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Assessment of the radiological and heavy metal water quality of Vaal River, South Africa

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The issues of an increased water quality and deterioration due to mining activities are if major concern. The river systems have deteriorated noticeably due to mining effluent and other industrial effluents.Mining activities are the major sources of the radio toxic and heavy metals pollutants.These pollutants are naturally found everywhere in the environment, and accumulate easily in the soil and water. Their concentration can negatively impact on the environment and to some extent the society. Some of the negative impacts of mining include destruction of water bodies, loss of biodiversity and food insecurity, high cost of living and water pollution.

Rivers play a significant role in providing needed portable water, which is not only a basic need but also a social, environmental and economic good wherein access to it is of radical need.The relationship between people and rivers existed for centuries as they depend on rivers for food and water, however, rivers tend to be easily misused through pollution by industries such as mining , agriculture and many other uses. It is of significance to have a functional river system that provide needed portable water to industries and domestic use.

In this study, Vaal River plays a significant role in providing needed portable water to varied industries of Gauteng and nearby Provinces of South Africa. However the river is polluted beyond acceptable measures and it is considered a dumping site for toxic pollutants such as the radiotoxic and heavy metals which affect the water quality of the river. The rate at which the river is being polluted will have severe impacts on the economy,food and the river system.

This study was selected following continuously reported pollution of the Vaal River despite several studies conducted.The study focuses on mining as the major user and pollutants of the water system, the river as a pathway of pollutants with more focus on the radiotoxic and heavy metals from the water source, hence the main objective is to assess the radiological and heavy metals. The study results is aimed at assessing the water quality and sustainability of the Vaal River for future reference, looking at all angles that may contribute to pollution, which include challenges faced when dealing with water quality of the river, monitoring and management program of the river as a way to propose a conceptual management model for the Vaal River.

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

Yes

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

PhD

Primary author: BOITSHEKWANE, Kgantsi (University of North West)

Presenter: BOITSHEKWANE, Kgantsi (University of North West)

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