



WATER RESOURCE CENTER

FACT SHEET

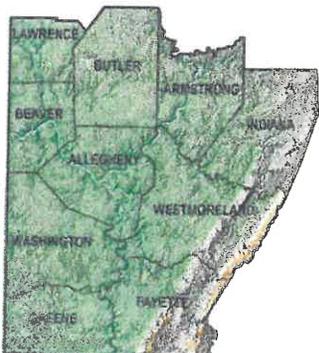
Southwestern Pennsylvania Commission

WATER RESOURCE CENTER

Mission

To promote regional collaboration on water topics; be a leader in facilitating coordination and education; and provide technical assistance to its member governments.

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STRUCTURAL BMPs

STORMWATER MANAGEMENT

Structural Stormwater Best Management Practices (BMPs) are engineered systems that are designed to mitigate the impacts of stormwater. Structural BMPs are effective tools for stormwater management in both development and retrofit situations.

Structural BMPs include systems that rely on the natural processes of soil and vegetation (e.g. vegetated swale) as well as systems that rely on manufactured components (e.g. water quality filters). Structural BMPs can be utilized to reduce volume and peak flows, and to improve water quality.

The Pennsylvania Best Management Practices Manual divides Structural BMPs into the following groups:

- Volume & Peak Rate Reduction by Infiltration BMPs
- Volume & Peak Rate Reduction BMPs
- Runoff Quality & Peak Rate Control BMPs
- Restoration BMPs
- Other BMPs & Related Structural Measures



Volume & Peak Rate Reduction by Infiltration BMPs

- ◆ Infiltration Basin
- ◆ Subsurface Infiltration Bed
- ◆ Infiltration Trench
- ◆ Rain Garden / Bioretention
- ◆ Dry well / Seepage Pit
- ◆ Constructed Filter
- ◆ Vegetated Swale
- ◆ Vegetated Filter Strip
- ◆ Infiltration Berm & Retentive Grading
- ◆ Pervious Pavement with Infiltration Bed

Volume & Peak Rate Reduction BMPs

- ◆ Vegetated Roof
- ◆ Runoff Capture & Reuse

Other BMPs & Related Structural Measures

- ◆ Level Spreader
- ◆ Special Detention Areas



Constructed wetlands (above) and vegetated swales (top right) remove pollutants, and reduce peak flow rates and runoff volume.

Restoration BMPs

- ◆ Riparian Buffer Restoration
- ◆ Landscape Restoration
- ◆ Soil Amendment & Restoration
- ◆ Floodplain Restoration

Runoff Quality & Peak Rate Control BMPs

- ◆ Constructed Wetland
- ◆ Wet Pond / Retention Basin
- ◆ Dry Extended Detention Basin
- ◆ Water Quality Filters & Hydrodynamic Devices

This information was adapted from the Pennsylvania Stormwater Best Practices Manual. Check out SPC's other fact sheets to learn more about specific BMPs, flooding, and more.

Photos: lowimpactdevelopment.org & ashmedia.org



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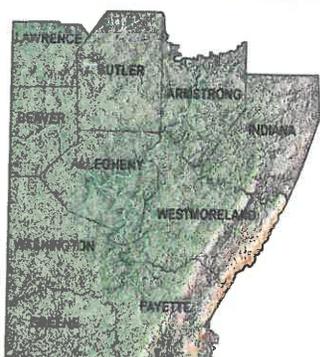
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NON-STRUCTURAL BMPs

STORMWATER MANAGEMENT

Non-Structural Stormwater Best Management Practices (BMPs) focus on the prevention of stormwater generation, therefore effectively reducing runoff volume, and decreasing development costs while increasing property value and marketability.

Non-structural BMPs refer to the suite of options available to avoid and/or minimize damages associated with stormwater volumes and runoff from development. The most effective way to manage stormwater begins with the prevention of problems. It is much more efficient and cost-effective than attempting to correct problems after development has occurred. Utilizing non-structural BMPs is the most important step in managing runoff.

The Pennsylvania Best Management Practices Manual divides Non-Structural BMPs into the following groups:

- ◆ Protect Sensitive and Special Value Resources
- ◆ Cluster and Concentrate
- ◆ Minimize Disturbance and Minimize Maintenance
- ◆ Reduce Impervious Cover
- ◆ Disconnect / Distribute / Decentralize
- ◆ Source Control



Protect Sensitive and Special Value Resources

- ◆ Protect Sensitive / Special Value Features
- ◆ Protect / Conserve / Enhance Riparian Areas
- ◆ Protect / Utilize Natural Flow Pathways in Overall Stormwater Planning and Design

Cluster and Concentrate

- ◆ Cluster Uses at Each Site; Build on Smallest Area Possible
- ◆ Concentrate Uses Area-wide through Smart Growth Practices

Reduce Impervious Cover

- ◆ Reduce Street Imperviousness
- ◆ Reduce Parking Imperviousness

Disconnect / Distribute / Decentralize

- ◆ Rooftop Disconnection
- ◆ Disconnection from Storm Sewers



Protection of sensitive areas, such as this riparian area and steep slopes (top right) and forested wetland (bottom right) are examples of non-structural BMPs. Photos: summitpost.org & Erin Kepple

Minimize Disturbance and Minimize Maintenance

- ◆ Minimize Total Disturbed Area
- ◆ Minimize Soil Compaction in Disturbed Areas
- ◆ Re-Vegetate and Re-Forest Disturbed Areas Using Native Species

Source Control

- ◆ Streetsweeping

Benefits of Non-Structural BMPs

There are environmental, economic, and social benefits associated with incorporating non-structural BMPs into site planning and development. These benefits may include but are not limited to:

Environmental

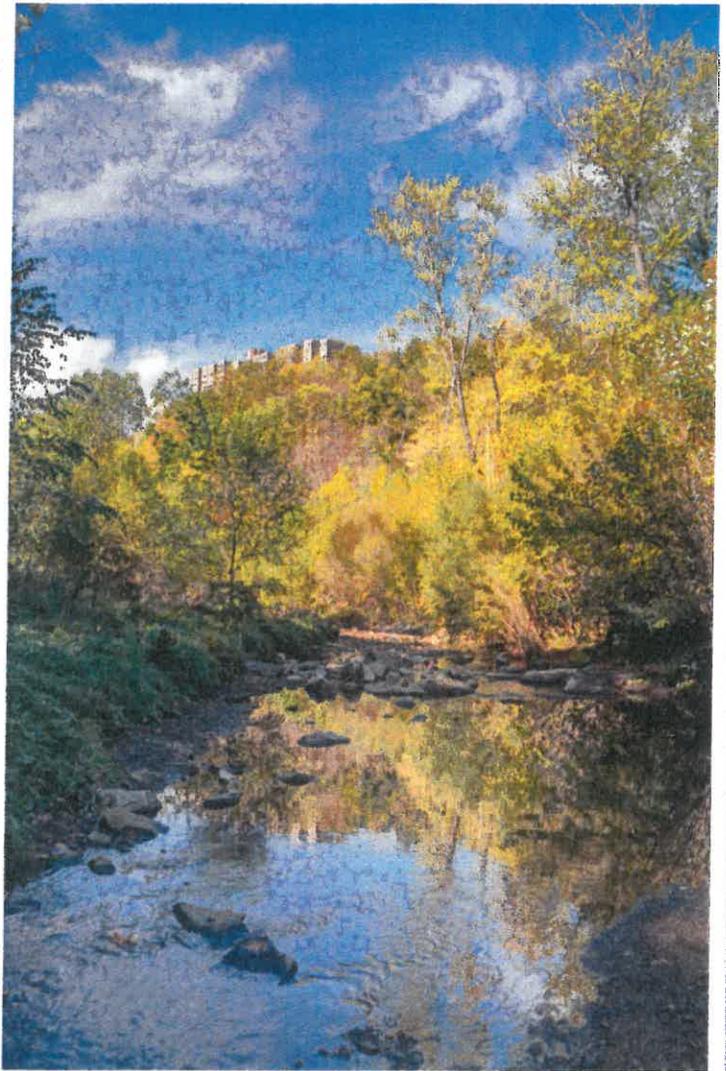
- ◆ Maintains a more natural and functional landscape
- ◆ Promotes harmony between development and existing natural systems
- ◆ Mitigates flooding through reductions of peak flows
- ◆ Retains wildlife habitat and supports biodiversity
- ◆ Reduces soil erosion
- ◆ Protects drinking water supply through groundwater recharge
- ◆ Encourages decentralized treatment, infiltration, and evaporation of precipitation, helping to prevent negative consequences associated with stormwater
- ◆ Protects water quality and aquatic habitat
- ◆ Protects and improves air quality

Economic

- ◆ Reduction in stormwater infrastructure costs
- ◆ Disconnection of impervious surfaces to infiltration areas decreases pressure on existing stormwater or combined sewer system
- ◆ May help to increase community marketability and property values
- ◆ Reduces development cost
- ◆ Rooftop disconnection and use of rain barrels can save money for landscape irrigation

Social

- ◆ Preserves open space
- ◆ Reduces heat island effect
- ◆ Provides recreational opportunities
- ◆ Improves neighborhood aesthetics
- ◆ Reduces noise pollution



Protecting, conserving, and enhancing riparian areas is an important non-structural BMP. Riparian areas are very effective at protecting and improving water quality. This non-structural BMP has many additional stormwater management benefits, including but not limited to: volume reduction, groundwater recharge, and peak rate control.

For More Information

To learn more about non-structural BMPs, stormwater management, and more, visit the following websites:

- ◆ <http://water.epa.gov/infrastructure/greure/index.cfm>
- ◆ http://spcwater.org/ed_bmp_specnonstruct.shtml
- ◆ <http://www.stormwaterpa.org/non-structural-bmps.html>
- ◆ <http://www.bmpdatabase.org/>
- ◆ <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8305>

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