

Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number

& Reporting Period: No. 12: March 14-March 15

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

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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 1, 2015

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 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities Permit Year 13
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.	<p>Information was developed on the following and included in the following city publications: <u>CityView</u> (Summer 2014)</p> <ul style="list-style-type: none"> Safely Dispose of Unused Medications, Needles and Syringes (p.6), describes how residents can dispose of unwanted medications (etc) in a safe and environmentally-friendly manner. www.cambridgepublichealth.org Cambridge Preps for Climate Change (p7) informs the public on the steps and initiatives that Cambridge is undertaking to confront Climate Change www.cambridgema.gov/climate <p><u>The Cambridge Life</u> (2014-2015 Edition)</p> <ul style="list-style-type: none"> Alewife Constructed Wetland, <i>Now Open</i> (p.12-13) invites the public to see and explore the newly constructed wetland and recreational facilities. The wetland was constructed to treat and slow the discharge of stormwater. <p><u>American Public Works Association APA Project of the Year</u> (July 2014)</p> <ul style="list-style-type: none"> The Alewife Stormwater Wetland was awarded the 2014 project of the year in the Environment \$25 to \$75 million category, for the project's demonstration of how innovative approaches to science, engineering, and ecology can concurrently resolve infrastructure problems, enhance the environment, and provide open-space resources to the community. See: http://issuu.com/apwa/docs/201407_reporteronline/84?e=0 <p>Copies of the above are provided in Appendix 1. Electronic copies of <i>CityView</i> and <i>The Cambridge Life</i>, can be found on the following website: www.cambridgema.gov/citynewsandpublications/publications.aspx</p> <p>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:</p> <ul style="list-style-type: none"> Western Avenue Construction Update (Winter 2014-2015) 	Continue to develop relevant information on stormwater management for residents and businesses.

Revised 1.a cont			Expanded BMP element in Year 3	<ul style="list-style-type: none"> • Alewife Sewer Separation Construction Update (August 2014) • Stormwater Quality Enhancements: Porous Pavement & Biobasin Installation (August 29, 2014) <p>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 distributed through e-mail, and hand delivered to residents/businesses in project areas.</p> <p>The Cambridge Water Department (CWD) also provides information on its website regarding projects related to protection of Fresh Pond Reservoir. An example of a project completed during Year 12 at Fresh Pond includes:</p> <ul style="list-style-type: none"> • Kinglesy Park Improvements <p>The Kingsley Park website can also be found at: https://www.cambridgema.gov/Water/Projects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2fWater%2fProjects%2ffreshpondreservation%2fkingsleyparkimprovements</p>	
		Commissioner/ DPW	(ii) Post information on the web	<p>DPW continued to update its website and make information more readily accessible to the public.</p> <p>The NPDES Phase II Annual Report Year 11, Stormwater Management Program Phase II NPDES Public Meeting 2014 presentation, Joint Public Notice (April 2014) for the Alewife Brook CSO Progress Update, information on water quality and street sweeping were added/revised to the DPW/Stormwater web sites.</p> <p>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</p> <p>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.</p> <p>The DPW Facebook page can be viewed at: www.facebook.com/CambridgeDPW</p> <p>The DPW Twitter feed can be viewed at: https://twitter.com/CambridgeDPW</p>	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program.

1.a cont Revised		Commissioner/ DPW	(iii) Distribute materials Expanded BMP element in Year 3	The <i>CityView</i> newsletter referenced in BMP 1.a (i) above is distributed to over 50,000 households in Cambridge actively receiving mail. <i>CityView</i> is a publication of the City of Cambridge. In addition, copies of <i>CityView</i> are available at various municipal buildings, on-line and are provided in Appendix 1, referenced above under BMP 1.a (i). The <i>Cambridge Life</i> 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 22 nd) 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.	Distribute information on Stormwater /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 related events at the 2014 Science Festival included: Climate Change Comes to Thoreau’s Concord, Climate Change and the Outdoors, Dive Into Oceanography, and other events at the Science Carnival and Robot Zoo! A copy of the programs offered throughout the 10 day event is included in Appendix 1	Participate in the 2015 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: <ul style="list-style-type: none"> DPW Vehicle Road Show held on May 19, 2014 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. A copy of the Fresh Pond Day May 31, 2014 flyer and activities schedule is attached in Appendix 1. The link to the Fresh Pond Day 2014 photos is: https://www.cambridgema.gov/Water/freshpondreservation/freshpondphotos/freshpondday2014.aspx 	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: 77 in the Charles (C), and 67 in the Alewife (A) watersheds under the following contracts: FY14 Misc Sidewalk: C (16) A (2) FY 14 Remedial: A (5) Chapter 90 Contract 16: C (12) Chapter 90 Contract 17: C (6) Common Manhole #7: A (7) Cambridge Common: C (7) Waverly Path/Harvard Sq.: C (1) Western Ave.: C (35) Huron A: A (53)	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 2014. 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 the May 2014 calendar 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 40 currently active PTDM projects, 35 submitted complete monitoring reports in 2014, or 88%. 2014 monitoring reflects:
 - More than 9.1 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 17,045 parking spaces come under the Ordinance, with facility sizes ranging between 3 and 4,576 parking spaces.

- Approximately 29,574 employees, 11,495 graduate/middle school students, and 1,600 library patrons are covered by PTDM plans in Cambridge.
- Thirty of the 35 projects, or 86% met or surpassed their mode split.
- Thirty-two of the projects, or 91%, 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:

- North Point (Large Project PTDM retail amendment)
- 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 121: May 22nd. Approximately 100 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 2014 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 12 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 in August 2014 that if approved will provide residents with a 5% discount on their flood insurance premiums. It is expected that a decision will be made by FEMA during 2015.
 - For the past seven 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. Attached in [Appendix 1](#) is a copy of a brochure created by the 2014 Team GreenSense participants. For more information see: <https://www.cambridgema.gov/theworks/greenliving/cambridgegreensense/teamgreensense.aspx>

MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 13
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 12 and to discuss potential issues/projects for Year 13 was held on March 26, 2015. 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, 2014 as part of Park Serve Day.	Support/assistance will be provided for one clean-up event.

2.b cont.		Commissioner/ DPW	(ii) Support educational efforts of local watershed groups as opportunities arise through talks and /or support of grant applications	<p>The DPW gave three tours of the Alewife Stormwater Wetland on May 2, July 17 and August 21, 2014 to MWRA Wastewater Advisory Board, Team GreenSense and MWRA staff respectively.</p> <p>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 2014 is attached in Appendix 2 and details the various activities supported by the Water Dept.</p> <p>See additional outreach and educational efforts listed under “MCM #2. Additional Information” at the end of this section.</p>	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)	<p>Four (4) Household Hazardous Waste (HHW) collection days were held this permit year on May 3, June 7, August 23 and October 4, 2014.</p> <p>Approximately 13,423 tons (estimated) of materials have been recycled, including 26 tons (estimated) of HHW.</p>	4 HHW collection days will be held on April 11, June 6, September 12 and October 17, 2015.

2.c cont.		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2014 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 from 9 a.m. – 4 p.m. More information about the Cambridge Recycling Center can be found at: www.cambridgema.gov/theworks/ourservices/recyclingandtrash.aspx	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 and reporting illicit discharge/dumping is provided in the Recycling and Trash Guidelines for Residents. The guidelines were last updated in the fall of 2010 and were mailed to every household. These guidelines were provided to residents when they picked up their 2014 rain barrels together with other stormwater management information. Information on illegal dumping is also provided on the Stormwater Management web page and under FAQ, see: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/faq.aspx	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 http://www.cambridgema.gov/cdd/cp/zng/concalew/index.html	Completed.
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2.d Cont.		Assistant City Manager for Community Development/CDD and Commissioner/DPW	(ii) Complete Phase II if authorized	Not applicable in Year 12, 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 12, 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 12, 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 12, completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006. A copy can be found at: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx	Completed.
		Commissioner/DPW	(vi) Place LID document on the Stormwater web site	Not applicable in Year 12, completed in Year 4 (see BMP 2.d.(v) above).	Completed
		Commissioner/DPW	(vii) Execute the Environmental Joint Powers Agreement (EJPA)		
<i>revised</i>			Work with EOEa to advance the EJPA to a final document (Revised in Year 1)	Not applicable in Year 12. The final EJPA was fully executed on March 4, 2005 and forwarded to EOEa. (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 12 on Sept. 9 and Nov. 18, 2014 and Jan. 13 and March 10, 2015. 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. A copy of the Secretary's letter approving the extension of the ABC Flooding Board is attached in Appendix 2	The ABC Flooding Board will meet 4 times per year.
<i>revised</i>			Schedule Revised in Year 1		
		Commissioner/ DPW	(ix) Finalize Tri- Community Working Group's <u>Progress Report</u>	Not applicable in Year 12, this report was finalized in Year 3	Completed.
<i>revised</i>					
		Commissioner/ DPW	(x) Place Tri- Community Working Group's <u>Progress Report</u> on web site	Not applicable in Year 12. This report was placed on the web site in Year 4 see: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx	Completed.
<i>revised</i>					

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. When sewer separation is completed in the three project areas (December 2015) separated stormwater will discharge to the newly constructed stormwater wetland. During Year 12 there was a community BBQ/open house for the community to discuss these sewer separation projects, schedule 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. In addition to community meetings/presentations efforts to reach the broader community included open houses, neighborhood BBQs and tree walks. 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.

- ❑ 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 website for more information: www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2011%2fcambridgeparkdrivewetlands . An extensive outreach program has surrounded this construction activity. During Year 12 four (4) tours of the stormwater wetland were conducted to discuss the stormwater wetland and its benefits and construction process:
 - MWRA Wastewater Advisory Board May 2, 2014
 - Team GreenSense: July 17, 2014
 - ACEC/MA (tour by Kleinfelder, Inc), September 10, 2014
 - MWRA Senior Management: August 21, 2014
- ❑ Climate Change, Resilience and Adaptation: The City of Cambridge continued work on the climate change vulnerability assessment. A number of analyses are being performed to inform the assessment and a significant amount of public outreach and engagement is being conducted. The City is nearing the completion of the vulnerability assessment in spring 2015 and will then begin soon after on the climate change preparedness plan. Modeling for coastal storm surge risks up to 2070 is in progress. The vulnerability assessment will be completed upon receipt of the modeling results.
 - A public meeting to present the interim results of the climate change vulnerability assessment was held on March 17 at the MIT Stata Center. About 130 people attended to hear about the assessment and to discuss the results. The presentation is posted here. The Summary Report about the meeting recaps the presentation, questions and answers, and feedback received during the breakout sessions and from the questionnaire circulated at the meeting.
 - The next steps for the project are:
 - Issue an interim report based on risks from precipitation-driven flooding and increased temperatures.
 - Complete the storm surge/sea level rise modeling for 2070 and complete the assessment in terms of identifying physical

and social vulnerabilities based on a sea level rise and storm surge scenario.

- Make the data and information from the assessment publicly available.
- Conduct additional technical analyses before starting the climate change preparedness plan, e.g., modeling flooding from other storm events.
- Meet with community groups and stakeholders to discuss the vulnerability assessment results in greater depth.
- Coordinate with stakeholders undertaking their own preparedness efforts.
- Work on regional coordination and cooperation, such as the Metro Mayors climate resilience initiative.
- Coordinate the upcoming Citywide Plan with the preparedness plan and the Getting to Net Zero Task Force recommendations.
- Start the climate change preparedness plan process -- an expected two-year process -- and program early actions.
- See the following links for more information:
 - Preparing For Climate Change: Building Community Resilience (May 22, 2014) in [Appendix 2](#)
<https://www.cambridgema.gov/CDD/Projects/Climate/climatechangeresilienceandadaptation.aspx>
 - Climate Change Vulnerability Assessment:
<https://www.cambridgema.gov/CDD/Projects/Climate/climatechangeresilienceandadaptation.aspx>
 - Climate Change summary report, March 17, 2015:
<https://www.cambridgema.gov/CDD/Projects/Climate/~media/77130ADC5A01402399E5345D64C02D37.ashx>
 - Climate Change Presentation:
<https://www.cambridgema.gov/CDD/Projects/Climate/~media/21301A9065C04B7B8CE6FF2BC7F210E2.ashx>

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MCM #3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 13
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 are tracked in a database (see Appendix 3). Approximately 71 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 12 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	<ul style="list-style-type: none"> In the Charles River watershed twenty-five (25) outfalls were inspected/ sampled for dry weather flow: eleven (11) were sampled/ Inspected once, eight (8) were inspected/sampled twice, five (5) were inspected/sampled three times and one (1) was sampled/inspected five times. 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. In the Alewife Brook watershed fourteen (14) outfalls were sampled: Six (6) were sampled/inspected once, one (1) was sampled/inspected three times, six (6) were sampled /inspected four times, and one (1) was sampled/inspected five times. Of the above outfalls, six (6) outfalls [Russell Field and Blanchard Road (18'')] were inspected, but not sampled due to the lack of dry weather flow <p>See Appendix 3 and Part IV of this report for sampling locations and information.</p>	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)	Six (6) oil & grease samples were done during Year 12: One (2) sample in the Charles and five (5) in Alewife. (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	No Illicit discharge/connection were discovered in separated areas during Year 12.	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Nine (9) water quality samples (including three (3) profiles) were taken from three ponds that surround Fresh Pond including: Little Fresh Pond, Black's Nook, and North Pond Twenty three (23) water quality profiles were taken from Fresh pond at three 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 12. Sampling equipment was purchased in Year 4.	Supplies will be purchased as needed.

3.b cont.		Commissioner/ DPW	(vii) Investigate Sparks Street drainage area	<p>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. The following items need to be addressed before this investigation can be completed:</p> <ul style="list-style-type: none"> • 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. • Three (2) 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. The legal issues have been resolved regarding right of entry. Temporary repairs were made to the Brewer CMH to repair a collapsed pipe pending the full separation in early 2015. 	<p>Investigation into the Sparks Street drainage area will continue following the separation of the CMHs.</p> <p>Separation of the 3 common manholes will be separated in Year 13.</p>
		Commissioner/ DPW	(viii) Investigate Lechmere Canal drainage area.	<p>Completed as far as possible due to influence of Charles River.</p> <p>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.</p>	Completed.

3.b cont.		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	<p>No Common Manholes (CMHs) in separated drainage areas were separated during Year 12. The structural and legal issues that hindered the separation of the three CMHs that were remaining from CMH #7 contract (see 3.b.vii above) have been resolved during Year 12. These will be removed in Year 13.</p> <p>The follows contracts include CMH separation that will lead to separation of a combined catchment area as part of the sewer separation program for the Alewife Brook:</p> <ul style="list-style-type: none"> • Concord Area (4) <ul style="list-style-type: none"> ○ Saville (1) ○ Alpine (3) • Huron B (4) <ul style="list-style-type: none"> ○ Blakeslee (2) ○ Granville (1) ○ Appleton (1) • Huron A (1) <ul style="list-style-type: none"> ○ Larch Rd (1) 	<p>The number of Common Manholes separated in separated drainage areas will be counted.</p> <p>The three (3) remaining CMHs from CMH #7 contract will be removed.</p>
		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 not influenced by common manholes, one catchment in the Alewife watershed (Normandy Terrace) and one in the Charles River watershed (Sparks Street). No wet weather samples were taken during Year 12 due to the other demands associated with the wet weather events during 2014, but the City has made progress on its plans to install 5 automatic sampling stations that will aid in obtaining wet weather sampling data.	<p>Cambridge will continue to take wet weather samples at the same 2 outfalls (Sparks Street and Normandy Terrace) and monitor sampling results.</p> <p>Installation of 5 automatic sampling stations will be bid and constructed during Year 13: three in the Alewife Watershed (wetland outlet, upstream of wetland and Columbus Ave) two in the Charles Watershed (Sparks St and Western Ave)</p>

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 12. Hotline information was included in the <i>Recycling and Trash Guidelines for Residents</i> updated Fall 2010. The recycling guidelines are posted on the DPW website and are available in Spanish, Portuguese, Creole, Chinese and Ethiopian.	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 12, completed in Year 1.	Complete.
		Commissioner/ DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 12, completed.	Completed.
		Commissioner/ DPW	(iii) Revise draft as necessary	Not applicable in Year 12, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Not applicable in Year 12, completed in Year 5. A copy of the Wastewater and Stormwater Drainage System ordinance can be viewed on line at www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	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 315 common

manholes have been separated through March 1, 2015 in separated catchment areas.

- ❑ 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 12 the city issued 589 permanent and 212 temporary dumpster licenses under the new ordinance.
- ❑ Drainage areas in the Cambridge Cemetery are being investigated in Year 13 to improve the GIS data and understanding of the drainage system in this area. This information will be added to our GIS system following verification.

MCM #4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 13
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 12, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 12, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	Not applicable in Year 12, 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. http://www.cambridgema.gov/theworks/our-services/stormwatermanagement/ordinanceandregulations.aspx	Completed.
		Commissioner/ DPW	(iv) Present draft to City Manager, City Council and the community for review	Not applicable in Year 12. 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. A copy is posted on the DPW stormwater website. http://www.cambridgema.gov/theworks/our-services/stormwatermanagement/ordinanceandregulations.aspx	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Not applicable in Year 12, completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Six (6) Stormwater Control Permits (formerly Land Disturbance Permits) were issued for the following projects: <ul style="list-style-type: none"> • 1868 Mass Ave • 33 Cottage Pk Dr • 270 Third Street62 Mooney Street • 15 Richdale Ave • 150 CambridgePark Drive • 62 Mooney Street. 15 applications were submitted	The number of Stormwater Control Permit applications submitted and approved will be tracked.
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	No additional guidance materials or BMP fact sheets were developed during Year 12.	Continue to maintain and revise guidelines as necessary.
		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).	Complete.
		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 6	The number of enforcement action taken and reported will be tracked in a database. The new Warning” ticket will

4.a cont.				<p>Erosion and Sedimentation Control WARNING tickets issued for stormwater related violations at the following locations:</p> <ul style="list-style-type: none"> • 50-60 Binney Street • Cambridge Common Improvement Project • 240 Sidney Street • 70 Fawcett Street • 1434 Massachusetts Ave • 300 Massachusetts Ave <p>These Warnings are tracked in a database rather than using the Cambridge Request System (CRS).</p>	be used to track stormwater violations.
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	<p>Completed.</p> <p>See BMPs for Construction Controls: http://www.cambridgema.gov/theworks/our-services/engineering/Resources/contractorresources.aspx </p>	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	<p>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: June 22 and September 22, 2014 and March 30, 2015. Copies of sign-in sheets and meeting notes are provided in Appendix 4. The City purchased <i>Ground Control: Stormwater Pollution Prevention for Construction Sites</i>” and presented it at the beginning of the 2015 construction season on March 30th.</p>	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 12. 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 12.	Meetings will be held to discuss new ordinances and regulations as necessary.

MCM #4. Additional Information

- ❑ In addition to the six Stormwater Control Permits issued during Year 12 nine (9) additional permits were submitted for review to DPW as follows:
 - 279 Concord Ave
 - 1971 Walden Street
 - 253 Walden
 - 131 Harvard Street
 - 130 CambridgePark Drive
 - 10 Acorn Park Drive
 - 20 Acorn Park Drive
 - 30 Acorn Park Drive
 - 40 Acorn Park Drive

- ❑ The City's Wastewater (Stormwater) Compliance Officer completed two hundred and twenty seven (227) inspections:
 - 273 stormwater erosion and sediment control site inspections,
 - 4 sewer use compliance inspections, and
 - 6 violation sites for erosion and sediment control.

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 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 13
5.a	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Not applicable in Year 12, this activity was completed 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 12, completed in Year 5. The 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 12.	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 12, 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	<p>Not applicable in Year 12, completed in Year 5. The Commissioner of Public Works promulgated Land Disturbance Regulations and Wastewater and Stormwater Drainage Use Regulations.</p> <ul style="list-style-type: none"> ❑ The 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. <p>A copy of the Ordinance and Regulations can be viewed on the DPW Stormwater website (see MCM 5.a (ii) above).</p> <p>Staff continued to review Regulations for revisions. These changes are still draft and have not yet been advertised.</p>	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 15 Stormwater Control Permits submitted/issued in Year 12. 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 12, completed in Year 6.	Completed.
		Commissioner/ DPW	(ix) Adopt procedures for post construction inspections	<p>Completed.</p> <p>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.</p> <p>The compliance officer created and maintains a private BMP database for use in post construction inspections. A copy of the Private Property BMPs installed during Year 12 is attached in Appendix 3. Eighteen (18) post-construction inspections were performed during Year 12. See more information in the “Additional Information” section below.</p>	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	<p>Completed.</p> <p>Owner’s are required to perform long-term operation and maintenance of BMPs as follows:</p> <ul style="list-style-type: none"> • 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. <p>It is expected that the Wastewater Compliance Officer will work with property owners to ensure that their BMPs are being maintained.</p>	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 12, 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	<p>The City Arborist participates in varied outreach activities each year. During Year 12 activities included:</p> <ul style="list-style-type: none"> • Arbor Day celebration at the King Open School • Continued the Water by Bike/Tree Ambassador, Tree Inventory, and Junior Forester Programs <p>The arborist also works closely with the Public Planting Committee and administers Tree hearings for the removal of trees from the public way.</p>	DPW will continue outreach efforts on the importance and protection of trees.
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MCM #5. Additional Information

- ❑ DPW's arborist had eleven (11) meetings with the Committee on Public Planting regarding the benefits of green space and trees.
- ❑ The City's Wastewater (Stormwater) Compliance Officer conducted eighteen (18) post construction inspections as follows:
 - 87 New Street
 - 200-300 Acorn Park Dr
 - 665 Concord Ave
 - 61-69 Bolton Street
 - 22 & 27 Cottage Park Drive
 - 277 Broadway
 - 7 Common Ave
 - 150 Second Street
 - 225 Binney Street
 - 300 Binney Street
 - 1066 Cambridge Street
 - 61-69 Bolton
 - 50 Rogers Street
 - 355 Fresh pond Parkway
 - 75 Ames Street
 - 223 Concord Turnpike
 - 190 Walden Street
 - 259 Harvard Street

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 12 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 13
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	<p>During Year 10 DPW purchased <i>RAINcheck Stormwater Pollution Prevention for MS4s</i> from Excal Visual as a training aid for employees. During Year 12 thirty-seven (37) municipal employees were trained as follows:</p> <ul style="list-style-type: none"> • DPW Engineering (15) • DPW Parks (1) • Water Dept. (9) • Traffic Dept. (7) • Human Services - Golf Course (1) <p>Attached in Appendix 6 is a copy of the sign-in sheets.</p>	Conduct training annually. Use the <i>RAINcheck Stormwater Pollution Prevention for MS4s</i> to train individual division personnel.
		Commissioner/ DPW	(ii) Work with managers to identify operations personnel with stormwater responsibilities	<p>A list of responsible operations personnel with stormwater responsibilities is maintained. During Year 12 DPW trained six (2) DPW divisions and personnel from the Human Services, Water and the Traffic Departments on proper municipal Operation & Maintenance practices through the use of the <i>RAINcheck Stormwater Pollution Prevention for MS4s</i> (see BMP 6.a(i) above.</p>	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 12, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Record number of municipal facilities inspected on an annual basis	70 facility inspection reports have been completed and returned to DPW (see summary sheet in Appendix 6). This represents 60% of the facilities in separated areas and 35% 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 12, 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.	The site plan for Kingsley Park within the Fresh Pond Reservation was updated to reflect the improvements made during the Kingsley Park Restoration Project.	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	There were no new activities identified in Year 12.	New activities at facilities should be noted and applicable BMPs implemented.
		Commissioner/ DPW	(ii) Identify municipal facilities in separated areas and identify structural controls	Completed. Changes are updated annually. 154 municipal facility sites were mapped in GIS according to location in separated or combined sewer areas. 89 facilities lie within a combined sewer area and 65 lie within a separated stormwater area.	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).

6.b cont.		Commissioner/ DPW	(iii) Document inspections procedures and maintenance schedules in a procedures manual	Not applicable in Year 12, 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	Over 3,133 work orders were tracked for catch basin and drainage system inspection, repairs, maintenance, clean, clear in the Cambridge Request System. A summary of all work orders submitted relative to the stormwater drainage system is in Appendix 6 .	The DPW will keep track of the number and type of drainage system work orders completed, as recorded in the Cambridge Request System.
		Commissioner/ DPW	(v) Record percentage of City catch basins cleaned	2177 catch basins cleaned [approximately 36% (6,000 total)]	Keep record of City catch basins cleaned annually.
		Commissioner/ DPW	(vi) Record tons of street sweepings collected	2,208 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	13,423 tons	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	442 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 twice a year as part of our standard operations. A new street sweeping contract was approved for 2012 (Year 10). This new contract provides for a third vacuum sweeping of all municipal streets in April, July and November.

- In public construction projects the following stormwater best management practices (BMPs) were constructed:
 - Number of new catch basins with deep sumps and hoods: 181
 - Number of deep sump drain manholes (grit pits): 15
 - Oil/Water Separator: 1
 - Infiltrating Catch Basins/dry wells: 9
 - Biobasins: 2 Fawcett Street
 - Porous Pavement: 17,650 SF on Fawcett St and Western Ave

- Additional maintenance activities were performed on stormwater drainage systems including:
 - Pump Inspections & Maintenance = 108 (Pump Inspections Maintenance Contract)
 - Storm drain cleaned and televised = 13,266 LF (TV and Cleaning Contract)

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 2014 through March 2015 and their associated summary of results.
 - ❑ Alewife Brook samples: April 2014 – June 2014, June 2014 - August 2014 and August 2014 – October 2014.
 - ❑ Charles River dry weather samples: November 2013 – June 2014, and June 2014 – November 2014.
 - ❑ Little Fresh Pond, North Pond and Black’s Nook Water Quality Samples and Profiles: May, July and November 2013.
 - ❑ Fresh Pond Reservoir Water Quality Samples and Profiles: April, May, June, July, August, September and November 2014 and March 2015
 - ❑ Alewife Brook Oil and Grease samples: April 4, June 24, June 30 and July 22, 2014.
 - ❑ Charles River Oil and Grease sample: November 11, 2014.

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 **	(#)	3
▪ community participation **	(# or %)	882 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	(#)	44
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 **	(#)	0
Illicit discharges identified (Since beginning of permit coverage)	(#)	39
Illicit connections removed **	(#); and (est. gpd)	0
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	39
% of population on sewer	(%)	99.9%
% of population on septic systems	(%)	.1%

Construction

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

+ 33 Cottage Park

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 **	(#)	2,177
Qty. of storm drain cleaned **	(%, LF or mi.)	13,266 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)	\$74/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 vector **	(%)	20%

+ Storm drain pipe maintenance TV and Cleaning Contract

	(Preferred Units)	Response
Average frequency of street sweeping (non-commercial/non-arterial streets) **	(times/yr)	10 times/yr
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)	2,208 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill & transfer station
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	(\$)	\$337,000 (contract only)
• Hourly or lane mile contract rate **	(\$/hr. or ln mi.)	\$80.00/hr/rotary sweeper \$30.00/hr/vacuum sweeper
• Disposal cost**	(\$)	\$30.00-39.25/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 12 (April 1, 2014 - March 31, 2015)

Appendix 1 – Public Education and Outreach

- CityView (Summer 2014)
 - Safely Dispose of Unused Medications, Needles and Syringes (p.6)
 - Cambridge Preps for Climate Change (p7)
- The Cambridge Life (2014-2015 Edition)
 - Alewife Constructed Wetland, Now Open (p. 12-13)
 - City Projects Update (p.13)
- American Public Works Association (July 2014)
 - APWA Project of the Year: Alewife Stormwater Wetland
- Construction/Design Notice examples:
 - Western Avenue Construction Update (Winter 2014-2015)
 - Alewife Sewer Separation Construction Update (August 2014)
 - Stormwater Quality Enhancements: Porous Pavement & Biobasin Installation (August 29, 2014)
- Examples of website updates:
 - Alewife Brook Combined Sewer Overflows (CSO) Joint Public Notice Project Update (April 2014)
 - FEMA Searchable Flood Plain Map (July 2014)
 - Rain Garden: Reuse Stormwater In Your Yard (revised March 2015)
- Cambridge Science Festival Program of Activities April 18-27, 2014)
- DPW Vehicle Road Show flyer and photos
- Fresh Pond Day flyer and activities (May 2014)
- Sustainable Transportation Calendar May 2014
- Rain Barrel installation assistance - GreenCambridge.org
- 2014 Team GreenSense Outreach Pamphlet

Appendix 2 – Public Involvement and Participation

- NPDES Phase II public meeting information: Presentation and sign-in sheet (March 26, 2015)
- Public Meeting on Stormwater Management Citywide calendar posting, DPW News and Events posting
- Friends of Fresh Pond The Year in Review 2014
- EOEEA's letter authorizing the revival and extension of the Arlington-Belmont-Cambridge (ABC) Stormwater Flooding Board, May 29, 2014.
- Building Community Resilience (May 22, 2014)

Appendix 3 – Illicit Discharge Detection and Elimination

- Private BMP's Installed
- Site Plan Review Listing
- Water Quality Samples, Reports and Maps
 - Charles River:
 - Charles River Dry Weather Sampling: November 2013 - June 2014, and June 2014 - November 2014 (includes oil & grease sample for Ames Street [11/05/14])
 - Charles River: East, Central and West sampling location maps
 - Alewife Brook:
 - Alewife Brook Dry Weather Sampling: April 2014 - June 2014 (includes oil & grease sample for Blanchard Rd), June 2014 - August 2014 (includes oil & grease samples for Acorn Park Dr. [8/26/14] Alewife Stormwater Wetland [6/24/14 and 7/22/14] and Normandy Terrace [6/30/14], and August 2014 - October 2014.

- Alewife Brook: North and South sampling location maps
- 2014 Water Quality Reports - Fresh Pond Reservation Class B Ponds
- Map of Separated Common Manhole through March 1, 2015

Appendix 4 – Construction Site Stormwater Runoff Control

- Monday Construction Coordination Meeting - Invitation to Attend, March 10, 2015
- Construction Coordination Meeting - sign-in sheet and meeting notes (June 2, 2014, September 22, 2014 and March 30, 2015).

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

- Stormwater Control Permit database, summary for Year 12

Appendix 6 – Pollution Prevention and Good Housekeeping in Municipal Operations

- Sign-In Sheet for *RAINcheck Stormwater Pollution Prevention for MS4s*
- Municipal Facilities Good Housekeeping Inspections summary
- Stormwater Work Order Requests Submitted - summary (CRS)
- Trees Planted in Cambridge in 2014

(hard copies of appendixes are provided under separate cover)