

ASSESSMENT OF THE OBM-PROCESS FOR DRINKING WATER TREATMENT

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Removal of natural organic matter (NOM) and providing safe hygienic barriers are the main challenge in producing good drinking water qualities from surface water in many countries. Use of ozone as the primary disinfectant is increasing in popularity. Ozonation will also oxidize the NOM content removing colour and taste, but forming more easily biodegradable organic matter in the water which may cause regrowth problems in the distribution network. Biologically active filters can, however, be used to remove the biodegradable fraction produced after ozonation. Consequently, ozonation followed by biofiltration is well known and promising drinking water treatment process for surface waters. However, biofiltration step will produce/release sludge, bacteria and particles which should be removed from the water before distribution. This could be achieved by for instance membrane filtration, which also would provide a second hygienic barrier. Consequently, as a part of the EU-project TECHNEAU a novel process combination consisting of the three steps oxidation (ozonation), biodegradation and membrane filtration (the OBM-process) is being developed.

In this paper we have investigated in a pilot plant the process combination consisting of ozonation, biofiltration, and membrane filtration. Two membranes have been tested (a Zenon ZW10 ultrafiltration unit and a NGK ceramic microfiltration unit). The effect of different surface water qualities (NOM-concentration and pH) and operational process conditions on the membrane performance have been investigated. Then a cost assessment of the OBM process has been made. Color, UV_{254} , DOC, BDOC and NOM-fractionation was used to assess the ozonation-biofiltration efficiency, while for the membrane, turbidity, SS, particles size distribution and TMP-development were used. The results show that the OBM-process was able to produce good drinking water quality in a cost efficient way, which makes it competitive with traditional treatment processes.