IRON REMOVAL BY INTERMITTENT SAND FILTRATION

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by

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ABSTRACT:

Iron is present in many ground water. According to the standards in various countries the amount of iron should not exceed 0.3mg/L in water for public supply. Too much iron in the water tends to stain laundry and also gives bad taste to the water etc. Iron is generally removed from water by precipitation through oxidation and filtration. Using sand as a filter media, four filters of varying depth have been designed and constructed. The dosages were intermittently applied. This study was carried out to evaluate the effect of depth on the performance and potential of intermittent sand filtration for iron removal. A series or test was carried out on water of high iron concentration level. Based on the percentage of removal, the effect of dosing time and depth will be analysed and compared with other methods using coal ash as a filter media. It was found, dosing time of 9 hours with an interval of 2 days each, gave better performance compared with the 6 and 3 hours dosing time.

1.0 INTRODUCTION.

1.1.1 Iron.

Iron is frequently found in raw waters. It is not harmful but there are two objections to its presence above a certain amount.

(i). It can make water unpalatable, imparting a bitter taste to the water when present in large amount.

(ii). When water is exposed to the air and takes up oxygen, the iron is likely to precipitate and form deposits which cause brown stain upon sinks, bath, washbasin, and laundry.

The WHO 'International Standard' for drinking water gives 0.3mg/L as the maximum permissible limit. To remove iron from these waters it is therefore only necessary to add sufficient air to provide the necessary oxygen to allow the ferrous iron to oxidise to ferric ion and to provide a suitable filter or other situation in which the ferric hydroxide can be removed, leaving clear water. Iron is the fourth most abundant element by weight in the earth's crust. The chemistry of aqueous iron involves primarily the ferrous (II) and ferric (III) oxidation states, and is of engineering interest in water supply and wastewater treatment. Iron cycling in nature is also of interest due to its nutrient status and the active surface chemistry of iron oxidation. (Thwort, 1974)