



**MINNEHAHA CREEK
WATERSHED DISTRICT**

Inspection Guide

Stormwater Ponds, Wet Ponds, Retention Ponds, NURP Ponds



Maintenance of stormwater management structures is essential for keeping nearby lakes, wetlands, and streams within the Minnehaha Creek Watershed District (MCWD) clean. A poorly maintained and failing best management practice (BMP) provides little to no water quality benefit. BMPs are used to mitigate the negative effects of development by storage, infiltration, and/or filtration of stormwater runoff before it reaches valuable waterbodies.

Key Terms



BMPs (Best Management Practices) are structures or techniques used to reduce the impacts of stormwater runoff. This runoff often contains pollutants or flows at rates that negatively affect water bodies downstream.



Compaction is the process by which the porosity of a given form of sediment is decreased as a result of its mineral grains being squeezed together by the weight of overlying sediment or by mechanical means.



Erosion is the process by which rocks, sediments, and soils are worn away by water and wind. Erosion also results in the displacement of this material to a new location.



Gullies or channelization is the formation of a ditch or channel from running water.



Impervious Surfaces are hard surfaces through which water cannot pass. Instead, the water simply runs off these surfaces. Examples include: most streets, driveways, sidewalks, and highly compacted soils.



Sediment is the weathered fragments of rock deposited by wind, water, or ice. Most commonly referred to as sand, silt, and clay.

Where does the water that flows into your BMP come from?

1.

In a natural environment, most rainwater soaks into the ground or is captured by trees and other plants. As land is developed, it is covered by hard surfaces (roads, parking lots and rooftops) that prevent natural infiltration, and allow water to quickly run downstream. This runoff, known as stormwater, carries soil, fertilizer, pet waste, pesticides and debris into lakes, streams and wetlands. In many urban environments, stormwater is managed with storm sewer systems that quickly move stormwater away to prevent localized flooding. However, storm sewers often drain directly into lakes, streams and wetlands, rapidly carrying pollution into our valuable surface waters. To deal with this polluted runoff we use stormwater best management practices (BMPs). They include: ponds, raingardens, porous pavement, green roofs, or other practices that temporarily hold, filter, or reduce stormwater.



This booklet focuses on stormwater ponds, their importance, and how we can keep them maintained to ensure they are protecting our water resources.

Stormwater ponds are engineered basins designed to have a permanent pool of water that can slowly drain or evaporate. They can:

- Prevent flooding by slowing the rate water enters the receiving water bodies and storm sewer system.
- Remove pollutants by holding water until it is displaced by the next storm. During this time, particles and associated pollutants settle to the bottom of the pond.
- Plantings in and around the pond help remove pollutants, especially excess nutrients which at high levels can create algae blooms.

2.

Inlet, outlet, and overflow evaluation

Stormwater ponds have a variety of designs and structures, but most will have three vital components:

- an inlet structure where water flows into the pond
- an outlet in which the water can exit the pond
- an emergency overflow; which provides a path for water to exit the pond during extreme rain events

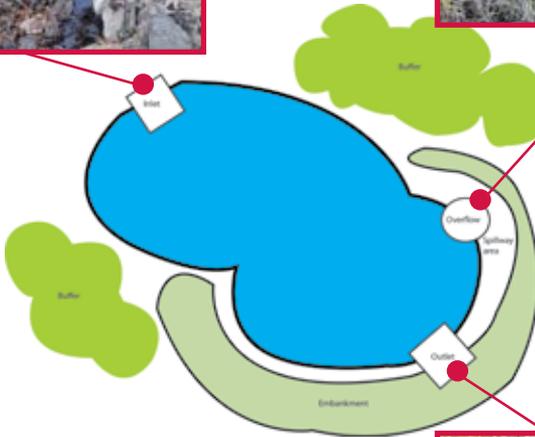
The overflow structure will be surrounded by a spillway, a place for the stormwater pond to hold excess water when the system is either backed up or too full.



Inlet



Overflow



Outlet



What can you do? Take some time to become familiar with your pond. Do you know where the inlet, outlet, and overflow structures are?

Are any of the Inlet, outlet, or overflow structures clogged?

2.a.

In order for water to flow properly through a stormwater pond the inlet, outlet, and overflow should be cleared of dead leaves and plant material.



Clogged overflow and inlet structures.



What can you do? Clear off dead leaves and plant material from inlets, outlets, and overflow.

2.b.

Sediment accumulation at inlets and outlets

Accumulation of sediment is a core purpose of stormwater ponds. It is expected that the pond will slowly fill, but to ensure that water is free to continue to flow into the pond it is vital that inlets are clear of debris and excess sediment.



What can you do? Accumulation like this is problematic, contact someone to have the pond maintained, or take a shovel and clean the inlet and outlet out yourself.

These inlets have significant sediment and organic matter accumulation. To ensure water can continually flow into the pond, they must be cleared out.



Is there vegetation growth obstructing pond structures?

2.c.

Litter, all large debris, and solid waste need to be removed from pond structures to ensure there is no blockage of inlets, outlets, and overflows. When these structures are blocked water will not flow as easily through the pond and back-ups are possible.



The pictures show an overflow being covered by vegetation. This vegetation should be trimmed back and the overflow cleared.



What you can do? Check on the inlet, outlet, and overflow structures to ensure that plants are not blocking waterflow.

3.a.

Sediment (sand, silt, and clay) accumulation

Accumulation of sediment is a core purpose of stormwater ponds and it is expected that the pond will slowly fill. All ponds are designed to collect and store sediment. To ensure that the pond will still provide the level of treatment and storage it was designed to, you will need to have the pond dredged. Obvious indicators, such as sediment piles building so high a bird can sit in the middle of the pond is a good sign that it needs maintenance. The key places to look for accumulation are at the inlets and outlets.



Below are two pictures of ponds with problematic sediment accumulations and should be dredged to ensure the pond can continue to function as designed.



What can you do? Accumulation like this is an indicator that maintenance needs to be performed on the pond. Contact a professional.

Erosion or gully channelization

3.b.

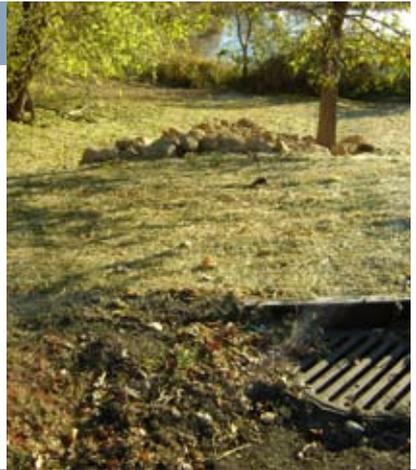
Erosion or gullies occur when the soil is exposed and channels are created by flowing water. This exposed soil is now easily washed away and will add extra sediment to the pond. This happens because water is flowing into the BMP faster than the design predicted, and it is not holding up to large amounts of fast water. It can also indicate that water is entering the BMP in ways that were unintended by the design, or that an animal burrow collapsed.



Before



At this site, the erosion became very serious and needed extensive restructuring.



After

What can you do? The best option is to contact someone at your city or watershed who is familiar with BMPs. Your BMP may be in need of some structural repairs to fix the problem.

3.c.

Litter or debris



Photo Credit: U.S. Fish and Wildlife Service



Garbage needs to be removed from ponds.

Litter, all large debris, and solid waste need to be removed to ensure that there is no blockage of inlets, outlets, and overflows. Debris can block or stop the movement of water into and out of the pond. Additionally, this waste can continue out of the pond to downstream water bodies.

What can you do? Check on your pond inlet and outlet regularly to make sure there is not a garbage pile collecting in it.

Fish in the pond

3.d.



To the left is a picture of fish enjoying their lives in a lake. The types of fish that are introduced to ponds often create murky water with minimal clarity.

Photo Credit: David Wagner

Fish can be problematic in stormwater ponds due to the types of fish that are often introduced into them. Certain types of fish that are in the carp family such as goldfish, common carp, and koi carp all pull up roots of plants which can absorb and use excess nutrients in the pond. Plants have many important functions in a pond and the fish can decrease some of the extra benefits plants can provide.

What can you do? Do not introduce fish or crayfish into the pond. If there are healthy populations of fish contact a professional before you do anything to the pond.



STOP AQUATIC HITCHHIKERS!

Prevent the transport of nuisance species.
Clean all recreational equipment.
www.ProtectYourWaters.net

Ensure you know which species should not be introduced into your pond. This includes aquatic plants and animals. For more information please visit:

For Aquatic Invasive Species information: www.ProtectYourWaters.net
For Responsible Consumer Choices: www.habitattitude.net

3.e.

Algae blooms



Algae blooms are a sign that nutrient levels in your pond have become excessive. In some cases this may be an indicator that the pond needs maintenance. After a large amount of sediment has accumulated in the pond it often can begin to release stored nutrients. This is a good sign that sediment and nutrients are being kept out of our lakes, wetlands, and streams. In order to continue to protect these water bodies we must ensure that the pond is being maintained and functions at a high capacity.

What can you do? Plant a buffer around your pond to capture excess nutrients. Also, ensure that you are not over using fertilizers, pesticides, and other lawn chemicals. Check with a professional to see if your pond is in need of maintenance.

Sheen from oil or gas may be a sign that your pond is in need of maintenance. If it has recently been dredged or has not been identified as needing maintenance, then there is a chance these substances are entering the pond at unusually high quantities and may have a particular source. This is called an illicit discharge. Your pond may need to be restored from excessive exposure to gas and oil. A slight sheen from gas and oil in the pond is not always of great concern. The pond is completing one of its functions keeping this pollution out of our lakes, wetlands, and streams.



What can you do? The best thing to do is to ensure you do not spill oil or gasoline on your driveway. Contact a professional to ensure your pond does not need immediate maintenance.

4.a-c.

Vegetation Evaluation

Using perennial plants around a pond offers many benefits. The first benefit is the roots, which break up the soil and make space for water to easily enter the ground, in addition to stabilizing soil on the banks of the pond. They also create habitats for birds, butterflies, and other wildlife. When the plants around the pond look wilted, have discolored leaves, and have few to no flowering buds or new buds, stunted growth, or plants dying off completely they are under identifiable stress. This can be from a variety of things:

When the plants around the pond look wilted, have discolored leaves, and have few to no flowering buds or new buds, stunted growth, or plants dying off completely they are under identifiable stress. This can be from a variety of things:

- too much or too little water
- a shady plant receiving too much light or vice versa
- a lack of nutrients to support growth
- compacted soil
- toxic pollutants.

What can you do? Keep an eye on your stormwater pond and plant as needed to ensure a healthy buffer around the pond to prevent pests like Canada geese and muskrats. A buffer will also protect the banks from erosion. To get a better idea of what's around your pond, what plants are best for the area, and to learn more about native plants, visit Blue Thumb™'s website.



Pond with a healthy buffer



Pond with turf along banks, signs of excess nutrients and algae growth.



Without healthy vegetation here, the ground was vulnerable, and a gully was formed.



Beaver damage around a pond. They took out several trees and began piling branches around the outlet of the pond. The most important thing in this situation was to ensure that the inlets and outlets remained clear of branches and vegetation was re-introduced.

Animals burrowing in the side of your pond can be an issue for bank de-stabilization. These burrows often create unstable slopes on the banks of your pond. When they collapse they can cause a problem spot that will need some work to fix.



Animal burrows near a pond.

What can you do? The best way to prevent these critters from using your pond as a home is to create a buffer around your pond. A buffer will introduce new wildlife that won't disturb your pond, but will discourage pests like Canada geese and muskrats.

Learn More:



Blue Thumb: Planting for Clean Water

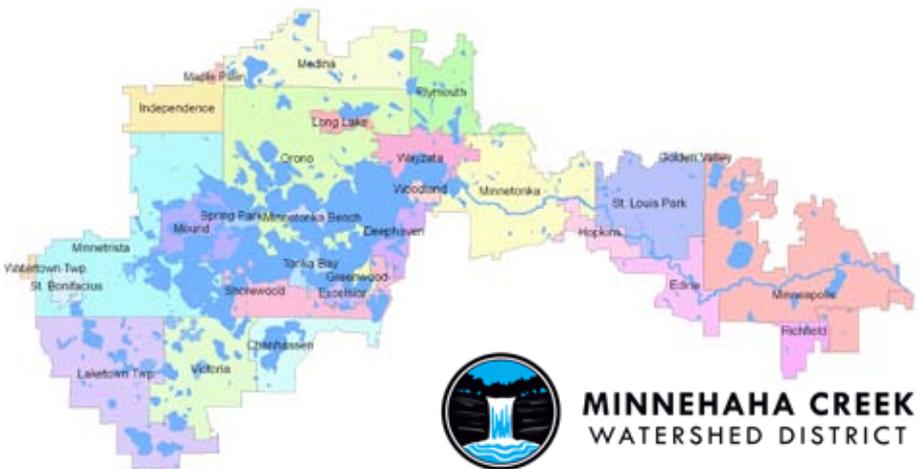
www.bluthumb.org

Blue Thumb is a collaborate program that is a one-stop resources for finding government agencies and non profits, landscape designers and contractors, and nursery and garden centers that specailize in native plants, shoreline stabilization, and raingardens.



U of M Stormwater Assessment and Maintenance
stormwater.saf1.umn.edu

The University of Minnesota Stormwater Assessment and Maintenance site is a great resource for technical information on all stormwater best management practices.



Minnehaha Creek Watershed District

Stormwater BMP Maintenance Program

www.minnehahacreek.org/permits/regulatory-programs/stormwater-bmp-maintenance-program

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