Pilot plant comparison study of two commercial nanofiltration membranes in a drinking water treatment plant

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ABSTRACT

A wide range of commercial membranes were tested and compared at laboratory scale in order to select the most appropriate for improving the final water quality of a real drinking water treatment plant (DWTP). Most of the membranes tested showed a reduction of trihalomethanes formation potential (THMFP) higher than 90%. In this work, several NF membranes were tested at laboratory scale in order to evaluate the most suitable NF membrane to reduce THMFP. NF270 (Dow Chemical) and ESNA1LF2 (Hydranautics) were finally selected based on their permeability and inorganic salt rejection. These two membranes were tested in parallel in a pilot-scale plant. The effectiveness in THMFP removal was evident for all membranes tested. The comparison of both membranes was carried out simultaneously in a pilot plant installed in the DWTP of Manresa. In the spiral wound configuration, both membranes also showed effective separation of trihalomethanes (THM) precursors, reducing THMFP in treated water at values of approximately 90%, depending on the season.

Keywords: Pilot plant; Nanofiltration; Spiral-wound modules; NF270; ESNA1LF2; Drinking water; Trihalomethane formation potential

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