

Practice Report, Treatment Systems

Tailor-Made Solutions for Sewage Treatment in Tourist Areas

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In the Black Forest, the sewage from a village with 400 inhabitants is purified with one of the most modern SBR treatment plants using HST technology. The first HST treatment plant using membrane technology has been put into service in the Hochsauerland area.

St. Märgen in the Black Forest

The municipality of St. Märgen in its picturesque Black Forest setting is responsible for disposing of the sewage from around 1900 inhabitants as well as numerous tourists who come to enjoy the beauty of the landscape in all seasons. Besides the main town of St. Märgen, is also responsible for the village of Glashütte which has formed part of the municipality since 1936. To date, the 400 inhabitants of the village disposed of sewage in decentralised facilities such as multi-chamber domestic sedimentation tanks and septic tanks. The sewage was only purified mechanically and then discharged into the Glaserbach. From the early 1990s, the possibility of installing a centralised system for the village of Glashütte was discussed. The Black Forest valley of Glashütte with its unique history and tourist trade required a very special solution to comply with the area's image of untouched nature with clean sparkling streams and rivers. In addition to the inhabitants of the village, the solution selected had to be capable of coping with the guests of the Neuhäusle Hotel and the varying numbers of holidaymakers in a way which was both economical and in compliance with regulations. In order to deal with the fluctuating amounts of waste, the engineering office Hunziker in Hohentengen which was commissioned with the task, decided in favour of the SBR process with a maximum capacity of 660 EW. Other processes are less suitable for strongly fluctuating quantities. The concept which was then put out to tender was based on three SBR treatment tanks, which was unusual for a project of this

size. As a rule, SBR treatment plants with capacities of between 1000 – 2000 EW are equipped with one tank only. This design was proved correct in the first months after start-up when the diminishing amount of waste at the end of the tourist season can only be purified economically by an SBR type reactor.

The order for the machinery and electrical technology for the Glashütte treatment plant went to HST Hydro-Systemtechnik. The Glashütte treatment plant consists of the following units:

Strainer screen (rod distance 5 mm) with integrated fine press Strainer-screen

cleaner and strainer press

- Buffer tank (V = 30 m³)
 - 3 SBR reactors (V = 50 m³ each)
 - Sludge storage (V = 70 m³)
- Control and remote monitoring systems.

In view of the special location in a nature-conservancy area, the entire treatment plant is accommodated in a building, as is the case in St. Märgen. From outside, it cannot be seen that the building on the outskirts of the village is a sewage-treatment plant. Tourists and hikers passing the building encounter no unpleasant sights or smells which may spoil their enjoyment.





At the early meetings between Hunziker and the HST project engineers, it was agreed to add HST technology and special concepts without altering the price quoted. The problem of the fluctuating amounts of waste makes high demands on the control system of the SBR automation as well as requiring the use of complex machinery to draw off the purified waste water. While retaining the basic planning concept, it was agreed to fit the three reactor tanks with HST clarified-water discharge units of type HdroKlar-Plus. The projected flow-measurement system at the outlet of the treatment plant was no longer required since the amount of

waste water is calculated using the height measurement in the individual tanks. This meant that the amount of water purified can be measured for each tank separately, whereas the original intention was to measure the overall amount.

The so-called impulse-aeration was another speciality suggested by the HST engineers. During mixing phases without aeration (denitrification) it is generally agitating devices which carry out the mixing operation. However, this was now achieved by a blast of air lasting several seconds at a pre-determined interval. The required degree of mixing is carried out by alternating air input and rest phases with-

out allowing the content of oxygen (which hinders denitrification) to rise above a certain set maximum. This method also contributed to reducing operating costs by eliminating agitating equipment. For control purposes, the software component RBS 15, specially developed by HST for SBR plants, was integrated in the process-control system HydroDat® V8.

Walbecke in the Hochsauerland

Because of its geographic location, it was not economical to connect the village of Walbecke (part of the town of Schmallenberg) to the public sewerage system. As part of a research project carried out by the Fachhochschule Südwestfalen (university of applied science), a special membrane-type treatment plant was developed with plate membranes for 50 EW and then installed by HST Hydro-Systemtechnik. It is specially designed to cope with the waste from a local industrial bakery. This requirement was met by including a detritus chamber of suitable size.

