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A study of Some environmental Properties for some wells water in Al-Muthanna Province/Iraq

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Abstract

The current study is conducted on wells water to identify some of the environmental properties of this water within Al-Muthanna province, five wells with depths ranging from (40-75) meters have been selected, distributed over five different regions, namely (Wadi Kharaz, Al-Mamlha, Al-Ghadhari, Al-Ameed, Al-Rehab) to determine the viability of these wells and to know the monthly and local changes in them during the study period from (January - June) 2021.

The study includes the measurement of some physical Parameters such as (Water temperature, Turbidity, Electrical conductivity, Total dissolved solids) and some chemical Parameters (pH,Total hardness, Calcium hardness, Magnesium hardness, Sodium, Potassium, Sulfates, Phosphates, Nitrites, Nitrates). Indicators of bacterial contamination are also studied, which includs (Total Coliform bacteria, Fecal Coliform bacteria, Fecal Streptococci bacteria) .

The results showed that the water temperature values ranged between (23-27) , and the water turbidity during the current study showed a narrow variation for all studied wells, and all turbidity values were within the standard specifications, which ranged between (0.1 - 3.7) NTU. The Electrical conductivity values were recorded between (3690-23737) µS/cm , the values of Total Dissolved Solids were high in the water of the wells studied, where their values ranged between (2460 - 15820) mg / l, while the pH values were recorded between(7.3-8.4). The studied wells water is very hard, and the area follows the geological characteristics of the study area, where the Total hardness were recorded between (1600-3600)mg.CaCo3/l,Calcium hardness (900-2800)mg.CaCo3/l,and Magnesium values (34.02 -544) mg/l ,Sodium (274.9-815) mg/l and Potassium values (23.80-90.20) mg/l.The Sulfates concentration ranged between (314.02-485.5) mg/l. As for nutrients, the current study recorded low or almost perceptible concentrations of nutrients, as Phosphate values ranged between (0.001-0.004) mg/l, while Nitrite levels ranged between (0.001-0.006) mg/l and Nitrate values ranged between (0.131 -0.300) mg/l .

As for the bacterial examination, the total number of Coliform bacteria ranged between (4200-86000) CFU/ml, the number of Fecal Coliform bacteria ranged between (3900-69000) CFU/ml, and as for Fecal Streptococci, the number ranged (1230-120000)CFU/ml.Through the results of the environmental properties of the study wells for a period of six months, most of the parameters were higher than the permissible standards for drinking such as TDS, EC, TH for all months and for all wells, and therefore these wells are considered unfit for drinking, as well as the variation of the source of pollution for the wells and for all months between human contamination and animal contamination With the exception of well 5, the source of pollution was animal for all months.