

## CASE HISTORY

SEMICONDUCTOR  
SOLAR  
PHARMA  
POWER GENERATION  
FOOD & BEVERAGE  
PULP AND PAPER  
CHEMICAL  
OIL AND GAS  
MINING  
AEROSPACE AND TRANSPORT  
METAL FINISHING  
**MUNICIPAL**



An **aquarion** Group Company

# TOVEKO Filters

## Hedåker Municipality – Sweden



## Background

Hedåker is a village of approximately 500 inhabitants in central Sweden. The sole industry is a sawmill. In consequence, the flow from the village consisted of virtually raw sewage with no dilution water from other sources. This flowed to a nearby river and caused major pollution, resulting in the death of many fish.



Building housing the sewage treatment plant at Hedåker



Toveko CX filter as final treatment stage

## Plant design

The flow diagram below shows the general design of the plant. The sewage flows to a pump station located within the treatment plant that transfers it to a primary settlement tank. A flocculant chemical is added immediately prior to the settlement tank that is a simple, circular, open-topped stainless steel tank. Following primary settlement, the flow passes by gravity into the inlet shaft of the filter. The treated sewage overflows from the filter directly to the nearby stream.

For this installation a TOVEKO filter Model S-450 is used. The rejected water is continuously pumped back to the initial pump station. Settled sludge in the bottom of the sedimentation tank is pumped to a sludge lagoon. Following natural digestion, the sludge is eventually recycled on land by local farmers.

## Results from 24-average values of influents and effluents during 1992-1994

DATE	BOD <sub>7</sub> Influent to filter (mg/l)	BOD <sub>7</sub> discharge from filter (mg/l)	P <sub>TOT</sub> Influent to filter (mg/l)	P <sub>TOT</sub> discharge from filter (mg/l)
920331	61	8,4	3,3	0,05
920929	38	6,2	6,0	0,18
930406	88	7,9	4,3	0,05
930824	40	4,9	4,4	0,03
931005	103	7,4	7,7	0,05
940412	92	6,6	5,1	0,059
941004	41	7,1	3,1	0,07

Results from a random sampling taken on 05 Oct 93 are given below.

	Filter Inlet	Filter Discharge
BOD <sub>7</sub> mg/l	15	5,7
Total P mg/l	0,41	0,07
Total N mg/l	35	31
COD <sub>Cr</sub> mg/l	52	31
Ammoniacal nitrogen mg/l	34	31
Nitrate/nitrite-N mg/l	0,8	0,1
pH	6,7	6,6

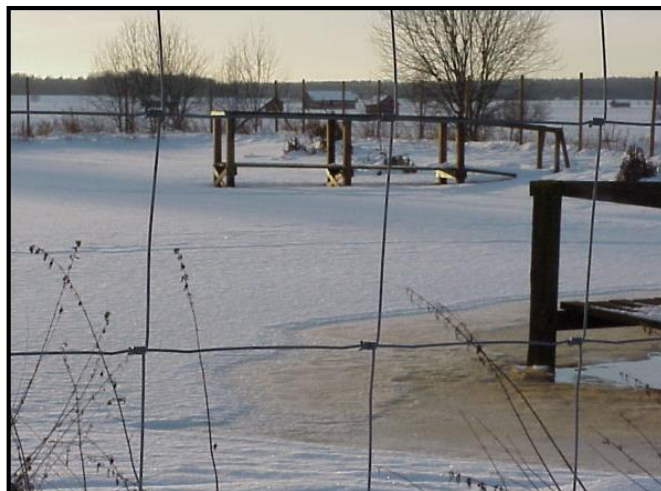
Filter discharge average results since 2001 are given below:

Parameter	2001	2002	2003	2004	2005	2006	2007
BOD <sub>7</sub> mg/l	4.07	6.32	6.84	8.33	8.10	11.34	9.16
Total P mg/l	0,07	0.23	0.12	0.25	0.19	0.31	0.37
Total N mg/l	13.33	19.77	18.17	20.96	18.08	24.91	23.29
COD <sub>Cr</sub> mg/l	34.12	32.75	33.63	37.96	33.08	41.29	37.54
TOC	6.67	10.74	8.21	8.98	10.93	11.27	12.75
Suspended solids	12.9	9.75	7.03	9.75	9.95	14.68	12.0
pH	6,87	7.15	7.24	7.31	7.16	7.20	7.28

The plant has now been operating successfully for more than 15 years and as the results show, it has given consistently good service over the period.

**Government standards for discharges from sewage treatment plants are;**

P	≤0,5 mg/l
BOD <sub>7</sub>	≤45,0 mg/l
SS	≤20,0 mg/l



**Sludge lagoon**



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