

2045 - Domaining Hyperspectral Mineralogy and Geochemistry to Characterize Gold Recovery at Alturas Deposit, El Indio Belt, Chile

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Alturas is an oxide high-sulfidation epithermal advanced stage exploration project in the El Indio Belt, Chile. Gold recovery, in this and other types of Au deposits, may be affected by the presence of Cu- and As-bearing sulfides and the occurrence of sulfosalts and clays. Therefore, the determination of mineralogical controls which differentiate Au that is cyanide-leachable and non-cyanide-leachable is tantamount to the successful mining of gold. Between 2014 and 2015, 57 diamond drillholes at Alturas were analyzed using the HCI-3 Corescan system from which spectral geologists interpreted 16 distinct minerals and their variations in mineral chemistry and crystallinity. Combining mineralogical data from Corescan and multielement geochemistry (4-acid digestion followed by ICP-MS analysis for 48 major and trace elements, as well as Au by fire assay and AAS) allowed for the definition of distinct domains which are characterized by specific mineral assemblages associated with recoverable and non-recoverable Au.

In addition to the impact on Au recovery, these domains predict other ore-body attributes. For example, there are implications for bench and block design based on the spatial variability of mineral and textural domains. Furthermore, there is a strong influence on ore processing through domaining the distribution of alteration and primary rock type; these parameters are linked to grinding, flotation and leachability via solubility, hardness, and the presence of minerals such as clays. Consequently, mineralogical domaining has larger implications to refine geological, geometallurgical and process optimization models in a predictive space.