



Dual media filtration and ultrafiltration as pretreatment options of low-turbidity seawater reverse osmosis processes

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ABSTRACT

Well-controlled laboratory scale experiments were carried out to estimate the performance of dual media filtration (DMF) and ultrafiltration (UF) as a pretreatment for seawater reverse osmosis (SWRO) processes. Raw seawater was taken from the place close to the construction site of the SEAHERO test-bed of 45,000 m³/d in capacity, which is planning to be operated from 2013. The raw seawater turbidity was rather low and the focus of this study is to find out the better process between DMF and UF for the pretreatment of low turbidity seawater. The UF process exhibited a good performance to produce qualified RO feed water and coagulation added the removal of aromatic organics and better resistance to the membrane fouling. However the DMF process could not make RO feed water to satisfy the SDI standard and variations in operation conditions did not change the product water quality. In order to enhance the performance of DMF process, a multi-pass design or an improved coagulation strategy for low turbidity water should be necessary, which makes a proper design of DMF more difficult. Therefore, UF can be a better option for the pretreatment of low turbidity seawater.

Keyword: Dual media filtration (DMF); Ultrafiltration (UF); Pretreatment; Low-turbidity seawater; Seawater reverse osmosis (SWRO)

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