DEP NPDES MS4 Program Updates

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Agenda

1. Overview of MS4 Program
2. Plan Update Process
3. 2018 PAG-13 – What's New?
4. Stormwater Management Program
5. Pollutant Reduction Plans
6. Example Case Study
7. Discussion

MS4 Program

What is MS4?

- Municipal Separate Storm Sewer System

A conveyance or system of conveyances (incl. roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is:

- ✓ Owned/operated by public body (State, City, County, etc.)
- ✓ Designed or used for collecting and conveying stormwater
- ✓ Not a combined sewer or part of a Publicly Owned Treatment Works

MS4 Program

MS4 Phases

Phase 1

- Large and Medium MS4 with populations exceeding 100,000 people
- Based on data on the EPA website, this pertains to approximately 750 phase I MS4s.

Phase 2

- Small MS4 is any MS4 that is not already covered by the Phase I stormwater program.
- Regulated small MS4s covered by the Phase II Final Rule, either through
  - automatic nationwide designation (Census-defined Urbanized Areas (UA))
  - designation on a case-by-case basis by the NPDES permitting authority (Outside UA & potential to cause adverse impact to WQ or MS4 that substantially contributes to Physically interconnected regulated MS4)

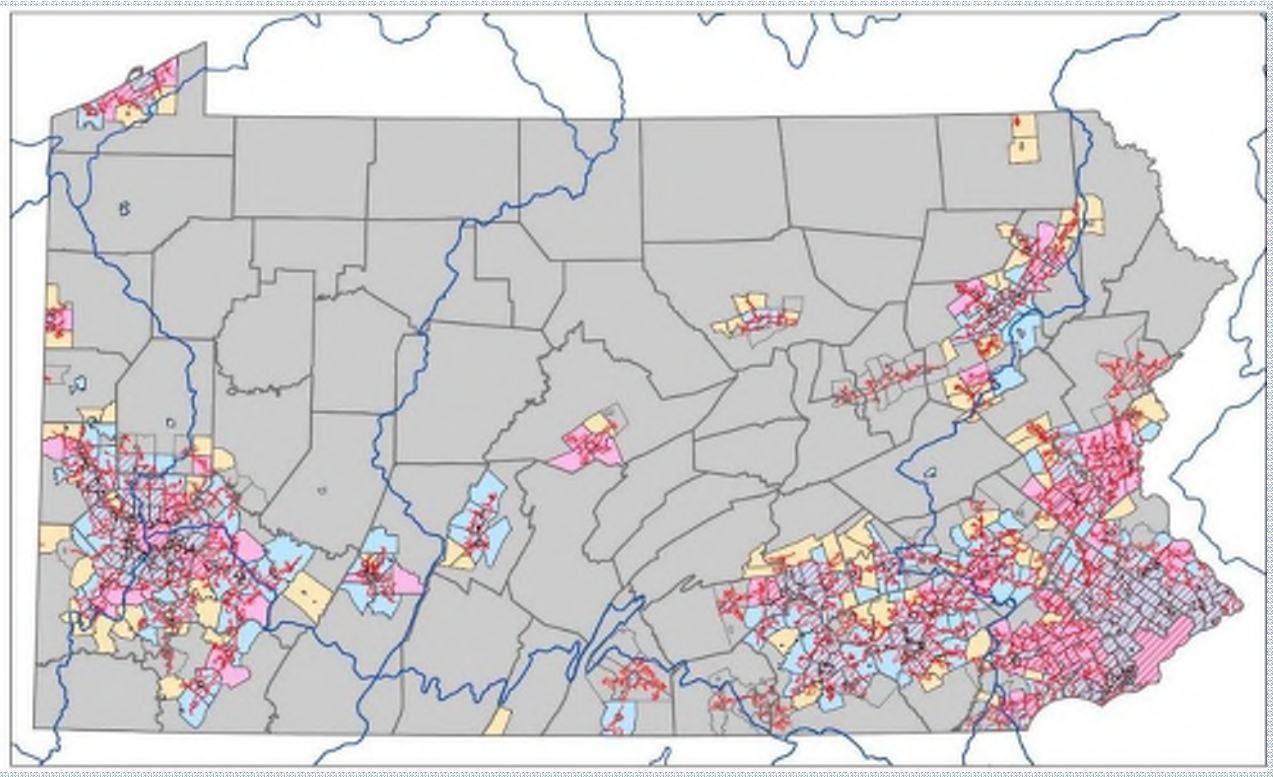
MS4 Program

Small MS4

- Generally includes all government entity-owned storm sewers that are not Phase I MS4s
- Excludes sewers in “very discrete areas” such as individual buildings that are not part of municipal system
- Small MS4 within a census-designated “urbanized area” as of the latest 2010 Census is regulated
- Only the part within the UA is regulated
- Unlike Phase I MS4 universe, the number of Phase II MS4s grows with each census
- Limited opportunity to avoid regulation by obtaining a waiver
- Additional MS4s may be designated by State/EPA for regulation

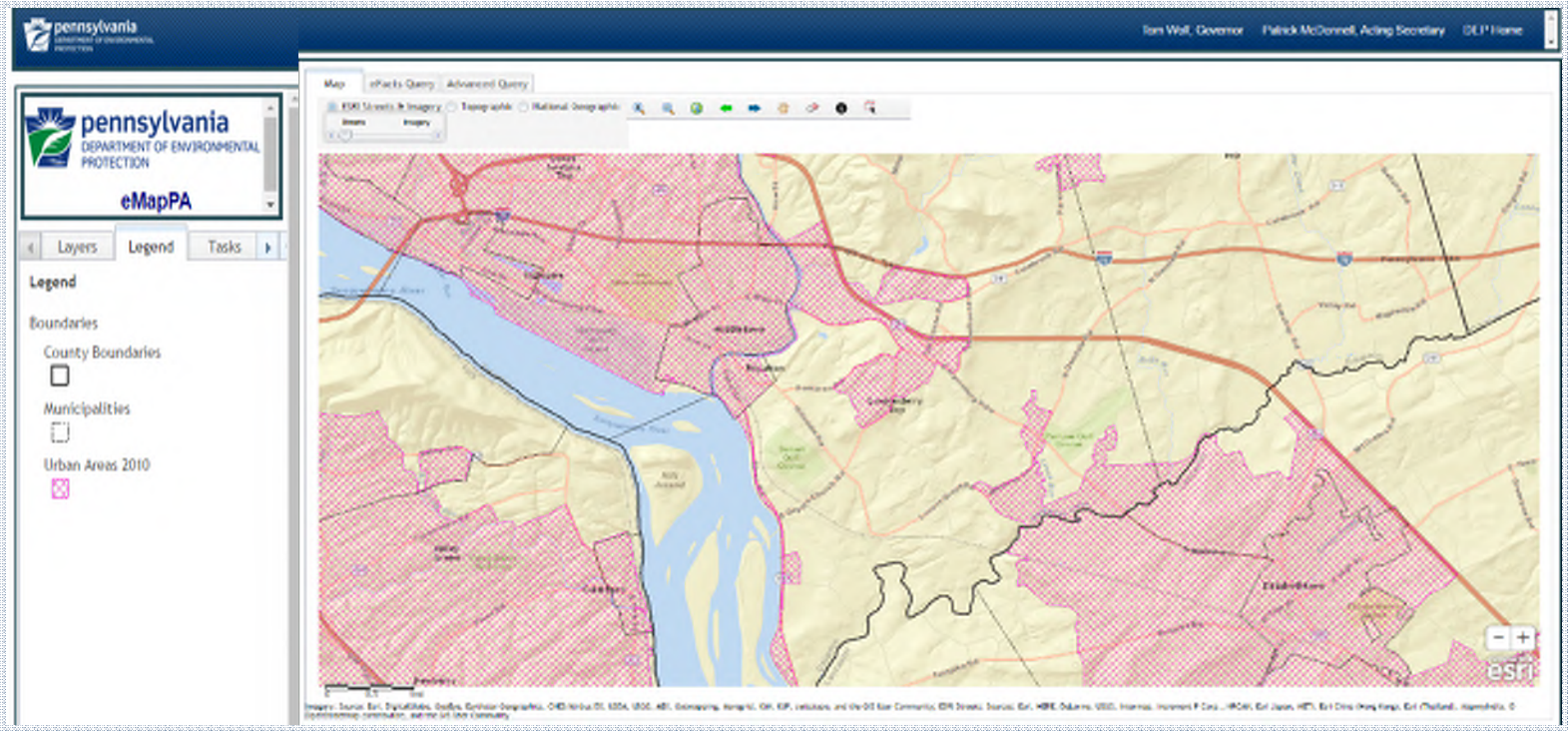
PA Urbanized Areas Map

Source: http://www.lyco.org/Portals/1/PlanningCommunityDevelopment/Documents/MS4-UA-2010.pdf



PA Urbanized Areas Map

Source: http://www.depgis.state.pa.us/emappa



MS4 Plan Update Process

How did it all happen?

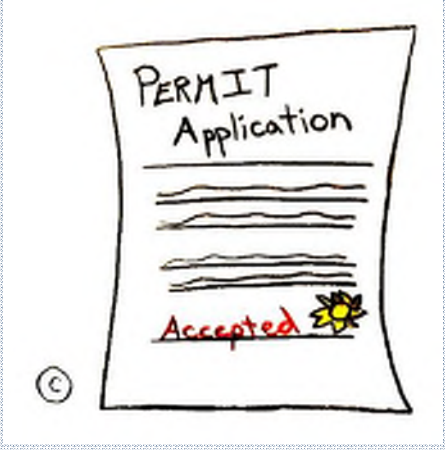
Source: choosecleanwater.org

- Draft NPDES General Permit for Stormwater Discharges for Small MS4s (PAG-13 General Permit) published in Pennsylvania Bulletin on May 20, 2015
- 60 day comment period, which was further extended ended on August 31, 2015
- DEP received over 600 comments from 64 individuals/organizations
- Comments were responded and published
- 2018 PAG-13 finalized and published in PA Bulletin on June 4, 2016
- 2018 PAG-13 will become effective on **March 16, 2018**

PAG-13 MS4 Permit Requirements

2018
PAG 13

- Application/NOI Forms
  - Application Appendices
- Fees
- Stormwater Management Plan (SWMP)
  - Minimum Control Measures (MCM)
- Pollutant Reduction Plans & Chesapeake Bay Pollutant Reduction Plans (PRPs)
- Stormwater Ordinance
- Waivers (if applicable)
- MOUs



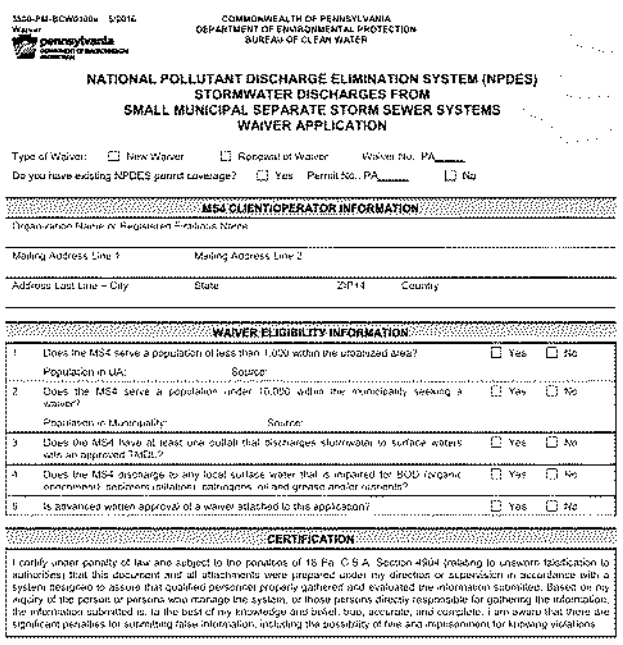
Remember the Date – September 16, 2017.

DEADLINES

- New and Existing Permittees eligible for and desire continued coverage under 2018 PAG-13 must submit NOI by September 16, 2017
- Permittees with existing coverage under the 2013 PAG-13 General Permit that will NOT be eligible for continued coverage under the 2018 PAG-13 General Permit must submit an application for an individual NPDES permit by September 16, 2017
- MS4s with existing individual NPDES permit coverage must submit an individual permit application by September 16, 2017 or at least 180 days prior to the expiration date specified on page 1 of the permit, whichever is later

Source: Firstapproach.biz

Permit Waivers



3150-PM-BCW0100m 5/2016
Waiver

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
WAIVER APPLICATION

Type of Waiver: ☐ New Waiver ☐ Renewal of Waiver Waiver No. PA____
Do you have existing NPDES permit coverage? ☐ Yes Permit No.: PA_____ ☐ No

MS4 CLIENT/OPERATOR INFORMATION

Organization Name or Registered Fictitious Name

Mailing Address Line 1 Mailing Address Line 2

Address Last Line – City State ZIP+4 County

WAIVER ELIGIBILITY INFORMATION

1	Does the MS4 serve a population of less than 1,000 within the urbanized area? Population in UA: Source:	☐ Yes	☐ No
2	Does the MS4 serve a population under 10,000 within the municipality seeking a waiver? Population in Municipality: Source:	☐ Yes	☐ No
3	Does the MS4 have at least one outfall that discharges stormwater to surface waters with an approved TMDL?	☐ Yes	☐ No
4	Does the MS4 discharge to any local surface water that is impaired for BOD (organic enrichment), sediment (siltation), pathogens, oil and grease and/or nutrients?	☐ Yes	☐ No
5	Is advanced written approval of a waiver attached to this application?	☐ Yes	☐ No

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa. C.S.A. Section 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

- New and Existing Permittees that may be eligible for waivers must submit waiver application by September 16, 2017
- Waivers may be approved if the following is true:
  - MS4 serves a population of less than 1,000 within the urbanized area OR the MS4 serves a population under 10,000 within the municipality seeking a waiver; AND
  - The MS4 does not discharge stormwater to surface waters with an approved local TMDL (for any pollutant of concern and regardless if a WLA has been developed or not); AND
  - The MS4 does not discharge to any local surface water that is impaired for BOD (organic enrichment), sediment (siltation), pathogens, oil and grease and/or nutrients OR
  - The applicant has received advanced written approval of a waiver from DEP's Central Office

Permit Fees, Expiry, & Renewals.

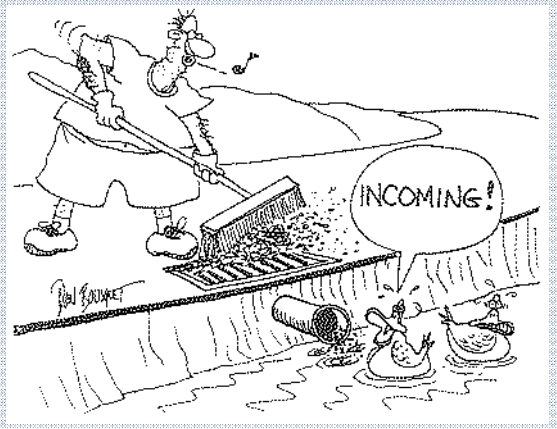
- NOI fee for coverage under this General Permit is $500 per year
- An installment of $500 will be paid each year by September 30th
- Submission of the Annual MS4 Status Report by September 30th each year which will also serve as an NOI for ongoing coverage, unless otherwise instructed by DEP to submit a new NOI

- The expiration date of the 2018 General Permit will be March 15, 2023, but a permittee's coverage will continue indefinitely as long as:
- DEP reissues or extends the General Permit,
- Permittee continues to be eligible for Permit coverage
- Permittee submits its Annual MS4 Status Reports and is otherwise in compliance, and
- DEP does not notify the permittee that a renewal NOI is required

Discharges not authorized by 2018 PAG-13

PROHIBITIONS

- Permit lists 20 discharge characteristics that are not authorized under the general permit including:
  - Discharges that have the potential to be a contributor of pollution per CWA
  - A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source
  - The discharge is not, or will not, result in compliance with an applicable effluent limitation or water quality standard
  - Discharges to High Quality (HQ) or an Exceptional Value (EV) surface water
  - Discharge has the potential to cause significant adverse environmental impact
  - Industrial or Construction discharges



Source: web.uri.edu

Authorized Non-Stormwater Discharges

Source: http://www.uppergwynedd.org/

- Discharge of non-contaminated water from geothermal systems.
- Water resulting from residential (not commercial) car washing to the MS4 only when cleaning agents are not utilized
- Removal of dechlorinated swimming pool discharges from the list of authorized discharges
- Addition of non-contaminated hydrostatic test water discharges that do not contain detectable concentrations of Total Residual Chlorine (TRC)

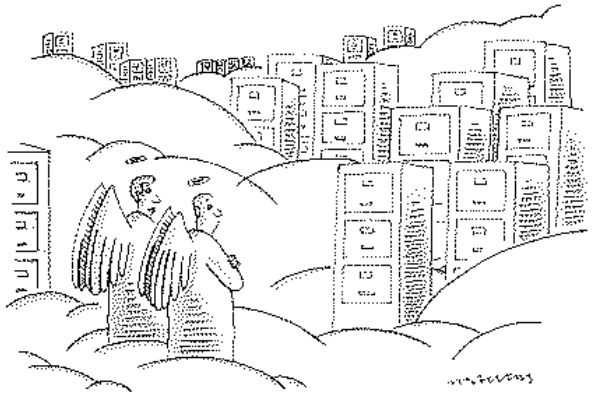
Coverage of SWM Outfalls

What's New?

- 2018 General Permit adds clarification concerning General Permit coverage for stormwater discharge points (outfalls).
  - DEP coverage includes all outfalls identified in the NOI, including map(s) submitted with the NOI.
  - Additional outfalls discovered in the course of a permittee's investigations (not part of the NOI) should be notified in the subsequent Annual MS4 Status Report.
  - For new proposed stormwater outfalls, a written notification to DEP at least 60 days prior to commencing a discharge, unless such discharges would meet criteria specified in the "Discharges Not Authorized By This General Permit" section, in which case an individual permit must be obtained prior to commencing a discharge

Retention of Permit Records

What's New?

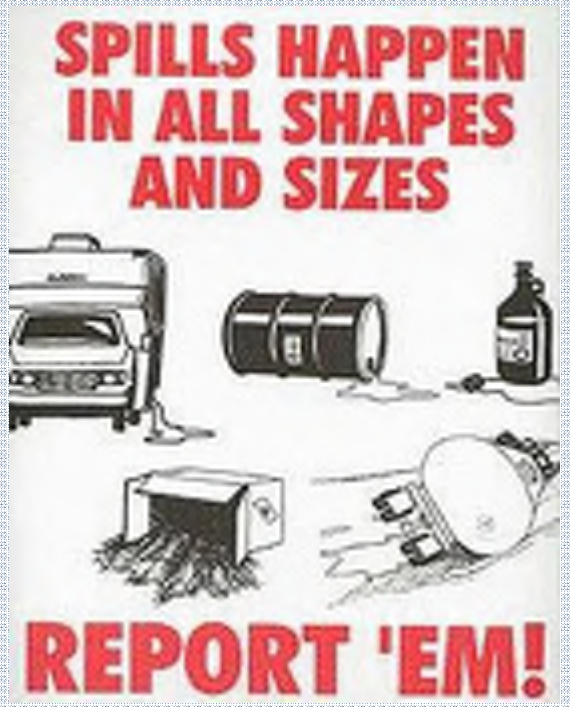


"It was much nicer before people started storing all their personal information in the cloud."

- Records of all monitoring activities and results, copies of all plans and reports, and records of all data used to complete the application for this General Permit to be retained for at least 5 years from the date of the sample measurement, report or application
- Records to be submitted to DEP upon request or as required for annual reports
- Records should be made available to the public at reasonable times during regular business hours.

Pollution Prevention & Non-Compliance Reporting

What's New?

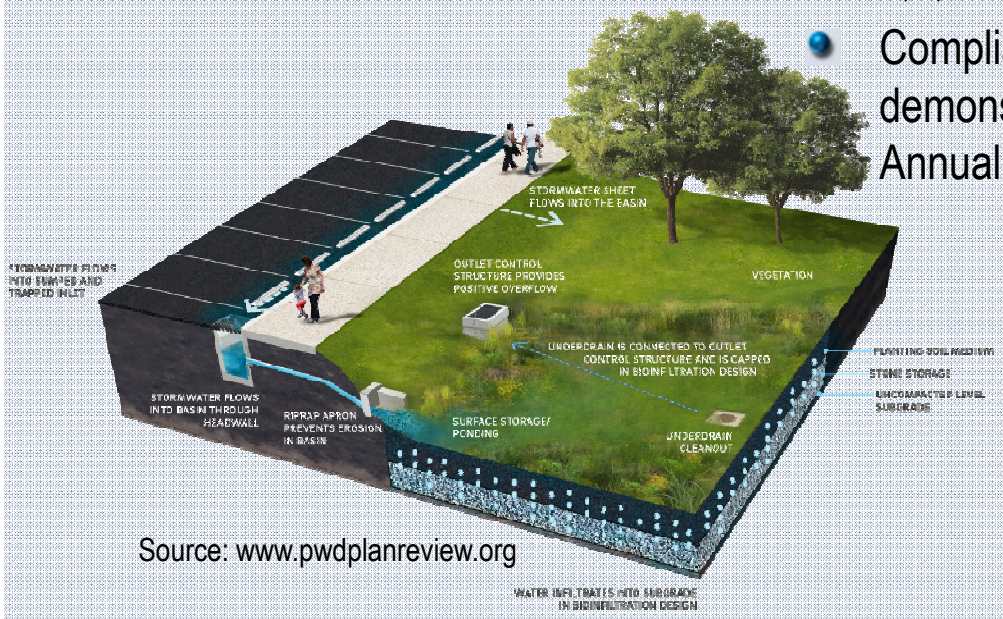


- MS4 permittees have an obligation under state and federal regulations to report all incidents causing or threatening pollution (e.g., spills into an MS4 that could cause adverse impacts to surface waters or public health) and other non-compliance to DEP.
- Remediation of pollution is not, however, the responsibility of the permittee unless the permittee is considered the responsible party for the pollution incident.
- 2013 General Permit did not contain these provisions

Stormwater Management Program (SWMP)

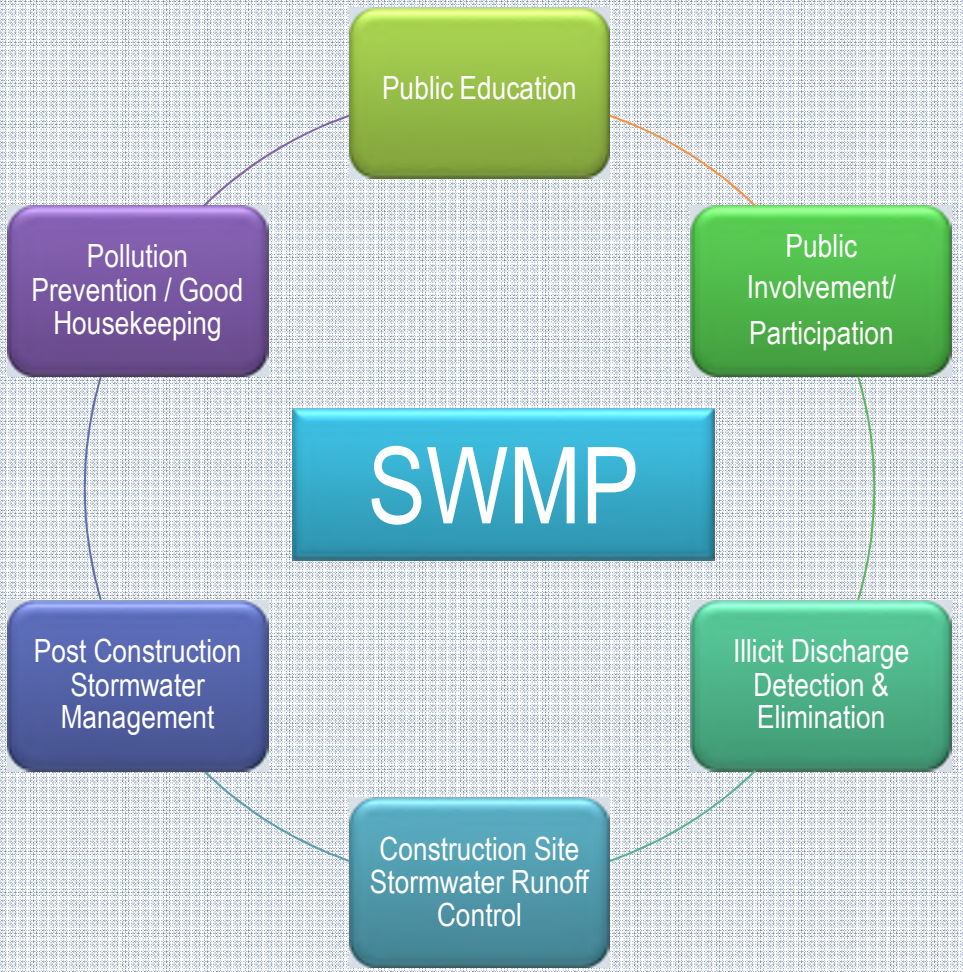
What's New?

- SWMP language has been moved to part C I of the 2018 General Permit (Appendix A for 2013 General Permit)
- Based on federal six (6) Minimum Control Measures (MCMs) with associated BMPs
- Changes made to the BMPs for MCM # 2, 3, 4,5,6
- Compliance with SWMP should be demonstrated through the submission of Annual MS4 Report (September 30)



Source: www.pwdplanreview.org

Minimum control Measures (MCMs)



MCM #1 Public Education

No Updates

Source: www.fairviewtownship.com

- BMP #1: Develop, implement and maintain a written Public Education and Outreach Program.
- BMP #2: Develop and maintain lists of target audience groups
- BMP #3: Annually publish at least one issue of a newsletter, a pamphlet, a flyer, or a website that includes general stormwater educational information, a description of the permittee's SWMP, and/or information about the permittee's stormwater management activities
- BMP #4: Distribute stormwater educational materials and/or information using a variety of distribution methods

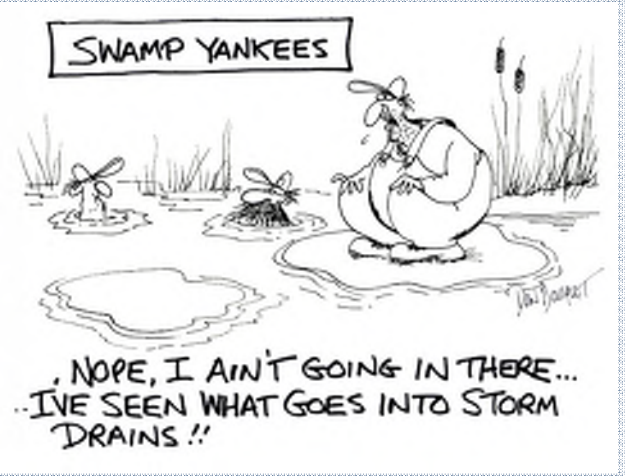
MCM #2 Public Involvement / Participation

Updated BMP 1

- BMP #1: Develop, implement and maintain a written Public Involvement and Participation Program (PIPP).
  - clarification has been added that all plans, programs, maps and reports developed by the permittee under the General Permit must be posted to the permittee's website or be made available at the permittee's office(s).
- BMP #2: Advertise to the public and solicit public input on the following documents prior to adoption or submission to DEP: Stormwater Management Ordinances (for municipalities); Standard Operating Procedures (SOPs) (for non-municipal entities); and Pollutant Reduction Plans (PRPs), including modifications thereto.
- BMP #3: Regularly solicit public involvement and participation from the target audience groups

MCM #3 Illicit Discharge Detection and Elimination

Updated BMP 3



Source: web.uri.edu

- BMP #1: Develop and implement a written program for the detection, elimination, and prevention of illicit discharges
- BMP #2: Develop and maintain map(s) that show permittee and UA boundaries, outfalls locations, and the locations and names of all surface waters that receive discharges.
- BMP #3: In conjunction with the map(s) created under BMP #2, develop a map for the entire storm sewer collection system within the permittee's jurisdiction
- Clarification has been added that the map(s) must include privately-owned components of the collection system where conveyances or BMPs on private property are connected to publicly owned components of the system and transport stormwater downstream of publicly-owned components, within the permittee's jurisdiction

MCM #3 Illicit Discharge Detection and Elimination

Updated BMP 4

Source: www.stream-smart.com

- BMP #4: The permittee shall conduct dry weather screenings of its MS4 outfalls to evaluate the presence of illicit discharges
- 2018 General Permit specifies the use of the MS4 Outfall Field Screening Report form (3800-FM-BCW0521), or equivalent, for dry weather screening of MS4 outfalls.
- 2018 General Permit specifies that if the permittee determines that an outfall is inaccessible due to safety or other reasons, an "observation point" at an appropriate location upstream of the outfall should be established where outfall field screening shall be performed and such points must be identified on the map(s) required by the General Permit.

MCM #3 Illicit Discharge Detection and Elimination

No Updates

Source: www.franconiatownship.org

- BMP #5: Enact a Stormwater Management Ordinance or SOP to implement and enforce a stormwater management program
- BMP #6: Provide educational outreach to target audiences about the program to detect and eliminate illicit discharges.

MCM #4 Construction Site Stormwater Runoff Control

Updated BMPs

- BMP #1: The permittee may not issue a building or other permit to those proposing earth disturbance activities requiring an NPDES permit unless the party proposing the earth disturbance has valid NPDES Permit coverage
- BMP #2: A permittee which issues building or other permits shall notify DEP or the applicable county conservation district (CCD) within 5 days of the receipt of an application for a permit involving an earth disturbance activity consisting of one acre or more
- BMP #3: Enact, implement and enforce an ordinance or SOP to require the implementation and maintenance of E&S control BMPs, including sanctions for non-compliance, as applicable

MCM #4 Construction Site Stormwater Runoff Control

Updated BMPs

- BMP #1, 3 and 4 from 2013 General Permit relating to review of E&S plans, control of waste at construction sites and procedures for the receipt of public enquires at construction sites has been removed.

Source: www.franconiatownship.org

MCM #5 Post-Construction Stormwater Management

Updated BMPs

- BMP #1: Enact, implement and enforce an ordinance or SOP to require post-construction stormwater management from new development and redevelopment projects, including sanctions for non-compliance
- BMP #2: Develop and implement measures to encourage and expand the use of Low Impact Development (LID) in new development and redevelopment
- BMP #3: Ensure adequate O&M of all post-construction stormwater management BMPs
- BMP #1, 2 & 3 of the 2013 General Permit, relating to post-construction stormwater management (PCSM) BMP requirements , review of PCSM plans and relating to inspection of PCSM BMPs, respectively, (associated with QLP) have been removed.

MCM #6 Pollution Prevention / Good Housekeeping

Updated BMP 2

- BMP #1: Identify and document all operations that are owned or operated by the permittee and have the potential for generating pollution in stormwater runoff to the regulated small MS4
- BMP #2: Develop, implement and maintain a written O&M program for all operations that could contribute to the discharge of pollutants from the regulated small MS4, as identified under BMP #1.
- Clarifications to BMP #2 to include controls for solid chemical products stored & utilized for the principal purpose of deicing
- BMP #3: Develop and implement an employee training program that addresses the goal of preventing or reducing the discharge of pollutants from operations to the regulated small MS4

Pollutant Control Measures & Pollutant Reduction Plans

Plan the Work
Work the Plan

- PCMs are activities (BMPs) undertaken by the MS4 permittee to identify and control pollutant loading to impaired waters
- PRP is a planning document which guides the selection and implementation of specific BMPs
- A PRP must be developed and submitted to DEP with the NOI if one or both of the following criteria are met:
  1. The permittee has at least one stormwater outfall that discharges to surface waters within the Chesapeake Bay watershed, or otherwise at least one discharge to storm sewers owned or operated by a different entity within the Chesapeake Bay watershed

Pollutant Control Measures & Pollutant Reduction Plans

Plan the Work
Work the Plan

Appendix	Pollutant	Requirements
A	Metals & pH	Pollutant Control Measures
B	Pathogens	Pollutant Control Measures
C	Organic Compounds(PCBs, Chlorides, others)	Pollutant Control Measures
D	Sediments & Nutrients	Chesapeake Bay Pollutant Reduction Plan (CBRP)
E	Sediments & Nutrients	Pollutant Reduction Plan

2. The permittee has at least one stormwater outfall that discharges to waters impaired for nutrients (i.e., Total Nitrogen (TN) and/or Total Phosphorus (TP)) and/or sediment (i.e., siltation)

DEP's MS4 Requirements Table, identifies the responsibilities for MS4s for implementing PCMs under Appendices A, B, and C of the General Permit, and for developing and implementing PRPs under Appendices D and E of the General Permit.

Development of PCMs – Appendix A-C

Plan the Work
Work the Plan

Appendix	Pollutant	Requirements
A	Metals & pH	Pollutant Control Measures
B	Pathogens	Pollutant Control Measures
C	Organic Compounds(PCBs, Chlorides, others)	Pollutant Control Measures
D	Sediments & Nutrients	Chesapeake Bay Pollutant Reduction Plan (CBRP)
E	Sediments & Nutrients	Pollutant Reduction Plan

- PCM includes development of:
  - Storm sewershed map to impaired waters
  - An inventory of known and suspected sources of the pollutants of concern
  - An investigation of suspected sources; and documentation of ongoing PCM implementation in Annual Reports
- Other requirements include :
  - The enactment of an ordinance for animal wastes
  - Elimination of illicit and illegal discharges,
  - Notification to DEP of sources originating from industrial sites.
- If an applicant demonstrates that there are no stormwater discharges to waters impaired by the pollutants of concern, the permittee is not required to follow Appendices A, B and/or C, as applicable.
- .

Chesapeake Bay Pollutant Reduction Plan– Appendix D

Plan the Work
Work the Plan

- Provisions in Appendix D relate to Chesapeake Bay Pollutant Reduction Plan (CBPRP) and applies when the sewershed discharges into Chesapeake bay Watershed. CBPRP is required as part of the NOI that is due by September 16, 2017
- Pollutant Reduction Required by Appendix D (percent relative to existing loading) over 5 year period following DEP's approval of coverage
  - Sediment – 10%
  - Total Phosphorous – 5%
  - Total Nitrogen – 3%

Chesapeake Bay Pollutant Reduction Plan– Appendix D

Plan the Work
Work the Plan

- 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.

Chesapeake Bay Pollutant Reduction Plan– Appendix D

Pollutant Loading Rate

ATTACHMENT B

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

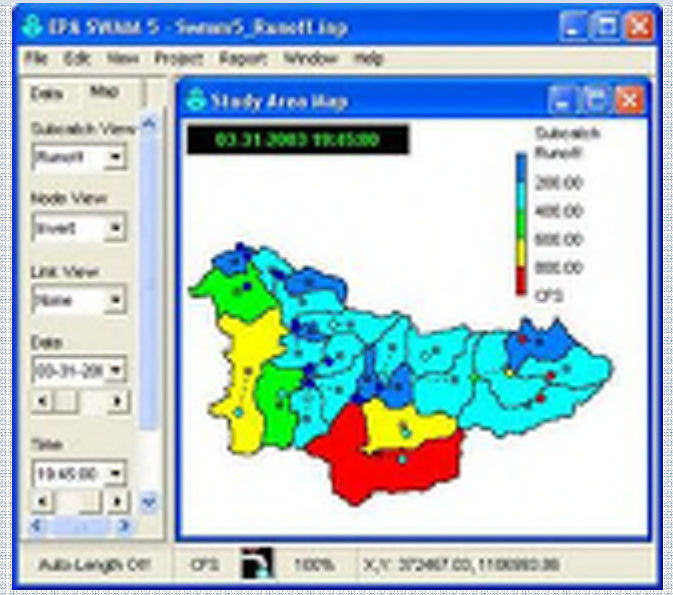
County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Adams	impervious developed	10,373.2	33.43	2.1	1,398.77
	pervious developed	44,028.6	22.99	0.8	207.67
Bedford	impervious developed	9,815.2	19.42	1.9	2,034.34
	pervious developed	19,425	17.97	0.68	301.22
Berks	impervious developed	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

MapShed Overview

- Existing loading to be calculated and reported as of the date of the development of PRP
- DEP prescribes a Simplified method for calculating pollutant loading based on percent impervious and pervious surface within the urbanized storm sewershed
- EPA SWMM, PSU MapShed , other software can be used
- For CBPRP, use attachment B of PRM instruction document (3600-PM-BCW0100K) for loading rates for all PA counties

Pollutant Reduction Plan– Appendix E

Plan the Work
Work the Plan



- Provisions in Appendix E relate to Pollutant Reduction Plans (PRPs) and applies when the sewershed discharges to local surface waters impaired for nutrients and /or sediments
- Pollutant Reduction Required by Appendix E (percent relative to existing loading) over 5 year period following DEP's approval of coverage:
  - If the impairment is based on siltation only- 10% sediment reduction 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.") - 5% TP reduction required
  - If the impaired is due to both siltation and nutrients - Both sediment (10% reduction) and TP (5% reduction) required

Pollutant Reduction Plan– Appendix E

Pollutant Loading Rate

Category	TN (lbs/ac./yr)	TP (lbs/ac./yr)	TSS (lbs/ac./yr)
Impervious Developed	23.06	2.28	1839
Pervious Developed	20.72	0.84	264.96

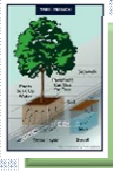
- For MS4 outside of the Chesapeake Bay, the loading rates for "All Other Counties" from Attachment B may be used
- For land area outside of the urbanized area, DEP recommends the following loading rates (for any county) for undeveloped land:
  - TN – 10 lbs/acre/yr
  - TP – 0.33 lbs/acre/yr
  - TSS (Sediment) – 234.6 lbs/acre/yr

Stormwater BMP Selection

SMP/LID/GSI

Rain Gardens, Stormwater Basin, Stormwater Bumpouts (Maximize Surface Features & Vegetation)

Stormwater Planters and Swales (Smaller Surface Features & Footprint)



Stormwater Tree Trenches (Maximize Tree Planting)

Infiltration Trenches & Pervious Pavers

- BMP Effectiveness Values document (3800-PM-BCW0100m) to be used in evaluating the selection of BMPs and pollutant loading reductions
- This list is based primarily on the Chesapeake Assessment Scenario Tool (CAST) BMP effectiveness values, with some additions made by DEP. The values in this document or those contained in Chesapeake Bay Program expert panel reports must be used for the BMPs identified in those resources when developing PRPs.
- If BMPs are proposed that are not addressed in those resources, BMP effectiveness values from other technical resources may be proposed if the resources are documented.

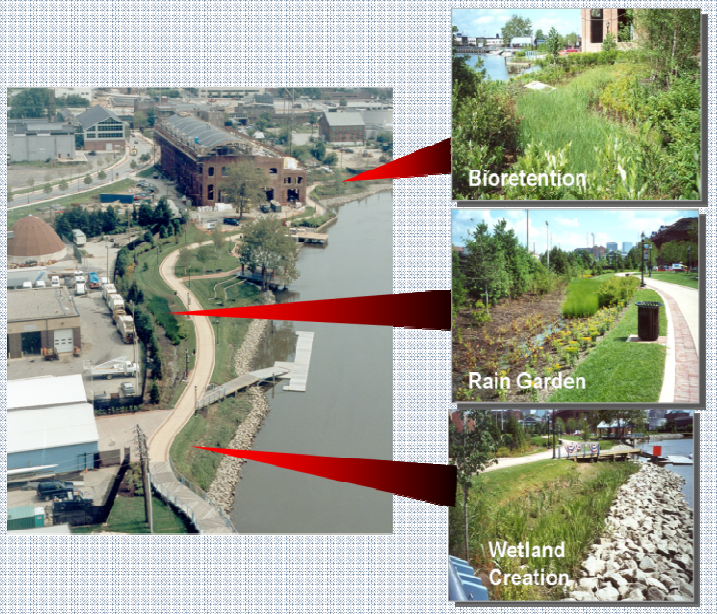
BMP Effectiveness Table(3800-PM-BCW0100m)

SMP/LID/GSI

BMP Type	BMP Effectiveness Values		
	TN	TP	Sediment
Wet Ponds and Wetlands	20%	45%	60%
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%
Dry Extended Detention Basins	20%	20%	60%
Infiltration Practices w/ Sand, Veg.	85%	85%	95%
Filtering Practices	40%	60%	80%
Filter Strip Runoff Reduction	20%	54%	56%
Filter Strip Stormwater Treatment	0%	0%	22%
Bioretention – Raingarden (C/D soils w/ underdrain)	25%	45%	55%
Bioretention / Raingarden (A/B soils w/ underdrain)	70%	75%	80%

BMP Effectiveness Table(3800-PM-BCW0100m)

SMP/LID/GSI



BMP Type	BMP Effectiveness Values		
	TN	TP	Sediment
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%
Vegetated Open Channels (C/D Soils)	10%	10%	50%
Vegetated Open Channels (A/B Soils)	45%	45%	70%
Bioswale	70%	75%	80%
Permeable Pavement w/o Sand or Veg. (C/D Soils w/ underdrain)	10%	20%	55%
Permeable Pavement w/o Sand or Veg. (A/B Soils w/ underdrain)	45%	50%	70%
Permeable Pavement w/o Sand or Veg. (A/B Soils w/o underdrain)	75%	80%	85%
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%
Vegetated Open Channels (C/D Soils)	10%	10%	50%

BMP Effectiveness Table(3800-PM-BCW0100m)

SMP/LID/GSI

BMP Type	BMP Effectiveness Values		
	TN	TP	Sediment
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%
Stream Restoration	0.075 lbs/ft/yr	0.068 lbs/ft/yr	44.88 lbs/ft/yr
Forest Buffers	25%	50%	50%
Tree Planting	10%	15%	20%
Street Sweeping	3%	3%	9%
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1 – TN and TP concentrations
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%

Example Case Study – CBPRP – Cumberland County

ABC City in Cumberland 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.

Section D. Determine Existing Loading for Pollutants of Concern.

3800-PM-BCW0100k 5/2016
PRP Instructions

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
Cumberland	impervious developed	8,774.8	28.93	1.11	2,065.1
	pervious developed	26,908.6	23.29	0.34	306.95

Example Case Study – CBPRP – Cumberland County

Sediment Loading rate for Undeveloped area – 234.6 lbs/acre/year

Hence , Existing Loading Rate = (400 ac x 2065.1lbs/ac./yr) + (400ac. X 306.95 lbs/ac./yr)+ (200ac. X 234.6 lbs/ac./yr) = 995,740 lbs/yr Sediment

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 = 995,740 lbs/yr existing loading x 0.1 (10%) = 99,574 lbs/yr sediment

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

The City comes up with the following plan to achieve Pollutant reduction goal:

Example Case Study – CBPRP – Cumberland County

BMP Option	BMP Effectiveness	Estimated Sediment Reduction	Deficit (-)/ Surplus (+)
1. Increase Street Sweeping frequency from 1/month to 25/year for 200 ac. of existing impervious streets	9% TSS reduction for 25 events annually	200 ac. X 2065.1 lbs/ac./yr*.09 (9%) = 37,170 lbs/yr	37,170 lbs yr - 99,574 lbs/yr = -62,404 lbs/yr
2. Converting exiting impervious parking lots (2 sites, 10 Ac.) to permeable pavement. Sites have A soils.	85% TSS removal	10 ac. X 2065.1 lbs/ac./yr x 0.85 (85%) = 17,553 lbs/yr	17,553 lbs/yr - 62,404 lbs/yr. = -44,851 lbs/yr
3.Urban Stream Restoration - 1,200 linear feet	44 lbs TSS/ft	44 lbs/ft x 1200 ft = 52,800	52,800lbs/ yr - 44,851 lbs/yr = 7,949 lbs/yr

Example Case Study –PRP – Cumberland County

XYZ City in Cumberland County, PA has a total of 2,000 acres in its storm sewershed 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).

Section D. Determine Existing Loading for Pollutants of Concern.

3800-PM-BCW0100k 5/2016
PRP Instructions

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
Cumberland	impervious developed	8,774.8	28.93	1.11	2,065.1
	pervious developed	26,908.6	23.29	0.34	306.95

Example Case Study – CBPRP – Cumberland County

Hence , Existing Loading Rate :

Sediment = (600ac x 2065.1lbs/ac./yr) + (1400ac. X 306.95 lbs/ac./yr) = 1,668,790 lbs/yr Sediment
TP = (600 ac. x 1.11lbs/ac./yr) + (1400ac. X 0.34 lbs/ac./yr) = 1,142 lbs/yr TP

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 = 1,668,790 lbs/yr existing loading x 0.1 (10%) = 166,879 lbs/yr sediment
Minimum TP Reduction Required =1142 lbs/yr existing loading x 0.05 (5%) = 57.1 lbs/yr TP

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

The City comes up with the following plan to achieve Pollutant reduction goal:

Example Case Study – CBPRP – Cumberland County

BMP Option	BMP Effectiveness	Estimated Sediment & TP Reduction	Deficit (-)/ Surplus (+)
1. Increase Street Sweeping frequency from 1/month to 25/year for 200 ac. of existing impervious streets	9% TSS & 3% for TP reduction for 25 events annually &	200 ac. x 2065.1 lbs/ac./yr x 0.09 (9%) = 37,170 lbs/yr Sediments 200 ac. x 1.11 lbs/ac/yr x 0.03 (3%) = 6.66 lbs/yr TP	37,170 lbs yr - 166,879 lbs/yr = -129,709 lbs/yr Sediments 6.66 lbs/yr- 57.1 lbs/yr = -50.44 lbs/yr TP
2. Converting exiting impervious parking lots (2 sites, 10 Ac.) to permeable pavement. Sites have A soils.	85% TSS removal 80% TP removal	10 ac. x 2065.1 lbs/ac./yr x 0.85 (85%) = 17,553 lbs/yr Sed 10 x 1.11 lbs/ac/yr x 0.80 (80%) = 8.88 lbs/yr TP	17,553 lbs/yr – 129,709 lbs/yr. = -112,156 lbs/yr Sediments 8.88 lbs/yr- 50.44 lbs/yr = -41.56 lbs/yr TP

Example Case Study – CBPRP – Cumberland County

BMP Option	BMP Effectiveness	Estimated Sediment & TP Reduction	Deficit (-)/ Surplus (+)
3. Four Regional Subsurface Mixed Media Infiltration system for total of 50 ac. Impervious area	95% TSS removal 85% TP removal	50 ac. x 2065.1 lbs/ac./yr x 0.95 (95%) = 98,092 lbs/yr Sediments 50 ac. x 1.11 lbs/ac/yr x 0.85 (85%) = 47.17 lbs/yr TP	98,092 lbs/yr – 112,156 lbs/yr. = -14,064 lbs/yr Sediments 47.17 lbs/yr- 41.56 lbs/yr = +5.61 lbs/yr TP
4.Urban Stream Restoration - 400 linear feet	44 lbs TSS/ft 0.068lbs/ft/yr TP	44 lbs/ft x 400 ft = 17,600 lbs sediment	17,600 lbs/yr – 14,064 lbs/yr. = +3, 536lbs/yr Sediments

Contact Us

Need more information on the MS4 permit requirements or Program implementation? Contact us.

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Discussion

MS4 Related Resources

MS4 Resources

2018 General Permit Package (All forms & Worksheets) :
http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9457

PA DEP MS4 Resources (eMapPA, Urbanized Area, MCMs):
http://www.dep.pa.gov/Business/Water/PointNonPointMgmt/StormwaterMgmt/Stormwater/Pages/MS4-Resources.aspx

PADEP MS4 Training Registration:
http://files.dep.state.pa.us/Water/BPNPSM/StormwaterManagement/MunicipalStormwater/2016MS4NOIWorkshopRegistrationForm_revised.pdf

Center for Watershed Resources (Pollutant load calculators, library) : http://www.cwp.org/pollution-calculators/

Chesapeake Bay Program – BMP Expert Panel: http://www.cwp.org/pollution-calculators/

US EPA MS4 Resources: https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#overview