Mound Systems

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Fact Sheet

What is a mound system?

A septic tank mound system is a technology used for treating and disposing of domestic wastewater in areas unsuitable for conventional septic tank soil absorption systems. Mounds are pressure-dosed sand filters placed above, and discharging directly to, the natural soil. Their main purpose is to provide additional treatment to the wastewater before it enters the natural environment. Mound systems are designed to overcome site restrictions such as:

- slow or fast permeability soils,
- shallow soil cover over creviced or porous bedrock, and
- a high water table.

The three components of a mound system are a pretreatment unit(s), dosing chamber, and the elevated mound. See Figure 1 on page 2 for an illustration.

The pretreatment unit is usually a septic tank, which removes solids from the wastewater. The dosing chamber follows the septic tank and contains a pump, which uses pressure to evenly distribute the wastewater over the infiltration surface of the mound.

The mound is made up of a soil cover that can support vegetation and a fabric-covered coarse gravel aggregate in which a network of small diameter perforated pipe is placed. The network of perforated pipe is designed to distribute the effluent evenly through the gravel from where it trickles down to the sand media and hence, into the plowed basal area (natural soil).

Treatment occurs through physical, biological, and chemical means as the wastewater filters down through the sand and the natural soil.

What are the advantages and disadvantages of using mound systems?

Advantages

- The mound system enables use of land that would otherwise be unsuitable for in-ground or at-grade onsite systems.
- The natural soil utilized in a mound system is usually the top layer, which is typically the most permeable.
- A mound system does not have a direct discharge to a ditch, stream, or other body of water.
- If care is taken, construction damage can be minimized since there is little excavation required in the mound area.
- Mounds can be utilized in most climates.

Disadvantages

- Construction costs are typically much higher than those of conventional systems.
- Since there is usually limited permeable topsoil available at mound system sites, extreme care must be taken not to damage this layer with construction equipment.
- The location of the mound may affect drainage patterns and limit land use options.
- The mound may have to be partially rebuilt if seepage or leakage occurs.
- All systems require pumps or siphons.
- Mounds may not be aesthetically pleasing in some cases.

What determines the performance of a mound system?

Years of monitoring the performance of mound systems have shown that mounds can consistently and effectively treat and dispose of wastewater. One factor that determines good performance is the selection of sand media that can be dosed at a reasonable rate and can adequately treat the wastewater. Usually a coarse sand with the right characteristics provides the best treatment because the wastewater will percolate through the sand, allowing time for adequate treatment.

Successful performance also depends on proper design, installation, and maintenance. For design of residential mounds, the daily wastewater volume is determined by the number of bedrooms in a house. Typical design flow requirements for individual homes are up to 150 gallons per day (gpd) per bedroom.

Are mound systems easy to operate and maintain?

When a mound system is properly installed and maintained, it should last for a

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A General Overview

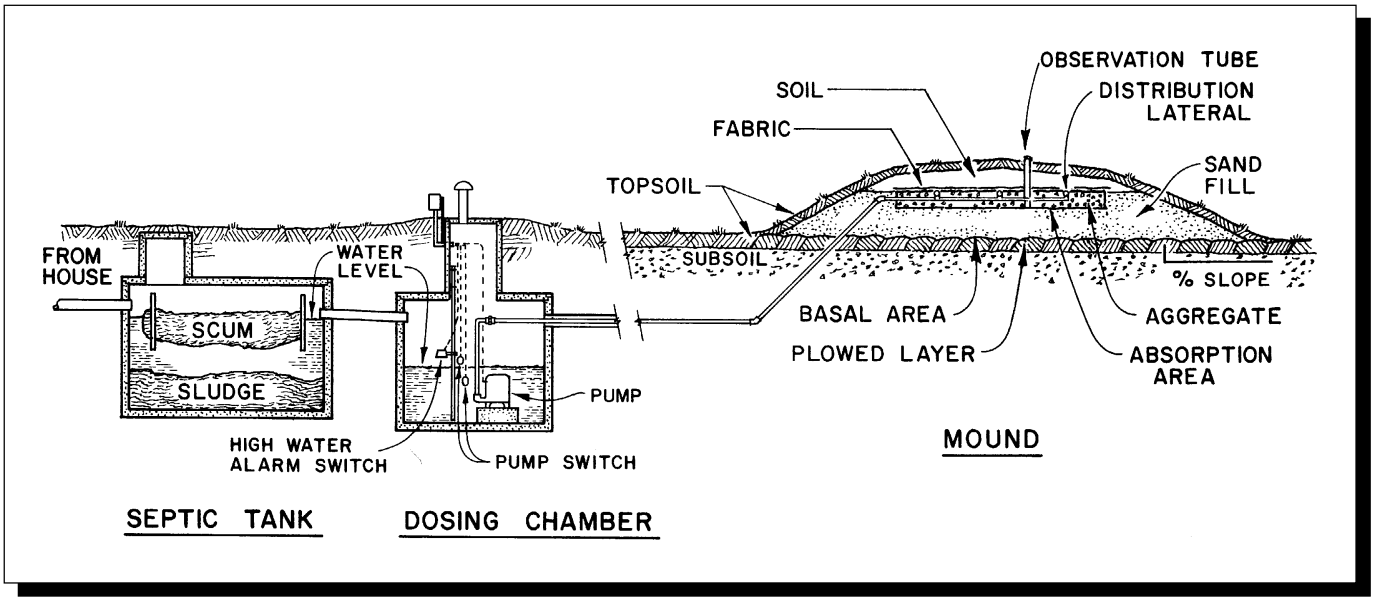

Figure 1: Schematic of a Wisconsin Mound System

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long period of time. In general, the maintenance required for mounds is minimal. However, as with any system, poor maintenance could lead to system failure. Possible problems that can occur in a mound system include:

- ponding in the absorption area of the mound;
- seepage out of the side or toe of the mound;
- spongy area developing on the side, top, or toe of the mound; and
- clogging of the distribution system.

The septic tank and dosing chamber should be checked for sludge and scum buildup and pumped as needed to avoid carryover of solids into the mound. The dosing chamber, pump, and floats should be checked annually and replaced or repaired as necessary. It is critical that the septic tank and dosing chamber be watertight. In addition, electrical parts and conduits must be checked for corrosion.

Follow all of the manufacturer's operation and maintenance (O&M) instructions. All equipment must be tested and calibrated as recommended by the equipment manufacturer. A routine O&M schedule should be developed and followed for any mound system.

What is the cost of a mound system?

According to one mounds designer/installer, average construction costs are approximately $9,000 for a mound system serving a three-bedroom single home (150 gpd/bedroom) at a flow rate of about 450 gpd. However, the cost of mound systems will vary depending on the contractor, the manufacturers, the site, and the characteristics of the wastewater. To keep construction costs to a minimum, use locally available materials of good quality.

How do I stay informed about mound technology?

For more information on mound systems or a list of other fact sheets, contact the National Small Flows Clearinghouse (NSFC) at West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. Phone: (800) 624-8301 or (304) 293-4191. Fax: (304) 293-3161. World Wide Web site: *http://www.nsfc.wvu.edu*.

The NSFC provides free and low-cost informational services and products to help homeowners and small communities address their wastewater needs. Also, information about manufacturers, consultants, regulations, and facilities can be obtained from the NSFC's databases.

References

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