

DESCRIPTIVE NOTES

This open file geological map presents results of bedrock mapping undertaken in the region during 1986 and 1987 field seasons and include geochronological data. The objectives of the mapping were to upgrade the reconnaissance database, and to address some of the outstanding structural, metamorphic, and metallogenic problems in the region...

PREVIOUS GEOLOGICAL MAPPING

The Chesterfield Inlet map area represents a portion of an Archaean and Early Proterozoic granite-greenstone terrain within the Churchill Structural Province of the Canadian Shield. The map area straddles the boundary between the Rae and Hearne subprovinces (Hoffman, 1988).

REGIONAL GEOLOGY, STRUCTURE AND METAMORPHISM

The Archaean and/or Early Proterozoic lithologies in the Chesterfield Inlet region are dominated by polydeformed and regionally metamorphosed granulite gneiss (Agn), layered quartzofeldspathic gneiss (Agn), pelitic gneiss and migmatite (As), granitoid (Ag), and gabbro (Agg).

The granulite suite (Agn) is dominated by well layered and compositionally banded, quartzofeldspathic granulites interlayered with minor proportions of mafic granulite, paragneiss, granitic gneiss, layered anorthosite, and anorthositic gabbro. The suite is widely distributed in the northwestern part of the map area.

A west-trending paragneiss belt (As), consisting of garnet-biotite +/- staurolite +/- muscovite +/- aluminio silicate + plagioclase + quartz assemblages structurally overlies the layered quartzofeldspathic gneiss (Agn). Gneissosity in the paragneiss is concordant with that in the layered gneiss for the most part.

At least four sets of folds are present in the paragneiss belt (As). An early isoclinal, doubly plunging, recumbent fold set (F1) is refolded by a NW-plunging open to tight fold set (F2), which in turn, is modified by moderately (c. 45°) west plunging open F3 folds, and north plunging F4 folds.

Unit (Agn) comprise mixed assemblages of polydeformed, amphibolite grade orthogneiss, migmatite, biotite-muscovite-sillimanite +/- cordierite +/- garnet gneiss, minor proportions of iron-rich metasediments, and different generations of mafic dykes, now transformed into garnetiferous amphibolites.

Numerous discontinuous, folded, ductile, high-strain zones, which display excellent mylonitic textures, are an integral part of unit Agn (Tella and Annesley, 1987, 1988). They are well exposed along the Hudson Bay shoreline and along the Chesterfield Inlet. High-strain zones, a few metres to over hundreds of metres wide, are commonly separated by low-strain isoclinal, Protolite-like deformed orthogneiss, migmatite, paragneiss, and minor anorthosite, gabbro, and several generations of metamorphic and granitic dykes.

The Hanbury Island Shear Zone (A'his) is an ENE to NE trending, ENE plunging, synformal ductile shear zone formed under amphibolite to granulite facies conditions (Tella and Annesley, 1988). The zone overlies a relatively low grade granulite gneiss (Agn) terrane. The mylonitic layering contains disrupted and boudinaged mafic and quartzofeldspathic layers, and heterogeneously strained coronitic gabbro and anorthositic gabbro.

An equigranular, megacrystic (K-feldspar), and magnetite-rich leucogranite (A'gg) occupies most of the north-eastern portions of the map area. The magnetite rich character of the pluton is reflected in a pronounced aeromagnetic signature (Geological Survey of Canada, 1986). The large pluton is mylonitized at the southern and western margins adjacent to the Hanbury Island Shear Zone (A'his).

A well foliated, biotite-muscovite leucogranite (A'gm), which forms WNW-trending elongate masses, is extensively exposed in the southern part of the map area. The granite is coarse- to medium grained, grey to white weathering, and weakly to well foliated. The regional foliation within the unit trends west-northwest and dips steeply (60°-75°) to the south, although local reversals to the north are noted.

Two large relatively undeformed granite plutons (A'gf) intrude the layered gneiss (Agn). One of the plutons, exposed on Fairway Island, yielded a U-Pb zircon age of 1.826 Ga (J.C. Roddick, GSC, pers. com.). The plutons range in composition from quartzodiorite to granite. They are equigranular to massive, pink to salmon coloured plutons that contain abundant inclusions and rafts of layered gneiss, paragneiss, and metagabbro.

Lamprophyre dykes (A'bl; not shown on the map) are relatively rare in the region. They are dark grey to black, relatively undeformed, medium- to fine-grained rocks with large biotite/epidote phenocrysts. They are texturally similar to lamprophyre dykes described from the Rankin Inlet region (Tella et al., 1986; Digel, 1986), and probably are related to the ca. 1.85 Ga alkaline gabbro suite in the central Keewatin (LeCheminant et al., 1987b).

Northwest trending gabbro dykes (A'gb; not shown on the map), probably part of the 1.27 Ga Mackenzie swarm, were noted in a few localities in the central part of the gneiss terrane. They are massive, relatively fresh, and coarse grained.

REFERENCES

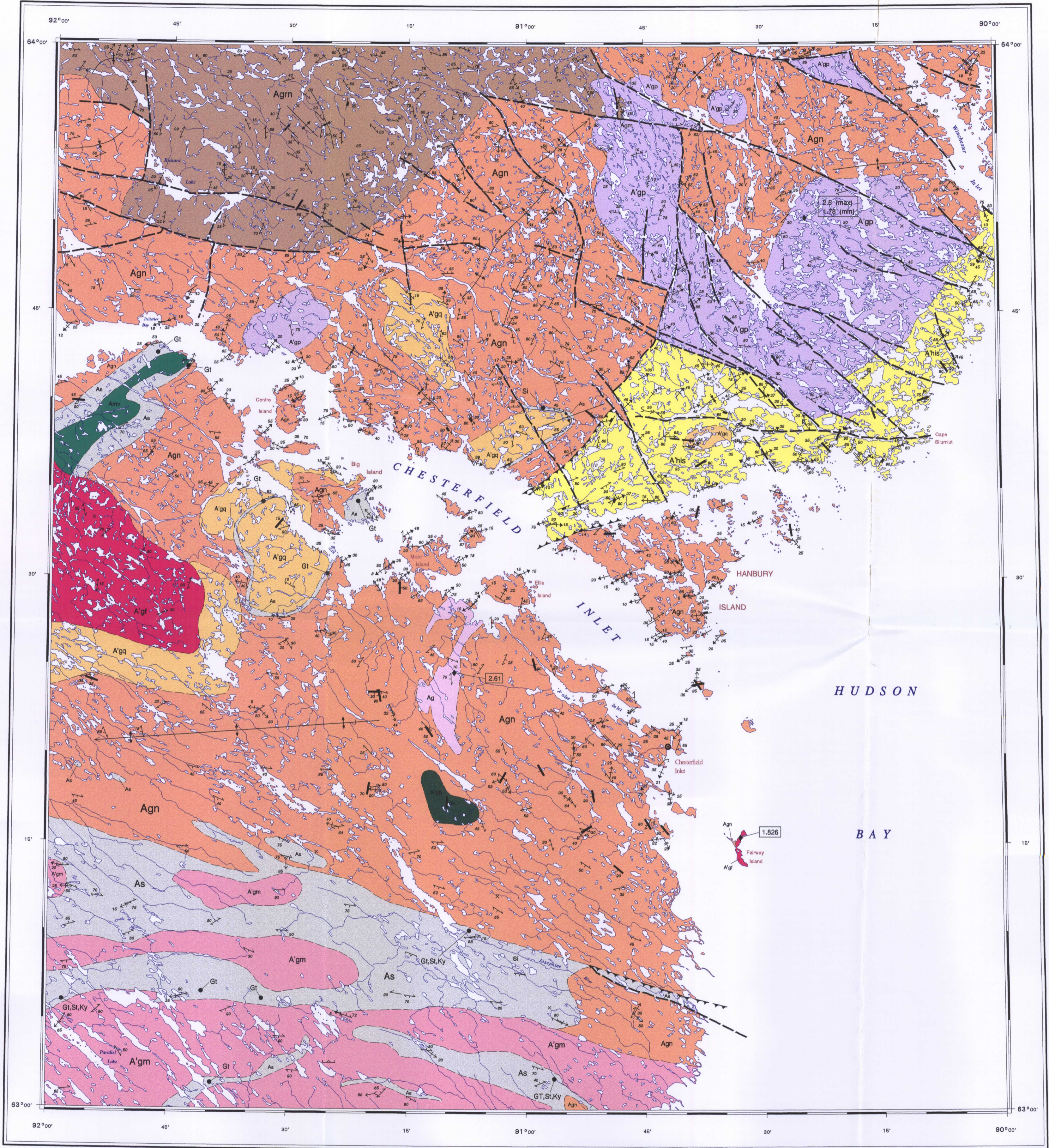
Armitage, A.E., Tella, S., and Miller, A.R. 1993: Iron-formation hosted gold mineralization and its geological setting, Meliadine Lake area, District of Keewatin, Northwest Territories. In Current Research, Part C, Geological Survey of Canada, Paper 93-1C, p.187-195.

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LEGEND: PROTEROZOIC (A'gbm, A'bl, A'gf, A'gm, A'gg, A'gpp, A'his, Ag, Amy, As, Agn, Agn), ARCHAIC AND/OR EARLY PROTEROZOIC (A'gg, A'gm, A'gpp, A'his, Ag, Amy, As, Agn, Agn), MINERAL OCCURRENCES (Ky, St, Si, Gt). Includes descriptive text for each unit and a list of mineral occurrences.

Map title: CHESTERFIELD INLET, DISTRICT OF KEEWATIN, NORTHWEST TERRITORIES. Scale: 1:250 000. Includes a location map of the region in the Northwest Territories, a scale bar in kilometers, and a note about the magnetic compass.