

Spatial and Temporal Relationships Between Carlin-Style Gold and Polymetallic Mineralization at the Deep Cove Gold-Silver Deposit, Lander County, Nevada

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Cove is a ~39 Ma previously mined Au-Ag deposit in the Battle Mountain area of Nevada that contains both Carlin-style and polymetallic mineralization. It has been interpreted as a distal disseminated deposit approximately 1.5 km northeast of the ~39 Ma McCoy Au skarn deposit located adjacent to a ~41.5 Ma quartz monzonite stock. Previous geologic mapping, stable isotope analyses, and geochronology have suggested Cove is genetically associated with the intrusive system responsible for the skarn mineralization at McCoy. Recent exploration drilling by Premier Gold Mines below, north, and south of the open pit has intercepted at least three previously undefined ore zones including the Carlin-style Helen and Cove South Deep (CSD) zones and the polymetallic vein-type 2201 zone, all hosted in Triassic sedimentary rocks.

Polymetallic vein-type mineralization of the 2201 zone, located below the old Cove open pit beginning at depths of ~2000 feet, is mostly confined to the conglomerate and sandstone members of the Dixie Valley Formation, and as disseminations in carbonates. The veins range up to 6.5 cm in width and contain variable amounts of pyrite, sphalerite, galena, chalcopyrite, arsenopyrite, pyrrhotite, quartz, calcite, Ag-bearing sulfides, and native Au. The polymetallic veins have K-feldspar alteration envelopes, as evidenced from sodium cobaltinitrite staining. The Helen zone is hosted in commonly silty limestone of the Favret Formation and overlying dolomite of the Augusta Mountain Formation about 500 m northwest of the pit, at depths of 1200 to 1800 ft along the NW-trending Cove anticline, whereas the CSD zone is below the pit hosted in the same lithologies and at similar depths. Gold and silver mineralization in the Carlin-style zones is strongly associated with zones of decarbonatization and silicification and is rich in fine-grained arsenian pyrite that may or may not display rims and arsenopyrite. Cove displays unusually high Ag/Au ratios for Carlin-style mineralization. In the Helen zone, where Au grades are as high as 135 g/t, Ag/Au ratios average 2:1 but are locally >1000:1. Inspection of Premier's recent drill core from the CSD zone suggests the Carlin-style mineralization has locally overprinted earlier polymetallic sulfide mineralization. Intrusions, which can host gold and silver mineralization, are more commonly encountered in drill core at the Helen Zone but are also observed in the CSD and 2201 zones. They routinely display quartz-sericite-pyrite alteration and are mostly classified as granitic to granodioritic porphyries. A different finer-grained, pilotaxitic-textured andesitic dike with abundant calcite alteration has been encountered in the Helen Zone but not observed elsewhere.

Ongoing petrography, microanalyses, and age dating are aimed at documenting (1) the temporal relationship between Carlin-style mineralization and polymetallic mineralization, (2) the temporal relationship between dikes and the two styles of mineralization, and (3) the deportment of silver in zones of Carlin-style mineralization where there is no evidence of polymetallic mineralization. This study is not only assisting exploration and development of the Cove property, but will also lend insight into questions about the relationships between Carlin-type deposits, distal-disseminated deposits, and magmatism.