APPENDIX F

Requirements for Discharges to Impaired Waters with an Approved TMDL

Table of Contents

A. Requirements for Discharges to Impaired Waters with an Approved MassDEP In State TMDL

I. Charles River Watershed Phosphorus TMDL Requirements

On October 17, 2007, EPA approved the *Final TMDL for Nutrients in the Lower Charles River Basin* (Lower Charles TMDL)[1] and on June 10, 2011 EPA approved the *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River* (Upper/Middle Charles TMDL)[2]. The two nutrient TMDLs address severe water quality impairments resulting from the excessive growth of algae caused by an over-abundance of phosphorus in discharges to the Charles River system. In summary, the TMDLs set wasteload allocations (WLAs) and reductions for phosphorus sources throughout the entire Charles River watershed. The following phosphorus reduction requirements are consistent with the TMDL WLAs established to restore water quality and attain Massachusetts water quality standards.

1. To address the discharge of phosphorus from its MS4, the permittee shall develop a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater (SW) discharges from its MS4 to the Charles River and its tributaries.the PCP shall be completed in phases and add it as an attachment to its written SWMP upon completion and report in annual reports pursuant to Part 4.4 of the Permit on its progress toward achieving its Phosphorus Reduction Requirement. The PCP shall be developed and fully implemented as soon as possible but no later than 20 years after the permit effective date in accordance with the phases and schedule outlined below. Each Phase shall contain the elements required of each phase as described in Parts a.through c below. The timing of each phase over 20 years from the permit effective date is:

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

a. Phase 1

1) The permittee shall complete a written Phase 1 plan of the PCP five years after the permit effective date and fully implement the Phase 1 plan of the PCP as soon as possible but no longer than 10 years after the permit effective date.
2) The Phase 1 plan of the PCP shall contain the following elements and has the following required milestones:

[1] Massachusetts Department of Environmental Protection. 2007. *Final TMDL for Nutrients in the Lower Charles River Basin*. CN 301.1
[2] Massachusetts Department of Environmental Protection. 2011. *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River Basin, Massachusetts*. CN 272.0

Item Number	Phase 1 of the PCP Component and Milestones	Completion Date
1-1	Legal analysis	2 years after permit effective date
1-2	Funding source assessment.	3 years after permit effective date
1-3	Define scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	4 years after permit effective date
1-4	Description of Phase 1 planned nonstructural controls	5 years after permit effective date
1-5	Description of Phase 1 planned structural controls	5 years after permit effective date
1-6	Description of Operation and Maintenance program for structural controls	5 years after permit effective date
1-7	Phase 1 implementation schedule	5 years after permit effective date
1-8	Estimated cost for implementing Phase 1 of the PCP	5 years after permit effective date
1-9	Complete Written Phase 1 PCP	5 years after permit effective date
1-10	Full implementation of nonstructural controls	6 years after permit effective date
1-11	Performance Evaluation	6, and 7 years after permit effective date
1-12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
1-13	Performance Evaluation	9 years after permit effective date
1-14	1. Performance Evaluation.	10 years after

	2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.75 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.75)$	permit effective date

Table F-1:Phase 1 of the PCP components and Milestones

3) Description of Phase 1 PCP Components

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances, and describe any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Funding source assessment – The permittee shall describe known and anticipated funding mechanisms (e.g. general funding, enterprise funding, stormwater utilities)that will be used to fund PCP implementation. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Scope of the PCP, Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) The permittee shall indicate the area in which it plans to implement the PCP. The permittee may choose to implement its PCP in all areas within its jurisdiction (for municipalities this would be the municipal boundary) within the Charles River Watershed or the permittee may choose to implement its PCP in regulated MS4 areas only within its jurisdiction within the Charles River Watershed. This area is known as the "PCP Area". Table F-2 and Table F-3 list the permittees subject to phosphorus reduction requirements along with the estimated baseline watershed stormwater phosphorous loads in mass/yr, the calculated Allowable SW Phosphorus Load in mass/yr, the SW Phosphorus Reduction Requirement in mass/yr and the respective percent reductions necessary. The two tables contain different reduction requirements for each permittee based on the PCP Area they choose in the development and implementation of the PCP. Although the phosphorus control measures need only be applied in those areas within the regulated portion of the permittee's MS4 (see permit Part 1.2.1), permittees may find more cost effective opportunities to reduce phosphorus discharges outside of the regulated area. Therefore, the permittee should consider implementation of measures in non-regulated areas, especially where such implementation requires little or no additional resources; or where such implementation would have a significant and demonstrable

effect on phosphorus loading. If the permittee chooses to implement the PCP in its regulated MS4 area only, then the permittee may only demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load through controls implemented within the regulated MS4 area (i.e., structural and non-structural controls implemented outside of the MS4 regulated area may not be counted towards meeting the Allowable Phosphorus Load milestones for the purposes of permit compliance).

The permittee shall select the Baseline Phosphorus Load, Phosphorus Reduction Requirement and Allowable Phosphorus Load that corresponds to the PCP Area selected. The Phosphorus Reduction Requirement will be used to determine compliance with PCP milestones of this Phase and Phase 2 and Phase 3. If the permittee chooses to implement its PCP in all areas within its jurisdiction within the Charles River Watershed, then the permittee shall use Table F-2 to determine the Baseline Phosphorus Load, Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area[3]. If the permittee chooses to implement its PCP only within the regulated MS4 area in its jurisdiction within the Charles River Watershed, then the permittee shall use Table F-3 to determine the Baseline Phosphorus Load, Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area[4].

The Permittee may submit more accurate land use data from 2005, which is the year chosen as the baseline land use for the purposes of permit compliance, for EPA to recalculate baseline phosphorus stormwater loads for use in future permit reissuances. ,Updated land use maps, characteristics and land areas shall be submitted to EPA along with the year 4 annual report for consideration for future permit requirements[5]., Until such a time as

[3] The estimated Baseline Phosphorus Load, Allowable Phosphorus Load, Phosphorus Reduction Requirement and percent reductions presented in Table F-2 apply to the entire watershed land area that drains to the Charles River and its tributaries, and represent phosphorous loadings from regulated and unregulated stormwater discharges, and nonpoint sources. Therefore, the permittee is not responsible for satisfying the entire reduction assigned to its municipality through implementation of its PCP by controlling its MS4 discharges. Rather, the permittee's PCP shall support achievement of the Allowable Phosphorus Load by reducing phosphorus loading from its MS4 areas in concert with phosphorus reductions achieved outside of the MS4 areas.

[4] The phosphorus reduction requirements in Table F-3 represent the estimated Baseline Phosphorus Load and the Allowable Phosphorus Load and Phosphorus Reduction Requirement for the regulated MS4 area only that drains to the Charles River and its tributaries, In choosing the scope of the PCP (Section A.I.1.ii.a.3. of Appendix F) the permittee can choose to implement its PCP in the MS4 area only and reduce its phosphorus load to the Allowable Phosphorus Load in Table F-2 OR choose to implement its PCP jurisdiction-wide and support the achievement of the Allowable Phosphorus Load in Table F-1 and take credit for phosphorus reduction practices implemented inside and outside of the regulated area within the permittee's jurisdiction.

[5] This submission is optional and needs only be done if the permittee has more accurate land use information from 2005 than information provided by MassGIS (http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/lus2005.html, retrieved 10/1/2013) and the permittee would like to update the Baseline Phosphorus Load.

future permit requirements reflect information submitted in the year 4 annual report, the permittee shall use the Baseline Phosphorus Load, Phosphorus Reduction Requirement and Allowable Phosphorus Load Table F-2 (if its PCP Area is the permittee's entire jurisdiction) or Table F-3 (if its PCP Area is the regulated MS4 area only) to calculate compliance with milestones for Phase 1, 2, and 3 of the PCP.

Description of Phase 1 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of Phase 1 planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of structural phosphorus controls during Phase 1. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to Part 2.3.4.6of the Permit. The permittee shall also include in this priority ranking a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of Part 2.3.6.8.b of the Permit. A description and the results of this priority ranking shall be included in Phase 1 of the PCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of structural controls shall include the planned and existing measures, the areas where the measures will be implemented or are currently implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[6] may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish and Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 1 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule or each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

[6] This does not include structural BMPs installed in compliance with any other NPDES stormwater permit that requires phosphorus reductions consistent with a TMDL.

Phase 1 Implementation Schedule – A schedule for implementation of all planned Phase 1 BMPs, including, as appropriate: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance activities, and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 1 Plan, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 8 and 10 year phosphorus load milestones established in Table F-1. The Phase 1 plan shall be fully implemented as soon as possible, but no later than 10 years after the effective date of permit.

Estimated cost for implementing Phase 1 of the PCP – The permittee shall estimate the cost of implementing the Phase 1 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to assess the validity of the funding source assessment completed by year 3 after the permit effective date and to update funding sources as necessary to complete Phase 1.

Complete written Phase 1 Plan – The permittee must complete the written Phase 1 Plan of the PCP no later than 5 years after the permit effective date. The complete Phase 1 Plan shall include Phase 1 PCP item numbers 1-1 through 1-7 in Table F-1. The permittee shall make the Phase 1 Plan available to the public for public comment during Phase 1 Plan development. EPA encourages the permittee to post the Phase I Plan online to facilitate public involvement.

Performance Evaluation –The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development during the reporting period shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in Part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by Part 4.4 of the Permit.

Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed

Community	Baseline Phosphorus Load, kg/yr	Phosphorus Load Reduction Requirement kg/yr	Allowable Stormwater Phosphorus Load, kg/yr	Percent Reduction in Stormwater Phosphorus Load (%)
Arlington	111	60	51	54%
Ashland	67	24	43	36%
Bellingham	958	344	614	36%
Belmont	208	94	114	45%
Brookline	1,695	853	842	50%
Cambridge	523	274	249	52%
Dedham	836	355	481	42%
Dover	833	150	683	18%
Foxborough	2	-	2	0%
Franklin	2,367	869	1,498	37%
Holliston	1,555	424	1,131	27%
Hopedale	107	39	68	36%
Hopkinton	293	73	220	25%
Lexington	550	214	336	39%
Lincoln	595	109	486	18%
Medfield	966	297	669	31%
Medway	1,066	337	729	32%
Mendon	29	9	20	31%
Milford	1,654	708	946	43%
Millis	973	261	712	27%
Natick	1,148	429	719	37%
Needham	1,829	852	977	47%
Newton	4,067	2,100	1,967	52%
Norfolk	1,006	244	762	24%
Somerville	653	345	308	53%
Sherborn	848	136	712	16%
Walpole	159	31	128	19%
Waltham	2,985	1,531	1,454	51%
Watertown	1,164	613	551	53%
Wayland	48	17	31	35%
Wellesley	1,506	734	772	49%
Weston	1,193	318	875	27%
Westwood	395	134	261	34%
Wrentham	620	177	443	29%
Mass-DCR	433	97	336	22%

Table F-2: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be the entire community within the Charles River Watershed.

Regulated Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Stormwater Phosphorus Load, kg/yr**	**Percent Reduction in Phosphorus Load (%)**
Arlington	111	60	51	54%
Ashland	67	24	43	36%
Bellingham	812	304	508	37%
Belmont	208	94	114	45%
Brookline	1,695	853	842	50%
Cambridge	523	274	249	52%
Dedham	836	355	481	42%
Dover	282	67	215	24%
Foxborough	2	-	2	0%
Franklin	2,334	864	1,470	37%
Holliston	1,370	398	972	29%
Hopedale	107	39	68	36%
Hopkinton	280	72	208	26%
Lexington	544	212	332	39%
Lincoln	367	71	296	19%
Medfield	838	289	549	34%
Medway	1,040	328	712	32%
Mendon	10	5	5	50%
Milford	1,528	698	830	46%
Millis	503	171	332	34%
Natick	1,032	402	630	39%
Needham	1,828	852	976	47%
Newton	4,067	2,100	1,967	52%
Norfolk	1,003	244	759	24%
Somerville	653	345	308	53%
Sherborn	203	43	160	21%
Walpole	159	31	128	19%

Regulated Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Stormwater Phosphorus Load, kg/yr**	**Percent Reduction in Phosphorus Load (%)**
Waltham	2,985	1,531	1,454	51%
Watertown	1,164	613	551	53%
Wayland	48	17	31	35%
Wellesley	1,506	734	772	49%
Weston	1,193	318	875	27%
Westwood	364	128	236	35%
Wrentham	558	164	394	29%
Mass DCR	404	94	310	23%

Table F-3: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be only the regulated MS4 area (Urbanized Area) within the Charles River Watershed.

b. Phase 2

1) The permittee shall complete the Phase 2 Plan of the PCP 10 years after the permit effective date and fully implement the Phase 2 plan of the PCP as soon as possible but no longer than 15 years after the permit effective date.
2) The Phase 2 plan of the PCP shall be added to the Phase 1 Plan and contain the following elements and has the following required milestones:

Item Number	Phase 2 of the PCP Component and Milestones	Completion Date
2-1	Update Legal analysis	As necessary
2-2	Description of Phase 2 planned nonstructural controls	10 years after permit effective date
2-3	Description of Phase 2 planned structural controls	10 years after permit effective date
2-4	Updated description of Operation and Maintenance Program	10 years after permit effective date
2-5	Phase 2 implementation schedule	10 years after permit effective

		date
2-6	Estimated cost for implementing Phase 2 of the PCP	10 years after permit effective date
2-7	Complete written Phase 2 Plan	10 years after permit effective date
2-8	Performance Evaluation.	11, and 12 years after permit effective date
2-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.65 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.65)$	13 years after permit effective date
2-10	Performance Evaluation	14 years after permit effective date
2-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.50 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.50)$	15 years after permit effective date

Table F-4: Phase 2 of the PCP components and Milestones

3) Description of Phase 2 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 2 Plan.

Description of Phase 2 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual

phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 2 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices during Phase 2. The ranking shall build upon the ranking developed for Phase 1. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[7] may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish and Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule or each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 2 Implementation Schedule – A schedule for implementation of all planned Phase 2 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 2 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 13 and 15 year milestones established in Table F-4. The Phase 2 plan shall be fully implemented as soon as possible, but no later than 15 years after the effective date of permit.

Estimated cost for implementing Phase 2 of the PCP – The permittee shall estimate the cost of implementing the Phase 2 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 2.

Complete written Phase 2 Plan – The permittee must complete a written Phase 2 Plan of the PCP no later than 10 years after the permit effective date. The complete Phase 2 Plan shall include Phase 2 PCP item numbers

[7] This does not include structural BMPs installed in compliance with any other NPDES stormwater permit that requires phosphorus reductions consistent with a TMDL.

2-1 through 2-6 in Table F-4. The permittee shall make the Phase 2 Plan available to the public for public comment during Phase 2 plan development. EPA encourages the permittee to post the Phase 2 Plan online to facilitate public involvement.

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development during the reporting period shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in Part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by Part 4.4 of the Permit.

c. Phase 3

1) The permittee shall complete the Phase 3 Plan of the PCP 15 years after the permit effective date and fully implement the Phase 3 plan of the PCP as soon as possible but no longer than 20 years after the permit effective date.
2) The Phase 3 plan of the PCP shall be added to the Phase 1 Plan and the Phase 2 Plan to create the comprehensive PCP and contain the following elements and has the following required milestones:

Item Number	Phase 3 of the PCP Component and Milestones	Completion Date
3-1	Update Legal analysis	As necessary
3-2	Description of Phase 3 planned nonstructural controls	15 years after permit effective date
3-3	Description of Phase 3 planned structural controls	15 years after permit effective date
3-4	Updated description of Operation and Maintenance (O&M) Program	15 years after permit effective date
3-5	Phase 3 implementation schedule	15 years after permit effective date
3-6	Estimated cost for implementing Phase 3 of the PCP	15 years after permit effective date
3-7	Complete written Phase 3 Plan	15 years after

		permit effective date
3-8	Performance Evaluation.	16, and 17 years after permit effective date
3-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	18 years after permit effective date
3-10	Performance Evaluation	19 years after permit effective date
3-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load (P_{allow}) $P_{exp} \leq P_{allow}$	20 years after permit effective date

Table F-5:Phase 3 of the PCP components and Milestones

3) Description of Phase 3 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 and Phase 2 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 and Phase 2 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 3 Plan.

Description of Phase 3 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 3 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices

during Phase 3. The ranking shall build upon the ranking developed for Phase 1 and 2. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[8] may be included in a municipal PCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish and Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1, 2 and 3 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 3 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule or each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 3 Implementation Schedule – A schedule for implementation of all planned Phase 3 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 3 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 18 and 20 year milestones established in Table F-5. The Phase 3 plan shall be fully implemented as soon as possible, but no later than 20 years after the effective date of permit.

Estimated cost for implementing Phase 3 of the PCP – The permittee shall estimate the cost of implementing the Phase 3 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 3.

Complete written Phase 3 Plan – The permittee must complete the written Phase 3 Plan of the PCP no later than 15 years after the permit effective date. The complete Phase 3 Plan shall include Phase 3 PCP item numbers 3-1 through 3-6 in Table F-5. The permittee shall make the Phase 3 Plan available to the public for public comment during Phase 3 Plan development. EPA encourages the permittee to post the Phase 3 Plan online to facilitate public involvement.

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through

[8] This does not include structural BMPs installed in compliance with any other NPDES stormwater permit that requires phosphorus reductions consistent with a TMDL.

implementation of structural and non-structural BMPs and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development during the reporting period shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in Part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by Part 4.4 of the Permit.

2. Reporting

Beginning 6 years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to Part 4.4 of the Permit:

1. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
2. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance and inspection for each Structural control
3. Phosphorus load increases due to development over the previous reporting period and incurred to date (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
4. Estimated yearly phosphorus export rate (P_{exp}) from the PCP Area calculated using Equation 2. Equation 2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the PCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 1. Equation used to calculate yearly phosphorus export rate from the chosen PCP Area. P_{exp}=Current phosphorus export rate from the PCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the PCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the PCP Area in mass/year. Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since 2005 in the PCP Area in mass/year.

5. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

   I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

II. Lake and Pond Phosphorus TMDL Requirements

Between 1999 and 2010 EPA has approved 14 Lake TMDLs[9] completed by MassDEP covering 78 lakes and ponds within the Commonwealth of Massachusetts. These lake and pond TMDLs were developed using land use models and estimated phosphorus loads from various land uses. The TMDLs require site specific reductions in phosphorus loads from urban land use sources within the watersheds of each lake or pond. The identified impairments in these waters include noxious plants, low DO, and nutrient enrichment, all of which are associated with the overabundance of phosphorus in discharges to the impaired lake or pond.

1. Permittees that operate regulated MS4s (traditional and non-traditional) that discharge to the identified impaired waters or their tributaries must reduce phosphorus discharges to support achievement of phosphorus load reductions identified in the TMDLs. To address phosphorus, the permittee shall develop a Lake Phosphorus Control Plan (LPCP) designed to reduce the amount of phosphorus in stormwater discharges from its MS4 to the impaired waterbody or its tributaries in accordance with the phosphorus load reduction requirements set forth in Table F-6 below. Table F-6 identifies the primary municipalities located within the watershed of the respective lake or pond and the percent phosphorus reductions necessary from urban stormwater sources. Primary municipalities indicate the municipality in which the majority of the lake or pond is located but does not necessarily indicate each municipality that has regulated area that discharges to the lake or pond or its tributaries. Any permittee (traditional or non-traditional) that discharges to a lake or pond listed in Table F-6 or its tributaries is subject to the same phosphorus percent reduction requirements associated with that lake or pond.

Primary Municipality	Waterbody Name	Required Percent Reduction
Auburn	Leesville Pond	34%
	Auburn Pond	27%
	Eddy Pond	2%
	Pondville Pond	11%
	Stoneville Pond	6%
Charlton	Buffumville Lake	31%
	Dresser Hill Pond	20%
	Gore Pond	17%
	Granite Reservoir	14%
	Jones Pond	16%
	Pierpoint Meadow Pond	30%
	Pikes Pond	41%
Dudley	Gore Pond	17%

[9] Final TMDLs for lakes and ponds in the Northern Blackstone River Watershed, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin and Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Leesville Pond, Salisbury Pond, White Island Pond, Quaboag Pond and Quacumquasit Pond can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Primary Municipality	Waterbody Name	Required Percent Reduction
	Larner Pond	58%
	New Pond	59%
	Pierpoint Meadow Pond	30%
	Shepherd Pond	28%
	Tobins Pond	65%
	Wallis Pond	57%
Gardner	Hilchey Pond	30%
	Parker Pond	50%
	Bents Pond	55%
	Ramsdall Pond	52%
Grafton	Flint Pond/Lake Quinsigamond	52%
Granby	Aldrich Lake East	1%
Hadley	Lake Warner	27%
Harvard	Bare Hill Pond	5%
Hudson	Lake Boon	31%
Leicester	Smiths Pond	33%
	Southwick Pond	67%
	Cedar Meadow Pond	20%
	Dutton Pond	26%
	Greenville Pond	17%
	Rochdale Pond	11%
Ludlow	Minechoag Pond	51%
Millbury	Brierly Pond	17%
	Dorothy Pond	4%
	Howe Reservoir	51%
Oxford	Buffumville Lake	31%
	Hudson Pond	40%
	Lowes Pond	54%
	McKinstry Pond	82%
	Robinson Pond	11%
	Texas Pond	24%
Shrewsbury	Flint Pond/Lake Quinsigamond	52%
	Jordan Pond	63%
	Mill Pond	46%
	Newton Pond	22%
	Shirley Street Pond	33%
Spencer	Quaboag Pond	32%

Primary Municipality	Waterbody Name	Required Percent Reduction
	Quacumquasit Pond	5%
	Jones Pond	16%
	Sugden Reservoir	34%
Springfield	Loon Pond	13%
	Long Pond	59%
	Mona Lake	60%
Stow	Lake Boon	31%
Templeton	Brazell Pond	65%
	Depot Pond	53%
	Bourn-Hadley Pond	52%
	Greenwood Pond 2	59%
Wilbraham	Spectacle Pond	48%
Winchendon	Lake Denison	25%
	Stoddard Pond	27%
	Whitney Pond	19%
	Whites Mill Pond	24%

Table F-6: Phosphorus impaired Lakes or Ponds subject to a TMDL along with primary municipality and required percent reduction of phosphorus from urban stormwater sources

i. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

a. LPCP Implementation Schedule – The permittee shall complete the implementation of its LPCP as soon as possible but no later than 15 years after the effective date of the permit.

b. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

Number	LPCP Component and Milestones	Completion Date
1	Legal Analysis	2 years after permit effective date
2	Funding source assessment	3 years after permit effective date
3	Define LPCP scope (LPCP Area)	4 years after permit effective date
4	Calculate Baseline Phosphorus, Allowable Phosphorus Load and Phosphorus Reduction Requirement	4 years after permit effective date
5	Description of planned nonstructural and	5 years after permit

	structural controls	effective date
6	Description of Operation and Maintenance (O&M) Program	5 years after permit effective date
7	Implementation schedule	5 years after permit effective date
8	Cost and Funding Source Assessment	5 years after permit effective date
9	Complete written LPCP	5 years after permit effective date
10	Full implementation of nonstructural controls.	6 years after permit effective date
11	Performance Evaluation.	6 and 7 years after permit effective date
12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
13	Performance Evaluation	9 years after permit effective date
14	1. Performance Evaluation. 2. Update LPCP 3. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.60 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.60)$ OR that the permittee has reduced their phosphorus export rate by 30kg/year (whichever is greater, unless full Phosphorus Reduction Requirement has been met)	10years after permit effective date
15	Performance Evaluation	11 and 12 years after permit effective date
16	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the	13years after permit effective date

	applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	
17	Performance Evaluation	14 years after permit effective date
18	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) $P_{exp} \leq P_{allow}$	15years after permit effective date

Table F-7: LPCP components and milestones

c. Description of LPCP Components:

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances and describe any changes to these regulatory mechanisms that may be necessary to effectively implement the LPCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Scope of the LPCP (LPCP Area) - The permittee shall indicate the area in which the permittee plans to implement the LPCP, this area is known as the "LPCP Area". The LPCP Area can either be: 1) the drainage area to the impaired waterbody within the jurisdiction of the permittee (for a municipality this would be the municipal boundary) or 2) the MS4 regulated area only that is within the drainage area of the impaired waterbody and in the jurisdiction of the permittee. Although the phosphorus control measures need only be applied in those areas in the regulated portion of the permittee's MS4 that are within the impaired waterbody's watershed (see permit Part 1.2.1), permittees may find more cost effective opportunities to reduce phosphorus discharges outside of the regulated area. Therefore, the permittee should consider implementation of measures in non-regulated areas, especially where such implementation requires little or no additional resources; or where such implementation would have a significant and demonstrable effect on phosphorus loading. If the permittee chooses to implement the LPCP only in the regulated MS4 within the watershed of the impaired lake or pond, then the permittee may only demonstrate compliance with the milestones in Table F-7 through controls implemented within the regulated MS4 area (structural and non-structural controls implemented outside of the MS4 regulated area may not be counted towards the meeting the Allowable Phosphorus Load for the purposes of permit compliance).

Calculate Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) –Permittees shall calculate their numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by first estimating their Baseline Phosphorus Load in mass/yr from its LPCP Area consistent with the methodology in Attachment 1 to Appendix F, the

baseline shall only be estimated using land use phosphorus export coefficients in Attachment 1 to Appendix F and not account for phosphorus reductions resulting from implemented structural BMPs completed to date. Table F-6 contains the percent phosphorus reduction required from urban stormwater consistent with the TMDL of each impaired waterbody. The permittee shall apply the applicable required percent reduction in Table F-6 to the calculated Baseline Phosphorus Load to obtain the permittee specific Allowable Phosphorus Load. The Allowable Phosphorus Load shall then be subtracted from the Baseline Phosphorus Load to obtain the permittee specific Phosphorus Reduction Requirement in mass/yr.

Description of planned non-structural controls – The permittee shall describe the non-structural stormwater control measures to be implemented to support the achievement of the milestones in Table F-7. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F. The permittee shall update the description of planned non-structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to Part 2.3.4.6 of the Permit. The permittee shall also include in this prioritization a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of Part 2.3.6.8.b of the Permit. A description and the result of this priority ranking shall be included in the LPCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the milestones in Table F-7. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[10] may be included in the LPCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F. The permittee shall update the description of planned structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs

[10] This does not include structural BMPs installed in compliance with any other NPDES stormwater permit that requires phosphorus reductions consistent with a TMDL.

implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Implementation Schedule – An initial schedule for implementing the BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the LPCP, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the permittee shall within four years of the effective date of the permit have a schedule for completion of construction consistent with the reduction requirements in Table F-7. The permittee shall complete the implementation of its LPCP as soon as possible or at a minimum in accordance with the milestones set forth in Table F-7. The implementation schedule shall be updated as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Cost and funding source assessment – The permittee shall estimate the cost for implementing its LPCP and describe known and anticipated funding mechanisms. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Complete written LPCP – The permittee must complete the written LPCP 5 years after permit effective date. The complete LPCP shall include item numbers 1-8 in Table F-7. The permittee shall make the LPCP available to the public for public comment during the LPCP development. EPA encourages the permittee to post the LPCP online to facilitate public involvement. The LPCP shall be updated as needed with an update 10 years after the permit effective date at a minimum to reflect changes in BMP implementation to support achievement of the phosphorus export milestones in Table F-7. The updated LPCP shall build upon the original LPCP and include additional or new BMPs the permittee will use to support the achievement of the milestones in Table F-7.

Performance Evaluation – The permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the permit. Phosphorus reductions shall be calculated consistent with Attachment 2 (non-structural BMP performance), Attachment 3 (structural BMP performance) and Attachment 1 (reductions through land use change), to Appendix F for all BMPs implemented to date[11]. Phosphorus load increases resulting from development

[11] Annual phosphorus reductions from structural BMPs installed in the LPCP Area prior to the effective date of this permit shall be calculated consistent with Attachment 3 to Appendix F. Phosphorus Reduction Credit for previously installed BMPs will only be given if the Permittee demonstrates that the BMP is

shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. The permittee shall also include all information required in Part II.2 of this Appendix in each performance evaluation.

2. Reporting

Beginning 6 years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to Part 4.4 of the Permit:

1. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
2. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance for each Structural control
3. Phosphorus load increases due to development over the previous reporting period and incurred to date (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
4. Estimated yearly phosphorus export rate (P_{exp}) from the LPCP Area calculated using Equation 2. Equation2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the LPCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 2. Equation used to calculate yearly phosphorus export rate from the chosen LPCP Area. P_{exp}=Current phosphorus export rate from the LPCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the LPCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the LPCP Area in mass/year. Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since the year baseline loading was calculated in the LPCP Area in mass/year.

5. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

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performing up to design specifications and certifies that the BMP is properly maintained and inspected according to manufacturer design or specifications. This certification shall be part of the annual performance evaluation during the year credit is claimed for the previously installed BMP.

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

3. As an alternative to tracking phosphorus reductions as described in Parts II.1.-2 above, the permittee may choose to evaluate the effectiveness of the LPCP or evaluate the effectiveness of previously implemented BMPs or programs at restoring the impaired waterbody by using monitoring or other means. In this case, the permittee shall work with MassDEP and EPA to develop a monitoring plan or other assessment plan the permittee will use to evaluate the effectiveness of the LPCP or other work the permittee has conducted in restoring the waterbody. The permittee shall work with MassDEP and EPA to develop the alternative analysis plan and keep the written plan as part of their SWMP. Until the production of a written alternative analysis plan with input and assistance from MassDEP and EPA, the permittee remains subject to the requirements described in Parts II.1-2 above.

III. Bacteria and Pathogen TMDL Requirements

There are currently approved 15 approved bacteria (fecal coliform bacteria) or pathogen (fecal coliform, E. coli, and/or enterococcus bacteria) TMDLs for certain waterbody Massachusetts[12]. The goal for these bacteria or pathogen TMDLs is for the bacteria or pathogen concentration in each waterbody to meet the water quality standards for the designated uses of the water body. The WLA for all waters with applicable bacteria or pathogen TMDLs is set at the state water quality standard for the indicator organism for that water body at the time of TMDL development. Table F-8 lists primary municipalities discharging stormwater to waters subject to an approved TMDL the impaired receiving water and the applicable indicator organism. Primary municipalities indicate the municipality in which the majority of the segment is located but does not necessarily indicate each municipality that has regulated area that discharges to the waterbody segment. Any permittee (traditional or non-traditional) that discharges to a waterbody segment on Table F-8 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-8 and that discharge to a waterbody identified on Table F-8 shall identify and implement BMPs designed to reduce bacteria or pathogen discharges from its MS4. To address bacteria or pathogen discharges, each permittee shall implement additional or enhanced BMPs as described below:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.3. Public Education: The permittee shall supplement its Residential program 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 non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

            2. Part 2.3.4 Illicit Discharge: Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

[12] Final bacteria or pathogen TMDLs can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Abington	Ma62-09	Beaver Brook	Escherichia Coli (E. Coli)
Abington	Ma62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Acushnet	Ma95-31	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	Ma95-32	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	Ma95-33	Acushnet River	Fecal Coliform
Andover	Ma83-04	Rogers Brook	Fecal Coliform
Andover	Ma83-15	Unnamed Tributary	Fecal Coliform
Andover	Ma83-18	Shawsheen River	Fecal Coliform
Andover	Ma83-19	Shawsheen River	Fecal Coliform
Avon	Ma62-07	Trout Brook	Escherichia Coli (E. Coli)
Barnstable	Ma96-81	Snows Creek	Fecal Coliform
Barnstable	Ma96-82	Hyannis Inner Harbor	Fecal Coliform
Barnstable	Ma96-93	Halls Creek	Fecal Coliform
Barnstable	Ma96-94	Stewarts Creek	Fecal Coliform
Barnstable	Ma96-01	Barnstable Harbor	Fecal Coliform
Barnstable	Ma96-02	Bumps River	Fecal Coliform
Barnstable	Ma96-04	Centerville River	Fecal Coliform
Barnstable	Ma96-05	Hyannis Harbor	Fecal Coliform
Barnstable	Ma96-06	Maraspin Creek	Fecal Coliform
Barnstable	Ma96-08	Shoestring Bay	Fecal Coliform
Barnstable	Ma96-36	Lewis Bay	Fecal Coliform
Barnstable	Ma96-37	Mill Creek	Fecal Coliform
Barnstable	Ma96-07	Prince Cove	Fecal Coliform
Barnstable	Ma96-63	Cotuit Bay	Fecal Coliform
Barnstable	Ma96-64	Seapuit River	Fecal Coliform
Barnstable	Ma96-66	North Bay	Fecal Coliform
Barnstable	Ma96-92	Santuit River	Fecal Coliform
Bedford	Ma83-01	Shawsheen River	Fecal Coliform
Bedford	Ma83-05	Elm Brook	Fecal Coliform
Bedford	Ma83-08	Shawsheen River	Fecal Coliform
Bedford	Ma83-10	Kiln Brook	Fecal Coliform
Bedford	Ma83-06	Vine Brook	Fecal Coliform
Bedford	Ma83-14	Spring Brook	Fecal Coliform
Bedford	Ma83-17	Shawsheen River	Fecal Coliform
Bellingham	Ma72-03	Charles River	Pathogens
Bellingham	Ma72-04	Charles River	Pathogens
Belmont	Ma72-28	Beaver Brook	Pathogens
Berkley	Ma62-20	Assonet River	Fecal Coliform
Berkley	Ma62-03	Taunton River	Fecal Coliform
Berkley	Ma62-02	Taunton River	Fecal Coliform
Beverly	Ma93-08	Bass River	Fecal Coliform
Beverly	Ma93-20	Beverly Harbor	Fecal Coliform
Beverly	Ma93-09	Danvers River	Fecal Coliform
Beverly	Ma93-25	Salem Sound	Fecal Coliform
Billerica	Ma83-14	Spring Brook	Fecal Coliform
Billerica	Ma83-17	Shawsheen River	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Billerica	Ma83-18	Shawsheen River	Fecal Coliform
Bourne	Ma95-15	Phinneys Harbor	Fecal Coliform
Bourne	Ma95-16	Pocasset River	Fecal Coliform
Bourne	Ma95-17	Pocasset Harbor	Fecal Coliform
Bourne	Ma95-18	Red Brook Harbor	Fecal Coliform
Bourne	Ma95-47	Back River	Fecal Coliform
Bourne	Ma95-48	Eel Pond	Fecal Coliform
Bourne	Ma95-01	Buttermilk Bay	Fecal Coliform
Bourne	Ma95-14	Cape Cod Canal	Fecal Coliform
Brewster	Ma96-09	Quivett Creek	Fecal Coliform
Brewster	Ma96-27	Namskaket Creek	Fecal Coliform
Bridgewater	Ma62-32	Matfield River	Escherichia Coli (E. Coli)
Brockton	Ma62-05	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	Ma62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	Ma62-08	Salisbury Brook	Escherichia Coli (E. Coli)
Brockton	Ma62-07	Trout Brook	Escherichia Coli (E. Coli)
Brockton	Ma62-09	Beaver Brook	Escherichia Coli (E. Coli)
Brookline	Ma72-11	Muddy River	Pathogens
Burlington	Ma83-06	Vine Brook	Fecal Coliform
Burlington	Ma83-11	Long Meadow Brook	Fecal Coliform
Burlington	Ma83-13	Sandy Brook	Fecal Coliform
Cambridge	Ma72-38	Charles River	Pathogens
Cambridge	Ma72-36	Charles River	Pathogens
Canton	Ma73-01	Neponset River	Fecal Coliform
Canton	Ma73-05	East Branch	Fecal Coliform
Canton	Ma73-20	Beaver Meadow Brook	Fecal Coliform
Canton	Ma73-22	Pequid Brook	Fecal Coliform
Canton	Ma73-27	Ponkapog Brook	Fecal Coliform
Canton	Ma73-02	Neponset River	Fecal Coliform
Chatham	Ma96-79	Cockle Cove Creek	Fecal Coliform
Chatham	Ma96-79	Cockle Cove Creek	Enterococcus Bacteria
Chatham	Ma96-11	Stage Harbor	Fecal Coliform
Chatham	Ma96-41	Mill Creek	Fecal Coliform
Chatham	Ma96-42	Taylors Pond	Fecal Coliform
Chatham	Ma96-43	Harding Beach Pond	Fecal Coliform
Chatham	Ma96-44	Bucks Creek	Fecal Coliform
Chatham	Ma96-45	Oyster Pond	Fecal Coliform
Chatham	Ma96-46	Oyster Pond River	Fecal Coliform
Chatham	Ma96-50	Ryder Cove	Fecal Coliform
Chatham	Ma96-49	Frost Fish Creek	Pathogens
Chatham	Ma96-51	Muddy Creek	Pathogens
Cohasset	Ma94-20	Little Harbor	Fecal Coliform
Concord	Ma83-05	Elm Brook	Fecal Coliform
Danvers	Ma93-01	Waters River	Fecal Coliform
Danvers	Ma93-02	Crane Brook	Escherichia Coli (E. Coli)
Danvers	Ma93-04	Porter River	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Danvers	Ma93-09	Danvers River	Fecal Coliform
Danvers	Ma93-36	Frost Fish Brook	Escherichia Coli (E. Coli)
Danvers	Ma93-41	Crane River	Fecal Coliform
Dartmouth	Ma95-34	Slocums River	Fecal Coliform
Dartmouth	Ma95-39	Apponagansett Bay	Fecal Coliform
Dartmouth	Ma95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Dartmouth	Ma95-62	Buzzards Bay	Fecal Coliform
Dartmouth	Ma95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
Dartmouth	Ma95-38	Clarks Cove	Fecal Coliform
Dedham	Ma72-21	Rock Meadow Brook	Pathogens
Dedham	Ma73-02	Neponset River	Fecal Coliform
Dedham	Ma72-07	Charles River	Pathogens
Dennis	Ma96-12	Bass River	Fecal Coliform
Dennis	Ma96-13	Sesuit Creek	Fecal Coliform
Dennis	Ma96-14	Swan Pond River	Fecal Coliform
Dennis	Ma96-35	Chase Garden Creek	Fecal Coliform
Dennis	Ma96-09	Quivett Creek	Fecal Coliform
Dighton	Ma62-51	Muddy Cove Brook	Fecal Coliform
Dighton	Ma62-55	Segreganset River	Fecal Coliform
Dighton	Ma62-03	Taunton River	Fecal Coliform
Dighton	Ma62-50	Broad Cove	Fecal Coliform
Dighton	Ma62-57	Three Mile River	Fecal Coliform
Dighton	Ma62-02	Taunton River	Fecal Coliform
Dighton	Ma62-56	Three Mile River	Escherichia Coli (E. Coli)
Dover	Ma72-05	Charles River	Pathogens
Dover	Ma72-06	Charles River	Pathogens
East Bridgewater	Ma62-32	Matfield River	Escherichia Coli (E. Coli)
East Bridgewater	Ma62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
East Bridgewater	Ma62-38	Meadow Brook	Escherichia Coli (E. Coli)
East Bridgewater	Ma62-09	Beaver Brook	Escherichia Coli (E. Coli)
East Bridgewater	Ma62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Eastham	Ma96-15	Boat Meadow River	Fecal Coliform
Eastham	Ma96-16	Rock Harbor Creek	Fecal Coliform
Eastham	Ma96-68	Town Cove	Fecal Coliform
Eastham	Ma96-34	Wellfleet Harbor	Fecal Coliform
Essex	Ma93-11	Essex River	Fecal Coliform
Essex	Ma93-45	Alewife Brook	Escherichia Coli (E. Coli)
Essex	Ma93-46	Alewife Brook	Fecal Coliform
Essex	Ma93-16	Essex Bay	Fecal Coliform
Everett	Ma93-51	Unnamed Tributary	Enterococcus Bacteria
Fairhaven	Ma95-64	Little Bay	Fecal Coliform
Fairhaven	Ma95-42	New Bedford Inner Harbor	Fecal Coliform
Fairhaven	Ma95-62	Buzzards Bay	Fecal Coliform
Fairhaven	Ma95-63	Outer New Bedford Harbor	Fecal Coliform
Fairhaven	Ma95-65	Nasketucket Bay	Fecal Coliform
Fairhaven	Ma95-33	Acushnet River	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Fall River	Ma61-06	Mount Hope Bay	Fecal Coliform
Fall River	Ma62-04	Taunton River	Fecal Coliform
Falmouth	Ma95-20	Wild Harbor	Fecal Coliform
Falmouth	Ma95-21	Herring Brook	Fecal Coliform
Falmouth	Ma95-22	West Falmouth Harbor	Fecal Coliform
Falmouth	Ma95-23	Great Sippewisset Creek	Fecal Coliform
Falmouth	Ma95-24	Little Sippewisset Marsh	Fecal Coliform
Falmouth	Ma95-25	Quissett Harbor	Fecal Coliform
Falmouth	Ma95-46	Harbor Head	Fecal Coliform
Falmouth	Ma96-56	Little Pond	Fecal Coliform
Falmouth	Ma96-17	Falmouth Inner Harbor	Fecal Coliform
Falmouth	Ma96-18	Great Harbor	Fecal Coliform
Falmouth	Ma96-19	Little Harbor	Fecal Coliform
Falmouth	Ma96-20	Quashnet River	Fecal Coliform
Falmouth	Ma96-53	Perch Pond	Fecal Coliform
Falmouth	Ma96-54	Great Pond	Fecal Coliform
Falmouth	Ma96-55	Green Pond	Fecal Coliform
Falmouth	Ma96-57	Bournes Pond	Fecal Coliform
Falmouth	Ma96-62	Oyster Pond	Fecal Coliform
Falmouth	Ma96-21	Waquoit Bay	Fecal Coliform
Falmouth	Ma96-58	Hamblin Pond	Fecal Coliform
Foxborough	Ma62-47	Wading River	Escherichia Coli (E. Coli)
Foxborough	Ma62-39	Rumford River	Escherichia Coli (E. Coli)
Foxborough	Ma73-01	Neponset River	Fecal Coliform
Franklin	Ma72-04	Charles River	Pathogens
Freetown	Ma62-20	Assonet River	Fecal Coliform
Freetown	Ma62-04	Taunton River	Fecal Coliform
Gloucester	Ma93-12	Annisquam River	Fecal Coliform
Gloucester	Ma93-18	Gloucester Harbor	Fecal Coliform
Gloucester	Ma93-28	Mill River	Fecal Coliform
Gloucester	Ma93-16	Essex Bay	Fecal Coliform
Hanson	Ma62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Harwich	Ma96-22	Herring River	Fecal Coliform
Harwich	Ma96-23	Saquatucket Harbor	Fecal Coliform
Harwich	Ma96-51	Muddy Creek	Pathogens
Holliston	Ma72-16	Bogastow Brook	Pathogens
Hopedale	Ma72-03	Charles River	Pathogens
Hopkinton	Ma72-01	Charles River	Pathogens
Ipswich	Ma93-16	Essex Bay	Fecal Coliform
Lawrence	Ma83-19	Shawsheen River	Fecal Coliform
Lexington	Ma72-28	Beaver Brook	Pathogens
Lexington	Ma83-10	Kiln Brook	Fecal Coliform
Lexington	Ma83-06	Vine Brook	Fecal Coliform
Lincoln	Ma83-08	Shawsheen River	Fecal Coliform
Lincoln	Ma83-05	Elm Brook	Fecal Coliform
Lynn	Ma93-24	Nahant Bay	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Lynn	Ma93-44	Saugus River	Fecal Coliform
Lynn	Ma93-52	Lynn Harbor	Fecal Coliform
Lynnfield	Ma93-30	Beaverdam Brook	Escherichia Coli (E. Coli)
Lynnfield	Ma93-32	Hawkes Brook	Escherichia Coli (E. Coli)
Lynnfield	Ma93-34	Saugus River	Escherichia Coli (E. Coli)
Lynnfield	Ma93-35	Saugus River	Escherichia Coli (E. Coli)
Malden	Ma93-51	Unnamed Tributary	Enterococcus Bacteria
Manchester	Ma93-19	Manchester Harbor	Fecal Coliform
Manchester	Ma93-25	Salem Sound	Fecal Coliform
Manchester	Ma93-29	Cat Brook	Escherichia Coli (E. Coli)
Manchester	Ma93-47	Causeway Brook	Escherichia Coli (E. Coli)
Mansfield	Ma62-49	Wading River	Escherichia Coli (E. Coli)
Mansfield	Ma62-47	Wading River	Escherichia Coli (E. Coli)
Mansfield	Ma62-39	Rumford River	Escherichia Coli (E. Coli)
Marblehead	Ma93-22	Marblehead Harbor	Fecal Coliform
Marblehead	Ma93-21	Salem Harbor	Fecal Coliform
Marblehead	Ma93-25	Salem Sound	Fecal Coliform
Marion	Ma95-05	Weweantic River	Fecal Coliform
Marion	Ma95-07	Sippican River	Fecal Coliform
Marion	Ma95-08	Sippican Harbor	Fecal Coliform
Marion	Ma95-09	Aucoot Cove	Fecal Coliform
Marion	Ma95-56	Hammett Cove	Fecal Coliform
Mashpee	Ma96-92	Santuit River	Fecal Coliform
Mashpee	Ma96-21	Waquoit Bay	Fecal Coliform
Mashpee	Ma96-24	Mashpee River	Fecal Coliform
Mashpee	Ma96-39	Popponesset Creek	Fecal Coliform
Mashpee	Ma96-58	Hamblin Pond	Fecal Coliform
Mashpee	Ma96-61	Little River	Fecal Coliform
Mashpee	Ma96-08	Shoestring Bay	Fecal Coliform
Mattapoisett	Ma95-10	Hiller Cove	Fecal Coliform
Mattapoisett	Ma95-35	Mattapoisett Harbor	Fecal Coliform
Mattapoisett	Ma95-60	Mattapoisett River	Fecal Coliform
Mattapoisett	Ma95-61	Eel Pond	Fecal Coliform
Mattapoisett	Ma95-65	Nasketucket Bay	Fecal Coliform
Mattapoisett	Ma95-09	Aucoot Cove	Fecal Coliform
Medfield	Ma72-10	Stop River	Pathogens
Medfield	Ma73-09	Mine Brook	Fecal Coliform
Medfield	Ma72-05	Charles River	Pathogens
Medway	Ma72-04	Charles River	Pathogens
Medway	Ma72-05	Charles River	Pathogens
Melrose	Ma93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Mendon	Ma72-03	Charles River	Pathogens
Milford	Ma72-01	Charles River	Pathogens
Millis	Ma72-16	Bogastow Brook	Pathogens
Millis	Ma72-05	Charles River	Pathogens
Milton	Ma73-26	Unquity Brook	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Milton	Ma73-30	Gulliver Creek	Fecal Coliform
Milton	Ma73-03	Neponset River	Fecal Coliform
Milton	Ma73-04	Neponset River	Fecal Coliform
Milton	Ma73-29	Pine Tree Brook	Fecal Coliform
Milton	Ma73-02	Neponset River	Fecal Coliform
Nahant	Ma93-52	Lynn Harbor	Fecal Coliform
Nahant	Ma93-53	Lynn Harbor	Fecal Coliform
Nahant	Ma93-24	Nahant Bay	Fecal Coliform
Natick	Ma72-05	Charles River	Pathogens
Natick	Ma72-06	Charles River	Pathogens
Needham	Ma72-21	Rock Meadow Brook	Pathogens
Needham	Ma72-18	Fuller Brook	Pathogens
Needham	Ma72-25	Rosemary Brook	Pathogens
Needham	Ma72-06	Charles River	Pathogens
Needham	Ma72-07	Charles River	Pathogens
New Bedford	Ma95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
New Bedford	Ma95-38	Clarks Cove	Fecal Coliform
New Bedford	Ma95-42	New Bedford Inner Harbor	Fecal Coliform
New Bedford	Ma95-63	Outer New Bedford Harbor	Fecal Coliform
New Bedford	Ma95-33	Acushnet River	Fecal Coliform
Newton	Ma72-24	South Meadow Brook	Pathogens
Newton	Ma72-29	Cheese Cake Brook	Pathogens
Newton	Ma72-23	Sawmill Brook	Pathogens
Newton	Ma72-07	Charles River	Pathogens
Newton	Ma72-36	Charles River	Pathogens
Norfolk	Ma72-10	Stop River	Pathogens
Norfolk	Ma72-05	Charles River	Pathogens
North Andover	Ma83-19	Shawsheen River	Fecal Coliform
Norton	Ma62-56	Three Mile River	Escherichia Coli (E. Coli)
Norton	Ma62-49	Wading River	Escherichia Coli (E. Coli)
Norwood	Ma73-16	Hawes Brook	Fecal Coliform
Norwood	Ma73-17	Traphole Brook	Fecal Coliform
Norwood	Ma73-01	Neponset River	Fecal Coliform
Norwood	Ma73-15	Germany Brook	Fecal Coliform
Norwood	Ma73-24	Purgatory Brook	Fecal Coliform
Norwood	Ma73-02	Neponset River	Fecal Coliform
Orleans	Ma96-72	Paw Wah Pond	Fecal Coliform
Orleans	Ma96-73	Pochet Neck	Fecal Coliform
Orleans	Ma96-76	The River	Fecal Coliform
Orleans	Ma96-78	Little Pleasant Bay	Fecal Coliform
Orleans	Ma96-26	Little Namskaket Creek	Fecal Coliform
Orleans	Ma96-16	Rock Harbor Creek	Fecal Coliform
Orleans	Ma96-27	Namskaket Creek	Fecal Coliform
Orleans	Ma96-68	Town Cove	Fecal Coliform
Peabody	Ma93-05	Goldthwait Brook	Escherichia Coli (E. Coli)
Peabody	Ma93-39	Proctor Brook	Escherichia Coli (E. Coli)

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Peabody	Ma93-01	Waters River	Fecal Coliform
Raynham	Ma62-02	Taunton River	Fecal Coliform
Rehoboth	Ma53-03	Palmer River	Pathogens
Rehoboth	Ma53-04	Palmer River	Pathogens
Rehoboth	Ma53-05	Palmer River	Pathogens
Rehoboth	Ma53-07	Palmer River - West Branch	Pathogens
Rehoboth	Ma53-08	Palmer River - East Branch	Pathogens
Rehoboth	Ma53-09	Rumney Marsh Brook	Pathogens
Rehoboth	Ma53-10	Beaver Dam Brook	Pathogens
Rehoboth	Ma53-11	Bad Luck Brook	Pathogens
Rehoboth	Ma53-12	Fullers Brook	Pathogens
Rehoboth	Ma53-13	Clear Run Brook	Pathogens
Rehoboth	Ma53-14	Torrey Creek	Pathogens
Rehoboth	Ma53-15	Old Swamp Brook	Pathogens
Rehoboth	Ma53-16	Rocky Run	Pathogens
Revere	Ma93-51	Unnamed Tributary	Enterococcus Bacteria
Revere	Ma93-15	Pines River	Fecal Coliform
Revere	Ma93-44	Saugus River	Fecal Coliform
Revere	Ma93-52	Lynn Harbor	Fecal Coliform
Revere	Ma93-53	Lynn Harbor	Fecal Coliform
Rockport	Ma93-17	Rockport Harbor	Fecal Coliform
Salem	Ma93-21	Salem Harbor	Fecal Coliform
Salem	Ma93-40	Proctor Brook	Enterococcus Bacteria
Salem	Ma93-42	North River	Fecal Coliform
Salem	Ma93-20	Beverly Harbor	Fecal Coliform
Salem	Ma93-39	Proctor Brook	Escherichia Coli (E. Coli)
Salem	Ma93-09	Danvers River	Fecal Coliform
Salem	Ma93-25	Salem Sound	Fecal Coliform
Sandwich	Ma95-14	Cape Cod Canal	Fecal Coliform
Sandwich	Ma96-84	Old Harbor Creek	Fecal Coliform
Sandwich	Ma96-85	Mill Creek	Fecal Coliform
Sandwich	Ma96-86	Dock Creek	Fecal Coliform
Sandwich	Ma96-87	Springhill Creek	Fecal Coliform
Sandwich	Ma96-30	Scorton Creek	Fecal Coliform
Saugus	Ma93-15	Pines River	Fecal Coliform
Saugus	Ma93-33	Hawkes Brook	Escherichia Coli (E. Coli)
Saugus	Ma93-43	Saugus River	Fecal Coliform
Saugus	Ma93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Saugus	Ma93-49	Shute Brook	Fecal Coliform
Saugus	Ma93-50	Shute Brook	Escherichia Coli (E. Coli)
Saugus	Ma93-44	Saugus River	Fecal Coliform
Saugus	Ma93-35	Saugus River	Escherichia Coli (E. Coli)
Seekonk	Ma53-01	Runnins River	Fecal Coliform
Seekonk	Ma53-12	Fullers Brook	Pathogens
Seekonk	Ma53-13	Clear Run Brook	Pathogens
Seekonk	Ma53-14	Torrey Creek	Pathogens

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Sharon	Ma73-31	Unnamed Tributary	Fecal Coliform
Sharon	Ma62-39	Rumford River	Escherichia Coli (E. Coli)
Sharon	Ma73-17	Traphole Brook	Fecal Coliform
Sherborn	Ma72-05	Charles River	Pathogens
Somerset	Ma61-01	Lee River	Fecal Coliform
Somerset	Ma61-02	Lee River	Fecal Coliform
Somerset	Ma61-06	Mount Hope Bay	Fecal Coliform
Somerset	Ma62-03	Taunton River	Fecal Coliform
Somerset	Ma62-04	Taunton River	Fecal Coliform
Somerset	Ma62-50	Broad Cove	Fecal Coliform
Stoughton	Ma73-20	Beaver Meadow Brook	Fecal Coliform
Swampscott	Ma93-24	Nahant Bay	Fecal Coliform
Swansea	Ma61-08	Kickemuit River	Pathogens
Swansea	Ma53-06	Warren River Pond	Fecal Coliform
Swansea	Ma61-04	Cole River	Fecal Coliform
Swansea	Ma61-07	Mount Hope Bay	Fecal Coliform
Swansea	Ma61-01	Lee River	Fecal Coliform
Swansea	Ma61-02	Lee River	Fecal Coliform
Swansea	Ma53-03	Palmer River	Pathogens
Swansea	Ma53-16	Rocky Run	Pathogens
Taunton	Ma62-02	Taunton River	Fecal Coliform
Taunton	Ma62-57	Three Mile River	Fecal Coliform
Taunton	Ma62-56	Three Mile River	Escherichia Coli (E. Coli)
Tewksbury	Ma83-07	Strong Water Brook	Fecal Coliform
Tewksbury	Ma83-15	Unnamed Tributary	Fecal Coliform
Tewksbury	Ma83-18	Shawsheen River	Fecal Coliform
Wakefield	Ma93-31	Mill River	Escherichia Coli (E. Coli)
Wakefield	Ma93-34	Saugus River	Escherichia Coli (E. Coli)
Wakefield	Ma93-35	Saugus River	Escherichia Coli (E. Coli)
Walpole	Ma73-06	School Meadow Brook	Fecal Coliform
Walpole	Ma72-10	Stop River	Pathogens
Walpole	Ma73-09	Mine Brook	Fecal Coliform
Walpole	Ma73-17	Traphole Brook	Fecal Coliform
Walpole	Ma73-01	Neponset River	Fecal Coliform
Waltham	Ma72-28	Beaver Brook	Pathogens
Waltham	Ma72-07	Charles River	Pathogens
Wareham	Ma95-01	Buttermilk Bay	Fecal Coliform
Wareham	Ma95-02	Onset Bay	Fecal Coliform
Wareham	Ma95-03	Wareham River	Fecal Coliform
Wareham	Ma95-29	Agawam River	Fecal Coliform
Wareham	Ma95-49	Broad Marsh River	Fecal Coliform
Wareham	Ma95-50	Wankinco River	Fecal Coliform
Wareham	Ma95-51	Crooked River	Fecal Coliform
Wareham	Ma95-52	Cedar Island Creek	Fecal Coliform
Wareham	Ma95-53	Beaverdam Creek	Fecal Coliform
Wareham	Ma95-05	Weweantic River	Fecal Coliform

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Wareham	Ma95-07	Sippican River	Fecal Coliform
Watertown	Ma72-30	Unnamed Tributary	Pathogens
Watertown	Ma72-32	Unnamed Tributary	Pathogens
Watertown	Ma72-07	Charles River	Pathogens
Watertown	Ma72-36	Charles River	Pathogens
Wellesley	Ma72-18	Fuller Brook	Pathogens
Wellesley	Ma72-25	Rosemary Brook	Pathogens
Wellesley	Ma72-06	Charles River	Pathogens
Wellesley	Ma72-07	Charles River	Pathogens
Wellfleet	Ma96-32	Duck Creek	Fecal Coliform
Wellfleet	Ma96-33	Herring River	Fecal Coliform
Wellfleet	Ma96-34	Wellfleet Harbor	Fecal Coliform
West Bridgewater	Ma62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Weston	Ma72-07	Charles River	Pathogens
Westport	Ma95-37	West Branch Westport River	Fecal Coliform
Westport	Ma95-41	East Branch Westport River	Fecal Coliform
Westport	Ma95-44	Snell Creek	Escherichia Coli (E. Coli)
Westport	Ma95-45	Snell Creek	Escherichia Coli (E. Coli)
Westport	Ma95-54	Westport River	Fecal Coliform
Westport	Ma95-58	Bread And Cheese Brook	Escherichia Coli (E. Coli)
Westport	Ma95-59	Snell Creek	Fecal Coliform
Westport	Ma95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Westwood	Ma73-15	Germany Brook	Fecal Coliform
Westwood	Ma73-24	Purgatory Brook	Fecal Coliform
Westwood	Ma73-27	Ponkapog Brook	Fecal Coliform
Westwood	Ma72-21	Rock Meadow Brook	Pathogens
Westwood	Ma73-02	Neponset River	Fecal Coliform
Whitman	Ma62-38	Meadow Brook	Escherichia Coli (E. Coli)
Whitman	Ma62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Whitman	Ma62-09	Beaver Brook	Escherichia Coli (E. Coli)
Wilmington	Ma83-18	Shawsheen River	Fecal Coliform
Winthrop	Ma93-53	Lynn Harbor	Fecal Coliform
Yarmouth	Ma96-80	Mill Creek	Fecal Coliform
Yarmouth	Ma96-38	Parkers River	Fecal Coliform
Yarmouth	Ma96-82	Hyannis Inner Harbor	Fecal Coliform
Yarmouth	Ma96-12	Bass River	Fecal Coliform
Yarmouth	Ma96-35	Chase Garden Creek	Fecal Coliform
Yarmouth	Ma96-36	Lewis Bay	Fecal Coliform
Yarmouth	Ma96-37	Mill Creek	Fecal Coliform

Table F-8: Bacteria or pathogens impaired waterbody names and segment IDs along with primary municipality and indicator organism identified by the applicable TMDL

IV. Cape Cod Nitrogen TMDL Requirements

There are 13 approved TMDLs for nitrogen for various watersheds, ponds and bays on Cape Cod[13]. The Cape Cod TMDLs for nitrogen specifically identify stormwater as a source of nitrogen to the impaired waterbodies. The WLAs for stormwater from MS4s do not require nitrogen reductions but also do not allocate additional nitrogen from stormwater sources associated with future growth. Therefore measures are needed to ensure that current nitrogen loads from MS4 stormwater discharged into the impaired waterbodies do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-9 or any other MS4 (traditional and non-traditional) that discharges to any waterbody listed in Table F-9 or their tributaries shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute 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. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute 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

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

[13] Final nitrogen TMDLs for Cape Cod can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in Part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots to a minimum of two (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (following leaf fall).

Municipality	**Waterbody Name**
Barnstable	Centerville River
Chatham	Crows Pond
Chatham	Bucks Creek
Chatham	Harding Beach Pond
Chatham	Mill Creek
Chatham	Mill Pond
Chatham	Oyster Pond
Chatham	Oyster Pond River
Chatham	Stage Harbor
Chatham	Taylors Pond
Falmouth	Bournes Pond
Falmouth	Great Pond
Falmouth	Green Pond
Falmouth	Perch Pond
Falmouth	Little Pond
Falmouth	Oyster Pond
Bourne	Phinneys Harbor
Orleans	Areys Pond
Chatham	Frost Fish Creek
Orleans	Little Pleasant Bay
Harwich	Muddy Creek - Lower
Harwich	Muddy Creek - Upper
Orleans	Namequoit River
Orleans	Paw Wah Pond
Orleans	Pleasant Bay
Orleans	Pochet Neck
Orleans	Quanset Pond
Harwich	Round Cove
Chatham	Ryder Cove
Mashpee	Mashpee River

Municipality	Waterbody Name
Barnstable	Popponesset Bay
Barnstable	Shoestring Bay
Barnstable	Cotuit Bay
Barnstable	North Bay
Barnstable	Prince Cove
Barnstable	West Bay
Mashpee	Great River
Mashpee	Hamblin Pond
Mashpee	Jehu Pond
Mashpee	Little River
Falmouth	Quashnet River
Falmouth	Inner West Falmouth Harbor
Falmouth	West Falmouth Harbor
Falmouth	Snug Harbor
Falmouth	Harbor Head

Table F-9: Waterbodies subject to a Cape Cod nitrogen TMDL and the primary municipalities

V. Assabet River Phosphorus TMDL Requirements

On September 23, 2004 EPA approved the *Assabet River Total Maximum Daily Load for Total Phosphorus*[14]. The total phosphorus TMDL addresses water quality impairments resulting from the excessive growth of algae caused by an over-abundance of phosphorus in the Assabet River system. The TMDL sets waste load allocations (WLAs) for Publically Owned Treatment Works (POTWs) within the Assabet River watershed as well as load allocations (LAs) for sediment flux and cultural contribution associated with stormwater runoff and groundwater. While the TMDL does not require phosphorus load reductions from MS4 permittees, neither does it allocate additional phosphorus from stormwater sources associated with future growth. Therefore, measures are needed to ensure that current phosphorus loads from MS4 stormwater discharged directly or indirectly via tributaries into the Assabet River do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-10 within the Assabet River Watershed shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute 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. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute 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.

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus

[14] Massachusetts Department of Environmental Protection, 2004. *Assabet River Total Maximum Daily Load for Total Phosphorus.* CN 201.0

removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (following leaf fall).

Municipality
Acton
Berlin
Bolton
Boxborough
Boylston
Carlisle
Clinton
Concord
Grafton
Harvard
Hudson
Littleton
Marlborough
Maynard
Northborough
Shrewsbury
Stow
Westborough
Westford

Table F-10: Municipalities located in the Assabet River Watershed

B. Requirements for Discharges to Impaired Waters with an Approved Out of State TMDL

I. Nitrogen TMDL Requirements

Discharges from MS4s in Massachusetts to waters that are tributary to Long Island Sound (LIS), which has an approved TMDL for nitrogen[15], are subject to the requirements of this part. The LIS TMDL establishes both in-basin nitrogen reductions and out-of-basin nitrogen reductions necessary to achieve water quality standards for Dissolved Oxygen in Long Island Sound. Out-of-basin areas are considered to be those areas north of Connecticut.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-11 shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute 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. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute 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

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

            3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of

[15] Connecticut Department of Environmental Protection. 2000. *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*

slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in Part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots to a minimum of two (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (following leaf fall).

b. Nitrogen Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Nitrogen Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area within the permittee's jurisdiction that is within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to Part 2.3.4.6,
2. All screening and monitoring results pursuant to Part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high nitrogen loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re-development

ii. The final Nitrogen Source Identification Report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit Part 2.3.6.d.ii. or identified in the Nitrogen Source Identification Report. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual

report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs listed in Table 4-3 of Attachment 1 to Appendix H installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the nitrogen removal by the BMP consistent with Attachment 1 to Appendix H. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP in each annual report.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer
Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell
Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton
Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon

Monson	

Table F-11: Massachusetts municipalities in which MS4 discharges are within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed.

II. Phosphorus TMDL Requirements

There are currently eight approved phosphorus TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing phosphorus to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Kickemuit River, Ten Mile River, Central Pond, Turner Reservoir, Lower Ten Mile River, and Omega Pond TMDLs[16]. Table F-12 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-12 and that discharges to a waterbody or tributary of a waterbody listed on Table F-12 is subject to the requirements of this part.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-12 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-12 shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute 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. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute 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.

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management

[16] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (following leaf fall).

b. Phosphorus Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Phosphorus Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to Part 2.3.4.6,
2. All screening and monitoring results pursuant to Part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high phosphorus loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re development, including the removal of impervious area of permittee owned properties

ii. The phosphorus source identification report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit Part 2.3.6.d.ii or identified in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;

2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high phosphorus load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the phosphorus removal by the BMP consistent with Attachment 3 to Appendix F. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorus removed in mass per year by the BMP in each annual report.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-

Municipality	Receiving Water	TMDL Name
		08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Swansea	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)

Table F-12: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name.

III. Bacteria and Pathogen TMDL Requirements

There are currently six approved bacteria (fecal coliform bacteria) or pathogen (fecal coliform and/or enterococcus bacteria) TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing bacteria or pathogens to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Ten Mile River, Lower Ten Mile River and Omega Pond TMDLs[17] Table F-13 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-13 and that discharges to a waterbody or a tributary of a waterbody listed on Table F-13 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-13 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-13 shall identify and implement BMPs designed to reduce bacteria or pathogen discharges from its MS4. To address bacteria or pathogen discharges, each permittee shall implement additional or enhanced BMPs as described below:

    a. Additional or Enhanced BMPs

        i. Enhancement of BMPs required by Part 2.3 of the permit that shall be implemented during this permit term:

            1. Part 2.3.3. Public Education: The permittee shall supplement its Residential program 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 non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

            2. Part 2.3.4 Illicit Discharge: Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten	Total Maximum Daily Load Analysis For The Ten

[17] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

	Mile River, Omega Pond	Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-13: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name

IV. Metals TMDL Requirements

There are currently five approved metals TMDL for a waterbody segment in Rhode Island that that identifies urban stormwater discharges in Massachusetts as sources that are contributing metals (Cadmium, Lead, Aluminum, Iron) to the impaired segment. The TMDLs include the Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir and Omega Pond TMDLs[18]. Table F-14 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-14 and the discharge is to a waterbody or tributary of a waterbody listed on Table F-14 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-14 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-14 shall identify and implement BMPs designed to reduce metals discharges from its MS4. To address metals discharges, each permittee shall implement additional or enhanced BMPs as described below:

    a. Additional or Enhanced BMPs

        i. The permittee remains subject to the requirements of Part 2.3. of the permit and shall include the following enhancements to the BMPs required by Part 2.3 of the permit:

            1. Part 2.3.6, Stormwater Management in New Development and Redevelopment: stormwater management systems designed on commercial and industrial land use area draining to the water quality limited waterbody shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event. EPA also encourages the permittee to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

            2. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: increased street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or drainage areas with a large amount of

[18] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-14: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern.