

Characteristics of the Epithermal Veins in the South Teresa Deposit, Lepanto, Mankayan District, Philippines

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The South Teresa deposit is one of the newly delineated epithermal veins located in Lepanto, Mankayan District, Philippines. The veins are characterized by gray quartz with abundant pyrite (stage 1), white quartz with sphalerite, galena, and pyrite (stage 2), and anhydrite with sulfides (stage 3). The veins are hosted in hornblende diorite and andesite porphyry. Alteration haloes composed of illite and kaolinite typically surround the veins. Bulk geochemical analysis reveals that the veins of the stages 2 and 3 have significant mineralization with 0.08 to 5.7 ppm Au, 1.4 to 7.2 ppm of Ag, 43 to 950 ppm Cu, 5.97 to 7400 ppm Zn and 3.0 to 4600 ppm Pb. The Stage 1 veins contain 0.1 to 0.3 ppm of Au, while Ag content is lower than limit of detection.

$\delta^{34}\text{SCDT}$ values of pyrite in the stage 1 veins range from 0.0 to +2.2 ‰, while those in the stage 2 veins range from -1.9 to + 1.2 ‰. Pyrite from the stage 3 has a $\delta^{34}\text{SCDT}$ value of -0.1 ‰. Anhydrite from the stage 1 has $\delta^{34}\text{SCDT}$ values ranging from +16 to +18 ‰, while those from the stage 2 range from +17.0 to +22.0 ‰. Calculated sulfur isotope equilibrium temperatures using pyrite – anhydrite pairs range from 280 to 389 °C for the stage 1, 239 to 362 °C for the stage 2, and 340 °C for the stage 3. Trace element analysis of sphalerite reveals significant amounts of Fe, Cd and Mn contents. FeS content of sphalerite of the stage 2 ranges from 0.13 to 0.95 mol%. These results are consistent with base metal bearing epithermal Au-Ag mineralization derived from an intermediate sulfidation state fluid.