Volcanic stratigraphy and setting of the Hood volcanogenic massive sulphide (VMS) deposit, Nunavut, Canada

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The Slave Province, Nunavut, contains numerous undeveloped and underexplored volcanogenic massive sulphide (VMS) deposits. The Hood deposit of the Hanikahimajuk Lake area, Nunavut (total resource of all lenses - 3.8 Mt @ 2.6% Cu and 3.8% Zn), located 425 km north of Yellowknife, NWT, remains poorly understood, in spite of intermittent exploration for the past 40 years. The Hood deposit consists of a cluster of lenses over a ~10 km^2 area hosted by the late Archean Amooga Booga volcanic belt. Re-logging of drill core has resulted in new stratigraphic reconstructions for the different lenses of the deposit, including the H10, H41 and H41A lenses. Mineralization is hosted in a bimodal volcanic sequence composed of basaltic and rhyolitic tuffs and flows. Basaltic and diorite dykes cross-cut the volcanic rocks. The volcanic and intrusive rocks are regionally metamorphosed to greenschist-grade. Younger (~2.58 Ga) pink granitoids have intruded all the above rocks and are associated with quartz-K-feldspar alteration. There are variations in the lithofacies, host rocks, and structural setting in each lens. The H10 lens is hosted in a steeply-dipping isoclinally folded sequence dominated by felsic volcanic flows. Stratigraphy of the H41 deposits lies at a near vertical angle and mineralized horizons occur near the contact of mafic and felsic volcanic flows. The H41A deposit is dominated by steeply-dipping mafic volcanic rocks including abundant mafic to intermediate tuffs. Volcanogenic massive sulphide-related alteration includes chlorite-quartz and sericite-quartz alteration that is strong in the immediate footwall of the various lenses and extends into the hanging wall. Mineralization in the lenses consists of massive and semi-massive pyrite-pyrrhotite-sphalerite-chalcopyrite and minor zones of stringer sulphides. Abundant clasts within the ore and abundant hanging-wall alteration are consistent with formation via sub-seafloor replacement.