



# SBGf Conference

18-20 NOV | Rio'25

**Sustainable Geophysics at the Service of Society**

**In a world of energy diversification and social justice**

**Submission code: 98VQA0YW56**

See this and other abstracts on our website: <https://home.sbgf.org.br/Pages/resumos.php>

## **Overview, Challenges, Opportunities, and Developments in Definition Geophysics for Iron Ore**

**Raphael Prieto (Vale), Hugo Oliveira (Cepemar), Demetrius Souza, Victor Marini (Geotek do Brasil), Divanir Junior (Master Geophysicist), Moara Matos (Vale), Thiago Mendes (Vale), Maria Masella, Rodrigo Mabub (Vale)**

## Overview, Challenges, Opportunities, and Developments in Definition Geophysics for Iron Ore

Copyright 2025, SBGf - Sociedade Brasileira de Geofísica/Society of Exploration Geophysicist.  
This paper was prepared for presentation during the 19<sup>th</sup> International Congress of the Brazilian Geophysical Society held in Rio de Janeiro, Brazil, 18-20 November 2025. Contents of this paper were reviewed by the Technical Committee of the 19<sup>th</sup> International Congress of the Brazilian Geophysical Society and do not necessarily represent any position of the SBGf, its officers or members. Electronic reproduction or storage of any part of this paper for commercial purposes without the written consent of the Brazilian Geophysical Society is prohibited.

---

### Introduction

The exploration of iron ore presents challenges not only in the stages of discovery and addition of new deposits but also in the extension of the Life-of-mine of existing operations. The sustainability of operations is a strategic driver for companies engaged in the commercialization of this commodity. The advancement of data acquisition and processing technologies, driven by the development of new sensors and the power of machine learning, has revolutionized the sector, promoting greater efficiency, sustainability, and precision in the identification and characterization of mineral deposits.

### Method and/or Theory

This work presents in-depth the execution of the Geophysics Definition program for Iron Ore, covering non-conventional multimethod airborne survey campaigns for mineral prospecting; implementation of hyperspectral core scanning; geophysical logging; and the integration of geophysical and geological data and products. This integration is carried out under an advanced analytics approach, aiming to support the stages of the mining value chain, including exploration in brownfield areas, drilling programming, and geological modeling.

### Results and Conclusions

The integrated multimethod data strategy allowed the definition of exploratory targets confirmed by geological drilling, adding potential mining operations and accelerating the data-driven decision-making process.