From the Mineral Inventory Files

The Long Lake Mo-W-Cu Greisens: a Classic Example of Greisen Development

Greisen is defined as an altered granitic rock consisting of quartz and white mica. Typical greisens have a silver-grey, sparkly appearance. Greisens are common hosts to deposits of granophile elements (Sn, W, Mo, Li, Rb, Be, Cs, F) and base metals, especially in the contact zones and apical portions of peraluminous granites. Southern mainland Nova Scotia is underlain by many such granites with numerous greisen occurrences, most notable being the East Kemptville Sn-Zn-Cu-Ag deposit in Yarmouth County. Despite its smaller size, greisens at the Long Lake Mo-W-Cu Prospect, west of Chester Grant in Lunenburg County (Fig. 1), reveal a much more impressive example of classic greisen development.

The first mention of minerals at Long Lake was noted as Mo-bearing pegmatite float on E. R. Faribault's 1924 geology map. It wasn't until the late 1950s that an F. Matthews first explored the property, and shortly thereafter provincial geologist J. D. Wright noted the presence of scheelite in greisen outcrops nearby. Subsequent trenching unearthed several quartz-pegmatite dykes rich in molybdenite. The property went through two periods of exploration during the 1960s, when trenching and 15 diamond-drill holes indicated the presence of widespread greisenization along the contact with the Goldenville Group metasediments (Fig. 1). Most of the high-grade molybdenite occurs in the pegmatites (up to 3.5% Mo) and the adjacent greisens host most of the wolframite-scheelite (2.5% W), chalcopyrite (1900 ppm Cu) and lesser molybdenite (765 ppm Mo). The low grade of Cu in the greisens and the sporadic Mo and W levels led to the ground being dropped.

I visited the site in 1979 (see DNR Paper ME 1982-002) while most of the trenched areas were still not overgrown and I was impressed by both the degree of greisen development and how well it was exposed, and by the abundance of highly mineralized float that remained strewn about. I was able to collect several spectacularly mineralized samples

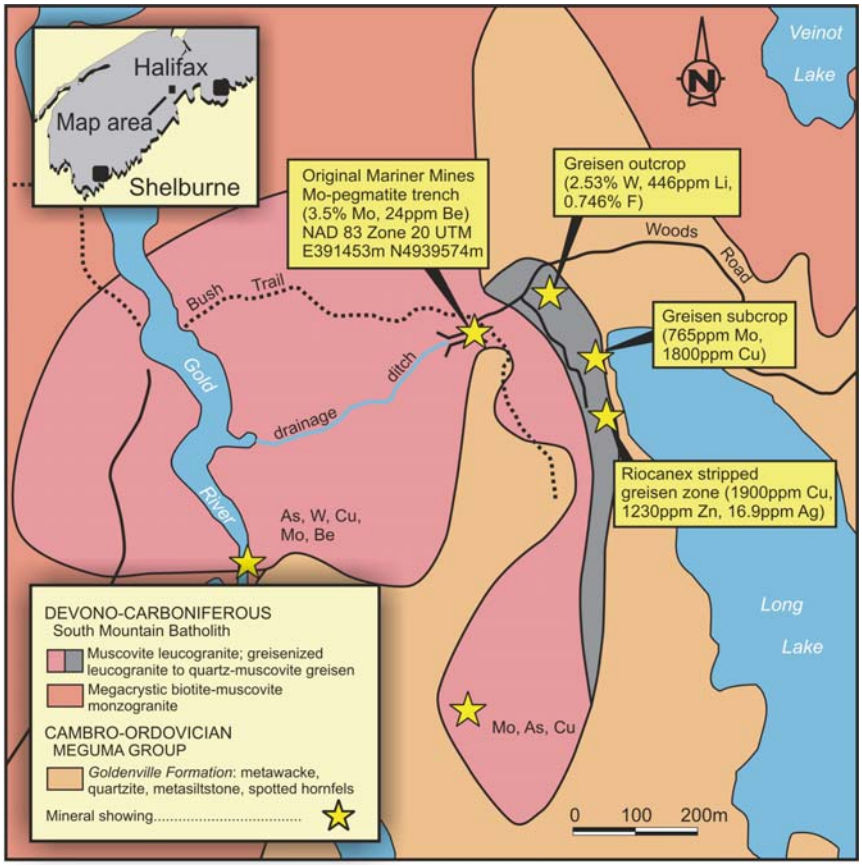

***Figure 1**. Geology of the Long Lake Mo-W-Cu-bearing greisens and pegmatites, Chester Grant, Lunenburg County.*

including a cigar-shaped pod of massive wolframite-scheelite 20 cm long by 6-8 cm in diameter and a single, euhedral, molybdenite crystal almost 2 cm across and 3 cm long. Because the greisen zone was so well exposed and the transition from unaltered to altered rock is so striking, I mapped the property in detail (Fig. 1). The main granitic host rock, medium-grained, orange to cream coloured leucogranite, consists of quartz, orthoclase (microcline), albite and muscovite. Toward the granite-metasediment contact, the orange colour fades (with a decrease of orthoclase content) and the rock grades into a greisenized leucogranite (quartz, albite and muscovite). Increased greisenization resulted in replacement of the albite by quartz and muscovite to produce a zone of classic quartz-muscovite greisen. Within this greisen zone are veins, pods and lenses of very well developed, muscovite-rich greisen and within these are found the wolframite, scheelite, chalcopyrite and molybdenite.

The greisens at Long Lake constitute the second largest, and best developed greisen body known in the province, next to those at the East Kemptville Sn-Zn-Cu-Ag deposit. The greisen zones at Long Lake, however, have experienced only a fraction of the exploration undertaken at East Kemptville. Further, the exploration at Long Lake was done prior to the recognition of southwest Nova Scotia as a *bona fide* tin metallogenic domain. Perhaps if Long Lake were re-evaluated using modern exploration models something more could be found.

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