

## What makes Waterschoon sustainable?

The new sanitation system in the Noorderhoek district has a high environmental yield consisting of the following elements:

- Water conservation by households (25-50%)
- Removal of harmful substances (more than 90%) from the wastewater, such as nitrogen, phosphate and drug waste, before the water is discharged into the surface water
- Reduction of polluted by-product streams (sewage sludge)

- Generation of energy from wastewater, and therefore savings on space heating and with that a reduction of CO2 emission.
- Conversion of chemical elements such as nitrogen and phosphate into fertilizer
- Recycling energy, chemical elements and water; in short 'cradle to cradle'



### Advantages for residents

- Residents are no longer bothered by nasty kitchen smells, because the kitchen garbage disposal units render separate waste containers for fruit and vegetable waste redundant
- Residents use less water, thus saving on their water bill



# WaterSchoon Noorderhoek

The new wastewater treatment!



Contact person  
WaterSchoon  
Brendo Meulman  
T +31 515 428 680  
b.meulman@desah.nl  
www.waterschoon.nl



[www.waterschoon.nl](http://www.waterschoon.nl)

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## Innovative and sustainable wastewater treatment

Wetterskip Fryslân, Woningstichting de Wieren, STOWA, the municipality of Súdwest-Fryslân and DeSaH bv have jointly installed a sustainable and innovative wastewater treatment system in the Noorderhoek district in Sneek. The wastewater of 232 newly built houses is collected separately at source, and cleaned in a small sewage treatment plant located in the district. The “Waterschoon” project is the first in the world on this scale.

Both on a national and international level there is a growing awareness that we need to treat our environment in a more sustainable manner. The world population continues to grow, as does the demand for clean water, energy and raw materials. As a result the availability of natural resources is decreasing. In order to continue to meet the demand for these resources it will be necessary to use them in a more sustainable way. This can be achieved by ensuring that fewer resources are used, but also by recycling what is used as much as possible.

### Durability as a target

In the years to come Woningstichting de Wieren, DeSaH bv, Wetterskip Fryslân, the municipality of Súdwest-Fryslân and STOWA want to commit to a high degree to the concept of durability. The restructuring of the Noorderhoek district in Sneek offers the parties an excellent opportunity to apply innovative and sustainable technologies with the installation of a new sanitation system.



## Noorderhoek

The Noorderhoek 1 district in Sneek is being completely restructured. Over the course of a ten-year period 282 outdated houses will be demolished to make way for 232 new ones. All the houses will be connected to the Waterschoon system. This means that they will be equipped with vacuum toilets and kitchen garbage disposal units for fruit and vegetable waste. The houses' black- and greywater is collected separately and cleaned in a small, local sewage treatment plant. The treatment system is combined with a sustainable method of heat generation.

## How does Waterschoon work?

Each household daily produces various kinds of waste, such as greywater (dishwasher, washing machine, bath and shower), blackwater (toilet) and fruit and vegetable waste (organic waste). Traditionally, the sewer takes both the greywater and the blackwater to a sewage treatment plant, where the water is cleaned. The treated water then ends up in the surface water again. The organic waste is thrown into the green refuse container.

### Separation at source

The Waterschoon process is different. A vacuum system collects organic waste and blackwater together, while the greywater is separately drained away from the house right away. Both the blackwater and the greywater, also known as by-product streams, are cleaned separately from each another in a local sewage treatment plant (i.e. within the Noorderhoek district!), and then discharged into the rainwater drainage system.



### Energy from by-product streams

The sewage treatment plant is located in a utility building within the district. Besides treating wastewater, the facility produces energy in the form of biogas and recovers heat from the by-product streams. The energy that is released is used to heat the houses. This is combined with a TES installation (Thermal Energy Storage) and a heat pump that are both located in the energy building.

The local sewage treatment plant also converts the solid waste in the by-product streams into fertilizer and removes substances such as drug waste and hormone-disturbing substances from the by-product streams.

### Waterschoon in summary

The new Waterschoon system consists of the following elements:

- Complete treatment of the two by-product streams of blackwater and greywater
- Biogas production from blackwater
- Heat recovery from greywater
- Use of released energy to heat houses
- Production of a fertilizer replacement (struvite)
- Removal of drug waste and hormone-disturbing substances

## Biogas production

The blackwater of all 232 houses goes to a fermentation plant in the utility building. During the fermentation process biogas is released, which is partly used to heat the houses and the tap water in the district. In this way approximately 12% of the total gas demand in the district is produced!



## Energy and water saving

Running a vacuum sewage system requires energy. Because the wastewater from the district is treated in the adjacent utility building, it no longer needs to be transported to a central sewage treatment plant anymore. This saves pump horsepower at the sewage pump station! The use of vacuum toilets also ensures considerable savings on water consumption. Vacuum toilets only require 1 litre of water per flush, whereas an ordinary toilet easy uses between 7 and 8 litres per flush.

## Heat recovery

The greywater, which originates from washing machines, dishwashers, baths and showers, amongst others, is also cleaned in the utility building. The majority of this water is heated up and – even after transportation through the sewer – still has a high temperature. This heat is used to heat the houses in the district.

## Saving on space heating

Heat recovery from sewage water constitutes a 10% savings on space heating. On top of that, the production of biogas from sewage water ensures another 10% savings on space heating.

