

BY JEFFERSON KOLLE

Sepptic systems are similar to roofs: You never think about them unless they leak. They sit all but forgotten out there in the yard, silently taking care of whatever goes down your drain—that is, until a noxious puddle develops on your lawn or, worse, backs up into your sinks, toilets, and tubs.

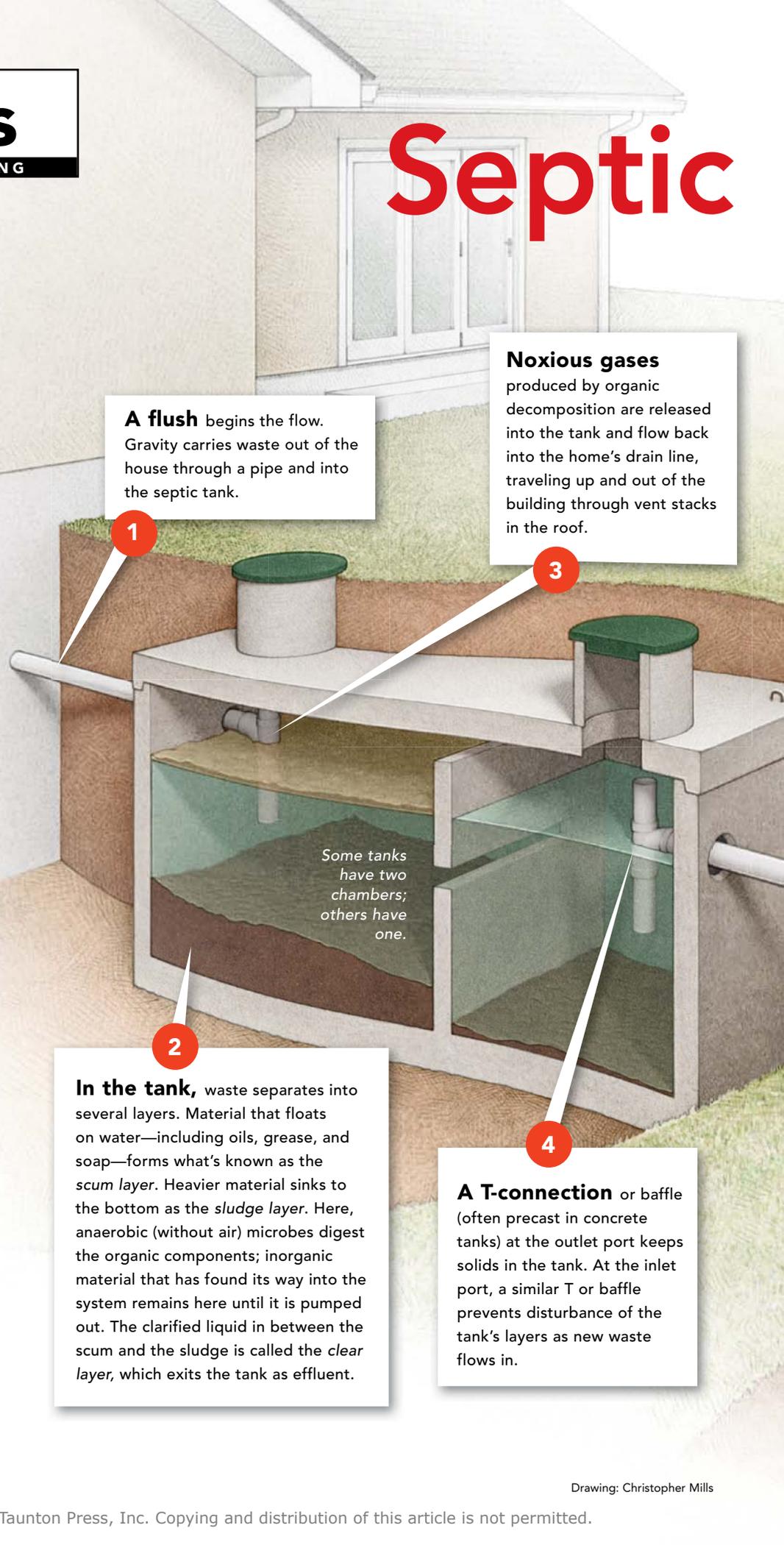
Nearly one in four American households depends on an on-site septic system for wastewater removal and treatment. There are different types of systems, and some are more complicated and expensive than others. What's installed is usually dictated by the size of your house, the topography and soil composition of your building lot, and what's been approved by your local health inspector and building department. Unlike most other aspects of residential construction, there is no national code that applies to septic systems.

To work, septic systems rely on the simple fact that all organic material eventually decomposes—a process involving microbes and their digestion. While you may not think of a septic system as beautiful, there is beauty in its organic simplicity. Compared to the other systems in your house, a septic system is low-maintenance and, given a small level of attention, mostly trouble-free.

Here's how it works.

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Septic



1 **A flush** begins the flow. Gravity carries waste out of the house through a pipe and into the septic tank.

3 **Noxious gases** produced by organic decomposition are released into the tank and flow back into the home's drain line, traveling up and out of the building through vent stacks in the roof.

2 **In the tank**, waste separates into several layers. Material that floats on water—including oils, grease, and soap—forms what's known as the *scum layer*. Heavier material sinks to the bottom as the *sludge layer*. Here, anaerobic (without air) microbes digest the organic components; inorganic material that has found its way into the system remains here until it is pumped out. The clarified liquid in between the scum and the sludge is called the *clear layer*, which exits the tank as effluent.

4 **A T-connection** or baffle (often precast in concrete tanks) at the outlet port keeps solids in the tank. At the inlet port, a similar T or baffle prevents disturbance of the tank's layers as new waste flows in.

Some tanks have two chambers; others have one.

systems



Some maintenance required

To keep a septic system functioning, pumping the tank is recommended every three to five years. Without this pumping, scum and sludge build up in the tank and flow out into the leach field, clogging pipes and gravel and causing the biomat to thicken to a point where it's impermeable and fails to absorb effluent. The result is puddles of effluent in the yard, a sure sign of a failed system. Most professionals

agree that so-called septic-system maintenance products that you flush down the toilet to keep a healthy microbe level in your septic tank are a waste of money. Unless you're pouring huge quantities of microbe-killing paint solvents or gasoline down the drain on a regular basis, your septic system has all the natural organisms it needs to function properly.

The outlet pipe carries effluent out of the tank when it reaches a certain level.

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The distribution box channels the effluent into pipes leading to each of the galleys in the soil treatment area.

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The soil treatment area

(also called a leach field or drainfield) typically consists of a series of perforated distribution pipes set in trenches or mounds (depending on soil conditions) layered with gravel or other coarse aggregates. Plastic chambers, concrete galleys, and other structures may also be used.

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Treatment is completed in the *biomat*, a thick, black layer of anaerobic micro-organisms and their by-products that forms around the trench as the effluent soaks into the ground. In this bacterial slime layer, microbes remove virtually all the remaining pathogens from the effluent.

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