



Stormwater Management: Best Management Practices (BMPs)

Stormwater Runoff

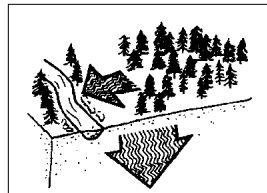
Stormwater runoff is water that flows over land from rainfall or snowmelt, often causing flooding, erosion and pollution problems. It includes flows from storm drains and natural drainage courses serving industrial, commercial, residential, undeveloped, recreational and agricultural lands. According to the Michigan Department of Natural Resources, stormwater runoff is a leading cause of water quality impairment to our local rivers. As a result, people can't eat the fish they catch or swim in many area waters.

Stormwater Management

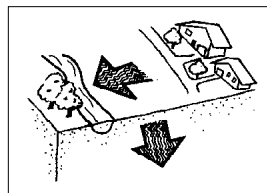
Stormwater management reduces or eliminates the negative impacts of stormwater runoff. Today, stormwater management includes controlling flooding, reducing erosion and improving water quality. This can be accomplished by implementing what are known as Best Management Practices (BMPs). BMPs are structural, vegetative or managerial practices used to treat, prevent or reduce water pollution.

LAND USE IMPACT ON RUNOFF

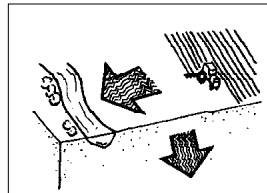
- Forest**
- Low runoff
 - High infiltration



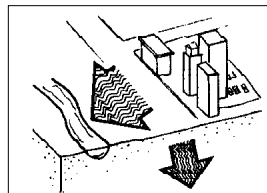
- Residential**
- Moderate runoff
 - Moderate infiltration



- Agriculture**
- Moderate/high runoff
 - Moderate infiltration



- Urban**
- High runoff
 - Low infiltration



Structural BMPs

Extended Detention Ponds. Instead of flowing directly to a river, stormwater can be transported to a detention pond. These ponds hold the water until pollutants settle to the bottom. The water is then released slowly into the river, reducing flooding and pollution in the rest of the system.

Wet Pond/ Detention Ponds. Wet ponds allow incoming stormwater runoff to replace pond water. When pond water flows out, the new runoff is stored in the pond until the next storm. This system enables many of the runoff pollutants to settle to the bottom of the pond. This prevents pollutants from entering the river, but provides minimal flood protection.

Infiltration Basins. Infiltration basins capture stormwater and store it until some, or all, of the stormwater filters into the surrounding soil. This system is effective for removing fine grained pollutants, but coarse grained pollutants can clog infiltration basins.

Porous Pavement. Porous pavement, such as interlocking tiles or bricks, allows stormwater runoff to infiltrate the pavement and enter the soil. This removes fine grain pollutants and provides erosion control.

Water Quality Inlets Water quality inlets are also known as oil/grease separators. These separators remove sediments, oils and greases from parking lots prior to discharge to the storm drain or infiltration basin.

Source: Adapted from William M Marsh, Environmental Planning.



Vegetative BMPs

Vegetative BMPs include a number of landscaping practices. Grassed swales, or ditches, can be placed in residential areas or in highway medians. This BMP helps reduce peak runoff downstream through infiltration and storage. Filter strips are designed to direct stormwater from impervious areas into a stone trench, which evenly distributes the runoff over a grass strip.

Managerial BMPs

Pollution Prevention Pollution prevention reduces the amount of pollutants contained in stormwater runoff. Common pollution prevention techniques include spill prevention and waste reduction practices.

Benefits of BMPs

Flood control. Implementing BMPs temporarily detains a large portion of the runoff volume and releases it at a slow rate, which limits flooding.

Improved Water Quality. Many stormwater BMPs remove pollutants from the water. Some of the water quality benefits are reduced soil erosion, lower contaminant loadings and cleaner bottom sediments.

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Environmental Amenities. Certain BMPs provide attractive environmental features. For example, shallow marshes and wet ponds can be designed to create wetland habitat or open water areas ideal for use by waterfowl, marsh birds and other wildlife. Some large wet ponds can provide fishing, swimming or skating recreation sites. Pond BMPs can also provide pleasant areas for walking, bird watching or nature hikes.

Choosing a BMP

The advantages and disadvantages of each BMP must be weighed against physical site constraints, management goals (flood control and/or water quality improvements) and costs to determine the optimum approach. The physical characteristics of the drainage area make some BMPs more beneficial than others.

In fully developed areas or on small sites, the use of BMPs that require a lot of land, such as ponds and basins, may not be practical. Vegetative BMPs may not be suitable for some sites due to space limitations and economic restrictions.

Maintaining a BMP

BMPs can be owned by counties, watershed districts, local governments, homeowner associations or the private sector.

Local ordinances are the most common method used to control the operation of stormwater systems, and to establish how stormwater controls will be administered. These ordinances are adopted by governing bodies and, because they are part of the local law, have enforcement power. More importantly, ordinances can generate methods of collecting funds to construct, maintain, operate and expand stormwater management systems.

Demonstration Project Activities

The Rouge River National Wet Weather Demonstration Project is implementing BMPs throughout the Rouge River Watershed including: constructed swales, innovative water quality inlets and detention ponds. Swales are being constructed to treat stormwater runoff from highways, water quality inlets are being installed in parking lots, and existing detention ponds are being monitored and modified to increase the amount of pollutants removed from the stormwater. Resulting water quality improvements will guide implementation of future BMPs throughout the Watershed.

This fact sheet was prepared as part of the Rouge River National Wet Weather Demonstration Project, USEPA grant #X995743-02.

If you have any questions about the Stormwater Management or the Project in general, please call the Rouge Hotline at (888) 223-2363 or visit our web site at <http://www.rouge.com>.

