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Radioactivity assessment of Uranium Isotopes concentration in water sources at and near selected former uranium mines in the West-Rand area of Johannesburg

Radioactivity from several naturally occurring and anthropogenic sources is present throughout the environment and trace levels of radioactivity are normally found in all types of drinking water. The activity concentration and composition of these radioactive constituents vary from place to place, depending principally on the radiochemical composition of the soil and rock strata through which the raw water may have passed. The focus of this Master's program will be primarily on the Uranium activity in all types of drinking water near Uranium mines.

The main goal of the project is to determine natural radioactivity concentration of uranium isotopes in the surrounding areas of uranium and gold mines. The focus of the study will be in the West Rand area of Johannesburg where primarily most of the gold mining activity is concentrated.

The first part of this study will concentrate on the discharged effluent water (from the mines) into the nearby stream or river. The same stream or river where the mine chosen for the study is discharging its effluent water; a sampling point lower down the stream or river will be chosen where there is a possibility of farming activities;

The third part will focus on analyzing drinking water from the tap in the Johannesburg and Pretoria municipalities and look at a few commercially bottled mineral water available in supermarkets in the surrounding areas in Pretoria.

The analysis will be carried out by an Alpha Spectroscopy system (Canberra) with Passivated Implanted Planar Silicon (PIPS) detector which has 12 chambers. The relative efficiency of the system on desired shelf is approximately 12% which will also be verified during the study.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

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