



# ARSENIC REMOVAL

## CASE STUDY

### Initial situation

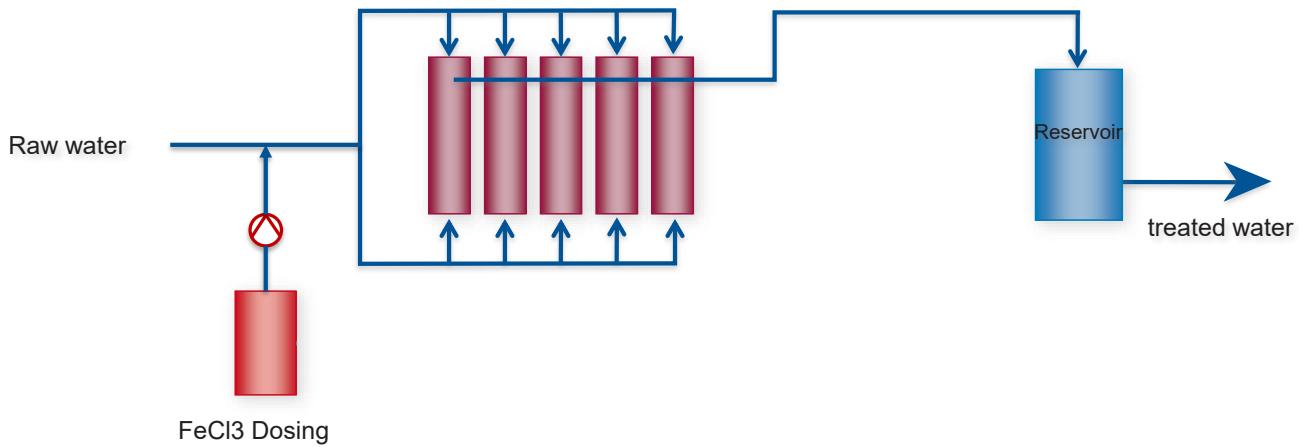
The brewery of this case study secures its water supply from its own wells. However, the well water is contaminated with arsenic. The alternative supply from the municipality would cause substantial additional costs and limit the independence of the brewery with respect to its water supply. Therefore the well water had to be significantly reduced in its arsenic content - in addition to other treatment steps.

In this particular case the target was set at 5 ppb, well below the drinking water limit of 10 ppb in order to balance the inevitable entry of arsenic into the beer through other raw materials and process aids.

Initially, the brewery filtered its well water over granulated iron hydroxide (GEH), whereby the desired arsenic reduction was achieved. However, the operating costs went completely out of control as the GEH filter material needed to be changed frequently as GEH not only removes arsenic from the water, but loses some of its capacity through its affinity towards other water constituents such as silica.

Regeneration of the GEH material within the filtration system was not economically feasible, a complicated and expensive filling replacement was the only choice open to the brewery. For that reason the brewery asked EUWA for an alternative treatment proposal.





### The EUWA solution

The realised EUWA concept consists of an ultrafiltration unit with an upstream  $\text{FeCl}_3$  dosage. In a first step arsenic contained in the well water is flocculated with ferric hydroxide, and then removed from the water through the subsequent ultrafiltration.

### Practical experience

Since the commissioning of the EUWA process, the brewery reduced the arsenic content of its well water safely to the desired value. At the same time, ultrafiltration removes turbidity and also acts as a microbiological barrier.

In contrast to the previous solution no expensive and complex replacement of filter material is necessary, the ultrafiltration can be cleaned periodically by flushing with water or chemically enhanced flushing. The operating costs are significantly lower compared to filtration with GEH. Therefore, the investment in the new EUWA plant has paid off in less than two years.

Power:  $40 \text{ m}^3 / \text{h}$

As-content in the feed: approx.  $20 \mu\text{g} / \text{l}$

As-content in the effluent:  $<5 \mu\text{g} / \text{l}$

no GEH necessary



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