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Natural treatment based on willows for concentrate of reverse osmosis

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ABSTRACT

Aquaduin started reusing wastewater effluent for infiltration, *Cf.* managed aquifer recharge (MAR), in its dune water catchment St-André in 2002. The treatment train at the Water Production Centre Torreele is based on multiple barrier approach with submerged ultrafiltration prior to reverse osmosis (RO). The project not only resulted in enhanced ecological values of the dunes but during the recent longer periods of drought, the combination of reuse/MAR proved to be a robust and safe way to ensure drinking-water production and thus is a potential solution to mitigate the impact of climate change [1]. Concentrate disposal is an issue when using RO. However, as Aquaduin operates in a coastal area, disposal could be managed; the concentrate was discharged in a canal that drained to the sea. To mitigate the impact of this discharge, treatment of RO concentrate using willows has been tested since 2007. This research resulted in the full-scale implementation of a willow field or marsh, that is based on the concept of a horizontally constructed wetland combined with short rotation coppice using willows (*Salix*). The construction started in 2021 and early 2022 the willow marsh became operational. In 2022 a total volume of 538.446 m^3 was treated by the willow marsh, 85% of the total volume of RO concentrate produced. This paper will present the preliminary research, construction and initial results of the treatment.

Keywords: Water reuse; Membranes; Concentrate disposal; Natural treatment; Managed aquifer recharge; Climate change

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