

How to Take Care of a Septic Tank and Maintain a Septic System

Septic system maintenance is often overlooked by the majority of homeowners, until there are septic system problems. Unfortunately, often by the time a septic tank problem is noticeable the septic system repairs can run into thousands of dollars. Understanding how a septic system works, taking some preventative measures, and following basic care rules now, can save cash later.

General Operation of Septic System:

The main parts of a standard septic system include the drain lines, the septic tank, the organisms living in the tank, the leach field drain lines, the soil surrounding the drain field, the vent stacks, and the water itself. Learning how a septic system works allows you to understand what septic system problems can arise and their causes.

Waste water from bathrooms, toilets, the kitchen sink, and laundry, flows through drain lines into a septic tank. The septic tank is a large, water tight box, usually of concrete, metal or fiberglass, that can hold from 750 to 2000 gallons of waste water. At the upper end where the house drain pipe enters the tank, there is a baffle, which can simply be a "T" shaped section of pipe or a compartment formed by a wall that extends several inches above and below the drain pipe opening. The baffle is open at the bottom and top, so waste can drop into the tank and gases can rise to the top. Waste separates in the tank by gravity into three layers:

1. Top - Scum Layer consists of Lightweight insoluble materials which float to the top of the tank and consists of soaps, greases, toilet paper, etc.
2. Middle - Liquid layer - water, liquid, and suspended solids in the center of the tank.
3. Bottom - Sludge Layer - heavy organic and inorganic materials at the bottom of the tank.

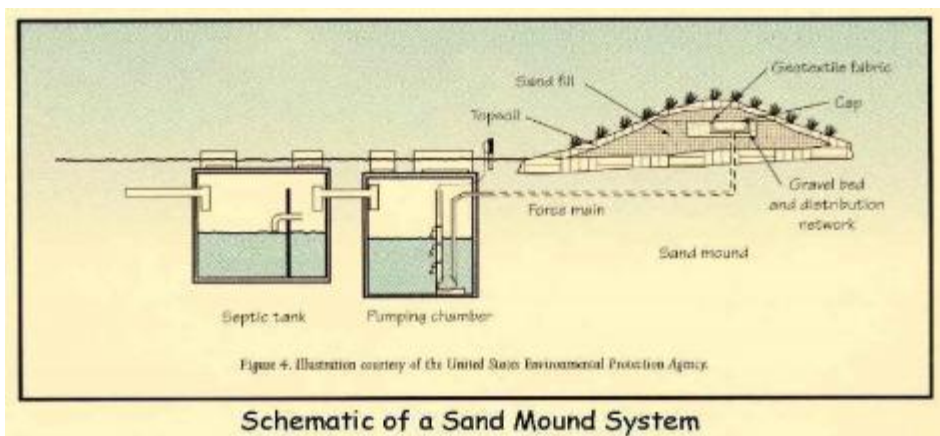
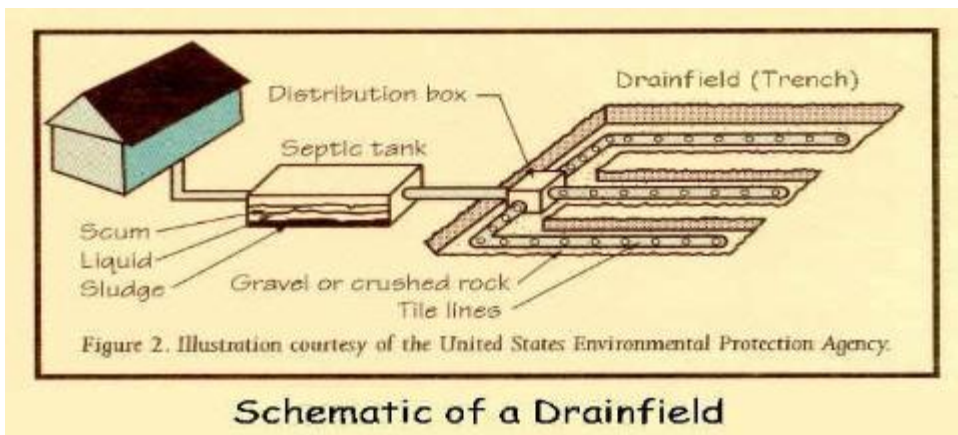
The baffle keeps floating scum from backing up into the drain lines as long as the scum level does not become too thick. On the opposite end of the tank is the exit pipe with another baffle. This pipe carries the clarified waste water out of the septic tank to the leach field after the heavy indigestible solids have settled out of it, forming a sludge layer on the bottom of the septic tank. It is this sludge and scum that must be periodically removed from the tank before getting too deep or thick. Some septic tanks also have additional short walls that act as baffles creating separate chambers to hold waste back from the pipes. The solids that enter the tank are attacked and digested by naturally occurring anaerobic bacteria and microorganisms in the sewage that act to pre-clean and clear the water before it enters the leach field to be absorbed by the soil. It is not a matter of solids simply settling out in the septic tank but a biological process that takes place to break those solids down and

cycle them back into the leach field soil. The drainage pipes going out to the leach field are perforated so the waste water can enter the soil and be filtered and taken up by the plants above the field.

This is often referred to as primary treatment. Pathogens in the waste are NOT destroyed in the septic tank. Anaerobic bacteria that live with very limited oxygen in the septic tank prepare the sewage for final treatment in the soil treatment unit. Liquid leaving the septic tank is referred to as effluent

Another part of the septic system are the vent pipes that extend up from the drain lines through your roof. These vents allow waste gases to escape and keep pressure from building up so the water can flow freely.

The Drain Field (Trench or Leach) is connected to the septic tank by a solid pipe from the septic tank to a distribution box where the waste water is channeled into one or more perforated pipes set in trenches of gravel. Here the water slowly infiltrates (seeps) into the underlying soil. Dissolved wastes and bacteria in the water are trapped or adsorbed to soil particles or decomposed by microorganisms. This process removes disease-causing organisms, organic matter, and most nutrients (except nitrogen and some salts). The purified wastewater then either moves to the ground water or evaporates from the soil. Trench systems are the most common type of system used in new home construction.



By following some rules it is possible to keep the septic system parts all working together and prevent septic system problems from occurring.

- First the household drains should not be treated as garbage disposals. Don't put anything down the toilets except for human waste, septic tank safe toilet paper, and the occasional cleaner. This means no cigarette butts, tampons, paper towels, hair, cat litter, disposable diapers, or facial tissues as these will only add to the undigestible load in the septic tank. It has been found through several studies that toilet paper made from recycled paper is the best kind for septic tank systems. Extra soft, extra strong, scented, and fluffed up toilet papers are not good for the system as they add chemicals to it and are slow to break down, thus adding to the solid load.
- Normal use of soaps, laundry detergents, and disinfectants will not harm a properly working septic system, but it is best to keep chemical additives to a minimum. Never dispose of solvents or paints from washing paint brushes, or antibiotics. Hydrogen peroxide or alcohols can harm the septic system organisms. In the kitchen, grease and oils should never be poured down the drain as they, along with coffee grounds, are best placed in the trash.
- CONSERVE WATER. Fix leaks and drips. If you replace old fixtures, install new "low flow" types. Direct downspouts and excess ground water AWAY from the septic field to avoid saturating the area with excess water. Do not overload the system -- this is the primary cause of system failures. Early morning and bedtime are peak water use times in the bathroom. Run dishwashers and washing machines at other times of the day. Don't do all the family laundry in one day.
- Garbage disposals are not good for septic tanks, as they add greatly to the septic tank load with raw materials that have not been broken down in any way. It is better to make a compost pile and recycle all the food scraps. If a disposal is a must, pick one that grinds the waste into the smallest possible pieces and use it sparingly.
- Try to keep hair out of drains as much as possible as grease and hair clogs are the main reason for using harsh chemical drain cleaners that are bad for the system. Use strainers to catch hair at the drains, and to clean out clogs use drain snakes rather than chemicals whenever possible. Unlike harsh chemical drain cleaners and clog removers, enzymatic drain cleaners that clean drain pipe walls have been shown to be safe for septic systems and will help to dissolve buildups from waxy shampoos and lotions. Baking soda mixed with vinegar and hot water will not harm the septic system and makes a good drain cleaner.
- Periodic preventive maintenance is required to remove the irreducible solids which settle and gradually fill the tank, reducing its efficiency. In most jurisdictions this maintenance is required by law, yet often not enforced. Those who ignore the requirement will eventually be faced with extremely costly repairs when solids escape the tank and destroy the clarified liquid effluent disposal means. How often the septic tank has to be emptied depends on the volume of the tank relative to the input of solids, the amount of indigestible solids and the ambient temperature (as anaerobic digestion occurs more efficiently at higher temperatures). In general some septic tanks may need to be emptied every six months while others every 3 years depending on use. When emptying a tank, only a small residue of sludge should be left in the tank. HIRE A LICENSED PROFESSIONAL (listed in the phone book under "septic tank cleaners") to pump the waste out of your tank. The tank should be pumped out through the manhole, not the smaller inspection ports. The tank should be cleaned completely, leaving nothing in the tank. Make sure the baffles are inspected and that the tank is checked for leaks. Anaerobic decomposition is

rapidly re-started when the tank re-fills. A properly designed and normally operating septic system is odor free and, besides periodic inspection and pumping of the septic tank, should last for decades with no maintenance. A well designed and maintained concrete, fiberglass or plastic tank should last about 50 years.

- Dense grass cover and other shallow rooted plants are beneficial over a septic field. However, do not plant trees because large plant roots can clog or break the pipes. Avoid compacting the soil over the infiltration area.
- DO NOT DRIVE OR PARK vehicles over the area and don't build a shed or driveway in this area. These activities can also crack pipes or cause the distribution box to settle unevenly, meaning that effluent will only flow into part of the drain field.

What can I do to increase the longevity of my system?

In-tank, external canister, and dosing tank Filters are one of the best forms of insurance against premature system failure available for a system. These do so by trapping scum, sludge and other particles, preventing the possibility of said items reaching your leaching field and clogging the lines. Available in many different types, particulate filtration sizes, and flow rates, these can be installed during initial system installation or into an existing system. Pump your system on a regular basis, watch what you put down the drain, and conserve water.

Is my system in failure?

The septic tank has not been pumped out in the past five years. Even if the system appears to be working well, sludge may have built up to the point where waste water is released without sufficient time in the tank for treatment and settling of particles. This situation may result in pollution of groundwater or cause eventual clogging of the drain field.

A wet area or standing water occurs above the drain field. This situation can develop when sludge particles clog the drain field, when tree roots or broken pipes keep the waste water from dispersing through the entire drain field, or when water use in the house regularly exceeds the design capacity of the system. When these conditions occur, waste water does not move through the soil as it should, and instead rises to the surface creating a serious health risk and odor problems.

Toilets run slowly or backup: in the worst cases, the basement is flooded with sewage. This can be the result of plugged sewer lines to the tank, a plugged inlet or outlet pipe, a full septic tank, or a failed drain field.

Septic odors occur in the house, above the tank and drain field, or escape from the vent pipe. If the system is operating properly, there should be no odors. If there are odors, it can be an early warning sign that the system is failing.

The Indiana Onsite Wastewater Professionals Association (IOWPA) is a good resource to assist and educate homeowners as well as the professionals in the onsite sewage treatment industry. Please feel free to contact us at any time with any questions you may have.



*Indiana Onsite Waste Water
Professionals Association, Inc.*

Purdue University of Lafayette, Indiana has a section of their website for the homeowner. If you click on the link below, it will take you to that portion of their site.

Purdue Information for Homeowners

The environmental Protection Agency offers the following for Homeowners:

EPA Homeowners Guide to Septic System