How Septic Systems Work

By Cory Frank

Water is the main component of the wastewater generated by homes and businesses. There is a finite supply of water on our planet. The water in our wastewater must be "recycled" for future use.

Treatment of wastewater with a septic system begins with the plumbing in the house. It funnels wastewater to the septic tank. In the tank, solids are separated from the liquids. Some solids float to the top and others settle to the bottom. Natural bacteria in wastewater break down the organic solids. Solids not broken down by bacteria are stored in the septic tank until the tank is pumped. They should be pumped out of the tank through the manhole every three to five years. Septic tanks do **not** destroy disease-causing pathogens. Septic tanks prepare the liquid for final treatment by the soil. Wastewater from septic tanks may be distributed into the soil by a lateral drainfield, mound, or drip dispersal system. Soil conditions or site limitations may require the use of a discharging system such as an intermittant sand filter, mechanical aerobic systems, or peat filters.

A biomat forms where sewage meets the soil. Once wastewater is through the biomat, harmful pathogens are destroyed. When owners don't clean septic tanks often enough, too many solids clog the biomat. Liquids can't pass through. This means the septic system will fail with untreated water coming to the surface or backing up into the home.

Complete treatment of wastewater in a traditional soil treatment system depends on unsaturated soil. A minimum of three feet of unsaturated soil below the drainfield is Iowa's standard. Some local units of government have adjusted this requirement for local conditions. Saturated soil is determined by soil color and mottling. Mottling is identified in soil borings when the system is designed. The soil provides the final treatment. A properly designed and installed soil treatment system destroys all disease-causing pathogens. It also removes many of the nutrients in wastewater. Drainfields recycle some water and nutrients to grass and trees. The remainder percolates downward replenishing the groundwater. Nitrates from a septic system are rarely a problem when a properly cased well is more than 50 feet deep and meets setback requirements. When properly designed, installed, operated and maintained, a septic system treats sewage as well or better than municipal treatment plants.