

## Septic Tanks – Definition & Types

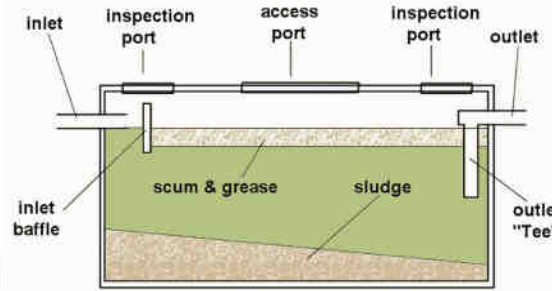
# Definition of Septic Tanks/Sewage Treatment Plant

- Definition

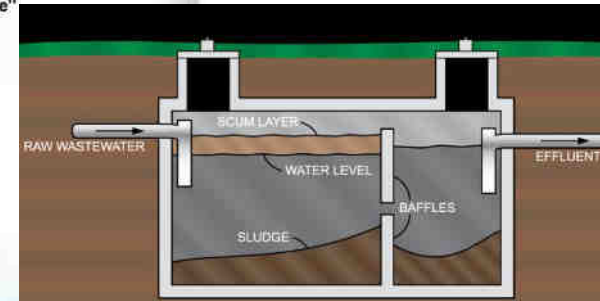
A septic tank is a key component of the septic system, a small-scale sewage treatment system common in areas with no connection to main sewage pipes provided by local governments or private corporations. Other components, typically mandated and/or restricted by local governments, optionally include pumps, alarms, sand filters, and clarified liquid effluent disposal means such as a septic drain field, ponds, natural stone fiber filter plants or peat moss beds. The effluent generated by the tank is filtered through the tank and the filter beds into the existing soil and will eventually reach the groundwater level.

The septic container has five functions. It:

- receives the wastewater from the house
- separates the solids from the liquids
- stores the solids
- decomposes the solids
- sends the effluent wastewater out to the drain field.



Single Chamber Tank



Two Chamber Tank

Septic Tanks may be installed (subject to consent) in applications where:

- Soil is of suitable porosity.
- Installation complies with Building Regulations (Approved Document H).
- The installation will not contaminate any ditch, stream or other watercourse.

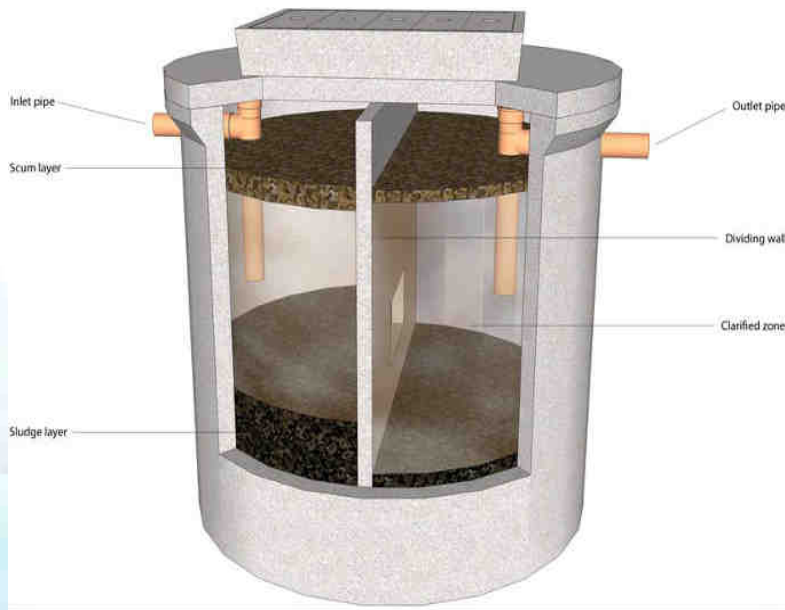
If the above criteria is not meant then a Sewage Treatment Plant (STP) will be required. A STP should be considered even when the criteria is meant due to the Water Act and environmental concerns over groundwater.

# Types of Septic Tank Systems

- **Gravity**
- Pressure Distribution
- Sand Filter
- Peat Moss System
- Mound System

## Gravity

This system works using gravity, the drainage field must be below the level of the septic tank. Also, the bottom of the trenches must be 1-1.2m above the water table. This soil above the water table is used to treat the wastewater before it returns to the environment. The septic tank can be constructed from concrete or reinforced plastic.



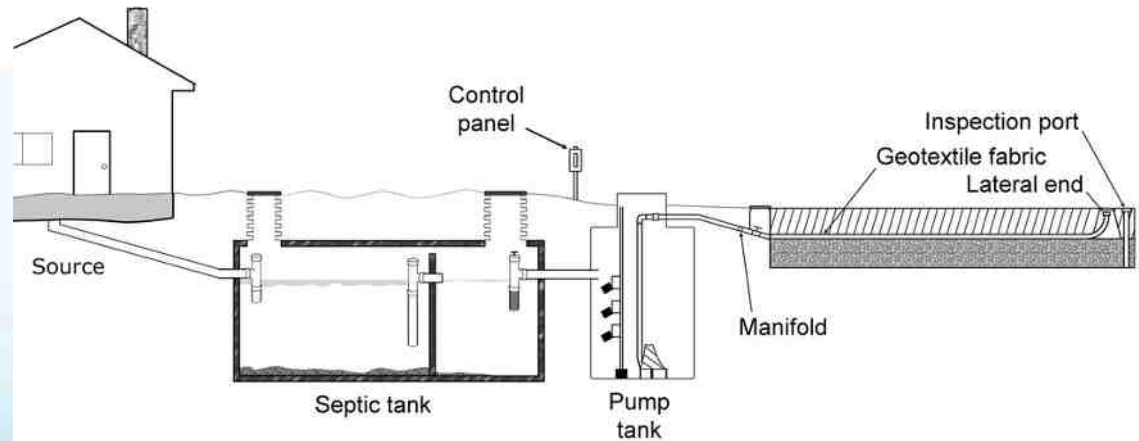


## Types of Septic Tank Systems

- Gravity
- **Pressure Distribution**
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## Pressure Distribution

This system has a pump that distributes wastewater evenly throughout the drainage field. The pump tank holds wastewater until a certain point before it releases it into the drainage field. Pressure distribution systems are normally used when there is not enough soil depth to accommodate gravity-based systems.

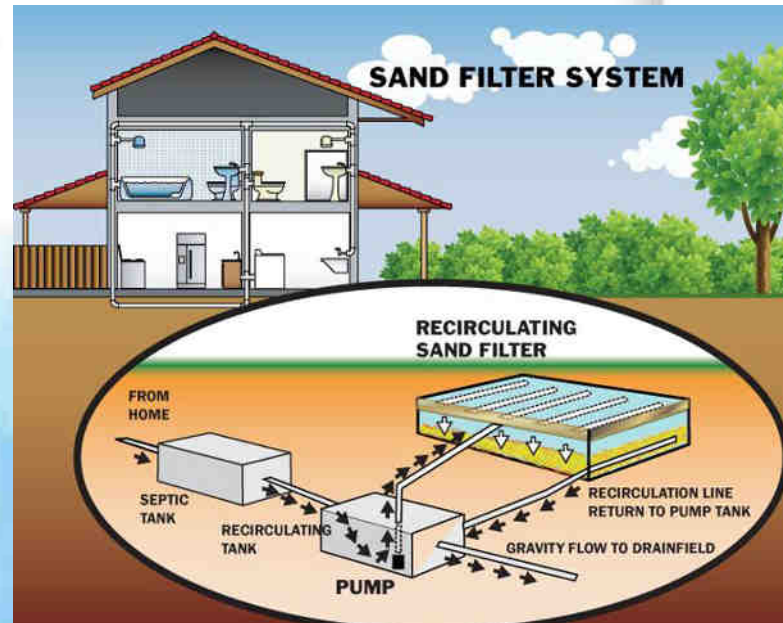


## Types of Septic Tank Systems

- Gravity
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## Sand Filter

Sand filter systems are also one of the most common types of septic systems. This system uses sand between the pump tank and the drainage field. The sand is used to treat the wastewater before it enters the field. These types of septic systems are used when there is very shallow soil. Treating the wastewater with sand makes up for the lack of soil that would normally be used to treat the waste.

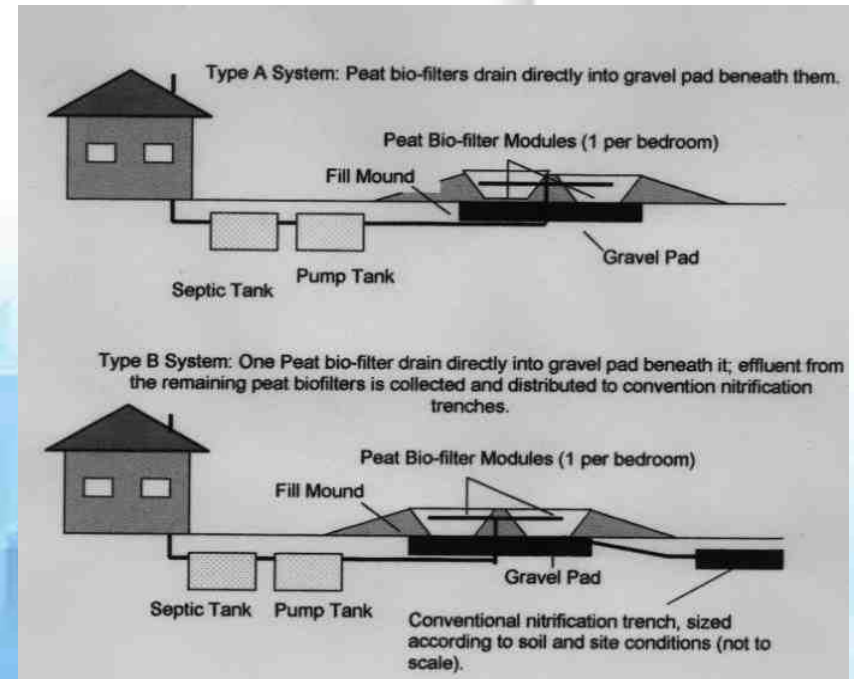


## Types of Septic Tank Systems

- Gravity
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- **Peat Moss System**
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## Peat Moss System

This system uses peat moss between the pump tank and the drainage field. The peat is used to treat the wastewater before it enters the field. These types of septic systems are used when there is very shallow soil or high water table.





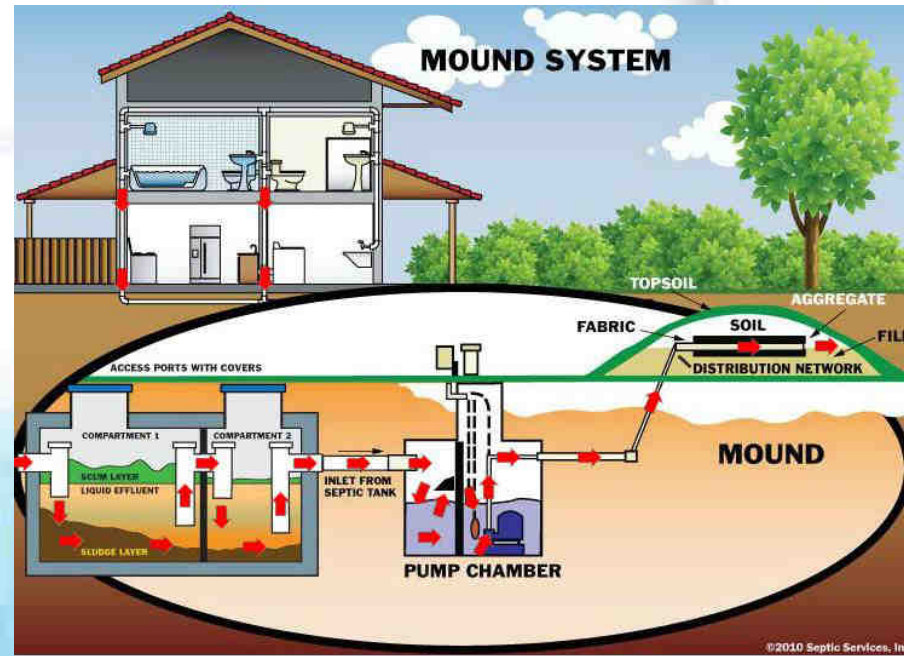
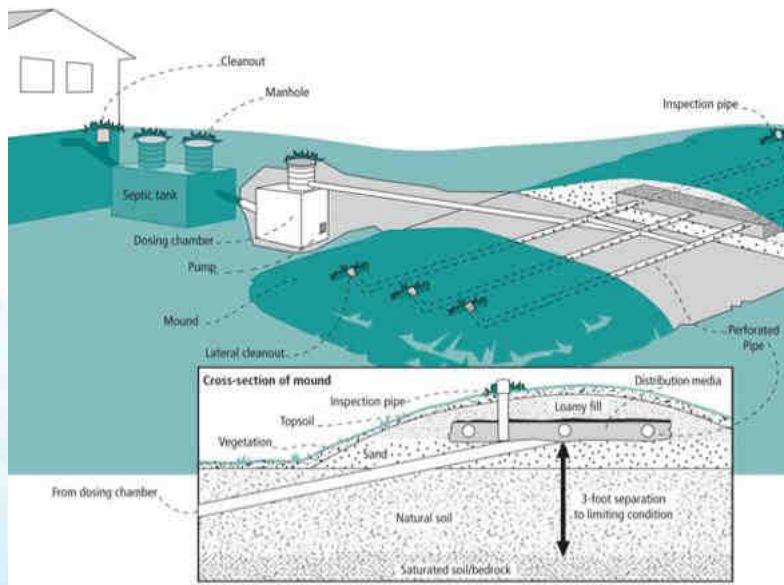
# Types of Septic Tank Systems

- Gravity Distribution
- Sand Filter
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- **Mound System**

## Mound

One of the next types of septic systems is the mound design. This system is also used when the soil isn't deep enough for a traditional system. These types of septic systems have a sand-filled mound raised over the natural soil above a drainage field. The wastewater is treated as it travels through the sand and into the natural soil.

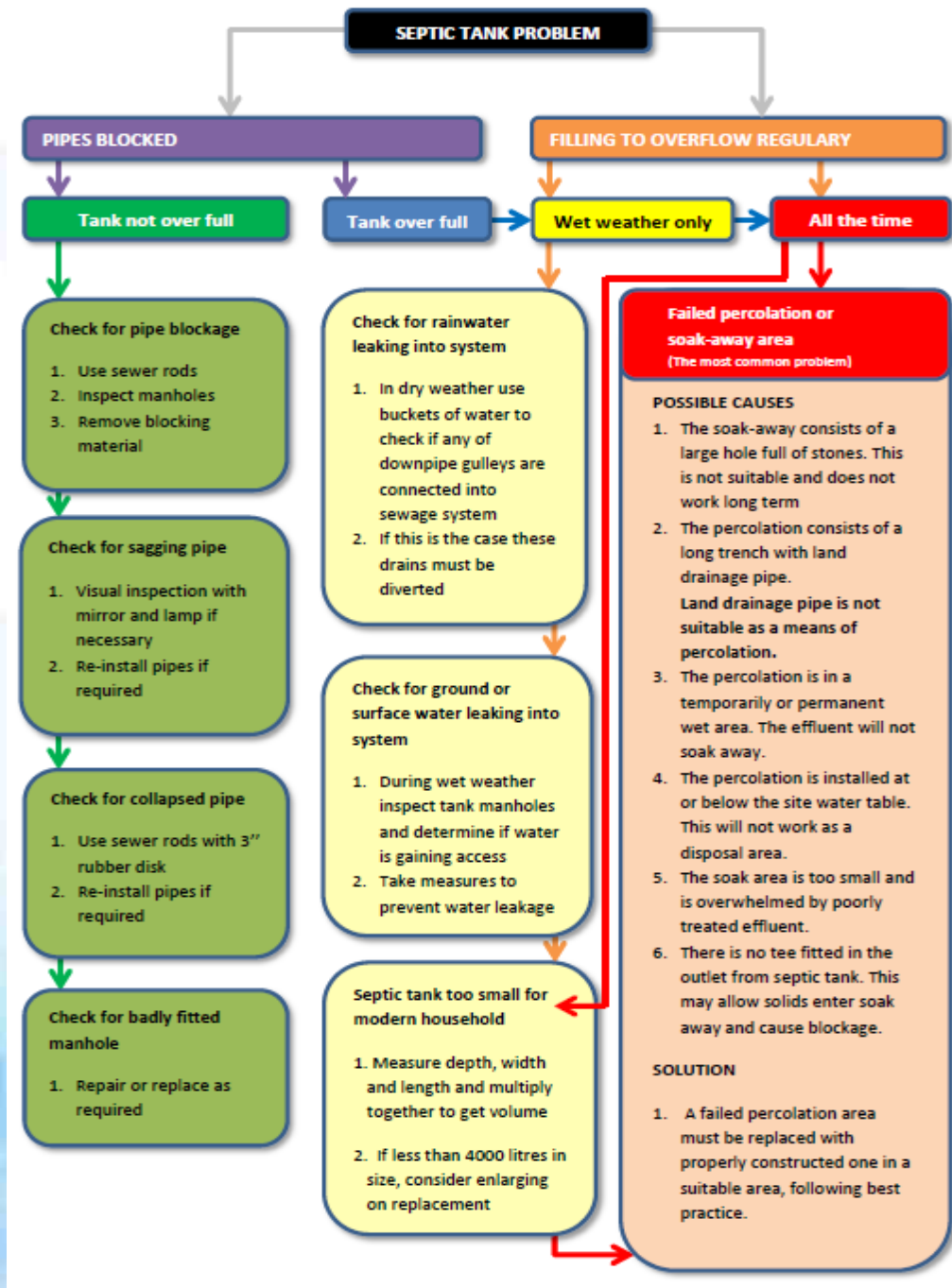
**Mound Distribution System**



# Septic Tank Problems and Causes

## Signs of a failed septic tank & soakaway:

1. Septic Tank Maintenance  
All septic tanks require emptying ONCE A YEAR.
2. Depth of the septic tank soakaway  
All septic tank soakaways must be constructed in the AEROBIC soil layer. This is soil which has oxygen in the air spaces between the particles and only occurs within the top metre of the soil.
3. Nature of the soil and its effect on the soakaway performance
4. Winter water table and its effect on the septic tank soakaway
5. Deterioration of the septic tank
6. Binding in the soil
7. Another house joining the septic tank system
8. Heavy Rain and its effect on the septic tank system
9. More people using the septic tank system than the tank was designed for.





# Septic Tank Problems and Causes

## Signs of a failed septic tank & soakaway:



Failure of Filter Bed/Media



Lack of Maintenance by owner



High Water Table



Collapse of Septic Tank due to lack of maintenance



# Alternatives to Septic Tank Systems

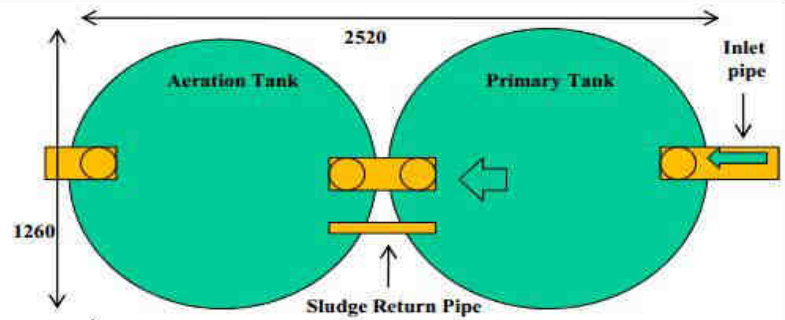
## Sewage Treatment Plants

This system is equipped with a watertight tank that has an aeration chamber. Waste is broken down by bacteria in the aeration chamber. These systems are capable of producing cleaner wastewater, so they are commonly used in sensitive environments and will become more common when septic tanks are being replaced near watercourses. An example is shown beneath



Bioflow Watercare, 8 Goatstown Ave., Dundrum, Dublin 14 Tel. 01 2964047 Fax 01 2982193 www.bioflowtanks.com

Bioflow Watercare 6pe Sewage Treatment System is design for a daily inflow of 1,440 litres of domestic sewage with the effluent quality better then 20mg per litre of BOD and 30mg per litre of SS. The system comprises of 1 x 1,800L & 1 x 1,500L rotationally moulded plastic tanks which have a working volume in excess of 3,080 litres. The system is designed to meet the requirements of the Irish EPA and BS6297.



Housing for air compressor and electrical connections

Pedestrian Manhole Covers



The sewage enters the primary tank then mainly liquid goes to the aeration tank for aeration treatment. The heavier material that settles at the bottom of the aeration tank will get pump back to the primary tank by means of a sludge return pipe. The treated effluent flows by gravity to the percolation area. If it is not possible to have gravity flow to the percolation area a discharge pump with float switch can be added.

Drawing is not to scale and the measurements are in millimetres. Bioflow Watercare can build the system to suit your site. Please let us know your inlet pipe size and the measurement from it base to the finished ground level.



## Water Services Amendments Act 2012

### • Maintenance

- Owners of domestic waste water treatment systems need to:
- Know where their septic tank is located
- Operate and maintain the system so it is fit for purpose and fully operational
- Ensure that the system cannot pollute the environment by discharging or leaking waste anywhere it is not supposed to, that is, into the ground or any water source
- Ensure that roof water or surface water run-off cannot enter a domestic waste water treatment system
- De-sludge the system at intervals appropriate to the tank capacity and the number of people resident in the premises connected to it, or as recommended by the system's manufacturer. De-sludging should be carried out by an authorised contractor.

### Inspections

- Local authorities will arrange for inspections to be carried out. The inspectors will be appointed and approved by the EPA. They will have to carry identification and show it to householders on request.
- If the inspector finds that your system is working properly and being maintained correctly, you need take no extra action. Otherwise you will get an advisory notice from the local authority, requiring you to improve the maintenance of your system or to upgrade or remediate it. Any remediation work required will be based on factors such as the nature of the problem, the extent of risk to public health or the environment, existing site size and the hydrological and geological conditions present.

### Grants for remedial work

- If you need to carry out this type of work, you may be able to get a [grant to help with the cost of the work required](#). The grant is means-tested. In order to be eligible for a grant, **you must have registered by 1 February 2013.**

### Standards

- If you have a septic tank or similar domestic waste water treatment system, you already have a duty of care (under the [Water Services Act 2007](#)) to ensure that your treatment system does not cause a risk to human health or the environment or create a nuisance through odours. The 2012 Act adds to the existing duty of care provisions.
- The EPA's 2009 [Code of Practice on waste water treatment systems for single houses](#) sets out the most up-to-date standards. However, these will not be applied to older systems. The 2012 Regulations define performance standards, including maintenance and de-sludging requirements.





# Costs of Septic Tank Systems

The costs of a Septic Tank and its percolation unit will vary due to ground conditions and local authority regulations. All work should have the CE and NSAI standards. Costs for a standard system would average €6,500.

The costs for a Sewage Treatment Plant and associated equipment would average €10,000. This Plant requires less maintenance and de-sludging.

Due to the Water Services Act in 2012 we expect to see more claims for Septic Tank issues once home owners realise that maintenance of the system is their responsibility.



# CASE STUDIES



