



# **SHARON'S GUIDE TO SEPTIC SYSTEMS**

Department of Public Works

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# WHAT IS WASTEWATER AND HOW DOES IT AFFECT ME?

**Wastewater** is water that has been used in the home, in a business, or as part of an industrial process.

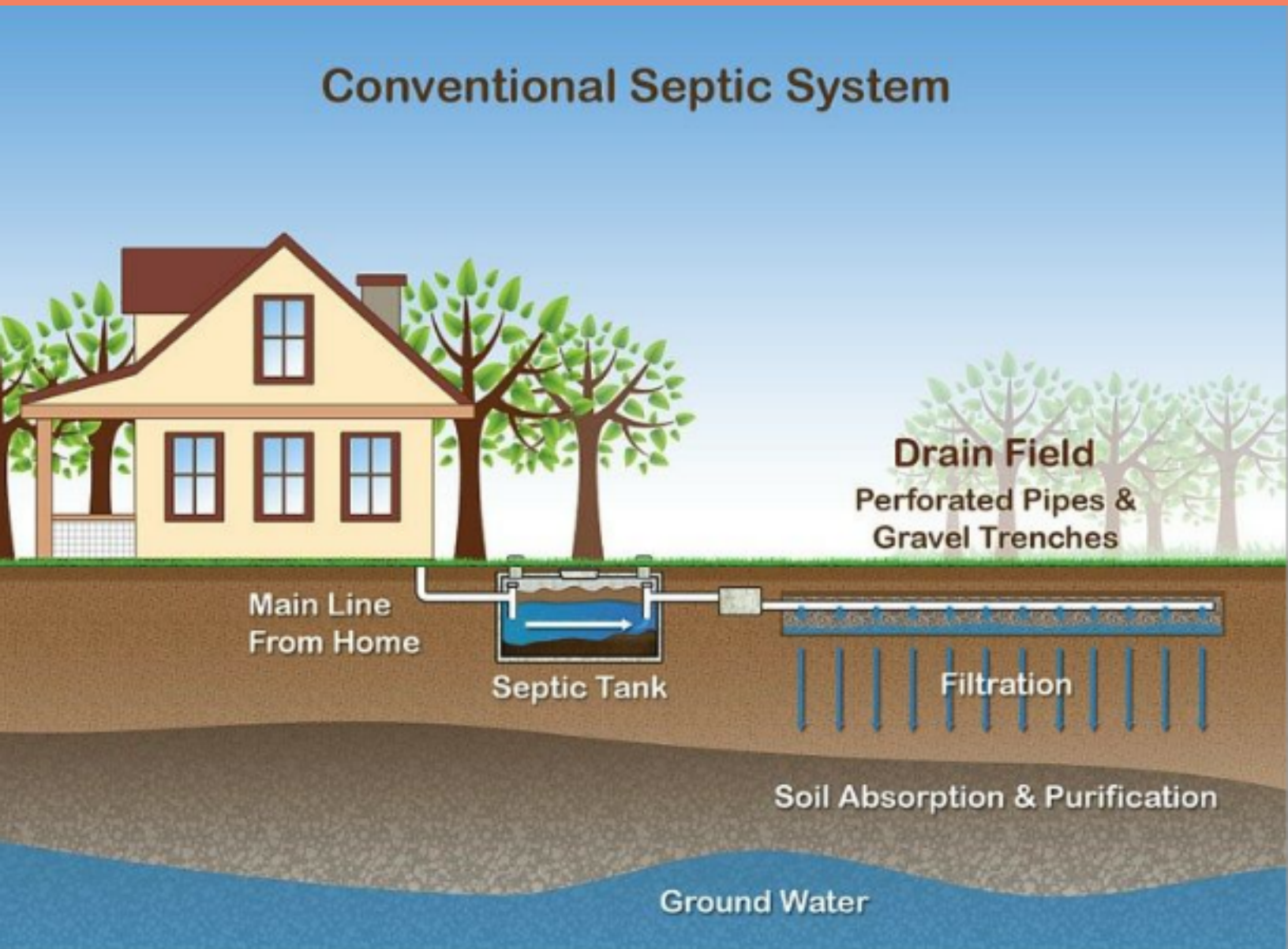
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**Homes and businesses** in Sharon are **entirely dependent** on on-site wastewater processing involving standard **septic** designs or innovative/alternative systems.

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This guide is meant to help you understand how wastewater treatment works, and how it impacts our community.

# WHAT IS A SEPTIC SYSTEM AND HOW DOES IT WORK?



According to the [EPA](#): "Septic systems are underground wastewater treatment structures [...] They use a combination of nature and proven technology to treat wastewater from household plumbing produced by bathrooms, kitchen drains, and laundry."

The EPA goes on to explain, "A typical septic system consists of a **septic tank** and a drainfield, or **soil absorption field**.

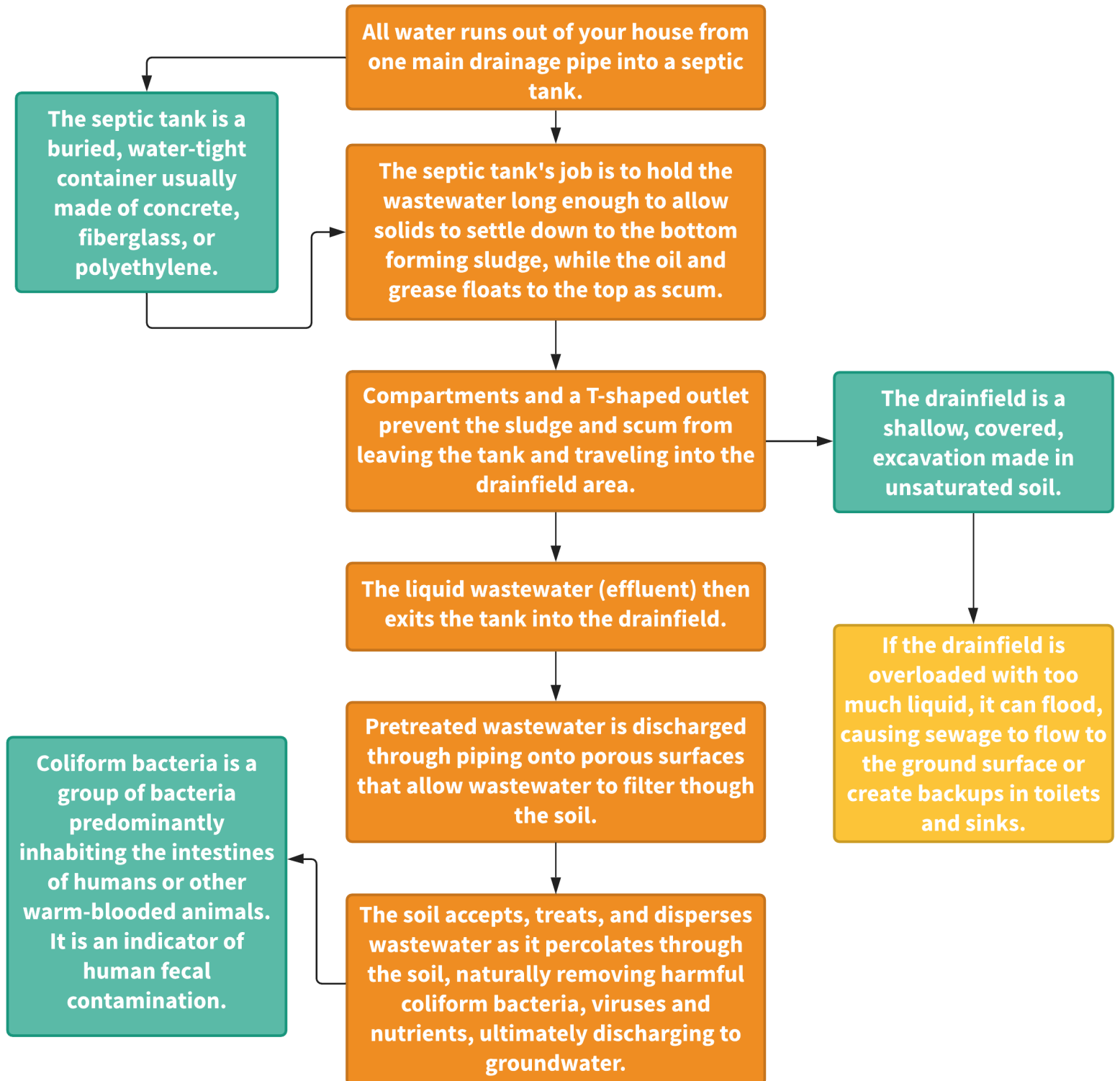
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The septic tank **digests organic matter** and **separates floatable matter** (e.g., oils and grease) **and solids** from the wastewater. Soil-based systems **discharge the liquid** (known as effluent) from the septic tank into a series of **perforated pipes** buried in a leach field, chambers, or other special units designed to **slowly release the effluent into the soil.**"

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**Alternative systems** use non-traditional methods of treating effluent. A common alternative method uses **pumps or gravity** to help septic tank effluent trickle through sand, organic matter (e.g., peat and sawdust), constructed wetlands, or other media to **remove or neutralize pollutants** like disease-causing pathogens, nitrogen, phosphorus, and other contaminants. Some alternative systems are designed to evaporate wastewater or disinfect it before it is discharged to the soil.

# HOW IS WATER PROCESSED IN A SEPTIC TANK?



# ALTERNATIVE SEPTIC SYSTEMS

Secondary Treatment Units (STUs) are treatment structures that add additional treatment to your on-site subsurface septic system. They are known as Innovative and Alternative (I/A) technologies. This treatment lowers Nitrogen and other harmful byproducts of your septic systems to protect our environment. In most cases, a traditional septic system will provide adequate treatment; however, this treatment may not be enough in Nitrogen sensitive and protected areas in town. STUs generally fall into four main categories.

Disclaimer – Some systems may employ some combinations of the below treatments, and no one Secondary Treatment Unit (STU) is the same. As I/A technology continues to develop, new and exciting forms of treatment may emerge. It is recommended you consult with your Civil Engineer to determine which type of system works best for your site.

To see MassDEP'S list of approved I/A systems, [click here.](#)



# Examples of how Alternative or Innovative (AI) Systems Work:

An **aerobic treatment system** incorporates oxygen into the treatment tank with an air pump, which pulls air from the atmosphere into the septic tank. This additional oxygen helps clean the effluent by stimulating natural bacterial activity. According to the EPA, aerobic treatment systems apply the same technology as large-scale sewage plants but on a smaller scale. This is a good alternative septic system for small lots, lots with suboptimal soil conditions, or lots near bodies of water that are sensitive to pollution ([source](#)).

## Aerobic Treatment Unit

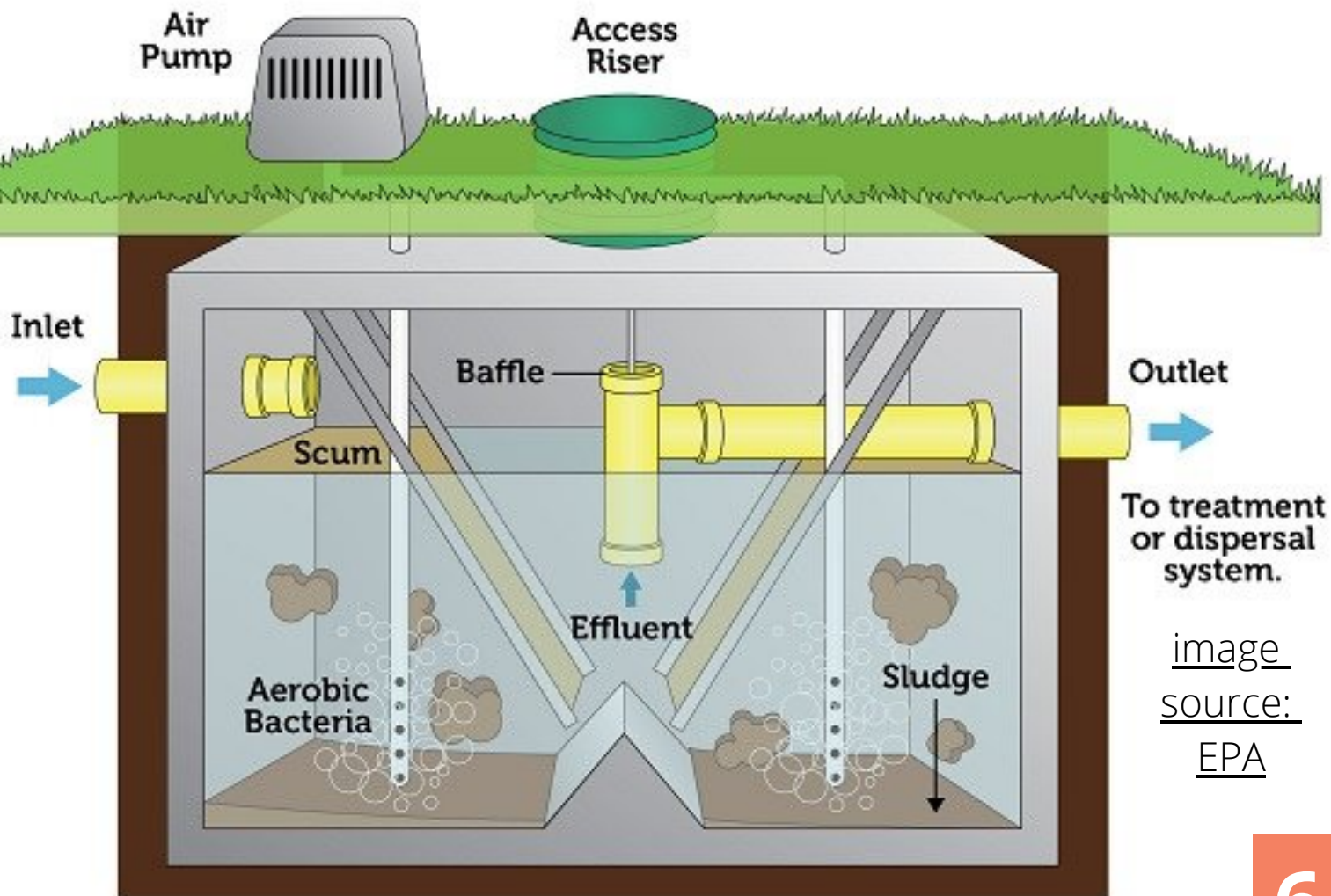


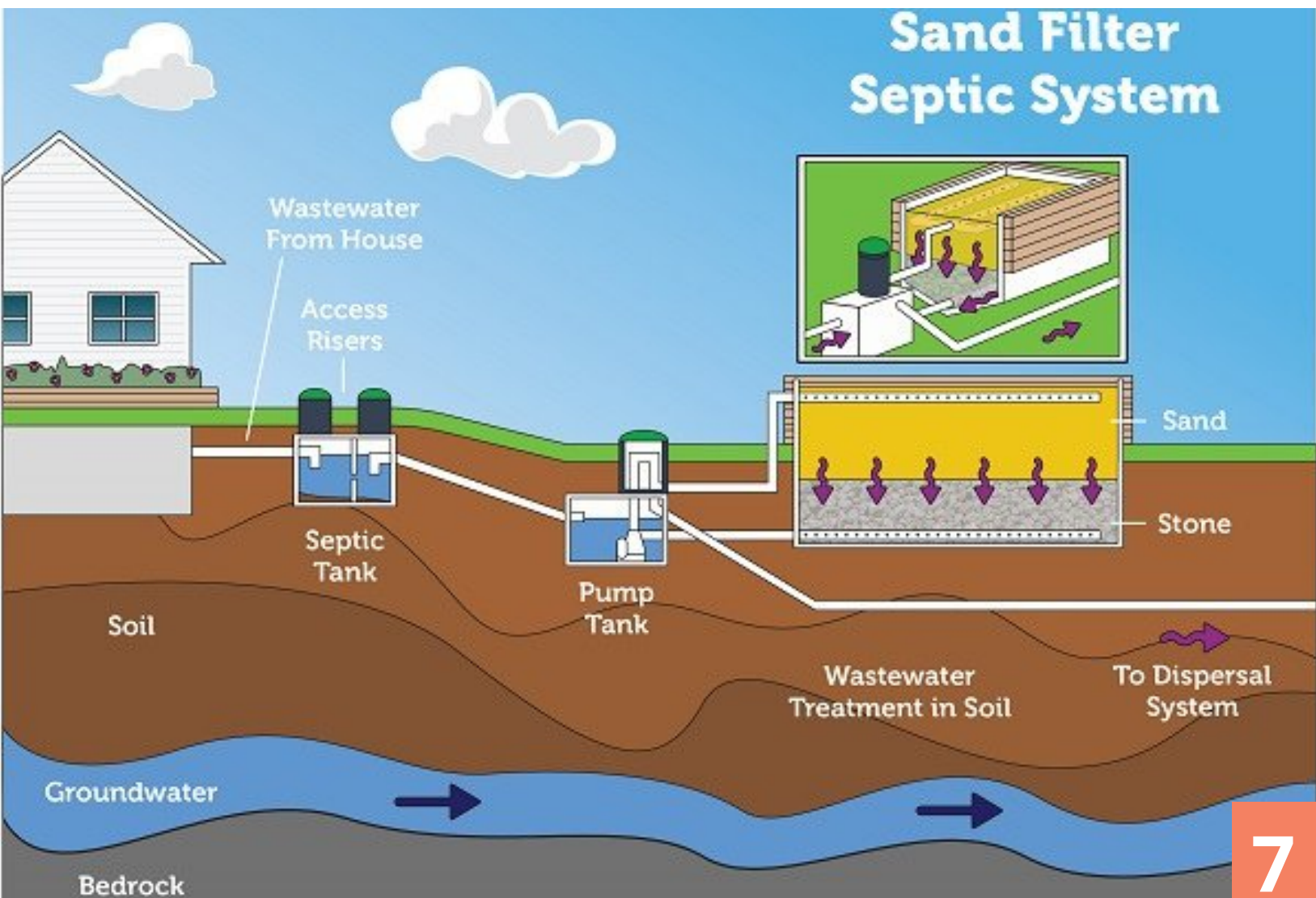
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Please note: The Aerobic Treatment Unit can vary in components and design



**Sand filter septic systems** use sand to purify and remove toxins from wastewater. The sand filter system also incorporates oxygen into its system to filter out pathogens. This purification takes place in a sealed chamber that can be built above or below the ground. This is one example of an alternative septic system without a leach field, which makes it compatible with environmentally sensitive areas. In some cases, the treated water can pass directly from the sand filtration system to the soil without needing to flow through more piping to a leach field ([source](#)).

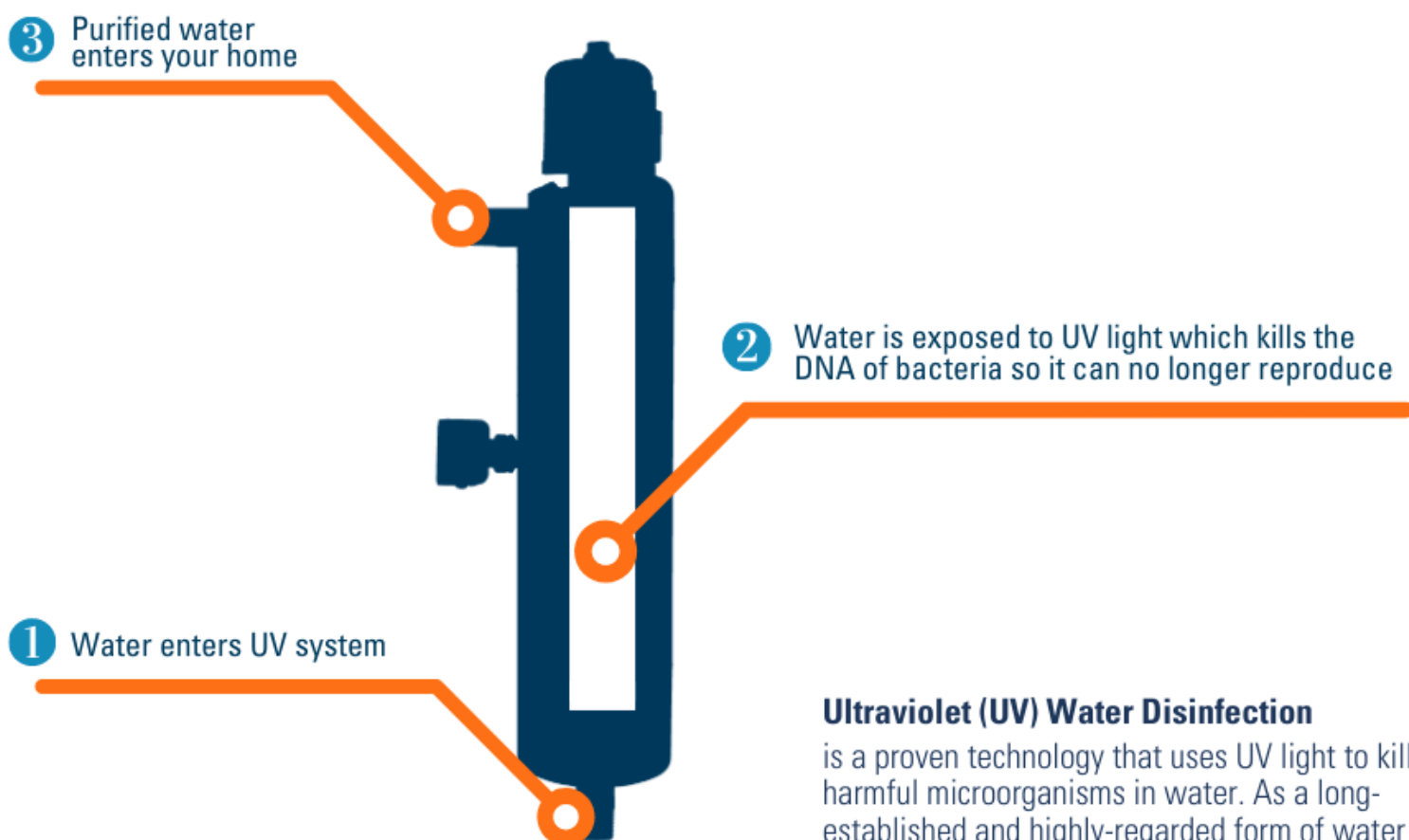
image source: EPA



A **chemical/UV treatment** system employs disinfection and chemical reactions to treat septic effluent. The UV light destroys the genetic material of microorganisms which prevents them from reproducing. These systems generally require pretreatment to be practical, and power to operate.

# HOW DOES UV WORK?

## The UV WATER PURIFICATION PROCESS



### Ultraviolet (UV) Water Disinfection

is a proven technology that uses UV light to kill harmful microorganisms in water. As a long-established and highly-regarded form of water treatment, UV systems are used around the world in millions of businesses and homes.

**Media Treatment systems** utilize pro bacterial growth media to promote treatment within the clarifying unit. The septic effluent and suspended solids treatment takes place by microbes which form as a biomat on the surface of the filter media. Effluent passing through the media filter comes into contact with the biomass where the biomat's microorganisms further process and sanitize the liquid effluent by removing pathogens, nitrogen, and viruses.

These systems enhance natural processing and clarification of effluent, but you may need to replace the media during the lifetime of the treatment unit ([source](#)).





# HOW LONG DOES A SEPTIC TANK LAST?

The lifespan of a septic system varies widely — from 15 to 40 years. The four main materials a tank can be built of are steel, fiberglass, plastic, and concrete.

- **Steel** tanks usually last up to 15 years.
- **Fiberglass** tanks last anywhere between 20 to 30 years.
- **Plastic** tanks last anywhere between 30 to 40 years.
- **Concrete** tanks last 40 years or more.

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Additionally, the quality of your **drain field** is very important. The lifespan of this component varies dramatically depending on many factors, including the size of the drain field, the percolation rate of the soil and how frequently it is used. A large, well-maintained drain field in good soil could last for over 50 years, whereas a drain field with poorly installed piping may not even last a full day.

The most effective way to increase the lifespan of your septic tank is to have it regularly serviced.

# SEPTIC MAINTENANCE

The septic tank **MUST be periodically pumped** to remove floating scum and sludge that accumulated. If either floating scum or sludge is allowed to enter the soil treatment system (drainfield) it will **cause expensive and often irreparable damage.**

Regular **maintenance** fees vary between **\$250 to \$500** every two years, and regular maintenance is necessary to avoid **repairing** or **replacing a malfunctioning system**, which can cost between **\$3,000 and \$7,000** for a repair, or **up to \$22,000** for a replacement of a conventional system. Alternative systems can cost even more. The frequency of pumping required for each system depends on how many people live in the home and the size of the system. See the next pages for exact guidelines.

Groundwater contaminated by poorly or untreated household wastewater poses dangers to drinking water and to the environment. **Malfunctioning septic systems release bacteria, viruses, and chemicals toxic to local waterways.** When these pollutants are released into the ground, they eventually **enter streams, rivers, lakes, and more, harming local ecosystems by killing native plants, fish, and shellfish.**

In **new home installations**, the tank should be **pumped after 6-12 months** of use as a **precautionary measure** to ensure good bacterial activity and proper functioning. In new homes, wastewater from painting, varnishing, staining, and other construction functions can reduce the initial levels of bacterial activity causing damage to the soil treatment system. If finishing work is still being completed, the tank should be pumped before it is used for sewage.

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**A typical household** shall have a **cleaning frequency of 18-30 months**. No tank should go more than 36 months without pumping.

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If you have to pump the tank very frequently (less than every 12 months), the system may need to be upgraded and/ or use habits changed.



# SEPTIC ADDITIVES

When looking at costs, septic system additives may seem like a bargain compared to pumping a septic tank. However, **some products can damage septic systems**, interfere with treatment of wastewater, and contaminate groundwater. Septic tank additives fall into **three categories: inorganic compounds, organic solvents, and biological additives.**

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Companies market **inorganic additives**, generally strong acids or alkalis, for their ability to open clogged drains. These contain similar ingredients to popular drain cleaners. These products can **destroy the biological function of your septic tank, sterilizing it for days, allowing raw sewage to flow directly into your drainfield, potentially clogging pipes and soil pores.** These types of products can also **corrode concrete tanks and distribution boxes**, causing them to leak and potentially **break apart**. Research found hydrogen peroxide degrades soil structure in a drainfield, reducing its ability to treat and absorb wastewater effluent.

**Organic solvent additives** contain concentrated amounts of chemicals used for degreasing machine parts due to their effectiveness at breaking down oils and grease. Unfortunately, these products also **kill bacteria and other beneficial microbes in your tank and may contaminate groundwater**. Some states ban these products and their use may trigger liability issues if groundwater becomes contaminated.

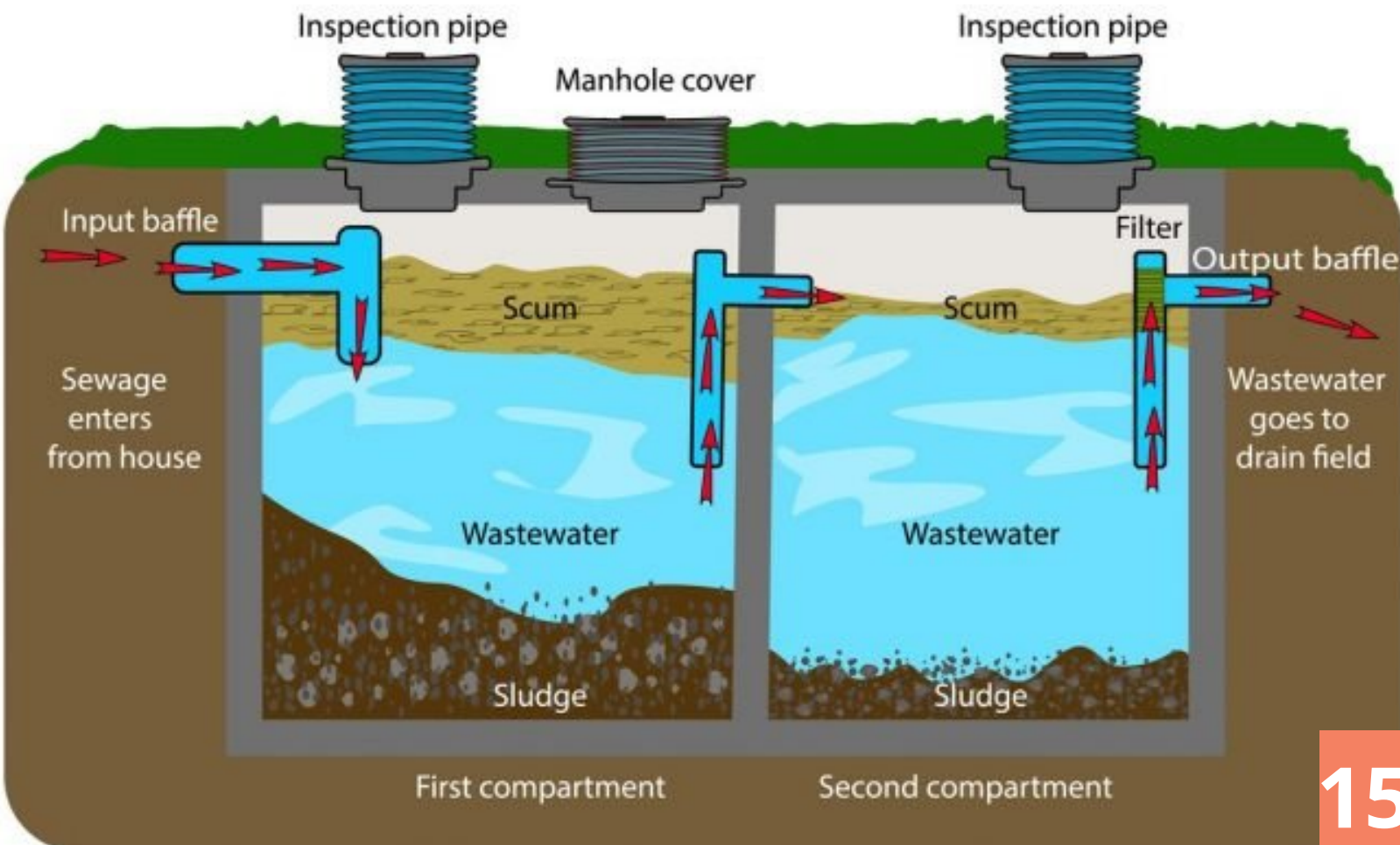
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**Biological additives** combine enzymes and bacteria to supposedly enhance the existing biota in septic tanks to provide a start for new systems or to augment stressed systems. For new systems, many people believe you must add bacteria. **While septic systems require bacteria to work, no special bacteria need to be added.** The simple act of using the system promotes the growth of bacteria needed to make the system work. The amount of bacteria or enzyme in an additive dose remains small compared to the bacteria already in a tank and therefore provides **little, if any, benefit in wastewater breakdown**. In addition, if many of the bacteria in your tank died due to introduction of a harmful substance, **introduced bacteria will likely die as well.**

**What additives can you use?** Title 5 (310 CMR 15.000) allows the use of septic system additives under certain conditions: see 310 CMR 15.027. The manufacturer must show that an additive will not harm the system or the environment when properly used.

The Department's decision to allow the use of an additive is not an endorsement or approval of the product. If a product is not on this list, MassDEP has not approved it for use.

[Click here to see the allowed additives in MA.](#)





## How can I keep my septic in good condition without using additives?

- **Use less water!** Repair leaks and install new, water efficient toilets, faucets, and showerheads whenever possible. Run the washer and dishwasher only with full loads. This saves money on water and energy bills as well as prolonging the life of the septic system.
- **Keep toxic chemicals from going down the drain.** Properly dispose of solvents, paint, varnish, oil, and pesticides at the local garbage transfer station
- **Keep solids out.** Cigarettes, left over medications, feminine hygiene products, paper towels, tissues, kitty litter, and other solid items should go into the trash, not your septic system. Left over medications could kill bacteria in your tank.
- **Keep grease and fat out** of your kitchen drain.
- **Space clothes washing throughout the week.** This avoids overloading the system over a short time period.
- **Divert runoff and drainage water.** Never drain swimming pools or hot tubs onto your septic system or drainfield. Downspouts and roof runoff should be directed away from your drainfield to limit water input to the system.

No additive compensates for poor design, regular maintenance and inspection, and pumping every three to five years. Additives claiming to eliminate the need for pumping usually re-suspend solids, moving them to the drainfield, thus clogging lines and leading to system failure.

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Even well-designed septic systems need to be replaced eventually, anywhere between 20 and 30 years depending on use.

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**Safe additives will likely be ineffective, while an effective additive will likely be unsafe to use.** Money spent on additives would better be spent pumping your septic tank every three to five years. Research and experience demonstrate regular inspection and maintenance of properly designed and installed septic systems prevent failure and extend system life.

# TYPICAL RANGES OF WATER USED

**TYPICAL RANGES OF WATER USED (IN GALLONS)**

<b>ACTION</b>	<b>TYPICAL USE</b>	<b>CONSERVATIVE USE</b>	<b>ULTRA-CONSERVATIVE USE</b>
<b>Toilet flushing</b>	6 (old standard)	1.5-3 (low-flow)	Composting toilet
<b>Tub bath</b>	30 (1/2 filled)	15 (1/4 filled)	Sponge bath
<b>Shower</b>			
10 min	50 (5 gal/min)	2.5 (2.5 gal/min)	3 (camper style)
30 min	150 (5 gal/min)	7.5 (2.5 gal/min)	
<b>Laundry - full load</b>			
Top loading	50-60 (older models)	40 (newer models)	Laundromat
Front loading	33 (older models)	17-28 (newer models)	
(suds-saver reuses most of the 'wash fill' for the 2nd load)			
<b>Dishwashing</b>			
Machine	12-15 (old-reg cycle)	6-9 (new-reg cycle)	
(prerinsing before loading adds 3-5 gal.)			
Hand	16 (faucet rinse)	6 (basin rinse)	
<b>Teeth-brushing</b>	2 (faucet running)	1/8 (wet brush, brief rinse)	
<b>Hand-washing</b>	2 (faucet running)	1 (basin; brief rinse)	
<b>Shaving</b>	3-5 (faucet running)	1 (basin; brief-rinse)	





# WHEN ARE SYSTEM INSPECTIONS REQUIRED?

## When are system inspections required?

- **Within 2 years before a sale.** If weather conditions prevent inspection at the time of a sale, the inspection must take place within 6 months afterward.
- When there is a proposed change to the facility which requires a **building or occupancy permit**.
- Any **change in the footprint of a building**, to make sure that new building construction will not take place on top of any system components or on the system's reserve area.
- For **large systems** with a design flow of 10,000 to 15,000 gallons per day or more at full build-out, on the basin schedule shown in 310 CMR 15.301(6), and **every five years** thereafter.
- **Every 3 years for shared systems.**
- When the **property is divided**, or **ownership** of 2 or more properties is **combined**.
- When **MassDEP** or the local **Board of Health** orders an inspection.

# WHEN DO I NOT NEED AN INSPECTION?

- Transfers between certain family members: Title 5 does not require a system inspection if the transfer is of residential real property, and is between the following relationships:
  - a. Between current spouses;
  - b. Between parents and their children;
  - c. Between full siblings; and
  - d. Where the property is held in a trust. See the "[Guidance on Exemptions from Title 5 System Inspections](#)".
- Refinancing a mortgage or similar financial instrument;
- Taking of a security interest in a property, e.g., issuance of a mortgage;
- Appointment of, or a change in, a guardian, conservator, or trustee;
- Any other change in ownership or the form of ownership where NO NEW parties are introduced (e.g., for estate planning or in a divorce);
- The property owner or buyer has signed an enforceable agreement with the Board of Health to upgrade the system or to connect the facility to a sanitary sewer or a shared system within 2 years following the transfer of title, provided that such agreement has been disclosed and is binding on subsequent owners;
- The property is subject to a comprehensive local plan of septic system inspection approved in writing by MassDEP and administered by a local or regional government; and the system has been inspected at the most recent time the plan requires.

[source: MassGov](#)

# OTHER FAQs- SEPTIC TANKS

## How do I find my septic system?

Once you have determined that you have a septic system, you can find it by:

- Looking on your home's "as built" drawing. [Click here to search for your property files.](#)
- Checking your yard for lids and manhole covers.
- Contacting a septic system service provider to help you locate it.

## What are the symptoms of septic failure?

A foul odor is not always the first sign of a malfunctioning septic system. Call a septic professional if you notice any of the following:

- Wastewater backing up into household drains.
- Bright green, spongy grass on the drainfield, especially during dry weather.
- Pooling water or muddy soil around your septic system or in your basement.
- A strong odor around the septic tank and drainfield.