

ABSTRACT

Slow sand filtration is one of the most effective surface water treatment methods because of its low cost and simplicity in operation and maintenance especially for rural areas in developing countries.

In Aqbat Jabar WSP this method is used to treat water coming from Al-Qist and Al-Fawwar springs transported through 13 Km open canal.

However, above raw water turbidity of 20 NTU, pretreatment is required. Direct roughing filtration (a modification of roughing filtration in which coagulant is added to the influent water before filtration with the aim of improving particle removal) is a promising pre treatment method for slow sand filtration.

Several jar tests were conducted in order to assess the optimum operating conditions for roughing filter to find the optimum coagulant dose needed to simulate coagulation and flocculation processes, up flow roughing filters in layers (4 layers) was used in this study, different flow rates (1, 1.5) and coagulant doses (10 to 50) were applied to achieve the best way of particle removal.

The roughing filters effluent quality met the influent requirement of SDF in this study of less than 20 NTU, implying that under the given process conditions a filtration rate of 1.5 m/hr and 0.5 m/hr produces a good results without addition of any chemical with turbidity range 20 to 100 NTU.

It was observed that coagulation in roughing filtration could be effectiveness with more than 100 NTU canal turbidity.

The results of this study also showed a high pollution of Total and Fecal coliform bacteria of raw water open canal due to a different pollution sources.