

Investigation of reliability and efficiency of wastewater treatment plants TOPAS in Sweden

Sweden is a country, which is known for its positive access to the nature. Swedish people consider the nature rightly as one of their greatest treasure and they appreciate it appropriately. Forests are greatly pure and clear rivers flow through them, numerous lakes are also Swedish pride.



It is no wonder that there is placed big emphasis on protection of this treasure and it belongs to political priorities. Protection of water, both surface and underground, is of course part of it. As well as protection of Baltic Sea, which belongs to very dirty seas. Therefore representatives of the Baltic countries agreed on sea protection with that if conditions set in association HELCOM will not observed, the states will be subjected to unpleasant pressure on the part of neighbouring countries. According to this plan the countries are obliged to reduce quantity of phosphorus and nitrates

discharge. They are the matters, which partake in eutrophication principally and so overmultiplication of bacteria and anabaenas happens, which releases poisonous matters into water. Eutrophication is especially supported by waste waters, faeces, phosphorus fertilizers and other impurities coming in rivers and after in sea.

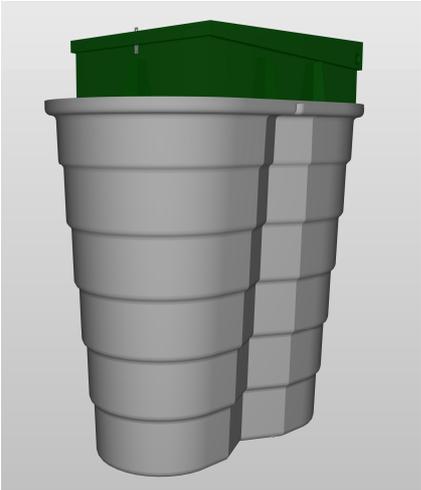
On the basis of these facts, Swedish government watches over observance of the strict limits, which are assessed for treated waste waters, and it concerned both municipal and house wastewater treatment plants. With regard to the total area of Sweden it is not possible to connect each object to sewerage. This situation naturally leads to decentralized solution and installation of small wastewater treatment plants. Especially in distant areas and on plentiful islands around the whole Sweden, there is not possible other solution practically.

Reliability and efficiency are so the main requirements for house wastewater treatment plants in Sweden.

On Swedish market there is sold a lot of plants, which all have variety of testimonials and European certificate CE. But these plants show little different results in operation than by declared values. These differences are caused by their construction and way of operation. It is obvious to the government, expert public and officials, who take care of the mentioned area.



On their impulse a research went ahead in Sweden recently. The purpose of this research was to watch random selected plants during their operation by an independent commission. The plants were visited without any advice note to avoid any adjustment of their operation and to show the actual state of their reliability. All the research was paid from government money and its independent was carefully supervised, because it was very important for the results.



Wastewater treatment plants TOPAS, which are imported into Sweden from the Czech Republic and their producer is TOPOLWATER, attained excellent results. These plants proved high efficiency and reliability thanks to their construction and thanks to the way of their operation by the local company TOPAS VATTEN. The permitted limit was not exceeded by any one of measured plants. The resultant values of the 7 measured plants are shown in the following tables.

The first table shows BOD₇ on outlet from the plant, which is the abbreviation for **biochemical oxygen demand** during 7 days. It indicates quantity of oxygen, which is necessary to complete oxidation of biodegradable substances contained in the tested water. According to this value the rate of water cleanness is expertized. In the Czech Republic BOD₅ is more used, which is the **biochemical oxygen demand** during 5 days. Ratio BOD₇:BOD₅ is 1,15. Daily production for one equivalent person is 60 g of BOD₇/day, which means the concentration of 400 mg/l in volume of 150 l/day of sewerage by one person. It is the concentration, which is normally counted with on inlet into the wastewater treatment plant. The accepted concentration on outlet is assessed then in water right permit.

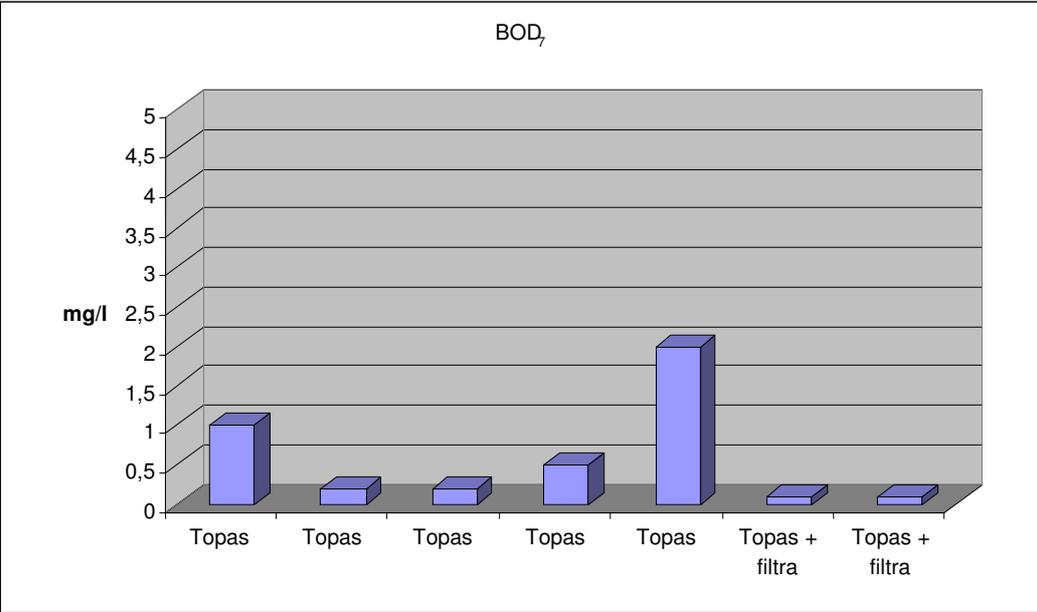


Table 1: Concentration of BOD₇ on outlet from plant

From the next table there is perceptible the concentration of phosphorus on outlet from the plant. As it was mentioned above, Sweden places big emphasis on this index, because it is one of the main elements causing water eutrophication. The plants for export to Sweden are equipped with a dosing pump and a doser for chemicals on phosphorus removing. Into the areas with stricter limits the plants are delivered with a phosphorus trap (which is marked as “filtra” in the table). Daily concentration moves about 15 mg/l on inlet in current house waste waters.

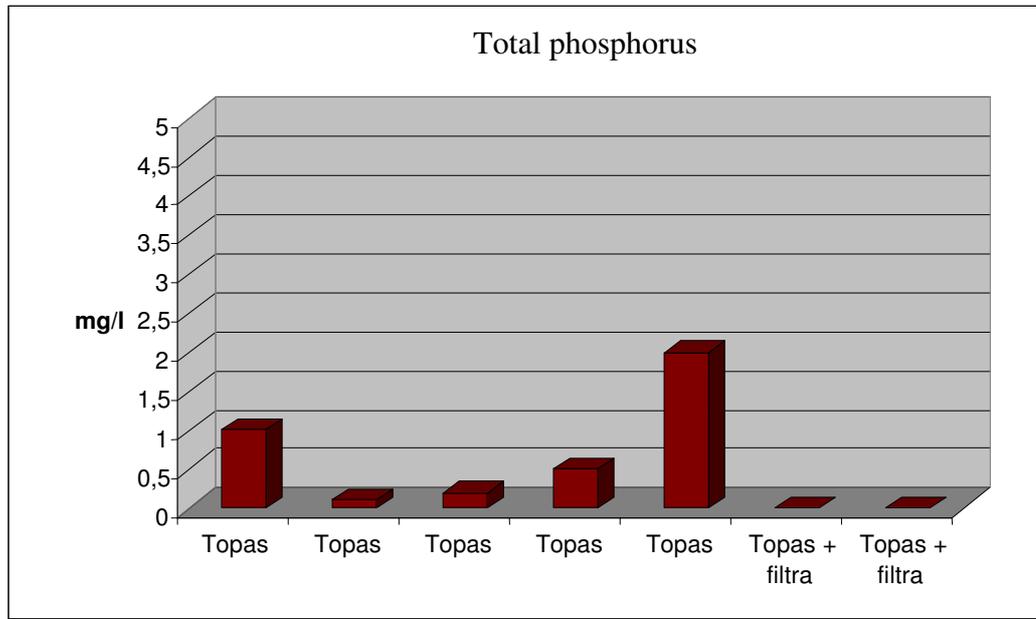


Table 2: Concentration of phosphorus on outlet from plant

Used literature and sources:

Materials of company Topas Vatten (<http://www.topasvatten.se/>) and company TopolWater (<http://www.topolwater.com/>)

Report from the conference Helcom Baltic Sea Action Plan, Poland, Krakow, 11/2007

Report from the independent research about efficiency of wastewater treatment plants in Sweden