

## Fact Sheet 99-26 (formerly 92-27)

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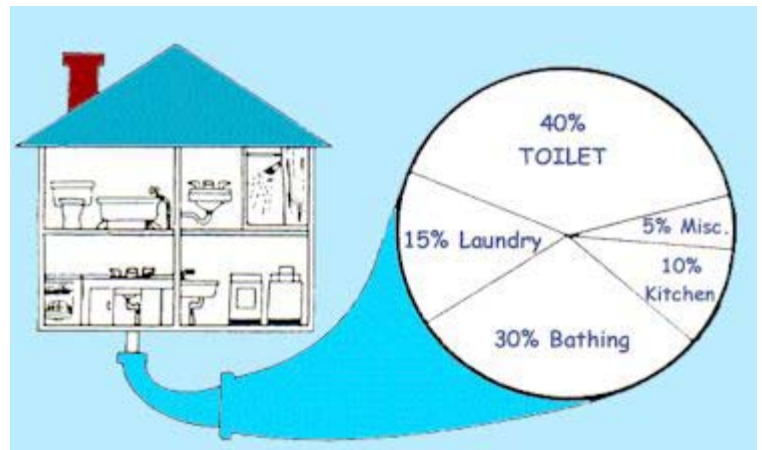


## SEPTIC SYSTEMS

Because they are out of sight, they are often out of mind, but septic systems cannot be neglected without problems for the homeowner.

While public sewer lines carry away household waste in urban areas, rural properties rely on self-contained sewage treatment systems installed below ground near the property they serve. Such systems are called septic tank-soil absorption systems, otherwise known as "septic systems."

Proper disposal of domestic waterborne wastes includes physical disposal of the sewage into the environment without adverse health, odor, aesthetic or nutrient (fertilization) effects. This is provided by a properly managed septic system. Appropriate handling of waste water is essential in maintaining health standards of water quality and recharging ground water. To avoid contamination of ground water supplies, septic systems should be installed at least 150 feet from any drinking water well.



Septic systems are called upon to receive and process household wastewater from toilets, showers, washing machines, sinks and garbage disposal units (see Figure 1). Their efficiency is dependent upon their design, proper installation, and maintenance program. Failure in any one of these areas can lead to improper operation, which can create a health hazard and a potential financial burden.

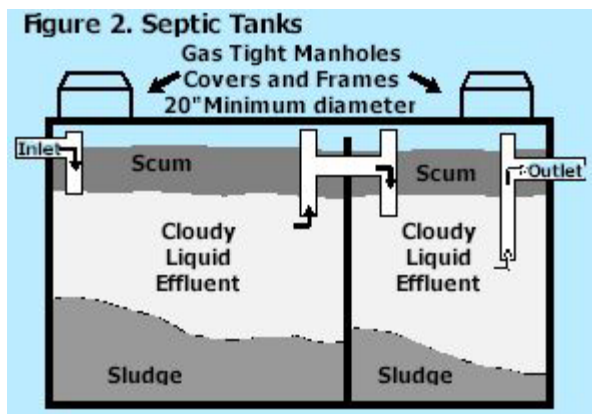
## HOW A SEPTIC SYSTEM WORKS

All septic systems function in the same general manner, piping household wastewater to a holding tank where solids are removed. Through bacterial action, some of the solids are digested and converted to liquid for discharge into a "soil absorption area." The remaining solids are stored for future disposal.

The septic tank was patented in London, England around 1900 and is described in Webster's Dictionary as "a tank in which waste matter is decomposed through bacterial action." The modern septic tank is a watertight box usually made of precast concrete, concrete blocks, or reinforced fiberglass. When household waste material enters the box, several things occur:

1. Organic solid material floats to the surface and forms a layer that is commonly called "scum." Bacteria in the septic tank set about to biologically convert this material into liquid.
2. Inorganic or inert solid materials that cannot be biologically converted, and the by-products of bacterial digestion, sink to the bottom of the tank and form a layer commonly called "sludge."
3. A cloudy liquid lies between the two layers and is the only ingredient that should overflow into the soil absorption area.

A properly functioning tank is illustrated in Figure 2.



The overflow of solid material into the soil absorption area should be avoided because it will clog soil pores in the absorption area and result in system failure. Two factors contribute to solid material overflow: bacterial deficiency and failure to have sludge accumulations removed periodically.

Bacteria must be present in the septic tank to digest the organic solids. Normal household waste provides enough bacteria to digest the solids UNLESS the bacteria is killed off. Bacteria are very sensitive to environmental changes and may be destroyed by such common home-care products as:

- detergents
- cleaning compounds
- disinfectants
- polishes
- toilet
- sink and tub cleaners
- bleach
- caustic drain openers
- acids
- cleaners

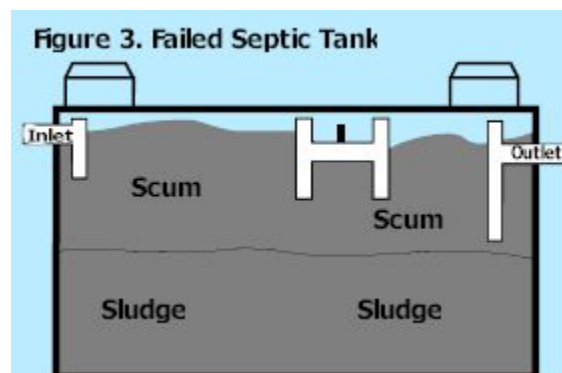
Check the labels on these and other products used in the home. Labels carrying any of the following warnings indicate the presence of ingredients that may kill bacteria.

- "Harmful if swallowed"
- "Avoid contact with the skin"
- "Do not get in open cuts or sores"
- "If product comes in contact with eyes, call a physician immediately"

Look for products labeled "safe for use in septic systems."

When bacteria are not present to digest and liquefy the scum at the top of the septic tank, the scum will accumulate until it overflows, clogging the soil absorption area.

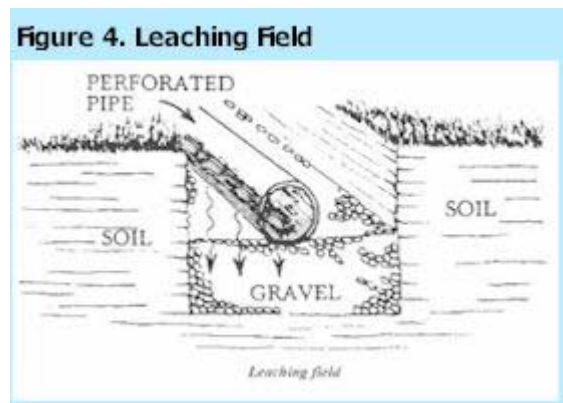
The sludge at the bottom of the septic tank is inorganic and inert material that is not biodegradable and will not decompose. If not removed on a periodic basis, it will accumulate and overflow, also clogging the absorption area. Figure 3 illustrates a failed septic system.



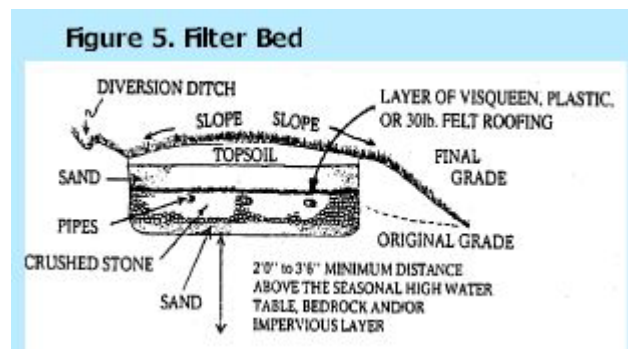
## SOIL ABSORPTION AREAS

There are three main types of absorption areas — leaching fields, filter beds, and drainage pits sometimes called drywells or cesspools.

Leaching fields generally consist of a network of perforated pipes laid in a gravel-lined trench. If solids are permitted to enter the pipes, they can clog the perforations, causing draining to slow and eventually stop. See Figure 4.



Filter beds shown in Figure 5 work on the same principle as leaching fields, with a perforated pipe running through layers of sand and crushed stone. Filter beds are wider than leaching fields and can be constructed either above or below ground. Because of their smaller size, filter beds are more suitable to high water table soils, or smaller properties that lack the space required for the long trenches of a leaching field. Again, solids must be kept out of the filter lines to prevent clogging.



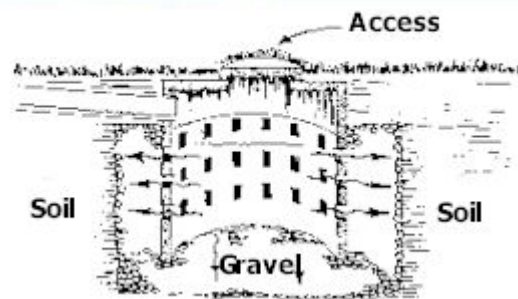
Drainage pits shown in Figure 6 are constructed of either precast or concrete block cylinders. They have closed tops, open bottoms, and holes in the sidewalls. Some older septic systems consist of only a drainage pit or a cesspool. Their use is no longer permitted.

## SEPTIC SYSTEM MAINTENANCE

Septic systems require two things: proper bacterial action and periodic pumping.

To ensure that proper bacterial action takes place, the system should receive normal household waste that contains the organisms necessary to initiate and promote anaerobic digestion. All bacteria-killing products should be disposed of properly according to label directions and should not be disposed of in the household septic system.

Figure 6. Drainage Pit



The frequency of pumping the septic tank will depend on the size of the tank, the number of people occupying the home, the frequency of garbage disposal use, and the condition of the system. Since there is no tank additive that will dissolve or eliminate the accumulation of sludge, IT MUST BE PUMPED OUT. Failure to pump periodically can cause solids to overflow into the absorption area. This can clog the system and may force replacement of the absorption area at considerable expense and inconvenience. Typical replacement costs are likely to exceed \$4,000.

Generally, a properly designed tank of 1,000 gallons capacity and used by a family of 4 people should be pumped about every 3 years. More frequent pumping may be necessary in larger families or if a garbage disposal is used or excessive amounts of household grease enter the system.

Pumping of septic tanks should be performed by professionals who have the necessary equipment to do the job properly. They can be found in the Yellow Pages of your telephone directory under "Septic."

### COMMONLY ASKED QUESTIONS

**Q: What causes the thick crust in my septic tank?**

A: This is organic material that has congealed into a solid mass. The condition is dangerous and indicates a bacterial deficiency. Have the tank pumped to avoid future problems.

**Q: Will acid help my septic system?**

A: Acids and chemicals work only temporarily. They are extremely dangerous to use and are harmful to the environment. The Environmental Protection Agency has banned the use of these hazardous materials in many places.

**Q: Does it help to add yeast, baking soda or inoculants?**

A: Yeast merely provides a fermentation environment. It does not provide bacteria. Baking soda raises the pH in the tank and also provides no bacteria. A high pH can harm the septic process. The benefits of inoculants are inconclusive.

**Q: My system recently backed up for the first time in years. What do I do now?**

A: A backup is the first sign of septic system failure. It will occur again unless maintenance is begun. Contact a septic service provider immediately.

### WARNING SIGNS OF SEPTIC SYSTEM PROBLEMS

- Sluggish drains in the home
- Plumbing backups
- Gurgling sound in pipes or drains
- Outdoor odors
- Mushy ground or greener grass around septic system

### OTHER CAUSES OF SEPTIC FAILURE

- Placement in poor drainage area
- Failure to install according to septic codes
- Overloading. Use water sparingly. Do only full loads of wash at off-peak times, if possible, and try to limit the number of loads daily.
- Pouring kitchen grease into drains.
- Flushing cigarette butts, sanitary napkins or other inorganic materials down the toilet.
- Extensive use of garbage disposals. Ground up foods are hard on septic systems because they are not digested first by the human body.
- Use of salts and chemicals from water softeners and washing machines can damage septic tanks.
- Channel washing machine water and waste from water softeners into a separate disposal area such as a dry well, if permitted.
- Tree roots clogging pipes. Contact a septic contractor for repairs.

*Source: Cape Cod Biochemical Co., Pocasset, MA*

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