

## **ABSTRACT**

Water resources are of great importance in the world's agriculture, especially regarding the scarcity of these resources. That calls for attention appropriate for analysis, study, and research in all issues and aspects that would contribute to the development and maintenance of those resources and achieve the maximum possible levels of quality and efficiency of use. The study was conducted during the fall season of 2020 to study groundwater quality (well water) in the city of Al-Qaim of Anbar Province to explain its suitability for agricultural exploitation in the region. The study included seven sites in Al-Qaim (Rtemi, Medicis, Eastern Akash, Okesha, Sawab, Albu-Hayat, and Al-Karah) to assess the validity of irrigation. The pH, Electrical conductivity (EC), positive ions ( $K^+$ ,  $Na^+$ ,  $Mg^{2+}$ ,  $Ca^{2+}$ ), and negative ions ( $HCO_3^-$ ,  $Cl^-$ ,  $SO_4^{2-}$ ) and  $CO_3^{2-}$  were measured. The results showed that the studied well water is acceptable for irrigation purposes in terms of pH value, as for the electrical connection, it was six wells within the class (C2), which is adequate for irrigation for medium-salty crops, except for one well, which is a fine well within class C3 suitable for irrigation of high salinity crops. The total hardness values were low and did not pose any risk; as for the positive and negative ions, they were within the permissible limits within the specified classifications. By measuring the positive ions, the Sodium Adsorption Ratio (SAR) value was calculated and determined to be within the class S1, which means that the groundwater in the region is suitable for irrigation.