



Facts about **Sewage Bypasses**

Nearly all cities in the United States now use centralized sewer and wastewater treatment systems. Modern wastewater systems do a great job of protecting our water.

Nonetheless, sometimes things go wrong. When that happens, it may become necessary to release untreated or partially treated wastewater to the environment. This type of discharge is known as a sewage bypass.

What is a sewage bypass?

Most wastewater treatment systems consist of a collection system and a treatment plant. The collection system, commonly called the “sewer system,” carries wastewater (sewage) from homes and businesses through pipes to the treatment plant. There, the wastewater is treated to remove or neutralize its potentially harmful components, and the treated wastewater is then discharged to local waterways or used for agricultural irrigation.

Almost all wastewater systems depend heavily on water, to both collect and move sewage and to provide a treatment medium. This water is always on the move. Collection systems are designed for the normal volume of sewage generated in the community. They are not normally designed to handle large inflows of water from storms, floods, or infiltration of groundwater.

When a part of the system breaks down or gets overwhelmed by flooding, the wastewater can’t just stop; it has to go somewhere. Usually, it either escapes from the collection system, or the system operators have to release it untreated to the nearest drainageway. While it is sometimes possible to contain relatively small amounts of untreated wastewater and haul it to the treatment facility, the large volumes involved in wet-weather bypasses are often too large to contain. It then becomes necessary to discharge untreated wastewater to the environment.

These events are called “bypasses” because the wastewater has bypassed some portion of the treatment system.

What causes bypasses?

Bypasses can be caused by accidents, such as pumps failing or pipes bursting. Sometimes wastewater operators may be forced to bypass if they have to shut down equipment for emergency repairs and there’s no feasible way to reroute or contain the wastewater. Heavy rains, rapid snow melt, or flooding can also cause bypassing, when more water gets into the sewer system than it has the capacity to move (system overload). Bypassing in this case sometimes is used as a “safety valve” to keep sewage from backing up into homes. This type of bypass is usually more diluted because of the extra water that is mixed with the sewage. (Municipal sewage normally consists of about 97 percent or more water.)

How are bypasses prevented?

In an ideal world there would never be any bypasses. But wastewater treatment systems are complex and the weather is not under our control. Because things do go wrong, a certain number of bypasses is inevitable. However, we can take precautions to reduce the need for bypasses and, when they do occur, to minimize their impact.

All wastewater treatment systems designed to handle at least 10,000 gallons per day must have a permit from the Minnesota Pollution Control Agency. Among other things, the permit requires the system operators to exercise reasonable care to prevent bypasses. Operators can do this by controlling the inputs to their facilities and keeping their systems in good operating order. If a city is having excessive bypassing, that is, more than could reasonably be prevented, the MPCA will work with them to solve



the problem and, if necessary, take enforcement action.

Wastewater treatment operators are required to report all bypasses within one hour to the Minnesota State Duty Officer. The duty officer then notifies the MPCA.

Do bypasses harm the environment?

The term “bypass” covers a range of possible discharges. Some bypasses, such as those caused when water overloads a sewer system, can be fairly “weak” compared with normal sewage (although even dilute wastewater is likely to contain disease-causing micro-organisms which can be harmful to human health). Other bypasses may be “high strength,” such as when a treatment plant shuts down because of an emergency or equipment failure and has to bypass completely untreated sewage. Untreated sewage can contain high levels of disease-causing organisms and sometimes harmful chemicals. Bypasses definitely are to be prevented if possible. When they do occur, they must be managed to minimize potential impacts.

The degree of environmental harm posed by a bypass also depends on a number of factors, including:

- the volume of the bypass (how much was discharged, how fast, and for how long)
- the “strength” of the bypass
- The volume, flow rate, and “sensitivity” of the receiving water (the river or lake to which the bypass is discharged).

For example, a high-strength discharge to a small river that’s at low summer flow may be very harmful. A more diluted bypass to a large river in high-flow conditions will have much less effect. Bypassing during conditions of flooding may have little measurable impact on water quality.

Can homeowners help prevent bypasses?

Homeowners can help reduce the need for bypassing by making sure they’re not putting excess “clear water” into the sanitary sewer system. For example, many Minnesota homes use sump pumps and foundation drains to keep ground water from flooding basements. Unfortunately, these are often connected to the sanitary sewer system, and can be the major source of clear water in the system. Clear water “wastes” the system’s capacity, because it doesn’t need treatment but goes through the treatment system anyway. The greater the number of clear-water inputs to a system, the likelier a bypass during wet weather. Most cities are now taking action to prohibit such discharges to the sanitary sewer. If you believe that your home may be contributing to such a problem, contact your city offices to find out what local ordinances require and how you can help.

What about bypassing in floods?

During record floods, as in Minnesota in 1993 and 1997, some wastewater treatment facilities were completely flooded and stopped treating sewage altogether. While this is obviously an undesirable situation, the impact of this kind of failure is considerably lessened because of the large dilution factors available when rivers are in flood.

Flood waters also contain many other wastes besides sewage, such as manure, industrial effluent, and debris. The Minnesota Department of Health recommends that people regard all flood waters as potentially contaminated and avoid contact with them if possible. Most water-borne diseases are not transmitted just by touching the water, and outbreaks of such disease are rare in Minnesota. Nonetheless, if you must contact flood waters or other potentially contaminated water sources, take reasonable precautions, including avoiding getting the water in your mouth and washing with soap and water after contact.

For more information on sewage bypasses, contact the MPCA at (612) 296-6300 or toll-free at (800) 657-3864.