

## The application of membrane filtration for recovery of water from filtration bed backwashing stream

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### ABSTRACT

The objective of the article is to evaluate the transport and separation abilities of membranes in a multistage systems for treatment of washings from swimming pool flushing. The studied system was a two-stage ultrafiltration process (UF I–UF II), in which membranes with different the molecular weight cutoff equal to 200 and 30 kDa were used, followed by nanofiltration (NF) process (150–300 Da). Washings were taken from a children's and a adults pool circuits. The process of UF I enabled a significant decrease of the studied parameters and a reduction of transport of pollutants to the membrane used in UF II. The turbidity of the permeate from UF II did not exceed 0.45 NTU and the concentration of total organic carbon was in the range of 1.64–2.69 mg C/L. In order to prevent elevated concentrations of harmful low-molecular-weight organic compounds in closed water circuits, it was justified to use a third treatment stage in the form of a NF process. The high separation ability of the studied NF membranes made it possible to reduce the turbidity of the washings below 0.10 NTU. The treated flux could be safely returned to the pool.

*Keywords:* Swimming pool water; Wastewater treatment; Ultrafiltration; Nanofiltration; Water recovery

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