

Optimization of Pre-Treatment Process of Iron Removal from Groundwater

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The presence of iron is one of the major issues experienced by groundwater consumers. The rural water treatment plant located at Bolagala area in Kandy treats water mainly for iron removal. The available half treatment process of this plant removes 83.20 - 93.06 % iron from natural water. As the raw water iron concentration is high, the removal percentage is not adequate to bring the iron concentration down to the recommended standards (SLS 614: 2013). The study was carried out to optimize the existing pre-treatment process with the purpose of bringing the treated water iron concentration under 0.3 mg/l. Two oxidation processes a) Aeration b) Chlorination were experimented to select an optimum oxidant. Aeration was tested for different time periods. 6 min aeration time showed approximately 50% removal of dissolved iron concentration. Chlorination was tested for different doses. 5 ppm chlorine dose was effective in 99% removal of the dissolved iron. The final dissolved iron (DI) concentration reached 0.03 mg /l which is ten times lower than recommended level. The plant pre-treatment step should include a chlorination step with aeration to achieve the optimum removal of dissolved iron in raw water.

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