

Investigation of the hydrocarbon contamination of the Dibdibba aquifer in Al-Zubair area, southern Iraq

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Abstract

The importance of Al-Zubair area in Basra governorate is highlighted by the presence of agricultural activities. The Dibdibba aquifer is the main supplier of water which used for irrigation, livestock and some different industries are scattered around the region. This research aims to investigate the extent and impact of hydrocarbon contamination of the Dibdibba aquifer in Al-Zubair region, southern Iraq, due to its proximity to oil fields sites. 18 groundwater samples from different locations within the aquifer were collected in dry and wet season to determine their chemical and physical properties and total petroleum hydrocarbon (TPH) including petroleum-based compounds and their derivatives. The analytical results revealed that the Dibdibba groundwater in this area is polluted with TPH and have high levels of electrical conductivity (EC) and total dissolved salts (TDS) due to the high content of salts along with the high concentrations of calcium and magnesium ions. The overall outcomes of the main elements of water showed that it is unfit for human use due to the high levels of the above parameters. All the water tests carried out indicate the presence of contamination with petroleum hydrocarbons, surpassing the allowable limits set by the World Health Organization (2008) and Iraqi Quality Standard (2009). This observed particularly in areas adjacent oil spills, where the TPH concentrations exceeding 35 µg/l in the northwest of Al-Zubair area near the Rumaila oil field. Significantly, this investigation indicated a clear evidence of hydrocarbon contamination in the study area.

Keywords: Groundwater contamination, Total petroleum hydrocarbons (TPH), Dibdibba aquifer, South of Iraq.