

## **Valentine Lake: A Trondhjemite-hosted Orogenic Gold Deposit in the Dunnage Terrane (Exploits Subzone), Newfoundland**

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### Abstract

Marathon Gold Corporation's Valentine Lake property is located in the Exploits Subzone of the Newfoundland Appalachians, approximately 20 km east of the main Iapetan suture - the Red Indian Line (RIL). The property contains numerous auriferous zones, largely hosted within trondhjemite of the Neoproterozoic (563±2 Ma) Valentine Lake Intrusive Suite (VLIS). The largest recognized zone (Leprechaun Gold Deposit) contains measured and indicated resources totalling 10.59 Mt at 2.28 g/t Au (775,000 oz. Au) as per August 1, 2013 press release. Gold mineralization occurs almost exclusively in quartz-tourmaline-pyrite (QTP) veins, stockworks and adjacent vein selvages. Vein networks are proximal to a 30 km regionally extensive, brittle-ductile shear zone, which defines the eastern contact of the VLIS with the more competent Silurian Rogerson Lake Conglomerate (RLC). A suite of variably-deformed mafic dykes, oriented sub-parallel to shear, are also concentrated in this zone. Significant orogenic gold occurrences have been previously discovered within the more intensely deformed Cambrian volcanic sequences of the adjacent Victoria Lake Supergroup (VLSG), located immediately north-west and approximately 10 km east of the RIL. Here, gold mineralization is also localized along late brittle-ductile shear zones, a characteristic that essentially mimics the structural control observed in the VLIS mineralization. Detailed mineralogical and geochronological (rutile U-Pb) studies are designed to elucidate the timing and nature of gold mineralization and related alteration at Valentine Lake, and test the possibility of multiple mineralization episodes that correlate with Salinic (Silurian) and/or Acadian (Devonian) orogenic events. Petrographic, lithochemical and zircon U-Pb analysis of representative mafic dyke samples is directed at constraining their age and timing with respect to proximal gold mineralized zones. This study should provide better understanding of the timing and specific process(es) of gold mineralization at Valentine Lake, with potential application to a refined exploration strategy.