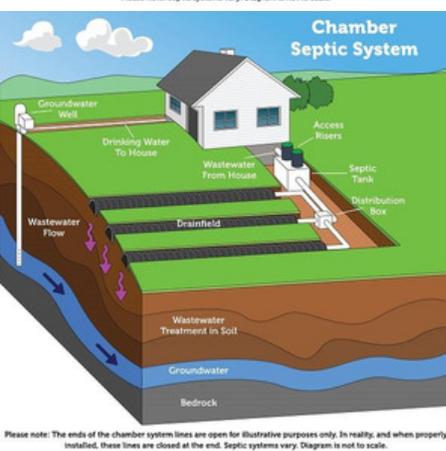




SEPTIC SYSTEMS PART I: HOW THEY WORK



Over 1.3 million homes in Michigan have no access to municipal sewer systems. This is because they are located in rural areas where homes are so spread out that it is too expensive or otherwise impractical to connect pipes from the homes to municipal systems. The rural nature of Barry County leads to septic systems being a common place part of our homes[SN1] here. Septic systems are individual wastewater treatment plants for homeowners in that they treat sewage before it reaches clean ground water or surface water.

Septic systems incite an out-of-sight out-of-mind way of thinking. For one, they are underground. There is also the idea that if everything flushes fine, there isn't anything to worry about. Septic systems require routine maintenance and a basic knowledge of their function to ensure they operate properly as well as protect our water.

Septic systems have generally two, but sometimes three main components. The first component of the septic system is a watertight tank, typically made of concrete. The tank separates the waste and begins pre-treatment. Within the tank, the solids (known as scum and sludge) separate from the liquid (effluent). Pre-treatment begins, and good bacteria works to break down and digest the solids in the tank.

The tank has a hole in each end for an inlet and outlet pipe. To keep the solids from leaving the tank, there is typically an outlet tee or an effluent filter on the pipes. On the top side of the tank there are one or more access holes for inspections and pumping when needed. Risers from these access holes go to the surface of the ground for ease of locating the tank.

Inside a functioning tank, waste is separated into three forms: sludge, scum and effluent. The sludge (bottom) and scum (top) layers are what build up and need to be removed by a septic pumper. The effluent is the liquid that flows from the tank into the drain field.

In some circumstances, a system will include a dosing or pump chamber, which is a second tank with a pump inside to move the effluent out to the drain field. The pump chamber also contains inlet and outlet pipes

as well as an access hole with a riser. The pump is turned on and off by a float switch so that it only runs when the effluent level is high enough and it shuts off when the level drops. Pump chambers should also be equipped with a high-water alarm attached to a float switch to alert homeowners if the pump malfunctions. Not all systems have a pump chamber, but they are used any time the drain field is higher in elevation than the tank, such as a low-dose pressure system (mound).

The final component in a septic system is the drain field, which filters the effluent coming out of the septic system as it seeps through the soil before it reaches the groundwater. It does this by way of perforated pipes laid out into a stone bed.

There are also several alternative options for drain fields. Low-dose pressure systems (mounds) consist of a raised drain field that receives effluent from a pump chamber, which spreads the liquid more evenly through all parts of the field. Mound systems are used where there is a high water table or poorly-drained soils. Chamber systems have dome-shaped plastic chambers or other man-made components. Chamber systems do not need stone, which gives greater flexibility to install timing. These systems are typically used in hard-to-access sites or when proper stone can't be sourced. Stay tuned next month when we will discuss the use, maintenance, and signs of failure for septic systems.

If you or someone you know needs a new septic system, certain areas of Barry and Eaton counties are eligible to receive financial assistance for inspections and repairs or replacement. Contact your watershed Coordinator David at 269.908.4099 or david.comeau@macd.org for more information and to see if you are eligible.

Above: an overview of basic septic system types- Conventional, Mound, and Chamber

