## Paragenetic Relationships at the Tuvatu Alkaline Epithermal Gold Deposit, Fiji

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The Tuvatu alkaline epithermal Au-Te deposit is located on the island of Viti Levu, Fiji. Mineralization occurs in high grade, narrow veins that are hosted by the 4.85 Ma Navilawa monzonite, which forms a subvolcanic intrusion to a partially eroded shoshonitic volcano. The main mineralized zone strikes almost 900 m, has a vertical extent of more than 500 m, and remains open at depth. The deposit is currently under development and contains an indicated resource of 1.0 Mt grading 8.48 g/t Au (274,600 oz Au) and an inferred resource of 1.3 Mt at 9.0 g/t Au (384,000 oz Au) at a cut-off grade of 3.0 g/t Au. Microanalytical work reveals a complex overlap of high- and low temperature processes. Pervasive high-temperature potassic alteration of the Navilawa monzonite is characterized by abundant hydrothermal K-feldspar and secondary biotite. The potassic-altered monzonite is crosscut by first-stage epithermal veins hosting abundant base-metal sulfides. These base-metal rich veins contain euhedral pyrite as well as dendritic aggregates of chalcopyrite, sphalerite, and galena. Mosaic quartz is the principal gangue mineral. Second-stage epithermal veins host the majority of the Au mineralization. Native gold and telluride dendrites occur with roscoelite in bands of mosaic quartz. Relic microtextures suggest that the quartz formed as the result of the recrystallization of non-crystalline, microspherical silica. The microspherical silica is interpreted to have formed under conditions of rapid silica supersaturation caused by the flashing of the hydrothermal fluids, which also triggered gold deposition at far-from equilibrium conditions. Formation of the high-grade vein material was followed by the deposition of chalcedony or euhedral quartz. The third and final stage of epithermal mineralization consists of barren carbonate veinlets. Identification of fluid flashing during deposit formation has important implications for further exploration at Tuvatu and advances the model for how alkaline epithermal deposits form.