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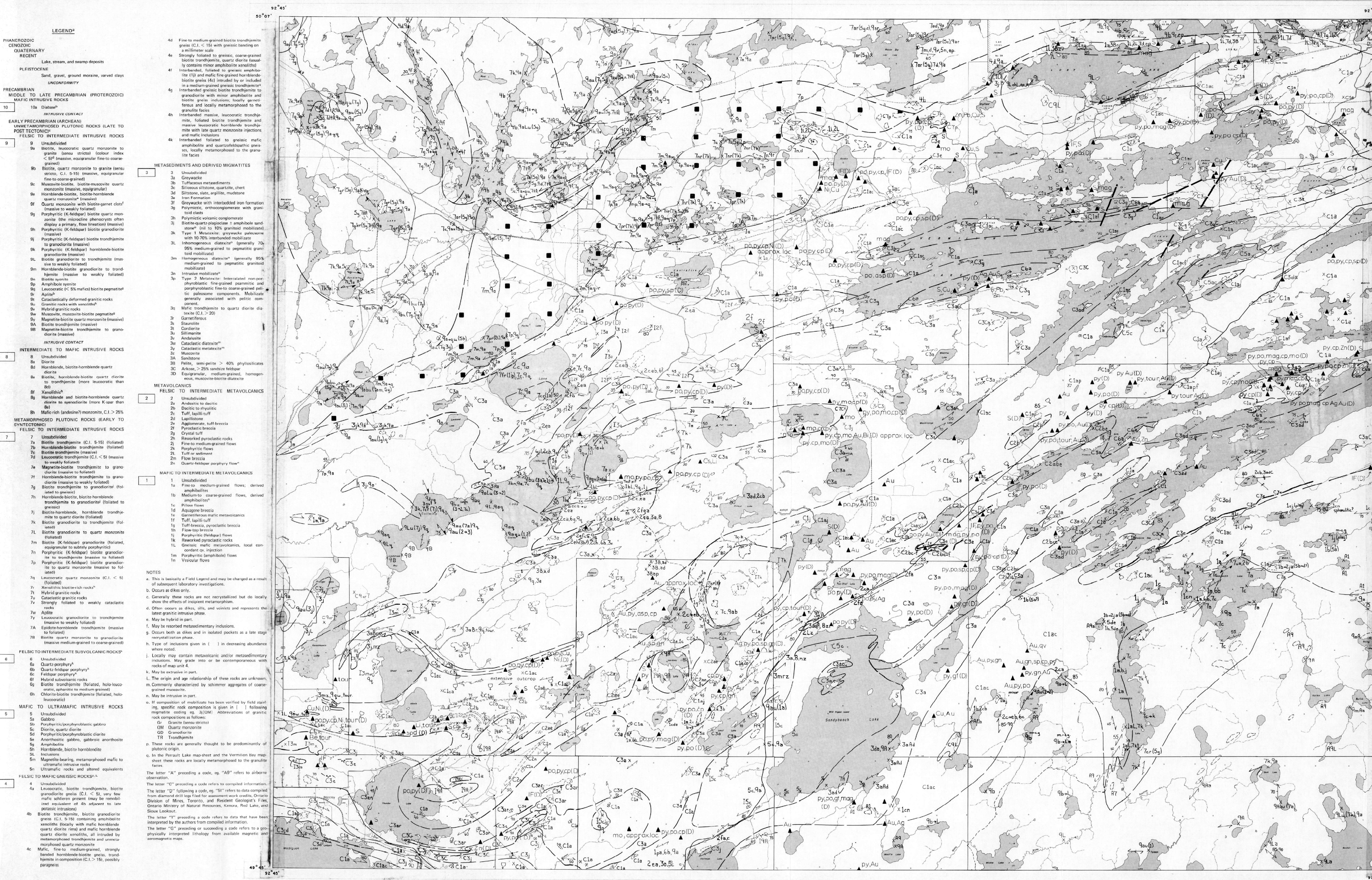
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- LEGEND***
- PHANEROZOIC**
- QUATERNARY**
- RECENT**
- Lake, stream, and swamp deposits
- PLEISTOCENE**
- Sand, gravel, ground moraine, varved clays
- UNCONFORMITY**
- PRECAMBRIAN**
- MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)**
- MAFIC-INTRUSIVE ROCKS**
- 10a Diabase*
- INTRUSIVE CONTACT**
- EARLY PRECAMBRIAN (ARCHEAN)**
- UNMETAMORPHOSSED PLUTONIC ROCKS (LATE TO POST TECTONIC)**
- FELSIC TO INTERMEDIATE INTRUSIVE ROCKS**
- 9 Unsubdivided
- 9a Biotite-leucocratic quartz monzonite to granite (sensu stricto) (colour index < 5)† (massive, equigranular fine to coarse-grained)
- 9b Biotite-quartz monzonite to granite (sensu stricto, C.I. 5-15) (massive, equigranular fine to coarse-grained)
- 9c Muscovite-biotite, biotite-muscovite quartz monzonite (massive, equigranular)
- 9d Hornblende-biotite, biotite-hornblende quartz monzonite* (massive)
- 9f Quartz monzonite with biotite-garnet clots† (massive to weakly foliated)
- 9g Porphyritic (K-feldspar) biotite quartz monzonite (the microcline phenocrysts often display a primary, flow lineation) (massive)
- 9h Porphyritic (K-feldspar) biotite granodiorite (massive)
- 9j Porphyritic (K-feldspar) biotite trondhjemite to granodiorite (massive)
- 9k Porphyritic (K-feldspar) hornblende-biotite granodiorite (massive)
- 9l Biotite granodiorite to trondhjemite (massive to weakly foliated)
- 9m Hornblende-biotite granodiorite to trondhjemite (massive to weakly foliated)
- 9n Hornblende-biotite quartz diorite to trondhjemite (more K-feldspar than 8f)
- 9o Xenolithic†
- 9p Amphibole syenite
- 9q Leucocratic (< 5% mafic) biotite pegmatite†
- 9r Apatite†
- 9s Cataclastically deformed granitic rocks
- 9t Granite rocks with muscovite*
- 9u Hybrid granitic rocks
- 9v Muscovite, muscovite-biotite pegmatite†
- 9w Magnetite-biotite quartz monzonite (massive)
- 9x Biotite trondhjemite (massive)
- 9y Magnetite-biotite trondhjemite to granodiorite (massive)
- INTRUSIVE CONTACT**
- INTERMEDIATE TO MAFIC INTRUSIVE ROCKS**
- 8 Unsubdivided
- 8a Diorite
- 8b Hornblende, biotite-hornblende quartz diorite
- 8c Biotite, hornblende-biotite quartz diorite to trondhjemite (more K-feldspar than 8f)
- 8d Xenolithic†
- 8e Hornblende and biotite-hornblende quartz diorite to syenodiorite (more K-feldspar than 8f)
- 8f Mafic-rich (andesine?) monzonite, C.I. > 25%
- METAMORPHOSSED PLUTONIC ROCKS (EARLY TO SYNTECTONIC)**
- FELSIC TO INTERMEDIATE INTRUSIVE ROCKS**
- 7 Unsubdivided
- 7a Biotite trondhjemite (C.I. 5-15) (foliated)
- 7b Hornblende-biotite trondhjemite (foliated)
- 7c Biotite trondhjemite (massive)
- 7d Leucocratic trondhjemite (C.I. < 5) (massive to weakly foliated)
- 7e Magnetite-biotite trondhjemite to granodiorite (massive to foliated)
- 7f Hornblende-biotite trondhjemite to granodiorite (massive to weakly foliated)
- 7g Biotite trondhjemite to granodiorite (foliated to gneiss)
- 7h Hornblende-biotite, biotite-hornblende trondhjemite to granodiorite (foliated to gneiss)
- 7i Biotite-hornblende, hornblende trondhjemite to quartz diorite (foliated)
- 7j Biotite granodiorite to trondhjemite (foliated)
- 7k Biotite granodiorite to quartz monzonite (foliated)
- 7l Biotite (K-feldspar) granodiorite (foliated, equigranular to subequi-porphyratic)
- 7m Porphyritic (K-feldspar) biotite granodiorite to trondhjemite (massive to foliated)
- 7n Porphyritic (K-feldspar) biotite granodiorite to quartz monzonite (massive to foliated)
- 7o Leucocratic quartz monzonite (C.I. < 5) (foliated)
- 7p Xenolithic biotite-rich rocks*
- 7q Hybrid granitic rocks
- 7r Cataclastic granitic rocks
- 7s Strongly foliated to weakly cataclastic rocks
- 7t Aplite
- 7u Leucocratic granodiorite to trondhjemite (massive to weakly foliated)
- 7v Epidote-hornblende trondhjemite (massive to foliated)
- 7w Biotite quartz monzonite to granodiorite (massive medium-grained to coarse-grained)
- FELSIC TO INTERMEDIATE SUBVOLCANIC ROCKS***
- 6 Unsubdivided
- 6a Quartz-porphyrity*
- 6b Quartz-feldspar porphyry*
- 6c Feldspar porphyry*
- 6d Hybrid subvolcanic rocks
- 6e Biotite trondhjemite (foliated, halo-leucocratic, aphanitic to medium grained)
- 6f Chlorite-biotite trondhjemite (halo-leucocratic)
- MAFIC TO ULTRAMAFIC INTRUSIVE ROCKS**
- 5 Unsubdivided
- 5a Gabro
- 5b Pyroxenitic/porphyroblastic gabro
- 5c Diorite, quartz diorite
- 5d Porphyroblastic diorite
- 5e Anorthositic gabro, gabbroic anorthositic
- 5f Amphibolite
- 5g Hornblende, biotite hornblende
- 5h Inclusions
- 5n Magnetite-bearing, metamorphosed mafic to ultramafic intrusive rocks
- 5o Ultramafic rocks and altered equivalents
- FELSIC TO MAFIC GNEISSIC ROCKS***
- 4 Unsubdivided
- 4a Leucocratic, biotite trondhjemite, biotite granodiorite gneiss (C.I. < 5), very few mafic schlieren present (may be remobilized equivalent of 4b adjacent to late-potassic intrusions)
- 4b Biotite trondhjemite, biotite granodiorite gneiss (C.I. 5-15) containing anorthositic xenoliths (locally with mafic hornblende quartz diorite rims) and mafic hornblende quartz diorite xenoliths, all intruded by metamorphosed trondhjemite and unmetamorphosed quartz monzonite
- 4c Mafic, fine to medium-grained, strongly banded hornblende-biotite gneiss, trondhjemite in composition (C.I. > 15), possibly paragneiss
- METASEDIMENT AND DERIVED MIGMATITES**
- 3 Unsubdivided
- 3a Gneiss
- 3b Tuffaceous metasediments
- 3c Siliceous siltstone, quartzite, chert
- 3d Siltstone, slate, argillite, mudstone
- 3e Iron formation
- 3f Greywacke with interbedded iron formation
- 3g Polystratic, orthoconglomerate with granitoid clasts
- 3h Polystratic volcanic conglomerate
- 3i Biotite-quartz-plagioclase ± amphibole sandstone* (up to 10% granitoid mobilize)
- 3j Type 1 Muscovite greywacke sequence with 10-70% interbedded mobilize
- 3k Inhomogeneous diatexite* (generally 70% 95% medium-grained to pegmatitic granitoid mobilize)
- 3m Homogeneous diatexite* (generally 95% medium-grained to pegmatitic granitoid mobilize)
- 3n Intrusive mobilize*
- 3o Type 1 Metarhyolite: Interbedded non-porphyratic fine-grained psammite and porphyroblastic fine to coarse-grained pelitic paleosol components. Mobilize generally associated with pelitic conglomerate
- 3p Mafic trondhjemite to quartz diorite diatexite (C.I. > 20)
- 3q Garnetiferous
- 3r Staurolite
- 3s Cordierite
- 3t Sillimanite
- 3u Andalusite
- 3v Cataclastic diatexite**
- 3w Cataclastic metatexite**
- 3x Muscovite
- 3y Sandstone
- 3z Pelite, semi-pelite > 40% phyllosilicates
- 3aa Arkose, > 25% sandsize feldspar
- 3ab Equigranular, medium-grained, homogeneous, muscovite-biotite diatexite
- METAVOLCANICS**
- FELSIC TO INTERMEDIATE METAVOLCANICS**
- 2 Unsubdivided
- 2a Andesite to dacite
- 2b Dacite to rhyolite
- 2c Tuff lapilli tuff
- 2d Lapillitstone
- 2e Agglomerate, tuff breccia
- 2f Pyroclastic breccia
- 2g Crystal tuff
- 2h Reworked pyroclastic rocks
- 2i Fine to medium-grained flows
- 2j Porphyritic flows
- 2k Tuff or sediment
- 2l Flow breccia
- 2m Quartz-feldspar porphyry flow*
- MAFIC TO INTERMEDIATE METAVOLCANICS**
- 1 Unsubdivided
- 1a Fine to medium-grained flows; derived amphibolites
- 1b Medium to coarse-grained flows, derived amphibolites
- 1c Pillow flows
- 1d Aquagene breccia
- 1e Garnetiferous mafic metavolcanics
- 1f Tuff, lapilli tuff
- 1g Tuff breccia, pyroclastic breccia
- 1h Flow-top tuff
- 1i Porphyritic (feldspar) flows
- 1j Reworked pyroclastic rocks
- 1k Gneissic mafic metavolcanics, local concordant or injection
- 1m Porphyritic (amphibole) flows
- 1n Volcanic flows
- NOTES**
- a. This is basically a Field Legend and may be changed as a result of subsequent laboratory investigations.
- b. Occurs as dikes only.
- c. Generally these rocks are not recrystallized but do locally show the effects of incipient metamorphism.
- d. Often occurs as dikes, sills, and veins and represents the latest granitic intrusive phase.
- e. May be hybrid in part.
- f. May be reworked metasedimentary inclusions.
- g. Occurs both as dikes and in isolated pockets as a late stage recrystallization phase.
- h. Type of inclusions given in () in decreasing abundance where noted.
- i. Locally may contain metavolcanic and/or metasedimentary inclusions. May grade into or be contemporaneous with rocks of map unit 4.
- j. May be anorthositic in part.
- k. The origin and age relationships of these rocks are unknown.
- l. Commonly characterized by schimmer aggregates of coarse-grained muscovite.
- m. May be intrusive in part.
- n. If composition of mobilize has been verified by field sampling, specific rock composition is given in () following magnetite coating eg. 3(U)M Abbreviations of granitic rock compositions as follows:
Gr Granite (sensu stricto)
QM Quartz monzonite
GD Granodiorite
TR Trondhjemite
- o. These rocks are generally thought to be predominantly of plutonic origin.
- p. In the Perrault Lake map-sheet and the Vermilion Bay map-sheet these rocks are locally metamorphosed to the granulite facies.
- The letter "A" preceding a code, eg. "A9" refers to airborne observation.
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- The letter "D" following a code, eg. "D1" refers to data compiled from diamond drill logs (not for assessment work credits, Ontario Division of Mines, Toronto, and Resident Geologist's Files, Ontario Ministry of Natural Resources, Kenora, Red Lake, and Sioux Lookout).
- The letter "I" preceding a code refers to data that have been interpreted by the author from compiled information.
- The letter "M" preceding or succeeding a code refers to a geophysically interpreted lithology from available magnetic and aeromagnetic maps.

ONTARIO
Division of Mines

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Dr. J. R. HEDGECOCK, Deputy Minister of Natural Resources
G. A. Jewell, Executive Director, Division of Mines E. G. Fyfe, Director, Geological Branch

PRELIMINARY MAP P.1204
GEOLOGICAL SERIES

**OPERATION KENORA - EAR FALLS
SANDYBEACH - ROUTE LAKES SHEET**

DISTRICT OF KENORA

Scale: 1:63,360 or 1 inch to 1 mile
NTS Reference: 52 F.115E, 16, 52 K.1, 2E
ODM GSC Aeromagnetic Maps: 11486, 11476, 11566, 11566
ODM Geological Compilation Series Maps: 2115, 2176

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INDEX MAP
Scale: 1:1,584,000 or 1 inch to 25 miles

GEOLOGICAL AND MINING SYMBOLS

Glacial striae
Small bedrock outcrop
Area of bedrock outcrop
Bedding, top unknown; (inclined, vertical)
Bedding, top indicated by arrow; (inclined, vertical, overturned)
Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned)
Bedding, top (arrow) from cross bedding; (inclined, vertical, overturned)
Lava flow, top (arrow) from pillows shape and packing
Schistosity; (horizontal, inclined, vertical)
Foliation; (horizontal, inclined, vertical)
Lamination with plunge
Geological boundary, position interpreted
Joining; (horizontal, inclined, vertical)

ADDITIONAL GEOLOGICAL SYMBOLS

Cataclastic foliation
Gneissosity
Flowage (primary) lineation
Orientation of inclusions
Symion (plunge and trend unknown)
Antiform (plunge and trend unknown)

MINERAL AND METAL REFERENCES

Ag	..... Silver	mo	..... Molybdenite
As	..... Arsenopyrite	Ni	..... Nickel
Au	..... Gold	Pb	..... Lead
Be	..... Beryllium	Py	..... Pyrrhotite
Bi	..... Bismuth	Py	..... Pyrite
Cs	..... Chalcophyllite	Sp	..... Spinel
Co	..... Cobalt	Ss	..... Sulfide Mineralization
Cu	..... Copper	St	..... Staurolite
Ep	..... Epidote	Tm	..... Tourmaline
Gr	..... Garnet	U	..... Uranium
Ga	..... Galena	W	..... Tungsten
Li	..... Lithium	Zn	..... Zinc
Mg	..... Magnetite		

SOURCES OF INFORMATION

Geology of Sandybeach-Route Lakes Sheet by N. Harris, W.D. Bond, F.W. Breaks, C.J. Westerman, D.W. Desnoyers and assistants, 1975.

Geology from published maps of the Ontario Division of Mines, Ministry of Natural Resources as per attached reference list. Geology not tied to survey lines.

Assessment Files Research Office, Ontario Division of Mines, Toronto.

Resident Geologist's Files, Ontario Ministry of Natural Resources, Red Lake.

ODM GSC Aeromagnetic Maps 71056, 71236, scale 1 inch to 4 miles or 1:253,440.

Magnetic declination approximately 5°07' at center of sheet, 1975.

Issued 1976

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