

## **Hydrogeochemical evolution and contamination of groundwater in the Albertine Graben, Uganda**

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Synthesis of hydrochemistry for the riftmargin environments of the Albertine Graben, Uganda has been carried to conceptualize the influence of geology and local precipitation on the quality of groundwater. Recent oil discoveries are undergoing development in a region with one of the highest population growth rates (4.7%) in East Africa and the world, and yet the populace depends on groundwater resources for domestic water supply whose quality has been least studied in the region. Hydrogeochemical evolution and insights to potential contaminants of water resources arising from petroleum activities in the Albertine Graben were primarily determined by data collected under the current study and archived/historical data. Interpretation of hydrochemical data for the wet and dry season reveals weathering of silicate rocks that entails reverse cation exchange, precipitation and evaporation as the key processes influencing ionic concentrations. Multivariate statistical analyses of the hydrochemistry, trace and heavy metal data attributes high concentrations of Hg to possible anthropogenic sources associated with oil exploration in the Albertine Graben. Geogenic sources related to terrigenous input are suggested for the major cations and anions as well as some trace and heavy metals.