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Evaluation of Normally Occurring Radioactive Material (NORM) in the Ecuadorian Oil Industry

This project aimed to evaluate the presence of Natural Occurring Radioactive Materials (NORM) in oil extraction processes at the Auca, Sacha, and Shushufindi oilfields in the Ecuadorian Amazon. The Radionuclides activity readings were achieved by using high-purity Germanium (HPGe) Detectors and liquid scintillation counting. The samples came from sludge, scales and formation water, and a total of 25 samples were evaluated. Furthermore, using the Geiger Muller counter, the dose rate in 14 oil platforms was evaluated. The results evidenced the radioactive decay of U238 and Th232. Pb210 was the most active radionuclide with levels above 1000 Bq/Kg, which is the limit established by the International Atomic Energy Agency. The dose rate found in the platforms was below 1mSv/year, which is the recommended limit for the public. With the results of activity and dose rate, maps that represent the radioactivity in the Ecuadorian Amazon were plotted using Geographic Information Systems.

Keywords: NORM, High-purity germanium detectors, dose rate, activity

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