Desalination and Water Treatment
www.deswater.com
33 (2011) 295–299
September
1944-3994 / 1944-3986 © 2011 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2011.2654

Configuration of an efficient seawater pretreatment system for simultaneous organic and particulate matters removal

Kil-Soo Hyun

Department of Architectural & Urban Environmental Engineering, Kyungpook National University, 386 Gajang-dong, Sangju, Kyungsangbuk-do, 742-711, Korea
Tel. + 82 (54) 530-1442; Fax +82 (54) 530-1449; email: kshyun@knu.ac.kr

Received 30 November 2010; Accepted in revised form 27 March 2011

ABSTRACT

In this study, the high-rate fibre filter (HRF) using the fibre media and the biological aerated filter (BAF) followed by granular media filter (GMF) using anthracite and granular activated carbon (GAC) was evaluated as an effective pre-treatment for simultaneous organic and particulate matter removal. As a result, the HRF bed was more effective in reducing particulate matters, while the BAF bed was effective in reducing conventional pollutants as well as particulate matters. The performance results of combined HRF/BAF/GMF system in terms of pollutants and headloss achieved 12–35% higher reduction and about 1.7 times slower development than those of the combined HRF/GMF system. The performance of combined HRF/BAF system (FV 30/3 m/h) followed by GAC filter (FV 5 m/h) showed an excellent removal results of >80% for organics and nutrients and >90% for particulate matters, which typically cause membrane biofouling and colloidal fouling. This reveals that combined HRF/BAF/GMF system is an effective pretreatment system to control and reduce the extent of membrane fouling compared to conventional coagulation-granular filtration.

Keywords: Seawater pretreatment; High-rate fibre filter; BAF; Granular media filter