Desalination and Water Treatment
www.deswater.com

46 (2012) 182–187
August

doi: 10.1080/19443994.2012.677553

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Greywater treatment in a submerged membrane bioreactor with gravitational filtration

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Received 16 September 2011; Accepted 12 February 2012

ABSTRACT

This study examined the practical performance of a submerged membrane bioreactor treating low-load greywater. A 17 L laboratory-scale bioreactor with a flat-plate microfiltration membrane (polyethylene; pore size 0.4 μm) was operated to treat the effluent from the showers of the student housing complex at the Tunis Agriculture University (Tunisia). Permeate was intermittently withdrawn at constant transmembrane pressure induced by water level difference. The Pollutant removal and membrane behaviour were monitored. The treatment obtained a stable output with an excellent effluent quality in terms of chemical oxygen demand, suspended solids and anionic surfactant levels (20, <0.1 and 0.025 mg/L, respectively); in addition, faecal coliforms in the permeate were undetectable. The average power consumption by the experimental plant was 3.3 kWh per 1 m^3 of treated water.

Keywords: Greywater; Gravitational filtration; Membrane bioreactor; Microfiltration

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