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GSA Annual Meeting in Phoenix, Arizona, USA - 2019

Paper No. 258-18

Presentation Time: 9:00 AM-6:30 PM

PETROGENESIS OF THE SHOSHONE GRANITE BENEATH THE ROUND MOUNTAIN GOLD MINE, NEVADA

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The Round Mountain Gold Mine in Nye County, Nevada, produces half a billion dollars' worth of gold annually from several rhyolitic tuffs in the open pit mine. Round Mountain itself is located in the Big Smoky V₂ regionally characterized by several horst-and-graben structures resulting from Basin and Range-related extension which is accommodated by extensive normal faulting. This study focuses on the relationship between the Oligocene-aged rhyolite-hosted gold, designated as rock type 2, 3 and 4, and the Shoshone granite (designated as type 8) which exists directly beneath type 4. Investigation of the Shoshone granite beneath the Round Mountain Gold Mine aims to evaluate the potential connection between the granite and the subsequent generation of the rhyolites and their associated mineralization.

Hand samples of granite were studied in order to determine general characteristics. Thin sections were analyzed under a polarized light microscope and will be further studied using scanning electron microscopy (SEM) and elemental mapping capabilities. Bulk geochemical characteristics (major and trace elements) will also be used to evaluate its petrogenetic history. In addition, by employing the use of U-Pb dating of zircon and apatite, a more precise age for the granite will be determined (currently mapped as Cretaceous). Collectively, this dataset will help place granite formation within the geological evolution of the region's history of magmatism at the Round Mountain Gold Mine.

Initial observations of granite samples have revealed a variety of textures and constituents. Samples are holocrystalline, phaneritic, seriate, with subhedral-anhedral crystals. The granite is characterized by an abundance of plagioclase and quartz and a lack of alkali feldspars, classifying it as a tonalite (QAF classification). Accessory apatite and zircon are also present. To date, one zircon in the overlying rhyolite tuffs has yielded a U-Pb age of 3.5 ± 0.5 Ma. The preliminary interpretation is that this one crystal was recycled from the underlying granite thus implying that the Shoshone granite does indeed have a role to play in the generation of the gold-bearing rhyolites.

Session No. 258--Booth# 62

T167. Geologic Energy Research (Posters)

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