

SEPTIC TANK SYSTEMS and Household Cleaning Products

CLEANING PRODUCTS in Household Wastewater

After a cleaning product has been used and goes down the drain, its ingredients become part of your household wastewater and are treated by the same wastewater treatment system that treats the other wastes from your home — before the water reaches groundwater or its receiving streams, lakes, estuaries or oceans.

Today's cleaning products are designed to be compatible with a wide variety of wastewater treatment systems in use throughout the United States, including septic tank systems. This means that household cleaning products can be safely disposed down the drain into properly designed and maintained septic tank systems.

A Look at Common Ingredients in Household Cleaning Products

Antimicrobial agents kill or inhibit the growth of microorganisms that cause disease and/or odor. They are effective at the concentrations recommended for use in the home.

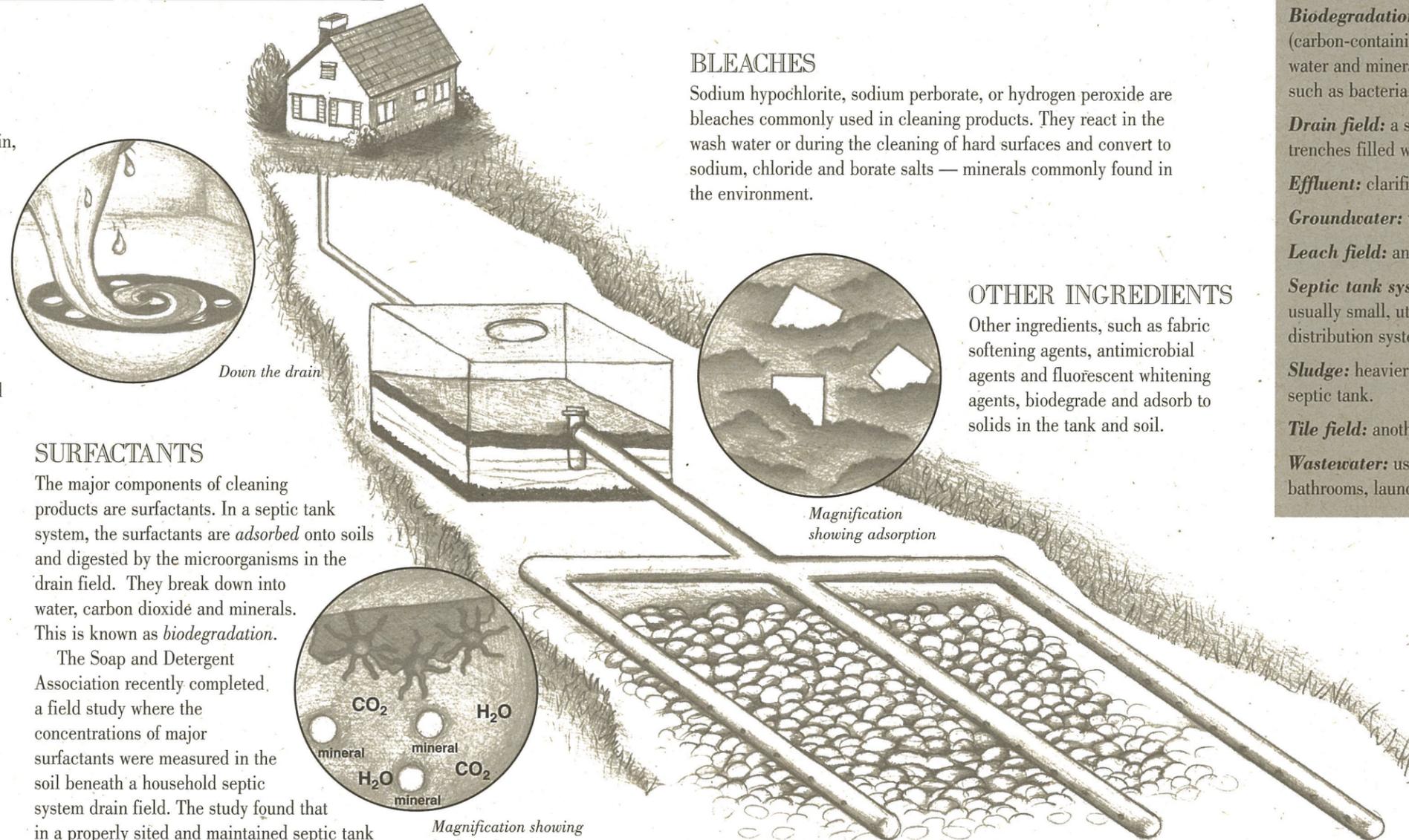
Bleaches help whiten, brighten and remove stains. Some bleaches disinfect.

Builders reduce water hardness, provide alkalinity (which helps cleaning) and help keep soil from redepositing on surfaces.

Fabric softening agents impart softness and control static electricity in fabrics.

Fluorescent whitening agents attach to fabrics to create a whitening or brightening effect.

Surfactants enable the cleaner to wet a surface more quickly so soil can be easily loosened and removed. They break up oily soils and keep them suspended in the wash water so they don't settle back on the surface being cleaned.



SURFACTANTS

The major components of cleaning products are surfactants. In a septic tank system, the surfactants are *adsorbed* onto soils and digested by the microorganisms in the drain field. They break down into water, carbon dioxide and minerals. This is known as *biodegradation*.

The Soap and Detergent Association recently completed a field study where the concentrations of major surfactants were measured in the soil beneath a household septic system drain field. The study found that in a properly sited and maintained septic tank system there will be no surfactant residues in groundwater, indicating that surfactants are completely biodegraded before they reach groundwater. (1)

BUILDERS

The other major ingredients in cleaning products are builders. The most commonly used builders are inorganic compounds, including carbonate and phosphate compounds and zeolites (aluminosilicates).

Builders either break down in the drain field into minerals common in nature, such as carbonate, phosphate and silicate; or they settle out in the septic tank and are disposed with the sludge; or they are captured by the soils below the drain field and remain in the soil.

BLEACHES

Sodium hypochlorite, sodium perborate, or hydrogen peroxide are bleaches commonly used in cleaning products. They react in the wash water or during the cleaning of hard surfaces and convert to sodium, chloride and borate salts — minerals commonly found in the environment.

OTHER INGREDIENTS

Other ingredients, such as fabric softening agents, antimicrobial agents and fluorescent whitening agents, biodegrade and adsorb to solids in the tank and soil.

Let's Talk Septic Tank Systems

A glossary of common terms

Adsorption: the attachment of soluble material to soil.

Biodegradation: the breaking down of organic (carbon-containing) ingredients into carbon dioxide, water and minerals by the action of microorganisms, such as bacteria.

Drain field: a series of distribution pipes placed in trenches filled with gravel.

Effluent: clarified wastewater.

Groundwater: water beneath the ground surface.

Leach field: another name for drain field.

Septic tank system: wastewater treatment system, usually small, utilizing a settling tank and a wastewater distribution system.

Sludge: heavier solids that collect on the bottom of the septic tank.

Tile field: another name for drain field.

Wastewater: used household water from kitchens, bathrooms, laundry rooms, etc.

What About Antimicrobial Products?

Products designed to kill microorganisms have become increasingly common in today's homes. But how do these products affect septic tank systems, where microorganisms are needed to treat wastewater?

- SDA recently completed an evaluation of this subject and concluded that disposal of *household quantities* of cleaning products — such as bleaches and disinfectants — does not interfere with the function of a properly sited and maintained septic tank.
- A typical septic tank holds 500 - 1,000 gallons of wastewater. Dilution of antimicrobial cleaning products in such large volumes of wastewater allows for effective operation of biological waste treatment following the disposal of cleaning products. This appears to be true even under the worst case scenario, where whole packages of products are disposed into relatively small septic tanks. (2)

Note: The evaluation also concluded that disposal of household quantities of alkali-based drain openers does not interfere with the function of a properly sited and maintained septic tank.

6 T I P S

for a Properly Functioning Septic Tank System

As with any equipment, a septic tank system must be correctly installed and maintained in order to work properly. These six tips will help ensure that you're properly managing your wastewater.

1. Have your septic tank system installed by a licensed contractor following local guidelines and regulations.
2. Have your system inspected and pumped out regularly, following local guidelines and regulations.
3. Follow basic water conservation practices to avoid overloading the system. For example, fill the sink to do dishes rather than washing them under running water; don't leave water running continually while brushing teeth.
4. Repair any leaky faucets or toilets.
5. Divert other sources of water, like roof drains, house footing drains and sump pumps, away from the septic tank system. Excessive water keeps the soil in the drain field from naturally cleansing the wastewater.
6. Be careful of what you put down the drain. For example, products not normally used with water, such as gasoline, motor oil, etc., should not be disposed into septic tank systems. If in doubt about disposal of a product, contact the manufacturer.

References

1. The results of this study are being summarized for publication in 1998.
2. Assessing the Impact of Disposing Household Cleaning Products to Wastewater Treatment Systems. Edwards, D.E. and DeCarvalho, A.J.: in publication.

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According to the U.S. Census Bureau, 25% of homes in the United States are connected to septic tanks. That means that all household wastewater from these homes is treated on the property owner's site, rather than in a municipal wastewater treatment facility.

Studies show it's safe to use and dispose of household cleaning products in these systems.

As you read on, you'll find basic information about how household cleaning products are treated in septic tank systems. But first — here's a look at how these systems work.

THE SEPTIC TANK SYSTEM What It Is and How It Works

A septic tank system is actually a small wastewater treatment system that's designed to treat wastewater from one home, or group of homes, rather than from a whole community. The system is generally located underground in the back yard. It consists of a tank usually connected to a series of pipes set into trenches — the drain field.

IN THE TANK Solid Waste

Wastewater from the home flows into the tank. The tank separates solids from the wastewater, so the solids are removed before they reach the drain field. The heavier solids, called *sludge*, collect on the bottom of the tank. The lighter solids, like hair and grease, float to the top and form a scum layer on the water. Both the top and bottom layers of solids are trapped in the tank and need to be pumped out periodically. In the meantime, the microorganisms in the tank begin breaking down many of these solid waste materials.

TO THE DRAIN FIELD Liquid Waste

Once the solids have been removed, the clarified wastewater, or *effluent*, is transported to a drain field by a pipeline.

The drain field (sometimes called a *tile field* or *leach field*) consists of a series of distribution pipes set in trenches filled with gravel. These distribution pipes have holes so that the wastewater from the septic tank flows out into the gravel trenches, then trickles through the gravel and into the soil under the drain field.

INTO THE SOIL A Natural Filter

Soil acts as a natural filter in the septic tank system. It filters out many of the bacteria that can cause diseases. Soil can also retain certain nutrients, such as phosphate and some forms of nitrogen. The microorganisms in the soil break down many of the remaining impurities.

Finally, the filtered water flows into the *groundwater*.

