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Optimum backwash method for granular media filtration of seawater

Seung-Hyun Kim[a]*, Hwan-Kyu Lim[a], Woo-Chang Jeong[a], No-Suk Park[b]

[a]*Civil Engineering Department, Kyungnam University, Wolyilueg-dong, Changwon, Republic of Korea*
Tel. +82 55 249 2671; Fax +82 505 999 2165; email: shkim@kyungnam.ac.kr
[b]*Water Research Center, K-water Institute of Water and Environment, Daejeon, Republic of Korea*

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ABSTRACT

In order to determine an effect backwash method in granular media filtration of seawater, effectiveness of three backwash methods was evaluated in this study. The first method (W) is water wash alone at fluidization velocity. The second method (AW) is air scouring followed by fluidized water wash. The third method (SAW) is simultaneous air scouring and sub-fluidized water wash. These methods were evaluated by four parameters; turbidity of backwash waste, mass of suspended solids in backwash waste, head loss development, initial turbidity breakthrough. According to this study results, simultaneous air scouring and sub-fluidized water wash (SAW) was the most effective backwash in seawater filtration and water wash alone (W) was the least effective. Subsequent analysis of computational fluid dynamics (CFD) confirmed the effectiveness of the SAW method. Calculation of shear rate and fluid velocity around the media showed that values of these parameters were the highest when a filter was backwashed by simultaneous air scouring and sub-fluidized water wash.

Keywords: Seawater filtration; Backwash; Air scouring; CFD

* Corresponding author.