

A geological, geochemical, and mineralogical study of the Heritage gold–silver prospect, Point May, Newfoundland, Canada

GREG C. WOODLAND AND GRAHAM D. LAYNE

Department of Earth Sciences, Memorial University of Newfoundland, 300 Prince Philip Drive, St. John's, Newfoundland and Labrador, A1B 3X5, Canada

The Heritage Project is located on the southern shore of the Burin Peninsula, a part of the Avalonian terrane increasingly recognized for its potential to host epithermal precious-metal deposits. In addition to the Heritage Project, several other significant prospects have been identified on the Peninsula (including Big Easy, Hickey's Pond, and Stewart). First discovered in 2011, the Point May Epithermal System (PMES) contains both multi-episode vein breccias and massive veins (Eagle Zone). The PMES is 4.5 km long and up to 2 km wide and trends in a north-northeast direction. The system has yielded widespread anomalous Au (up to 3.5 oz/ton) and Ag (up to 89 oz/ton), with minor Cu, Pb, and Zn throughout this area.

A previously unmapped geological unit, termed the High Beach Andesites (HBA), is the exclusive host of the PMES. It consists of a large succession of intermediate crystal tuff, crystal lapilli tuff, and tuff breccia, as well as coarse pyroclastic rocks. These rocks are broadly indicative of an arc-type volcanic environment formed during a protracted period of active magmatism. A large flow-banded rhyolite unit in the center of the mapped area indicates the presence of a paleo-caldera positioned on the 'toe' of the peninsula. The abundance of jasperoidal fragments and fracture fillings implies a shallow subaqueous paleoenvironment during emplacement.

Shear zones located along the western margin of the HBA may have acted as a structural control on the emplacement of the large irregular quartz vein found at the Eagle Zone. It has been suggested that these shear zones and similar structures on the eastern margin could be attributed to extensional forces during back-arc rifting, which is further supported by the presence of a horst-like structure recently identified on the property.

The PMES is a low-sulphidation epithermal system, which is indicated by the presence of banded veins and bladed silica, along with diagnostic clay-chlorite-adularia alteration. Alteration, as mapped on surface, is characterized by an extensive outer silica-phengite (low temperature clay) zone, which surrounds an inner alteration zone consisting of chalcedony-adularia-illite. Surface sampling of the PMES has identified two discreet NNE-trending mineralized zones located on the eastern and western boundaries of the inner alteration zone, now known as the Eagle and Pinnacle Zones, respectively. These zones are characterized by the presence of large veins and pronounced multi-episode hydrothermal breccias, which contain Au–Ag and base-metal mineralization. There appears to be two distinctive mineralizing events: the first event is characterized by higher Au/Ag ratios and the second event by the lower Au/Ag ratios. Mineralized veins are easily identifiable by the presence of ginguero-style mineralization (GSM), as characterized by black 'sooty' stringers and fragments with a fairly simple polymetallic mineral assemblage comprised of native silver and acanthite with lesser amounts of naumannite, electrum, galena, clausthalite, chalcopyrite, and sphalerite.