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PANIT PRATUMSRISAKORN : THE DIRECT FILTRATION EFFICIENCY OF DUAL MEDIA FILTER BACKWASHED BY POLYMER ADDED WATER. THESIS ADVISOR : CHAOVAYUT PHORNPIMOLTHAPE M.S.I.E.(Operations Research), KRISANA TEANKAPRASITH M.S. (Env. Health), UDOMSAK KONGMUANG M.S. (Env. Eng.), VAJIRA SINGHAKAJEN M.A. (Demography). 116 p. ISBN 974-664-374-6

The objectives of this research were to study the turbidity of initial filtration, initial turbidity breakthrough duration, filter run and the turbidity of supernatant backwashed water from direct filtration with dual media filter which was backwashed by polymer added water. The concentrations of nonionic polymer in backwashed water was 0, 0.05, 0.1 and 0.15 mg/l. The filtration rates were 4 and 5 gpm/ft^2.

The experiment model consisted of transparent acrylic cylindrical filtration columns of 5 cm. diameter containing dual media with total thickness of 70 cm.. Sand and anthracite on top had effective sizes of 0.4 and 0.8 mm., uniformity coefficient of 1.4 and 1.5 and thickness of 30 and 40 cm., respectively. The synthetic water turbidity was in the range of 15-20 NTU and alum was used as coagulant with dose of 30-35 mg/l. During filtration, the filtered water samples were taken every 1 min. for the first 15 min., followed by every 5 min. for 45 min. and then every 1 hr. until the turbidity of filtered water reached 1 NTU.

From the experiment, it was found that backwashing the filter by polymer added water of 0.05 mg/l concentration was able to reduce the turbidity of initial filtration by 67.81 and 42.17 percent in 4 and 5 gpm/ft^2, respectively, shorten the initial turbidity breakthrough duration to reach the permissible level (0.2 NTU) by 35.37 percent for rate 4 gpm/ft^2 and reduce the turbidity of supernatant backwashed water by 25.63 and 23.07 percent in 4 and 5 gpm/ft^2, respectively. When the concentration of polymer in backwashed water was 0.15 mg/l for 4 grm/ft^2, the turbidity of supernatant backwashed water was decreased by 39.75 percent. When the concentration of polymer in backwashed water was increased, the filter run was also increased for both filtration rates. The filter run of filtration rate 4 gpm/ft^2 was longer than that of 5 gpm/ft^2 in every polymer concentration.