LES CONDITIONS CI-DESSOUS RÉGISSENT L'UTILISATION DU PRÉSENT DOCUMENT.

Votre utilisation de ce document de la Commission géologique de l'Ontario (le « contenu ») est régie par les conditions décrites sur cette page (« conditions d'utilisation »). En téléchargeant ce contenu, vous (l'« utilisateur ») signifiez que vous avez accepté d'être lié par les présentes conditions d'utilisation.

Contenu : Ce contenu est offert en l'état comme service public par le *ministère du Développement du Nord et des Mines* (MDNM) de la province de l'Ontario. Les recommandations et les opinions exprimées dans le contenu sont celles de l'auteur ou des auteurs et ne doivent pas être interprétées comme des énoncés officiels de politique gouvernementale. Vous êtes entièrement responsable de l'utilisation que vous en faites. Le contenu ne constitue pas une source fiable de conseils juridiques et ne peut en aucun cas faire autorité dans votre situation particulière. Les utilisateurs sont tenus de vérifier l'exactitude et l'applicabilité de tout contenu avant de l'utiliser. Le MDNM n'offre aucune garantie expresse ou implicite relativement à la mise à jour, à l'exactitude, à l'intégralité ou à la fiabilité du contenu. Le MDNM ne peut être tenu responsable de tout dommage, quelle qu'en soit la cause, résultant directement ou indirectement de l'utilisation du contenu. Le MDNM n'assume aucune responsabilité légale de quelque nature que ce soit en ce qui a trait au contenu.

Liens vers d'autres sites Web : Ce contenu peut comporter des liens vers des sites Web qui ne sont pas exploités par le MDNM. Certains de ces sites pourraient ne pas être offerts en français. Le MDNM se dégage de toute responsabilité quant à la sûreté, à l'exactitude ou à la disponibilité des sites Web ainsi reliés ou à l'information qu'ils contiennent. La responsabilité des sites Web ainsi reliés, de leur exploitation et de leur contenu incombe à la personne ou à l'entité pour lesquelles ils ont été créés ou sont entretenus (le « propriétaire »). Votre utilisation de ces sites Web ainsi que votre droit d'utiliser ou de reproduire leur contenu sont assujettis aux conditions d'utilisation propres à chacun de ces sites. Tout commentaire ou toute question concernant l'un de ces sites doivent être adressés au propriétaire du site.

Droits d'auteur : Le contenu est protégé par les lois canadiennes et internationales sur la propriété intellectuelle. Sauf indication contraire, les droits d'auteurs appartiennent à l'Imprimeur de la Reine pour l'Ontario.
Nous recommandons de faire paraître ainsi toute référence au contenu : nom de famille de l'auteur, initiales, année de publication, titre du document, Commission géologique de l'Ontario, série et numéro de publication, nombre de pages.

Utilisation et reproduction du contenu : Le contenu ne peut être utilisé et reproduit qu'en conformité avec les lois sur la propriété intellectuelle applicables. L'utilisation de courts extraits du contenu à des fins *non commerciales* est autorisé, à condition de faire une mention de source appropriée reconnaissant les droits d'auteurs de la Couronne. Toute reproduction importante du contenu ou toute utilisation, en tout ou en partie, du contenu à des fins *commerciales* est interdite sans l'autorisation écrite préalable du MDNM. Une reproduction jugée importante comprend la reproduction de toute illustration ou figure comme les graphiques, les diagrammes, les cartes, etc. L'utilisation commerciale comprend la distribution du contenu à des fins commerciales, la reproduction de copies multiples du contenu à des fins commerciales ou non, l'utilisation du contenu dans des publications commerciales et la création de produits à valeur ajoutée à l'aide du contenu.

Renseignements :

POUR PLUS DE RENSEIGNEMENTS SUR	VEUILLEZ VOUS ADRESSER À :	PAR TÉLÉPHONE :	PAR COURRIEL :
la reproduction du contenu	Services de publication du MDNM	Local : (705) 670-5691 Numéro sans frais : 1 888 415-9845, poste 5691 (au Canada et aux États-Unis)	Pubsales@ndm.gov.on.ca
l'achat des publications du MDNM	Vente de publications du MDNM	Local : (705) 670-5691 Numéro sans frais : 1 888 415-9845, poste 5691 (au Canada et aux États-Unis)	Pubsales@ndm.gov.on.ca
les droits d'auteurs de la Couronne	Imprimeur de la Reine	Local : 416 326-2678 Numéro sans frais : 1 800 668-9938 (au Canada et aux États-Unis)	Copyright@gov.on.ca

MARGINAL NOTES

INTRODUCTION AND ACCESS

Chabanel Township is centered at approximately 48°03′ N Latitude and 84°44′ E Longitude.

Access to Chabanel Township is fair. The Algoma Central Railway spur line to Wawa roughly follows the northern boundary of Esquega Township and then swings southwest across Chabanel Township. A private mine-access road leading north from Highway 17 at the east end of Wawa Lake, 6.4 km west of Wawa, provides access to the west side of Esquega Township and the east side of Chabanel Township. This road terminates before reaching the northern boundary of Chabanel Township. A four-wheel-drive road leads north from the sinter plant of the Algoma Ore division of the Algoma Steel Corporation Limited to the abandoned power site at Steephill Falls on the Magpie River; in the center of Chabanel Township. Helicopter is the most efficient means of access to that portion of Chabanel Township which lies northwest of the Magpie River.

Outcrop in the central and eastern portions of the township is abundant and the lack of forest cover in this area permits greater geological interpretation than is normally permitted in the shield area of Ontario. The township has been extensively prospected for iron, and production of iron from the Helen iron range has been continuous since the 1930s.

MINERAL EXPLORATION

Chabanel Township contains the George W. Macleod Mine of the Algoma Steel Corporation Limited, currently in production, as well as two abandoned open pit iron mines. The abandoned open pit iron mines occur in the Lucy and Eleanor iron ranges.

A gold showing at Magpie Junction has been recently examined by Canabec Explorations Limited (Assessment Files Research Office, Toronto). North of Wawa Lake, and just south of the Chabanel Township boundary, the former Mammoth Metals Limited tested a quartz vein containing galena, sphalerite and arsenopyrite. Silver values of up to 60 ounces per ton have been reported from this quartz vein.

Three gold showings in intermediate to felsic metavolcanics are reported to occur northwest of the McLeod Mine, however, information concerning work on these showings is sketchy. Phelps Dodge Corporation of Canada Limited diamond drilled several airborne geophysically indicated conductors in the northwestern corner of the township. These conductors contain barren sulphide mineralization. Exploration for minerals in Chabanel Township has been dominated by the search for economic deposits of iron.

GENERAL GEOLOGY

Intermediate to felsic metavolcanics lie stratigraphically below the Helen, Eleanor, Lucy and Mildred iron ranges. These felsic metavolcanics strike northeast and dip subvertical to vertical. They consist of coarse massive breccias to fine-grained laminated tuffs. Chloritoid occurs in those felsic metavolcanics stratigraphically below the Helen and Lucy iron ranges. Northwest of the Magpie River an extensive exposure of felsic metavolcanics is present. These rocks strike southeast and dip east to subvertical, they consist of coarse pyroclastics to fine-grained tuffs.

In the southeastern corner of Chabanel Township north-facing, northeast-striking, vertically to subvertically dipping massive and pillowed mafic metavolcanics are present. A minor unit of northeast-striking sheared, pillowed, mafic metavolcanics is also present south of the Magpie River and occurs in association with intermediate to felsic metavolcanics and metasediments.

Additional northeast-striking and north-facing pillowed and massive intermediate to mafic metavolcanics occur stratigraphically above the Lucy iron range. Massive and pillowed intermediate to mafic metavolcanics are extensively developed, striking northwest from Mildred Lake to the northern border of Chabanel Township. These mafic metavolcanics dip east and face west. The author considers the northwest-striking mafic metavolcanics north of Mildred Lake to represent the same volcanic cycle as the mafic metavolcanics lying stratigraphically above the Lucy iron range. Faulting however complicates correlation of the units.

The mafic to felsic metavolcanics stratigraphically below the Lucy, Eleanor and Helen iron ranges are considered by the author to represent the oldest or first cycle of volcanism in the Wawa area. The mafic metavolcanics lying stratigraphically above the Lucy iron range and those lying between Mildred Lake and the northern boundary of Chabanel Township are part of the middle or second cycle of volcanism. The coarse fragmental felsic metavolcanics lying beneath the Helen iron range are considered by the author to have been deposited proximal to the centre of first cycle volcanism, and the coarse fragmental felsic rocks north of the Magpie River are considered to have been deposited proximal to the middle cycle event. Upper cycle volcanism is not represented in Chabanel Township, but rather is associated with the Jubilee stock and is found in McMurray Township which adjoins Chabanel Township to the south (Sage 1979).

The first and middle cycles of volcanism are separated by the Michipicoten iron formation from which the bulk of the iron ore has been extracted from the Wawa area. The iron formations lie stratigraphically above the felsic metavolcanics of the lower cycle, and stratigraphically below the mafic metavolcanics of the middle cycle. From the stratigraphic bottom to the stratigraphic top, the iron formation consists of siderite, pyrite, chert, and graphite. The respective facies of iron formation vary considerably in degree of development between the ranges.

Major accumulations of metasediments are present in the Arliss Lake area, north and east of the Magpie River, and north of the Lucy iron range. A minor metasedimentary unit occurs south of the Magpie River. The metasediments stratigraphically above the Lucy iron range occur above the mafic to intermediate metavolcanics of the middle cycle, and in the area north of the Magpie River the metasediments interdigitate with various felsic fragmental rocks of the middle cycle. The metasediments are considered by the author to be laterally equivalent to the felsic metavolcanics and largely derived by erosion of the middle cycle felsic metavolcanics. Medium-grained trondhjemite clasts appear in some conglomerate horizons (Doré type) indicating that a minor component of the metasediments has been derived from a granitic terrain marginal to the Precambrian supracrustal basin.

In the Arliss Lake area small irregular bodies of quartz-feldspar porphyry are most extensively developed in proximity to the metasediment-metavolcanic contact.

Mafic to ultramafic intrusions are present in Lena Lake, at the north end of Mildred Lake, and on the west side of Bauldry Lake. These small bodies appear to have been emplaced within fault zones or at points of intersection of fault zones.

Stratigraphically below the Helen, Eleanor, and Lucy iron ranges mafic sill and dike-like intrusions intrude lower cycle felsic metavolcanics. These intrusions reach a maximum development below the Helen iron range where the mafic intrusions exceed 300 m in thickness. Minor mafic intrusions that consist largely of chlorite and rhombs of orange carbonate are abundant throughout the area.

The felsic metavolcanics and mafic intrusions located northwest of the Helen Mine and south of the Magpie River are interpreted to be equivalent to lower cycle metavolcanics that are thrust up and over the Helen iron range. The largest body of mafic intrusive rock within the lower cycle metavolcanics thrust over the Helen iron range, is centered on Legarde Lake. On the basis of this proposed overthrusting the Mildred iron range, which lies within this overthrust sequence, is considered to have once been the western extension of the Helen iron range.

The supracrustal rocks have been metamorphosed to the greenschist facies rank of regional metamorphism. Carbonate alteration is pervasive and may decrease in intensity towards the northwestern corner of the township. Carbonate alteration imparts light brown, brown, grey, and grey-brown colors to the mafic metavolcanics which are usually green. Silicification of pillowed rocks in the area south of Arliss Lake has given some pillowed mafic metavolcanics a light grey to white color.

Chloritoid is well developed in the rocks below the Helen iron range, and a zone 1650 m by 350 m has been outlined. A chloritoid zone also exists below the Lucy iron range. This zone is on the order of 30 to 40 m in maximum width and is not continous along the length of the range.

Two small but poorly outlined areas of chloritoid alteration are found in the northwestern corner of the township. Neither iron formation nor sulphide mineralization is known to be associated with these zones.

STRUCTURAL GEOLOGY

The structural geology of Chabanel Township is complex. The stratigraphy north of the Magpie River and west of Mildred Lake strikes southeast, faces west, and dips from 30 to 70° east. The rocks in this area have been overturned and consist exclusively of middle cycle metavolcanics.

The rocks above and below the Helen, Eleanor, and Lucy iron ranges, strike northeast, face north, and are vertical to subvertical in dip. This northeast-striking stratigraphy consists of both lower and middle cycle metavolcanics.

The lower cycle metavolcanics thrust over the Helen iron range likely have been folded, however, facing directions which would define the fold are lacking. The large horse-shoe shaped, open to the west, mafic intrusion centered on Legarde Lake crudely outlines this proposed fold. This body is not considered a phacolithic intrusion but, rather, the western extension of the mafic sill-like intrusion lying below the Helen iron range; This extension has been thrust up and over the Helen iron range. Its present shape is considered to have resulted from this folding-thrusting process. Separating the lower cycle rocks thrust up over the Helen iron range is the Talbot Lake fault. This fault is represented by lithologic offset, strongly developed schistosity, carbonate alteration, and a topographic linear. Schistosities and primary bedding in the felsic metavolcanic rocks due west of the Helen Mine indicate an abrupt change in strike from northeast to north. The lithologic and structural trends suggest that movement along the Talbot Lake fault was of the northside going eastward. The movement and drag along this fault, indicated by lithologic and structural trends, likely resulted in the tectonic thickening of the Helen iron formation at the site of the McLeod Mine. Minor structural features such as folds and stretched volcanic clasts suggest that the iron formation and associated metavolcanics plunge at approximately 60° east. The western limit of the Talbot Lake fault extends beyond the western boundary of the map, and the eastern end is cut off by the Walbank Lake fault.

In the area of the Magpie River, northwest of the Helen Mine, the northern limits of the lower cycle volcanic and intrusive rocks are likely indicated by a series of closely spaced faults which separates northeast-striking lower cycle metavolcanics from generally southeast-trending middle cycle metavolcanics. The rocks display penetrative schistosity between ridges of more massive-appearing rock. The main fault likely lies along the bed of the Magpie River and is referred to as the Magpie River fault. The eastern limit of this fault zone may be the Mildred Lake fault.

As a consequence of this interpretation the author considers the Eleanor iron range to be the eastern extension of the Helen.

The Eleanor iron range is an isolated block separated by two branches of the Mildred Lake fault. One branch of the fault (west branch) strikes north and merges with an inferred fault lying beneath Wawa Lake. This branch is indicated by a lithologic offset and a strong topographic linear. The eastern branch of the fault swings southeast from the north end of Lena Lake and merges with the Bauldry Lake fault which eventually joins with the Wawa Lake fault. This eastern branch of the Mildred Lake fault is indicated by abrupt lithologic changes and in diamond drilling by Algoma Ore Properties. This fault is occupied by a southeast-trending diabase dike.

The Mildred Lake fault is clearly indicated by abrupt lithologic change, abrupt change in structure, and a prominent topographic linear. The bulk of the movement along this fault was taken up along its east branch and the author considers the Lucy iron range to be the eastern extension of the Eleanor iron range which has been faulted northward. The Mildred Lake fault is a left-lateral fault with a displacement on the order of 4.2 km.

The Mildred Lake fault appears to have displaced the Magpie River fault northward and the author tentatively considers the eastern extension of the Magpie River fault to continue east from the northeast corner of Mildred Lake. This interpretation is based on topographic linears and intense shearing observed in outcrop. The eastern extension of this fault may consist of two branches northeast of the Lucy iron range. The author suspects that the north-facing metasediments in this area may represent a repeated section due to strike-slip movement which laterally thrust part of the section over and above another portion of the unit giving an unusually thick north-facing facing section of metasediments. The eastern extension of the Magpie River fault is terminated by the left-lateral Bauldry Lake fault, which lies on or just east of the eastern boundary of Chabanel Township. The Bauldry Lake fault displaces the continuation of the Magpie River fault north to the area of Goetz Lake, and beyond the map-area. The Bauldry Lake fault is represented by a lithologic offset of approximately 0.9 km and by a linear topographic low.

The structural interpretation presented means that the Mildred, Helen, Johnson, Eleanor, and Lucy iron ranges, along with the Ruth (Esquega Township) and Josephine (Corbiere Township) iron ranges, are stratigraphic as well as time equivalent and represent a fundamental break in volcanism between the lower and middle cycles.

Mapping indicates that the largely strike-slip Talbot Lake and Magpie River faults are older faults cut by the younger northwest-trending left-lateral Mildred and Bauldry Lake faults. The prominent northwest-trending set of Proterozoic dikes found in the area commonly occupy fault or shear zones.

ECONOMIC GEOLOGY

The Sir James Mine of The Algoma Steel Corporation Limited, located in the Eleanor iron range, has produced 7 790 632 tons of iron ore from pre-production reserves of 80 000 000 tons, while the Lucy Mine produced 1 107 773 tons of ore from unspecified reserves[1].

The Helen iron range has produced in excess of 60 000 000 tons of iron ore. Reserves of 93 000 000 tons were indicated in 1972.

Prospecting for gold in the area of Magpie Junction and northeast of the Helen iron range has indicated anomalous gold values (Assessment Files Research Office, Toronto).

The lead-zinc-silver showing northeast of Wawa Lake is in a quartz vein cutting mafic intrusive rocks. While impressive assays can be obtained on grab samples the narrow width (25 to 30 cm) of the vein inhibits additional work (Assessment Files Research Office, Toronto).

In road cuts along Highway 10 numerous narrow radioactive carbonate dikes are present. These dikes are too small to be of economic interest. Assay data on the veins is given in Table I. The dikes are likely coeval to the emplacement of the Firesand River Carbonatite located 3.0 km south of the southeastern corner of the township (Sage 1979)

RECOMMENDATIONS TO THE PROSPECTOR

The iron ranges have been extensively diamond drilled so as to preclude the location of additional near-surface iron deposits.

The rocks found in Chabanel Township are favourable for base-metal mineralization even though base-metal showings are not common. The shallow-dipping attitude of the rocks found in the central portion of Chabanel Township may make geophysical surveying in this area less effective than in an area of subvertically-dipping rocks.

Minor iron-sulphide mineralization was commonly observed near the mafic metavolcanic-metasedimentary and mafic-felsic metavolcanic contacts.

The gold showings located northwest of the Helen iron range have not been examined since the 1930s and may warrant reinvestigation.

[1] Ontario Geological Survey, Toronto, Geoscience Data Centre, Mineral Deposit Files, Sir James Mine, Lucy Mine, Helen-McLeod Mines, District of Algoma, Chabanel Township.

REFERENCE

Sage, R.P.

1979: Wawa Area, District of Algoma; p.49-53 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, Edited by V.G. Milne, O.L. White, R.B. Barlow, and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.

LIST OF PROPERTIES AND OCCURRENCES

1. Boliden showing
2. Eleanor iron range (Sir James Mine)
3. Helen iron range (McLeod Mine)
4. Johnson iron range.
5. Lucy iron range (Lucy Mine)
6. Magpie Junction showing
7. Mildred iron range.
8. Miller showing
9. Williamson showing
10. Mammoth Metals Limited
11. Phelps Dodge Corporation of Canada Limited

NOTE: Not all properties may appear on this map-sheet.

TABLE 1: TABULATED DATA FOR RADIOACTIVE CARBONATE DIKES ALONG HIGHWAY 101

Dike No.	Station No.	CPM-dike	CPM-WR	Strike	Dip	Width	U(ppm)	Th(ppm)	Ce(ppm)	Nd(ppm)
RA-1	111-2B	7500	1800	015°	55°S	15cm	24	70	560	300
RA-2	111-23	8000	1500	345°	76°W	5cm	NA	—	—	—
RA-3	111-24C	15000	2000	000°	9°W	40cm	9	260	440	230
RA-4	111-25A	20000	2000	135°	50°W	15cm	8	420	380	190
RA-5	111-27	15000	2500	145°	50°W	Braided	NA	—	—	—
RA-6	111-31	4000	1500	070°	82°S	5cm	< 1	10	40	30
RA-7	111-32	3000	2000	345°	71°N	—	NA	—	—	—
RA-81	111-33	4500	2000	150°	69°S	Braided	11	70	660	360
RA-82	111-34B	15000	2000	350°	52°E	Braided	6	120	1520	700

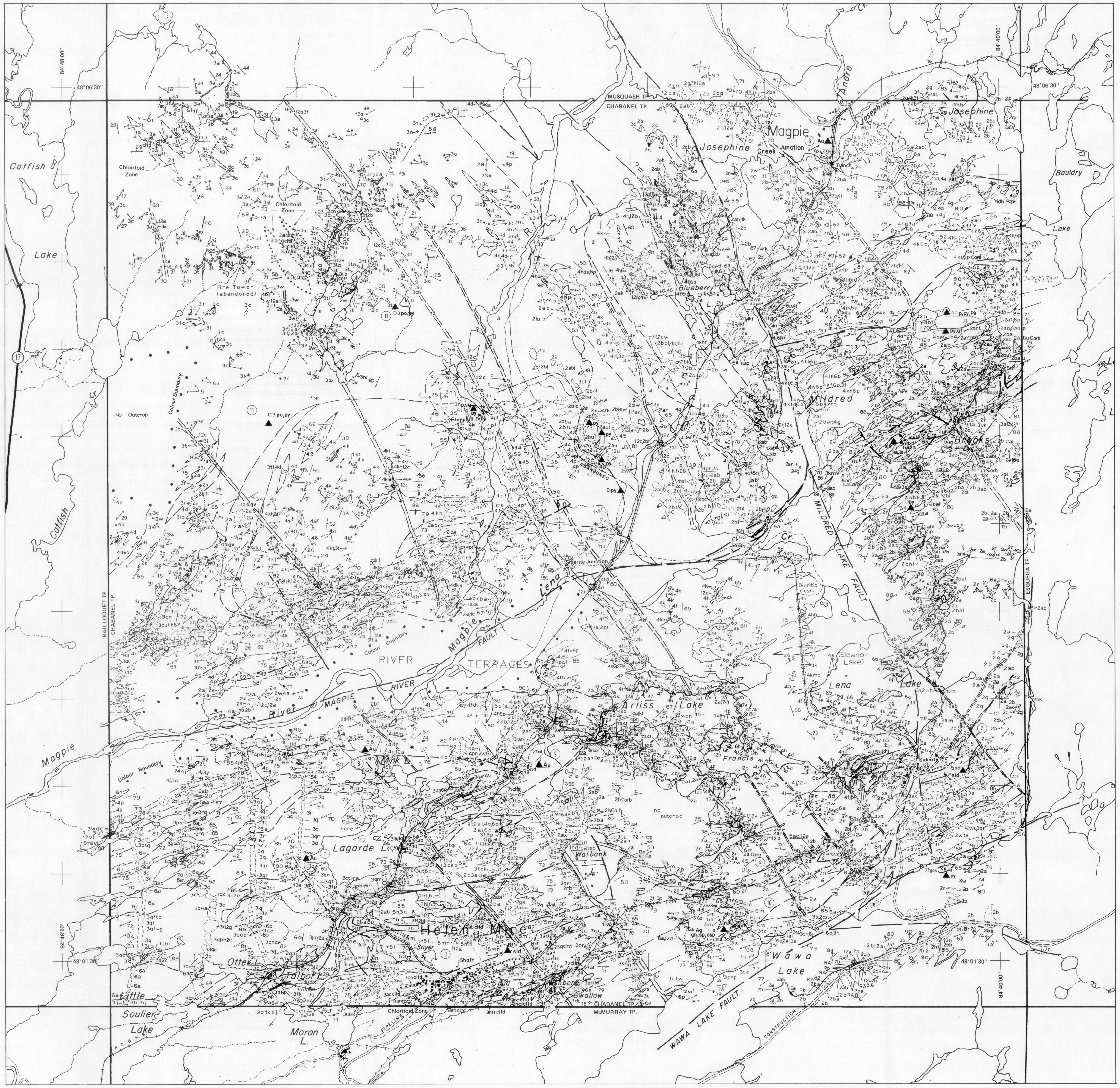
NA = not analyzed, CPM = counts per minute, WR = wall rock

NOTES FOR LEGEND

a) This is a field legend and may be changed subsequent to laboratory investigations. The legend applies to Chabanel, Musquash, McMurray, Lastheels and Esquega Townships. Units listed may not all be present in each township.
b) Greater than 50 percent silicate-oxide minerals.
c) Greater than 50 percent carbonate.
d) Colour index 20 to 40.
e) Colour index 10 to 25.
f) Transitional porphyritic to non-porphyritic.
g) Associated with mafic intrusive rocks.
h) A chemical sedimentary bed which contains 33 percent or more of the common iron minerals by volume. This does not include commonly associated interbeds of chert or clastic sedimentary material. A sufficiently extensive mappable unit containing a significant proportion of ironstone interbeds may be designated as an iron formation.
i) Doré type conglomerate
j) Green mica may be present.
k) May be intrusive in part.
l) Greater than 5 percent quartz.
m) Possibly contemporaneous with unit 7.

Where a rock-unit code is followed by a second code in brackets, xenoliths of the second unit occur within the first unit.

Many drillholes, pits, trenches, and all surveyed claims were not plotted on map-face due to lack of space.



LEGEND[a]

PHANEROZOIC
CENOZOIC
QUATERNARY
PLEISTOCENE AND RECENT

Organic soils, sandy till, glaciofluvial sand and gravel

UNCONFORMITY

PRECAMBRIAN
LATE PRECAMBRIAN
MAFIC INTRUSIVE ROCKS

12

- 12 Unsubdivided
- 12a Diabase
- 12b Porphyritic (feldspar) diabase
- 12c Glomeroporphyritic (feldspar) diabase
- 12d Diabase with minor biotite
- 12n Carbonatite
- 12p Olivine lamprophyre
- 12q Carbonatite-silicocarbonatite[b]
- 12r Ferruginous carbonatite
- 12s Syenite
- 12t Biotite lamprophyre
- 12u Porphyritic (feldspar) lamprophyre

CARBONATITE INTRUSIVE ROCKS
FIRESAND CARBONATITE

11

- 11a Sovite[c]
- 11b Silicocarbonatite[b]
- 11c Rauhaugite (ferruginous 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[d]
- 7e Granodiorite, granite[e]
- 7f Aplite
- 7g Diorite, granodiorite
- 7k Felsic dikes
- 7m Trondhjemite, granodiorite, quartz feldspar porphyry[f]
- 7o Porphyritic granodiorite, granitic rocks
- 7p Intrusive breccia
- 7r Porphyritic (plagioclase) diorite, granodiorite

INTRUSIVE CONTACT

MAFIC TO ULTRAMAFIC INTRUSIVE ROCKS

6

- 6 Unsubdivided
- 6a Gabbro, diorite
- 6b Anorthositic gabbro
- 6c Anorthosite
- 6d Diabase
- 6f Hornblende diorite
- 6g Peridotite
- 6h Pyroxenite
- 6i Talc schist
- 6j Mafic dikes
- 6k Quartz diorite, trondhjemite[g]
- 6m Quartz gabbro
- 6n Xenolithic gabbro
- 6q Porphyritic gabbro, diorite
- 6p Carbonatized or carbonate-bearing mafic intrusion
- 6r Hornblendite

INTRUSIVE CONTACT

METASEDIMENTS AND METAVOLCANICS
CHEMICAL METASEDIMENTS

5

- 5 Unsubdivided
- 5a Magnetite and/or hematite ironstone[h], chert
- 5b Carbonate ironstone[h]
- 5c Sulphide ironstone[h]
- 5d Chert, sideritic, pyritic or graphitic
- 5e Graphite
- 5f 5a, 5d (1:1)
- 5g 5b, 5d (1:1)
- 5h 5c, 5d (1:1)
- 5i Chert, graphite, argillite
- 5j Chert
- 5k 5d, 5b, 5a
- 5m Chert, wacke, siltstone
- 5n Chert, cemented with iron oxides, weathered iron formation
- 5o Magnetite ironstone, wacke
- 5p Chert, hematite
- 5q Iron oxide, chert, wacke
- 5r Iron oxide, wacke
- 5s 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 Interlaminated siltstone, mudstone
- 4g Conglomerate with granite clasts[i]
- 4h Volcanic-clast conglomerate
- 4j Siltstone, sandstone, lithic sandstone
- 4k Quartz arenite, arkose, lithic arkose
- 4m Carbonate-rich metasediment[j]
- 4n Lithic arkose
- 4p Thinly bedded wacke, siltstone
- 4q Carbonate, ferruginous limestone

INTERMEDIATE TO FELSIC METAVOLCANICS

3

- 3 Unsubdivided
- 3a Sericite schist
- 3b Heterolithic breccia
- 3c Monolithic lapilli-tuff
- 3d Tuffaceous quartz-eye, feldspar clast, sericite schist
- 3e Banded tuff with fiamme
- 3f Massive flow
- 3g Monolithic breccia (felsic matrix, mafic clasts)
- 3h Porphyritic (feldspar) flow
- 3i Feldspar crystal tuff, intermediate
- 3j Porphyritic (quartz) flow
- 3k Spherulitic flow
- 3m Flow-banded lava
- 3n Autoclastic monolithic breccia
- 3o Intermediate tuff
- 3p Heterolithic lapilli-tuff
- 3q Quartz-eye crystal tuff
- 3r Heterolithic quartz-eye crystal tuff, lapilli-tuff
- 3s Heterolithic crystal tuff, breccia
- 3t Tuff
- 3u Laminated tuff
- 3v Chlorite-sericite schist
- 3w Feldspar crystal tuff, felsic
- 3y Crystal (quartz-feldspar) tuff
- 3z Heterolithic (cataclastic) breccia

MAFIC TO INTERMEDIATE METAVOLCANICS

2

- 2 Unsubdivided
- 2a Massive flows
- 2b Pillowed flows
- 2c Chlorite schist
- 2d Heterolithic breccia
- 2e Monolithic breccia (mafic matrix, felsic clasts)
- 2f Porphyritic (feldspar) flows
- 2g Massive medium-grained flows[k]
- 2h Magnetite-bearing flows
- 2i Tuffaceous chloritic schist
- 2j Pillowed porphyritic (feldspar) flows
- 2k Variolitic flows
- 2l Amygdaloidal flows
- 2m Feldspar (quartz) crystal tuff
- 2n Heterolithic breccia, lapilli-size clasts
- 2p Heterolithic breccia (mafic matrix, intermediate to felsic clasts)
- 2q Amphibolite
- 2r Laminated tuff, lapilli-tuff
- 2s Crystal (feldspar) tuff, crystal lithic tuff
- 2t Talc-actinolite, actinolite rock
- 2u Monolithic breccia (mafic matrix, mafic clasts)
- 2v Laminated tuff
- 2w Lapilli-tuff
- 2y Porphyritic (amphibole) flows
- 2z Tuff, chloritic schist with quartz[l]

UNCONFORMITY

EARLY FELSIC PLUTONIC ROCKS
GNEISSIC GRANITIC ROCKS

1

- 1a Aplite
- 1b Pegmatite
- 1c Diorite, quartz diorite
- 1d Trondhjemite
- 1e Trondhjemite, gneissic to massive
- 1f Leucocratic trondhjemite
- 1g Porphyritic biotite trondhjemite dikes

MASSIVE GRANITIC ROCKS[m]

- 1n Aplite, pegmatite dikes
- 1p Diorite, quartz diorite
- 1q Trondhjemite
- 1r Granodiorite, quartz monzonite
- 1s Monzonite, quartz monzonite
- 1t Porphyritic monzonite, quartz monzonite
- 1u Granodiorite, trondhjemite, weakly foliated
- 1v Porphyritic granodiorite
- 1w Massive quartz monzonite

- Bx Breccia
- Carb Carbonatized

SOURCES OF INFORMATION

Base-map derived from Forest Resources Inventory maps, Lands and Waters Group, Ontario Ministry of Natural Resources.

Geology not tied to surveyed lines.

Assessment Work Library, Ministry of Natural Resources, Toronto Sault Ste. Marie.

Records, Algoma Ore Properties, Sault Ste. Marie.

Records, Algoma Central Railroad, Sault Ste. Marie.

Magnetic declination was 6°17″ in 1979.

Metric Conversion Factor: 1 foot = 0.3048 m

Ministry of Natural Resources
Ontario

Hon. Alan W. Pope
Minister

W.T. Foster
Deputy Minister

ONTARIO GEOLOGICAL SURVEY

MAP P.2439

GEOLOGICAL SERIES — PRELIMINARY MAP

PRECAMBRIAN GEOLOGY OF CHABANEL TOWNSHIP

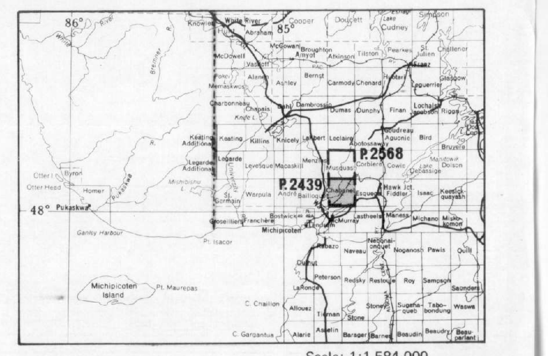
ALGOMA DISTRICT

Scale 1:15 840

Mile ¼ 0 ¼ ½ Mile
Metres 100 0 0.2 0.4 0.6 0.8 1 Kilometre

NTS Reference: 42C/2
ODM-GSC Aeromagnetic Map: 2192G
ODM Geological Compilation Map: 2220

This map is published with the permission of E.G. Pye, Director, Ontario Geological Survey.



LOCATION MAP

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

SYMBOLS

- Schistosity; inclined, vertical
- Lineation; m=mullion structure, c=clast, p=pillow, s=slickensides, b=biotite, mf=intersection of two foliations, F=fold axis of minor fold, se=stretched spherulites
- Glacial striae
- Pillowed volcanics, dip and facing direction indicated.
- Pillow elongation; inclined, vertical, facing direction unknown
- RA² Radioactivity; superscript refers to number in table
- Minor shear; inclined, vertical
- Major shear; attitude uncertain, attitude indicated
- IF Iron formation
- Trench
- Pit Pit
- Sil Silicified
- 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, interpreted
- Small bedrock outcrop
- Area of bedrock outcrop
- gos Gossan
- Fe Iron staining
- cltd Chloritoid
- MA Magnetic activity
- Mine
- py Mineral occurrence
- 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
- Paleocurrent direction as suggested by ripple marks
- Jointing; inclined, vertical
- Lineament
- Lineament, possibly a fault zone
- D Data from diamond drillhole
- 39′ Shaft, depth in feet

NOTE: Not all symbols may appear on this map-sheet.

METAL AND MINERAL ABBREVIATIONS

Ag	Silver
asp	Arsenopyrite
Au	Gold
gn	Galena
gf	Graphite
po	Pyrrhotite
py	Pyrite
qv	Quartz vein
sp	Sphalerite
sid	Siderite

NOTE: Not all abbreviations may appear on this map-sheet

CREDITS

Geology by R.P. Sage, Z. Rebic, S. Abercrombie, K. Neale, D. MacMillan, 1980; R. Sage, D. England, and T. Calvert, 1981.

Issued 1982

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., Rebic, Z., Abercrombie, S., Neale, K., MacMillan, D., England, D., and Calvert, T.
1982: Precambrian Geology of Chabanel Township, Algoma District; Ontario Geological Survey, Map P.2439, Geological Series — Preliminary Map, scale 1:15 840 or 1 inch to ¼ mile. Geology 1980, 1981.