

# Wastewater treatment in Sweden 2018

## WHY DOES WASTEWATER NEED TO BE TREATED?

Wastewater is water that comes from households, industry or other activities. Other sources also include stormwater (consisting primarily of rain, meltwater, rinsing water etc). Wastewater from households contains organic matter (e.g. food waste skin residue etc.), nutrients such as nitrogen and phosphorus, and bacteria. When nutrients are transported to lakes, watercourses, and oceans they contribute to an abnormal growth of plants e.g. algae. This is what is called eutrophication. When these plants die, they sink to the bottom where they decompose. The decomposition of dead plants and other organic matter consumes oxygen. This leads to a deficiency of oxygen, referred to as hypoxia, at the bottom. Oxygen is necessary for animals and plants to survive.

Some algae that thrive in nutrient rich waters are so-called blue-green algae. These can be toxic to both humans and animals. Some bacteria that exist in wastewater can also be toxic to humans and animals if they end up in our waters.

To prevent harming aquatic plants and animals, and reduce the risk to people wastewater needs to be treated before it is released to our lakes, watercourses and oceans.

## TREATMENT METHODS

Methods for treating wastewater include mechanical, biological and chemical techniques. These techniques can be combined in different ways. Mechanical treatment is used to remove bigger things such as toilet paper and other things that do not dissolve in the water. Mechanical treatment

This information sheet is only an abbreviated version. You are able to read more detailed information in the Swedish EPA report "Wastewater treatment in Sweden 2018"

ISBN: 978-91-620-8867-5

<http://www.naturvardsverket.se/Om-Naturvardsverket/Publikationer/ISBN/8800/978-91-620-8867-5/>



Himmerfjärdsverket. Source: SYVAB



Source: Swedish EPA

## THE HISTORY OF SEWERAGE SYSTEMS IN SWEDEN

### 19th CENTURY

The big cities start building sewerage systems with pipelines. Water from kitchens and toilets are transported to lakes or coastal waters.

### 1940s

The environmental issues with polluted waters have grown. However, the problem is still only regarded as a municipal concern.

### 1960s

The issue of eutrophication attracts more attention. The Swedish EPA is formed in 1967.

### 1970s

Wastewater treatment is expanding. Primarily within large urban areas and some industrial sites.

### PRESENT

97 % of urban wastewater undergoes secondary treatment. However, many of the onsite wastewater treatment systems are still deemed inadequate.

often includes screens that remove larger items found in the water. During the biological treatment the water is oxygenated in large tanks. In this oxygenated environment microorganisms grow and use the nutrients and the organic matter as food, thus removing them. The microorganisms and other heavier material sinks to the bottom of the tank and forms sludge, which can be removed and treated separately. Chemical treatment aims at reducing substances such as phosphorus. Most commonly, chemical treatment involves adding a chemical that causes the phosphorus to precipitate (fall out of solution). The precipitated phosphorus can then form bigger flocs that also sink to the bottom and can then be removed and treated separately.

### SEWAGE AS A RESOURCE

Many of the substances that need to be removed from wastewater because they risk damaging the environment, can be used in other parts of society. For example, nutrients such as nitrogen and phosphorus can be used in agriculture. Both substances and energy can also be extracted from the organic components and used to replace fossil fuels and other materials used in industry. Even the treated wastewater can be utilised for irrigation and within certain industrial processes where drinking water quality is not necessary.

### WORK UPSTREAM

It is important to reduce the amount of unwanted substances entering our wastewater to ensure that wastewater and sludge can be used as resources.

Such substances can include residues from medicines, cleaning products, microplastics and metals from for example washing of sport attire and fleece. Microplastics can also enter wastewater through skin care and beauty products or from packaging and other debris that should be sorted elsewhere. Furthermore, stormwater transports substances such as heavy metals from traffic, microplastics from tyres, cigarette filters, sweet wrappers and many other things. The microplastics are efficiently removed from wastewater in treatment plants but will then accumulate in the sludge. There is a need for more advanced treatment that removes other pollutants from the wastewater. Presently there are several wastewater treatment plants that use, or plan to use, more advanced treatment methods.

However, the best way to avoid these pollutants collecting in wastewater is to decrease the amount of hazardous substances entering. You can help by only flushing urine, faeces and toilet paper down the toilet. You can also use environmentally friendly cleaning products. There are more things that private individuals can do to reduce the amount of pollutants that end up in the wastewater. If you search for wastewater on your municipality's website, you can learn more about what you can do. Municipalities, County Administrative Boards and the Swedish EPA work to inform companies and private individuals about what they should and can to reduce the amount of pollutants in our wastewater.



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