

SPECTRAL CHARACTERIZATION OF HYDROTHERMAL ALTERATION AT QUELLAVECO CU-(MO) MINE IN SOUTHERN PERU

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Quellaveco Cu-(Mo) mine is located in southern Peru, within the northern extension of the Chilean cupriferous trend, in the Andean Pre-Cordillera. A structural feature of regional dimensions, Arica Mega-Inflection, controls the occurrence of several porphyritic and epithermal ore-deposits. Mineralization is related to the intrusion of early Cenozoic dioritic and granitic domes. Among these, the Quellaveco Cu-Mo porphyry represents a major deposit of 2 By Mt with 0.7%Cu. The objective of the study was to determine the spectral signature of the alteration halo, in order to use this information for regional exploration purposes. Spectral characterization was based on 40 surface rock samples, collected from the outcropping outer shell of the mineralized core of the porphyritic system. Samples were analyzed using two reflectance spectrometers, Pima and Fieldspec FR, within the ranges of 1,3-2,4 and 0,35-2,5nm, respectively. Dominant alteration spans from potassic (Bio-Ser) to argillic (I-Sm). Several veins containing allunite and secondary copper minerals (malachite, chalcocite) were also recognized. The spectral response obtained from both instruments was similar, although the spectral range of Pima is limited to the SWIR, whereas the Fieldspec-FR covers the VNIR and the SWIR. This is because the alteration mineralogy in Quellaveco shows diagnostic features mostly in the SWIR. However, it was observed that the characterization of Fe-bearing carbonates and clay minerals can be improved if the VIS and NIR ranges are included in the analysis.