Lake Conservation Notes

Northeast Glacial Lakes Watershed Project
600 East Highway 12, Suite 1
Webster, SD 57274
Phone: 605/345-4661

On-Site Septic Systems along Shoreline Property

On-site septic systems located along lake shores require special considerations. That's because soil and water conditions near shorelines may make on-site septic systems less efficient in treating waste. This in turn could cause harmful pollutants to reach the lake or other surface waters.

The purpose of an on-site septic system is to effectively accept and treat liquid wastes (effluent) from your house and to prevent contaminants from getting into your well or nearby surface waters. Most of this treatment happens in the soil below the absorption or drain field. The physical and chemical properties of the soils combine with microscopic organisms to decompose or prevent movement (leaching) of contaminants and nutrients.

When drain fields have the proper soil type, biological contaminants (bacteria and viruses) and nutrients usually are absorbed and rendered inactive within a few feet of the drain field. However, contaminants and nutrients can travel or leach beyond the drain field depending on the type of soil, the amount and concentration of wastes, and the age of the system. Soil type is probably the most important factor in treating effluent. Loamy and clayey soils have a greater long-term ability to absorb nutrients and prevent leaching than do sand and gravel. Sand and gravel is extremely permeable allowing nutrients and biological contaminants to move great distances (in some cases, up to several hundred feet from the drain field). Unfortunately, most of the soils surrounding the glacial lakes of northeast South Dakota are unsuited for drain fields. Most include either gravel or sandy soils that are too permeable or clayey soils not permeable enough for proper absorption.

When drain fields located near lake shores are saturated during high water periods, they are likely to leach contaminants into the lake. When shorelines erode, the distance between the septic system and the shoreline decreases, making it more likely that liquid waste could move through the soil to the bank and into the lake.

How septic system wastes can affect your lake!

Nutrients (especially phosphorus) from untreated effluent can cause excessive weed (macrophytes) growth and algal blooms in lakes (above photo). Excessive growth of these plants can reduce the recreational uses of a lake that usually include boating, fishing, and swimming. Some algal types that grow in phosphorus rich waters are toxic to animals or may cause skin inflammation in humans.

Bacteria and viruses from effluent that reach surface water can cause serious illnesses in humans who come in contact with these contagions while swimming.

Scientists are discovering that water quality and aquatic organisms may also be negatively affected by what is being called “contaminants of emerging concern”. These include components of household products we use everyday including personal care products (make-up, toothpaste etc.) pharmaceuticals, nanomaterials, flame retardants, and plasticizers that are not treated by on-site septic systems and could reach surface waters. Pharmaceuticals that contain endocrine-active compounds (for example birth control pills) can pass through our digestive systems into waste water and eventually lakes and streams. These compounds have been shown to cause deformities in the reproductive organs of male freshwater fish, especially smallmouth bass. These compounds are also being found in treated drinking water!

Indicators that contaminants may be reaching the lake.

- Excessive weed or algal growth near the shoreline.
- Increase in infections or illnesses associated with swimming.
- Unpleasant odors, soggy soil, or liquid waste flowing over the land surface.
- Lush green grass growing over the drain field, even during dry weather.
- Sewage backup in toilets and floor drains.

Why septic systems fail.

On-site septic systems are designed to have a lifetime of 20 to 30 years under ideal conditions. Even if the correct soils are present, the soil surrounding the drain field will eventually become clogged with organic material preventing the proper treatment of effluent. (Many lake shore properties are not large enough to allow for the construction of a new drain field.) By far the most common cause of septic system failure is improper maintenance or use by the homeowner. Below are several suggestions on how to keep your septic system operational.

Preventing on-site sanitary sewer problems.

- Pump and maintain your septic system regularly
- Reduce the volume of waste water to your system by conserving water
- Do not use the area directly over the drain field for roadways or parking (The weight of vehicles can compact soil in the absorption field preventing proper treatment and drainage)
- Do not cover the drain field with storage sheds, patios, walkways or other landscaping
- Use white biodegradable toilet paper (colored or multiply paper does not break down as quickly)
- Do not flush unused pharmaceuticals down the drain
- Do not flush paint thinners, gasoline, pesticides or other toxic materials into the system (These materials can kill the naturally occurring bacteria that decomposes septic tank waste)
- Use “green” household cleaning products
- Do not dispose of cooking fats or grease into the system (Grease can build up and clog system components)
- Do not deposit paper towels and tissues, sanitary napkins and tampons or disposable diapers into the system
- Plant a vegetative buffer between the drain field and shoreline

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