

## Preliminary environmental magnetic results from heavy metal contamination around the Erdenet Cu-Mo deposit, Mongolia.

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The Erdenet Cu-Mo porphyry deposit in Mongolia is one of the largest mines in the world and it has been operating since 1978. The ore processing waste is pumped into a tailings pond that contains ~400 million tons of tailings and 15 million m<sup>3</sup> of supernatant water. Environmental magnetic results are reported here for surrounding topsoils, stream sediments and sediments from the pond. The rock magnetic analyses indicate that the main magnetic minerals are pseudosingle domain magnetite and/or partially oxidized magnetite with minor pyrrhotite. This magnetic mineralogy is consistent through all samples, indicating that the observed fluctuations of magnetic susceptibility and saturation isothermal remanent magnetization (SIRM) intensity record the abundance of magnetic minerals in the samples. Based on geochemical analyses of the topsoils and stream sediments, positive correlations are found between susceptibility and SIRM intensity with heavy metal concentrations such as Cr and Zn. Further, SIRM intensity showed a more positive correlation with heavy metal concentration than susceptibility, implying that some of magnetite may be substituted by metal ions. These results indicate that environmental magnetic monitoring, especially the SIRM intensity, can be a rapid and cost-effective method for studying the spatial distribution of heavy metals in the Erdenet area.

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