

London Grove Township On-Lot Sewage Management Program
Public Education Series #1:
What is an On-Lot Sewage System?

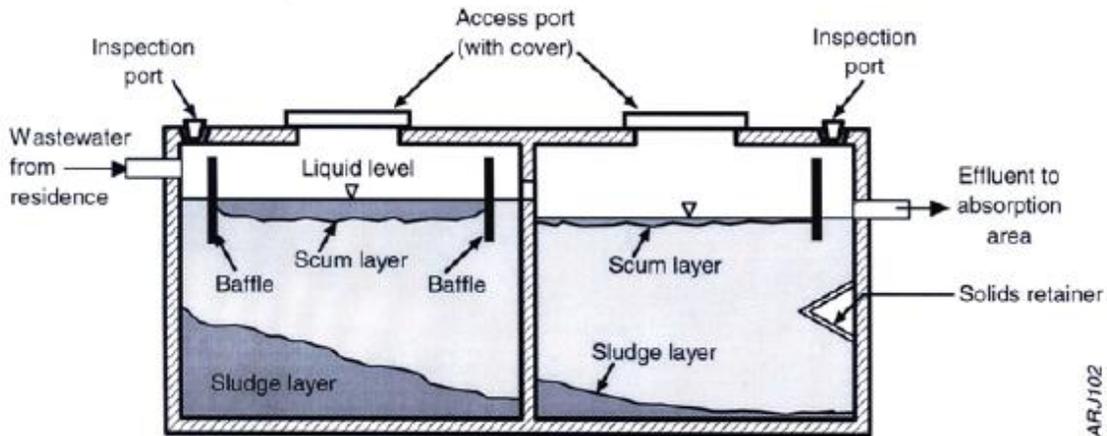
Any infrastructure (pipes, tanks, pumps, drainfields, etc.) located outside of a building and intended to convey, treat and dispose of wastewater on a single lot, or in some cases more than one lot, is collectively considered an on-lot sewage system. The specific nature of these components can range widely depending upon the age of the system, soil conditions, and size of the home or building in question.

Most of the on-lot sewage systems in use in London Grove Township can generally be described as septic systems, with some number of cesspools still in use for older homes. Cesspools, and a variation of this technology known as a seepage pit, are discussed more fully in another article in this series. The following discussion about septic systems will be applicable to most residents.

Septic systems are sewage systems designed to treat and dispose of domestic household sewage through natural processes. In its most basic form, a septic system consists of a treatment tank (i.e., septic tank) and a disposal area (i.e. drainfield). Both of these components play important roles in cleaning up the wastewater and disposing it into the soil in an environmentally friendly manner.

The treatment tank is a large watertight “box”, usually made of concrete, with an inlet and outlet pipe. Wastewater flows from the home to the treatment tank through the sewer pipe. The treatment tank treats the wastewater naturally by holding it in the tank long enough for solids and liquids to separate. The wastewater forms three layers inside the tank. Solids lighter than water (such as fats, oils, and greases) float to the top forming a layer of scum. Solids heavier than water settle at the bottom of the tank, forming a layer of sludge. This leaves a middle layer of partially clarified wastewater. The layers of sludge and scum remain in the septic tank where bacteria found naturally in the wastewater continue to break the solids down. The sludge and scum that cannot be broken down are retained in the tank and build up until it is pumped.

Baffles in the tank serve a very important role in preventing accumulated solids from traveling out of the tank. Any solids which escape the tank can clog up the drainfield and cause premature (and expensive) failure. The illustration below shows how sludge and scum layers separate and how baffles serve to keep these layers from leaving the tank. This illustration shows a tank constructed with 2 compartments in series, which has been required in Pennsylvania for homes built since 1997 so that an additional level of protection is in place to prevent solids or scum from flowing out of the tank.



Cross Section of a typical Two Compartment Septic Tank

The layer of clarified liquid, also known as effluent, flows from the septic tank to the disposal area. A drainfield (also known as a leachfield, disposal field, or a soil absorption area) represents the most common disposal component of a septic system. This is the place where the effluent from the septic tank trickles through the soil for final treatment and disposal. There are many different kinds of drainfields, but most involve an excavation in the ground with perforated pipe set in crushed stone. The diagram below shows one of the more common layouts in London Grove Township, with several long and narrow excavations, or trenches.

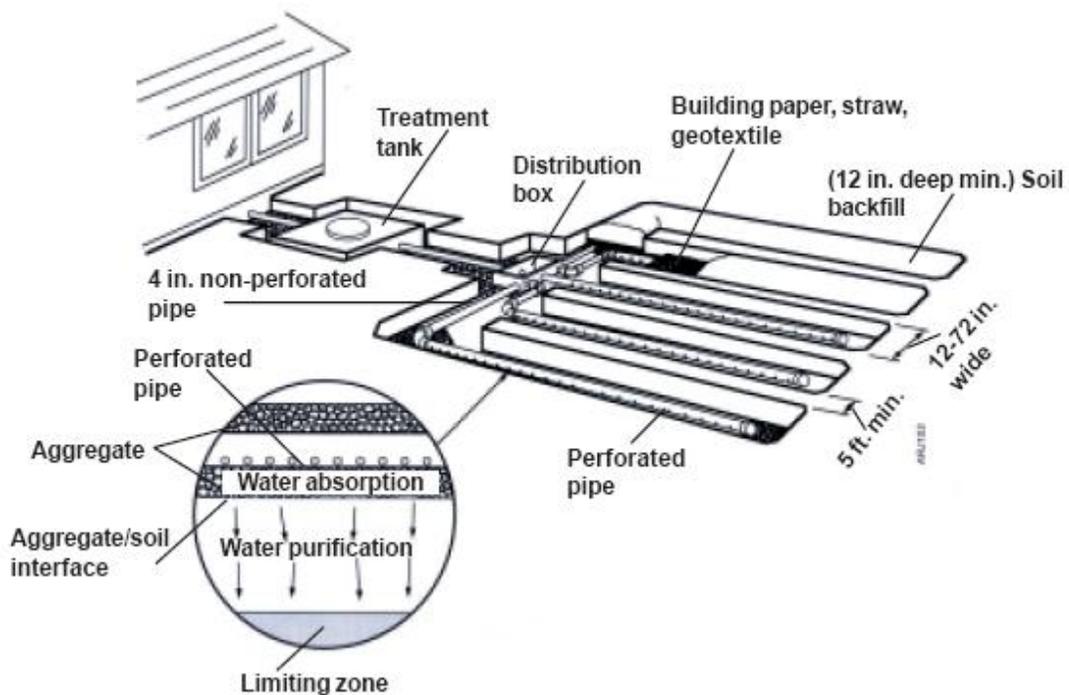


Diagram of Typical Drainfield Showing Underground Trenches

The more common types of drainfields in London Grove Township are:

1. Standard trench – two or more long narrow trenches with stone and perforated pipe to distribute the wastewater (as illustrated above). These designs may also include a pump and associated pump tank to convey wastewater from the septic tank to the trenches in cases where gravity flow is not possible, or where a poor percolation rate requires the piping in the trenches to be pressurized for more even distribution.
2. Seepage bed – a single rectangular excavation filled with stone and perforated pipe to distribute the wastewater. These designs may also include a pump and associated pump tank to convey wastewater from the septic tank to the seepage bed in cases where gravity flow is not possible, or where a poor percolation rate requires the piping in the bed to be pressurized for more even distribution.
3. Elevated sand mound – typically used when rock or a water table is too close to the ground surface to allow for an in-ground system. Sand is placed on top of the ground to make up for the lack of soil depth, and the stone and pipe are placed on top of the sand. All of this is covered and surrounded by a soil berm. An additional tank with a pump is required for all elevated sand mounds, so that the perforated pipe can be pressurized with the wastewater and thereby spread it out more evenly throughout the whole drainfield area.

More complex septic systems may be needed to accommodate sites which have more challenging soil and site conditions. Residents using these advanced technologies are advised to consult with the Chester County Health Department for more information.