Quality Assessment of Groundwater in Almadinah Almunawarah City

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ABSTRACT
This study was conducted to assess the quality of groundwater in Al-Madinah Al-Munawarah. Water samples were collected from sixty wells over a period between June and July 2010. Physical parameters such as taste, odor, color and turbidity; and general chemical parameters, such as nitrate, nitrite, hardness, pH, chloride, sulfate, TDS, fluoride, sodium and residual chlorine, were measured. Also the concentrations of heavy metals in the samples were determined using inductively coupled plasma mass spectrometer ICP-MS system. The results were compared, where possible, to the local, US-EPA, and WHO drinking water guidelines.

The turbidity, color, odor, nitrite, fluoride, sodium, residual chlorine and pH values were all below their respective USEPA drinking water standards and/or SASO maximum admissible concentrations for drinking water. About 80-87% of the analysed samples contain chloride, sulfate, TDS and hardness above the limits, and 5-10% showed higher amounts of nitrate, As, Fe and Mg above the standards. Mg, V, As, Se, Sr, Ba, Hg and Pb were detected in all samples, but in some samples the elements were below the detection limits; Cr (33.3%), Mn (3%), Fe (3%), Co (18%), Ni (58%), Cu (86.7%), Zn (41.7), Cd (88%) and Tl (66.7%).