

Characterization of the Mineralization and Alteration of Tower Mountain, Conmee Township, Shebandowan Greenstone Belt

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The Tower Mountain Intrusion (2690 \pm 3Ma; U-Pb zircon age) is interpreted to be a Timiskaming-type, alkalic pluton, which intruded intermediate metavolcanic rocks of the Shebandowan Greenstone belt in Conmee Township located west of Thunder Bay. The intrusion comprises multiple phases that include syenite, and monzonite, with gabbro located mostly within the core of the intrusion; the latter distinguished by higher magnetic properties. The margin of the intrusion and surrounding undated volcanic rocks displays intense hematite-carbonate-sericite-chlorite-epidote-potassic alteration that has been interpreted to be associated with gold mineralization. The western contact zone of the intrusion contains the highest gold grades. One of the best intersections yielded assay results of 160.0 g/t Au / 1.5 m, but the controls on gold mineralization are poorly understood. This study aims to characterize the mineralization and the alteration associated with the Tower Mountain intrusion. Mapping and sampling of the various phases within the intrusion and in the surrounding metavolcanic rocks at surface and within two drill cores that intersect the gold mineralized zone provided geological constraints for this study. Petrographic and SEM analysis will characterise the textures, and mineralogy of the intrusive, metavolcanic and altered rocks and whole rock major, trace and REE analyses will characterize their composition. In addition, a sample of the metavolcanic rocks was submitted for U-Pb zircon geochronology to determine the absolute age of the metavolcanic rocks and, therefore, their temporal relationship to the Tower Mountain intrusion. Petrographic analyses indicates that the intrusion is dominantly monzonite to quartz monzonite in composition, with lesser syenite and a gabbroic core. Plagioclase phenocrysts are sodic and display polysynthetic and lesser Carlsbad twins, whereas SEM analysis indicate that the groundmass is a mixture of sodium and potassium feldspars and quartz. The most intense alteration is associated with the margins of the pluton but diminishes significantly a few 100 meters away from the contact zone. SEM analyses indicate that the gold occurs as inclusions within pyrite grains and along fractures in pyrite which is hosted within hornblende \pm tourmaline veins.