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FLIN FLON BELT
KISSEYNEW BELT TRANSITION ZONE

MANITOBA - SASKATCHEWAN

OPEN FILE 3064
GEOLOGY

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Coordinated through the auspices of the NATMAP Shield Margin Project by P. Lenton* and M. Lewry*

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Scale 1:100 000 - Echelle 1/100 000

Kilometre | Kilometre

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Mean magnetic declination 1995, 15°56' E, increasing 0.4' annually
Readings vary from 15°07' E to the SW corner to 21°47' E to the NE corner of the map

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Mineral Deposits

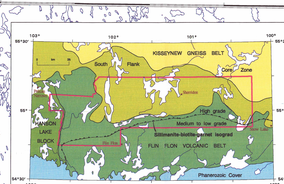
1	Zn-Cu-Pb-Ag	Yakusheshin Island	17	Zn-Cu	Nor (Wildmere Mines)
2	Cu-Zn-Pb-Ag	Weir	18	As	Puffy Lake
3	Cu-Zn	Cold Lake	19	As	Naiscoutaing
4	Cu-Zn	Fairy Lake	20	As	Nickerson Creek
5	Cu-Zn	Fidelity	21	As	Wildmere
6	Cu-Zn	Rob Lake	22	As	Dolly
7	Cu-Zn	Rod Lake			
8	Cu-Zn	Ross Lake			
9	Cu-Zn	Ace Zone			
10	Cu-Zn	Chisholm			
11	Cu-Zn	Sherritt Gordon			
12	Cu-Zn	Sam (Wildmere Lake)			
13	Cu-Zn	Abbott Lake			
14	Cu-Zn	Trophy Lake			
15	Cu-Zn	Treby (Cut, Hose Lake)			
16	Zn-Cu	Flin			
19	Zn-Cu	CRS (School's Lake)			

Mine

1	Zn-Cu	Callinan Mine

Abandoned Mine

1	Cu-Zn	Aberdeen West
2	Cu-Zn	Sherridon East
3	Zn-Cu	Flin Flon Mine
4	Au	Graham



Lithotectonic and Metamorphic Zones

The Flin Flon volcanic belt consists of volcanic and related sedimentary rocks and synvolcanic plutons, which were formed in 1.91-1.88 Ga volcanic arc and back-arc environments. The belt is subdivided into the Hanson Lake Block (Amisk collage, formerly part of the Amisk Group). They were subsequently intruded by 1.87-1.83 Ga plutons, which represent younger magmatic arcs, synvolcanic to the north and to the south. The Hanson Lake Block, which is only locally preserved in narrow fault blocks. The Amisk collage and many plutons were unconformably overlain by 1.85-1.83 Ga dominantly sedimentary basin fill of the Missi Group. The Hanson Lake Block is a 1.91-1.88 Ga dominantly felsic to tholeiitic magma suite, which is separated from the younger rocks in the southern part of the belt by the Hanson Lake Shear Zone (Watson Shear) marks the boundary between the Hanson Lake Block volcanic- plutonic suites and a fractured package consisting of Archean charnockite, and migmatitic quartzose wackes and lavaogenic rocks of unknown age.

The Kisseynew gneiss belt consists of complexly folded mid-crustal gneisses and migmatites. The Core Zone is a migmatitic gneiss dome, which is equivalent to low-grade metavolcanic in the eastern part of the Flin Flon belt. The **Kisseynew South Flank** differs from the **Core Zone** by containing a greater proportion of metasedimentary rocks, and by containing fewer orthogneiss, the arc plutonic and the Missi suite. These rocks are structurally interleaved with the Burntwood suite. Metavolcanic gneisses are an important component of the Kisseynew North Flank. The contact between the North Flank and the Kisseynew belt represents a structural and stratigraphic transition from dominantly volcanic and intrusive rocks to dominantly younger sedimentary rocks. It is locally marked by early thrust faults and later discontinuous shear zones.

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PHANEROZOIC

CRYOVICIAN

Red River Formation

Dolomite

PALEOPROTEROZOIC

INTRUSIVE ROCKS

Rpv to pvar/diker (1100 Ma)

Weakly deformed to massive medium-grained to pegmatitic

Fine- grained to pegmatitic leucogranite to leucotic (gneiss)

Fine-grained to pegmatitic leucogranite to granodiorite (leucocratic-orthogneiss to pegmatite

Foliated granodiorite and leucotic minor diorite, quartz diorite or hornblende quartz diorite

Gabbro

Gabbro to plagioclase-phyric gabbro

Granodiorite tonalite to intermediate mafic or hornblende-plagioclase(-phyric) gabbro

Plagioclase-phyric granodiorite to tonalite

Pre-Metis (>1900 Ma) and Uncertain Age

Granite to granodiorite or plagioclase-phyric granodiorite to granodiorite

Equigranular to plagioclase-phyric granodiorite to quartz diorite

Equigranular to plagioclase-phyric granodiorite to quartz diorite

a) granodiorite to leucocratic
b) granodiorite to granodiorite to tonalite
c) migmatite granodiorite to leucocratic

Foliated and gneissic tonalite to granodiorite

a) quartz-rich tonalite gneiss (gneiss), local supracrustal rocks
b) quartz-rich tonalite, local quartz porphyry, all with abundant inclusions
c) migmatite to diatexite tonalite and granodiorite
d) migmatite tonalite and granodiorite

Quartz-phyric tonalite to quartz diorite, locally biotite-phyric

a) tonalite to intermediate dyke complex

Gneissic tonalite to quartz diorite with abundant inclusions

Quartz-diorite to hornblende-biotite granodiorite
a) heterogeneous granodiorite to quartz diorite
b) tonalite to quartz diorite
c) metasupracrustal granodiorite tonalite granodiorite to diorite rocks

Quartz diorite and gabbro
to coarse grained amphibolite, metagabbro, quartz diorite

Gabbro and diorite
to coarse grained amphibolite, metagabbro, quartz diorite

a) diorite and gabbro with mafic inclusions

Ultramafic rocks

a) hornblende-pyroxene metagabbro

Layered Intermediate to Ultramafic Intrusions (post-Amisk)

Fractionated mafic sills and sheeted amphibolite
a) metagabbro to leucogabbro

b) quartz diorite, leucotonalite

TECTONITES

Mafic phyllonite

METASEDIMENTARY ROCKS, LOCAL VOLCANIC AND INTRUSIVE ROCKS

Minor Rocks

Pelitic volcanic rocks, minor sedimentary and intrusive rocks:
a) Mafic fragmental volcanic grades
b) fine grained quartzofeldspathic granofelsite

Intermediate to mafic volcanic, sedimentary and intrusive rocks:
hornblende-biotite gneiss to amphibolite, migmatite

Meta-arenite, minor volcanic rocks (generally magnetite bearing):
quartzofeldspathic gneiss and locally amphibolitic amphibolite

a) quartzofeldspathic gneiss (allothonic igneous)

a) quartzofeldspathic biotite-hornblende gneiss (igneous) (allopeak

a) quartzofeldspathic migmatite

Polymictic metaconglomerates, interlayered pelitic meta-arenite

Quartzarenite

Metarenite, siltstone, mudstone (generally graphitic):
granule-pebble gneiss, biotite gneiss (allothonic)
a) granule-pebble gneiss (allothonic-diorite)
b) biotite-muscovite gneiss (igneous), locally mixed with psammite or granite

Siltstone, shelaea, basalt, iron formation:
amphibolite subgrade, garnet amphibolite, minor felsic gneiss

Sedimentary Gneisses of Uncertain Age (generally graphitic rocks)

Interlayered feldspathic quartzite and minor pelitic gneiss

Biotite gneiss (igneous) (allothonic), local arenite

a) quartzofeldspathic gneiss (igneous) (allothonic)

a) Interlayered amphibolite, mica-granoarenite and mafic schist

VOLCANIC, SEDIMENTARY AND INTRUSIVE ROCKS (AMISK GROUP)

Gneisses of Uncertain Origin (includes alteration)

Granodiorite to tonalite gneiss (gneiss), local supracrustal rocks
a) granodiorite to intermediate gneiss (igneous) (allothonic)

Coarse grained 10-30g/t Au-albite gneiss
mainly altered V4 and V5 (igneous) (allothonic-)pyrite

Cordierite-anthophyllite and garnet-anthophyllite assemblages in alteration

Cordierite-anth. in part derived by alteration of V3 - V4
a) quartz-feldspar-cordierite rock, alteration of felsic to V4

Rocks of Volcanic, Intrusive and Volcaniclastic Origin

Felsic volcanic rocks and related gneisses, minor intrusives

a) felsic grades (quartz phenocrysts (igneous) (amphibole, probably
b) foliated quartz porphyry

Felsic to intermediate volcaniclastic rocks and minor intrusives

a) mafic grained garnet grained biotite grades (amphibole, derived from V4 and sedimentary clasts

Intermediate to mafic volcanic and volcaniclastic rocks:
amphibolite-plagioclase grades (igneous) (allothonic (igneous)

Mafic volcanic, minor volcaniclastic and intrusive rocks:
layered to variably deformed, amphibolite, volcanic (igneous)

a) fine grained amphibolite derived from quartzo basalt (locally pillowed) and diabase

b) amphibolite and granoulerite (migmatite with abundant dykes of it)

Mafic and minor ultramafic flows, dykes and sills:
pillowed and massive basalt, gabbro, diabase and intercalcite
a) amphibolite, largely derived from V1

Long Bay Conglomerate (oceanic volcanic island strata)

Mafic conglomerate

Flin Flon Assemblage (volcanic arc strata)

Felsic volcanic:
porphyritic and aphyric basic to mafic dykes

Rhyolite (quartz phenocrysts

Felsic to intermediate volcaniclastic rocks and flows
a) intermediate to felsic grades derived from V3

Intermediate porphyritic volcaniclastic rocks and sills

Basalt and basaltic andesite, local pillows or breccia
a) basalt, basaltic andesite, commonly pillowed, fine diabase and basalt, locally pillowed,
b) mafic porphyritic and aphyric flows, local breccia

Athapapuskow Assemblage (ocean floor / back-arc strata)

Basalt, local pillows or breccia, minor diabase
a) intermediate) dominated basalt and diabase

Area with little or no outcrop

Geological contact

Fault

Shear zone

Stratigraphic facing (generalized)

Foliation (undefined)

Mineral deposit

Abandoned adit

Abandoned shaft

Cordierite-anthophyllite and garnet-anthophyllite assemblages in alteration

Hydrothermal alteration zone

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