Characterization of the Gold Hill Low Sulfidation Epithermal Au-Ag Vein Deposit, Northern Nye County, Nevada

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The Gold Hill low-sulfidation epithermal (LSE) vein system is an exceptionally well-preserved and extensive Oligocene-age deposit located within Round Mountain mining district of northern Nye County, Nevada, USA Gold Hill seven kilometers north of the world-class Round Mountain LSE deposit, which has produced >16 million ounces of gold to date. Although there is a close spatial and temporal relationship between Gold Hill and Round Mountain, the genetic relationship (if any) between these two systems remains unclear. This study presents new data that characterizes the ore and gangue mineralogy of at least three stages of mineralization at Gold Hill as follows: Stage I), Pyrite-breccias and quartz- adularia- K-feldspar alteration of wallrock angular clasts polymictic-monomictic breccias with pyrite +/- As-rich rims. Stage II), white-tan-pink medium-coarse grained, massive-ghost-bladed- saccrodial- quartz veins with pyrite +/- marcasite +/- electrum +/- Cu-Zn metal +/- chalcopyrite, and Stage III), fine-grained crustiform-colloform quartz-chalcedony veins with pyrite, electrum, proustite-pyrargyrite, argentiferous tetrahedrite-tennantite, and minor arsenopyrite. Economic Au-Ag mineralization is restricted to the base of the boiling zone ~450 m below the base of the sinter. Wallrock alteration envelops high grade portions of the vein-hosted orebodies and typically consists of a quartz-adularia-illite-pyrite assemblage that replaces primary feldspars. This alteration transitions to a K-feldspar-interlayered illite/smectite-quartz +/- sericite assemblage adjacent to inferred high-temperature upwelling zones. Pyrite, chalcopyrite and acanthite samples from the Gold Hill deposit have $\delta^{34}S$ values that range from -14.4‰ to +16.6‰, including a pyrite-chalcopyrite mineral pair that yielded a temperature estimate of 226ºC. Gold Hill appears to be a unique vein system, outboard of the Round Mountain deposit, that shows distinct base-metal anomalies associated with high-grade veins, a subvertical nature of the vein system, and a close spatial association to intrusive dike units, indicating potential for other additional deposits within the Round Mountain mining district.