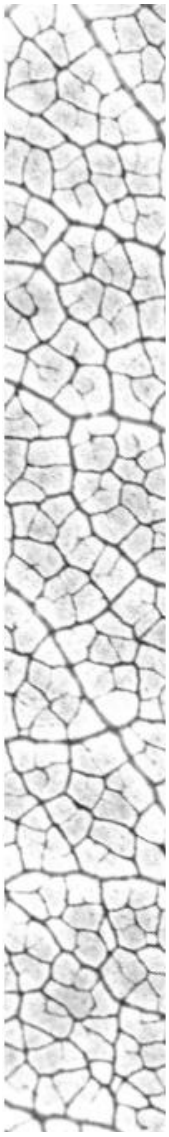

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Measuring the most important physical properties and Major Cations and Major Anions of groundwater within the Safwan-Zubair area, Basra, Iraq

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Abstract
The groundwater contains many salts present as a result of the ability of the water to dissolve the salts, and the quantity and quality of dissolved salts determine the suitability of the water for irrigation and various uses. Five different locations and during three periods, depended on rain season, Dry period , The period of rainfall , The period after the rains, spread from August 2018 to April 2019 for sampling and performing laboratory analyzes, according to (APHA, 2005). Groundwater wells were evaluated based on the most important physical properties and main ions, which are electrical conductivity, as the highest value of 32.2 mS/cm was recorded in well W3 and the lowest value was 7.1 mS/cm in well W7, The highest pH value was recorded at 7.81 in the W3 well and the lowest value 7.3 in the W8 well. Major Cations include Ca^{2+} the highest value 1617 mg / l in the W3 well and the lowest value 376 mg / l in the W7 well and Mg^{2+} the highest value 612 mg / l in W1 well and the lowest value is 191.1 mg / l in well W7, As for Major Anions, the Cl^{-} the highest value 8133 mg / l in the W3 well, the lowest value 1532 mg / l in the W7 well and $SO4^{2-}$ the highest value 830.8 mg / l in the W6 well, and the lowest value 363 mg / l in the W2 well. The results showed that all groundwater wells within the study area are not suitable for drinking.

Keywords: groundwater, water quality, drinking water, Safwan Al-Zubair

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INTRODUCTION

The increase in population and dramatic climate change has increased the demand for water worldwide (Ma et al, 2009; Farid et al, 2013). So groundwater has become an important source in many regions of the world for domestic, agricultural and industrial use groundwater is an indispensable source as the only available and economical source of water (Keesari et al, 2014). Groundwater is the main source of water for various uses, the most important of which are domestic and agricultural in the southwestern parts of Basra, especially in desert areas; due to the lack of surface water and the rule of the desert climate (Al-Rikabi, 2017) The need for detailed studies of the trend towards groundwater use and the suitability of it as an alternative source of surface water was increased (Al-Dahaan and Al-Ansari, 2019).

High Groundwater salinity levels are a major problem in water quality due to irrigation and infiltration of seawater, excessive and continuous pumping of groundwater. Salinity limits water use in irrigation and agriculture, and therefore more attention must be given to assessing water quality. Through hydro-chemical and environmental analyzes, it is necessary to assess groundwater quality (Glynn and Plummer 2005; Edmunds, 2009; Herczeg and Leaney, 2011; Keesari et al, 2014). For instance, the effects of its chemical constituents on both soils and plants may determine the use of groundwater for irrigation (Srinivasa and Gowd 2005; Raju 2007).

The water is suitable for use when its variables meet the pre-determined criteria for that use (Cordoba, 2010). On this basis, water quality has been defined as a description of the water condition in terms of physical, chemical, biological, and radiological properties, is used evaluate, the criteria most commonly used to assess water quality related to environmental health and safety systems for human use. (WHO, 2011).

Evaluating the importance of water resources used for any purpose through the content of chemical (Al-Janabi, 2008) . The suitability of the quality of any groundwater for a specific purpose depends on being acceptable and of appropriate quality Therefore use (Todd, 2007).

Major ions in groundwater are provided by weathering of rocks and the quality of water is related to several factors such as geology, weathering regime,