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UNIVERSITY OF MINNESOTA
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SERVICE

Ensuring a Safe Water Supply

SHORELAND BEST MANAGEMENT PRACTICES

NUMBER 4 IN THE SERIES

What Are Shoreland BMPs?

Best Management Practices (BMPs) are actions you can take to reduce your impact on the environment. BMPs have been described for agriculture, forest management, and construction. This fact sheet describes BMPs you can adopt on your shoreland property to help protect and preserve water quality. In many cases, the best management for shorelands may be retaining the natural characteristics of your property.

A Safe Supply?

Most people take a safe water supply for granted. When clear, good-tasting water comes out of the faucet, we assume it is safe to drink. Unfortunately this assumption is not always correct. Most shoreland properties have a private water supply that needs to be tested regularly to confirm safe water.

At seasonal or vacation homes that are used infrequently, the water supply may go untested for years. It is important to test water every year if the well is not used continuously. Residences near lakes and rivers often have wells that use shallow ground water. Seasonal homes or cottages may have older wells that need repair or replacement, but are a lower priority than the primary residence. Older, shallow wells are at the most risk from ground water contamination, so the water from these needs to be tested annually.

Many vacation dwellings use surface water for the household water supply. Surface water presents a different set of risks and problems; information about special consideration and testing for surface water is available from the MN Department of Health (MDH).

The most obvious concern about an unsafe water supply is the health risk to family or guests. Wastewater contamination serves as a source of bacteria, viruses, and parasites that can cause gastrointestinal problems or transmit contagious diseases. High levels of nitrate from fertilizer or wastewater can present a serious health risk to infants, and poisons

resulting from improper use or disposal of chemicals can cause long-term or chronic health problems for humans or animals.

Another reason to make sure your shoreland property has a safe water supply relates to property value and transfer. A safe water supply is an essential component of a valuable piece of shoreland property. Also, time of property transfer, most lending institutions will not provide financing for the purchase of a property without a safe supply. They generally require a water test on a sample collected by a third party within 60 days of closing.

Is There a Problem?

The following may indicate there is a problem with the quality of your water, and that you should have the water tested to ensure that it is safe:

- if there is a sudden or gradual change in taste, odor, or color
- if family members frequently get upset stomachs, nausea, or diarrhea
- if visitors get sick even when family members don't; those who use the water regularly may have become accustomed to it
- if an oily sheen appears when the water stands for a while (this might also result from dissolved iron, which is not a health risk)
- if you smell petroleum or a chemical odor

Problem Wells

Sandpoint or drivepoint wells are common near shorelines, taking advantage of the high water table that may occur near lakes or rivers. They consist of a screen on the end of a pointed pipe that is pounded, or driven, down to the water table. Because surface and ground water are directly connected in shoreland areas, shallow wells may be essentially drawing water from the lake itself.

Many shallow hand-dug wells still exist in rural areas. Dug wells may be cased with tile or culvert and are especially susceptible to contamination.

Water wells that are no longer in use must be properly sealed to prevent contamination from seeping into ground water. Any unused or abandoned well can present a serious safety hazard for children or pets, as well as a direct route for contaminants to reach ground water.

Using Surface Water

The MDH does not recommend using surface water as a drinking water supply. If you decide to use surface water for drinking at your shoreland property, contact MDH or your county health department for guidelines on how to treat it to ensure a safe supply.

Because water from lakes and rivers contains bacteria and other living organisms, it must be disinfected before being used as drinking water. Water can be disinfected with chemicals (chlorine, bromine, iodine), by boiling, or with ultraviolet light. Filtration alone will not provide safe drinking water because it does not kill the bacteria, viruses, or parasites that can cause disease.

Giardia parasites are present in most of Minnesota's surface water today and can cause giardiasis, an intestinal disorder. The parasites are very small and will pass through filter membranes unless they are extremely fine.

When to Test

Private water supplies should be tested regularly. The MDH requires a well test immediately after construction. After that, recommended test frequency depends on well location, construction, and on previous test results. Testing every two to three years may be sufficient for wells that have no history of contamination, are isolated from pollution sources, and have 50 feet of watertight casing.

Shallow wells, wells that have shown contamination, or wells without a watertight casing (such as dug wells) should be tested at least once a year. Testing should be done when the well is most susceptible to contamination, usually immediately after spring thaw or heavy rainfall.

The water should also be tested:

- when a well is newly constructed or repaired
- before using a well that has not been used for a long time
- when a new baby is expected, arrives, or visits; don't forget visiting grandchildren
- when the water is used by an expectant or nursing mother
- when there is a change in odor, taste, or color
- when a neighbor's well is found to be unsafe
- when family or guests experience recurring stomach illness
- when there is a chemical spill or accident nearby
- when high water or flooding covers the top of the well
- when there has been a significant change in landuse in the area

What to Test for

Water quality may be affected by two types of contaminants:

primary contaminants – Chemicals and organisms that may cause acute disease or long-term health effects; coliform bacteria and nitrate are examples of primary contaminants.

secondary contaminants – Cause objectionable odors, tastes, staining, corrosion, or other aesthetic problems that do not generally pose a health risk; secondary contaminants are usually naturally occurring minerals (such as iron) or organisms (such as soil bacteria).

Municipal water supplies must be tested for over 80 primary drinking water standards. It would be prohibitively expensive to do all these tests on private wells, so they are usually tested for coliform bacteria and nitrate. Coliform bacteria and nitrate are used as indicators of water contamination. Bacteria may come from septic systems or animal feedlots and nitrate may indicate contamination from wastewater or fertilizer.

Be sure to have your water tested at a certified lab. For accurate results, water samples should be tested within 24 hours of collection. For more information on how to collect a water sample or on drinking water standards, contact a regional office of the MDH, your community health service, or your county office of the University of Minnesota Extension Service.

BMPs for Safe Water Supplies

To maintain a safe water supply, follow these guidelines:

Short-term BMPs

- Test the water annually for nitrate and coliform bacteria.
- Disinfect the well and plumbing system following maintenance on the well or pump and after appliances or plumbing fixtures are repaired or replaced.
- Maintain septic systems properly and pump septic tanks regularly; see fact sheet #2.
- Avoid diverting surface drainage to low areas where it may seep into ground water; see fact sheet #8.
- Minimize the use of fertilizer and pesticides, particularly in sandy soils or with shallow wells; see fact sheet #9.
- Dispose of hazardous household products properly; see fact sheet #14 for additional tips.

Long-term BMPs

- Use a licensed well contractor for installing new wells or sealing unused wells.
- When installing or replacing a well, follow the required isolation distances (see Figure 1).
- When planning development on your lot, leave enough room for future expansion to avoid crowding the well.
- Immediately replace or repair wells in which the casing is no longer watertight because of damage or corrosion.
- Properly seal unused wells to prevent direct contamination of ground water.

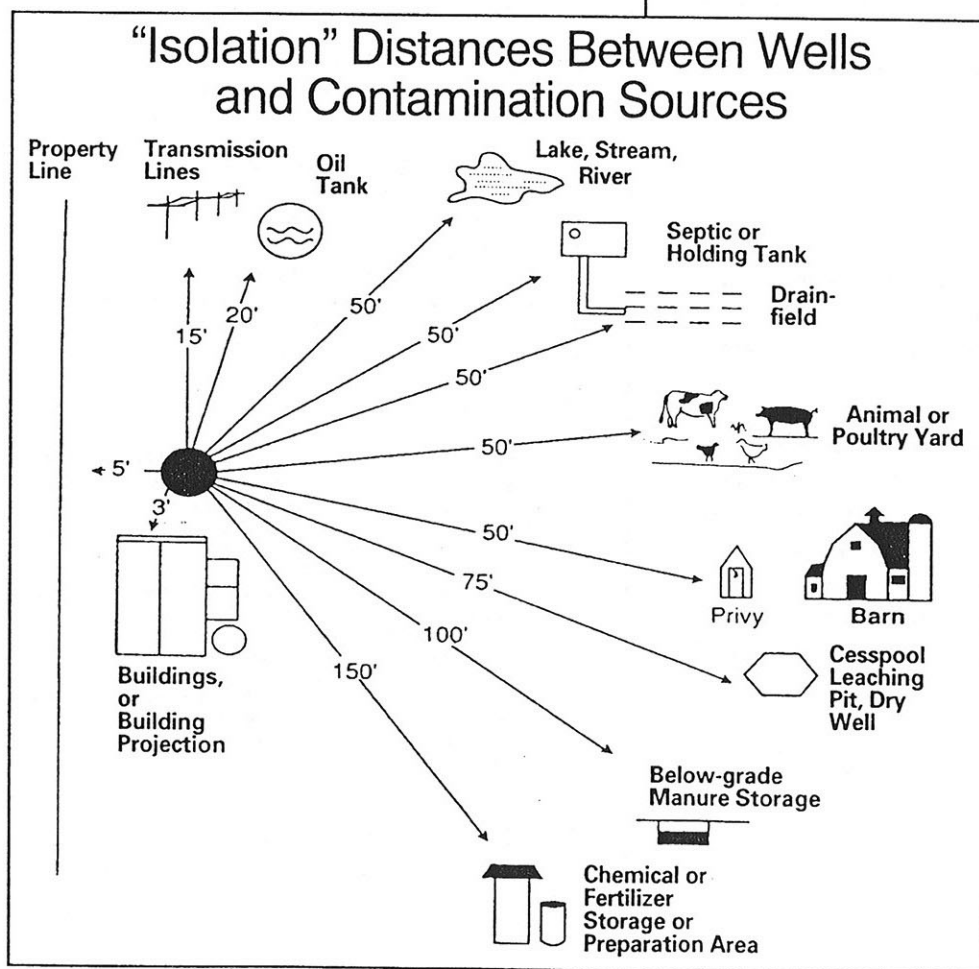


Figure 1: Minimum isolation distances required by Minnesota Department of Health between wells and possible sources of contamination. Wells with less than 50 feet of watertight casing must be located at least twice as far from contamination sources.

Regulations that Apply

In Minnesota, there are certain regulations and recommendations to guarantee a safe water supply:

- New wells should be installed by a licensed well contractor.
- New wells may no longer be constructed within a dwelling.
- A property owner may install a well, but the installation must meet all state requirements and the MDH must be notified.
- Wells that are no longer used must be properly sealed by a licensed well contractor and reported to the MDH.
- New wells must be tested at a certified lab for coliform bacteria and nitrate before they may be placed into service.
- Although it is required **by law** in only a few counties in Minnesota, a water test confirming a safe water supply is required by many financial institutions at the time of property transfer.

Costs

Testing for nitrate and coliform bacteria usually costs less than \$15 per test. Some communities offer free water testing or low-cost screening for residents.

Drilling a new well can be expensive, costing \$10-20 per foot. However, constructing a new well will increase property value and may be necessary for future property transfer if water from the existing well is unsafe. The health and safety of family and guests should outweigh the financial costs of ensuring a safe water supply.

For More Information...

call

Minnesota Water Line 1-800-455-4526

county offices:

- Health Department or Sanitarian
- University of Minnesota Extension Service

regional offices of MN State agencies:

- MN Department of Health (MDH)

read

Safe Drinking Water for Minnesotans. Bulletin, FO-0814. Contact county offices of the University of Minnesota Extension Service.

Nitrate in Drinking Water. Fact sheet, PS-01. Available from county offices of the University of Minnesota Extension Service.

Bacteria in Drinking Water. Fact sheet, PS-02. Available from county offices of the University of Minnesota Extension Service.

Giardia in Drinking Water. Fact sheet, PS-07. Available from county offices of the University of Minnesota Extension Service.

PART OF A SERIES...

This fact sheet is one of a series designed to assist shoreland property owners in protecting and preserving water quality. The series includes:

- 1 Understanding Shoreland BMPs
- 2 Maintaining Your Shoreland Septic System
- 3 Installing a Shoreland Septic System
- 4 **Ensuring a Safe Water Supply**
- 5 Limiting Impact of Recreation on Water Quality
- 6 Developing Shoreland Landscapes and Construction Activities
- 7 Stabilizing Your Shoreline to Prevent Erosion
- 8 Minimizing Runoff from Shoreland Property
- 9 Caring for Shoreland Lawns and Gardens
- 10 Managing Your Shoreland Woodlot
- 11 Valuing Your Shoreland Trees
- 12 Preserving Wetlands
- 13 Managing Crops and Animals Near Shorelands
- 14 Reducing the Use of Hazardous Household Products
- 15 Preventing the Introduction of Exotic Species
- 16 Accessing Information to Protect Water Quality
- 17 Shoreland Stewardship Scorecard
- 18 Conserving Water

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Minnesota Board of Water and Soil Resources
Minnesota Department of Health
Minnesota Department of Natural Resources, Division of Fish and Wildlife,
Division of Waters, Division of Forestry
Minnesota Pollution Control Agency
Minnesota Sea Grant Extension Program
Mississippi Headwaters Board
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Natural Resources Conservation Service
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