Desalination and Water Treatment
www.deswater.com
32 (2011) 411–421
August
1944-3994 / 1944-3986 © 2011 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2011.2760

Performance of a 270,000 CMD integrated membrane system for water supply in Taiwan

Benson Liao[a], Chia-Yuan Chang[b]*, Chao-Chang Chang[a], Tzu-Wen Liu[a]

[a]*KINTECH Technology Co. Ltd. No, 20, 7th Rd Taichung Industrial Park, Taichung City, Taiwan*
email: kintech@kin-tech.com.tw
[b]*Department of Environmental Engineering and Science, Chia Nan University of Pharmacy and Science, Tainan 71710, Taiwan*
Tel. +886 (953) 850-800; Fax +886 (6) 266-9090; email: mcychang@mail.chna.edu.tw

Received 27 August 2010; Accepted in revised form 1 March 2011

ABSTRACT

This paper presents an integrated membrane system (IMS) designed, installed by KINTECH Technology Co. Ltd. and its long term performance at Kaotan Water Treatment Plant (KTWTP). The IMS installed at KTWTP is the first membrane system as well as the first IMS for tap water production in Taiwan. The raw waters from Kaoping River, local subsurface flow and groundwater were pumped into KTWTP for the tap water supply of Kaohsiung area. Turbidity of water in the Kaoping River during the typhoon usually increases abruptly up to 5,000–10,000 NTU, greatly surpassing the upper limit of 1,500 NTU for conventional purification to be effective. In addition, field data also showed that the levels of ammonia-nitrogen, total hardness, total dissolved solid and certain inorganic constituents in local groundwater are too high to be effectively removed by conventional system. The KTWTP was established by Taiwan Water Corporation (TWC) in 1972 and initially operated on conventional process. To meet increasingly stringent drinking water standards set by Taiwan EPA, KTWTP was upgraded in 2007 by integrating IMS (ultrafiltration, nanofiltration and reverse osmosis) into the conventional system. A two-year monitoring survey of UF-NF-RO integrated membrane system at KTWTP showed that the treated water quality is far beyond expectation as well as the substantial accomplishment of the IMS process control and data processing resulted in an excellent performance of the integrated membrane system.

Keywords: Integrated membrane system (IMS); Ultrafiltration; Nanofiltration; Reverse osmosis

* Corresponding author.