Advanced Enviro-Septic™ Wastewater Treatment System

Owner's Manual

Operating & Maintenance Instructions

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The Next Generation of Wastewater Treatment Technology

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Dear System Owner:

Congratulations! You made a wise investment and an environmentally-responsible decision by selecting a state-of-the-art Advanced Enviro-Septic™ Onsite Wastewater Treatment System ("AES"). The AES system requires virtually no maintenance on the part of the homeowner; however, a basic understanding of how septic systems function and what is needed to keep them in good working order will help protect your investment, your health and your environment. While the Advanced Enviro-Septic™ system is more tolerant of "abuse" than most, using reasonable care will ensure the longevity and trouble-free operation of your system. The Advanced Enviro-Septic™ System creates an ecosystem that is highly effective at purifying wastewater; the living organisms that perform these natural processes need to be provided with the right environment in order to survive and carry out their work.

This manual will familiarize you with simple steps to maximize the functioning of your system and prevent problems, as well as providing instructions for routine maintenance, troubleshooting and repair. An onsite wastewater treatment system is a significant financial investment, and addressing any problems as soon as they are detected is essential to minimizing the extent of repair that may be required. Wastewater treatment systems that are improperly designed, installed, used or not maintained can malfunction, sometimes necessitating replacement of the entire system.

Having accurate records will greatly assist your service provider in maintaining and evaluating your system. We encourage you to utilize the System Information and Maintenance Record section (found in the back of this manual) to record important information about your system and its maintenance history for ease of future reference.

If you ever have questions or need technical assistance of any kind, please contact us by phone at (800) 473-5298, by email to info@presbyeco.com, or via our website at www.PresbyEnvironmental.com.

Sincerely,

David W. Presby

David W. Presby
President, Presby Environmental, Inc.
Inventor, Advanced Enviro-Septic™ System

TABLE OF CONTENTS

Introduction to the Wastewater Treatment Process

What is the Advanced Enviro-Septic™ Wastewater Treatment System?
Advanced Enviro-Septic™ is a passive, non-mechanical wastewater treatment system designed to process, purify and disperse wastewater in locations not served by a public sewer system. It requires no electricity, no mechanical devices, and no special maintenance. Advanced Enviro-Septic™ has been vigorously tested and proven to remove approximately 99% of the contaminants from wastewater that has received primary treatment in a septic tank. No other passive system provides treatment this effective, and neither do most expensive mechanical devices. An Advanced Enviro-Septic™ Wastewater Treatment System provides superior environmental protection and long-term, reliable service at a price that makes it exceptionally cost-effective for the consumer.

What happens in the septic tank?
When greywater (from sinks, showers and washing machines) and blackwater (from toilets) exits the structure, this wastewater flows into a septic tank. The septic tank is a watertight container usually made of concrete, fiberglass or polyethylene and buried so the top of the tank is below the surface of the ground; sometimes a riser is installed to facilitate access to the tank. The wastewater is held in the septic tank long enough for solids to settle to the bottom of the tank (forming the "sludge layer") and for grease, oil and foam to rise to the surface (forming the "scum layer"). The clarified water in between the sludge and the scum layers exits the septic tank and travels through a tee or baffle into the Advanced Enviro-Septic™ pipes.

What happens in the Advanced Enviro-Septic™ System?
The patented design of the pipe creates the ideal conditions for further separation of grease and solids (which are retained inside the pipe) and further purification of the wastewater by bacterial action as it passes through the geotextile fabrics and the aerobic "biomat" that forms on it. The biomat is a layer of bacteria that operates like a living filter, digesting waste materials as the wastewater passes through. AES provides superior treatment and dispersal processes as a result of the addition of Bio-Accelerator. This proprietary enhancement filters additional solids from effluent, enhances and accelerates treatment, facilitates quick start-up after periods of non-use, provides additional surface area for bacterial growth, promotes even distribution, and further protects outer layers and the receiving surfaces so they remain permeable. The treated wastewater next passes through a layer of System Sand and then into the soil, safely recharging groundwater.

How is the Advanced Enviro-Septic™ System different from a pipe and stone leaching system?
A conventional pipe and stone leaching system is a method of "dispersing" wastewater rather than a treatment system. The biomat in a pipe and stone system eventually becomes dominated by "anaerobic" bacteria (bacteria that exist without oxygen) which forms a thick, slimy biomat, while in the Advanced Enviro-Septic™ System, the multi-stage biomat maintains a healthy population of "aerobic" bacteria (bacteria that require oxygen), which are considerably more efficient at digesting waste materials. A pipe and stone system relies on the soil to purify wastewater, while the wastewater which exits an Advanced Enviro-Septic™ System has already been purified to a high degree before it reaches the soil. A pipe and stone leaching system would require almost three times as much area to handle the same amount of wastewater flow. Conventional systems are also more prone to failure because the solids in the wastewater (grease and oils, in particular) eventually coat the soil's surface, preventing the wastewater from infiltrating into the ground. Outdated technologies like pipe and stone systems are big, expensive to build, and they pose a greater threat of groundwater contamination.

What happens in the soil?
The treated wastewater passes through the System Sand and slowly infiltrates into the soil. The Advanced Enviro-Septic™ treatment field may be located underground or constructed as an above-ground mound depending on the site's soil conditions and topography. Microbes contained in the soil provide final purification of the wastewater, removing bacteria, viruses and nutrients, as the treated wastewater percolates through the soil and eventually returns to the groundwater. Since the Advanced Enviro-Septic™ Wastewater Treatment System releases much cleaner water than conventional systems, it can be placed closer to the groundwater than other systems in many states.

The Advanced Enviro-Septic™ System

What is the Advanced Enviro-Septic™ System and how does it work?

The Advanced Enviro-Septic™ Wastewater Treatment System consists of a 12" diameter, high-density plastic pipe which is corrugated and perforated with skimmer tabs protruding inwardly. A layer of Bio-Accelerator™ runs along the bottom of the pipe on the outside surface*. A mat of coarse plastic fibers surrounds the outside of the pipe, and a geo-textile fabric holds the fibers in place, creating a protected surface that is optimal for the bacterial processes that purify the wastewater. Wastewater is either pumped or travels by gravity into the Advanced Enviro-Septic™ System, where the patented Advanced Enviro-Septic™ pipe cools the liquid, separating and retaining the remaining solids and grease inside the pipes, while allowing the treated wastewater to pass through the pipes and into the fibers and fabric. This provides optimal conditions for the aerobic bacterial activity that result in purification. The Advanced Enviro-Septic™ pipes are surrounded by a bed of System Sand, which facilitates the process by wicking the liquid out of the pipes and ensuring that the system receives sufficient oxygen to support a healthy population of bacteria.

Advantages of an Advanced Enviro-Septic™ Wastewater Treatment System:

- Cost-effective compared to conventional systems and mechanical devices
- Requires no electricity or mechanical parts
- Needs no maintenance other than pumping septic tank
- Requires a smaller treatment field
- Blends into sloping terrain
- Adapts to difficult site constraints
- Installs more easily and quickly than conventional systems
- Eliminates the need for expensive washed stone
- Adapts easily to both commercial and residential sites
- Uses a protected receiving surface to maximize bacterial activity
- Superior system performance and longevity
- Environmentally safer than conventional systems (confirmed by scientific testing)
- Recharges groundwater more safely than conventional systems
- Significant post-consumer recycled plastic content

Expected characteristics of wastewater after being treated in the Advanced Enviro-Septic™ System:

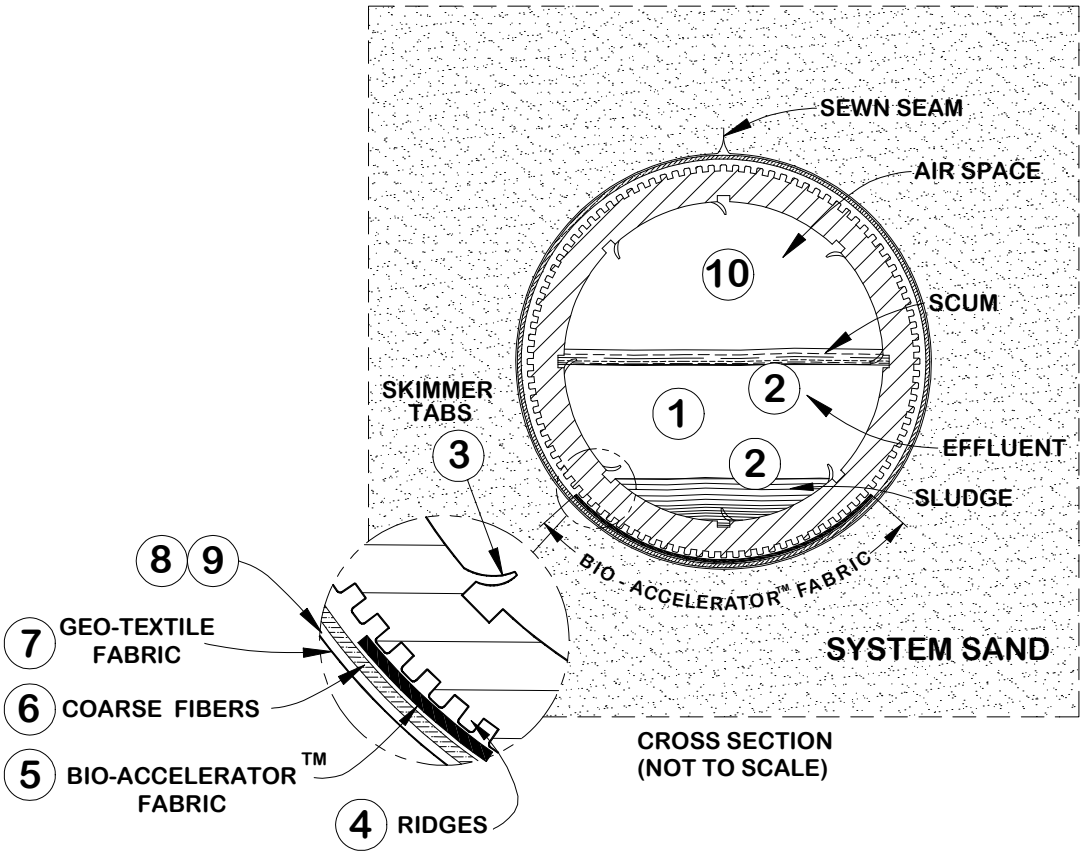
Tested Wastewater Characteristics	Wastewater from septic tank	After treatment by pipe and stone	After treatment by Advanced Enviro-Septic™	Percentage Removed
Total Suspended Solids	125 mg/L	25 mg/L	2 mg/L	98.4%
MPN Fecal Coliforms	3,091,000 per 100 ml	190,000 per 100 ml	2,300 per 100 ml	99.9%
Biological Oxygen Demand	172 mg/L	21 mg/L	2 mg/L	98.8%

* AES provides superior treatment and dispersal processes as a result of the addition of Bio-Accelerator. This proprietary enhancement filters additional solids from effluent, enhances and accelerates treatment, facilitates quick start-up after periods of non-use, provides additional surface area for bacterial growth, promotes even distribution, and further protects outer layers and the receiving surfaces so they remain permeable. Original Enviro-Septic® does not include Bio-Accelerator™.

Cross-Section of Advanced Enviro-Septic™ Pipe:

ADVANCED ENVIRO-SEPTIC™ WASTEWATER TREATMENT SYSTEM

TEN STEPS OF WASTEWATER TREATMENT: ADVANCED ENVIRO-SEPTIC™ TREATS EFFLUENT MORE EFFICIENTLY TO PROVIDE LONGER SYSTEM LIFE AND TO PROTECT THE ENVIRONMENT.



STAGE 1: WARM EFFLUENT ENTERS THE PIPE AND IS COOLED TO GROUND TEMPERATURE.

STAGE 2: SUSPENDED SOLIDS SEPARATE FROM THE COOLED LIQUID EFFLUENT.

STAGE 3: SKIMMER TABS FURTHER CAPTURE GREASE AND SUSPENDED SOLIDS FROM THE EXITING EFFLUENT.

STAGE 4: PIPE RIDGES ALLOW THE EFFLUENT TO FLOW UNINTERRUPTED AROUND THE CIRCUMFERENCE OF THE PIPE AND AID IN COOLING.

STAGE 5: BIO-ACCELERATOR™ FABRIC SCREENS ADDITIONAL SOLIDS FROM THE EFFLUENT AND DEVELOPS A BIOMAT WHICH PROVIDES TREATMENT AND ENSURES ACCELERATED BIOMAT DEVELOPMENT.

STAGE 6: A MAT OF COARSE RANDOM FIBERS SEPARATES MORE SUSPENDED SOLIDS FROM THE EFFLUENT.

STAGE 7: EFFLUENT PASSES INTO THE GEO-TEXTILE FABRICS AND GROWS A PROTECTED BACTERIAL SURFACE.

STAGE 8: SAND WICKS LIQUID FROM THE GEO-TEXTILE FABRICS AND ENABLES AIR TO TRANSFER TO THE BACTERIAL SURFACE.

STAGE 9: THE FABRICS AND FIBERS PROVIDE A LARGE BACTERIAL SURFACE TO BREAK DOWN SOLIDS.

STAGE 10: AN AMPLE AIR SUPPLY AND FLUCTUATING LIQUID LEVELS INCREASE BACTERIAL EFFICIENCY.

Care and Maintenance

Note: These recommendations are applicable to nearly all onsite septic systems. The AES system requires virtually no maintenance on the part of the system owner. However, reasonable use and care will enhance the longevity and trouble-free operation of your system.

Gutter, Drainage and Irrigation Systems:

Roof drains, foundation drains, French drains, gutter systems, sump pumps, irrigation systems, etc. should NOT discharge on or near your Advanced Enviro-Septic™ System. Such additional hydraulic loading could overload the system and cause it to malfunction. The water from such systems does not require treatment and can be safely dispersed away from your treatment system; consult with your designer or installer for more information.

Perimeter Drains:

Perimeter drains are used to lower the groundwater under and around the system location (if necessary and if allowed per state/local regulations). They surround the system on all four sides and are designed to intercept water and transport it away from the system before being dispersed. If your system includes a perimeter drain, it is very important that you periodically check the outlet to ensure that it remains unobstructed. It is also a good idea to install "animal guards" (a screen covering the outlet) to prevent animal activity.

Grading, Swales and Surface Diversions:

After installation, you will probably notice that the soil above the treatment field is slightly "crowned;" this is done purposely to direct surface water flows away from the system. You may also notice a "swale," which is a shallow trench in the soil upslope of the treatment field. Crowning and swales are used to intercept surface water flows and direct them away from the treatment field. It is important to the proper functioning of your system that you do not alter these surface diversions, since they protect the system from being flooded.

Venting:

An adequate supply of oxygen throughout the Advanced Enviro-Septic™ System is essential to proper functioning. Do not alter or remove any vent stacks. If you are displeased with the appearance of vent stacks, consult with your installer about "remote venting" or vent disguises.

Periodic Pumping of the Septic Tank:

One of the advantages of the Advanced Enviro-Septic™ System is that it requires virtually no maintenance other than the need to remove the accumulated matter from the septic tank. The majority of the solids in wastewater are retained in the septic tank, where they settle into the "sludge" layer or float on the surface as the "scum" layer. The bacterial action within the septic tank will break down some of the solids in the tank; the solid waste that isn't digested accumulates over time as these sludge and scum layers, which eventually need to be removed. Pumping is required approximately every 3 to 5 years for a typical residence with a properly sized system. If a garbage disposal is used, more frequent pumping will be required.

There are many factors which determine how often a particular system's septic tank needs to be emptied, including:

- The number of occupants;
- The amount of wastewater generated;
- The volume of solids in the waste;
- The size of the septic tank.

Refer to the Proper Use section for useful information about how to conserve water and minimize the accumulation of solids in your septic tank. As a general rule, the septic tank should be pumped when the surface scum and bottom sludge occupy one-fourth or more of the septic tank's liquid depth.

Selecting a Service Provider:

When selecting an individual or a company to pump your tank and inspect your system, make sure that they are familiar with Advanced Enviro-Septic™ Systems. Your designer and/or installer may be a good resource for providing referrals to a reputable local service provider.

Routine Inspection and Pumping Frequency:

Since it is difficult to predict with precision how often a particular system's tank will require pumping, Presby Environmental, Inc., recommends that a service professional inspect the system at least once every two years, **even if there are no indications of a problem**, in order to access the need for tank pumping and to confirm that the system's components are in good working order. There would be no "downside" to emptying the tank every two years, even if the accumulated solids have not reached one-fourth of the tank's liquid depth. Advanced Enviro-Septic™ Systems equipped with a pump or effluent filter will require more frequent maintenance (refer to and follow the manufacturer's recommendations). Septic tanks contain toxic gases and only a trained professional with proper gear should attempt to service a septic tank.

Use of Additives:

There are a variety of additives on the market which claim to breakdown sludge or boost the bacteria population so that the septic tank will need to be pumped less frequently. These claims are largely unsupported, and therefore Presby Environmental does not recommend the use of additives of any kind. The microbes needed for effective treatment are naturally present in wastewater; there is no need to use any chemicals, enzymes, yeast, cleaners, solvents or other additives with an Advanced Enviro-Septic™ System. Some of these "treatments" can actually have a detrimental effect on the system, and some states have even banned their use.

Routine Inspection of System:

At the same time that the need for pumping the tank is assessed, the service provider will typically perform a routine inspection. Make sure that your service provider is familiar with Advanced Enviro-Septic™ Systems; our systems work differently than conventional systems, so it is important that your service provider knows what is "normal" for our system.

***-Evaluate the Integrity of the Septic Tank and its Components*:** (connecting pipes; inlet and outlet baffles; lids, seals and risers; distribution box; filters; pumps; etc.): It is especially important that your service provider confirms the structural integrity of the septic tank; if the tank and its seals are not watertight, water can leak both in and out of it. Water from the environment leaking into the septic tank overloads the system beyond its treatment capabilities, while untreated wastewater leaking out of the septic tank poses a health hazard and can contaminate the groundwater. If your system includes a distribution box, the service provider should inspect it to make sure that it has remained level, that its equalizers are in place (if included in the design), and that it has not become clogged.

-Inspect Vents: The service provider should also verify that the vents are in place and free of obstructions, since the flow of air to the Advanced Enviro-Septic™ System is crucial to its functioning. A "draw test" may be conducted to confirm that vents are functioning properly. If your system is vented, DO NOT remove the vent, as this will diminish the oxygen supply to the Advanced Enviro-Septic™ System, which could result in system malfunction. Consult with your designer or installer, or visit our website, for some suggested ways to relocate or "disguise" unsightly vents.

NOTE: Refer to the back of this manual for a System Information and Maintenance section, where you can keep a record of your system's maintenance history.

Proper Use of Onsite Septic Systems

Importance of Water Conservation:

Onsite systems are designed based on "daily design flow", which is usually calculated based on the number of bedrooms for residential systems. Note that the daily design flow (in gallons per day) is two or three times greater than the "actual" amount of wastewater that is expected to be generated by the structure on a daily basis. Therefore, be aware of situations (additional occupants, addition of fixtures, etc.) which result in an increase of water usage, since this will require more frequent septic tank pumping and may even necessitate expanding (increasing the size of) the system. If the amount of wastewater entering is more than the system can handle, wastewater can back up into the house or the yard, creating a health hazard and a nuisance. The Advanced Enviro-Septic™ System's ability to be expanded to accommodate increased daily flow if necessary is one of the product's many advantages. The use of the toilet, shower/bath and washing machine account for the majority of water use in a typical household.

In general, the less wastewater that goes down the drain, the better any onsite system will work. A common sense approach to water consumption will maximize your system's effectiveness. A few suggestions for ways to conserve water consumption:

- Don't wash all your laundry on the same day, since this will "flash flood" the system and agitate the settled solids. A single load of wash in a typical machine can use up to 62 gallons of water. If the system is flash flooded, liquid will pass through more quickly than it is intended to, resulting in incomplete treatment. Instead, distribute the wash loads throughout the week.

- Run your washing machine and dishwasher only when they have full loads.

- Careful selection of appliances and fixtures that use less water is another way to minimize the demands placed on your Advanced Enviro-Septic™ System. Look for the terms "Energy Star" or "high-efficiency" in the product's description. For example, an "Energy Star" washing machine uses one-half as much water as a traditional model.

- When you consider that 25-30% of total household wastewater is attributable to toilet use, it is easy to see that replacing a traditional toilet (5-7 gallons per flush) with a high efficiency toilet (1.6 gallons per flush) can conserve a considerable amount of water.

- Installing aeration devices on faucets and showerheads greatly reduces the amount of water used. A "low flow" showerhead reduces the water used in a ten minute shower from 50 gallons to 25 gallons. Multiply this by the number of showers per day, and the water conservation is significant.

- Leaks and drips within the plumbing system can waste a significant amount of water and should be repaired immediately. One toilet leaking at a rate of one gallon per minute could needlessly send over 1,400 gallons of water per day into your wastewater treatment system.

TIP: *An excellent resource for learning more about water conservation is available from the EPA at www.epa.gov/owm/water-efficiency/index.htm*

What <u>not</u> to flush:

As described above, how often your septic tank needs to be pumped is dependant on the amount of solids that are accumulating in the tank; in addition, certain items if flushed down the toilet can lead to blockages in the pipes or in components of the wastewater treatment system. The following should be disposed of in the trash rather than by flushing down the toilet:

- Diapers
- Baby, hand or cleaning wipes (even if they state “flushable” or “septic safe”)
- Cat Litter
- Cigarette butts and ashes
- Plastic or cellophane wrappers
- Chewing gum
- Coffee grounds or eggshells
- Feminine hygiene products
- Excessive amounts of toilet paper
- Napkins, tissues, paper towels
- Cotton swabs or cotton balls
- Dental floss
- Condoms, rubber gloves or other plastic or latex items
- Adhesive bandages
- Laundry lint
- Hair

NOTE: If it is **not** biodegradable, it does **not** belong in your wastewater treatment system!

Use of Garbage Disposals:

The use of a garbage disposal (also called a “garbage grinder”) creates a **tremendous** increase in the amount of solids in wastewater, resulting in the need for more frequent pumping (one to two years sooner than if no garbage disposal is used). While some of the kitchen waste from a garbage disposal will be broken down by bacterial action, most of it will eventually have to be pumped out.

Considerations regarding Hot Tubs:

Hot tubs use a tremendous amount of water; if your plumbing system includes a jetted tub larger than 125 gallons, the system should be increased in size to accommodate this additional flow. If the hot tub drains into the system, the sudden influx of water stirs up the solids in the septic tank and could push them into the Advanced Enviro-Septic™ System. In addition, the chemical additives sometimes used to disinfect the water in hot tubs are detrimental to the helpful bacteria that are essential to the treatment process. The water from a hot tub does not require treatment, so it is recommended that hot tub water be cooled and then dispersed in an area that is not near the septic tank or treatment field.

Water Softeners and Water Purifiers:

Water purification systems and water softeners use hundreds of gallons of water. If these appliances discharge into the septic tank, it will cause agitation of solids and excess flow to the system. Check with your plumber about alternative ways to disperse these discharges. The “brine” which exits the water purification contains calcium, magnesium and salt; there are differing opinions regarding whether or not the concentrations of these minerals in the backwash has a negative effect on bacterial function or the hydraulic conductivity of the soil. Since this “backwash” does not require treatment, there is no sense in overburdening your wastewater treatment system with it.

Special Considerations for Pumped Systems:

Pressure distribution is not to be used with the Advanced Enviro-Septic™ System; however, in some situations systems may require a pump to gain elevation if the site's topography does not allow for a gravity system. We recommend that the pump dosing frequency be set so the system is dosed a minimum of 4 times a day. If it is dosed less frequently, an increased volume of wastewater will be sent to the system, which could disrupt the settling of solids and greases and lead to clogging.

Other substances detrimental to wastewater treatment systems:

An Advanced Enviro-Septic™ System is a living collection of organisms, and the introduction of toxins and chemicals can kill the bacteria that are essential to the treatment process. If it is impossible to avoid the use of any of the following substances, use care to introduce them a little at a time so their concentration is diluted and the system can neutralize them gradually.

Cleaning Products: The system's bacteria should recover quickly after small amounts of household cleaning products enter the system, but using excessive amounts of such substances constitutes system abuse.

***Especially Harmful to Bacteria, Use Only in Moderation*:**

- bleach
- chlorine
- ammonia
- anti-bacterial soaps
- disinfectants

Medications: Some people dispose of medications by flushing them down the toilet. Certain medications, particularly antibiotics, can have adverse effects on the system's bacteria. Dispose of medications in the trash and not in your plumbing system.

Chemicals and Toxic Substances: The following substances are harmful to the living organisms in your system and introducing them constitutes system abuse. These substances can not only have an adverse effect on your system, they can also result in groundwater contamination. Check with your local sanitation department for proper disposal procedures for:

- Fertilizers
- Root killers or other products with copper sulfate
- Poisons or pesticides
- Drain cleaners
- Oven cleaners or other lye-based products
- Degreasers
- Photographic processing chemicals
- Petroleum products of any kind
- Latex paint, oil paint, stains, thinners and solvents
- Antifreeze
- Chlorinated water from swimming pools or hot tubs

Grease and Cooking Oil: Grease may harden in the septic tank's scum layer and result in a blockage of the inlet or outlet. If you melt grease and pour it down the drain, it may make its way into the system before hardening, which could clog the fibers and fabrics in the Advanced Enviro-Septic™ pipe and/or the pores of the soil in the treatment field. Whenever possible, it is preferable to dispose of waste grease and oil in the trash rather than down the drain.

Care of System During Periods of Intermittent or Non-use:

The Advanced Enviro-Septic™ System does not require any special maintenance before, during or after periods of non-use. While the system's bacteria may go temporarily dormant if the system is not used for awhile, once wastewater re-enters the system it will return to its normal function in a short period of time. It would not be advisable to have the septic tank pumped and left unused at times when the groundwater is high, as this could cause the tank to "float" out of the ground.

Proper Care of the Treatment Field:

***General Comments*:**

- Do not build anything above the treatment field
- Do not drive over the treatment field (unless the system was designed for this)
- Do not dig in the treatment field
- Do not plant trees or shrubs in the treatment field
- Do not store heavy equipment or park on the treatment field
- Do not install irrigation systems in the treatment field
- Do not allow any gutter or drainage systems to discharge above the treatment field
- Do not install additional soil cover materials over the treatment field

***Landscaping and Planting in the Treatment Field*:**

- Do not plant trees or shrubs within 10' of the treatment field, since there is the potential for roots to damage the components and interfere with the system's functioning.
- After installation and proper grading to divert surface waters, the treatment field should be mulched and seeded promptly in order to prevent erosion.
- Only shallow rooted, native vegetation should be planted above the treatment field. Grass, wildflowers and shallow-rooted groundcovers are good choices.
- Vegetative cover over the treatment field is important because it contributes to the elimination of nitrogen and phosphorous.
- Do not use fertilizers in the area above the treatment field.
- Do not plant gardens for human consumption above the treatment field.
- Take care not to compact the soil when landscaping; compacted soil above the system can reduce the oxygen supply and gas transfer.

***Ventilation*:**

- Vents are required for Advanced Enviro-Septic™ Systems to ensure that the system receives a sufficient supply of oxygen, which is required for the bacterial processes that treat the wastewater.

- Typically, vents will look like a cane-shaped piece of PVC protruding straight up out of the ground or mound in the treatment field.

- Vents should be checked periodically to ensure that they are not clogged or blocked in any way, for instance by leaves, animal activity or snow accumulation.

- Do not under any circumstances remove the vent or cover it with any materials that will impede the flow of oxygen. The vent inlet should be a minimum of 3 ft. higher than final grade or above the yearly expected height of snow accumulation.

- If you are concerned about the unsightly appearance of vents, consult with your installer about the possibility of installing remote or by-pass venting in order to locate vents in a less-conspicuous area away from the treatment field. This information is also available on our website, www.PresbyEnvironmental.com.

- Unsightly vents can also be disguised by installing specially-designed products which conceal the vent but still allow sufficient oxygen flow. These products, constructed of durable but lightweight plastic, are made to look like a large rock, a granite post, a birdbath, etc. If you are interested in purchasing a vent disguise, contact your installer or call Presby Environmental and we can refer you to a distributor near you.

- Some customers find that simply painting the vent stack (green, brown, camouflage, etc.) makes it much less noticeable.

- Resist the temptation to conceal vents with landscaping; no trees or shrubs may be located within 10 feet of the treatment field to prevent the infiltration of roots.

Causes & Indicators of Septic System Malfunction

What is "System Malfunction"?

The term "system malfunction" refers to any situation in which a septic system has stopped operating as expected. One of the unique advantages of the Advanced Enviro-Septic™ System is that in many cases it is possible to restore the system to proper functioning through the process of "Rejuvenation," which returns the system's bacteria to an aerobic state. (See "Rejuvenation, Replacement and Expansion" section of this manual for more information.)

What can Cause Septic System Malfunction?

- Continuous volume of wastewater in excess of design flow
- System flooded with excessive volumes of wastewater which agitates sludge in the septic tank and sends solids into the Advanced Enviro-Septic™ System
- Hydraulic overload from surface or ground water
- Improper design or installation of system and/or plumbing fixtures
- Compacted soil under or over the Advanced Enviro-Septic™ System
- Use of incorrect product for System Sand
- Lack of oxygen, improper venting, vent obstructions
- Failure to periodically pump the septic tank
- Clogged or improperly maintained septic tank effluent filters
- System components clogged by grease, non-biodegradable solids, or roots
- Excessive use of chemicals, toxic substances, cleaning products, etc.
- Excessive volume of solids and/or non-biodegradable materials in the wastewater
- Damage to or leaks in any of the system components

What are the Symptoms of Septic System Malfunction?

- A foul odor in the treatment field or from plumbing fixtures
- Ponding or surfacing of wastewater at the ground surface
- Wastewater collecting in the basement
- Backing up of wastewater inside the structure (sluggish drains or toilets slow to flush)

Contact Your Service Provider IMMEDIATELY if You Observe Symptoms of System Malfunction.

You may also call Presby Environmental directly at 800-473-5298 and we will provide technical assistance and trouble-shooting guidance. No matter what the problem may be, the sooner it is addressed the easier it will be to correct or repair.

Problem	Possible Cause(s)	Action to take
Wastewater backup into plumbing fixtures (sluggish drains or slow flushing toilets)	Sewage line to septic tank clogged	Use a plumbing "snake" to remove the clog. Do not use caustic chemical drain cleaners.
	Sewage line damaged or invaded by roots	Replace sewage line to septic tank
	Too many accumulated solids in the septic tank	Have septic tank pumped
	Damaged or missing inlet or outlet baffles	Repair/replace baffle
	D-Box plugged	Clean out D-Box
	Pump Failure	Contact service provider
	Effluent filter is blocked	Clean or replace filter
	Connecting pipe from septic tank to Advanced Enviro-Septic™ System damaged or invaded by roots	Replace connecting pipe
Foul odor detected	System overload or malfunction	Restrict water use as much as possible and contact service provider
	Ventilation malfunction or improper configuration	
Ponding or pooling of wastewater on ground surface or basement	System overload or malfunction	Restrict water use as much as possible and contact service provider
For any malfunction or questions…..	**First** consult your service provider, designer or installer for assistance.	Presby Environmental's technical support team can be contacted by telephone at (800) 473-5298 or by email to info@presbyeco.com.

Rejuvenation, Replacement & Expansion

What is the Difference Between "Aerobic" and "Anaerobic" Bacteria?

The bacterial processes that provide treatment of wastewater in the Advanced Enviro-Septic™ System are performed by "aerobic" bacteria (bacteria that require oxygen.) When a system malfunctions, it is most often due to a lack of oxygen, which results in the bacteria being converted to an "anaerobic" state (bacteria that exist without oxygen.) (See preceding section of this manual for more information about the possible causes of system malfunction.) These anaerobic bacteria are severely limited in their ability to treat the contaminants in wastewater effectively, which means that the liquid passing through the system is not being purified as intended. When the bacteria turn anaerobic, the System Sand around the pipes turns a darker color.

What is "Rejuvenation"?

"Rejuvenation" is a procedure for returning the system's bacteria to its intended aerobic state. This feature is unique to the Advanced Enviro-Septic™ System, and could save thousands of dollars compared to the expense of replacing a failed system. The procedure is relatively simple and takes only a few days. Consult your service provider, installer or Presby Environmental technical advisors for more details before proceeding.

NOTE: It is helpful to have your septic tank pumped in preparation for Rejuvenation procedures.

Procedures for Rejuvenation:

Step 1: Determine and correct the problem causing the bacteria conversion. (See preceding section of this manual for possible causes of system malfunction.)
Step 2: Excavate one end of all lines and remove the end cap(s) or offset adapter(s).
Step 3: If necessary, have the wastewater pumped from the system and septic tank.
Step 4: Safeguard the open excavation and guarantee passage of air through the system. If possible, attempt to perform procedure during warm, dry weather.
Step 5: Allow all lines to dry for a minimum of 72 hours. When the bacteria have successfully been converted back to an aerobic state, the System Sand will return to nearly its original color.
Step 6: Reassemble the system to its original design configuration, re-install proper cover materials.

Components Reusable and Replaceable:

Since Advanced Enviro-Septic™ components are non-biodegradable and highly durable, they may be re-used in cases of improper initial installation. In many situations, it will be possible to excavate the system and clean and reinstall all system components. If any components are discovered to be damaged, the individual component can be replaced easily.

System Expansion:

Another unique advantage of the Advanced Enviro-Septic™ System is its ability to be expanded if necessary to accommodate an increase in the daily flow to the system. As mentioned previously, systems are designed to accommodate a particular volume of liquid per day, and exceeding the system's design flow will overload it, possibly resulting in system malfunction. The Advanced Enviro-Septic™ System can be increased in size in order to handle an increase in the daily design flow. Equal lengths of pipe may be added to each Advanced Enviro-Septic™ line, or additional equal sections can be added to the system.

Appendix A
System Information & Maintenance Records

Designer & Installer Information:

Date of Installation	
Copy of Plan available?	Yes No
Designer Name	
Designer Company	
Designer Address	
Designer Telephone	
Installer Name	
Installer Company	
Installer Address	
Installer Telephone	

Site Information:

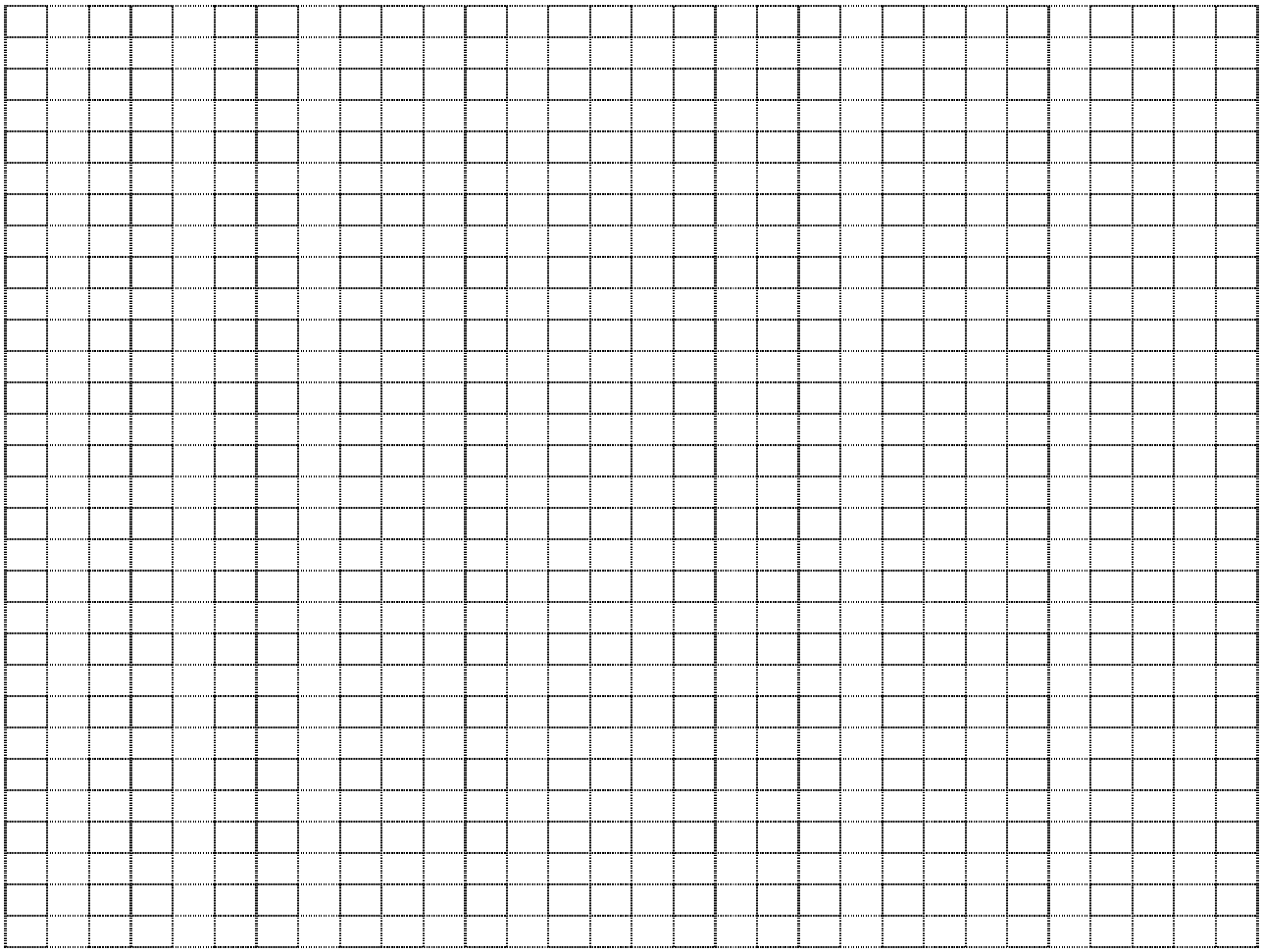
Street Address	
Town / County / State	
Map/Lot	
Municipal Contact Name & Telephone	
Permit Number	
Water Supply	Public Private (circle one)
If private, Well Info.	
Soil Type / Perc Rate	
Relevant Site Characteristics	
Proximities to bodies of water, wetlands, etc.	

System Information:

Design Flow	_____ Gallons per Day _____ # of Bedrooms
Design Type (circle all that apply)	Basic Serial Combination D-Box Multiple Beds (#_____) Pump Gravity Raised (mound) In-Ground Non-Conventional Non-Standard Flow Equalizers Velocity Reducers
Site Slope	Level _____%
System Slope	Level _____%
Vent Locations	
Vent Size	
Linear Feet E-S pipe	
Number of Lines	
Pipe Spacing (center-to-center)	
Sand Bed Dimensions & Number of Beds	
Other Comments:	

Diagram System Location:

Indicate location of structure, septic tank & access hatch, treatment field, vents, wells, restrictive features (pavement, swimming pools, foundations, surface water, property lines, etc.)



System Maintenance and Service Record		
DATE:	**PERFORMED BY:**	**DESCRIPTION OF SERVICE:**