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Constraining Mineralization and Alteration Through New Geologic Mapping at Spring Peak Low-Sulfidation Epithermal System, Mineral County, NV

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Spring Peak is a newly discovered low-sulfidation epithermal system with a well-preserved epithermal footprint at surface. The high-grade gold mineralization at Spring Peak is located within the boiling horizons of thermal upwelling zones, one of which is located directly beneath the outcropping sinter, which preserves high-temperature lithofacies. Sinters are surficial expressions of low-sulfidation epithermal systems and form where silica oversaturated alkali-chloride fluids are expelled in hot spring deposits, forming a predictable gradient in lithofacies with distance from the vent source. This project involves detailed 1:2000 geologic mapping, which aims to identify alteration trends and the location of favorable structural controls in order to delineate additional upwelling zones with potential to host previously unrecognized gold mineralization. Geologic mapping to date has identified a window of Mesozoic units exposed by faulting and Tertiary bi-modal volcanism. Epithermal alteration is most intense around NNE-NE striking high-angle normal faults and includes sinter, hydrothermal breccia, quartz veins with preserved boiling textures, adularia and argillic alteration. This detailed mapping will be complemented by research into the Spring Peak sinter and preserved lithofacies to identify the locations of high temperature vent conduits and low temperature, distal-apron fluid pathways and to identify the spatial and temporal relationships of sinter deposition with gold mineralization. The age of mineralization at Spring Peak has yet to be constrained and $^{40}\text{Ar}/^{39}\text{Ar}$ dating of adularia in mineralized drill core, coupled with rhyolite domes collected at surface, will determine whether Spring Peak has similar Miocene mineralization analogous to the nearby Aurora system, or if Spring Peak is a potentially younger sinter-vein system. Geologic mapping of the sinter-vein system at Spring Peak offers a unique opportunity to study epithermal alteration and associated sinter deposition with proximate gold mineralization at depth.