

CEST02\_068

## ASSESSMENT OF GROUNDWATER QUALITY FOR DRINKING AND IRRIGATION PURPOSES IN ALHARSHA DISTRICT

Najat Mansour<sup>1\*</sup>, Omar Algeidi<sup>2</sup>, Abdulozez Arzoga<sup>3</sup>

<sup>1,2,3</sup> Department of Chemical Engineering, Faculty of Engineering, Sabratha University, Libya  
[abdulaziz.arzouga@gmail.com](mailto:abdulaziz.arzouga@gmail.com)

### ABSTRACT

In Libya, the main source of consumed water supply come from groundwater. Many ions and dissolved solids occur naturally in aquifers due to geological features and the composition of the soil. However, human activities cause the contamination of water by metals, hydrocarbons and microorganisms. Water quality is the critical factor that influences human health and irrigation proposes. The aim of this study is to investigate the hydrochemical and geochemical processes that influence the groundwater aquifers of Alharsha area (Zawia, Libya). Fifteen water samples were collected from domestic and agricultural water wells and analyzed for conventional classification techniques. The concentration of TDS, NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, Mg<sup>++</sup> and Na<sup>+</sup> were measured in order to determine the pollution level in these wells. In addition, various indices like Salinity Index, Sodium Absorption Ratio (SAR), Kelly's Ratio (KR), Residual Sodium Carbonate (RSC), Soluble Sodium Percentage (SSP), Permeability Index (PI) and Magnesium ratio are used to classify groundwater and surface water for drinking and irrigation purposes. Besides this, Piper, Gibbs, Wilcox and Chadha diagrams were studied for geochemical controls, and hydrogeochemistry of groundwater. The probabilities of pollutants transmission from sea and from sewage waste to water aquifers were also discussed.

**Keywords:** Groundwater, aquifers, total dissolved solids TDS.