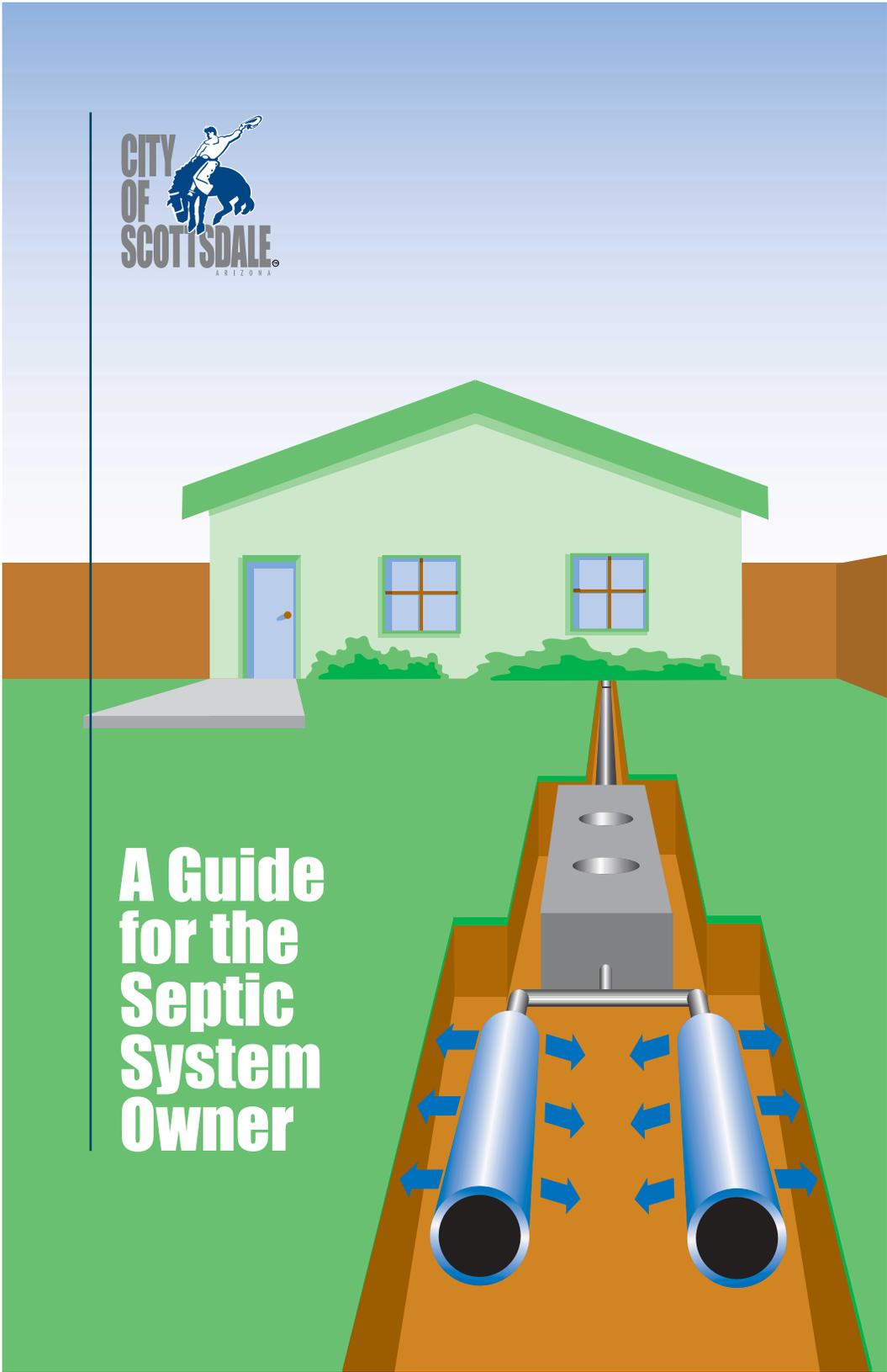




A Guide for the Septic System Owner



Chances are, you play a number of roles in life: spouse, friend, child, parent, homeowner, career person. But if you have a septic tank, you have one more very important role. A septic system is a “mini water treatment plant.” So, in a very practical way, you are your own wastewater treatment manager and are responsible for its operation and maintenance.

While many homeowners don't give a second thought to what happens once something goes down the drain, safeguarding the treatment process of your septic system is essential.

Why?

The primary reason is to protect the health of your family, the community and the environment. Septic systems are designed to hold, treat and dispose of household wastewater. The liquid portion leaves the system and may eventually reach groundwater or surface water, depending on local hydrology, which may be your source of drinking water.

Household wastewater contains bacteria, viruses, household chemicals and excess nutrients such as nitrates, all of which can cause health problems. Chemicals improperly released through a septic system can also pollute the local water sources you and

your community use for drinking water, commercial and/or recreational activities.

Preventing drinking water contamination at the source makes good sense in terms of public health, economics and environmental awareness.

Other reasons to take your role seriously include maintaining costs and property values. Failed septic systems are expensive to repair or replace. They can also cause property values to decline. For these reasons, it's important that you educate yourself about what should and shouldn't be disposed of through your septic system (also called “on-site wastewater treatment facilities”).

This easy-to-follow guide is designed to help you meet this responsibility in an easy and effective manner. By following a few simple steps, you and your septic system should get along just fine and have many productive years of working together.



GETTING TO KNOW YOUR SEPTIC SYSTEM

What is a Septic Tank?

Wastewater from toilets, sinks, showers, washing machines and other drains flow from the household sewer drain into an underground septic tank near your house. The tank is typically a large volume, watertight tank made of concrete or fiberglass. While relatively simple in construction, the septic tank provides a number of important functions through a complex interaction of physical and biological processes.

Simply put, the septic tank:

- Receives wastewater from the house;
- Separates solid waste from liquid waste;
- Stores separated solid wastes; and,
- Passes the liquid wastes out of the tank for final treatment and disposal.

A septic tank is often designed with a 1,000-gallon liquid capacity.

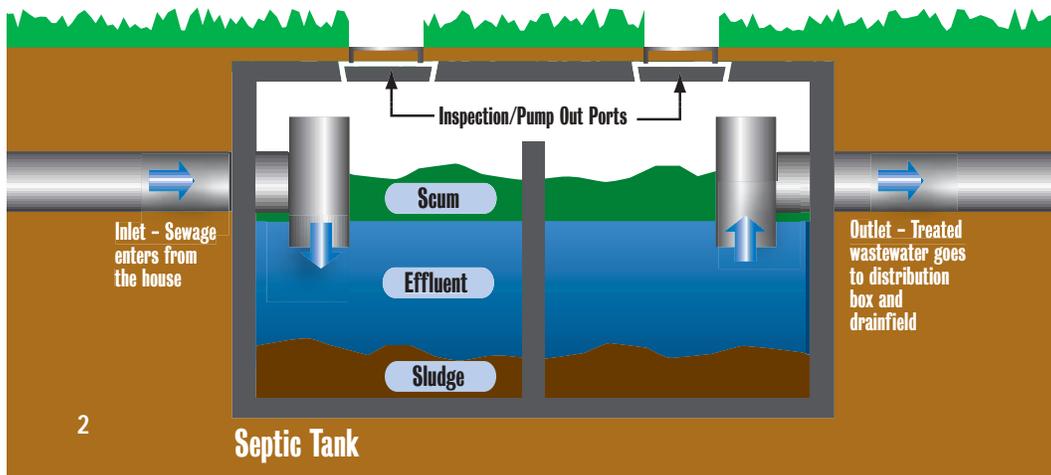
In Arizona, the size of the tank is legally determined by the number of

bedrooms and/or number of water fixtures in the home. Arizona requires a center wall, making two compartments in the tank.

What accumulates in the Septic Tank?

The main function of the septic tank is to remove solid waste from liquid waste. The process relies on gravity and time to naturally separate the wastewater into three layers:

- *Scum* - Substances lighter than water (oil, grease, fats) float to the top, forming a layer on top of the water.
- *Sludge* - Substances heavier than water (soil, unconsumed food particles) settle to the bottom of the tank and form a sludge layer.
- *Effluent* - This is the wastewater left between the scum and sludge layers. The effluent flows through the tank outlet to the drainfield where natural treatment occurs.



How long does the effluent stay in the Septic Tank?

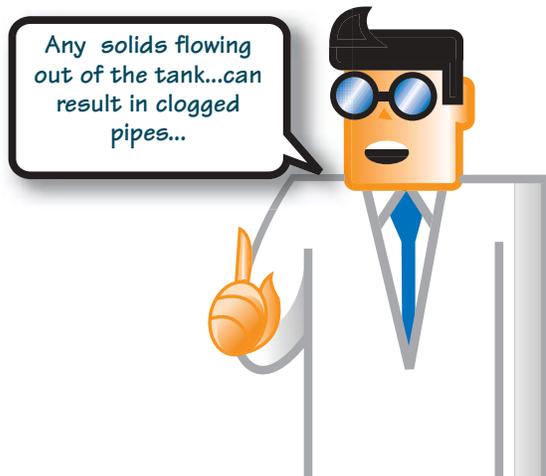
In order for adequate separation of solids to occur, the effluent needs to spend an adequate amount of time in the tank. This is referred to as “retention time” and is a function of the water volume in the tank and the volume of wastewater coming into the tank. Ideally, the retention time should be two to four days and not less than 24 hours. As sludge and scum accumulate in the tank, the retention time is reduced. If solids are not pumped out often enough, the effluent will not spend enough time in the tank to adequately separate the solids. Any solids flowing out of the tank with the effluent can result in clogged pipes and gravel in the drainfield, one of the most common causes of septic tank failure. Newer systems are often equipped with an effluent filter which will help, but not completely prevent, this problem. Such filters are relatively inexpensive and can quickly be installed or retrofitted. In many Arizona counties, effluent filters are required on new tank installations.

Where does the water go after it leaves the tank?

After the effluent leaves the tank, it flows into a natural soil absorption system, commonly referred to as the drainfield. In Arizona, most drainfields are a series of parallel, underground perforated pipes on top of gravel. The drainfield allows the effluent to percolate slowly into the surrounding soil.

Most of the actual wastewater treatment in a septic system occurs in the soil beneath the drainfield. As effluent enters and flows through the tiny pores in the soil, many of the bacteria that can cause disease are filtered out by small grains of sand and clay.

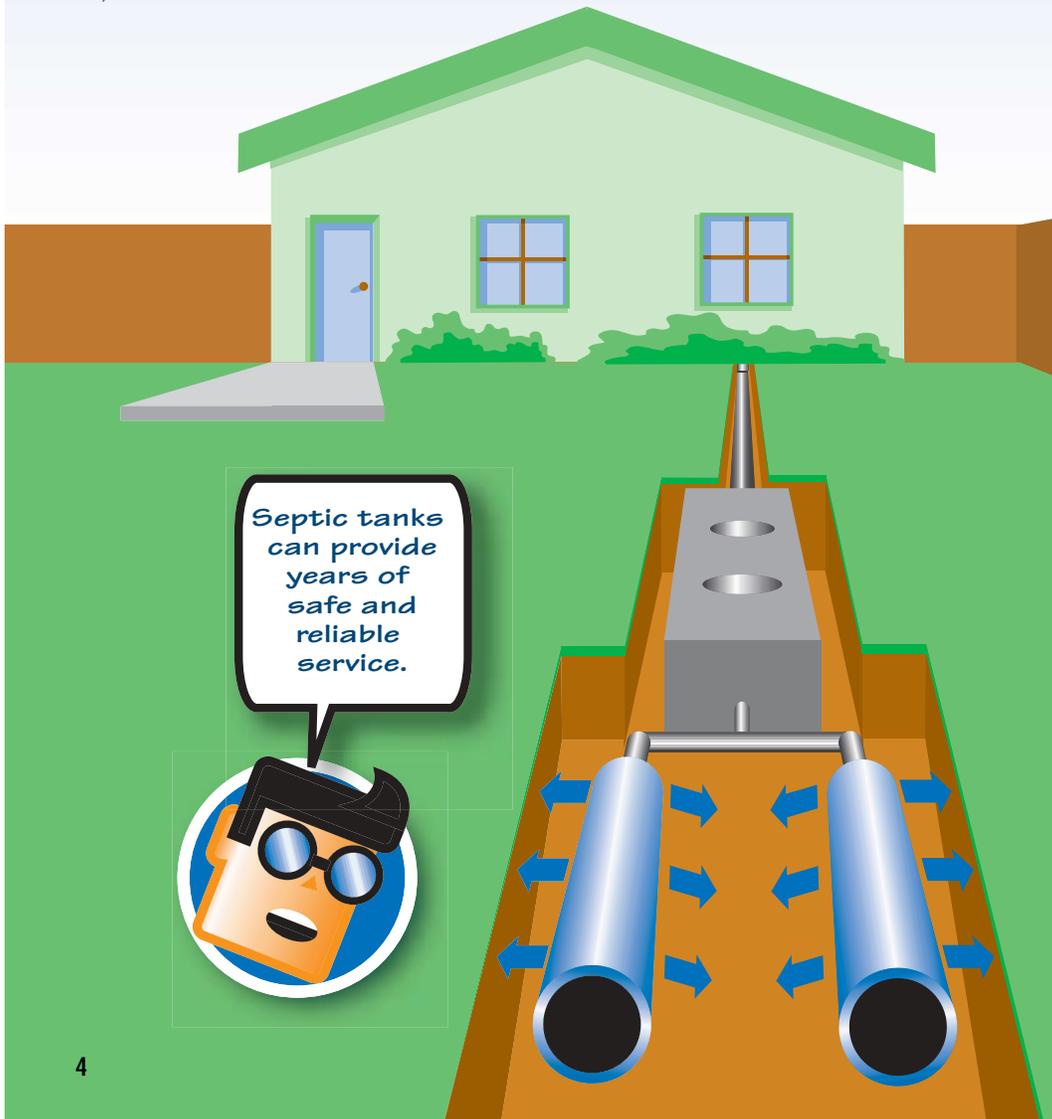
Some of the smaller microorganisms, like viruses, adhere to clay particles in the soil and eventually die. The soil can also retain certain chemicals, such as phosphorus and some forms of nitrogen.



Where do the scum and sludge end up?

Over time, the floating scum and submerged sludge accumulate in the tank and must be removed by a qualified septic tank contractor. Frequency varies from one household to another and can only be determined by routine septic tank inspections.

Once you understand how the system filters and treats water, it is easier to understand the importance of keeping your septic system in proper working order. When properly constructed and maintained, septic systems can provide years of safe, reliable service.



THE CARE AND FEEDING OF YOUR SEPTIC TANK

There are numerous ways to minimize the potential negative impact of septic systems on the environment. These include caring for the quality of water in your system (household waste disposal), paying attention to the quantity of water in the system (water conservation) and ensuring the system is inspected and maintained regularly.

Household Waste Disposal - Pay Attention to What Goes Down the Drain!

- **Household Cleaning Products** — Most experts agree that the normal use of household cleaning products will not harm the system. Large amounts of certain chemicals, however, may interfere with the breakdown of wastes in the tank or could clog the drainfield. You also need to keep in mind that the products you use may eventually find their way into local water sources. Consider using biodegradable alternatives for routine cleaning chores. Oxidized bleach, borax, vinegar and baking soda are less hazardous alternatives to common household cleaning products.
- **Cooking Oils and Fats** — These harden after disposal and can block the septic tank inlet, causing sewage back-up into the house. Dispose of them separately by using a glass jar for skimmed off fat and putting it in the trash, rather than down the drain.

- **Chemicals** — Chemicals like paints, solvents and pesticides should never be dumped down the drain. These will not be treated sufficiently to prevent contamination of water that returns to your local groundwater and/or surface water. Dispose of these items through local household waste disposal days. Never let wash water from latex paint on brushes or rollers go down the drain and into the septic system.
- **Garbage Disposals** — The use of a garbage disposal can also affect your septic system by adding to the amount of suspended solids entering the tank. Septic systems are intended to treat and dispose of human wastes and wash waters, not garbage.
- **Trash** — The following need to go in the trash, not in the septic system: coffee grounds, dental floss, disposable diapers, cat box litter, cigarette butts, chewing tobacco, sanitary products, plastics, facial tissues and paper towels.
- **Drains** — Drains should be equipped with strainers or other filtration devices to reduce the amount of food particles, hair and lint entering the system.
- **Toilet Paper** — Use moderate amounts of white toilet paper. Some dyes used in toilet paper are difficult for bacteria to break down.

Water Conservation

It's important to not overload the system. The septic tank is designed to hold incoming wastewater for a certain time period so that solids have time to settle and lighter portions can rise to the top. By conserving water, you can ensure that the water is flowing in and out of the tank in a regular, balanced fashion.

In most households, toilet flushing is the largest indoor user of water, followed by bathing, laundry and dishwashing.

Here are some tips:

- Consider installing water conserving devices such as low-flow toilets, showerheads and faucets.
- Avoid “marathon” showers and other large uses that can send big surges of wastewater into the system.
- Try to space out wash loads over the course of a week instead of running many loads in one day. Ideally, no more than two loads of laundry (one in the morning and one in the evening) should be done a day.
- Wash only full loads in the dishwasher.
- Do not route chlorine-treated water from swimming pools and hot tubs into your septic system.
- Visit www.wateruseitwisely.com for other water conservation tips.



Annual inspections of your septic system are recommended to ensure that it is working properly and to determine when the septic tank should be pumped.

Regular Inspection

Annual inspections of your septic system are recommended to ensure that it is working properly and to determine when the septic tank should be pumped. This extends the life of a septic system and helps you avoid unnecessary and expensive repair and replacement costs. Space to record service visits is included at the end of this booklet.

A thorough septic system inspection will include:

- *Locating the system* —
Even a professional may have trouble locating your system if the access to your tank is buried. Once you know where your system is, sketch a map to save time on future service visits. Space for a sketch of your system is included on the worksheet at the end of this booklet so you can keep everything together in one handy place.
- *Uncovering the manhole and inspection ports* —
This may entail some digging in your yard.
- *Flushing the toilets* —
This is done to determine if the plumbing going to the system is working correctly.
- *Measuring the scum and sludge layers* —
As a general rule, if the scum layer is within three inches of the bottom of the inlet, the tank should be pumped. If the sludge depth is equal to one third or more of the liquid depth, the tank should be pumped.
- *Checking the tank and drainfield* —
The contractor will check the condition of the baffles or tees, the walls of the tank for cracks and the drainfield for any signs of failure.
- *Remove the solids from the tank as needed* —
Most tanks need to be pumped every three to five years, depending on the size of the tank, daily flow of wastewater into the tank and use of a garbage disposal.

There are many septic tank additives (starters, feeders and cleaners) on the market today that claim to improve the performance of your septic system. However, there is little evidence that these products will prevent septic system failure or will improve performance. To the contrary, some could actually harm your system.

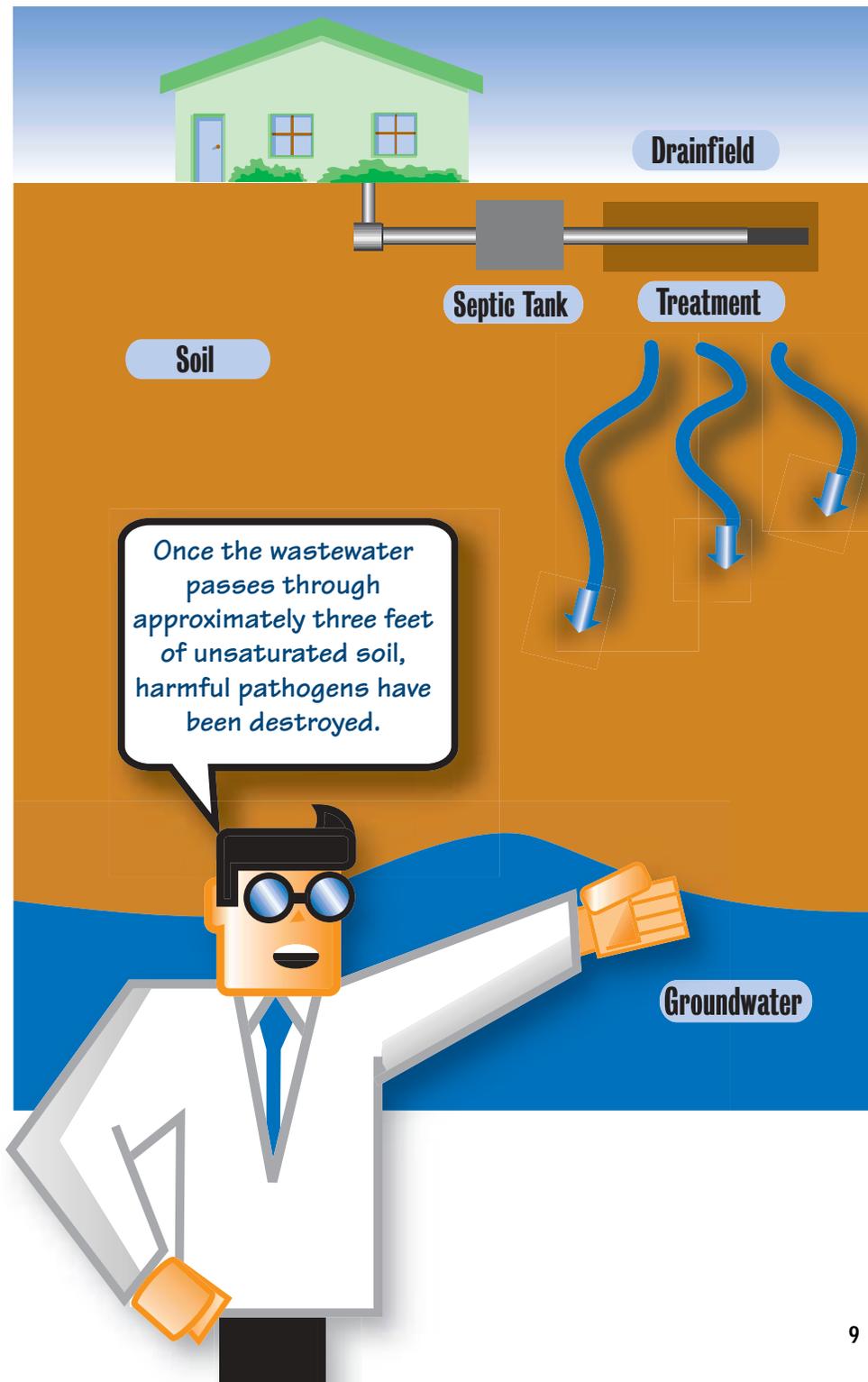
BEING SENSITIVE TO THE NEEDS OF YOUR DRAINFIELD

The final treatment of wastewater occurs in the soil beneath the drainfield. The beneficial bacteria in the soil need air to live and to ensure adequate treatment of the effluent. Therefore, the soil must remain uncompacted, unsaturated and undisturbed.

The biomat is a thin layer of fine solids, dead bacteria and soil bacteria that forms where the sewage meets the soil. This biomat layer regulates how fast liquid passes out of the trench or mound into the soil. Once the wastewater is through the biomat layer and passes through approximately three feet of unsaturated soil, harmful pathogens have been destroyed.

In order to keep this system working naturally and properly, follow a few key tips:

- **Avoid overloading** — The soil treatment system can become clogged by overloading with water and solids. The same things that keep your septic tank running properly will also do the same for your drainfield. (see page 6)
- **Maintain your septic tank** — Adding “dirty” water to the soil treatment system forces the biomat to become thicker than desired. This thickened layer slows the soil’s ability to accept water, requiring more soil area than would normally be necessary. (see page 5)
- **Don’t compact the soil** — Driving heavy vehicles on the drainfield can cause damage. Soil treatment depends on the soil being undisturbed.
- **Direct drainage away from the drainfield** — Runoff from the roof, driveway and other impermeable surfaces should be directed away from the drainfield. In doing so, you will prevent accumulating water in the drainfield.



LANDSCAPING THE DRAINFIELD

It's also important to ensure the proper planting over a drainfield. Plants help with oxygen exchange and evaporation in the drainfield area. Covering the drainfield with plastics, bark, gravel or patio blocks won't give your septic system the same benefits as planting.

Although grass is often recommended in other parts of the country, here in the desert native and drought tolerant plants with shallow root systems are a better choice. Native grass seed blends and native wildflower seed mixes that are well suited for planting over the drainfield are available through local growers. You'll find many small perennials, groundcovers and shallow-rooted succulents are also available that will enhance the landscape and provide the various benefits of plantings. Large trees and shrubs with invasive or deep roots can damage or break pipes. Consider the mature size of trees and shrubs when planting and locate them outside the drainfield.



The following list of plants offers a variety of suggested plantings for drainfield landscaping. Don't over-water plants and please make sure plantings are consistent with any zoning restrictions and Codes, Covenants & Restrictions. Plants bearing fruit and/or vegetable gardens must not be placed over the drainfield.

Bunch Grasses

- Blue Grama
(*Bouteloua gracilis*)
- Sideoats Grama*
(*Bouteloua curtipendula*)
- Mexican Thread Grass
(*Stipa tenuissima*)

Groundcovers

- Katie Ruellia
(*Ruellia brittoniana* 'Katie')
- Red Spike Ice Plant
(*Cephalophyllum* 'Red Spike')
- Trailing Gazania
(*Gazania rigens*)



- Tufted Evening Primrose
(*Oenothera caespitosa*)

Perennials

- Angelita Daisy
(*Hymenoxys acaulis*)
- Blackfoot Daisy*
(*Melampodium leucanthum*)
- Firecracker Penstemon
(*Penstemon eatonii*)
- Parry's Penstemon*
(*Penstemon parryi*)
- Paper Flower*
(*psilostrophe cooperi*)
- Desert zinnia
(*Zinnia acerosa*)
- Prairie zinnia
(*Zinnia grandiflora*)

Succulents/Accents

- Squid Agave
(*Agave bracteosa*)
- Queen Victoria Agave
(*Agave victoriae-reginae*)
- Blue Elf Aloe
(Aloe 'Blue Elf')
- Dawe's Aloe
(Aloe dawei)
- Partridge Breast Aloe
(Aloe variegata)
- Desert Milkweed
(*Asclepias subulata*)
- Yellow Bulbine
(*Bulbine frutescens*)
- Spruce Cones
(*Tephrocactus articulatus*)

* *plants approved for use in areas zoned under Scottsdale's Environmentally Sensitive Lands Ordinance (ESLO)*



KEEP AN EYE OUT FOR POTENTIAL PROBLEMS

How do you know if your septic system is failing? Consider the following. . .

- Toilets backing up into the house.
- Slow drains.
- Sewage or effluent seeping into the house. The water will have a noticeable odor.
- Effluent ponding on the ground surface in the area of the drainfield. A sewage odor and overly lush vegetation may accompany effluent. Grass should not be unusually green over the septic field.
- Water from your well or your neighbor's well has a foul odor.
- Well water analysis indicates contamination.

Safety, Safety, Safety. . .

Operating a septic system is not without risk. Be aware of potential problems and always exercise these safety precautions.

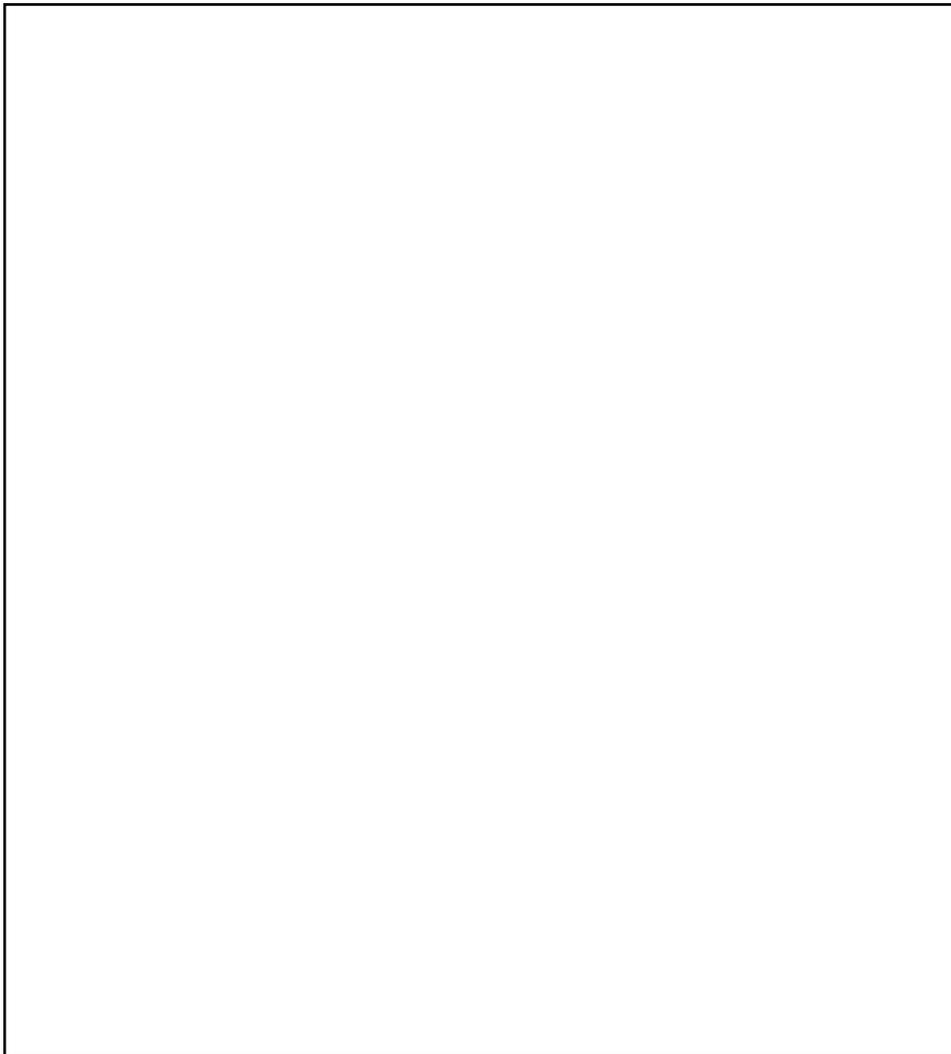
- Never enter the septic tank. The tank has a manhole for cleaning and inspection from the outside only. The tank contains very little oxygen and has high levels of hydrogen sulfide, methane, carbon dioxide and other life-threatening gases.
- Never use electrical lights, appliances or tools in or close to the

water or wet ground near the septic tank or drainfield. This can result in explosion or electrical shock.

- Always remember that the liquid and solid contents of the septic system are capable of causing infectious disease. After working on any part of the septic system, always wash hands thoroughly with soap and warm water. Change clothes before coming into contact with food or other people.
- Keep vehicles and other heavy equipment away from the septic system. The tank and other components may collapse due to weakness from corrosion.
- Never smoke near septic tank openings. Potentially combustible gases such as methane may be present.
- Keep children and other spectators away from the septic system when it is being cleaned or excavated.
- If there is a smell of sewer gas in your home, immediately call a plumber or other qualified person to identify the source and correct it. If the gas smell is very strong, evacuate until the problem is corrected and the gases are removed. Above all, do not smoke. Be sure to shut off the stove and any appliances that could cause a spark and ignite the gas.

Septic System Location

Using the box below to represent the property, sketch the location and dimensions of your septic system. Show the location of the house, septic tank and drainfield.



Annual Maintenance Review

Records of the maintenance performed on the system should be kept together with the permit, location map and other pertinent documents. These records must be passed on to subsequent homeowners if the property changes ownership.

If the house is sold, the septic tank may need to be pumped at the time of the sale. For additional information on transfer of ownership, visit: www.adeq.state.az.us/environ/water/permits/wastewater or call the Arizona Department of Environmental Quality at (602) 771-2300.

Source Water Protection

Source water is untreated water from streams, rivers, lakes or underground aquifers which is used to supply private wells and public drinking water. Preventing contamination of drinking water supplies is an important mission of the Environmental Protection Agency (EPA) and the Arizona Department of Environmental Quality (ADEQ).

ADEQ's Source Water Protection Program is designed to protect drinking water sources from becoming contaminated. The program provides a mechanism through which ADEQ and local communities throughout Arizona can protect both surface and groundwater drinking water sources. Using information that is now available about source water and drinking water, citizens can learn about the challenges of protecting drinking water quality and also take an active role in protecting drinking water.

To learn more about source water protection, visit:

EPA: www.epa.gov/safewater/protect.html

ADEQ: www.azdeq.gov/environ/water/dw/swap.html

If you have questions about source water protection and are curious as to whether your septic system is within a designated source water protection area, contact your local water supplier.



This brochure was produced by the City of Scottsdale, in conjunction with the Arizona Department of Environmental Quality (ADEQ) and the U.S. Environmental Protection Agency (EPA). Funding was provided by an EPA grant to support its efforts to protect watersheds and sources of drinking water.

We hope you have found this handbook useful and wish you the best of luck in successfully maintaining your septic system and becoming a first-rate Water Treatment Manager!

SEPTIC TANK MAINTENANCE RECORDS

MAINTENANCE

COMPANY

DATE

Scum/Sludge Measurements _____



Maintenance Receipts



Water Quality | Water Resources

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Scottsdale, AZ 85255
480-312-8732

www.ScottsdaleAZ.gov/water

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