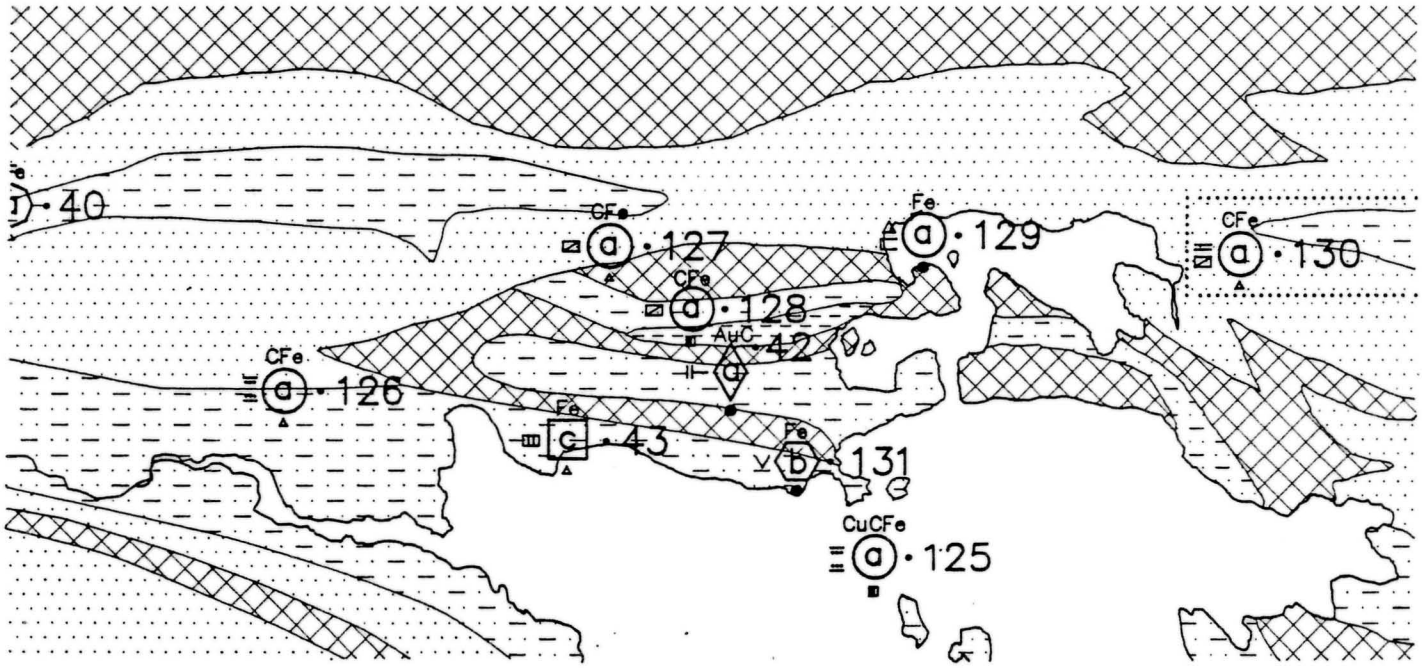
Mineral Deposit Series Report No. 23



Mineral Deposits and Occurrences in the Sickle Lake Area, NTS 64C/10

By K.J. Ferreira

Manitoba
Energy and Mines
Geological Services

1993

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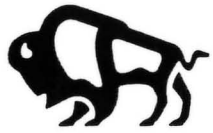

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By K.J. Ferreira
Winnipeg, 1993

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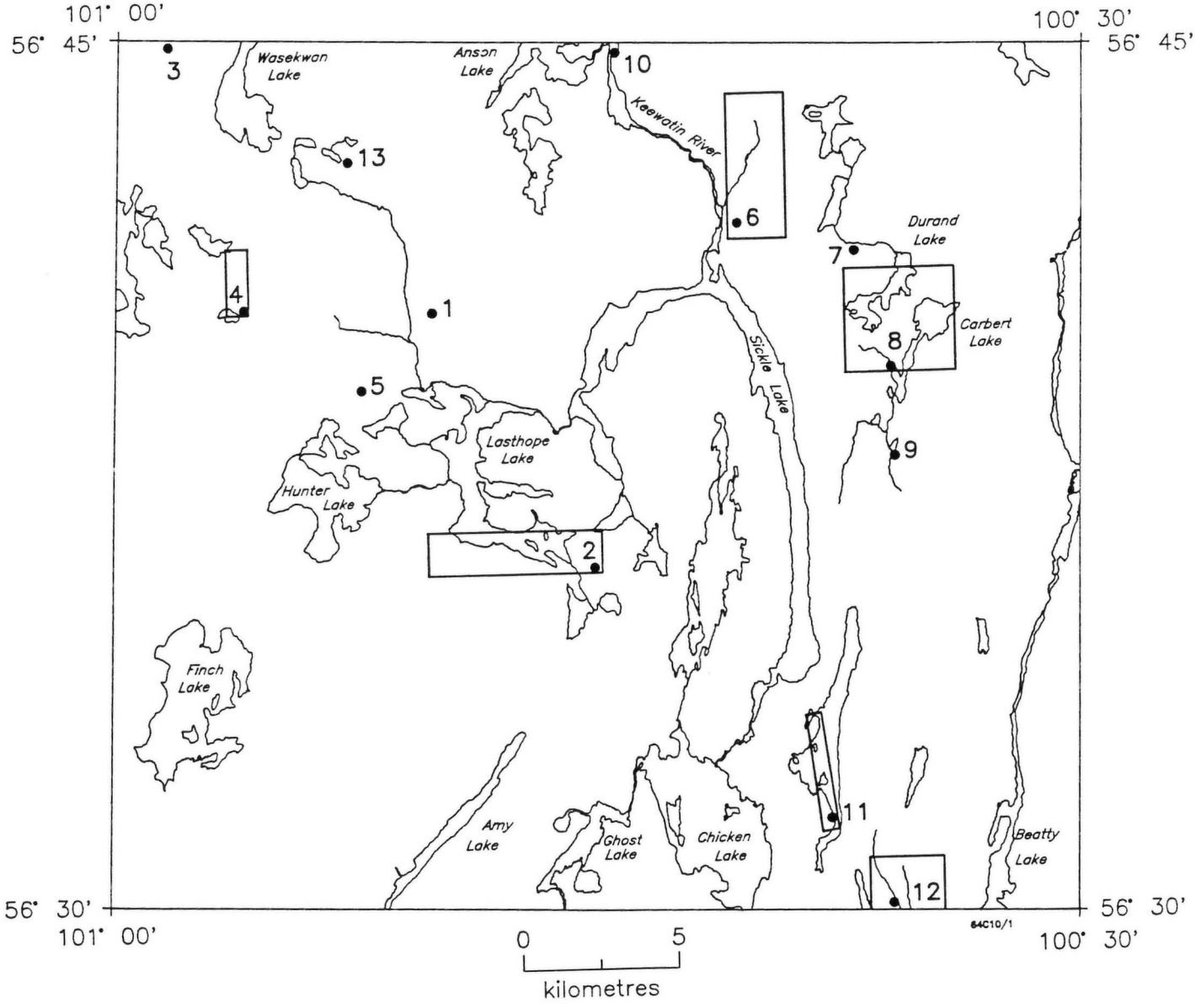

Figure 1: *Location of mineral deposits and occurrences (64C/10).*

INTRODUCTION

This report and accompanying map are part of a Mineral Deposit Series presenting a uniformly organized and up-to-date collation and analysis of information on mineral occurrences in the Province of Manitoba. The series is intended: (1) to provide explorationists with a geoscientific data base that can be used in mineral exploration; and (2) to provide a technical data base for other government users in resource evaluations, formulation of mineral and land use policies, and the initiation of regional development programs.

METHODOLOGY

The documentation program was initiated in the main mining districts of the province under the 1984-1989 Canada-Manitoba Mineral Development Agreement. Under this project mineral deposit geologists of the Geological Services Branch have attempted to inspect and evaluate each known mineral occurrence. These site visits ranged from a preliminary half day or less search of an area for old workings, to extensive geological mapping of selected occurrences for a week or more. In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources. The Manitoba Mineral Inventory Card Index and the cancelled Assessment Files have been used extensively in the preparation of the report. Mineral occurrence documentations representing only cancelled assessment file compilations are identified as such under the heading 'Name'. Information for all other occurrences was acquired primarily by field examination and are commonly supplemented by cancelled assessment file compilations.

Information has been collated and maps prepared with the assistance of junior staff geologists and summer assistants. Senior mineral deposit geologists have provided the deposit classifications and text for the report.

The locations of all mineral deposits and occurrences are presented in Figure 1.

Deposit versus Occurrence

Throughout this report mineralization is referred to as a deposit if tonnage and grade figures are known; all other mineralization is referred to as an occurrence.

Massive Sulphide versus Solid Sulphide

The use of 'massive sulphide' in the geological literature is confusing in that it is not always clear whether the authors are referring to a 'massive sulphide deposit' (*cf.* Sangster, 1972) or a section of sulphide-rich rock. In this publication 'massive sulphide' will be used in reference to a deposit type, i.e., a volcanogenic massive sulphide deposit type, rather than the nature of the mineralization. A volcanogenic or sedimentogenic massive sulphide deposit can contain a sulphide lens that locally contains as little as 10% sulphide minerals by volume. The alteration zones that are an integral part of many massive sulphide deposits rarely contain more than 50% sulphide minerals. Consequently, the use of 'solid sulphide' for 75% to 100% and 'near solid sulphide' for 50% to 75% sulphide minerals is adopted in place of the commonly used term 'massive' to describe the textural aspects of a sulphide mineralization.

FORMAT OF MINERAL DEPOSIT MAPS

Location:

One of the incentives spurring the mineral deposit documentation was the absence of accurate location maps for known mineral occurrences. Inaccurate land bases have previously resulted in failure to find old workings, surveys carried out in wrong areas, and even cancellation of intended surveys by explorationists. Consequently, considerable field time has been spent in establishing occurrence locations and attempts have been made to display exact locations both on the map and in the accompanying report.

The location number on the map is a unique reference number that will be used both in the report and the geologists' unpublished data base. These numbers are consecutive within each 1:50 000 NTS map sheet (but not within portions of a map sheet such as Map MDS87-1).

Deposit Types:

In order to maintain a mineral deposit classification, which will be useful to both explorationists and metallogeneticists, a simplified descriptive classification was selected. This classification is based on the use of common deposit types for the classification of both deposits and occurrences. The classification of mineralization is based on the premise that the mineral explorationist requires information on metals and types of mineralization in an area as well as on the economic deposits (past, present and future producers).

All deposits and occurrences are classified according to the Deposit Type classification in Table 1.

The deposit type displayed on the map represents mineralization with the greatest economic potential, for example a disseminated narrow chalcopyrite layer is emphasized rather than a much thicker solid pyrite-graphite layer.

Mineralization:

A symbol is used to denote the percentage and/or type of mineralization present. At some localities more than one type of mineralization is present. The type of mineralization displayed in the symbol represents the mineralization with the greatest economic potential as indicated by the deposit type symbol. It should be noted that in the context of this report a "sulphide facies iron formation" is equivalent to a "sulphide stratum". For a discussion of sulphide stratum the reader is referred to Gale *et al.* (1980).

TABLE 1: MINERAL DEPOSIT TYPES

STRATABOUND MASSIVE SULPHIDE TYPE DEPOSITS
- a) Volcanic rock associated
- b) Sedimentary rock associated
- c) Alteration zone associated with a or b

CHEMICAL SEDIMENT TYPE DEPOSITS
- a) Sulphide facies iron formation
- b) Oxide facies iron formation
- c) Carbonate facies iron formation
- d) Silicate facies iron formation
- e) Other chemical sediments

VEIN TYPE DEPOSITS
- a) Single vein
- b) Multiple veins or lenses
- c) Stockwork

MAGMATOGENIC TYPE DEPOSITS ASSOCIATED WITH MAFIC/ULTRAMAFIC ROCKS
- a) Disseminated
- b) Layered
- c) Net textured
- d) Podiform

DEPOSITS WITH PORPHYRY AFFINITIES
PEGMATITE TYPE DEPOSITS
CLASTIC SEDIMENT TYPE DEPOSITS
REPLACEMENT TYPE DEPOSIT
DISSEMINATED MINERALIZATION-NOT CLASSIFIED

Host Rocks:

In general, this description refers to the immediately underlying and overlying rock types. When a number of rock types are present in an extensive zone of mineralization, the most common rock types are indicated.

Elements:

This description allows for a maximum of three metals present in increasing order of abundance by volume. The precious and base metals are indicated in preference to elements such as iron and carbon.

In some instances it has been more efficient on the map and in the report to make reference to an area of mineralization rather than individual deposits or occurrences. All mineralization in the area delineated by a dotted line on the map is referenced in the report under the location number within that area.

FORMAT OF MINERAL DEPOSIT REPORTS

Location:

Each deposit or occurrence description will contain the unique deposit reference number, deposit or claim name where applicable, UTM coordinates, general area description, the reference number of the airphoto on which the deposit can be located and a brief description of method(s) of access.

Exploration Summary:

This section provides a summary of the extent of exploration. Information for this section was compiled from Mineral Inventory Cards, cancelled Assessment Files, and maps and files from the Mining Recording Office.

Geological Setting:

In this section the general geology of a deposit or occurrence is described. The information levels of the descriptions vary considerably and depend largely upon the extent of geological mapping during the documentation project. For further details the reader should consult the references cited.

Mineralization:

A detailed description of the mineralization provides the reader with the opportunity to make his own evaluation of the significance of a mineral occurrence or deposit.

Geochemical Data:

In addition to detailed geological mapping around individual mineral occurrences, rock samples were collected from trenches and outcrops in the vicinity of the occurrences. The assay and geochemical data are included in this section. Extensive geochemical data bases are referenced but not reproduced here.

Classification:

In this section the geologist may indicate the reasons for the classification appearing on the Mineral Deposit Map. For those localities containing more than one deposit type, the deposit types not shown on the map are documented here.

References:

These include both published and unpublished sources. For published and assessment report information the reader should obtain desired material directly from the source. The mineral deposit geologists will endeavour to supply copies of unpublished material on a deposit by deposit basis. References listed at the end of each occurrence description may also include sources of additional information not directly cited in the text.

ABBREVIATIONS

The following abbreviations are used throughout the occurrence descriptions:

A.F.	assessment file
asp	arsenopyrite
CB	claim block
c.g.	coarse grained
cm	centimetre
cp	chalcopyrite
DDH	diamond drill hole(s)
diss.	disseminated
EM	electromagnetic
g/t	grams per tonne
ga	galena
HLEM	horizontal loop electromagnetic

km	kilometre
m	metre
mt	magnetite
oz/ton	ounces per ton
po	pyrrhotite
py	pyrite
SGM	Sherritt Gordon Mines Limited
sp	sphalerite
t	tonne
tr.	trace
VLF-EM	very low frequency electromagnetic

ACKNOWLEDGMENTS

K. Dahlin provided office assistance in data compilation. The map was drafted by J. Morales and C. Wojciechowski; figures were drafted by M. Pacey and B. Lenton. Technical review by G. Ostry, G.H. Gale and W.D. McRitchie, and editorial comment by D.A. Baldwin are greatly appreciated. Desktop publishing was done by S. Weselak.

Field work for the Mineral Deposit Series in the Lynn Lake region was directed and supervised by D.A. Baldwin. Geological field work for the Lasthope deposit (location 1) was carried out by D. Parbery and A. Michielsen.

NOTE: This mineral deposit report and the accompanying map are intended to be active documents that can be updated as new information becomes available. Although revisions of the publication are anticipated, any additional unpublished information may be obtained by contacting the authors or the Director, Geological Services Branch.

GENERAL GEOLOGY OF NTS AREA 64C/10

The geological base for mineral deposit map sheet 64C/10 is taken from the 1:50 000 map of Gilbert *et al.* (1980). Reconnaissance geological mapping had been previously done in this area by Norman (1934), Fawley (1949, 1952) and Milligan (1960). Bateman (1945) mapped the rocks at 1:18 000 between Wasekwan and Miskwa lakes, and examined a section near Lasthope Lake. The Sickle Lake area is underlain by rocks of the Proterozoic Lynn Lake greenstone belt, bounded to the east and west by large granodioritic to tonalitic plutons. Supracrustal rocks of the Lynn Lake greenstone belt are subdivided into the volcanic and volcanic-derived sedimentary rocks of the Wasekwan Group (Bateman, 1945) and younger sedimentary rocks of the Sickle Group (Norman, 1934).

The Wasekwan Group consists mainly of basaltic to andesitic flows and volcaniclastic rocks, and lesser amounts of felsic volcanic rocks. The earliest volcanic episodes (1910 Ma; Baldwin *et al.*, 1987) are synchronous with early volcanism in the Flin Flon greenstone belt to the south (Gordon *et al.*, 1990). Wasekwan Group rocks have been subdivided into geochemically distinct northeasterly-trending "northern" and "southern" belts. Rocks in the "southern belt" comprise up to 2100 m of tholeiitic, aphyric and porphyritic basalt, overlain by discontinuous units of sedimentary rocks and an up to 2700 m thick calc-alkaline suite of mafic, intermediate and felsic volcanic rocks.

In the Sickle Lake map area, Gilbert *et al.* (1980) describe the Miskwa Lake and Keewatin River belts of Wasekwan Group rocks. The Miskwa Lake belt is separated from the "southern belt" north of Wasekwan Lake by the Johnson Shear Zone (Bateman, 1945), a major easterly-trending zone of deformation. This belt is interpreted to form part of an isoclinal anticline with a northwesterly axial trace, and is cored by an tonalite pluton. Rocks on the northeast limb of the anticline comprise a northeast-facing sequence of (1) basal aphyric basalt, overlain by (2) 460 to 800 m of massive aphyric, plagioclase phyric and pyroxene-plagioclase phyric flows and autoclastic breccia, (3) up to 180 m of siltstone and mafic mudstone, and (4) an unknown thickness of greywacke. The southwest limb comprises a southwest-facing sequence that includes (1) a unit up to 150 m thick of interlayered ferruginous chert and basalt flows or sills, overlain by (2) a wedge of felsic tuff (ash flow?) up to 720 m thick, (3) up to 500 m of siltstone and mafic mudstone, (4) 670 m of massive aphyric basalt flows and associated mafic volcanic and hypabyssal rocks, and (5) up to 460 m of biotitic greywacke and siltstone (Gilbert *et al.*, 1980).

To the east, the arcuate Keewatin River belt is separated from the "southern belt" by intermediate plutons. It comprises a homoclinal, west-facing sequence of (1) intermediate and mafic massive flows and tuff up to 2500 m thick, including a wedge of mafic lapilli tuff and crystal tuff, 10 to 50 m of magnetite-quartz iron formation and mafic tuff, and local intercalations of greywacke and siltstone; (2) dacite up to 790 m thick, including massive plagioclase phyric flows, crystal tuff and lithic tuff; and (3) greywacke and siltstone, with minor pebble conglomerate and massive mafic flows or sills. The greywacke-siltstone unit has an exposed thickness of 840 m, but is inferred from aeromagnetic data to be up to 1050 m thick (Gilbert *et al.*, 1980).

Other smaller areas of Wasekwan Group rocks are isolated in granitic terrane between Sickle Lake and Counsell Lake (NTS 64C/11) to the west.

The Sickle Group, named for the type locality at Sickle Lake, consists of a basal conglomerate up to 540 m thick that is overlain by an arkosic sequence that is dominated by medium grained sandstone and minor pebbly sandstone (Norman, 1934; Bateman, 1945; Fawley, 1949, 1952; Milligan, 1960; Campbell, 1972; Gilbert *et al.*, 1980). The Sickle Group is at least 3900 m thick (Gilbert *et al.*, 1980). The conglomerate contains clasts of pre-Sickle intrusive rocks, Wasekwan Group volcanic, sedimentary and intrusive rocks, and other pre-Sickle sedimentary and igneous rocks that have not been identified in the Sickle Lake - Granville Lake region, and thin interbeds of arkose and arkosic sandstone (Campbell, 1972). The arkosic sequence that overlies the conglomerate consists of fine- to coarse-grained recrystallized arkosic sandstone, pebbly sandstone, greywacke, argillite and impure quartzite (Norman, 1934; Fawley, 1949; Milligan, 1960; Gilbert *et al.*, 1980). The unconformity between Sickle Group rocks and underlying Wasekwan Group rocks was first documented along the east side of Black Trout Lake (Norman, 1934), and was examined in further detail by Campbell (1972). Bateman (1945) estimated that as much as 3660 m of Wasekwan Group rocks had been removed by erosion and/or faulting before deposition of Sickle Group rocks from the section north of Lasthope Lake.

Mafic, intermediate and felsic plutons were intruded during and after volcanism that produced the Wasekwan Group, and after deposition of the Sickle Group. The latest plutonism occurred at 1876 Ma, contemporaneous with early volcanism in the Rusty Lake greenstone belt to the east (Baldwin *et al.*, 1987).

The Lynn Lake greenstone belt has undergone medium- to high-grade regional metamorphism. Lower- to middle-amphibolite facies assemblages are prevalent in the Sickle Lake map area (Gilbert *et al.*, 1980).

Five episodes of deformation have been identified in the Lynn Lake area (Gilbert *et al.*, 1980):

D_1: isoclinal folding of Wasekwan Group rocks about steeply dipping ENE-trending axial surfaces;

D_2: uplift, erosion, faulting and tilting. Rocks that have been affected by D_1 and D_2 are truncated by the unconformity that predates deposition of the Sickle Group;

D_3: thrust faulting at the margins of the greenstone belt (not identified in NTS 64C/10);

D_4: formation of domal complexes in Sickle Group rocks from north- and east-trending folds (e.g., at Sickle Lake); regional metamorphism and development of foliation; and

D_5: continued development of foliation and open cross folding, development of brittle structures, cataclasis and kink folds. The Miskwa Lake belt is truncated from the "southern belt" by the Johnson Shear Zone (Bateman, 1945), a D_5 feature that is characterized by a pronounced foliation, shear textures, brecciation, fractures, truncation of lithologic units, obliteration of primary features, alteration and mineralization (Fedikow *et al.*, 1991; Fedikow *et al.*, 1986).

The Lasthope deposit (Location 1) contains drill-indicated proven, probable and possible reserves of 541 000 tonnes grading 8.23 g/t Au (The Northern Miner, June 20, 1988). Gold is hosted by sulphide-bearing quartz veins in a dominantly quartzitic rock sequence. Vein type gold occurrences also occur within the Black Trout diorite. A small shaft and various trenches tested the most notable of these occurrences (Location 11) along the western shore of Black Trout Lake.

Geological data for most of the other occurrences that are located with this map area are sparse; therefore, these descriptions are short and classifications are tentative.

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MINERAL DEPOSITS AND OCCURRENCES: SICKLE LAKE AREA (64C/10)

LOCATION: 1

NAME LASTHOPE, MADOLE VEIN

UTM: 6282164N/387431E

ACCESS: By float plane to Lasthope Lake, then by a trail; or, by winter roads and trails from the town of Lynn Lake.

AREA: 3.5 km northwest of Lasthope Lake

AIRPHOTO: A23828-137

EXPLORATION SUMMARY:

This description is summarized from Mineral Inventory Card 64C/10 Au1 unless otherwise indicated. The Smoke, Nencie, Heath and Oro claim groups were staked in 1938-39 by R. Madole, A. Anderson, F.S. Johnson, R. Rundle, J.W. Rundle, H.H. Hales, A.E. Gallie, W.J. Farley, E.L. Brown, J. Stewart and J. Sayies. The Smoke, Nencie and Heath claims were optioned to SGM in 1939. Forty-one trenches were blasted along the strike of the Madole vein in 1938 (Milligan, 1960); most of these are now slumped and overgrown (Baldwin *et al.*, 1985). SGM drilled 59 holes totalling 3127 m in 1939. In 1940, SGM announced reserves of 127 000 tonnes grading 7.9 g/t Au to a depth of 46 m. The claims were transferred to E.L. Brown in 1940, and Lasthope Lake Gold Mines Limited, a subsidiary of SGM, was incorporated to develop the property. An additional 1333 m diamond drilling was carried out in 1941. Leases M1455 through M1490 were issued to cover the claims in 1944. In 1945, SGM released revised reserve figures for the Lasthope deposit of 118 000 tonnes grading 7.2 g/t Au to a depth of 114 m.

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Mattagami Lake Mines Limited in 1973 (A.F. 91826). Questor Surveys Ltd. (1976, 1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government. Part of the area was covered by an airborne radiometric survey conducted by Dome Exploration (Canada) Limited in 1969 (A.F. 91674). The Smoke claims lapsed in 1977.

W. Bruce Dunlop Limited staked CB 9043 in 1978, and transferred the claim to Jalna Resources Limited (now Consolidated Jalna Resources Limited) in 1983. Prospecting and geophysical surveys (types unspecified) were carried out in 1982 and 1985. Grand Energy Corporation, later renamed Balcor Resources Corporation, optioned the property in 1986. Magnetometer, VLF-EM and IP surveys, geological mapping, prospecting, sampling (type unspecified), and 18 300 m diamond drilling were carried out in 1987-88. Drill-indicated proven, probable and possible reserves of 541 000 tonnes grading 8.23 g/t Au have been outlined at the Lasthope deposit (The Northern Miner, June 20, 1988).

Thirty holes totalling 903 m were drilled in 1948 (by SGM?) on claim Elk 2, east of the Lasthope deposit (Milligan, 1960, p. 186-187). The specific locations of these holes and what they intersected are not available.

Granges Aktiebolag drilled two holes totalling 111 m on CB 7577 east of the Lasthope deposit in 1977 (A.F. 92701). SGM drilled DDH KW-1 (69 m) in 1977 on CB 7714, near Miskwa Lake to the north of the Lasthope deposit (A.F. 92274).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group sedimentary rocks, mafic and felsic volcanic rocks and mafic intrusions (Fig. 1-1; Gilbert *et al.*, 1980). At the Lasthope deposit, Bateman (1945) mapped a northwest-trending sequence that consists of magnetite-bearing quartzite, feldspathic quartzite, mafic tuff, and quartz-feldspar porphyry. In addition, Baldwin *et al.* (1985) identified thin layers or lenses of mudstone, chlorite-feldspar-quartz gneiss and quartzite. The quartzite hosts two quartz veins, a northern nonmineralized vein, and the southern Madole vein, which is described in 'Mineralization' (Fig. 1-2; Baldwin *et al.*, 1985; Bateman, 1945; Milligan, 1960).

Drill holes EL-68-77 and EL-69-77, collared east of the Lasthope deposit, intersected sericitic rhyolite, chloritic andesite and quartz-chlorite-biotite schist interbanded with rhyodacite to dacite; DDH EL-68-77 also intersected grey granite near the end of the hole (Fig. 1-1; A.F. 92701). Drill hole KW-1, collared north of the Lasthope deposit, intersected tuffaceous sedimentary rocks, quartzite, greywacke, felsic and reworked intermediate tuff, and a minor intermediate flow (A.F. 92274).

MINERALIZATION:

The Madole vein strikes 135°, dips 80°SW (Bateman, 1945), and is 0.3 to 1.2 m wide (Baldwin *et al.*, 1985). It is exposed for 225 m along strike (Bateman, 1945), and extends another 305 m, mostly to the northwest, as inferred from drill hole intersections (Milligan, 1960). The vein fills a fracture in thin bedded impure quartzite; it is bounded to the north by a felsite dyke, and to the south by cherty feldspathic quartzite, mafic tuff and quartz-feldspar porphyry (Fig. 1-2). The vein consists of "crushed" sugary quartz with minor chlorite, minor pyrite, chalcopyrite and sphalerite, and trace galena. Visible gold was not observed in outcrop or in polished sections (Bateman, 1945). Baldwin *et al.* (1985) noted two "units" within the vein (not distinguished in

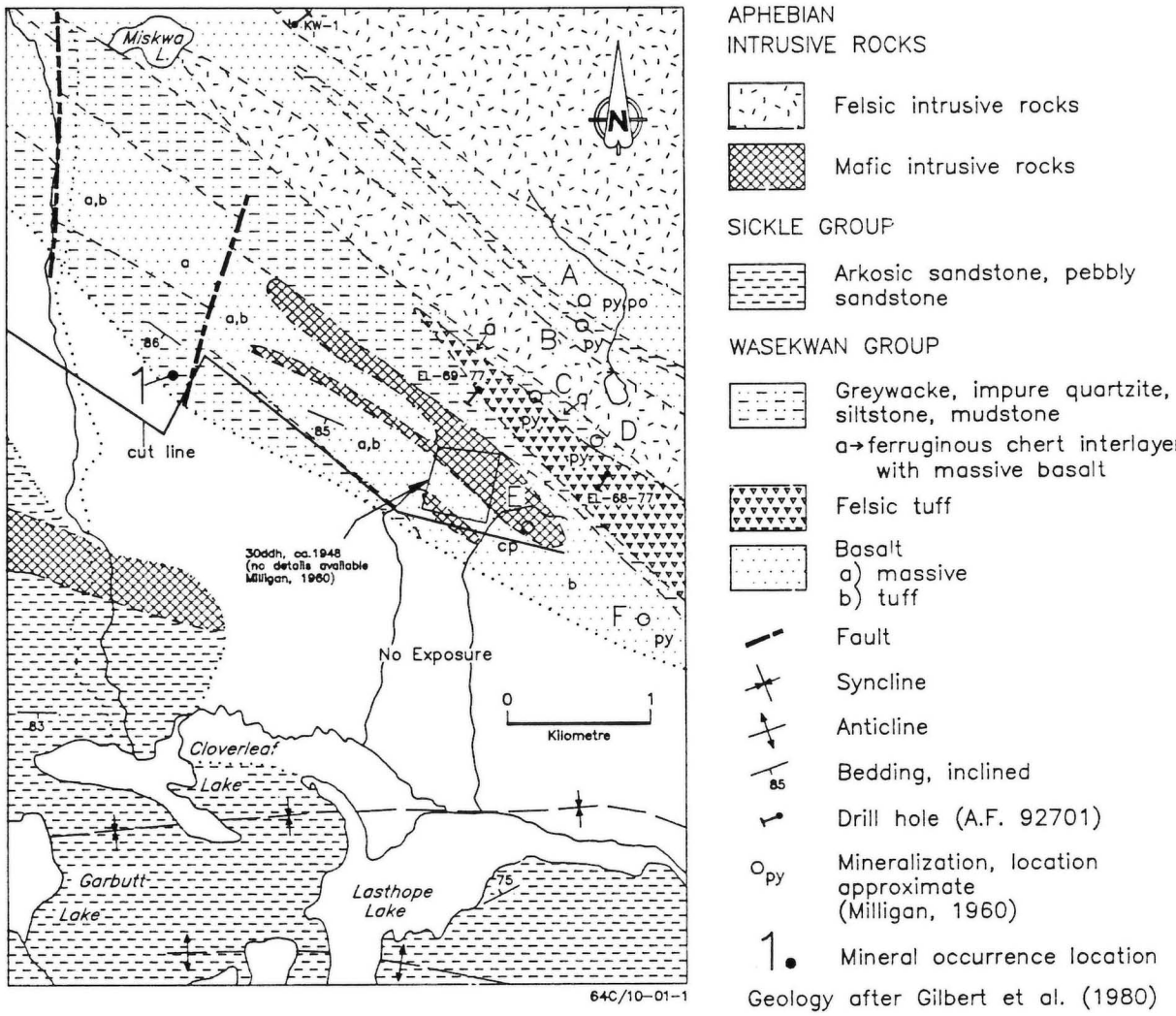


Figure 1-1: Geological setting of the Lasthope deposit (1).

Figure 1-2): white massive quartz to the south, and grey aphanitic quartz with minor disseminated and stringer pyrite and trace chalcopyrite to the north. Sulphide minerals locally constitute up to 15%, but average 5%, throughout the vein (Baldwin *et al.*, 1985). Fawley (1952) noted a correlation between portions of the vein that contain >3.5 g/t Au and the presence of sphalerite. There is only minor silicification of wall rocks immediately adjacent to the vein, and the vein cuts quartz stringers in the wall rock (Milligan, 1960).

Drill hole EL-68-77 contained a 0.2 m intersection of near solid pyrite, which occurs within a 6.9 m thick mineralized intersection of rhyodacite to rhyolite that contains 5 to 15% pyrite, 0 to 15% pyrrhotite and "minor" chalcopyrite. Drill holes EL-68-77 and EL-69-77 intersected several sections, 0.2 to 16.6 m long, that contained 5 to 20% pyrite, 0 to 20% pyrrhotite, and locally, "minor" chalcopyrite. Rhyodacitic to rhyolitic rocks and quartz-chlorite-biotite schist host the mineralization.

Drill hole KW-1 intersected 0.6 m of felsic tuff(?) with 20 to 25% pyrrhotite, 4 to 5% pyrite and 1% chalcopyrite stringers enveloping quartz and volcanic rock fragments. Felsic tuff and tuffaceous sedimentary rocks up and down the hole from this intersection contain minor pyrrhotite and pyrite stringers, blebs and disseminations (A.F. 92274).

Six other sites of mineralization, labelled A through F in Figure 1-1, are described as follows:

(A) "Pyrite in rusty zone about 18 inches [46 cm] wide between quartzite and sheared andesite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285);

(B) "Considerable mineralization (pyrite)(in small shear?) in greenstone" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285);

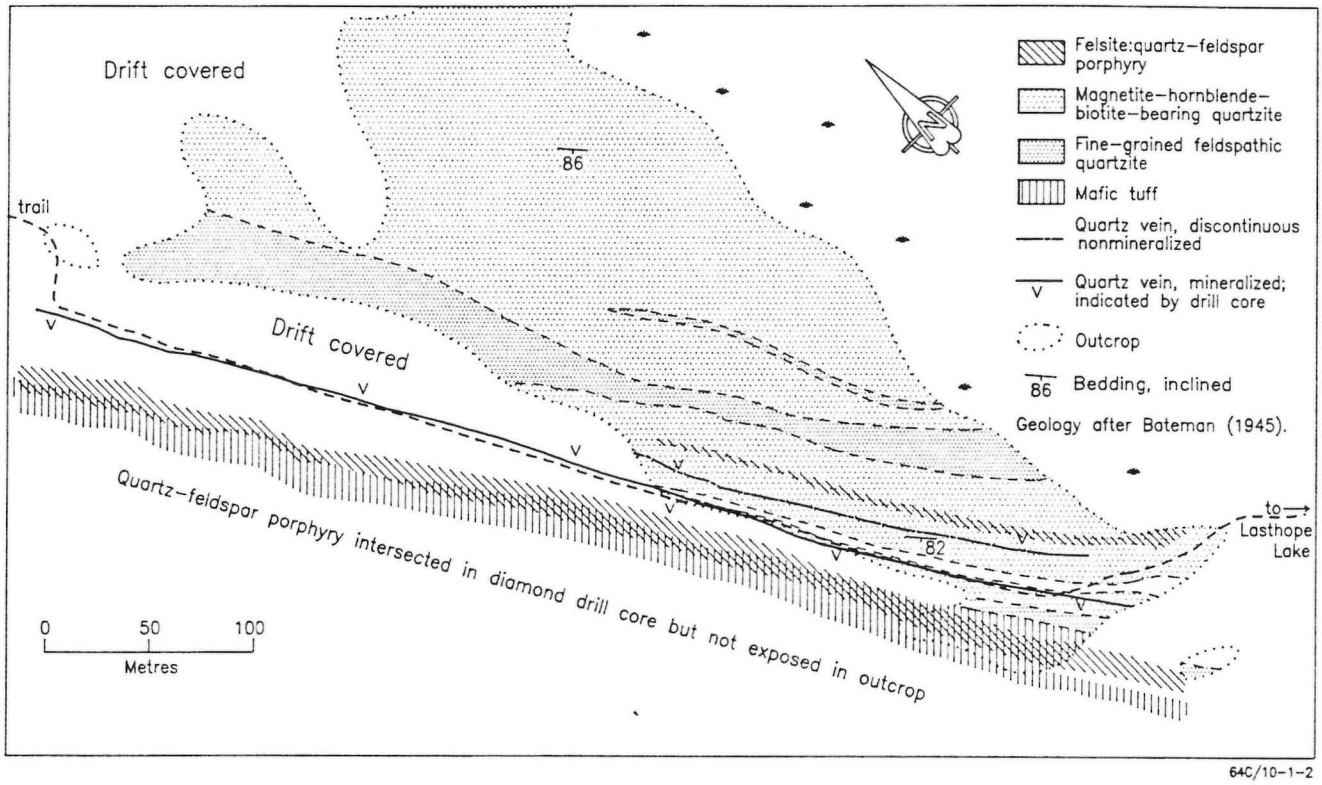


Figure 1-2: Detailed geology of the Lasthope deposit (1).

(C, D) up to 10% pyrite occurs as disseminated crystals, fine grained fracture fillings and laminae in ferruginous chert. The rusty weathered chert forms beds or screens, <1 to 5 m thick, that are interlayered with massive basalt flows or sills. The chert/basalt unit is up to 150 m wide and pinches out against the tonalitic pluton that cores the Miskwa Lake belt (Gilbert *et al.*, 1980, p. 51);

(E) "Trace chalcopyrite in 1/8 inch [3 mm] quartz along shear lines of 'Basic gneiss'" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285);

(F) "'Slight' mineralization in fine grained to medium grained massive hornblende 'gabbro' cut by pink aplite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285).

GEOCHEMICAL DATA:

Drill-indicated proven, probable and possible reserves of 541 000 tonnes grading 8.23 g/t Au have been outlined at the Lasthope deposit (The Northern Miner, June 20, 1988).

Two (grab?) samples of quartz vein collected by Manitoba Energy and Mines staff in 1985 contained (1) 0.7 g/t Au and 158 ppm Cu and (2) 4.1 g/t Au and 76 ppm Cu.

Drill core samples from DDH EL-68-77 and EL-69-77 contained <0.1 to 3.8 g/t Au, 0.3 to 2.4 g/t Ag, 0.01 to 0.14% Cu and 0.01 to 0.10% Zn (A.F. 92701). The best mineralized drill core sample from DDH KW1 assayed 0.18% Cu, 0.33% Zn, nil Pb, nil Au and nil Ag over 0.6 m (A.F. 92274).

CLASSIFICATION:

Vein type deposit; single vein. An auriferous quartz vein with minor sulphide minerals is hosted by quartzite.

REFERENCES:

Assessment Files 91616, 91622, 91674, 91699, 91826, 92274, 92701; Manitoba Energy and Mines, Minerals Division.

Baldwin, D.A., Parbery, D., Boden, S. and Michielsen, A.
1985: Mineral deposit studies in the Lynn Lake and Barrington Lake areas; In Manitoba Energy and Mines, Geological Services, Mines Branch, Report of Field Activities, 1985, p. 20-23.

Bateman, J.D.
1945: McVeigh Lake area, Manitoba; Geological Survey of Canada, Paper 45-14, 34p.

Davies, J.F., Bannatyne, B.B., Barry, G.S. and McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Mines and Natural Resources, Mines Branch, Special Publication, 190p.

Fawley, A.P.
1952: Geology of the Lasthope Lake area, Manitoba; Manitoba Mines and Natural Resources, Publication 49-5, 27p.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Mineral Inventory Card 64C/10 Au1
Manitoba Energy and Mines, Minerals Division.

Questor Surveys Ltd.
1976: Airborne INPUT survey, Lynn Lake area (Phase I); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

Richardson, D.J. and Ostry, G.
1987: Gold deposits of Manitoba; Manitoba Energy and Mines, Economic Geology Report ER86-1, 91p.

LOCATION: **2**

NAME:

UTM: 6273870N/392429E

ACCESS: By float plane or winter road to Lasthope Lake and traverse.

AREA: South shore of Lasthope Lake

AIRPHOTO: A23828-139

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699). Part of the area was covered by an airborne radiometric survey conducted by Dome Exploration (Canada) Limited in 1969 (A.F. 91674).

GEOLOGICAL SETTING:

The area is underlain predominantly by Sickle Group conglomerate and sandstone with small intrusions of diorite. A thin wedge of Wasekwan Group mafic and dacitic volcanic rocks occurs between the Sickle Group rocks and a large tonalitic intrusion to the southwest (Fig. 2-1; Gilbert *et al.*, 1980).

MINERALIZATION:

"Specks of sulphides in very fine grained Black Trout Diorite" were noted by A.P. Fawley in 1948, and quoted by Milligan (1960, p. 285). Three other sites of mineralization, labelled A through C in Figure 2-1, are described as follows:

(A) no details available (Gilbert *et al.*, 1980);

(B) no details available (Gilbert *et al.*, 1980);

(C) "Slight mineralization in Black Trout Diorite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622, 91674, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.

1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.

1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

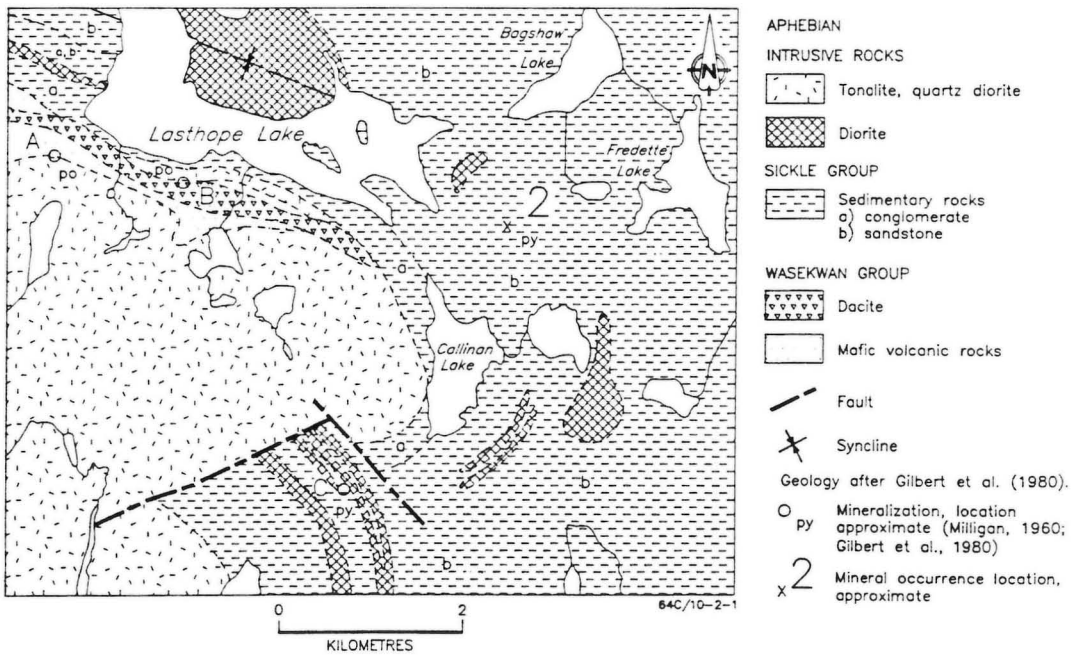


Figure 2-1: Geological setting of occurrence 2.

LOCATION: **3**

NAME:

UTM: 6290839N/379245E

ACCESS: By float plane to Foster Lake or Wasekwan Lake and traverse.

AREA: 250 metres southeast of Foster Lake

AIRPHOTO: A23828-80

EXPLORATION SUMMARY:

SGM conducted a geological mapping program at a scale of 1:6000 in 1945 (A.F. 90992). An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 (A.F. 91622), Hudson Bay Exploration and Development Company Limited in 1970 (A.F. 91679) and Mattagami Lake Mines Limited in 1973 (A.F. 91826). Questor Surveys Ltd. (1976, 1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic volcanic and sedimentary rocks that are intruded by and bordered to the south by felsic intrusive rocks (Fig. 3-1; Gilbert *et al.*, 1980). Rocks in the area have been affected by the Johnson Shear Zone (see 'Geology of NTS Area 64C/10').

MINERALIZATION:

Several quartz pods and lenses with "considerable" pyrite are hosted by thin bedded greywacke and quartzite (A.F. 90992). Milligan (1960, p. 285) describes "Pyrite - frequent specks in what Fawley calls laminated [sedimentary rocks] and Bateman, sheared granite gneiss".

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Vein type deposit; multiple veins.

REFERENCES:

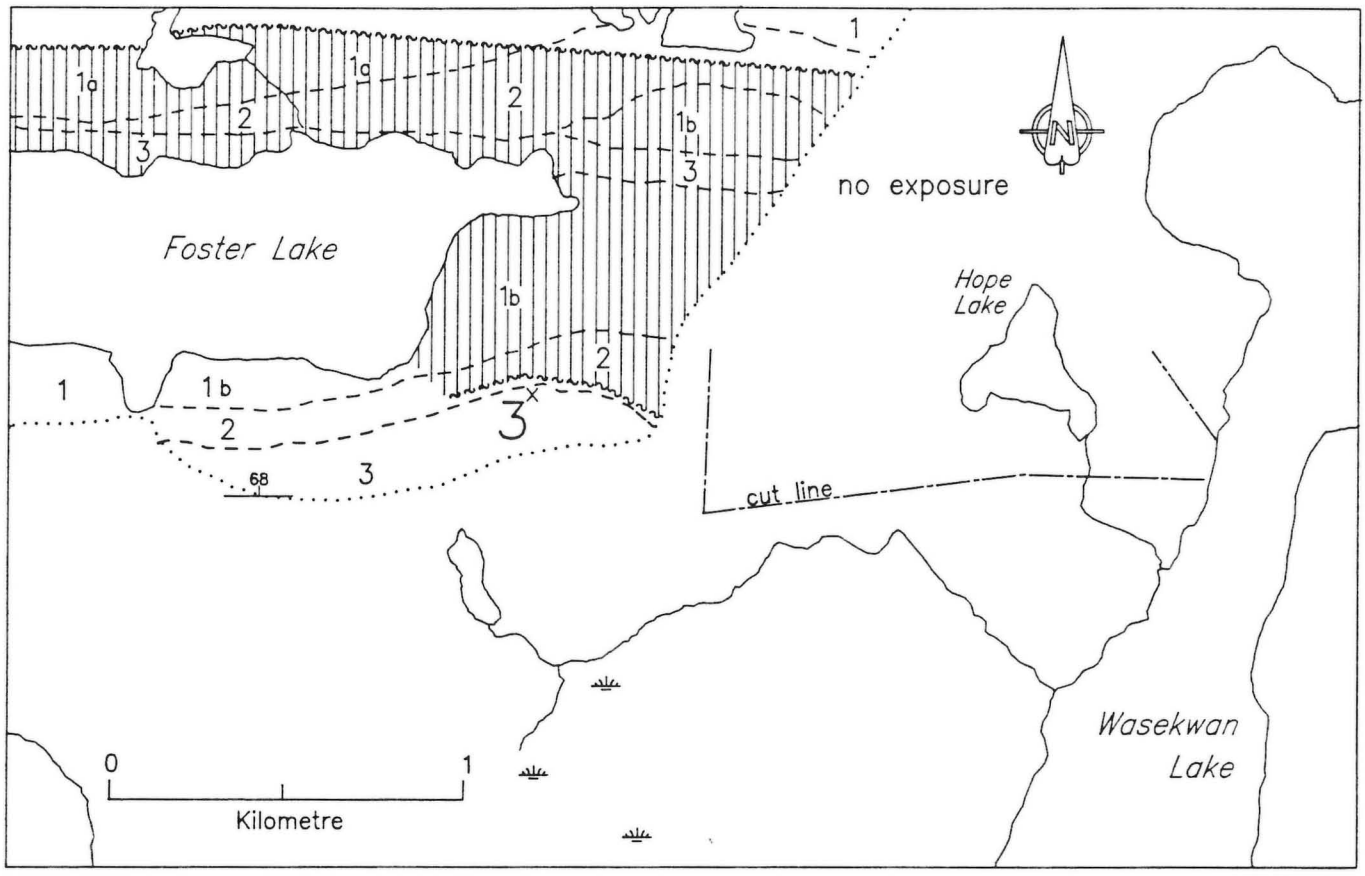
Assessment Files 90992, 91616, 91622, 91679, 91826; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1976: Airborne INPUT survey, Lynn Lake area (Phase I); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.



Aphebian

INTRUSIVE ROCKS

3 Granite, granodiorite

WASEKWAN GROUP

2 Greywacke, siltstone, mudstone

1 Mafic volcanic rocks
- a) aphyric massive basalt
- b) mafic tuff

Geology after Gilbert *et al.* (1980).

- Geological contact, approximate
- Shear zone *(Johnson Shear Zone)*
- 68 Bedding, inclined
- 3× Mineral occurrence location, approximate
- ..... Limit of drift cover

Figure 3-1: Geological setting of occurrence 3.

LOCATION: 4

NAME:

UTM: 6282359N/381462E

ACCESS: By float plane and traverse.

AREA: Young Lake

AIRPHOTO: A23828-82

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 (A.F. 91622). Questor Surveys Ltd. (1976, 1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by undivided Wasekwan Group rocks, which probably include mafic volcanic rocks, amphibolite and some immature sedimentary rocks. These rocks are bordered to the west, north and east by felsic intrusive plutons (Fig. 4-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Field notes by A.P. Fawley, 1948, are quoted by Milligan, (1960, p. 285): "Quartz-filled shear, traced for 100 ft. [30.5 m] to overburden. Width 5 to 15 ft. [1.5 to 4.6 m]. Rusty and white quartz. Cutting greenstone?". An additional site of mineralization is labelled A in Figure 4-1: "Pyrite in Wasekwan amphibolite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 285).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1976: Airborne INPUT survey, Lynn Lake area (Phase I); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

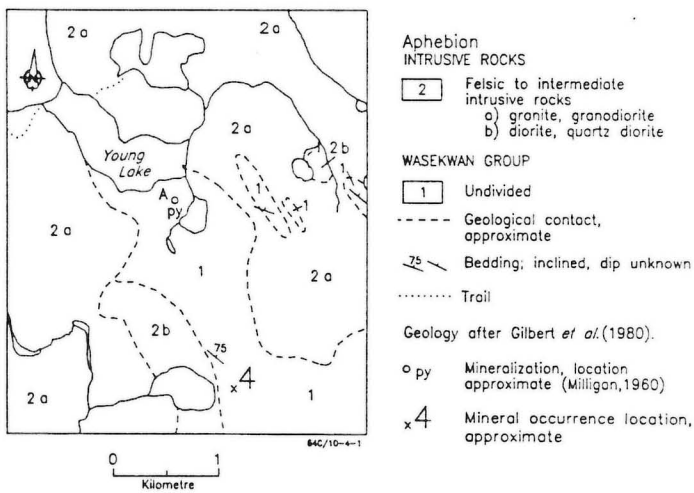


Figure 4-1: Geological setting of occurrence 4.

LOCATION: **5**

NAME:

UTM: 6279715N/385133E

ACCESS: By float plane or winter road to Cloverleaf Lake and traverse.

AREA: Approximately 1 km northwest of Garbutt Lake

AIRPHOTO: A23828-110

EXPLORATION SUMMARY:

Airborne radiometric surveys were carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616) and Dome Exploration (Canada) Limited in 1969 (A.F. 91674). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699).

GEOLOGICAL SETTING:

The area is underlain by Sickle Group sandstone and small intrusions of diorite (Fig. 5-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 285) cites field notes by A.P. Fawley: "Pyrite, very slight, in Black Trout Diorite".

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622, 91674, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

GEOCHEMICAL DATA:

None.

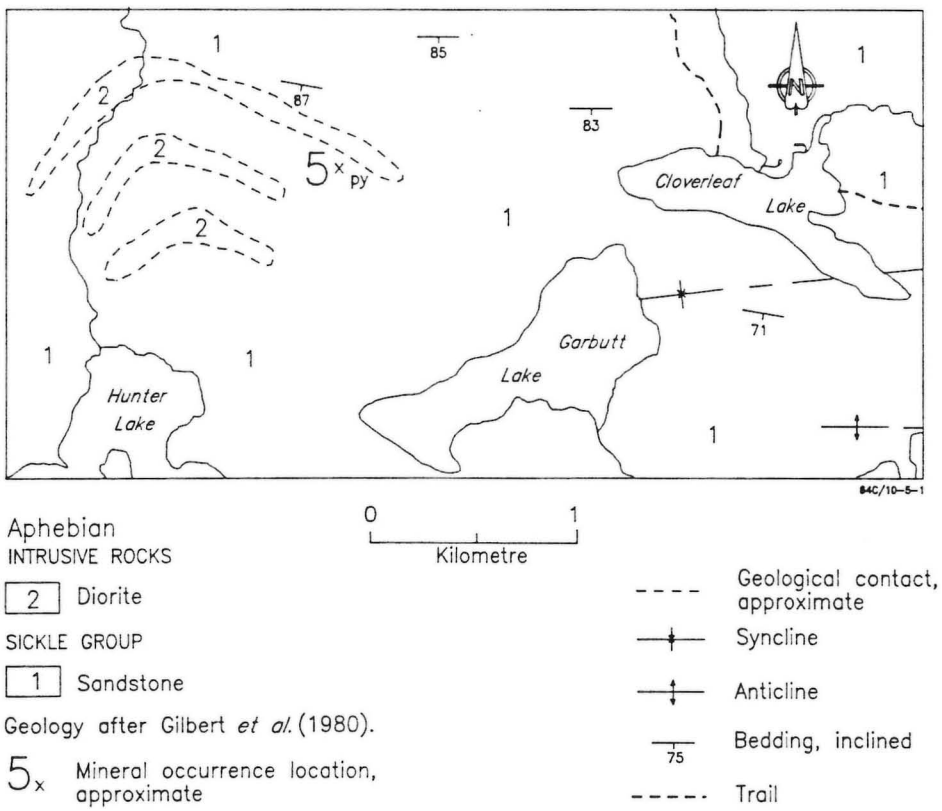


Figure 5-1: Geological setting of occurrence 5.

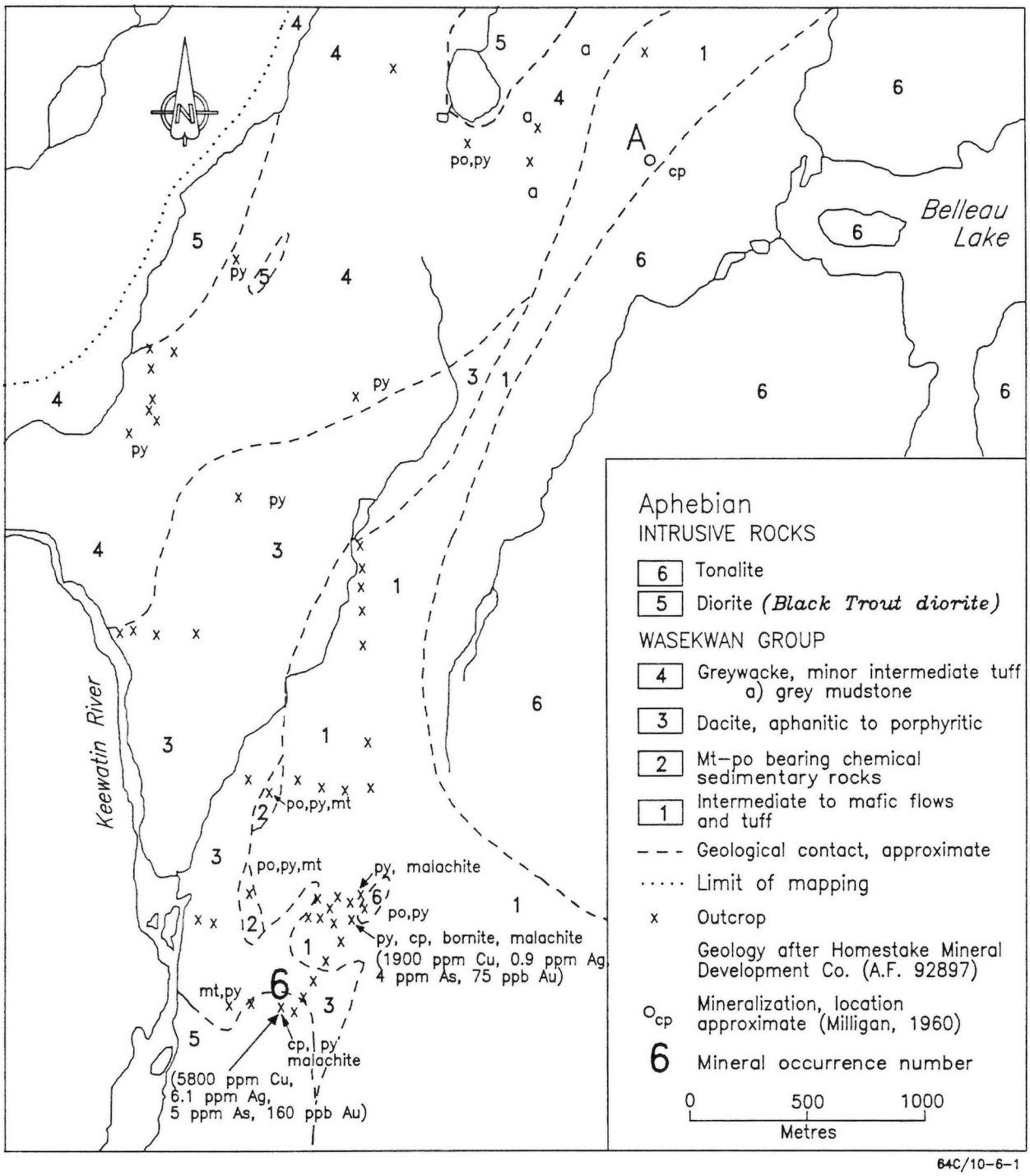


Figure 6-1: Detailed geology in the area of occurrence 6.

LOCATION: 6

NAME:

UTM: 6284839N/397205E

ACCESS: By float plane to Belleau Lake or the Keewatin River.

AREA: East of the Keewatin River near Belleau Lake

AIRPHOTO: A24299-83, -84, -85

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Selco Exploration Company Limited in 1960 (A.F. 91626). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government. Homestake Mineral Development Company carried out geological mapping (1:10 000) and rock geochemical surveys in 1987 (A.F. 92897), and a ground magnetometer survey in 1987 (A.F. 92898).

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group mafic and felsic volcanic and sedimentary rocks, bounded to the southeast and northwest by tonalitic plutons. Six units were delineated: (1) intermediate to mafic flows and tuffs; (2) magnetite-pyrrhotite-bearing chemical sedimentary rocks; (3) aphanitic to porphyritic dacite; (4) greywacke with minor intermediate tuff or grey mudstone; (5) Black Trout diorite; and (6) tonalite (Fig. 6-1; A.F. 92897).

MINERALIZATION:

Several minor pyrite ± pyrrhotite ± magnetite ± chalcopyrite ± bornite ± malachite occurrences were noted by Homestake Mineral Development Company (Fig. 6-1). Most of the mineralization is disseminated or fills fractures; copper mineralization appears to be restricted to vein type fracture fillings (A.F. 92897).

Milligan (1960, p. 284) reports "Slight chalcopyrite in andesite" at Site A (Fig. 6-1).

GEOCHEMICAL DATA:

Two rock samples contained noteworthy amounts of Cu and Au:

1. 5800 ppm Cu, 6.1 ppm Ag, 5 ppm As, 160 ppb Au; and
2. 1900 ppm Cu, 0.9 ppm Ag, 4 ppm As, 75 ppb Au (Fig. 6-1).

Both of these samples were from veinlets with associated pyrite, chalcopyrite, bornite and malachite. In the first sample, the veinlets were hosted by Black Trout diorite; those in the second were hosted by intermediate to mafic volcanic rocks. Other rock geochemical analyses (not shown in Fig. 6-1) had ranges of 53 to 158 ppm Cu, 0.1 to 0.3 ppm Ag, 2 to 39 ppm As and <5 to 10 ppb Au (A.F. 92897).

CLASSIFICATION:

Vein type deposit; multiple veins.

REFERENCES:

Assessment Files 91616, 91622, 91626, 91699, 92897, 92898; Manitoba Energy and Mines, Minerals Division.

Milligan, G.C.

1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.

1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

LOCATION: 7

NAME:

UTM: 6283865N/400889E

ACCESS: By float plane to Durand Lake and traverse.

AREA: 1.5 km northwest of Durand Lake

AIRPHOTO: A24299-83

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Selco Exploration Company Limited in 1960 (A.F. 91626). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government. Sherritt Gordon Mines Limited carried out HLEM and ground magnetometer surveys and drilled DDH Sic-1 (77 m) on CB 7831 in 1978-79 (A.F. 92297).

GEOLOGICAL SETTING:

The area is underlain by mafic intrusive rocks, bounded to the north and east by tonalitic plutons, and to the west by Wasekwan Group mafic volcanic rocks (Fig. 7-1; Gilbert *et al.*, 1980). DDH Sic-1 intersected gabbro, mafic volcanic xenoliths, hornblendite and minor quartz-feldspar dykes (A.F. 92297).

MINERALIZATION:

DDH Sic-1 intersected 8.2 m of 3 to 70% disseminated magnetite, 3 to 15% blebs and stringers of pyrrhotite and/or pyrite, and up to 3% disseminated chalcopyrite, which includes two sections, 0.7 and 0.1 m, of near solid magnetite. This mineralization is hosted by hornblendite that grades down the hole to fine- to medium-grained gabbro. In addition, four other intersections, 0.2 to 3.8 m in core length, with up to 30% disseminated or interstitial magnetite, up to 10% pyrrhotite and/or pyrite, and up to 2% chalcopyrite are hosted by hornblendite or medium- to coarse-grained gabbro (A.F. 92297).

GEOCHEMICAL DATA:

The maximum drill core sample assay listed in A.F. 92297 was 0.01% Ni, 0.11% Cu, 0.01% Zn and 0.008% Co over 0.2 m.

CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks; disseminated.

REFERENCES:

Assessment File 91616, 91622, 91626, 91699, 92297; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

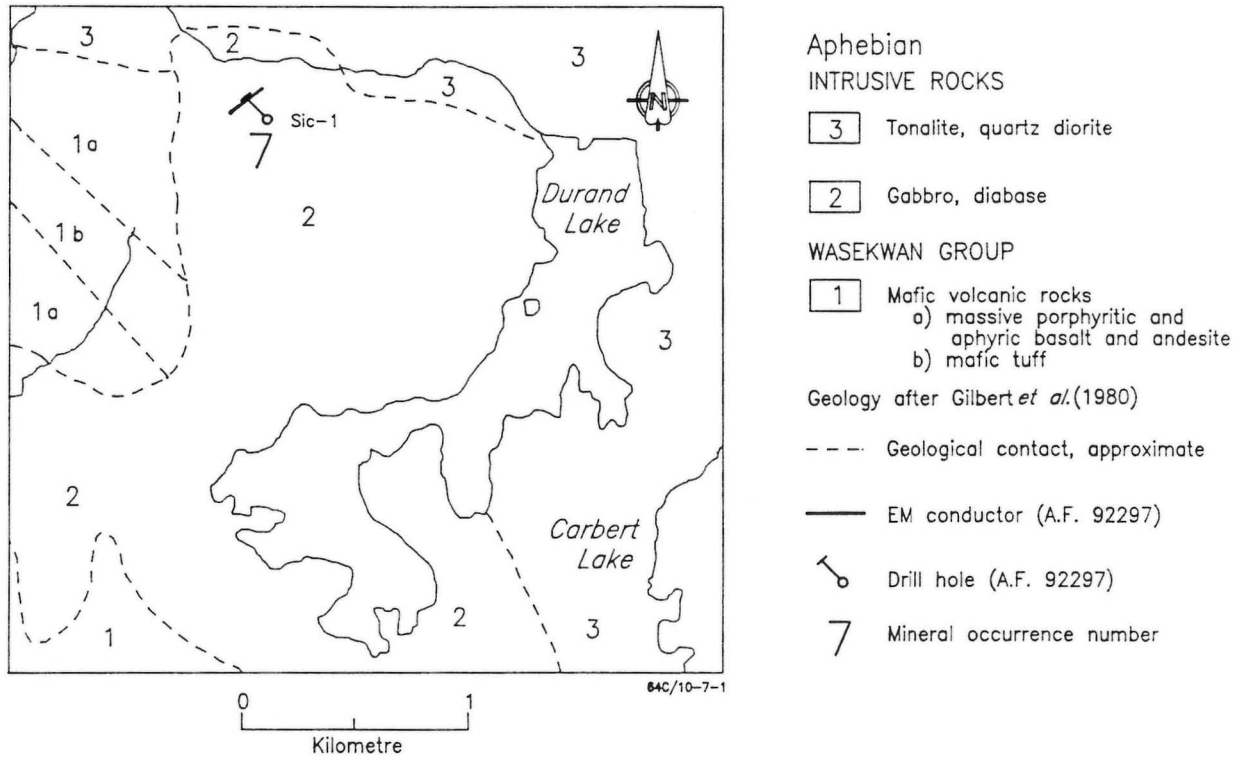


Figure 7-1: Geological setting of occurrence 7.

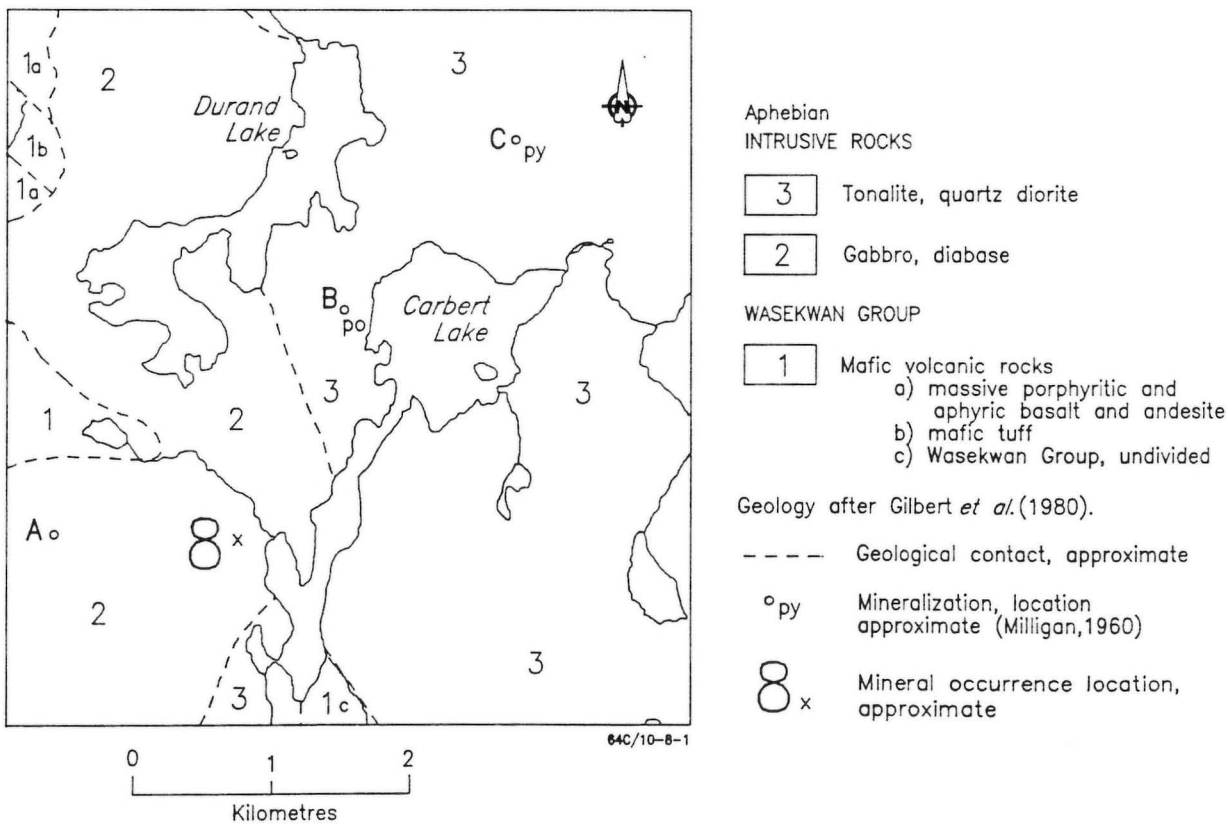


Figure 8-1: Geological setting of occurrence 8.

LOCATION: 8

NAME:

UTM: 6280111N/401994E

ACCESS: By float plane to Carbert Lake.

AREA: Durand and Carbert lakes

AIRPHOTO: A24297-72, -73

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Selco Exploration Company Limited in 1960 (A.F. 91626). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by gabbroic rocks, bounded to the east by tonalitic rocks. Wasekwan Group rocks, primarily mafic volcanic rocks, occur to the northwest and southeast (Fig. 8-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 284) quotes field notes by A.P. Fawley from 1948: "Sulphide in hornblende gabbro which is cut by quartz stringers and granite dykes. Rusty along fractures. Severe local magnetic anomaly in area. Worth prospecting, says [A.P. Fawley]".

Three additional sites of mineralization, labelled A through C in Figure 8-1, are described as follows:

(A) "Rusty places locally in hornblende gabbro (due to sulphide or hornblende?)";

(B) "2% pyrrhotite(?) in basic inclusions in hybrid rock (mainly granite-hornblende gabbro mixture)";

(C) "Trace of sulphides in variable gneissic rock predominantly hornblende-feldspar - mapped as hybrid inclusions in granite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622, 91626, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

LOCATION: 9

NAME:
UTM: 6277242N/402069E
ACCESS: By float plane to Sickle Lake.

AREA: East shore of Sickle Lake
AIRPHOTO: A24299-80

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Selco Exploration Company Limited in 1960 (A.F. 91626). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by gabbroic and tonalitic plutons, bounded to the west by Sickle Group sandstone; minor Wasekwan Group rocks (undivided)(Fig. 9-1) are present in the northeast part of the area (Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 284) quotes field notes taken by A.P. Fawley in 1948: "2% sulphides reported in hybrid rock ('hornblendite and biotite syenite')".

An additional site of mineralization, labelled A in Figure 9-1, was noted by A.P. Fawley in 1948, and quoted by Milligan (1960, p. 284): "Quartz mica schist, as float, with high pyrite and some chalcopyrite".

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622, 91626, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

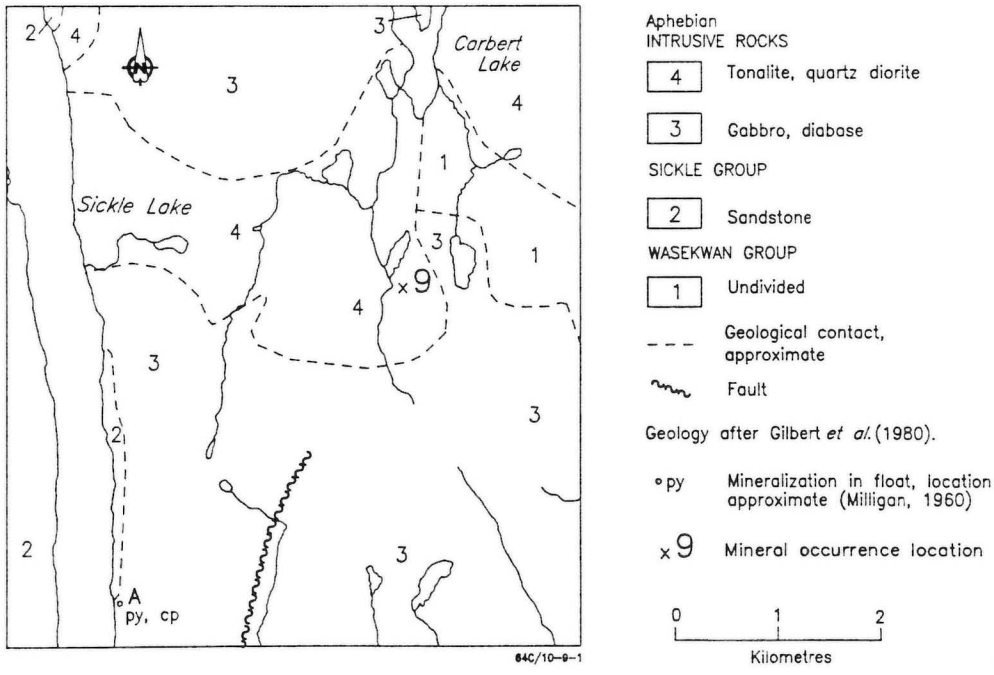


Figure 9-1: Geological setting of occurrence 9.

LOCATION: **10**

NAME:

UTM: 6290385N/393401E

ACCESS: By float plane to the Keewatin River.

AREA: East shore of Keewatin River near Anson Lake

AIRPHOTO: A24297-47

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699) and Selco Exploration Company Limited in 1960 (A.F. 91626). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group rocks (undivided), bounded to the west by Wasekwan Group sedimentary rocks, and flanked on the east by Sickle Group conglomerate. Tonalitic plutons occur to the west and east (Fig. 10-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Milligan (1960, p. 284) cites a "Company Report" (presumably for Sherritt Gordon Mines Limited): "Sulphides: In sediments on (claim) V.M.C. 23, in a shear zone and disseminated in sediments and sills nearby. Mainly pyrrhotite with lesser amounts pyrite chalcopyrite sills nearby. Mainly pyrrhotite with lesser amounts pyrite, chalcopyrite, sphalerite and galena. Assays very low; not related to amount of sulphide."

GEOCHEMICAL DATA:

See quotation in 'Mineralization' above.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91616, 91622, 91626, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.

1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.

1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.

1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.

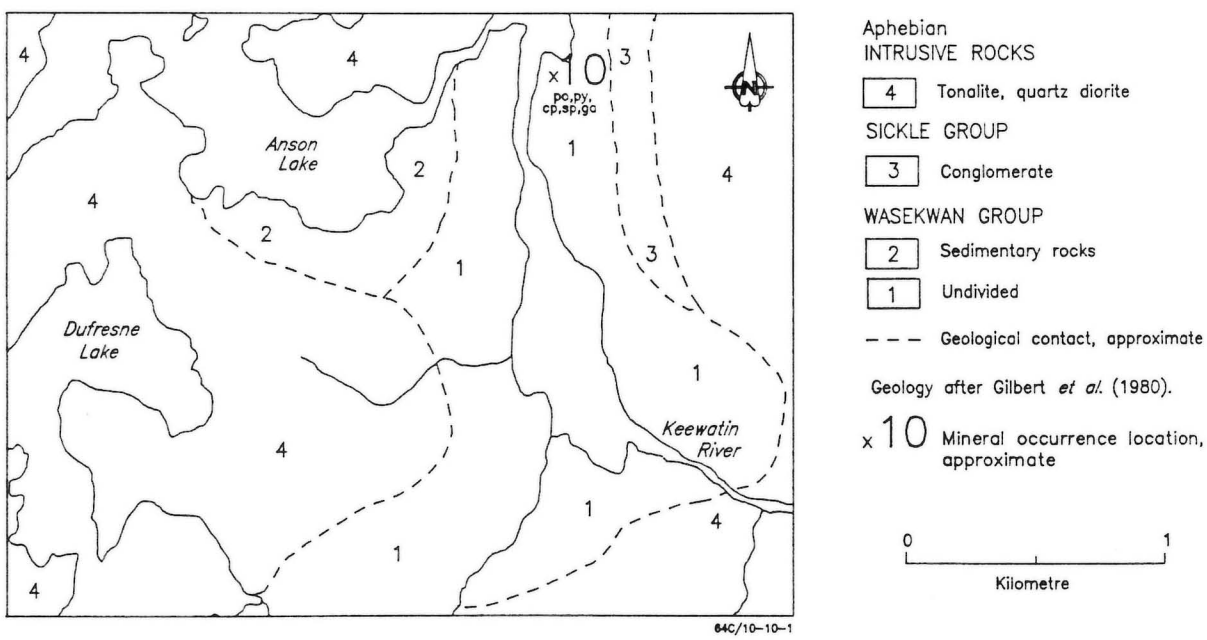


Figure 10-1: Geological setting of occurrence 10.

LOCATION: **11**

NAME:
UTM: 6265640N/399839E
ACCESS: By float plane to Black Trout Lake.

AREA: Southwest shore, Black Trout Lake
AIRPHOTO: A24299-77

EXPLORATION SUMMARY:

The Lakeshore group of claims was staked along the west side of Black Trout Lake in 1939 by O. Johnson. Nine trenches were excavated in 1940 and a shaft was sunk in 1940-41 (Milligan, 1960, p. 184-185). The locations of four of the trenches and the shaft are shown in Figure 11-1. Assessment reports describe the depth of this shaft as 9 m, but W. Hanson, who worked on the shaft, describes the depth as 20 m (Milligan, 1960, p. 184-185). Noranda Mines Limited drilled five holes totalling 130 m in 1947 (A.F. 90991). The Golite claims were staked in 1943 in the area west of the small lake southwest of Jac Lake, and trenching was reported in 1943-44, but exact locations are not known (Milligan, 1960, p. 185). Airborne radiometric surveys were carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616) and Dome Exploration (Canada) Limited in 1969 (A.F. 91674). Airborne geophysical surveys were conducted over the area by SGM in 1957 and 1972 (A.F. 91622, 91699).

GEOLOGICAL SETTING:

The area is underlain by gabbroic intrusive rocks and Sickle Group sandstone and conglomerate; felsic to intermediate plutons occur to the east (Fig. 11-1; Gilbert *et al.*, 1980). Drill holes intersected diorite; some of the holes also intersected minor (Sickle Group?) sedimentary rocks near the bottom of the holes (A.F. 90991).

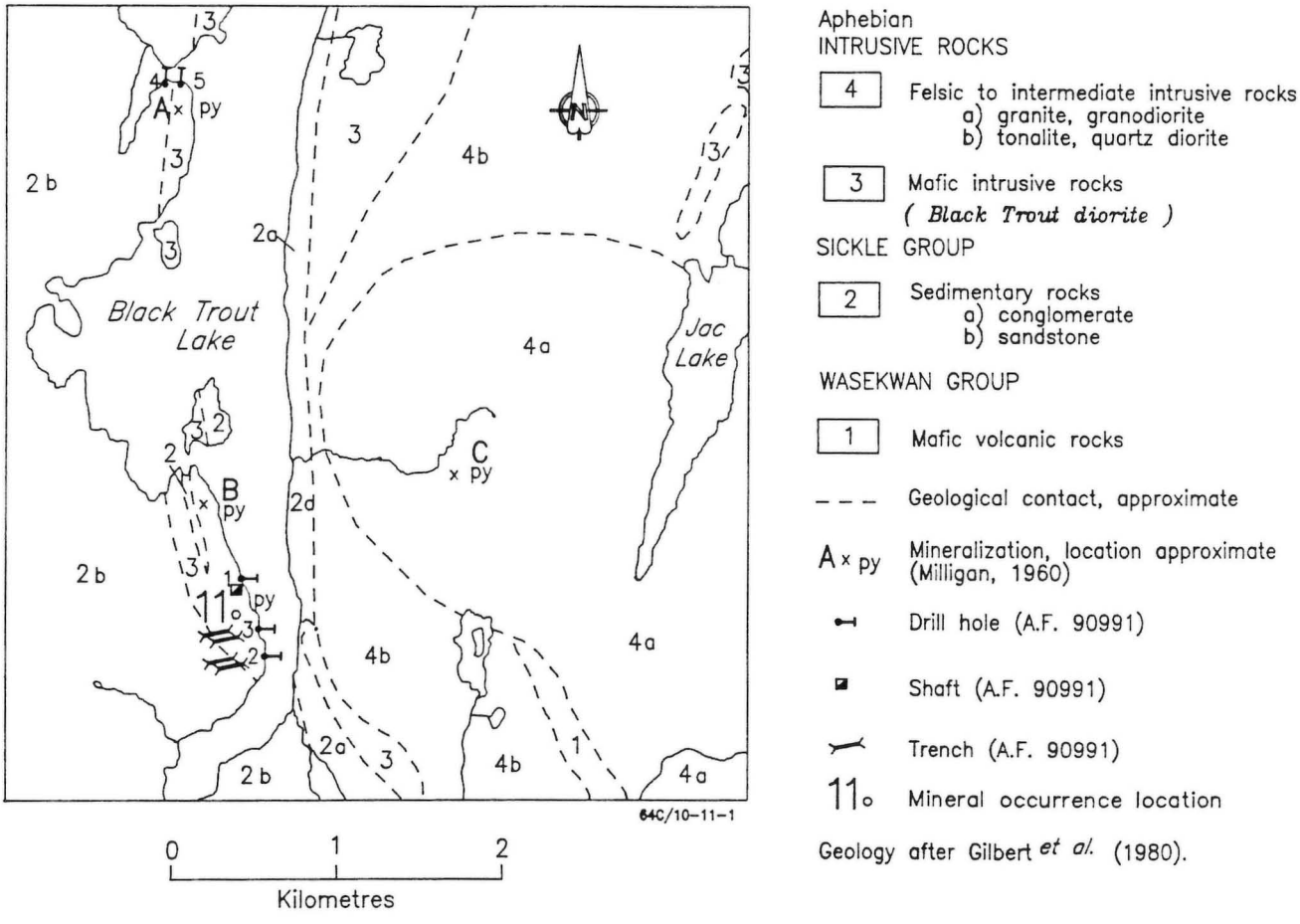


Figure 11-1: Geological setting of occurrence 11.

MINERALIZATION:

Drill plans from A.F. 90991 indicate that mineralization (type, amount unspecified) occurs in quartz veins, and that quartz float is present near the drill hole collars. Field notes taken by A.P. Fawley in 1948 are quoted by Milligan (1960, p. 284): "Quartz in fine grained Black Trout Diorite. 2-5% pyrite and 5-10% chloritized amphibole. Pits south of cabin on Black Trout Lake".

Three additional sites of mineralization, labelled A through C in Figure 11-1, are described as follows:

(A) "'Specks of sulphide' in Black Trout Diorite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284);

(B) "Sulphides in parts of Black Trout Diorite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284);

(C) "1-2% sulphides in granite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284);

GEOCHEMICAL DATA:

"Substantial but erratic values in gold were obtained from some quartz veins in the vicinity but only very little was found in the shaft, according to [Walter] Hanson" (Milligan, 1960, p. 184-185). The best assay of drill core from three holes near the shaft was 0.7 g/t Au over 0.3 m; the best assay of drill core from two holes to the north (DDH 4, 5) was 0.3 g/t Au over 0.3 m (A.F. 90991).

Hulbert (1988) collected twenty nonmineralized mafic and ultramafic rock samples in the "Sickle Lake intrusion" (equivalent to the Black Trout diorite?). He obtained "sporadic values" up to 63 ppb Pt and 50 ppb Pd, and calculated means of 8 ppb Pd, 8 ppb Pt and 4 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple veins.

REFERENCES:

Assessment File 90991, 91616, 91622, 91675, 91699; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Hulbert, L.J.
1988: Metallogeny of mafic-ultramafic rocks, northern Churchill; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1988, p. 175, 176.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

LOCATION: **12**

NAME:

UTM: 6262857N/401758E

ACCESS: Float plane to an unnamed lake south of Black Trout Lake and traverse.

AREA: Approximately 2 km southeast of Black Trout Lake

AIRPHOTO: A24297-76

EXPLORATION SUMMARY:

Milligan (1960, p. 183-184, 186) describes this area as having "long been a favourite spot for prospectors" with many trenches put down from 1939 to 1950.

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). Selco Exploration Company Limited geologically mapped the property at 1:4800 in 1958 (A.F. 91833). Part of the area was covered by an airborne radiometric survey conducted by Dome Exploration (Canada) Limited in 1969 (A.F. 91674). Airborne geophysical surveys were conducted by SGM in 1972 (A.F. 91699). Questor Surveys Ltd. (1977) carried out airborne INPUT and magnetometer surveys on behalf of the Manitoba Government.

GEOLOGICAL SETTING:

The area is underlain by Wasekwan Group greywacke, siltstone, mudstone, iron formation, and dacite, including altered dacite and schist (alteration type not specified). Mafic intrusive rocks and Sickle Group conglomerate and sandstone occur to the west, and tonalitic intrusive rocks and Wasekwan Group mafic volcanic rocks occur to the east (Fig. 12-1; Gilbert *et al.*, 1980).

MINERALIZATION:

Field notes taken by A.P. Fawley in 1948 are quoted by Milligan (1960, p. 284): "Spotty mineralization in trench; associated with garnet tourmaline bands and iron-formation (Ruth claim)".

Three additional sites of mineralization, labelled A through C in Figure 12-1, are described as follows:

(A) "Trace of sulphides in Black Trout Diorite" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284);

(B) "Granite 'mineralized near contact' with hornblende gabbro" (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284);

(C) "Spotty mineralization in flows or sediments cut by granite. Rusty." (field notes by A.P. Fawley, 1948, quoted by Milligan, 1960, p. 284).

Milligan (1960, p. 184) also describes a 45 to 90 cm wide shear zone (not identified on his maps) that strikes northerly and dips 55°E. The shear zone is hosted by iron formation (facies unspecified) that contains 30 cm thick bands of hornblende schist. Pyrite and pyrrhotite (amounts not specified) are disseminated throughout the schist, and the area is strongly rusty weathered. The schist is chloritized, recrystallized and contains amphibole crystals up to 2 cm long. Some quartz is present, but sulphide minerals are preferentially concentrated in the chloritized hornblende schist.

GEOCHEMICAL DATA:

On the former Ruth claim, a 28 cm channel sample of quartz vein with visible gold contained 835.6 g/t Au, and an adjoining 10 cm channel sample of wall rock contained 15.8 g/t Au. A grab sample of pyrite-bearing rock from the shear zone described in 'Mineralization' contained 7.5 g/t Au (Milligan, 1960, p. 184).

CLASSIFICATION:

Vein type deposit; multiple veins.

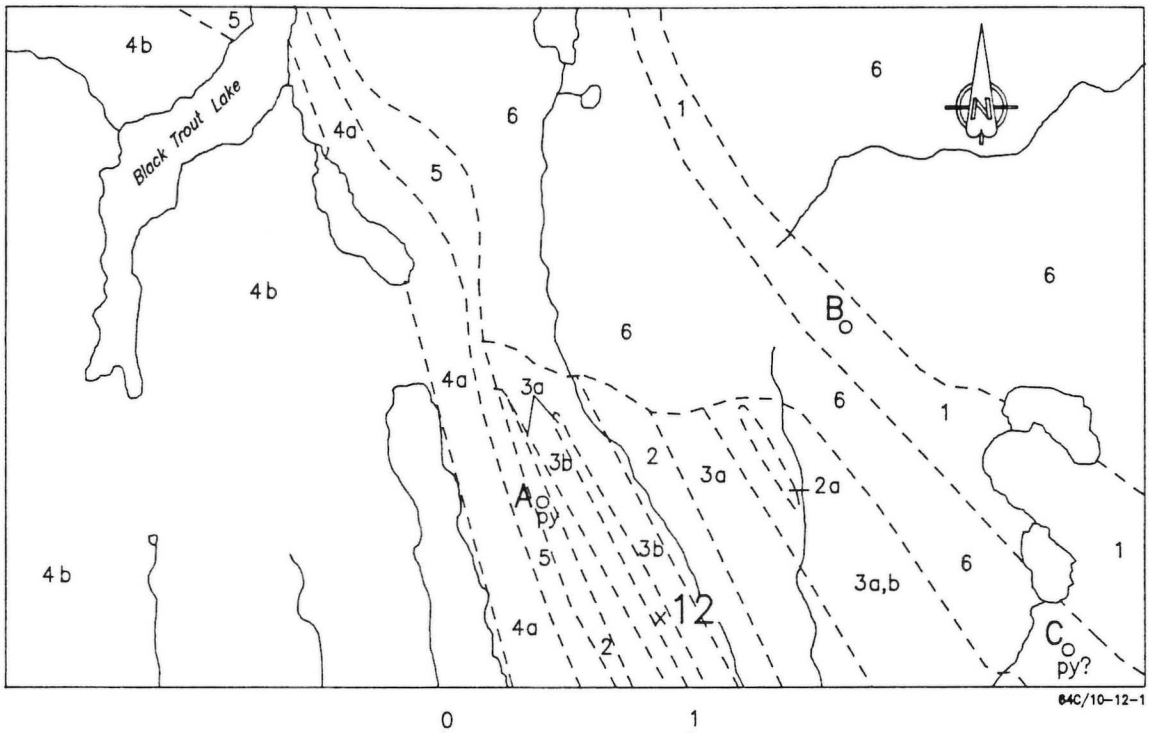
REFERENCES:

Assessment Files 91616, 91674, 91699, 91833; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.

Questor Surveys Ltd.
1977: Airborne INPUT survey, Lynn Lake area (Phase II); Manitoba Energy and Mines, Mineral Resources Division, Miscellaneous Publication.



Aphebian
INTRUSIVE ROCKS

6 Tonalite, quartz diorite

5 Diorite

SICKLE GROUP

4 Sedimentary rocks
a) conglomerate
b) sandstone

WASEKWAN GROUP

3 Sedimentary rocks
a) greywacke, siltstone, mudstone
b) iron formation

2 Dacite
a) altered dacite, schist

1 Mafic volcanic rocks

Geology after Gilbert *et al.* (1980).

– – – Geological contact, approximate

o py Mineralization, location approximate (Milligan, 1960)

x 12 Mineral occurrence location, approximate

Figure 12-1: Geological setting of occurrence 12.

LOCATION: **13**

NAME:

UTM: 6287061N/384827E

ACCESS: By winter road or float plane to Wiley Lakes and traverse.

AREA: Wiley Lakes

AIRPHOTO: A23828-112

EXPLORATION SUMMARY:

An airborne radiometric survey was carried out by Eldorado Mining and Refining Limited in 1954 (A.F. 91616). An airborne geophysical survey was conducted over the area by SGM in 1957 (A.F. 91622), and by Mattagami Lake Mines Limited in 1973 (A.F. 91826). Hudson Bay Exploration and Development Company Limited conducted an HLEM survey in 1964 (A.F. 91373) and drilled two holes, DDH Nun 1 and Nun 2, totalling 425 m on the Nun claims in 1965 (A.F. 91366). The locations of six other drill holes (DDH Nut 2, Nut 10, Nut 12-14, Nut 16; logs not submitted) are shown on maps in A.F. 91366 (*cf.* Fig. 13-1).

GEOLOGICAL SETTING:

The area is underlain by tonalitic and dioritic intrusions, and Wasekwan Group aphyric and porphyritic basalt with minor rhyolite tuff (Fig. 13-1; Gilbert *et al.*, 1980). Drill holes intersected andesitic to rhyodacitic volcanic rocks with siliceous and/or chloritic sections, chlorite ± sericite schist, quartz porphyry, and gabbroic, dioritic and granodioritic dykes (A.F. 91366).

MINERALIZATION:

Drill core from DDH Nun 1 and Nun 2 contained several intersections from ≤0.1 to 2.9 m in core length with up to 25% pyrite, up to 5% pyrrhotite, and locally, traces of chalcopyrite. Core from DDH Nun 1 also included three intersections, ≤0.1 m, that contain up to 5% chalcopyrite. The mineralization is hosted by andesite, dacite, chlorite ± sericite schist and minor dacite porphyry. The andesitic to dacitic rocks contain abundant siliceous, chloritic and/or biotitic zones, quartz veinlets, and epidote veins. Some of the mineralization contained in DDH Nun 2 is also hosted by quartz felsite, quartz diorite and gabbro. Core from DDH Nun 2 locally contains garnet and/or magnetite (A.F. 91366).

GEOCHEMICAL DATA:

None.

CLASSIFICATION:

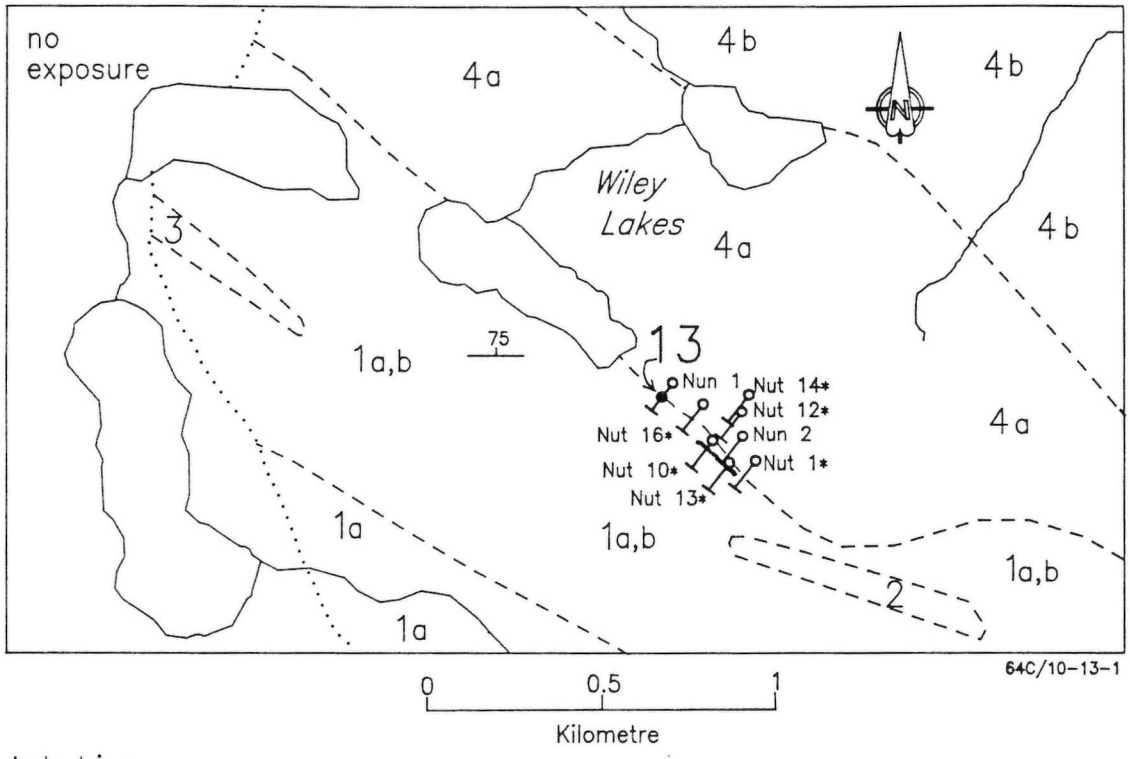
Massive sulphide type deposit; volcanic rock associated.

REFERENCES:

Assessment Files 91366, 91373, 91616, 91622, 91826; Manitoba Energy and Mines, Minerals Division.

Gilbert, H.P., Syme, E.C. and Zwanzig, H.V.
1980: Geology of the metavolcanic and volcaniclastic metasedimentary rocks in the Lynn Lake area; Manitoba Energy and Mines, Geological Paper GP80-1, 118p.

Milligan, G.C.
1960: Geology of the Lynn Lake district; Manitoba Mines and Natural Resources, Mines Branch, Publication 57-1, 317p.



Aphebian

INTRUSIVE ROCKS

4 Intermediate intrusive rocks
a) diorite
b) tonalite

WASEKWAN GROUP

3 Greywacke, siltstone, mudstone

2 Rhyolite tuff

1 Basalt
a) aphyric
b) porphyritic

---- Geological contact, approximate

——— EM conductor (A.F. 91366)

..... Limit of mapping

75 Bedding, inclined

Geology after Gilbert *et al.* (1980).

Drill hole (A.F. 91366)
* no log

Figure 13-1: Geological setting of occurrence 13.