



Comparison of backwashing with conventional cleaning methods in slow sand filters for small-scale communities

Bruno Segalla Pizzolatti^{a,*}, Marcus Soares^b, Luis Romero^c, Maurício Luiz Sens^a

^aFederal University of Santa Catarina, Campus Universitario Trindade, Florianopolis, Brazil

Tel. +55 48 3733 9883; email: brunosegalla@me.com

^bTechnical University of Berlin, Strasse des 17 Juni 135, Berlin 10623, Germany

^cInstitute of Technology of Costa Rica, Cartago, Costa Rica

Received 3 July 2013; Accepted 18 December 2013

ABSTRACT

The application of slow sand filtration technology for domestic water supply was investigated, with particular attention to the issue of periodic maintenance (cleaning the filter layer). The study used raw lake water with a high algal density to allow results to be obtained in a short time. Two filters were constructed with the same filter layer characteristics and were operated in parallel under the same conditions (filtration rate 0.16 m/h and hydraulic load variable maximum 0.80 m). Periodic maintenance was performed when the hydraulic load on the filtration layer reached 0.80 m. One filter was cleaned conventionally and the other by backwash. Nine filtration runs were performed, with an average duration of 14 d. Both filters provided significant improvements in water quality: filtered water turbidity less than 1 NTU, apparent color average of 15 Pt/Co, and removal of total coliforms and *Escherichia coli* around 1.5 log. In general, the quality of filtered water from the two filters was similar. However, the results obtained indicated that the backwash facilitates the operation of slow sand filters by simplicity (opening one valve) and time consumption (7 min), and ensures the water quality in terms of the parameters evaluated, justifying increased use of this technology, especially in small communities and rural areas. Nevertheless, this technology is applicable in small filters (up to 93 m²), because uniform backwash does not occur in filters with large dimensions.

Keywords: Decentralized water treatment; Slow sand filter; Backwash; Cleaning filter

*Corresponding author.