MAINTAINING YOUR SHORELINE SEPTIC SYSTEM

SHORELAND BEST MANAGEMENT PRACTICES

Why Are Septic Systems a Problem?

In shoreland areas it is particularly important to maintain your septic system properly because soil and water conditions near shore may make the system less efficient in treating wastewater. Incomplete treatment can result in health risks for humans and water quality problems.

Potential health risks are the most serious concern related to failing septic systems. Hepatitis, dysentery, and other diseases may be spread by bacteria, viruses, and parasites in wastewater. These disease-causing organisms, called pathogens, may make nearshore water unsafe for recreation. Flies and mosquitoes that are attracted to and breed in wet areas where wastewater reaches the surface may also spread disease. Many of the synthetic cleaning products or other chemicals used around the house can be toxic to humans, pets, and wildlife.

These products may reach the ground surface or the water. Excessive nitrate levels in drinking water can result in serious health problems for infants. High nitrate levels in ground water can result from inadequately treated wastewater. Inadequate treatment can also allow excess nutrients to reach your lake, promoting algae or weed growth. Algal blooms and abundant weeds not only make the lake unpleasant for swimming and boating, but they also affect water quality for fish and wildlife habitat. As plants die, settle to the bottom, and decompose, they use up oxygen that fish need to survive.

How a Septic System Works

The purpose of an on-site wastewater treatment system, commonly known as a septic system, is to treat sewage from your household. A septic system has two parts: the sewage tank and the soil treatment system. The most common sewage tank in Minnesota is a septic tank that receives raw sewage from the household. Three layers form in the tank: solids settle to the bottom and a layer of scum or grease floats on the surface of a liquid layer (Figure 1). raw sewage is added to the tank, an equal amount of liquid flows out into the soil treatment system.

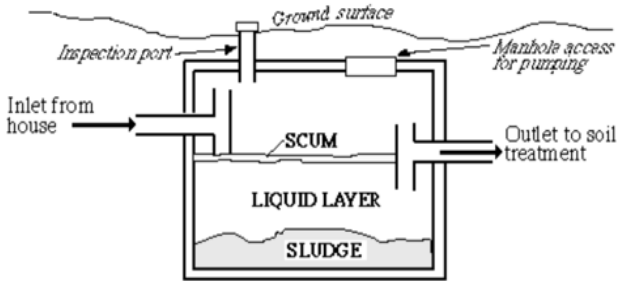


Figure 1: Typical cross section of a septic tank showing the layers of sludge, liquid, and scum. Newer tanks will have access ports for pumping. Older tanks may have a manhole cover that should be removed for pumping. Inspection ports on older tanks are not suitable for pumping.

Wastewater treatment is completed in the soil absorption area. There are three basic types of soil treatment systems. Drainfield trenches are the most common and do the most effective job of treating wastewater. They take full advantage of evaporation and plant life to help treat sewage. Seepage beds do not require as large a lawn area, but they have a smaller capacity and are less efficient than drainfield trenches. Mounds are elevated systems that may use pressure to distribute sewage effluent. Seepage pits, dry wells, and cesspools are no longer approved and may not be installed. On-site systems with seepage pits should be upgraded to include the proper size tank and drainfield to accommodate the house size and number of residents.

In the soil, microscopic organisms break down remaining biological contaminants such as bacteria or viruses. Nutrients are absorbed by soil particles or taken up by plant life. These processes only work in soil that is not saturated with water. If the soil is too wet, biological breakdown may be incomplete and nutrients may move much greater distances, sometimes hundreds of feet from the drainfield or mound and possibly into surface water (Figure 2). Even systems that appear to be working well or are in compliance with the health code may allow nutrients or bacteria to reach the water.

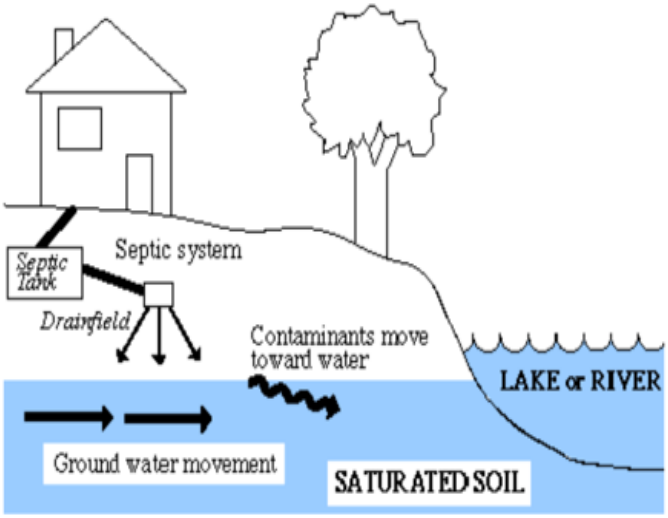


Figure 2: Avoid water contamination from inadequate wastewater treatment! If your system is improperly designed or located too close to the water, contaminants may reach your lake. This figure shows how ground water moving toward the lake can carry contaminants in saturated soil.

How to tell if there is a problem

These conditions indicate your septic system may be failing

- Sewage backup in your drains or toilets. This may be a black liquid with a bad odor.
- Slow toilet flushing. Even if you use plungers or drain cleaners, drains may run slower than usual.
- Wet areas or water seeping near drainfield. It may or may not have an odor. Excessive growth of aquatic weeds or algae in the lake near your home. Incomplete treatment of nutrient-rich water seeping from your system promotes this growth.
- Unpleasant odors around your house. This may result from improper venting or a failing system. Bacteria or nitrates are found in your well water. This indicates a serious water contamination problem that may come from your own or a neighbor's failing system.
- Biodegradable dye flushed through the system shows up in the lake or river.

What to do if your system fails

Immediate Action

- Call the local health or zoning and planning department. They will help you get the expert advice you need to solve your problem.
- Have the septic tank pumped, making sure that sludge as well as liquid is removed. This will often help solve the problem temporarily, particularly if you also cut back significantly on water use. If the drainfield or household piping is clogged or if high water levels are a problem, this won't help.
- Fence off the area to minimize contact with wastewater (for humans, pets, wildlife).
- Don't use additives. Additives are no benefit and may harm the system.

These actions may help if the system fails

- Increase the absorption field size of the existing system. This will help if the original field was sized too small for the household or if water doesn't percolate well through the soil.
- Connect to a community or lakeshore "cluster" sewage system. Although initial costs may be high, this strategy offers long-term protection for your water resources and environment.
- Installing a holding tank system is considered a temporary alternative in many counties, and is not a method of treating.

How to Keep Your System in Shape

Household Habits

- Conserve water. Excessive water use is the most common cause of septic failure, so reduce water used for bathing, laundry, and flushing the toilet.
- Identify and repair leaking pipes, sticking float valves in toilets, and dripping faucets to reduce water waste. A dripping faucet can waste 15-20 gallons per day.
- Shorten shower times and choose showers over baths to minimize wasted water. A full bath uses 50-60 gallons, while a shower uses only about 5 gallons per minute. Of course, a 20-minute shower is not a savings over a bath.
- Install low-volume toilets and low-flow showerheads. Typical toilets use 5-6 gallons per flush, providing nearly half the wastewater from a house. Flush toilets using 11/2 gallons of water are available.
- Keep a container of drinking water in the refrigerator. This saves having to run water until it's cold. Use toilet tissue that breaks up easily when wet to help prevent clogging. To test tissue quality, place a piece in a jar half full of water and shake. If the tissue breaks up easily, it is suitable. The color of tissue has no effect on septic system action.
- Do not use the toilet as a wastebasket. Don't flush facial tissue, diapers, tampons, or any kind of plastic down the drain. Eliminate the use of garbage disposals. Ground-up garbage does not decompose easily, causes rapid buildup of solids in the tank, and may move out of the tank into the drainfield, clogging distribution pipes and soil

pores. If you have a disposal--don't use it. When building or remodeling--don't install one.

- Never put coffee grounds down your drain. Dispose of household hazardous waste properly. See fact sheet #14 for additional tips on reducing household hazardous waste.

For cleaning and laundry

- Wash only full loads in the dishwasher. Typical dishwashers use about 13 gallons for each wash. Newer models use 8-9 gallons.
- Use low-phosphate dishwasher detergent. In Minnesota, detergents may contain up to 11% phosphorus by weight; but some brands may exceed this level, so check the labels.
- Wash only full loads of clothes and use front-loading washers and suds-savers to save water. To avoid overloading your system, spread washing over the week instead of washing several loads on one day. A single load takes about 40 gallons.
- Use liquid laundry detergent because it's less likely to have fillers or carriers that may damage the septic system. Try to use the minimum amount because detergents can cause problems with the system. Minimize use of household chemicals and cleaners. Normal amounts of household detergents, bleaches, drain cleaners, toilet bowl deodorizers, and other cleaners won't harm bacterial action in the septic tank.

Maintain the Septic Tank

- Discharge all sewage waste from the house into the septic tank. Don't run wastewater from laundry or saunas directly into the drainfield as the detergent or soap scum will quickly clog soil pores and cause failure.
- Do not add "starters" to your septic system. Enough bacteria are available in the wastes flushed into the septic tank. Even after the tank has been pumped, enough bacteria will be provided when you use the system again.
- Do not use additives in your system. They are of no benefit and may harm the system. Additives that cause the accumulated sludge to increase in volume or float will result in sludge being flushed into the drainfield, plugging soil pores. Also, some additives, particularly degreasers, may be carcinogens that will flow into ground water with treated wastewater.
- Pump the septic tank every year to remove solids and scum. Although tanks away from lakes or rivers may not need it every year, annual pumping is excellent insurance near shorelines.
- Remove the manhole cover when having the tank pumped to make sure that all solids have been removed. The sludge in the tank should be mixed during pumping. A tank cannot be adequately cleaned through a 4-inch inspection pipe. Pumping through the inspection port may clog the outlet baffle with scum and grease.

Your Investment and Costs 

It will cost $75 to $150 each time you have a septic tank pumped, but replacing the entire system and drainfield may cost from $2,000 to $7,000. Threats to human health and water quality increase if your septic system is not properly maintained. If water quality in the lake deteriorates, property values are likely to decrease. In addition, if your on-site treatment system fails, you'll have the inconvenience of being able to use household plumbing until the system is replaced. For property transactions, a septic inspection is required and the financial institution generally requires proof that the

septic system conforms to standards. Minnesota's shoreland regulations require that septic systems within shoreland areas are in compliance with state standards before building permits for additions or new construction are issued. Overall, your investment to properly maintain a septic tank and djainfield is minimal compared with the cost involved in repairing or replacing the system.

Regulations that Apply

Regulations may vary somewhat in different counties. The state of Minnesota has minimum requirements that apply to shoreland areas, but some counties may have more restrictive ordinances. Check with your county Zoning and Planning, Health, or Shoreland offices for the setback requirements and permits needed in your county.

Setback is the distance away from the shore and is usually measured from the ordinary high water level. In some cases, the setback may be measured from a bluff face or where vegetation begins. The setback for septic systems depends on the type of lake or river, Required setbacks range from 50 feet for general development lakes to 150 feet for remote river segments or natural environment lakes.

The Minnesota Rules for on-site waster treatment systems are governed by the Department of Health and the Pollution Control Agency in Chapter 7080. When upgrading or building a new system , be sure to use a licensed contractor who has been trained to comply with these standards.

REDUCING THE USE OF HOUSEHOLD PRODUCTS

SHORELAND BEST MANAGEMENT PRACTICES

Why Are Hazardous Household Products a Problem?
Many common household cleaners and home improvement products contain ingredients that are corrosive, toxic, or flammable. When used improperly or disposed of improperly, these products can become personal health and safety concerns and can also cause problems in the environment, contaminating ground water and soil and eventually reaching surface waters.

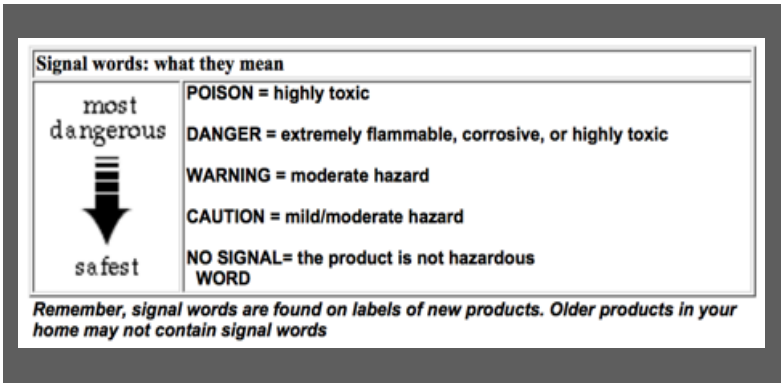
Smart Shopping

Think twice before buying household cleaning and maintenance products. General purpose products may work just as well as products developed for a specific surface or appliance. Some products may contain hazardous ingredients, such as degreasers, which contain petroleum distillates. Purchase nontoxic or less toxic products whenever possible (like water-based rather than solvent-based paints and cleaners). Alternatives to hazardous cleaning products are cheaper and some are equally effective. Do not use pesticides unless you have tried all other alternatives without success. The Western Lake Superior Sanitary District (WLSSD), the MN Pollution Control Agency (PCA), and the University of Minnesota Extension Service can provide information on alternatives to pesticides, cleaning products, and other hazardous products.

If you use a hazardous product, read the label carefully before purchasing. Make sure the product will do what you want it to. Buy only the amount you need, and use it up. If you can't, give it to someone who can.

Read the Label!

Reading product labels is the best way to get information about that product. Labels contain information about product ingredients, how to store and use safely, and hazards associated with the product. Labels on hazardous products contain SIGNAL WORDS, which tell how hazardous the product is to humans. This can give some indication of the potential problems to the environment.



Safe Storage and Disposal

Follow label instructions for use and storage of all household products. Do not store paints and pesticides in unheated buildings where they will freeze and become waste. Dispose of banned or unusable products properly. Do not pour leftovers down the drain, on the ground, or into a storm sewer. Empty containers, including paint cans (lids should be left off) and aerosol cans, should be placed in the trash.

Pesticide containers must be triple-rinsed before disposal. The rinse water should be used for the same purpose the pesticide was used for. The clean, empty containers can then be placed in the trash. In some areas, pesticide containers can be collected to be recycled into new pesticide containers. Hazardous product containers should not be recycled through community recycling programs. Call your county solid waste office for information about household hazardous waste collections in your area. Special Concerns About Mercury

Mercury in the environment is a serious public health issue in northern Minnesota. Many household products, including paints, batteries, thermometers, and fluorescent tubes, contain small amounts of mercury. When these products are not disposed of properly, mercury can be released into the environment. Mercury in lakes and rivers can accumulate in fish and be passed on to humans who eat them.

Fish consumption advisories have been established by the MN Department of Health. Advisories have been set for certain lakes and fish species. Product manufacturers are aware of the problems with mercury and many are modifying their products to reduce or remove it. Alkaline batteries sold in Minnesota after January 1, 1996, have no added mercury and can safely be discarded in the trash.

Here are some things you can do to reduce mercury waste:

- Look for alternatives; many mercury-free products are available and can replace mercury-containing products.
- Purchase alkaline batteries with no added mercury. Use rechargeable nickel-cadmium batteries to reduce overall battery waste by 90%; nickel-cadmium batteries should be saved for a collection and recycling program.
- Button batteries, used in watches, cameras, and calculators, are recyclable. Return these to a retail outlet that collects them, or to a household hazardous waste collection program.
- Fluorescent tubes--contact your county solid waste officer for disposal or handling advice. Take paints, thermostats, mercury switches, thermometers, blood pressure cuffs, and other items containing mercury to a household hazardous waste collection program for recycling; do not throw these in the trash.
- Look before you buy items to see if they contain mercury; many products you might not suspect contain mercury (e.g., some red-light tennis shoes).

How Mercury is added to the food chain

Here's what can happen when mercury is improperly disposed of and mercury compounds enter a river or lake food chain:

1. Mercury enters the river or lake.
2. Mercury attaches to particles of organic material or sediment and falls to the river or lake bottom.
3. Bacteria and other microorganisms consume the mercury and convert it to a fat-soluble form.
4. Bacteria that contain mercury are eaten by small animals on the riverbed and the mercury enters their fatty tissues.
5. Small fish eat the small animals.
6. Larger fish eat the smaller fish and the mercury builds up in their tissues. The older the fish, the more mercury it contains.
7. If a contaminated fish is eaten by a human, the mercury in the fish is absorbed into human fatty tissues. Although mercury will be eliminated from our bodies over time, frequent meals of contaminated fish will cause accumulation of mercury in human tissue to potentially unsafe levels. No method of cleaning or cooking fish will reduce the amount of mercury in its flesh.