

sulphides such as chalcopyrite, pyrrhotite, galena, sphalerite and a variety of telluride phases. This honours research project is focused on elucidating the paragenesis and origin of the mineralization through the trace element signatures of the native gold found at Valentine Lake, as well as the compositions of other sulphides and alteration assemblages associated with the mineralization. The samples for this project were collected from two of the license areas of the project (Leprechaun Pond Deposit and Valentine East Zone), and have been cut to produce a series of polished thin sections and 1” diameter polished pucks. The thin sections are presently undergoing petrographic and SEM analysis to identify possible titanium bearing minerals and complex mineral intergrowths, and to develop a host rock-alteration-veining-ore mineral paragenesis. Secondary Ion Mass Spectrometer (SIMS) analyses are being conducted on the polished puck samples to determine the detailed element composition of the native gold. With these data, the ultimate goal is to describe the paragenesis of gold mineralization in the Leprechaun Pond and Valentine East zones, and utilize the trace element signatures of the native gold to identify the consanguineous episodes of gold mineralization and/or discriminate multiple gold mineralization events within single or multiple zones. Further, the trace element compositions of the native gold may allow a comparison Valentine Lake to other similar gold mineralization in the Dunnage Zone, and begin to establish a regional relationship for at least some of the gold forming events and occurrences.

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**Paragenesis and composition of native gold from the Valentine Lake Deposit, central Newfoundland: a secondary ion mass spectrometry and S scanning electron microscope – energy dispersive analysis investigation**

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S. TARRANT, AND G. LAYNE

*Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland A1C 5S7*

The Valentine Lake Deposit is an orogenic-structurally controlled gold occurrence located in central Newfoundland, 57 km south of the town of Buchans and 90 km southwest of the municipality of Millertown. The occurrence is hosted by altered and locally metamorphosed trondhjemite of the Precambrian Valentine Lake Intrusive Suite located in the western extension of the Exploits Subzone. The native gold mineralization is found predominantly along the sheared contact of the intrusive unit and the younger, yet structurally underlying, Silurian Rogerson Lake Conglomerate. It is hosted mainly within extensional and shear-fracture filling auriferous quartz and quartz-calcite veins but is also seen in limited amounts within both the host rock and underlying conglomerate. The mineralized veins are generally quartz-tourmaline-pyrite veins, with the native gold closely associated with the pyrite. The veining also contains