pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS POLLUTANT REDUCTION PLAN (PRP) INSTRUCTIONS

The Department of Environmental Protection (DEP) has developed these instructions to assist MS4 applicants and permittees (MS4s) in the preparation of Pollutant Reduction Plans (PRPs) for stormwater discharges of nutrients and sediment to surface waters in the Chesapeake Bay watershed, and for stormwater discharges to local surface waters impaired for nutrients and/or sediment. MS4s identified in DEP's MS4 Requirements Table (available at www.dep.pa.gov/MS4) as needing to comply with Appendix D and/or Appendix E of the PAG-13 General Permit or an individual permit must attach PRP(s) to the NOI for General Permit coverage or application for an individual permit, except as noted below. These instructions explain how to develop a satisfactory PRP for both the Chesapeake Bay (Appendix D) and impaired waters (Appendix E).

NOTE – A PRP is not required to be attached to the NOI or individual permit application if the applicant has received an Advanced Waiver Approval (see Waiver Application Instructions, 3800-PM-BCW0100f). A PRP is also not required to be attached to the NOI or individual permit application if the applicant is not eligible for a waiver but has completed its mapping of all stormwater outfalls and can demonstrate the following (as shown on a map submitted with the NOI or individual permit application):

- There are no stormwater discharges to the Chesapeake Bay watershed; and/or
- There are no stormwater discharges to local surface waters impaired for nutrients and/or sediment.

I. General Information

A. **Terms**: The term "nutrients" refers to "Total Nitrogen" (TN) and "Total Phosphorus" (TP) unless specifically stated otherwise in DEP's latest Integrated Report. The terms "sediment," "siltation," and "suspended solids" all refer to inorganic solids and are hereinafter referred to as "sediment." The term, "storm sewershed" is defined in the PAG-13 General Permit as the land area that drains to the municipal separate storm sewer from within the jurisdiction of the MS4 permittee. This term is used in these instructions as well as the term, "PRP Planning Area" (or "Planning Area"), which refers to all of the storm sewersheds that an MS4 must calculate existing loads and plan load reductions for.

B. **Pollutants of Concern and Required Reductions**: For all PRPs, MS4s shall calculate existing loading of the pollutant(s) of concern, in lbs/year; calculate the minimum reduction in loading, in lbs/year; select Best Management Practice(s) (BMP(s)) to reduce loading; and demonstrate that the selected BMP(s) will achieve the minimum reductions.

For Chesapeake Bay PRPs (Appendix D), the pollutants of concern are sediment, TP and TN and the minimum reductions in loading are 10%, 5% and 3%, respectively. Permittees are encouraged to select appropriate BMPs to achieve the 10% sediment loading reduction objective, as it expected that, overall within the Bay watershed, the TP (5%) and TN (3%) goals will be achieved when a 10% reduction in sediment is achieved.

For PRPs developed for impaired waters (Appendix E), the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., "Excessive Algal Growth" and "Organic Enrichment/Low D.O."), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.

C. **Existing Pollutant Loading**: Existing loading must be calculated and reported for the portion of the Planning Area which drains to impaired waters as of the date of the development of the PRP. MS4s may not claim

credit for street sweeping and other non-structural BMPs implemented in the past. If structural BMPs were implemented prior to development of the PRP and continue to be operated and maintained, the MS4 may claim pollutant reduction credit in the form of reduced existing loading.

Each impairment identified on the MS4 Requirements Table ("Table") must be addressed in a PRP document. The Table listings for each MS4 are different because they reflect local conditions, which is why an MS4 must carefully interpret the information on the Table.

For example, it is not unusual for the Table to list a requirement which reflects a discharge from an **entire municipality** to the Chesapeake Bay drainage. The Table may also list a requirement to address a local impaired water which also drains to the Chesapeake Bay. A BMP located in the area which drains to the locally impaired waters will be credited to the PRP requirements of both obligations.

Example 1 – An MS4 discharges to Stream A and Stream B. Both streams are tributary to River C. Stream A is impaired for sediment, and Stream B is unimpaired. River C is impaired for sediment and nutrients. The PRP Planning Area includes the drainage area of all MS4 outfalls that discharge to Streams A and B. The existing load to Stream A must be calculated both due to the local impairment and because of the impairment to River C. The existing load to Stream B must be calculated due to the impairment to River C. The MS4 may choose to presume that a 10% sediment reduction will address the nutrient obligation as well as sediment. The result is therefore to calculate the sediment load for the entire Planning Area, and to propose BMPs that reduce 10% of that load within the permit term. Note that BMPs should be located within the storm sewershed of the locally impaired water (Stream A) rather than Stream B unless approved by DEP.

NOTE – An MS4 may not reduce its obligations for achieving permit term pollutant load reductions through previously installed BMPs. An MS4 may use all BMPs installed prior to the date of the load calculation to reduce its estimate of existing pollutant loading. For example, if a rain garden was installed ten years ago and is expected to remove 100 lbs of sediment annually, and the overall annual loading of sediment in the storm sewershed is estimated to be 1,000 lbs without specifically addressing the rain garden, an MS4 may not claim that the rain garden satisfies its obligations to reduce sediment loading by 10%. The MS4 may, however, use the rain garden to demonstrate that the existing load is 900 lbs instead of 1,000 lbs, and that 90 lbs rather than 100 lbs needs to be reduced during the term of permit coverage.

NOTE - MapShed, or any other watershed model where channel erosion is explicitly modeled, should be run on a minimum of ~10 mi^2 area to properly account for downstream channel impacts and include impaired waters identified in the MS4 Requirements Table. Aggregation of these waters up to approximately the 12-digit HUC scale for modeling purposes is acceptable. Modeling may not be done at the individual storm sewershed or municipal scale where the extent of downstream impact is not included in load calculation.

D. **BMP Effectiveness**: All MS4s must use the BMP effectiveness values contained within DEP's BMP Effectiveness Values document (3800-PM-BCW0100m) or Chesapeake Bay Program expert panel reports for BMPs listed in those resources when determining pollutant load reductions in PRPs, except as otherwise approved by DEP. An example of other approaches that may be approved by DEP include the use of thoroughly vetted mechanistic models with self-contained BMP modules (e.g., Storm Water Management Model (SWMM), WinSLAMM) to demonstrate achievement of reduction targets. Application of these data intensive models could allow for a streamlining of the planning and design phases of BMPs that may provide future cost savings as municipalities move toward implementation of the plan. Such resources must be documented in the PRP, and must reflect both overland flow and in-stream erosion components.

NOTE - Calculation of sediment load reductions for PRP purposes using the *Expert Panel to Define Removal Rates for Individual Stream Restoration Projects* report should be done as follows:

- Where existing sediment loads are calculated using the Chesapeake Bay loading rates (i.e., the "simplified method" illustrated in Attachments C and D), the Sediment Delivery Ratio (SDR) of 0.181 must be applied and the effectiveness value contained in Table 3 of the Expert Panel Report applies (44.88 lb/ft/yr TSS). The effectiveness values in document 3800-PM-BCW0100m implicitly apply the SDR; thus, sediment load reductions calculated from stream restoration projects must be consistent.

Alternately, sediment reduction from streambank restoration projects when existing loads are calculated using the simplified method may be estimated using the Protocols outlined in Section 5 of the report and must then apply the 0.181 SDR along with the 50% efficiency uncertainty factor.

- Where existing sediment loads were calculated using modeling at a local watershed scale, the default rate to be used is 115 lb/ft/yr. This default rate comes from a convergence of MapShed modeled streambank erosion loads from a group of urbanized watersheds, the 248 lb/ft default edge-of-field (EOF) rate in the Expert Panel Report with the 50% efficiency uncertainty factor specified for the Protocols applied, and field data were collected following the BANCS methodology where projects have been implemented and load reductions calculated using the Protocols.

  Alternately, sediment reduction from streambank restoration projects when existing loads are calculated using modeling at a local scale may be estimated using the Protocols outlined in Section 5 of the report and must then apply the 50% efficiency uncertainty factor.

NOTE – Use of default effectiveness values (44.88 lb/ft/yr and 115 lb/ft/yr) will be accepted for the subsequent permit term. It is recommended that the data required to complete load calculations using the Protocols be collected during the design phase for use in subsequent load reduction calculations.

NOTE – Desktop MapShed users may not use the streambank restoration or street sweeping components included in the MapShed BMP editor for pollutant reduction calculations. Pollutant reductions associated with streambank restoration projects must use the methods described above; whereas, reductions from street sweeping must be calculated in accordance with the *Recommendations of the Expert Panel to Define Removal Rates for Street and Storm Drain Cleaning Practices* or the BMP Effectiveness Values Table.

NOTE – If BMP effectiveness values are updated in DEP's BMP Effectiveness Values document or in Chesapeake Bay Program expert panel reports between the time the PRP is approved and the time the final report is developed to document compliance with the permit, those updated effectiveness values may optionally be used.

E. **Combining PRPs**: If an MS4 discharges stormwater to local surface waters that drain to the Chesapeake Bay watershed (Appendix D) that are also impaired for nutrients and/or sediment (Appendix E), separate or combined PRPs may be submitted, at the MS4's discretion.

For MS4s within the Chesapeake Bay watershed who are submitting combined PRPs to address both Appendices D and E, it is recommended that permittees focus on the impaired local surface waters first, and then determine if the BMPs proposed in the Planning Area(s) for locally impaired waters will be sufficient to meet the overall pollutant reduction requirements for the Planning Area for the Chesapeake Bay. In general, PRPs that include both local impaired waters (Appendix E) and Chesapeake Bay watershed (Appendix D) must address the local impaired waters (i.e., credit cannot generally be claimed under Appendix E for BMPs implemented outside of the Planning Area of the local impaired waters).

F. **Joint PRPs**: An MS4 may develop and submit a joint PRP in concert with (an)other MS4(s). In general, the MS4s participating in a joint PRP should have contiguous land areas. The area to be used to calculate existing loads is the PRP Planning Area for all MS4 jurisdictions.

DEP requires that joint PRP participants document their involvement with a written agreement. DEP recommends that such agreements include the following topics:

- Scope of the Agreement
  - Complete Pollutant Reduction Plan implementation (or individual BMP implementation)

- Roles and Responsibilities
  - How projects will be selected
  - Selection of engineering and other contracted services
  - Long-term O&M
  - Adaptive management of the PRP (or the individual BMPs) over the permit term
  - Commitment to using the Plan (or to implementing the individual BMP)

- Allocations of Cost and pollutant reduction
  - Methodology for sharing the cost
  - Methodology for distributing the pollutant reductions

- Timeline for implementation
  - Schedule of milestones to complete and implement the plan (or the individual BMP)

MS4s participating in collaborative efforts are encouraged to contact DEP's Bureau of Clean Water during the PRP development phase for feedback on proposed approaches.

G. **BMP Selection**: MS4s may propose and take credit for only those BMPs that are not required to meet regulatory requirements or otherwise go above and beyond regulatory requirements. For example, a BMP that was installed to meet Chapter 102 NPDES permit requirements for stormwater associated with construction activities may not be used to meet permit term minimum pollutant reductions unless the MS4 can demonstrate that the BMP exceeded regulatory requirements; if this is done, the MS4 may take credit for only those reductions that will occur as a result of exceeding regulatory requirements.

NOTE – Street sweeping may be proposed as a BMP for pollutant loading reductions if 1) street sweeping is not the only method identified for reducing pollutant loading, and 2) the BMP effectiveness values contained in 3800-PM-BCW0100m or Chesapeake Bay Program expert panel reports are utilized.

H. **Offsets**. DEP may authorize the use of offsets toward meeting PRP load reduction requirements, if an individual permit application is submitted. Please refer to DEP's TMDL Plan Instructions (3800-PM-BCW0200d) for additional information.

II. Required PRP Elements

Each PRP must include the following elements. The paragraph numbers in these instructions correspond to the organization of the PRP. For example, Section A of the PRP must be "Public Participation," Section B must be the map, Section C must be "Pollutants of Concern," etc.

A. **Public Participation**. The MS4 shall complete the following public participation measures listed below, and report in the PRP that each was completed.

- The applicant shall make a complete copy of the PRP available for public review.

- The applicant shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it may be reviewed by the public, and the length of time the permittee will provide for the receipt of comments. The public notice must be published at least 45 days prior to the deadline for submission of the PRP to DEP. **Attach a copy of the public notice to the PRP**.

- The applicant shall accept written comments for a minimum of 30 days from the date of public notice. **Attach a copy of all written comments received from the public to the PRP**.

- The applicant shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee.

- The applicant shall consider and make a record of the consideration of each timely comment received from the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment. **Attach a copy of the permittee's record of consideration of all timely comment received in the public comment period to the PRP**.

For PRPs developed on a regional scale by multiple MS4 permittees or by co-permittees, the collaborating permittees may implement these public participation requirements as a joint effort as long as the notice of the availability of the PRP and the notice of a public meeting or hearing reaches the target audience groups of all permittees involved in the joint effort.

B. **Map**. Attach a map that identifies **land uses and/or impervious/pervious surfaces** and the **storm sewershed boundary** associated with each MS4 outfall that discharges to impaired surface waters, or surface waters draining to the Chesapeake Bay (see note below), and calculate the storm sewershed area that is subject to Appendix D and/or Appendix E. In addition, the map must identify the proposed location(s) of structural BMP(s) that will be implemented to achieve the required pollutant load reductions.

The map may be the same as that used to satisfy MCM #3 of the PAG-13 General Permit, with the addition of land use and/or impervious/pervious surfaces, the storm sewershed boundary, and locations of proposed BMPs, or may be a different map.

The map must be sufficiently detailed to identify the PRP Planning Area relevant to satisfying the requirements of Appendix D and/or Appendix E, and to demonstrate that BMPs will be located in appropriate storm sewersheds to meet the requirements.

NOTE – Delineation of storm sewersheds associated with individual MS4 outfalls is typically necessary in order to determine the PRP Planning Area. The MS4 may display the storm sewershed for each MS4 outfall or just the PRP Planning Area, at its discretion. In cases where there are no local surface water impairments but the entire municipality is located in the Chesapeake Bay watershed, the map can display the entire storm sewershed within the municipality, without distinction between discharges to various local surface waters. In addition, a municipality entirely within the Chesapeake Bay watershed with no local surface water impairments may elect to consider the entire urbanized area within its municipality as its PRP Planning Area, and calculate existing loading using that area.

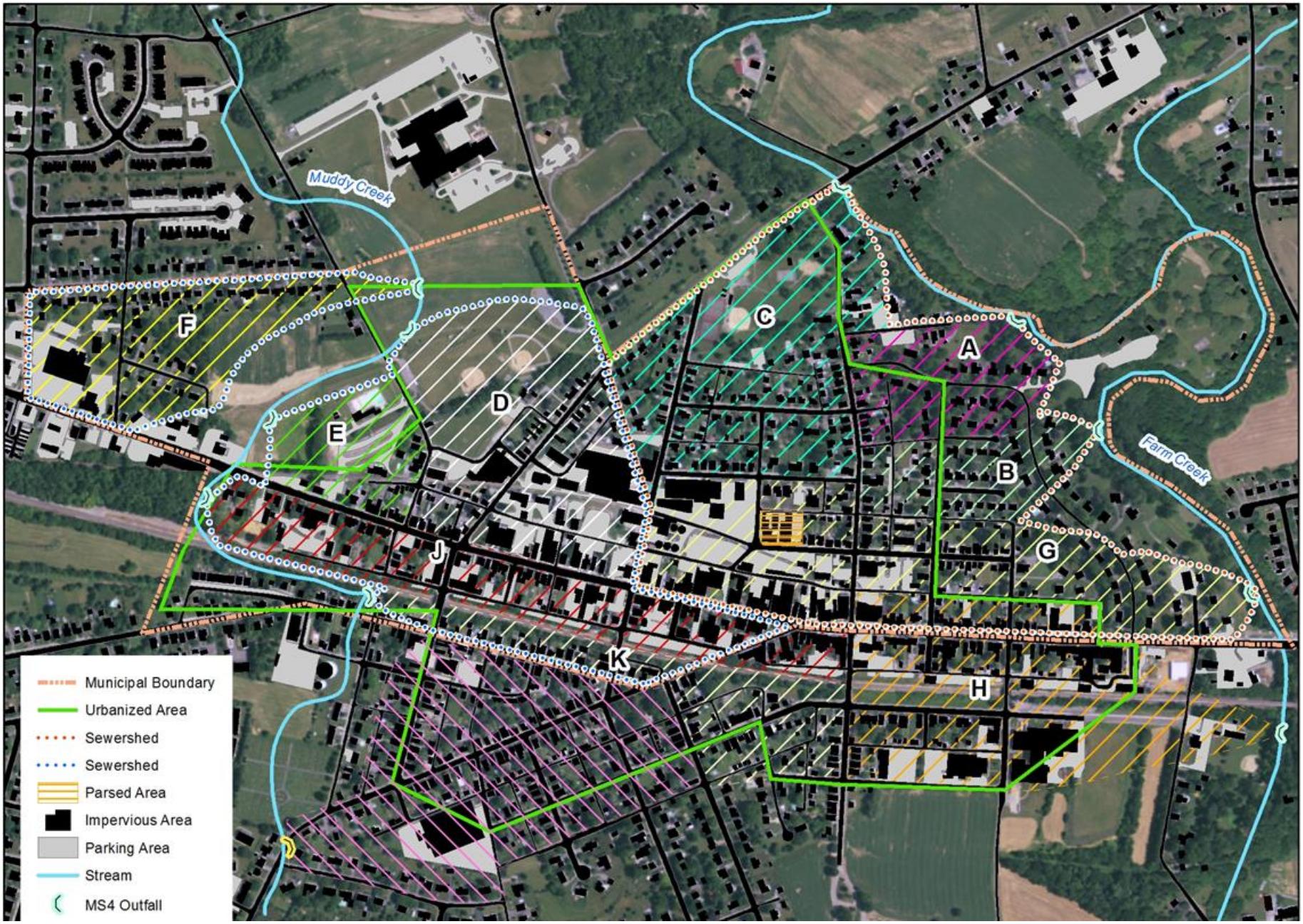
Figure 1 presents an example storm sewershed map developed for a single MS4 applicant's PRP to address two impaired surface waters. Figure 1 shows an example municipality (whose border is shown with an orange line) and its urbanized area (green border). It also delineates the drainage areas of MS4 outfalls (storm sewersheds), which are labeled as letters. Each storm sewershed is represented by hatched lines of different colors. Storm sewersheds A, B, C, G and H drain to Farm Creek and storm sewersheds D, E, F, J and K drain to Muddy Creek. (As noted above, delineation of the combined storm sewershed in lieu of individual storm sewersheds may be done at the MS4's discretion). A red dotted line depicts the combined storm sewershed ("planning area") for Farm Creek, and a blue dotted line indicates the combined storm sewershed for Muddy Creek. BMPs selected to address pollutant reductions for Farm Creek and Muddy Creek must be implemented within the red and blue dotted borders, respectively, except that in the Farm Creek storm sewershed one area has been parsed because this site already has NPDES permit coverage for stormwater (see below). Storm sewershed H includes some area within the municipality and urbanized area, although the outfall is located in a different municipality. The portion of storm sewershed H that is within the municipality must be included in the planning area for the Farm Creek PRP. Also, storm sewershed K includes area both inside and outside of the municipality; the portion of storm sewershed K that is within the municipality must be included in the planning area for the Muddy Creek PRP. (Note – this example map does not show the location of selected structural BMPs, but this would be expected for an actual map).

The map may show areas that are to be "parsed" from the PRP Planning Area. In other words, at the MS4's discretion (subject to DEP rules), certain areas may be shown on the map that are within the Planning Area but are not included in the calculation of land area and existing pollutant loading. Guidance on parsing is contained in **Attachment A**. Note that if parsing is done, BMPs implemented within the parsed area will not count toward achieving pollutant reduction objectives.

C. **Pollutants of Concern**. Identify the pollutants of concern for each storm sewershed or the overall PRP Planning Area (see Section I.B of these instructions).

D. **Determine Existing Loading for Pollutants of Concern**. Identify the date associated with the existing loading estimate (see Section I.C of these instructions). Calculate the existing loading, in lbs per year, for the pollutant(s) of concern in the PRP Planning Area.

Figure 1: Example Storm Sewershed Map



There are several possible methods to estimate existing loading, ranging from simplistic to complex. One method to estimate existing loading that is acceptable to DEP is to determine the percent impervious and pervious surface within the urbanized area of the storm sewershed and calculate existing loading by multiplying the developed impervious and developed pervious land areas (acres) by pollutant loading rates (lbs/acre/year) ("simplified method"). The MS4 may use loading rates for undeveloped land for areas outside of the urbanized area which flows into the urbanized area. Where structural BMPs are currently in place and are functioning, the existing loading estimate may be reduced to account for pollutant reductions from those BMPs.

Attachment B presents land loading rates for impervious and pervious surfaces for each county within the Chesapeake Bay watershed, as well as generalized loading rates for counties outside of the Chesapeake Bay watershed, which may be used if the simplified method for estimating existing loading is selected.

Attachment C presents an example calculation of existing sediment loading for a Chesapeake Bay PRP using DEP's simplified method. **Attachment D** presents an example calculation of existing sediment loading for an impaired waters PRP, outside of the Chesapeake Bay watershed, using DEP's simplified method.

Use of DEP's simplified method is not required. Any methodology that calculates existing pollutant loading in terms of lbs per year, evaluates BMP-based pollutant reductions utilizing the BMP effectiveness values contained in 3800-PM-BCW0100m or Chesapeake Bay Program expert panel reports, uses average annual precipitation conditions, considers both overland flow and stream erosion, and is based on sound science may be considered acceptable.

Whatever tool or approach that is used to estimate existing loading from the PRP Planning Area must also be used to estimate existing loading to planned BMPs. This avoids errors in percent pollutant removal calculations that would result if different methods were used. Later BMP design efforts will usually apply a more sophisticated method than used in planning to calculate load to a BMP. The design loading may not however be used to alter the assumed pollutant reduction by the BMP unless the PRP is revised to apply the more sophisticated method to the load from the storm sewershed as a whole.

MS4s may claim "credit" for structural BMPs implemented prior to development of the PRP to reduce existing loading estimates. In order to claim credit, identify all such structural BMPs in Section D of the PRP along with the following information:

- A detailed description of the BMP;
- Latitude and longitude coordinates for the BMP;
- Location of the BMP on the storm sewershed map;
- The permit number, if any, that authorized installation of the BMP;
- Calculations demonstrating the pollutant reductions achieved by the BMP;
- The date the BMP was installed and a statement that the BMP continues to serve the function(s) it was designed for; and
- The operation and maintenance (O&M) activities and O&M frequencies associated with the BMP.

The MS4 permittee may optionally submit design drawings of the BMP for previously installed or future BMPs with the PRP.

E. **Select BMPs To Achieve the Minimum Required Reductions in Pollutant Loading**. Identify the minimum required reductions in pollutant loading (see Section I.B of these instructions). Applicants must propose the implementation of BMP(s) or land use changes within the PRP Planning Area that will result in meeting the minimum required reductions in pollutant loading within the Planning Area. These BMP(s) must be implemented within 5 years of DEP's approval of coverage under the PAG-13 General Permit or an individual permit, and may be located on either public or private property. If the applicant is aware of BMPs that will be implemented by others (either in cooperation with the applicant or otherwise) within the Planning Area that will result in net pollutant loading reductions, the applicant may include those BMPs within its PRP.

Historic street sweeping practices should not be considered in calculating credit for future practices. All proposed street sweeping practices may be used for credit if the minimum standard is met for credit (see

3800-PM-BCW0100m). In other words, if sweeping was conducted 1/month and will be increased to 25/year in the future, the MS4 does not need to use the "net reduction" resulting from the increased sweeping; it may take credit for the full amount of reductions from 25/year sweeping.

The names and descriptions of BMPs and land uses reported in the PRP should be in accordance with the Chesapeake Bay Program Model. The names and descriptions are available through CAST (log into www.casttool.org, select "Documentation," select "Source Data" and see worksheets named "Land Use Definitions" and "BMP Definitions").

Opportunities for BMP installation vary across a municipality, and for that reason MS4s with multiple PRP obligations need not propose BMPs to address each impairment listed in the Table during the permit term. The existing loading must be calculated for the entire PRP Planning Area which drains to impaired waters, but pollutant controls to be installed during the subsequent permit term may be located such that they reduce the load in one sub-watershed by less than 10% and by more than 10% in another (as long as the overall amount of lbs reduced constitutes 10% of the existing loading for the entire PRP Planning Area).

Example 2 – An MS4 has stormwater discharges to three separate streams, A, B, and C, all of which are in the same HUC-12 basin. All three are impaired for sediment and are identified on the Table as needing a PRP. The MS4 decides to combine all three watersheds into one PRP, and maps the PRP Planning Area as the combination of the storm sewersheds for Streams A, B, and C. The existing load from the PRP Planning Area is estimated to be 100,000 lbs/yr, and the required load reduction is 10,000 lbs/yr. The MS4 has identified an existing flood control basin within the PRP Planning Area that can be retrofitted to provide the full 10,000 lbs/yr reduction. Although the flood control basin is within the storm sewershed of only one impaired stream, the reduction is credited to the entire PRP Planning Area, and therefore BMPs are not required during the permit term for the storm sewersheds which drain to the other two impaired streams.

Example 3 – An MS4 has stormwater discharges which flow to two different HUC-12 basins. The MS4 attempted to locate BMPs so that they would reduce the sediment from both respective areas by 10%. It was however infeasible to fully address the load in the Planning Areas separately. The MS4 discussed the issue with DEP and it was agreed that the load reductions could be more than 10% in one basin and less than 10% in the other (but the total reduction would be at least 10% of the combined existing load).

See **Attachments C and D** for examples of selecting BMPs to meet pollutant reduction requirements in Chesapeake Bay PRPs and impaired waters PRPs, respectively.

F. **Identify Funding Mechanism(s)**. Prior to approving coverage DEP will evaluate the feasibility of implementation of an applicant's PRP. Part of this analysis includes a review of the applicant's proposed method(s) by which BMPs will be funded. Applicants must identify all project sponsors and partners and probable funding sources for each BMP.

G. **Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs**. Once implemented the BMPs must be maintained in order to continue producing the expected pollutant reductions. Applicants must identify the following for each selected BMP:

- The party(ies) responsible for ongoing O&M;
- The activities involved with O&M for each BMP; and
- The frequency at which O&M activities will occur.

MS4 permittees will need to identify actual O&M activities in Annual MS4 Status Reports submitted under the General Permit.

III. Submission of PRP

Attach one copy of the PRP with the NOI or individual permit application that is submitted to the regional office of DEP responsible for reviewing the NOI or application. In addition, one copy of the PRP (not the NOI or application) must be submitted to DEP's Bureau of Clean Water (BCW). BCW prefers electronic copies of PRPs, if possible. Email the electronic version of the PRP, including map(s) (if feasible), to RA-EPPAMS4@pa.gov. If the MS4 determines that submission of an electronic copy is not possible, submit a hard copy to: PA Department

of Environmental Protection, Bureau of Clean Water, 400 Market Street, PO Box 8774, Harrisburg, PA 17105-8774.

IV. PRP Implementation and Final Report

Under the PAG-13 General Permit, the permittee must achieve the required pollutant load reductions within 5 years following DEP's approval of coverage under the General Permit, and must submit a report demonstrating compliance with the minimum pollutant load reductions as an attachment to the first Annual MS4 Status Report that is due following completion of the 5th year of General Permit coverage.

For example, if DEP issues written approval of coverage to a permittee on June 1, 2018, the required pollutant load reductions must be implemented by June 1, 2023 and the final report documenting the BMPs that were implemented (with appropriate calculations) must be attached to the annual report that is due September 30, 2023.

ATTACHMENT A

PARSING GUIDELINES FOR MS4s IN POLLUTANT REDUCTION PLANS

DEP has developed these guidelines to assist owners and operators of MS4s that are required to develop Pollutant Reduction Plans (PRPs) in understanding where it is possible to "parse" land area in the course of developing those plans. For the purpose of this document, parsing is defined as a process in which land area is removed from a Planning Area in order to calculate the actual or target pollutant loads that are applicable to an MS4.

Parsing is not required by NPDES permits and is therefore optional; however, some MS4 permittees may benefit from parsing. When parsing is done, best management practices (BMPs) implemented within the land area that is parsed may not be considered for meeting pollutant loading reductions.

MS4s must identify the target pollutant loadings (i.e., existing pollutant loading minus loading reduced by existing BMPs). In order to estimate existing pollutant loading, MS4s may parse out appropriate land area.

All parsing must be supported by a map and a determination of the area being parsed and/or appropriate calculations demonstrating how the parsing was done.

Parsing for PRPs

Parsing provides an opportunity for an MS4 permittee to eliminate areas within the storm sewershed that do not drain to the MS4 and areas that are already covered by an NPDES permit (i.e., not a waiver or no exposure certification) for the control of stormwater. For example, the land area of an industrial site that is covered by the PAG-03 General Permit for Stormwater Associated with Industrial Activity that discharges stormwater to the MS4 may be parsed out of the assessment of land area within the storm sewershed that is subject to the calculation of existing pollutant loading. If, however, the industrial land area is removed, BMPs implemented on that land may not be used as credit toward meeting the MS4's pollutant loading reduction requirements. Other examples of land area that may be parsed include:

- The land area associated with non-municipal stormwater NPDES permit coverage that exists within the urbanized area of a municipality (in such cases the entities may submit a combined PRP);
- Land area associated with PennDOT roadways and the Pennsylvania Turnpike (roads and right of ways);
- Lands associated with the production area of a Concentrated Animal Feeding Operation that is covered by an NPDES permit;
- Land areas in which stormwater runoff does not enter the MS4. If an accurate storm sewershed map is developed, these lands may be parsed or excluded as part of that process. Potential examples include homeowner's associations and schools which do not contain municipal roads or other municipal infrastructure.

If parsing is initially done for the PRP but the MS4 permittee decides later that it would be in their best interests to include that land in the PRP, the permittee may submit a modified PRP to DEP, following the public participation requirements of Appendices D and E of the permit.

ATTACHMENT B

DEVELOPED LAND LOADING RATES FOR PA COUNTIES[1,2,3]

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Adams	impervious developed	10,373.2	33.43	2.1	1,398.77
	pervious developed	44,028.6	22.99	0.8	207.67
Bedford	impervious developed	9,815.2	19.42	1.9	2,034.34
	pervious developed	19,425	17.97	0.68	301.22
Berks	impervious developed	1,292.4	36.81	2.26	1,925.79
	pervious developed	5,178.8	34.02	0.98	264.29
Blair	impervious developed	3,587.9	20.88	1.73	1,813.55
	pervious developed	9,177.5	18.9	0.62	267.34
Bradford	impervious developed	10,423	14.82	2.37	1,880.87
	pervious developed	23,709.7	13.05	0.85	272.25
Cambria	impervious developed	3,237.9	20.91	2.9	2,155.29
	pervious developed	8,455.4	19.86	1.12	325.3
Cameron	impervious developed	1,743.2	18.46	2.98	2,574.49
	pervious developed	1,334.5	19.41	1.21	379.36
Carbon	impervious developed	25.1	28.61	3.97	2,177.04
	pervious developed	54.2	30.37	2.04	323.36
Centre	impervious developed	7,828.2	19.21	2.32	1,771.63
	pervious developed	15,037.1	18.52	0.61	215.84
Chester	impervious developed	1,838.4	21.15	1.46	1,504.78
	pervious developed	10,439.8	14.09	0.36	185.12
Clearfield	impervious developed	9,638.5	17.54	2.78	1,902.9
	pervious developed	17,444.3	18.89	1.05	266.62
Clinton	impervious developed	7,238.5	18.02	2.80	1,856.91
	pervious developed	11,153.8	16.88	0.92	275.81
Columbia	impervious developed	7,343.1	21.21	3.08	1,929.18
	pervious developed	21,848.2	22.15	1.22	280.39
Cumberland	impervious developed	8,774.8	28.93	1.11	2,065.1
	pervious developed	26,908.6	23.29	0.34	306.95
Dauphin	impervious developed	3,482.4	28.59	1.07	1,999.14
	pervious developed	9,405.8	21.24	0.34	299.62
Elks	impervious developed	1,317.7	18.91	2.91	1,556.93
	pervious developed	1,250.1	19.32	1.19	239.85
Franklin	impervious developed	13,832.3	31.6	2.72	1,944.85
	pervious developed	49,908.6	24.37	0.76	308.31
Fulton	impervious developed	3,712.9	22.28	2.41	1,586.75
	pervious developed	4,462.3	18.75	0.91	236.54
Huntington	impervious developed	7,321.9	18.58	1.63	1,647.53
	pervious developed	11,375.4	17.8	0.61	260.15
Indiana	impervious developed	589	19.29	2.79	1,621.25
	pervious developed	972	20.1	1.16	220.68
Jefferson	impervious developed	21.4	18.07	2.76	1,369.63
	pervious developed	20.4	19.96	1.24	198.60
Juniata	impervious developed	3,770.2	22.58	1.69	1,903.96
	pervious developed	8,928.3	17.84	0.55	260.68
Lackawana	impervious developed	2,969.7	19.89	2.84	1,305.05
	pervious developed	7,783.9	17.51	0.76	132.98
Lancaster	impervious developed	4,918.7	38.53	1.55	1,480.43
	pervious developed	21,649.7	22.24	0.36	190.93
Lebanon	impervious developed	1,192.1	40.58	1.85	1,948.53
	pervious developed	5,150	27.11	0.4	269.81
Luzerne	impervious developed	5,857	20.43	3	1,648.22
	pervious developed	13,482.9	19.46	0.98	221.19
Lycoming	impervious developed	10,031.7	16.48	2.57	1,989.64
	pervious developed	19,995.5	16	0.84	277.38

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
McKean	impervious developed	38.7	20.93	3.21	1,843.27
	pervious developed	5.3	22.58	1.45	249.26
Mifflin	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Montour	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Northumberland	impervious developed	8,687.3	25.73	1.54	2,197.08
	pervious developed	25,168.3	24.63	0.54	367.84
Perry	impervious developed	5,041.1	26.77	1.32	2,314.7
	pervious developed	9,977	23.94	0.51	343.16
Potter	impervious developed	2,936.3	16.95	2.75	1,728.34
	pervious developed	2,699.3	17.11	1.09	265.2
Schuylkill	impervious developed	5,638.7	30.49	1.56	1,921.08
	pervious developed	14,797.2	29.41	0.57	264.04
Snyder	impervious developed	4,934.2	28.6	1.11	2,068.16
	pervious developed	14,718.1	24.35	0.4	301.5
Somerset	impervious developed	1,013.6	25.13	2.79	1,845.7
	pervious developed	851.2	25.71	1.14	293.42
Sullivan	impervious developed	3,031.7	19.08	2.85	2,013.9
	pervious developed	3,943.4	21.55	1.31	301.58
Susquehanna	impervious developed	7,042.1	19.29	2.86	1,405.73
	pervious developed	14,749.7	20.77	1.21	203.85
Tioga	impervious developed	7,966.9	12.37	2.09	1,767.75
	pervious developed	18,090.3	12.22	0.76	261.94
Union	impervious developed	4,382.6	22.98	2.04	2,393.55
	pervious developed	14,065.3	20.88	0.69	343.81
Wayne	impervious developed	320.5	18.69	2.89	1,002.58
	pervious developed	509	21.14	1.31	158.48
Wyoming	impervious developed	3,634.4	16.03	2.53	2,022.32
	pervious developed	10,792.9	13.75	0.7	238.26
York	impervious developed	10,330.7	29.69	1.18	1,614.15
	pervious developed	40,374.8	18.73	0.29	220.4
All Other Counties	impervious developed	-	23.06	2.28	1,839
	pervious developed	-	20.72	0.84	264.96

Notes:

1 These land loading rate values may be used to derive existing pollutant loading estimates under DEP's simplified method for PRP development. MS4s may choose to develop estimates using other scientifically sound methods.

2 Acres and land loading rate values for named counties in the Chesapeake Bay watershed are derived from CAST. (The column for Acres represents acres within the Chesapeake Bay watershed). For MS4s located outside of the Chesapeake Bay watershed, the land loading rates for "All Other Counties" may be used to develop PRPs under Appendix E; these values are average values across the Chesapeake Bay watershed.

3 For land area outside of the urbanized area, undeveloped land loading rates may be used where appropriate. When using the simplified method, DEP recommends the following loading rates (for any county) for undeveloped land:

- TN – 10 lbs/acre/yr
- TP – 0.33 lbs/acre/yr
- TSS (Sediment) – 234.6 lbs/acre/yr

These values were derived by using the existing loads for each pollutant, according to the 2014 Chesapeake Bay Progress Run, and dividing by the number of acres for the unregulated stormwater subsector.

ATTACHMENT C

CHESAPEAKE BAY PRP EXAMPLE USING DEP SIMPLIFIED METHOD

This example illustrates how Sections D and E of a Chesapeake Bay PRP may be developed using DEP's simplified method.

Section D. Determine Existing Loading for Pollutants of Concern.

ABC City in Dauphin County, PA has a total of 1,000 acres in its storm sewershed for surface waters draining to the Chesapeake Bay, 40% (400 acres) of which are impervious, 40% (400 acres) of which are pervious and 20% (200 acres) of which are undeveloped. The City must prepare a PRP for Chesapeake Bay waters and must follow Appendix D in the PAG-13 General Permit.

The date of this existing loading determination is September 16, 2017 (date of NOI submission). The MS4 is not considering any previously installed structural BMPs.

According to Attachment B of the PRP Instructions, Dauphin County's developed and undeveloped land loading rates for sediment are as follows:

Category	Sediment Loading Rate (lbs/acre/yr)
Impervious developed	1,999.14
Pervious developed	299.62
Undeveloped	234.6

The existing loading using DEP's simplified method is calculated as follows:

(400 acres x 1,999.14 lbs/acre/yr) + (400 acres x 299.62 lbs/acre/yr) + (200 acres x 234.6 lbs/acre/yr)
= 964,424 lbs/yr

Section E. Select BMPs To Achieve the Minimum Required Reductions in Pollutant Loading.

The City needs to determine the minimum sediment loading (lbs/yr) that must be reduced within 5 years following DEP's approval of coverage. The minimum percent reduction according to Appendix D is 10%.

Minimum Sediment Reduction Required = 964,424 lbs/yr existing loading x 0.1 (10%) = 96,442 lbs/yr sediment

The following describes the analysis of BMPs undertaken by ABC City to reduce 96,442 lbs/yr of sediment.

BMP Option 1. The City currently conducts street sweeping at a frequency of 1/month. The City's engineer proposes to increase street sweeping to 25 times per year (or approximately 2/month, the minimum necessary to obtain credit in the Chesapeake Bay Model). The BMP effectiveness value for street sweeping 25 times per year (the same street) is 9% for sediment (see 3800-PM-BCW0100m). Of the 400 acres that are impervious in the storm sewershed, 100 acres represent City streets that will be swept at the increased frequency. The following sediment loading reduction from increased street sweeping is estimated (values are rounded):

Estimated Sediment Reduction = 100 acres x 1,999.14 lbs/acre/yr x 0.09 (9%) = 17,992 lbs/yr

The minimum sediment loading reduction of 96,442 lbs/yr is not satisfied by increased street sweeping. (Even if satisfied, street sweeping may not be the only BMP proposed in a PRP). Additional BMPs are needed.

BMP Option 2. The City examines the BMP effectiveness values and notices that permeable pavement results in relatively high pollutant reductions. The City has applied for a grant to modify three municipally-owned parking lots (a total of 3 acres) to permeable pavement, and believes the work could be completed within 5 years of PAG-13 General

Permit coverage approval. The sediment BMP effectiveness value for permeable pavement is 85% for A or B soil without an underdrain.

Estimated reductions use the BMP effectiveness value above multiplied by the BMP acres and the impervious surface loading rates:

Estimated Sediment Reduction = 3 acres x 1,999.14 lbs/acre/yr x 0.85 (85%) = 5,098 lbs/yr

The minimum sediment loading reduction of 96,442 lbs/yr has not been met; a balance of 73,352 lbs/yr remains (96,442 lbs/yr – 17,992 lbs/yr – 5,098 lbs/yr). Additional or alternative BMPs are needed.

BMP Option 3. The City has been approached by the local girl scouts who are seeking a project relating to stormwater management. The City's engineer looks at a map and the BMP effectiveness values and suggests that a bioswale could be installed in the City's park, which sits adjacent to a stream and receives drainage from 5 acres of pervious developed land and 2 acres of impervious developed land. Stormwater currently flows through a 24-inch pipe but could be removed for this project. The bioswale would replace 100 feet of pipe receiving drainage from 7 acres. The sediment BMP effectiveness value for a bioswale is 80%.

Estimated Sediment Reduction, Impervious = 2 acres x 1,999.14 lbs/acre/yr x 0.8 (80%) = 3,199 lbs/yr
Estimated Sediment Reduction, Pervious = 5 acres x 299.62 lbs/acre/yr x 0.8 (80%) = 1,198 lbs/yr

The total sediment reduction would be 4,397 lbs/yr, leaving a balance of 68,955 lbs/yr for sediment. Additional or alternative BMPs are needed.

BMP Option 4. The City is considering "Urban Stream Restoration" through cooperation with a watershed group. A total of 1,000 linear feet of stream banks will be restored. The sediment BMP effectiveness value is 44 lbs/ft.

Upon completion of the project, the following sediment loading reduction is anticipated:

Estimated Sediment Reduction = 1,000 ft x 44.88 lbs/ft = 44,880 lbs/yr

The restoration of 1,000 linear feet of stream banks will not satisfy the minimum required sediment reduction, leaving a balance of 24,075 lbs/yr. Additional or alternative BMPs are needed.

BMP Option 5. During heavy rains stormwater promotes flooding on a PennDOT roadway. The pipe used to convey stormwater is too small to handle design storm events. The proposed solution was replacement with a larger pipe; however, the City's engineer determines that an infiltration basin could be sized properly upstream of the pipe to accommodate average annual stormwater flow conditions and help reduce flooding during severe weather. The best location for this basin is on privately-owned property that is undeveloped (outside of the urbanized area). The City proposes to acquire a right-of-way to install the basin, which will treat runoff from 34 acres of undeveloped land, and apply for a PENNVEST loan to pay for it. The sediment BMP effectiveness value is determined to be 95%.

Upon completion of the project, the following sediment loading reduction is anticipated:

Estimated Sediment Reduction = 34 acres x 234.6 lbs/acre/yr x 0.95 (95%) = 7,578 lbs/yr

The installation of an infiltration basin will not satisfy the minimum required sediment reduction, leaving a balance of 16,497 lbs/yr. Additional or alternative BMPs are needed.

BMP Option 6. The City is evaluating the possibility of installing sediment filter bags on some of its stormwater inlets. The City has 150 stormwater inlets, and 100 have drainage areas of 0.5 acre or less. The City proposes to purchase and maintain 100 filter bags that receive drainage from 40 acres of impervious developed land. The manufacturer of the filter bags claims up to 95% removal of sediment when properly maintained; for planning purposes, 80% efficiency is used. According to the manufacturer, the filter bags will need to be inspected and solids removed at least monthly and following rain events of 0.5 inch or more.

Upon completing the installation of filter bags, the following annual loading of material to the filter bags is estimated as follows:

Estimated Material Captured = 40 acres x 1,999.14 lbs/acre/yr x 0.8 (80%) = 63,972 lbs/yr (wet weight)

It is estimated that, by weight, 50% of the material captured will be inorganic sediment, 40% will be organic material, and 10% will be debris and refuse. The 10% debris and refuse component will need to be deducted (6,397 lbs/yr), leaving 57,575 lbs/yr in wet weight.

Of the remaining wet material collected, it is estimated that 55% will be inorganic sediment and 45% will be organic material. The material, in dry weight, is as follows (the factors are contained in DEP's Effectiveness Values document):

- 57,575 lbs/yr wet weight x 0.55 (55%) x 0.7 = 22,166 lbs/yr dry weight sediment
- 57,575 lbs/yr wet weight x 0.45 (45%) x 0.2 = 5,182 lbs/yr dry weight sediment

In order to find the total annual sediment reduction from this BMP that can be used toward meeting PRP reduction requirements, the fraction of TN and TP in the dry weight sediment need to be excluded (the factors are contained in DEP's Effectiveness Values document):

Fraction (in terms of loading) of TN in dry weight sediment:

22,166 lbs/yr x 0.0027 = 60 lbs/yr TN
5,182 lbs/yr x 0.0111 = 58 lbs/yr TN

Fraction (in terms of loading) of TP in dry weight sediment:

22,166 x 0.0006 = 13 lbs/yr TP
5,182 lbs/yr x 0.0012 = 6 lbs/yr TP

The total sediment loading reduction from this BMP is estimated as 27,211 lbs/yr (22,166 + 5,182 – (60 + 58 + 13 + 6)). The installation of sediment filter bags will satisfy 28% of the City's sediment pollutant loading reduction requirement, and will satisfy the balance after considering BMP Option 5.

Summary of Alternatives and Selection of BMPs

The City evaluates its BMP alternatives and selects Option 4, Urban Stream Restoration, because it believes the watershed group will receive a grant from DEP to cover most of the costs and because of the significant pollutant reductions the project offers. The City also selects Option 6 because of the relatively high reductions that can be achieved through filter bags, with proper maintenance. These two projects do not satisfy the full reduction needed, so at least one more must be selected. The City decides to pursue Option 5, infiltration, as it may help reduce a roadway flooding issue. The City still has not met its minimum required reduction, so it therefore decides to increase street sweeping frequency to 2/month.

In summary, the City in this example will commit to implementing the following BMPs in its PRP to meet the 10% sediment loading reduction requirement for the PAG-13 General Permit:

Selected BMP	Estimated Sediment Loading Reduction (lbs/yr)
Street Sweeping	17,992
Urban Stream Restoration	44,880
Infiltration Basin	7,578
Sediment Filter Bags on 100 Inlets	27,211
Total:	97,661 ✓
Minimum Required:	96,442

ATTACHMENT D

IMPAIRED WATERS PRP EXAMPLE USING DEP SIMPLIFIED METHOD

This example illustrates how Sections D and E of an impaired waters PRP may be developed using DEP's simplified method.

Section D. Determine Existing Loading for Pollutants of Concern.

XYZ Township in Allegheny County, PA has a total of 2,000 acres in a storm sewershed that drains to a surface water that is impaired for siltation and nutrients. The MS4 Requirements Table specifies that a PRP for impaired waters (Appendix E) must be developed. In this storm sewershed, 30% (600 acres) is impervious developed land and 70% (1,400 acres) is pervious developed land.

The date of this existing loading determination is January 1, 2017 (the date of PRP development).

According to Attachment B of the PRP Instructions, Allegheny County's (outside of the Chesapeake Bay watershed) developed land loading rates for sediment are as follows:

Category	Sediment Loading Rate (lbs/acre/yr)	TP Loading Rate (lbs/acre/yr)
Impervious developed	1,839	2.28
Pervious developed	264.96	0.84

The existing loading using DEP's simplified method is calculated as follows:

Existing Sediment Loading: (600 acres x 1,839 lbs/acre/yr) + (1,400 acres x 264.96 lbs/acre/yr) = 1,474,344 lbs/yr
Existing TP Loading: (600 acres x 2.28 lbs/acre/yr) + (1,400 acres x 0.84 lbs/acre/yr) = 2,544 lbs/yr

Section E. Select BMPs To Achieve the Minimum Required Reductions in Pollutant Loading.

The Township needs to determine the minimum sediment and Total Phosphorus (TP) loading (lbs/yr) that must be reduced within 5 years following DEP's approval of coverage. The minimum percent reduction according to Appendix E is 10% for sediment and 5% for TP.

Minimum Sediment Reduction Required = 964,424 lbs/yr existing loading x 0.1 (10%) = 147,434 lbs/yr sediment
Minimum TP Reduction Required = 2,544 lbs/yr existing loading x 0.05 (5%) = 127 lbs/yr TP

The following describes the analysis of BMPs undertaken by XYZ Township to reduce sediment and TP loads.

BMP Option 1. The City currently conducts street sweeping at a frequency of once every three months. The City's engineer proposes to increase street sweeping to 25 times per year. The BMP effectiveness value for street sweeping 25 times per year (the same street) is 9% for sediment and 3% for TP (see 3800-PM-BCW0100m). Of the 600 acres that are impervious in the storm sewershed, 150 acres represent City streets that will be swept at the increased frequency. The following sediment loading reduction from increased street sweeping is estimated (values are rounded):

Estimated Sediment Reduction = 150 acres x 1,839 lbs/acre/yr x 0.09 (9%) = 24,827 lbs/yr
Estimated TP Reduction = 150 acres x 2.28 lbs/acre/yr x 0.03 (3%) = 10 lbs/yr

The minimum sediment and TP loading reductions are not satisfied by increased street sweeping. (Even if satisfied, street sweeping may not be the only BMP proposed in a PRP). Additional BMPs are needed.

BMP Option 2. The Township has been planning to establish an authority and begin charging a fee based on the area of impervious surface associated with parcels. The fee can be offset through the installation of BMPs that reduce the rate and volume of stormwater runoff. The Township is aware of a large industrial operation within the

storm sewershed that is planning to construct to remove vacant parking lots and install a series of infiltration galleries to treat runoff from approximately half of its complex, or about 50 acres. The BMP effectiveness values for TP and sediment are 85% and 95%, respectively. Of the 50 acres to be treated, 45 are impervious and 5 are pervious.

Estimated Sediment Reduction, Impervious = 45 acres x 1,839 lbs/acre/yr x 0.95 (95%) = 78,617 lbs/yr
Estimated Sediment Reduction, Pervious = 5 acres x 264.96 lbs/acre/yr x 0.95 (95%) = 1,259 lbs/yr

Estimated TP Reduction, Impervious = 45 acres x 2.28 lbs/acre/yr x 0.85 (85%) = 87 lbs/yr
Estimated TP Reduction, Pervious = 5 acres x 0.84 lbs/acre/yr x 0.85 (85%) = 4 lbs/yr

The minimum sediment loading reduction of 147,434 lbs/yr has not been met; a balance of 42,731 lbs/yr remains (147,434 lbs/yr – 24,827 lbs/yr – 78,617 lbs/yr). Additional or alternative BMPs are needed.

The minimum TP loading reduction of 127 lbs/yr has not been met; a balance of 26 lbs/yr remains (127 lbs/yr – 10 lbs/yr – 87 lbs/yr – 4 lbs/yr). Additional or alternative BMPs are needed.

BMP Option 3. The Township has a park with a lake used for recreation, which is owned and operated by the county. The lake is manmade and receives inflow from a small stream. This stream receives stormwater discharges from 10 MS4 outfalls prior to flowing into the lake, draining an area of 75 acres, 25 of which are in the Township (all of which are impervious). The Township is aware that the lake is nearly full of sediment, and is considering dredging the lake. The Township learned that dredging sediment will not count toward meeting pollutant reduction goals, but is still interested in dredging for future recreational use. It is also cognizant that the same problem could recur unless steps are taken upstream to reduce stormwater flows. The Township engineer proposes to reroute stormwater piping to bypass the small stream into a belowground mixed media filtration system, immediately upstream from the lake, which will provide some infiltration but will also capture sediment. The upstream end of the lake will be dredged to make room for the filtration system, and the outflow from this BMP would discharge to the lake. Both the Township and County agree in principal to the proposal, and believe grant funds can be secured for the work.

Estimated Sediment Reduction = 25 acres x 1,839 lbs/acre/yr x 0.95 (95%) = 43,676 lbs/yr

Estimated TP Reduction = 25 acres x 2.28 lbs/acre/yr x 0.85 (85%) = 48 lbs/yr

NOTE – If the neighboring municipality was an MS4 permittee and the permittees collaborated on the PRP, credit for an additional 50 acres could have been taken.

With the selection of this BMP, the sediment and TP loading reduction requirements will be met.

Summary of Alternatives and Selection of BMPs

The Township wishes to pursue all three BMPs it has evaluated. These BMPs will meet the objectives of 10% and 5% loading reductions for sediment and TP, respectively:

Selected BMP	Estimated Sediment Loading Reduction (lbs/yr)	Estimated TP Loading Reduction (lbs/yr)
Street Sweeping 25/Year	24,827	10
Infiltration Practices (Industrial)	79,876	91
Infiltration Practices (County Park)	43,676	48
Total:	148,379 ✓	149 ✓
Minimum Required:	147,434	127