

# Accepted Manuscript

Radionuclide geochemistry of groundwater in the Eastern Desert, Egypt

Mahmoud I. Sherif, Neil C. Sturchio

PII: S0883-2927(18)30080-5

DOI: [10.1016/j.apgeochem.2018.04.004](https://doi.org/10.1016/j.apgeochem.2018.04.004)

Reference: AG 4067

To appear in: *Applied Geochemistry*

Received Date: 13 November 2017

Revised Date: 11 March 2018

Accepted Date: 9 April 2018

Please cite this article as: Sherif, M.I., Sturchio, N.C., Radionuclide geochemistry of groundwater in the Eastern Desert, Egypt, *Applied Geochemistry* (2018), doi: 10.1016/j.apgeochem.2018.04.004.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Radionuclide geochemistry of groundwater in the Eastern Desert, Egypt

MAHMOUD I. SHERIF<sup>1,2</sup> AND NEIL C. STURCHIO<sup>1</sup>

<sup>1</sup>Dept. of Geological Sciences, University of Delaware, Newark, DE 19716, USA

<sup>2</sup>Geology Dept., Tanta University, Tanta 31527, Egypt

## ABSTRACT

*Radionuclides have been recognized as a limiting factor of groundwater quality in the Middle East and Northeastern Africa. High levels of naturally occurring radioactivity, mostly from radium and radon isotopes, have been reported in waters from the Nubian Sandstone Aquifer System (NSAS) in several countries in the Middle East including the Sinai Peninsula of Egypt. This study aims at extending the existing data coverage by investigating radionuclide concentrations and their potential geological and hydrogeochemical controls in groundwater of the NSAS and the overlying alluvial aquifers in the Eastern Desert of Egypt. Radium isotope activities ( $^{226}\text{Ra}$  and  $^{228}\text{Ra}$ ) and uranium concentrations were analyzed in 39 groundwater samples from these aquifers. The shallow Nubian aquifer has  $^{226}\text{Ra}$  and  $^{228}\text{Ra}$  activities ranging from 0.016 to 0.750 and 0.018 to 1.421 Bq/L, respectively. The deep Nubian aquifer has  $^{226}\text{Ra}$  and  $^{228}\text{Ra}$  activities ranging from 0.019 to 0.051 and 0.014 to 0.248 Bq/L, respectively. The shallow alluvial aquifers have  $^{226}\text{Ra}$  and  $^{228}\text{Ra}$  activities ranging from 0.008 to 0.086 and 0.006 to 0.081 Bq/L, respectively. Groundwater in the Nubian aquifer may have Ra activities substantially in excess of the drinking water MCL values of the US Environmental Protection Agency (EPA), the European Union (EU), and the World Health Organization (WHO). The concentration of U varies from 0.06 to 33.06  $\mu\text{g/L}$ , 0.06 to 15.46  $\mu\text{g/L}$ , and 0.01 to 13.19  $\mu\text{g/L}$  for the shallow Nubian aquifer, the deep Nubian aquifer, and the shallow alluvial aquifers,*

Download English Version:

<https://daneshyari.com/en/article/8863103>

Download Persian Version:

<https://daneshyari.com/article/8863103>

[Daneshyari.com](https://daneshyari.com)