Optimization of enhanced sand filtration with secondary-flocculation for polluted water treatment

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\textbf{ABSTRACT}

In order to meet standards for drinking water quality (GB5749-2006) in China, the sand filtration with a high dosage of secondary-flocculation following biological activated carbon (BAC) filter is employed at Nanjiao waterworks, which leads to greatly shortening the running cycle and increasing operating costs. In an effort to reduce the chemical dosage, optimization of sand filtration and BAC filtration were performed. The results show that the enhanced sand filtration and the improvement of water quality of BAC filter effluent can significantly reduce the dosage. Appropriate sand gradation (0.5–0.8 mm), sand filter backwashing with high air flow rate and low water flow rate, the BAC filter with 0.3–0.6 mm carbon operating with appropriate flow rate are beneficial in reducing the dosage. Compared with the full-scale plant, over 60\% dosage can be saved by reducing chemical dosage to 0.3 mg/L, thereby decreasing the amount of sludge, increasing the running cycle of the filter, saving the volume of backwash water, and finally reducing operating costs.

\textbf{Keywords:} Biological activated carbon; Dosage; Drinking water; Sand filtration; Secondary-flocculation

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