

Gold in the Meguma Terrane, Southern Nova Scotia: Is There a Continuum between Mesothermal Lode Gold and Intrusion-related Gold Systems?¹

D. J. Kontak, G. A. O'Reilly, M. A. MacDonald, R. J. Horne and P. K. Smith

The Meguma Terrane (MT) of southern Nova Scotia is dominated by two lithotectonic units, the Cambro-Ordovician Meguma Group metasedimentary rocks and 380 Ma peraluminous South Mountain Batholith and related intrusions. The Meguma Group consists of a lower, sandstone-dominated unit and an overlying siltstone dominated unit. These strata were folded (chevron and box fold styles) and metamorphosed (greenschist to amphibolite grade) during the Acadian Orogeny at ca. 410 Ma. Intrusive activity of 380-370 Ma was dominated by crust-derived peraluminous granites, but lesser amounts of spatially- and temporally-related mafic intrusions occur. Gold production from Meguma lode-gold deposits (MLGD) was from both concordant and discordant, quartz-carbonate-sulphide veins that formed relatively late in the folding history of the host rocks - a metamorphic origin is suggested for their origin. However, integration of past and recent observations with changing global concepts on gold metallogeny suggests that a reassessment of these deposits is warranted. In this regard, the following points are highlighted: (1) recent Re/Os dating of arsenopyrite from several MLGD indicates two vein-forming events at 408 and 380 Ma. These ages for vein formation are significant and coincide with regional deformation and plutonism in the MT; (2) widespread occurrence of MLGD throughout the MT irrespective of metamorphic grade, stratigraphic position, and proximity to intrusions; (3) spatial association of some vein mineralogy (e.g., garnet, amphibole, tourmaline, calcic plagioclase) in MLGD proximal to intrusions (e.g., Newhouse, 1936); (4) elemental enrichment of some MLGD veins in a suite typical of intrusion-related gold deposits (i.e., Bi, Te, Mo, Sb), and (5) arsenopyrite-bearing albitites, quartz veins, and quartz-muscovite-tourmaline-sulphide greisen swarms (e.g., 260 m long by 120 m wide) that are hosted by 380 Ma, reduced, peraluminous granites. These systems are variably enriched in Au (to 2 g/t) and have a metal association (i.e., Bi, Co, W, Sb) typical of intrusion-related gold systems. The foregoing observations are interpreted to indicate that those MLGD of ca. 380 Ma may in fact form a continuum with intrusion-related gold mineralization hosted by intrusions of similar age. Thus, within the MT two distinct gold-mineralizing events are suggested, one at 408 Ma related to regional deformation accompanying accretion of the MT to Avalonia and a second at 380 Ma that is related to emplacement of crust-derived granites. The general similarities of all the MLGD indicates the non-uniqueness of the deposits and suggests, instead, that there may be a continuum between intrusion-related and mesothermal type vein mineralization.

¹Geological Association of Canada-Mineralogical Association of Canada, Annual Meeting, Brock University, St. Catharines, Ontario; *in* Abstracts with Programs