance

Regional Tunnel

Charles River Sample Alternative: Storage Tank



er Infrastructure

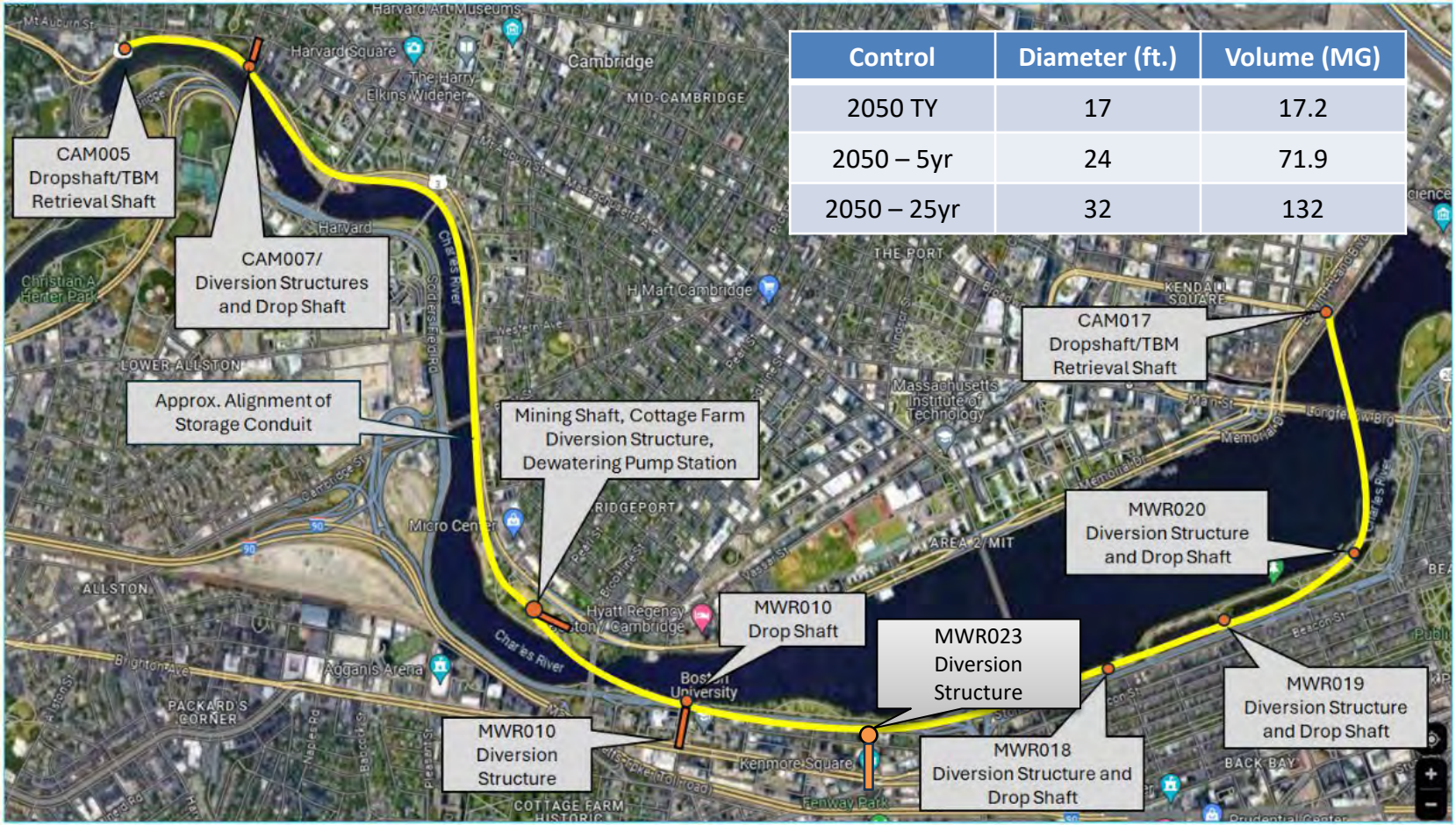
Conveyance

Regional Tunnel

Charles River 2050 Typical Year (TY) Alternatives

Control Level	Alternative Name	Combined Sewer Overflow Outfalls						Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
		CAM005	CAM017	MWR018-020	MWR023	MWR010	MWR201		
0 CSOs in 2050 TY	CR – Integrated Alternative	Stormwater Storage Tank with Underflow Restrictions 2.5 MG	CSO Storage Tank 0.6 MG	MWR018-020 included in MWR201	Storage Box Conduits 0.08 MG at RE046-381 0.16 MG at RE046-100	No Action	Tunnel 17.2 MG (11,700 LF, 17' dia.) to store MWR201 and MWR018-020	15	$770 – $1,280
0 CSOs in 2050 TY	CR – Hybrid Alternative 1	Same as above	80-acre sewer separation	Same as above	Same as above	Same as above	Same as above	15	$810 – $1,350
0 CSOs in 2050 TY	CR – Hybrid Alternative 2	Same as above	Same as above	204 acres partial sewer separation Microtunnel 1.73 MG (3,800 LF, 9 ft dia.)	Same as above	Same as above	Storage Tank 10.2 MG (305' x 150' x 40' sidewater depth)	25	$440 - $740
0 CSOs in 2050 TY	CR – Hybrid Alternative 3	Same as above	Same as above	366 acres partial sewer separation	Same as above	Same as above	Storage Tank 10.1 MG (300' x 150' x 40' sidewater depth)	30	$400 - $670
0 CSOs in 2050 TY	CR – Tunnel	Tunnel 17.8 MG (23,700 LF, 12' dia.) with dewatering pump station and odor control MWR023 Storage Box Conduits (same as other alternatives)						15-20	$1,000 – $1,660
0 CSOs in 2050 TY	CR – Tunnel + GSI	Tunnel 17.1 MG (23,700 LF, 12' dia.) with dewatering pump station and odor control MWR023 storage (same as other alternatives) + 74 impervious acres GSI						15-20	$1,060 – $1,760
0 CSOs in 2050 TY (min)	CR – Sewer Separation	481 acres (BOS) + 1231 acres (CAM) + 1101 acres (SOM) for SS + treatment 695 acres (BOS) + 930 acres (CAM) for conveyance + treatment						>50	$2,280 – $3,800

Charles River Sample Alternative: Regional Tunnel



Control	Diameter (ft.)	Volume (MG)
2050 TY	17	17.2
2050 – 5yr	24	71.9
2050 – 25yr	32	132

Charles River 2050 Typical Year (TY) Alternatives

Control Level	Alternative Name	Combined Sewer Overflow Outfalls						Estimated Duration [1] (years)	Preliminary Estimated Cost [2] (Millions)
		CAM005	CAM017	MWR018-020	MWR023	MWR010	MWR201		
0 CSOs in 2050 TY	CR – Integrated Alternative	Stormwater Storage Tank with Underflow Restrictions 2.5 MG	CSO Storage Tank 0.6 MG	MWR018-020 included in MWR201	Storage Box Conduits 0.08 MG at RE046-381 0.16 MG at RE046-100	No Action	Tunnel 17.2 MG (11,700 LF, 17' dia.) to store MWR201 and MWR018-020	15	$770 – $1,280
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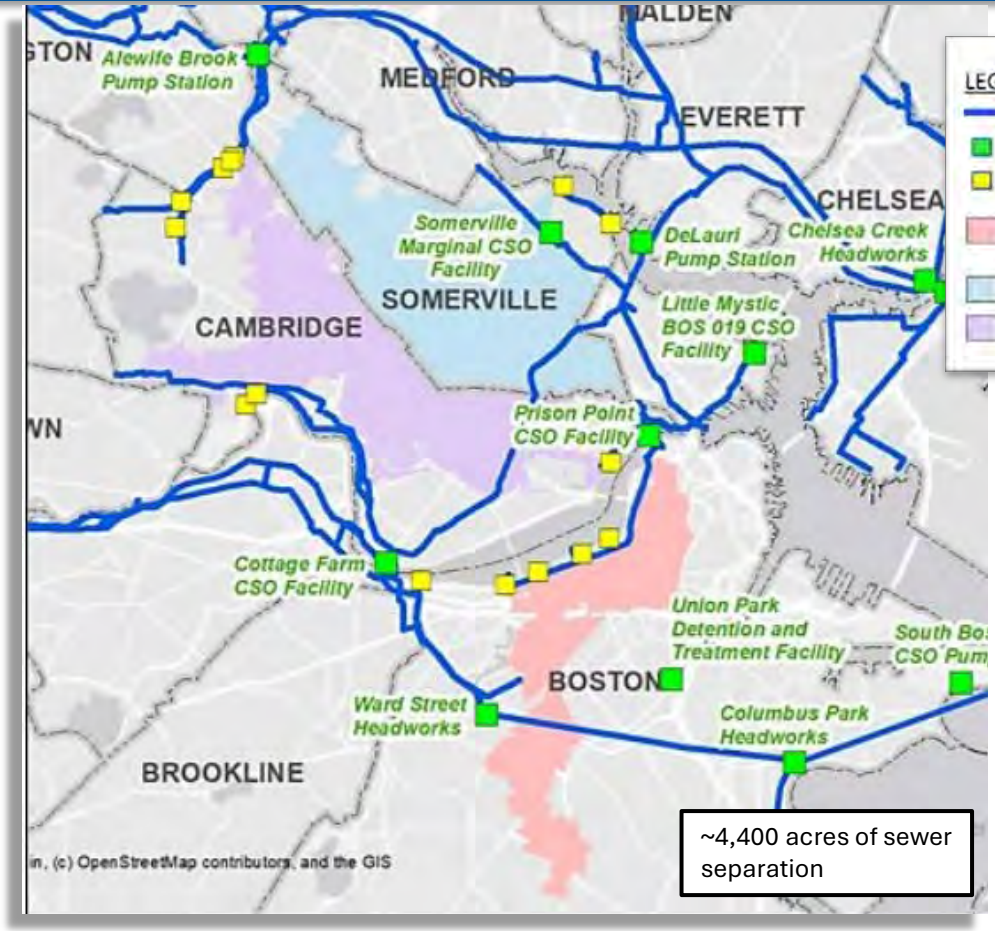
0 CSOs in 2050 TY (min)	AB/MR/CR – Sewer Separation	481 acres (BOS) + 1231 acres (CAM) + 1101 acres (SOM) for SS + treatment 695 acres (BOS) + 930 acres (CAM) for conveyance + treatment						>50	$2,280 – $3,800

Sample Alternative: Regional Sewer Separation



Challenges:

- Stormwater storage and/or treatment needed
- Limited hydraulic capacity of Alewife Brook
- Disruption, road closures, construction fatigue

Next Steps

- Continued Public Engagement
  - Public Information Session Sept. 25th
  - Draft Updated Control Plan Presentation & Hearing, Spring 2026

- Continue working with project partners
  - Propose recommended alternative
  - Propose cost sharing approach

- Obtain MWRA Consensus
  - Board Meetings – September, October, November
  - Advisory Board – October

- Submit Draft Report **December 31st**


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Presentation to

MWRA Board of Directors

MWRA's Resilience Efforts & Climate Change Adaptation Strategy

September 17, 2025

Climate Change Impacts to MWRA Operations

- Sea Level Rise & Coastal Storms
- Intense Precipitation
- Extreme Heat

Early Adaptation for Sea Level Rise in the Design of Deer Island

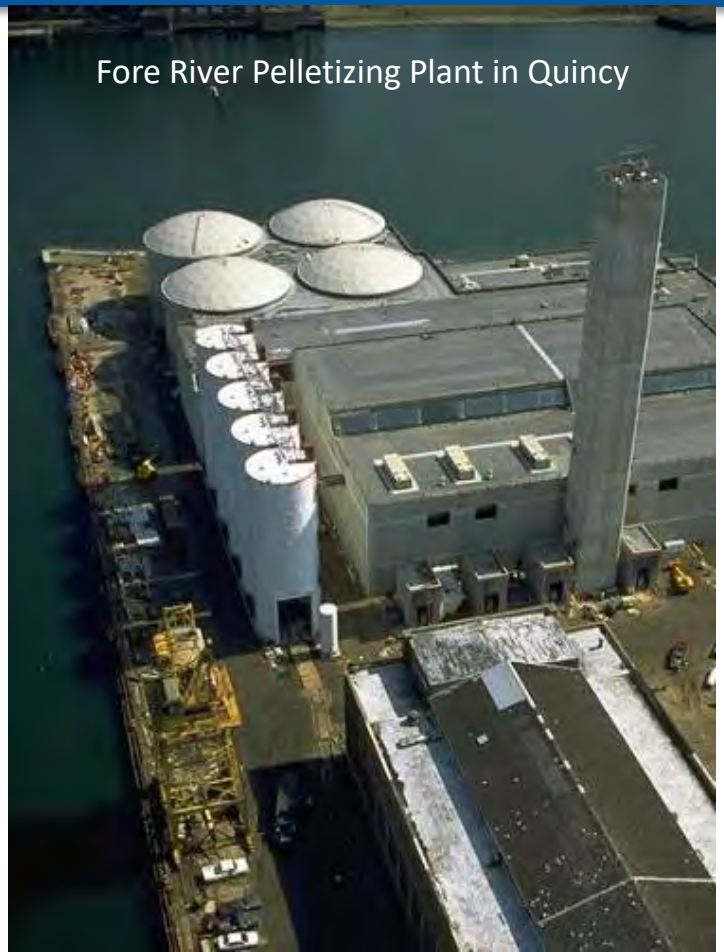
- One of the nation's first physical climate adaptation efforts
- Deer Island is protected from:
  - FEMA 100-year flood and nearly 2 feet of sea level rise
  - Wave action of 14 feet on east side and 2 feet on west side
- Outfall diameter increased to accommodate sea level rise without reducing the plant capacity

Initial Approach to Adaptation in 2016

- Understand the potential impacts
  - Assess what facilities are vulnerable and prioritize
- Act quickly to mitigate impacts
  - No perfect models
  - Site-specific, multi-tool approach
- Develop institutional standards to create long-term resiliency

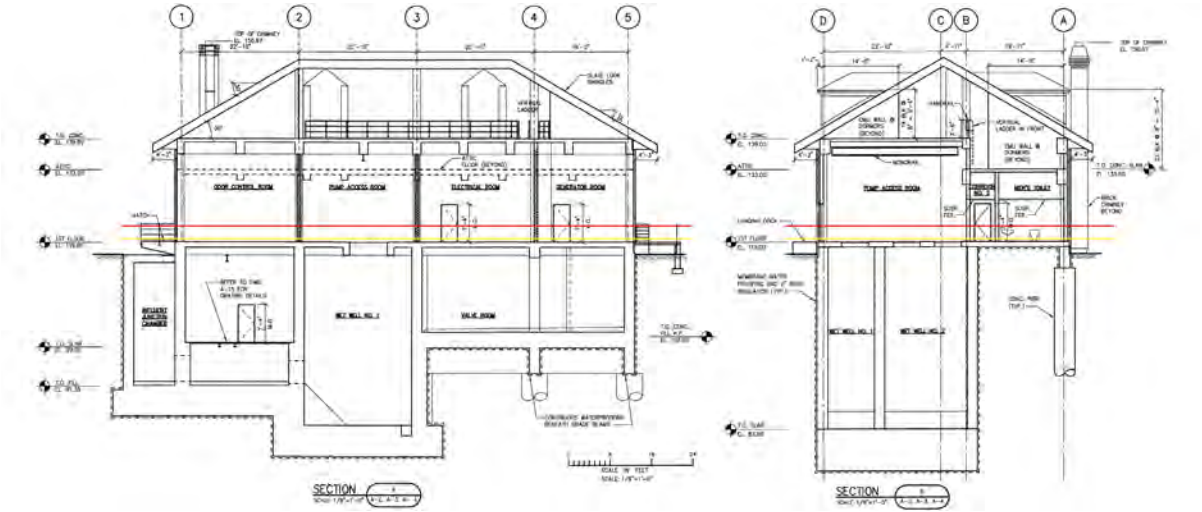
Benchmarks For Evaluating Facilities

- 100-year FEMA flood
- **Add 2.5 ft of sea level rise – conservative estimate**
- *Wave action was reviewed for relevant facilities*



Facility Assessment Strategy

- Reviewed record drawings for all 30 coastal facilities to identify lowest elevations
  - Usually first floor, but also underground hatches
- Performed site-specific inspections to note critical equipment elevation



Facility Vulnerability Ranking

Flood Level	Facility Ranking	Facility Name	Depth (ft)	
			100yr	100yr+2.5
Flooding During 100yr Storm	1	PELLETIZING PLANT	3.42	5.92
	2	HOUGHS NECK PUMP STATION	2.63	5.13
	3	SQUANTUM PUMP STATION	2.53	5.03
	4	ALFORD ST FACILITY	1.93	4.43
	5	QUINCY PUMP STATION	1.73	4.23
	6	CHELSEA CREEK SCREENHOUSE	1.43	3.93
	7	BRAINTREE-WEYMOUTH PUMP STATION	0.93	3.43
	8	SOUTH BOSTON CSO TUNNEL	0.43	2.93
Flooding Within 1ft of Elevation of 100yr Storm	9	S BOSTON CSO PUMP STATION	-0.07	2.43
	10	CHARLESTOWN NAVY YARD	-0.30	2.20
	11	ALEWIFE BROOK PUMP STATION	-0.67	1.83
	12	CHELSEA CREEK HEADWORKS	-0.69	1.81
	13	UNION PARK TREATMENT FACILITY	-0.82	1.68
Flooding During 100yr+2.5ft Storm	14	MYSTIC RIVER GATEHOUSE	-1.07	1.43
	15	CHELSEA ADMIN FACILITY	-1.32	1.18
	16	CHELSEA MAINTENANCE FACILITY	-1.40	1.10
Flooding Within 1ft of Elevation of 100yr+2.5ft	17	DEER ISLAND	-3.00	-0.50
	18	WIGGINS PUMP STATION	-3.19	-0.69
	19	COTTAGE FARM CSO FACILITY	-3.35	-0.85

Flood Level	Facility Ranking	Facility Name	Depth (ft)	
			100yr	100yr+2.5
No flooding During 100yr+2.5ft storm	20	DELAURI PUMP STATION	-3.57	-1.07
	21	CARUSO PUMP STATION	-3.57	-1.07
	22	PRISON POINT CSO FACILITY	-3.57	-1.07
	23	SOMERVILLE CSO FACILITY	-5.57	-3.07
	24	COLUMBUS PARK HEADWORKS	-6.69	-4.19
	25	SOMERVILLE SAMPLING BUILDING	-6.82	-4.32
	26	WARD STREET HEADWORKS	-7.57	-5.07
	27	INTERMEDIATE PUMP STATION	-7.82	-5.32
	28	LITTLE MYSTIC CHANNEL CSO	-8.57	-6.07
	29	HINGHAM PUMP STATION	-10.37	-7.87
	30	NUT ISLAND HEADWORKS	-14.07	-11.57

- 8 Sewer Facilities Likely Affected by a 100 Year Event
- 4 Sewer and 1 Administration Facilities Within One foot of a 100 Year Event
- 3 Sewer Facilities Affected by 100 plus 2.5 ft SLR

Flood Elevations Braintree Weymouth Pump Station

Adaptation Plans: Protect Most Vulnerable Facilities

- At-risk buildings fitted with deployable flood barriers
- Sandbags for areas that cannot be outfitted
- Build protective walls around critical equipment, such as generators
- Move or raise electrical equipment

MWRA Long-Term Approach Going Forward

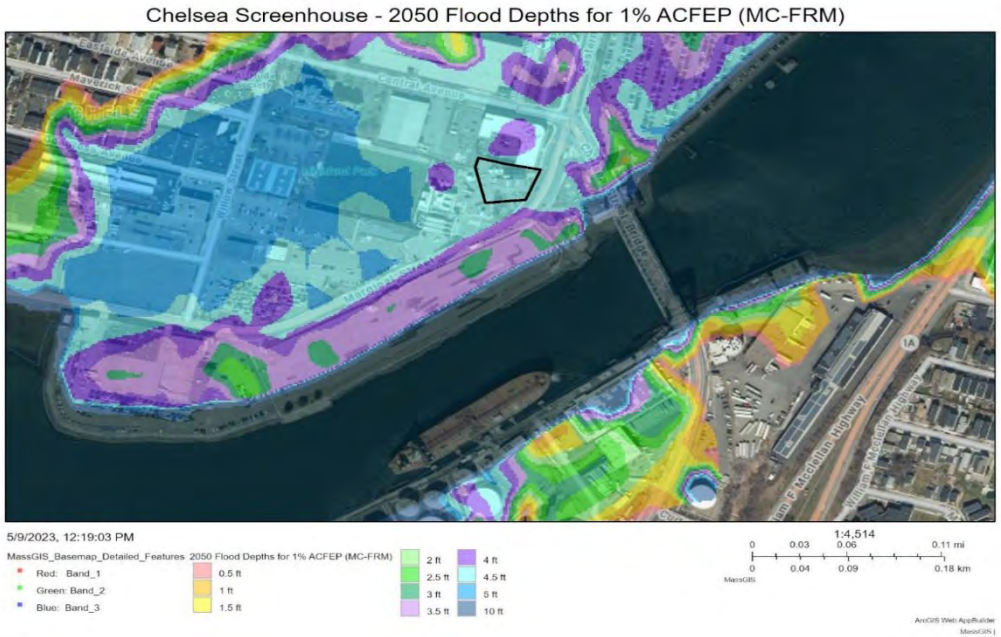
- During facility assessments, three significant rehabilitation projects were in design
  - Amended each design to account for 2.5 feet of sea level rise
  - Full retrofit rather than spot repairs
  - Every future rehabilitation contract takes sea level rise into account
  - On average, we rehabilitate our facilities every 15 or 20 years

Accomplishments Since Assessments

- Nearly all facilities vulnerable to a 100-yr storm are protected
  - Union Park and Pellet Plan underway
  - South Boston CSO Tunnel ventilation linked with Boston's Moakley Park project
- Instituted regular training on deployment of temporary flood barriers

Updating Facility Vulnerability

- Original assessments based on FEMA 100-year storm and conservative 2.5 SLR
- Models have improved and become more local
  - Massachusetts Coastal Flood Risk Model
  - Projects 2.4 ft. by 2050 and 4.2 ft. by 2070
- Closely matches initial rankings for 2050

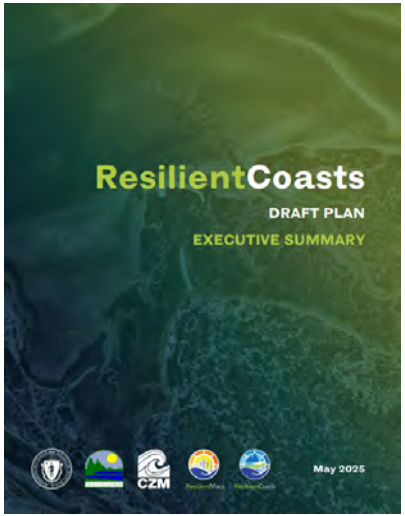


- MWRA will use MA's State Climate Resilience Design Standards Tool to determine protection needed as facilities are rehabilitated

Regional Collaboration

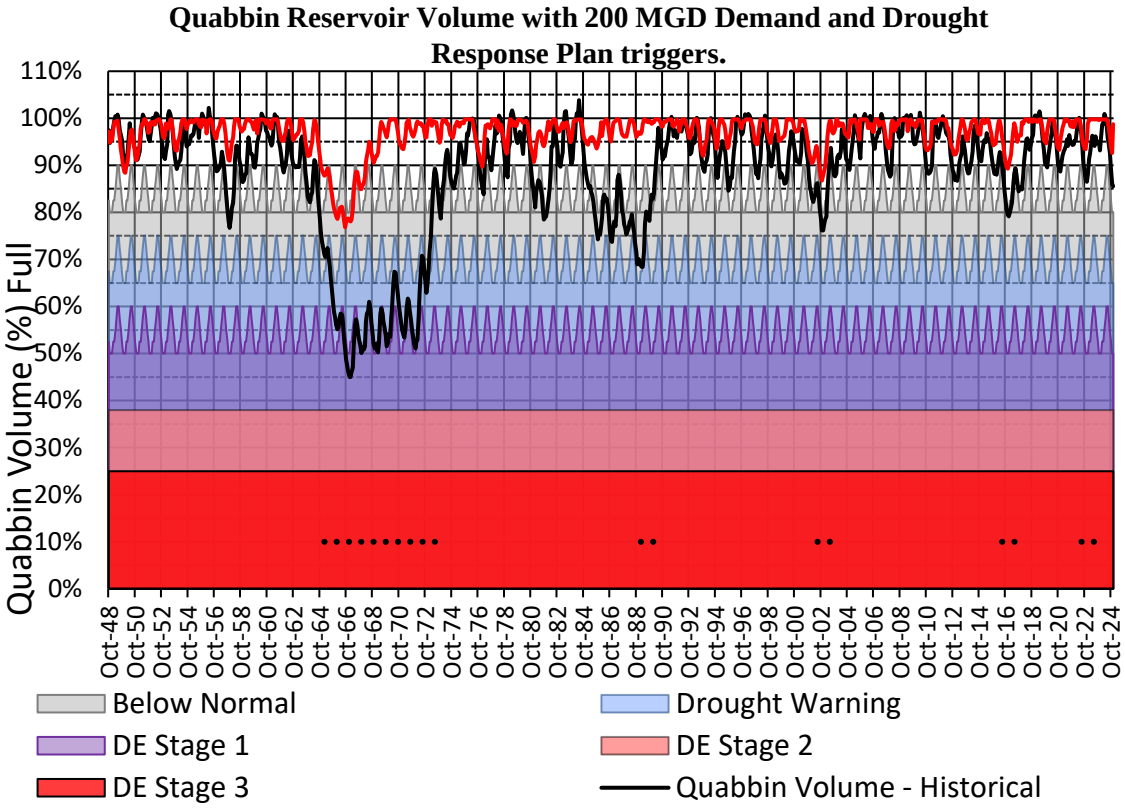
- Coordinating with Boston on Moakley Park and connectors
- Member of the Resilient Mystic Collaborative
- Participated in drafting of State plans

Mystic River
WATERSHED ASSOCIATION



Source Reservoirs are Resilient to Dry and Wet Conditions

- Safe yield expected to increase in the coming decades
- Quabbin is resilient to even the most severe droughts



Water System Assets are Well Prepared for Climate Change

- All MWRA dams, dikes, spillways are in good condition to withstand intense precipitation
- Quabbin and Wachusett spillways have been improved to be able to discharge the probable maximum flood (1 in 1000 years)
- All MWRA dams are also designed to meet the Spillway Design Flood

Extreme Heat will Impact MWRA in Several Ways

- Workforce safety is a priority
  - Developed Heat Stress Prevention Plan
- Water Quality could be affected by both heat and intense rainfall
  - Increase in algal blooms and turbidity events
  - Watershed forest health
- Staff continues to monitor all these potential impacts

Ongoing Efforts & Next Steps

- Complete protection to 2.5ft of sea level rise at remaining facilities
- Evaluate vulnerability for future facility rehabilitation using MA Design Tool
- Continue collaborating with regional partners
- Continue to monitor and prepare for the impacts of changing heat and rainfall conditions on source water.

MA Coastal Flood Risk Model – Flood depth in 2070 1% event