

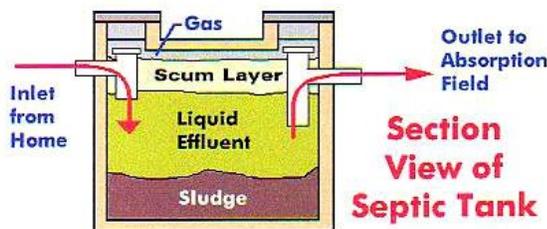
Septic Systems

What is the purpose of septic systems?

The purpose of a septic system is to provide effective wastewater treatment that does not pose an environmental or human health risk.

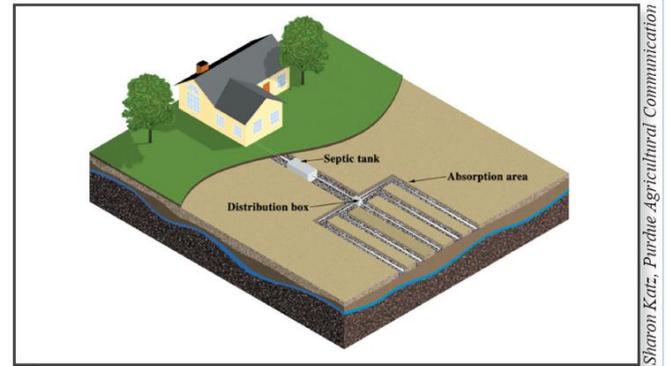
Wastewater and residential waste (organic matter and human excrement) both flow into a household septic system. This is comprised of a tank and an absorption system. These components function together to separate the solid and liquid waste. The solid waste is stored and decomposes anaerobically in the tank. The wastewater moves slowly through the system where it is cleansed by soil microorganisms. If the wastewater is not fully treated it can leach contaminants into well water or streams, lakes, rivers causing possible environmental concerns and human exposure.

How do the components of a septic system work?



Cross sectional view of the septic tank¹

Wastewater flows from the house into a tank that separates and stores the solid matter. The heavier solids sink and settle to the bottom of the tank forming a sludge layer. The lighter material (scum) floats to the top. The liquid part called the effluent eventually flows from the tank into a distribution box and then the soil absorption system. The primary separation of these layers is called the primary treatment.



The soil absorption system²

The secondary treatment of the effluent occurs in the absorption system. There are various kinds of systems but the most common is an absorption (also called a leach or drain) field that consists of several relatively narrow and shallow trenches filled with sand, crushed rock or gravel. At the top of each trench is a perforated pipe which allows the effluent to filter through the gravel and then into the soil beside and beneath the trench.

The effluent is purified by biological activity occurring on the sides and bottom of the trenches. At the bottom of the trenches, microorganisms that live in an environment without oxygen (anaerobic) attach themselves to the soil. They feed on the organic matter in the effluent, and by doing so, remove harmful bacteria and parasites. These microorganisms form a biological mat called the biomat. Soil bacteria living on the sides of the trenches feed on the biomat so it usually does not get too thick. The delicate balance of the biomat and other soil microorganisms can be disrupted by the improper care and maintenance of a septic system.

Septic System Failure

A septic system fails when either the tank or the absorption field cannot efficiently filter and treat wastewater. It is a good practice to have the tank ***inspected annually and pumped every three to five years by a professional.***

Pumping your tank costs approximately \$300 to \$350. However, to replace a septic tank can cost anywhere from \$2,000 to \$3,000. To clean or change an absorption field it can often cost in excess of \$10,000. Aside from the financial expenses, health and environmental concerns can occur from septic system failure. Wastewater may back up into your yard or contaminate nearby water sources (including your well) with heavy metals, nutrients and/or pathogens.

Possible warning signs of system failure

- Gurgling sounds in pipes and/or drains
- Sewage backup in drains or toilets
- Pooled or seeping liquid on the surface of the lawn
- Lush green grass over absorption field in dry weather
- Presence of nitrates or bacteria in well water (determined by analyzing a water sample)
- Buildup of aquatic weeds or algae in lakes or ponds adjacent to the home
- Unpleasant odours especially near the filter bed.

To protect your system from failure you should be mindful of its location and upkeep. The best thing to do is map out where the septic tank is situated in respect to your home. Writing down and keeping a record of any repairs to your system is also beneficial should any problems arise.



Sign of a failed septic system

Things to consider indoors:

Water conservation- The amount of wastewater a septic tank can accommodate depends on its capacity. A high volume of wastewater flowing through the absorption field will disrupt the filtering process and result in untreated wastewater leaving the system.

- Use water efficiently in your home. Try not to leave taps running unnecessarily when you are washing.
- Replace leaky toilets or faucets. They can waste a lot of water and burden your system needlessly.
- Retrofit your present water appliances with water saving devices such as a faucet aerator, low flow toilet, and low flow shower head.
- Try not to supplement water for your lawn if it does not need it. Lawns require approximately 2.5 cm (1 inch) of water per week.
- Do full loads of laundry and dishes. Try to avoid multiple laundries in a single day and instead spread them out over the week.

Restrict the amount of solids going into the system-

Overburdening the septic system with solids will accelerate the necessity to pump the septic tank. Also, a high volume of material moving through the system could potentially cause untreated solids to get through the absorption field by not allowing enough time for them to settle.

- Put grease/ oil into containers to cool and harden so you can throw them into the compost bin rather than dumping them down the drain. The oil and grease can block the pipes in the septic system.
- Throw out hair, kitty litter, diapers, paper towel, facial tissues, feminine hygiene products, condoms, cigarette butts, dental floss and other non-biodegradable items rather than flushing them down the toilet.
- Compost kitchen scraps rather than use a garbage disposal system. These systems significantly increase the amount of solids going into the septic tank causing the sludge and scum layers to increase rapidly.

Limit the amount of chemicals getting into your system- The biomat is a living system that can be disturbed or killed by chemicals. Furthermore, if these substances pass through the absorption field without proper treatment they could contaminate the surface and groundwater nearby your home.

- Most septic systems can accommodate small and moderate amounts of bleach and detergents. Large doses, however, could destroy the biomat. Avoid the use of drain cleaners and septic system “additives”. Try a drain snake to unclog drains and remember regular pumping of the tank is the best way to maintain an effective system.
- Avoid anti-bacterial soaps and bathroom cleaners. They can damage the biomat.
- Unused over the counter and prescription medicines should be returned to the pharmacy. If they are dumped down the drain or toilet they can adversely affect the microorganisms in the system.
- Dispose of hazardous waste at a facility designated for this purpose. These are substances such as paint, paint thinners and strippers, solvents, pesticides, fertilizers, oil, gasoline, antifreeze, and wood preservatives.



Things to consider outdoors:

Excess water will decrease the ability of the soil to absorb and treat the effluent.

- When clearing your driveway in the winter avoid piling snow on your absorption field.
- Avoid letting water from your roof drains discharge into the absorption field.

Treat your absorption field with tender loving care- It is imperative that you make sure the absorption field is not physically damaged. If the soil is compacted it will decrease the absorption capacity of the soil.

Heavy equipment used over this area could potentially break pipes. Landscaping choices can also adversely affect the absorption field so be aware of your plant’s characteristics.

- Avoid planting trees, shrubs, and plants that have deep roots over the absorption field. Deep roots can grow into underground pipes and cause them to crack and break.
- Avoid using heavy machinery or vehicles over the absorption field. This could compact the soil and decrease its efficiency in treating the effluent.
- Avoid installing patios, pools, decks, basketball courts, etc. over or within 3 m (10 ft) of the absorption field. If you do, efficient evaporation of the effluent will be compromised.

Did You Know?
About 45% of Nova Scotia homes are connected to an on-site septic system!

Alternative Cleaning Products to support your septic system:

To protect microorganisms in your septic system try to use non-toxic cleaners. Several Canadian companies manufacture effective and environmentally friendly products for various cleaning purposes. You can also make inexpensive cleaning supplies by purchasing a few items and following the instructions listed on the next page.

Alternative Cleaning Products DIY

Product	Ingredients	Instructions
All-purpose cleaner	<ul style="list-style-type: none"> • 1 tsp. borax • 2 tbsp. vinegar • 2 cups very hot water 	Mix ingredients. Apply and rinse.
Glass cleaner	<ul style="list-style-type: none"> • ½ tsp. Liquid soap • ¼ cup vinegar • 2 cups water 	Put in spray bottle, shake and clean
Disinfectant	<ul style="list-style-type: none"> • ½ cup Borax • 4 L of warm water 	Mix ingredients. Apply and rinse.
Spills and Stains	<ul style="list-style-type: none"> • Salt • Milk 	Pour salt on the stain and soak it in milk. Sponge after 1 hour with hot water.
Mold/ Mildew Remover	<ul style="list-style-type: none"> • Baking soda • Vinegar 	Apply some baking soda and vinegar to an old moist toothbrush and scrub the stained area.
Laundry Detergent	<ul style="list-style-type: none"> • 1 cup liquid soap • ¼ cup washing soda or Borax 	Mix and use like any other detergent. Note: When you wash clothes in cold water mix this solution together in a small amount of hot water before adding it to the machine.
Bleach Alternative (general use)	<ul style="list-style-type: none"> • 1 part Borax or washing soda or hydrogen peroxide • 8 parts water 	Mix thoroughly.
Bleach Alternative (to whiten laundry)	<ul style="list-style-type: none"> • ½ cup white vinegar or washing soda or Borax 	Add ingredients to wash water before adding the clothes.
Furniture/floor polish	<ul style="list-style-type: none"> • 1 part lemon juice • 2 parts olive oil or vegetable oil 	Mix together and then rub surface with a soft cloth.

Environmental Home Assessment Program Clean Nova Scotia proudly delivers the Environmental Home Assessment Program (EHAP) in the Central and Northern Regions of Nova Scotia. Developed and funded by Nova Scotia Environment, EHAP provides homeowners living on septic systems and private water supplies with a **free** and **confidential** home visit and visual inspection of their septic system, well head, and oil tank.

The program delivers information and savings right to your door. Homeowners receive a rebate of up to \$100 on their next septic pumping, free water conservation devices, samples of local environmentally friendly cleaning products, valuable tips and reference materials to enhance the performance and longevity of on-site septic systems, oil tank security and tap-water quality. In addition, a septic system repair grant of up to \$3,000 is available to homeowners who qualify.

EHAP is available province-wide. Please call 1-888-380-5008 to register. Or for additional information please visit: <http://www.gov.ns.ca/nse/hap/>

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Update by the NS Environmental Farm Plan Program 2013

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