

Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number  
& Reporting Period: No. 8: March 10-March 11

## NPDES PII Small MS4 General Permit Annual Report

### Part I. General Information

Contact Person: Lisa Peterson 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: 

Printed Name: Robert W. Healy

Title: City Manager

Date: March 19, 2012

## **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, except for the following provision:

Part 11.F Did not submit annual report on or before May 1, 2010, annual report was submitted on March 19, 2012.



		Commissioner/ DPW	(ii) Post information on the web	<p>In November 2010 the City of Cambridge launched a new and improved website that enhances usability and incorporates more photography and scenes from city life. The websites for Cambridge Public Library and the Department of Public Works were completely redesigned and are now much more dynamic and interactive. The redesigned DPW site includes a completely revised “Stormwater Management” website with pages devoted to</p> <ul style="list-style-type: none"> <li>• <a href="#">About Stormwater Management</a></li> <li>• <a href="#">Water Quality Sampling/Monitoring</a></li> <li>• <a href="#">Stormwater Management Plan</a></li> <li>• <a href="#">Combined Sewer Overflows</a></li> <li>• <a href="#">Sewer Separation</a></li> <li>• <a href="#">Stormwater Resources</a></li> <li>• <a href="#">Ordinance and Regulations</a></li> <li>• <a href="#">Contact</a></li> <li>• <a href="#">FAQ</a></li> </ul> <p>The Stormwater Management web page can be viewed at: <a href="http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx">www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx</a></p> <p>A copy of Year 6 annual report, annual meeting presentation, Joint Public Notice (April 2009) for the Alewife Brook CSO Progress Update was added to the site.</p> <p>In addition to the Stormwater Management webpages, information pertaining to protection of water quality as a result of our good housekeeping measures, such as street sweeping; also include information on their importance to water quality protection.</p> <p>Examples of some of the content updates made to the web page see <a href="#">Appendix 1</a>. These updates include posting from both the old website format and the new format. Due to the change in FEMA Flood Insurance Rate Maps for the Alewife section of the city, significant efforts were made to ensure residents understood and knew about the changes to the maps.</p>	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program.
		Commissioner/ DPW	(iii) Distribute materials	<p>The <i>CityView</i> articles referenced in BMP 1.a(i) above are distributed to every household in Cambridge actively receiving mail. <i>CityView</i> is a publication of the City of Cambridge. In addition, copies of <i>CityView</i> are</p>	Distribute information on Stormwater

Revised			<b>Expanded BMP element in Year 3</b>	available at various municipal buildings and on-line. 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 <a href="#">Appendix 1, referenced above under BMP 1.a (i)</a> . DPW also provided stormwater management materials/brochures to Friends of Alewife Reservation for distribution during Park Serve Day (April 24 <sup>th</sup> ), distributed materials at Household Hazardous Waste days, Rain Barrel distribution event (May 20 <sup>th</sup> ) and at the Container Gardening Workshop (May 22 <sup>nd</sup> ). DPW also distributes information electronically (e-mails, e-line, web site) and in hard copies, as well as, posting notices in local newspapers.	/Watersheds to every household actively receiving mail in Cambridge.
Revised		Commissioner/ DPW	(iv) Assess local/regional mass media marketing campaigns <b>Revised in Year 3– new BMP element</b>	The Cambridge Science Festival is a multi day public celebration offering a wide range of science and technology related activities including tours, displays, and hands-on experiments sponsored and co-founded by the City of Cambridge, MIT and others. Water related events at the 2010 Science Festival included <i>Whaddya Know About Your H2O and CDM</i> (carnival exhibit), <i>Water, Water, Everywhere!</i> , <i>Cambridge Water Dept Tour</i> , <i>Flying Through Alewife Reservation</i> , and <i>CSI Aquatic: Virtual Reality enters the Real World</i> . A copy of the programs offered during this week long celebration is included in <a href="#">Appendix I</a> .	Participate in the 2011 Cambridge Science Festival or other public event.
<b>1.b</b> Revised	Develop Outreach Materials/Activities for Children	Commissioner/ DPW	Include school children in stormwater outreach activities  <b>Revised in Year 5 – [formerly 1.b (i) and (ii)]</b>	This activity was completed in Year 2. Outreach activities to children continue in general including at the Science Festival discussed in BMP 1.a.(iv) above and during the DPW Vehicle Road Show held on May 18, 2010 which featured activities explaining how DPW keeps Cambridge Clean, including EnviroScape demonstration of stormwater pollution. Copies of the Road Show flyer and pictures of EnviroScape demonstration are attached in <a href="#">Appendix 1</a> .  DPW also worked with two separate youth programs during the summer of 2010: Team GreenSense (July 14 <sup>th</sup> ), and FAR Ecology Camp (July). Stormwater pollution and solutions were discussed via use of the EnviroScape model and airing of the “After the Rain” EPA video. A second presentation was made to the FAR Ecology Campers on August 9 <sup>th</sup> about the proposed Alewife Stormwater Wetland. A copy of this presentation is attached in <a href="#">Appendix 1</a> .  The Cambridge Water Department sponsor weeklong activities that highlight watershed protection, water treatment and other water related activities. A copy of the Water Week schedule and Fresh Pond Day May 8, 2010 flyer and event schedule is attached in <a href="#">Appendix 1</a> .	Schoolchildren will be included in stormwater outreach activities in general.

<b>1.c</b>	Develop a Stormwater Web Page	Commissioner/ DPW	(i) Develop a stormwater web page	DPW's Stormwater Management web pages can be viewed at <a href="http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx">www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx</a> 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
<b>1.d</b>	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 173 have been installed: 105 in the Charles (C) and 68 in the Alewife (A) watersheds under the following contracts: FY10/11 Misc Sidewalk: C (46) A (52) FY 10/11 Remedial: C (43) A (11) Chapter 90- Contract 12: C (10) Chapter 90 Contract 11: C (6) Concord Ave : A (5)	Continue to install catch basin curb markers during construction projects.
<b>1.e</b>	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 the May 2010 Go Green Month events. Activities included events for alternative forms of transportation, informational tables, giveaways to cyclists and pedestrians, participation in local bike week events/tours. A listing of Go Green Month events is provided in <a href="#">Appendix I</a> .	Alternative forms of transportation will be promoted through activities and events.

### **MCM #1. Additional Information**

- In 2009 CDD began a pilot program in Cambridgeport to encourage and promote alternative modes of transportation entitled CitySmart: Fast, Flexible, Fun. CitySmart connects residents with the information and resources they need to get around without getting behind the wheel. Biking, walking and transit take you where you need to be. CitySmart is a pilot program to test the application of social marketing techniques on transportation choices. Based on successful implementation in Europe, Australia and the United States, the City hopes to achieve a shift of approximately 10% of single-occupant vehicle trips to more sustainable modes, such as walking, bicycling and transit. The CitySmart pilot began in the Cambridgeport neighborhood in 2009 and moved to North Cambridge neighborhood in 2010. See [Appendix 1](#) for a copy of the CitySmart Year Two: Final Report, Executive Summary (February 2011).
- 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, and an internal car pool matching service. The City also supports bicycle use and walking through the respective city programs and provides an internal web site that provides information on other regional ride matching and sharing programs.

- DPW also sponsored a rain barrel event during Year 8: May 20<sup>th</sup>. A total of 44 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.
- DPW sponsored a Container Gardening Workshop on May 22<sup>nd</sup>. An information tables was set up that included a display on Healthy Household Habits and a rain barrel was displayed. A rain barrel was awarded as a door prize at the workshop and stormwater management information /brochures were distributed (see [Appendix 1](#) for more information).
- The Federal Emergency Management Agency issued new Flood Insurance Rate Maps for a portion of Cambridge. During Year 8 DPW continued to inform residents of these changes through meetings and web site updates.

## MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 8 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 9
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 8 and to discuss potential issues/projects for Year 9 was held on March 24, 2010. A copy of the presentation and sign-in sheet is provided in <a href="#">Appendix 2</a> .  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 in the Cambridge Chronicles’ on-line edition and posted at the City Clerk’s office at City Hall. A copy of the NPDES meeting notice from the website is provided in <a href="#">Appendix 2</a>	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 24, 2010 as part of Park Serve Day. DPW provided supplies and stormwater brochures for distribution.	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 participated in the Friends of Alewife Reservation’s (FAR) Summer Ecology Camp (see 1.b above).</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 2010 is attached in <a href="#">Appendix 2</a> 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		
2.c cont.  Revised		Commissioner/ DPW	Hold 3 Household Hazardous Waste Collection days annually <b>(Revised in Year 1)</b>	Three Household Hazardous Waste (HHW) collection days were held this permit year on April 24, June 19 and October 2, 2010. See <a href="#">Appendix 2</a> for a summary of recycling tonnage from Drop-off center, curbside and HHW collections. Approximately 12,129 tons of materials have been recycled, including .43 tons of HHW.	HHW collection will be held on April 9, June 4, and October 1, 2011.
		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2010 DPW continued to operate a recycling drop-off center at the DPW yard on Tuesdays and Thursdays from 4 – 7:30 p.m. and	DPW will continue to operate a recycling drop-off center.

				Saturdays form 9 a.m. – 4 p.m. More information about the Cambridge Recycling Center can be found at:  <a href="http://www.cambridgema.gov/theworks/ourservices/recyclingandtrash.aspx">www.cambridgema.gov/theworks/ourservices/recyclingandtrash.aspx</a>	
<b>2.c cont.</b>		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 updated in the fall of 2010 and are mailed to every household annually. A copy is attached in <a href="#">Appendix 2</a> .  Information on and how to report illegal dumping was added to the Stormwater Management web site homepage.	DPW will continue to provide information on illicit discharges and reporting at Household Hazardous Waste events and/or in its meetings and through print materials.

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

<b>2.d</b>	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 8, completed in Year 1. Information from this process can be viewed at <a href="http://www.cambridgema.gov/cdd/cp/zng/concalew/index.html">http://www.cambridgema.gov/cdd/cp/zng/concalew/index.html</a>	Completed.
		Assistant City Manager for Community Development/CDD and Commissioner/DPW	(ii) Complete Phase II if authorized	Not applicable in Year 8, completed in Year 3.	Completed.

<b>2.d cont.</b>		Assistant City Manager for Community Development/CDD and Commissioner/DPW	(iii) Forward study recommendations to the City Manager for consideration	Not applicable in Year 8, 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 8, 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 8, completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006. A copy can be found at: <a href="http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx">www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx</a>	Completed.
		Commissioner/DPW	(vi) Place LID document on the Stormwater web site	Not applicable in Year 8, 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 EOEА to advance the EJPA to a final document <b>(Revised in Year 1)</b>	Not applicable in Year 8. The final EJPA was fully executed on March 4, 2005 and forwarded to EOEА.	Completed.
		Commissioner/DPW	(viii) ABC Flooding Board to meet 4 times annually	The ABC Flooding Board met approximately 5 times during Year 8 on April 13, May 11, September 14, November 9, 2010, and February 8, 2011. Discussion topics included revisions to the flood insurance rate maps, flood insurance, proposed improvements to Blair Pond by DCR, MWRA/Cambridge CSO control projects, and Alewife Brook bathymetry and sediment study.	The ABC Flooding Board will meet 4 times.
<i>revised</i>			<b>Schedule Revised in Year 1</b>		

		Commissioner/ DPW	(ix) Finalize Tri-Community Working Group's <u>Progress Report</u>	Not applicable in Year 8, this report was finalized in Year 3	Completed.
<i>revised</i>					
<b>2.d cont.</b>		Commissioner/ DPW	(x) Place Tri-Community Working Group's <u>Progress Report</u> on web site	Not applicable in Year 8. This report was placed on the web site in Year 4 see: <a href="http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx">www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx</a>	Completed.
<i>revised</i>					

## MCM #2. Additional Information

- ❑ The Cambridge Department of Public Works (DPW) began the design 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. In total the Alewife Sewer Separation Project will separate combined sewers in an area of approximately 335 acres. The design of the 1<sup>st</sup> phase of this program began in December 2010 with a kick off meeting with the community on December 9, 2010. Additional meetings were held on this project with the City Council Roundtable on January 3, 2011 and again with the community on March 1, 2011. Community discussions have centered on the environmental goals of this project to separate the combined sewer system, how to best treat the newly separated stormwater and ways to manage/infiltrate the stormwater through the design of the street restoration project. Detailed information regarding this project can be found on the City Projects website at: [www.cambridgema.gov/theworks/cityprojects.aspx](http://www.cambridgema.gov/theworks/cityprojects.aspx) under "Alewife Sewer Separation Project". A copy of the December 9, 2010 community meeting presentation is provided in [Appendix 2](#).
- ❑ The Cambridge DPW joined with the Friends of Alewife Reservation and participated in Pfizer's Earth Day Celebration on April 22, 2010. An information booth was set up to discuss the upcoming construction, purpose and benefits of the Stormwater Wetland that will be constructed in the Alewife Reservation adjacent to their facility. An informational video was also displayed "Think Again, Think Blue" that highlighted the journey of a rubber duck (non point pollution) as it travels from its source to the local river.
- ❑ The Cambridge Water Department began a site restoration project at Black's Nook at the Fresh Pond Reservation. This project is listed as a high priority in the Fresh Pond Reservation Master Plan. This restoration project aims to increase wildlife habitat value and water quality, and will allow for this area to be used as a natural study area for children. A summary of the

restoration project and a copy of the October 4, 2010 presentation made to the Black's Nook Stakeholders, Planting and Wildlife Subcommittee are provided in [Appendix 2](#).

- ❑ The Cambridge Arts Council sponsored a public exhibition that features four artists working within the realm of “Remediation” – a practice of public art that deals directly with environmental intervention. Of specific note to stormwater management was an installation and exhibit by Matthew Mazzotta’s development of a prototype of his *Park Spark* project in Cambridge, a methane digester that converts dog waste into an ‘eternal flame’ that powers a situation for civic engagement. Also on display in the Cambridge Arts Council Gallery were images and descriptions of several City of Cambridge “green Remediate” projects including the DPW demonstration Rain Garden, Alewife Stormwater Wetland and the green roof on the Robert W. Healy Public Safety Building. See photos, invitation and description of the Park Spark program in [Appendix 2](#).
- ❑ The City of Cambridge recognizes businesses and organization that are taking environmental action through the GoGreen Awards. This is the second year that the City included an award category for Stormwater Management in order to recognize local property owners/developers that are undertaking important stormwater management elements in their redevelopment projects and/or property maintenance practices. Other award categories include waste reduction, transportation, energy, climate leader, and community sustainability. The second Stormwater Management awards were awarded on May 25, 2010 recognizing Linear Retail Properties for their commercial redevelopment that increased onsite groundwater recharge through the use of bio-swales, rain gardens and infiltration basins, and the Massachusetts Institute of Technology for their redevelopment of the Stata Center and incorporation of infiltration systems and an innovative rainwater reuse system. Information on the awardees and GoGreen Awards are provided in [Appendix 2](#).
- ❑ DPW and city representatives attended and participated in EPA meetings and conference calls regarding the Mystic River Watershed Initiative during Year 8 including the Steering Committee meetings and Water Quality Subcommittee.
- ❑ The tri-community working group 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. The real time flow measurements can be observed at <http://waterdata.usgs.gov/ma/nwis/uv?01103025> .

**MCM #3. Illicit Discharge Detection and Elimination**

<b>BMP ID #</b>	<b>BMP Description</b>	<b>Responsible Dept./Person Name</b>	<b>Measurable Goal(s)</b>	<b>Progress on Goal(s) – Permit Year 8</b> (Reliance on non-municipal partners indicated, if any)	<b>Planned Activities – Permit Year 9</b>
3.a	Update Stormwater Drainage System, Outfalls and Receiving Waters in GIS	Commissioner/ DPW	(i) Map Fresh Pond outfalls	The Cambridge Water Department recently completed a slope restoration project adjacent to the Golf Course Clubhouse within the Fresh Pond Reservation. They have updated the BMPs constructed within this area in GIS (see <a href="#">Appendix 3</a> ).	Completed.
		Commissioner/ DPW	(ii) Migrate existing GIS database to a new format	Completed in Year 3.  On April 14, 2010 the City conducted a flyover of the City to be used to update the base map layer. The City also updated its software and hardware to provide a broader range of uses for the GIS program including “tru” ortho, 40 scale mapping, infrared ortho, 1 foot contouring, impervious surface layer , building elevations, and several different paved surface layers. See <a href="#">Appendix 3</a> for a newsletter from the City’s GIS Department that explains these upgrades.	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 <a href="#">Appendix 3</a> ).  Approximately 84 projects underwent DPW site plan review (see <a href="#">Appendix 3</a> ).  DPW reviewed 8 projects under our Land Disturbance Regulations.	DPW will continue to track private structural controls through our site plan review and inspection process.

<b>3.a cont.</b>		Commissioner/ DPW	(iv) Catalogue record drawings	<p>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.</p> <p>During 2010 record drawing indexing was further updated to include updated current and recent historical as-built information by each street segment. Reference is also made to information from the City Water Atlas and Comcast Atlas.</p>	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 8 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.
<b>3.b</b>	Detect and Eliminate Illicit Discharges	Commissioner/ DPW	(i) Perform routine water quality sampling	<ul style="list-style-type: none"> <li>• In the Charles River watershed twenty-two (22) outfalls were inspected/ sampled for Dry weather flow: ten (10) were sampled once, and twelve (12) were inspected/sampled twice. 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.</li> <li>• In the Alewife Brook watershed ten (9) outfalls were sampled: six (6) were sampled four times, two (2) were sampled one times, and One (1) was sampled three times. See <a href="#">Appendix 3</a> and Part IV of this report for sampling locations.</li> </ul>	Water quality samples will continue in each watershed for all known City of Cambridge outfalls.
			<b>Revised in Year 3 to include all Cambridge owned outfalls</b>		
		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			<b>(Revised for Year 2 only)</b>	Two (2) oil & grease samples were done during Year 8: one (1) sample in the Charles and one (1) in Alewife. (See <a href="#">Appendix 3</a> ).	
<b>3.b cont.</b>		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			<b>Revised in Year 3</b> 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.
		Commissioner/ DPW	(iv) Identify and remove illicit discharges	Five (5) Illicit discharges/connections were discovered/removed as follows: <ul style="list-style-type: none"> <li>• 132/134 Banks Street (1) discovered and removed (Remedial)</li> <li>• 205/207 Appleton Street (1) discovered and removed (Remedial)</li> <li>• 2526 Seagrave (1) discovered and removed (Contract 4/13)</li> <li>• Pearl Street (2) discovered</li> </ul>	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Eight (8) water quality samples were taken from three ponds that surround Fresh pond including: Little Fresh Pond, Black's Nook, and North Pond (see <a href="#">Appendix 3</a> for summary report).	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 8. 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. 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. Several illicit connections were identified and removed in previous years. In addition two (2) common manholes were discovered in a sewer easement on private property between Fernald Drive and Linnaean Street within the catchment. These CMHs will be separated during out CMH #7 contract. Investigations are expected to begin for CMH #7 during 2011. All remaining CMHs in separated areas will be put in the CMH #7 contract and put out to bid in 2012.	Investigation into the Sparks Street drainage area will continue following the repair of cracked pipes in this system.
		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.
		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	Fourteen (14) CMHs were separated during Year 8 in the follows contracts: <ul style="list-style-type: none"> <li>• C4/C13 (13)</li> <li>• CMH #4 (1)</li> </ul> The removal of the 13 CMHs through C3/C13 resulted in the closure of the CAM400 CSO regulator and conversion to a new stormwater outfall.	The number of Common Manholes separated in separated drainage areas will be counted. Also, the design for the removal of the remaining Common Manholes in separated areas of the city will begin in 2011 through the CMH #7 contract. Construction of CMH #7 is expected to commence in 2012.

3.b cont.		Commissioner/ DPW	<b>(X) Perform wet weather water quality sampling at 2 outfalls annually</b>	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). These results are provided in <a href="#">Appendix 3</a> . In addition, wet weather sampling of hot spot areas in the Mystic watershed is conducted by the Mystic River Watershed Association (MyRWA) and is shared with various agencies including Cambridge. MyRWA sampling in and around the Alewife Brook was conducted on 01/19/2010 (See Additional Information below).	Cambridge will continue to take wet weather samples at the same 2 outfalls (Sparks Street and Normandy Terrace) and monitor sampling results.
3.c	Conduct Illicit Discharge Education Program	Commissioner/ DPW	(i) Advertise illicit discharge hotline number and information on illicit discharges	Hotline information was included in the <i>Recycling and Trash Guidelines for Residents</i> updated Fall 2010 (see Appendix 2 for copy of this brochure). The recycling guidelines are distributed annually by mail to every household receiving mail in the city, are posted on the DPW website and are available in Spanish, Portuguese, Creole and Chinese. Also see information under MCM#3 Additional Information below regarding presentations on proper management of food waste.	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 8, completed in Year 1.	Complete.
		Commissioner/ DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 8, completed.	Completed.

3.d cont.		Commissioner/ DPW	(iii) Revise draft as necessary	Not applicable in Year 8, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Not applicable in Year 8, completed in Year 5. A copy of the Wastewater and Stormwater Drainage System ordinance can be viewed on line at DPW stormwater website.	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 278 common manholes have been separated through March 31, 2010 in separated catchment areas.
- ❑ During Year 8 Cambridge completed the separation of 13 CMHs in the CAM400 area. This project is part of the Massachusetts Water Resources Authority’s Long Term CSO Control Plan for the Alewife Brook. The removal of these CMHs resulted in the closure of the CSO regulator and conversion to a new stormwater outfall. This contract separated the following 13 CMHs::
  - Whittemore Avenue (6)
  - Seagrave Avenue (3)
  - Harrison Avenue (2)
  - Kimball (1)
  - Columbia (1)
- ❑ Cambridge issues an annual Remedial Construction Contract to address immediate infrastructure needs and illicit connection removals. Two illicit connections were removed under this contract in Year 8 as follows:
  - 132/134 Banks Street
  - 205/207 Appleton Street
- ❑ Common manholes contract #4A was designed and readied for bid during Year 5 and included the separation of approximately

23 CMHs. CMH #4A began construction during Year 6. One (1) CMH was separated during Year 8 as follows:

- Flagg Street @ Putnam
- Additional Sampling by others: The MyRWA performs hot spot dry and wet weather monitoring in the Mystic River watershed which includes the Wellington Brook and Alewife Brook. The MyRWA shares this data with the associated municipalities, DEP and EPA. Cambridge reviews the report results and discusses exceedances with the MyRWA. A copy of the MyRWA wet weather sampling report for December 13, 2010 is attached in [Appendix 3](#).
- 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 8 the city issued 932 dumpster licenses under the new ordinance.

**MCM #4. Construction Site Stormwater Runoff Control**

<b>BMP ID #</b>	<b>BMP Description</b>	<b>Responsible Dept./Person Name</b>	<b>Measurable Goal(s)</b>	<b>Progress on Goal(s) – Permit Year 8</b> (Reliance on non-municipal partners indicated, if any)	<b>Planned Activities – Permit Year 9</b>
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 8, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 8, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	Not applicable in Year 8, 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 8. 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.	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Not applicable in Year 8, completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Eight (8) Stormwater Control Permits (formerly Land Disturbance Permits) were submitted for the following projects: <ul style="list-style-type: none"> <li>• 61 Moulton St/</li> <li>• 61-69 Bolton</li> <li>• 178 Coolidge Hill</li> <li>• 402 Mass Ave</li> <li>• 1991 Mass Ave</li> <li>• 625 Putnam</li> <li>• 32 Quincy St</li> <li>• 1075 Massachusetts Ave</li> </ul>	The number of Stormwater Control Permit applications will be tracked.
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	An additional fact sheet was prepared for Concrete Washout and added to Appendix A Section 2 Construction Controls. This document is available under Contractor Resources on our website. A copy of the new fact sheet is included in <a href="#">Appendix 4</a>  A new permit application was created for the Stormwater Control Permit and revisions were made to the Checklists for submitting the permit (Appendix G). A copy of the checklists and permit application is included in <a href="#">Appendix 4</a> .	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).	Complete.

				In Year 8 DPW developed a (ix) above. "WARNING" ticket to be used for stormwater violations. This ticket will be used in Year 9. A copy of the ticket is provided in <a href="#">Appendix 4</a> .	
<b>4.a cont.</b>		Commissioner/ DPW	(x) Record the number of enforcement actions taken and reported	<p>When DPW finds a site without proper erosion control in place we work with them to bring it into compliance. There were 18 Erosion and Sedimentation Control warnings issued for stormwater related violations at the following locations:</p> <ul style="list-style-type: none"> <li>• 29 Fields St</li> <li>• 619 Franklin St</li> <li>• 77 Hurly St</li> <li>• 54 Gardner St</li> <li>• 0 Blanchard Rd</li> <li>• 298 Harvard St</li> <li>• 11 Reservoir St</li> <li>• 55 Essex St</li> <li>• 281 Broadway at Elm Street</li> <li>• 22-24 Inman Street</li> <li>• 8 Austin Park</li> <li>• 46 Acorn Park Drive</li> <li>• 93 Spring St</li> <li>• 65 Mooney Street</li> <li>• 72 Alpine St</li> <li>• 22 Lakeview Ave</li> <li>• 278 Broadway</li> <li>• 386 Rindge Ave</li> </ul> <p>It was decided to track these Warnings in a database rather than using the Cambridge Request System (CRS).</p>	The number of enforcement action taken and reported will be tracked in a database. The new Warning" ticket will be used to track stormwater violations – BMP see 4.a.
<b>4.b</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>See BMP 4.a (vii) above.</p> <p>The revised erosion &amp; sediment control BMP fact sheets have been placed on the DPW website.</p>	Post erosion & sediment control information as it becomes available.

<b>4.b Cont.</b>		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. Erosion and sedimentation control was discussed during at least 8 of these meetings including: April 5, April 12, 2010, June 19, 2010, July 19, 2010, August 9, 2010, September 27, 2010, October 4, 2010, and October 12, 2010. Copies of the sign-in sheets are provided in <a href="#">Appendix 4</a> .	The City Engineer will discuss erosion and sediment control practices and problems with contractors at 3 construction coordination meetings.
<b>New</b>		Commissioner/ DPW	(iii) Record the number of guidance materials or reference materials provided.	A new fact sheet on concrete washout was added to the guidance material for erosion and sediment control practices. This document contained 22 new or revised fact sheets. See BMP 4.a (vii) above.  A Stormwater Control Permit application was developed and the checklists for the new Stormwater Control Permit were revised. See BMP 4.a (vii) above.	Develop and/or revise specification, fact sheets or other guidance documents.
		DPW	(iv) Create a list of resources, which provides BMP suggestions for the targeted pollutants of concern.	Appendix A Section 2 contains Construction Control fact sheets. These fact sheets were revised. See BMP 4.1.(vii) above.	Work on revisions/edits to other sections of the BMPs.
		Commissioner/ DPW	(v) Record the number of workshops or meetings with City departments to discuss implementation of plan requirements	No inter departmental meeting were held to discuss implementation of plan requirements. DPW coordinates reviews with the Inspectional Services Department on a routine basis.	Meetings will be held to discuss new ordinances and regulations as necessary.

#### **MCM #4. Additional Information**

- A construction coordination meeting notice inviting representatives from private utility companies, large contractors, MIT, Harvard, and city departments (Water Dept., Police, DPW, and Traffic Parking & Transportation) was distributed on March 30, 2010 to discuss upcoming construction season expectations and requirements for construction activities in the city (including stormwater management). A copy of the invitation letter and sign-in sheet is provided in [Appendix 4](#).
- The City's Wastewater (Stormwater) Compliance Officer inspected thirty (31) active construction sites on one hundred and nineteen (119) different occasions.

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

<b>BMP ID #</b>	<b>BMP Description</b>	<b>Responsible Dept./Person Name</b>	<b>Measurable Goal(s)</b>	<b>Progress on Goal(s) – Permit Year 8</b> (Reliance on non-municipal partners indicated, if any)	<b>Planned Activities – Permit Year 9</b>
<b>5.a</b>	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Not applicable in Year 8, this activity was completed in Year 4.	Completed.
Revised	Develop Program for Post Construction Site Runoff Control		<b>(Revised in Year 3)</b>		
		Commissioner/ DPW	(ii) Undertake and complete peer review and legal review of draft	Not applicable in Year 8, completed in Year 5. The Regulations and Ordinance can also be viewed on-line at: <a href="http://www.cambridgema.gov/TheWorks/stormwater/index.html">http://www.cambridgema.gov/TheWorks/stormwater/index.html</a>	Completed.
		Commissioner/ DPW	(iii) Develop draft guidelines on BMPs	Sections updated in Year 8 include Appendix A (Section 2). See BMP 4.a. (vii) above and Appendix 4).	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 8, 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 (see MCM 5.a (ii) above).	Completed.

<p><b>5.a Cont.</b></p>		<p>Commissioner/ DPW</p>	<p>(v) Present final regulation, guidance and monitoring program for consideration and adoption</p>	<p>Not applicable in Year 8, 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"> <li>❑ 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.</li> <li>❑ 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.</li> </ul> <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 met several times to review and revised the current regulations. These changes are still draft and have not been yet advertised.</p>	<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.</p>
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5.a cont.		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	<p>During Year 6 DPW began a review of all DPW permits to streamline our permits and make them more user-friendly and to allow on-line filing.</p> <p>During Year 8 the permits required under the Wastewater and Stormwater Drainage and Land Disturbance Regulations were developed and guidance checklists were revised (see BMP 4.a (vii) above) . Currently this is a paper permit and not yet able to be incorporated into the online permit system.</p>	Create a database to track Stormwater Control Permits
		Commissioner/ DPW	(viii) Administer procedures for enforcement and penalties for violations	Not applicable in Year 8, 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 8 is attached in Appendix 3.</p>	A data base for projects with private BMPs regulated under the Land Disturbance Regulations will be maintained.
		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"> <li>• Owner is responsible for ongoing maintenance, inspections, recordkeeping and reporting.</li> <li>• Owner is required to maintain log and update plan. New owner must submit a new plan.</li> </ul>	DPW will continue to work with property owners by performing inspections on properties with Stormwater Control Permits. Stormwater

				<ul style="list-style-type: none"> <li>Applicant is responsible for adhering to design standards. Plan requirements and guidance will be provided in the guidance documents</li> <li>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.</li> </ul> <p>It is expected that the Wastewater Compliance Officer will work with property owners to ensure that their BMPs are being maintained.</p>	Compliance officer will check his data base for inspection dates and will perform inspection following the sites long term O&M plan.
<b>5.a cont.</b>		Commissioner/ DPW	(xi) Provide legal mechanism to require annual compliance for the operation and maintenance of BMPs	Not applicable in Year 8, completed in Year 5. The Land Disturbance Regulations provide for Post-Construction inspection and enforcement of provisions in the Regulations.	Completed.
<b>5.b</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 participated in a tree planting outreach and education activity at the Tobin School during the April 30, 2010 Arbor day celebration event. A copy of the Arbor Day activities and a photo of the event is attached in <a href="#">Appendix 5</a></p> <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.

**MCM #5. Additional Information**

- ❑ DPW has monthly meetings with the Committee on Public Planting regarding the benefits of green space and trees.
- ❑ The City’s Wastewater (Stormwater) Compliance Officer conducted four (4) post-construction BMPs inspections of projects with a Stormwater Control Permit post-construction O&M Plan..

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 8 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 9
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	<p>A list of responsible operations personnel with stormwater responsibility was maintained.</p> <p>During Year 8 two outside vendors (Nitsch Engineering and Weston &amp; Sampson) gave presentations to staff on “Green Streets” and “Silva Cells” to address phosphorous reduction and infiltration to improve water quality and promote the growth of street trees. The Silva Cell presentation was an interdepartmental meeting that included members of both DPW and the Community Development Department. In addition, two DPW members attended the Charles River Watershed Association’s Phosphorous Control Workshop.</p>	Conduct training annually.
		Commissioner/ DPW	(ii) Work with managers to identify operations personnel with stormwater responsibilities	A list of responsible operations personnel with stormwater responsibilities was maintained. No formal training was held during Year 8, rather individual assistance with Good Housekeeping inspections was provided Peter Baudreau - Police department	DPW will continue to work with facility managers to ensure Good Housekeeping inspections are done properly.
		Commissioner/ DPW	(iii) Develop and implement training protocols that are applicable to operations	Not applicable in Year 8, completed in Year 5.	Completed.

		Commissioner/ DPW	(iv) Record number of facility personnel who complete inspections on an annual basis	145 facility inspections were completed. (see summary sheet in <a href="#">Appendix 6</a> ).	Number of good housekeeping inspections completed by facility personnel on an annual basis will be recorded.
<b>6.a cont.</b>		Commissioner/ DPW	(v) Record number of facilities that have initial good housekeeping inspections conducted	Not Applicable in Year 8, all municipal facilities have has an initial inspection.	Completed.
		Commissioner/ DPW	(vi) Record the number of municipal facility site plans updated, including structural controls based upon initial site visits.	There were no facility sit plan updates during Year 8.	Municipal facility site plans will be updated based upon revised information from the initial site inspections. The following site plans will be updated: <ul style="list-style-type: none"> <li>• Rain Garden @ DPW</li> <li>• Pours Asphalt @ Moore School</li> <li>• Public Safety Building</li> <li>• Cambridge Main Library</li> </ul>
<b>6.b</b>	Maintain Strong Operations & Maintenance Program to Reduce Pollutants from Operations	Commissioner/ DPW	(i) Review operations and maintenance programs	No new O&M fact sheets were created during Year 8.	New activities at facilities should be noted and applicable BMPs implemented. New maintenance fact sheets will be created for rain gardens, green roof systems and porous pavement.
		Commissioner/ DPW	(ii) Identify municipal facilities in separated areas and identify structural controls	Completed. 151 municipal facility sites were mapped in GIS according to location in separated or combined sewer areas. 93 facilities lie within a combined sewer area and 58 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.
		Commissioner/ DPW	(iii) Document inspections procedures and maintenance schedules in a procedures manual	Not applicable in Year 8, Good Housekeeping Inspection Manuals have already been developed for municipal facilities.	Completed. Update as necessary.

<b>6.b cont.</b>		Commissioner/ DPW	(iv) Develop inspections procedures and maintenance schedules for long term structural controls	Over 4,210 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 <a href="#">Appendix 6</a> .	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	2792 catch basins cleaned [approximately 47% (6,000 total)]	Keep record of City catch basins cleaned annually.
		Commissioner/ DPW	(vi) Record tons of street sweepings collected	1,311 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	12,129 tons	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	296 trees were planted by the forestry division. See <a href="#">Appendix 6</a> 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.

- In addition to our regular street sweeping program the City had worked in close collaboration with the U.S. Geological Survey (USGS), EPA, and DEP on a vacuum sweeping study. The goal of the study was to better quantify the effectiveness of high efficiency (HE) street sweeping activities on phosphorous, metals and polycyclic aromatic hydrocarbons (PAHs) that are removed by two types of street sweeping technologies from a well-defined urban area representing a single land-use category during monthly street sweeping periods. A Total Maximum Daily Load (TMDL) for total phosphorus has been established for the Lower Charles River basin. Urban areas are highly impervious, meaning water ‘runs off’ its surfaces rather than infiltrating. To meet the total phosphorus criteria in the TMDL, the City of Cambridge is implementing a 65 percent reduction in total phosphorus load. A portion of this reduction is expected from the management of non-point source runoff, or water ‘running off’ urban surfaces. The effectiveness of a high-efficiency street cleaning program at reducing the City’s phosphorus loads to the Lower Charles River is not known.

During Year 7 the City worked with USGS to develop a scope for a grant to fund the study. A grant application was submitted to DEP in May 2009. The grant scope included both sweeping and sampling protocols and required that the City designate a single High Efficiency vacuum sweeper over a two day period in a designated established sweeping area and work with USGS to obtain samples from sweepers and separate vacuum sweepings at the yard where samples can be weighed independently of other sweeping loads. DEP approved the grant application in November 2009. A final study scope was approved by DEP in December 2009.

During Year 8 a Joint Funding Agreement was executed between USGS and the City. The study collected sweeping samples from May 2010 through December 2010; and USGS continued sampling, processing and analyzing the samples and data into Year 9.

- In public construction projects the following stormwater best management practices (BMPs) were constructed:
  - Number of infiltrating catch basins = 22 (10) Contract 4 – CAM400, (12) Prentiss Street
  - number of locations with permeable pavement = 1 (139 SY) Morse School parking lot (MWRA/SEP)
  - number of bioretention systems (filterra) = 1 Whittemore Ave (Contract 4 – CAM400)
  - number of rain gardens = 1 (Whittemore Ave at Seagrave) Contract 4 – CAM400
- Additional maintenance activities were performed on stormwater drainage systems including:
  - Pump Inspections & Maintenance = 159 (FY10 and FY11 Pump Inspections Maintenance)
  - Storm drain cleaned and televised = 22,699 LF (FY10 and FY10 TV & Cleaning),

#### 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 2010 through March 2011 and their associated summary of results.
  - Alewife Brook samples from May 2010, August 2010, November, 2010 and March 2011.
  - Alewife Brook wet weather sample November 4, 2010.
  - Charles River dry weather samples from July/August/September 2010.
  - Charles River wet weather sample from November 4, 2010.
  - Little Fresh Pond and Black's Nook samples May 2010, September 2010 and March 2011; North Pond samples May 2010 and September 2010.
  - Alewife Brook Oil and Grease samples November 3, 2010.
  - Charles River Oil and Grease sample from August 5, 2010.
  - MyRWA wet weather samples from December 13, 2010.

**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, 2010 through March 31, 2011)

**Programmatic**

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

<sup>+</sup> 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 %)	951 vehicles
▪ material collected **	(tons or gal)	30.88 tons <sup>+</sup>
School curricula implemented	(y/n)	

<sup>+</sup> A total of 58.63 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	(#)	34
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 **	(#)	5
Illicit discharges identified (Since beginning of permit coverage)	(#)	33
Illicit connections removed **	(#); and (est. gpd)	4
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	32
% 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 %)	0
Fines collected **	(# and \$)	0
Complaints/concerns received from public **	(#)	0

+ [178 Coolidge Hill](#)

## 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 **	(#)	2,792
Qty. of storm drain cleaned **	(%, LF or mi.)	22,699 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		
<ul style="list-style-type: none"> <li>Annual budget/expenditure (labor &amp; equipment)**</li> </ul>	(\$)	\$200,000

• Hourly or per basin contract rate **	(\$/hr or \$ per basin)	\$72/basin <sup>+</sup>
• Disposal cost**	(\$)	\$123/ton <sup>++</sup>
Cleaning Equipment		
• Clam shell truck(s) owned/leased	(#)	2
• Vacuum truck(s) owned/leased	(#)	2
• Vacuum trucks specified in contracts	(y/n)	Y <sup>+++</sup>
• % Structures cleaned with clam shells **	(%)	80%
• % Structures cleaned with vector **	(%)	20%

<sup>+</sup> Reduction over last year due to continuous cleaning of catch basins resulting in less time per basin.

<sup>++</sup> Increase over last year due to additional testing requirements of landfills and contaminated materials.

<sup>+++</sup> Storm drain pipe maintenance

	(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)	1,311 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill & transfer station
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	(\$)	\$293,000 (contract only)
• Hourly or lane mile contract rate **	(\$/hr. or ln mi.)	\$72/hr/rotary sweeper \$29/hr/vacuum sweeper <sup>+</sup>
• Disposal cost**	(\$)	\$24.00/ton
Sweeping Equipment		
• Rotary brush street sweepers owned/leased	(#)	2
• Vacuum street sweepers owned/leased	(#)	2 <sup>++</sup>
• Vacuum street sweepers specified in contracts	(y/n)	Y (2x/yr) <sup>+++</sup>
• % Roads swept with rotary brush sweepers **	%	100
• % Roads swept with vacuum sweepers **	%	100

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 <sub>2</sub> % MgCl <sub>2</sub> % 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%)
<del>Zero-velocity spreaders used</del> ** Automatic – control spreader	(y/n or %)	N (25%)
Estimated net reduction or increase in typical year salt/chemical application rate	(±lbs/l <sub>n</sub> mi. or %)	N/A
Estimated net reduction or increase in typical year sand application rate **	(±lbs/l <sub>n</sub> 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

## Appendix 1 - Public Education and Outreach

- *CityView* - Spring/Summer 2010: Recycle More, Trash Less (page 6) and Enjoying Cambridge Parks and Public Spaces with Your Pet. (page 7)
- *CityView* - Winter 2010-11: Cambridge Climate Initiative (page 4), Protecting Yourself from Flooding and Back-Ups (page 6) and Helpful Tips from the Department of Public Works (page 6).
- *Cambridge Life* - Spring 2010 - Spring 2011: Cambridge DPW Goes Green (pages 6-7)
- Construction/Design Notice examples:
  - Alewife Brook Parkway (CSO Control project) flyer
  - Myrtle/Magnolia (design) flyer
  - Western Avenue Reconstruction(design) booklets, June 2010 and October 2010
- Examples of website updates:
  - Joint Public Notice: Alewife Brook Combined Sewer Overflows Progress Update, April 2010 (DPW homepage)
  - Street Cleaning Improves Water Quality (DPW/Street Cleaning page)
  - Of Special Interest (City of Cambridge Homepage)
  - News and Updates (DPW homepage)
  - New FEMA Flood Insurance Rate Maps Effective Soon (DPW/Stormwater Management page)
- Science Festival information April 24 - May 2, 2010
- DPW Vehicle Road Show 2010, EnviroScape demonstration photos
- FAR Ecology Camp - presentation August 9, 2010
- Water Week and Fresh Pond Day flyer and event schedule (May 2010)
- GoGreen Month, May 2010 calendar and events
- CitySmart Fast.Flexible.Fun. program Year 2 Report Executive Summary
- Container Gardening Workshop flyer, press release and photos (May 22, 2010)

## Appendix 2 - Public Involvement and Participation

- NPDES Phase II public meeting information: Presentation and sign-in sheet (March 29, 2011)
- Public Meeting on Stormwater Management Citywide calendar posting
- Friends of Fresh Pond The Year in Review 2010
- Recycling and Household Hazardous Waste collection summaries
- Recycling and Trash Guidelines for Residents (updated fall 2010)
- Alewife Sewer Separation, December 9, 2010 community meeting presentation
- Black's Nook Restoration Project summary and October 4, 2010 presentation
- Remediate/Re-Vision - Cambridge Arts Council gallery event: Cambridge DPW Projects photos and event invitation; and The Park Spark Project press release
- 2010 GoGreen Awards - press release, reception invitation, Stormwater Management Award display board for Small Business and Large Organization winners

## Appendix 3 - Illicit Discharge Detection and Elimination

- Golf Course Clubhouse Improvements map
- Summer 2010 Newsletter (Cambridge GIS)
- Private BMP's Installed
- Site Plan Review Listing
- Water Quality Samples, Reports and Maps
  - Charles River Dry Weather Sampling (March 2010 - June 2010, Sept 1, 2010)
  - Alewife Brook Dry Weather Sampling (March 2010 - June 2010, June 2010 - August 2010, August 2010 -- November 2010, and November 2010 - March 2011)
- Oil & Grease sampling results
  - Endicott Street (8-5-10)
  - Acorn Park Drive (11-3-10)
- 2010 Water Quality Report and sample results - Fresh pond Reservation

- Charles River and Alewife Brook wet weather sample results (November 4, 2010)
- Map of Separated Common Manhole through March 31, 2011
- MyRWA Bacterial Assessment: Wellington and Alewife Brook, Hotspot sampling date: December 13, 2010 (Report Date: January 25, 2011)

#### **Appendix 4 - Construction Site Stormwater Runoff Control**

- Appendix A (DRAFT BMPs) for Construction Controls (revised Section 2 Table of Contents and new Concrete Washout sheet)
- Appendix G Stormwater Control Permits Checklists (December 2010) and Stormwater Control Permit
- Construction Meeting Sign-In Sheets (April 5, April 12, 2010, June 19, 2010, July 19, 2010, August 9, 2010, September 27, 2010, October 4, 2010, October 12, 2010)
- Stormwater Compliance WARNING ticket
- Construction Coordination Meeting - letter and sign-in sheet (March 30, 2010 invitation - see April 5, 2010 sign-in sheet above).

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

- Information and photos of the 2010 Arbor Day tree planting event at the Tobin School

#### **Appendix 6 - Pollution Prevention and Good Housekeeping in Municipal Operations**

- Municipal Facilities Good Housekeeping Inspections summary
- Stormwater Work Order Requests Submitted (CRS)
- Trees Planted in Cambridge in 2010