

Septic System Maintenance

The Water Quality Program Committee, Virginia Tech

How Septic Systems Work

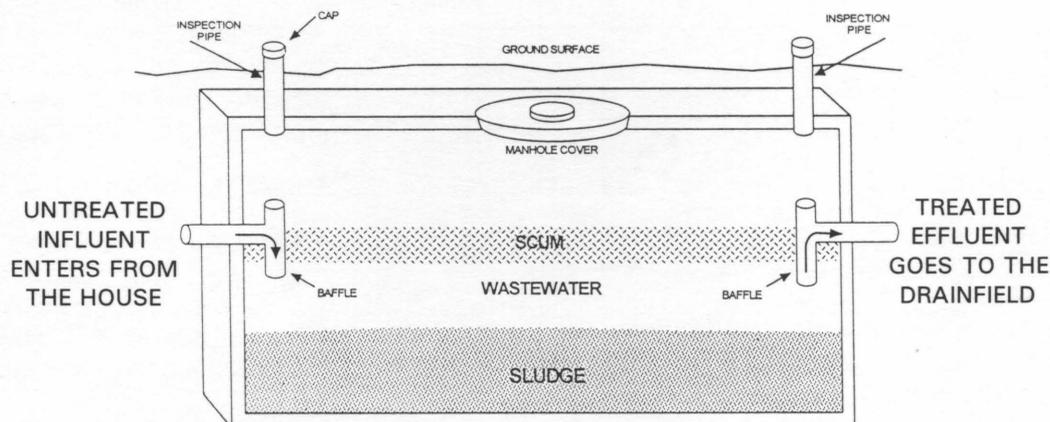
The septic system is a natural method of treatment and disposal of household wastes for those homeowners who are not part of a municipal sewage system. A septic system works by allowing waste water to separate into layers and begin the process of decomposition while being contained within the septic tank. Bacteria, which are naturally present in all septic systems, begin to digest the solids that have settled to the bottom of the tank, transforming up to 50 percent of these solids into liquids and gases. When liquids within the tank rise to the level of the outflow pipe, they enter the drainage system. This outflow, or *effluent*, is then distributed throughout the drain field through a series of subsurface pipes. Final treatment of the effluent occurs here as the soil absorbs and filters the liquid and microbes break down the rest of the waste into harmless material.

Most septic systems are *conventional* systems that use gravity to distribute the effluent from the tank. When site conditions are not appropriate for a conventional system, other types of systems, such as *low pressure distribution* or *mound* systems are sometimes used. For more information on these systems see the Virginia Cooperative Extension publications in this series.

Septic systems cannot dispose of all the material that enters the system. Solids that are not broken down by bacteria begin to accumulate in the septic tank and eventually need to be removed. The most common reason for system failure is not having these solids removed on a regular basis. When the holding tank is not pumped out frequently enough, the solids can enter the pipes leading to and from the tank. This can cause sewage to back up into the house or cause the drainage system to fail as the pipes and soil become congested. These problems are often costly to fix, pose a danger to public health, and are a significant source of water pollution. Seepage from inadequate or failing septic systems can contaminate both ground and surface waters. Malfunctioning septic systems are currently the leading cause of groundwater pollution in Virginia.

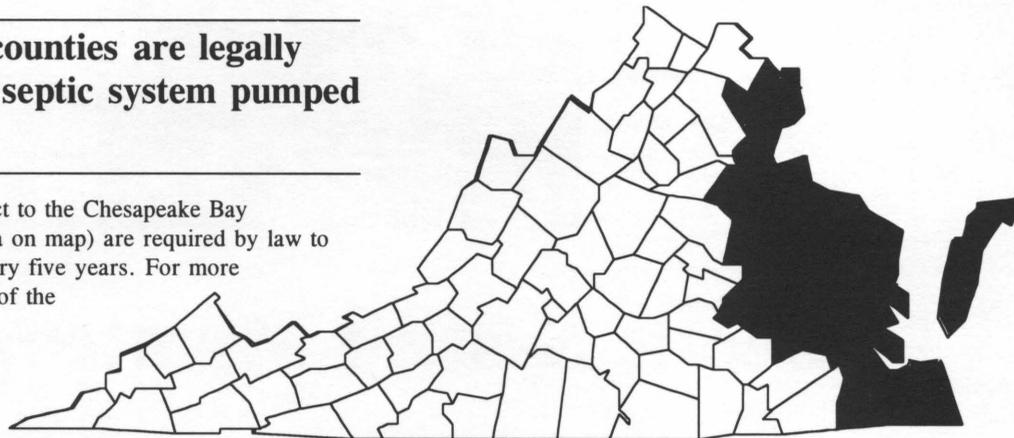
Wastewater contains several undesirable pollutants. Pathogens such as viruses or bacteria can enter drinking water supplies creating a potential health hazard. Nutrients and organic matter entering waterways can lead to tremendous growth in the quantity of aquatic microorganisms. Metabolic activity of these microbes can reduce oxygen levels in the water causing aquatic life to suffocate.

A Conventional Septic Tank



Homeowners in some counties are legally required to have their septic system pumped every five years.

Households within the counties subject to the Chesapeake Bay Preservation Act (see highlighted area on map) are required by law to have their septic systems pumped every five years. For more information on specific requirements of the Act, contact your local zoning authority or the Chesapeake Bay Local Assistance Department, 805 E. Broad Street, Suite 701, Richmond, Virginia 23219.



Maintenance of an Individually Owned Conventional Septic System

All septic tanks should be checked on an annual basis to ensure they are working properly. *Baffles*, specially designed pipes which allow the sewage into and out of the tank, need to be checked to ensure they are not worn or damaged. The level of *sludge* (the material that accumulates at the bottom of the tank) needs to be measured to determine when the system should be pumped. If the tank currently does not have observation tubes, it is recommended that they be installed to facilitate the monitoring of these solids.

The Commonwealth of Virginia advises homeowners to routinely have their septic tanks pumped out every three to five years. However, the frequency with which your tank needs to be pumped may vary depending on the size of the tank and number of people in the household:

Suggested Pumping Frequency (Years)*

(*More frequent pumping may be required by law in some counties. See map above.)

Tank size (gal)	Household Size (No. of People)							
	1	2	3	4	5	6	7	8
500	5.8	2.6	1.5	1.0	0.7	0.4	0.3	0.2
750	9.1	4.2	2.6	1.8	1.3	1.0	0.7	0.6
1000	12.4	5.9	3.7	2.6	2.0	1.5	1.2	1.0
1250	15.6	7.5	4.8	3.4	2.6	2.0	1.7	1.4
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8
1750	22.1	10.7	6.9	5.0	3.9	3.1	2.6	2.2
2000	25.4	12.4	8.0	5.9	4.5	3.7	3.1	2.6
2250	28.6	14.0	9.1	6.7	5.2	4.2	3.5	3.0
2500	31.9	15.6	10.2	7.5	5.9	4.8	4.0	4.0

Source: Cooperative Extension Service, University of Maryland, 1991

Use a Licensed Pumper and Hauler

In Virginia, it is mandatory for homeowners to hire a licensed pumper and hauler to service their system. This requirement is primarily for homeowner safety, since septic systems produce harmful fumes and can be dangerous to clean for those not adequately prepared. Using qualified professionals also reduces the chance of improper monitoring or possible damage to the system during

pumping. Contact either your local health and sanitation department or a local Virginia Extension agent for a list of licensed pumpers in your area or for more information on system maintenance in general. It is worth stressing again that it is much less expensive to maintain a system than to repair or replace it later.

Use of Additives

The use of additives to help maintain the system is not recommended. They will not extend the amount of time required between pumping, and, although they may not harm the septic tank, they could contaminate the soil. As mentioned earlier, the most effective method of breaking down the solid matter in the sewage is allowing the naturally present bacteria to digest it.

Other Ways to Prolong the Life of Your System

There are many ways to prolong the life of your septic system and lengthen the period between pumpings. Household water use directly controls how quickly waste travels through a conventional system. Wastewater that enters the tank requires time to allow the solids to settle to the bottom. The higher the volume of water that is introduced to the system, the less opportunity the wastewater has to settle in the holding tank and the less opportunity the bacteria have to break down the solids. Therefore, limiting the use of water in the home will go far in prolonging the life of the system.

Reduce Household Water Use

- Use water-saving shower heads and faucet aerators.
- Install low-flow toilets.
- Repair leaking toilets (place a few drops of food coloring into the toilet tank to detect water leakage into the bowl).
- Make sure sump pumps and roof drains are not connected to the sewage system.
- Use front load washers and space out the time between washings.

Watch What Goes Down the Drain

Controlling what goes into the water that enters the system is just as important as reducing the amount of water that flows into the system.

- Never dispose of toxic or hazardous chemicals by dumping them down the drain as they have the potential to contaminate groundwater.
- Refrain from putting any plastic, cloth, or unnecessary paper products into the sewage system.
- Avoid using garbage disposals as they accelerate the accumulation of solids in the holding tank. Especially avoid putting any grease or oil in the disposal or drain. These can clog pipes and drain field soil and damage your system.

Protect Your Drain Field

The drainage field is an often overlooked aspect of the septic system, yet it is more important than the tank for the proper operation of the entire system. Homeowners can take several measures to ensure their drain field is properly maintained.

- Never park vehicles or place other large objects on the drain field, as this will compact the soil and reduce its ability to treat wastewater. It also may damage the

network of drain pipes within the field, causing them to need to be replaced.

- Avoid planting water-loving shrubs with deep root systems or trees near the drain field, as roots could damage the pipes, or they could change moisture levels within the soil causing it to be less effective.
- Effluent from sump pumps and roof drains should not be discharged in the vicinity of the drain field, as this could keep the soil too wet, reducing its capacity to absorb the waste water and causing it to puddle on the surface, creating an environmental and health hazard.
- Check for depressions in the drain field where surface water can collect. The drain field should be level with the surrounding soil to discourage puddling. If the drain field is on a sloping site, surface water diversion may need to be considered.

It is helpful to draw a diagram of the septic system which shows the location of the house, the septic tank and its manholes, and the drain field. This diagram will make it easier for a qualified maintenance worker to check and maintain the system. This need only be a sketch, although the more accurate the drawing, the more helpful it will be in the future, so include measurements of distance wherever possible.

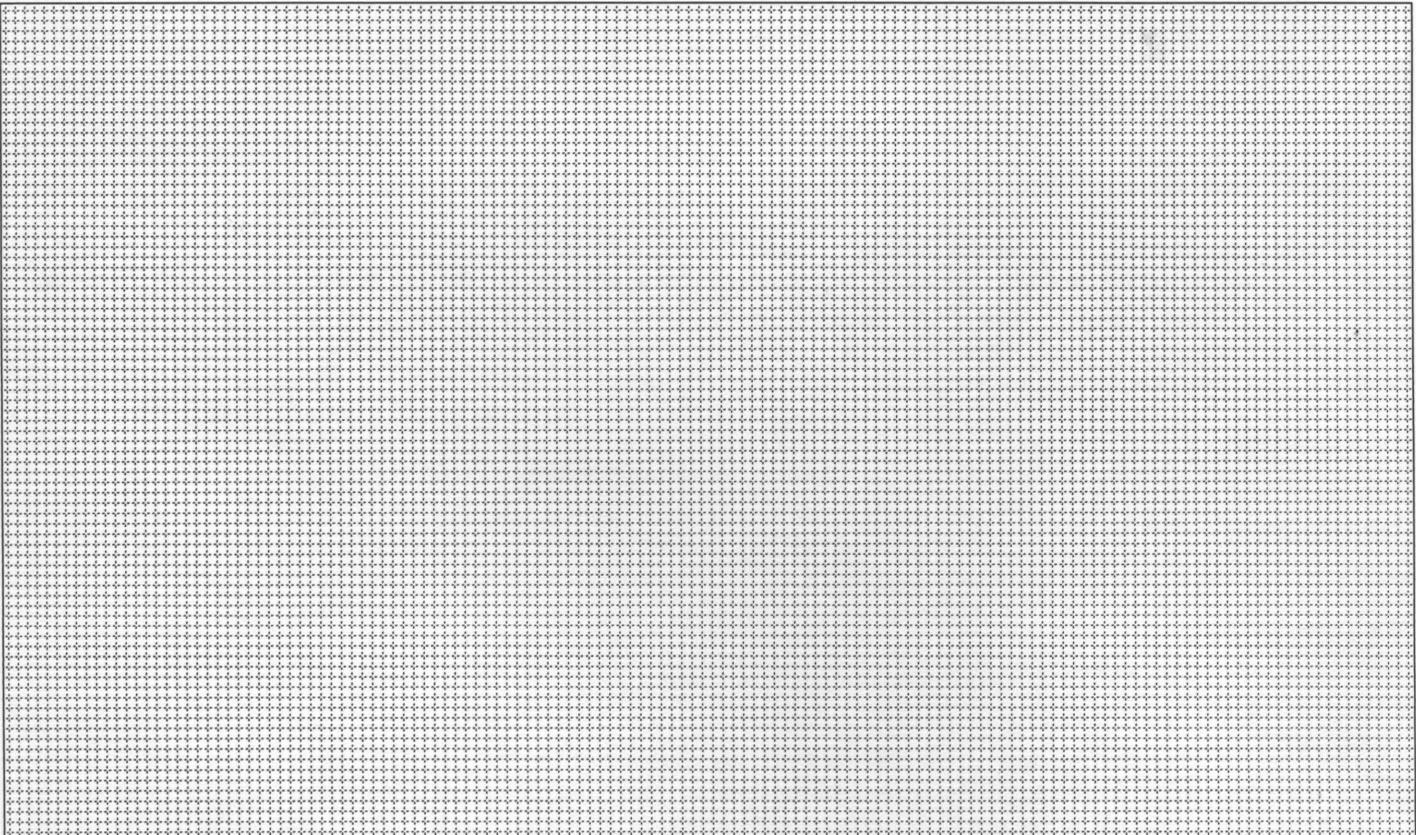


Diagram of Your Septic System: Sketch a diagram showing the location of your septic tank and drain field in relation to your house. Measure exact distances from at least two reference points (such as the corner of the house and a tree) if possible.

Maintenance Records

Keep a record of maintenance on your system using the table below. It is suggested that you include who maintained the system, what was done, the date of the work, and the current status of the system.

Date	Contractor and Description of Work

Who to call	Name	Phone Number
Local health department		
Local sanitarian		
Extension agent		
Licensed pumpers and haulers		
VA Dept. of Health		(804) 786-1750

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