



## Drinking Water Treatment with Final Sulfur Removal, Nitrification (Ammonia Degradation), Removal of Turbidity and Fluoride Reduction

In a municipal water works it was necessary to replace an open sand filtration for removal of excessive biomass (turbidity), which was located downstream of a biological hydrogen sulfide reduction process in an aerated fluidized bed. In parallel it was desired to prevent a brake through of hydrogen sulfide and additionally to remove ammonia, as well to reduce excessive fluoride concentrations. Furthermore the effectivity of filtration should be increased significantly.

To implement these targets, a complete new water works was build beside the old filter house. Chriwa received the order for design, engineering, supply, assembly and start-up for a complete water treatment plant, including all electrical and automation technology, as well as for the extension of and implementation into the existing water suppliers SCADA system.

### Process Technology

To cope with this extensive task, as a first step it was chosen a "dry filtration" (trickling filters) for a final sulfur reduction with simultaneous nitrification and partial reduction of organic matter in the water.

This process is followed by an inline flocculation with ferric salts and subsequent filtration via closed sand filters with the target of removal of turbidity and a partial reduction of fluoride by a process of co-precipitation.

A partial current of this pre treated water additionally will be desalinated in a reverse osmosis unit (RO) for complete removal of fluoride and afterwards remixed with the main stream. So it is guaranteed that the concentration of fluoride in the mixed water is kept within the limits.

Finally a reduction of excessive carbon dioxide, which is dissolved in the water, is done in a trickling cascade to stabilize the water on a low-corrosive level of calcite saturation

near the carbonate balance prior to the final water distribution.

### Numbers - Data - Facts:

<b>Location:</b>	Water works in Lithuania
<b>Plant Capacity:</b>	150 ... 900 m <sup>3</sup> /h variable
<b>Task:</b>	Drinking Water Treatment with Final Sulfur Removal, Nitrification (Ammonia Degradation), Removal of Turbidity and Fluoride Reduction
<b>Scope of supply:</b>	Design, engineering, production, ready-to-use commissioning of complete works, SCADA, Construction, assembly, start-up
<b>Time:</b>	2013
<b>Project manager:</b>	Dr.-Ing. Gerhard Hörner

