TENTATIVE DETERMINATION TO EXTEND VARIANCE
FOR COMBINED SEWER OVERFLOW DISCHARGES
TO
ALEWIFE BROOK/UPPER MYSTIC RIVER BASIN

FACT SHEET

This document is intended to provide a summary of the activities that have taken place since the Massachusetts Department of Environmental Protection's ("DEP") issuance of the Combined Sewer Overflow ("CSO") Variance for the Alewife Brook/Upper Mystic River Basin on March 5, 1999, and to provide a frame of reference for DEP's decision to extend the Variance for a period not to exceed three years, to September 1, 2016.

I. Background on CSO Control and Variance

Boston Harbor Case

As part of the Boston Harbor Case (D. Mass. C.A. No. 85-0489-RGS), the Massachusetts Water Resources Authority ("MWRA") is required to implement a Long Term CSO Control Plan ("LTCP") to reduce or eliminate CSO discharges to Alewife Brook/Upper Mystic River and other Boston area surface waters affected by CSO. MWRA's approved LTCP comprises 35 wastewater system improvement projects that will reduce or eliminate CSO discharges at 84 outfalls in the metropolitan Boston area at an MWRA capital cost of $888.1 million.

MWRA originally presented a recommended region-wide LTCP in its Final CSO Facilities Plan and Environmental Impact Report, July 31, 1997 ("1997 Facilities Plan/EIR"). In August 2005, MWRA recommended revisions to its LTCP, including a new schedule for implementing a revised and expanded plan for Alewife Brook, while MWRA had already completed the LTCP projects intended to control CSO to the Upper Mystic River (Mystic Basin). In March 2006, MWRA reached agreement with the U.S. Environmental Protection Agency ("EPA"), DEP and the U.S. Department of Justice on the revised LTCP and a new implementation schedule. The agreement was filed with the Federal District Court as part of a joint motion to amend the court schedule in the Boston Harbor Case.

As part of the agreement, DEP and EPA determined that MWRA's LTCP satisfied the requirements for a variance from water quality standards for CSO discharges to the Alewife Brook/Upper Mystic River Basin through 2020, when the LTCP would be fully implemented and verification of attainment of the long-term levels of CSO control would be made. Accordingly, DEP and EPA agreed that DEP would issue and EPA would approve five consecutive variance extensions of no more than three-year duration each through 2020, and that each variance extension would be consistent with and limited to the requirements in MWRA's LTCP.

In April 2006, the Court allowed the joint motion and issued an Order with a new schedule. Under the Order, MWRA has until the year 2020 to complete the remaining CSO work and subsequent monitoring to verify that the long-term CSO control goals are achieved. In addition, the United States and MWRA agreed to withdraw the February 27, 1987 Stipulation of the United States and the Massachusetts Water Resources Authority on Responsibility and Legal Liability for Combined Sewer Overflows and replace it with a Second Stipulation that requires MWRA to implement the CSO requirements set forth in the court schedule and to meet the levels of control described in MWRA's LTCP. In July 2006, the Court accepted revisions to Schedule Six incorporating a new Schedule Seven with modified or additional schedule milestones for projects in the CSO plan for Alewife Brook.

More information about MWRA's LTCP, including the status of implementation of each of the 35 projects, is presented in MWRA's CSO Annual Progress Report 2012 (March 2013), available at: http://www.mwra.com/01news/2013/031513-csocontrolreport.html. To date, MWRA has completed 31 of the 35 projects in the LTCP. Two of the projects not yet complete are currently in construction, including CAM004 sewer separation – one of the five projects in the Alewife Brook CSO control plan – and Reserved Channel Sewer Separation in South Boston. The remaining two projects, both components of the Alewife Brook CSO control plan, are in design and are scheduled to move into construction in 2013 and 2014.

Within the current variance period, MWRA and the City of Cambridge completed two CSO projects affecting the Alewife Brook and are making progress with design and construction of the other Alewife Brook projects in the LTCP in compliance with Schedule Seven. The following sections summarize the implementation status of the LTCP projects intended to control CSO discharges and improve the water quality of Alewife Brook and the Upper Mystic River.

Long-Term CSO Control Plan for Upper Mystic River

MWRA, in cooperation with the City of Somerville, completed the LTCP projects in the Upper Mystic River in the period 1996 through 2001. In 1996, the City of Somerville eliminated CSO discharges at outfalls SOM006 and SOM007 by separating manholes common to the local storm drain and sewer systems. In September 2001, MWRA completed construction to upgrade the Somerville Marginal CSO Facility, including replacement and improvement of the disinfection system, addition of a dechlorination system, and improvement of treatment controls. CSO discharges to the Upper Mystic River Basin, not including discharges to Alewife Brook, are now limited to infrequent, treated discharges from the Somerville Marginal facility through the high tide outfall (SOM007A/MWR205A) upstream of the Amelia Earhart Dam.

Long-Term CSO Control Plan for Alewife Brook

The Alewife Brook CSO control plan is intended to minimize CSO discharges to the Alewife Brook primarily by separating combined sewer systems in parts of Cambridge to remove storm water and by upgrading hydraulic capacities at local connections to the MWRA interceptors. The plan also includes a new storm water outfall and a wetland basin to accommodate the separated storm water flows, prevent any increase in flooding along Alewife Brook, and provide a level of storm water treatment. The City of Cambridge manages the design and construction work for four

of the six projects that comprise the approved Alewife Brook CSO control plan with MWRA funding pursuant to a Memorandum of Understanding and Financial Assistance Agreement.

Cambridge began construction of the sewer separation plan in July 1998, in accordance with the recommended plan in the 1997 Facilities Plan/EIR and in compliance with the original set of project milestones in the court schedule then in effect. Cambridge completed all four of the construction contracts it awarded at that time, and the completed work significantly reduced CSO discharges to the Alewife Brook (see page 13, Table 3).

In 2000, MWRA and Cambridge suspended further design work and construction contract awards related to the 1997 plan, because new field information showed that conditions in the Cambridge combined sewer system were markedly different from conditions assumed in 1997. MWRA and Cambridge determined that a considerably greater scope of work would be necessary to meet the 1997 CSO control goals for Alewife Brook. In April 2001, MWRA and Cambridge submitted the *Notice of Project Change for the Long Term CSO Control Plan for Alewife Brook* (the "April 2001 NPC") to the Massachusetts Environmental Policy Act (MEPA) Office for public review, which recommended an expanded and much more costly sewer separation plan.

The revised CSO control plan for the Alewife Brook comprises six component projects (Table 1), each with its own design and construction milestones in Schedule Seven (Table 2). Project locations are shown in figures 1 and 2. Together, these projects are predicted to reduce annual CSO volume to the Alewife Brook by 85 percent in a typical year, from 50 million gallons in 1997 to 7.3 million gallons. CSO activations in a typical year will be reduced from 63 in 1997 to seven. MWRA hydraulic model and water quality model simulations predict that the recommended control levels will comply with Class B (fishing and swimming) water quality criteria 98.5 percent of the time.

Table 1: Alewife Brook CSO Control Plan - Project Components

Project	Cambridge Contract No.	Benefit
CAM004 Stormwater Outfall and Wetland Basin	12	Convey storm water flows to wetland system for attenuation and treatment.
CAM004 Sewer Separation(1)	8A, 8B, 9	Remove large quantities of storm water from the sewer system; eliminate CSO at Outfall CAM004.
CAM400 Manhole Separation	4/13	Remove storm water from the sewer system; eliminate CSO at Outfall CAM400.
Interceptor Connection Relief and Floatables Control at CAM002 and CAM401B and Floatables Control at CAM001		Upgrade connections between Cambridge and MWRA systems to provide relief; add floatables control.
Control Gate/Floatables Control at Outfall MWR003 and MWRA Rindge Avenue Siphon Relief	MWRA Contracts	Optimize hydraulic conveyance; minimize overflows while controlling system flooding in large storms; provide floatables control.
Interconnection Relief and Floatables Control at Outfall SOM01A		Upgrade connection and provide floatables control.

(1) Also includes initial construction contracts completed by Cambridge in 2002

Table 2: Alewife Brook Project Schedules and Court Milestones

Alewife Brook CSO Project	Commence Design		Commence Construction		Complete Construction	
	Court Milestone	Project Schedule	Court Milestone	Project Schedule	Court Milestone	Project Schedule
Managed by City of Cambridge						
CAM004 Stormwater Outfall and Wetland Basin			Apr 11	Apr 11	Apr 13	Apr 13
CAM004 Sewer Separation	Jan 97	Jan 97	Jul 98 Sep 12	Jul 98 Sep 12	Dec 15	Dec 15
Interceptor Connection Relief and Floatables Control at CAM002 and CAM401B and Floatables Control at CAM001	Jul 06	Oct 08*	Jan 10	Jan 10	Oct 10	Oct 10
CAM400 Manhole Separation	Jul 06	Oct 08*	Jan 10	Jan 10	Mar 11	Mar 11
Managed by MWRA						
Control Gate/Floatables Control at Outfall MWR003 and MWRA Rindge Avenue Siphon Relief	Apr 12	Apr 12	Aug 14	Aug 14	Oct 15	Oct 15
Interceptor Connection Relief and Floatables Control at Outfall SOM01A	Apr 12	Apr 12	Sep 13	Sep 13	Jun 14	Jun 14

*** Cambridge met reported project schedules that were revised due to citizens' appeals of the wetlands permit for Contract 12.**

In December 1996, the City of Somerville eliminated CSO discharges at Outfall SOM001 by removing common manholes on its tributary sewer and storm drain systems. In October 2010, the City of Cambridge completed construction to upgrade its connections to MWRA's Alewife Brook interceptor system at regulators associated with outfalls CAM002 and CAM401B, as well as provide floatables controls at these outfalls and at Outfall CAM001. And in March 2011, the City of Cambridge completed construction to remove common manholes and eliminated CSO discharges at Outfall CAM400.

CAM004 Stormwater Outfall and Wetland Basin

Figure 3 is a rendering of the CAM004 wetland basin. MWRA and the City of Cambridge completed the CSO related elements of the CAM004 stormwater outfall and detention basin project, including the 4-foot by 8-foot box culvert storm drain and its outfall to the wetland basin and all functional components of the wetland basin, on April 25, 2013, in compliance with Schedule Seven. Storm water flows removed from Cambridge's and MWRA's sewer systems as a result of early construction contracts and limited upstream sewer separation work Cambridge completed more than a decade ago will be redirected from CSO outfall CAM004 to the wetland basin once the wetland vegetation and soils stabilize later this year. Storm water flows to the basin will increase over the next two and half years (through December 2015) as Cambridge makes progress with the CAM004 sewer separation project and removes large volumes of storm water from the sewer system.

The CAM004 stormwater outfall and the wetland basin are intended to deliver the separated storm water flows to the Little River and downstream Alewife Brook without causing an increase in

Figure 1

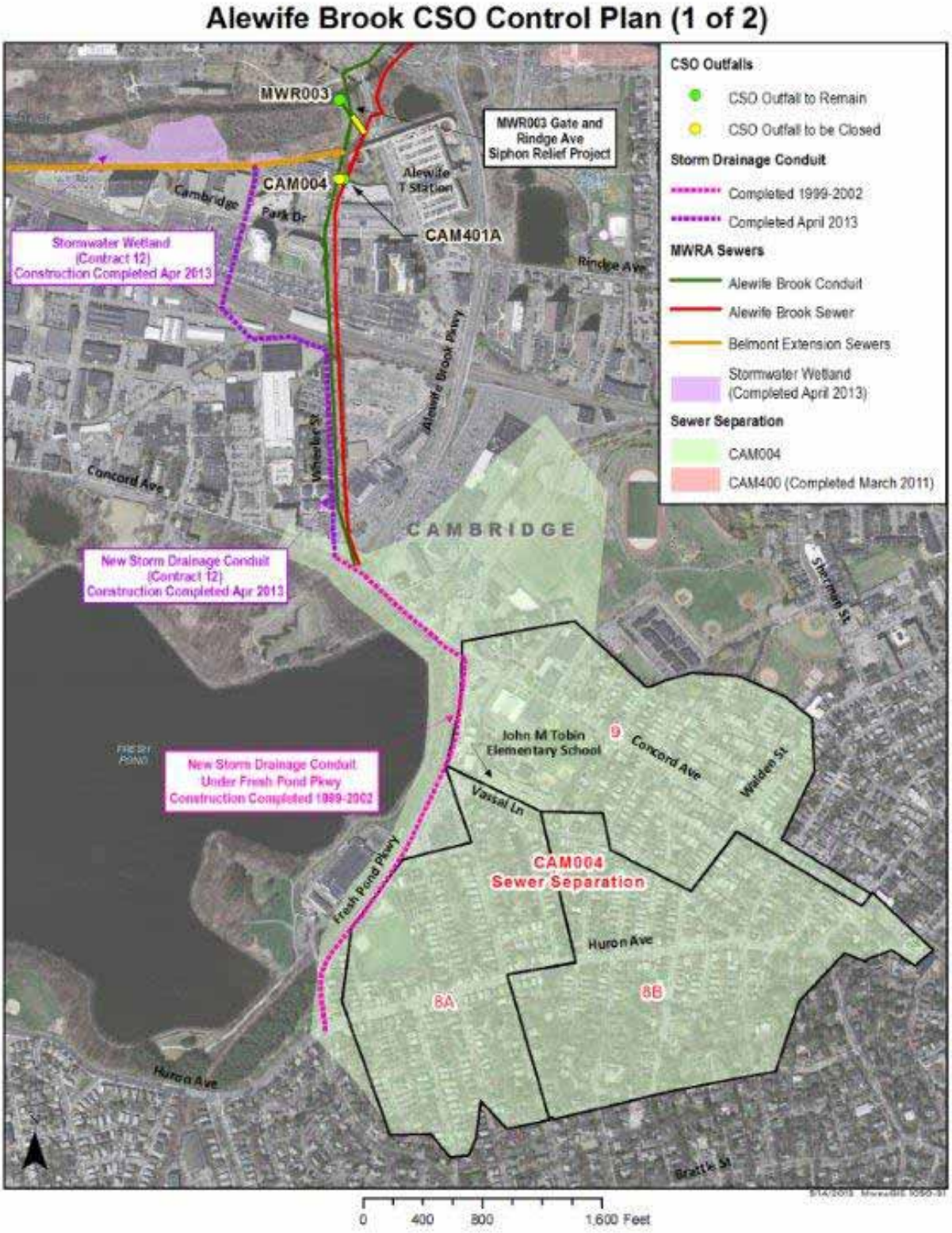
Alewife Brook CSO Control Plan (1 of 2)
MWR003
CAM004
CAM401A
MWR003 Gate and Rindge Ave Siphon Relief Project
Alewife T Station
Cambridge Park Dr
Rindge Ave
Stormwater Wetland (Contract 12) Construction Completed Apr 2013
Alewife Brook Pkwy
Wheeler St
Concord Ave
CAMBRIDGE
New Storm Drainage Conduit (Contract 12) Construction Completed Apr 2013
Sherman St
John M Tobin Elementary School
9
Concord Ave
Walden St
Vassal Ln
FRESH POND
New Storm Drainage Conduit Under Fresh Pond Pkwy Construction Completed 1999-2002
Fresh Pond Pkwy
CAM004 Sewer Separation
Huron Ave
8A
8B
Huron Ave
Brattle St
CSO Outfalls
CSO Outfall to Remain
CSO Outfall to be Closed
Storm Drainage Conduit
Completed 1999-2002
Completed April 2013
MWRA Sewers
Alewife Brook Conduit
Alewife Brook Sewer
Belmont Extension Sewers
Stormwater Wetland (Completed April 2013)
Sewer Separation
CAM004
CAM400 (Completed March 2011)
0
400
800
1,600 Feet

Figure 2

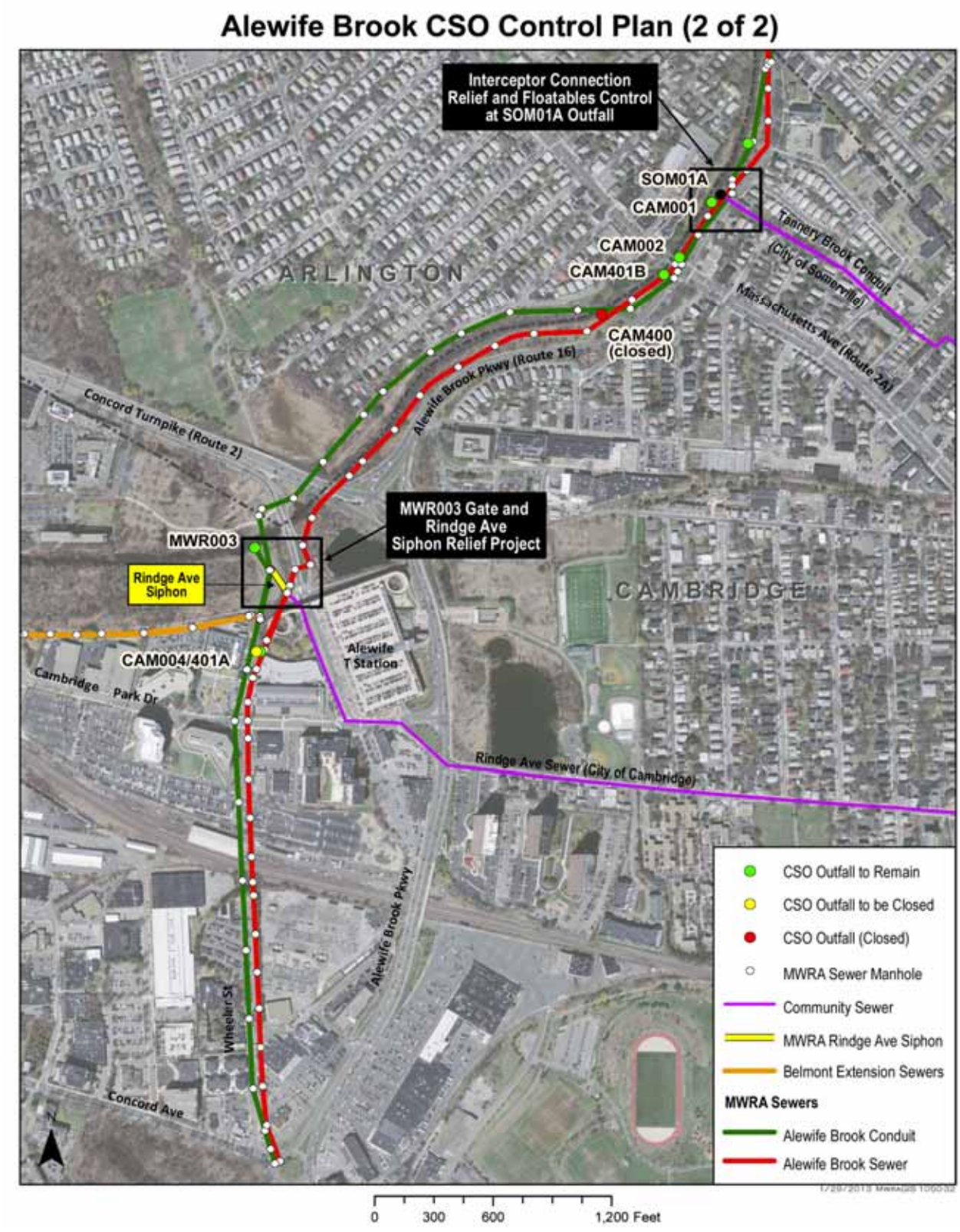
Alewife Brook CSO Control Plan (2 of 2)
Interceptor Connection Relief and Floatables Control at SOM01A Outfall
SOM01A
CAM001
CAM002
CAM401B
CAM400 (closed)
ARLINGTON
Tannery Brook Conduit (City of Somerville)
Massachusetts Ave (Route 2A)
Alewife Brook Pkwy (Route 16)
Concord Turnpike (Route 2)
MWR003 Gate and Rindge Ave Siphon Relief Project
MWR003
Rindge Ave Siphon
CAMBRIDGE
CAM004/401A
Alewife T Station
Cambridge Park Dr
Rindge Ave Sewer (City of Cambridge)
Alewife Brook Pkwy
Wheeler St
Concord Ave
CSO Outfall to Remain
CSO Outfall to be Closed
CSO Outfall (Closed)
MWRA Sewer Manhole
Community Sewer
MWRA Rindge Ave Siphon
Belmont Extension Sewers
MWRA Sewers
Alewife Brook Conduit
Alewife Brook Sewer
0
300
600
1,200 Feet

Figure 3: Rendering of Alewife Wetland Basin

flood levels or pollutant loadings. The project included the construction of a 3,300-foot long, 4-foot by 8-foot box culvert storm drain to convey the separated storm water to the new 3.4-acre wetland in the Department of Conservation and Recreation's ("DCR") Alewife Brook Reservation. The wetland basin provides 10.3 acre-feet of detention storage of the storm water flows and an attenuation of the rate of storm water discharge to the Little River and Alewife Brook. The basin also provides a level of removal of pollutants associated with urban storm water by natural treatment processes in the constructed wetland system.

In addition to these CSO related functional objectives, the design of the basin incorporates other "green technology" attributes that are intended to provide or enhance plant and wildlife habitat, natural flood control and recreational and educational opportunities consistent with DCR's Alewife Brook Reservation Greenway Master Plan. The Oxbow is a constructed open water extension of the Little River intended to provide spawning habitat for migratory fish such as alewife and blueback herring. The Oxbow is now fully connected to the Little River. A mounded amphitheater, boardwalks and boardwalk overlooks in and around the wetland are intended to provide recreational and environmental learning opportunities for students, visitors and conservationists.

CAM004 Sewer Separation

Design and construction efforts for the three remaining construction contracts to complete the CAM004 sewer separation project – Cambridge contracts 8A (Huron Avenue A), 8B (Huron Avenue B) and 9 (Concord Avenue) – are also progressing on schedule. The three contracts will separate combined sewers upstream of Outfall CAM004 in the Huron Avenue and Concord Avenue neighborhoods, encompassing a 211-acre area east of Fresh Pond Parkway (see Figure 1 on page 5).

Cambridge issued the notice to proceed with construction of Contract 8A on September 29, 2012, in compliance with Schedule Seven. Contract 8A includes the separation of approximately 13,500 linear feet of sanitary sewer and storm drain pipe up to 54-inch diameter in Huron Avenue and several intersecting streets and 7,200 linear feet of smaller diameter drain pipe for building, catch basin and other connections in a 68-acre area immediately east of Fresh Pond Parkway, from Fresh Pond to Brattle Street. The contract also includes the installation of three large storm drain vaults on Vassal Lane, 45 new or replacement catch basins with hoods and 6-foot sumps, work on private property exterior to 58 buildings within the project area to remove roof runoff and sump pump discharges from the sewer system, and 6,700 linear feet of replacement water main ranging from 6-inch to 12-inch diameter.

Cambridge has also included "Green Technologies" in the contract for storm water quality improvement and quantity control. The Green Technologies consist of 8,500 linear feet of porous pavement, five "biobasins" with overflow connections to the storm drain system, and 145 new street trees. The biobasins are planted areas that function as part of the storm water system by intercepting and detaining street runoff to capture some of the sediments, provide a level of removal of other pollutants such as phosphorus and nitrogen, and potentially reduce the rate and volume of storm water runoff to the drainage system.

The sewer separation work of Contract 8A is approximately 50 percent complete and is scheduled to be substantially complete in May 2014, while surface restoration work will continue through contract completion in December 2014.

Cambridge completed the design of Contract 8B and advertised the construction documents for bids on April 18, 2013. Contract 8B includes the installation of new sanitary sewers and storm drains in Huron Avenue and several intersecting streets to separate combined sewers in an 83-acre area east of the Contract 8A work area, extending as far east and north as Concord Avenue and as far south as Brattle Street. Cambridge plans receive bids on June 13, and award the contract and issue the notice to proceed with construction this July.

Cambridge's design of Contract 9, which includes the installation of new sanitary sewers and storm drains in Concord Avenue and several intersecting streets to separate combined sewers in a 60-acre area north of Contracts 8A and 8B and extending from Fresh Pond Parkway in the west to the intersection of Concord Avenue and Huron Avenue in the east is approximately 50 percent complete. Cambridge plans to commence construction of Contract 9 in January 2014 and complete the sewer separation work by December 2015, in compliance with Schedule Seven.

Control Gate and Floatables Control at Outfall MWR003 and MWRA Rindge Avenue Siphon Relief and Interceptor Connection Relief and Floatables Control at Outfall SOM01A

While the City of Cambridge is implementing four of the six projects in the Alewife Brook CSO control plan, MWRA is currently designing and will construct the remaining two projects: Control Gate and Floatables Control at Outfall MWR003 and MWRA Rindge Avenue Siphon Relief (the "MWR003 project"), shown in Figure 4, and Interceptor Connection Relief and Floatables Control at Outfall SOM01A (the "SOM01A project"), shown in Figure 5. These two projects are the last two of the six projects in MWRA's Alewife Brook CSO plan and the last two of the 35 projects in MWRA's regional long-term CSO control plan to proceed into implementation.

As recommended in the April 2001 NPC, the projects' intended objectives include 1) ensuring adequate sewer system hydraulic relief capacity through MWRA's Rindge Avenue overflow siphon to Outfall MWR003 and Alewife Brook in extreme storms, 2) reducing CSO discharges at the City of Somerville's Outfall SOM01A by increasing the size of the local sewer connection between Somerville's Tannery Brook Conduit and MWRA's interceptor system, and 3) providing for the control of floatable materials in the CSO discharges at both outfalls. Providing greater system relief through the Rindge Avenue siphon and Outfall MWR003 in extreme storms is necessary in part to compensate for the loss of system relief with the planned closing of Outfall CAM004 with completion of the CAM004 sewer separation project in 2015.

MWRA issued the notice to proceed with the design services for both projects on March 30, 2012, in compliance with the April 2013 milestone in Schedule Seven. In addition to the April 2001 NPC project objectives listed above, the design scope also includes optimization of the overall hydraulic performance of MWRA's interceptor system to maximize conveyance to downstream MWRA transport and treatment facilities and to minimize overflows to Alewife Brook.

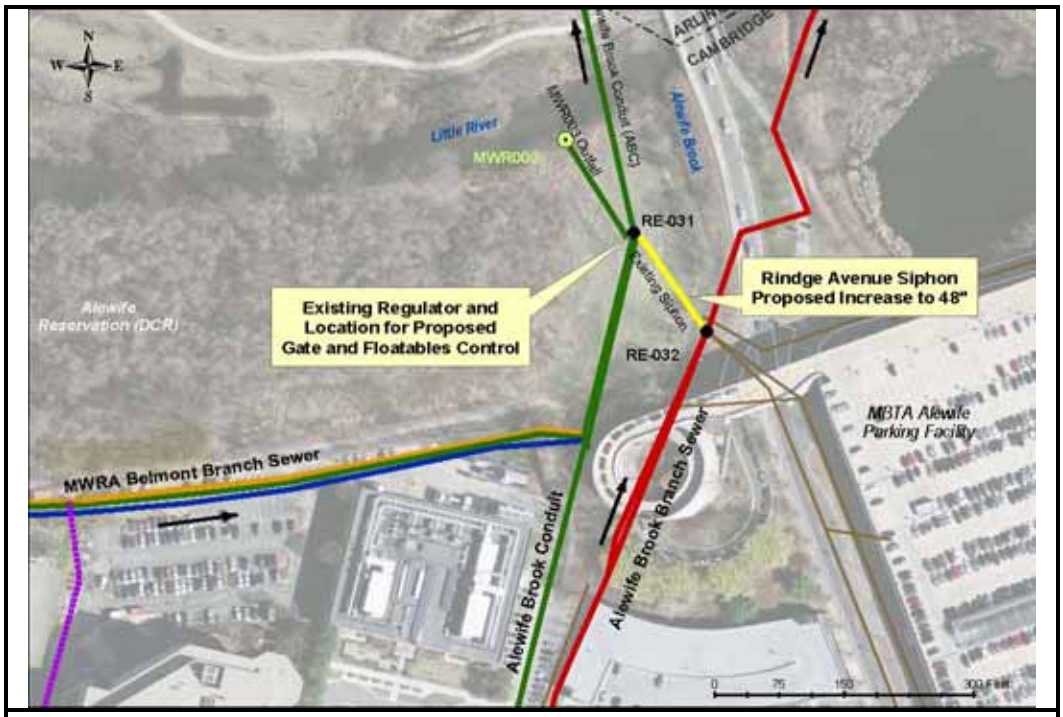

Figure 4: Control Gate and Floatables Control at Outfall MWR003 and MWRA Rindge Ave. Siphon Relief

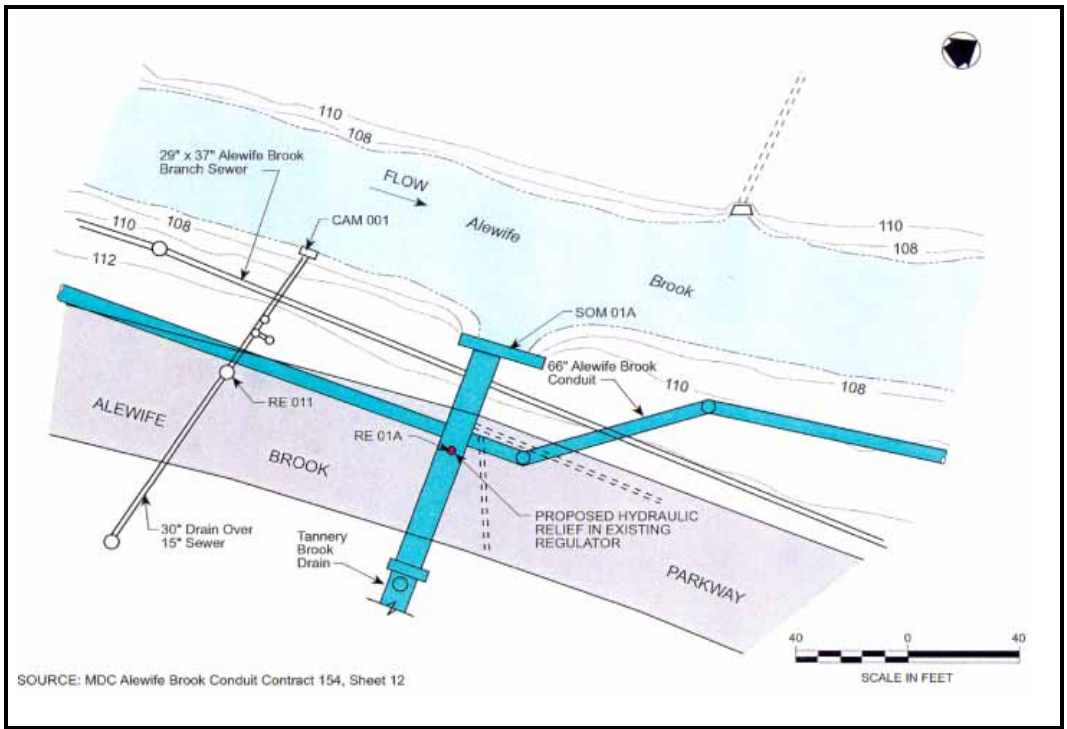

Figure 5: Interceptor Connection Relief and Floatables Control at Outfall SOM01A

As part of its preliminary design investigations, MWRA completed extensive updates to the characterization of the Alewife Brook interceptor system in its InfoWorks collection system model. MWRA obtained new information from the communities and from system inspections, and performed a recalibration of the collection system model using recent (2011) flow data from its permanent meters. MWRA's updated model predictions of current system performance show considerably lower CSO discharges to Alewife Brook than previous model estimates. The updated model (2012 system conditions) predicts that CSO discharges to Alewife Brook have been reduced to 12 activations and 14.6 million gallons total volume in a typical year.

The SOM01A project will upgrade the hydraulic capacity of the connection between the City of Somerville's Tannery Brook Conduit ("TBC") and MWRA's Alewife Brook Conduit to reduce CSO discharges from the TBC at Outfall SOM01A and will provide floatables control for the remaining discharges. MWRA has completed final design of the project and has obtained a construction permit from DCR, issued March 28, 2013, allowing the SOM01A work within DCR's Alewife Brook Reservation and Alewife Brook Parkway. The traffic management plan for Alewife Brook Parkway includes Massachusetts State Police details, and MWRA met with the State Police on May 30, 2013, to review the plans. MWRA is finishing the SOM01A construction contract documents and plans to advertise the contract for bids later this month and issue the notice to proceed by September 2013, in compliance with Schedule Seven.

The MWR003 project will upgrade the overflow hydraulic capacity at Outfall MWR003 for extreme storms in part to compensate for the loss of system relief with the planned closing of Cambridge's nearby Outfall CAM004. The project will increase the hydraulic capacity of the Rindge Avenue Siphon, which delivers overflows to the outfall, replace the existing static overflow weir at MWR003 with an automated gate that will in its lowered position provide a higher overflow capacity when needed to mitigate system flooding, and provide floatables control for the remaining discharges.

MWRA has completed the preliminary design work and moved the project into final design. Construction related issues under consideration include required Wetlands Protection Act and DCR permits, mitigation of construction impacts to the Fitchburg Cutoff Bikepath and a bike path bridge, the siting of above ground equipment related to the automated overflow gate and associated power and controls, and access to the construction site. A final preliminary design report is due soon. The design work remains on schedule for commencement of construction by August 2014, in compliance with Schedule Seven.

CSO Variance

A three-year Variance for CSO discharges to the Alewife Brook/Upper Mystic River Basin was issued by DEP on March 5, 1999. The Variance is a short-term modification of the Water Quality Standards issued by DEP subject to approval by the United States Environmental Protection Agency ("EPA"). The Variance allows limited CSO discharges from the outfalls along the Alewife Brook/Upper Mystic River permitted to MWRA and the cities of Cambridge and Somerville, subject to specific conditions. Other standards and criteria of the receiving waters' Class B designation are unaffected and remain in force.

The CSO Variance was issued in 1999 to allow time for DEP to obtain the information necessary to determine the appropriate long-term water quality standard and level of CSO control for the Basin, while ensuring that recommended CSO controls approved by DEP would be implemented. The Variance required the implementation of the cost-effective CSO control actions included in MWRA's Final CSO Facilities Plan and Environmental Impact Report, July 31, 1997 (the "FEIR") and also required other actions necessary to properly assess pollutant loads in the Basin and minimize the impact of CSO discharges.

The March 5, 1999 Alewife Brook/Upper Mystic River Basin Variance included specific conditions on activities of MWRA and the cities of Cambridge and Somerville including the submittal of a Reassessment Report by MWRA summarizing information gathered during the Variance process and reevaluating the costs and benefits of additional CSO controls in the Alewife Brook/Upper Mystic River Basin, up to and including elimination of CSOs. The Reassessment Report was intended to provide the basis for a final determination on the appropriate long-term level of CSO control.

With the variance, DEP approved MWRA's LTCP for the Alewife Brook/Upper Mystic River Basin and required MWRA to implement the LTCP, evaluate the potential for infiltration/inflow (I/I) removal to increase CSO control and benefits, and conduct additional water quality investigations to assess pollutant loadings to these waters. With the new information collected during the variance period, MWRA was required to report on whether additional CSO control measures beyond the LTCP recommendations might be cost effective.

On December 14, 2001, MWRA submitted a request to DEP to extend the Alewife Brook/Upper Mystic River Basin Variance for 18 months and defer the requirement for the CSO Reassessment Report until July 1, 2003. After review of public comments on the MWRA request, DEP agreed that an extension was reasonable and necessary to complete the data collection and technical reports required under the Variance, and on May 5, 2002, DEP extended the Variance to September 5, 2003.

In July 2003, MWRA submitted the Reassessment Report (*Final Variance Report for the Alewife Brook and Upper Mystic River*) to DEP and MEPA, which included the evaluation of alternative levels of CSO control and affirmed the recommended alternative and level of control that are now a part of the approved LTCP. DEP extended the variance again in 2003 for nine months and in 2004, 2007 and 2010 for three years each. Water quality data collection and water quality characterization by MWRA and other parties, including the Mystic River Watershed Association, have continued through these extension periods. The current variance extension expires August 31, 2013.

II. Level of CSO Control

The six projects, together with the earlier CSO control actions mentioned above, are intended to reduce CSO discharges to the Alewife Brook from 63 activations and 50 million gallons volume in a typical year in 1997 to 7 activations and 7.3 million gallons, an 85 percent reduction by volume. MWRA's hydraulic model and water quality model simulations predict that the recommended control levels will bring CSO discharges into compliance with Class B water quality

criteria 98.5 percent of the time. Levels of CSO control at outfalls on the Alewife Brook for baseline (1997), current (2012) and revised recommended plan (LTCP - 2015) conditions are shown in Table 3.

Table 3: CSO Discharges at Alewife Brook/Upper Mystic River Outfalls in a Typical Year

Outfall	Baseline Condition[1]		Current Conditions[2]		Long-term CSO Control Plan[3]	
	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)
CAM001	1	0.01	1	0.06	5	0.19
CAM002	7	1.57	4	0.35	4	0.69
MWR003	1	0.06	4	0.80	5	0.98
CAM004	63	24.10	7	4.17	Closed	-
CAM400	10	0.80	Closed		Closed	-
CAM401A	7	2.74	4	1.42	5	1.61
CAM401B	25	10.50	10	2.01	7	2.15
SOM01A	10	9.89	7	4.99	3	1.67
SOM001	Closed		Closed		Closed	
SOM002A	Closed		Closed		Closed	
SOM003	Closed		Closed		Closed	
SOM004	Closed		Closed		Closed	
Total Alewife	63	49.70	10	13.79	7	7.29
SOM007A/ MWR205A	11	6.72	3	1.54	3	3.48
SOM007	2	0.04	Closed		Closed	
Total Upper Mystic	11	6.76	3	1.54	3	3.48

(1) Updated estimates from the April 2001 Notice of Project Change (NPC).

(2) From MWRA modeling of 2012 system conditions.

(3) From model predictions in Final Variance Report (for Alewife) and 1997 FEIR (for Upper Mystic). Construction of the long-term CSO control plan for Boston Harbor and its tributaries is scheduled to be complete by December 2015. The construction will be followed by a period of monitoring in accordance with Schedule Seven of the Boston Harbor Case.

Cost of the Long-term CSO Control Plan

The estimated cost of the Alewife Brook/Upper Mystic River CSO control plan has grown from approximately $14 million in the 1997 Facilities Plan/EIR (in 1997 dollars) to approximately $112 million today, a cost that is shared by Cambridge and MWRA. Most of the increase in cost is due to engineering investigation of the Cambridge sewer system in the period 1997-2000 revealing an extent of required sewer separation substantially greater than originally assumed, higher unit

costs for installation of new storm drain and other elements of the work, and the need for a new outfall and stormwater detention basin required to manage the increase in separate storm water volumes that were not included in the original plan.

In the fall of 2012 and again in February 2013, Cambridge submitted updated cost estimates to MWRA for the CAM004 sewer separation project (Cambridge Contracts 8A, 8B and 9), based on its design progress and the low bid award amount for Contract 8A. With its updated cost estimate, Cambridge sought an increase in MWRA's cost share for the Alewife Brook CSO projects of $27.1 million, potentially increasing the award amount in the MWRA's Memorandum of Understanding and Financial Assistance Agreement with Cambridge for the Alewife Brook projects from $60 million to $87.1 million. In March 2013, MWRA's Board of Directors authorized increasing the award amount in the agreements with Cambridge by $17.3 million, primarily to cover the updated construction related costs of Contract 8B, which Cambridge had been able to progress to 90 percent design. This authorization also allowed Cambridge to advertise Contract 8B for construction bids without delay in April 2013.

Cambridge's most recent estimates for the construction related costs of Contract 9, including costs for construction, engineering services during construction and police details, suggest that the award amount should be further increased by approximately $10 million. MWRA has included an additional $10 million in its Fiscal Year 2014 Capital Improvement Program budget submission, which is subject to approval by its Board of Directors. If the higher budget is approved, MWRA expects to seek Board authorization to increase the award amount of the agreement with Cambridge by approximately $10 million later this year, when Cambridge has made further design progress with Contract 9 and is prepared to advertise the construction contract.

Other Priorities to Ensure Continued Progress

Further water quality improvements in the Alewife Brook/Upper Mystic River watershed will rely largely on municipal efforts to locate and remove illegal discharges to storm drains, implement storm water Best Management Practices, and address other storm water impacts as they contribute to wet weather issues affecting these watersheds. DEP recognizes that progress is continuing to be made by the communities in these areas.

DEP also acknowledges the importance of proper operation, maintenance, and rehabilitation of MWRA and community sewer and storm water systems to assure optimized conditions for conveying wastewater flows through the system for treatment and discharge at Deer Island and improving storm water quality. Sewer system repairs and cleaning, as well as optimized operation of the sewer system and facilities during wet weather, have resulted in improved conveyance capacities in a number of locations, removal of localized system flow constraints, and maximum use of in-system storage, all contributing to CSO reduction. MWRA completed interim improvements to the Alewife Brook Pumping Station in 2009, which were estimated to have reduced average annual CSO discharge volume to the Alewife Brook by approximately 30 percent. In April 2010, MWRA issued the Notice to Proceed with the design contract for long-term improvements to the station that will enhance station reliability and expects to complete the station improvements in 2016.

III. Proposed Variance Extension and Next Steps

As part of the agreement on the LTCP reached in March 2006 among EPA, DEP, DOJ and MWRA, MWRA requested that the Variance for the Alewife Brook/Upper Mystic River Basin be reissued through 2020 when MWRA must complete the region-wide LTCP and subsequent monitoring to verify that the long-term CSO control goals are achieved. At that time, DEP and EPA determined that MWRA's LTCP satisfied the requirements for a variance from water quality standards for CSO discharges to the Alewife Brook/Upper Mystic River Basin through 2020. As part of this determination, DEP and EPA agreed that DEP would issue and EPA would approve five consecutive extensions on no more than a three-year duration each through 2020, which would be consistent with and limited to the requirements in MWRA's LTCP. MWRA bases this request on the work completed to date to achieve a high level of CSO control at certain outfalls, the expectation for significant CSO control and water quality improvement with the remaining CSO projects in the Alewife Brook CSO control plan, and the desire to provide a level of financial certainty and stability for its ratepayers.

Substantial and Widespread Social and Economic Impact

DEP has emphasized cost-effectiveness for CSO long-term control plans, to ensure that financial resources for pollution abatement actually provide improvements in water quality. The principles of cost-effectiveness and water quality benefits have been a major factor used by MWRA in the development of its present $888.1 million CSO abatement plan. MWRA has spent $827.5 million developing and implementing the plan since the late 1980's and plans to spend an additional $54.8 million through December 2015 to complete construction of the remaining CSO projects. MWRA sewer rates are among the highest in the nation and are projected to increase significantly over the next five years.

Implementation of the revised recommended plan will reduce CSO discharges to the Alewife Brook to a level that will allow attainment of Class B water quality standards 98.5 percent of the time. In accordance with DEP's CSO Guidance, cost-effectiveness, protection of sensitive uses, and the financial capability of CSO permittees are all important factors in making determinations on the appropriate level of CSO control.

In 1997, MWRA submitted data related to DEP's finding of "substantial and widespread economic and social impact," the basis for its issuance of a Variance (See 314 CMR 4.03(4)(f)). DEP reviewed updated financial data submitted by MWRA for each of the variance and variance extension determinations since then, and also reviewed a report by Robert N. Stavins, Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls on Households and Communities in the Massachusetts Water Resources Service Area, dated March 17, 2004. DEP also reviewed the Affordability Analysis Worksheets included in Appendix H of the Cottage Farm Report dated January 2004, which were based on EPA's Interim Economic Guidance for Water Quality Standards.

DEP's conclusions from its review of the documents submitted by MWRA and determination in support of the Variance Extension request have not changed. DEP has reviewed updated information regarding the scope, status, predicted benefits, achieved benefits, costs and cost

impacts of MWRA's LTCP, and has determined that additional controls beyond those recommended in the MWRA CSO Plan would not be cost-effective or affordable at this time.

Based on these important considerations, DEP has determined that proceeding at this time with controls beyond those included in the MWRA Long-Term CSO Control Plan would result in substantial and widespread social and economic impact as specified in 314 CMR 4.03(4), and that an extension to the CSO Variance is appropriate at this time. Issuing of the CSO Variance Extension in the Alewife Brook/Upper Mystic River watershed is consistent with EPA Guidance: *Coordinating CSO Long-Term Planning with Water Quality Standard Reviews (July 31, 2001)*, which asserts that longer term variances and renewal of variances are warranted given the extended duration necessary for implementation of LTCPs.

Determination to Extend Variance

DEP makes the following determinations:

- The MWRA CSO control plan for the Alewife Brook/Upper Mystic River, which includes projects to optimize sewer system performance and remove storm water inflow through sewer separation, is responsive to the conditions and intent of the Variance and will achieve substantial CSO control benefits.

- MWRA has completed numerous analyses since the late 1980s evaluating alternatives for eliminating CSOs from the collection system tributary to the Deer Island Wastewater Treatment Plant. Among these are the 1997 FEIR, the April 30, 2001 Alewife Brook Notice of Project Change, and the July 2003 Alewife Brook and Upper Mystic River Final Variance Report. MWRA's revised LTCP incorporates all cost-effective and feasible CSO abatement projects for this watershed. At this point in time, it does not appear technically feasible to eliminate all CSO outfalls to this watershed given the engineering and infrastructure constraints in the MWRA interceptor system, headworks, conveyance tunnels, the Deer Island wastewater treatment plant, and the ocean outfall.

- Progress to date in implementing the LTCP for Alewife Brook and Upper Mystic River has greatly reduced CSO discharges to Alewife Brook, eliminated CSO discharges at several outfalls along Alewife Brook and Upper Mystic River, and improved treatment at MWRA's Somerville Marginal CSO Facility.

- Proceeding at this time with controls beyond those presently included in the revised LTCP would result in substantial and widespread social and economic impact as specified in 314 CMR 4.03(4). The cost of MWRA's CSO control program is substantial, at $888.1 million. MWRA's detailed financial impact assessment considered the effect of expected sewer rate increases, and, appropriately, median household income as adjusted by the relatively high cost of housing in the Boston area. The MWRA adequately demonstrated that proceeding at this time with CSO controls necessary for full attainment of Class B water quality standards in the Alewife Brook/Upper Mystic River watershed would result in substantial and widespread economic and social impact.

DEP concludes that extension to the CSO Variance for the Alewife Brook/Upper Mystic River watershed is appropriate at this time, and extends the CSO Variance for MWRA, and the cities of Cambridge and Somerville to September 1, 2016. A determination on the highest feasible level of CSO control and associated water quality standard is deferred until the LTCP is implemented and the associated benefits are verified in 2020, in compliance with Schedule Seven.

Future Actions

(1) The Variance for CSO discharges to the Alewife Brook/Upper Mystic River Basin will be extended by a period not to exceed 3 years (to September 1, 2016).

(2) MWRA and the City of Cambridge shall implement all elements of the LTCP as defined in the Second CSO Stipulation and in accordance with Schedule Seven.

(3) MWRA, the City of Cambridge, and the City of Somerville shall continue to implement the Nine Minimum Controls and report on CSO activations and volumes.

(4) MWRA shall continue to implement its receiving water monitoring in the Alewife Brook/Upper Mystic River Basin watershed.