



MASSACHUSETTS WATER RESOURCES AUTHORITY

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May 24, 2019

Douglas Fine, Assistant Commissioner
Bureau of Water Resources
Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108

Re: Variances for Combined Sewer Overflow Discharges to Lower Charles River/Charles Basin and Alewife Brook/Upper Mystic River – Supporting Economic Documentation

Dear Mr. Fine:

The Massachusetts Water Resources Authority is providing the following information in support of our May 14, 2019 request for combined sewer overflow (CSO) variance extensions through August 2024 for the Lower Charles River/Charles Basin and the Alewife Brook/Upper Mystic River. MWRA believes this information demonstrates that current financial circumstances preclude total elimination of CSO discharges and thereby compliance with Class B standards in the waters affected by remaining discharges from the MWRA wastewater system and its communities' combined sewer systems. MWRA understands that variances must be supported in part by a demonstration that achieving water quality standards by eliminating overflows to all waters affected by CSO would cause widespread social and economic impact.

MWRA has updated its evaluation of the cost of system-wide elimination of CSO discharges, building on the original evaluation provided to EPA and DEP by letter dated October 7, 2005, as well as updates provided in correspondence dated September 2, 2011 and August 27, 2013. This evaluation and the periodic updates were provided to support review of MWRA's revised Long-Term CSO Control Plan (LTCP), which was approved in March 2006, and of subsequent extensions to water quality standards variances issued by DEP.

MWRA based its 2005 evaluation on a determination that system-wide elimination of CSOs would require a set of major sewer system improvements and expansions involving:

- 1) complete, area-wide separation of remaining combined sewers,
- 2) extensive relief of the transport systems both upstream and downstream of the MWRA headworks facilities, including relief of MWRA-owned interceptors and certain community-owned interceptors, and

- 3) major expansion of the headworks facilities and the Deer Island treatment plant, including the North Main Pump Station and the effluent outfall to Massachusetts Bay.

MWRA determined that area-wide sewer separation by itself, while feasible for CSO elimination in certain areas (e.g. Constitution Beach, South Dorchester Bay), would not provide the hydraulic relief necessary to eliminate CSO discharges because 100% inflow removal would not be feasible. In addition, the transport and treatment system would have to convey, treat and discharge the remaining inflow, along with peak sanitary flows and infiltration, in extreme storm events up to and including at least the 25-year storm. MWRA conducted the 2005 evaluation utilizing its InfoWorks collection system model to predict the hydraulic benefits and remaining hydraulic grade line problems with 80% inflow removal in all areas that will continue to be served by combined sewers after completion of MWRA's approved LTCP.

MWRA estimated the total cost for the full program of improvements necessary for area-wide CSO elimination at \$11.536 billion in our October 2005 letter, including an estimate of \$2.5 billion to separate all remaining combined sewer areas upstream of the Ward Street, Columbus Park, and Chelsea Creek Headworks facilities based on a 20-year construction schedule. MWRA derived the \$2.5 billion estimate by inflating the \$1.4 billion estimate for system-wide sewer separation presented in MWRA's 1994 conceptual CSO control plan, less the total cost of sewer separation in the LTCP. MWRA also included \$9.036 billion to expand capacity at the Ward Street, Columbus Park and Chelsea Creek Headworks, the Boston Main Drain Tunnel (from Ward Street Headworks to Deer Island), the Metropolitan Relief Tunnel (from Chelsea to Deer Island), the Deer Island treatment plant ("DITP"), the DITP North Main Pump Station, the DITP outfall tunnel, and the related residuals facilities. Notwithstanding this cost estimate, expansion of the regional collection and treatment systems may also not be technically or logistically feasible.

Since 2005, MWRA has continued to perform sewer subsystem investigations, primarily to support its implementation of the LTCP through 2015 and the CSO performance assessment currently underway. MWRA has continued to collect and evaluate updated information about the MWRA and community sewer systems, including information from detailed inspection of CSO regulators and information from its CSO communities regarding measures completed or planned that may provide CSO control. MWRA has also continued to collect and evaluate data from its many permanent interceptor meters and permanent or temporary overflow meters. From all of this information, we conclude that conditions, assumptions and cost information factored into the 2005 evaluation have not substantively changed. Therefore, there is no reason to believe that elimination of CSO discharges can be accomplished more easily or at less cost, inflation aside, than we estimated in 2005.

The necessary wastewater system improvements and cost assumptions to eliminate CSO system-wide have not changed, except for cost inflation. MWRA estimates that the current cost of area-wide sewer separation (80% inflow removal), relief of transport system upstream and downstream of the headworks, and expansion of transport and treatment facilities is \$18.607 billion. This estimate is derived from an escalation of the 2005 estimate of \$11.536 billion to

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May 2019 using the Engineering News Record (ENR) construction indices for the Boston area. The ENR inflation factor from 2005 to May 2019 is 61.29%. Attachment 1 presents the escalated cost estimates previously submitted to DEP and EPA and the current escalated estimate.

In addition to this estimate, MWRA has updated the financial data necessary to facilitate an analysis of the economic impacts that would result from financing the cost of eliminating CSO discharges. We present these data in Attachment 2.

If you have questions regarding these updated costs and financial information, or questions related to other aspects of our request for variance extensions, please do not hesitate to contact me at 617-788-4359.

Very truly yours,



David W. Coppes, P.E.
Chief Operating Officer

cc: Ken Moraff and Todd Borci, EPA Region 1
Eric Worrall, Kevin Brander, and Susannah King, MassDEP

Attachment 1
Cost of Area-wide CSO Elimination
2005 Estimate and Escalations

	Total cost with contingency and inflation October 7, 2005 <i>inflated from 1994</i>	Total cost with contingency and inflation September 2, 2011 <i>inflated from 2005</i>	Total cost with contingency and inflation August 27, 2013 <i>inflated from 2005</i>	Total cost with contingency and inflation May 24, 2019 <i>further inflated from 9/1/2013 to 5/1/2019</i>
Ward St., Columbus Park and Chelsea Creek Headworks	675,000,000	843,749,599	916,246,642	1,088,727,374
Boston Main Drainage Tunnel (from Ward St. to Deer Island)	616,000,000	769,999,634	836,159,899	993,564,537
Metropolitan Relief Tunnel (from Chelsea to Deer Island)	345,000,000	431,249,795	468,303,839	556,460,658
Deer Island Treatment Plant, including North Main Pump Station	5,300,000,000	6,624,996,851	7,194,232,894	8,548,526,045
Effluent Outfall Tunnel	1,600,000,000	1,999,999,049	2,171,843,892	2,580,687,108
Residuals Facilities	500,000,000	624,999,703	678,701,216	806,464,721
Subtotal	9,036,000,000	11,294,994,631	12,265,488,382	14,574,430,443
Area-wide Sewer Separation	2,500,000,000	3,124,998,515	3,393,506,082	4,032,323,606
Total	11,536,000,000	14,419,993,146	15,658,994,464	18,606,754,049

Total increase referenced in letter (1) 25.00% 35.74% 18.82%

The inflation factor from 2005 to May 2019 based on ENR is 61.29%

(1) actual reported Engineering News Record Construction Cost Index inflation rate

Attachment 2
Information Supporting the Identification of Financial Barriers to Meeting Standards

a. Median household income

The Median Household Income weighted by number of households in the 43 sewer communities service area as of December 31, 2017 is \$84,456 (Source: US Census Bureau American Community Survey (2013-2017)).

b. Number of households in the service area

The number of households in the 43 sewer communities service area as of December 31, 2017 is 897,840 (Source: US Census Bureau American Community Survey (2013-2017)).

c. Explanation of whether 100% of the costs be borne by ratepayers, or whether some costs would be met through other means, such as state grants

MWRA’s capital expenditures are financed by the issuance of tax-exempt general revenue bonds, bonds issued to the Massachusetts Clean Water Trust and by current revenue for capital (pay-as-you-go). The debt service on the bonds and the current revenue for capital is included in the MWRA’s Current Expense Budget. The Rate Revenue Requirement assessed to our member communities supports over 97% of the total Current Expense Budget for the Wastewater Utility. The total revenue supporting the Current Expense Budget as of the latest approved budget is detailed below.

FY2019 Waste Water Utility Revenue & Income <i>amounts in \$000s</i>		
	Amount	% of Total Revenue
Community Assessments	\$489,187	97.3%
Interest Income	8,336	1.7%
Other Revenue	5,229	1.0%
Total	\$502,752	

d. Current wastewater treatment rates

The MWRA Board of Directors approved retail sewer rate for the current fiscal year (FY2019) is \$3,963.00 per million gallons.

e. Direct net debt

All MWRA debt is secured by a pledge of certain revenues of the Authority.

f. Overlapping debt

MWRA has no Overlapping debt.

g. Market value of taxable property

MWRA does not have taxable property.

h. Bond rating

In April 2019 in connection with MWRA's General Revenue Bonds series 2019B and General Revenue Refunding Bonds series 2019C (Green Bonds) issues, MWRA received the following ratings: Moody's Investor Service Aa1, Standard & Poors' S&P Global Ratings: AA+, Fitch Ratings: AA+.

i. Property tax collection rate

MWRA does not collect property tax.

j. Property tax revenue

MWRA does not collect property tax.