

## MANGENESE AND IRON REMOVAL FROM GROUNDWATER THROUGH AERATION

**KHODADADI<sup>1</sup>, A. KHERADMAND<sup>1</sup>, AND R.N. YONG<sup>2</sup>**

<sup>1</sup>Faculty of Engineering, Mining Eng Dep., Tarbiat Modares University, Tehran, Iran, P.O. Box 14155-4838

<sup>2</sup>Geoenvironmental Research Centre, Cardiff School of Engineering, University of Wales, Cardiff, P.O. Box 917, Newport Road, Cardiff, UK, CF2 1XH

Iron and manganese are common groundwater contaminants that are not considered health hazards. Treatment of these elements depends on the form in which they occur in the untreated water. Aeration is considered as the simplest method for iron and manganese removal from the water. In this pilot study, polluted water with manganese and iron are exposed to O<sub>2</sub> and hence oxidized to insoluble forms such as Fe (OH)<sub>3</sub> and MnO<sub>2</sub>. The pilot consisted of three chambers, was constructed in the form of rectangular cube with height of 1 meter and profile of 15 cm x 15 cm. The chambers, separated by reticulated screen, were filled with crushed stone, gravel, fine sand and very fine sand. The pilot study was performed at a constant temperature of 22 and SOR (surface overflow rate of 0.134, 0.108, 0.086 and 0.042 m<sup>3</sup>/m<sup>2</sup>. Min; and also with a pH between 7.5-9.5. The results indicated that maximum iron and manganese removal (96% and 85%) was achieved when crushed stone, sand and fine sand were arranged respectively downward. The geochemical model predicts the similar results when the above material and the test condition were applied as the input.