Gold Mineralization at the Texas Canyon Project, Northeastern Elko County, Nevada

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Geologic mapping, petrology, geochemistry, geophysical, and hyperspectral surveys of the Texas Canyon project, about 60 kilometers north of Wells, Nevada in the eastern Knoll Mountains and within the eastern Contact Mining District, are being used to elucidate the lithologic, stratigraphic, and structural controls on sedimentary rock-hosted gold mineralization. Mineralization at the Texas Canyon project is not typical of Carlin-type sedimentary rock-hosted gold deposits in eastern Nevada, although the Texas Canyon project is located along the northeastern margin of the recently identified Long Canyon trend in eastern Nevada, a region of Paleozoic strata that were strongly and complexly deformed by mid-Mesozoic orogeny and host major gold deposits. The oldest structures are Mesozoic thrust faults which offset Paleozoic stratigraphy and are, in turn, displaced by Tertiary age, high-angle faults. At Texas Canyon, base and precious metals mineralization are hosted both by Mesozoic thrust faults and by high angle Tertiary normal faults.

The prospect is centered on a broad zone of structurally controlled hydrothermal alteration that includes decalcification and silica replacement of limestone. This alteration is localized along numerous northeast-striking high-angle veins as are bodies of clast-supported polyphase hydrothermal breccia and adjacent hydrothermal replacement zones. Silicification is common to all areas of gold mineralization (up to 1,280 ppb Au) and occurs within strongly altered limestone and breccia. The breccia is younger than the high angle faults that it cuts.

Host rock lithostratigraphy includes west and northwest dipping, shallow marine units of the Cisuralian (lower Permian) Pequop Formation, composed of fossiliferous limestone, siltstone, sandstone, chert, and conglomerate. Fossil hash beds and clastic sedimentary rocks are locally poorly sorted and suggest shallow water dynamic deposition. Tertiary pyroclastic surge and air-fall tuffs, and associated volcaniclastic rocks, unconformably overlie the Pequop Formation, and in the west are overlain by highly porphyritic rhyolite flows and welded tuffs with discontinuous basal vitrophyre and base-surge deposits interpreted as cogenetic. Younger unsorted and poorly indurated Tertiary lahar, debris flow, and boulder conglomerates crop out in a likely graben between mineralized Paleozoic rocks to the east and post-mineralization volcanic rocks to the west.

At Texas Canyon a detailed radiometric survey identified a greater than 400-foot diameter, roughly circular anomaly coincident with polyphase breccia centered on the historic Prince Mine uranium prospect and in the hanging wall of a northeast-striking, southwest-dipping normal fault. This anomaly includes elevated gold, molybdenum up to 1,660 ppm, and uranium mineralization of up to 7 percent in historic samples. Within the Prince Mine workings, uranium mineralization is related to a subvertical body of hydrothermal breccia and alteration, and likely formed along a synvolcanic graben or caldera-related fault. Coincident gold-molybdenum-uranium values occur throughout the Texas Canyon prospect but are highest within the polyphase breccia at the Prince Mine.

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