

UNDERSTANDING YOUR HOUSEHOLD SEPTIC SYSTEM

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Introduction

As long as people have lived in communities, there has been a need for sanitary disposal of human wastes. About three thousand years ago, homes in the Indus Valley had bathrooms with water-flushed latrines that emptied into pits similar to modern septic tanks. In contrast, many Europeans were still dumping human wastes into the streets a little more than two hundred years ago. In the United States, early sanitation consisted of outhouses with earthen-pits. Later, flush toilets were added to homes, but they emptied directly into surface waters, not into sewers. Today, most homes are connected to public sewer systems. Homes not connected to public systems usually have separate on-site treatment systems to handle household wastewater. This fact sheet is one in a series concerning domestic wastewater treatment. It gives a brief overview on how septic systems work. Knowing how your septic system functions will help you understand how to care for the system to maximize its ability to treat your household's wastewater.

How a Septic System Works

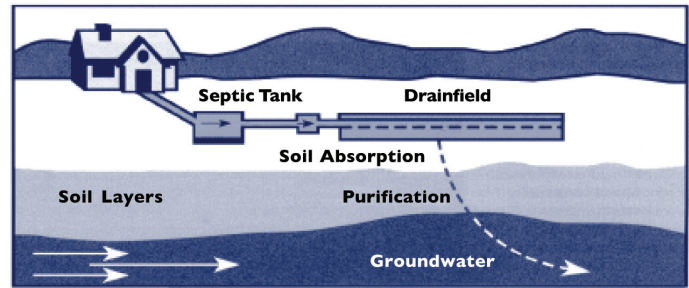
Septic systems are designed to hold, treat, and dispose of household wastewater. Household wastewater contains bacteria, viruses, household chemicals, and excess nutrients such as nitrates, all of which can cause health problems. Therefore, household wastewater must have adequate treatment to prevent water contamination.

Your septic system has two major parts: a septic tank and a treatment area. Wastewater from toilets, sinks, showers, and other drains, flows from the household sewer drain to an underground septic tank. There, waste components separate--the heavy solids settle on the bottom, forming a sludge layer, while grease and fatty solids float to the top, forming a scum layer. Bacteria in the tank partially decompose the solids.

Solids will build up in the tank and must be removed periodically by a professional contractor. The relatively clear layer of wastewater in the middle is called effluent. Effluent flows from the septic tank outlet to the soil where most of the treatment process occurs.

The Soil Treatment Area

The soil treatment area, also known as the drainfield, leach field, consists of gravel-filled trenches containing plastic



Conventional septic system with drainfield. Adapted with permission from National Small Flows Clearinghouse, 1-800-624-8301. From Pipeline Vol. 6, No. 3. Summer 1995.

chambers or perforated plastic pipe. This underground portion of the system accepts effluent from the septic tank outlet. Effluent moves through the pipes and seeps into surrounding soil for final treatment. Soil particles filter out small suspended solids and organic matter, while soil bacteria break down harmful microorganisms and other organic components. Viruses adhere to clay particles in the soil and eventually die. The now treated effluent continues its downward flow through the soil layers.

Managing Your System

As long as your septic system has been properly designed and installed, there are some things you can do to keep it functioning well.

- Protect the system from being overloaded with water.
- Improve the quality of your wastewater.
- Protect the soil treatment area.

Less water entering the system means better treatment and longer system life. Keep in mind that as water enters the septic tank, an equal amount is displaced and released into the treatment area. When excess wastewater enters the septic tank, settling time is reduced, enabling some solids to enter the area. Excess solids in the drainfield can cause the system to fail by clogging the soil pores. Clean water from heavy rains or too much lawn watering can also negatively affect the soil treatment area. Because it is designed to treat wastewater, any excess clean water that enters the soil treatment area makes the system work more than is necessary.

You can improve the quality of your wastewater by reducing the amount of suspended solids that go into the system. Suspended solids include grease and fat particles and ground-up foods from the garbage disposal. These small particles don't settle out well in the tank and can end up in the drainfield reducing its useful life-span.

Since the soil treatment area is where most of the treatment occurs, it's very important to protect this portion of the system. Soil compaction is a major hazard to the operation of the soil treatment area because compacted soil cannot treat wastewater. Once compacted, soil can't be restored; the installation of a costly new drainfield is the usual solution to the problem. Examples of things that can cause soil to become compacted include vehicle traffic, heavy objects, and buildings.

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A properly designed, installed, and maintained septic system should protect the environment and give your household many years of good service.

For more information on household septic systems, visit the Arizona Extension publications web page at ag.arizona.edu/pubs.



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