2017 Annual Report
National Pollutant Discharge Elimination System

For The
City of Cambridge, Massachusetts
Combined Sewer Overflow Permit
#MA0101974

Submitted to
U.S. Environmental Protection Agency
Water Technical Unit

MA Department of Environmental Protection
Bureau of Resource Protection

Submitted by

City of Cambridge
Department of Public Works

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Official: Louis A. DePasquale
City Manager, City of Cambridge

05/01/2018
Date

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1. Purpose of Report

This report has been prepared in accordance with Part I, Section D of Permit No. MA0101974, issued to the City of Cambridge Department of Public Works on September 30, 2009. The permit authorizes the City of Cambridge to discharge flow from twelve (12) Combined Sewer Overflows (CSO) located in eleven (11) regulator structures to the receiving water bodies named in the permit.

The City of Cambridge is additionally required to provide a comparison between the precipitation for the year and the precipitation of the typical year under future planned conditions in the MWRA Final CSO Facilities Plan or "Notice of Project Change for the Long Term CSO Control Plan for Alewife Brook" document. Also, required for each CSO is a comparison between the activation volume and frequency for the year and the volume and frequency during a typical year under future planned conditions.

Finally, an evaluation was performed of whether the CSO activation volumes and frequencies for 2017 are in accordance with the estimate in the MWRA Final CSO Facilities Plan or the report entitled "Notice of Project Change for the Long Term CSO Control Plan for Alewife Brook", given the precipitation which occurred during the year, and the CSO abatement activities which have been implemented. Where CSO discharges are determined to be greater than the activation frequency or volume in either document, an assessment of the results was completed and documented. A discussion of remaining CSO abatement activities and an assessment of the impact of those projects on attaining the level of CSO control identified in the relevant document or any amendments is provided in this document.

2. Hydraulic Model Updates

The existing hydraulic model was adjusted prior to the 2017 CSO monitoring assessment. Model re-calibration was performed under both dry and wet weather conditions using 2017 flow data, when available, for the systems listed below. The Chartered Institution of Water and Environmental Management (CIWEM) Urban Drainage Group has established guideline tolerances for wet weather and dry weather flow calibration in its Code of Practice for the Hydraulic Modeling of Sewer Systems. These guidelines were referenced during calibration of the Cambridge network model.

2.1 CAM401B

Dry and wet weather re-calibration was performed for areas upstream of the CAM401B CSO regulator. Overall, dry weather flows were slightly increased and wet weather response was decreased in order to replicate flow meter data more accurately. Simulated peak flows and flow volumes were deemed satisfactory, as the modeled-to-metered comparisons fell within the acceptable CIWEM guidelines.

2.2 CAM002

CAM002 area model re-calibration could only be performed under dry weather flow conditions as there were no wet weather periods with adequate and reliable data. Flow meter readings did not capture any wet weather flow response at this regulator during the 2017 storm events. However, the water level readings did capture significant changes in flow depth. Dry weather flow calibration resulted in a better match of the diurnal patterns and met the CIWEM guidelines for dry weather flow calibration. Even though wet weather flow re-calibration could not be performed, the model results accurately replicated the reported CAM002 CSO regulator activations in 2017.

2.3 CAM017

In the CAM017 area, MWRA's meter CB-SO1 in the Cambridge Branch Sewer in Warren Street was used to re-calibrate dry and wet weather flows in this area. Model re-calibration resulted in simulated peak flows and flow volume comparisons meeting the guidelines for multiple storm events. Level data in the Binney Street combined sewer, upstream of the CAM017 regulator, was also provided by MWRA and used to calibrate the model response in this conveyance conduit. Since only depth data was available in 2017 for the Binney Street sewer conduit, additional flow monitoring is proposed during the 2018 CSO analysis along the Binney Street brick sewer upstream of the regulator.

2.4 Other Model Updates

In addition to the model calibration carried out at three of the regulators, the following adjustments were made to the Cambridge network model during the 2017 CSO analysis;

- Added detailed Belmont sanitary model connected to the MWRA interceptors in the Alewife Brook and Charles River basins, respectively;
- Removed Waverly and Erie Street underflow connection to the MWRA (currently plugged);
- Removed underflow connection to the MWRA system at Pacific at Albany Street as field inspections indicated it was clogged in 2017. This underflow has recently been reopened;
- Adjusted operation of the Cottage Farm wet weather sluice gates to shut when a level of 95 feet is reached instead of 94 feet used last year (in MDC Datum).

3. Combined Sewer Overflow Monitoring Plan

As part of the 2017 Annual CSO reporting process, a review of the available meter data for 2017 was performed. This data review was used to identify periods with good quality meter data that could be used to cross-check against model results and also identify potential meter malfunctions and data discontinuities. CSO activations and volumes presented in this report are based on model-simulated data but they were cross-checked against meter data, when available. Where flow meter data was available, the modeled and metered CSO activations were generally well correlated.

3.1 Existing CSO monitoring methodology

3.1.1 Existing CSO Structures

In accordance with the City of Cambridge's current CSO permit, the city has a total of twelve CSOs located in 11 regulator structures (listed in Table 3.1), five CSOs and regulator structures are located on the Charles River and seven CSOs and six regulator structures are located on Alewife Brook.

Seven of the twelve existing CSOs are currently open, four located on the Alewife Brook and three on the Charles River. On the Alewife Brook, the CAM004 and CAM400 regulators were permanently closed and CAM002B is temporarily closed and will be re-opened in June 2018. On the Charles River, both CAM009 and CAM011 have been temporarily closed. Figure 3.1 presents the locations of the seven active CSOs throughout the City of Cambridge.

Table 3.1 Summary of Combined Sewer Regulator Structures

Regulator Structure	Location	Status	Waterbody
CAM 001	Alewife Brook Parkway @ Foch St.	Open	Alewife Brook
CAM 002	2A-Massachusetts Ave. at Alewife Brook Parkway	Open	Alewife Brook
	2B-Massachusetts Ave. at Alewife Brook Parkway	Closed[1]	Alewife Brook
CAM 004	Fresh Pond Rotary	Closed[2]	Alewife Brook
CAM 400	Alewife Brook Parkway and Harrison Avenue	Closed[3]	Alewife Brook
CAM 401A	Sherman Street at railroad crossing	Open	Alewife Brook
CAM 401B	Massachusetts Ave. at Alewife Brook Parkway	Open	Alewife Brook
CAM 005	Mount Auburn Street @ Lowell Street	Open	Charles River
CAM 007	Memorial Drive at Hawthorne Street	Open	Charles River
CAM 009	Memorial Dr. at Old Murray Rd.	Closed[4]	Charles River
CAM 011	Plympton St. @Memorial Dr.	Closed[4]	Charles River
CAM 017	Binney Street at Land Blvd.	Open	Charles River

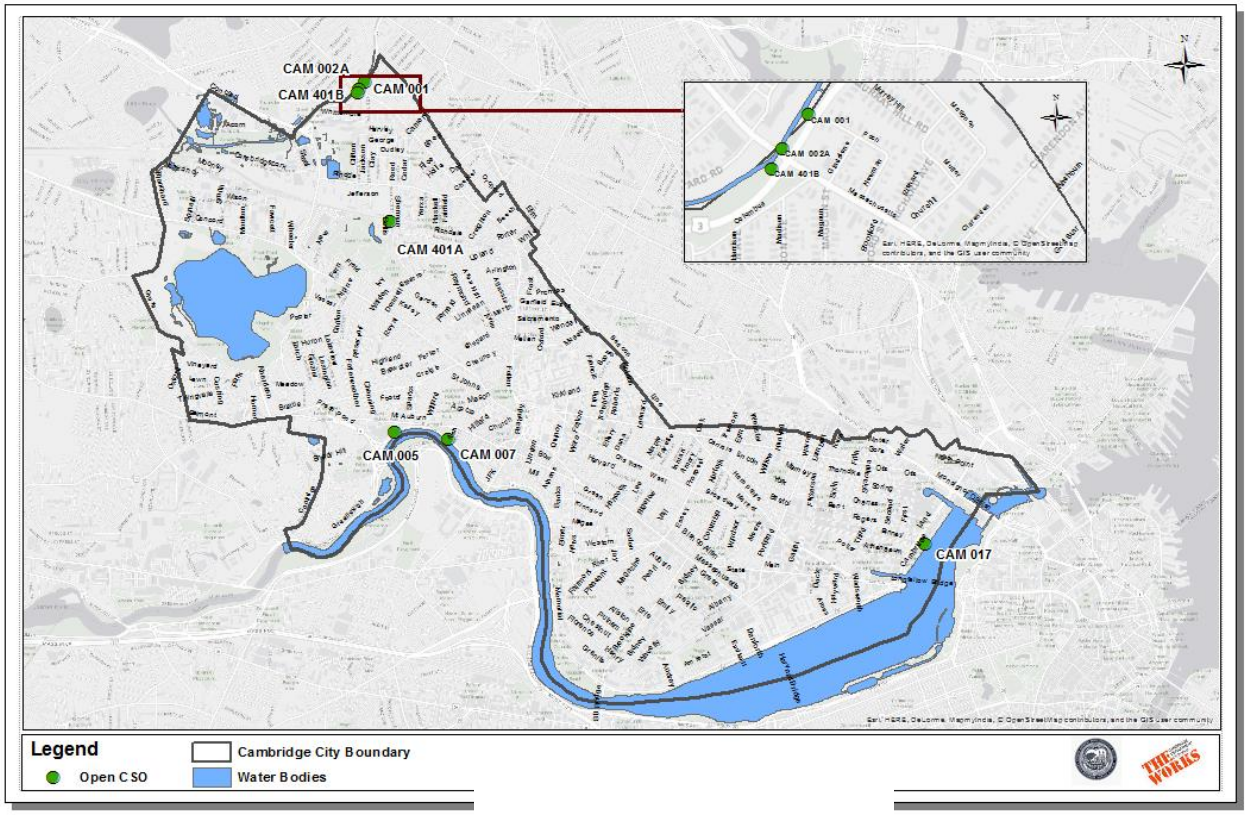
[1] Temporarily Closed-To be reopened in June 2018

[2] Permanently closed on December 27, 2015

[3] Permanently closed on March 31, 2011

[4] City retains the right to re-open once a hydraulic study is completed

Figure 3.1 Active CSO Regulator Locations



3.1.2 CSO Monitoring

The following section outlines the current methodology for CSO monitoring at each location including metering as well as network model representation and simulation.

CAM 001 Monitoring

The permitted configuration for CAM 001 consisted of an 18" overflow pipe with a steel plate at the end. The plate covered the bottom portion of the 18" pipe. The top of the steel plate was 5-3/4 inches below the crown of the 18" pipe. This created a restricted 70.6 square inch opening with an overflow elevation of 4.36 Feet (CCB).The final configuration for CAM 001 consists of a 10" PVC pipe outlet with a 15" PVC elbow for floatable controls. There is also a brick weir set as elevation 4.36 feet (CCB). The configuration of the CAM001 regulator has not changed since the 2016 Annual CSO Report submission.

The metered data recorded at the CAM 001 outfall showed the highest water levels on October 30th 2017. The model predicted a very small activation during that event that is reported herein.

CAM 002A Monitoring

Spill events and CSO volumes at CAM002 were previously calculated using a standard weir equation for each storm event using the SCADA data for depth inside the CAM002 regulator structure (on Mass Avenue at Alewife Brook Parkway). The depth data available on the CAM002 regulator pipe showed a clear rainfall response but it was unclear if the level readings corresponded to CSO activations. The CAM002A outfall pipe flow meter data had only negative values due to the backflow from the Alewife Brook and could not be used for confirmation. However, two CSOs at this regulator were reported by DPW in 2017 due to backflow from the Alewife Brook (one on July 12th and another one on October 30th). The Infoworks ICM network model replicated these spills successfully and was used to determine the spill count and volume at CAM002A. A third, very small activation (0.03MG) was predicted by the model on 9/15 and has been included in this report because the depth of flow measured by the meter was close to an activation level.

CAM 004 Monitoring

The CAM 004 CSO regulator was located within the Drain Vault 5 structure in the Alewife Brook Rotary at the junction of Concord Avenue and The Alewife Brook Parkway. The CAM004 outfall was permanently closed on December 27, 2015, as part of a multiyear construction project in accordance with the MWRA's LTCP for the Alewife Brook.

CAM 400 Monitoring

Sewer separation work in this area was completed in March 2011 and the CAM 400 CSO regulator was permanently closed in accordance with the MWRA's LTCP for the Alewife Brook.

CAM 401A Monitoring

The CAM 401A regulator structure includes floatables control brush screens mounted on a static weir structure, as well as flap gates located just downstream of the weir. Due to the complicated nature of the structure and the difficulty identifying spill activations and calculating flow, the City's model was used to determine the activation volume at the CAM 401A regulator. Where available, data from the depth meter sensor located upstream of the brush screens was compared to the model-simulated spill results. Depth sensor meter data was available for all 2017 except for November and December. The level meter identified two activations during 2017, one on July 12th and one on October 30th. The model correctly identified these two activations but also predicted two additional small activations during short but intense storms that the level sensor did not capture as spills. Consequently only the July 12th and October 30th activations were considered valid and reported herein.

CAM 401B Monitoring

At the CAM 401B regulator, depth and flow is recorded inside of the regulator structure and a flow meter is mounted on the 401B CSO outfall pipe. Flow level data within the regulator captured water levels above the activation threshold on January 27, July 12 and October 30, 2017. Level data for the first level activation event seemed suspicious as there was no precipitation on that day and it was discarded due to a meter malfunction, meter data was erratic for a one hour period. Level readings for the second activation event were slightly above the activation threshold (5.7ft versus 5.6ft needed

to activate) and within potential meter reading error. The model did not capture this spill but it was very close. Level in the third event was well above the activation threshold. One CSO activation is reported at the CAM401B regulator for 2017.

CAM 005 Monitoring

The CAM 005 outfall is monitored with a depth/velocity sensor mounted on the upstream side of the outfall weir. Water depth data was available for all year except from 05/30 to 06/18 while flow meter data was missing for the whole year. The flow depth data was reviewed for correlation with the rainfall data, as well as correlation with the InfoWorks ICM network model's simulation of spills at CAM005. It should be noted that in the case of CAM005, backwater condition from the Charles River have been observed on the outfall pipe on a regular basis as its invert is below normal river levels.

The model indicated two CSO activations occurred at CAM005 in 2017 (July 12th and October 30th) as shown in Table 3.3. The depth meter data showed only positive values (activations) for these same two storms on July 12th and October 30th so there was good agreement between the model and the meter.

CAM 007 Monitoring

The CAM007 CSO regulator has also been known to experience backwater conditions from the Charles River. This structure is also monitored using depth sensors within the regulator structure but data was missing for the month of January and from 05/30 to 06/16. The metered data was used to identify periods of increased depth in the regulator and the data was then correlated to the rainfall and the model's simulation of spills at CAM007. CSO volumes were reported using the model predictions. Two spills were predicted at this location in 2017 (July 12th and October 30th, the July activation was very small (0.0004MG)).

CAM017 Monitoring

The CAM 017 regulator structure underwent a major construction project in 2013 that reconfigured the weir structure. Previously, the overflows at CAM 017 were regulated by a 10-ft wide static weir at an elevation of 14.39ft-CCB. Three bending weirs were installed in different chambers. Two of the weirs are set at an elevation of 15.19ft-CCB and are 7.5-ft wide. The other bending weir was set at 15.08ft-CCB and is 9.5-ft wide. The new weirs have a variable release elevation based on the hydraulic conditions in the system. CSO meter data for this regulator was not available during 2017, therefore the CSO results from the 2017 model simulation are being reported. However, flow depth readings upstream, of the CAM 017 regulator were made available by the MWRA. The hydraulic model identified one spill during 2017, which occurred on October 30th. The MWRA depth meter readings are inconclusive during that storm because there are sudden drops of water elevation (around 8 feet) at the peak of the storm but the recorded peak levels are quite close to the threshold level.

3.2 Summary of 2017 CSO Activations

In 2017 there were a total of seven activations at the six Alewife Brook CSO regulators and five activations occurred at the three Charles River CSO regulators. A summary of 2017 activations for the Alewife Brook and Charles River outfalls is provided in Table 3.2 and 3.3, respectively.

3.2.1 Alewife Brook CSO Results

The four active CSO outfalls along Alewife Brook spilled a total on seven occasions in 2017 resulting in a total of approximately 2.9MG of CSO. There was one spill forecasted at CAM001 for 2017. The model simulation results showed three spill events at CAM002 during 2017, which matched well with significant water level increases recorded by the meter in the regulator structure.

As previously mentioned, the CAM 401A regulator is monitored using a depth sensor and, due to the complicated nature of the structure, the City's InfoWorks ICM model was used to determine spill volumes. The depth sensor data was reviewed and activations were observed on July 12 and October 30, 2017, which were also predicted by the hydraulic model with a total volume of 1.7MG. The model predicted one activation at CAM 401B, which aligned well with the third and largest activation captured by the depth meter on October 30.

. **Table 3.2 Summary of 2017 Activations at Alewife Brook CSOs**

Receiving Water	Outfall No.	Results	
		2017 CSO Spills	2017 CSO Volume (MG)
Alewife Brook	CAM 001	1	0.013
	CAM 002A	3	1.023
	CAM 002B[1]	-	-
	CAM 004[2]	-	-
	CAM 400[3]	-	-
	CAM 401A	2	1.704
	CAM 401B	1	0.185
	TOTAL	**7**	**2.925**

1 CAM 002B is temporarily closed
2 Permanently closed December 27, 2015
3 Permanently closed on March 31, 2011

3.2.2 Charles River CSO Results

The level meter at the CAM005 regulator recorded two CSO activations on July 12 and October 30, 2017. Model simulations for 2017 were in strong agreement and captured spills on the same dates with a total volume of 1.18MG.

Similar to CAM005, two spills on July 12 and October 30, 2017, were modeled at the CAM007 regulator structure. Flow depth data at CAM007 showed a significant rainfall response during those two events as well. The spill in July was very small with a total of 0.0004MG.

Flow depth readings upstream, of the CAM 017 regulator were made available by the MWRA. After model re-calibration of the CAM017 catchment, model results and reported depths were in strong agreement. The model predicted one activation during the October 30th, 2017 event. The MWRA

depth meter readings are inconclusive during that storm because there are sudden drops of water elevation (around 8 feet) at the peak of the storm. These wide fluctuations are suspected to be faulty meter readings that might have been caused by quick water elevation changes in the Binney Street combined sewer once the bending weirs in the regulator become active affecting meter performance.

Table 3.3 Summary of 2017 Activations at Charles River CSOs

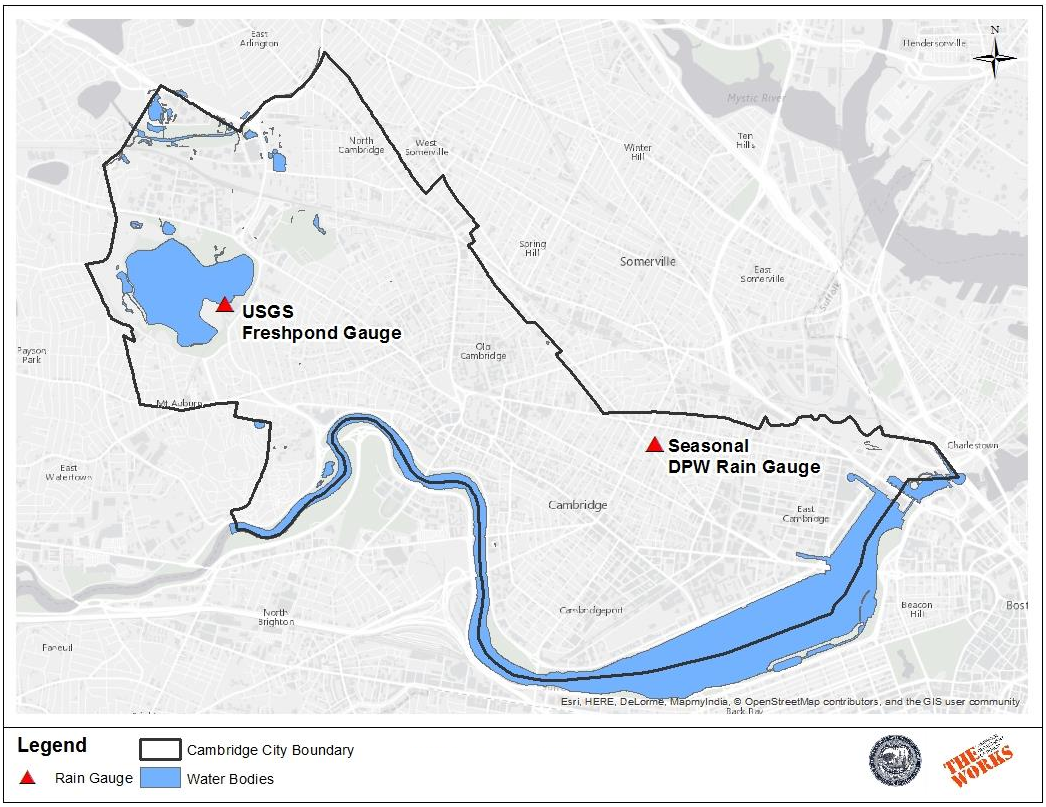
Receiving Water	Outfall No.	Modelled (Metered) Results	
		2017 CSO Spills	2017 CSO Volume (MG)
Charles River	CAM 005	2	1.177
	CAM 007	2	0.749
	CAM 009	-	-
	CAM 011	-	-
	CAM 017	1	2.057
	TOTAL	**5**	**3.983**
*CAM 009 and CAM 011 are temporarily closed			

3.3 Rainfall Characteristics

Under the City of Cambridge Combined Sewer Overflow Permit MA0101974, as part of the CSO NPDES Annual Report, precipitation data from the previous calendar year (2017) must be analyzed against the typical year (1992) rainfall record.

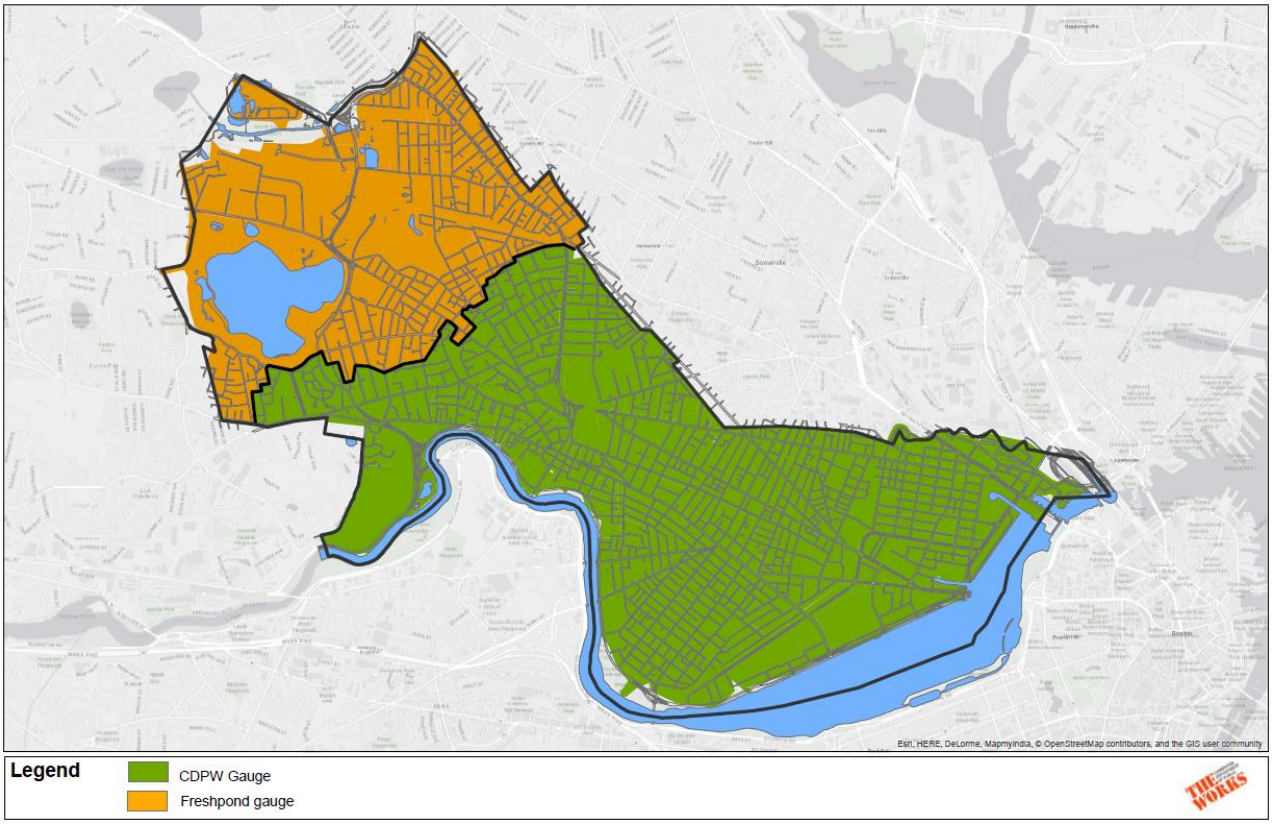
The City of Cambridge currently operates one seasonal rain gauge on the roof of the Cambridge DPW that in 2017 was operational from March 27, 2017 through December 31, 2017. The Cambridge DPW gauge data is presented in Appendix I. In addition to the seasonal DPW rainfall gauge, a second rain gauge operated by the USGS is in Fresh Pond. Figure 3.2 shows the location of the two rainfall gauges used to obtain 2017 rainfall data.

Figure 3.2 Rain Gauge Locations



Given the geographic location of the two rain gauges in the two different watersheds in the City (Alewife Brook and Charles River), it was determined that the USGS Fresh Pond gauge would be most spatially representative of the Alewife Brook subcatchments and CSOs, whereas the DPW seasonal gauge provides a more spatially representative rainfall data for the Charles River subcatchments and CSOs. Figure 3.3 presents the model subcatchments tributary to the Alewife Brook CSOs and those tributary to the Charles River CSOs.

Figure 3.3 Model Rain Gauge Distribution



The Cambridge DPW gauge is removed over the winter months, therefore in order to create a year-long rainfall series for the Charles River catchments, missing rainfall data was filled in with rainfall data from the USGS gage from January 1st through March 26th, 2017. The two 2017 annual rainfall series (the USGS Fresh Pond Gauge data for the Alewife Brook and the hybrid series data for the Charles River catchments) were compared to the typical year rainfall in order to assess any similarities and differences in the rainfall distribution and patterns.

As shown in Graph 3.1, the accumulated 2017 USGS Fresh Pond and CDPW rainfall data are both less than the typical year (1992) rainfall. In addition, Figure 3.4 presents a map of the twenty-year average precipitation in the Northeast United States, indicating that the average total precipitation from 1981 to 2010 is between 45 and 50 inches, which is greater than the observed 2017 total rainfall (41.58 inches in the DPW/USGS hybrid rainfall series and 40.17 inches in the USGS rainfall series at Fresh Pond).

Graph 3.1
Typical Year Rainfall versus 2017 Rainfall

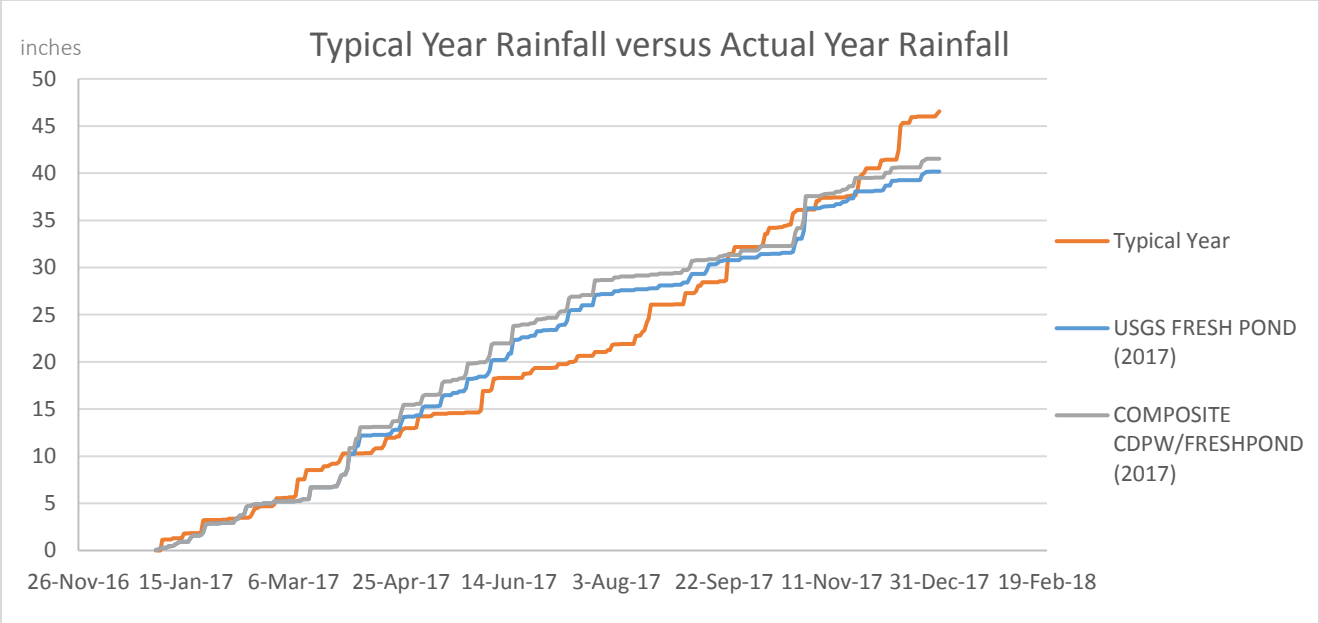
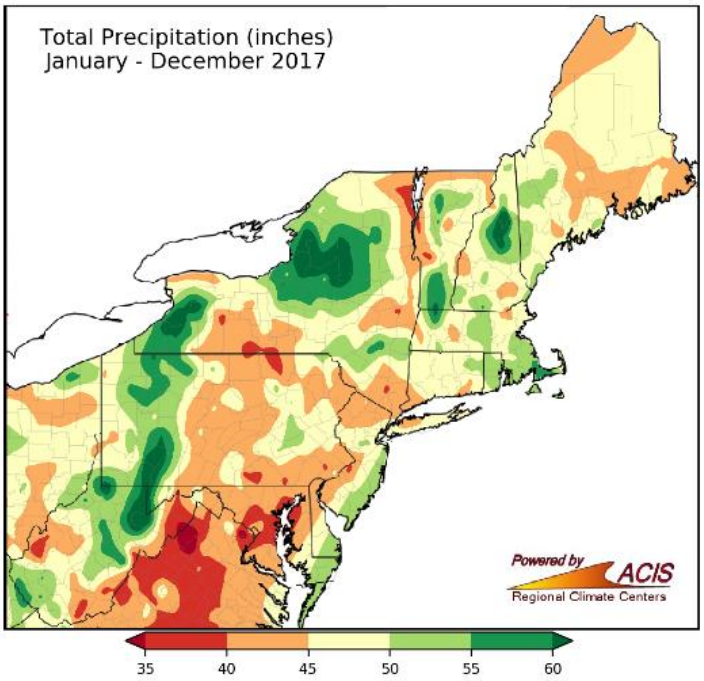


Figure 3.4 Twenty Year Average Rainfall in the Northeast US



[1]Map from Northeast Regional Climate Center

A review of the distribution of storms in 2017 by total rainfall was performed. Tables 3.4 and 3.5 present a comparison of storm frequency and volumes within various ranges of total precipitation for the two 2017 series and for the typical year. The USGS/DPW hybrid gauge recorded two storms more than the typical year (120 versus 118). On the other hand, the 2017 USGS rain series had a larger number of storms totaling 129 for the year. The number of storms were counted assuming an inter-event time equal to six hours. Both 2017 rainfall series had a smaller total rainfall than the typical year (11.21% and 14.22% less for the hybrid series and the USGS Fresh Pond series, respectively). The Fresh Pond gage had 88 storms in the <0.25 inch range, with a total volume of 6.50in and the hybrid meter recorded less storms in this lower range (83) with very similar volume (6.48 inches).

The number of storms and volume in the 0.25 to 0.50 inch range was slightly higher in the typical year than in the 2017 as shown in Tables 3.4 and 3.5.

For storms with volumes greater than 1.0 inch and less than 2.0 inches, there was a significant difference between the 2017 hybrid and the Fresh Pond rainfall series. Both series had similar number of storms. However, the hybrid series had an overall volume for this range higher than the typical year, but overall, the total volume and frequency for this series was close to the typical year's. On the other hand, the 2017 Fresh Pond series had significantly less volume (15.06in in the typical year vs. 12.92 in 2017).

Both 2017 Fresh Pond and hybrid rainfall have 2 storms above 2 inches, while the typical year rainfall includes three storms of this magnitude.

Table 3.4 Frequency of Rainfall Events per Storm Depth Range

Rainfall Series	Total Rainfall (inches)	Total Number of Storms	Number of Storms by Volume				
			Volume <0.25 inches	Volume 0.25 to 0.50 inches	Volume 0.5 to 1.0 inches	Volume 1.0 to 2.0 inches	Volume >=2.0 inches
Typical Year	46.83	118	70	17	17	11	3
CDPW/Fresh Pond Composite	41.58	120	83	13	11	11	2
Fresh Pond (USGS)	40.17	129	88	14	15	10	2

Table 3.5. Annual Rainfall Volume Distribution per Storm Depth Range

Rainfall Series	Total Rainfall (inches)	Total Number of Storms	Total Rainfall Volume of Storms				
			Volume <0.25 inches	Volume 0.25 to 0.50 inches	Volume 0.5 to 1.0 inches	Volume 1.0 to 2.0 inches	Volume >=2.0 inches
Typical Year	46.83	118	4.52	6.33	12.01	15.06	8.91
CDPW/Fresh Pond Composite	41.58	120	6.48	4.72	8.22	15.95	6.21
Fresh Pond (USGS)	40.17	129	6.50	5.09	10.27	12.92	5.39

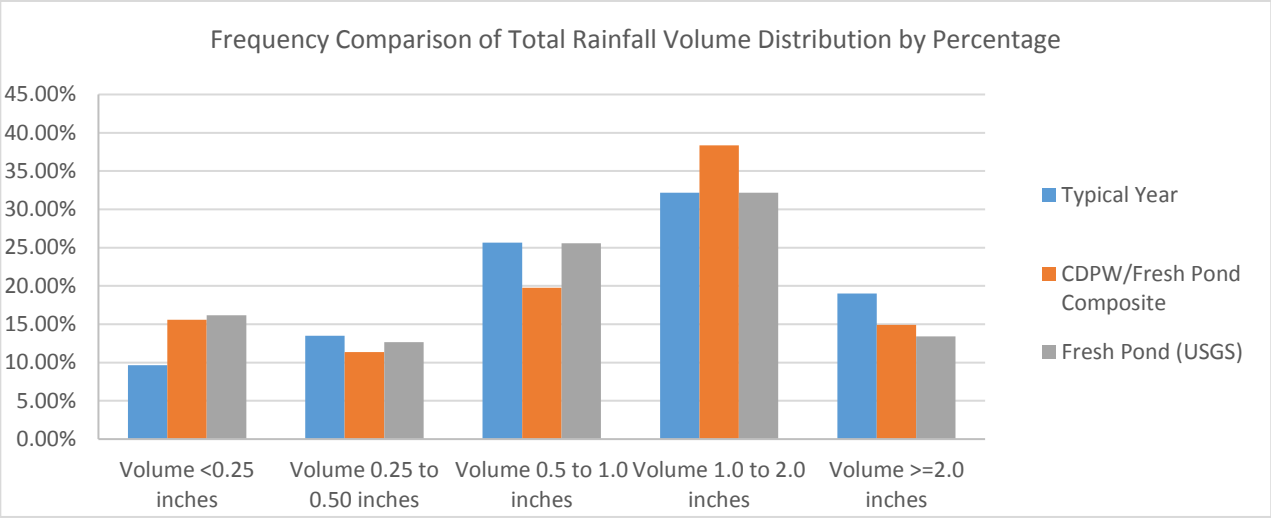
Table 3.6 Percent of Annual Rainfall Volume per Storm Depth Range

Rainfall Series	Total Rainfall (inches)	Total Number of Storms	Volume of Storms by Percentage				
			Volume <0.25 inches	Volume 0.25 to 0.50 inches	Volume 0.5 to 1.0 inches	Volume 1.0 to 2.0 inches	Volume >=2.0 inches
Typical Year	46.83	118	9.65%	13.52%	25.65%	32.16%	19.03%
CDPW/Fresh Pond Composite	41.58	120	15.58%	11.35%	19.77%	38.36%	14.94%
Fresh Pond (USGS)	40.17	129	16.18%	12.67%	25.57%	32.16%	13.42%

Table 3.6 and Graph 3.2 present the distribution of the total volume of storms by percentage. In 2017, the hybrid series had rainfall mostly concentrated in the 0.5-1.0inch range and the 1.0-to-2.0 inch range, being the latter the most dominant in overall volume. On the other hand, the 2017 USGS series and the typical year had most of the rainfall concentrated in the 0.50-to-1.0 inch and the 1.0-to-2.0 inch range with the latter being less dominant when compared to the hybrid series. However, the typical year had a larger amount of annual rainfall accumulated in events greater than 2 inches compared with the amount in 2017.

This variability amongst the 2017 series and the typical year indicates that significant deviations with regards to CSO performance are to be expected between CSOs in the Alewife Brook versus the Charles River basins. Overall performance measured against the typical year is a function not only of storm volumes but also of storm intensity, which is analyzed in this section.

Graph 3.2 Frequency Comparison of Total Rainfall Volume Distribution by Percentage



In addition to the analysis of storm events by total rainfall depth, the storm intensities of the 2017 and the typical year rainfall series were also compared. Table 3.7 presents the distribution of storms among of the rainfall series by 15-minute peak intensity. Table 3.8 presents the average and peak intensities for storms greater than 1 inch in depth and Table 3.9 presents the same metrics for storm events with a 15-minute peak intensity greater than 0.40in/hr.

Table 3.7 Number of Storm Events at Selected Ranges of 15-min Peak Intensity

Rainfall Series	No. of Storms	Total Rainfall	Number of Storms by Peak Intensity				
			0.01 to 0.10	0.10 to 0.25	0.25 to 0.50	0.50 to 1.0	> 1.0
		(inches)	(in/hr)	(in/hr)	(in/hr)	(in/hr)	(in/hr)
Typical Year	118	46.83	60	27	16	11	4
CDPW/Fresh Pond	120	41.58	53	39	14	10	4
Fresh Pond (USGS)	129	40.17	64	35	13	11	6

As outlined in Table 3.8, the typical year includes fourteen storm events over one inch whereas both hybrid and the Fresh Pond gauge recorded twelve and nine events greater than one inch in total rainfall, respectively. Storm events were counted assuming an inter-event time equal or greater than six hours (i.e. if no rain occurs between the end of one rainfall period and the beginning of the next then they are counted as two separate events). Recurrence intervals listed in Table 3.8 indicate that the typical year has three storms over one inch in rainfall (12/11/1992, 10/23/1992, and 9/22/1992) near or above the 1 year recurrence interval, whereas the 2017 data showed two storm events

(10/29/2017 and 3/31/2017) with a recurrence interval greater than 1 year for the hybrid series and only one (10/29/2017) for the Fresh Pond gauge.

Table 3.8 Comparison of Storms Greater 1 Inch of Total Rainfall, Typical Year Versus 2017

Rainfall Series	No. of Storms	Date	Duration (h)	Total Rainfall (in)	Average Intensity (in/h)	15-min Peak Intensity (in/h)	Recurrence Interval
Typical Year	14	12/11/1992	39.5	3.88	0.1	0.24	2-5Y
		9/22/1992	22	2.79	0.13	0.65	1-2Y
		5/31/1992	29.3	2.24	0.08	0.48	<1Y
		3/6/1992	34	1.89	0.06	0.22	<1Y
		11/21/1992	34.8	1.88	0.05	0.36	<1Y
		8/17/1992	25.5	1.81	0.07	0.8	<1Y
		1/23/1992	16	1.36	0.09	0.4	<1Y
		6/5/1992	17.3	1.34	0.08	1	<1Y
		9/3/1992	12.3	1.19	0.1	0.68	<1Y
		10/23/1992	3	1.18	0.39	1.08	~1Y
		1/4/1992	20.8	1.15	0.06	0.48	<1Y
		5/2/1992	5.5	1.14	0.21	1.32	<1Y
		8/15/1992	38.5	1.1	0.03	0.28	<1Y
		4/16/1992	30	1.02	0.03	0.28	<1Y
CDPW/Fresh Pond Composite	13	10/29/2017	16	3.39	0.21	1.56	2-5 Y
		3/31/2017	32.3	2.82	0.09	0.26	1-2Y
		6/16/2017	14	1.88	0.13	0.78	<1Y
		10/24/2017	46.3	1.79	0.04	1.42	<1Y
		4/25/2017	33.3	1.72	0.05	0.58	<1Y
		6/5/2017	35.5	1.66	0.05	0.28	<1Y
		7/24/2017	15.8	1.56	0.10	0.64	<1Y
		5/25/2017	24.5	1.49	0.06	1.16	<1Y
		3/14/2017	15.8	1.25	0.08	0.32	<1Y
		4/6/2017	11.8	1.21	0.10	0.42	<1Y
		5/14/2017	16.8	1.16	0.07	0.34	<1Y
		7/12/2017	4	1.12	0.28	2.34	<1Y
		1/23/2017	22.50	1.11	0.05	0.28	<1Y

Rainfall Series	No. of Storms	Date	Duration (h)	Total Rainfall (in)	Average Intensity (in/h)	15-min Peak Intensity (in/h)	Recurrence Interval
Fresh Pond (USGS)	12	10/29/2017	23.8	3.22	0.14	1.6	2-5 Y
		3/31/2017	31.3	2.17	0.07	0.24	<1Y
		6/4/2017	56.3	1.74	0.03	0.68	<1Y
		6/16/2017	10	1.46	0.15	0.68	<1Y
		10/24/2017	46.8	1.45	0.03	0.88	<1Y
		4/25/2017	39.3	1.38	0.04	0.32	<1Y
		5/25/2017	37.3	1.32	0.04	0.8	<1Y
		3/14/2017	15.8	1.25	0.08	0.32	<1Y
		1/23/2017	22.5	1.11	0.05	0.28	<1Y
		7/24/2017	19.3	1.1	0.06	0.44	<1Y
		4/6/2017	12.3	1.09	0.09	0.48	<1Y
		7/12/2017	2.8	1.02	0.36	2.32	<1Y

Table 3.9 lists storms with peak intensities greater than 0.40in/hr and their average intensities for all three rainfall series.

Table 3.9 Comparison of Storms with 15-min Peak Intensities Greater than 0.40 Inches/hour, Typical Year Versus 2017

	No. of Storms	Date	Duration (hours)	15-min Peak Intensity	Average Intensity	Recurrence Interval
Typical Year	14	9/9/1992	0.5	1.72	1.14	<1Y
		5/2/1992	5.5	1.32	0.21	<1Y
		8/11/1992	10.5	1.24	0.08	<1Y
		10/23/1992	3	1.08	0.39	~1Y
		6/5/1992	17.3	1	0.08	<1Y
		7/11/1992	0.5	0.84	0.44	<1Y
		8/17/1992	25.5	0.8	0.07	<1Y
		10/10/1992	5.3	0.72	0.09	<1Y
		10/10/1992	6.5	0.68	0.1	<1Y
		9/3/1992	12.3	0.68	0.1	<1Y
		7/31/1992	18.8	0.68	0.03	<1Y

	No. of Storms	Date	Duration (hours)	15-min Peak Intensity	Average Intensity	Recurrence Interval
		9/22/1992	22	0.65	0.13	<1Y
		7/29/1992	0.5	0.64	0.4	<1Y
		6/20/1992	2.3	0.56	0.15	<1Y
		1/14/1992	9.5	0.52	0.05	<1Y
		5/31/1992	29.3	0.48	0.08	<1Y
		1/4/1992	20.8	0.48	0.06	<1Y
		3/11/1992	12.3	0.48	0.08	<1Y
		6/20/1992	0.3	0.44	0.44	<1Y
		10/11/1992	12.8	0.44	0.05	<1Y
CDPW/Fresh Pond Composite	17	7/12/2017	4	2.34	0.28	<1Y
		10/29/2017	16	1.56	0.21	2-5 Y
		10/24/2017	46.3	1.42	0.04	<1Y
		5/25/2017	24.5	1.16	0.06	<1Y
		6/16/2017	14	0.78	0.13	<1Y
		9/6/2017	0.5	0.76	0.42	<1Y
		9/6/2017	9.3	0.70	0.08	<1Y
		10/9/2017	11	0.64	0.03	<1Y
		7/24/2017	15.8	0.64	0.10	<1Y
		6/27/2017	3.3	0.62	0.12	<1Y
		4/25/2017	33.3	0.58	0.05	<1Y
		7/18/2017	0.5	0.58	0.40	<1Y
		5/19/2017	1	0.52	0.19	<1Y
		7/8/2017	2.8	0.52	0.08	<1Y
		5/5/2017	9.5	0.46	0.09	<1Y
		8/18/2017	4.8	0.44	0.03	<1Y
		4/6/2017	11.8	0.42	0.10	<1Y
Fresh Pond (USGS)	21	7/12/2017	2.8	2.32	0.36	<1Y
		10/29/2017	23.8	1.6	0.14	2-5 Y
		9/6/2017	0.5	1.44	0.78	<1 Y
		9/14/2017	6.5	1.24	0.06	<1 Y
		9/15/2017	1	1.24	0.59	<1 Y
		7/18/2017	3	1.12	0.17	<1 Y
		10/24/2017	46.8	0.88	0.03	<1 Y
		6/27/2017	3	0.84	0.16	<1 Y
		6/14/2017	1	0.8	0.51	<1 Y

	No. of Storms	Date	Duration (hours)	15-min Peak Intensity	Average Intensity	Recurrence Interval
		5/19/2017	1.3	0.8	0.18	<1 Y
		5/25/2017	37.3	0.8	0.04	<1 Y
		8/23/2017	1.5	0.8	0.21	<1 Y
		6/4/2017	56.3	0.68	0.03	<1 Y
		6/16/2017	10	0.68	0.15	<1 Y
		5/5/2017	23.8	0.6	0.04	<1 Y
		9/6/2017	10.8	0.52	0.05	<1 Y
		6/13/2017	0.5	0.52	0.34	<1 Y
		4/6/2017	12.3	0.48	0.09	<1 Y
		6/20/2017	2.8	0.44	0.06	<1 Y
		7/24/2017	19.3	0.44	0.06	<1 Y
		5/31/2017	1.8	0.44	0.01	<1 Y

Comparison of peak intensity distributions of the 2017 rainfall series and the typical year shows that 2017 Fresh Pond rainfall data had approximately 50% more storms with a peak intensity higher than 0.40 in/hr. The typical year has a total of five storms with an average intensity greater than 0.30in/h. Four out of these five have a duration of 30 minutes or less and only the 10/23/1992 is more significant in terms of duration (3 hours) and rainfall accumulation (1.18 inches). On the other hand, the 2017 hybrid series had two events with an average rainfall intensity greater than 0.30in/h on 9/6/2017 and 7/18/2017. Both events are smaller in volume (0.21 inches and 0.2inches) and 30 minutes in duration. The 2017 Fresh Pond rainfall series has 5 storms (7/12/2017, 9/6/2017, 9/15/2017, 6/14/2017 and 6/13/2017) with average intensity greater than 0.30 inch/hour, out of which three (7/12/2017, 9/15/2017 and 6/14/2017) have a duration of more than 30 minutes and a rainfall accumulation of 1.02 inches, 0.59 inches and 0.51 inches, respectively.

3.4 Combined Sewer Overflow Comparison

With the analysis of the 2017 rainfall complete and the CSO spill count and activations for 2017 calculated, the 2017 CSO results were then compared to those anticipated during the typical rainfall year. Table 3.10 presents the 2017 and typical year model simulation results for the existing conditions Cambridge network model, as well as the LTCP model. As noted previously, there are a number of inactive CSOs on both the Alewife Brook and the Charles River systems that are included in the table for consistency. The main differences between the 2017 and LTCP condition include:

1. CAM002 in LTCP (not completed)
   - Re-opening of CAM002B (June, 2018)
   - Remove temporary plate partially blocking the CAM002A outfall pipe

- Remove bulkhead to connect CAM002 regulator to the Alewife Brook Conduit

2. SOM001-A in LTCP (note that SOM001-A is not owned by Cambridge but its modification may affect the performance of Cambridge's CSOs):
   - Expand the underflow pipe equivalent diameter from 2 to 3 feet

   Even though not part of Cambridge's LTCP, potential, long-term sewer separation work in the Charles River watershed tributary to the North Charles Met and North Charles Relief sewers is expected to further reduce CSO activations at CAM005 and CAM007.

Table 3.10 Comparison of 2017 and Typical Year CSO Results

	2017 RAINFALL UNDER 2017 SYSTEM CONDITIONS		TYPICAL YEAR RAINFALL UNDER 2017 SYSTEM CONDITIONS		TYPICAL YEAR RAINFALL WITH LONG TERM CONTROL PLAN*	
OUTFALL	ACTIVATION FREQUENCY	VOLUME (MG)	ACTIVATION FREQUENCY	VOLUME (MG)	ACTIVATION FREQUENCY	VOLUME (MG)
ALEWIFE BROOK						
CAM 001	1	0.013	1	0.010	5	0.190
CAM 002	3	1.023	6	1.246	4	0.690
CAM 004[1]	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	N/A
CAM 400[2]	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	N/A
CAM 401A	2	1.704	6	2.549	5	1.610
CAM 401B	1	0.185	2	0.115	7	2.150
TOTAL	**7**	**2.925**	**15**	**3.920**	**21**	**4.630** [4]
CHARLES RIVER						
CAM 005	2	1.177	5	0.646	3	0.840
CAM 007	2	0.749	1	0.013	1	0.030
CAM 009[3]	0	0	0	0	2	0.010
CAM 011[3]	0	0	0	0	0	0
CAM 017	1	2.057	1	0.359	1	0.450
TOTAL	**5**	**3.983**	7	**1.018**	**7**	**1.330**

*VALUES REFLECT TARGET CSO VOLUMES AT LTCP COMPLETION AS PER CSO PERMIT. THESE ARE NOT MODEL RESULTS.

1. CAM 004 CLOSED ON DECEMBER 27, 2015
2. CAM 400 CLOSED ON MARCH 31, 2011
3. TEMPORARILY PLUGGED
4. THIS TOTAL DOES NOT INCLUED MWRA 003 AND SOM 001, THE TOTAL LTCP VOLUME OF CSO IS 7.29 MG PER YEAR IF THESE ARE INCLUDED

Alewife Brook Comparisons

The Alewife Brook in existing conditions showed a total of seven activations with 2.9MG volume under the 2017 rainfall series while in a typical year it resulted in a total of fifteen spills with 3.9MG in total. This is well below the targeted 4.63MG in a typical year in LTCP conditions.

CAM 001

Both the 2017 and typical year rainfall had one spill in current system conditions. Under 2017 conditions in a typical rainfall year, CAM001 meets the targeted total volume of 0.19MG during the typical year in LTCP conditions.

CAM 002

The 2017 rainfall under existing condition at CAM002 had three activations and a volume of 1.023MG. The typical year under 2017 system conditions generated six activations and a volume of 1.246MG, which is more than the targeted 0.69MG in LTCP conditions during a typical rainfall year in LTCP conditions. Adjustments to the CAM002 regulator are expected to reduce both the frequency and volume of spill at CAM002.

CAM 004

This structure was closed as of December 27, 2015 and the LTCP has CAM 004 closed since that date.

CAM 401A

In 2017, the model and depth meter predicted two overflows with 1.704MG of volume in current model conditions. In a typical year under current system conditions, the frequency and volume of activation would increase to six and 2.5MG, respectively. This is more than the targeted 1.61MG in LTCP conditions and in a typical year. However, the CAM401A and CAM401B (401A/B) systems must be looked at as a whole due to the high level of inter-connections between systems. If we look at these two CSO regulators as one system, then the targeted LTCP volume in a typical year is 3.76MG versus 2.66 MG in current system conditions.

CAM 401B

In 2017, the model forecasted a total of 0.185MG of spill under one activation. The typical year rainfall under current conditions would generate two activations with a total of 0.115MG. The typical year rainfall under LTCP predicted a total of 2.15MG, which is greater than the CSO volume generated by current system conditions. As previously stated, comparing the 401A/B system as a whole indicates that the combined, targeted LTCP volume in a typical year (3.76 MG) is being achieved with 2.66 MG in the current 2017 conditions model.

Charles River Comparisons

A summary of the CSO activations under different rainfall and system conditions is provided below.

CAM 005

The 2017 rainfall under the existing conditions had two activations with an overflow volume of 1.18MG, which is higher than in a typical rainfall year with 0.65MG. The typical year rainfall under LTCP conditions targets 0.84MG in a year, 30% higher than the CAM005 CSO volume in the existing system conditions.

CAM 007

2017 rainfall produced 2 spills under 2017 system conditions for a total of 0.75MG. The typical year rainfall under 2017 conditions would generate one spill with a total of 0.013MG according to the model. The targeted volume for CAM007 for a typical year under LTCP conditions is 0.03MG. The LTCP threshold would, therefore be achieved under the current 2017 system conditions.

CAM 009 and CAM 011

CAM 009 and CAM 011 are temporarily plugged. The LTCP has both outfalls open. The City of Cambridge plans to keep these outfalls closed until a more comprehensive study can be completed in this area on the effects of climate change and upstream conditions.

CAM 017

The 2017 rainfall under existing conditions produced one spill at CAM017. The Typical Year Rainfall under 2017 system conditions would generate 0.36MG of spill. This is 0.09MG lower than the targeted 0.45MG in a typical year under LTCP conditions. As additional data becomes available for the bending weir rotation, as well as the depth and velocity of flow at various points within the regulator, the model will be further calibrated using this data.

3.5 Monitoring Recommendations

The 2017 CSO data analysis carried out on both the metered CSO data and the modeled CSO simulations identified a number of recommendations for the 2018 CSO monitoring and analysis, as outlined below.

CAM 002

The two model-simulated spill events matched the dates of the reported spills on July 12 and October 30, 2017 at CAM002. It is recommended that the CAM002 outfall data be regularly reviewed during the upcoming year to identify any spurious readings that may be unrelated to rainfall, as well as any gaps in data availability. The model at CAM 002 should also be further enhanced with valid upstream inflow meter data and regulator level data to calibrate the model's representation of the CSO structure.

CAM 401A/401B

Given the complicated nature of the CAM401A regulator, the City should consider flow metering and recalibration of the tributary sewers upstream of the structure that might provide a more accurate understanding of CSO spills and volume at this location.

At CAM401B, the model's representation of CSO catchment was calibrated using SCADA data. Continuous review of the CAM401B meter data is recommended during the coming year to identify any spurious readings that may be unrelated to rainfall, as well as any gaps in data availability. The model at CAM 401B can also be further improved by using upstream inflow meter data and regulator level data to further calibrate the model's representation of the 401B CSO catchment.

CAM007

At CAM007 inspection of the regulator structure, flow metering and recalibration of the model are recommended in order to better capture activations during large storm events.

CAM017

As additional metered data for the CAM017 regulator and tributary sewers becomes available, the model should be further calibrated using this data. In particular, the bending weir controls within the model will be adjusted accordingly. It is highly recommended that a flow meter be installed in the Binney Street combined sewer upstream of the CAM017 regulator in order to further refine model calibration.

System-wide, periodic coordination with the MWRA is advised in order to routinely incorporate changes in the regional system and capture existing and final LTCP conditions. Pump operations and system optimization at different key MWRA facilities is critical and may have a significant impact on Cambridge CSOs as the combined system ties to MWRA's interceptors.

4. Status of CSO Abatement Projects

4.1 Project Updates

The City of Cambridge continues to implement abatement projects to remove stormwater from its combined sewer system, which includes:

- Cardinal Medeiros and Binney St sanitary system separation
- Cottage Lopez drainage improvements
- Willard St Outfall
- Talbot Street Outfall
- Monsignor O'Brien Highway sewer separation and new Lechmere Canal outfall

The information provided in this Annual Report conforms to information and data submitted to the MWRA for inclusion in their court-ordered annual report on CSO abatement project progress.

As described in more detail in the MWRA 2015 CSO Annual Progress Reports (available at http://www.mwra.com/cso/csoannualreports.htm), the CSO Control Plan for Alewife Brook includes four (4) project components for which the City of Cambridge is responsible, including:

- CAM004 Stormwater Outfall and Wetland Basin (Contract 12)
- CAM004 Sewer Separation (Contracts 8A, 8B, and 9)
- CAM400 Common Manhole Separation (Contract 13)
- Interceptor Connection Relief and Floatables Control (Contract 4)

All of these projects have been completed.

Contracts 8A, 8B and 9

For a copy of the project plans visit:

Concord Ave.:
https://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2013%2falewifesewerseparationconcordavenueneighborhood

Huron 8A:
https://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2010%2falewifesewerseparationproject

Huron 8B:
https://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2012%2falewifesewerseparationprojecthuronb

4.2 Project Schedule

Design and construction milestones for the Alewife Brook projects were added to Schedule Seven (7) in 2006 when EPA and DEP approved the regional long-term CSO control plan. Dates of completion are listed below.

Project	Benefit	Implementation Status
Contract 4: Interceptor Connection Relief and Floatables Control	Upgrades connections between Cambridge and MWRA systems to provide greater capacity; provides floatables control.	Project completed in October 2010.
Contract 13: CAM400 Manhole Separation	Removes stormwater from the sewer system; eliminate CSO at Outfall CAM400.	Project completed in March 2012.
Contract 12: CAM004 Stormwater Outfall and Wetland Basin	Conveys separated stormwater flows to wetland system for treatment and flow attenuation.	Project completed in 2014.
Contracts 8A, 8B and 9: CAM004 Sewer Separation	Removes stormwater from the sewer system; eliminate CSO at Outfall CAM004.	CAM004 CSO closed in 2015

Table 4.1 – City of Cambridge CSO Abatement Projects and Status

CSO Outfall	Required Project Type Under 2nd Stipulation	Receiving Water	Contract / Project Name	Completion Date or *Proposed Completion Date*	Notes
CAM001	Floatables Control	Alewife	Contract 4 - Floatables	*October 2010*	Baffles installed.
CAM002	Floatables control; interceptor relief	Alewife	Contract 4 - Floatables	*October 2010*	Baffles installed 2010 and blocked underflow.
CAM004	Sewer Separation	Alewife	2A/2B Fresh Pond Parkway	2001	CSO is now controlled by Drain Vault 5
CAM004	Sewer Separation	Alewife	Contract 8A/8B/9	*December 27st 2015*	Completed in 2015
CAM004	Sewer Separation	Alewife	Contract 12- Stormwater Outfall	*April 2013*	Stormwater outfall and treatment wetland
CAM400	Sewer Separation / common manholes	Alewife	Contract 13	*March 2011*	CSO regulator eliminated; converted to stormwater outfall.
CAM401A	Floatables Control	Alewife	Bellis Circle	2005	Installed brush screen
CAM401B	Floatables control; interceptor relief	Alewife	Contract 4- Floatables	*October 2010*	Baffles installed in 2010 and underflow throttled.
CAM005	Hydraulic Relief	Charles	MWRA CAM005 Hydraulic Relief	2000	For full project description see: http://www.mwra.com/annual/csoar/2009/csoar2009.pdf
CAM007	Floatables Control	Charles	Contract 5	2009	Baffle installed
CAM009	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM011	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM017	Floatables Control	Charles	Contract 5	2009	Baffles were installed in 2009.
CAM017	Hydraulic Relief	Charles	CAM 017 Hydraulic Relief	2013	Bending weirs and baffles installed in 2014

5. Modifications to Nine Minimum Controls Plan

The Nine Minimum Controls Plan (NMCP) was updated in its entirety and submitted together with the first annual report (April 2009). The plan provides a summary of the evaluations undertaken to address each control measure since the original plan was developed in 1997. Enhancements were made to the NMCP to meet the minimum implementation levels stipulated in the permit. These enhancements, extracted from the April 2009 CSO Report, are provided below.

Table 5.1 – Proposed Enhancements to the Nine Minimum Controls Plan

Control Measure	Proposed Enhancement
1. Proper Operation and Regular Maintenance Programs	• Adherence to detailed "Good Housekeeping Manual" to provide specific guidance and protocols for major DPW tasks • Development and utilization of routine inspection forms and work order system • Update of infrastructure assets and nomenclature • Update of DPW organizational structure and budget figures
2. Maximization of Storage in the Collection System	• Update database of existing key regulator components • Establish procedure for documentation of purpose and benefits to any future modifications to existing structures
3. Review and Modification of Pretreatment Requirements	• Adherence to recently developed Wastewater and Stormwater Use Regulations, inspection frequencies and enforcement activities
4. Maximization of Flow to POTW	• Maintain updated inventory of CSO capital projects; • Continue funding for annual cleaning and remedial repair and reconstruction contracts
5. Prohibition/Elimination of Dry Weather Discharges	• The City is unaware of any dry weather discharges from CSO outfalls
6. Control of Solid and Floatable Materials in CSOs	• Continue to implement floatable controls projects in conformance with revised Schedule Seven milestone deadlines. • Continue to require compliance with new City Wastewater and Stormwater Use Regulations
7. Pollution Prevention Programs to Reduce Contaminants in CSOs	• Adherence to "Good Housekeeping Manual" guidance and protocols to reduce the City's contribution of contaminants to stormwater; • Adherence to City of Cambridge Integrated Pest Management plan to reduce contributions of pesticides, fungicides, herbicides and fertilizer to run-off; • Continue aggressive recycling, street sweeping and household hazardous waste collections and management • Continue with public education and outreach activities • Continue to require compliance with new City Wastewater and Stormwater Use Regulations

Control Measure	Proposed Enhancement
8. Public Notification	• Continue with 24-hour notification of CSO activations from CAM-401B through e-mails notification to EPA, DEP, local health agents and the Mystic River Watershed Association, and post such activations on the DPW website.
9. Monitoring to Characterize CSO Impacts and Efficacy of CSO Controls	• On a regulator site-specific basis, use revised weir equations and parameters and/or hydraulic models and analysis to estimate effluent volumes released during CSO events

APPENDIX I

2017 DAILY RAINFALL DATA

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
1/1/17	0.07	0.00	0.04
1/2/17	0.00	0.00	0.00
1/3/17	0.17	0.01	0.16
1/4/17	0.04	0.00	0.04
1/5/17	0.00	0.00	0.00
1/6/17	0.04	0.00	0.04
1/7/17	0.14	0.01	0.04
1/8/17	0.00	0.00	0.00
1/9/17	0.01	0.00	0.04
1/10/17	0.18	0.01	0.12
1/11/17	0.10	0.00	0.08
1/12/17	0.17	0.01	0.12
1/13/17	0.00	0.00	0.00
1/14/17	0.00	0.00	0.00
1/15/17	0.00	0.00	0.00
1/16/17	0.00	0.00	0.00
1/17/17	0.39	0.02	0.20
1/18/17	0.27	0.01	0.08
1/19/17	0.00	0.00	0.00
1/20/17	0.00	0.00	0.00
1/21/17	0.00	0.00	0.00
1/22/17	0.05	0.00	0.04
1/23/17	0.27	0.01	0.12
1/24/17	0.87	0.04	0.28
1/25/17	0.02	0.00	0.04
1/26/17	0.07	0.00	0.08
1/27/17	0.00	0.00	0.00
1/28/17	0.00	0.00	0.00
1/29/17	0.00	0.00	0.00
1/30/17	0.00	0.00	0.00
1/31/17	0.03	0.00	0.04
Total	2.89		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
2/1/17	0.04	0.00	0.04
2/2/17	0.00	0.00	0.00
2/3/17	0.00	0.00	0.00
2/4/17	0.00	0.00	0.00
2/5/17	0.00	0.00	0.00
2/6/17	0.00	0.00	0.00
2/7/17	0.37	0.02	0.12
2/8/17	0.03	0.00	0.04
2/9/17	0.39	0.02	0.12
2/10/17	0.00	0.00	0.00
2/11/17	0.14	0.01	0.08
2/12/17	0.77	0.03	0.12
2/13/17	0.11	0.00	0.04
2/14/17	0.00	0.00	0.00
2/15/17	0.10	0.00	0.08
2/16/17	0.05	0.00	0.04
2/17/17	0.00	0.00	0.00
2/18/17	0.00	0.00	0.00
2/19/17	0.00	0.00	0.00
2/20/17	0.11	0.00	0.12
2/21/17	0.00	0.00	0.00
2/22/17	0.00	0.00	0.00
2/23/17	0.00	0.00	0.00
2/24/17	0.00	0.00	0.00
2/25/17	0.19	0.01	0.36
2/26/17	0.00	0.00	0.00
2/27/17	0.00	0.00	0.00
2/28/17	0.00	0.00	0.00
Total	2.30		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
3/1/17	0.01	0.00	0.04
3/2/17	0.00	0.00	0.00
3/3/17	0.00	0.00	0.00
3/4/17	0.00	0.00	0.00
3/5/17	0.00	0.00	0.00
3/6/17	0.00	0.00	0.00
3/7/17	0.03	0.00	0.04
3/8/17	0.05	0.00	0.04
3/9/17	0.00	0.00	0.00
3/10/17	0.14	0.01	0.08
3/11/17	0.02	0.00	0.04
3/12/17	0.00	0.00	0.00
3/13/17	0.00	0.00	0.00
3/14/17	1.25	0.05	0.32
3/15/17	0.00	0.00	0.00
3/16/17	0.00	0.00	0.00
3/17/17	0.00	0.00	0.00
3/18/17	0.00	0.00	0.00
3/19/17	0.00	0.00	0.00
3/20/17	0.00	0.00	0.00
3/21/17	0.00	0.00	0.00
3/22/17	0.00	0.00	0.00
3/23/17	0.00	0.00	0.00
3/24/17	0.04	0.00	0.04
3/25/17	0.07	0.00	0.08
3/26/17	0.00	0.00	0.00
3/27/17	0.50	0.02	0.20
3/28/17	0.65	0.03	0.20
3/29/17	0.10	0.00	0.08
3/30/17	0.00	0.00	0.00
3/31/17	0.68	0.03	0.12
Total	3.54		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
4/1/17	1.49	0.06	0.24
4/2/17	0.00	0.00	0.00
4/3/17	0.00	0.00	0.00
4/4/17	0.89	0.04	0.16
4/5/17	0.00	0.00	0.00
4/6/17	1.09	0.05	0.48
4/7/17	0.00	0.00	0.00
4/8/17	0.00	0.00	0.00
4/9/17	0.00	0.00	0.00
4/10/17	0.00	0.00	0.00
4/11/17	0.00	0.00	0.00
4/12/17	0.06	0.00	0.08
4/13/17	0.00	0.00	0.00
4/14/17	0.00	0.00	0.00
4/15/17	0.00	0.00	0.00
4/16/17	0.00	0.00	0.00
4/17/17	0.00	0.00	0.00
4/18/17	0.00	0.00	0.00
4/19/17	0.06	0.00	0.04
4/20/17	0.02	0.00	0.04
4/21/17	0.39	0.02	0.12
4/22/17	0.06	0.00	0.04
4/23/17	0.00	0.00	0.00
4/24/17	0.00	0.00	0.00
4/25/17	0.79	0.03	0.32
4/26/17	0.58	0.02	0.24
4/27/17	0.01	0.00	0.04
4/28/17	0.01	0.00	0.04
4/29/17	0.01	0.00	0.04
4/30/17	0.00	0.00	0.00
Total	5.46		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
5/1/17	0.01	0.00	0.04
5/2/17	0.12	0.01	0.20
5/3/17	0.00	0.00	0.00
5/4/17	0.00	0.00	0.00
5/5/17	0.84	0.04	0.60
5/6/17	0.11	0.00	0.12
5/7/17	0.01	0.00	0.04
5/8/17	0.00	0.00	0.00
5/9/17	0.00	0.00	0.00
5/10/17	0.00	0.00	0.00
5/11/17	0.00	0.00	0.00
5/12/17	0.02	0.00	0.08
5/13/17	0.06	0.00	0.08
5/14/17	0.92	0.04	0.24
5/15/17	0.18	0.01	0.08
5/16/17	0.00	0.00	0.00
5/17/17	0.00	0.00	0.00
5/18/17	0.00	0.00	0.00
5/19/17	0.23	0.01	0.80
5/20/17	0.00	0.00	0.00
5/21/17	0.00	0.00	0.00
5/22/17	0.17	0.01	0.08
5/23/17	0.01	0.00	0.04
5/24/17	0.00	0.00	0.00
5/25/17	0.35	0.01	0.12
5/26/17	0.97	0.04	0.80
5/27/17	0.00	0.00	0.00
5/28/17	0.00	0.00	0.00
5/29/17	0.06	0.00	0.08
5/30/17	0.00	0.00	0.00
5/31/17	0.17	0.01	0.44
Total	4.23		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
6/1/17	0.01	0.00	0.04
6/2/17	0.00	0.00	0.00
6/3/17	0.02	0.00	0.04
6/4/17	0.19	0.01	0.12
6/5/17	0.45	0.02	0.32
6/6/17	1.03	0.04	0.68
6/7/17	0.07	0.00	0.04
6/8/17	0.00	0.00	0.00
6/9/17	0.00	0.00	0.00
6/10/17	0.00	0.00	0.00
6/11/17	0.00	0.00	0.00
6/12/17	0.00	0.00	0.00
6/13/17	0.17	0.01	0.52
6/14/17	0.53	0.02	0.80
6/15/17	0.00	0.00	0.00
6/16/17	1.43	0.06	0.68
6/17/17	0.03	0.00	0.08
6/18/17	0.00	0.00	0.00
6/19/17	0.06	0.00	0.12
6/20/17	0.18	0.01	0.44
6/21/17	0.00	0.00	0.00
6/22/17	0.00	0.00	0.00
6/23/17	0.03	0.00	0.12
6/24/17	0.11	0.00	0.12
6/25/17	0.03	0.00	0.08
6/26/17	0.02	0.00	0.08
6/27/17	0.48	0.02	0.84
6/28/17	0.00	0.00	0.00
6/29/17	0.00	0.00	0.00
6/30/17	0.08	0.00	0.16
Total	4.92		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
7/1/17	0.00	0.00	0.00
7/2/17	0.00	0.00	0.00
7/3/17	0.06	0.00	0.12
7/4/17	0.00	0.00	0.00
7/5/17	0.00	0.00	0.00
7/6/17	0.00	0.00	0.00
7/7/17	0.42	0.02	0.24
7/8/17	0.09	0.00	0.08
7/9/17	0.01	0.00	0.04
7/10/17	0.00	0.00	0.00
7/11/17	0.40	0.02	0.28
7/12/17	1.02	0.04	2.32
7/13/17	0.16	0.01	0.36
7/14/17	0.00	0.00	0.00
7/15/17	0.00	0.00	0.00
7/16/17	0.00	0.00	0.00
7/17/17	0.00	0.00	0.00
7/18/17	0.51	0.02	1.12
7/19/17	0.00	0.00	0.00
7/20/17	0.00	0.00	0.00
7/21/17	0.00	0.00	0.00
7/22/17	0.00	0.00	0.00
7/23/17	0.00	0.00	0.00
7/24/17	1.09	0.05	0.44
7/25/17	0.02	0.00	0.04
7/26/17	0.00	0.00	0.00
7/27/17	0.07	0.00	0.08
7/28/17	0.00	0.00	0.00
7/29/17	0.00	0.00	0.00
7/30/17	0.00	0.00	0.00
7/31/17	0.00	0.00	0.00
Total	3.85		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
8/1/17	0.00	0.00	0.00
8/2/17	0.29	0.01	0.24
8/3/17	0.00	0.00	0.00
8/4/17	0.00	0.00	0.00
8/5/17	0.11	0.00	0.20
8/6/17	0.00	0.00	0.00
8/7/17	0.00	0.00	0.00
8/8/17	0.00	0.00	0.00
8/9/17	0.01	0.00	0.04
8/10/17	0.00	0.00	0.00
8/11/17	0.00	0.00	0.00
8/12/17	0.11	0.00	0.08
8/13/17	0.00	0.00	0.00
8/14/17	0.00	0.00	0.00
8/15/17	0.00	0.00	0.00
8/16/17	0.00	0.00	0.00
8/17/17	0.00	0.00	0.00
8/18/17	0.05	0.00	0.08
8/19/17	0.02	0.00	0.04
8/20/17	0.00	0.00	0.00
8/21/17	0.00	0.00	0.00
8/22/17	0.00	0.00	0.00
8/23/17	0.31	0.01	0.80
8/24/17	0.00	0.00	0.00
8/25/17	0.00	0.00	0.00
8/26/17	0.00	0.00	0.00
8/27/17	0.00	0.00	0.00
8/28/17	0.00	0.00	0.00
8/29/17	0.01	0.00	0.04
8/30/17	0.07	0.00	0.08
8/31/17	0.00	0.00	0.00
Total	0.98		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
9/1/17	0.00	0.00	0.00
9/2/17	0.00	0.00	0.00
9/3/17	0.25	0.01	0.16
9/4/17	0.00	0.00	0.00
9/5/17	0.00	0.00	0.00
9/6/17	0.45	0.02	1.44
9/7/17	0.46	0.02	0.52
9/8/17	0.00	0.00	0.00
9/9/17	0.00	0.00	0.00
9/10/17	0.00	0.00	0.00
9/11/17	0.00	0.00	0.00
9/12/17	0.00	0.00	0.00
9/13/17	0.00	0.00	0.00
9/14/17	0.40	0.02	1.24
9/15/17	0.60	0.03	1.24
9/16/17	0.00	0.00	0.00
9/17/17	0.00	0.00	0.00
9/18/17	0.00	0.00	0.00
9/19/17	0.16	0.01	0.24
9/20/17	0.18	0.01	0.08
9/21/17	0.00	0.00	0.00
9/22/17	0.11	0.00	0.12
9/23/17	0.00	0.00	0.00
9/24/17	0.00	0.00	0.00
9/25/17	0.00	0.00	0.00
9/26/17	0.00	0.00	0.00
9/27/17	0.00	0.00	0.00
9/28/17	0.00	0.00	0.00
9/29/17	0.00	0.00	0.00
9/30/17	0.29	0.01	0.32
Total	2.90		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
10/1/17	0.00	0.00	0.00
10/2/17	0.00	0.00	0.00
10/3/17	0.00	0.00	0.00
10/4/17	0.00	0.00	0.00
10/5/17	0.00	0.00	0.00
10/6/17	0.00	0.00	0.00
10/7/17	0.00	0.00	0.00
10/8/17	0.14	0.01	0.16
10/9/17	0.22	0.01	0.08
10/10/17	0.00	0.00	0.00
10/11/17	0.00	0.00	0.00
10/12/17	0.00	0.00	0.00
10/13/17	0.00	0.00	0.00
10/14/17	0.03	0.00	0.08
10/15/17	0.00	0.00	0.00
10/16/17	0.00	0.00	0.00
10/17/17	0.00	0.00	0.00
10/18/17	0.00	0.00	0.00
10/19/17	0.09	0.00	0.36
10/20/17	0.00	0.00	0.00
10/21/17	0.00	0.00	0.00
10/22/17	0.00	0.00	0.00
10/23/17	0.00	0.00	0.00
10/24/17	0.11	0.00	0.08
10/25/17	0.96	0.04	0.88
10/26/17	0.45	0.02	0.16
10/27/17	0.00	0.00	0.00
10/28/17	0.00	0.00	0.00
10/29/17	0.82	0.03	0.28
10/30/17	2.40	0.10	1.60
10/31/17	0.00	0.00	0.00
Total	5.22		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
11/1/17	0.00	0.00	0.00
11/2/17	0.00	0.00	0.00
11/3/17	0.00	0.00	0.00
11/4/17	0.00	0.00	0.00
11/5/17	0.00	0.00	0.00
11/6/17	0.07	0.00	0.12
11/7/17	0.10	0.00	0.08
11/8/17	0.03	0.00	0.04
11/9/17	0.00	0.00	0.00
11/10/17	0.03	0.00	0.04
11/11/17	0.00	0.00	0.00
11/12/17	0.00	0.00	0.00
11/13/17	0.20	0.01	0.16
11/14/17	0.00	0.00	0.00
11/15/17	0.00	0.00	0.00
11/16/17	0.22	0.01	0.16
11/17/17	0.01	0.00	0.04
11/18/17	0.08	0.00	0.08
11/19/17	0.30	0.01	0.16
11/20/17	0.00	0.00	0.00
11/21/17	0.00	0.00	0.00
11/22/17	0.76	0.03	0.16
11/23/17	0.00	0.00	0.00
11/24/17	0.00	0.00	0.00
11/25/17	0.00	0.00	0.00
11/26/17	0.00	0.00	0.00
11/27/17	0.00	0.00	0.00
11/28/17	0.00	0.00	0.00
11/29/17	0.00	0.00	0.00
11/30/17	0.00	0.00	0.00
Total	1.80		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

USGS METER AT FRESHPOND CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
12/1/17	0.05	0.00	0.08
12/2/17	0.00	0.00	0.00
12/3/17	0.00	0.00	0.00
12/4/17	0.00	0.00	0.00
12/5/17	0.08	0.00	0.12
12/6/17	0.47	0.02	0.36
12/7/17	0.00	0.00	0.00
12/8/17	0.00	0.00	0.00
12/9/17	0.51	0.02	0.08
12/10/17	0.01	0.00	0.04
12/11/17	0.00	0.00	0.00
12/12/17	0.05	0.00	0.04
12/13/17	0.00	0.00	0.00
12/14/17	0.00	0.00	0.00
12/15/17	0.00	0.00	0.00
12/16/17	0.00	0.00	0.00
12/17/17	0.00	0.00	0.00
12/18/17	0.00	0.00	0.00
12/19/17	0.00	0.00	0.00
12/20/17	0.00	0.00	0.00
12/21/17	0.00	0.00	0.00
12/22/17	0.00	0.00	0.00
12/23/17	0.63	0.03	0.20
12/24/17	0.09	0.00	0.04
12/25/17	0.18	0.01	0.16
12/26/17	0.00	0.00	0.00
12/27/17	0.01	0.00	0.04
12/28/17	0.00	0.00	0.00
12/29/17	0.00	0.00	0.00
12/30/17	0.00	0.00	0.00
12/31/17	0.00	0.00	0.00
Total	2.08		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
1/1/17	0.07	0.00	0.04
1/2/17	0.00	0.00	0.00
1/3/17	0.17	0.01	0.16
1/4/17	0.04	0.00	0.04
1/5/17	0.00	0.00	0.00
1/6/17	0.04	0.00	0.04
1/7/17	0.14	0.01	0.04
1/8/17	0.00	0.00	0.00
1/9/17	0.01	0.00	0.04
1/10/17	0.18	0.01	0.12
1/11/17	0.10	0.00	0.08
1/12/17	0.17	0.01	0.12
1/13/17	0.00	0.00	0.00
1/14/17	0.00	0.00	0.00
1/15/17	0.00	0.00	0.00
1/16/17	0.00	0.00	0.00
1/17/17	0.39	0.02	0.20
1/18/17	0.27	0.01	0.08
1/19/17	0.00	0.00	0.00
1/20/17	0.00	0.00	0.00
1/21/17	0.00	0.00	0.00
1/22/17	0.05	0.00	0.04
1/23/17	0.27	0.01	0.12
1/24/17	0.87	0.04	0.28
1/25/17	0.02	0.00	0.04
1/26/17	0.07	0.00	0.08
1/27/17	0.00	0.00	0.00
1/28/17	0.00	0.00	0.00
1/29/17	0.00	0.00	0.00
1/30/17	0.00	0.00	0.00
1/31/17	0.03	0.00	0.04
Total	2.89		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
2/1/17	0.04	0.00	0.04
2/2/17	0.00	0.00	0.00
2/3/17	0.00	0.00	0.00
2/4/17	0.00	0.00	0.00
2/5/17	0.00	0.00	0.00
2/6/17	0.00	0.00	0.00
2/7/17	0.37	0.02	0.12
2/8/17	0.03	0.00	0.04
2/9/17	0.39	0.02	0.12
2/10/17	0.00	0.00	0.00
2/11/17	0.14	0.01	0.08
2/12/17	0.77	0.03	0.12
2/13/17	0.11	0.00	0.04
2/14/17	0.00	0.00	0.00
2/15/17	0.10	0.00	0.08
2/16/17	0.05	0.00	0.04
2/17/17	0.00	0.00	0.00
2/18/17	0.00	0.00	0.00
2/19/17	0.00	0.00	0.00
2/20/17	0.11	0.00	0.12
2/21/17	0.00	0.00	0.00
2/22/17	0.00	0.00	0.00
2/23/17	0.00	0.00	0.00
2/24/17	0.00	0.00	0.00
2/25/17	0.19	0.01	0.36
2/26/17	0.00	0.00	0.00
2/27/17	0.00	0.00	0.00
2/28/17	0.00	0.00	0.00
Total	2.30		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
3/1/17	0.01	0.00	0.04
3/2/17	0.00	0.00	0.00
3/3/17	0.00	0.00	0.00
3/4/17	0.00	0.00	0.00
3/5/17	0.00	0.00	0.00
3/6/17	0.00	0.00	0.00
3/7/17	0.03	0.00	0.04
3/8/17	0.05	0.00	0.04
3/9/17	0.00	0.00	0.00
3/10/17	0.14	0.01	0.08
3/11/17	0.02	0.00	0.04
3/12/17	0.00	0.00	0.00
3/13/17	0.00	0.00	0.00
3/14/17	1.25	0.05	0.32
3/15/17	0.00	0.00	0.00
3/16/17	0.00	0.00	0.00
3/17/17	0.00	0.00	0.00
3/18/17	0.00	0.00	0.00
3/19/17	0.00	0.00	0.00
3/20/17	0.00	0.00	0.00
3/21/17	0.00	0.00	0.00
3/22/17	0.00	0.00	0.00
3/23/17	0.00	0.00	0.00
3/24/17	0.04	0.00	0.04
3/25/17	0.07	0.00	0.08
3/26/17	0.00	0.00	0.00
3/27/17	0.50	0.02	0.20
3/28/17	0.65	0.03	0.20
3/29/17	0.10	0.00	0.08
3/30/17	0.00	0.00	0.00
3/31/17	0.68	0.03	0.12
Total	3.54		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
4/1/17	2.25	0.09	0.26
4/2/17	0.00	0.00	0.00
4/3/17	0.00	0.00	0.00
4/4/17	0.97	0.04	0.22
4/5/17	0.01	0.00	0.04
4/6/17	1.21	0.05	0.42
4/7/17	0.00	0.00	0.00
4/8/17	0.00	0.00	0.00
4/9/17	0.00	0.00	0.00
4/10/17	0.00	0.00	0.00
4/11/17	0.00	0.00	0.00
4/12/17	0.04	0.00	0.04
4/13/17	0.00	0.00	0.00
4/14/17	0.00	0.00	0.00
4/15/17	0.00	0.00	0.00
4/16/17	0.00	0.00	0.00
4/17/17	0.00	0.00	0.00
4/18/17	0.00	0.00	0.00
4/19/17	0.00	0.00	0.00
4/20/17	0.00	0.00	0.00
4/21/17	0.58	0.02	0.14
4/22/17	0.05	0.00	0.04
4/23/17	0.00	0.00	0.00
4/24/17	0.00	0.00	0.00
4/25/17	1.02	0.04	0.58
4/26/17	0.70	0.03	0.46
4/27/17	0.00	0.00	0.00
4/28/17	0.00	0.00	0.00
4/29/17	0.00	0.00	0.00
4/30/17	0.00	0.00	0.00
Total	6.83		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
5/1/17	0.00	0.00	0.00
5/2/17	0.10	0.00	0.08
5/3/17	0.00	0.00	0.00
5/4/17	0.00	0.00	0.00
5/5/17	0.83	0.03	0.46
5/6/17	0.12	0.01	0.16
5/7/17	0.00	0.00	0.00
5/8/17	0.00	0.00	0.00
5/9/17	0.00	0.00	0.00
5/10/17	0.00	0.00	0.00
5/11/17	0.00	0.00	0.00
5/12/17	0.03	0.00	0.04
5/13/17	0.00	0.00	0.00
5/14/17	1.19	0.05	0.34
5/15/17	0.20	0.01	0.16
5/16/17	0.00	0.00	0.00
5/17/17	0.00	0.00	0.00
5/18/17	0.00	0.00	0.00
5/19/17	0.19	0.01	0.52
5/20/17	0.00	0.00	0.00
5/21/17	0.00	0.00	0.00
5/22/17	0.13	0.01	0.08
5/23/17	0.01	0.00	0.04
5/24/17	0.00	0.00	0.00
5/25/17	0.50	0.02	0.22
5/26/17	1.07	0.04	1.16
5/27/17	0.00	0.00	0.00
5/28/17	0.00	0.00	0.00
5/29/17	0.06	0.00	0.08
5/30/17	0.00	0.00	0.00
5/31/17	0.05	0.00	0.08
Total	4.47		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
6/1/17	0.03	0.00	0.04
6/2/17	0.00	0.00	0.00
6/3/17	0.00	0.00	0.00
6/4/17	0.20	0.01	0.16
6/5/17	0.54	0.02	0.28
6/6/17	1.14	0.05	0.16
6/7/17	0.12	0.01	0.08
6/8/17	0.00	0.00	0.00
6/9/17	0.00	0.00	0.00
6/10/17	0.00	0.00	0.00
6/11/17	0.00	0.00	0.00
6/12/17	0.00	0.00	0.00
6/13/17	0.01	0.00	0.04
6/14/17	0.00	0.00	0.00
6/15/17	0.00	0.00	0.00
6/16/17	1.84	0.08	0.78
6/17/17	0.04	0.00	0.04
6/18/17	0.00	0.00	0.00
6/19/17	0.03	0.00	0.10
6/20/17	0.10	0.00	0.14
6/21/17	0.00	0.00	0.00
6/22/17	0.00	0.00	0.00
6/23/17	0.00	0.00	0.00
6/24/17	0.10	0.00	0.12
6/25/17	0.04	0.00	0.12
6/26/17	0.01	0.00	0.04
6/27/17	0.38	0.02	0.62
6/28/17	0.00	0.00	0.00
6/29/17	0.00	0.00	0.00
6/30/17	0.07	0.00	0.12
Total	4.65		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
7/1/17	0.00	0.00	0.00
7/2/17	0.10	0.00	0.22
7/3/17	0.02	0.00	0.08
7/4/17	0.00	0.00	0.00
7/5/17	0.00	0.00	0.00
7/6/17	0.00	0.00	0.00
7/7/17	0.44	0.02	0.22
7/8/17	0.23	0.01	0.52
7/9/17	0.00	0.00	0.00
7/10/17	0.00	0.00	0.00
7/11/17	0.27	0.01	0.18
7/12/17	1.12	0.05	2.34
7/13/17	0.15	0.01	0.40
7/14/17	0.00	0.00	0.00
7/15/17	0.00	0.00	0.00
7/16/17	0.00	0.00	0.00
7/17/17	0.00	0.00	0.00
7/18/17	0.20	0.01	0.58
7/19/17	0.00	0.00	0.00
7/20/17	0.00	0.00	0.00
7/21/17	0.00	0.00	0.00
7/22/17	0.00	0.00	0.00
7/23/17	0.00	0.00	0.00
7/24/17	1.56	0.07	0.64
7/25/17	0.00	0.00	0.00
7/26/17	0.00	0.00	0.00
7/27/17	0.03	0.00	0.04
7/28/17	0.00	0.00	0.00
7/29/17	0.00	0.00	0.00
7/30/17	0.00	0.00	0.00
7/31/17	0.00	0.00	0.00
Total	4.12		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
8/1/17	0.00	0.00	0.00
8/2/17	0.27	0.01	0.22
8/3/17	0.00	0.00	0.00
8/4/17	0.00	0.00	0.00
8/5/17	0.09	0.00	0.12
8/6/17	0.00	0.00	0.00
8/7/17	0.00	0.00	0.00
8/8/17	0.00	0.00	0.00
8/9/17	0.00	0.00	0.00
8/10/17	0.00	0.00	0.00
8/11/17	0.00	0.00	0.00
8/12/17	0.10	0.00	0.08
8/13/17	0.00	0.00	0.00
8/14/17	0.00	0.00	0.00
8/15/17	0.00	0.00	0.00
8/16/17	0.00	0.00	0.00
8/17/17	0.00	0.00	0.00
8/18/17	0.01	0.00	0.04
8/19/17	0.11	0.00	0.44
8/20/17	0.00	0.00	0.00
8/21/17	0.00	0.00	0.00
8/22/17	0.00	0.00	0.00
8/23/17	0.09	0.00	0.12
8/24/17	0.00	0.00	0.00
8/25/17	0.00	0.00	0.00
8/26/17	0.00	0.00	0.00
8/27/17	0.00	0.00	0.00
8/28/17	0.00	0.00	0.00
8/29/17	0.00	0.00	0.00
8/30/17	0.06	0.00	0.04
8/31/17	0.00	0.00	0.00
Total	0.73		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
9/1/17	0.00	0.00	0.00
9/2/17	0.00	0.00	0.00
9/3/17	0.31	0.01	0.14
9/4/17	0.00	0.00	0.00
9/5/17	0.00	0.00	0.00
9/6/17	0.27	0.01	0.76
9/7/17	0.73	0.03	0.70
9/8/17	0.00	0.00	0.00
9/9/17	0.06	0.00	0.18
9/10/17	0.00	0.00	0.00
9/11/17	0.00	0.00	0.00
9/12/17	0.00	0.00	0.00
9/13/17	0.00	0.00	0.00
9/14/17	0.04	0.00	0.12
9/15/17	0.07	0.00	0.12
9/16/17	0.00	0.00	0.00
9/17/17	0.00	0.00	0.00
9/18/17	0.00	0.00	0.00
9/19/17	0.07	0.00	0.16
9/20/17	0.23	0.01	0.08
9/21/17	0.00	0.00	0.00
9/22/17	0.10	0.00	0.04
9/23/17	0.03	0.00	0.04
9/24/17	0.00	0.00	0.00
9/25/17	0.00	0.00	0.00
9/26/17	0.00	0.00	0.00
9/27/17	0.00	0.00	0.00
9/28/17	0.00	0.00	0.00
9/29/17	0.00	0.00	0.00
9/30/17	0.48	0.02	0.30
Total	2.39		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
10/1/17	0.00	0.00	0.00
10/2/17	0.00	0.00	0.00
10/3/17	0.00	0.00	0.00
10/4/17	0.00	0.00	0.00
10/5/17	0.00	0.00	0.00
10/6/17	0.00	0.00	0.00
10/7/17	0.00	0.00	0.00
10/8/17	0.10	0.00	0.12
10/9/17	0.35	0.01	0.64
10/10/17	0.00	0.00	0.00
10/11/17	0.00	0.00	0.00
10/12/17	0.00	0.00	0.00
10/13/17	0.00	0.00	0.00
10/14/17	0.02	0.00	0.08
10/15/17	0.01	0.00	0.04
10/16/17	0.00	0.00	0.00
10/17/17	0.00	0.00	0.00
10/18/17	0.00	0.00	0.00
10/19/17	0.00	0.00	0.00
10/20/17	0.00	0.00	0.00
10/21/17	0.00	0.00	0.00
10/22/17	0.00	0.00	0.00
10/23/17	0.00	0.00	0.00
10/24/17	0.16	0.01	0.14
10/25/17	1.22	0.05	1.42
10/26/17	0.52	0.02	0.22
10/27/17	0.00	0.00	0.00
10/28/17	0.00	0.00	0.00
10/29/17	0.95	0.04	0.30
10/30/17	2.45	0.10	1.56
10/31/17	0.00	0.00	0.00
Total	5.77		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2017 DAILY RAINFALL DATA

COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
11/1/17	0.00	0.00	0.00
11/2/17	0.00	0.00	0.00
11/3/17	0.00	0.00	0.00
11/4/17	0.00	0.00	0.00
11/5/17	0.00	0.00	0.00
11/6/17	0.05	0.00	0.08
11/7/17	0.10	0.00	0.06
11/8/17	0.09	0.00	0.06
11/9/17	0.00	0.00	0.00
11/10/17	0.04	0.00	0.12
11/11/17	0.00	0.00	0.00
11/12/17	0.00	0.00	0.00
11/13/17	0.20	0.01	0.08
11/14/17	0.00	0.00	0.00
11/15/17	0.00	0.00	0.00
11/16/17	0.20	0.01	0.16
11/17/17	0.00	0.00	0.00
11/18/17	0.08	0.00	0.08
11/19/17	0.28	0.01	0.20
11/20/17	0.00	0.00	0.00
11/21/17	0.00	0.00	0.00
11/22/17	0.88	0.04	0.36
11/23/17	0.00	0.00	0.00
11/24/17	0.00	0.00	0.00
11/25/17	0.00	0.00	0.00
11/26/17	0.00	0.00	0.00
11/27/17	0.00	0.00	0.00
11/28/17	0.00	0.00	0.00
11/29/17	0.00	0.00	0.00
11/30/17	0.00	0.00	0.00
Total	1.91		

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2017 DAILY RAINFALL DATA
COMPOSITE FRESH POND (1.1.2017-3.26.2017, 12.6.2017-12-31.2017) & DPW RAINFALL GAUGE (3.27.2017-12.6.2017), CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
12/1/17	0.050	0.000	0.080
12/2/17	0.000	0.000	0.000
12/3/17	0.000	0.000	0.000
12/4/17	0.000	0.000	0.000
12/5/17	0.080	0.000	0.120
12/6/17	0.470	0.020	0.360
12/7/17	0.000	0.000	0.000
12/8/17	0.000	0.000	0.000
12/9/17	0.510	0.020	0.080
12/10/17	0.010	0.000	0.040
12/11/17	0.000	0.000	0.000
12/12/17	0.050	0.000	0.040
12/13/17	0.000	0.000	0.000
12/14/17	0.000	0.000	0.000
12/15/17	0.000	0.000	0.000
12/16/17	0.000	0.000	0.000
12/17/17	0.000	0.000	0.000
12/18/17	0.000	0.000	0.000
12/19/17	0.000	0.000	0.000
12/20/17	0.000	0.000	0.000
12/21/17	0.000	0.000	0.000
12/22/17	0.000	0.000	0.000
12/23/17	0.630	0.030	0.200
12/24/17	0.090	0.000	0.040
12/25/17	0.180	0.010	0.160
12/26/17	0.000	0.000	0.000
12/27/17	0.010	0.000	0.040
12/28/17	0.000	0.000	0.000
12/29/17	0.000	0.000	0.000
12/30/17	0.000	0.000	0.000
12/31/17	0.000	0.000	0.000
Total	2.080		

APPENDIX II

MONTHLY CSO VOLUMES

January 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
January	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
1/1	N/A	0.070	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000
1/2	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/3	N/A	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/4	N/A	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/5	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/6	N/A	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/7	N/A	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/8	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/9	N/A	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/10	N/A	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/11	N/A	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/12	N/A	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/13	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/14	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/15	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/16	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/17	N/A	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/18	N/A	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/19	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/20	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/21	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/22	N/A	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/23	N/A	0.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/24	N/A	0.870	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/25	N/A	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/26	N/A	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/27	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/28	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/29	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/30	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1/31	N/A	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	N/A	2.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000

February 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
February	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
2/1	N/A	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/2	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/3	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/4	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/5	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/6	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/7	N/A	0.370	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/8	N/A	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/9	N/A	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/10	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/11	N/A	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/12	N/A	0.770	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/13	N/A	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/14	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/15	N/A	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/16	N/A	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/17	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/18	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/19	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/20	N/A	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/21	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/22	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/23	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/24	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/25	N/A	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/26	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/27	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2/28	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	N/A	2.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000

March 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
March	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
3/1	N/A	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/2	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/3	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/4	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/5	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/6	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/7	N/A	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/8	N/A	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/9	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/10	N/A	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/11	N/A	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/12	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/13	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/14	N/A	1.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/15	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/16	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/17	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/18	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/19	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/20	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/21	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/22	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/23	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/24	N/A	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/25	N/A	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/26	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/27	0.480	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/28	0.650	0.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/29	0.130	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3/31	0.580	0.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	N/A	3.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000

April 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
April	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
4/1	2.250	1.490	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/4	0.970	0.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/5	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/6	1.210	1.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/12	0.040	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/19	0.000	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/20	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/21	0.580	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/22	0.050	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/25	1.020	0.790	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/26	0.700	0.580	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/27	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/28	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/29	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4/30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	6.830	5.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000

May 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
May	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
5/1	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/2	0.100	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/5	0.830	0.840	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/6	0.120	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/7	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/12	0.030	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/13	0.000	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/14	1.190	0.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/15	0.200	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/19	0.190	0.230	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/22	0.130	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/23	0.010	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/25	0.500	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/26	1.070	0.970	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/29	0.060	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5/31	0.050	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	4.470	4.230	0.000	0.000	0.000	0.000	0.000	0.000	0.000

June 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
June	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
6/1	0.030	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/3	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/4	0.200	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/5	0.540	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/6	1.140	1.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/7	0.120	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/13	0.010	0.170	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/14	0.000	0.530	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/16	1.840	1.430	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/17	0.040	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/19	0.030	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/20	0.100	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/23	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/24	0.100	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/25	0.040	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/26	0.010	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/27	0.380	0.480	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6/30	0.070	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	4.650	4.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000

July 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
July	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
7/1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/2	0.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/3	0.02	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/7	0.440	0.420	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/8	0.230	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/9	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/11	0.270	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/12	1.120	1.020	0.000	0.250	0.472	0.000	0.477	0.0004	0.000
7/13	0.150	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/18	0.200	0.510	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/24	1.560	1.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/25	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/27	0.030	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7/31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	4.120	3.850	0.000	0.250	0.472	0.000	0.477	0.0004	0.000

August 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
August	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
8/1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/2	0.270	0.290	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/5	0.090	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/9	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/12	0.100	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/18	0.010	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/19	0.110	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/23	0.090	0.310	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/29	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/30	0.060	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8/31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.730	0.980	0.000	0.000	0.000	0.000	0.000	0.000	0.000

September 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
September	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
9/1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/3	0.310	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/6	0.270	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/7	0.730	0.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/9	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/14	0.040	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/15	0.070	0.600	0.000	0.029	0.000	0.000	0.000	0.000	0.000
9/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/19	0.070	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/20	0.230	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/22	0.100	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/23	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/30	0.480	0.290	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	2.390	2.900	0.000	0.029	0.000	0.000	0.000	0.000	0.000

October 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
October	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
10/1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/8	0.100	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/9	0.350	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/14	0.020	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/15	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/19	0.000	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/24	0.160	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/25	1.220	0.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/26	0.520	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/29	0.950	0.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/30	2.450	2.400	0.013	0.744	1.232	0.185	0.700	0.745	2.057
10/31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	5.770	5.220	0.013	0.744	1.232	0.185	0.700	0.745	2.057

November 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
November	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
11/1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/6	0.050	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/7	0.100	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/8	0.090	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/10	0.040	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/13	0.200	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/16	0.200	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/17	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/18	0.080	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/19	0.280	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/22	0.880	0.760	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	1.910	1.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000

December 2017 Daily Rainfall and Combined Sewer Overflows

			Alewife Brook				Charles River		
December	Rain Gauges		CAM001	CAM002	CAM401A	CAM401B	CAM005	CAM007	CAM017
	Cambridge DPW	USGS Fresh Pond	Foch St. @Alewife Brook Pkwy.	Mass Ave. @ Alewife Brook Pkwy	Sherman St. @ B&M Railroad	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	Lowell St. @ Mt. Auburn St.	Memorial Dr. @ Hawthorne St.	Edwin Land Blvd. @ Binney St.
	(in)	(in)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
12/1	0.040	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/5	0.060	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/6	N/A	0.470	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/7	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/8	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/9	N/A	0.510	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/10	N/A	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/11	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/12	N/A	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/13	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/14	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/15	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/16	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/17	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/18	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/19	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/20	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/21	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/22	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/23	N/A	0.630	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/24	N/A	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/25	N/A	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/26	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/27	N/A	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/28	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/29	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/30	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12/31	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	N/A	2.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000

APPENDIX III
CSO NOTIFICATIONS

Notice Alert: CSO Activation in Alewife Brook

TO: **Patrick Herron, Executive Director, Mystic River Watershed Association**
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Angela Braun, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: **City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.**
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery, David Parker, David Wu, Nicole Johnson, Wenley Jiang, Wendy Leo, Maret
Smolow, Nadine Smoske, Mark Sullivan
Representative Denise Provost
Mystic River Watershed Association – Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O'Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjan, Brian McLane, Rebecca Fuentes, Wendy Robinson, Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

DATE: July 13, 2017

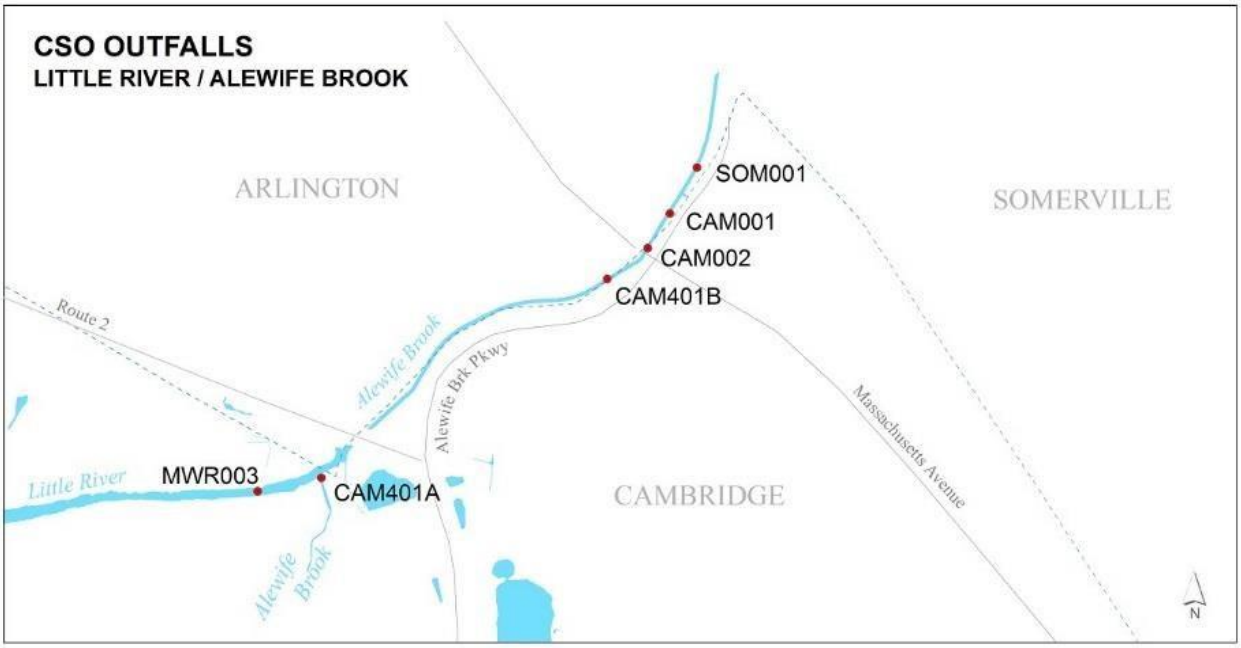
In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on July 12, 2017 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are six CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to

the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: http://www.mass.gov/dep/floodcleanup.htm For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: http://waterdata.usgs.gov/ma/nwis Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

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FROM: James Wilcox, Cambridge DPW

CC: **City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.**
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Catherine Daly Woodbury, Jeya Niranjan, Brian McLane, Rebecca Fuentes, Wendy Robinson, Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

DATE: October 30, 2017

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on October 30, 2017 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

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CSO Outfalls along the Little River/Alewife Brook