



Removal of iron and manganese from water using Filtralite Mono-Multi

Danka Barloková^{a,*}, Ján Ilavský^a, Ondrej Kapusta^a, Michal Kunštek^a, Pavol Hudec^b

^aDepartment of Sanitary and Environmental Engineering, Faculty of Civil Engineering, Slovak University of Technology, Radlinského 11, 810 05 Bratislava, Slovak Republic, emails: danka.barlokova@stuba.sk (D. Barloková),

jan.ilavsky@stuba.sk (J. Ilavský), ondrej.kapusta@stuba.sk (O. Kapusta), michal.kunstek@stuba.sk (M. Kunštek)

^bDepartment of Petroleum Technology and Petrochemistry, Faculty of Chemical and Food Technology, Slovak University of Technology, Bratislava, Radlinského 9, 812 37 Bratislava, Slovak Republic, email: pavol.hudec@stuba.sk

Received 17 May 2016; Accepted 15 May 2017

ABSTRACT

In over 38% of the groundwater drinking water sources in Slovakia, iron and manganese concentrations exceed the recommended levels set by Regulation of the Government of the Slovak Republic No. 496/2010 on Drinking Water. Iron and manganese are not considered health hazards, although micro-environments may be supported in wells and distribution systems which harbor microorganisms. The main concern with these metals is the color imparted by the oxidized forms that rarely goes unnoticed by the consumer. In addition, clothes and plumbing fixtures are easily stained. The aim of this study was to verify the efficient removal of iron and manganese from water using the two-layer material Filtralite Mono-Multi and monitor the surface properties and chemical composition of each layer of Filtralite Mono-Multi (HC 0.8–1.6 and NC 1.5–2.5 (N = normal density, H = high density, C = crushed)) before and after the experiment. The results of the pilot-scale experiments at the water treatment plant in Kúty have shown that the gradual preparation of the Filtralite material using KMnO_4 and the creation of an MnO_2 contact layer on the surface of the Filtralite increased the efficient removal of manganese from the water. After the experiment, the surface properties of the Filtralite were improved.

Keywords: Treatment of water; Removal of iron and manganese; Filtration; Filtralite Mono-Multi; Surface properties; Chemical composition

* Corresponding author.