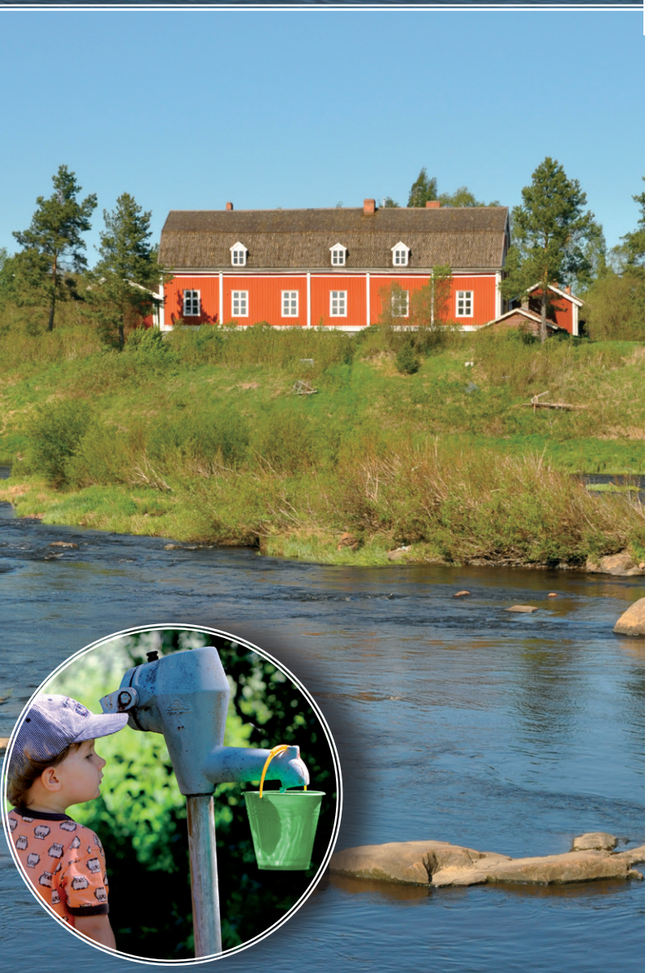
A GUIDE TO WASTEWATER



In Finland regions outside of the sewage networks the property owner is accountable for the water management of the household. A well maintained wastewater treatment system reduces the risk of contamination of wells, ground water and surface water and improves the state of the nearby environment. The simplest way to meet the treatment requirements is with a separated black and grey water management.

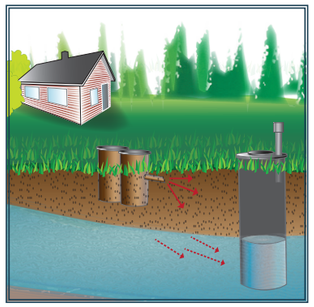
The Federation of Water Protection Associations in Finland

Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
VillageWaters

Environmental impacts of wastewater

Everything that goes into the sewer in a household will end up in the wastewater. However, if the wastewater ends up in the environment it causes a risk of contamination. Areas close to the surface and groundwaters are particularly sensitive to the wastewater load. In addition, properties relying on their own well for drinking water risk its contamination.

Significant in the risk management is not only the level of treatment but also the location of the sewage system and the well on the property. We consume a great variety of products from the chemical industry, out of which many are harmful to the environment and health. Removal of these compounds by the sewage systems is poor. The most efficient way to limit the chemical load to the environment is by reducing the use of unnecessary chemicals and by appropriate disposal of unused products.



Invest in the comfort of your own environment and raise the property value by treating your wastewaters appropriately!

Wastewater components	Negative impact
Nutrients	Eutrophication and oxygen consumption
Organic matter	Oxygen consumption
Enteric bacteria	Hygienic effects
Chemicals	Possibility of unpredictable impacts

Documents regarding the wastewater system required on property:

- System description
- Maintenance instructions
- Operational log book

How to proceed?

1. Find out if there is a possibility to join a centralized sewage network.
2. Find out if it would be possible to create a shared system with a neighbor.
3. Hire a wastewater planner and get required permits from the municipality.
4. Fix up the system and maintain it!

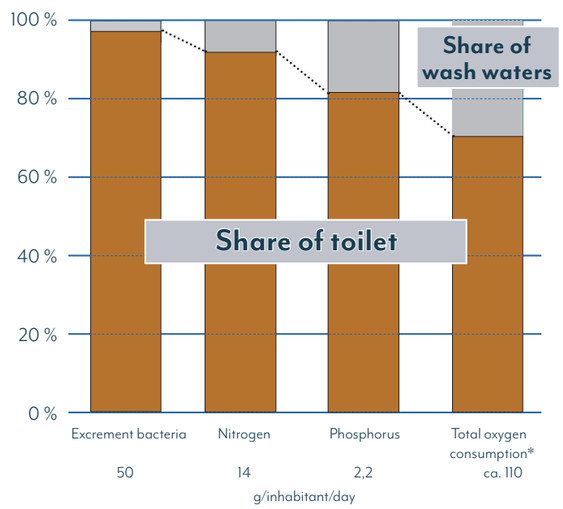
It pays off to separate the black and grey waters

Most of the nutrients and bacteria are found in the excrement and urine. Hence, there is only little oxygen consuming organic matter that requires treatment in the wash waters. By using a dry toilet it is possible to reuse the nutrients as a fertilizer in the same property after composting. Appropriate composting destroys the bacteria.

In a separating system it is also possible to use a water retaining seat and direct the wastewater either to a compost tank or a holding tank. Large composting tank may require emptying only after 10 years! Emptying of a holding tank will be reduced to one tenth in comparison to a traditional water closet.

With a double sewer all waste water treatment alternatives are available. By separating grey and black waters you will ensure the best treatment result.

Wastewater load of a household



*Total oxygen consumption includes organic matter, as well as the oxygen consumption effect of reduced nitrogen compounds, which is 4,57g O2 / lgNH4-N.

What does the legislation say?

According to the Finnish Environmental law, if the property is not part of a centralized sewage network and the activity does not require an environmental permit, sewage waters need to be directed and treated in such a way that they do not cause danger of contamination.

- The property owner ensures that the wastewater treatment system meets the treatment requirements.
- The treatment requirements concern three compounds causing euthrophication and the aim is to reduce environmental impacts (figure). Municipalities may have stricter regulations.
- If the treatment requirements are not met, the system needs to be refurbished
  - by 31.10.2019 in groundwater areas and within 100 m from surface waters.
  - in other areas when there are larger, permit requiring construction on going, a water system is established, or specific renovation or changes are made on the property.
  - immediately, if a new construction takes place.
- Treatment requirements do not concern:
  - Properties which have no water toilet and wash water use is low (e.g. cottages and saunas where water is carried): small amounts of wash water can be directed to the ground without treatment in a controlled manner.
  - Permanently inhabited properties owned by persons turning 68 by 9.3.2011 (so called age specific exemption)

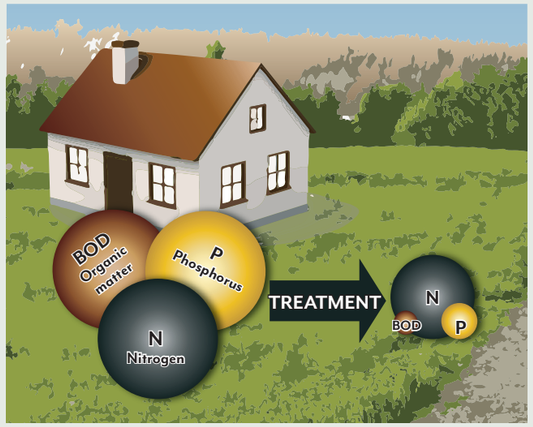


Figure: 80 % of organic, oxygen consuming matter, 70 % of phosphorus and 30 % of nitrogen are required to be removed from the wastewater.

A GUIDE TO WASTEWATER
WWW.VESIENSUOJELU.FI/JATEVESI

Graphic design: © Avite.fi/Katja Ranta
Front page photos: Vastavalo.fi
Graphics: © Suomen Vesiensuojeluyhdistysten Liitto ry

Printing house: Painotalo Seiska Oy, 2018

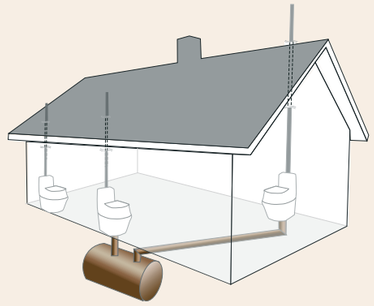
On-site wastewater treatment alternatives

Wastewater treatment systems which separate toilet and wash waters

Alternatives for separating systems

Dry toilet

- In a toilet functioning completely without water excrement is composted to soil. In this alternative appropriate post-composting has to be arranged.
- Filtered liquids or separated urine is collected to a closed tank or is directed to a specific post-treatment system. After aging, the nutrient-rich liquids can be used on the property for fertilizing or for refreshing a leaf compost.



Low water consumption toilet

- Only half a litre is used for flushing. Excrements are transferred to the tank normally by underpressure.
- The frequency of emptying the tank is reduced to one tenth in comparison to a normal water toilet, if excrements and urine are directed either to a large compost tank or are stored in a holding tank.

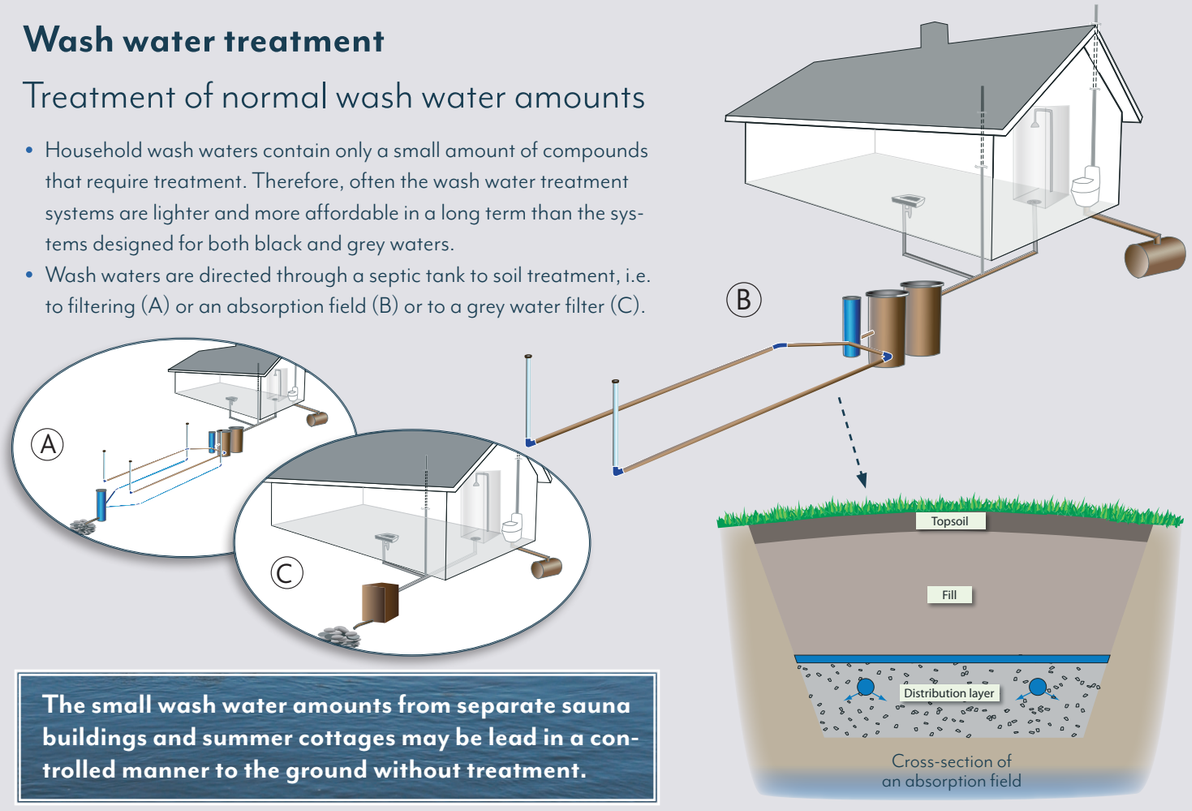
Traditional toilet

- A traditional toilet uses 5 litres of water for flushing.
- Waters are directed to a holding tank, which has to be emptied regularly and delivered to a wastewater treatment plant or other appropriate treatment.

Wash water treatment

Treatment of normal wash water amounts

- Household wash waters contain only a small amount of compounds that require treatment. Therefore, often the wash water treatment systems are lighter and more affordable in a long term than the systems designed for both black and grey waters.
- Wash waters are directed through a septic tank to soil treatment, i.e. to filtering (A) or an absorption field (B) or to a grey water filter (C).



Cross-section of an absorption field

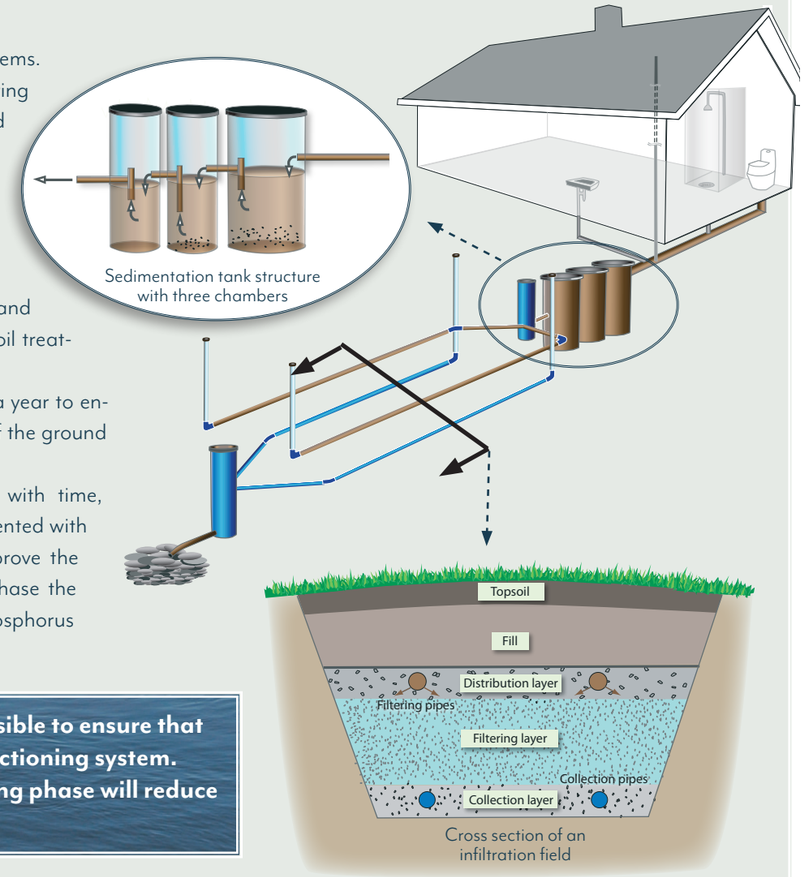
The small wash water amounts from separate sauna buildings and summer cottages may be lead in a controlled manner to the ground without treatment.

Black and grey water treatment in a single system

Treatment of all wastewaters

Soil treatment

- Soil treatment refers to soil infiltration systems.
- Wastewater gets purified while transferring through built or natural filtering layers and soil profile.
- To treat all wastewater in a soil treatment system requires primary treatment in a three compartment (or similar) septic tank.
- A septic tank prevents solid matter and grease from entering and clogging the soil treatment system.
- The septic tank requires emptying twice a year to ensure healthy and long-lived functioning of the ground treatment system.
- The phosphorus retention deteriorates with time, however the soil system can be complemented with filtering materials or additives that improve the phosphorus retention. In the planning phase the municipal regulations regarding the phosphorus retention rates need to be considered.

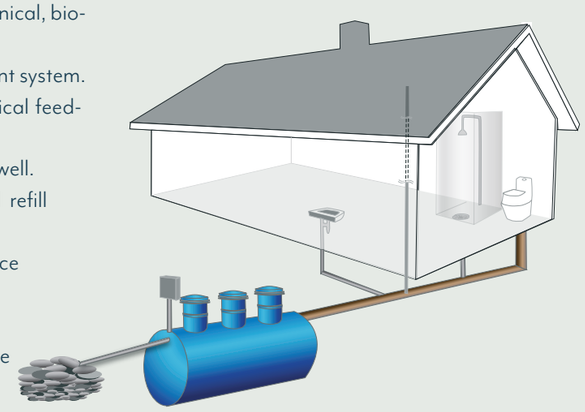


Cross section of an infiltration field

By professional planning it is possible to ensure that the property has a fitting and functioning system. The decisions made in the planning phase will reduce the overall expenses.

On-site treatment plant

- In a on-site waste water treatment plant the treatment is mechanical, biological or chemical.
- The unit requires less space and digging than a ground treatment system.
- The unit is sensitive to malfunction (electricity shortage, chemical feeding, incoming water quality and amount fluctuations).
- Requires daily monitoring and does not handle long downtime well.
- Requires careful and regular management, such as chemical refill and sludge removal several times a year.
- Technical parts, such as pumps, require professional maintenance at least once a year.
- Make a maintenance agreement if needed.
- The final effluent discharge point has to be planned carefuly due to the large volume of discharged water



A guide to wastewater: www.vesiensuojelu.fi/jatevesi