



Contribution ID: 293

Type: Oral Presentation

In situ radionuclide analysis at a rehabilitated contamination site using a mobile gamma-ray detection unit equipped with a LaBr₃:Ce detector

Thursday, 6 July 2023 10:00 (20 minutes)

Carbonatite-peralkaline complexes represent the major type of host rock for phosphate in South Africa. It is well known that this rock also contains small amounts of naturally occurring uranium and its decay products. The spillage of polluted process water during December 2013 at the Bosveld Phosphates mine in Phalaborwa, South Africa, led to the run-off of this water into the adjacent Selati River that runs through the Kruger National Park (KNP). This caused concern for possible radiation pollution in the river and surrounding ecosystems. It is known that the site has since been rehabilitated. A mobile radiation detection unit equipped with a LaBr₃:Ce detector was used to perform in situ radiation measurements at two sites in the KNP, one unaffected by the process water spillage and the other being the contaminated site itself. Real-time activity data, synchronised with GPS coordination, was collected at both sites. Analysis of the spectral data and radiation mapping indicated successful rehabilitation as no elevated radiation levels were observed at the previously contaminated site compared to the unaffected site. Results obtained during the experimental measurements will be presented and discussed, and conclusions drawn during the presentation.

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

No

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

N/A

Primary author: VAN NIEKERK, Ferdie

Co-authors: Dr JONES, Pete; Prof. WOODBORNE, Stephan

Presenter: VAN NIEKERK, Ferdie

Session Classification: Nuclear, Particle and Radiation Physics

Track Classification: Track B - Nuclear, Particle and Radiation Physics