

Huntington County

Department of Health

354 N Jefferson St.
Huntington, IN 46750

“In the Court House Annex, Suite 201”
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Informational Sheet for Onsite Sewage Systems

High-Organic-Strength Wastewater (Including Garbage Grinders)

Please consider this document if you plan on utilizing a garbage disposal!

Description

Because many onsite treatment alternatives are sensitive to organic loading rate, high-strength wastewaters may require additional treatment steps to ultimately meet environmental discharge or reuse goals. Among the individual home options that increase the organic strength of the wastewater (see chapter 3) are water conservation and use of garbage grinders (disposals).

The major concern caused by high organic loadings in the pretreated wastewater is higher organic loadings (e.g., BOD) to the infiltrative surface of the soil, which could result in clogging. A certain degree of clogging at the interface of infiltration trenches and the surrounding soil is expected and helps the soil absorption field function properly. The clogging layer, or biomat, which forms at this interface, is composed of organic material, trapped colloidal matter, bacteria, and microorganisms and their by-products. The biomat may slow the infiltrative capacity of the soil, but it increases effluent treatment time under unsaturated aerobic conditions (in the vadose zone below the trenches).

Physical clogging occurs when solid material such as grit, organic material, and grease is carried in the effluent beyond the septic tank to the soil adsorption field and deposited on the biomat. Biological clogging generally occurs with excessive organic loading to the biomat, which results in excess microbial growth that restricts the passage of effluent into the soil. Slimes, sugars, ferrous sulfide, and the precipitation of metals such as iron and manganese are additional clogging byproducts. Chemical clogging can occur in clayey soils when high concentrations of sodium ions exchange with calcium and magnesium ions in the clay. The soil loses its structure and becomes tighter and more impervious.

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Garbage disposals

Garbage disposals, which have become a standard appliance in many residential kitchens in the United States, contribute excessive organic loadings to the infiltrative field and other system components. Usually installed under the kitchen sink, disposals are basically motorized grinders designed to shred food scraps, vegetable peelings and cuttings, bones, and other food wastes to allow them to flow through drain pipes and into the wastewater treatment system. Disposing of food waste in this manner eliminates the nuisance of an odor of food wastes decaying in a trashcan by moving this waste to the wastewater stream. Many states accommodate these appliances by prescribing additional septic tank volume, service requirements, or other stipulations (e.g., septic tank effluent filter, multiple tanks, larger infiltration field) that address higher BOD and TSS loadings.

Table 1 contains reported information that illustrates that in-sink garbage disposal units increase septic tank loadings of BOD by 20 to 65 percent, suspended solids by 40 to 90 percent, and fats, oils, and grease by 70 to 150 percent. For any septic system, the installation of a disposal causes a more rapid buildup of the scum and sludge layers in the septic tank and an increased risk of clogging in the soil adsorption field due to higher concentrations of suspended solids in the effluent. Also, it means that septic tank volumes should be increased or tanks should be pumped more frequently.

Table 1. Increase in pollutant loading caused by addition of garbage disposal

Parameter	Increase in pollutant loading (%)
Suspended solids	40 - 90
Chemical oxygen demand	20 - 65
Total nitrogen	3 - 10
Total phosphorus	2 - 3

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Fats, oils, and grease	70 - 150
Sources: Hazeltine, 1951; Rawn, 1951;	

Eliminating the use of garbage disposals will significantly reduce the amount of grease, suspended solids, and BOD in wastewater (see table 1). Elimination of garbage disposal use reduces the rate of sludge and scum accumulation in the septic tank, thus reducing the frequency of required pumping. All of these can improve wastewater system performance.

For system owners who choose to use garbage grinders, manufacturers recommend grinding wastes with a moderate flow of cold water. No research data representing claims of enhanced performance of garbage grinders equipped with septic system additive injectors are available. Additives are not required nor recommended for onsite system operation, and some might actually interfere with treatment, damage the drainfield, or contaminate ground water below the drainfield. (See Special Issues Fact Sheet 1.)

Management needs

Management needs are the same as those noted in the unit process fact sheets.

Risk management issues

Depending on the sequence of processes chosen, the impacts of flow variation, toxic shocks, extreme temperatures, and power outages may cause significant variations from expected treatment performance. However, high-strength wastewaters greatly increase the potential for odors and, where concrete structures are employed, corrosion. Therefore, protection from odor becomes a major issue for the designer in these situations.

Costs

Costs of treatment trains for high-organic-strength wastewaters can be estimated from the costs of the unit process components.

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