



New State Storm Water Rules:

WHAT MUNICIPALITIES NEED TO KNOW

Storm Water Detention Ponds Site Safety & Design

Storm water detention ponds are widely used and are among the most effective storm water treatment practices. They remove pollutants by slowing the flow of rushing storm water and holding it long enough to allow sediment, nutrients and other pollutants to settle out. They can also help communities meet the “control measures” required by new federal and state regulations.

In addition to removing pollutants, many ponds are designed to create an aesthetic site amenity, wildlife habitat and/or a development focal point or recreational area. Inviting as they may look, However, storm water ponds can also pose hazards including strong currents during storm events, steep side slopes and drop-offs, unsafe winter ice and contaminated water and sediment. This fact sheet discusses the potential safety hazards that can be associated with detention ponds, and techniques to reduce the risk of such hazards.



Many communities with storm sewer systems are now required to obtain state permits before discharging storm water to streams and lakes. These permits are required by federal and state laws, and are administered by the Wisconsin Department of Natural Resources. The permit program has been phased in over time. Phase I mainly affected large communities such as Milwaukee and Madison. Phase II is now affecting many more communities.

Federal rules that require storm water permits are referred to as Phase I or Phase II rules. The state rule is found in Chapter NR 216 of the WI Administrative Code. This fact sheet refers specifically to Wisconsin’s NR 216 rule, but be aware that the “Phase II” term is often used to refer to required permit programs.

Communities must meet the requirements of six “minimum control measures.” These are:

- Post-construction runoff control
- Pollution prevention/Good housekeeping
- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control

Typical Safety Concerns

Steep embankments

Steep embankments can make it difficult to climb out if someone is wading in the pond. Steep embankments can also be hazardous to maintenance staff, such as those operating lawnmowers, pruning or cleaning out inlet/outlet structures.

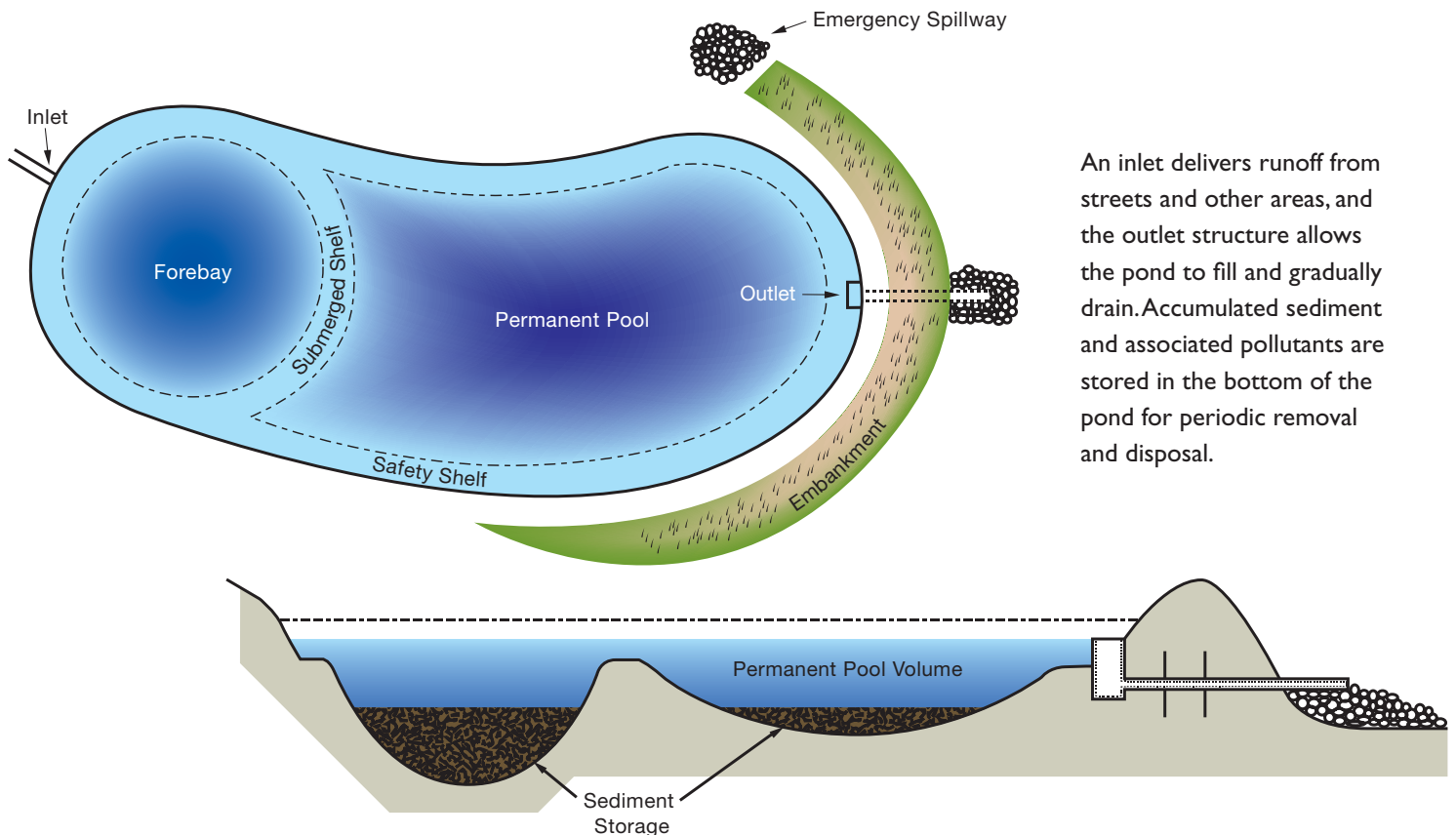
Inlet/Outlet structures

During large rainfall events, strong currents moving through inlet and outlet drains can be hazardous. Outlets that are open and unprotected by trash/safety racks pose a danger. Racks that are too close to the outlet do not sufficiently slow water velocity and could trap a person against them. Storm water ponds are also a collection point for debris of all types.

Unsafe sediment

A properly designed storm water pond protects our lakes and streams by holding runoff contaminants such as sediment and phosphorous. Storm water ponds located in commercial-industrial areas, or near transportation corridors, also concentrate heavy metals like chromium or lead and organic chemicals such as polyaromatic hydrocarbons (PAHs). These ponds can also accumulate enough phosphorus to support toxic algae blooms that can be life-threatening to pets and people.

FIGURE 1 General schematic of a detention pond.



An inlet delivers runoff from streets and other areas, and the outlet structure allows the pond to fill and gradually drain. Accumulated sediment and associated pollutants are stored in the bottom of the pond for periodic removal and disposal.



Reducing Risks through Good Design

Reducing risks starts before preliminary designs are drawn up. Members of the design team must view public safety as an essential design objective. Design staff should review preliminary designs with the facility owner, municipality, state staff and parties responsible for long-term operation and maintenance, and modify as needed. Landscape architects can recommend ways to enhance appearance and improve safety.

Public education

Education of community members, maintenance staff and public officials is critical in reducing safety risks. Designers can fail to anticipate the amount of public use that will occur, especially when the pond is located near a park, playground or bike trail, and fail to provide adequate information and education. A complicating factor is that children and teens may be drawn to detention ponds.

“No Swimming” signs can warn of rapidly rising storm water runoff. Other signs can explain the purpose of the ponds and include a telephone number to call if citizens observe damage, outlet clogging or other problems. Education about possible hazards should include school children and teachers as well as property owner associations.

Pond access

Ponds are often located near parks, trails and other recreational settings, which can encourage the public to view the pond as an amenity, rather than a device treating polluted water. Discouraging people and pets from entering storm water ponds should be a primary design consideration.

Safety shelf

A safety shelf around the perimeter of the detention pond reduces the risk of someone falling into the permanent pool. Wetland plants on the safety shelf combined with shrubs and tall grasses on the slopes and an unmowed buffer around the pond will discourage wading and swimming. This approach can also create wildlife habitat and an attractive natural shoreline.

Outlets

Outlets pose particular risks and merit special attention. When feasible, place the outlet away from areas of heavy public use such as playgrounds, parks, and schools. Screen the outlet so that the public will not be drawn to it. Thick shrubs, grading techniques, and aesthetic fencing or railing can be used. Embankment side slopes and the rack itself should be sloped enough to allow a person to crawl away from the structure when the pond waters rise.

Fencing

Fencing is sometimes considered an additional safeguard at some sites. However, it can hamper mowing, collect debris and detract from the area's open space. Fencing might discourage toddlers and other people from accessing ponds, but can be viewed as a worthy and exciting challenge to some children and older youth. If an accident does occur, the fence may hamper rescue efforts. Generally, fencing should not be necessary if other appropriate design practices are used.





Sweeping parking lots and streets can be part of a larger effort to keep pollutants out of streams and lakes.



Pollution Prevention: *Look at the Big Picture*

An effective storm water pollution prevention plan begins where debris and pollutants are washed into storm drains. Reducing pollutants before they enter the storm water system improves pond performance and lowers maintenance costs. An effective, storm water pollution prevention plan involves community members and governmental officials. Street sweeping, leaf collection, fertilizer and pesticide application restrictions, and commercial and industrial pollution prevention all serve to minimize health related hazards, and extend the service life of storm water detention ponds.

For more information on storm water pollution prevention, see the Wisconsin Department of Natural Resources runoff management website:

www.dnr.wi.gov/runoff/stormwater
or runoffinfo.uwex.edu

This publication is available from county UW-Extension offices, Cooperative Extension Publications 1-877-947-7827, and from DNR Service Centers.

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