

Aerobic Treatment Units

When Aerobic Units are used:

Aerobic treatment units are sometimes used in place of standard septic tank systems. Typically, aerobic units are used when soil conditions are not right for drainfields, when groundwater levels are high, when a high quality effluent is desired for irrigation use, when an existing septic system has failed or when small lot sizes limit subsurface disposal.

Aerobic units require mechanical aeration to mix and oxygenate the wastewater. The process uses suspended growths of oxygen-loving bacteria to treat wastewater. The treatment process is similar to the bacterial breakdown of organic matter that occurs in the top layers of moist soil that is well aerated. The major advantage of aerobic treatment units is that the effluent produced is typically high quality (low in organic matter and solids).

Approval of Units:

Manufacturers must include two years of service in the cost of their aerobic units. Maintenance contracts are continually required for units used with surface irrigation. Homeowners are required to extend maintenance contracts.

Aerobic units require more service and care than conventional septic tank systems. All aerobic units have mechanical aeration devices that require routine maintenance. Many also have electrical control panels, alarm systems, filters, and chlorination equipment that require periodic inspection and maintenance.

How the Process Works:

Aerobic units treat wastewater in stages. Many units have a septic tank as a pretreatment unit. Following pretreatment, the flow goes into the aeration chamber. Here bacteria breakdown organic material into carbon dioxide and water, producing more bacteria as a result. The accumulation of bacteria in the aeration tank forms a slurry of solid matter and wastewater. After about 24-36 hours of aeration the flow continues on to a clarifier (settling tank). In the settling tank the mixed slurry, being heavier than water, settle to the bottom and return to the aeration tank. The clear water leaves the top of the clarifier and goes to disinfection and storage. Pumps, working on timers or level control, pump the effluent to the irrigation system.

In theory the treatment process should consume the organic matter, leaving only small amounts of inert matter to be disposed by pumping. However, experience indicates that aerobic units must be pumped out periodically. The frequency of pumping depends on the organic and inorganic loading to the unit and the efficiency of the treatment process. Routine inspection and sampling by the service provider will indicate when pumping is necessary.

Conventional Septic System

How Septic Systems work:

There are two main parts to the basic septic system: tank and the drainfield.

The Septic Tank:

Household wastewater first flows into the septic tank where it should stay for at least a day. In the tank, heavy solids in the wastewater settle to the bottom forming a layer of sludge, and grease and light solids float to the top forming a layer of scum.

The sludge and scum remain in the tank where naturally occurring bacteria cannot completely break down all of the sludge and scum, however, and this is why septic tanks need to be pumped periodically.

The separated wastewater in the middle layer of the tank is pushed out into the drainfield as more wastewater enters the septic tank from the house. If too much water is flushed into the septic tank in a short period of time, the wastewater flows out of the tank before it has had time to separate. This can happen on days when water use is unusually high (laundry day, for example), or more often if the septic tank is too small for the needs of the household.

The Drainfield:

When wastewater leaves a septic tank too soon, solids can be carried with it to the drainfield. Drainfields provide additional treatment for the wastewater by allowing it to trickle from a series of perforated pipes, through a layer of gravel, and down through the soil. The soil acts as a natural filter and contains organisms that help treat the waste. Solids damage the drainfield by clogging the small holes in the drainfield pipes and the surrounding gravel and excess water strains the system unnecessarily.

Care for Your System:

Septic system maintenance is often compared to automobile maintenance because only a little effort on a regular basis can save a lot of money and significantly prolong the life of the system.

Sound septic system operation and maintenance practices include conserving water, being careful that nothing harmful is disposed of through the system, and having the system inspected annually and pumped regularly.