Wastewater Advisory Committee

CSO Update

October 4, 2024

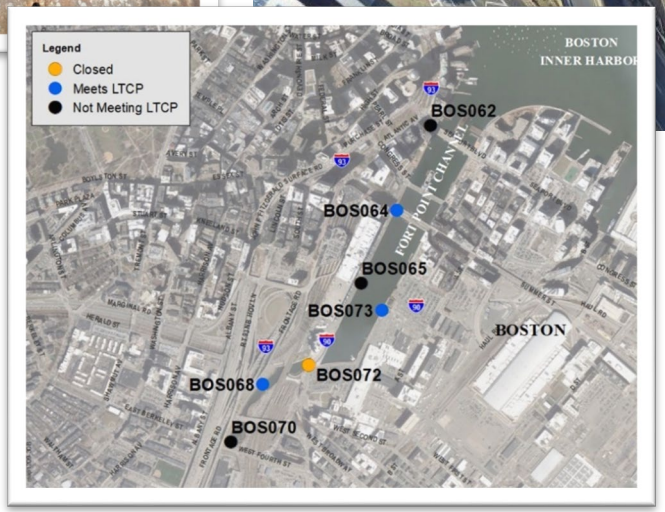
Agenda - CSO Update

1. 2023 Typical Year CSO Performance
2. Ongoing work to meet LTCP Goals and Supplemental Performance Assessment Submittal in December
3. Supplement Report
4. What's in the New Variance
5. Status of Updated CSO Control Plan Development and Next Steps

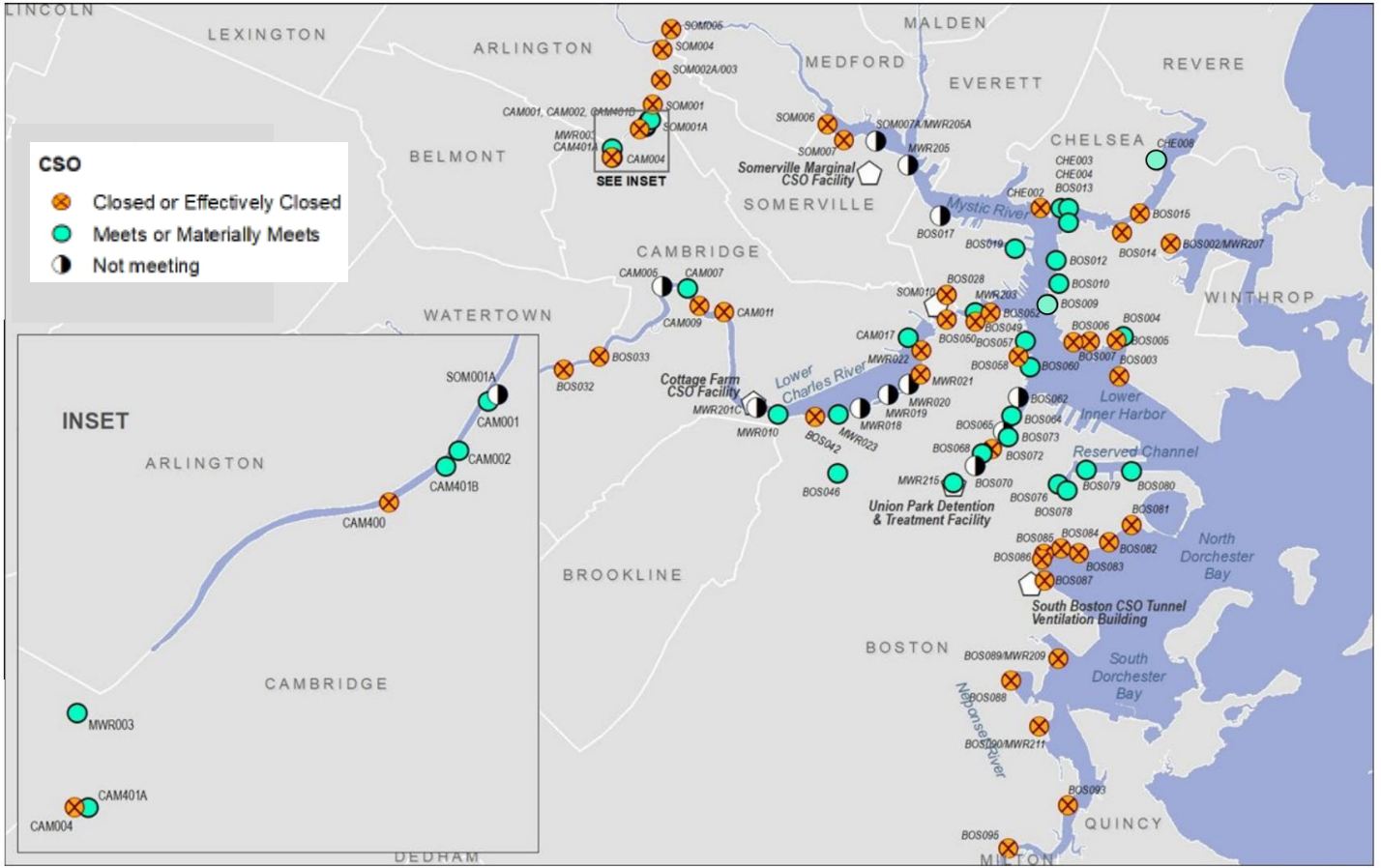
2023 Typical Year CSO Performance Results

Currently:

- 397 MG per year (7 MG under goal) – 88% reduction from 1988.
- 41 of 86 CSO outfalls closed / effectively closed
- 73 of 86 CSOs meet or materially meeting LTCP goals
- Now 13 short of goals
  - 7 with projects in Design or Construction
  - 6 Challenging CSOs fully investigated.



Outfall Performance toward LTCP Goals



Ongoing work to meet LTCP Goals

OUTFALL	LOCATION	TO BE IMPLEMENTED BY	TENTATIVE SCHEDULED COMPLETION
MWR205	Somerville Marginal CSO Facility	MWRA	2025
SOM007A/ MWR205A			
BOS003	East Boston	BWSC	Completed 2023
BOS 009			2024
BOS014			Completed 2023
CHE008	Chelsea Creek	MWRA	Completed 2023
BOS017	Mystic/Chelsea Confluence	BWSC	2024
BOS062	Fort Point Channel	BWSC	2024
BOS065		BWSC	2024
BOS070		BWSC	2024

Supplement Report

- December 2024 Supplement to the Updated CSO Control Plan

August 2024 Variance

NOTABLE VARIANCE CONDITION CHANGES FROM PRIOR VARIANCE

- Variance term is September 1 2024 to August 31, 2029
- Revised schedule for Updated CSO Control Plan

- **D. Notification to the Public of CSO Discharges and Impacts:**
  - Added - a feasibility study for "real time, public notification system for CSO discharges" due 8/31/25; interim enhancements also required.
  - Annual CSO Discharge Report: Storm recurrence intervals are based on NOAA Atlas 14
  - All draft and final reports for public comment posted on a public website.

- **F. Updated CSO Control Planning:**
  - More specific requirements for public participation, including "conduct robust public outreach" to EJ communities.
  - Parties to conduct their affordability analyses separately.

- **Exhibit A**
  - Section 1: MWRA, Cambridge, Somerville to provide meter data to EPA and DEP on request.
  - Section 3: Feasibility study on additional floatables controls and submit a written report by 10/1/25. Any recommendations are to be implemented.
  - Section 4: Conduct an evaluation of odors emanating from "the collection system in the vicinity of CSO structures" and identify BMPs. Evaluation to be submitted by 6/1/25. Feasible BMPs are to be implemented.
  - Section 5: Table of CSO projects to be completed by end of Variance period. Progress on CSO projects to be included in the Annual CSO Discharge Report.

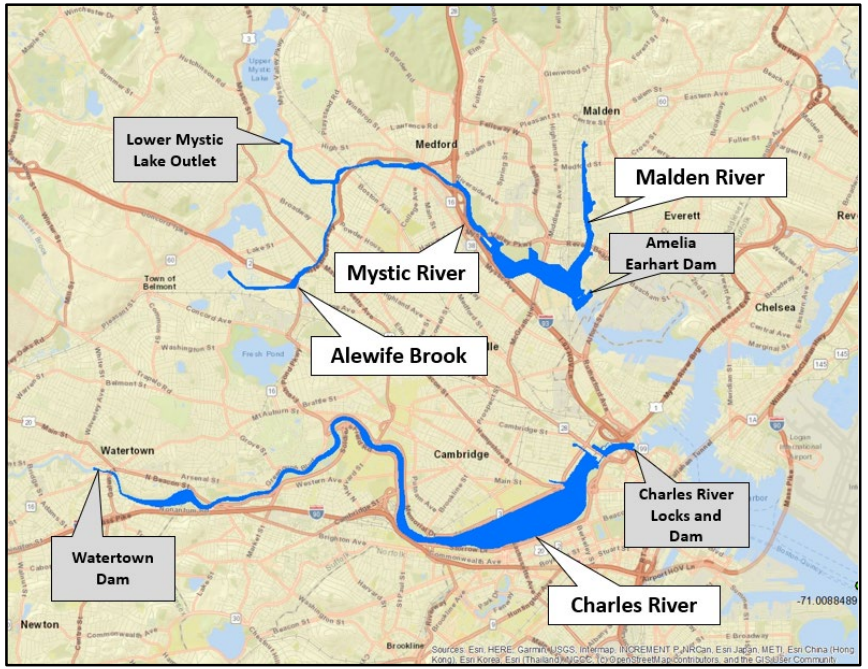
Other requirements (monitoring reporting) continue

Updated CSO Control Plan Requirements

- Description of existing levels of CSO Control
- Evaluation of Costs and water quality benefits of further CSO control Alternatives
- Public Participation Plan
- Affordability Analysis based on EPA Clean Water Act Financial Capability Assessment Guidance
- Draft Updated CSO Control Plan including a Recommended Plan – December 31, 2025
- Final Updated CSO Control Plan – January 31, 2027

Status of Updated CSO Control Plan Development and Next Steps

- Updated CSO Control Plans being developed in accordance with the Variances for the Alewife Brook/Upper Mystic River and Charles River.
- MWRA is working closely with Cambridge and Somerville to prepare these plans including bi-weekly coordination meetings.



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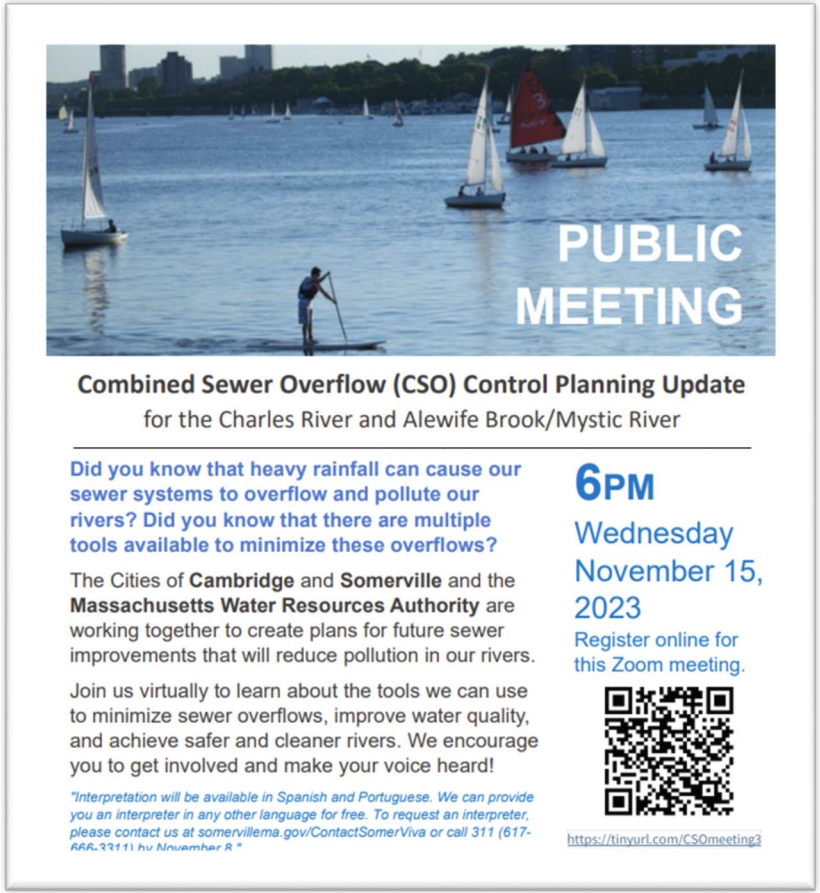
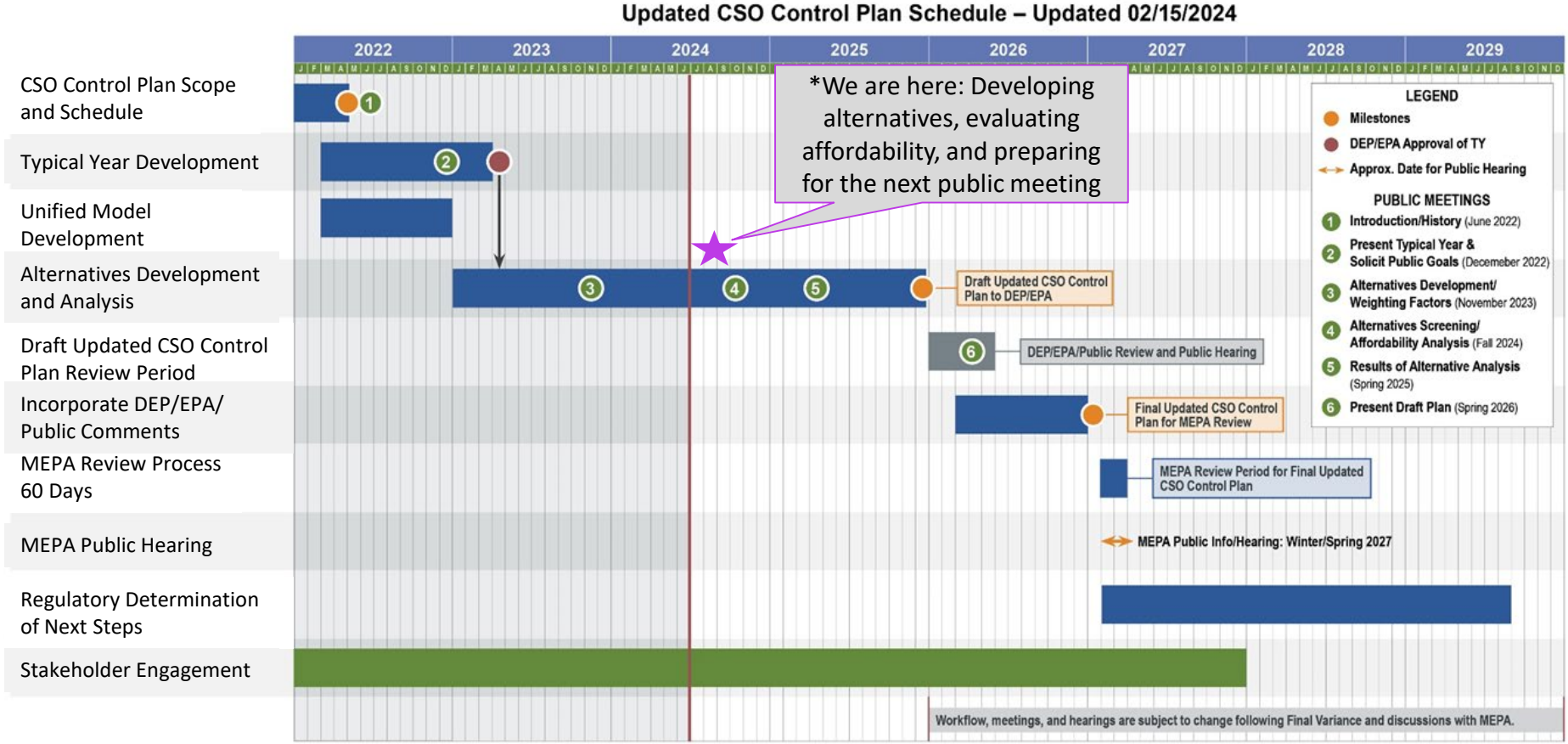


Timeline


Updated CSO Control Plan Schedule – Updated 02/15/2024
2022
2023
2024
2025
2026
2027
2028
2029
CSO Control Plan Scope and Schedule
Typical Year Development
Unified Model Development
Alternatives Development and Analysis
Draft Updated CSO Control Plan Review Period
Incorporate DEP/EPA/ Public Comments
MEPA Review Process 60 Days
MEPA Public Hearing
Regulatory Determination of Next Steps
Stakeholder Engagement
*We are here: Developing alternatives, evaluating affordability, and preparing for the next public meeting
Draft Updated CSO Control Plan to DEP/EPA
DEP/EPA/Public Review and Public Hearing
Final Updated CSO Control Plan for MEPA Review
MEPA Review Period for Final Updated CSO Control Plan
MEPA Public Info/Hearing: Winter/Spring 2027
LEGEND
Milestones
DEP/EPA Approval of TY
Approx. Date for Public Hearing
PUBLIC MEETINGS
1 Introduction/History (June 2022)
2 Present Typical Year & Solicit Public Goals (Decemeber 2022)
3 Alternatives Development/ Weighting Factors (November 2023)
4 Alternatives Screening/ Affordability Analysis (Fall 2024)
5 Results of Alternative Analysis (Spring 2025)
6 Present Draft Plan (Spring 2026)
Workflow, meetings, and hearings are subject to change following Final Variance and discussions with MEPA.

Unified Model Baseline Conditions: Preliminary Results with 2050 Typical Year

- MWRA, Cambridge, and Somerville worked together to develop the 2050 TY and Unified Model
- The Unified model was developed by combining the MWRA, Cambridge, and Somerville hydraulic models to provide consistent results.
- The Unified Model results for the 2050 TY are being used for the alternatives analysis.

Outfall	1992 Typical Year - Future Baseline Conditions*		2050 Typical Year - Future Baseline Conditions*	
	Activation Frequency	Volume (MG)	Activation Frequency	Volume (MG)
ALEWIFE BROOK				
CAM001	0	0.00	1	0.02
CAM002	0	0.00	0	0.00
CAM401A	8	5.29	12	10.95
CAM401B	1	0.02	3	0.30
MWR003	2	0.13	3	1.08
SOM001A	8	4.45	13	8.51
Alewife Total	**8**	**9.89**	**13**	**20.85**
MYSTIC RIVER				
SOM007A/MWR205A	2	1.30	8	29.31
CHARLES RIVER				
CAM005	1	0.19	6	0.73
CAM007	0	0.00	0	0.00
CAM017	0	0.00	3	1.04
MWR018	3	0.50	4	1.86
MWR019	2	0.26	3	1.33
MWR020	2	0.28	3	3.14
MWR201 - Cottage Farm	2	6.59	4	30.12
MWR023	3	0.05	6	0.13
Charles Total	**3**	**7.87**	**6**	**38.35**

Additional information on the 2050 TY can be found: 2050 TY

** The Unified Model is still being developed and reviewed. Model results provided in this presentation are preliminary and are subject to change. Model run 06FC*

Unified Model Baseline Conditions: Preliminary Results with 2050 Typical Year and Design Storms

Outfall	2050 Typical Year - Future Baseline Conditions*		2050 5 Year Design Storm	2050 25 Year Design Storm
	Activation Frequency	Volume (MG)	Volume (MG)	Volume (MG)
ALEWIFE BROOK				
CAM001	1	0.02	0.21	0.54
CAM002	0	0.00	0.20	0.70
CAM401A	12	10.95	8.43	16.75
CAM401B	3	0.30	1.29	2.82
MWR003	3	1.08	5.63	10.70
SOM001A	13	8.51	5.10	8.56
Alewife Total	**13**	**20.85**	**20.86**	**40.07**
MYSTIC RIVER				
SOM007A/MWR205A	8	29.31	17.42	27.17
CHARLES RIVER				
CAM005	6	0.73	1.61	4.13
CAM007	0	0.00	5.92	15.72
CAM017	3	1.04	12.54	24.96
MWR010	0	0	1.32	3.62
MWR018	4	1.86	2.14	3.24
MWR019	3	1.33	1.63	2.48
MWR020	3	3.14	6.21	9.86
MWR201 - Cottage Farm	4	30.12	33.84	55.92
MWR023	6	0.13	0.26	0.57
Charles Total	**6**	**38.35**	**65.47**	**120.5**

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***The Unified Model is still being evaluated for use with storms larger than the TY. Discharge volumes during storms larger than the Typical Year may not account for overland flows that could potentially affect the CSO discharge volumes and does not include SSO volume.*

Alternatives Development

CSO Control Tools:

- Sewer Separation
- Green Stormwater Infrastructure
- Infiltration/Inflow Reduction
- Storage
- Conveyance
- Treatment

North Dorchester Bay Storage Tunnel

Stormwater Bumpout on Somerville Ave, Somerville (200 sf footprint, 250 cf storage)

Union Park CSO Facility Storage Basins: Photo Credit: Simpson Gumpertz & Heger (SGH)

Sheeting for Drain MH on Concord Avenue
Cambridge Sewer Separation Contract 9

Concord Avenue Drain Installation
Cambridge Sewer Separation Contract 9

Conceptual Modeling of Full Sewer Separation

Outfall	2050 TY- Future Baseline Conditions* Full Separation			2050 2 Year Design Storm Full Separation		2050 5 Year Design Storm Full Separation		2050 10 Year Design Storm Full Separation		2050 25 Year Design Storm Full Separation	
	Activation Frequency	# of outfalls activating	Volume (MG)	# of outfalls activating	Volume (MG)	# of outfalls activating	Volume (MG)	# of outfalls activating	Volume (MG)	# of outfalls activating	Volume (MG)
Alewife Brook Total	0	0	0.00	1	0.02	1	0.15	1	0.38	*Run in progress*	
Mystic River Total	0	0	0.00	1	0.68	1	3.63	1	6.03	1	8.93
Charles River Total	6	2	0.27	2	9.15	5	19.07	6	25.42	8	40.66

- "Full" separation assumes approximately 90% of runoff area is removed from the combined sewer system
- In large storms, the remaining 10% can still result in overflows

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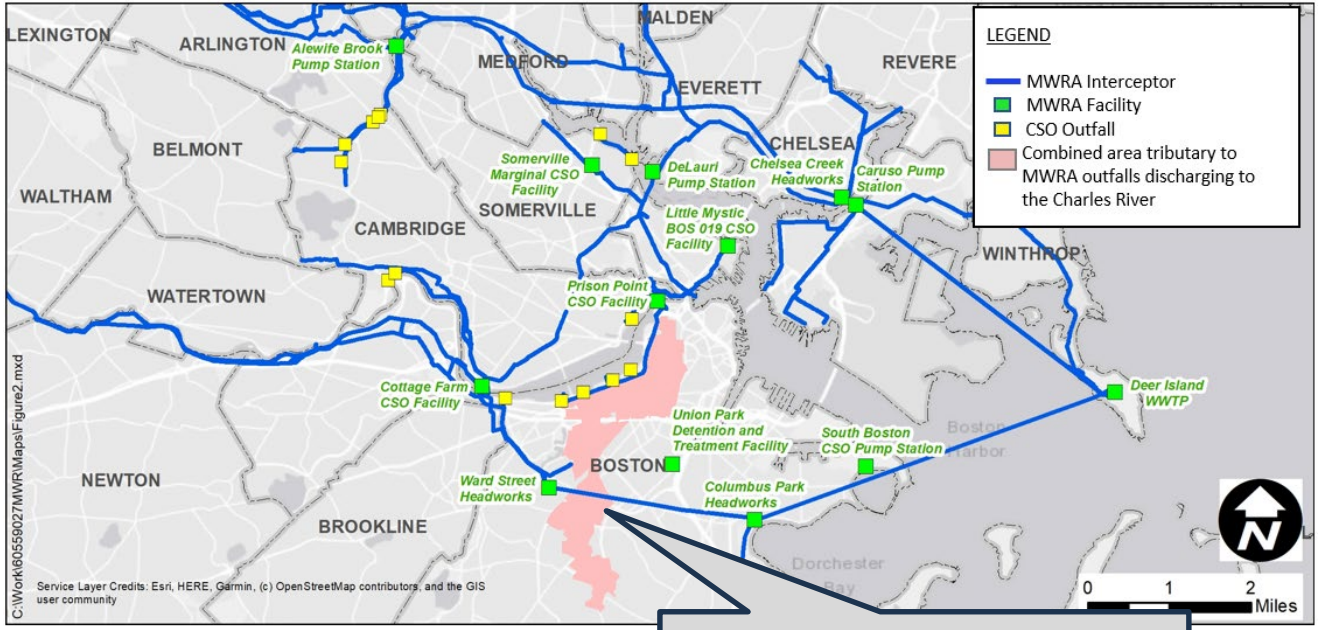
Charles River 2050TY Charles River Green Infrastructure

Green Infrastructure

- First 1.5-inch of rain over 10% of the Right of Way impervious area was conveyed to Green Infrastructure
- Boston: 150-200 projects assuming 1,000 cubic feet (cf) storage capacity per GSI project

2050 Typical Year		
Outfall	Baseline Volume (MG)	GSI Volume (MG)
MWR018	1.85	1.82
MWR019	1.33	1.28
MWR020	3.07	3.02
SUM (MWR018/019/020)	**6.25**	**6.12**



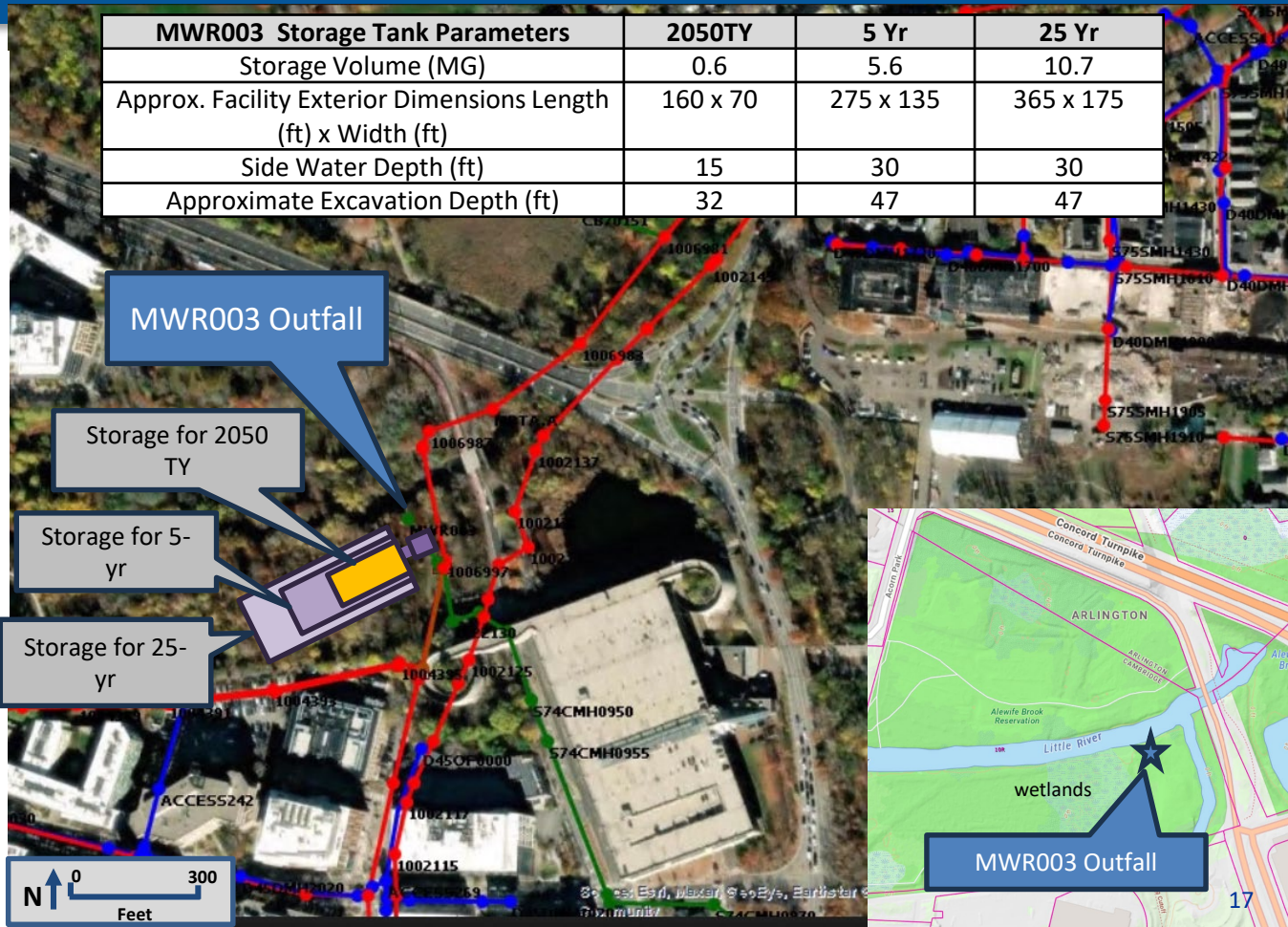
Combined Area Tributary to Outfalls Discharging to the Charles River = Approximately 1,200 acres

alysis

MWR003- Potential Storage Location

- Divert MWR003 overflow to storage
- Pump back to interceptor when capacity is available
- Site access difficult
- Wetlands adjacent to site
- Site located on the Alewife Reservation which would likely require Article 97 legislation

MWR003 Storage Tank Parameters	2050TY	5 Yr	25 Yr
Storage Volume (MG)	0.6	5.6	10.7
Approx. Facility Exterior Dimensions Length (ft) x Width (ft)	160 x 70	275 x 135	365 x 175
Side Water Depth (ft)	15	30	30
Approximate Excavation Depth (ft)	32	47	47

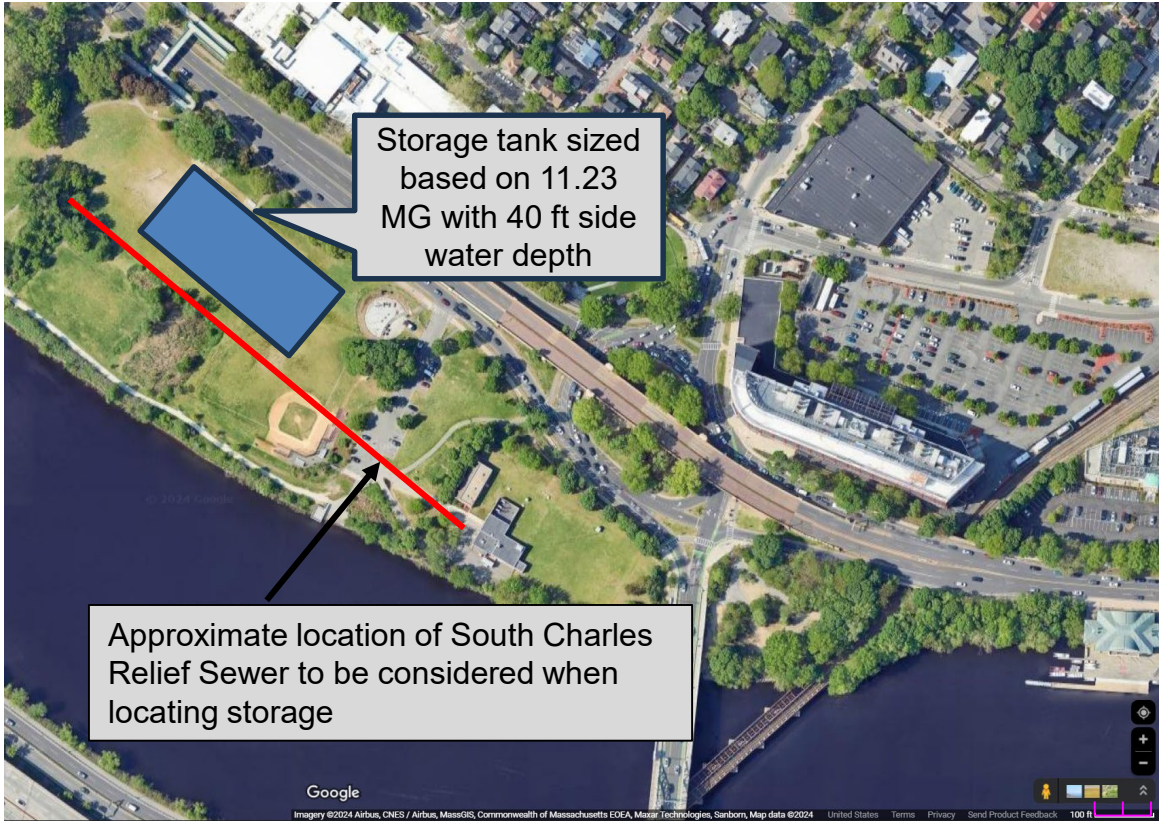


Charles River 2050TY Cottage Farm Tank Storage

Storage Tank Parameters	40 ft SWD
2050 TY Storage Volume (MG)	11.23
Length (ft) x Width (ft)	340 x 155
Ground Elevation (ft AD)	115
Excavation Depth (ft)	65
Elevation of Bottom of Excavation (ft AD)	71

Considerations:

- Exterior dimensions of facility are approximate and include estimations of required area for influent screens and dewatering pumps.
- Eversource ductbank to be constructed on this site. Construction estimated to start in 2025.



Charles River 2050TY Cottage Farm Tunnel Storage

Cottage Farm Storage for largest storm in the 2050TY = 11.23 MG

Preliminary Tunnel Sizing:

- 5,000 ft long = 21 ft diameter
- 7,000 ft long = 17 ft diameter
- 10,000 ft long = 15 ft diameter

Considerations:

- Constructability of tunnel is still being evaluated
- Need to identify mining and retrieval shaft locations
- Limited available Geotech info shows bed rock hundreds of feet deep.
- Info also indicates very soft clay above the bed rock which would make soft ground tunneling extremely difficult.

MWRA CSO Performance Assessment