

The Phelps Lake Area: A Look at the Hearne Province in Northeast Saskatchewan - Field Trip Guide

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Rotated blocks of migmatitic gneiss in foliated tonalitic migmatites indicating an early thermo-tectonic event

Probable basement rocks (ca. 3.3 - 2.8 Ga)



← Truncated isoclinally folded tonalitic leucosome



Rotated block with amphibolite bands

Vein, layered, boudinaged, & folded structures



**Deep structural level
exposed in Mudjatik**

Ennadai Group

Interlayered & overlying psammopelitic to pelitic rocks, interlayered iron formation



ca. 2.71 - 2.68 Ga

Archean Intrusive Rocks



At higher meta grade garnet-bearing mafic to felsic tuffs



Well-foliated biotite-muscovite granite



Intermediate to felsic volcanic sequence (next)



Mylonitic biotite augen granite



Massive & pillowed flows, interlayered iron formation, mafic to felsic tuffs

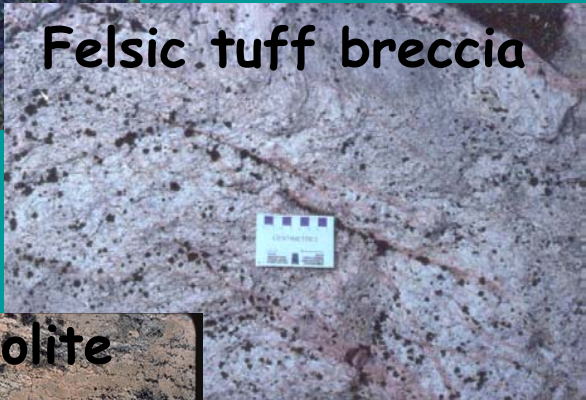


BIF

Ennadai Gp. Felsic volcanic sequence



Felsic and intermediate volcanic rocks exposed adjacent to MacKenzie Creek.



Felsic tuff breccia



Flow banded rhyolite



Interlayering of felsic volcanic rocks and sedimentary rocks



Interlayering of
marble, calc-silicate
& calc pelite



Marble



Interlayered calc-
silicates & calc pelite



Pelitic migmatite

Upper Sequence ca. 1.96 - <1.9 Ga

Psammopelite-pelite (Ducker Fm)

Marble & calc-silicate rocks
(Watterson Fm)

~~~~~ Disconformity ~~~~~

Lower Sequence ca. 2.45 - 2.1 Ga

Pelite (pelitic migmatite), calcic  
pelite, calc-silicate & marble,  
quartzite, mafic volcanic, &  
gabbro sills (Ameto Fm)

# Hurwitz Group NE Quarter

Upper Sequence ca. 1.96 - <1.9 Ga

Psammopelite-pelite (Ducker Fm)

Marble & calc-silicate rocks  
(Watterson Fm)

~~~~~ Disconformity ~~~~~

Lower Sequence ca. 2.45 - 2.1 Ga

Pelite (pelitic migmatite), calcic pelite, ferruginous pelite, iron formation, quartzite, felsic volcanic rocks (Ameto Fm)

Note: quartzite & felsic volcanic rock occur near top of lower sequence



4. Mineral Occurrences & Discoveries



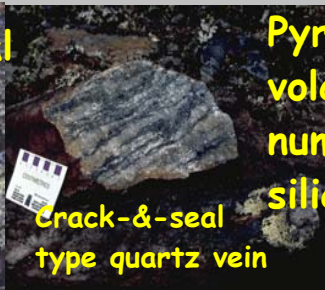
Gossanous outcrop from sulphide & silicate facies BIF, Gebhard L. Other BIF found in both Ennadai & Hurwitz Gp rocks.



Sulphide zones in Hurwitz Gp calc-silicates (above on N Wapiyao L) & volcanic rocks (L, MacKenzie Ck)



Mineralized boulders in till derived from sulphide facies BIF, W of Hatle L. (Multiple choice for scale). Also found at many other locations.



Pyritic Q veins in mafic volcanics were found at numerous places & in calc-silicate rocks locally.



Late granites have potential to host F, REE, & rare metals



garnet pegmatites could potentially host beryl or REE. Skarn-type mineralization could exist in Hurwitz carbonates.



New Mineral Occurrences in NE



- Variety of banded silicate-sulphide & oxide facies iron formations
- Cu minerals in EG mafic volcanic and HG pelitic rocks
- Weakly pyritic quartz veins in mafic volcanic rocks (gold ? potential)
- Quartz-tourmaline veins in granitic gneiss (gold ?)
- Molybdenite in granite
- Allanite+molybdenite & allanite+pyrite in tonalitic & granitic migmatites (REE potential)
- Elevated REE in fluoritic granites; lithium & related elements in pegmatite
- Asbestos in ultramafic intrusion associated with EG