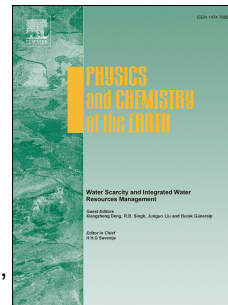


Accepted Manuscript

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PII: S1474-7065(16)30103-6

DOI: [10.1016/j.pce.2017.04.006](https://doi.org/10.1016/j.pce.2017.04.006)

Reference: JPCE 2601

To appear in: *Physics and Chemistry of the Earth*

Received Date: 1 June 2016

Revised Date: 5 April 2017

Accepted Date: 24 April 2017

Please cite this article as: Nthunya, L.N., Masheane, M.L., Malinga, S.P., Nxumalo, E.N., Mamba, B.B., Mhlanga, S.D., Determination of Toxic Metals in Drinking Water Sources in the Chief Albert Luthuli Local Municipality in Mpumalanga, South Africa, *Physics and Chemistry of the Earth* (2017), doi: 10.1016/j.pce.2017.04.006.

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Determination of Toxic Metals in Drinking Water Sources in the Chief Albert Luthuli Local Municipality in Mpumalanga, South Africa

Lebea N. Nthunya^{a,b}, Monaheng L. Masheane^{a,b}, Soraya P. Malinga^b, Edward N. Nxumalo^a, Bhekie B. Mamba^a, Sabelo D. Mhlanga^{a*}.

^aNanotechnology and Water Sustainability Research Unit, College of Science, Engineering and Technology, University of South Africa, Florida, 1709, Johannesburg, South Africa

^bDepartment of Applied Chemistry and the DST/Mintek Nanotechnology Innovation Centre-Water Research Node, University of Johannesburg, P.O. Box 17011, Doornfontein, 2028, Johannesburg, South Africa

Corresponding Author email address: mhlansd@unisa.ac.za; Tel: +2711 471 2104

Abstract

This study was conducted to determine the presence and levels of toxic metals on selected water sources in a rural community in Lochiel, South Africa. Collection of water samples from identified drinking water sources (open wells, community tanks, water treatment works and boreholes) was done in all seasons of the year (winter, spring, summer and autumn) between 2014 and 2015. The concentrations of identified toxic metals (cobalt, chromium, copper, lead, zinc, manganese and iron) were measured using ICP-OES. Some water sources were found to contain concentrations of toxic metals at levels slightly higher than USEPA, WHO and SANS241 set limits (*e.g.* manganese and cobalt), while others were found to be within the acceptable limits. This suggested that the residents residing in locations that have water sources containing toxic metals at the concentrations above the set limits are at risk and susceptible to suffer diseases caused by these toxic metals. The side effects of the metals may not be acute; however prolonged exposure to the toxic metals may result in detrimental effects since they are known to bioaccumulate in the body.

Key words: Toxic metals, contamination, rural communities, health effects

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