Desalination and Water Treatment
www.deswater.com
13 (2010) 275–281
January
1944-3994 / 1944-3986 © 2010 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2010.1035

An innovative coastal protection system: Quality characteristics and reuse options of drained seawater derived from its operation

Lucia Bonadonna*, Maurizio Semproni

Department of Environment and Primary Prevention, Istituto Superiore di Sanita`, Viale Regina Elena, 299 00161 Rome, Italy
Tel. +39 0649902317; Fax +39 0649902390; email: lucybond@iss.it

Received 20 February 2009; Accepted 9 July 2009

ABSTRACT

Coastal areas represent an important resource intrinsically linked to economics through the tourism industry. Nevertheless erosion along shorelines is becoming one of the growing serious environmental problems. For coastal defence, an innovative coastal protection system, the BMS (Beach Management System or RSA), was installed along a stretch of Italian coast. The technique is based on the principle of the artificial drainage of the beach to keep the water surface level low. After seawater drainage, pumps discharge the drained water back to the sea. Our proposal is to use the drained water as an option to its discharge into the sea. Therefore a study was carried out with the aim to verify if this proposal can be achievable. Analyses of both microbial parameters, such as bacterial indicators and *Salmonella*, and physico-chemical parameters were carried out for the evaluation of the hygienic characteristics of the drainage water at the outlet of the system. Results showed that a significant reduction (1–2 orders of magnitude) of the microbial loads was achieved after the transport of water through the sand and the coated-pipes of the system that work as an efficient mechanism of bacterial removal. Taking into consideration the obtained results, this new solution for the defence of shorelines could be used for making a productive reuse of good quality non-conventional water, such as sea water. Areas subject to coastal erosion could maximise benefits due to sustainable forms of coastal management with practices of water saving and use the drained water for replenishment of marine swimming-pools, aquatic parks, aquariums and aquaculture pools or for the re-qualification of humid zones or for contrasting subsidence phenomena along the coasts.

Keywords: Bacteria; Beach management; Coastal protection; Erosion; Reuse; RSA system; Seawater

* Corresponding author.

Presented at the AQUA 2008 International Conference on Water Science and Technology-Integrated Water Resources Management, 16–19 October 2008, Athens Greece.