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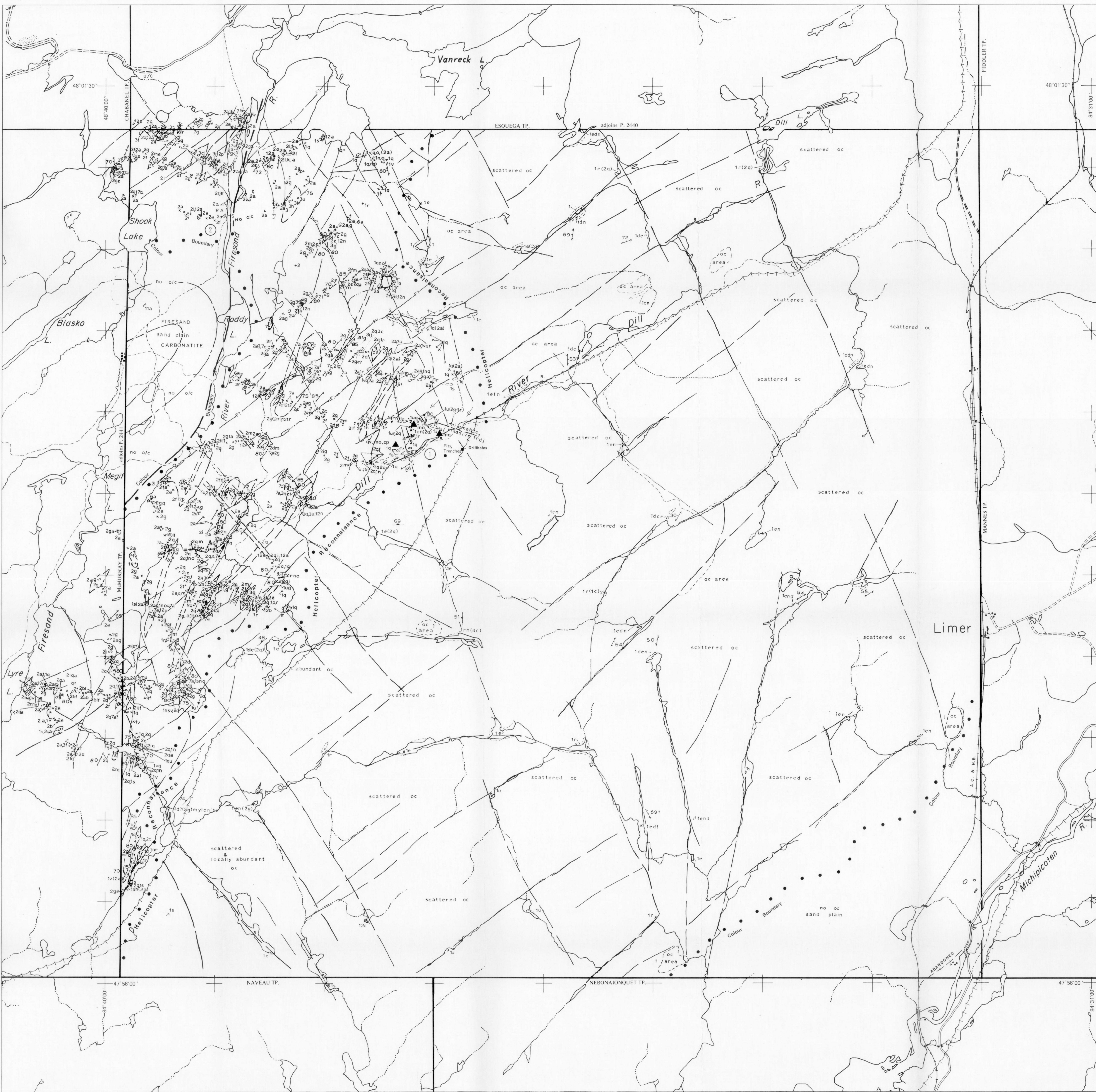
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Ministry of Natural Resources  
Ontario  
Hon. Alan W. Pope, Minister  
W. T. Foster, Deputy Minister

ONTARIO GEOLOGICAL SURVEY  
MAP P. 2442  
GEOLOGICAL SERIES - PRELIMINARY MAP  
PRECAMBRIAN GEOLOGY  
of  
**LASTHEELS TOWNSHIP  
WAWA AREA  
ALGOMA DISTRICT**

Scale: 1:15 840  
NTS Reference: 41 N/15, 42 C/2  
ODM-GSC Aeromagnetic Maps: 219-G, 2192-G  
ODM Geological Compilation Map: 2220

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LOCATION MAP  
Scale: 1:1 584 000 or 1 inch to 25 miles

**METAL AND MINERAL ABBREVIATIONS**  
cp Chalcopyrite  
mo Molybdenite

**LIST OF PROPERTIES**  
1. Alko Palma Claims, Anax Minerals Canada Limited.  
2. Mc-North Engineering (1956).

**SYMBOLS**

- Schistosity, inclined, vertical
- Lineation, m = mullion structure, s = cleft, p = pillow, b = bed, l = lenticles, t = tectonite
- Glacial striae
- Piled volcanic with dip and facing direction indicated
- Flow elongation, inclined, vertical, facing direction unknown
- Radioactivity
- Minor shear, inclined, vertical
- Major shear, attitude uncertain, attitude indicated
- Iron formation
- Trench
- Pit
- Banding, inclined, vertical
- Kinkband, inclined, vertical with plunge of fold and direction of movement indicated
- Minor fold, strike and dip of axial plane, bearing and plunge of fold axis
- Geological boundary, observed
- Geological boundary, interpreted
- Geological boundary, geophysically inferred
- Gossan
- Iron staining
- Chloroid
- Bedding, top (arrow) from grain gradation, inclined, vertical, overturned
- Bedding, top (arrow) from cross bedding, inclined, vertical, overturned
- Bedding, top (arrow) indicated by flame structures in interbedded sandstone-siltstone, inclined, vertical, overturned
- Precedent direction as suggested by ripple marks
- Jointing, inclined, vertical
- Lineament
- Lineament, possibly a fault zone
- Shaft-depth in feet

**LEGEND**

**PHANEROZOIC**  
CENOZOIC  
QUATERNARY  
PLEISTOCENE AND RECENT  
12 Organic silt (fill, glaciifluvial sand and gravel)  
UNCONFORMITY

**PRECAMBRIAN**  
LATE PRECAMBRIAN  
MAFIC INTRUSIVE ROCKS  
12 12 Unsubdivided  
12a Diabase  
12b Porphyritic (feldspar) diabase  
12c Diomorphitic (feldspar) diabase  
12d Diabase with minor biotite  
12e Carbonate  
12f Chlorite lamprophyre  
12g Carbonatite-silicocarbonatite<sup>†</sup>  
12h Ferruginous carbonatite  
12i Syenite  
12j Biotite lamprophyre  
12k Porphyritic (feldspar) lamprophyre

CARBONATITE INTRUSIVE ROCKS  
FIRE SAND CARBONATITE  
11 11a Sulfite<sup>†</sup>  
11b Silicocarbonatite<sup>†</sup>  
11c Rhyolite (feruginous dolomite)

INTRUSIVE CONTACT

EARLY PRECAMBRIAN (ARCHEAN)  
FELSIC INTRUSIVE ROCKS  
7 7 Unsubdivided  
7a Quartz-feldspar porphyry  
7b Feldspar porphyry  
7c Quartz porphyry  
7d Diorite, quartz diorite<sup>†</sup>  
7e Granodiorite, granite<sup>†</sup>  
7f Aegle  
7g Diorite, granodiorite  
7h Felsic dikes  
7i Trondhjemite, quartz monzonite, quartz diorite porphyry<sup>†</sup>  
7j Porphyritic granodiorite, granite  
7k Intrusive breccia  
7l Porphyritic (plagioclase) diorite, granodiorite

INTRUSIVE CONTACT

MAFIC TO ULTRAMAFIC INTRUSIVE ROCKS  
6 6 Unsubdivided  
6a Gabbro, diorite  
6b Anorthositic gabbro  
6c Anorthosite  
6d Diabase  
6e Hornblende diorite  
6f Xenodiorite  
6g Pyroxenite  
6h Talc schist  
6i Mafic dikes  
6j Quartz diorite, trondhjemite<sup>†</sup>  
6k Quartz gabbro  
6l Xenolithic gabbro  
6m Porphyritic gabbro, diorite  
6n Carbonatized or carbonate bearing mafic intrusive

INTRUSIVE CONTACT

**METASEDIMENTS**  
CHEMICAL METASEDIMENTS  
5 5 Unsubdivided  
5a Magnetite, hematite ironstone<sup>†</sup>, chert  
5b Carbonate ironstone<sup>†</sup>  
5c Sulfur ironstone<sup>†</sup>  
5d Chert, sideritic, pyritic or graphitic  
5e Graphite  
5f 5a, 5c (1:1)  
5g 5c, 5d (1:1)  
5h 5c, 5d (1:1)  
5i Chert, graphite, argillite  
5j Chert  
5k 5d, 5f, 5a  
5l Chert, wacke, siltstone  
5m Chert, wacke, magnetite ironstone  
5n Magnetite ironstone, wacke  
5o Chert breccia

CLASTIC METASEDIMENTS  
4 4 Unsubdivided  
4a Volcanic clast wacke  
4b Chert  
4c Plagioclase-quartz-biotite schist  
4d Wacke, lithic wacke  
4e Argillite  
4f Inter-massifed siltstone, mudstone  
4g Conglomerate with granite clasts  
4h Volcanic clast conglomerate  
4i Siltstone, sandstone, lithic sandstone  
4j Quartz arenite, siltstone, lithic siltstone  
4k Carbonate-rich metasediment  
4l Lithic siltstone  
4m Thinly bedded wacke, siltstone  
4n Carbonate, ferruginous limestone

METAVOLCANICS  
INTERMEDIATE TO FELSIC METAVOLCANICS  
3 3 Unsubdivided  
3a Sericite schist  
3b Helvetic breccia  
3c Monolithic tuff  
3d Tuffaceous quartz eye, felsic clast, sericite schist  
3e Banded tuff with laminae  
3f Massive flows  
3g Monolithic breccia (felsic matrix, felsic clasts)  
3h Porphyritic (feldspar) flow  
3i Feldspar crystal tuff, intermediate to felsic  
3j Porphyritic (quartz) flow  
3k Sericite schist  
3l Flow banded lava  
3m Autoclastic monolithic breccia  
3n Intermediate tuff  
3o Helvetic tuff  
3p Helvetic tuff  
3q Helvetic quartz eye crystal tuff, lapilli tuff  
3r Helvetic crystal tuff, breccia  
3s Tuff  
3t Laminated tuff  
3u Chlorite-sericite schist  
3v Feldspar crystal tuff, felsic  
3w Crystalline quartz crystal tuff  
3x Helvetic (cataclastic) breccia

MAFIC TO INTERMEDIATE METAVOLCANICS  
2 2 Unsubdivided  
2a Massive flows  
2b Pillowed flows  
2c Chlorite schist  
2d Helvetic breccia  
2e Monolithic breccia (mafic matrix, felsic clasts)  
2f Porphyritic (feldspar) flow  
2g Massive medium-grained flows<sup>†</sup>  
2h Magnetite-bearing flows  
2i Tuffaceous chloritic schist  
2j Pillowed porphyritic (feldspar) flows  
2k Vesiculate flows  
2l Amygdaloidal flows  
2m Feldspar (quartz) crystal tuff  
2n Helvetic breccia (mafic matrix, intermediate to felsic clasts)  
2o Archaic tuff  
2p Laminated tuff, lapilli tuff  
2q Crystalline quartz crystal tuff  
2r Talc-actinolite, actinolite rock  
2s Monolithic breccia (mafic matrix, mafic clasts)  
2t Laminated tuff  
2u Lapilli tuff  
2v Porphyritic (amphibole) flows  
2w Tuff, chloritic schist with quartz<sup>†</sup>

UNCONFORMITY

EARLY FELSIC PLUTONIC ROCKS  
GNEISS GRANITIC ROCKS  
MASSIVE GRANITIC ROCKS<sup>†</sup>  
1 1a Apatite, pegmatite dikes  
1b Diorite, quartz diorite  
1c Trondhjemite  
1d Trondhjemite, quartz monzonite  
1e Monzonite, quartz monzonite  
1f Porphyritic monzonite, quartz monzonite  
1g Granodiorite, trondhjemite, weakly foliated  
1h Porphyritic granodiorite  
1i Massive quartz monzonite

**SOURCES OF INFORMATION**

Base map derived from the Forest Resources Inventory Maps, Lands and Waters Group, Ontario Ministry of Natural Resources. Geology is not tied to surveyed lines. Resident Geologist's Files, Ontario Ministry of Natural Resources, Sault Ste. Marie. Assessment Work Library Report 10. McMurtry Tp. and Parts of Surrounding Townships, District of Algoma, Ontario Division of Mines, Preliminary Map, P. 828, by R. J. Rupert, 1976, scale 1:15 840 or 1 inch to 1/4 mile. Magnetic declination was approximately 6'4" in 1960.

**CREDITS**

Geology by R. P. Sage, E. Sawtish and assisted by J. Turner, P. Laessle and E. Sage, 1979.

Every possible effort has been made to ensure the accuracy of the information presented in this map. However, the Ontario Ministry of Natural Resources does not assume any liability for errors that may occur. Users may wish to verify critical features. Sources include both the references listed here, and information on file at the Resident or Regional Geologist's Office and the Mining Recorder's office at the Resident or Regional office.

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Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form: Sage, R. P., Sawtish, E., Turner, J., Laessle, P., and Sage, E., 1982. Precambrian Geology of Lastsheels Township, Wawa Area, Algoma District, Ontario Geological Survey Preliminary Map P. 2442, Geological Series, Scale 1:15 840 or 1 inch to 1/4 mile. Geology 1979.

**MARGINAL NOTES**

**LOCATION AND ACCESS**  
The center of Lastsheels Township is located at approximately 47°50' north latitude and 84°35' west longitude. Access to most of the township is poor. A rough trail extends from the Firesand River to the north-south line in the northwest corner of the township. The southern half of the township has little or limited access. Access to the area underlain by the supra-crustal rocks is by long traverse from the Firesand River or by helicopter.

**MINERAL EXPLORATION**  
The principal mineralized showing known to exist in the township is the molybdenite showing found near the Dill River in the northwest quadrant of the township. This showing has in the past been known as the Peters Quarry molybdenite property. This property was controlled by International Rankov Uranium Mines Limited and Fox International Uranium Mines Limited and was mineralized during the 1950s and early 1960s, and a considerable amount of prospecting was completed. During this period 1806 (1968) m of diamond drilling was completed in three holes. Assay data on the indicate values of up to 0.25 percent Mo (Resident Geologist's Office File 83-3169, Sault Ste. Marie, Ontario). The mineralization occurs in subordinate quartz veins striking southeast and dipping 20 to 50 degrees north. The molybdenite occurs as coarse grained masses in the quartz and as seams of fine-grained molybdenite along the contact of the quartz veins with the granitic host rock. The granitic host rock varies from trondhjemite to quartz diorite in composition and locally contains abundant xenoliths of amphibolite and biotite-quartz-plagioclase schist. The mineralized zone occurs near the area of contact between a xenolith-rich (granitic) granitic rock and a relatively xenolith-free granitic rock. The showing is currently known as the Alko Palma property and is being evaluated by Anax Minerals Canada Limited.

A chemical assay of a sample of the molybdenite from a subsurface showing west of the Firesand River in the northwest corner of the township (Assessment Files Research Office, Ontario Geological Survey, Toronto, Library Report 10). The results of this work are unknown. This showing may be related to dikes rocks associated with the Firesand Carbonatite intrusion.

On the basis of aeromagnetic data, the Firesand and limited diamond drilling a portion of the Firesand River Carbonatite Complex extends from McMurray Township into the northwestern corner of Lastsheels Township. This complex has been dated by K-Ar isotope techniques as being 1048 m.y. in age (Wanless, 1970).

The southeastern two-thirds of the township consist of granitic rocks ranging from quartz diorite to quartz monzonite in composition. The quartz monzonite is massive, equigranular, and relatively homogeneous. These rocks cut the less potassic phases. The less potassic phases are generally also relatively massive, equigranular, and homogeneous. However, they are locally schistose to gneissic and contain amphibole and biotite-quartz-plagioclase inclusions.

Within the northwestern corner of the township a number of linears are thought to be representative of faults though geological evidence for offset is lacking. The north-trending faultlines found in the northwest corner of the township appear to cut sharply against northeast trending structures found in the southwest corner of adjoining Esouega Township. A fault zone likely exists in this area.

The granitic-metavolcanic contact displays both intrusive and tectonic relations. Small to large blocks of metavolcanics appear to have been sloped or plucked from the supra-crustals, and locally it is difficult to define the contact of the granitic mass. The contact has been placed where granitic rock becomes dominant. Local linear features, displaying a prominent foliation are present, suggesting at least local shearing or faulting within the contact area.

The supra-crustal and surrounding granitic rocks are cut by northwest-trending diabase dikes which contain locally buff to pale green plagioclase phenocrysts. These dikes are thought to be Late Precambrian in age.

On the basis of aeromagnetic data, one outcrop and limited diamond drilling a portion of the Firesand River Carbonatite Complex extends from McMurray Township into the northwestern corner of the township and consist of crystal tufts of intermediate composition, felsic porphyry and aegleitic flows, and fine grained tufts. These units are limited in extent and concordant with the associated mafic-metavolcanics.

The volcanic rocks have been metamorphosed to amphibolite rank close to the granite-supracrustal contact and fall to greenschist or upper greenschist rank westward away from the contact.

The schistosity and associated amphibolite rank close to the granite-supracrustal contact and fall to greenschist or upper greenschist rank westward away from the contact.

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**ECONOMIC GEOLOGY**  
The molybdenite showing on the Dill River is the most significant occurrence of mineralization in the township. Grade and tonnage figures for this showing are unavailable.

**RECOMMENDATIONS FOR PROSPECTING**  
The mafic-metavolcanics may offer some potential for base metal mineralization but evidence of significant sulphide mineralization was not observed.

Molybdenite mineralization in quartz veins is common near the Dill River and prospecting for similar occurrences may be warranted. The contact zone between the metavolcanics and granitic intrusives should be the initial area of search for this type of mineralization.

**REFERENCE**

Wanless, R.K., 1970. Isotope Age Map of Canada. Geological Survey of Canada Map 1259A. Scale 1:5 000 000.