

# SEG 2023 Conference: Resourcing the Green Transition

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## **Cerro Manomó: Carbonatites and BIFs with Rare Earth and Radioactive Mineral Anomalies**

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Cerro Manomó is located in eastern Bolivia in the Bolivian Precambrian region, southwest of the Amazon craton in South America. It is a sub-Amazonian region with subtropical jungle and vast vegetation, savannah-type plains, a surface area of 26 km<sup>2</sup>, and temperatures between 32° and 38°C. It is a conical and brecciated volcanic complex with extrusive rocks of fenitized carbonatitic magma, with lava flows and alkaline breccias. Various types of rocks containing rare earth elements, uranium, and thorium have been described. Some breccia dikes form annular domes on the top of the hill, with apatite lenses and the presence of BIF-type (non-marine) banded iron formations as well as pumice-type pyroclastic rolls. In the northern sector of the hill, concentrations rich in phosphates and uranium and thorium minerals have accumulated, where the BIFs with bands rich in silica and iron contain high anomalies in rare earth elements and radioactive minerals. The presence of iron carbonates, which are close to the alkaline annular cones, means that the complex is highly altered, with the presence of chalcedonic carbonatites with sharp edges, chalcedony and magnetite, and a record of 1500 cpm of radioactivity. The brecciated dikes have a composition of goethite, quartz-barite, and bastnaesite, which are interpreted as weathered carbonatites. Colluvium of carbonatites with goethite-type weathered iron oxide, in the upper middle part of the hill, has radioactivity of 3000 and 3600 cpm. On the slopes close to the volcanic breccias, there is presence of silver anomalies with little alteration. In the upper part of the hill, there are reddish clayey laterites, of high magnetic susceptibility, with high values of rare earths and with botryoidal goethite, goethite, hematite, jarosite, and magnetite.