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MINNESOTA EXTENSION SERVICE

UNIVERSITY OF MINNESOTA
COLLEGE OF AGRICULTURAL, FOOD,
AND ENVIRONMENTAL SCIENCES

Septic System

Owner's Guide

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*This guide is provided free of charge by
Metropolitan Council Environmental Services.*

Septic Tank: Primary Treatment

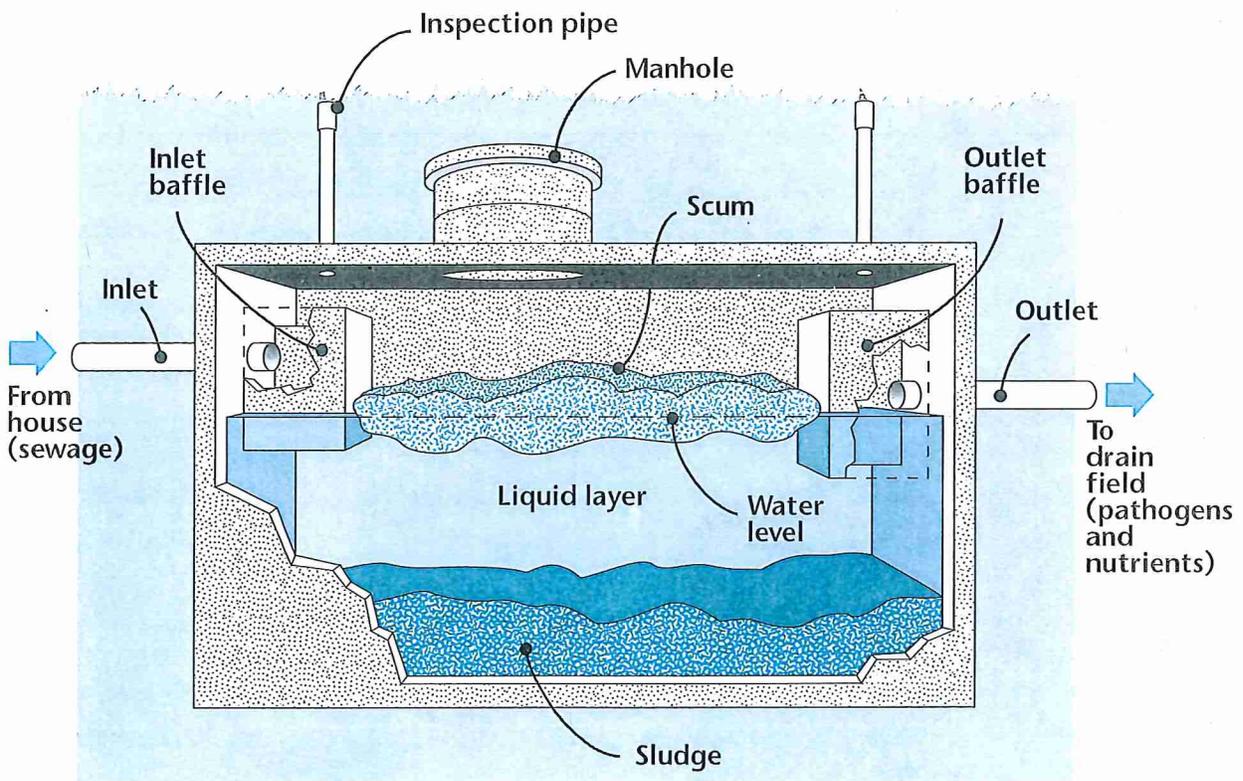
How the Tank Works

The contents of the septic tank separate into three layers:

- **Floating scum layer** - soaps, greases, toilet paper, etc.
- **Liquid layer** - water, liquid, and suspended solids
- **Sludge** - heavy organic and inorganic materials at the bottom of the tank.

Naturally-occurring bacteria in the sewage begin to break down organic materials in the tank. This is often referred to as **primary treatment**. Pathogens in the waste are NOT destroyed in the septic tank. Bacteria in the septic tank prepare the wastewater for final treatment in the drainfield.

Figure 1 – Septic tank



Components of the Tank

The **septic tank** is the first step of the wastewater treatment process. The septic tank is a solid tank designed specifically to accept all wastewater from the home. Some installations may have two tanks in a row or one large tank with two compartments. Several tank designs are available but all tanks should have inlet and outlet baffles, inspection pipes, and a manhole for cleaning (**Figure 1**). A few homes on small lots or in poor soil treatment situations may have a large holding tank to store wastewater until the entire contents are hauled away for treatment at another location.

The **inlet baffle** forces wastewater entering the tank to be mixed with the liquid contents to begin bacterial breakdown of organic materials and separation of solids. The inlet baffle also prevents the floating scum layer from floating back and clogging the inlet pipe.

The **outlet baffle** prevents scum from leaving the tank. If the scum layer reaches the outlet pipe, the pipe will become plugged. Scum in the drainfield will clog soil pores and destroy its ability to treat wastewater. Filtering devices can be installed at the outlet of new or existing tanks to prevent solids from reaching the drainfield. Regular maintenance is required to keep the filters from clogging and causing backups. Filters are not a substitute for proper operating or maintenance practices!

Inspection pipes of 4- or 6-inch PVC (plastic) material should be located above the inlet and outlet baffles to allow for inspection of pipes and baffles. Clogs in the inlet or outlet pipes can be unplugged through the inspection pipes. When operating properly, the septic tank is always "full" to the level of the bottom of the outlet pipe.

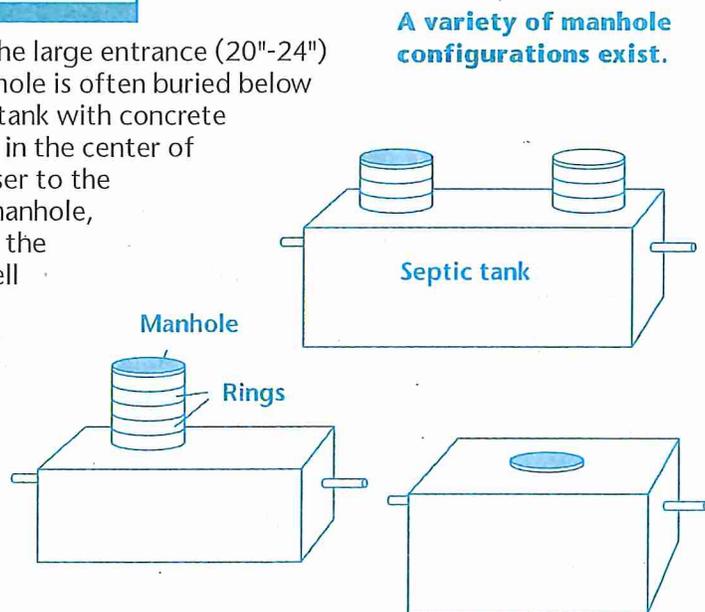
Inspection pipes must always be capped. They may be cut off flush with the ground to ease lawn care; however, the pipes should be left "long" until the final grade on a new site is determined. Metal covers can help in locating the inspection pipes when the ground is covered with snow.

! Do NOT use inspection pipes to clean or pump a tank! !

The **manhole** in the cover of the septic tank is the large entrance (20"-24") through which the tank should be cleaned. The manhole is often buried below ground level. It may be raised from the cover of the tank with concrete or plastic rings for easier access. It is usually located in the center of the tank; however, some manufacturers locate it closer to the inlet end of the tank. There may be more than one manhole, in which case they are usually located at the ends of the tank. The manufacturer or installer may be able to tell you where it is.

! Be careful when removing the manhole cover! It is heavy and creates a large, dangerous opening!! !

The manhole allows proper cleaning and inspection of the tank (see Maintenance and Care). The manhole cover must be kept securely in place. If the septic tank cover does not have a manhole or inspection openings, sometimes a new cover with these features can be installed on an existing tank.



Maintenance and Care

Tank Maintenance

Frequency of Pumping

The septic tank **MUST** be periodically cleaned (pumped) to remove floating scum and sludge that accumulate. If either floating scum or sludge is allowed to enter the soil treatment system (drainfield) it will cause expensive and often irreparable damage. How often to clean a septic tank depends on its size, use, and operating condition.

In **new home installations**, the tank should be cleaned after 6–12 months of use as a precautionary measure to ensure good bacterial activity and proper functioning. In new homes, wastewater from painting, varnishing, staining, and other construction functions can reduce the initial levels of bacterial activity causing damage to the soil treatment system. If finishing work is still being completed, the tank should be cleaned before it is used for sewage.

Once a system is known to be operating properly, the worksheet on page 18 can be used as a guideline for cleaning frequency. Take into consideration both the calculated guideline results (in months) and the condition of the tank (amount of scum and sludge) at the last cleaning. Homeowners should be present when the cleaning is done or be sure to get this information from the cleaning contractor.

A typical household will calculate a cleaning frequency (using the guideline worksheet) of 18–30 months. If your final result is very different from this, recheck your responses and the math. If your result is still very different, contact a qualified septic system professional for additional advice.

If the result suggests very frequent cleaning (less than every 12 months), the system may need to be upgraded and/or use habits changed. Use the space provided in the folder accompanying this guide to record the cleaning dates.

Never go more than 36 months between cleanings!!

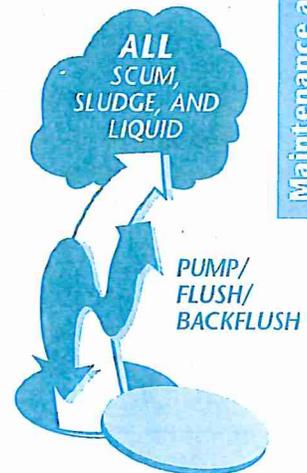
Proper Cleaning Method

Cleaning, or “pumping” as it’s often called, must be done by a licensed and bonded professional. Proper cleaning will remove **ALL** scum, sludge, and liquid from the septic tank(s). This requires pumping, flushing, and backflushing liquid contents back and forth between the truck’s tank and the septic tank through the manhole several times. This process breaks up all scum and sludge in the tank, allowing all solids to be removed by the truck’s suction line. Floating scum left in the tank after cleaning may plug baffles or allow solids to enter the drainfield when the tank refills. Cleaning will leave a black film on the tank walls and a small amount of liquid on the tank floor. This contains millions of bacteria to help get the tank working following the cleaning.

When the tank is cleaned, ask the contractor to make sure the baffles are in place and functioning properly. Cleaning a tank through the inspection pipes will often leave solids in the tank and possibly damage baffles. **Insist** that the tank be cleaned through the manhole if the tank has one. Ask beforehand if the tank will be cleaned through the manhole, and if it will not, find a different contractor. It may cost slightly more to have the tank cleaned through the manhole, but this will save money in the long run.

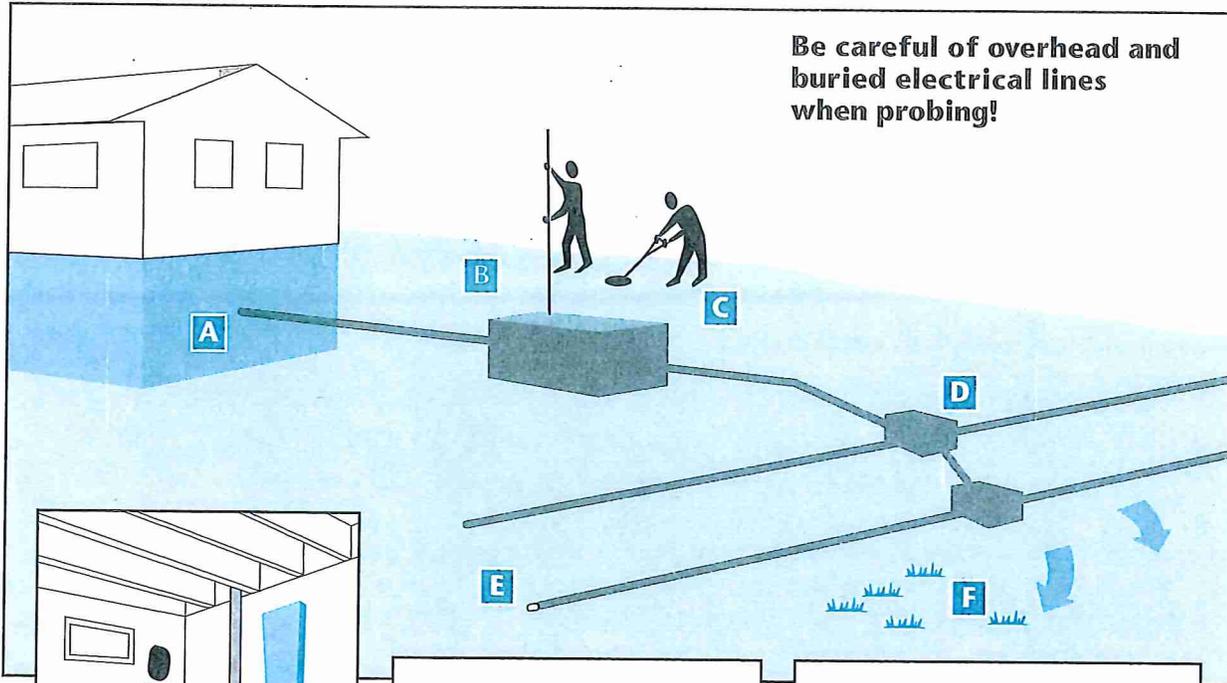
After cleaning, it is not necessary to add a starter. Bacteria present in wastewater and in the tank will do the job.

A few dollars spent every one to three years on proper cleaning is much less expensive and easier to plan for than an unexpected \$2,000 to \$10,000 repair bill!

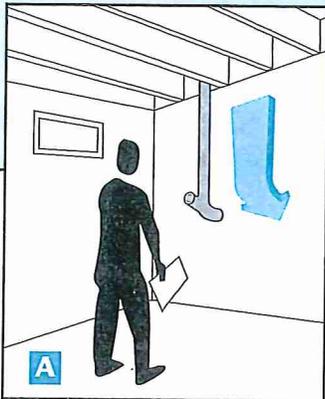


Maintenance and Care

Locating a system



Be careful of overhead and buried electrical lines when probing!



In what part of the yard is the septic system located?

- If no access pipes are showing, locate the sewer pipe in the basement.
- Check existing plans.

Can I find the septic tank?

- B** Begin probing about ten feet from the house with a metal rod, listening for a hollow sound. The tank will be at least as deep as the outgoing sewer pipe.
- C** Use a metal detector. You may be able to locate the manhole cover.

What clues will help me locate the soil treatment area?

- D** A mound or settled area?
- E** The exposed end of an outgoing pipe?
- F** An area where:
 - the snow melts more quickly?
 - the grass doesn't grow well, or where it grows greener and faster?
 - the earth is soggy, or there is moisture-loving vegetation?