

Abstract

Water quality of the Upper Cheliff region, located in North West Algeria, has in recent years undergone serious deterioration due to uncontrolled discharge of urban wastewaters, intensive use of chemical fertilizers in agriculture as well as to overexploitation.

This study aims at analyzing the flow pattern of the Mio-Plio-Quaternary aquifer, determining its

current hydrochemical status, understanding the mineralization processes involved in its chemical quality and evaluating the dams water quality located in the region of Upper Cheliff, through the achievement of monthly and annual quality sheets and interpretations and their changes over time during a cycle ten-years study (1999-2008). Environmental issues namely the

presence of pollutants and their origins, are also considered.

We studied hydrogeochemistry groundwater based on chemical elements analysis campaigns (cations, anions and TDS) in high and low waters that are performed by the ANRH during the two years 2002 and 2008; well as the temporal evolution of these elements over a period from 2002 to 2008.

Several studies have been performed; namely: geological, climatic, hydrogeological and hydrochemical. The processing and interpretation of hydrochemical data were made using various methods and tools (piezometric, statistics, Piper diagram, Stabler classification, chloroalkaline

indexes, bi-elements scatter diagrams, saturation indexes and mapping).

Groundwater is characterized by three hydrochemical facies according to Piper and Stabler diagrams, which are calcium chloride, sodium chloride and calcium bicarbonate.

The chemical water quality is poor, resulting from the strong salinity influenced by the lithology

of the aquifer, the climatic factors (evaporation) and anthropogenic factors (agricultural and urban wastes).

Quality sheets of surface water for 04 dams in the Upper Cheliff region (Ghrib, Deurdeur, Harreza and Ouled Mellouk) show a degradation over time from 1999 to 2008. This is due to organic pollution, nitrogen and phosphate expressed as COD, BOD₅, NH₄

+, NO₂

-, NO₃

- and

PO₄

³⁻, with a very high salinity expressed TDS.

Keywords: Groundwater, Hydrochemistry, Mineralization, water surface, Upper Cheliff.