

Phosphorus Control Plan (PCP) Template - Appendix R.2

1 Calculation Support Worksheet for Determination of PCP Area

Goal: Provide guidance and support to select your PCP scope (area) based on land use analysis. Many communities have a decision to make between implementing the PCP in just the Urbanized Area (UA), or within your municipality’s entire jurisdiction within the watershed.

“Item 1-3” of Permit Appendix F allows municipalities to select the PCP Area (PCP Scope) Baseline. This dictates:

- (a) Where within the municipality the PCP will be implemented, and
- (b) What the associated Phosphorus reduction target is for the area selected.

Here, we will walk you through the key considerations for PCP-scope determination. Table 1 compares the differences in reduction targets for each municipality between your entire watershed and your Urbanized Area. This information is pulled from Tables F-2 and F-3 of Permit Appendix F, which are also presented in Table 3 and Table 4 at the end of this worksheet. Note that the information in Table 1 is reported in both pounds/year and kg/year. For ease of tracking, we recommend converting each of the key parameters to lb/yr. This will likely align with your internal tracking and operations more seamlessly. Conversion presented below:

$$1 \text{ kg/year} = 2.2045 \text{ lb/year}$$

For municipalities NOT highlighted in yellow in Table 1, the entire Charles River watershed area in your community is also completely Urbanized/Regulated MS4 area, and therefore PCP Scope is pre-determined. Skip to the final section of the Calculation Support Worksheet titled "PCP Area" (page 3).

Note: In all cases, the selected PCP Area must be entirely located within the Charles River Watershed boundary. For municipalities that straddle the Charles River Watershed and another watershed, even if you select the “Entire Jurisdiction,” you are only required to implement the PCP within your municipality’s jurisdiction within Charles River Watershed.

Table 1. Comparison of PCP Area for Each Municipality¹

Community	Stormwater Phosphorus Load Reduction Requirement, Entire Jurisdiction in Charles River (kg/yr)	Stormwater Phosphorus Load Reduction Requirement, Urbanized Area Only in Charles River (kg/yr)	Stormwater Phosphorus Load Reduction Requirement, Entire Jurisdiction in Charles River (lb/yr)	Stormwater Phosphorus Load Reduction Requirement, Urbanized Area Only in Charles River (lb/yr)	Difference (lb/yr)
Arlington	68	68	149.9	149.9	0
Ashland	28	28	61.7	61.7	0

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Bellingham	398	352	877.4	776	101.4
Belmont	105	105	231.5	231.5	0
Boston	4145	4145	9138.1	9138.1	0
Brookline	968	968	2134.1	2134.1	0
Cambridge	317	317	698.9	698.9	0
Dedham	404	404	890.7	890.7	0
Dover	180	82	396.8	180.8	216.1
Foxborough	0	0	0	0	0
Franklin	1012	1007	2231.1	2220.1	11
Holliston	496	466	1093.5	1027.4	66.1
Hopedale	47	47	103.6	103.6	0
Hopkinton	89	88	196.2	194	2.2
Lexington	242	241	533.5	531.3	2.2
Lincoln	127	84	280	185.2	94.8
Mass-DCR	91	89	200.6	196.2	4.4
Medfield	345	335	760.6	738.5	22
Medway	400	390	881.8	859.8	22
Mendon	11	6	24.3	13.2	11

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Milford	809	798	1783.5	1759.3	24.3
Millis	301	200	663.6	440.9	222.7
Natick	486	456	1071.4	1005.3	66.1
Needham	974	974	2147.3	2147.3	0
Newton	2365	2365	5213.9	5213.9	0
Norfolk	286	285	630.5	628.3	2.2
Sherborn	156	52	343.9	114.6	229.3
Somerville	400	400	881.8	881.8	0
Walpole	37	37	81.6	81.6	0
Waltham	1755	1755	3869.1	3869.1	0
Watertown	703	703	1549.8	1549.8	0
Wayland	19	19	41.9	41.9	0
Wellesley	821	821	1810	1810	0
Weston	375	375	826.7	826.7	0
Westwood	150	143	330.7	315.3	15.4
Wrentham	210	196	463	432.1	30.9

¹ Note: Highlighted rows have differences between two options (“decision communities”) and require analysis. Non-highlighted rows have no differences between scope areas (“no decision communities”).

For those municipalities highlighted in yellow in Table 1, this will guide the comparison between the two options, presenting suggested considerations for your decision. The required reduction in the entire jurisdiction is higher than that for just the Urbanized Area.

There are a few reasons you may decide to implement your PCP across your entire jurisdiction, including:

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- Most readily developable and re-developable land is located outside the Urbanized Area;
- Key large parcels suitable for structural BMPs are located outside the Urbanized Area;
- Soil types, groundwater conditions, etc. most suitable to BMPs are outside the Urbanized Area (this may be a consideration for communities with a very small difference);
- New development with modern stormwater controls is present/prevalent outside the Urbanized Area.
- Planned practices/approaches will be implemented at the municipal scale and you want to “take credit” for all the non-structural and structural stormwater practices being implemented in the community
- Creating a distinction of the Urbanized Area will complicate BMP tracking and regulatory requirements. (i.e. how easy or difficult will it be to implement and track enhanced non-structural BMPs in a targeted area vs. entire town?)

Please see the maps in Appendix R.5, which contains overlays illustrating where some of the best land areas for structural BMPs, both within and outside of the Urbanized Area, are located for each municipality. This will help indicate if there is ample opportunity for phosphorus-credits outside the Urbanized Area.

We also recommend considering the following question:

- Do/should local regulations require the same phosphorus removal standards in UA vs outside of UA?

Note: A community can always elect to expand the PCP Area from only the Urbanized Area to the entire Charles River Watershed in their municipal bounds *at a later phase of PCP planning*; however, if you select your entire jurisdiction, you cannot go backwards.

PCP Area: For use in Template

Based on these instructions and considerations, select a PCP Area and enter your selection below:

- Urbanized Area Only
- Entire Jurisdiction in the Charles River Watershed
- N/A no distinction

Based on this selection, enter the associated values from either Table 3 or Table 4 into the table below. These values will be input into Tables 1-3 and 1-4 of your PCP. Note that the first column, “Item Number,” will be used throughout this Appendix and the PCP Template to track calculated values.

Table 2. Selected Phosphorus Load Characteristics

Item Number	Name	lbs/yr (convert values)	kg/yr (copy from table)
1.1	Baseline Phosphorus Load		
1.2	Stormwater Phosphorus Load Reduction Requirement		

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1.3	Allowable Phosphorus Load		
1.4	Stormwater Percent Reduction in Phosphorus Load		

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Table 3. (Permit Table F-2) Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed

Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Arlington	106	68	38	64%	13.6	17	23.8	34	47.6	68
Ashland	67	28	39	42%	5.6	7	9.8	14	19.6	28
Bellingham	947	398	549	42%	79.6	99.5	139.3	199	278.6	398
Belmont	202	105	97	52%	21	26.25	36.75	52.5	73.5	105
Boston	6,886	4145	2741	60%	829	1036.25	1450.75	2072.5	2901.5	4145
Brookline	1,635	968	667	59%	193.6	242	338.8	484	677.6	968
Cambridge	512	317	195	62%	63.4	79.25	110.95	158.5	221.9	317
Dedham	805	404	401	50%	80.8	101	141.4	202	282.8	404
Dover	831	180	652	22%	36	45	63	90	126	180
Foxborough	2	0	2	0%	0	0	0	0	0	0
Franklin	2,344	1012	1332	43%	202.4	253	354.2	506	708.4	1012
Holliston	1,543	496	1046	32%	99.2	124	173.6	248	347.2	496

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Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Hopedale	107	47	60	44%	9.4	11.75	16.45	23.5	32.9	47
Hopkinton	292	89	203	31%	17.8	22.25	31.15	44.5	62.3	89
Lexington	530	242	287	46%	48.4	60.5	84.7	121	169.4	242
Lincoln	593	127	466	21%	25.4	31.75	44.45	63.5	88.9	127
Medfield	955	345	611	36%	69	86.25	120.75	172.5	241.5	345
Medway	1,063	400	662	38%	80	100	140	200	280	400
Mendon	29	11	17	40%	2.2	2.75	3.85	5.5	7.7	11
Milford	1,611	809	802	50%	161.8	202.25	283.15	404.5	566.3	809
Millis	969	301	668	31%	60.2	75.25	105.35	150.5	210.7	301
Natick	1,108	486	622	44%	97.2	121.5	170.1	243	340.2	486
Needham	1,772	974	797	55%	194.8	243.5	340.9	487	681.8	974
Newton	3,884	2365	1519	61%	473	591.25	827.75	1182.5	1655.5	2365
Norfolk	1,004	286	718	28%	57.2	71.5	100.1	143	200.2	286

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Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Somerville	646	400	245	62%	80	100	140	200	280	400
Sherborn	846	156	690	18%	31.2	39	54.6	78	109.2	156
Walpole	159	37	121	24%	7.4	9.25	12.95	18.5	25.9	37
Waltham	2,901	1755	1146	60%	351	438.75	614.25	877.5	1228.5	1755
Watertown	1,127	703	424	62%	140.6	175.75	246.05	351.5	492.1	703
Wayland	46	19	27	42%	3.8	4.75	6.65	9.5	13.3	19
Wellesley	1,431	821	609	57%	164.2	205.25	287.35	410.5	574.7	821
Weston	1,174	375	799	32%	75	93.75	131.25	187.5	262.5	375
Westwood	376	150	226	40%	30	37.5	52.5	75	105	150
Wrentham	618	210	407	34%	42	52.5	73.5	105	147	210
Mass-DCR	421	91	330	22%	18.2	22.75	31.85	45.5	63.7	91

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Table 4. (Permit Table F-3) Urbanized Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed

Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Arlington	106	68	38	64%	13.6	17	23.8	34	47.6	68
Ashland	67	28	39	42%	5.6	7	9.8	14	19.6	28
Bellingham	801	352	449	44%	70.4	88	123.2	176	246.4	352
Belmont	202	105	97	52%	21	26.25	36.75	52.5	73.5	105
Boston	6886	4145	2741	60%	829	1036.25	1450.75	2072.5	2901.5	4145
Brookline	1,635	968	667	59%	193.6	242	338.8	484	677.6	968
Cambridge	512	317	195	62%	63.4	79.25	110.95	158.5	221.9	317
Dedham	805	404	401	50%	80.8	101	141.4	202	282.8	404
Dover	282	82	199	29%	16.4	20.5	28.7	41	57.4	82
Foxborough	2	0	2	0%	0	0	0	0	0	0
Franklin	2,312	1007	1305	44%	201.4	251.75	352.45	503.5	704.9	1007
Holliston	1,359	466	892	34%	93.2	116.5	163.1	233	326.2	466

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Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Hopedale	107	47	60	44%	9.4	11.75	16.45	23.5	32.9	47
Hopkinton	280	88	191	32%	17.6	22	30.8	44	61.6	88
Lexington	525	241	284	46%	48.2	60.25	84.35	120.5	168.7	241
Lincoln	366	84	282	23%	16.8	21	29.4	42	58.8	84
Medfield	827	335	492	41%	67	83.75	117.25	167.5	234.5	335
Medway	1,037	390	647	38%	78	97.5	136.5	195	273	390
Mendon	10	6	5	57%	1.2	1.5	2.1	3	4.2	6
Milford	1,486	798	688	54%	159.6	199.5	279.3	399	558.6	798
Millis	501	200	300	40%	40	50	70	100	140	200
Natick	994	456	538	46%	91.2	114	159.6	228	319.2	456
Needham	1,771	974	797	55%	194.8	243.5	340.9	487	681.8	974
Newton	3,884	2365	1519	61%	473	591.25	827.75	1182.5	1655.5	2365
Norfolk	1,001	285	716	29%	57	71.25	99.75	142.5	199.5	285

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Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement, kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)	Stormwater Phosphorus Load Reduction Requirement, kg/yr					
					PCP Phase 1		PCP Phase 2		PCP Phase 3	
					Permit Year 8	Permit Year 10	Permit Year 13	Permit Year 15	Permit Year 18	Permit Year 20
					20%	25%	35%	50%	70%	100%
Somerville	646	400	245	62%	80	100	140	200	280	400
Sherborn	203	52	151	26%	10.4	13	18.2	26	36.4	52
Walpole	159	37	121	24%	7.4	9.25	12.95	18.5	25.9	37
Waltham	2,901	1755	1146	60%	351	438.75	614.25	877.5	1228.5	1755
Watertown	1,127	703	424	62%	140.6	175.75	246.05	351.5	492.1	703
Wayland	46	19	27	42%	3.8	4.75	6.65	9.5	13.3	19
Wellesley	1,431	821	609	57%	164.2	205.25	287.35	410.5	574.7	821
Weston	1,174	375	799	32%	75	93.75	131.25	187.5	262.5	375
Westwood	346	143	203	41%	28.6	35.75	50.05	71.5	100.1	143
Wrentham	556	196	361	35%	39.2	49	68.6	98	137.2	196
Mass DCR	396	89	307	22%	17.8	22.25	31.15	44.5	62.3	89

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2 Calculation Support for Structural and Non-Structural BMP Tracking

Goal: Provide guidance to calculate phosphorus loads/credits for:

- Land use, development, and impervious cover changes since 2005; and
- Structural and non-structural BMPs.

The three sections of this worksheet will provide guidance for calculating both of these items. Additional guidance can be found in the PCP Training Workshop Series and Presentations.

Most of the calculations here will need to be performed in an accounting tool while leveraging data within your municipality. A summary of potential inputs and calculation tools is provided in Table 5. The BMP Accounting and Tracking Tool (BATT) is strongly recommended for any calculations that will be used to document permit compliance. A more detailed resource summary is included Appendix R.4:

Table 5. Accounting Resources

<u>Potential Input Sources</u>	<u>Potential Methods to Perform Calculations</u>
<ul style="list-style-type: none">• Town maps/ GIS data• Oliver online tool• MassGIS land use (2005 vs 2016)• MassGIS impervious cover data (2005) and more recent impervious cover that is specific to a municipality• Local permit filings (Stormwater Authority/ Agency, Planning Board Records, Conservation Commission NOIs, Board of Health review, etc.)• Zoning, Conservation, and Public Works/ Engineering Records	<ul style="list-style-type: none">• MassDEP Watershed Based Planning Tool• BMP Accounting and Tracking Tool (BATT)• UNHSC Simple Municipal tracking form

Part (2a). Changes to Land Use, Development, and Conversion of Impervious Cover from 2005 – 2022

Under the Performance Evaluation section in Appendix F, permittees are required to calculate “phosphorus export increases since 2005 due to development¹” and augment their baseline loads accordingly. The PCP Area and Baseline selected in Worksheet 1 were calculated based on Phosphorus Loading Export Rates (PLERs) estimated from different land use/land cover types, and these can be used to make updates on the changes since 2005, as detailed in Attachment 1 to Appendix F of the Permit.

You will need to estimate the following items:

- (1) Acreage of net change to impervious cover since 2005, and
- (2) Acreage of changed land uses since 2005.

¹ Appendix F – Requirements for Discharges to Impaired Waters with an Approved TMDL. Note, this is **NOT** the same exercise as the optional re-baselining that the Permit also allows.

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If you have in-house GIS capability, the easiest way to do this will likely be to compare MassGIS 2016 Land Cover/Land Use Layer to 2005 Land Use for your PCP Area to document the changes. You can also compare changes to impervious cover using MassGIS or locally available ortho/fly over imagery of impervious cover, or other locally managed GIS data.

If you do not have GIS capabilities in house you can estimate changes based on changes at the site scale using:

- Planning Board plans and records
- Zoning Board plans and records

Tip/Trick: If you do not have GIS capacity in house nor the funds to hire out this analysis you could consider getting assistance with this task from a local university at this stage in your planning process as this is a recommended estimate. This activity is required under the Permit in Years 6 and 7 under the Performance Evaluation. However, we recommend completing this now, as it will be beneficial to understand how impervious cover and development since 2005 impacts your progress towards the reduction target early on.

Land areas, in acres, for each land use type can be calculated by following the guidance provided by Workshop #1 of the PCP training workshop series. This will use the PLERs in Attachment 1 to calculate the changes in phosphorus loading based on the different land use types.

Item 2.1: Report the net change in phosphorus loading from land use change: _____ lb/yr (note whether it's in increase (+) or a decrease (-))

This change will be used to calculate your current phosphorus load, which will update the total amount of phosphorus that must be mitigated to meet your Allowable Phosphorus Load selected in Worksheet 1. Use the value above (Item 2.1) and the results from Worksheet 1 to fill in Table 6. For simplicity of calculation, we ask you to re-report the values determined on Worksheet 1.

Table 6. Phosphorus Loads Reflecting Current Conditions

Condition	Value
Baseline P-Load, lbs/yr	<i>[Item 1.1]</i>
Allowable P-Load, lbs/yr	<i>[Item 1.3]</i>
Stormwater P-Load Reduction Requirement, lbs/yr³	<i>[Item 1.2]</i>
Changes in P-Load Since 2005 (P-inc), lbs/yr	<i>[Item 2.1]</i>
Current P-Load, lbs/yr	<i>Item 2.2 = [Item 1.1 + Item 2.1]</i>
Current Stormwater P-Load Reduction Requirement, lbs/yr	<i>Item 2.3 = [Item 2.2 – Item 1.3]</i>
Year 8 Milestone: 20% of Reduction, in lbs/yr	<i>0.2 * [Item 2.3]</i>

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Year 10 Milestone: 25% of Reduction, in lbs/yr	0.25 * [Item 2.3]
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Part (2b). Non-Structural BMP Calculation for Current Practices

Appendix F also allows municipalities to take credit for any enhanced non-structural BMPs that are currently in practice. Step (2b) focuses on the three non-structural BMPs for which permittees can receive credit: street sweeping, catch basin cleaning, and yard waste/leaf litter collection. See Workshop #2 showing steps for Non-Structural BMP calculation and Permit Appendix F Attachment 2 excerpts detailing what may be credited.

First, we recommend you calculate your credits from **existing** BMPs to better understand what portion of your Stormwater Phosphorus Load Reduction (determined in Worksheet 1 of this appendix) you are currently getting credit for. Then, the guidance provided here and in Workshop #2 presentation (Slides 10-15) can also be used to estimate and track credits for **planned** BMPs.

From the permit:

Street Sweeping: For full credit for monthly and weekly sweeping frequencies, sweeping must be conducted year-round. If not, an adjustment factor will be used². The following frequencies are considered enhanced:

- 2 times / year
- Monthly
- Weekly

Catch Basin Cleaning: To take credit, you must maintain a minimum sump storage capacity of 50% throughout the year, and clean catch basins semi-annually. Note that impervious areas eligible for this credit are principally streets.

Enhanced Organic Waste and Leaf Litter Collection Program: In order to earn this credit (Credit leaf litter), the permittee must gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week during the period of September 1 to December 1 of each year. Credit can only be earned for those impervious surfaces that are cleared of organic materials in accordance with the description above. The gathering and removal shall occur immediately following any landscaping activities in the Watershed and at additional times when necessary to achieve a weekly cleaning frequency. The permittee must ensure that the disposal of these materials will not contribute pollutants to any surface water discharges. The permittee may use an enhanced sweeping program (e.g., weekly frequency) as part of earning this credit provided that the sweeping is effective at removing leaf litter and organic materials.³

Tip from Workshop #2:

² Attachment 2 to Appendix F, page 5 of 10: "for example, if sweeping does not occur Dec – Feb, the adjustment factor would be 9/12 (months) = 0.75. Year-round sweeping has an adjustment factor of 1.0.

³ Attachment 2 to Appendix F Excerpt, page 9 of 10

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To perform Street Sweeping credits calculations, the permittee will need an edge of pavement GIS layer (polygon) that must be segmented based on equipment type and sweeping frequency. If using the 2016 MassGIS Land Use layer, use a PLER = 1.95 lb/ac/yr instead of the PLER values in 2016 MS4 Permit, Appendix F, Attachment 1, Table 1-2 applicable to the 2005 MassGIS Land Use.

Report Results by Category:

Table 7. Existing Non-Structural BMPs

Non-Structural BMP	Implementation Levels	Average Annual P-Reduction (lbs/yr)
Street Sweeping		
CB Cleaning		
Leaf Litter Program		
Item 2.4: Total Existing Non-Structural Credit		

Use the information in the table above to enter into Table 1-5 of the Template.

Part (2c). Structural BMP Calculation from Constructed and Maintained BMPs

Before determining enhancements that should be undertaken moving forward, this is an opportunity to take credit for any structural BMPs already in place that are receiving proper maintenance and are currently working as intended. Part (2c) focuses on structural BMP implementation. **EPA's BMP Accounting and Tracking Tool (BATT) is the tool that is best suited for this step.** It will also help you establish a good database for tracking structural controls going forward.

Note that if you decide to take credit for existing BMPs, we recommend you complete this ASAP to get a better idea of how much progress you've already made towards your Allowable Phosphorus Load, which will direct how you continue to plan your program. We recommend that you undertake this effort if there has been considerable development or redevelopment in your community in the past two decades that has involved installation of stormwater BMPs and 1. You have documentation on these systems, and 2. The systems have been maintained and are functioning as designed.

To calculate reduction credit, you will need to build an inventory of all installed structural BMPs using the "InventoryStructuralBMPs" tab in Appendix R.6 which includes the following information:

- BMP Type
- BMP Drainage Area (acres)
- BMP Location

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- BMP Design Storage Volume (ft³)
- Impervious and Pervious Area Contributions, with
 - Impervious Land Use Type and Area (acres)
 - Pervious Hydrologic Soil Group (HSG) and Area (acres)
- Phosphorus Reduction (% Removal)
 - Note, this can be calculated based on the storage capacity of a BMP using the performance curves in Appendix F Attachment 3 (utilized in the BATT tool).

Need BMP type and storage volume.

Some recommendations on how to compile the above information is as follows:

- BMP record plans and as-built drawings
- BMP design documents
- Local GIS information for land use

For all structural BMPs that have already been installed, use the BATT tool to calculate associated phosphorus credits that can be taken. BATT uses the equations in Attachment 3 to Appendix F to estimate phosphorus credits. Workshops #2 and #3 of the PCP workshop series details how and what is needed to use these equations. A spreadsheet can also be used for planning purposes such as if you want to make an educated guess about how much credit you might get from BMPs that are currently installed before tracking down all the data needed for the BATT and investing in staff capacity to learn BATT. **EPA recommends using the BATT tool for compliance reporting and documentation.**

Based on BATT, or any other tool used, enter the summary of current structural BMPs and their associated phosphorus credit in the table below. This will be replicated in 1-7 of the template.

Table 8. Structural BMPs

Current Structural BMP Type	Number of BMPs	Total Acres Managed	Total Annual P-Reduction (lb/yr)
Item 2.5: Total Phosphorus Credit from Current Structural BMPs			

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Note that the procedures for Parts (2b) and (2c) will be replicated for planned BMPs in subsequent sections of the PCP. The guidance here should be followed for all planned BMPs. Take note of any data that was not easily accessible for calculation here – procedures for structural BMP implementation moving forward should work to address this deficiency, by working with developers to obtain this information during your site plan approval or other permitting. Processes should be standardized and efficient moving forward. Maintenance requirements that are the Town’s responsibility should be detailed in your Stormwater Water Management Plan (SWMP).

Calculation Summary: With your current phosphorus load (Item 2.2) calculated above, and your reductions due to current structural and non-structural BMPs, you can now apply these credits to augment that reduction requirement, progressing you further towards your Allowable Phosphorus Load. Use the information calculated in this worksheet to populate the following table.

Table 9. Calculation Summary for Existing Conditions

Condition	From Permit ¹
Current Stormwater P-Load Reduction Requirement, lbs/yr	<i>Item 2.3 = [Item 2.2 – Item 1.3]</i>
Non-Structural BMP Reduction Credit, lbs/yr	<i>Item 2.4</i>
Structural BMP Reduction Credit, lbs/yr	<i>Item 2.5</i>
Total Reductions due to Existing BMPs, lbs/yr	<i>Item 2.6 = [Item 2.4 + Item 2.5]</i>
Remaining Stormwater P-Load Reduction Requirement, lbs/yr	<i>Item 2.7 = [Item 2.3 – Item 2.6]</i>

Other Useful Benchmarking Exercises

Based on the data collected in this worksheet, we recommend a couple of benchmarking exercises, which may help lend some context to your future planning. This information will not be explicitly used in the Template, but it will be good information to inform your PCP approach.

Non-Structural Control Benchmark: Re-Report 2.2: Total phosphorus credit associated with current non-structural BMPs: _____ lb/yr

What BMPs are in practice to achieve this reduction: _____

How much does this cost, annually (if available): _____

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Describe level of effort to maintain BMPs (staff time, equipment purchasing/maintenance, tracking, etc.)

To estimate costs for structural BMP controls, use the guidance provided in Slides 18-26 of the PCP Training Workshop #3 and the Cost-Benefit Resource Toolkit for Phosphorus Control BMPs (Appendix R.7). This document compiled cost information from numerous communities to provide an estimate for the cost of phosphorus removal in the Charles River watershed. If you have sufficient data from your own community you could do the benchmarking exercise below.

Structural Control Benchmark: Re-Report 2.3: Total phosphorus credit associated with existing structural BMPs: _____ lb/yr

What types of BMPs (and how many of each) were implemented to achieve this reduction :

How much did this cost overall to implement (if available; for municipally owned): _____

How much does this cost, annually, to maintain (if available; for municipally maintained):

Describe level of effort to maintain (staff time, equipment purchasing/maintenance, tracking, etc.)

Approximate Historical Unit Cost for Non-Structural BMPs = [Total implementation cost] / [lb removed] _____

Approximate Historical Unit Cost for Structural BMPs = [Total implementation cost] / [lb removed] _____

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If cost information is not readily available, use this as an opportunity to more qualitatively determine the relative efficacy of structural and non-structural BMPs based on historical data. The PCP Guidance Tools in Appendix R.1 will walk you through the process to begin selecting methods to obtain further phosphorus reduction credits, including, but not limited to, structural and non-structural BMPs. Some considerations, based on historical data, you should consider, include:

- How effective are the existing structural and non-structural BMPs?
- Is O&M manageable? Sustainable? What is the effort required to implement and maintain?
- Do you have capacity to enhance over existing? For example, if sweeping monthly, do you have the capacity to enhance further to weekly? What are your limiting factors if enhancing over current operations does not seem feasible? Staff availability? Funding? O&M training?