Municipality/Organization:	City of Westfield
EPA NPDES Permit Number:	MAR041236/MaDEP
MassDEP Transmittal Number:	**W-040836**
Annual Report Number & Reporting Period:	**Year 14** **April 1, 2016 – March 31, 2017**

NPDES PII Small MS4 General Permit Annual Report
(Due: May 1, 2017)

Part I. General Information

Contact Person: Joseph Kietner Title: Stormwater Coordinator

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Mailing Address: 28 Sackett Street Westfield, MA 01085

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: Joseph Kietner

Title: Stormwater Coordinator

Date: 4/28/17

Part II. Self-Assessment

The City of Westfield has completed the required self-assessment and has determined that our municipality is in compliance with its permit conditions with the following exceptions:

BMP 2-3: Marking of Catch Basins with "Do not dump" message needs improvement
BMP 3-4: Illicit connections identification and removal in priority waters is still underway.
BMP 4-5: Process improvements are needed for erosion and sediment control inspection reports.
BMP 5-3: Inventory of all private and public structural BMPs is still ongoing.
BMP 6-7: Cleaning of catch basins needs improvement

Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
1-1	Distribute Educational Pamphlets to municipal employees and households	Stormwater Coordinator and Westfield Gas & Electric Light Department	19,000 pamphlets distributed every two years to all residents and municipal employees	Pamphlet distributed in 4th Quarter of 2016	Pamphlet distribution planned for compliance with MS4 permit that becomes effective July 1, 2017
1-2	Distribute pamphlets to industries	Stormwater Coordinator	250 pamphlets distributed biannually to industries	Last pamphlet distribution Jan, Feb, and Mar 2016	Pamphlet distribution planned for compliance with MS4 permit that becomes effective July 1, 2017
1-3	Create and maintain stormwater website	Stormwater Coordinator and IT specialist	Stormwater web page created	No major informational changes to stormwater utility website this reporting period.	Update website to include recently approved storm water permit. Web site upgrades and maintenance to be a continuing effort.
1-4	Educate dog owners about picking up dog waste	Animal Control	Info posted on animal control website or fact sheet distributed	Dog waste pamphlets distributed to the Westfield Animal shelter. Reached out through Pioneer Valley Planning Commision to pet owners regarding pet waste disposal practices.	Continue posting/distributing dog waste pamphlets.
1-5	Contact local boy/girl scouts concerning volunteer projects	Stormwater Coordinator	Boy/Girl scout troop contacted	Participated in April 2016 Earth Day Clean up event.	Continue reaching out to scout groups. Earth Day clean up event April 22,2017
1-6 Revised	Update City Council on progress of Storm Water Management Plan activities	Stormwater Coordinator	Annual update via annual report	MS 4 Annual Report submitted to Public Works Officials for distribution to City Council and Mayor	Continue to update City officials.

1-7	Waterway labeling of various brooks, streams and rivers, to educate the public and increase environmental awareness.	Stormwater Coordinator	Number of signs posted and maintained identifying brooks and streams where they cross under roadways	Existing signage for waterways maintained this reporting period.	Continue to maintain existing signage.

1a. Additions

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
2-1	Form Stormwater Advisory Committee	City departments in committee	Committee formed and # meetings held per year	The Storm Water Advisory Committee met approximately 25 times as a part of the City's Weekly Round Table meeting.	Continue with meetings.
2-2	Comply with state public notification guidelines	All departments	Notices posted for all meetings as required by state	Ongoing conformance with state public notification requirements. Meeting agendas are posted on the city website.	Continue conformance with state requirements.
2-3	Stencil catch basins with "don't dump" message	DPW	0 catch basins stenciled per year	No new storm drains labeled this reporting period.	Increase level of storm drain marking by using Catch Basin cleaner crew to mark catch basins after cleaning and utilize volunteers.
Revised	Adhere plastic "No Dumping – Drains to River" labels to catch basins.	Stormwater Coordinator	0 catch basins per year		
2-4	Sponsor community participation event	DPW, Health, Police & School Departments	At least one event held annually - with residents participation	2016 Earth Day and biannual Westfield River Watershed Association river clean ups completed.	Continued effort. Planned activities for 2017 include 4-22-17 Earth Day clean up, WRWA River cleanups, and 4-29-17 Arbor Day tree planting.
Revised					
Revised					

2a. Additions

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
3-1	Develop ordinances for illicit connections and discharges	Planning	Ordinance developed and presented to City Council	Ordinance adopted by City Council in June of 2005.	Done
3-2	Map stormwater system, outfalls and receiving waters	Engineering	Map created	Updates and revisions made to the City's stormwater system map this year through routine field inspections.	Upgrade GIS to meet the needs of the new stormwater permit. Continue to locate unknown outfalls and update City stormwater system as necessary.
3-3	Conduct dry weather outfall screening	Engineering and DPW	Number of Outfalls screened	All known outfalls were initially screened during summer 2009. No new outfalls were screened this year.	Newly found outfalls require screening.
3-4	Develop and implement a plan to identify & remove non-stormwater discharges	DPW and Engineering	Number of illicit connections found and removed	One new illicit connection was found and removed this reporting period. The City engaged with Westfield State Univ. and the Mass. Dept of Fish and Wildlife to assist in bacterial source tracking in a stormwater subcatchment area discharging to the Little River.	Illicit connection identification and removal is ongoing effort. Future efforts to focus on outfalls discharging to the Westfield River, Little River, Powdermill Brook, Jacks Brook, and Moose Meadow Brook.
3-5	Investigate discharge locations of floor drains at fire dept.	DPW and Fire Department	Discharge location determined, connections to MS4 removed if necessary	None	None
Revised					
Revised					

3a. Additions

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
4-1	Develop construction site E&S control ordinance	DPW and Building/Zoning and Planning	Final ordinance developed and presented to City Council	Ordinance adopted by City Council on June 2005.	Done
Revised					
4-2	Require a waste management plan at construction sites>1 acre	DPW and Building/Zoning, and Planning	Requirement developed, # of waste management plans reviewed	Construction site waste management plans are required by ordinance at sites disturbing greater than one acre. Approximately 10 plans reviewed.	Continuing effort.
4-3	Review site plans for stormwater impacts	DPW, Engineering, Building/Zoning, Conservation	Internal protocol developed, # of plans reviewed	Continuing pre-permit practice of reviewing site plans by City departments and during a City Round Table meeting.	Continuing effort.
Revised					
4-4	Consider public input during project's planning phase for projects >1 acre	DPW, Engineering, and Planning	Number of public review and comment periods held	Continuing pre-permit practice. Public comment available during site plan approval process at Planning Board meetings. 19 meetings held.	Continuing effort.
Revised					
4-5	Inspect Erosion and Sediment Controls	DPW, Engineering, Con. Comm & Building.	Number of Inspections conducted	City personnel conducted approximately 130 construction site inspections this reporting period.	Continuing effort.
Revised		Add Health Dept			
Revised					

4a. Additions

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 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
5-1	Apply standard 2,3,4,7,9 of Mass. Stormwater Policy for Projects >1 acre	DPW	Final ordinance developed and presented to City Council	Included in stormwater management ordinance (BMP 4-1). Ordinance adopted by City Council.	Done.
5-2	Specify Stormwater BMP	DPW	BMP manual selected	BMP manual selected in 2004 and included in stormwater management ordinance (BMP 4-1). Ordinance adopted by City Council.	Done.
5-3	Develop procedure to track and schedule maintenance on BMPs	DPW	Procedure developed to track and plan regular maintenance on private structural BMPs	Procedure is developed. However, long term BMP maintenance is an ongoing effort. Tracking system for private structures needs improvement.	Continuing effort. Identify key contact persons and building plans to set up inspection schedule. Add private BMP structures to City's GIS.
Revised					
Revised					
Revised					
Revised					

5a. Additions

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 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
6-1	Conduct good housekeeping training	DPW	Training held for staff who could potentially impact stormwater	Training module given to key employees of the Department of Public Works. Municipal Airport employees are trained in accordance with the Airport Stormwater Pollution Protection Plan (SWPPP).	Continue development of training modules and training of more City employees.
6-2	Street sweeping	DPW	Percent of streets swept	City crews, with the assistance of hired contractors swept ≈ 80% of City streets. Urban areas swept multiple times.	Continue sweeping City streets.
6-3	Roadway deicing	DPW	Alternative deicers evaluated, amount of alternative deicers used	Cryotech NAAC alternative used on airport runways for de-icing. ClearLane® by Cargill was used on City streets this year. The City did not use sand this reporting season. Spreaders calibrated per DOT guidance	Continue to use alternative deicers, continue spreader calibration.
6-4	Snow removal	DPW	Install silt fence or hay bales around disposal area	Silt fence and hay bales were not installed around municipal snow disposal area, as City snow was stored in a field outside of aquifer area with no storm system or wetlands present.	Install silt fence or hay bales around snow pile where runoff may enter storm system as necessary.
6-5	Minimize impacts from municipal vehicle washing	Individual department heads	Need of additional controls evaluated, installed (if needed)	Phosphate-free biodegradable soap used for vehicle washings.	Continued use of phosphate-free, biodegradable soap.
6-6	Minimize impacts from municipal vehicle maintenance	Individual department heads	Hazardous material inventory updated	Hazardous material inventory is in place and up to date. Employees trained in hazardous materials handling as part of OSHA 10 hour construction outreach course.	Continue to update hazardous material inventory. Conduct hazardous materials/waste training for employees. Develop and update SWPPP and SPCC plans for municipal facilities.
6-7	Catch basin cleaning and storm drain maintenance	DPW	Number of CBs cleaned, condition of system recorded	0 catch basins inspected/cleaned, and approximately 0 tons of sediment removed.	Continued effort. Catch basin inspection reports linked to GIS.

6-8	Park and landscape maintenance	DPW	Obtain amounts of pesticides, fertilizers used by contractor	Use of herbicides, pesticides and fertilizers is set by School Department IPM Plan. Maintaining records of chemical usage. Soil analysis performed to maximize effectiveness of fertilizers. City parks and field fertilization contractor treated approximately 75 acres on four separate occasions this year.	Continue to research environmentally friendly landscape management techniques, and implement where feasible. Nitrogen and phosphorous reductions in areas near wetland buffer and storm water systems to be assessed.
6-9	Urban forestry program	DPW and Engineering	Urban forestry program developed, # of trees planted	Approximately 73 new City trees were planted this reporting period as part of redevelopment projects, and approximately 20 more trees were planted during Arbor day planting	Continued tree planting. Arbor day planting scheduled 4-22-17.
6-10	Illegal dumping control	Health	Number of signs posted, number of sites cleaned up	Continued illegal dumping monitoring and clean up. 4-25-15 Earth Day and WRWA clean ups held.	Continue effort to maintain records of all complaints, responses and clean-up efforts. 4-22-17 Earth Day and WRWA cleanup efforts targeting historic dumping sites and areas of windswept trash deposit sites.
6-11	Spill prevention and response	Individual department heads	Number of training sessions held; number of employees attending	Annual training performed for the Fire Department relating to hazardous materials and response to hazmat incidents. The Local Emergency Planning Committee (LEPC) met 7 times last year.	Continue hazmat trainings and holding LEPC meetings.

6a. Additions

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) *<<if applicable>>*

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 14 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised					
Revised					
Revised					
Revised					
Revised					
Revised					

7a. Additions

7b. WLA Assessment

Part IV. Summary of Information Collected and Analyzed

The City of Westfield has been operating its Municipal Separate Storm Sewer System (MS4) under a five year National pollution Discharge Elimination System (NPDES) permit as authorized by the US EPA NPDES Phase II Stormwater Regulations. This permit expired on April 30, 2008 and the EPA has drafted a new general permit for MS4 to take its place which will be effective July 1, 2017. The City has continued in its efforts to meet all of the permit requirements in this interim period.

Under the expired permit, the City was required to develop a Stormwater Management Program that included six minimum control measures. The following is a report on the City's current status pertaining to these six control measures and an assessment of their effectiveness.

Control Measure 1 – Public Education and Outreach

This measure requires the City to educate the public on the impacts of their activities on stormwater and on the impact of polluted stormwater on water quality.

Status – The City has initiated a public education program to distribute educational materials to the public. This program includes the distribution of educational pamphlets to residents with the City's combined utility bills, and the direct mailing of educational pamphlets to businesses and industrial facilities. Pamphlet distribution is done every other year. Educational materials were mailed in 2016. Educational pamphlets are displayed and available at City Hall and at the several City schools. Stormwater information for public review is maintained on the City's website.

Dog brochures detailing pet waste concerns are made available to dog owners. Dog brochures and have also been distributed to local veterinary clinics and the City's animal shelter. The City, with the help of the Connecticut River Stormwater Committee, reached out to dog owners about their pet waste disposal practices.

Informational door knob hangers have been created for distribution in neighborhoods where catch basin cleaning is performed.

Massachusetts Department of Agricultural Resources regulations governing plant nutrient applications 330 CMR 31.00 was issued to local fertilization distributors.

The City is also a member of the regional Connecticut River Stormwater Committee. Membership in this committee gives the City access to regional media campaigns that may be more effective in helping educating the public. With its larger resources, the Connecticut River regional stormwater committee provides the City with access to public education programs that would be difficult for the City to undertake on its own. The City intends to continue its participation in the regional stormwater committee in the coming year. The Stormwater Committee's 2016 Annual report is included as an attachment to this report.

In effort to increase environmental awareness, waterway labeling of brooks and streams where they cross under roadways has been maintained this reporting period.

Assessment: Based on the performance of educational and outreach measures, the City is in compliance with Control Measure 1.

Control Measure 2 – Public Participation and Involvement

This measure requires the City to promote public involvement in developing and implementing its Stormwater Management Program.

Status: The public is given an opportunity to participate in all Planning Board, City Council, Board of Public Works and Conservation Commission meetings where projects are being considered. Public participation is always welcome and encouraged.

A Volunteer Earth Day Cleanup was held in conjunction with the Westfield River Watershed Associations (WRWA) on April 2016, in which individuals removed over 100 bags of trash and several tons of bulk items from locations throughout the City. Hampden County Sherriff's Department collected more bags of trash in March from the City right of way at various locations throughout the City. The City conducted bulk trash pickups for City residents between April 1 and November 30th 2016.

The City's Stormwater Advisory Committee met as a part of the City's weekly Round Table meetings to comment on proposed developments and re-developments.

The City continued its membership in the regional Barnes Aquifer Protection Advisory Committee where all projects to be sited in the Barnes drinking water aquifer were reviewed and comments furnished to the appropriate City Committees. Stormwater management is a prime concern of this committee.

Assessment: The City's outreach and public participation and outreach continue to meet permit requirements.

Control Measure 3 – Illicit Discharge and Detection

The City developed a Stormwater System Map, which is updated continuously, and a program to find and remove illicit connections to the stormwater system.

Status: The City Council has adopted an ordinance governing illicit connections and their removal. The City has mapped the known storm sewer system and outfalls and a separate sewer separation investigation has been completed. A dry weather screening of all known outfalls in the City has also been completed.

The upstream piping system for new outfalls still needs to be investigated and added to the City's storm sewer map, and newly found outfalls still need to be screened.

Assessment: One illicit connection was found and removed this reporting period. The City's efforts on this control measure have been met for the most part. Locating and removing illicit connections will be an ongoing effort requiring increased departmental coordination and additional City resources to accomplish. The network of piping comprising the City's stormwater system requires additional investigations and continual updating. The City hopes to build collaborative efforts in the upcoming reporting year in order to advance the program.

Control Measure 4 – Construction Site Runoff Control

This measure requires the City to develop and enforce an erosion and sediment control program for construction activities that disturb greater than one acre of land.

Status: An ordinance was adopted by the City Council requiring erosion and sediment control at construction sites that disturb greater than one acre. This ordinance also provides for construction site waste management and has provisions for inspection and enforcement. Site inspections were performed by the

DPW, Building, Health, and Conservation personnel this reporting period.

Assessment: The required ordinances are in place and all site plans and special permits are reviewed for stormwater impacts and construction site erosion and sediment controls. Better interdepartmental coordination and communication would be beneficial in conducting inspections.

Control Measure 5 – Post Construction Stormwater Management

This measure requires the City to develop, implement and enforce a program addressing discharges of post construction stormwater runoff from developed and redeveloped sites.

Status: An ordinance was adopted by the City Council in 2005 to address stormwater runoff from new development and redevelopment sites. The ordinance covers long-term operation and maintenance of Stormwater Best Management Practices (BMPs) and ensures that controls are in place to prevent or minimize impacts to water quality. A procedure has been developed to track public and private structural BMPs; however, development of an inventory of existing private structural BMPs as well as tracking maintenance on private BMP's is an ongoing effort.

Assessment: Control measures are in place; however, additional resources are still needed to track and control private structural BMPs. Notices were issued for violations of the City stormwater ordinance.

Control Measure 6 – Municipal Pollution Prevention and Good Housekeeping

This measure requires the City to develop and implement a program to prevent or reduce pollutant runoff from municipal operations.

Status: Municipal Airport employees and tenants receive training in accordance with the Airport's Stormwater Pollution Prevention Plan (SWPPP). Approximately 80% of City streets were swept this year, and downtown area street were swept several additional times in preparation for events. An alternative deicer, ClearLane® by Cargill, was used on City streets. No sand was used on streets this reporting period. Silt fence and hay bale installation around the snow disposal sites were not completed this reporting period as snow was trucked to a City owned field that is outside the aquifer zone, borders no wetlands, and does not drain to municipal stormwater infrastructure. The City continues to use phosphate free soap. Hazardous material inventory is complete. 0 catch basins were inspected and cleaned this reporting period. City park and landscape fertilization contract is currently under review for compliance with MA DAR regulations. Approximately 93 new City trees were planted this reporting period, with collaboration from Westfield Technical Academy. Illegal dump sites are cleaned as they are discovered and "No Dumping" signs posted as appropriate. Local Emergency Planning Committee met seven times this reporting period.

Assessment: Efforts under this control measure will be ongoing and need periodic review to assure that all BMP's are being implemented to the most practicable extent. Catch basin cleaning and marking needs to increase.

Planned activities for the upcoming year:

The City of Westfield will continue to operate its municipally separate storm sewer system in accordance with the expired NPDES MS-4 permit until the new permit takes effect in July 2017. Planned activities for the coming year include:

1. Increase awareness of proper disposal of dog waste.
2. Continued improvement to the City website stormwater information.
3. Continue Stormwater Advisory Committee meetings.
4. Continue membership in the Connecticut Valley Regional Stormwater Committee.
5. Catch basin labeling and cleaning program improvements instituted.
6. Continue to target possible illicit connections to outfalls on the Westfield River, Little River, Powdermill Brook, Jack's Brook, and Moose Meadow Brook.
7. Continue building an inventory of all public and private stormwater structural BMPs. The City's GIS system will be used in this process.
8. Continue conducting city inspections of public and private structural BMPs.
9. Install silt fencing and/or hay bales around the City' snow removal sites as necessary.
10. Continue annual maintenance of City structural BMPs.
11. Continue city employee good housekeeping and stormwater management training.
12. Procedural improvement of construction site inspection report review and approval.
13. Continued compliance with the 2017 Massachusetts Small MS4 General Permit.

Conclusion:

At the completion of year 14 of the City's Stormwater Management EPA NPDES MS-4 Permit, the City of Westfield is in compliance with the conditions of this permit with the following exceptions:

BMP 2-3: Marking of Catch Basins with "Do not dump" message needs improvement
BMP 3-4: Illicit connections identification and removal in priority waters is still underway.
BMP 4-5: Process improvements are needed for erosion and sediment control inspection reports.
BMP 5-3: Inventory of all private and public structural BMPs is still ongoing.
BMP 6-7: Cleaning of catch basins needs improvement

No further changes are recommended at this time.

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)	
Annual program budget/expenditures **	($)	
Total program expenditures since beginning of permit coverage	($)	
Funding mechanism(s) (General Fund, Enterprise, Utility, etc)		

Education, Involvement, and Training

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

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					
▪ Erosion & Sediment Control					
▪ Post-Development Stormwater Management					
Accompanying Regulation Status (indicate with "X")					
▪ Illicit Discharge Detection & Elimination					
▪ Erosion & Sediment Control					
▪ Post-Development Stormwater Management					

Mapping and Illicit Discharges

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

Construction

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

Post-Development Stormwater Management

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

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 **	(#)	
Qty. of storm drain cleaned **	(%, LF or mi.)	
Qty. of screenings/debris removed from storm sewer infrastructure **	(lbs. or tons)	
Disposal or use of screenings (landfill, POTW, compost, beneficial use, etc.) **	(location)	

Basin Cleaning Costs		
• Annual budget/expenditure (labor & equipment)**	($)	
• Hourly or per basin contract rate **	($/hr or $ per basin)	
• Disposal cost**	($)	
Cleaning Equipment		
• Clam shell truck(s) owned/leased	(#)	
• Vacuum truck(s) owned/leased	(#)	
• Vacuum trucks specified in contracts	(y/n)	
• % Structures cleaned with clam shells **	(%)	
• % Structures cleaned with vactor **	(%)	

	(Preferred Units)	Response
Average frequency of street sweeping (non-commercial/non-arterial streets) **	(times/yr)	
Average frequency of street sweeping (commercial/arterial or other critical streets) **	(times/yr)	
Qty. of sand/debris collected by sweeping **	(lbs. or tons)	
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	($)	
• Hourly or lane mile contract rate **	($/hr. or ln mi.)	
• Disposal cost**	($)	
Sweeping Equipment		
• Rotary brush street sweepers owned/leased	(#)	
• Vacuum street sweepers owned/leased	(#)	
• Vacuum street sweepers specified in contracts	(y/n)	
• % Roads swept with rotary brush sweepers **	%	
• % Roads swept with vacuum sweepers **	%	

Reduction (since beginning of permit coverage) in application on public land of: ("N/A" = never used; "100%" = elimination)

▪ Fertilizers	(lbs. or %)	
▪ Herbicides	(lbs. or %)	
▪ Pesticides	(lbs. or %)	
Integrated Pest Management (IPM) Practices Implemented	(y/n)	

	(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	
Pre-wetting techniques utilized **	(y/n or %)	
Manual control spreaders used **	(y/n or %)	
Zero-velocity spreaders used **	(y/n or %)	
Estimated net reduction or increase in typical year salt/chemical application rate	(±lbs/ln mi. or %)	
Estimated net reduction or increase in typical year sand application rate **	(±lbs/ln mi. or %)	
% of salt/chemical pile(s) covered in storage shed(s)	(%)	
Storage shed(s) in design or under construction	(y/n or #)	
100% of salt/chemical pile(s) covered in storage shed(s) by May 2008	(y/n)	

Water Supply Protection

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

Connecticut River Stormwater Committee
Annual Report
April 1, 2015 to March 31, 2016

The Connecticut River Stormwater Committee

The Connecticut River Stormwater Committee is an intergovernmental compact of 13 municipalities organized to collaborate on education and outreach about stormwater impacts on the Connecticut River. Facilitated and staffed by the Pioneer Valley Planning Commission, committee work helps NPDES MS4 regulated member communities meet stormwater education and outreach permit requirements. Based on the Memorandum of Agreement under which the committee was formed in 2008, work also helps member communities with related bylaws/ordinances and other compliance measures. Member communities are shown in Table 1 below.

Table 1: Connecticut River Stormwater Committee Member Communities

Member Community	Committee Representatives and Departments
Agawam	Tracey DeMaio, Department of Public Works
Chicopee	Quinn Lonczak, Department of Public Works
Easthampton	Jim Gracia, Department of Public Works
Granby	Dave Derosiers, Highway Department
Holyoke	Yem Lip, Department of Public Works
Longmeadow	Mario Mazza, Department of Public Works
Ludlow	JT Gaucher, Department of Public Works
Northampton	Doug McDonald, Department of Public Works
Southwick	Randall Brown and Richard Grannells, Department of Public Works
South Hadley	Melissa LaBonte, Department of Public Works
Springfield	Kevin Chaffee, Conservation Commission
West Springfield	Jim Lyons and Amanda Santaniello, Department of Public Works
Westfield	Casey Berube, Department of Public Works

Education and Outreach over the Past Year

The Stormwater Committee has been in a transition phase over the past year, continuing education and outreach under the requirements of the 2003 permit, but taking important steps in preparing for the forthcoming 2016 permit. In some cases the work of preparing for the forthcoming permit has served to provide education and outreach under the 2003 permit. This is especially the case with the pet waste practices survey that went to dog owners throughout Stormwater Committee communities (described in greater detail below).

The narrative below summarizes the work of the Connecticut River Stormwater Committee during the 2016 reporting year, which includes the following:

- Promoted Soak up the Rain stormwater education campaign
- Designed and constructed 3 demonstration rain gardens with 2 hands-on training events

- Defined program of effective messaging on bacteria/pet waste management
- Began to define program of effective messaging on nutrients
- Discontinued collaboration with Greenscapes Program
- Began retooling website education and outreach for the Pioneer Valley
- Led first phase of urban tree planting project in Chicopee, Holyoke, and Springfield
- Collaborated with Massachusetts state-wide coalition of stormwater coalitions

1. Promoted "Soak up the Rain" stormwater education campaign

The Connecticut River Stormwater Committee continued to develop and promote the "Pioneer Valley Soak up the Rain" education campaign (a local version of the EPA's New England campaign). The campaign, a call to action for property owners to reduce stormwater runoff through strategies that soak up the rain, involved two outreach efforts for the Connecticut River this year:

Pioneer Valley Soak up the Rain Website www.pvpc.org/soakuptherain/
The Stormwater Committee continues to maintain the Pioneer Valley Soak up the Rain website, which promotes a range of practices, including tree plantings, rain gardens, permeable pavements, dry wells, and green roofs. An occasional blog that includes photos and video provides examples from the region. Property owners throughout the Pioneer Valley are also invited to submit projects that they know of to feature on the website. A "Cool resources" heading provides connection to the latest information and a "resources" menu item links to a library of informational resources. In the past year, the website had 33,997 hits with 12,095 of these hits resulting in information requests being sent to the user. Links to this website are on all member community stormwater web pages.

Soak up the Rain Signs for rain gardens and porous paving projects
The Stormwater Committee produced 150 Soak up the Rain signs, including 100 for rain gardens and 50 for porous paving. Each of the signs has two different sides to them, giving property owners the option to display a message that connotes pride in having such a facility or a more involved message that describes what the system does. Signs have been distributed to Stormwater Committee communities for use at green infrastructure stormwater management projects in their jurisdictions and distributed also to residential and business property owners with high profile projects. The Committee will continue to distribute and display signs to further the message about soaking up the rain. *See sign design below.*

Rain garden signs – both sides

Porous paving signs – both sides

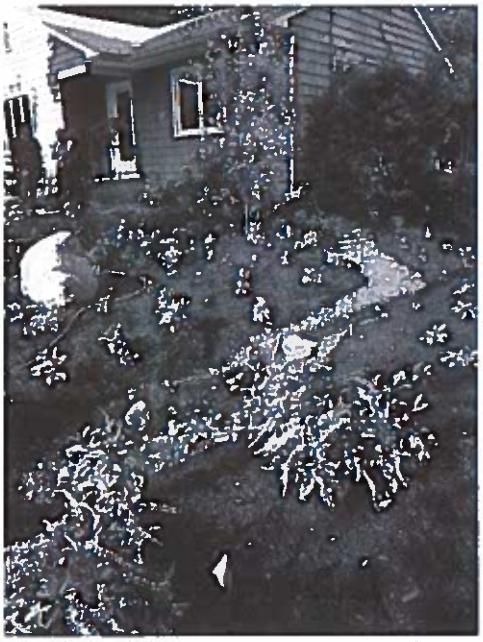
2. Designed and constructed 3 demonstration rain gardens with 2 hands-on training events

PVPC continued work with the Regenerative Design Group to design and construct demonstration rain gardens in Springfield. Two of the three projects to date have also included hands-on trainings to build regional know-how in the design and installation of rain gardens. Trainees then helped by volunteering to install plants in each of the rain gardens. Though rain garden facilities are located in Springfield, trainings have been advertised throughout the region to include all Stormwater Committee communities. The three rain garden projects to date have included:

Rain garden address	*Description of facility*	*Training details*
Birchland Avenue - residential demonstration project	370 square foot facility that has capacity to capture and soak up 1,384 gallons of rainfall from portion of rooftop.	NA
Springfield Museums - institutional demonstration project	2,900 square foot facility near Chestnut Street that has capacity to capture and soak up 11,800 gallons from half of large rooftop on Kilroy House	Training on May 16 drew 21 participants from several stormwater committee communities. Program began with overview on the nature of stormwater impacts on the Connecticut River and the advantages of capture and infiltration of flows using rain gardens to avert flooding and pollution, and promote improved aesthetics. The training then provided detail on site evaluation, design strategy, site preparation, and installation.
Gardening the Community - community demonstration project	1,000 square foot facility along Walnut and James Streets that has capacity to capture and soak	Training on October 3 drew 22 participants from various stormwater committee communities. Program

	up 3,740 gallons from paved parking lot - this is a new community garden site and the rain garden is part of the 1st phase of construction	began with overview on the nature of stormwater impacts on the Connecticut River and the advantages of capture and infiltration of flows using rain gardens to avert flooding and pollution, and promote improved aesthetics. The training then provided detail on site evaluation, design strategy, site preparation, and installation.

Promoting these trainings entailed reaching out to: Western Massachusetts Master Gardener Association, Ecological Landscape Alliance, local public libraries, and notice placements with area newspapers and social media resources. The rain garden work is made possible through a settlement agreement reached by Clean Water Action. Based on the materials, contracts, and know-how developed through this work in Springfield, this project can be easily duplicated in other stormwater committee member communities for the future. PVPC has talked with both Clean Water Action and MassDEP about additional funding to replicate this program in other communities.



Residential demonstration rain garden in Springfield

Institutional demonstration rain garden at Springfield Museums

Community demonstration rain garden at Gardening the Community's new site at Walnut and James Streets in Springfield

3. Defined program of effective messaging on bacteria/pet waste management

Based on the 2014 draft Massachusetts Municipal Separate Storm Sewer Systems (MS4) permit, the 2016 final permit to be issued by the U.S. Environmental Protection Agency will require urbanized areas draining to the Connecticut River to provide an annual message to encourage proper management of pet waste. Specifically, communities with systems that discharge to bacteria or pathogen impaired waters without an EPA approved TMDL must supplement education and outreach programming,

> ...with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for noncompliance."[1]

Messaging on proper management of pet waste is also required in the June/July time frame for communities where there are nitrogen and phosphorous impaired waters.

All 13 member communities of the Connecticut River Stormwater Committee will be subject to these requirements. As such, the Connecticut River Stormwater Committee has been interested in

[1] Note that where appropriate municipalities must also provide messaging around septic system maintenance to help address bacteria impairments.

understanding the effectiveness of past pet waste messaging and how to move forward with messaging under the new permit.

With funding from the Massachusetts Direct Local Technical Assistance Program and match from the Connecticut River Stormwater Committee budget, the Pioneer Valley Planning Commission worked with member communities to devise and distribute a survey to help provide direction on bacteria messaging.

With members of the Connecticut River Stormwater Committee, the Pioneer Valley Planning Commission (PVPC) developed a three-page survey containing 20 questions for dog owners. Survey design was informed by the principles of community based social marketing. As defined by McKenzie-Mohr and Smith, community based social marketing seeks to foster sustainable behavior by first identifying barriers and benefits to a sustainable behavior. They note that barriers may be "internal" to the individual, such as lack of knowledge regarding how to carry out an activity, or external, as in structural changes that need to be made in order for the behavior to be more convenient.[2] As such, understanding current practices, barriers, and perceptions were integral to the six overarching questions the Stormwater Committee sought to answer through the survey:

1. Has the most recent dog waste messaging through the distribution of posters under the Think Blue Connecticut River campaign reached pet owners and got them to think about their practices?
2. Do people understand the connection between pet waste and stormwater?
3. What are current practices in yards at home, while walking in neighborhood, and walking in public parks?
4. What are the barriers to best practices?
5. What would make best practices easier for dog owners?
6. What are important considerations for messaging about pet waste practices going forward?

PVPC distributed the *paper survey* through animal hospital waiting rooms (see image at right) in Stormwater Committee municipalities and through direct distribution of surveys at two dog parks in the region. A link to the *electronic version of the survey* went by e-mail to clients of Dave's Soda and Pet City and the Northampton Veterinary Clinic. Both survey distribution methods included an incentive – a $5 coupon to Dave's Soda and Pet City, a local pet store, with franchises throughout the region, which kindly donated the coupons.

Box with surveys left in animal hospitals in stormwater committee municipalities.

A total of 1,279 people completed the survey – 100 paper surveys were collected and 1,179 people completed the online survey. Of the completed surveys, 641 were completed by people who live in Connecticut River Stormwater Committee member communities. The messaging analysis and report focuses on the results from those specific communities.

[2] From: *Fostering Sustainable Behavior: An Introduction to Community Based Social Marketing*, by Doug McKenzie-Mohr and William Smith, New Society Publishers, 1999.

Major Findings from Survey

Effectiveness of most recent messaging

The past poster message about dog waste in the Connecticut River Think Blue campaign reached 8.7% of survey respondents (59 people) in Connecticut River Stormwater Committee communities. What is interesting is that fully 134 people responded to the follow up question about whether the message got them to change their practices. This may indicate that by virtue of showing the message on the survey page itself, people took in the message and were prompted to consider their practices. Comments seem to reinforce this, with many writing, "I already pick up my pet's waste." Of those 134 survey respondents, nearly 40% indicated that the ad moved them to make "a major change" or "somewhat of a change in their practices." The remaining 60% indicated either "not much of a change," "no change at all," or "not sure." Based on written comments, it is likely that those in this later category are already picking up their dog's waste.

Connection between pet waste and stormwater

The survey indicates widespread awareness that pet waste can affect streams and rivers, with 74.5% recognizing that it contributes either "a great deal," "a moderate amount," or "a little." At the same time, 25.6% of respondents are "not sure" or "do not think" that pet waste is a contributing factor to water pollution.

Current practices (in yards at home, while walking in neighborhood, and walking in public parks or forests)

Regardless of whether they are in their yard with their dog, walking around the neighborhood, or walking at a public park or forest, the majority of respondents report picking up waste. In *their own yard or around the neighborhood*, 88% and 97% of respondents respectively report picking up after their dog, and put the waste in the trash (or for a few, flush it down the toilet).

When asked why they pick up after their dog *in their own yard*, the most common response is "hygiene/health reasons", followed by "courtesy to neighbors," "concern for environment," and "it's the law." When walking a dog *around the neighborhood* or at a *public park of forest*, "courtesy to neighbors" is the most common response, followed by "hygiene/health reasons."

For dog owners who do not pick up after their dog in their yard, a follow-up question on the survey asks to identify the reason why. Of the 125 people who answered this question, 63% stated that they think dog waste is a "natural fertilizer." A smaller number of people felt that it "makes little difference" (15.0%) or it is "too much trouble" (7.2%). From the comments made as part of this question, it is clear that many people who live in more rural locations feel it is not necessary to pick up waste, or that it is not going to contaminate a water supply.

When asked a similar question in regard to w*alking their dog in the neighborhood*, 12 people indicated that they don't pick up their dog's waste. In a follow up question, however, 26 people gave reasons for not picking up the dog's waste. Of those, the most popular response was that "it is a natural fertilizer." For a few, "it is too much trouble," or they simply forgot a bag or some other means of picking it up. Lastly, w*hen at a public park or forest*, 51 people stated they don't pick up after their dog. Of these, the most common reason was that "it is a natural fertilizer," followed by "makes little difference." Some of the comments suggest that if people are far in the woods, they don't see the need to pick it up. Similarly, if they have forgotten a bag, or do not have a way to dispose of the waste (short of bringing it home with them), they are likely to leave it.

There are several themes that emerge from among those who do not pick up after their dog. First, a sizeable number of respondents think of pet waste as a "natural fertilizer" and that it doesn't have a significant effect on water quality. Second, many respondents commented that they live in a rural area, and infer that the waste will decompose along with other wild animals wastes. These results suggest that there is an opportunity to raise awareness about pet waste in the environment and help to change behavior. If dog owners better understand the potential water quality impacts of leaving feces on the ground, they may be more likely not leave it where it falls. As several respondents who do pick up waste referred to the law as a reason, regulations and fines may be another useful strategy for behavior change as well.

Why you <u>do not</u> pick up your dog's waste?

	In yard		In neighborhood		In public park/forest	
Not concerned	12.0%	15	3.9%	1	7.8%	4
Makes little difference	15.0%	19	0%	0	17.7%	9
Too much trouble	7.2%	9	23.0%	6	13.7%	7
My neighbors don't; so why should I?	1.0%	1	7.7%	2	5.9%	3
It is a natural fertilizer	63.2%	79	50.0%	13	52.9%	27
It is not sanitary to pick up	1.6%	2	15.4%	4	2.0%	1
Total	*100.00%*	*125*	*100.00%*	*26*	*100.00%*	*51*

Generally, people are more likely to pick up after their dog if they are not on their own property. They are also more concerned about "courtesy toward their neighbors" when they are walking in the neighborhood or in a park, and this prompts them to pick up after their dog.

Why do you pick up your dog's waste?

	In yard		In neighborhood		In public park/forest	
Courtesy to neighbors	28.1%	232	37.4%	367	32.0%	315
Hygiene/health reasons	39.8%	329	30.3%	297	30.0%	294
Concern for the environment	22.3%	184	20.0%	197	24.0%	236
It's the law	9.8%	81	12.3%	121	14.0%	139
Total	*100.00%*	*826*	*100.00%*	*982*	*100.00%*	*984*

<u>Barriers to best practices</u>

Within this survey, responses indicate widespread understanding that pet waste should not be left on the ground, and that there is a responsibility as a pet owner to pick up after dogs. Some comments, however, indicate that despite good behavior reported by the survey respondents, there is a problem with "others" not picking up dog waste.

> "It's already quite easy. Wish more people thought this way. It's my worst pet peeve to see dog waste on the ground."
>
> "It's very easy to pick up my dog's poop. There should be no reason why people don't do this. Those that don't are just plain LAZY."

Public works and highway officials on the Connecticut River Stormwater Committee confirm that improper pet waste disposal practices are still a big problem in their communities.

Barriers to best practices evident in comments from survey respondents are:

- the need for greater understanding that pet waste doesn't stay where it falls – that water can carry it (or pieces of it) quite a distance so that it contaminates nearby waterbodies
- the need for greater understanding that pet waste is not a "natural fertilizer"
- lack of receptacles for easy disposal of waste
- winter months when fewer receptacles are out or it is just more difficult to access feces to pick them up
- forgetting bags at home

Making it easier for dog owners to do the right thing

To the question "What would it take to make picking up your dog's waste easier for you?" many respondents gave more than one response and also provided comments. Responses were as follows:

More receptacles	422 responses
Easier access to bags	286 responses
Monetary fine	17 responses

Seventy six of the respondents also provided comments under "other," indicating that they already pick up after their dog, or that it's the right and responsible things to do. A few commented that knowing it's a potential pollutant is a motivator. One mentioned more posted signs and making it an enforceable law and another said a compost facility so that the waste does not end up at a landfill.

Messaging Going Forward

For behavior change, community based social marketing practitioners have identified some important tools. These include gaining commitments from individuals to develop community norms that encourage people to behave more sustainably. Direct personal contact is a key technique as the research indicates that people are most likely to change some behaviors in response to direct appeals or social support from others. (McKenzie-Mohr and Smith) These are important guidelines in thinking about messaging going forward.

Discussion and key considerations

Most survey respondents report that they pick up their dog's waste. Strong motivators cited by respondents to picking up dog waste—including health/hygiene reasons and courtesy to neighbors—indicate that campaigns over the years, whether people acknowledge their impact or not, seem to have "normalized" the practice of carrying waste disposal bags, and picking up and disposing of dog waste. The availability of products, including dog waste scoops and the waste bag totes that clip to leashes, have likely also factored into this normalization of practice. From survey responses at least, the "yuck" factor of picking up waste is almost non existent. [Less than 2% of respondents (1 and 2 people depending on setting: yard, neighborhood, park/forest) indicate they do not pick up waste due to it not being sanitary to pick it up.]

The question remains whether this survey involves a self selected group most of whom "do the right thing" or whether the self reporting within the survey is overly optimistic (at least one past study has noted that people are inclined to want to report that they are "doing the right thing"). Some of the survey comments and certainly the experience of public works and local highway officials on the

Stormwater Committee indicate there remains a problem with people not picking up dog waste or picking it up and disposing of it improperly, either leaving bagged waste on the ground or putting it down the storm drain. As such, effective messaging about dog waste will continue to be important. Following are key considerations in messaging based on survey results:

- Disabuse dog owners of the idea that pet waste is a "natural fertilizer" and inform them about the contamination issues associated with this waste, broadening the understanding of stormwater runoff concepts.
- Encourage homeowners (in both rural and urban areas) to pick up after their dog. Inform homeowners that even though the waste may not initially be located near a storm drain, stream or river, the leachate may travel toward them when carried by rainfall or snowmelt.
- Capitalize on existing motivators to pick up dog waste, particularly health/hygiene reasons and courtesy to neighbors.
- While not as strong a motivator, reminding people of the law and possible consequences of not picking up dog waste could promote best practices
- Undertake a campaign to install more waste disposal facilities, making these facilities more highly visible in public parks, forests, and particularly locations where municipal officials observe persistent problems with proper waste disposal.

Next Steps

Based on survey results, PVPC has developed a draft program of messaging for Stormwater Committee communities on pet waste that includes metrics required under the forthcoming permit. This include proposed formats and venues. The Stormwater Committee will review and refine this program in the coming months to include in the Notice of Intent and Stormwater Management Program Plan that they must each complete.

4. Began to define program of effective messaging on nutrients

Based on the 2014 draft Massachusetts Municipal Separate Storm Sewer Systems (MS4) permit, the 2016 final permit to be issued by the U.S. Environmental Protection Agency will have various education and outreach requirements for nutrients, specifically nitrogen and phosphorous. While there are four audiences noted under the permit, nutrient outreach and education is largely aimed at the residential, and business and institutional audiences. Note that the business and institutional audience includes private colleges, private schools, hospitals, and commercial facilities. Education and outreach topics relative to nutrients involve: lawn care activities, proper management of pet waste, and maintenance of septic systems.

There are additional education and outreach requirements depending on water quality issues:

A. All Pioneer Valley stormwater regulated communities are subject to the *Long Island Sound Total Maximum Daily Load (TMDL) requirements for nitrogen* and must therefore supplement Residential and Business/Commercial/Institution programs with annual timed messages on specific topics:

- an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers;

- an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate;[3]
- an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter

"The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP."

B. Where water quality limited waterbodies are *impaired by phosphorus* (Belchertown, Easthampton, Granby, Southampton, Springfield, and Westfield), a municipality must supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics:

- an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers
- an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter

"The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP."

Note that communities that are subject to a *lake or pond Total Maximum Daily Load (TMDL) requirements for phosphorus* (Granby, Hadley, Ludlow, Springfield, and Wilbraham) must develop a Lake Phosphorus Control Plan and within it describe both planned structural as well as non-structural controls. These non structural controls could include education and outreach, but based on the 2014 draft MS4 permit there does not seem to be anything specifically required on education and outreach within the permit term.

Education and outreach on nutrients

All 13 member communities of the Connecticut River Stormwater Committee will be subject to education and outreach requirements on nutrients. As such, the Connecticut River Stormwater Committee has been interested in understanding how to move forward with messaging under the new permit.

With funding from the Massachusetts Direct Local Technical Assistance Program and match from the Connecticut River Stormwater Committee budget, the Pioneer Valley Planning Commission worked to examine useful research and understand new regulations to provide direction for messaging on nutrients by the Committee.

<u>New fertilizer use regulations in Massachusetts</u>

Massachusetts has two sets of new regulations related to fertilizer use: one for non-agricultural turf and lawns and another for agricultural land. The new regulations for turf and lawns became effective June 5, 2015, and stipulate that phosphorous containing fertilizers may only be applied to turf and lawns when:

[3] Annual messaging for pet waste is covered under the Bacteria section of this report.

1. a soil test indicates that it is needed; or
2. a lawn is being established, patched, or renovated.

This restriction mirrors laws already in place in Connecticut, Vermont, and New Jersey. Other highlights from the Massachusetts regulation prohibit nutrient applications between December1 to March 1 or to saturated soil or soils that are frequently flooded. Professionals must keep records of nutrient applications. Retailers must display phosphorous containing fertilizer products separate from non-phosphorous fertilizer products and post a sign displaying language informing the consumer about phosphorous containing fertilizer restrictions for turf and lawns. For more detail, see language of regulation in Appendix E, and Massachusetts Department of Agricultural Resources (MDAR) Fact Sheet in Appendix F.

On December 5, 2015, regulations for the application of plant nutrients on agricultural lands became effective.

Existing Studies and Reports

In researching messaging around lawn care and nutrients, PVPC found critical guidance for the Connecticut River Stormwater Committee in a multi-year study (2006 to 2010) by the Land Grant Universities/Cooperative Extensions in New Hampshire, Vermont, Maine, Rhode Island, and Connecticut. Unfortunately, the cooperative extension at the University of Massachusetts did not participate in this study.

Focused on residential property owners, the study explores current understanding and behavior and messaging to change homeowner lawn care behavior to reduce nutrient loss in New England. PVPC could not find any studies focused on other types of property owners with lawns or even lawn care businesses or any specific explanation why the focus in this study on residential property owners.

Funded by the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service (USDA CSREES), the multi-year study had three major components:

Part 1: Extensive social science survey on lawn care behavior in 5 New England communities (Hampden, ME; East Lyme, CT; Milton, NH; Brandon, VT; East Kingstown, RI) conducted to inform outreach design, development and implementation

Part 2: Development and distribution of education and outreach materials guided by the social science survey findings

Part 3: Follow up survey to understand effectiveness of project messaging in changing lawn care behavior

The program of this project was informed by the principles of community based social marketing. As defined by McKenzie-Mohr and Smith and mentioned above in the Bacteria section of this report, community based social marketing seeks to foster sustainable behavior by: identifying barriers and benefits to a sustainable behavior, designing a strategy that utilizes behavior change tools, piloting the strategy with a small segment of a community, and evaluating the impact of the program once it has been implemented across a community.

The central question to the USDA CSREES study is: What motivates environmentally responsible behavior in lawn care? Understanding the large answer to this question helped to inform design of a

specific outreach program aimed at measurable change in the practices of small-scale landowners in caring for their landscapes. Other objectives of the study included:

- Explore primary drivers of Do it Yourselfers (DIYers) lawn care choices and practices, especially with regard to fertilizer applications
- Investigate perceived barriers and benefits to adoption of more water quality friendly nutrient application practices
- Examine relative measures of trust and frequency of contact for various sources of yard care information by neighborhood residents
- Determine effectiveness of trained opinion leaders (such as Master Gardeneres, local garden center staff, alpha neighbors, Extension staff, etc) to invluence residential nutrient management behavior in neighborhoods

Results for part 1 of the program are included in a document entitled, "Changing Homeowner Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds, Social Science Results Summary," 2008. This work entailed 52 in depth interviews in 5 communities with turf care opinion leaders from 4 categories:

- industry/business group
- outreach/educators group
- community/alpha neighbor group
- research/scientist group

In addition self-administered questionnaires were sent to residents in each of the 5 communities with the return of 754 completed questionnaires. See a summary of the key findings in Appendix G.

Note that for parts 2 and 3 of the program (the outreach phase), Maine, conducted and reported the work separately from the other project partners. As a result there are two different reports under part 3 of the program, one that covers Maine and another report that covers the communities in Maine, as well as Connecticut, New Hampshire, Vermont, and Rhode Island. Respectively, these reports are entitled as follows: "Changing Bangor Area Lawn Care Behavior: Results from the Evaluation Survey," 2008, and "Changing Homeowner Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds, Final Social Science Project Evaluation Report," July 2010.

The 2010 study acknowledges, "...the study site in Maine was able to leverage the research from this project into a larger campaign than in other study communities..." In Maine, project partners followed up on the survey by testing messaging in six "...high amenity suburban communities with heavily managed lawns." They distributed messaging as follows: two neighborhoods received no messaging, serving as the control group; two neighborhoods received standard messaging about stormwater; and two neighborhoods received "normative" messaging (which aims to redefine the norm). Normative messaging picked up on indications from the USDA CSREES survey as well as previous studies that people feel it very important that their lawn fit in with their community and that community members adhere to community standards of lawn care (one researcher on the project referred to this as the "peer pressure" approach). So messages under this category were along the lines of, "Most of your neighbors don't apply chemicals to their lawns because they know that there is a better way to go in getting a healthy lawn."

Major Findings

While study findings within the USDA CEERES funded project agree that homeowners feel it very important that their lawn fit in with their community and that community members adhere to community standards of lawn care, study results also demonstrate that the standards of care and amount of fertilizers applied to lawns vary from neighborhood to neighborhood. In the first USDA CSREES survey of 5 communities across New England, the norm was not to apply fertilizers while in the Maine survey of the 6 "high amenity suburban neighborhoods," the norm is to apply fertilizers.

Also, while the project's first survey results indicate that there is a high level of awareness that lawn care practices may impact water quality, the Maine survey indicates that despite this understanding and concern, the perceived prevalence of chemicals used to maintain lawns in neighborhoods leads respondents to continue to apply chemicals to care for their lawns. Despite these issues, the Maine study did find that those who received normative messaging demonstrate a greater intention to reduce or eliminate fertilizer and pesticide use over those people who received standard messaging or no messaging at all.

What motivates lawn care choices and practices

The major driver for people seems to be a need to "fit in" by following the standards of lawn care they see in their neighborhood. At least one of the studies notes that this ideal of a desirable/healthy lawn is driven in large part by marketing, resulting in a type of lawn that demands high levels of input and intensive management strategies.

Most effective messaging

Based on the results coming out of the five-state New England study, it seems homeowners are aware that lawn chemicals can run off into waterways and negatively impact water quality. Homeowners also seem to understand the harmful impacts that lawn chemicals can have on children and pets. These connections between environment and health are important or very important to 77% of the respondents in the five-state USDA CEREES funded survey. Along these lines, making connections to specific, local bodies of water draws on people's a sense of place as a motivator in environmentally responsible behaviors.

While health and water quality information should continue to be part of messaging, the Maine study indicates that messaging focused on shifting norms in lawn care will be most effective in facilitating behavior change. This norm-based appeal to environmental behavior change is far more effective than other framings.

Normative messaging aims to redefine what is a desirable lawn/healthy lawn and provides a means for DIYers to achieve a desirable and healthy lawn while adhering to environmentally sensitive strategy. According to the surveys from the study, what constitutes a "healthy lawn" is interpreted on a highly variable basis-not driven by research, but marketing. These influences seem to be resulting in lawns that demand high levels of input and intensive management strategies that could easily be interpreted as being unhealthy.

Other important approaches to effective messaging from or derived from the USDA CEREES funded studies include:

- A component related to, "Don't' use it all" or "Use only what needed" to address the tendency for people to use an entire package of fertilizer to avoid storage and thus overfertilize. New Hampshire Cooperative Extension is already considering development and distribution of a bag

clip that not only helps to make storage of leftover fertilizer a bit more convenient, but reminds people not to use it all.

- Messaging that plays up what appears to be common regard for lawns as providing recreational space (a functional, rather than appearance defined standard). Messaging from Paul Tukey's Safe Lawns campaign and his two books related to this campaign could be effective in this regard. It appears that the campaign organization itself is no longer operational, though the website is still up and running with tremendous information. See: Safelawns.org

Barriers to best practices

As mentioned above, the norms for lawn care within a given neighborhood and the desire for property owners to adhere to that standard present the biggest challenge in getting adoption of better practices.

Directions for more environmentally friendly practices of care must be more easily and readily available. The USDA CEREES funded surveys found that people rely heavily on product packaging for application information. And the five-state survey found that University Extension and Master Gardeners are considered to be the most trustworthy sources of information.

It is important to note too that while people did not attach high importance to having a dark green lawn, clover free lawn, or golf-course quality lawn, they did feel that having a pest free lawn, having thick grass, and having a weed-free lawn are important.

While people in the 5-state survey do not seem averse to spending a little more time on their lawn (two-thirds of respondents indicated "no" or "no preference" to the question of whether they would prefer to spend less time managing their lawn than they currently do), they do feel that environmentally friendly lawn care practices will cost them more money. Good information on costs should be developed and distributed to help people understand the actual measure of this cost.

Making it easier for people to "do the right thing"

Points of purchase, where people are buying lawn care products and presumably looking for information on how to get desired results, presents great opportunity to help people do the right thing. Messaging and information could be provided in these locations through lawn care kiosks and workshops hosted by the local garden centers and hardware stores selling products in collaboration with some of the most trusted sources of information (as indicated by the New England survey): Cooperative Extension and Master Gardeners.

It is also critical to provide one reliable place to go for good information on homeowner lawn care practices. In Massachusetts, the new regulations refer people to the UMass Cooperative Extension for guidance. Guidelines for homeowners, however, are not immediately identifiable on the UMass website. Perhaps a great photo with a heading that says, "Your Lawn: What You Need to Know (click here)." While the new Massachusetts regulations focus on phosphorous, it will be important for people to also obtain information on nitrogen application, especially given that the Connecticut River basin contributes to water quality problems in Long Island Sound.

The USDA CEERES funded project noted that recommendations from each the University of Connecticut and University Massachusetts Cooperative Extensions are somewhat contradictory from one another. Other cooperative extensions in New England appear to be using the recommendations coming from UConn, which might create some inconsistency with professionals who travel to other states to do lawn care.

At the same time, the New England Interstate Water Pollution Control Commission has devised a set of fertilizer guidelines for what it defines as "nonperformance turf"/"urban turf" based on four stakeholder meetings between 2012 and 2013. Stakeholders included turf fertilizer manufacturers, lawn care professionals, sports turf managers, turf industry trade groups and professional associations, researchers, university extension specialists, municipal and private groundskeepers, state and federal environmental agencies, and watershed groups. These are published in a report entitled, "Regional Clean Water Guidelines for Fertilization of Urban Turf."

Since UMass Cooperative Extension is cited as the source for information in complying with new Massachusetts regulations, supporting UMass Cooperative Extension in developing and widely distributing concise and specific recommendations for best practices will be critical. Reconciling what may appear to be different recommendations coming from the NEIWPCC and UConn's Cooperative Extension could be helpful too.

With the new requirements that soils be tested before applying phosphorous to a lawn, it will be important to sponsor soil test days. Interpreting results will be another important component of enabling people to comply with the new regulations as results may be confusing.

Messaging Going Forward

Discussion and key considerations

While the New England USDA CESREES project focused on homeowners, there are three additional audiences to which messaging about fertilizer use is important and required under the MS4 permit. These are: lawn care companies and commercial and institutional property owners with large lawns. Working with these other audiences to understand barriers and motivations to better practices will be important going forward in communities with such property owners. (Note that under the MS4 permit, reduced fertilizer use by cities and towns on landscapes at municipal parks, schools, and other properties is part of the municipal Minimum Control Measure on Good Housekeeping.) At the same time, UMass Extension has been working already with several of these audiences. It will be important to coordinate and integrate with the work UMass is already doing.

It is also critically important to get consistent fertilizer application recommendations together for both phosphorous and nitrogen. Though the new Massachusetts fertilizer regulations only explicitly curtail phosphorous use, nitrogen is a concern in the entire Connecticut River watershed based on water quality problems in Long Island Sound. For now, the MS4 permit has no specific restrictions on nitrogen in stormwater, but this may change going forward.

To be most effective, it will be useful to focus energy toward behavior change in neighborhoods where it is clear the standard of lawn care requires high inputs of fertilizers. Door hangers, a lawn sign campaign, and workshops at nearby garden centers or hardware stores are all ways to provide focus on a specific neighborhood. Target audiences might include condominium or neighborhood associations as well. It may also make sense to identify those neighborhoods with high inputs where there are existing water quality issues in nearby lakes or rivers.

Following are key considerations in nutrient messaging for homeowners based on the MS4 permit requirements, the new Massachusetts fertilizer use regulations, and findings from the USDA CESREES project:

- Use normative messaging wherever possible making group standards more apparent (e.g., 70% of your neighbors do not apply chemical fertilizers because they understand there are better ways to get the great lawn they want). People often decide what attitudes and actions are appropriate from those around them. This will take additional research in many cases in order to understand the norm in a given area.
- Redefine what is a desirable lawn and connect this to public health and water impacts/improvements. Also, be sure to name the Connecticut River or a local lake with which people identify.
- Provide good, clear instructions on best fertilizer practices and application rates when needed. Include distinction between slow release fertilizers and information on proper use of composts.
- Provide good, clear instructions on proper use/disposal of grass clippings in April/May and proper disposal of leaf litter in August/September/October
- Draw on sense of lawns as recreational space, a functional space to keep safe for people and pets
- Promote ways to not use all the fertilizer in a bag if not needed
- Partner with UMass Cooperative Extension and Western Massachusetts Master Gardeners wherever possible as the USDA survey indicates that residents caring for lawns seem to most trust cooperative extensions and master gardener organizations on lawn care issues

Next Steps

Based on survey results, PVPC has developed a draft program of messaging for Stormwater Committee communities on nutrients that includes metrics required under the forthcoming permit. This includes proposed formats and venues. The Stormwater Committee will review and refine this program in the coming months to include in the Notice of Intent and Stormwater Management Program Plan that they must each complete.

5. Discontinued collaboration with the Greenscapes Program *www.Greenscapes.org*

On behalf of Stormwater Committee members, PVPC has had lengthy conversations with Greenscapes partners to encourage the coalition to stay with a program of building understanding about the connection between better lawn and garden care practices and reduced impacts on water resources and human and environmental health. It seems especially important to stay with this specialized program given the new fertilizer regulations just enacted by Massachusetts. Despite PVPC's urging, however, coordinators of the Greenscapes program decided to leave this program of messaging and expand Greenscapes to address a broader program of stormwater information to more fully serve member communities in eastern Massachusetts.

6. Began retooling website education and outreach for the Pioneer Valley

Given the various websites/pages the Stormwater Committee communities have been using to promote work under the 2003 permit, including Think Blue and Greenscapes, and the expanded education and requirements of the forthcoming permit, PVPC has begun working to retool and update web materials. This has started with a newly proposed website framework under "Think Blue: Clean Water Begins with You," that attends to the various stormwater issues and audiences under the new permit. It will bring together education and outreach materials together with metrics for understanding the effectiveness of

messages and movement away from behavior and practices that negatively impact the health of the Connecticut River.

7. Led first phase of urban tree planting project in Chicopee, Holyoke, and Springfield

PVPC is leading an effort to promote urban tree planting in the region's 3 major cities in partnership with the US Forest Service, Massachusetts Executive Office of Energy and Environmental Affairs, the Valley Opportunity Council, Nuestras Raices, ReGreen Springfield, Conway School of Design, Mass DCR, and the Cities of Chicopee, Holyoke, Springfield. Aimed at reducing stormwater flows to combined sewer areas and promoting greater climate reslience, the project involves an integrated community outreach process involving multiple neighborhood workshops and workshops for public works officials. The workshop for public works officials, held in November and conducted by engineering consultants TetraTech, drew 12 officials from 6 stormwater committee communities. The two neighborhood workshops held to date have each drawn some 40 participants. Once completed, the project will provide the following major deliverables:

- installation of 2,200 trees on local streets and yards
- final engineering design for a green streets in each municipality
- model stormwater tree rebate ordinance

The project is made possible thanks to a $239,000 grant award to PVPC from the US Forest Service under the State and Private Forestry FY15 Northeastern Area Landscape Scale Restoration Program.

8. Collaborated with Massachusetts state-wide coalition of stormwater coalitions

On behalf of the Connecticut River Stormwater Committee, PVPC has been participating in a state wide conversation with other stormwater coalitions to determine how best to build efficiencies through collaboration for the forthcoming MS4 stormwater permit. The group, called together by a consultant and leader of the Central Mass coalition, has had two meetings to date in an effort to identify existing resources and explore possible collaborations on education and outreach. PVPC's hope is that the group can better identify all possible activities for collaboration under the permit by:

- clarifying who has produced tools and resources that can help in meeting permit requirements, perhaps with some updating
- where the gaps are in possible joint state-wide materials, and
- who would like to take responsibility for specific work going forward