



## Geophysical and petrophysical prospecting of Rare-Earth Elements in the Fazenda Buriti Alkaline Complex, Goiás Alkaline Province

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This paper was prepared for presentation during the 18<sup>th</sup> International Congress of the Brazilian Geophysical Society held in Rio de Janeiro, Brazil, 16-19 October 2023.

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### Abstract

Alkaline mafic-ultramafic intrusive provinces are important areas for exploration of Rare-Earth Elements (REE). However, the Goiás Alkaline Province (GAP) has no known REE occurrences. In this study, exploratory techniques applied to petrophysical, aerial and terrestrial geophysical data were developed for the selection of prospective targets and the discovery of REE mineralization, in the Fazenda Buriti Mafic-Ultramafic Complex, in GAP. The use of statistics and Boolean logic together with methods of magnetometry and aerial radiometry, and petrophysical measurements correlated with geological information, allowed the selection of potential targets. An exploratory probe hole 100 m deep consolidated the discovery with positive geochemical analyzes for REE due to supergene enrichment. The terrestrial follow-up of the targets with geoelectric sections, induced polarization in the frequency domain, magnetometric survey and measurements of magnetic susceptibility and radiometry in rock samples from the field and cores from the drill hole, established in detail the geophysical and petrophysical footprint of the zone of Mineralized hydrothermal breccia. The geophysical footprint occurs in a conductive zone associated with fertile structures that are conduits for the remobilization of hydrothermal fluids with sulfidation. It occurs associated with an intermediate magnetization associated with brecciated pyroxenite fragments in relation to the high background of the intrusion and the low background of the Iporá Granite host. The petrophysical footprint delimited the non-magnetic breach zone with the highest REE concentration. In addition, the use of multisource data contributed to the creation of the geological map at a scale of 1:25000 and the interpretation of shallow and deep magnetic structures.