Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number & Reporting Period: No. 13: March 15-March 16

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Owen O'Riordan Title: Commissioner, Dept. of Public Works

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Certification:

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: Richard C. Rossi

Printed Name: Richard C. Rossi

Title: City Manager

Date: May 2, 2016

Part II. Self-Assessment

The City of Cambridge has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions.

Part III. Summary of Minimum Control Measures (MCM)

MCM #1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities Permit Year 14
1.a	Develop Educational and Outreach Material for Residents and Businesses	Commissioner/ DPW	(i)Develop 3 brochures or fact sheets (**completed under year 1 activities**) - Continue the development of relevant materials.	Information was developed on the following and included in the following city publications: *Brochure*: Stormwater Management & Green Infrastructure – Information Guide *Cambridge Life 2015-2016 Edition*: Cambridge Life 2015-2016 • The Path to "Net Zero" Cambridge (p. 10) • Compost Curbside (p.13) *City View (Winter 2015)* (p.1) • The Citywide Plan Copies of the above are provided in Appendix 1.Electronic copies of *CityView* and *The Cambridge Life*, can be found on the following website: www.cambridgema.gov/citynewsandpublications/publications.aspx The DPW also distributes flyers and e-mails to residents near and adjacent to active and proposed construction sites which briefly describes the scope and purpose of these design and construction activities. An example of project that has a stormwater benefit includes: • Alewife Sewer Separation Construction Update (September/October 2015) • Alewife Sewer Separation Construction Update (March 2016) Copies of these notices are included in Appendix 1. Construction notices are also posted on the DPW website, www.cambridgema.gov/theworks/ourservices/engineering/cityconstructionprojects.aspx	Continue to develop relevant information on stormwater management for residents and businesses.
Revised **1.a** cont			**Expanded BMP element in Year 3**		

		Commissioner/ DPW	(ii) Post information on the web	DPW continued to update its website and make information more readily accessible to the public. Updates included during Year 13 include: • The NPDES Phase II Annual Report Year 12, • Stormwater Management Program Phase II NPDES Public Meeting 2015 presentation, • Joint Public Notice (April 2015) for the Alewife Brook CSO Progress Update, and • An EPA press release regarding water quality grading system for the Mystic River For examples of some of the content updates made to the web page see Appendix 1 and on the Public Works website at: www.cambridgema.gov/theworks and the Stormwater Management website at: www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx The Cambridge Water Department (CWD) also provides information on its website regarding projects related to protection of Fresh Pond Reservoir. An example of projects during Year 13 at Fresh Pond includes: • Drainage & Community Gardens Project: Conceptual Design Presentation The Drainage and Community Gardens restoration project will seek to improve existing conditions to be consistent with the Fresh Pond Master Plan vision of better drinking water quality, universal accessibility, and enhanced habitat and user experience. Existing conditions to be addressed by the project include flooding, pooling, and icing along the perimeter road, poor drainage, lack of accessibility and poor plot definition in gardens, and debris and invasive species along the rail corridor. The project design includes elements of corridor naturalization, visual buffering from the parkway, plantings, storm water treatment and improved pond visibility. • Glaken Slope Improvement Project Phase V Presentation February 25, 2016 A high priority in the Fresh Pond Reservation Master Plan, the focus of Glacken Slope Restoration is to stabilize the slope, improve soil infiltration, control storm water runoff, and enhance habitat quality. A phased restoration approach, this project involves slope stabilization and gully repair, community-based restoration plantings, improving drainage to the Perimeter Road, and integrating the Upper Slope with the Glacken Field re-design. More CWD project information can be found at: http://www.cambridgema.gov/Water/Projects/freshpondreservation	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program.
1.a cont		Commissioner/ DPW	(iii) Distribute materials	The *CityView* newsletter referenced in BMP 1.a (i) above is distributed to over 50,000 households in Cambridge actively receiving mail. *CityView* is a publication of the City of Cambridge. In addition, copies of *CityView* are	Distribute information on Stormwater

Revised			**Expanded BMP element in Year 3**	available at various municipal buildings, on-line and are provided in Appendix 1, referenced above under BMP 1.a (i). The *Cambridge* Life also referenced in BMP 1.a (i) above is another publication of the City of Cambridge. This free magazine is distributed throughout Cambridge through 5 news boxes located in the major squares, and racks within City Hall and other municipal offices, and placed with other groups such as realtors, senior centers, university offices and others. Copies of all of these publications are available on-line and are provided in Appendix 1, referenced above under BMP 1.a (i). DPW also distributed stormwater management materials/brochures at the Rain Barrel distribution events May 21st) and at other public meetings and the annual Stormwater meeting. DPW also distributes information electronically (e-mails, e-line, web site, Facebook and Twitter) and in hard copies, as well as, posting notices in local newspapers and hand deliveries to individual homes/businesses.	/Watersheds to every household actively receiving mail in Cambridge and/or through electronic media.
Revised		Commissioner/ DPW	(iv) Assess local/regional mass media marketing campaigns **Revised in Year 3– new BMP element**	The Cambridge Science Festival is a multi-day public celebration offering a wide array of science and technology related activities including tours, displays, and hands-on experiments including water related events sponsored by the City of Cambridge, MIT and others. Water and sustainability related events at the 2015 Science Festival included: Marine Science Center Rocky Shore Field Study & Tour, Dive into Ocean Science, Restoring Ecosystems, and other events at the Science Carnival and Robot Zoo including Charles River Watershed Association info on restoring the Charles. A copy of the program guide for the 10 day event is included in Appendix 1	Participate in the 2016 Cambridge Science Festival or other public event.
1.b Revised	Develop Outreach Materials/Activities for Children	Commissioner/ DPW	Include school children in stormwater outreach activities **Revised in Year 5 – [formerly 1.b (i) and (ii)]**	This activity was completed in Year 2. Outreach activities to children continue in general including the Cambridge Science Festival discussed in BMP 1.a (iv) above and: • DPW Vehicle Road Show held on May 18, 2015 which featured activities explaining how DPW keeps Cambridge Clean, including a hands on demonstration using the EnviroScape model to explain how local waters can become polluted. Pictures from the DPW Road Show are attached in Appendix 1. • The Cambridge Water Department sponsors weeklong activities that highlight watershed protection, water treatment and other water related activities. DPW was on hand to demonstrate the EnviroScape medel. A copy of the Fresh Pond Day May 30, 2015 flyer and activities schedule is attached in Appendix 1. • As part of the Alewife Sewer Separation project DPW hosted a "Touch-A-Truck/Movie Night" on August 6, 2015 to engage local youth living through the major construction project.	Schoolchildren will be included in stormwater outreach activities in general.
1.c	Develop a Stormwater Web Page	Commissioner/ DPW	(i) Develop a stormwater web page	DPW's Stormwater Management web pages can be viewed at www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx Also refer to BMP 1.a (ii) above.	Completed

		Commissioner/ DPW	(ii) Update stormwater web page	See 1.a. (ii) above.	This site will continue to be updated and expanded
1.d	Create a Catch Basin Curb Marker Program	Commissioner/ DPW	(i) Install catch basin curb marker/plaques	DPW installed catch basin curb markers during sidewalk reconstruction projects and our remedial reconstruction projects. A total of 144 have been installed: 82 in the Charles (C), and 6267 in the Alewife (A) watersheds under the following contracts: FY15 Misc Sidewalk: C (18) A (8) FY 15 Remedial: C (9) A (3) Chapter 90 Contract 16: C (10) Chapter 90 Contract 18: C (30) Waverly Path/Harvard Sq.: C (5) Western Ave.: C (3) Huron A: A (7) Huron B: A (27) Concord Ave: A (17) Main/Kendall: C (7)	Continue to install catch basin curb markers during construction projects.
1.e	Reduce Stormwater Pollution from Automobiles	Assistant City Manager for Community Development/ CDD	(i) Sponsor an event to promote alternative forms of transportation	The Community Development Department (CDD) sponsored and participated in many activities promoting alternative forms of transportation during 2015. The CitySmart program is available to all Cambridge residents and public employees. Activities included events for alternative forms of transportation, informational tables, giveaways to cyclists and pedestrians, participation in local bike events/tours/workshops. More information on CitySmart can be found at: www.cambridgema.gov/CDD/Transportation/CitySmart.aspx A sample of Sustainable Transportation activities can be viewed in Bicycle Workshop Schedule of events in Appendix 1	Alternative forms of transportation will be promoted through activities and events.

MCM #1. Additional Information

- The City of Cambridge's Community Development Department (CDD) monitors 41 currently active PTDM projects, 36 submitted complete monitoring reports in 2015, or 88%. 2015 monitoring reflects:
  - More than 8.8 million square feet of commercial development and 15.5 million square feet of institutional development are subject to annual PTDM monitoring, including Harvard University.
  - A total of 17,989 parking spaces come under the Ordinance, with facility sizes ranging between 3 and 4,576 parking spaces.
  - Approximately 31,133 employees, 12,105 graduate/middle school students, and 2,000 library patrons are covered by

PTDM plans in Cambridge.

- Twenty nine of the 36 projects, or 81% met or surpassed their mode split.
- Thirty-six of the 36 projects, or 100%, submitting reports had a response rate of greater than 60%, giving results a very high degree of reliability.

New PTDM project approved in this period, but not yet implemented:

- MIT SOMA PUD (new plan)
- Novartis (F21 Amended)

- To improve and expand outreach DPW launched an official Facebook page during Year 9 and launched a Twitter account in 2012 in an effort to keep residents and other interested persons informed about programs, events, projects, and general updates. DPW continues to update its Facebook and Twitter pages
  - The DPW Facebook page can be viewed at: www.facebook.com/CambridgeDPW
  - The DPW Twitter feed can be viewed at: https://twitter.com/CambridgeDPW

- The City continues to provide a comprehensive City Employee Commuter Benefits to all of its employees. These benefits include subsidized T passes, a free shuttle service, Emergency Ride Home program, a regional car pool matching service, and free membership to Hubway. The City also supports bicycle use and walking through the respective city programs and provides an internal web site that provides information on commuter benefits and workshops.

- DPW also sponsored a rain barrel event during Year 13: May 22rd. Approximately 60 barrels were sold through this event. Stormwater management information on Healthy Household Habits, rain gardens, Household Hazardous Waste, etc was distributed with each rain barrel purchased. During our 2015 DPW again partnered with www.GreenCambridge.org to provide assistance or advice on the installation of the rain barrels (see Appendix 1 for copy of assistance letter).

- The Federal Emergency Management Agency issued new Flood Insurance Rate Maps for a portion of Cambridge in 2010. During Year 13 DPW continued to assist residents with these changes through e-mail, phone and help-desk requests for information. DPW submitted a local Community Rating System (CRS) application during Year 12 that was approved in Year 13 effective October 1, 2015 providing Cambridge residents with a 5% discount on their flood insurance premiums.

- For the past eight years DPW has sponsored Team GreenSense, a worksite of the Mayor's Summer Youth Employment Program. Each summer the DPW employs 10-15 teams for 6 weeks to learn about and work on solving environmental problems both locally and globally. During Year 13 the program ran from July 6 – August 14 and participants toured the Deer Island treatment facility, removed invasive plants at Fresh pond, removed water chestnuts on the Mystic, learned about climate change, helped with beach cleanup at Magazine Beach, among many other activities.

- Municipal Sewer and Water magazine did a feature article in April 2015 on the Alewife Constructed Wetland "*Back to Nature*". The article discusses the evolution of the sewer separation program, importance of the wetland to the project and the benefits of treating water through a "*natural*" system. A copy of the article is attached in Appendix 1.

- The Journal of the New England Water Environment Association did a feature article in the Summer 2015 edition. The article "*Alewife stormwater wetland – the "gem" of Cambridge's stormwater management program*" discusses the Alewife Sewer Separation Program and importance of the constructed wetland to the stormwater management objectives of the project, as well as, the other critical infrastructure pieces that support the water quality benefits of the overall Alewife sewer separation program.

- The Trust for Public Land did a case study on the Alewife Stormwater Wetland discussing how using open space offers win-win situations for cities to manage stormwater runoff while also meeting residents' recreation needs. A copy of the case study is attached in Appendix 1. This case study is excerpted from *City Parks, Clean Water: Making Great Places Using Green Infrastructure*, March 2016. The whole report can be viewed here.

- The DPW installed staff gauges within the Alewife Stormwater Wetland so that the City and the public could observe the elevation of the stormwater within the wetland. This will aid in understanding how the wetland responds to rain events and dry weather conditions. For images of the gauges and locations see Appendix 1.

MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 14
2.a	Participate in Public Meetings on Water Quality and Quantity	Commissioner/ DPW	(i) Participate in/sponsor a public meeting on water quality/quantity and/or the stormwater management plan	A public meeting to discuss the accomplishments of Year 13 and to discuss potential issues/projects for Year 14 was held on March 29, 2016. A copy of the presentation and sign-in sheet is provided in Appendix 2. See MCM 2 "Additional Information" at the end of this section for more information on public meetings and outreach efforts.	Public meeting will be hosted by DPW regarding the status of the stormwater management program and/or stormwater issues.
		Commissioner/ DPW	(ii) Advertise meeting through various sources	The above meetings were advertised on the city's web site on the citywide calendar and DPW homepage. In addition the NPDES meeting was posted at the City Clerk's office at City Hall. A copy of the NPDES meeting notice from the City calendar and DPW website are provided in Appendix 2	Meeting will be publicly advertised in local newspapers, through the web site and/or other means.
2.b	Support Volunteer Efforts	Commissioner/ DPW	(i) Provide clean-up assistance for one event annually	The City provided support to the Friends of Alewife Reservation for a large clean up at Alewife on April 26, 2015 as part of Earth Day/Park Serve Day.	Support/assistance will be provided for one clean-up event, as needed.

2.b cont.		Commissioner/ DPW	(ii) Support educational efforts of local watershed groups as opportunities arise through talks and /or support of grant applications	The DPW gave five (5) tours of the Alewife Stormwater Wetland on May 16, 27, June 6, October 9, and November 2, 2015 to Boston Society of Civil Engineers, MWRA Finance Committee, Cambridge residents, Tufts Urban & Environmental Policy Planning students, and Architecture Boston Expo (ABX) conference attendees, respectively. The Cambridge Water Department supported the efforts of the Friends of Fresh Pond Reservation in their stewardship and educational projects. A copy of their "The Year in Review" for 2015 is attached in Appendix 2 and details the various activities supported by the Water Dept. See additional outreach and educational efforts listed under "MCM #2. Additional Information" at the end of this section.	The City will continue to provide support to local watershed associations as opportunities permit.
		Commissioner/ DPW	(iii) Seek permission to post links to local watershed groups' web sites	The Stormwater Management web site was totally reorganized in November 2010. Hyperlinks were confirmed to be current. New information was added and where appropriate additional hyperlinks were made.	As new information is added to the stormwater management web pages new hyperlinks will be added and updated as needed.
2.c	Sponsor Recycling of Hazardous and Solid Waste	Commissioner/ DPW	(i) Hold 4 Household Hazardous Waste Collection (HHW) days annually		
Revised		Commissioner/ DPW	Hold 3 Household Hazardous Waste Collection days annually **(Revised in Year 1)**	Four (4) Household Hazardous Waste (HHW) collection days were held this permit year on April 11, June 6, September 12 and October 17, 2015. Approximately 13,933 tons (estimated) of materials have been recycled, including 38 tons (estimated) of HHW.	4 HHW collection days will be held on April 19, June 18, September 10 and October 29, 2016.

2.c cont.		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2015 DPW continued to operate a recycling drop-off center at the DPW yard on Tuesdays and Thursdays from 4 – 7:30 p.m. and Saturdays form 9 a.m. – 4 p.m. More information about the Cambridge Recycling Center can be found on the Recycling web page.	DPW will continue to operate a recycling drop-off center.
		Commissioner/ DPW	(iii) Beginning in yr 2 provide information on illicit discharges and reporting	Information on proper disposal of household hazardous waste is provided on the DPW Household Hazardous Waste (HHW) web page and in eNewsletters. Information on HHW was provided to residents when they picked up their 2015 rain barrels together with other stormwater management information. Information on illegal dumping is provided on the Stormwater Management web page and under FAQ,	DPW will continue to provide information on illicit discharges and reporting at Household Hazardous Waste events and/or in its meetings, through print materials and online.

The following BMP was relocated from BMP 5.b and further revised in Year 3.

2.d	Participate in Watershed and Planning Efforts	Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(i) Complete Phase I of Concord-Alewife study	Not applicable in Year 12, completed in Year 1. Information from this process can be viewed at: Concord-Alewife Study	Completed.
2.d Cont.		Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(ii) Complete Phase II if authorized	Not applicable in Year 13, completed in Year 3.	Completed.
		Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(iii) Forward study recommendations to the City Manager for consideration	Not applicable in Year 13, completed in Year 4. The Planning Board submitted the Concord-Alewife rezoning petition to the City Council on April 25, 2005. This petition was based on the zoning recommendations of the Concord-Alewife Planning Study Committee. The petition was refilled by the City Council on February 21, 2006. The Concord-Alewife Rezoning and Design Guidelines were adopted by the City Council on June 26, 2006. The changes have been incorporated into the Cambridge Zoning Ordinance and Zoning Map.	Completed
		Commissioner/ DPW	(iv) Discuss Concord-Alewife Stormwater Management strategies at a public meeting	Not applicable in Year 13, completed in Year 4. DPW participated in a City Council Ordinance Committee meeting on environmental and infrastructure issues with regard to the Concord/Alewife proposed zoning amendment on June 13, 2006. Issues on water quality/quantity in the Concord-Alewife area were discussed.	Completed.
		Commissioner/ DPW	(v) Publish LID guidelines	Not applicable in Year 13, completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006	Completed.
		Commissioner/ DPW	(vi) Place LID document on the Stormwater web site	Not applicable in Year 13, completed in Year 4 (see BMP 2.d.(v) above).	Completed
		Commissioner/ DPW	(vii) Execute the Environmental Joint Powers Agreement (EJPA)		

revised			Work with EOEA to advance the EJPA to a final document **(Revised in Year 1)**	Not applicable in Year 13. The final EJPA was fully executed on March 4, 2005 and forwarded to EOEA. The EJPA was extended in Year 12 until December 31, 2017 (see 2.d (viii) below for update on the extension of the expired EJPA agreement).	Completed.
2.d cont.		Commissioner/ DPW	(viii) ABC Flooding Board to meet 4 times annually	The ABC Flooding Board met four times in Year 13 on May 12, Sept. 8 and Nov. 10, 2015 and March 8, 2016. The Environmental Joint Powers Agreement (JPA) that authorized the ABC Flooding Board had expired during Year 10 and it was approved for continuation on May 28, 2014. The Secretary of the Executive Office of Energy and Environmental Affairs approved the extension of the ABC Flooding Board through December 31, 2017.	The ABC Flooding Board will meet 4 times per year.
revised			**Schedule Revised in Year 1**		
		Commissioner/ DPW	(ix) Finalize Tri-Community Working Group's *Progress Report*	Not applicable in Year 13, this report was finalized in Year 3	Completed.
revised					
		Commissioner/ DPW	(x) Place Tri-Community Working Group's *Progress Report* on web site	Not applicable in Year 13. This report was placed on the web site in Year 4 see: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx	Completed.
revised					

MCM #2. Additional Information

- The Cambridge Department of Public Works (DPW) began the design of the 1st phase of the Alewife Sewer Separation Project, Huron A, during Year 8. This project is a three phase program that is a part of the Massachusetts Water Resources Authority's Long Term CSO Control Plan for the Alewife Brook: Huron A, Huron B and Concord Avenue Neighborhood. In total the Alewife Sewer Separation Project will separate combined sewers in an area of approximately 220 acres. Huron A began construction in October 2012, Huron B (Phase 2) began construction in September 2013, and Concord Avenue Neighborhood (Phase 3) began construction in January 2014. Sewer separation was completed in December 2015 allowing separated stormwater to discharge to the newly constructed stormwater wetland. During Year 13 many community events were scheduled allowing different venues for the community to discuss the sewer separation projects, schedules and construction activities. Community design discussions have centered on the environmental goals of this project to separate the combined sewer system, how to best treat the newly separated stormwater, ways to manage/infiltrate the stormwater through the design of the

street restoration project and private inflow removal benefits. Community outreach efforts are directed at trying to reach the broader community including open houses, coffee talks, Touch-A-Truck/Movie Night for families, Summertime in the Village to help support local businesses, etc. Detailed information regarding these projects and the meeting presentations can be found on the City Projects website at: www.cambridgema.gov/theworks/cityprojects.aspx under Huron A Improvements, Huron B Improvements and Concord Avenue Neighborhood respectively. A copy of the 2015 Community Events flyer is attached in Appendix 2.

- The tri-community working group (ABC Flooding Board) worked with the USGS on a cooperative watershed effort to install a flow gage along the Alewife Brook to obtain and share important hydraulic information. The gage became functional in August 2005. Arlington, Belmont and Cambridge are continuing to participate on an equal financial and resource basis for the gauging station's installation and maintenance. This will ensure that this gage will not be affected by Massachusetts funding cuts and Federal Sequestration. The real time flow measurements can be observed at http://waterdata.usgs.gov/ma/nwis/uv?01103025 .

- DPW began the construction of the CambridgePark Drive Area Drainage Improvements Project and Stormwater Wetland Project during Year 10 and was completed and open to the public on October 15, 2013. This project is a key component of the Alewife Sewer Separation program to reduce Combined Sewer Overflows to the Alewife brook. See the project web page for more information. An extensive outreach program has surrounded this construction activity. During Year 13 five (5) tours of the stormwater wetland were conducted to discuss the stormwater wetland and its benefits and construction process:
    - Boston Society of Civil Engineers: May 16, 2015
    - MWRA Finance Committee: May 27, 2015
    - Cambridge community: June 6, 2015
    - Tufts Urban Environment Policy & Planning students: October 9, 2015
    - Architecture Boston Expo (ABX) conference attendees: November 18, 2015

- Climate Change, Vulnerability Assessment (CVVA): The City is planning ahead and preparing for the inevitable effects of global climate change. In November 2015, the city released The CCVA Report: Climate Change Vulnerability Assessment – Part 1, a rigorous and detailed assessment of Cambridge's vulnerabilities to rising temperatures and increasing precipitation. The analysis shows that there will be costs to the economy, public health, and livability of the city if no action is taken. The report identifies specific facilities and areas that are subject to vulnerabilities from future heat and flooding conditions and helps the city set planning priorities.

  The Part 1 report looks at what would happen to people, buildings, and infrastructure if we experienced more heat and rainfall. Using the best available science, the city used projections of temperature, humidity, and precipitation in 2030 and 2070. Among the effects we may see are:
    - Tripling of days with temperatures over 90 degrees Fahrenheit by 2030 and nearly 10 weeks of 90 plus degree weather

by 2070.

- Expanding areas of above average temperatures, reaching conditions on hot days that would be dangerous to public health.
- Increasing rates of rainfall that would cause flooding from the Alewife Brook overflowing its banks and backups in storm drainage systems throughout the city.

The CCVA Report – Part 1 is available at www.cambridgema.gov/climateprep. The Part 2 report will assess vulnerabilities related to sea level rise and storm surge and is expected out in 2016. Using the vulnerability assessment as its technical foundation, the City will then develop a preparedness and resilience plan: a strategy to make Cambridge more prepared and resilient to climate change impacts. The preparedness and resilience plan will be coordinated with the Citywide Plan (Envision).

More information can be found by clicking on the following links:

- Climate Change Vulnerability Assessment Information
- Climate Change Vulnerability Assessment Report Part 1, November 2015
- Climate Change Public Meeting Presentation, December 3, 2015

- Mystic River Watershed Initiative Science Forum: On April 9, 2015 DPW presented information on the creation of the Alewife Stormwater Wetland at the EPA sponsored Mystic Science Forum. Attendees included residents, science professionals, watershed participants, government officials (EPA, DEP, USGS, MWRA). A copy of the presentation is available in Appendix 2.

MCM #3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 14
3.a	Update Stormwater Drainage System, Outfalls and Receiving Waters in GIS	Commissioner/ DPW	(i) Map Fresh Pond outfalls	Not applicable in Year 12	Completed.
		Commissioner/ DPW	(ii) Migrate existing GIS database to a new format	Completed in Year 3.	DPW staff will primarily be responsible to maintain the GIS database. As-built information will be added to keep the system up to date.
		Commissioner/ DPW	(iii) Track private structural controls in a database	Private structural controls (BMPs) are tracked in a database. Approximately 62 projects underwent DPW site plan review (see Appendix 3).	DPW will continue to track private structural controls through our site plan review and inspection process.
		Commissioner/ DPW	(iv) Catalogue record drawings	Cataloguing of record drawings was not necessary. The contract to update the GIS database included scanning record drawings and has been completed in Year 3. A catalogue of updated information is available to query.	Record drawings and as-built information will continue to be added on an ongoing basis.
		Commissioner/ DPW	(v) Train engineering staff on new GIS software	Not applicable in Year 13 this was completed in Year 3.	Completed.
		Commissioner/ DPW	(vi) Begin updating GIS information with as-built/record drawings	As-built and record drawings are updated on an ongoing basis.	Record drawings will be linked as they become available.
3.b	Detect and Eliminate Illicit Discharges	Commissioner/ DPW	(i) Perform routine water quality sampling	• In the Charles River watershed twenty-five (25) municipal outfalls	

			Revised in Year 3 to include all Cambridge owned outfalls	were inspected/sampled for dry weather flow: all twenty-five were sampled/ Inspected once. Of the above outfalls, three (3) outfalls (River, Brewer and JFK east) were inspected, but not sampled due to the lack of dry weather flow. The Western Ave outfall is a new outfall and will be sampled beginning in Year 14. • In the Alewife Brook watershed fifteen (15) outfalls were sampled/inspected for dry weather flow: three (3) outfalls were inspected/ sampled four (4) times, seven (7) outfalls were inspected/sampled three (3) times, and five (5) outfalls were inspected / sampled one (1) time over the permit year. Of the above outfalls, six (6) outfalls [five (5) outfalls at Russell Field and one (1) outfall at Blanchard Road (18")] were inspected, but not sampled due to the lack of dry weather flow. One (1) outfall at Matignon Road was not sampled/ inspected during the permit year. This outfall will be sampled at least twice during Year 14. See Appendix 3 and Part IV of this report for sampling locations and information.	Water quality samples will continue in each watershed for all known City of Cambridge outfalls.
		Commissioner/ DPW	(ii) Test one location in each watershed for oil and grease annually	.	One location in each watershed will be tested for oil and grease.
Revised			**(Revised for Year 2 only)**	Four (4) oil & grease samples were done during Year 13: Two (2) sample in the Charles (Sparks St and Flagg St) and two (2) in Alewife (Outfall N. of CPD and Harrison Ave). (See Appendix 3).	

		Commissioner/ DPW	(iii) Perform additional water quality testing and field investigations as necessary	Additional water quality testing was performed to isolate the location of illicit discharges and to confirm their successful removal.	We will perform additional water quality testing and field investigations as necessary.
Revised			**Revised in Year 3** Expand Water Quality testing in both watersheds	See 3.b (i) above	All known Cambridge Outfalls will be sampled in the Charles and Alewife watersheds.
3.b cont.		Commissioner/ DPW	(iv) Identify and remove illicit discharges	One (1) illicit discharge/connection was discovered and removed in separated areas during Year 13 on Highland Street at Sparks.	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Fifteen (15) water quality samples were taken from three ponds that surround Fresh Pond including: Little Fresh Pond, Black's Nook, and North Pond Fourteen (14) water quality profiles were taken from Fresh pond at two locations. (see Appendix 3 for sampling data).	Water quality sample will be taken at Fresh Pond Reservation annually.
		Commissioner/ DPW	(vi) Purchase sampling equipment as recommended by EPA's Lower Charles IDDE Protocol	Not applicable in Year 13. Sampling equipment was purchased in Year 4.	Supplies will be purchased as needed.

3.b cont.		Commissioner/ DPW	(vii) Investigate Sparks Street drainage area	Investigation of the Sparks Street drainage area using the Charles River IDDE Protocol began in the Summer of 2006. Approximately 85% of this investigation is complete. Structural problems were identified and repairs made so that investigations could continue: • A few pipes were found to be in disrepair and required rehabilitation before additional testing could resume in this area due to the influence these pipe have on the downstream system. This area has a sewer over drain system and the sewer was found to be leaking. In lieu of lining the pipes the Healy Street sewer line was fully replaced in Year 12 and investigations continued in Year 13. • Three (3) Common Manholes (CMH) were discovered in sewer easements on private property two (2) between Fernald Drive and Linnaean Street and one (1) running beneath a building on Brewer. Separation was completed during Year 13.	Investigation into the Sparks Street drainage area will continue.
		Commissioner/ DPW	(viii) Investigate Lechmere Canal drainage area.	Completed as far as possible due to influence of Charles River. Investigation of the Lechmere Canal drainage area using the Charles River IDDE Protocol was begun in Year 5. Approximately 75% of the manholes have been checked. The remaining manholes are influenced by back flow from the Charles River and are extremely difficult to isolate.	Completed.

3.b cont.		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	Three (3) Common Manholes (CMHs) in separated drainage areas were separated during Year 13. All known CMHs in separated areas have been eliminated. Separation of future CMHs will help to separate sections of combined sewer areas combined through CMH structures. The removal of CMHs in the Alewife Sewer separation project area (CAM004) including the Huron A, Huron B, Concord Ave and Concord Lane project areas enabled over 220 acres of combined sewer catchment to be separated. This sewer separation program was completed in December 2015. Approximately 30 CMHs were separated in these project areas. An additional unknown CMH was discovered and removed from Hayes Street (an existing combined sewer area)	The number of Common Manholes separated in combined drainage areas will be tracked.
		Commissioner/ DPW	**(X) Perform wet weather water quality sampling at 2 outfalls annually**	Cambridge began a wet weather sampling program in Year 5 by sampling 2 outfalls in catchment areas	Cambridge will continue to take wet weather samples at the same 2 outfalls (Sparks Street and

				not influenced by common manholes, one catchment in the Alewife watershed (Normandy Terrace) and one in the Charles River watershed (Sparks Street). Two (2) wet weather samples were taken during Year 13, one in each watershed. See Appendix 3 for sampling data. The City has made progress on the installation of 5 automatic sampling stations three in the Alewife Watershed (wetland outlet, upstream of wetland and Columbus Ave) two in the Charles Watershed (Sparks St and Western Ave). These stations will aid in obtaining wet weather sampling data. During Year 13 the installation of these station were 90% complete.	Normandy Terrace) and monitor sampling results. Installation of 5 automatic sampling stations will be completed in Year 14 and programming and operational testing will begin.
3.c	Conduct Illicit Discharge Education Program	Commissioner/ DPW	(i) Advertise illicit discharge hotline number and information on illicit discharges	The hotline number was not added to any new material during Year 13, but is available on the DPW Stormwater homepage. Non-emergency citizen requests can now be reported through the Commonwealth Connect Program. This allows residents to report issues via easy to use GPS enabled mobile apps on an online mobile interface. See below under "Additional Information" for further details.	The Stormwater Hotline number for illicit discharges will be incorporated in public information where appropriate/applicable.
3.d	Develop Regulations Prohibiting Illegal Dumping of Non-Stormwater into the MS4	Commissioner/ DPW	(i) Develop a working draft	Not applicable in Year 13, completed in Year 1.	Complete.
		Commissioner/ DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 13, completed.	Completed.

		Commissioner/ DPW	(iii) Revise draft as necessary	Not applicable in Year 13, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Not applicable in Year 13, completed in Year 5. Click on the link to see a copy of Wastewater and Stormwater Drainage System Ordinance .	Completed.

MCM #3. Additional Information

- CMHs are underground structures that allow people to access both sewer and storm drainpipes through a single structure. Typically, the drainage system runs above the sanitary system, separated by a steel plate. Over time the steel plate deteriorates causing sewerage to mix with stormwater. This can lead to two problems during storm events. First it can cause stormwater to enter and overwhelm the sanitary system causing sewerage to overflow and back-up on to the street or into basements. Second, untreated sewerage can enter the storm drain system and be released into either the Charles River or Alewife Brook. See Appendix 3 for a map of the common manholes that have been separated throughout Cambridge. Approximately 318 common manholes have been separated through March 1, 2016 in separated catchment areas. Approximately 30 CMHs in a formerly combined sewer area (CAM004) were separated enabling this area of approximately 220 acres to become a separated catchment area. Sewer separation was completed in December 2015 in the CAM004 area.

- Effective January 1, 2010 the City enacted a new Ordinance governing the maintenance and operation of dumpsters of all new and existing dumpsters, including construction dumpsters. The ordinance requires that no dumpster be placed so that any liquid or runoff from the dumpster shall enter any catch basin or storm drain. In Year 13 the city issued 863 permanent and 261 temporary dumpster licenses under the new ordinance.

- During Year 13 the DPW began working on a Five Year Plan for the Cambridge Cemetery, which includes survey and design services to address issues associated with drainage, roadway delineation, and roadway pavement condition and reconstruction. Aerial and ground survey and drainage videos and investigations have been completed. The Plan will include a proposed drainage system and grading plan. During Year 14 DPW anticipates the draft Plan will be available for review in the spring and the final Plan in the summer.

- Bring Your Own Bag Ordinance took effect on March 31, 2016. The purpose of the Bring Your Own Bag Ordnance is to reduce disposable checkout bags by retail establishments to protect the marine environment, advance solid waste reduction, reduce greenhouse gas emissions and protect waterways. The Ordinance seeks to reduce the number of plastic and paper bags

being burned, used, discarded and littered, and to promote the use of reusable checkout bags.

- A New Public Service Request Platform: Cambridge Commonwealth Connect will allow residents to report quality-of-life concerns via the City of Cambridge's website, mobile applications, Facebook App, and SeeClickFix.com. When submitting issues via mobile app residents can provide location, descriptive, and photographic information as they see the issue in real time. Once the resident submits an issue, the City of Cambridge and anyone 'watching' the area will receive an alert. City staff will acknowledge the service request, route it to the proper department, and update the request—and residents following the issue—once it's been resolved. The City is reviewing the expansion of the categories of issues to specifically include sewer/stormwater related service requests, currently these issues can be reported under "other"..

MCM #4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 14
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 13, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 13, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	Not applicable in Year 13, completed during Year 5. Land Disturbance Regulations were finalized following the adoption of the revisions to Cambridge Municipal Code Chapter 13.16 Wastewater and Stormwater Drainage System.	Completed.
		Commissioner/ DPW	(iv) Present draft to City Manager, City Council and the community for review	Not applicable in Year 13. On October 29, 2007 the City Manager submitted a comprehensive revision to Chapter 13.16 of the Cambridge Municipal Code "Sewer System Regulations" to ensure this ordinance fully complies with the NPDES Phase II requirements for stormwater management as it relates to construction site runoff. On January 28, 2008 the City Council ordained the Wastewater and Stormwater Drainage System Ordinance by a vote of 9-0-0. This ordinance authorized the Commissioner of DPW to promulgate regulations to enforce the ordinance: ▪ Wastewater and Stormwater Drainage Use Regulations ▪ Land Disturbance Regulations	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Not applicable in Year 13, completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Nine (9) Stormwater Control Permits (formerly Land Disturbance Permits) were issued during Year 13 for the following projects: • 1971 Mass Ave • 131 Harvard St. • 130 CambridgePark Dr. • 10 Acorn Park Drive • 60 Vassar Street • 79 JFK St. • 1 Jefferson Place • 253 Walden Street • 160 Binney 11 applications were submitted in Year 13	The number of Stormwater Control Permit applications submitted and approved will be tracked.
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	Although no additional guidance materials or BMP fact sheets were developed during Year 13, Cambridge is in the process of completing a Climate Change Vulnerability Assessment. When completed additional materials will be developed to support adaptation objectives.	Continue to maintain and revise guidelines as necessary in conjunction with adaptation strategies.
		Commissioner/ DPW	(viii) Adopt procedures for inspections during construction activities.	A peer review of inspection was completed. Inspection procedures are incorporated into the Land Disturbance Regulations (Article VII) and will be further clarified in the guidance documents as necessary.	Incorporate inspection procedure information in the guidance document as necessary.
		Commissioner/ DPW	(ix) Adopt procedures for enforcement and penalties for violations.	Compliance and enforcement procedures are included in the Land Disturbance Regulations (Article X). In Year 8 DPW developed a "WARNING" ticket to be used for stormwater violations. Implementation of the ticketing program began Year 9 (see BMP 4 (a) (ix) below). During Year 13 DPW developed a Violation letter through Energov. An example can be viewed in Appendix 4.	Complete.

4.a cont.		Commissioner/ DPW	(x) Record the number of enforcement actions taken and reported	When DPW finds a site without proper erosion control in place we work with them to bring it into compliance. There were fifteen (15) Erosion and Sedimentation Control WARNING tickets issued for stormwater related violations.	The number of enforcement action taken and reported will be tracked in a database.
4.b	Educate Contractors and Residents about the Construction Site Runoff Control Program	Commissioner/ DPW	(i) Make materials available on erosion and sediment control practices available through city web site and/or other means	Completed. See BMPs for Construction Controls	Post erosion & sediment control information as it becomes available.
		Commissioner/ DPW	(ii) Discuss erosion and sediment control practices and problems at 3 construction coordination meetings annually	DPW holds weekly meetings with large contractors during April – November. Erosion and sediment control practices and problems with permitted contractors working in the City are discussed during these meetings see invitation letter in Appendix 4. Erosion and sedimentation control was discussed at the following meetings including: April 21, 27 and May 18, 2015. Copies of sign-in sheets and meeting notes are provided in Appendix 4.	The City Engineer will discuss erosion and sediment control practices and problems with contractors at 3 construction coordination meetings.
New		Commissioner/ DPW	(iii) Record the number of guidance materials or reference materials provided.	No additional fact sheets were developed during Year 13. See BMP 4.b (i) above for a link to the current fact sheets.	Develop and/or revise specification, fact sheets or other guidance documents, as necessary.
4.b cont.		DPW	(iv) Create a list of resources, which provides BMP suggestions for the targeted pollutants of concern.	Completed. See BMP 4.b (i) above for a link to the current fact sheets.	Completed.
		Commissioner/ DPW	(v) Record the number of workshops or meetings with City departments to discuss implementation of plan requirements	No meetings were held in Year 13.	Meetings will be held to discuss new ordinances and regulations as necessary.

MCM #4. Additional Information

- In addition to the nine (9) Stormwater Control Permits issued during Year 13 six (6) additional permits were submitted for review to DPW as follows:
    - 237 Franklin Street
    - 399 Binney Street
    - 32 Mill Street
    - 2 Leighton Street
    - 90 Broadway
    - 88 CambridgePark Drive

- The City's Wastewater (Stormwater) Compliance Officer completed two hundred and forty four (244) inspections:
    - 244 stormwater erosion and sediment control site inspections, and
    - Issued 15 violation/warnings for erosion and sediment control

- DPW transitioned to the Energov system in November 2015 to process all permits, inspections and code enforcement investigations. This DPW is no longer using the Cambridge Request System for permitting. The Energov system allows for permitting, inspection and code enforcement (post construction inspections, erosion and sediment control inspections, and fats, oils and grease inspections) to be conducted within the Energov system. Currently the DPW and Inspection Services Department are using Energov, the goal is to bring all municipal permits under this program.

MCM #5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 14
5.a	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Not applicable in Year 13, this activity was competed in Year 4.	Completed.
Revised	Develop Program for Post Construction Site Runoff Control		**(Revised in Year 3)**		
		Commissioner/ DPW	(ii) Undertake and complete peer review and legal review of draft	Not applicable in Year 13, completed in Year 5. Regulations and Ordinance can also be viewed on-line at: http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.
		Commissioner/ DPW	(iii) Develop draft guidelines on BMPs	No new fact sheets were developed in Year 13. New guidelines will be developed to support the CVVA findings and adaptation strategies.	Stormwater management guidance will continue to be revised.
		Commissioner/ DPW	(iv) Discuss final draft and guidance with City Manager, City Council and the community	Not applicable in Year 13, complete in Year 5. On October 29, 2007 the City Manager submitted a comprehensive revision to Chapter 13.16 of the Cambridge Municipal Code "Sewer System Regulations" to ensure this ordinance fully complies with the NPDES Phase II requirements for stormwater management as it relates to construction site runoff. On January 28, 2008 the City Council ordained the Wastewater and Stormwater Drainage System ordinance by a vote of 9-0-0. This ordinance authorized the Commissioner of DPW to promulgate regulations and guidance documents to enforce the ordinance. A copy of the Ordinance and Regulations can be viewed on the DPW Stormwater website: http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.

5.a Cont.		Commissioner/ DPW	(v) Present final regulation, guidance and monitoring program for consideration and adoption	Not applicable in Year 13, completed in Year 5. The Commissioner of Public Works promulgated Land Disturbance Regulations and Wastewater and Stormwater Drainage Use Regulations. ❑ Wastewater and Stormwater Drainage Use Regulations are intended to protect the public health, safety and welfare and the environment and to ensure proper and safe operation of the City's Sanitary Sewers, Combined Sewers and Stormwater Drains by regulating the direct and indirect discharge of Waste, stormwater and pollutants to the City's Wastewater and Stormwater Drainage system. These Regulations are also intended to prohibit and remove illicit connections and unauthorized discharges to the City's Stormwater Drainage system. This includes the legal authority to carry out all inspection, surveillance and monitoring procedures necessary to comply with this Regulation. ❑ The Land Disturbance Regulations are intended to reduce pollutants in stormwater runoff from construction activities and to address post construction stormwater runoff from new development and redevelopment projects. These Regulations include procedures for inspection and enforcement. A copy of the Ordinance and Regulations can be viewed on the DPW Stormwater website (see MCM 5.a (ii) above) and by clicking on the links above. Staff continued to review Regulations for revisions. These changes are still draft and have not yet been advertised.	Guidance documents will continue to be revised. Land Disturbance Regulations (now Stormwater Control Regulations) will be revised to reflect new permits and permit names.
		Commissioner/ DPW	(vi) Record the number of meetings held by the City for the regulatory process	The regulatory process is complete. No further regulatory meetings are planned.	Complete.
		Commissioner/ DPW	(vii) Administer stormwater management permit requirements	Administration of the Stormwater management permit [Stormwater Control Permit (SCP)] requirements is ongoing. A database was developed to track SCPs to facilitate reviews, construction inspections and post-construction inspections. There were nine (9) Stormwater Control Permits issued in Year 13. Refer to summary attached in Appendix 5.	Track Stormwater Control Permits in a database.

5.a cont.		Commissioner/ DPW	(viii) Administer procedures for enforcement and penalties for violations	Not applicable in Year 13, completed in Year 6.	Completed.
		Commissioner/ DPW	(ix) Adopt procedures for post construction inspections	Completed. Procedures for Post-Construction inspections are incorporated in the Draft guidance documents and were included in the Land Disturbance Regulations in Year 5. On June 11, 2009 the City hired a full time Wastewater (Stormwater) Compliance Officer whose job responsibilities include performing post-construction inspections. The compliance officer created and maintains a private BMP database for use in post construction inspections. Fifty-two (52) post-construction inspections were performed during Year 13. See more information in the "Additional Information" section below.	A data base for projects with private BMPs regulated under the Land Disturbance Regulations will be maintained. Track the number of Post-Construction inspections performed.
		Commissioner/ DPW	(x) Discuss alternatives to ensure adequate long-term operation and maintenance of BMPs	Completed. Owner's are required to perform long-term operation and maintenance of BMPs as follows: • Owner is responsible for ongoing maintenance, inspections, recordkeeping and reporting. • Owner is required to maintain log and update plan. New owner must submit a new plan. • Applicant is responsible for adhering to design standards. Plan requirements and guidance will be provided in the guidance documents • The Plan and Logs are required to be made available for inspection upon request by any public entity with administrative, health, environmental, or safety authority over the site. It is expected that the Wastewater Compliance Officer will work with property owners to ensure that their BMPs are being maintained. During Year 13 DPW worked with both Harvard and MIT on a tracking system and reporting format for all of the university owned properties covered under Stormwater Control Permits to assist the universities better track maintenance activities of post construction Stormwater control devices.	DPW will continue to work with property owners by performing inspections on properties with Stormwater Control Permits. Stormwater Compliance officer will check his data base for inspection dates and will perform inspection following the sites long term O&M plan.

		Commissioner/ DPW	(xi) Provide legal mechanism to require annual compliance for the operation and maintenance of BMPs	Not applicable in Year 13, completed in Year 5. The Land Disturbance Regulations provide for Post-Construction inspection and enforcement of provisions in the Regulations.	Completed.
5.b	Undertake Tree Protection Activities	Commissioner/ DPW	(i) Provide one community outreach and education activity annually on the care, importance and protection of trees and their role in climate protection	The City Arborist participates in varied outreach activities each year. During Year 13 activities included: • Arbor Day Celebration May 6, 2015 • Forestry Programs and Volunteer Opportunities including: the Water by Bike/Tree Ambassador and Junior Forester Programs • September 16, 2015 Tree walk The arborist also works closely with the Public Planting Committee and administers Tree hearings for the removal of trees from the public way.	DPW will continue outreach efforts on the importance and protection of trees.

MCM #5. Additional Information

- DPW's arborist had ten (10) meetings with the Committee on Public Planting regarding the benefits of green space and trees, and worked with them to strengthen tree planting specifications to help support the long term health of urban street trees.

MCM #6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 13 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 14
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	During Year 10 DPW purchased *RAINcheck Stormwater Pollution Prevention for MS4s* from Excal Visual as a training aid for employees. During Year 13 no employees were trained using RAINcheck Stormwater Pollution Prevention, but two (2) employees attended an IDDE workshop in Lexington on October 29, 2015. In addition, on December 7, 215 two (2) DPW employees became acquainted with the new Rainwater Harvesting system installed at the MLK School. Thirty-eight (38) DPW employees were trained on the new Energov system for permits, inspections and code enforcement.	Conduct training annually. Use the *RAINcheck Stormwater Pollution Prevention for MS4s* to train individual division personnel.
		Commissioner/ DPW	(ii) Work with managers to identify operations personnel with stormwater responsibilities	A list of responsible operations personnel with stormwater responsibilities is maintained.	DPW will continue to work with facility managers to ensure Good Housekeeping inspections are done properly.

6.a Cont.		Commissioner/ DPW	(iii) Develop and implement training protocols that are applicable to operations	Not applicable in Year 13, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Record number of municipal facilities inspected on an annual basis	129 facility inspection reports have been completed and returned to DPW This represents 86% of the facilities in separated areas and 93% of the facilities in combined sewer areas.	Number of good housekeeping inspections completed by facility personnel on an annual basis will be recorded.
		Commissioner/ DPW	(v) Record number of facilities that have initial good housekeeping inspections conducted	Not Applicable in Year 13, completed in Year 8. All municipal facilities have had an initial inspection.	Completed.
		Commissioner/ DPW	(vi) Record the number of municipal facility site plans updated, including structural controls based upon initial site visits.	Porous pavement within the public right-of-way is being tracked in the GIS system.	Municipal facility site plans will be updated based upon revised information from the initial site inspections.
6.b	Maintain Strong Operations & Maintenance Program to Reduce Pollutants from Operations	Commissioner/ DPW	(i) Review operations and maintenance programs	A contract was awarded to Parterre Ecological Services for the vegetation management within the Alewife Stormwater Wetland.	New activities at facilities should be noted and applicable BMPs implemented.

		Commissioner/ DPW	(ii) Identify municipal facilities in separated areas and identify structural controls	Changes are updated annually. 154 municipal facility sites were mapped in GIS according to location in separated or combined sewer areas. During Year 13, 89 facilities were within a combined sewer area and 65 were within a separated stormwater area, but with the completion of the Alewife Sewer Separation project and partial separation of Western Avenue the number of facilities in separated areas may have changed.	Continue to incorporate facility inspection drainage findings into the City's GIS system. Continue to develop updated facility maps as necessary for staff (refer to 6.a. (vi) above. Revise and review municipal facilities within the newly separated former CAM004 area.
6.b cont.		Commissioner/ DPW	(iii) Document inspections procedures and maintenance schedules in a procedures manual	Not applicable in Year 13, Good Housekeeping Inspection Manuals have already been developed for municipal facilities.	Completed. Update as necessary.
		Commissioner/ DPW	(iv) Develop inspections procedures and maintenance schedules for long term structural controls	3,025 work orders were tracked for catch basin and drainage system inspection, repairs, maintenance, clean, clear in the Cambridge Request System. Over 2,300 work orders were tracked for sewer system inspection, cleaning, repairs, etc. A summary of all work orders submitted relative to the stormwater and sewer system is in Appendix 6. The DPW is moving to Cartegraph, a new work order system that will replace CRS/Remedy. Sewer and drain assets will be added along with work order components to track scheduled and unscheduled infrastructure maintenance activities.	Continue to track of the number and type of drainage system work orders completed.
		Commissioner/ DPW	(v) Record percentage of City catch basins cleaned	2574 catch basins cleaned (522 tons) [approximately 43% (6,000 total)]	Keep record of City catch basins cleaned annually.

		Commissioner/ DPW	(vi) Record tons of street sweepings collected	1,285 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	13,933 tons	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	500 trees were planted by the forestry division. See Appendix 6 for location of trees planted. New tree plantings are now mapped in GIS.	Keep record of new trees planted.
		Commissioner/ DPW	(ix) Record number of public structural controls constructed/repaired.	Refer to information provided below under "Additional Information"	Keep record of public structural controls constructed or repaired.

MCM #6. Additional information

- The Street Cleaning Division is responsible for maintaining clean public ways through a contractual street sweeping operation, which runs from April through December each year. Two contract sweepers are used to clean both residential streets and major City squares. The City squares are cleaned very early in the morning (between 4:00 AM and 8:00 AM) 7 days per week. Residential streets are swept city wide on a monthly basis, resulting in approximately 11,000 street miles being cleaned each year.

  Additionally, beginning in 2006 the city started a pilot program which utilized two vacuum sweepers to supplement the mechanical sweepers during the months of April and November. Through these months the two vacuum sweepers were sent out behind the mechanical sweepers on a daily basis in an effort to further remove fine material that was being left on the roadway after mechanical sweepers had made a first pass. Because of the success of this pilot, the city has continued using these two additional sweepers three times a year as part of our standard operations, vacuum sweeping of all municipal streets in done in April, July and November.

- In public construction projects the following stormwater best management practices (BMPs) were constructed:
  - New Stormwater outfall: 1 (Western Avenue)
  - Number of new catch basins with deep sumps and hoods: 114 (citywide)
  - Number of deep sump drain manholes (grit pits): 12 (Concord Av and Concord Lane)
  - Infiltrating Catch Basins/dry wells: 7 [(Bigelow (1)), Dudley (1) and Clay St (5)]

- Biobasins: 5 (Huron A)
- Porous Pavement: 6,669 SF in Huron A

- Additional maintenance activities were performed on stormwater drainage systems including:

  - Pump Inspections & Maintenance = 175 (Pump Inspections Maintenance Contract)
  - Storm drain cleaned and televised = 17,353 LF (TV and Cleaning Contract)

- A five year sewer plan is in development using Infomaster software to characterize code defects. The first sewer lining contract is underway based upon this program.
- On March 2016 the City received a 5-Star rating from STAR Communities, a Washington, D.C. based non-profit organization that recognizes and certifies sustainable communities throughout North America. STAR defines a sustainable community as one that "promotes a healthy environment, a strong economy and well-being for all residents, now and for future generations." The STAR's framework consists of 55 distinct objectives across seven broad areas. Together, these collectively describe sustainable social, environmental and economic performance, policies and programs. Cambridge received a score of 637.4 points and the Certified 5-STAR Community Rating as a top tier achiever in national sustainability. Cambridge further distinguished itself by receiving the highest STAR score to date. To view the STAR Communities results for Cambridge follow the following link: Cambridge Star Communities Results

Part IV. Summary of Information Collected and Analyzed

- See Appendix 3 for the results of water quality sampling at Alewife Brook, Charles River and Fresh Pond from April 2015 through March 2016.
  - Alewife Brook dry weather samples 2015.
  - Charles River dry weather samples 2015.
  - Little Fresh Pond, North Pond and Black's Nook Water Quality Samples: May, July, August, December 2015 and March 2016.
  - Fresh Pond Reservoir Water Quality Profiles: April 28, June 3 and 24, August 13, Sept. 15, Oct. 21 and Dec. 10, 2015.
  - Alewife Brook Oil and Grease samples: December 14, 2015.
  - Charles River Oil and Grease sample: July 23, 2015.

Part V. Program Outputs & Accomplishments (OPTIONAL)
(Since beginning of permit coverage unless specified otherwise by a **, which indicates response is for period covering April 1, 2014 through March 31, 2015)

Programmatic

	(Preferred Units)	Response
Stormwater management position created/staffed	(y/n)	Y[+]
Annual program budget/expenditures **	($)	
Total program expenditures since beginning of permit coverage	($)	
Funding mechanism(s) (General Fund, Enterprise, Utility, etc)		

[+] New Stormwater compliance officer was hired during Year 7.

Education, Involvement, and Training

Estimated number of property owners reached by education program(s)	(# or %)	100% residents
Stormwater management committee established	(y/n)	N
Stream teams established or supported	(# or y/n)	1
Shoreline clean-up participation or quantity of shoreline miles cleaned **	(y/n or mi.)	Y
Shoreline cleaned since beginning of permit coverage	(mi.)	
Household Hazardous Waste Collection Days		
▪ days sponsored **	(#)	4
▪ community participation **	(# or %)	999 vehicles
▪ material collected **	(tons or gal)	26 tons[+]
School curricula implemented	(y/n)	

[+] A total estimate of 26 tons were collected including at local DPW drop-off center

Legal/Regulatory

	In Place Prior to Phase II	Reviewing Existing Authorities	Drafted	Draft in Review	Adopted
Regulatory Mechanism Status (indicate with "**X**")					
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control					X
▪ Post-Development Stormwater Management					X
Accompanying Regulation Status (indicate with "**X**")					
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control					X
▪ Post-Development Stormwater Management					X

Mapping and Illicit Discharges

	(Preferred Units)	Response
Outfall mapping complete	(%)	100%
Estimated or actual number of outfalls	(#)	45*
System-Wide mapping complete (complete storm sewer infrastructure)	(%)	99%
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	100%
▪ GIS	(%)	100%
Outfalls inspected/screened **	(# or %)	100%
Outfalls inspected/screened (Since beginning of permit coverage)	(# or %)	100%
Illicit discharges identified **	(#)	1
Illicit discharges identified (Since beginning of permit coverage)	(#)	40
Illicit connections removed **	(#); and (est. gpd)	1
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	40
% of population on sewer	(%)	99.9%
% of population on septic systems	(%)	.1%

* Western Ave outfall was opened this year

Construction

	(Preferred Units)	Response
Number of construction starts (>1-acre) **	(#)	6[+]
Estimated percentage of construction starts adequately regulated for erosion and sediment control **	(%)	100%
Site inspections completed **	(# or %)	100%
Tickets/Stop work orders issued **	(# or %)	12 warning tickets
Fines collected **	(# and $)	0
Complaints/concerns received from public **	(#)	

[+] 130 CambridgePark Dr, 10 Acorn Park Dr, 79 JFK St, 1 Jefferson Place, 253 Walden St, 100 Binney St.

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	100%
Site inspections (for proper BMP installation & operation) completed **	(# or %)	100%
BMP maintenance required through covenants, escrow, deed restrictions, etc.	(y/n)	Y
Low-impact development (LID) practices permitted and encouraged	(y/n)	Y

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets) **	(times/yr)	
Average frequency of catch basin cleaning (commercial/arterial or other critical streets) **	(times/yr)	
Qty of structures cleaned **	(#)	2,574
Qty. of storm drain cleaned **	(%, LF or mi.)	55,720 LF
Qty. of screenings/debris removed from storm sewer infrastructure **	(lbs. or tons)	
Disposal or use of screenings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill
Basin Cleaning Costs		
• Annual budget/expenditure (labor & equipment)**	($)	$200,000

• Hourly or per basin contract rate **	($/hr or $ per basin)	$76/basin
• Disposal cost**	($)	$140/ton
Cleaning Equipment		
• Clam shell truck(s) owned/leased	(#)	2
• Vacuum truck(s) owned/leased	(#)	2
• Vacuum trucks specified in contracts	(y/n)	Y [+]
• % Structures cleaned with clam shells **	(%)	80%
• % Structures cleaned with vactor **	(%)	20%

[+] Storm drain pipe maintenance TV and Cleaning Contract

	(Preferred Units)	Response
Average frequency of street sweeping (non-commercial/non-arterial streets) **	(times/yr)	9 times/yr (April – Dec)
Average frequency of street sweeping (commercial/arterial or other critical streets) **	(times/yr)	Approximately daily
Qty. of sand/debris collected by sweeping **	(lbs. or tons)	1,285 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill & transfer station
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	($)	$407,625 (contract only)
• Hourly or lane mile contract rate **	($/hr. or ln mi.)	$94.00/hr/rotary sweeper $68.00/hr/vacuum sweeper
• Disposal cost**	($)	$45.00-46.50/ton
Sweeping Equipment		
• Rotary brush street sweepers owned/leased	(#)	2
• Vacuum street sweepers owned/leased	(#)	2
• Vacuum street sweepers specified in contracts	(y/n)	Y (3x/yr) [+]
• % Roads swept with rotary brush sweepers **	%	100
• % Roads swept with vacuum sweepers **	%	100

[+] Vacuum sweepers accompany rotary brush sweepers for the months of April, July, and November

Reduction (since beginning of permit coverage) in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	IPM followed – only organic fertilizers used
▪ Herbicides	(lbs. or %)	NA
▪ Pesticides	(lbs. or %)	NA
Integrated Pest Management (IPM) Practices Implemented	(y/n)	Y

	(Preferred Units)	Response
Average Ratio of Anti-/De-Icing products used ** (also identify chemicals and ratios used in specific areas, e.g., water supply protection areas)	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	80% 0 20% 0 0 0 0
Pre-wetting techniques utilized **	(y/n or %)	Y
Manual control spreaders used **	(y/n or %)	Y (75%)
~~Zero-velocity spreaders used~~ ** Automatic – control spreader	(y/n or %)	N (25%)
Estimated net reduction or increase in typical year salt/chemical application rate	(±lbs/ln mi. or %)	N/A
Estimated net reduction or increase in typical year sand application rate **	(±lbs/ln mi. or %)	100% reduction
% of salt/chemical pile(s) covered in storage shed(s)	(%)	100%
Storage shed(s) in design or under construction	(y/n or #)	N
100% of salt/chemical pile(s) covered in storage shed(s) by May 2008	(y/n)	Y

Water Supply Protection

Storm water outfalls to public water supplies eliminated or relocated	# or y/n	0
Installed or planned treatment BMPs for public drinking water supplies and their protection areas	# or y/n	Y
• Treatment units induce infiltration within 500-feet of a wellhead protection area	# or y/n	

List of Appendices

Year 13 (April 1, 2015 – March 31, 2016)

Appendix 1 – Public Education and Outreach

- *Brochure*: Stormwater Management & Green Infrastructure – Information Guide
- *Cambridge Life 2015-2016 Edition*: Cambridge Life 2015-2016
  - The Path to "Net Zero" Cambridge (p. 10)
  - Compost Curbside (p.13)
- *City View (Winter 2015)* (p.1)
  - The Citywide Plan
- Construction/Design Notice examples:
  - Alewife Sewer Separation Construction Update (September/October 2015)
  - Alewife Sewer Separation Construction Update (March 2016)
- Examples of website updates:
  - Joint Public Notice (April 2015) for the Alewife Brook CSO Progress Update
  - EPA press release regarding water quality grading system for the Mystic River
- Cambridge Science Festival April 17-26, 2015
- DPW Vehicle Road Show flyer and photos
- Fresh Pond Day flyer and activities (May 2015)
- Bicycle Workshop Schedule
- Rain Barrel installation assistance – GreenCambridge.org
- Municipal Sewer and Water magazine article, April 2015, "*Back to Nature*"
- Journal of the New England Water Environment Association "*Alewife stormwater wetland – the "gem" of Cambridge's stormwater management program*"
- Trust for Public Land, March 2016, case study on the Alewife Stormwater Wetland
- Alewife Stormwater Wetland staff gauges

Appendix 2 – Public Involvement and Participation

- NPDES Phase II public meeting information: Presentation and sign-in sheet (March 29, 2016)
- Public Meeting on Stormwater - City Calendar posting (Stormwater Meeting City Calendar Posting)
  And DPW News and Events posting (Meeting Notice)
- Friends of Fresh Pond *The Year in Review* 2015
- Mystic River Watershed Initiative Science Forum: Alewife Constructed Wetland presentation, April 9, 2015

Appendix 3 – Illicit Discharge Detection and Elimination

- Site Plan Review Listing
- Water Quality Samples and Maps
  - Charles River:
    - Charles River Dry Weather Sampling 2015 (includes oil & grease sample for Flagg and Sparks Streets)
    - Charles River: East, Central and West sampling location maps

- Alewife Brook:
  - Alewife Brook Dry Weather Sampling 2015 (includes oil & grease sample for Outfall N. of CPD and Harrison Ave)
  - Alewife Brook: North and South sampling location maps
- 2015 Water Quality Reports – Fresh Pond Reservation Class B Ponds
- Map of Separated Common Manhole through March 1, 2016
- Wet Weather Water Quality Samples

Appendix 4 – Construction Site Stormwater Runoff Control

- Construction Erosion & Sediment Control Violation Warning example letter
- Monday Construction Coordination Meeting – Invitation to Attend, March 7, 2016
- Construction Coordination Meeting - sign-in sheets (April 21, 27 and May 18, 2015) and copy of meeting notes from May 18, 2015.

Appendix 5 – Post-Construction Stormwater Management in New Development and Redevelopment

- Stormwater Control Permit database, summary for Year 13

Appendix 6 – Pollution Prevention and Good Housekeeping in Municipal Operations

- Municipal Facilities Good Housekeeping Inspections summary
- Stormwater Work Order Requests Submitted - summary (CRS)
- Trees Planted in Cambridge in 2015