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1323 - Integrating geochemistry and gamma-ray surveys for REE targeting – a case study of Ouro Fino Intrusive Suite

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Located at the Brazil-Bolivia border, the Ouro Fino Intrusive Suite (OFIS) holds an unexplored potential for rare-earth elements (REE) deposits. This suite is a peralkaline, ferroan-granite and it is correlated to the mesoproterozoic Rondonian – San Ignácio orogeny. The OFIS is a NW-shaped granitic body and in its vicinities, there is a Cenozoic sedimentary sequence associated to the Guaporé River flood plain. This plain underwent intense laterization processes. A reassessment on soil and rock samples from previous exploration survey programs and airborne geophysical data analyses lead to a strong correlation between REE anomalies and gamma spectrometric thresholds. The main identified REE in soil samples are La, Ce, Nd and Y, and Yb in lower quantities. The ETR+Y contents reaches 2,43%, being constrained within granitic areas. Also, the bulk rock chemistry results yielded total rare-earth oxide contents of 1,06%. The presence of these elements is directly related to high eU-eTh and intermediate K% contents. The general K% and high-range of eU/eTh values are connected to the lateritic coverage and reflect the compositional variation of the laterites. The highest values of eU and eTh are concentrated in the eastern portion of the granitic body. As a final product of this study, a prospectivity model was used to define exploration targets for REE. This model was based on gamma ray values using the equation K%*(eTh+eU), whose results highlight as a potential deposit for REE the eastern part of the OFIS. This prospectivity model constrains the highest contents of soil chemistry but not entirely the REE anomalies in the NW part of the granitic hill. However, it is possible to consider it as a useful tool to trace REE in lateritic environments and granitic suites, given the notable contrast between K%, eU and eTh in both geological features.