

# Maintaining Home Aerobic Units

NSFC ENGINEERING SCIENTIST

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*Editor's Note: This column is based on calls received over the National Small Flows Clearinghouse (NSFC) technical assistance hotline. If you have further questions concerning home aerobic treatment units, call (800) 624-8301 or (304) 293-4191 and select option #2.*

*I recently had a home aerobic treatment unit installed at my house.*

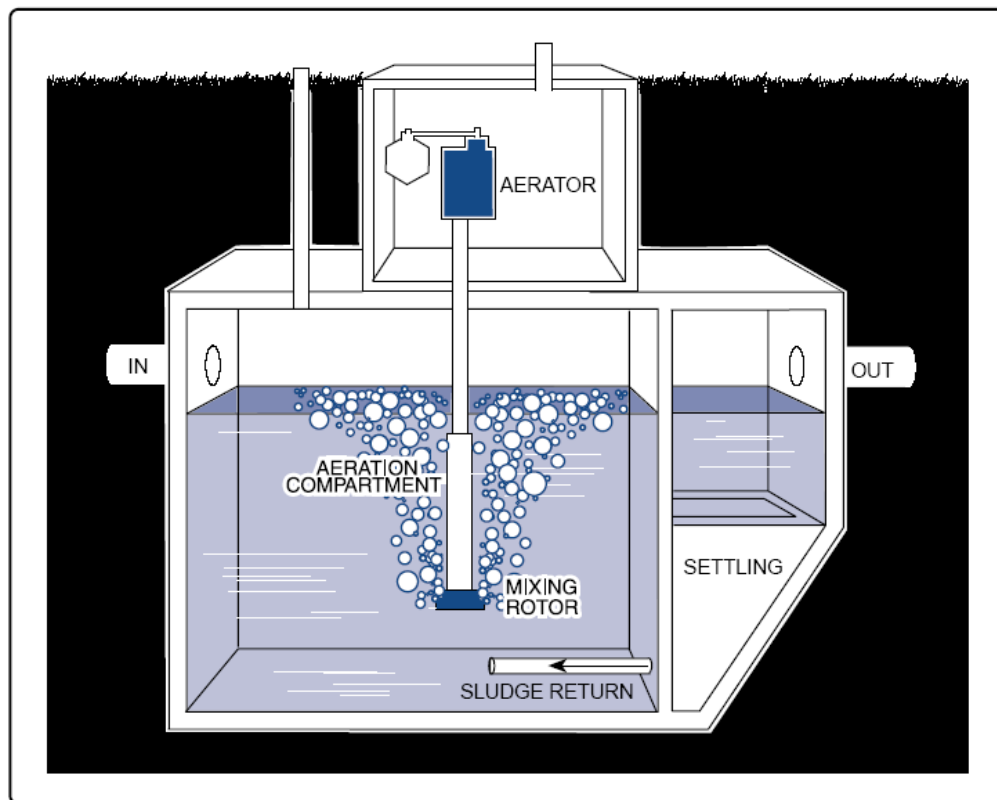
*What are the advantages of this system and what kind of maintenance does it require?*

The home aerobic unit (HAU), also commonly called an aerobic treatment unit (ATU), provides advanced treatment for wastewater from residences. They are often used when site conditions require more advanced treatment than a septic tank provides.

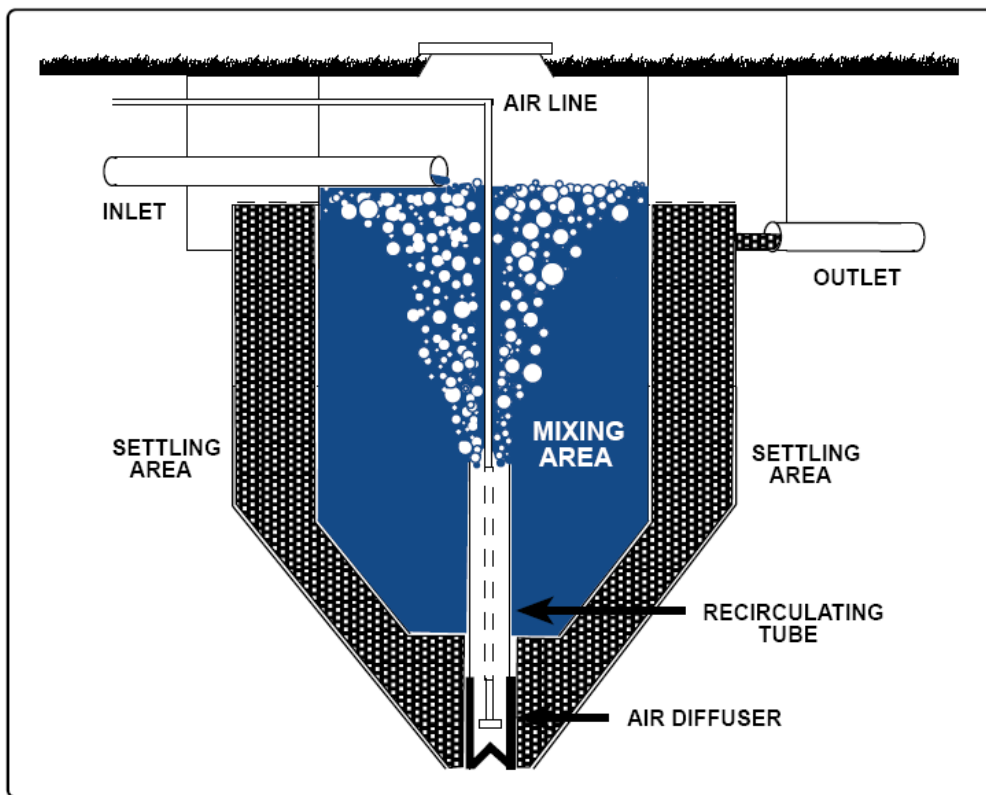
Basically, the ATU provides physical and biological treatment of your home's effluent (refer to Figure 1). Physical treatment includes settling out of solids and greases, while biological treatment involves using bacteria to clean up the wastewater. This is the central function of the ATU. Bacteria are naturally occurring in sewage and come in several types.

Anaerobic bacteria function without oxygen, while aerobic bacteria need oxygen to live. Facultative bacteria are capable of using oxygen or living without it if needed. However, the aerobic bacteria are much more efficient in terms of cleaning the wastewater. Thus, the ATU works by introducing air to the wastewater treatment process, allowing the aerobic bacteria to thrive. An ATU sometimes includes a pre-treatment settling tank to reduce solids, but all ATUs have a settling tank after aeration to store the sludge generated by the aerobic treatment.

The advantages to the homeowner of such a system are numerous, especially when dealing with a difficult site. Because ATUs provide a cleaner effluent, many states allow reductions in drainfield size (sometimes written into the regulations as an increase in the wastewater application rate) or separation distance. Separation distance is the vertical distance between the drainfield and a limiting layer, either bedrock or the drain table. So on smaller land parcels, or areas with high groundwater, ATUs may be permissible where standard systems will not work. Additionally, some states allow surface



**Figure 1** Mechanical Home Aerobic Treatment Unit



**Figure 2** Compressed Air Home Aerobic Treatment Unit

discharge from an ATU if the effluent is disinfected. Because each state has different regulations regarding ATUs, be sure to contact your local health department or local permitting agency before making a decision regarding which system to use.

So the ATU is more efficient at wastewater treatment than the septic tank, but at what price? First of all, there is the electricity needed to run the aerator. Aerators come in two types: air compressors (Figure 2) and mechanical (propeller) (Figure 1) aerators, either of which requires a small motor, typically less than 1 horse power (hp). These aerators can also break down, so having an alarm system for ATUs is mandatory. The alarm system includes a flashing light and an audible buzzer, and should be installed at the location of the ATU as well as inside the house for maximum visibility.

Additionally, aerobic treatment generates more sludge (which is kept within the tank itself) than anaerobic processes in a septic tank. As most ATUs are sized a bit smaller than standard septic tanks, this means that sludge accumulation is more rapid than with septic tanks, and pumping must occur more frequently. Typically, pumping out an ATU should be done every year.

Because of these increased maintenance concerns, sales of ATUs typically include a two-year service contract. The service contract should include inspections of the unit every six months, pumping of sludge when required, maintenance of the electrical and mechanical components, replacement when necessary, and responding to homeowner reports of

the alarm being set off. It would be an excellent idea to extend this service contract for the life of the system. Research in West Virginia on homeowner maintenance of ATUs showed that little effort was made and the systems' performance suffered accordingly.

Maintenance is key to the performance of any on-site system, but with more components, and more mechanical or electrical components, the need for proper maintenance to ensure proper functioning increases dramatically with ATUs.

Homeowners frequently tell of not having their septic tanks pumped out for 20 years at a time or more, or of dumping in excessive amounts of bleaches, or paints, or oil, or some other

hazardous (to your onsite system) substance. These practices will easily wreck an ATU, forcing expensive repairs or replacements on the careless homeowner. While no one likes to think about maintaining a wastewater treatment system, the effort to maintain it is much less than the cost of repairing or replacing it.

These systems are like cars—with proper maintenance, you get a long life and use from your vehicle. But if you don't change the oil, or check the air in the tires, or keep the engine tuned, it quickly loses its top performance. Take care of your onsite wastewater system, and you can also expect a long time of good performance.

#### Related NSFC Product

*Home Aerobic Wastewater Treatment: An Alternative to Septic Systems* (Item #SFPLNL04)

This is the Winter 1996 issue of *Pipeline*, a newsletter published by the NSFC that is written primarily for the homeowner. This issue discusses ATUs in general terms, describing how they work, pros and cons, do's and don'ts, and system maintenance. The cost for this reprint is 40 cents. ■

