



PRELIMINARY GEOLOGICAL MAP OF THE HOOD RIVER BELT (NTS 76K/N)  
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**Introduction**  
The Archean Hood River Belt is a supracrustal sequence exposed in a 1000 km<sup>2</sup> area south of James River. The southern and southeastern limits are marked by the unconformable overlap of the Proterozoic Goulburn Group and the intrusion of the Booth River Suite. An 800 km<sup>2</sup> extension to the north of James River (mapped by R. Johnstone 1989, 1990) is bounded by the Bathurst fault to the east and can be traced to the Arctic Ocean; the belt is intruded by ca. 2.8 Ga granite to the west and south.

**Lithology**  
The preserved Archean Hood River Supracrustal Belt consists of a vertical to overturned stratigraphic sequence generally younging eastward as follows:

Unit z: A remnant of pillow basalt less than one km thick, with interlayered metagreywacke overlain by a thin oxide and sulfide facies iron formation.

Unit y: A 6 km thick lower turbidite package including thick-bedded (1-10 m thick) silty metagreywacke and thin-bedded (2-10 cm thick), graded, sandy metagreywacke to pelite.  
Unit x: Two thin (20 m maximum) iron formations of variable oxide, sulfide and silicate facies, about 300 m apart extending along strike for about 50 km, pinching out southward. To the north, the iron formations are truncated sequentially by local erosional unconformities and included as fragments in overlying conglomerate.

Unit w: Excepting those local unconformities, conglomerate (200 to 300 m thick) conformably overlies the iron formations and turbidite. Pebble to boulder size clasts consist mainly of felsic quartzite (porphyry) to intermediate composition volcanic and intrusive rocks, iron formation and greywacke with minor lenses of arenite. Like the underlying iron formation and overlying volcanics, this unit pinches out north and south. A preliminary U-Pb age on a zircon boulder is 2850±10 Ma (Ott van Breemen, pers. comm. 1991).

Unit u, s, t: Metavolcanic rocks, mostly mafic (s) to intermediate (u) in composition, volcanoclastic and subvolcanic rocks (t), conglomerate lenses and intercalated arenites (y), are most abundant in the area near Turner Lake where they occur through a stratigraphic thickness of about 4 km. These units pinch out to the north and south.

Unit v: A monotonous upper greywacke package, about 10 km in thickness, for the most part comprising thick bedded turbidites (1-10 m thick) overlies the volcanics. Several beds containing mixed oxide, silicate, sulfide iron formation facies, including those at Pistol Lake, are contained within the upper greywacke.

Unit v: Several small rhyolite sills intrude the upper greywacke package.

Unit r: Several batholiths intrude the supracrustal sequence; they range from dioritic to monzogranitic composition and are late syn- to post-kinematic. (Preliminary U-Pb age of 2600±2 Ma, Ott van Breemen, pers. comm. 1991).

Unit p: An early Proterozoic ultramafic-mafic-felsic sill, dated at 2023 Ma (Booth River Intrusive Suite, Roscoe et al., 1987) intrudes the Archean Hood River Belt.

Unit n: Early Proterozoic Goulburn Group siltstones and quartzites, unconformably overlie the previous units including the Booth River Intrusive Suite.

Unit q: At least three dyke swarms intrude the Archean supracrustal sequence: the oldest, striking east-west intrudes 2800 Ma old granite; the northeast-southwest Mackenzie dyke swarm is Proterozoic (baddeleyite U-Pb age of 1270 Ma; LeCheminant and Hearn, 1989). A northerly trending diabase intrudes the east of the Hood River Belt and transects the basal Goulburn Group sill south of Pistol Lake and is correlated with the Franklin event (723 Ma, Hearn et al., 1991).

**Metamorphism**  
The metamorphic grade in the belt is uniform, characterized by andalusite cordierite with minor but regionally distributed and lithologically controlled sillimanite (fibrolite). Garnet was observed only in iron formation. Uniform metamorphic grade through a stratigraphic thickness of over 15 km of sediments, and for a strike length of over 40 km, is consistent with the succession prior to the metamorphic culmination. Coarse random muscovite porphyroblasts, probably due to contact metamorphism from the granitic batholiths, overprint the regional assemblage. Metoligoclase to chlorite grade occurs in the proximity of the Booth River Intrusive Suite.

**Deformation**  
Locally, soft sediment deformation affected the turbidite beds immediately below the conglomerate unit (w). Some porphyroblasts show an internal fabric (S) consisting mainly of bedding laminations but some represent a local tectonic fabric, probably in late porphyroblasts (see below). A pervasive regional cleavage, S<sub>1</sub>, post-dates most of the porphyroblasts, and is penetrative throughout the supracrustal belt. S<sub>1</sub> is vertical and strikes on average 25° clockwise from north-south-southwest. The foliation is interpreted as resulting from sinistral transpression distributed across the width of the belt. No macroscopic folds associated with S<sub>1</sub> were identified. A crenulation cleavage is developed locally; it is axial planar to south-plunging F<sub>2</sub> folds. The kinematics and tectonic significance of the latter structures are unclear. Late granitic intrusions, mostly post-kinematic, produced random, large muscovite porphyroblasts in the contact aureole.

**Economic geology**  
Gold at Turner Lake is found in an intermediate volcanoclastic unit (u), particularly in late crosscutting quartz veins.  
At Pistol Lake gold is found in iron formation beds within the upper turbidite unit (y); the iron formations are of mixed silicate, oxide and sulfide facies with gold commonly found in the latter. Other mineral occurrences of Ni, As, and Cu, have been reported in the area (Roscoe, 1984) associated with late mafic sills.

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