Groundwater hydrochemistry and effects of anthropogenic pollution in Béchar city (SW Algeria)

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\textbf{ABSTRACT}

Béchar city is located in the southwest part of Algeria, characterized by an arid climate with Saharan tendency. It is subject to an increasing demand for water like all the great agglomerations, due to the economic and demographic development. In spite of a rate of rather significant connection with drinking water feeder system, the groundwater remains solicited for daily human activities (irrigation, sanitation, etc.). However, after use, the wastewater are rejected into Béchar wadi (river), which flows along the city, where the sewerage is discharged without treatment, causing a real threat to the environment, particularly to the groundwater, due to the nature and the hydrodynamic aquifer system in the city. The identification of facies, principal component analysis, Gibbs diagram, and reporting features have all given satisfactory results. This facies varies with dilution (wet period) or concentration (dry period) preferably elements of $\text{Cl}^-$, $\text{Ca}^{2+}$, $\text{SO}_4^{2-}$, $\text{Na}^+$, and $\text{HCO}_3^-$, depending on groundwater recharge. The chemistry of groundwater is related to a mechanism of acquisition that depends on the hydrogeology of the city and the significant anthropogenic input.

\textit{Keywords:} Béchar; Wastewater; Groundwater; Hydrochemistry; Anthropogenic contributions

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