Stormwater Maintenance Workshop

Why Are We Here?

Stormwater Management in Waukesha County

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Waukesha County Dept. of Parks and Land Use
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Photo Credit: Waukesha County Historical Society

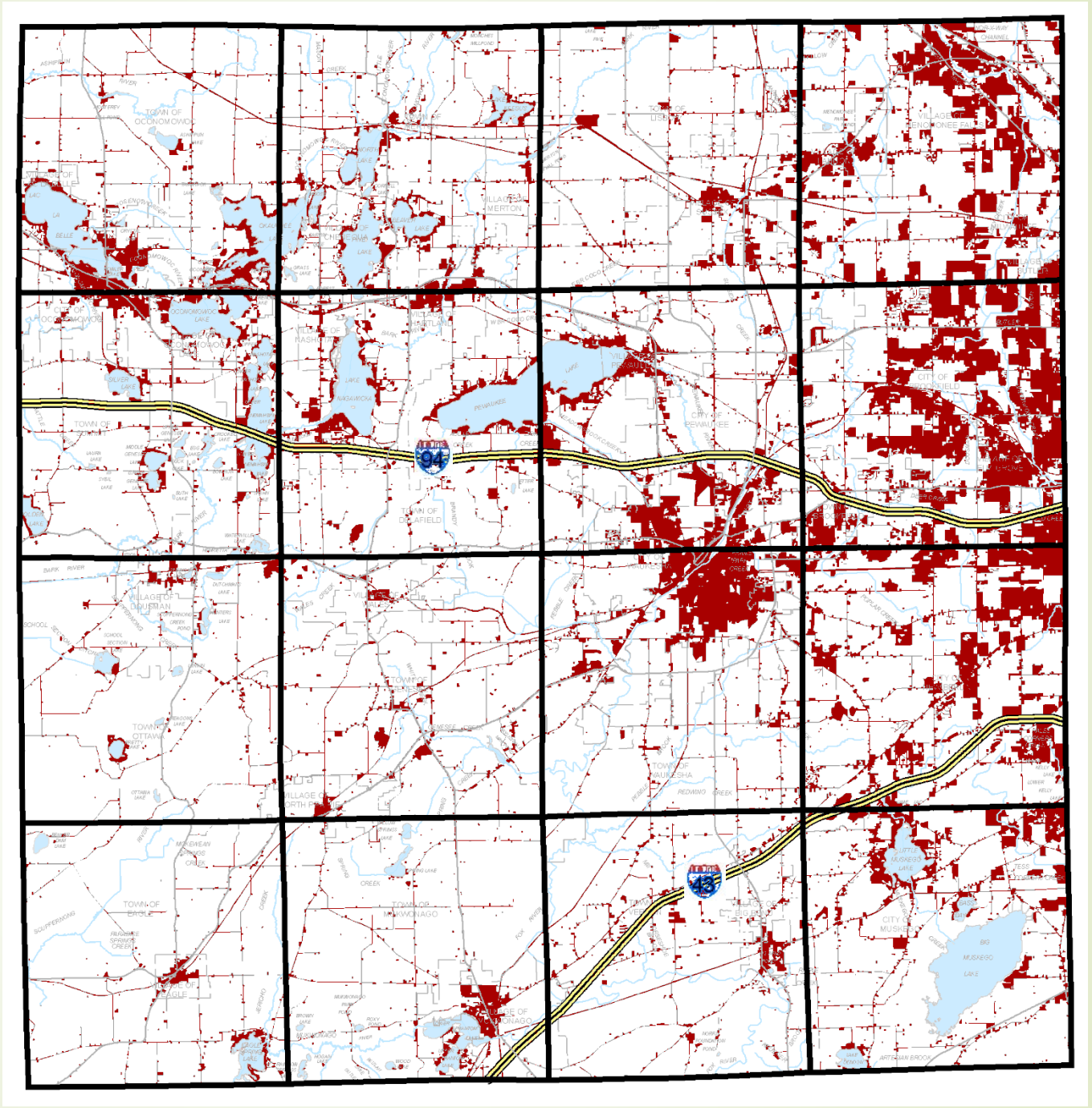





Developed Lands

Waukesha County

1963



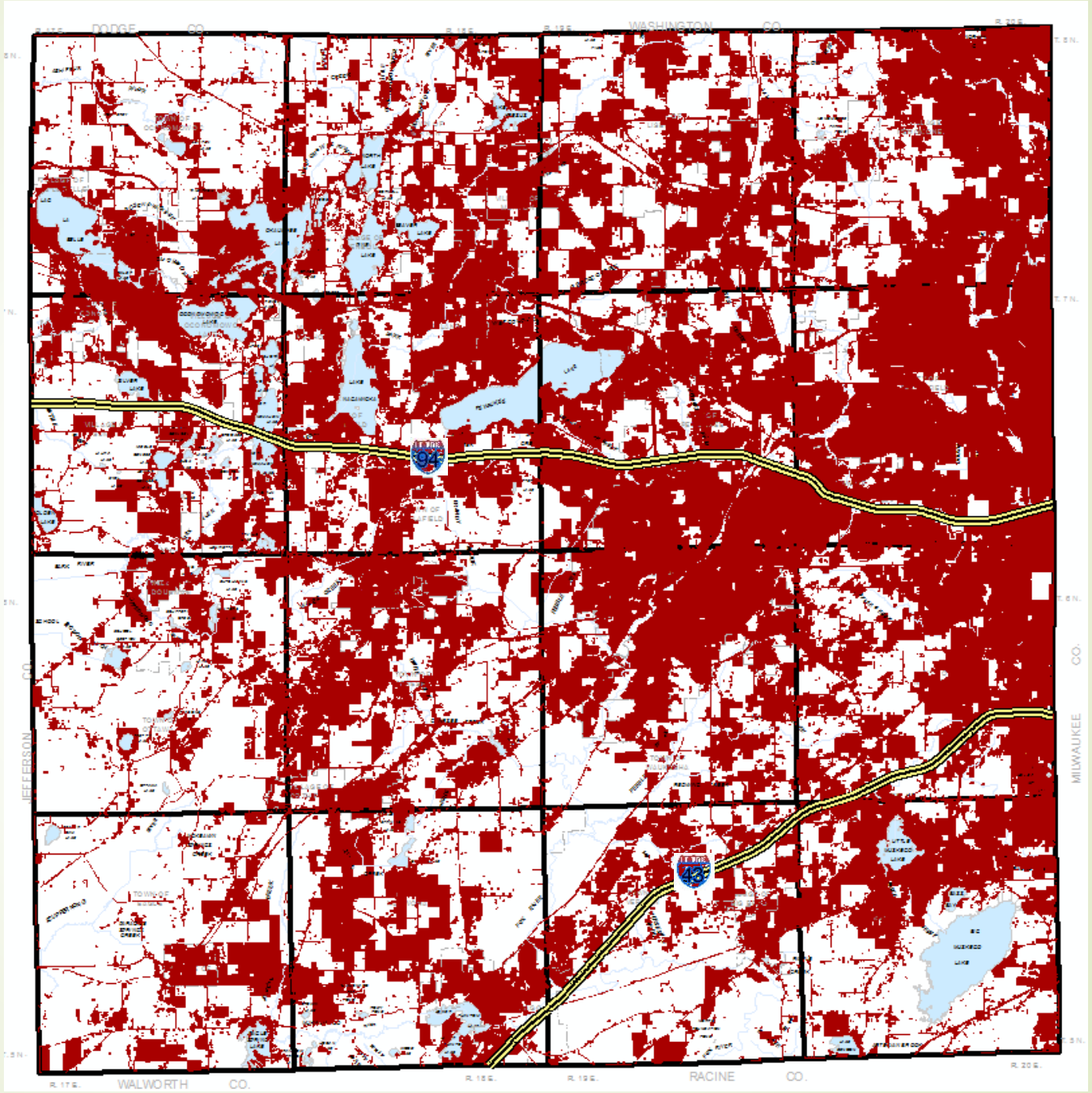
Legend

Urban and residential land uses

Developed Lands

Waukesha County

2010



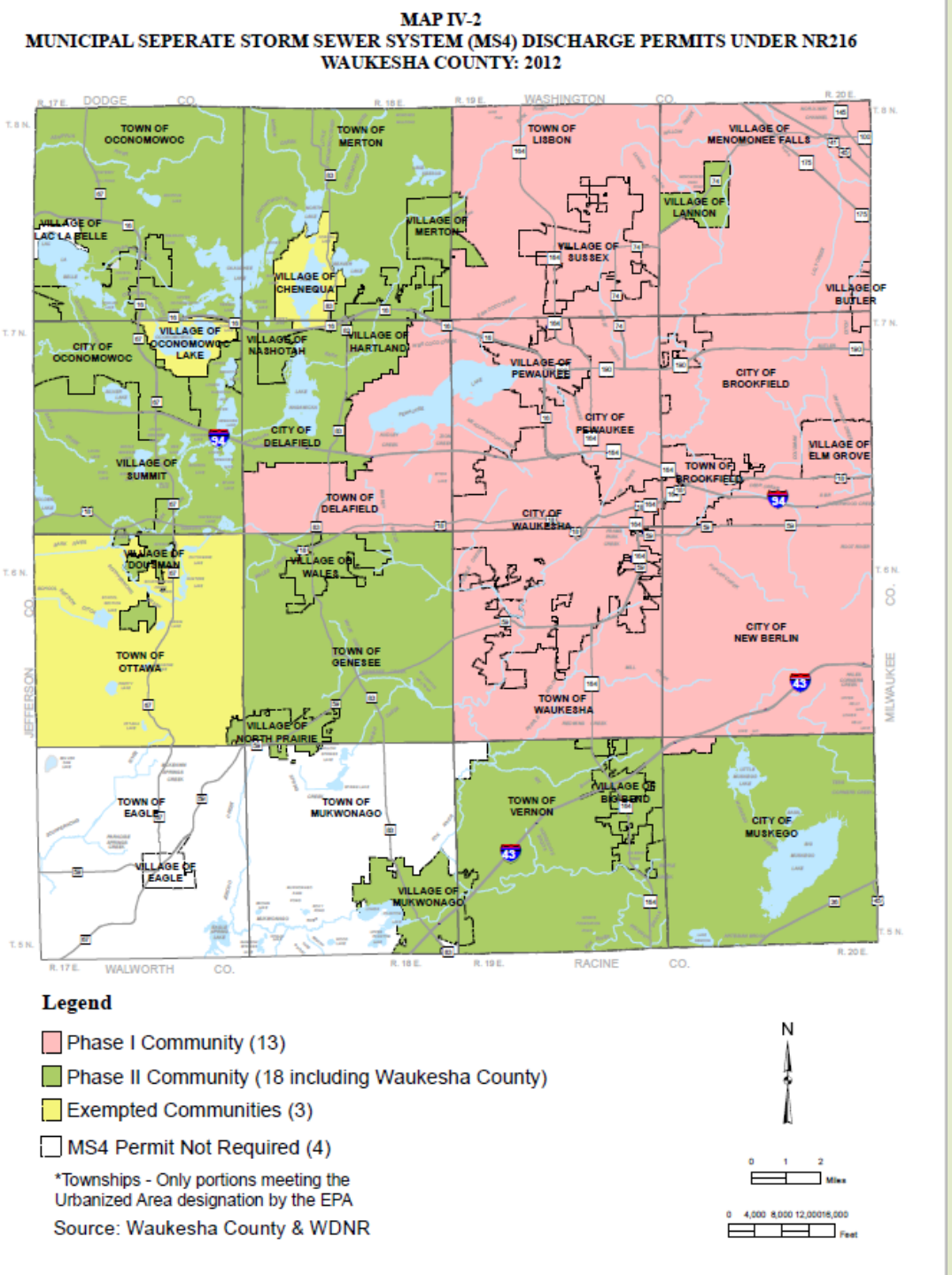
Legend

Urban and residential land uses






31 Communities, including Waukesha County are under MS4 permit requirements.








Waukesha Co. Stormwater & Erosion Control Ordinances

1992 – Construction Site Erosion Control

1998 – Construction Site Erosion Control & Storm Water Management
- Water Quality
- Peak Flows

2005 – Construction Site Erosion Control & Storm Water Management
- Water Quality
- Peak Flows
- Volumes (infiltration/reuse)
- Thermal Impacts

2011 – Authorized to Issue WPDES Permit Coverage

2016 – Stormwater Management and Erosion Control Updates

Erosion Control
- DNR's USLE Spreadsheet

Stormwater Management
- Atlas 14 Rainfall Depths and Distribution

The Waukesha County Board hereby finds that storm water runoff is polluting the water resources of the county. This ordinance is designed to address this concern by requiring all construction sites to obtain a Storm Water Permit and follow a storm water management plan. Failure to comply with this ordinance will result in bad things …..

Terminology

BMP means Best Management Practice

Basin or pond is a general term referring to an area designated for holding stormwater runoff

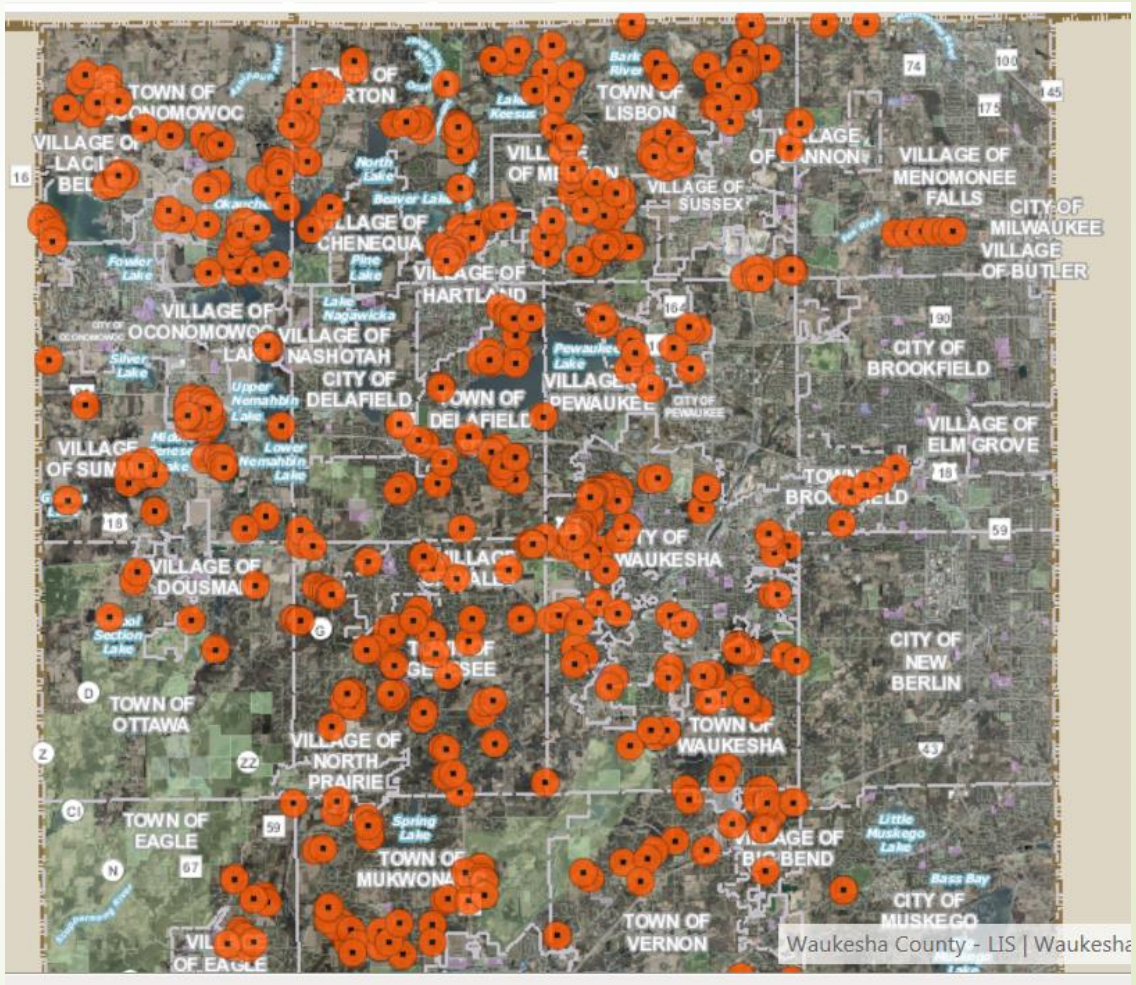
Infiltration means soaking water into the ground

Detention means to temporarily hold runoff and slowly release over time






Mapped Stormwater BMPs In Waukesha county



= BMP Location (~ 650 Practices)

Stormwater Maintenance Agreements

- ✓ Recorded as a deed restriction
- ✓ Before construction begins:
  - ✓ Basin locations
  - ✓ Maintenance plan
- ✓ After construction is done:
  - ✓ As-built plan views and cross-sections
  - ✓ Design summaries
  - ✓ Verification letter
  - ✓ Termination letter
    - ✓ Transfers maintenance responsibility from developer to owner

Once they go in, its only a matter of time!!



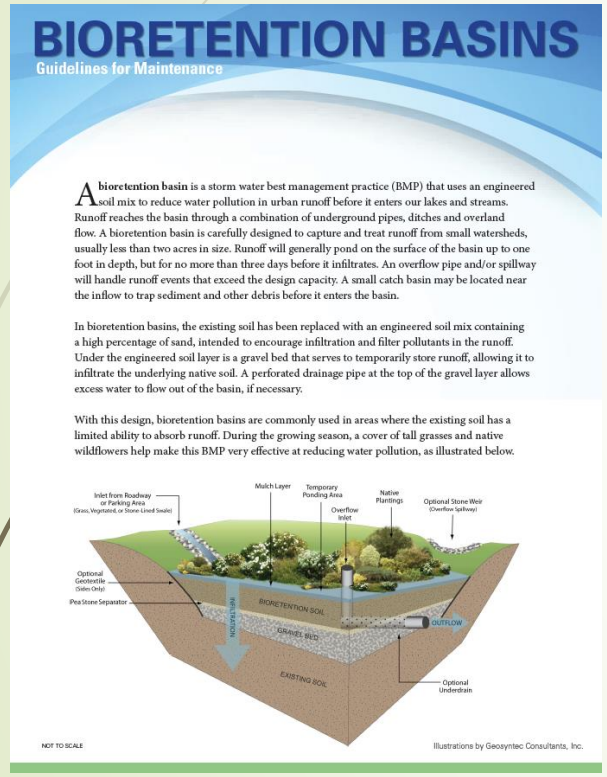



What Kind of Stormwater Management Practices are We Talking About?

- Bioretention Area
- Catch Basin with Sump
- Compensatory Flood Storage
- Constructed Wetland
- Dam
- Dry Detention Basin
- Filter Strip
- Grassed Swale
- Green Roof
- In-ground Water Quality Device
- Infiltration Basin
- Infiltration Basin with Wet Forebay
- Infiltration Trench/Structure
- Kettle
- Mitigation for Zoning
- Native Prairie
- Permanent Sediment Trap
- Permeable Pavers
- Porous Asphalt
- Rain Garden
- Sand Filter
- Underground Storage/Detention
- Wet Detention Basin

BMP Fact Sheets for Maintenance

www.waukeshacounty.gov/cleanwater



BIORETENTION BASINS

Guidelines for Maintenance

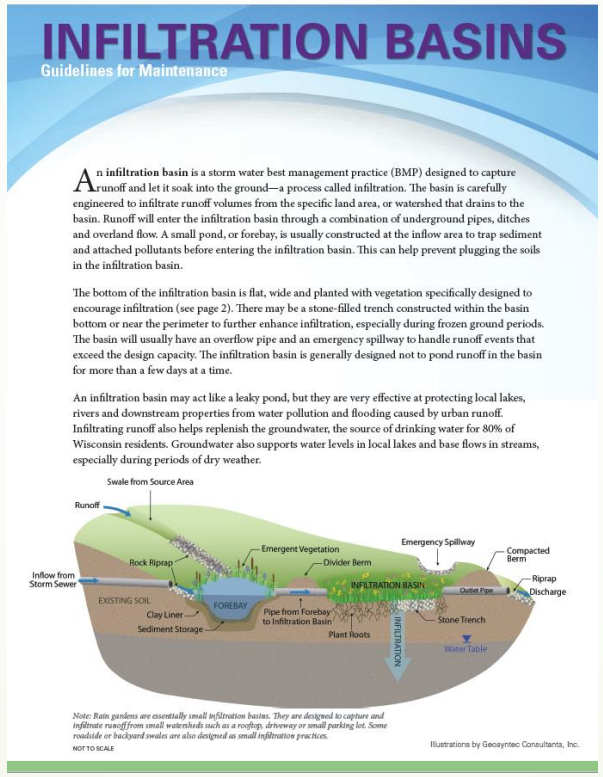
A **bioretention basin** is a storm water best management practice (BMP) that uses an engineered soil mix to reduce water pollution in urban runoff before it enters our lakes and streams. Runoff reaches the basin through a combination of underground pipes, ditches and overland flow. A bioretention basin is carefully designed to capture and treat runoff from small watersheds, usually less than two acres in size. Runoff will generally pond on the surface of the basin up to one foot in depth, but for no more than three days before it infiltrates. An overflow pipe and/or spillway will handle runoff events that exceed the design capacity. A small catch basin may be located near the inflow to trap sediment and other debris before it enters the basin.

In bioretention basins, the existing soil has been replaced with an engineered soil mix containing a high percentage of sand, intended to encourage infiltration and filter pollutants in the runoff. Under the engineered soil layer is a gravel bed that serves to temporarily store runoff, allowing it to infiltrate the underlying native soil. A perforated drainage pipe at the top of the gravel layer allows excess water to flow out of the basin, if necessary.

With this design, bioretention basins are commonly used in areas where the existing soil has a limited ability to absorb runoff. During the growing season, a cover of tall grasses and native wildflowers help make this BMP very effective at reducing water pollution, as illustrated below.

NOT TO SCALE

Illustrations by Geosyntec Consultants, Inc.



INFILTRATION BASINS

Guidelines for Maintenance

An **infiltration basin** is a storm water best management practice (BMP) designed to capture runoff and let it soak into the ground—a process called infiltration. The basin is carefully engineered to infiltrate runoff volumes from the specific land area, or watershed that drains to the basin. Runoff will enter the infiltration basin through a combination of underground pipes, ditches and overland flow. A small pond, or forebay, is usually constructed at the inflow area to trap sediment and attached pollutants before entering the infiltration basin. This can help prevent plugging the soils in the infiltration basin.

The bottom of the infiltration basin is flat, wide and planted with vegetation specifically designed to encourage infiltration (see page 2). There may be a stone-filled trench constructed within the basin bottom or near the perimeter to further enhance infiltration, especially during frozen ground periods. The basin will usually have an overflow pipe and an emergency spillway to handle runoff events that exceed the design capacity. The infiltration basin is generally designed not to pond runoff in the basin for more than a few days at a time.

An infiltration basin may act like a leaky pond, but they are very effective at protecting local lakes, rivers and downstream properties from water pollution and flooding caused by urban runoff. Infiltrating runoff also helps replenish the groundwater, the source of drinking water for 80% of Wisconsin residents. Groundwater also supports water levels in local lakes and base flows in streams, especially during periods of dry weather.

Note: Rain gardens are essentially small infiltration basins. They are designed to capture and infiltrate runoff from small watersheds such as a rooftop, driveway or small parking lot. Some roadside or backyard swales are also designed as small infiltration practices.

NOT TO SCALE

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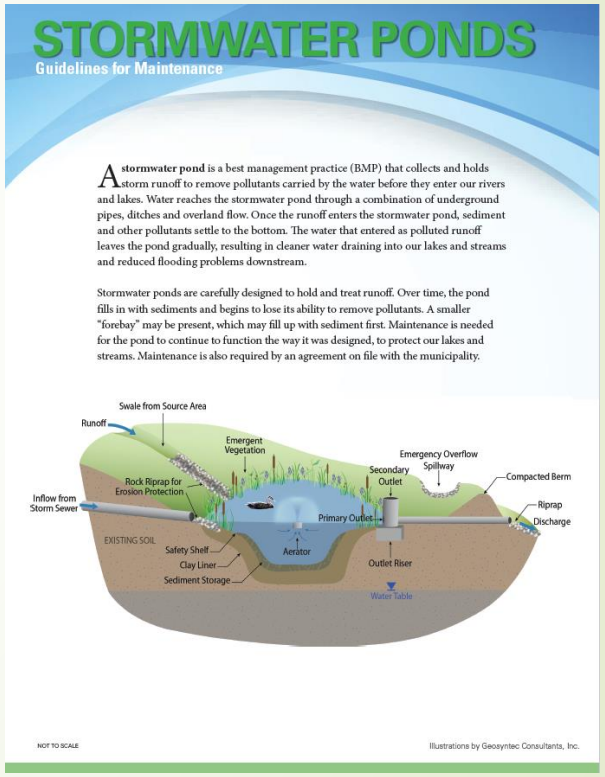


STORMWATER PONDS

Guidelines for Maintenance

A **stormwater pond** is a best management practice (BMP) that collects and holds storm runoff to remove pollutants carried by the water before they enter our rivers and lakes. Water reaches the stormwater pond through a combination of underground pipes, ditches and overland flow. Once the runoff enters the stormwater pond, sediment and other pollutants settle to the bottom. The water that entered as polluted runoff leaves the pond gradually, resulting in cleaner water draining into our lakes and streams and reduced flooding problems downstream.

Stormwater ponds are carefully designed to hold and treat runoff. Over time, the pond fills in with sediments and begins to lose its ability to remove pollutants. A smaller "forebay" may be present, which may fill up with sediment first. Maintenance is needed for the pond to continue to function the way it was designed, to protect our lakes and streams. Maintenance is also required by an agreement on file with the municipality.

NOT TO SCALE

Illustrations by Geosyntec Consultants, Inc.

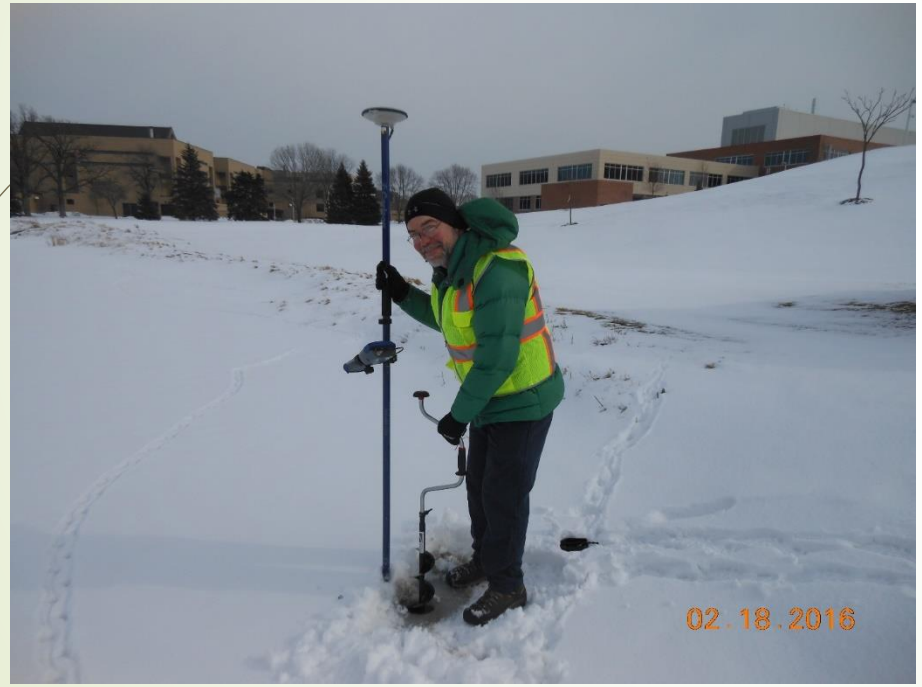
Importance of Maintenance

- Extend the life of your BMP
- Save you money
- Should be budgeted for
- Educate all residents in HOA –simple actions at each home also extends the life of BMP's






Maintenance HOA members can do



- Measure sediment depth: Use an ice auger to drill a hole and insert a pole. If there is less than 3 feet of depth remaining, consult a professional about sediment removal.






Maintenance HOA members can do

- Record water levels on the safety shelf
- Estimate percent weed/algae cover in early and late summer






Maintenance HOA members can do

- Remove vegetation from the outlet pipes and trash rack






Maintenance HOA members can do

- Remove trees and invasive species from the embankments
- Remove trash and litter
- Leave a buffer of cattails unmowed vegetation on the perimeter
- Inspect fencing and/or signage for damage






Maintenance HOA members can do

- If your HOA has someone knowledgeable about native plants, they can help identify weeds to be removed/suppressed






Maintenance HOA members can do

- Plug muskrat holes using mud/cement slurry

Mowing to Control Woody Vegetation

- Mow after July 15
- Once per growing season
- Mow before invasives go to seed (August 15)
- Herbicide to stumps
- **Do not mow** where native plants are established (bottom of bioinfiltration)






Maintenance HOA's should hire out

- Inspect condition of pipes, swales and structures
- Inspect condition of pond liner (if present)
- Inspect embankments for animal damage, soft spots and settling
- Survey permanent pool elevation and sediment depth






Maintenance to Contract Out

- Major erosion repair
- Major tree removal
- Native Plant mowing/prescribed burns
- Muskrat trapping
- Large scale or specialty mowing
- Pond dredging/sediment removal






Annual Inspections & Reporting

- Report your maintenance and inspection to your municipality

Note: Maintenance of a stormwater basin, which includes dredging or grading may need a permit from the County






Simple Actions Everyone Can Take

- Test your soil and apply fertilizer following directions
- Pick up pet waste
- Wash your car on the lawn or at a car wash
- Keep leaves and grass clippings out of the street
- If you have ditches, do not burn in your ditch






Questions?

Thank you!