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Portuguese Mine Generates Acidic Water Following 43 Years Of Inactivity

ScienceDaily (Feb. 12, 2009) — Located five kilometers from the Spanish border, the Portuguese São Domingos mine, abandoned since 1966, continues to pollute the river ways that flow into Chanza dam, the largest drinking water reservoir in the province of Huelva, according to scientists from the University of Huelva. The new study shows that oxidation and the dissolving of sulfurs are processes that remain active today.

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The Portuguese São Domingos mine is located in the Iberian Pyrite Belt along with other mines located on the Spanish side, such as Rio Tinto or Almagrera, Huelva. The mine abounds in highly contaminating waste, such as smelting dregs and ash. Active between 1857 and 1966, over time it has generated "extremely" acidic drainage due to the oxidation of sulfuric waste.

According to Antonio M. Álvarez-Valero, lead author of the study published recently in the journal *Environmental Geology* and currently a researcher at the Andalusian Institute of Earth Sciences (a University of Granada - CSIC joint center), "the fundamental concern

from the environmental point of view deriving from this waste oxidation is the generation of acidic waters".

And the acidic discharge from São Domingos affects Chanza dam, the largest drinking water reservoir serving Huelva, because the pollutants undergo "a relative attenuation".

To evaluate the environmental impact and determine the level of acidification of some components, the study presents a characterization of the mineralogical, geochemical and physical properties of the mining waste from the São Domingos district. "We have established, through a later work, the potential risk of moving the toxic metals in this waste, and their possible incorporation into the food chain", Álvarez-Valero explains to SINC.

Although the mine is abandoned, it remains active "from the point of view of contamination". The researcher says that the contaminating impact of the mine is renewed in annual cycles. During the wet or raining periods, the contaminating elements "re-dissolve and once again generate acidity", Álvarez-Valero points out.

The analysis shows that "the massive presence of sulfurs in São Domingos in some of the waste ensures a continuous, annual generation of acidic mine drainage", the researcher confirms.

The mine, which is considered medium in size compared to others, is exposed to "a remarkable" volume of waste: 25 Mm3. Although a large part of this waste is inaccessible because it is located beneath the town of São Domingos, "its high acidification potential represents a threat for environmental pollution", the scientist says.

Faced with this situation, the researchers say that the methodical sequence of this study should be applied to other mines in the same area, such as Caveira, Lousal, Aljustrel, in the south-east of Portugal, and Tharsis, La Zarza, Peña del Hierro, Almagrera or Rio Tinto, in Huelva, where research projects are already underway.

The São Domingos mining district was active between the 19th and 20th centuries, but "mining there goes back to pre-Roman times", says Álvarez-Valero. In the abandoned or fossil mining areas, the largest sources of soil and surface water contamination come from the leaching (washing) of metals and metalloids from waste rich in sulfur (such as pyrite).

Journal references:

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The Portuguese São Domingos mine, abandoned since 1966, continues to pollute the river ways that flow into Chanza dam, the largest drinking water reservoir in the province of Huelva. (Credit: Antonio M. Álvarez-Valero / SINC)

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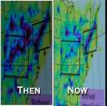
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