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- RAIN GARDENS



Welcome to WaterPro!

Timely and targeted communication is everything today. Last summer, we surveyed our readers about NewSplash and were pleased to learn that you like NewSplash and want it to continue.

We also learned that we need to serve our professional reader with more in-depth information about water use issues, MCWD permitting and technical information. As a result, WaterPro, a new special tech section, premieres this issue. It has been written for people in the public and private sectors who deal with land and water use issues, whether for a city planning operation or a new housing development. These are the resource management professionals the District works with to protect and restore the environment.

We also wanted to highlight towns, cities and other organizations that are working with us to restore and protect water quality. This issue features the City of Minnetonka and its dedication to cutting-edge water management planning and Jo Collieran, its new environmental resources coordinator.

You can receive NewSplash and WaterPro on-line. Help us save resources by signing on to our free electronic subscription service on the main page of our website, www.minnehahacreek.org. We hope you find these new and updated information services helpful.

Sincerely,

Eric Evenson, District Administrator,
Minnehaha Creek Watershed District

WaterWise: THE CITY OF MINNETONKA

Environmental respect and far-sighted planning work together to nourish that "Minnetonka feel"

Locals call it "that Minnetonka feel." One senses it driving along the city's rolling, sometimes narrow roads, glimpsing well-spaced homes surrounded by maple, oak, and basswood trees. A view of water, whether it's a creek, pond or lake, is never far away. Although the 26-square-mile city located in the western suburbs of Minneapolis is almost fully developed, one does not feel hemmed in.



Minnetonka grew up around Minnehaha Creek near McGinty Road when a sawmill was established in 1852 to process the nearby wood forest. Named Minnetonka Mills, this was

the first permanent European settlement west of Minneapolis in Hennepin County. Nearly 150 years later, its character is now mainly residential.

"The 'Minnetonka feel' is why many people moved here and continue to live here. They enjoy how the city was and continues to be developed around our natural resources," says Lee Gustafson, Minnetonka City Engineer. "This unique character has been maintained by the far-sighted planning efforts of past and present council members. Protecting these valuable resources requires the city to actually do more than most cities."

The City of Minnetonka, city council members and residents have done many smart things to protect its natural assets, from requiring large minimum lot sizes to steep-slope erosion prevention and tree preservation ordinances. Minnetonka's wetlands were first inventoried in the 1960s and again in the 1980s. "Minnetonka values its natural resources as part of the heritage of the community," says John Gunyou, Minnetonka City Manager. "We have been proactive in protecting our wetland environments even before the enactment of state regulation. The City's council, staff, and residents recognize our natural resources as part of our community infrastructure."

In addition to the wetland inventory, the City of Minnetonka has been recognized by the Minnehaha Creek Watershed District (MCWD) for its exemplary water management plan. "Minnetonka was one of the first cities in the District to develop a water management plan that based its water resource goals on thorough technical findings," says Glenda Spiotta, MCWD Planner and Program Manager.

All cities within the District are required to produce a water management plan to deal with storm water runoff, wetland protection and restoration, and flood control. The District works with cities to provide planning resources and a formal review of each city's plan. Ultimately, each city is responsible for implementing its own plan. "The significant detail in the plan is what sets it

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Continuing best management practices (BMPs)...

THE BIORETENTION CONCEPT: USING PLANTS AND MICROBES TO FILTER & CLEAN STORMWATER IN SMALL-SCALE, LANDSCAPED SETTLING AREAS

(This article is adapted from the Minnesota Urban Small Sites BMP Manual, 2001 and is the third BMP concept featured in MCWD's NewSplash. BMPs are a set of environmentally sustainable, practical approaches to protecting and restoring water sources adopted by public and private sector organizations around the country.)

For the purpose of this article, Bioretention Systems are presented as a general concept, rather than a specific BMP. They can be incorporated into different infiltration or filtration BMP designs, as:

- Infiltration Basins
- Rainwater Gardens (an On-Lot Infiltration System)
- Surface Sand Filters

What are bioretention systems? They can be described as shallow, landscaped depressions commonly located in parking lot islands or within small pockets in residential areas that receive stormwater runoff. Stormwater flows in the bioretention area, collects on the surface, and gradually infiltrates the soil bed. Pollutants are removed by a number of processes including absorption, filtration, volatilization, ion exchange and decomposition.

Filtered runoff can either infiltrate into the surrounding soil (functioning as an infiltration basin or rainwater garden), or be collected by an under-drain system and discharged to the storm sewer system or directly to receiving waters (functioning like a surface sand filter). Runoff from larger storms is generally diverted past the area to the storm drain system.

HERE ARE THREE TYPES OF BIORETENTION AREAS:

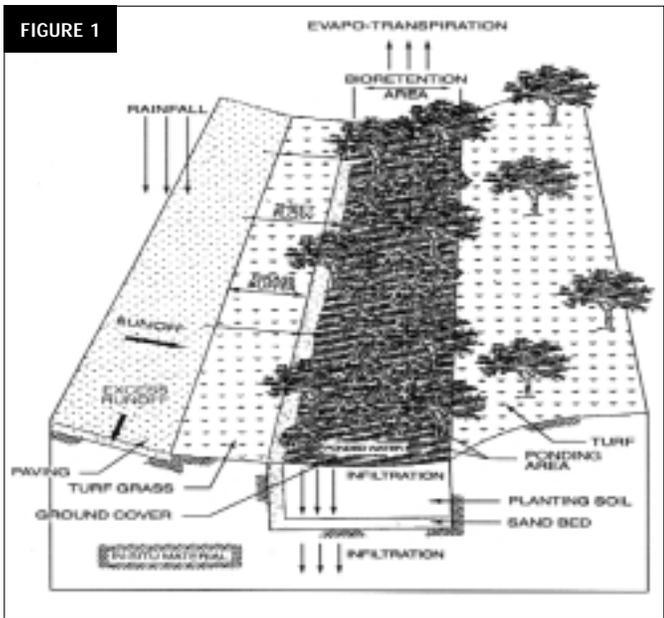


Figure 1: Bioretention Area Conceptual Layout (Functioning like an Infiltration Basin enhanced with planting soil and sand media.) Source: Prince George's County Dept. of Environmental Protection, 1993.

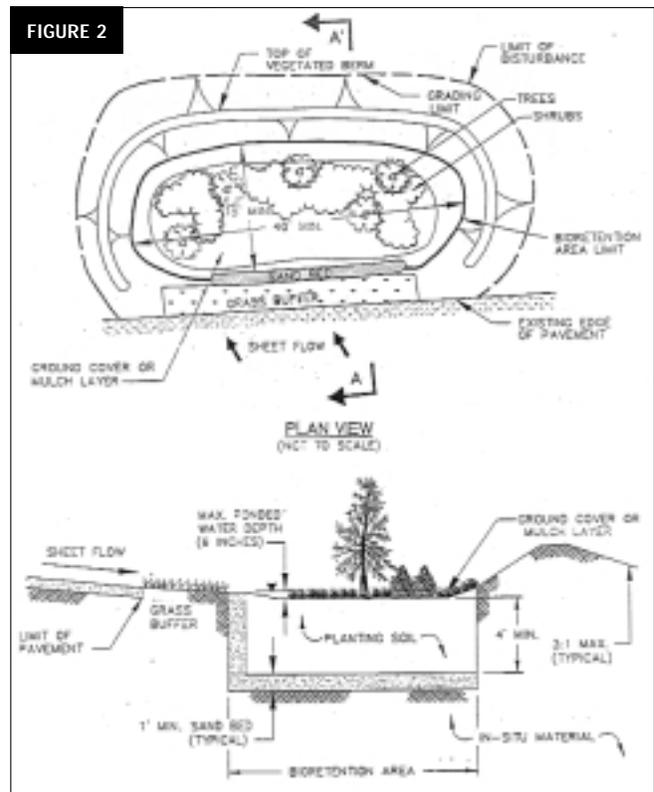


Figure 2: Bioretention Area: Parking Edge and Perimeter Without Curb (Functioning like a Rainwater Garden in a parking lot.) Source: Prince George's County Department of Environmental Protection, 1993.

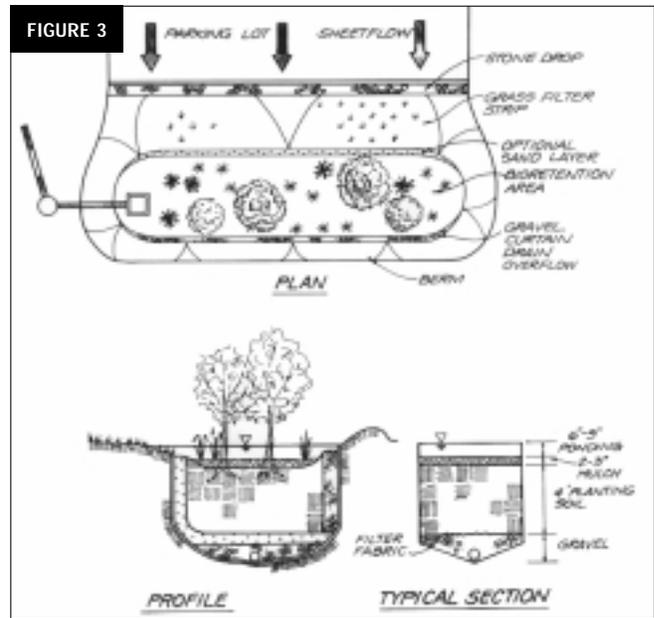


Figure 3: Bioretention Area: Parking Edge and Perimeter Without Curb (Functioning like a Surface Sand Filter with planting soil comprising most of the filter's cross section.) Source: Center for Watershed Protection, 1996.

BENEFITS to using these bioretention systems:

- ▶ More likely to be aesthetically pleasing because of the incorporation of plants when properly designed and maintained.
- ▶ Reduces the volume of runoff from a drainage area.
- ▶ Can be very effective for removing fine sediment, trace metals, nutrients, bacteria and organics
- ▶ Layout of bioretention facilities can be very flexible and the selection of plant species can provide for a wide variety of landscape designs.
- ▶ Can be applied in many different climates and geologic environments, with some minor design modifications.
- ▶ Ideally suited to many highly impervious areas, such as parking lots.
- ▶ Reduces the size and cost of downstream stormwater control facilities and/or storm drain systems by infiltrating stormwater in upland areas.
- ▶ Reduces downstream flooding & protects streambank integrity.
- ▶ Provides groundwater recharge & baseflow in nearby streams.
- ▶ Reduces local flooding.
- ▶ Can be used as a stormwater retrofit, by modifying existing landscaped areas, or if a parking lot is being resurfaced.

LIMITATIONS to using these bioretention systems:

- ▶ Cannot be used to treat drainage areas, limiting their usefulness for some sites.
- ▶ Susceptible to clogging by sediment and therefore pre-treatment is a necessary part of design.
- ▶ Tend to consume space (usually around five-percent of the area that drains to them).
- ▶ Incorporating bioretention into a parking lot design may reduce the number of parking spaces available.
- ▶ Construction cost can be relatively high compared with other stormwater treatment practices.

For other considerations on Site Design, Design Components, Plant List and Maintenance go to the MCWD website. Just visit www.minnehahacreek.org, click on the Urban Small Sites BMP Manual on the homepage under What's New!, click on Best Management Practices at top of page, click on "click here to view" under Additional Resources at the page top, scroll down left side of page to the chapter on Stormwater Treatment BMPs Infiltration System; each chapter is in PDF format and may be downloaded chapter by chapter at no cost.

"RAIN GARDEN" MODELS TO BE TESTED AT THE MINNESOTA LANDSCAPE ARBORETUM IN 2002

MCWD partners with Arboretum Foundation, to help fund the construction of a parking lot "Rain Garden"

The idea of a rain garden conjures up images of paradise in the tropics. But at the Minnesota Landscape Arboretum in Chanhassen, test rain gardens will be much more down to earth as hard-working stormwater runoff cleaners built next to a new parking lot.

In partnership with the MCWD, the Arboretum Foundation will build a "rain garden" demonstration site next to a new parking area near the recently expanded Learning Center.

Designed to compare methods of treating stormwater, the demonstration site is slated for completion in fall 2002. Once the rain gardens are put in, educational signage will be installed on site. Homeowners, commercial and residential builders and developers, neighborhood and lake associations, city staff, architects, engineers, watersheds, hydrologists, government and agency officials are expected to visit the test rain gardens. Five clearly defined, adjacent areas of equal size will each receive a different level of runoff infiltration. Each area will drain to its own ponding area (or sump) where the runoff can be observed and compared.

The five test areas are:

- 1. Bituminous parking area with adjacent paved slope, concrete curb and gutter, paved filter area, a worst-case scenario included for comparison purposes.*
- 2. Bituminous parking area flush with adjacent lawn slope and lawn filter area.*
- 3. Bituminous parking area with vegetated islands, adjacent vegetated slope and lawn filter area.*
- 4. Bituminous parking area with adjacent vegetated slope and vegetated filter area.*
- 5. Permeable pavement or "grasscrete" parking area with adjacent vegetated slope and vegetated filter area.*

The installation process will be documented. Photographs and written observations will be recorded during and after rains. Each ponding area will be designed so that accurate measurements can be taken. In addition, costs for maintaining each segment of the demonstration site will be tracked, allowing for a realistic cost/benefit analysis.



JO COLLERAN, MINNETONKA'S ENVIRONMENTAL RESOURCES COORDINATOR, FILLS MULTI-FACETED POSITION

"We can all make a difference in our own backyards. This includes the city's backyard, too," says Colleran.

Jo Colleran's job as Minnetonka's environmental resources coordinator requires her to be an advocate, a diplomat, a planner, an educator and a good citizen. Colleran works with Minnetonka city departments, environmental organizations, residents, developers, schools, and community groups on environmental issues, city ordinances, and education. "I have my hands in dozens of different projects," she says.

"The need for this position has been growing for quite some time," says Minnetonka City Engineer Lee Gustafson. "The job encompasses water resource education, but Jo also coordinates erosion control, conservation developments, and natural resource protection."

"We hired Jo to help promote the city's attitude of environmental stewardship, and to implement a natural resource-based education program," says Minnetonka City Manager John Gunyou. "Our hope is that the community will become even more engaged in our natural resource issues."

Prior to her job with the City of Minnetonka, Colleran worked as natural resources coordinator for 12 years with the City of Apple Valley. Her professional education and training includes biology, environmental science, and ecological technical training. Based in the city's planning department, Colleran serves as a liaison between departments. "We have more than 200 terrific employees here in different departments. My goal is to get departments talking to each other about common environmental concerns."

Colleran helps departments consider better environmental approaches to problems. For example, when Minnetonka Public Works needed to create parking space for its new facility, Colleran worked with Minnetonka Operations Manager Brian Wagstrom to acquire a \$50,000 Metropolitan Council grant to design and build three rain gardens to clean storm water run-off generated by the parking lot. (Rain gardens are naturally landscaped, shallow areas that capture and filter stormwater runoff.)

With completion scheduled for next fall, the three rain gardens will be built at the new operations and maintenance facility located on Minnetonka Boulevard, just west of Hopkins Crossroads (County Road 73). It will be adjacent to a cattail marsh that feeds into Minnehaha Creek. The rain garden project will also serve as an environmental education partnership with the Met Council, the Hennepin Conservation District, and the MCWD.

"The city's rain garden will be a visible working model. We hope it will inspire residents to consider similar approaches on a smaller scale for their own property in dealing with storm water runoff," says Colleran.

Colleran is keenly aware of water issues facing Minnetonka and the watersheds within city boundaries. "People don't generally understand that stormwater is not treated at a plant the way sanitary sewer water is treated. What runs off people's yards and driveways goes right into the creeks and lakes in Minnetonka. An important part of my job is not only to make people aware of these facts but to give them options to change things for the better in their backyards."

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apart from other plans," says Gustafson.

"Wetlands were classified and all water bodies were examined to determine if improvements were needed. Potential water-quality pond locations were also identified. The Minnehaha Creek Watershed District provided valuable feedback for ways to make it better."

Minnetonka lies at a crossroads of four watersheds, including Riley-Purgatory Creek, Nine Mile Creek, Bassett Creek, and Minnehaha Creek. This makes it extremely important for the city to be environmentally sensitive. "Other cities such as Eden Prairie have taken our water management plan to use as a template," says Jennifer Posma, Minnetonka Assistant City Engineer. "Our plan recognizes that we are a developed community with storm water issues. We need far-reaching strategies to preserve water quality. If there are gaps in our plan, for example with grading and erosion issues, we write an ordinance to deal with them following the rules set out by the District. This gives us guidelines and independence at the same time."

Last fall the city passed a \$15 million referendum for parks renewal and open space assessment. City residents and visitors now enjoy 13 major parks and many lakes, including Lake Minnetonka and miles of a regional trail system. "We want to maintain that Minnetonka feel," said Posma. "We will be very thoughtful in this planning process. We want to do right by our community and natural areas." The open space planning process, to take place over the next six years, will look at property easements, floodplains, wetlands, ponding areas, natural corridors and forest fragmentation. The city's natural inventory will also be upgraded.

"We continually try to balance the needs of a developed community with the preservation and enhancement of these natural resources," says Gunyou. "Our residents have expressed their commitment to our natural environment by recently passing this referendum for parks renewal and open space. This will assist the City in implementing conservation developments and acquiring parcels of land that hold an important ecological value. The City of Minnetonka is very proud of its natural environment and will continue to work to preserve and enhance it."