

**A Cleaner Lake**



**Starts at Home**

**A Guide to  
Owning & Maintaining  
a Septic System in  
Northwest Vermont**

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**Northwest  
Regional Planning  
Commission**

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# Purpose of this Guide

This guide will help you care for your septic system. It will help you understand how your system works and what steps you can take as a homeowner to ensure your system will work properly.

## A Properly Functioning System Will...

- Remove pollutants from wastewater including nitrogen and phosphorus
- Prevent illness and disease by removing disease causing bacteria and viruses

## A Failing System Can...

- Contaminate local rivers, lakes and groundwater
- Threaten the health of your family and neighbors
- Increase nutrient levels, which promotes the growth of algae and weeds
- Be very expensive to replace!

With one-fourth of U.S. homes using septic systems, more than 4 billion gallons of wastewater per day is dispersed below the ground's surface. Inadequately treated sewage from septic systems can be a cause of groundwater contamination. It poses a significant threat to drinking water and human health because it can contaminate drinking water wells and cause diseases and infections in people and animals. Improperly treated sewage that contaminates nearby surface waters also increases the chance of swimmers contracting a variety of infectious diseases. These range from eye and ear infections to acute gastrointestinal illness and diseases like hepatitis.

If properly designed, constructed and maintained your septic system will effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater.

## For More Information

**Contact NRPC at (802) 524-5958 or  
75 Fairfield Street, St. Albans VT 05478**

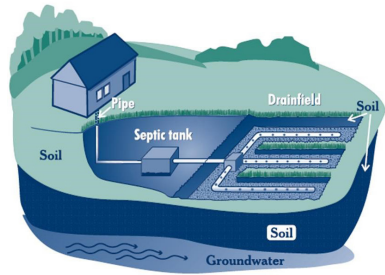
# How It Works

## CONVENTIONAL SYSTEM (In-Ground)

A Conventional Septic System has four basic components:

1. a pipe from the home
2. a septic tank
3. a drainfield
4. soil

The wastewater from your home will travel through a pipe to the septic tank. In a conventional system, the tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. The tank holds the water long enough to allow all solids to settle out (forming sludge) and oil and grease float to the surface (as scum). Compartments and a T-shaped outlet in the septic tank prevent sludge and scum from leaving the tank. Screens are also recommended to keep solids from entering the drainfield.



Water from the tank is pushed into the drainfield each time new wastewater enters the tank. Once in the drainfield, wastewater will percolate into the soil, which provides final treatment by removing harmful bacteria, viruses, and nutrients. Having appropriate soils is critical for successful wastewater treatment.

## MOUND SYSTEM

A mound system can be used for treating wastewater in areas unsuitable for conventional systems. Mounds are pressure-dosed sand filters placed above, and discharging directly to, the natural soil. Mound systems are most commonly used at sites where:

- soils have a very slow or extremely rapid permeability
- there are less than four feet of soils over bedrock
- there is a relatively high water table

The primary components of a mound system include a septic tank, dosing chamber, and elevated mound. The septic tank, which separates solids and oils from the wastewater and bacteria and fungi breaks down the organics. The dosing chamber follows the septic tank and contains a pump, which uses pressure to evenly distribute the wastewater over the infiltration surface of the mound.

The mound is made up of soil covered coarse gravel aggregate in which a network of small diameter perforated pipe is placed. The network of perforated pipe is designed to distribute the effluent evenly through the gravel. Treatment occurs through physical, biological, and chemical means as the wastewater filters down the sand and into the natural soil.

## AT-GRADE SYSTEM

At-grade systems may be used on some sites that are not suitable for in ground systems because of inadequate depths to seasonal high water table, bedrock or impermeable soil. At-grade systems are constructed by filling the ground surface and placing the crushed stone directly on the filled surface. The crushed stone is not placed subsurface as in an in ground system and no sand is placed under the crushed stone as in a mound wastewater disposal system. These systems also require a pumping station or tank to pressurize the system for adequate sewage distribution across the soil for effective treatment.

## SAND FILTER SYSTEM

A sand filter can be used in conjunction with a one of the above septic treatment systems to achieve additional treatment. A sand filter provides pre-treatment for water as it exits the septic tank and before it enters the drainfield. Effluent that passes through a sand filter is broken down and consumed by aerobic bacteria that live within the sand filter. Sites in close proximity to surface water bodies, with high water tables, or with limited space are all potential candidates for the use of a sand filter system.

## Innovative/Alternative Systems

In areas where soil type or other site conditions do not allow an in-ground or mound system to be used, you might have or need an innovative or alternative system. These systems may use sand, peat, aeration or plastic media instead of soil to pre-treat the wastewater. Float switches, pumps, and other electrical or mechanical components are often used in alternative systems. Innovative/alternative systems are installed to supplement conventional septic tanks, mounds or other wastewater systems. The Vermont Agency of Natural Resources publishes a list of approved alternative systems online at <https://dec.vermont.gov/water/programs/ww-systems/innovative-alternative/approved-systems>. Innovative/Alternative systems should be inspected annually and a maintenance contract is often required as a condition of the State permit.

# Maintaining Your System

In order to work properly, your septic systems will require regular maintenance. A key reason to maintain your septic system is to save money! Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. An unusable septic system or one in disrepair will lower your property value and could pose a legal liability. Below are some tips for how you can properly

maintain your septic system and ensure that it will provide long-term effective treatment of your household wastewater.

## Household Wastewater

“Wastewater” from your home includes water from the toilet, sink, shower, dishwasher, and washing machine. Wastewater from washing machines or other appliances should never be released into basement drains or other drainage pipes that may discharge directly into nearby waterways. This water can contain nutrients and other chemicals that can pollute water and harm wildlife.

## FINDING YOUR SYSTEM

If your home was constructed in the last two decades, your septic tank, drainfield, and reserve drainfield should be clearly designated on the “as-built” drawing for your home. An as-built drawing is a line drawing that accurately portrays the buildings on your property and is usually filed in your local land records as part of your wastewater permit. You may also be able to locate your system by looking for lids or manhole covers for your septic tank in your yard. Older tanks are often hard to find because there are no visible parts. An inspector/pumper can help you locate your septic system if your septic tank has no risers. If an as-built drawing is not in the local land records, you should provide the town with the correct information once you have found your system.

## INSPECT AND PUMP REGULARLY

Your septic system should be professionally inspected regularly. This will catch problems early and will help you know how often the tank must be pumped. Periodic pumping of the septic tank keeps solids from accumulating in the tank, reaching the outflow, and clogging the drainfield. A typical septic tank should be pumped, cleaned, and inspected by a licensed professional about every 3-5 years. The time interval depends on results of the inspections, the size of your septic tank, and your family’s water use. With a small septic tank, high water usage, or use of a kitchen sink disposal for food scraps, you will need to pump more often. Newer systems may have a filter that needs to be cleaned annually.

## CARE FOR YOUR DRAINFIELD

Your drainfield is an important part of your septic system. To properly maintain your drainfield (also known as a leach field):

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back up.

## USE WATER EFFICIENTLY

The average single family home uses almost 70 gallons of water per person per day. By reducing the amount of water your home uses, you can improve the operation of your septic system and reduce the risk of failure. Below are simple ways to reduce your water consumption:

- Turn off faucets while shaving or brushing your teeth.
- Run the dishwasher and clothes washer only when they're full.
- Make sure faucets are completely turned off when not in use.
- Maintain your plumbing to eliminate leaks.
- Install aerators in the faucets in your kitchen and bathroom.
- Replace old dishwashers, toilets, showerheads, and clothes washers with new, high-efficiency models.

## WATCH YOUR DRAINS

What goes down the drain can have a major impact on how well your septic system works. Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and other kitchen and bathroom items can clog and damage septic system components if they become trapped. Flushing household chemicals, medications, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system or might contaminate surface waters and groundwater. Fats, oils, and grease can also cause your system to require more frequent inspections and pumping.

# What Can Make My System Fail?

## HOUSEHOLD TOXICS

Oil-based paints, solvents, and large volumes of toxic cleaners should never enter your septic system. Even latex paint cleanup waste should be minimized. Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Leftover paints and wood stains should be taken to your local household hazardous waste collection center. Your septic system relies on a living collection of organisms in order to function properly. These organisms can be negatively impacted by toxic substances.

## HOUSEHOLD CLEANERS

For the most part, your septic system's bacteria should recover quickly after small amounts of household cleaning products have entered the system. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products. The word "Danger" or "Poison" on a label indicates that the product is highly hazardous. "Warning" tells you the product is moderately hazardous. "Caution" means the product is slightly hazardous. Regardless of the type of product, use it only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.

## SWIMMING POOLS AND OUTDOOR HOT TUBS

Your septic system was not designed to handle large quantities of water from your swimming pool or hot tub. Draining your pool or hot tub into a septic system or over the drainfield can overload the system. Instead, drain cooled water onto turf or landscaped areas well away from the septic tank and drainfield, and in accordance with local regulations.

## GARBAGE DISPOSALS

Eliminating the use of a garbage disposal can reduce the amount of grease and solids entering the septic tank and possibly clogging the drainfield. A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the mixture to the septic tank. Once in the septic tank, some of the materials are broken down by bacterial action, but most of the grindings have to be pumped out of the tank. Using a garbage disposal frequently can significantly increase the accumulation of sludge and scum in your septic tank, resulting in the need for more frequent pumping or a larger system.



## WATER PURIFICATION SYSTEMS

Some freshwater purification systems, including water softeners, pump water into the septic system. This can contribute additional water to the septic tank, causing agitation of solids and excess flow to the drainfield. Check with your wastewater treatment professional about alternative routing for such freshwater treatment systems.

## IMPROPER DESIGN OR INSTALLATION

Some soils provide excellent wastewater treatment; others don't. For this reason, the design of the drainfield of a septic system is based on the results of soil analysis. Homeowners and system designers sometimes underestimate the significance of good soils or believe soils can handle any volume of wastewater applied to them. Many failures can be attributed to having an undersized drainfield or high seasonal groundwater table. Undersized septic tanks—another design failure—allow solids to clog the drainfield and result in system failure.

If a septic tank isn't watertight, water can leak into and out of the system. Usually, water from the environment leaking into the system causes hydraulic overloading, taxing the system beyond its capabilities and causing inadequate treatment and sometimes sewage to flow up to the ground surface. Water leaking out of the septic tank is a significant health hazard because the wastewater has not yet been treated.

Even when systems are properly designed, failures due to poor installation practices can occur. If the drainfield is not properly leveled, wastewater can overload the system. Heavy equipment can damage the drainfield during installation which can lead to soil compaction and reduce the wastewater infiltration rate. And if surface drainage isn't diverted away from the field, it can flow into and saturate the drainfield.

### Should I Put Additives in My Septic System to Keep it Working Properly?

Research has shown that additives do not enhance the performance of your septic tank. The main thing that makes septic systems work is living bacteria. Plenty of bacteria will be introduced to the system through wastewater inputs, and they will live on the other components of the wastewater. No additions of bacteria, yeast, enzymes, or products containing them are necessary for the septic system to work properly.

## Symptoms of Failure

The most obvious septic system failures are easy to spot. Check for pooling water or muddy soil around your septic system or in your basement. Notice if your toilet or sink backs up when you flush or do laundry. You might also notice strips of bright green grass over the drainfield. Septic systems also fail when partially treated wastewater comes into contact with groundwater. This type of failure is not easy to detect, but it can result in the pollution of wells, nearby streams, or other bodies of water. Pumping a failing system is not a long term solution. If you suspect failure, consult a repair professional.

### Warning Signs!

- Sewage on the surface of the ground or discharging into surface waters.
- A foul smelling, slimy, blackish/grayish liquid in the drainfield area or nearby.
- Standing/flowing water or soggy soils in drainfield area.
- Greywater (laundry or sinkwater) discharge to the ground or surface waters.
- Sewage back-up into residence caused by slow soil absorption.

## Common Issues in Northwest Vermont

A majority of the region's residents use on-site septic systems to treat their residential wastewater. The shores of many lakes and larger ponds were developed with seasonal camps, at least in part. Originally, many of these camps had direct connections to the waters next to which they were located, drawing their water intakes located not far from shore. And some released wastewater into rudimentary septic tanks or even directly into surface waters. Over time, many of these homes have installed basic septic systems capable of handling seasonal use of basic plumbing. However, as many camps have expanded or been converted to full-time use and as many new appliances including washing machines, dishwashers, and additional bathrooms, have been added, many of these septic systems are no longer able to support the level of use.

Replacing a septic system alongside a lake or pond is a challenge. Many lakeshore homes are located on small lots with poor soils. A drainfield should not be located within 50 feet of a lake or stream, nor within 25 feet of a property line. On many small lots, these distances are not possible. Homeowners should work closely with a wastewater professional to explore options and ensure that septic systems are designed to protect public health and safety and the water quality of the Bay for current and future generations.

# Replacing Your Septic System

## REPLACING YOUR SEPTIC SYSTEM

At some point, every septic system will need to be replaced. The lifespan of a system depends largely on where it is located, how intensely it is used and whether it is well-maintained. A wastewater treatment professional can help you determine the expected life of your system and plan for proper replacement.

When replacing your septic system, the State of Vermont will require you to get a permit and to have the system designed and certified by a professional engineer or licensed designer. The designer will help you to determine which type of system is most appropriate given the amount of wastewater you generate and your specific site conditions. If you have future plans to expand your home or to convert it from seasonal to year-round use, you should discuss these plans with your system designer.

If your home is located on a small lot with poorly draining soils, a designer may not be able to propose a system that meets all of the current standards. In this case, the State of Vermont allows a designer to propose a "best fix" septic system. You may need to request a variance if the system will be located too close to a property line or existing well or too small for the number of bedrooms in the house.

A list of state licensed designers is available through the Vermont Wastewater Division Regional Office and at <https://dec.vermont.gov/water/licensed-designers>.

## Sharing a System

In densely developed neighborhoods, a shared wastewater system may be the best solution to treating wastewater. A shared system is centrally located and designed to accept wastewater from multiple homes. While shared septic systems are becoming increasingly common in new development, it may be a challenge to retrofit an existing neighborhood. To install a shared system requires coordination and buy-in from a core group of property owners in a neighborhood. However, in a neighborhood with old septic systems on small lots and poor soils, a shared system may provide a cost-effective means of wastewater treatment. Sharing a septic system requires legal agreements between all of the property owners hooked into the system and requires the payment of maintenance fees.

