The Rainy River Gold Project, Wabigoon Subprovince, Ontario: Preliminary Observations on Ore Zones' Geometry and Style, and Associated Alteration

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Abstract

The Rainy River gold project (measured and indicated resources of 177 Mt @ 1.09 g/t Au: 6.2 Moz) is located in the Archean Rainy River greenstone belt, part of the Wabigoon Subprovince in northwestern Ontario. Hosted mainly within felsic volcanic units, the deposit is set in a succession of variably altered basaltic to dacitic flows and associated volcaniclastic rocks. Massive facies include aphanitic to strongly quartz±plagioclase-phyric flow-banded lobes, amygdular flows and flow-breccias, while volcaniclastic rocks consist of fine-grained to lapilli-sized, largely monolithic fragmental units. Mineralized zones occur as a series of E-W orientated elongate bodies moderately south dipping, and subparallel to the dominant foliation (109°/46°S). High-grade ore shoots are elongated parallel to a SW-plunging stretching lineation (47°/233°). The ore (Au-Ag) is directly associated with sulphides (pyrite, sphalerite, chalcopyrite±galena and arsenopyrite) which can occur as disseminated or veinlet styles. Rare visible gold and electrum are present in strongly sericitized felsic rocks and within folded, transposed and boudinaged sulphide±quartz-calcite-tourmaline veinlets. Moderate to intense sericitization, chloritization, and local, minor silicification are associated with the ore zones and have been mapped via drill core along a plane (323°/53°NE) perpendicular to the main stretching lineation. Preliminary mapping and sampling of diamond drill core was undertaken on this oblique plane to better represent the geometry and distribution of the principal alteration assemblages and lithologies with respect to the different ore zones and the main structural elements of the area. The nature of the ore and the presence of deformed gold-bearing veinlets suggest a pre- deformation mineralizing event(s). Targeted geochronology, along with geochemical, structural and petrographic analyses will help further define controls on ore distribution and grades, as well as better characterize the deposit's type and geometry. Although still hypothetical, the Rainy River deposit could represent a new type of economically viable Archean synvolcanic gold deposit.