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Vale, BNDES and USP establish partnership to develop technology using micro-organisms that absorb copper waste

Aim is to recover low-concentration copper, currently deposited in tailings ponds, reprocess it and sell it on the international market

Vale, Brazil's national development bank BNDES, and the University of São Paulo (USP) have established a partnership to develop technology using micro-organisms that feed on copper. The idea is to identify the best micro-organisms at absorbing copper from tailings ponds, and then at a second stage to recover the copper, reprocess it and sell it on the market.

This research is taking place at Sossego Mine in Canaã dos Carajás, Pará, which began operating in 2004. The tailings pond, from which samples of micro-organisms are being taken, contains around 90 million metric tons of tailings (residual waste following ore processing) with 0.07% copper content.

Approximately R\$15 million will be invested in the five-year research project, funded by Vale (R\$3 million) and BNDES (R\$12 million). The bank is responsible for transferring the funds to the University of São Paulo Support Foundation, while the university is conducting the research, monitored by Vale.

The work is being performed by a team of 20 researchers at USP's Chemical Engineering Polytechnic School, under the coordination of chemical engineer Cláudio Oller. The resources do not include the copper-recovery technology's commercial application phase, which will depend on the project's results.

"So far we have collected around 35 micro-organisms, but the intention is to collect a much greater number. The initial goal is to identify the micro-organisms with the biggest capacity for absorbing copper and to understand how this occurs. All the analyses are being conducted at the engineering school's laboratories," explained Oller.

According to the director of the Vale Institute of Technology (known by Portuguese acronym ITV), Luiz Mello, who spearheaded the partnership on behalf of Vale, the agreement is a milestone for the company. Vale's Director of Copper Operations, Eugênio Victorasso, highlighted that, if successful, the research will generate a financial return for the business. The resources invested by BNDES, to be used by USP, come from FUNTEC, a technology fund created by the bank in order to stimulate the development of technologies based on scientific knowledge produced by Brazilian technology institutes.

"The solution will benefit the company, the university and the environment. It's the type of project that BNDES wants to promote in the country. We believe that the sustainability of the Brazilian private sector will be a competitive advantage in the international market this century, and we need to invest as of now to harness this opportunity," said Guilherme Lacerda, Environment Director at BNDES.

Sossego

Located in Canaã dos Carajás, southeast Pará, Sossego Mine was Vale's first copper project. Copper deposits were discovered in 1997 and construction work on the project began in 2002. The project was implemented in record time, with the first shipment of copper concentrate leaving the mine in June 2004.

The operation, which represents an investment of approximately R\$1.2 billion, generates around 2,500 direct and indirect jobs. Nearly 80% of the workers were recruited in Canaã dos Carajás and neighboring municipalities.

The mine's reserves are concentrated in two deposits, called Sossego and Sequeirinho. The open-pit mine uses large equipment such as excavators and off-highway trucks capable of carrying 240 metric tons.

More information



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