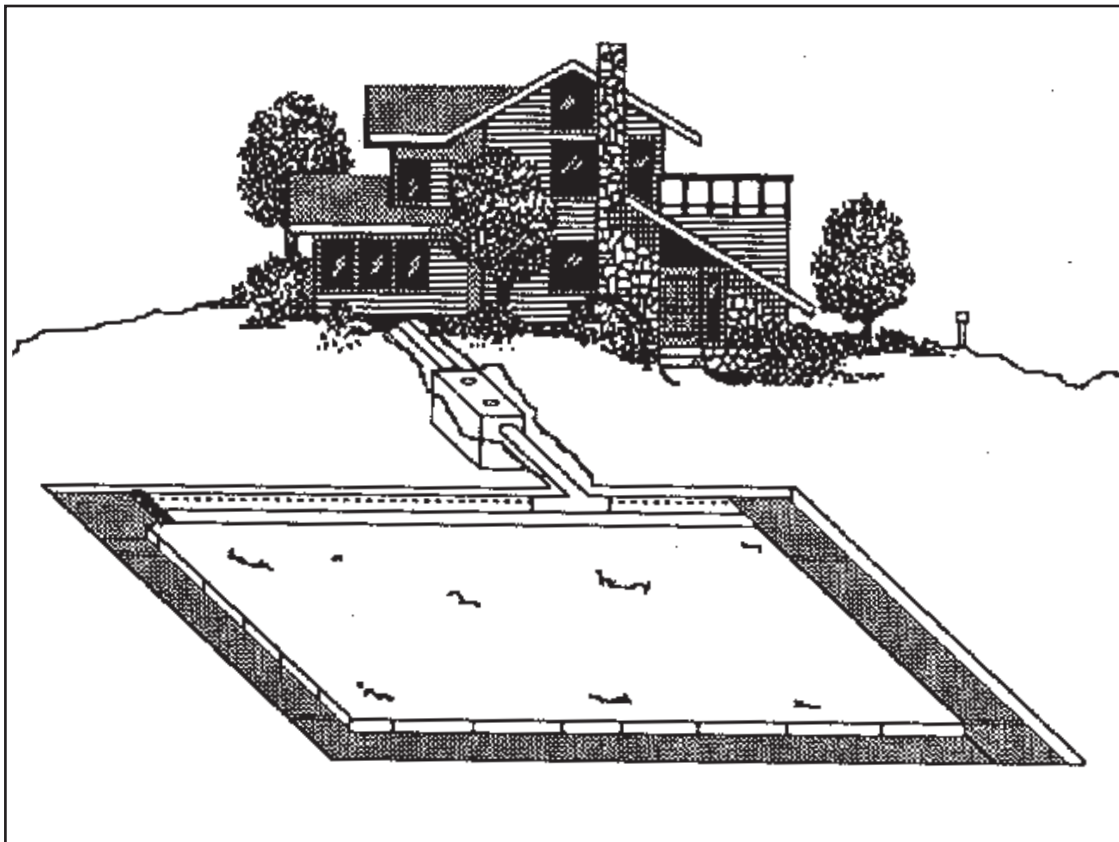


Septic Systems:

An Overview



McLean County
Health Department
Partners in Prevention

www.mcleancountyil.gov/health

Introduction

The septic tank/seepage field sewage disposal system is widely used as a convenient substitute where public sewers cannot be economically provided. This system usually will give satisfactory performance in suitable soils if properly designed, constructed and maintained.

This booklet will provide answers to some questions frequently asked by home owners about the design, construction, operation and maintenance of individual sewage disposal systems. It begins with a general description of septic systems, including descriptions of two types of systems: seepage field and sand filter. Next is an overview of the proper installation and maintenance of a system; then, a list of precautions that you should be careful to follow to help prolong the life of your system. Words *italicized* in the text can be found in the glossary at the end of the booklet.

The Septic System

In McLean County, septic systems generally consist of a *septic tank* followed by either a *seepage field* or a *sand filter*.

A waste disposal system consisting of only a tank followed by a tile that ultimately discharges sewage to the ground surface or a ditch is neither a legal nor a safe method of household waste disposal.

Septic Tanks

A septic tank receives liquid household wastes (soapy water from the laundry and the bath, discarded food scraps, body wastes, etc.) from the house plumbing. Solids settle to the bottom of the tank, and liquid *effluent* flows to the seepage field. The tank is large enough to accumulate substantial amounts of solids while bacteria work to decompose solid matter. *Baffles* are provided in the tank to prevent floating solids and scum from entering the seepage field. (See figure 1.)

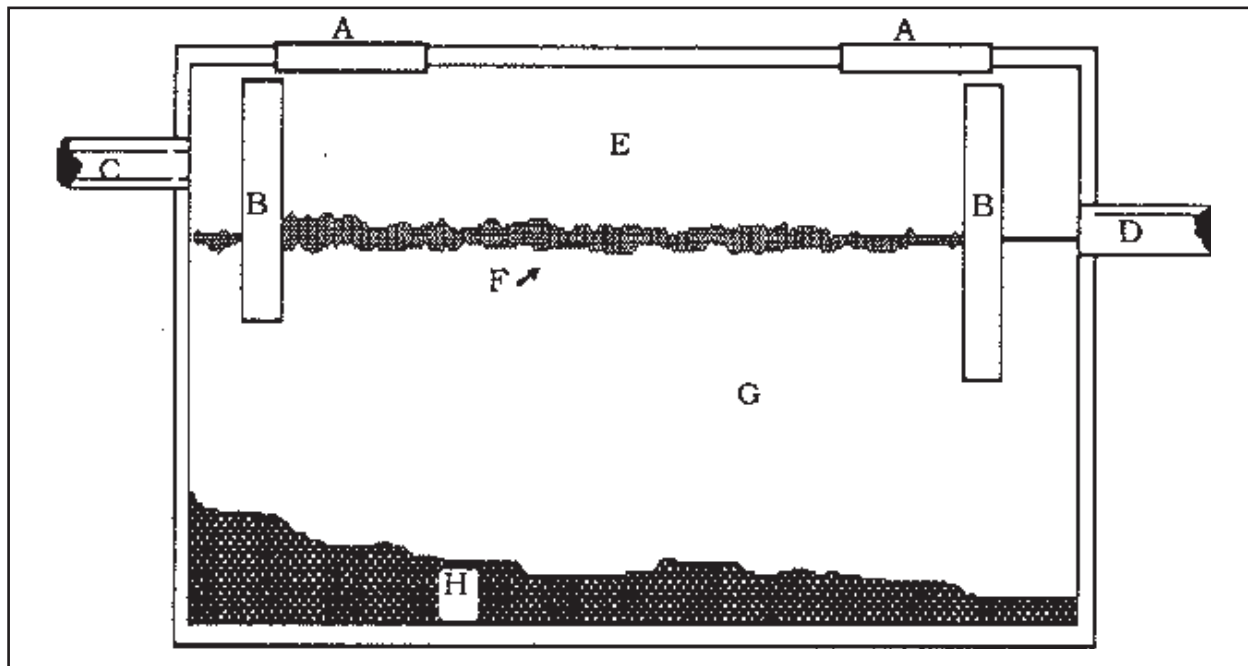


Figure 1 • *Septic Tank*

A. Access covers
B. Baffle

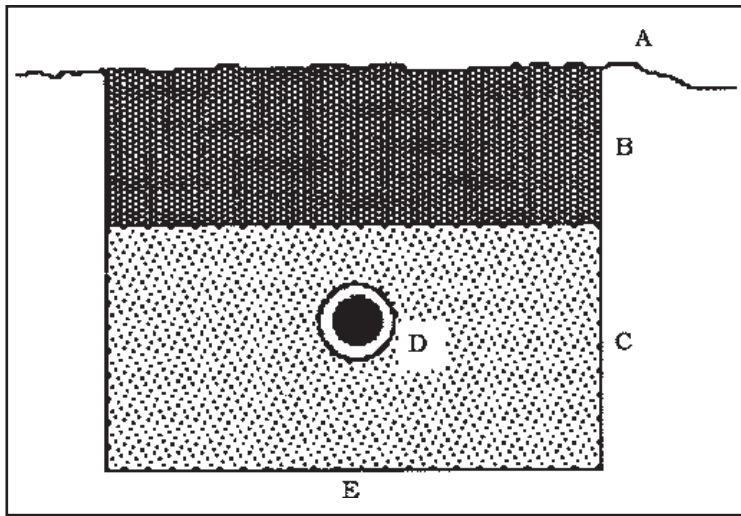
C. Inlet pipe
D. Outlet pipe

E. Air space
F. Floating scum and foam

G. Liquid sewage
H. Sludge and solids

Seepage Fields

A seepage field is usually a 3-foot wide trench, 36 inches deep, having 6 inches of gravel under and 2 inches of gravel over a 4-inch distribution pipe. Generally four to eight trenches, 50 to 100 feet long comprise a seepage field. (See figure 2).



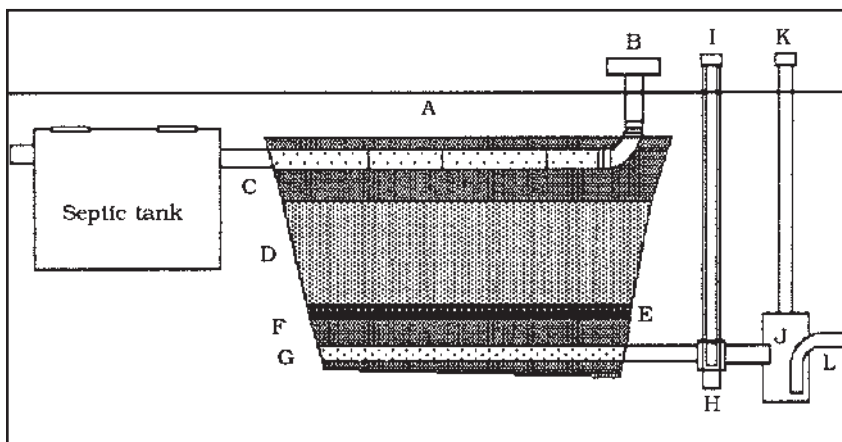
- A. Ground surface
- B. Earth fill (6" to 24")
- C. 12" gravel
- D. 4" tile
- E. Trench width of 24" to 36"

Figure 2 • *Seepage Field*

Sand Filters

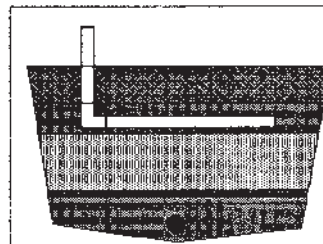
A *sand filter* is a specialized type of septic system used in areas where a seepage field is impractical due to soils that do not absorb water well. A typical sand filter is an excavation 20 feet wide, 30 feet long and 5 to 6 feet deep that is layered with specific amounts of gravel and filter sand. Effluent is distributed in the top 10 inches of gravel, filtered through sand and gravel and collected by a tile in the bottom of the pit. The filtered effluent is then directed through a *chlorinator* and contact tank and finally discharged.

As the sand filter effluent passes through a chlorinator it dissolves chlorine tablets contained in the unit. The chlorinated effluent is temporarily retained in a contact tank while chlorine kills the bacteria. The effluent can then be safely discharged into a buried drain tile or, in some cases, to the ground surface. (See figure 3.)



- A. Distribution pipe
- B. Vent
- C. 10" gravel
- D. 24" filter sand
- E. 2" pea gravel
- F. 10" gravel
- G. Collection tile
- H. Chlorinator
- I. Chlorinator feed pipe
- J. Contact tank
- K. Sampling pipe
- L. Discharge pipe

Figure 3 • *Sand-Filter System*



Septic System Installation and Maintenance

An individual must have a permit from McLean County Health Department to install a septic system. A system may be installed by a McLean County licensed septic system installer or by a home owner who has had proper training from health department personnel.

Location

Usually the septic tank is a minimum of 5 feet straight out from where the sewer pipe leaves the dwelling. A previously installed field can usually be located in summer and fall because the grass over the seepage trenches is distinctively darker or lighter in color than the surrounding grass covered areas. In winter, a light snow may melt sooner because of heat produced by bacteria in the tank and the field. Seepage fields are usually 6 to 24 inches below the ground surface and can be located with a *tile probe*.

Depth

A septic tank should be found within 12 inches of the ground surface. This depth allows service people to access the tank with little difficulty while still being deep enough to prevent unauthorized access.

A septic system is installed close to the surface of the ground because the top 6 to 36 inches of soil is more porous and will absorb water faster than the clay that usually comprises subsoil. This depth also helps keep seepage lines above seasonal high *water tables*.

Pumping the Septic Tank

In a septic tank heavier sewage solids settle to the bottom of the tank forming a layer of sludge. Lighter solids, including fats and grease, rise to the surface forming a layer of scum. If either the sludge or scum approaches the bottom of the baffle, the tank must be pumped. It is recommended to pump the tank every 3 to 5 years.

Pumping the tank on a periodic basis is one of the best ways to keep a system functioning the maximum length of time.

Chlorination

As described earlier, sand filter systems depend on chlorination to safely discharge treated effluent to buried tiles or to the ground surface. Maintaining a chlorine residual in your sand filter effluent is an easy process and is an additional step needed in properly maintaining a sand filter system so that it operates according to State and Local codes.

To chlorinate your sand filter effluent, simply remove the cap from the middle standpipe in your yard. Inside the pipe there is a smaller diameter pipe with a rope handle. Remove the smaller pipe and inspect the bottom of it to confirm it is free of any obstructions (see figure 3 H, I). Replace the pipe and insert an approved chlorine tablet into the smaller diameter pipe. **Do not use swimming pool chlorine tablets.** If you do not know which pipe is the chlorinator or you need information on where to purchase approved chlorine tablets, call the McLean County Health Department.

Septic System Failure

A septic system fails over time because suspended solids are carried out of the septic tank with effluent. These small solids plug up spaces between soil particles in seepage field trench walls and between the sand in a sand filter. It is important, therefore, to properly maintain a septic tank in order to ensure the system lasts approximately 20 years.

Avoiding Additives

Some 1,200 products, many containing enzymes and yeast, have been placed on the market for use in septic tanks. Extravagant claims have been made for some of these; however, research has shown no benefits resulting from their use and, in some cases, these products may actually cause a marked deterioration in the system.

Water Usage

New septic systems are designed to accommodate 100 gallons of water per person per day. If septic system problems are encountered, however, they may be minimized by practicing water conservation: installing low-flow shower heads, using clothes and dish washing machines only for full loads, reducing the quantity of water used when flushing the toilet (by displacing the water with a brick or sealed plastic container filled with water placed in the flush tank or adjusting the float), and repairing leaky faucets.

Garbage Disposals

Garbage disposals are not recommended in homes served by septic tanks and subsurface seepage fields or sand filters. If they are used, the accumulation of solids in the tank will be more rapid and the carry out of solids into the field or filter will be increased. This means that the life of the seepage field or sand filter is likely to be shortened.

On new system installations, extra septic tank capacity is required in order to accommodate garbage disposals.

Heavy Trucks and Equipment

Prevent heavy trucks and equipment from driving over your septic system. This is especially important to consider when a new home is being constructed. Concrete and building material trucks may make deliveries on the property and can easily damage a newly installed septic system.

Additional Construction

Do not build any new structures (driveways, patios, swimming pools, etc.) over a septic system. They will keep a system from working to its full capacity and may cause premature system failure.

Soaps and Detergents

Soaps, detergents, bleaches, drain cleaners or other chemicals normally used in the household will have no appreciable adverse effect on the system. However, because essential organisms might be adversely affected by large quantities of chemicals and disinfectants, **moderation should be the rule**. Check with a representative of the McLean County Health Department before discharging chemicals from a hobby or home industry into the system.

Cigarettes and Other Disposable Items

Cigarettes, paper towels, sanitary napkins, tampons, condoms, and disposable diapers will not readily decompose in the tank and are likely to clog the septic tank. Therefore, do not flush these items down the toilet.

Water Softener Backwash

State law requires water softener backwash to discharge into the septic system. Studies in controlled environments have suggested that water softener backwash may have adverse effects on the septic tank, bacterial growth, and the soil structure of the system. When it is possible, *backwash water* may be directed to a separate seepage field.

Other Water Discharges

Roof downspouts, footing tiles and drainage from other sources producing large intermittent or continuous volumes of clear water must **not** be directed into the septic tank or over the seepage field.

Trees and Shrubbery

Planting some varieties of trees and shrubs near properly constructed and maintained seepage fields have been found to have adverse effects on the septic system. Contact the McLean County Health Department or an arboretum for a list of trees and shrubs that commonly invade septic systems. All trees and shrubs should be kept away from sewer lines and septic tanks.

Freezing Weather

Shallow septic systems that are properly constructed and maintained will not freeze if kept in continuous service. No special precautions are necessary.

For More Information

Since the County Private Sewage Disposal System inspection program started in 1956, over 9,800 installations have been inspected. Permit applications, showing the size and location of each system, are available at the health department office.

For additional information, contact the McLean County Health Department's Environmental Health Division at 200 West Front Street, Bloomington, Illinois, or phone (309) 888-5482.

Glossary

Backwash Water • Water resulting from regeneration of a water softener system.

Baffle • A partition in the tank that prevents solids from flowing into the seepage field.

Chlorinator • A device used to disinfect effluent after sand filter treatment.

Effluent • Domestic waste water discharged from the septic tank.

Sand Filter • An effluent treatment system which consists of a large pit filled with specific amounts of layered rock, sand and perforated pipes.

Seepage Field • A series of perforated pipes in rock-filled trenches used for disposal of effluent from the septic tank.

Septic Tank • A tank for settling solids out of domestic waste water.

Tile Probe • A 4-foot to 5-foot long rod inserted into soil to locate tiles underground.

Water Table • The upper limit of the ground saturated with water.

Other Environmental Health Services

- Food Sanitation Program
- Private Water Supply Program
- Water Well Permit Program
- Tanning Facility Program
- Inquiries regarding nuisance control, solid waste, vector prevention, pest control, asbestos, radon, etc.