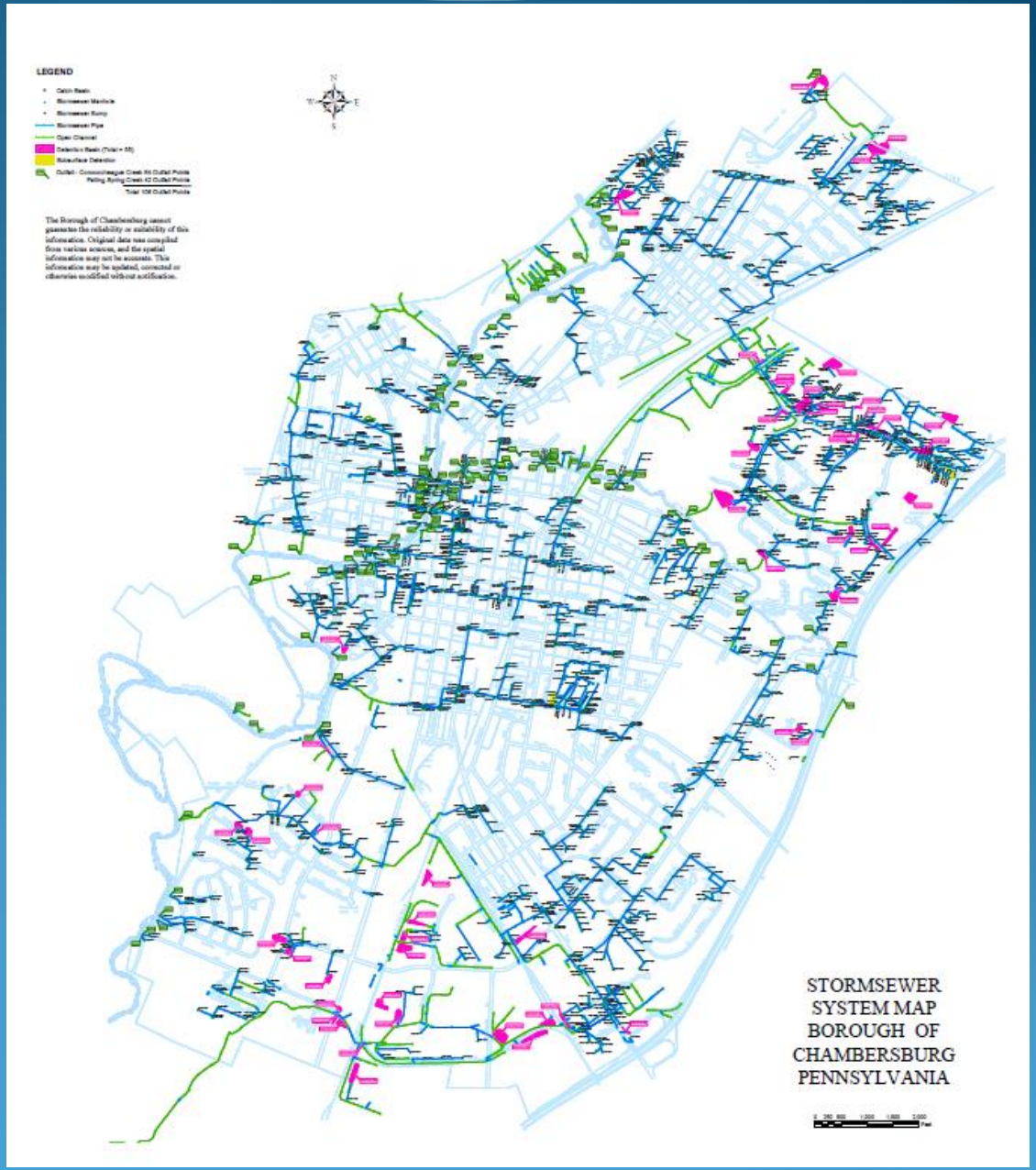
Chesapeake Bay Pollutant Reduction Plan

Town Council

July 28, 2014

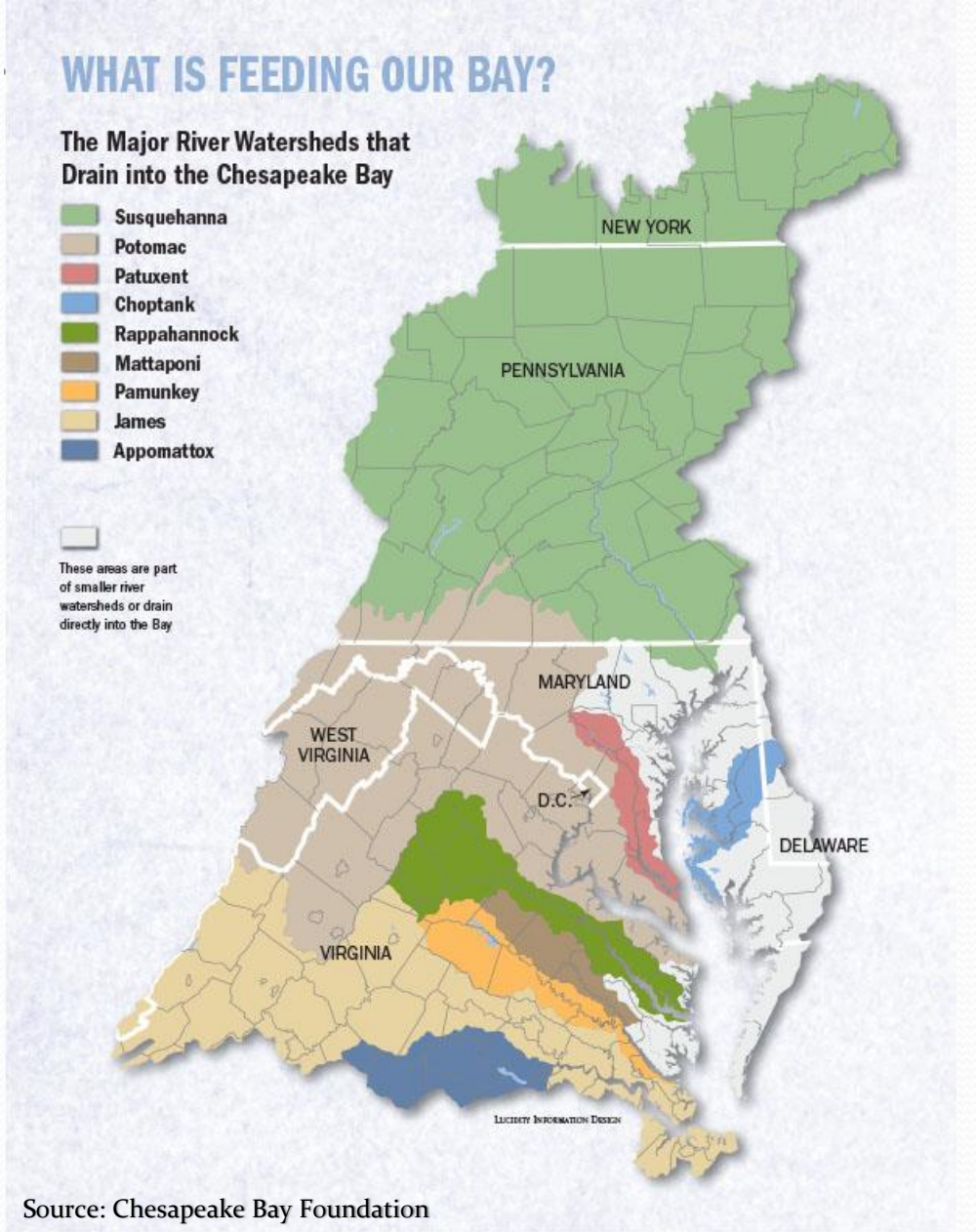
MS4: Municipal Separate Storm Sewer System

- Chambersburg MS4 Permit commenced on August 1, 2013 and will expire on July 31, 2018.
- The Borough regulates stormwater according to Stormwater Management Ordinance adopted by Town Council on June 20, 2004 and amended on July 14, 2014, as required by MS4 Permit.
- MS4 Permit also requires submission of a Chesapeake Bay Pollutant Reduction Plan to the Pennsylvania Department of Environmental Protection no later than August 1, 2014.



Plan Objective:

Implement Best Management Practices (BMPs) to produce tangible improvements to the quality of stormwater discharges in the Chesapeake Bay Watershed.



Source: Chesapeake Bay Foundation

What is a Best Management Practice?

Activities, structures, facilities, designs, measures, procedures, and techniques used to control, maintain or improve the quantity and quality of surface runoff; to manage stormwater impacts from regulated activities; to meet state water quality requirements; to promote groundwater recharge; and to otherwise meet the purposes of this Ordinance.

Source: Code of the Borough of Chambersburg
Chapter 251: Stormwater Management

Pennsylvania Stormwater Best Management Practices Manual

Chapter 3

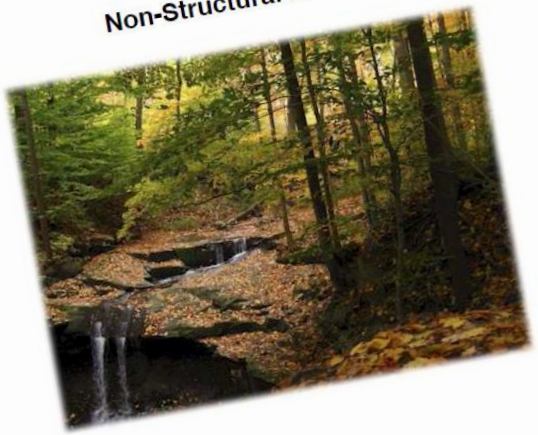
Stormwater Management Principles and Recommended Control Guidelines

363-0300-002 / December 30, 2006

Pennsylvania Stormwater Best Management Practices Manual

Chapter 5

Non-Structural BMPs



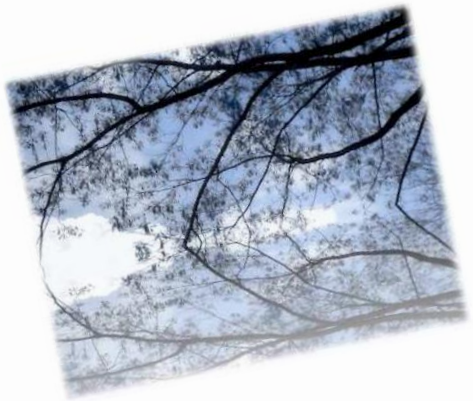
363-0300-002 / December 30, 2006

Chapter 5 Non-Structural BMPs

Pennsylvania Stormwater Best Management Practices Manual

Chapter 6

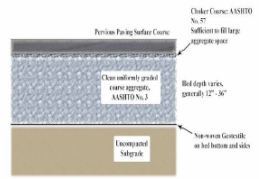
Structural BMPs



363-0300-002 / December 30, 2006

Chapter 6 Structural BMPs

BMP 6.4.1: Pervious Pavement with Infiltration Bed



Pervious pavement consists of a permeable surface course underlain by a uniformly-graded stone bed which provides temporary storage for peak rate control and promotes infiltration. The surface course may consist of porous asphalt, porous concrete, or various porous structural pavers laid on uncompacted soil.

Key Design Elements

- Almost entirely for peak rate control
- Water quality and quantity are not addressed
- Short duration storage; rapid restoration of primary uses
- Minimize safety risks, potential property damage, and user inconvenience
- Emergency overflows
- Maximum ponding depths
- Flow control structures
- Adequate surface slope to outlet

Potential Applications

Residential: Limited
Commercial: Yes
Ultra Urban: Yes
Industrial: Yes
Retrofit: Yes
Highway/Road: Limited

Stormwater Functions

Volume Reduction: Medium
Recharge: Medium
Peak Rate Control: Medium
Water Quality: Medium

Water Quality Functions

TSS: 85%
TP: 85%
NO3: 30%

Other Considerations

- **Protocol 1. Site Evaluation and Soil Infiltration Testing** and **Protocol 2. Infiltration Systems Guidelines** should be followed, see Appendix C

BMP 6.4.2: Infiltration Basin

An Infiltration Basin is a shallow impoundment that stores and infiltrates runoff over a level, uncompacted, (preferably undisturbed area) with relatively permeable soils.

Key Design Elements

- Maintain a minimum 2-foot separation to bedrock and seasonally high water table, provide distributed infiltration area (5:1 impervious area to infiltration area - maximum), site on natural, uncompacted soils with acceptable infiltration capacity, and follow other guidelines described in Protocol 2: Infiltration Systems Guidelines
- Uncompacted sub-grade
- Infiltration Guidelines and Soil Testing Protocols apply
- Preserve existing vegetation, if possible
- Design to hold/infiltrate volume difference in 2-yr storm or 1.5" storm
- Provide positive stormwater overflow through engineered outlet structure.
- Do not install on recently placed fill (<5 years).
- Allow 2 ft buffer between bed bottom and seasonal high groundwater table and 2 ft buffer for rock.
- When possible, place on upland soils.
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Potential Applications

Residential: Yes
Commercial: Yes
Ultra Urban: Limited
Industrial: Yes*
Retrofit: Yes
Highway/Road: Limited

* Applicable with specific consideration to design.

Stormwater Functions

Volume Reduction: High
Recharge: High
Peak Rate Control: Med./High
Water Quality: High

Water Quality Functions

TSS: 85%
TP: 85%
NO3: 30%

Other Considerations

- **Protocol 1. Site Evaluation and Soil Infiltration Testing** and **Protocol 2. Infiltration Systems Guidelines** should be followed, see Appendix C

BMP 6.4.8: Vegetated Swale

A Vegetated Swale is a broad, shallow, trapezoidal or parabolic channel, densely planted with a variety of trees, shrubs, and/or grasses. It is designed to attenuate and in some cases infiltrate runoff volume from adjacent impervious surfaces, allowing some pollutants to settle out in the process. In steeper slope situations, check dams may be used to further enhance attenuation and infiltration opportunities.

Key Design Elements

- Plant dense, low-growing native vegetation that is water-resistant, drought and salt tolerant, providing substantial pollutant removal capabilities
- Longitudinal slopes range from 1 to 6%
- Side slopes range from 3:1 to 5:1
- Bottom width of 2 to 8 feet
- Check-dams can provide limited detention storage, as well as enhanced volume control through infiltration. Care must be taken to prevent erosion around the dam
- Convey the 10-year storm event with a minimum of 6 inches of freeboard
- Designed for non-erosive velocities up to the 10-year storm event
- Design to aesthetically fit into the landscape, where possible
- Significantly slow the rate of runoff conveyance compared to pipes

Potential Applications

Residential:
Commercial: Yes Yes
Ultra Urban: Limited
Industrial: Yes Yes
Retrofit: Yes
Highway/Road:

Stormwater Functions

Volume Reduction: Low/Med.
Recharge: Low/Med.
Peak Rate Control: Med./High
Water Quality: Med./High

Water Quality Functions

TSS: 50%
TP: 50%
NO3: 20%

Other Considerations

- **Protocol 1. Site Evaluation and Soil Infiltration Testing** and **Protocol 2. Infiltration Systems Guidelines** should be followed whenever infiltration of runoff is desired, see Appendix C

PLAN PROJECTS	BMP
North Chambersburg Improvements Project	Reduce Street Imperviousness, Infiltration Trench, Vegetated Swale
South Street Project	Infiltration Trench
Pine Woods Park	Protect/Conserve/Enhance Riparian Areas and Riparian Buffer Restoration
Reduce Parking Lot Coverage	Reduce Parking Imperviousness
Planned Residential Development	Cluster Uses at Each Site; Build on the Smallest Area Possible
Land Use Permits for New Standalone Parking Lots or Driveways	Code Enforcement

Per Pennsylvania Department of Environmental Protection approval, projects will be implemented by July 31, 2018.

What's next?

The Chesapeake Bay Pollutant Reduction Plan will be submitted to the Pennsylvania Department of Environmental Protection by August 1, 2014.