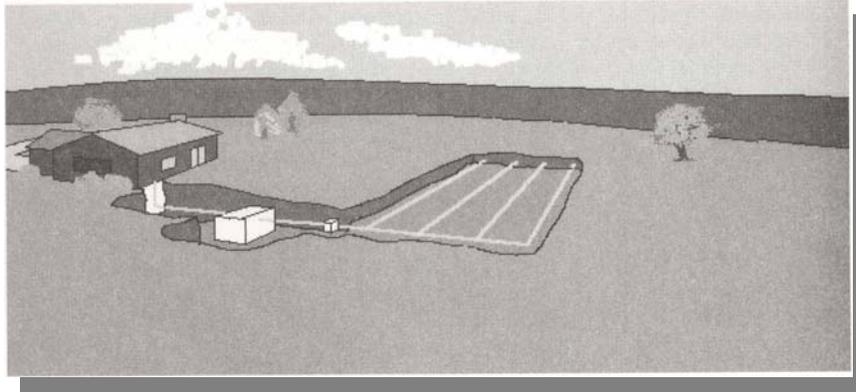


# SPECCO Environmental

## Septic Tank & Home Package Plants

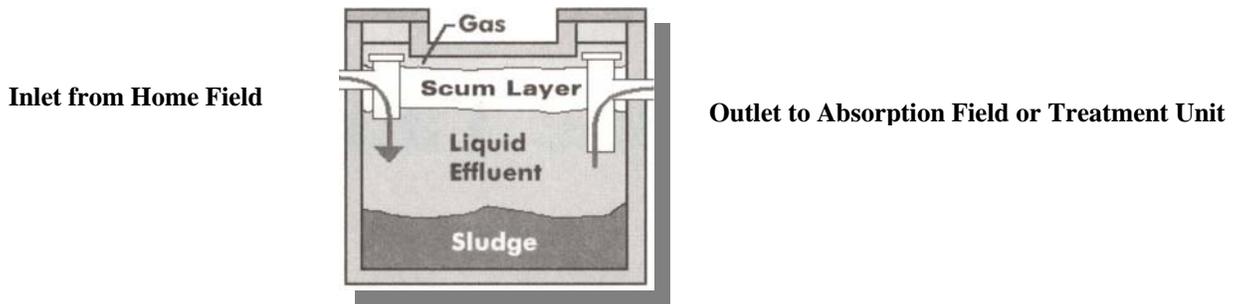


## Best Management Practice Manual

## Operational Guide

## What is a Septic System?

A septic system is an onsite wastewater treatment system that processes and purifies household waste (effluent). The effluent consists of blackwater (toilet wastes) and greywater (kitchen sink, bathtub and laundry waste).



Section View of Septic Tank

A septic system has two components: a septic tank and a leachfield or drainfield. Primary treatment occurs in the septic tank, where bacteria digest organic materials in the wastewater. The effluent then flows into the leachfield for secondary treatment. Here, bacteria complete the digestion and purification process as the wastewater slowly leaches or infiltrates into the soil.

The septic tank is a “watertight” underground box, usually concrete, about eight feet long, four feet wide, and five feet deep. It has at least a 1,000 gallon capacity for retaining, storing, and treating solids, in addition to releasing effluent into the leachfield, sometimes called a drainfield.

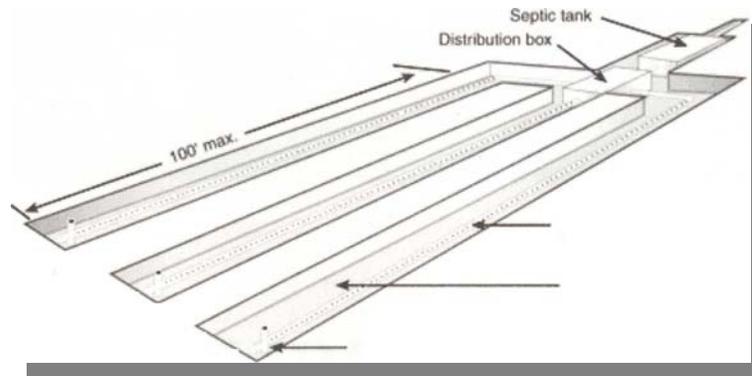
## How Septic Tanks and Pre-Treatment Work

Wastewater from toilets, sinks, dishwashers, garbage disposals, sump pumps, etc. flows from the house into the septic tank via an inlet baffle and is directed down into the tank. Heavy materials are deposited on the bottom as sludge. Lighter materials float to the top and form scum.

Bugs (bacterias) eat both the sludge and the scum and form gas. Clarified water (the middle layer), commonly called effluent, flows through the outlet baffle to the absorption field or to secondary treatment at the Advance Treatment Unit (ATU).

Liquid effluent flows by gravity or pressure (pump stations) from the septic tank or Home Package Plant (HPP) through a distribution box to the drain field (also called an absorption field) or to a pump tank that distribute to the Drip Irrigation Field. The water flows through perforated pipe that is laid on top of a gravel bed and slowly works its way down through native soil. Any contaminants are either attached to the soil particles or treated by bugs in the soil. Nutrients react with other chemicals that exist in the soil or decompose by the bugs that live in the soil.

### On-Site Treatment System



## What Can Go Wrong?

### Septic Tanks

- Damage to septic tank due to ground movement, age
- Bugs killed by too many chemicals in too large a quantity
- Too much water washes out scum and/or sludge.
- Failure to properly pump out tank on a regular basis

### Absorption or Drip Field

- **Clogging of pipes**
- **Incorrectly designed absorption field**
- **Placing too much weight on absorption field**
- **Breaking or puncturing drip lines with sharp objects in Drip Fields**
- **Not cleaning or backwashing the mesh filter regularly in Drip Fields**
- **Roots insertions into the absorption area**
- **Pump system failure of control panel**
- **Float signal failure**

### Advance Treatment Unit (ATU)

- **Oxygen Deficiency or improper distribution**
- **Failure of pump out a third of the tank on a regular basis**
- **Bugs killed, lack of food or too many chemicals**
- **Tank rupture or damage**
- Too much scum or grease and/or sludge
- Incorrect design of ATU capacity

## How Much Will It Cost Me?

- New Septic Tank: \$3,000-\$5,000
- **New ATU: \$ 5,000-8,000**
- New Drain Field: \$5,000-\$10,000
- Septic Tank Pump Out: \$100-\$300
- Septic or ATU Tank Inspection: \$50-\$100

## How Can I Tell If I Have a Problem?

These are signs that you have a problem:



- You have standing sewage over your absorption field or around your septic tank.
- You have a distinct sewage odor around your septic system.
- You have areas of soil that are collapsing over your septic system.
- You have a very slow draining or stopped up sink or toilet.
- Sewage backs up into your house.

## How Can I Protect My System?

### Get it pumped out regularly!

Follow the schedule below:

<i>Estimated Septic Tank Pumping Frequency in Years</i>											
<b>Tank Size</b>	<i>Household Size (Number of People Living in the House)</i>										
	<b>Gals</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
500	5.8	2.6	1.3	1	0.7	0.4	0.3	0.2	0.1		
750	9.1	4.2	2.6	1.8	1.3	1	0.7	0.6	0.4	0.3	
900	11	5.2	3.3	2.3	1.7	1.3	1	0.8	0.7	0.5	
1000	12.4	5.9	3.7	2.6	2.0	1.3	1.2	1	0.8	0.7	
1250	15.6	7.5	4.8	3.4	2.6	2.	1.7	1.4	1.2	1	
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8	1.5	1.3	
1750	22.1	10.7	6.9	5	3.9	3.1	2.6	2.2	1.9	1.6	
2000	25.4	12.4	8	5.9	4.5	3.7	3.1	2.6	2.2	2	
2250	28.6	14	9.1	6.7	5.2	4.2	3.5	3	2.6	2.3	
2500	31.9	15.6	10.2	7.5	5.9	4.8	4	4	3	2.6	

A septic system may be out of sight, but it definitely should not be out of mind. With proper standard maintenance and by being more aware of your daily living habits, you will greatly improve the life and health of your system. Here are some guidelines to help you protect your septic system investment.

### Why the Tank Needs Pumping Periodically

About 95 percent of the sludge and scum that is in your septic tank is broken down by bacteria. The other 5 percent remains in the tank and builds up in the sludge layer. Consequently, your septic tank must be pumped out regularly. Otherwise, solids would eventually fill the tank and wash out into the leachfield. This is detrimental to the overall health and longevity of your system.

As your septic tank ages, the scum and sludge layers build up and the area devoted to the liquid effluent decreases. At some time these layers may merge and the scum and sludge may be sent to the drain field where it will clog up the pipes and cause them to fail. A new absorption field is the only option. Pumping out your septic tank removes any accumulated sludge and scum. It also removes nutrients, such as phosphorous and nitrogen, that could otherwise find their way to the local ground water or surface water and degrade these.

Maintain a record of the Septic System maintenance such as dates the tanks were pump or serviced.

**Do not flush excess water through your system.**

*Excess water can flush out the scum and sludge layers and clog up your absorption field pipes.*

Spread out clothes washing evenly over the week, and switch to a front loading washer.



Wash only full loads of dishes and clothes. Install a filter between the washer and the septic tank.



Do not allow storm water to enter your septic system or absorption field. Drain rainwater from gutters and let it enter your storm water system, not your septic system.

Do not put your pool water through your septic system.



Do not put your water softener water through your septic system or set up a separate system just for this water.



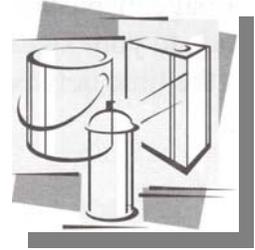
Use low flow showerheads, faucets, toilets, etc. or use them less often, and stop all drips and leaks.

## Keep Chemicals Out of Your Septic System

*Chemicals can kill the bugs that treat the sludge and scum. They can also find their way into the groundwater and contaminate your drinking water or the surrounding water that could be someone else's drinking water.*



Do not pour cleaners, solvents, paints, pesticides, inks, antifreeze, prescription drugs, or any other chemicals down any drains or sinks



Use natural drain cleaners such as vinegar and baking soda to unclog drains. Use nonphosphate or biodegradable detergents when washing clothes and dishes.

Do not use any additives, chemicals or biological enzymes that claim to improve your septic tank's operation; they do not work.

## What Can I Do In My Kitchen?

*There are some other procedures that you can use in the kitchen to help improve your septic system operation.*

Do not use a garbage disposal. Garbage disposals add 50% more solids to your septic system and will cut the time between pump outs in half.



Do not pour cooking fats, oils, and greases (FOG) down your kitchen or any other sink. FOG can build up in your pipes and cause clogs. In addition, FOG will increase the scum level in your septic tank and may require you to pump it out more frequently.

Hand wash dishes whenever possible.

Scrape food off plates, pots, etc. before washing.

## What Can I do In My Bathroom?

*There are a number of things you can do in your bathroom.*

- Install low flow showerheads, faucet aerators, and toilets.
- Take shorter showers.
- Do not take baths.
- Do not run your water while brushing teeth or shaving.
- Flush toilets less often.
- Do not use toilet bowl disinfectants and drain cleaners.
- Do not flush excessive toilet paper.
- Do not flush tissues, paper towels, personal hygiene products, or cigarette butts into the septic system.
- Do not allow hair to flush down the sink drain.



## How Can I Protect My Drain Field?

*Drain fields, also called absorption fields, should not have anything substantial placed over them.*

Do not park cars, trucks or other heavy equipment over a drain field.



Do not plant trees or bushes over the drain field. Only grass should be planted over one.

Do not place, buildings, sheds, porches, pools or other structures over the drain field.



Do not cover drain fields with asphalt, concrete, or other impermeable materials.

Do not allow storm water from roof drains, sump pumps, and etc. to flow over the drain field.

## Stone and Pipe Systems

Old-fashioned systems use gravel or crushed stone in the leaching trenches to create void space to store the effluent and release it slowly. However, such systems are prone to eventual failure as the voids (empty spaces) around the gravel become plugged. This phenomenon occurs over time as solids build up between the stones, limiting infiltration of water into the soil. As the gravel settles, it also tends to compact and accumulate fines (small soil particles), further reducing the infiltration rate.

## The Advantages of Infiltration Chambers Over Stone and Pipe Systems

Infiltration chambers are today's superior alternative to old-fashioned stone and pipe because they:

- Provide long-term savings due to longer life and greater operating efficiency
- Offer worry-free, long-term service with only simple, routine maintenance
- Protect valuable trees and plantings from damage caused by heavy trucks hauling stone
- Provide greater treatment area to handle more wastewater with higher efficiency
- Offer a "greener" approach utilizing recycled plastic resins to manufacture the chambers
- Are backed by a minimum 1-year warranty and a reputable, service-oriented company
- Can be installed in tight areas creating less site disruption
- Eliminate the destruction of natural resources and the cost of hauling stone

### SEPTIC TANK & TREATMENT SYSTEM

- Conserve water whenever and wherever you can, the more water that enters the system, the less effective the treatment system is. Conserve water by:
  - Fixing leaks and faucet drips;
  - Using low flow toilets, showerheads, and faucets;
  - Controlling the number of loads of clothes washed per day;
  - Taking shorter showers;
  - Reducing the amount of water running while brushing teeth, shaving, and bathing, etc.
- Flush toilets less often;
- Replace old appliances with modern water-efficient models;
- Use moderate amounts of toilet paper;
- Take showers instead of baths, and make them shorter;
- Wash only full loads of dishes and clothes, and evenly distribute the loads over the week;
- Use liquid detergent in the dishwasher;
- Use a front loading washer;
- Install a filter on the washer to remove lint;
- Use no-phosphate detergent;
- Hand wash dishes whenever possible;
- Use biodegradable detergents;
- Pour cooking fats, oils and greases in a container and place in trash;
- Route roof drains, storm drains, and sump pumps away from the septic system drain field;
- Consider replacing your toilet system with a composting or incinerating toilet;
- Landscape the absorption field with grass; not trees or bushes;
- Properly design for septic system expansion if additional bedrooms, bathrooms, or other water generating additions are planned;
- Have your septic tank system inspected annually; and your HPP every month to six month.
- **PUMP IT OUT** every three years, but more frequently, if required.

UIC Operations Manual

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- Use an excessive amount of water;
- Use toilet bowl disinfectants, they can kill the bacteria that treat the wastewater in the septic tank;
- Flush facial tissues, paper towels, personal hygiene products, or cigarette butts; Flush prescription drugs or over the counter medications, they can kill the bacteria that treat the wastewater in the septic tank, and can contaminate local groundwater or surface water;
- Use drain cleaners indiscriminately;
- Allow hair or other material to enter drains;
- Use a garbage disposal; such use could result in the need to pump the system twice as frequently;
- Pour cooking fats, oils or greases down the sink drain;
- Wash more than two clothes washer loads per day, this will keep the water from flushing through the septic tank;
- Send water softener water to the system;
- Send chlorine-treated pool water through the system;
- Drive or place heavy equipment on an absorption field;
- Cover over an absorption field with concrete, asphalt, or other impermeable materials;
- Build on an absorption field, such as a storage shed, addition, garage, or swimming pool;
- Allow storm drains, sump pumps, and other water to drain over the absorption field;
- Plant trees, bushes, etc. over an absorption field that could penetrate to the pipes and clog or destroy them;
- Enter a septic tank; toxic and explosive gases are formed in the tank, and could disable or kill;
- Use septic system additives such as starter enzymes, feeders, cleaners, degreasers, or chemicals designed to prevent pump-outs, they don't work and can contaminate local groundwater or surface water;
- Wash latex paint brushes or rollers in the sink; and
- Flush solvents, paints, antifreeze, and other chemicals, they can kill the bacteria that treat the wastewater in the septic tank, and can contaminate local groundwater or surface water.