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Base Metal, Molybdenum, and Precious Metal Deposits of the Madoc-Sharbot Lake Area Southeastern Ontario

by

J. Malczak, T.R. Carter, and J.S. Springer

1985

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V.G. Milne, Director
Ontario Geological Survey

FOREWORD

The Ministry of Natural Resources began a program to further investigate mineral resources in eastern Ontario in 1977 as part of a Mineral Resources Assessment Project, funded equally by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Treasury and Economics under the Community and Resource Development Subsidiary Agreement. The intent, to provide a compilation of mineral deposits in their geological context, resulted in inventories for specific areas dealing with particular commodities. For the Pembroke-Renfrew area for example, inventories on radioactive minerals, industrial minerals, marble and base and precious-metals were prepared, in addition to yearly interim summaries of progress, and special single-commodity reports on graphite, talc, gold and silica sand.

Additional studies of mineral deposits in the western segment of the Grenville Supergroup were a natural extension of the initial work. These were undertaken in 1979-1983 as part of the base program of the Ontario Geological Survey, and culminated in a summary geological report "The Metallogeny of the Grenville Province". The present volume is the mineral inventory for the western section (1:250,000 NTS sheet 31C "Kingston") which formed part of the data base for the summary report.

This inventory and special reports on talc and gold, already published in 1985, represent the final parts of an extensive and thorough re-evaluation of the geological setting and mineral potential of selected commodities, completed as part of the Eastern Ontario Summary Agreement funded equally by the Federal Department of Regional Economic Expansion (DREE) and the Ontario Ministry of Natural Resources.

An important outcome of the work is the realization that numerous commodities in the Grenville show a promising future because of market and technological changes which make the closeness of the area to processing and manufacturing a major advantage. Gold, particularly stockpiled or ready-to-leach ore material; zinc; ores for the alkaline earth metals, calcium, barium, strontium are all metallic commodities of immediate interest. The studies have also pointed to market opportunities in feed materials for "glass" fibre; structural fillers such as talc, tremolite and vermiculite; refractory feedstuffs such as diopside, dolomite, graphite; starter materials for pharmaceuticals (magnesium, strontium, barium), heavy brines and many other industrial commodities.

V.G. Milne, Director
Ontario Geological Survey

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by

J. Malczak[1], T.R. Carter[2], and J.S. Springer[1]

1) Geologist, Ontario Geological Survey, Toronto

2) Geologist, Ontario Ministry of Natural Resource, Wingham

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ABSTRACT

The southwestern part of the Grenville Geological Province in Ontario comprises the largest and thickest sequence of supracrustal metavolcanic and metasedimentary rocks in the whole Grenville Province. It also contains the greatest concentration of metallic mineral deposits.

In this report detailed property studies record the geological features of different types of metallic mineralization lying the area of the NTS sheet 31C (Kingston). They are grouped as base metal, molybdenum and gold-silver associations. New property mapping has been supplemented with exhaustive records drawn from published sources, assessment file records, private reports and manuscript data. Added petrographic, geophysical and geochemical data together with map sources make this a full documentation of the information available for this important part of the Grenville subprovince. These together with records from the Pembroke-Renfrew area in an earlier report have provided a foundation for a metallogenetic classification of the base and precious metal deposits already published by Carter (1984).

The new understanding points both to wider prospecting opportunities in metallic commodities such as gold and

zinc, but also to market opportunities in many of the non-metallic deposits. These include graphite, talc, fillers, and feedstuffs for manufacture of alkaline earth metals, agricultural products and pharmaceutical products.

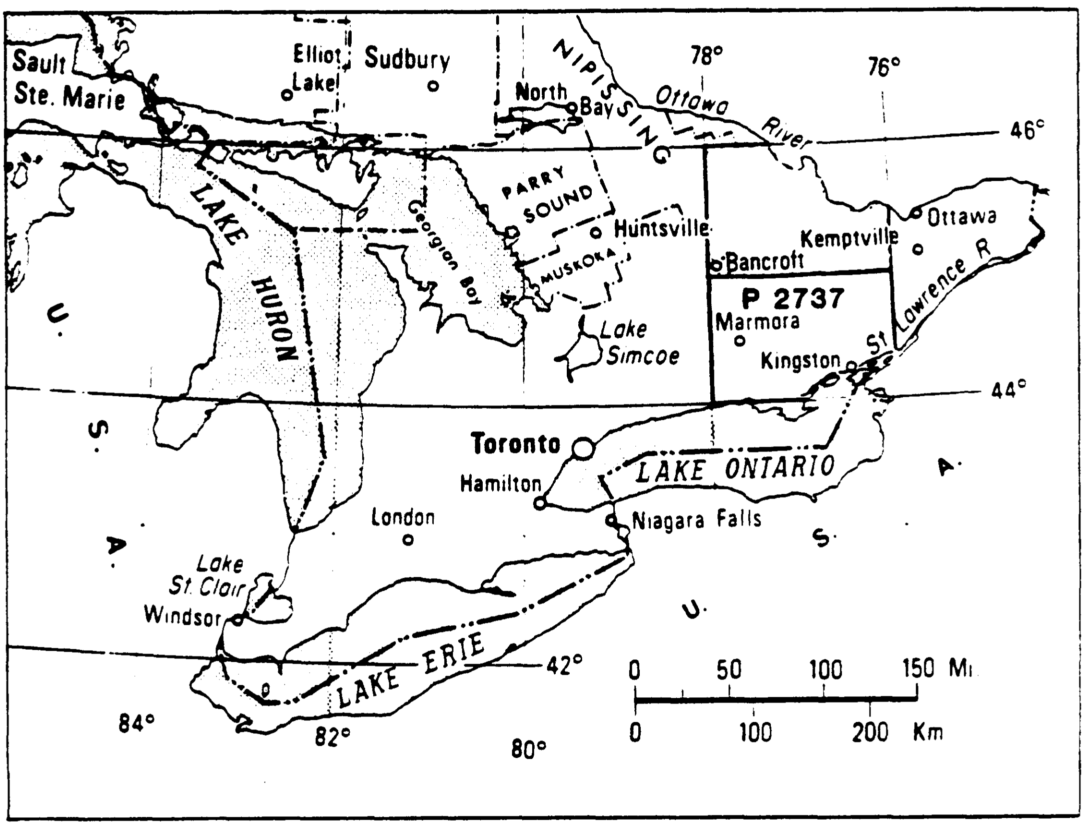

Figure 1: Location of the Madoc-Sharbot Lake Area

INTRODUCTION

This report contains descriptions of base metal, precious metal, molybdenum and pyrite deposits of the Grenville Province within the boundaries of the Kingston topographic sheet NTS 31C. The report complements Mineral Deposits Circular 20 covering a similar area to the north (Carter, Colvine and Meyn 1980). The accompanying deposit location map is based on a geological compilation produced by Kingston, P.W., Papertzian, V.C. and Williams, D.A., Map P. 2611 (in press).

Information came from Ontario Geological Survey reports; technical survey files and diamond drill reports filed by companies at the Assessment Files Research Office, mineral deposit files compiled by the Geoscience Data Centre, Ontario Geological Survey, Toronto; and mineral deposits files of the Mineral Development Sector, Department of Energy, Mines and Resources, Ottawa. Additional information was acquired from academic theses and private sources. T.R. Carter carried out investigations on a number of the deposits in 1979 and 1980.

A fuller report on the "Metallogeny of the Grenville Province, Southwestern Ontario" is available in Open File Report 5515 (Carter 1984).

REPORT FORMAT

The deposits are divided into three major sections: (a) Base Metal and Pyrite Deposits, (b) Molybdenum Deposits, and (c) Precious Metal Deposits. Each section is introduced by a deposit index which lists the numbered deposits alphabetically by townships and within each township, alphabetically by deposit name. At the end of each section, tables of occurrences with little available information are listed alphabetically in the same manner. The deposit number is keyed to the accompanying map P.2737 by it's appropriate symbol. The deposit index also indicates the status of the deposit, i.e. PP = past producer, P = prospect and O = occurrence and the deposit classification. "Producers" are deposits with recorded base metal, pyrite and molybdenite production or deposits which produced at least 100 ounces of gold. A "Prospect" has had at least 100 feet of underground lateral development, at least 2000 feet of diamond drilling or sufficient trenching to outline a significant mineralized zone.

The following are commonly used abbreviations:

Ag	silver
Au	gold
Con	concession
Cu	copper
GSC	Geological Survey of Canada
Mo	molybdenum
Ni	nickel
NTS	National Topographic System
OBM	Ontario Bureau of Mines (until 1919)
ODM	Ontario Department of Mines (until 1970) Ontario Division of Mines (1972-1976)
OFR	Open File Report
OGS	Ontario Geological Survey
oz/ton	troy ounces per short ton (2000 lbs)
Pb	lead
ppb	parts per billion
ppm	parts per million
Sb	antimony
Tp	township
Zn	zinc

GEOLOGY OF THE GRENVILLE PROVINCE, SOUTHEASTERN ONTARIO

The accompanying deposit location map covers the NTS 1:250,000 sheet 31C, Kingston. The geological base is a new compilation map of the area (Kingston et al. 1985, P2611). A short description of the general geology is taken from Carter (1984). Detailed O.D.M./O.G.S. geological reports of smaller areas are referenced.

The Grenville Province comprises a distinctive belt of rocks on the southeastern margin of the Canadian Shield, characterized by high-grade metamorphism, a northeast-trending structural fabric, and K-Ar ages averaging 950 Ma. In Ontario high-grade metamorphic rocks of the Grenville Province are separated from relatively low-grade rocks of the Superior and Southern Provinces to the northwest by the Grenville Front. To the southeast exposure is limited by the unconformably overlying Paleozoic sedimentary rocks of the St. Lawrence Platform. Rocks of Grenville age continue beneath this sedimentary cover sequence for an unknown distance to the south and east.

Two major sequences of supracrustal rocks have been identified by Lumbers (1982) southeast of the Grenville Front, in Ontario. The older succession is confined to the northern two-thirds of the Province, corresponding to the area designated by Wynne-Edwards (1972) as the Ontario Gneiss Segment.

The younger accumulation of supracrustal rocks dominates the southeastern portion of the Grenville Province in Ontario and comprises part of the Central Metasedimentary Belt, as defined by Wynne-Edwards (1972). As several major stratigraphic subdivisions within stratified rocks of the Central Metasedimentary Belt in southeastern Ontario can be recognized, another term, the 'Grenville Supergroup', has been adopted (Moore and Thompson 1972, 1980; Wynne-Edwards 1972). The principal exposures comprise metamorphosed units of volcanic, carbonate, and calcareous and non-calcareous siliceous clastic sedimentary units. The Grenville Supergroup is the largest and thickest of the metavolcanic-metasedimentary sequences known to occur in the Grenville Province and contains the greatest concentration of metallic mineral deposits. This is the only part where stratigraphic units have been correlated over any significant area, and where the geologic history has been documented with any degree of certainty (Sangster and Bourne 1982). Stratified rocks of the Grenville Supergroup are separated from the basement complex comprising a Middle Precambrian paragneiss-intrusive complex by a major northeast-trending zone of tectonic deformation. This zone of deformation is coincident with and obscures a major unconformity interpreted by Lumbers (1982) to separate the two supracrustal accumulations.

A second group of stratified surficial rocks, possibly correlative with the Grenville Supergroup, occurs in the Parry

Sound area. The rocks consist of high grade metamorphic gneisses believed to represent deep water siliceous clastic sedimentary rocks, with local marble horizons. There is also a sequence of amphibolites and felsic gneisses tentatively identified as mafic to felsic metavolcanic rocks.

The Grenville Supergroup

Lithostratigraphic subdivisions of the Grenville Supergroup have been proposed by several workers in selected parts of the area (see following page). Table 1 shows the three main groups and their lithologies but in many cases the stratigraphy is not formally defined and correlations between formations are not known with certainty. The Hermon Group and the overlying Mayo Group, which are in large part coeval, have been defined by Lumbers (1967) in the Bancroft-Madoc area where they have a minimum combined thickness of about 8,200 metres. They are characterized by predominantly volcanic and carbonate sedimentary rocks respectively, with intercalated siliceous clastic units. A-U-Pb age of 1310 + 15 Ma reported by Silver and Lumbers (1966) for a felsic volcanic number of the lowermost Tudor Formation, is widely considered as the age of the base of the Hermon Group in this area.

Table 1: Table of formations for the portion of the Grenville Supergroup exposed in southeastern Ontario, (Hermon and Mayo Groups after Lumbers, 1967b, Flinton Group after Moore and Thompson, 1972; Moore and Thompson, 1980)

Group	Formation	Description
	Stewart	marble, graphitic marble
	Madoc	pelite
Flinton		
	Fernleigh	thin-bedded black shale and limestone, pyritic in part
	Myers Cave	dolostone, limestone, dolostone conglomerate, black pyritic shale
	Lessard	calcareous and non-calcareous feldspathic sandstone
	Bishops Corners	basal, hematitic quartzite (locally cross-bedded) quartzite-pebble conglomerate and shale
		UNCONFORMITY
	Lasswade	marble, minor calcareous metasandstone and metasiltstone, rare recrystallized chert
	Apsley	poorly sorted feldspathic metasandstone with upper and lower members of calcareous metasandstone and metasiltstone
Mayo		
	Dungannon	80% marble; remainder mainly calcareous metasandstone and metasiltstone, poorly sorted feldspathic metasandstone, and rare recrystallized chert; mafic metavolcanic flows and iron-formation rare near base of formation overlying Tudor metavolcanic rocks
	Burnt Lake	mainly rhyolitic, trachytic, dacitic, and andesitic metavolcanic rocks with minor metabasaltic flows; lensoid marble units and sandy siliceous metasedimentary rocks found locally
Hermon		
	Turriff	75% pillowed basaltic and andesitic metavolcanic flows; remainder dacitic and felsic flows and pyroclastic rocks, and minor iron-formation
	Vansickle	mainly poorly sorted feldspathic metasandstone locally with abundant marble, felsic and mafic Hermon metavolcanic rocks, metaconglomerate, and well sorted quartz-rich metasandstone; arkosic metasedimentary rocks commonly associated with felsic metavolcanic rocks
	Oak Lake	mainly metamorphosed felsic pyroclastic rocks and arkose with some mafic and felsic metavolcanic flows; rare marble and metaconglomerate in upper part of formation
	Tudor	mainly metamorphosed, pillowed, basaltic and andesitic flows

The Flinton Group

The uppermost group of the Grenville Supergroup lies within evident conformity on the rocks below. It contains no metavolcanic rocks and northeast of Madoc is preserved in a series of long, narrow synclines whose dominant lithologies include quartzite, conglomerate, and other calcareous and non-calcareous clastic metasedimentary rocks, with significant amounts of marble.

Moore and Thompson (1972, 1980) conclude that the Flinton Group is significantly younger than the Hermon and Mayo Group, and was deposited between 1104±25 Ma and 1027 Ma ago.

Intrusive Rocks

A large number of igneous intrusions have invaded the stratified rocks of both the younger and older supracrustal successions. Descriptions of these and their relationships are summarized principally from Lumbers (1982, 1967). Between about 1300 and 1000 Ma ago a complex suite of intrusive rocks invaded the younger Grenville Supergroup. Five major suites are recognized, although not all plutonic rocks in the area have been assigned to a suite.

Most are generally concordant with regional structure, lack chilled margins, and only locally display discordant features such as dikes. Narrow thermal aureoles are developed around plutons in areas of low to moderate metamorphic grade. Outside these areas contact metamorphic effects are indistinct.

Metamorphism

Except for some late dikes of diabase, granite pegmatite, and a few small gabbro and syenite bodies, all of the Precambrian rocks have been affected by Late Precambrian metamorphism and tectonism commonly referred to as the "Grenvillian" or orogenic cycle, comprising at least two orogenic events (Moore and Thompson 1980). The latest metamorphism culminated approximately 1100 to 1000 Ma ago with the pressure-temperatures conditions of the upper almandine amphibolite facies throughout most of the area (Lumbers 1967, 1982). Granulite facies conditions were attained in parts of Frontenac Axis (Wynne-Edwards 1972) and the Ontario Gneiss Segment (Davidson et al. 1979). A major zone of greenschist facies rocks termed the Hastings "metamorphic low" occurs in the Madoc area, centred on the thickest accumulation of volcanic rocks.

The Precambrian rocks have been affected by complex, multi-phase deformation, producing a strong northeasterly structural trend. A single foliation parallel to lithologic layering is predominant. Axial plane foliation is largely absent except in low grade metamorphic terrain. Northeast trending, southeast dipping fold units are the predominant structures. Locally these structures fold earlier isoclinal folds and have in turn been broadly warped about northwest trending axes.

Regional Tectonic History

Basically similar outlines of the principal elements of the tectonic history of the Grenville Province in southeastern

Ontario have been presented by Sangster and Bourne (1982) and Moore and Thompson (1980). Lumbers (1982, 1967a,b) has defined the geologic history of the Renfrew County area and the Bancroft-Madoc area. The relationships can be summarized as follows:

1) Consolidation of a Late to Middle Precambrian metasedimentary and meta-intrusive basement gneiss complex about 1400 to 1500 Ma ago.
2) Deposition of the Grenville Supergroup, about 1300 Ma ago. Volcanism commenced about 1300 Ma ago in the Bancroft-Madoc area, as determined by U-Pb age dating of the lowermost Tudor Formation of the Hermon Group. Precise ages cannot be placed on the duration of the volcanism, on the commencement or duration of sedimentation, but they are inferred to have persisted until approximately 1225 to 1250 Ma ago.
3) Emplacement of a varied suite of plutonic rocks between about 1250 and 1100 Ma ago, with subsequent metamorphism and deformation.
4) Uplift, erosion, and deposition of the Flinton Group, about 1080-1050 Ma ago.
5) Deformation and regional metamorphism, producing a prominent northeast-trending structural fabric. Emplacement of pegmatite dikes and sills and the Westport granitic pluton, took place about 1050-1000 Ma ago.

PRODUCTION

Tables 2 and 3 are production figures for base metal and molybdenum deposits and precious metal deposits. Brackets indicate information which is reported but poorly documented.

TABLE 2: Mining Production: Base Metals and Molybdenum

	Mine	Year(s)	Tonnage Milled	Pyrite	Mo, lbs	Cu, lbs	Zn, lbs	Pb, lbs	Au, oz	Ag, oz	Grade
14.	Ontario Sulphur Mine	1911		5,300 tons							
21.	Frontenac Lead Mine	1866-1870, 1875	4,700					38,527			12 - 15 % galena
23.	Blakely Pyrite Mine	1906		"65 carloads"							45% S
25.	Eldorado Copper					109,000 lbs			23	182	4 - 10% Cu
26.	Hollandia Lead Mine	1903-05						2,653,365			
31.	Long Lake Zinc Mine	1902-4, 1906-7, 1950, 1970-77				1950, 1970-74	22,300,000				11.6% Zn
13.	Chisholm Molybdenite Mine	1904, 1915-1917	343		8,000						1.0-5.8 % Mo

TABLE 3: Mine Production, Precious Metals

	Mine	Year(s)	Tonnage Milled	Au (oz)	Ag (oz)	As (lb)	Recovered Grade (oz/ton Au)
4.	Big Dipper	1907, 1905	52	17	-	-	0.33
11.	Star	1905, 1907	976	134	-	-	0.14
12.	Cordova	1892-93, 1888-1903 1912-1915, 1917 1939-1940	120,670	22,774	687		0.19
13.	Ledyard	1893-94	55	13	-		0.24
14.	Boerth	1900		13			
19.	Addington	(Before 1921) 1919 1922		(480) 15 50	 26		
24.	Bannockburn Au	1896	(100)	3.5			
25.	Richardson			(75-100)			
26.	Sophia	1940-41	1800	110	7		0.06
28.	Cook	1901, 1902, 1904	1483	389			0.26
29.	Dean & Williams	1870	1000	500	0.5		
30.	Deloro	(Before 1884) 1897-1902	 39,143	(480) 10,360	 -		 0.26
31.	Gatling Five Acres	1900, 1902-03	6,114	2,353	-		0.38
32.	Pearce	1893, 1908	239	302	60		1.26
33.	Soverign	(1878-79) 1891-92 1900	 1,962	(1,100) 370	- -		 0.19
35.	Craig	1905, 1906	1,850	248	-		0.13

DEPOSIT CLASSIFICATION

The deposit classification system is derived from Carter (1979, 1980) and is generally consistent with MDC 20 for the Pembroke-Renfrew area to the north (Carter 1980). Extra categories have been added if necessary. A brief discussion of each classification follows.

BASE METAL AND PYRITE DEPOSITS

IA1: Stratiform, carbonate hosted, zinc
A2: Unconformable, carbonate hosted, lead

B1: Stratiform, sedimentary hosted, copper, zinc
B2: Other geological association, copper

C1: Gabbro hosted, copper, nickel

D1: Carbonate hosted breccia, zinc, lead, copper

E1: Stratabound, sedimentary hosted, pyrite
E2: Variable geological association, pyrite

IA1: Stratiform, carbonate hosted zinc

Deposits are generally stratiform, conformable within host stratigraphic sequences of carbonate and clastic metasedimentary rocks. The mineralization consists of disseminated to massive bands of sphalerite and pyrite, commonly concentrated within siliceous zones in marbles. All deposits are metamorphosed to the same degree as the host rocks.

IA2: Unconformable, carbonate vein-hosted lead

Mineralization occurs in the late stage fissure veins which cross cut Grenville marbles, metaclastics, metavolcanics and intrusive rocks, and in places Ordovician limestones. The veins are related to the NW trending post Ordovician faults of the Ottawa-Bonnechere graben system. Calcite is the major vein mineral, and the dominant sulphide mineral is disseminated to massive galena. Variable amounts of barite, pyrite, marcasite, sphalerite and chalcopyrite also occur in a number of deposits.

IB1: Stratiform, sedimentary hosted, copper, zinc

Deposits are thick, stratiform units of rusty-weathering schists or strongly foliated, fine-grained siliceous clastic metasedimentary units. The schists contain up to twenty percent sulphides in disseminated grains and thin, massive conformable streaks. Rusty zones contain pyrite, pyrrhotite , locally abundant graphite and minor sphalerite and chalcopyrite.

IB2: Other geological association, copper

Copper mineralization, predominantly in the form of disseminated chalcopyrite, occurs in a number of deposits within a variety of host rocks including marbles, metaclastics, metavolcanics and amphibolites. In cases, the mineralization is concentrated in shear zones, otherwise no consistent features can be identified.

IC1: Gabbro hosted, copper, nickel

Mafic intrusions or mafic and ultramafic phases of intrusive complexes are host rocks. Mineralization consists of zones of disseminated pyrrhotite, pentlandite, chalcopyrite and minor pyrite. Geological and textural features indicate that the mineralization is contemporaneous with the host rocks.

ID1: Carbonate hosted breccia, zinc, lead, copper

Mineralization consists of zones and lenses of massive and disseminated sphalerite, galena, pyrite and chalcopyrite in a matrix of brecciated marble and minor clastic metasedimentary and amphibolite units.

IE1: Stratabound, sedimentary hosted, pyrite

Pyrite occurs in massive to disseminated bands and lenses within clastic metasedimentary and metavolcanic rocks and marbles. The mineralization is conformable with the host rock and is generally confined to specific units within a clastic sequence.

IE2: Variable geological association, pyrite

Includes all other pyrite occurrences which have no apparent similarities. Styles of mineralization and host rocks are variable.

MOLYBDENUM DEPOSITS

IIA1 : Stratabound, skarn hosted, molybdenum

A2 : Unconformable-to-conformable, pegmatite hosted, molybdenum

A3 : Stratiform, amphibolite paragneiss hosted, molybdenum

IIA1: Stratabound, skarn hosted, molybdenum

Mineralization comprises irregularly disseminated coarse molybdenite grains within dark green, massive, coarse grained skarns which occur as stratabound lenses within interlayered marbles and siliceous paragneisses. Skarn minerals are diopside, scapolite or plagioclase and minor calcite, sphene, apatite, tremolite, actinolite, quartz, microcline, muscovite, pyrite and pyrrhotite.

IIA2: Unconformable-to-conformable, pegmatite hosted, molybdenum

Molybdenite occurs as disseminated, coarse flakes and in fractures and veinlets within massive pegmatite dikes which intrude sequences of interlayered marbles, paragneiss, and granite gneiss. They comprise quartz and feldspar with minor hornblende, pyroxene, pyrite and pyrrhotite.

IIA3: Stratiform, amphibole paragneiss hosted, molybdenum

Mineralization consists of irregularly disseminated, coarse flakes of molybdenite within a foliated to gneissic, medium-grained amphibolite gneiss composed of hedenbergite, and scapolite, with minor sphene, apatite and iron sulphides. Replacement by microcline, plagioclase, hornblende, calcite, quartz and biotite is common. Conformable paragneiss units occur within sequences of carbonate and siliceous clastic metasedimentary gneisses, usually at the contact between the marbles and paragneiss.

GOLD AND SILVER DEPOSITS

IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted, gold, silver and arsenic

A2: Stratabound, quartz-ankerite vein hosted, gold, copper, zinc, lead, antimony in dolomitic marble

A3: Other geological association, gold

IIIA1: Concordant to discordant quartz, quartz-ankerite vein hosted gold, silver and arsenic

Mineralized quartz, quartz-ankerite vein systems occur in

(i) shear zones in gabbroic and granitic intrusions, and mafic metavolcanic rocks

(ii) crosscutting fractures in marbles and metaclastic rocks

(iii) concordant veins in marbles and

(iv) concordant lenses in the basal unconformity of the Flinton Group

Mineralization is variable, gold is usually associated with pyrite and arsenopyrite. Deposits may also contain galena, sphalerite, chalcopyrite, pyrrhotite, tetrahedrite and native gold. Tourmaline and actinolite are accessory minerals in many deposits.

IIIA2: Stratabound, quartz-ankerite vein hosted gold, copper, zinc, lead, antimony in dolomitic marble

Deposits are stratabound networks of narrow quartz, quartz-dolomite veins, pods and lenses within dolomitic marbles. The gold is associated with erratically disseminated chalcopyrite, pyrite, tetrahedrite, bornite, boulangerite, jamesonite, sphalerite and galena.

IIIA3: Other geological association, gold

Deposits with no apparent consistent features.

INDEX OF BASE METAL AND PYRITE DEPOSITS
(Keyed to map p.2737 in pocket)

Name	Commodity	Township	Status	Classification
1. Barrie Syndicate	Zn-Pb-Cu	Barrie	O	ID1
2. Buffadison	Cu	Barrie	P	IB2
3. Stead (Cook)	Zn-Pb-Ag-Cu	Barrie	P	ID1
4. Murphy-Hickey	Pb-Zn	Bedford	O	IA2
5. Robinson	Pb	Bedford	P	IA2
6. Thirty Island Lake	Zn	Bedford	O	IA1
7. Deer Lake	Zn-Cu-As	Belmont	P	IB1
8. Gunter	Py	Cashel	O	IE2
9. Ardoch (Green Lake)	Zn	Clarendon	O	IA1
10. Wilkinson	Zn	Hinchinbrooke	O	IA1
11. Canada Pyrite Mine	Py	Hungerford	P	IE1
12. Hungerford Mine	Py	Hungerford	PP	IE1
13. Hungerford West Extension	Py	Hungerford	O	IE1
14. Ontario Sulphur Mine	Py	Hungerford	PP	IE1
15. Donahue Creek	Cu-Zn	Kaladar	O	IB1
16. Spry	Zn	Kaladar	O	IA1
17. Crowe River	Cu	Lake	P	IB2
18. Katherine Lead Mine	Pb	Lake	PP	IA2
19. Crysler	Pb	Limerick	P	IA2
20. Macassa	Cu-Ni	Limerick	P	IC1
21. Frontenac	Pb	Limerick	PP	IA2
22. Bannockburn Pyrite	Py	Madoc	PP	IE1
23. Blakely Pyrite	Py	Madoc	PP	IE1
24. Canada Sulphur Ore	Py	Madoc	PP	IE1
25. Eldorado Copper	Cu	Madoc	PP	IB2
26. Hollandia	Pb	Madoc	PP	IA2

Name	Commodity	Township	Status	Classification
27. Bonter	Cu-Ni	Marmora	P	IC1
28. Caverly	Zn-Cu	Marmora	O	IB1
29. Myers Rusty Schist	Zn-Cu	Marmora	O	IB1
30. Bertrim	Py	Olden	O	IE1
31. Long Lake	Zn	Olden	PP	IA1
32. Sharbot Lake Mines	Cu-Ni	Olden	P	IC1
33. Smith, W.J.	Zn	Olden	O	IA1
34. Long Point	Pb	Rear of Leeds and Landsdowne	O	IA2
35. Slave Lake	Zn	Sheffield	P	IA1
36. Blackburn	Pb-Zn-Ag	Tudor	O	IA2
37. Ramsay, W.	Pb-Zn	Tudor	O	IA2
38. Trianna	Ni-Cu	Tudor	O	IC1
39. Rose Island	Zn	Wollaston	O	IA1
40. Buckhorn Mines	Py	Barrie	O	IE2
41. Burridge Road	Pb	Bedford	O	IA2
42. A. Crozier	Pb	Bedford	O	IA2
43. Rupert Crozier	Pb	Bedford	O	IA2
44. James Murphy	Pb	Bedford	O	IA2?
45. John Murphy	Pb	Bedford	O	IA2
46. Leo Murphy	Pb	Bedford	O	IA2
47. Patterson	Pb	Bedford	O	IA2
48. Hinchcliffe Lake	Pb	Cashel	O	IA2
49. Little Salmon Lake	Py	Cashel	O	IE2
50. Trumble	Pb	Cashel	O	IA2?
51. Clarendon	Pb	Clarendon	O	IA2?
52. Minktrack Lake	Py	Clarendon	O	IE2
53. Mississippi	Py	Clarendon	O	IE2
54. Stalker	Py	Clarendon	O	IE2
55. Swamp Creek	Py	Clarendon	O	IE2
56. Turtle Lake	Py	Clarendon	O	IE2
57. Lot 23 Con. III	Cu	Dungannon	O	IC1?
58. Robson Claims	Pb	Grimsthorpe	O	IA2?
59. Wadsworth Lake	Cu	Grimsthorpe	O	IB2
60. Duncan Lake	Py	Hinchinbrooke	O	IE2

Name	Commodity	Township	Status	Classific- ation
61.Lot 33, Con. XII	Cu	Hungerford	O	IB2
62.North Brook	Cu	Kaladar	O	IB2
63.Big Clear Lake (Clark)	Py	Kennebec	O	IE2
64.Kennebec	Py	Kennebec	O	IE2
65.Lot 11, Con. II	Pb	Kennebec	O	IA2
66.Donahue Vein	Pb	Lake	O	IA2
67.Lot 8, Con.X	Pb	Lake	O	IA2?
68.Steen Lake	Cu	Lake	O	IB2?
69.Snooks	Py	Loughborough	O	IE2
70.Davis	Py	Madoc	O	IE2
71.Farrell Mine	Py	Madoc	O	IE2
72.Webber	Zn-Pb	Madoc	O	IE2
73.Methuen	Pb	Methuen	O	IA2
74.MacDonald, E.	Py	Olden	O	IE2
75.McKnight, W.M.	Py	Olden	O	IE2
76.Crain	Cu	Oso	O	IB2
77.Foley	Py	Sheffield	O	IE2
78.Lot 15, W. of Hastings Road	Py	Tudor	O	IE2
79.Lot 23, Con.B.	Pb	Tudor	O	IA2
80.Lot 28, Con.B.	Pb	Tudor	O	IA2
81.Lot 30, Con.B.	Pb	Tudor	O	IA2?
82.Lot 33, Con.III	Pb	Tudor	O	IA2?
83.Lot 34, Con.IV	Pb	Tudor	O	IA2
84.Lombard	Pb	Tudor	O	IA2
85.Murphy Mine	Pb	Tudor	O	IA2
86.Reelman	Pb	Tudor	O	IA2?
87.Roberts	Pb	Tudor	O	IA2
88.Stewart	Pb	Tudor	O	IA2
89.Wright	Pb	Tudor	O	IA2

1. BARRIE SYNDICATE (INTERNATIONAL) OCCURRENCE

COMMODITY:
Zinc, lead, copper

ROCK ASSOCIATION:
Host: Metagreywacke
Other: Dolomite marble

CLASSIFICATION
IDl: Carbonate-hosted breccia, zinc, -lead-copper

LOCATION AND ACCESS

The occurrence is located in the east-central part of Barrie township, between Mississagagon and Kashwakamak Lakes, approximately 6 kilometres northeast of Myers Cave. It is on the north side of Highway 506, approximately 14 road kilometres northeast of the intersection with Highway 41. The major shaft is indicated on the topographic map 31C/14 on O.D.M. maps 51d (Meen 1944) and 2053 (Hewitt, 1964) and OGS map P.2278 (Moore and Morton, 1980).

Lots 6-9, Con. IX Barrie township, Frontenac county
NTS Mazinaw Lake 31C/14, 1:50,000
Latitude: 44°52'23", Longitude 7°03'30"W
UTM Zone 18, 4970700 N, 337400E

SIZE AND GRADE

The major workings consist of a vertical and inclinal shaft (200 feet apart) with depths of 125 and 60 feet respectively (Meen 1944, p.41). Seven test pits were opened over a distance of three-quarters of a mile (Carter 1903, p.112).

DESCRIPTION
General Geology: The O.D.M. geological compilation map 2053 (Hewitt, 1964) indicates that the occurrence is situated within an extensive northeast trending sequence of marbles, quartzose metasedimentary rocks and mafic volcanic rocks which passes through the south part of Barrie township. The rocks are tightly folded and the axial traces and bedding orientations are conformable with the regional trend. Meen (1944, p.42) states: "The workings lies near the contact of Grenville dolomite and greywacke, which strike N56°E and dip 80°N. A strong shear zone in the greywacke is exposed ... and probably indicates a fault. No displacement was observed.". Carter describes the dolomitic marble as a light grey, very fine-grained, massive rock and the greywacke as a dark grey, fine to very fine-grained, thickly bedded rock with abundant disseminated magnetite.
Mineralization: Meen (1944, p.41) writes:
"....The material on the dump of the west shaft indicates a quartz vein in dolomite. The mineralization

galena and chalcopyrite. The material on the dump of the east shaft shows quartz in greywacke and quartzite with considerable amounts of pyrite.... Quartz stringers containing boulangerite and jamesonite are visible in the pits in lot 7."

Carter observed narrow (<1 mm) conformable layers and lenses of disseminated, fine-grained tetrahedrite, chalcopyrite and pyrite in the marble. He also reported a small percentage of sphalerite in quartz veins and minor mineralization in cross-cutting fractures.

A polished thin section of the mineralized vein contains up to 3% of finely disseminated jamesonite, sphalerite and chalcopyrite with minor pyrite, arsenopyrite and tetrahedrite. Jamesonite forms needle-like grains and irregular crystal aggregates (<2mm) and is replaced in places by chalcopyrite. Chalcopyrite occurs in small irregular blebs commonly with sphalerite and jamesonite. Sphalerite is found in small rounded grains and crystal aggregates disseminated throughout the section. Pyrite and arsenopyrite form subhedral grains (<0.3mm) in the gangue and with chalcopyrite. Tetrahedrite occurs in a rounded aggregate with chalcopyrite and gangue minerals. The gangue is composed of massive, very fine- to medium-grained quartz (55%) carbonate (35%) and muscovite (7%). Sulphides occur with all gangue minerals.

DEVELOPMENT HISTORY

pre 1900: -A zinc (sphalerite) occurrence was reported in the vicinity (Miller, 1900, p.209).

1902: -Two shafts and 7 pits were excavated by the International Gold and Copper Company Limited.
The west shaft has a vertical depth of 125 feet, the east shaft is inclined and has a depth of 60 feet. (Meen, 1944, p.42, Carter, 1903, p.112).

1937: -Mazinaw Base Metals Limited optioned part of the property from (International Mine) from Barrie Syndicate Limited, however no work on the deposit was reported (Meen 1944, p.42).

REFERENCES:

Carter, W.E.H.	1903, p.112-113
*Hewitt, D.F.	1964, Map 2053
Meen, V.B.	1944, p.41-42, Map 51d
*Moore, J.M. and Morton, R.L.	1980, Map P.2278
Miller, W.G.	1900, p 209
Sangster, A.L.	1970, p.230, 238, 239
Shklanka, R.	1969, p.135
Thomson, J.E. et al.	1957, p.8

2. BUFFADISON PROSPECT

COMMODITY
Copper

ROCK ASSOCIATION
Host: Diorite, quartz diorite
Other: Greywacke, volcanic tuff

CLASSIFICATION IB1: Other geological association, copper

LOCATION AND ACCESS

The Buffadison prospect is located in the northwest part of Barrie township, approximately 1 kilometre south of Shabomeka Lake and 3200 metres west of Little Shabomeka Lake (NTS31C/14). It is accessible on foot from all weather gravel roads passing south of Shabomeka and Mazinaw Lakes and joined to highway 41, 3.5 road kilometres north of Cloyne. The prospect is at the east end of a swamp, east of the gravel access road between McCausland and Semicircle Lakes. The deposit can be located on ODM map 2053 (Hewitt, 1964) and OGS Map P.2278 (Moore and Morton, 1980).

Lot 25, Concession XII, Barrie township, Frontenac County
NTS Mazinaw Lake 31 C/14 1:50,000
Latitude 44°52'33"N Longitude 77°08'58'W
UTM Zone 18, 4971200N, 330200E

SIZE AND GRADE

A total of 11 drill holes (4272 feet) were completed by Buffadison Gold Mines; only minor chalcopyrite was reported in one hole (Clarke, 1959). In addition, 10 short drill holes totalling 551 feet were drilled and no mineralization was intersected. (Salmond, 1957).

DESCRIPTION

Moore and Morton (1980, p.67) write:
"Copper sulphides are associated with a diorite to quartz diorite stock that has intruded meta-andesite and dacite flows, tuffs and their sedimentary equivalents. Both the metavolcanic rocks and the intrusion are overlain by metarhyolite tuffs.

....Chalcopyrite, bornite, chalcocite and pyrite are sparsely disseminated through the intrusive body and may represent original accessory minerals.

Both the stock and adjacent metavolcanic rocks are moderately to intensely fractured, schistose and altered. Fractures are sealed by chalcopyrite, pyrite, bornite, chalcocite and covellite, with traces of native copper accompanied by magnetite, potassic feldspar, epidote, quartz and biotite..."

All but one of the drill holes intersected greywacke or tuffaceous greywacke units. The remaining drill hole intersected granite gneiss. The intrusive hosted mineralization has not been tested by the drilling programs (Moore and Morton 1980, p.67).

DEVELOPMENT HISTORY

1957: 10 diamond drill holes totalling 551' were completed by K. Salmond (Salmond, 1957)
1959: 11 diamond drill holes, totalling 4272' were drilled by Buffadison Gold Mines (Clarke, 1959)

REFERENCES

Clarke, T.R. 1959, Geoscience Data Centre, Toronto
*Hewitt, D.F. 1964, Map 2053
*Moore, J.M. Jr and Morton 1980, p.66-68, Map P.2278
Salmond, K. 1957, Geoscience Data Centre, Toronto.

3. STEAD (COOK) PROSPECT

COMMODITY
Zinc, Lead, Silver, Copper

ROCK ASSOCIATION:
Host: Brecciated marble
Other: Amphibolite

CLASSIFICATION
IDI: Carbonate-hosted breccia, Zn-Pb-Cu-Ag

LOCATION AND ACCESS

The Stead prospect is located in the southwest part of Barrie township, approximately 1.7 kilometres south of Myers Cave (NTS 31C/14). It is accessible on foot from an all weather gravel road running south of Myers Cave on Highway 504. The main showing is about 200 m west of the access road, 2.0 road kilometres south of the town. The deposit occurs within the areas shown on ODM geological maps 51d (Meen 1944) and 2053 (Hewitt 1964).

Lot 25 Concession VI, Barrie township, Frontenac county
NTS MAZINAN LAKE 31 C/14, 1:50,000
Latitude 44° 49'34" N, Longitude 77°07'30" W
UTM Zone 18 4 965 600 N, 332 000E

SIZE AND GRADE

The workings consist of more than a dozen trenches and pits, a number of which are located on the accompanying map (Figure 2). A poorly defined mineralized zone was reported with surface dimensions 600 feet by 200 feet and a rough tonnage estimate of 50 tons per vertical foot to a depth of 100 feet (Kingston 1968 p.12). In this report, Kingston (1968, p.11) states:

> "....Assays by previous operators indicate an average grade of 0.01 oz Au, 2.4 oz Ag, 0.38 percent Cu over 10 feet by drilling, and 0.05 oz Au, 6 percent Zn, 5 percent Pb, 0.6 percent Cu, 7 oz Ag, per ton across an average width of 4 feet in trenches 'f' and 'g'. Spectrographic analysis done for the present owner on grab samples of mixed sulphide gives: Pb 0.6 percent, Zn 4.0 percent, Hg 0.1 to 1.0 percent, Cu 32 percent, Cd 1 to 10 percent, Ag 1 to 10 percent."

Analyses of two samples (79-TRC-54, 79-TRC-55) selected from the main trench by Carter give the following values: 1470, 1940 ppm Cd, 9000 ppm Cu, 1,20, 1.25 percent Pb, 13.5, 18.1 percent Zn, 0.07, 0.02 oz/ton Au and 0.48, 0.26 oz/ton Ag. Grab samples with assays as high as 10.1 percent Pb, 3 percent Co, 519.13 g/ton Ag and 8.23 g/ton Au were also reported in the assessment files (Cook 1980).

DESCRIPTION

General Geology: The O.D.M. geological compilation Map 2053 (Hewitt 1964) indicates the prospect within marbles folded with siliceous metasedimentary rocks and mafic volcanic rocks. They form a northeasterly oriented belt passing through the south half of Barrie township continuing north and eastwards beyond Clarendon township. This trend paralleled by axial traces of major folds, is interrupted by granitic intrusions west of Barrie township resulting in the formation of two separate branches which continue south and west. The entire belt is bounded, and in places intruded, by granitic bodies.

The local geology is dominated by a sequence of well-layered calcitic and dolomitic marbles which strike northeast and dip southeast. There are three narrow amphibolite units interbedded with the marbles and the marble-amphibolite sequence is bounded on the northwest by a conformable sequence of metaquartzite (See Figure 2). The metaquartzite units are typically grey to rusty-brown, well bedded rocks which are conformable with the marbles (Kingston 1968, p.6). These rocks are strongly sheared in places and contain a minor percentage of pyrite. In a recent field investigation of the prospect, Carter described the rocks at the showing as well-layered, interbedded calcitic and dolomitic marbles. The dolomitic marbles are generally white,. massive aphanitic rocks while the calcitic marbles are pink and have a massive, coarse-grained texture. The marbles are brecciated in places and the mineralization is closely associated with breccia zones. Kingston (1968, p.6) states that the marbles also contain narrow siliceous interbeds which illustrate strong local drag folds, plunging to the west at approximately 50 degrees. The bands of amphibolite interbedded with the marbles are sheared, brecciated units composed of approximately 60 percent hornblende, 35 percent quartz and 5 percent pyrrhotite and a minor amount of chalcopyrite and bornite (Kingston 1968, p.7). The rock sequence near the prospect is offset by late-stage normal faults which strike northwest. Fault displacement is minor and appears to have no significance in the location of the mineralization.

Mineralization: Carter reported mineralization consisting of lenses and zones of massive to disseminated sphalerite, galena, pyrite and chalcopyrite within a brecciated dolomitic marble. Moore and Morton (1980 p.69) reported the presence of tetrahedrite, hematite and cinnabar. Gold and silver were detected in a number of sample assays however no values were given. Carter noted that the sulphide mineralization commonly occurs between the marble fragments and the dark grey clay (and biotite?) matrix.

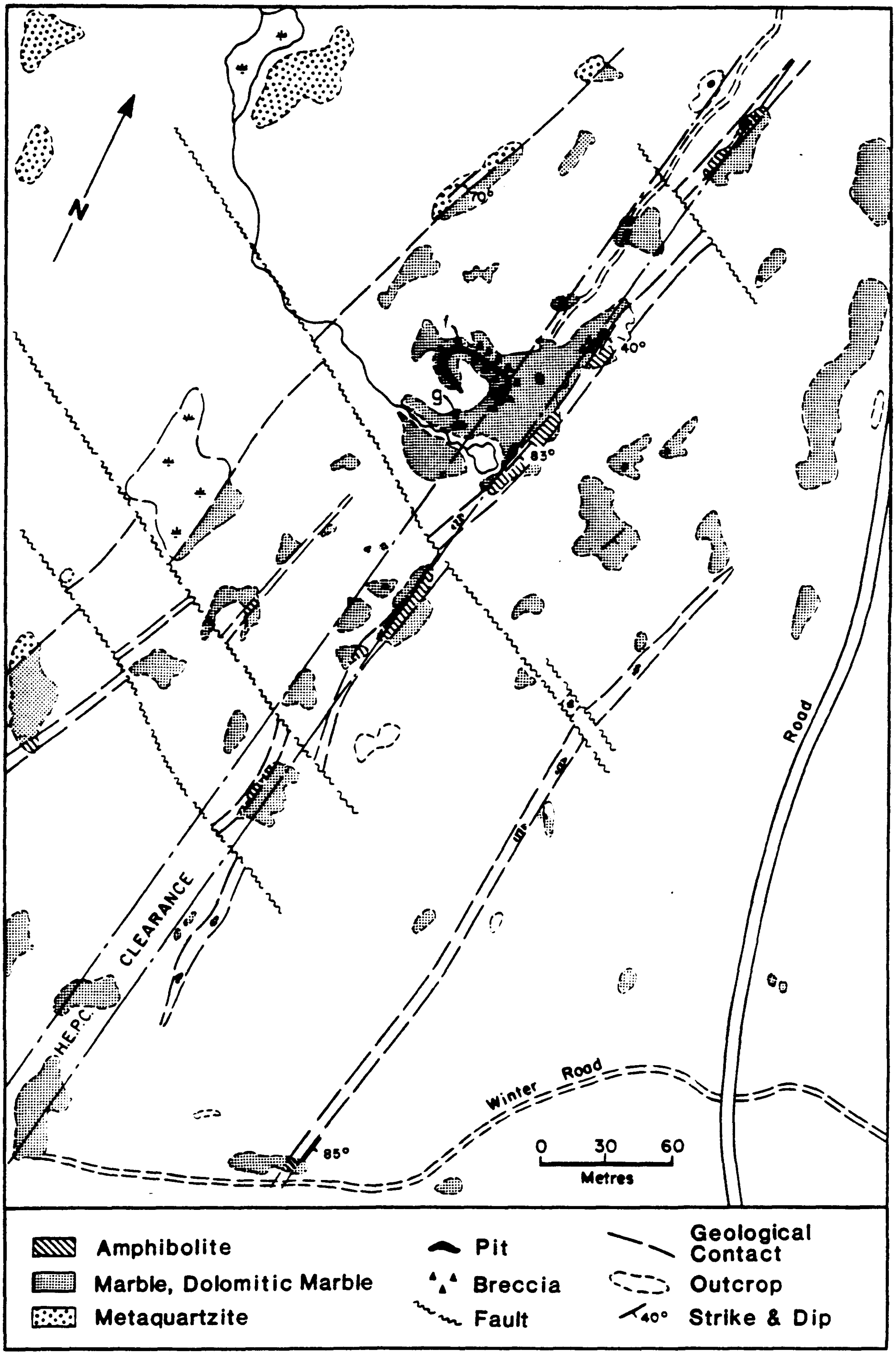

Figure 2: Geology of the Stead (Cook) Deposit (Adapted from Kingston, 1968)

DEVELOPMENT HISTORY

1960-1965:	The property was staked by Emrex Mines Ltd. At least 11 trenches were excavated and 3 diamond drill holes totalling 409 feet were completed (Emrex Mines Ltd. 1965, Moore and Morton, 1980, p.68).
1967:	The property was staked by P.W. Kingston. A geological survey was carried out over the claim and a number of rock samples were analysed (Kingston 1968, p.2).
1968:	Mr. P. Kingston completed 2 drill holes totalling 103' (Kingston, 1968).
1970:	The property was staked by Mr. H. Cooke. Additional trenches were excavated and a few samples were analysed. The property was optioned by the Selco Mining Company for a period of time (Moore and Morton 1980, p.68).
1975:	A soil geochemical survey was carried out for Mr. H. Cook (Gleeson 1975).
1976:	The geology of the property was mapped for Mr. H. Cook (Ehrlich 1976). At least one trench was excavated and 4 diamond drill holes totalling 230 feet were completed (Cook 1976).
1977-1978:	Four trenches were excavated and 3 diamond drill holes totalling 423 feet were completed (Cook 1978).
1979:	Five diamond drill holes totalling 257 feet in length were completed. Selected core samples were assayed (Cook 1979).
1980:	Three diamond drill holes totalling 294 feet were completed by H.F. Cook. Selected core samples were analyzed (Cook 1980).

REFERENCES

Cook, H.F.	1976, Geoscience	Data	Centre,	Toronto
	1978, "	"	"	"
	1980, "	"	"	"
Ehrlich, A.	1976, "	"	"	"
Emrex Mines Ltd.	1965, "	"	"	"
Gleeson, C.F.	1975, "	"	"	"
*Hewitt, D.F.	1964, Map 2053			
Kingston, P.W.	1968, Geoscience	Data	Centre,	Toronto
*Meen, V.B.	1944, Map 51d			
Moore J.M. and Morton, R.L.	1980, p.68-70			
Sangster, A.L.	1970, p.242-3			

4. MURPHY-HICKEY OCCURENCE

COMMODITY
Lead, Zinc

ROCK ASSOCIATION
Host: Marble
Other: Granite

CLASSIFICATION
IA2: Unconformable, carbonate vein-hosted, lead

LOCATION AND ACCESS

The Murphy-Hickey occurrence is located in the central part of Bedford Township, approximately 4 kilometres southwest of Fermoy (NTS 31C/10). It is accessible from a paved road joining Westport on Highway 42 to Godfrey on Highway 38. The occurrence is about 300 metres west of the road, 4.5 road km from Fermoy. The occurrence is located on ODM maps 2054 (Hewitt, 1964) and 1947-5 (Harding, 1951).

Lot 17 Con. VI, Bedford township, Frontenac county
NTS TICHBORNE 31 C/10, 1:50,000
Latitude: 44°37'53"N Longitude 76°33'56"W
UTM Zone 18, 4943000N, 375800E

SIZE AND GRADE
The mineralization occurs in a vein exposed intermittently for 1600 feet with a width ranging from a few inches to 6 feet (Uglow, 1916, p.26, Harding, 1951, p.67). Workings consist of at least 9 trenches and 2 shafts (Uglow, 1916, p.26, Alcock, 1930, p.153). The west (Hickey) shaft was reported to be 90 feet deep with 10 feet of drifting at the 65 feet level. The east (Murphy) shaft is 600 feet from the west shaft and is reported to be 26 feet deep with an opening 9 feet in diameter (Alcock 1930, p.153, Harding, 1951, p.69-70). Harding (1951, p.69) indicates 3 trench dimensions 35 feet by 10 feet deep, 30 feet by 10 feet deep and 10 feet by 4 feet by 10 feet deep. A 5 foot chip sample collected from a trench across the strike of the vein analysed 13.08 percent Pb, 0.06 percent Cu (Newburg 1974, p.4).

DESCRIPTION

General Geology: The occurrence is hosted in marbles which occupy the core of a northeast plunging synclinal structure identified by Wynne-Edwards (1963) as the Potspoon Lake synform. The marble zone is approximately 1.5 miles wide and 6000 feet in depth (Wynne-Edwards, 1970, p.6). The synform is part of a tightly-folded, northeast trending sequence of marbles interlayered with paragneisses.

grained and contain minor amounts of graphite, apatite, feldspar and mica (Newbury 1974, p.3). The mineralized calcite-barite vein is approximately 1600 feet long (ave. width 1 foot) and crosscuts both marbles and granites at N75°W (vertical dip).

Mineralization: Newbury (1944, p.3) writes:

"The galena mineralization occurs primarily in calcite-barite bearing veins enclosed within the crystalline limestone. Examination of the ore bin at the Murphy zone revealed samples exhibiting two distinct types of galena mineralization. The first type is massive galena crystals contained within massive barite and comprising up to 75 percent of the sample. The second type of mineralization occurs as disseminated galena crystals approximately 1/4 to 1/2 inch in diameter scattered through the rock and comprising up to 20 percent of the sample.

Some sphalerite was observed in the samples but it was generally less than 5 percent of the sample when present..."

Uglow (1916, p.25-26) states:
"...The chief gangue minerals in the vein are barite and calcite. The vein material is distinctly banded, but ordinarily the calcite and barite occur together within individual bands."

DEVELOPMENT HISTORY

pre 1863: Lead mineralization was first reported in the vicinity (Logan, 1863, p.687-688)

pre 1916: About 9 pits and trenches were excavated (main pit 26 feet deep) by unknown operators (Uglow, 1916, p.26)

1920: The McLaurin Development Company Ltd sank a shaft to a depth of 40 feet. Some mining equipment was installed (Sutherland et al., 1922, p.134).

1921-1930?: Two shafts were reported on the property, with dimensions 9 feet diameter by 20 feet deep and 90 feet deep with 10 feet of drifting on the 65 foot level (Alcock, 1930, p.153, Harding, 1951, p.69-70)

1974: A number of samples from old workings were collected and a soil geochemical program was carried out by New Growth Explorations Limited (Newbury, 1974).

1975: New Growth Explorations carried out detailed magnetic, V.L.F. electromagnetic and soil geochemical surveys over the occurrence.
- Two drill holes (400 feet) were completed near the mine shafts (Gledhill, 1975).

REFERENCES

Alcock, F.J.	1930,	p.151-153
Gledhill, T.	1975,	Geoscience Data Centre, Toronto
*Harding, W.D.	1951,	p.67-70, Map 1947-5.
*Hewitt, D.F.	1964,	p.11, Map 2054
Logan, W.L.	1863,	p.687-688
Newbury, M.	1974,	Geoscience Data Centre, Toronto
Shklanka, R.	1969,	p.135
Sutherland, T.F. et al.	1920,	p.122
" "	1922,	p.134
Uglow, W.L.	1916,	p.25-26
*Wynne-Edwards, H.R.	1965,	Map
" "	1970,	Geoscience Data Centre, Toronto

5. ROBINSON PROSPECT

COMMODITY
Lead

ROCK ASSOCIATION
Host: Marble
Other: Granite, pegmatite

CLASSIFICATION
IA2: Unconformable, carbonate vein-hosted, lead

LOCATION AND ACCESS

The Robinson prospect is located in the central part of Bedford township, approximately 3 kilometres west of Fermoy (NTS 31C/10). The deposit is approximately 300 metres north of a paved road passing through Bedford township, at a point 3.5 road kilometres west of Fermoy. A gravel road running north of the access road passes to the west of the showings. The prospect is indicated on ODM maps 2054 (Hewitt, 1964), and 1947-5 (Harding, 1951).

Lot 19 Con VII, Bedford Township, Frontenac County
NTS Tichborne 31C/10, 1:50,000
Latitude: 44°38'26"N Longitude: 76°33'16" W
UTM Zone 18, 4944000 N, 376700E

SIZE AND GRADE

The workings consist of two shafts, 100 feet in depth, spaced 1000 feet apart. Approximately 300 feet of drifting was completed in the west shaft (Consolidated Lead Mines Limited). A number of pits and trenches were opened up near the east shaft (Harding, 1951, p.70). The east and west shafts occur on veins approximately 700 and 900 feet long respectively. The veins have an average width of 14 inches on the surface and range up to 5 feet wide at depth (Consolidated Lead Mines Limited). The following is an analysis of a 100 pound sample of mineralization submitted to the Mines Branch in Ottawa by the Dominion Mining and Smelting Company. Nil Au, 0.16 ounces per ton Ag, 0.04 percent Cu, 0.60 percent Zn and 12.64 percent Pb. One drill hole near the west shaft intersected 1.7 feet of material assaying 1.73 percent Pb (Gledhill, 1975). Early reports by Consolidated Lead Mines Limited indicated that approximately 15,000 tons of 20 percent lead ore was present in the west vein system (Consolidated Lead Mines Limited).

DESCRIPTION

Wynne-Edwards (1970) writes:
"...The claim group is underlain by coarse-grained, white crystalline limestone of the Grenville Group. This rock includes lenses of lime silicates, layers and fragments of rusty, pyritic and graphitic gneisses, and small masses of white pegmatite and white granite. The

crystalline limestone lies in the core of a synclinal structure identified by Wynne-Edwards (1963) as the Potspoon Lake synform.

...The crystalline limestone is faintly foliated and dips gently southeast. Preliminary estimates suggest that in the neighbourhood of the claim group, the crystalline limestone zone is approximately 1.5 miles in width, and 6,000 feet in depth. It consists almost entirely of coarse-grained while calcite, with minor amounts of phlogopite mica, diopside, apatite, tourmaline, pyrite and graphite.

On many outcrops in the claim group fractures from one quarter inch to four inches in width are abundant. These are predominantly filled with calcite and barite of varying grain size.

Most of the veins strike between N40°W and N70°W and dip vertically or steeply northeastward...

The east and west shaft on the Robinson property within the claim group occur on two separate veins belonging to this system which have widths of up to two feet where exposed at the surface. Within these veins are pods of varying size from which grab samples contain up to twenty percent coarse-grained galena, up to five percent sphalerlite and minor pyrite.

Minerals in the veins on the property include coarse white barite, galena in crystals up to one inch in diameter, and pale honey-brown sphalerite in grains from one-quarter to one-half inch in diameter. At surface exposures the presence of pyrite is indicated by rusted pits about one-quarter inch in diameter."

DEVELOPMENT HISTORY

pre 1863:	The occurrence was discovered (Logan 1863, p.867-8)
1926-1929:	The Dominion Mining and Smelting Corporation Limited acquired the prospect, erected a mill and sank 2 major shafts (Wynne-Edwards, 1970, p.4).
1933:	Dominion Mining and Smelting Corporation Limited shipped mineralized samples to the Mines Branch in Ottawa for analysis (Timm, 1934, p.68)
1935:	The property was acquired by Consolidated Lead Mines Syndicate, and subsequently incorporated (1936) as Consolidated Lead Mines Limited. Little or no work was performed (Consolidated Lead Mines Limited)
1968:	Allcourt Mines Limited carried out an EM survey over the property (Sutherland, 1968).
1970:	Megaton Mines Limited examined the property and drilled one hole (Wynne-Edwards, 1970, Megaton Mines Ltd., 1970)

1974:	New Growth Explorations Incorporated acquired the property and carried out soil sampling and geophysical surveys (Newbury, 1974, Gledhill, 1975)
1975:	New Growth Explorations Incorporated completed 4 drill holes on the property (Gledhill, 1975)

REFERENCES

Consolidated Lead Mines Ltd.		
Gledhill, T.R.	1975,	Geoscience Data Centre, Toronto
*Harding, W.D.	1951,	p.70-1, Map 1947-5
*Hewitt, D.F.	1964,	p.11, Map 2054
Logan, W.D.	1863,	p. 867-868
Megaton Mines Ltd	1970,	Geoscience Data Centre, Toronto
Newburg, M.	1974,	Geoscience Data Centre,Toronto
Sutherland, H.H.	1968,	Geoscience Data Centre, Toronto
Shklanka, R.	1969,	p.135
Timm, W.B.	1934,	p.68
Uglow, W.L.	1916,	p.25-6
Wynne-Edwards, H.R.	1963,	5p.
Wynne-Edwards, H.R.	1967,	142p
Wynne-Edwards, H.R.	1970,	Geoscience Data Centre, Toronto.

6. THIRTY ISLAND LAKE OCCURRENCE

COMMODITY
Zinc

ROCK ASSOCIATION
Host: Calcitic marble
Other: Gabbro

CLASSIFICATION
IA1: Stratiform, carbonate hosted zinc

LOCATION AND ACCESS

The Thirty Island Lake occurrence is located in the southwest corner of Bedford township, on the southeast shore of Thirty Island Lake, approximately 7 kilometres east of Godfrey, Hinchinbrooke Township (NTS 31 C/10). It is accessible from a series of gravel roads which run around the south end of Thirty Island Lake and join the paved road between Godfrey and Westport. The deposit is approximately 11 road kilometres from Godfrey. It is located on ODM Map 2054 (Hewitt 1964)

Lot 5 Concession III, Bedford township,
Frontenac county
NTS TICHBORNE 31 C/10 1:50,000
Latitude 44°33'52"N Longitude 76°35'55"W
UTM Zone 18 4935600 N 373050 E

SIZE AND GRADE

Carter reported that the workings consist of 2 pits approximately 8 feet in diameter and 3 feet deep. The mineralized zone is confined to bands and lenses about 3 feet wide (Harding, 1951, p.95). A sample of mineralized rock collected by Carter analyzed 4.60 percent Zn, 94 ppm Cu, <10 ppm Pb and 43 ppm Cd.

DESCRIPTION

General geology: The Thirty Island Lake zinc occurrence is hosted in a marble unit, part of a sequence of marbles, paragneisses, mafic volcanic rocks and gabbroic rocks in the southwestern part of Bedford township. In places, the sequence is intruded by a number of small granitic bodies. The rock sequence is tightly folded with the axial traces oriented northeast-southwest and the fold axes plunging to the northeast. A major north east-trending fault zone passes through Canoe Lake, south and east of the occurrence.

Carter map (Figure 3) shows the zinc occurrence hosted in partially dolomitized calcitic marbles interfolded with and bounded by foliated gabbroic rocks. The calcitic marble is a medium-grained (1-2 mm) massive to poorly layered rock containing approximately 1 to 2 percent graphite muscovite and serpentine in fine, disseminated

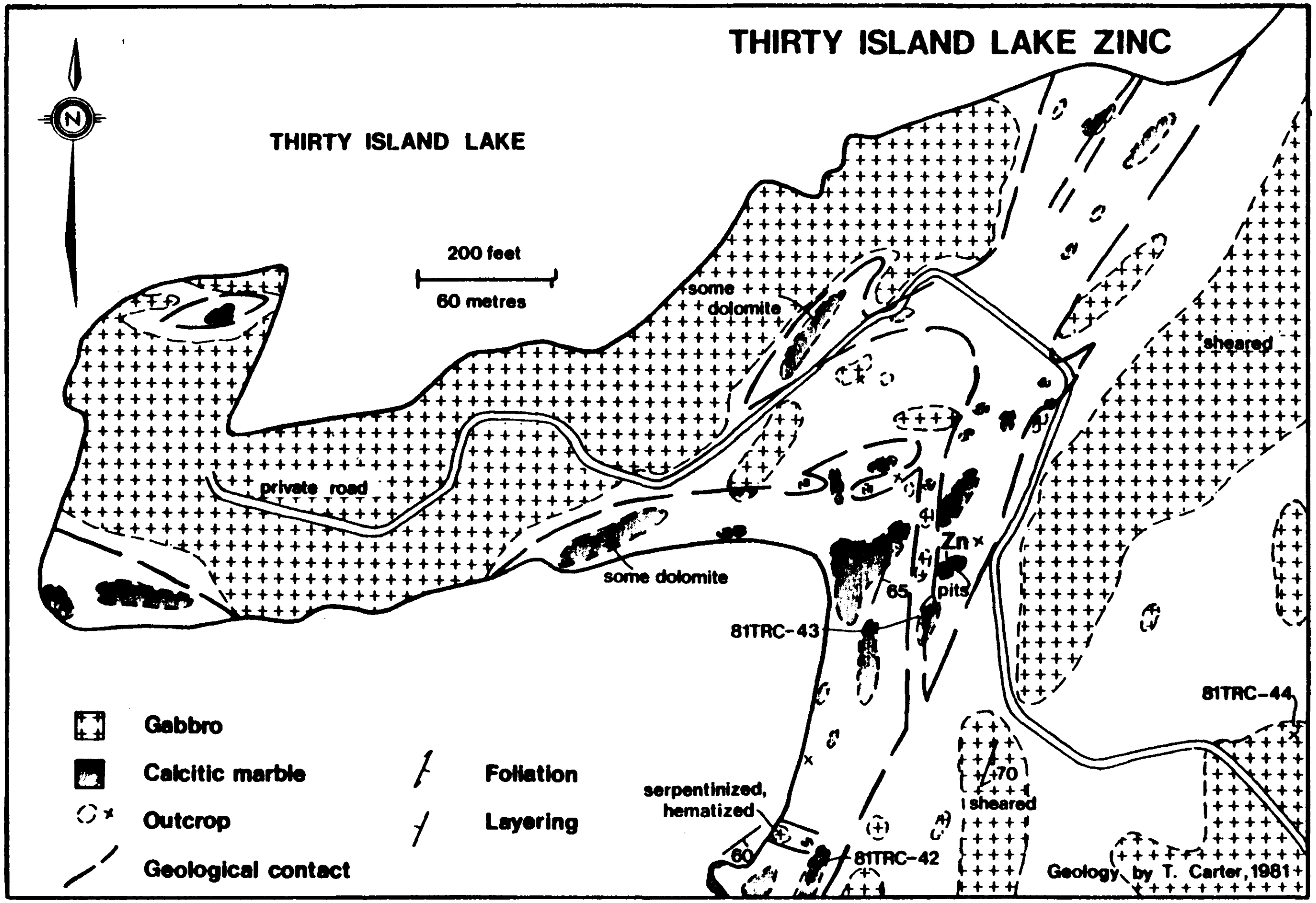

Figure 3: Geology of the Thirty Island Lake Zinc Deposit

grains. In places the marbles are well layered and contain rounded fragments of dolomitic marble and calc-silicate rocks. The mafic intrusive rocks range in composition from gabbro to anorthositic gabbro. These rocks are generally medium-grained and foliated, however in a locality immediately southwest of the showing, they are cut by fine-grained gabbro dikes. The mineralogical composition ranges from 20 to 70 percent hornblende, 30 to 80 percent feldspar, up to 10 percent magnetite and minor biotite. An outcrop of gabbro near the calcitic marble also displayed serpentine and hematitic mineralization.
Mineralization: Harding (1951 p.95) writes:

"... The sphalerite occurs as disseminations in highly folded Grenville crystalline limestones, which strike generally northeast and dip steeply to the southeast... The sphalerite is confined largely to bands and lenses, which lie parallel to the beds of limestone and constitute a zone in the limestones about 3 feet wide ... The zinc-bearing zone is highly contorted and could not be followed satisfactorily for any great distance."

Carter reported a 30 cm wide layer of heavily disseminated sphalerite and pyrite on the wall of one pit. In the rock dump, Carter observed erratically disseminated mineralization in calcitic marble and calc-silicate rocks and narrow (2-3 cm) mineralized layers in calcitic marble.

DEVELOPMENT HISTORY

1900-1910?: Two pits were excavated for Mr. H. Richardson (Harding 1951, p.95).

1974: The Phelps Dodge Corporation of Canada carried out an airborne magnetic and electromagnetic survey over the area (Sander 1974).

REFERENCES

Harding, W.D. 1951, p.95
*Hewitt, D.F. 1964, p.12, Map 2053
Sander, G.W. 1974, Geoscience Data Centre, Toronto
Sangster, A.L. 1970, p.123,135,136

7. DEER LAKE ZINC-COPPER-SILVER PROSPECT

COMMODITY

Zinc, copper, silver

ROCK ASSOCIATION

Host: Metamorphosed mudstones, siltstones, pelitic sandstones and felsic volcanic tuffs

CLASSIFICATION:

IB1: Stratiform, sedimentary hosted, copper-zinc

LOCATION AND ACCESS

The Deer Lake prospect is located in the northeast corner of Belmont township about 4 kilometres north of the village of Cordova Mines (NTS 31C/12). It is immediately west of a paved concession road marking the boundary between Marmora and Belmont townships. The mineralized zone occurs within a wooded area west of a number of abandoned farm buildings, at a point about 4.2 road kilometres north of the intersection of the concession road with the Cordova Mines Road. The prospect is indicated on O.G.S. Map P. 2488 (Bartlett, Moore and Murray, 1982).

Lots 27, 28, 29	Con. I,	Belmont Township, Peterborough county
NTS BANNOCKBURN	31C/12	1:50,000
Latitude: 44°34'20"N,		Longitude: 77°48'20"W
UTM Zone 18, 4 939 350 N,		227 250 E

ECONOMIC FEATURES

Mineralization at the Deer Lake Zn-Cu-Ag prospect consists of sparsely disseminated sulphides contained in a layer of rusty schist up to 50 metres thick. This rusty schist has been tectonically thickened in the nose of a syncline to form a mineralized zone approximately 200 to 250 metres wide and up to 600 metres long. A total of eight diamond drill holes ranging from less than 30 to 260 metres in length have been completed on the prospect (personal files, C.R. Young, Havelock). Mineralization was encountered over the entire length of all eight drill holes, with values ranging from 0.01 to 0.1 percent copper, 0.04 to 1.13 percent zinc, and trace to 0.5 oz of silver per ton (Diamond drill files no. 13,14 Belmont Township, Assessment Files Research Office, Toronto). Assays of up to 6.28 percent zinc over a length of 30 cm are also reported from one diamond drill hole (Technical File 63.952, Assessment Files Research Office, Toronto).

A series of representative surface chip samples were collected by the author from the southern part of the main mineralized zone (see Table 4). Samples 80TRC-194 to 201 were collected at 50 metre intervals across the main part of the mineralized zone, and sample 80TRC-191 is unmineralized schist collected adjacent to the country road. The remaining samples were collected randomly from surface outcrops of the rusty schist.

TABLE 4: Metal contents of representative samples of rusty schist collected by the author at the Deer Lake Zn-Cu-Ag prospect. Results in ppm except for gold and silver (oz per ton)

Sample No.	Cu	Zn	Pb	Au	Ag	Sb	As
80TRC - 69	96	37	-	<0.01	<0.1	-	-
- 70	6720	1360	-	0.02	2.74	-	-
- 71	366	7350	34	<0.01	0.10	-	-
-191	92	62	-	<0.01	<0.1	1.2	260
-192	132	1280	-	<0.01	<0.1	15	72
-194	205	2250	-	0.01	0.21	2.2	172
-195	156	1670	-	0.01	0.27	5.0	180
-196	205	245	-	0.01	0.11	2.2	450
-197	122	500	150	0.01	0.29	20	53
-198	86	340	24	<0.01	<0.1	0.5	120
-201	400	1410	20	0.01	0.13	0.7	92

The available assay results indicate average metal content of about 0.03 - 0.04 percent copper, 0.3 - 0.5 percent zinc, 0.2 oz Ag per ton, and 0.01 oz Au per ton could be expected for the main mineralized zone. Additional exploration might also reveal narrow high grade zones in the deposit, as suggested by the two high grade assay results.

GEOLOGY

The Deer Lake Zn-Cu-Ag prospect occurs between a major volcanic sequence and an overlying carbonate-clastic sedimentary succession on the northeastern edge of the Hastings metamorphic low. Bartlett et al. (1980, 1982) have defined 3 distinct mafic to felsic volcanic cycles, and 2 probable additional cycles in the volcanic sequence. The Deer Lake mineralized zone occurs at the top of Cycle III, which consists principally of submarine basalt and subordinate intermediate pyroclastics. Minor amounts of magnetite ironstone occur at the top of the cycle.

The Zn-Cu-Ag zone occurs within a sequence of thinly laminated mudstones, siltstones, pelitic sandstones, and felsic volcanic tuffs, with minor interbeds of magnetite ironstone (Figure 4). The rocks are very thinly laminated (1-2 cm), consisting typically of alternating dark grey mudstone and buff coloured siltstone, sandstone, or tuffaceous layers, commonly containing disseminated pyrite. Thin beds of quartzite, chert, and calcareous, chloritic mudstone are locally abundant. The mineralized zone is a sulphide-rich equivalent of these sedimentary rocks, consisting typically of very schistose, friable, 'rusty schists' that weather to a rusty black, porous gossan. Pyrite, pyrrhotite, and minor sphalerite and chalcopyrite occur disseminated within the rock, with total sulphide content ranging from 5 to 25 percent. The sulphides locally form very thin (2-10 mm), discontinuous, massive layers in

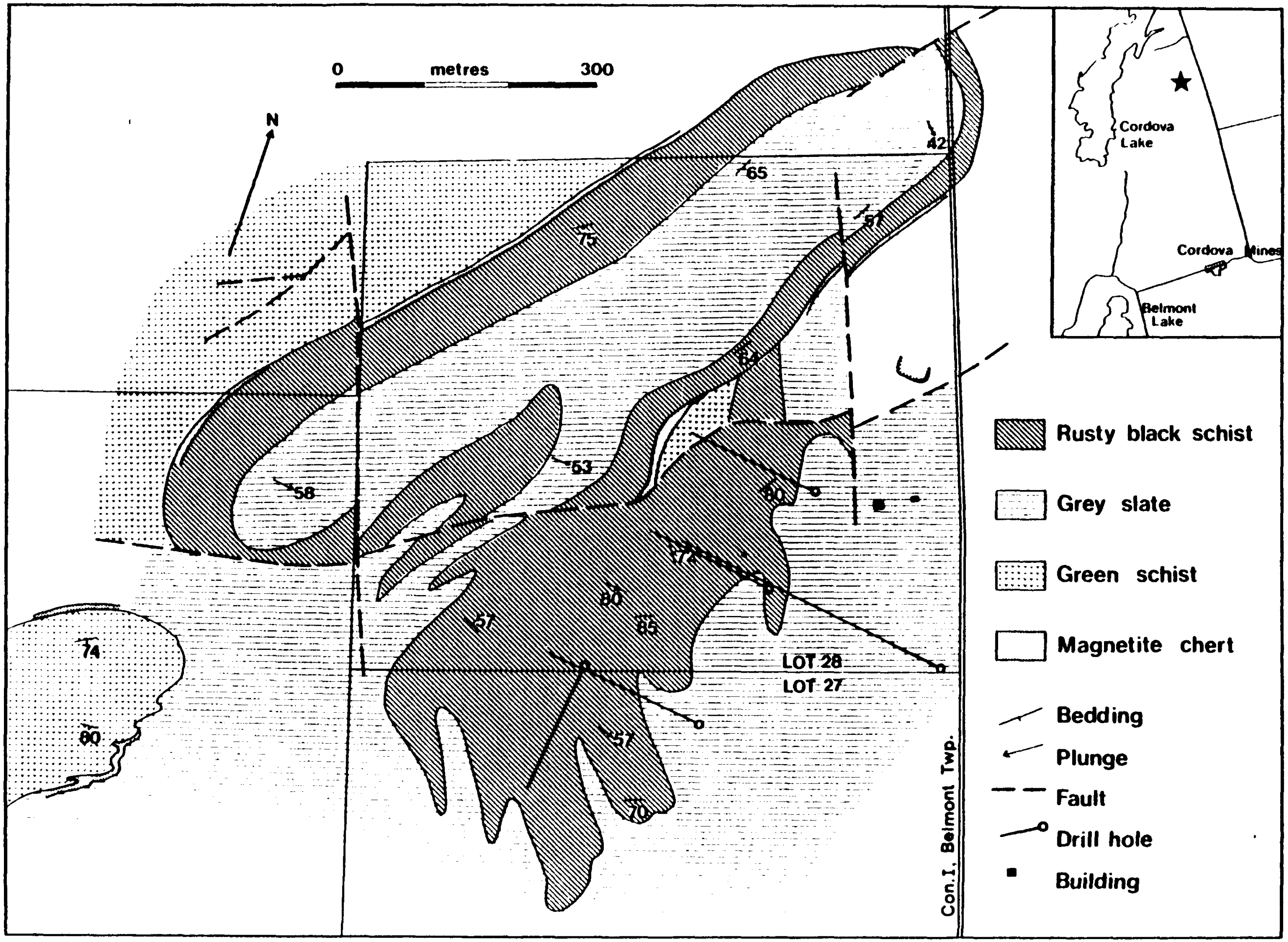

Figure 4: Geology of the Deer Lake Deposit (Adapted from a map by Benson (1967)).

the rusty schists, as reported by Miller (1957). Miller also reports the occurrence of thin sheets of graphite in the mineralized schists, alternating with massive pyrrhotite and biotitic siltstone. Bartlett et al. (1980) have noted the occurrence of garnet and garnet-cummingtonite schists in the mineralized zone.

Detailed mapping by Miller (1957) and Beavon (1967) indicates that the main mineralized zone lies in the nose of a syncline that plunges to the southeast at about 50-60 degrees. The axial plane strikes in an easterly direction and dips steeply to the southeast. Parasitic folds are common in the rusty schists around this structure.

The clastic and tuffaceous sediments of the host rock unit continue eastward across Marmora Township. Two other mineralized rusty schist horizons occur within this unit (Carter 1980). Rusty schist horizons containing significant amounts of copper and zinc also occur at the tops of the Cycle I and II volcanic sequences in Belmont Township (Bartlett et al. 1980, 1982).

Microscopy: Five thin and polished thin sections of rusty schist were examined by the author. The sections are composed essentially of variable amounts of very fine-grained to fine-grained (0.01 - 0.2 mm) quartz, feldspar, sericite, opaque minerals, and minor chlorite, with locally abundant biotite, garnet, and carbonate. Compositional layering is defined by variations in the relative proportions of mica to quartz and feldspar. All sections have a strong mica foliation conformable with the compositional layering. The foliation is crenulated in some of the sections.

Sulphide content of the sections varies from 1 to about 15 percent. The sulphides occur as scattered grains, as thin (2-3 mm) concordant lenses, or rarely as dispersed grains within narrow, discontinuous quartz veinlets. Pyrite is the most abundant sulphide, with about equal amounts of pyrrhotite, chalcopyrite, and sphalerite. Pyrite sometimes occurs as large (1-3 mm), irregular, partly recrystallized, oval aggregates that strongly resemble primary framboids. Abundant very fine grains of sericite and chlorite occur as inclusions within the framboidal structures. More commonly the pyrite forms scattered anhedral to euhedral grains. Pyrrhotite usually occurs as intergrowths within pyrite. Sphalerite and chalcopyrite usually occur together, either intergrown or as separate irregular grains.

DEVELOPMENT HISTORY;

1955-1957: The property was acquired by two local prospectors, Roger Young and James Cumming, in 1955, to investigate an aeromagnetic anomaly. In 1956 and early 1957 three diamond drill holes totalling 84.7 metres intersected minor disseminated sphalerite and chalcopyrite along with pyrite and pyrrhotite. In 1957 Texas Gulf Sulphur Co. completed geological mapping and

	vertical loop electromagnetic and magnetometer surveys (Miller 1957)
1964:	One diamond drill hole 112.2 metres in length completed by Keevil Mining Group on lot 27. Disseminated sulphides were encountered over the entire length. Assays ranged from 0.02 - 0.1 percent Cu, 0.2 - 0.5 percent Zn, 0.1 - 0.5 oz Ag per ton over a length of about 35 metres (Keevil Mining Group, 1964)
1967-1968:	Four diamond drill holes totalling 808.7 metres completed by Syngenore Explorations Ltd. The entire core length was mineralized. Assay values ranged from 0.04 - 1.13 percent Zn, 0.01 - 0.08 percent Cu, trace - 0.2 oz Ag per ton (Syngenore Explorations Limited, 1968). Tonnage in the order of 40 to 50 million tons is indicated (Syngenore Explorations, personal files of C.R. Young, Havelock).
1969:	Geochemical soil survey completed for Metalridge Mining Corp. Ltd. by Syngenore Explorations Ltd. Copper-zinc anomalies corresponding with rusty schist outcrops were outlined (Beavon 1969).

REFERENCES

*Bartlett, J.R. et al.	1980,	p.92-95, Map 2488
Bartlett, J.R. et al.	1982,	37p.
Beavon, R.V.	1967,	Geoscience Data Centre, Toronto
Beavon, R.V.	1969,	" " "
Carter, T.R.	1980,	p.169-174
Keevil Mining Group	1964,	Geoscience Data Centre, Toronto
Miller, L.J.	1957,	" " "
Syngemore Explorations Ltd.	1968,	" " "

8. GUNTER OCCURRENCE

COMMODITY
Pyrite

ROCK ASSOCIATION
Host: Felsic metavolcanic tuff
Other: Mafic metavolcanic rock, marbles

CLASSIFICATION
IE2: Variable geological association, pyrite

LOCATION AND ACCESS

The Gunter pyrite occurrence is located in the southwest corner of Cashel township immediately south of Gunter Lake (NTS 31C/13). It is accessible from the town of Gunter by an all-weather gravel road joined to McCrae on the east side of Cashel township. The occurrence is approximately 2 road kilometres southeast from Gunter, north of the access road and approximately 250 metres south of Gunter Lake. The deposit is indicated on ODM Map 2142 (Lumbers, 1968).

Lot 23 Concession IV, Cashel township, Hastings County
NTS Coe Hill 31 6/13 1:50,000
Latitude 44°53'46"N, Longitude 77°31'51"W
UTM Zone 18, 4974300 N, 300150E

SIZE AND GRADE

The occurrence is situated on a 5 foot wide zone containing bands of pyrite and quartz. A sample of the original dump yielded 39.50 percent sulphur (Fraleck 1907, p.163). Workings consist of a filled shaft originally 20 feet in depth.

DESCRIPTION
The Gunter occurrence is hosted in a narrow, northeast trending band of felsic metavolcanic rocks. The felsic volcanic band and a thin zone of oxidized pyritiferous schists form a relatively extensive boundary between mafic metavolcanic rocks to the south and interlayered marble, metagreywacke and gabbro to the north.

Fraleck (1907, p.163) writes:

"A shaft has been sunk on the lead to a depth of twenty feet in alternating bands of quartz and pyrite. The work was done while prospecting for gold. The soil on the surface is quite unaltered and no gossan, fahlband or other indications of a pyrite deposit are visible. The pyrites in the shaft, however, uniformly increased with depth. A sample representing two-thirds of the dump yielded 39.50 percent of sulphur. The total width of the vein is five feet".

The shaft had since been filled and the rock dump contains fragments of rusty-schists and fragments of massive, fine-grained pyrite with lenses and streaks of quartz (Lumbers 1968, p.38). Lumbers observed a metatuff unit about ten feet south of the shaft. Sangster (1970, p.81) states:

"Disseminations and grain aggregates of pyrite of unknown extent occur within a fine to medium-grained quartzite in rhyolite... Individual pyrite grains are euhedral to polyzonal within the quartz mozaic." The following is a geochemical analysis of the host material (Sangster 1970, p.26): 66.80 percent SiO_2, 14.90 percent Na_2O_3, 0.32 percent TiO_2, 0.63 percent Fe_2O_3, 2.90 percent CaO, 5,71 percent Na_2O, 1.52 percent K_2O, 0.90 percent MgO and 4.23 percent Loss on Ignition.

A recent topographic map indicates that new roads and buildings have been constructed very near the deposit.

DEVELOPMENT HISTORY

1907: A shaft was excavated to a depth of 20 feet by unknown operators. (Fraleck 1907, p.163)

REFERENCES

Fraleck, E.L. 1907, p.163
*Lumbers, S.J. 1968, p.38, Map 2142
Sangster, A.L. 1970, p.26,81,83
Wilson, A.G.W. 1912, p.70

9. ARDOCH ZINC (GREEN LAKE) OCCURRENCE

COMMODITY: Zinc

ROCK ASSOCIATION
Host: Calcitic marble
Other: Paragneiss, dolomitic marble

CLASSIFICATION
IA1. Stratiform, carbonate hosted zinc.

LOCATION AND ACCESS

The Ardoch Zinc occurrence is located in the northwest part of Clarendon township, approximately 7.5 kilometres east of Plevna and 3.5 kilometres northwest of Ardoch (NTS 31 C/15). It is accessible by a system of gravel roads leading northeast from Ardoch to Little Green Lake. The occurrence is near the northeast shore of the lake and can be located on ODM Maps 2053 (Hewitt 1964) and 1954-4 (Smith 1958) and OGS Map P2487 (Pauk and Mannard 1982).

Lot 33, Con. II, Clarendon township, Frontenac county
NTS SHARBOT LAKE 31 C/15, 1:50,000
Latitude 44°57'45"N Longitude 76°53'16"W
UTM Zone 18 4980300 N, 351100 E

SIZE AND GRADE
Workings consist of 2 parallel trenches in overburden one with dimensions 300 feet by 2 feet by 1 to 4 feet deep, the other is continuous for about 450 feet. The rocks contain minor disseminated sphalerite. A sample of mineralization from the east trench analyzed 8900 ppm Zn, 144 ppm Pb, 36 ppm Cu, 95 ppm Cd, <0.10 oz/ton Ag and <0.01 oz/ton Au (Sample 80-TRC-65).

DESCRIPTION
General Geology: Smith's (1958) geology map illustrates that the deposit occurs in a marble unit, part of an extensive sequence of intercalated marbles, metavolcanic rocks and paragneisses. Also present are small diorite and gabbro bodies and a number of granitic dikes. Pauk and Mannard (1982) state that the area was subjected to at least two phases of deformation. The first phase produced isoclinal folds with axial planes oriented N60°E and steeply dipping axial plane foliation, approximately parallel to bedding. The second phase resulted in more open northeast trending folds. Both sets if folds plunge gently east. This area is cut by 2 major faults, the Plevna fault, a northwest-trending feature which cuts across the sequence west of the occurrence and the Fernleigh-Clyde fault, an extensive northeast-trending fault which passes south of Little Green Lake.

The locality of the deposit was mapped in detail by St. Joseph's Exploration Limited (Jackson 1979) who outlined 3 major rock types, paragneiss, dolomitic marble and calcitic marble. Jackson's map indicates zinc and pyrite mineralization within a marble unit bounded on either side by dolomitic marbles. These rocks are bounded to thenorth by a paragneiss unit which is in turn bounded by calcitic marbles. The marbles commonly contain thin beds or lenses of biotite paragneiss. All rock units are conformable and strike northeast. Foliation orientations trend northeast with dips ranging from 50 to 90 degrees northwest. Carter describes the host calcitic marble as a fine to very fine-grained well-layered rock. Layers are generally thin (<1.0 cm) and are grey or white in colour, the result of varying percentages of minerals including muscovite, tremolite and quartz. Jackson (1979, p.4) also reports graphite as an accessory mineral. Carter noted that layers of biotite gneiss (1 to 15 feet wide) occur within the host unit. These layers consist of fine-to-medium grained rocks which consist of biotite, carbonate and actinolite. Jackson (1979, p.4) describes the dolomitic marble north of the host unit as a coarse-grained siliceous marble with abundant tremolite, diopside and serpentine. South of the host unit, the dolomitic marble is relatively pure. Both dolomitic marble units contained interbedded zones of calcitic marble as well as paragneiss. Jackson's (1974, p.4) definition of paragneiss includes cordierite muscovite schists, metaquartzites, hornblende paragneiss and biotite paragneiss.

Mineralization: Carter observed minor disseminated grains of sphalerite in thin layers (<1.0 cm wide) and locally abundant pyrite in trenches within the host calcitic marble.

DEVELOPMENT HISTORY

1979: St. Joseph Explorations Limited carried out a geological and soil geochemical survey over the area. Apparently 2 trenches were opened over a zone indicated to have anomalous Zn and Pb values (Jackson 1979).

1980: Selco Mining Corporation carried out a ground VLF and a magnetometer survey over the area. No significant geophysical features were detected near the showings (Sinclair 1980).

REFERENCES

*Hewitt, D.F.	1964,	Map 2053
Jackson, R.G.	1979,	Geoscience Data Centre, Toronto
Pauk, L.	1982,	p.102-104
*Pauk, L., and Mannard, G.	1982,	Map P.2487
Sinclair, I.G.L.	1980,	Geoscience Data Centre, Toronto
*Smith, B.L.	1958,	Map 1954-4

10. WILKINSON ZINC OCCURRENCE

Commodity
Zinc

Rock Association
Host: Marble
Other: Granite, granite gneiss, paragneiss

CLASSIFICATION
IA1: Stratiform, carbonate hosted, zinc

LOCATION AND ACCESS

The occurrence is located in the southwestern part of Hinchinbrooke township approximately 2 kilometres northwest of Wilkinson. It is accessible by secondary gravel roads from Wilkinson which is situated at a road intersection with the Canadian Pacific Railway line. The deposit is indicated on ODM Map 1947-5 (Harding 1951).

Lot 6, Concession XII, Hinchinbrooke Township
Frontenac County
NTS TICHBORNE 31C/10 1:50,000
Latitude 32°47'30"N Longitude 76°50'21"W
UTM Zone 18, 4934000N, 353900E

SIZE AND GRADE

According to an investigation by Carter, the workings consist of 2 small pits 1.5m in diameter and one trench with dimensions 1m by 10m by 2m deep. The mineralization occurs in a 10 to 20 cm wide band containing 40 percent sphalerite. Carter collected two samples which were analyzed by the Geoscience Laboratories at the Ontario Geological Survey in Toronto. The analyses in Table represent a chip sample across 15 cm of the best mineralized zone (81 TRC-22), and a chip sample across the width of the trench (1.2m) (81 TRC-23).

Table: 5 Trace element composition of mineralized samples from the Wilkinson Zinc occurrence

	81 TRC-22	81 TRC-23
Cu (ppm)	425	74
Pb (ppm)	345	30
Cd (ppm)	1260	17
Zn (percent)	45.6	3.58
Ag (oz/ton)	0.24	<0.10
Au (oz/ton)	<0.01	<0.01

DESCRIPTION
General Geology: The Wilkinson occurrence is hosted in a small marble body within an area dominated by granite gneiss and paragneiss.

Harding (1951, p.28) writes:

"The largest single area of gneiss encountered during the survey covers the middle and southern part of Hinchinbrooke township. Most of the Hinchinbrooke gneiss is brownish-weathering and has the composition of granite. In the southwestern part of the township in the section between Chippego Lake and the south boundary, the gneiss contains both massive and banded phases of granite, syenite and gabbro and remnants of Grenville sediments, including crystalline limestone."

The local geology of the deposit was mapped by Carter who outlined a northwest-trending band of dolomitic marble at the contact between calcitic marbles and syenite (Figure 5). Mineralization is hosted in the dolomitic marble, a white, medium-grained massive rock containing minor fine-grained graphite and serpentine. The syenite is a reddish coloured, very fine-grained massive rock containing small clots of fine-grained mafic minerals. It is cut by narrow veinlets of very fine-grained epidote. The last recognizable unit is a white, massive medium-grained calcitic marble with minor disseminated graphite and possibly brucite. Bedding planes are oriented north to northeast with dips ranging from 70°E to vertical (Harding, 1951, p.42).

Mineralization: Carter describes the mineralized zone as a narrow (10 to 20 cm), contorted layer of heavily disseminated to massive sphalerite. The sphalerite is black and medium-grained and comprises about 40 percent of the rock. Analyses of mineralized samples indicate a low silver content.

DEVELOPMENT HISTORY

pre 1947: The Consolidated Mining and Smelting Company Limited prospected the area. (Harding 1951, p.42).

REFERENCES

*Harding, W.D. 1951, p.28,42, Map 1947-5
Hewitt, D.F. 1964, p.13

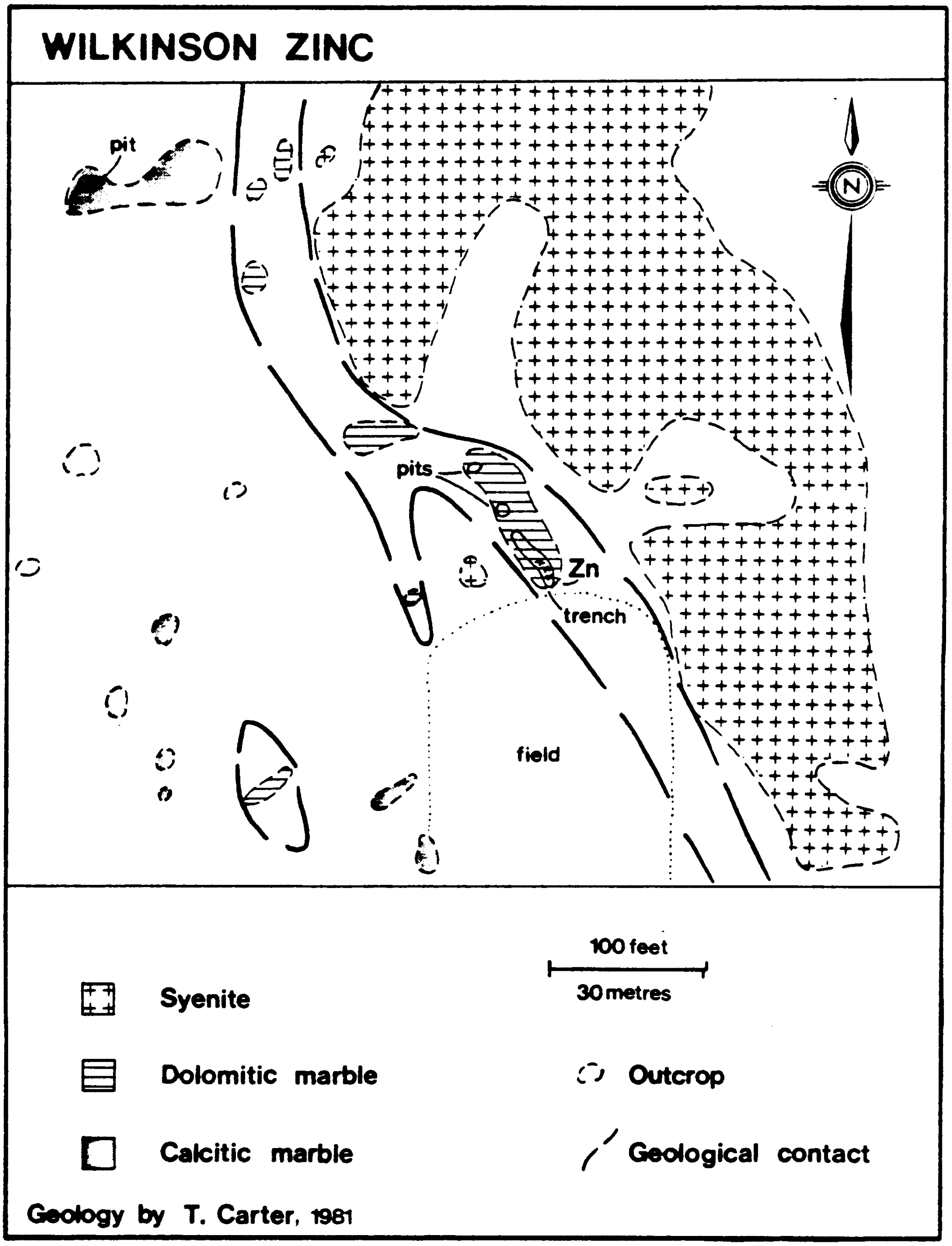

Figure 5: Geology of the Wilkinson Zinc Deposit.

11. CANADA MINE PYRITE PROSPECT

COMMODITY Pyrite

ROCK ASSOCIATION
Host: Quartzo-feldspathic gneiss
Other: Amphibolite, hornblende gneiss, granite gneiss

CLASSIFICATION
IE1: Stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS

The Canada Mine pyrite prospect is located in the northeast corner of Hungerford township, approximately 9.5 kilometers northeast of the town of Tweed (NTS 31C/11). It is approximately 11 road kilometers from Tweed via a paved county road and a gravel extension road at Sulphide. The deposit is about 2 road kilometres east of Sulphide and 120 metres north of an abandoned railway line, immediately east of its intersection with the access road. The deposit is indicated on ODM Map 2053 (Hewitt, 1964).

Lot 26, Concession XII, Hungerford township, Hastings county
NTS KALADAR 31C/11, 1:50,000
Latitude: 44°31'45"N Longitude 77°12'44"W
UTM Zone 18, 4 932 800 N, 324200E

SIZE AND GRADE

The mineralized zone ranges in width from 4 to 7 feet. The sulphur content of the ore dump was estimated to be 40 percent (Hopkins 1916, p.196-7). Workings consist of an inclined shaft 110 feet deep and an unspecified amount of drifting at the 85 foot level.

DESCRIPTION

General Geology: The Canada Mine pyrite prospect occurs within a northeast-trending belt of interlayered marble, siliceous metasediments and mafic metavolcanic rocks bounded predominantly by granite gneiss. The sequence averages 5 kilometres in width and extends for at least 40 kilometres from the northeast quadrant of Hungerford township to the central part of Kennebec township. These rocks are part of a major syncline which opens to the northeast with the axial trace parallel to the trend of the belt.

Satterly (1970, p.94) refers to the belt as the Clare River syncline and notes that two other pyrite deposits, the Ontario Sulphur and Hungerford Mines also occur within similar host rocks at the same general stratigraphic level (Figure 6). These deposits are within 3.5 kilometres of one another, close to the northern boundary of the belt, near the syncline closure.

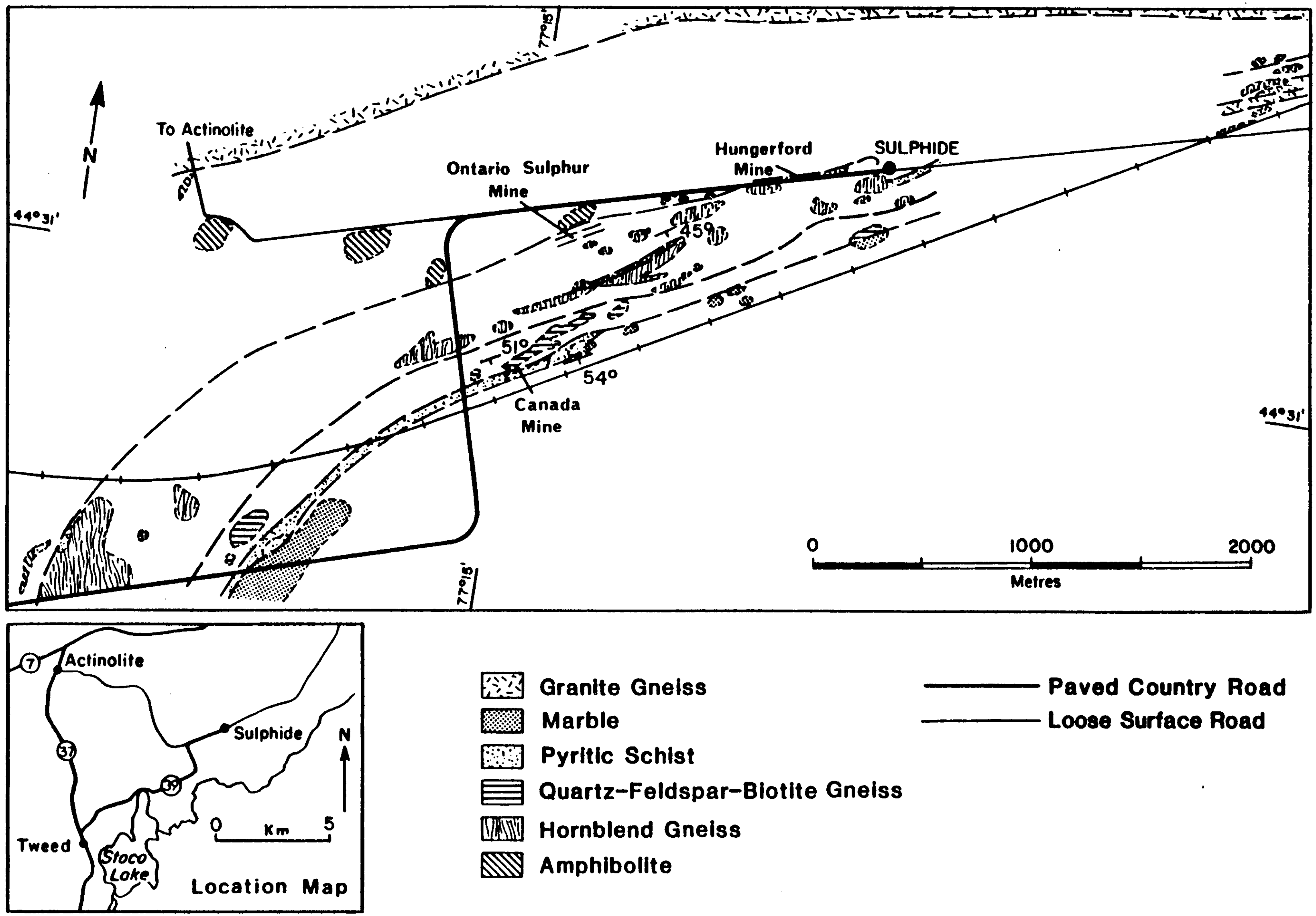

Figure 6: Geology of the vicinity of the Canada Pyrite, Hungerford and Ontario Sulphur Deposits (Adapted from Satterly, 1970, p.93).

The Canada Mine occurs in a pyrite schist or gneiss bounded on the north by hornblende gneiss and amphibolite and on the south by granite gneiss. The gossan zone is 4 to 7 feet wide and trends east-west with a southerly dip of 50° (Hopkins 1916, p.196-7).

The host unit is a narrow band of quartzo-feldspathic gneiss or schist composed of plagioclase, feldspar, quartz, muscovite, phlogopite and minor biotite, apatite, sphene, calcite and zircon (Sangster 1970, p.95). Bands of disseminated euhedral and anhedral pyrite grains parallel the foliation of the host rock (Sangster 1970, p.95). The original mine dump contained pyrite and pyrrhotite with an estimated grade of 40 percent sulphur (Hopkins 1916, p.196). An unspecified amount of diamond drilling was also completed (Hopkins 1916, p.197). All mining activities took place during 1907.

DEVELOPMENT HISTORY

1907: Canadian Pyrite Company sank an inclined shaft to a depth of 110 feet and completed an unspecified amount of drifting at the 85 feet level. Diamond drilling activities were also reported (Hopkins 1916, p.196-7).

REFERENCES

Fraleck, E.L. 1909, p.158-9
*Hewitt, D.F. 1964, p.20, Map 2053
Hewitt, D.F. 1969, p.9
Hopkins, P.E. 1916, p.196-7
Janes, T.H. 1952, p.37
Sangster, D.L. 1970, p.94,95
Wilson, A.W.G. 1912, p.66

12. HUNGERFORD MINE (Past Producer)

COMMODITY
Pyrite

ROCK ASSOCIATION
Host: Quartz-feldspar-muscovite schist
Other: Quartz-feldspar-biotite gneiss, hornblende gneiss, marble

CLASSIFICATION
IE1: Stratabound, sedimentary hosted-pyrite

LOCATION AND ACCESS

The Hungerford Mine is located in the northeast corner of Hungerford township at the village of Sulphide approximately 7.5 kilometres northeast of the town of Tweed (NTS 31C/11). It is accessible from highway 37 at Tweed by a paved country road leading to Sulphide. The mine is located on ODM Map 2053 (Hewitt 1964).

Lot 23, Concession XII Hungerford Township, Hastings county
NTS Kaladar 31C/11 1:50,000
Latitude: 44°31'20"N Longitude: 7°14'14"W
UTM Zone 18, 4932100 N 322200 E

SIZE AND GRADE

Hopkins (1916, p.196) writes:

"The pyrite occurs in three parallel deposits striking with the schist and dipping 60° to the south...The north deposit upon which most of the work has been done, varies in width from 6 to 22 ft. It has been exploited to a length of 620 feet and to a depth of 575 feet, and the ore still continues. The length as indicated on the surface is about 500 feet. There are now two shafts on the property and about 3,500 feet of drifting has been done on the orebodies on the six levels. During 1915 work was confined to stoping on the north vein and drifting on the south vein.

...The average percentage of run of mine ore is about 35 percent, the fines being much higher."

DESCRIPTION

General Geology: The Hungerford Mine is situated on the northern flank of a major northeast trending structure referred to as the Clare River Syncline (Sangster 1970, p.90). It is located at the southern end of the structure near the closure of the syncline in the northeast part of Hungerford township. The rock sequence is comprised of interbedded marble, amphibolite and biotite and hornblende gneiss units all bounded by granite gneiss (Figure 6). Pillow structures and conglomerate units in the amphibolite and hornblende gneiss units indicate volcanic and sedimentary origins for the respective units (Sangster 1970, p.91). The hornblende gneiss unit grades into a quartz-feldspar-biotite gneiss which in turn comes into contact with a marble unit.

The Hungerford Mine is one of a series of pyrite occurrences found along the "Hungerford Fahlband", a relatively narrow, conformable pyritiferous zone extending for approximately 3 kilometres. The zone at the mine is oriented N65'E and dips 60° to the south. The host rock is a narrow, concordant band of pyrite schist bounded by hornblende and quartz-feldspar-biotite gneiss. Carter of the Ontario Geological Survey noted 3 major rock types in the vicinity of the mine. The nearest outcrops consist of well-layered, medium-grained quartz-feldspar-biotite paragneiss. These rocks are stained black and may be either sedimentary or volcanic in origin. Well-layered, white-medium-grained, calcitic marbles occur in outcrop south of the mine workings. The other recognizable unit is a calcareous paragneiss composed of irregular fragments of quartz-feldspar paragneiss cemented by a calcitic matrix. The host rock is similar in composition to the quartz-feldspar-biotite gneiss, however muscovite and phlogopite are the dominant micaceous minerals (Sangster 1970, p.95). The host material in thin section illustrates a fine-to-medium grained aggregate of quartz, orthoclase, muscovite and pyrite (Sangster 1970, p.96). A major element chemical analysis of a sample of the pyrite schist gave the following results: 28.80 percent SiO_2, 11.15 percent Al_2O_3, 1.75 percent TiO_2, 32.90 percent Fe_2O_3, 0.85 percent MgO, 2.18 percent CaO, 2.26 percent Na_2O, 1.20 percent K_2O and 19.78 percent loss on ignition (Sangster 1970, p.116).

Mineralization: The mineralized zone consists of 3 conformable lenses or bands. The lenses are 6 to 22 feet wide and extend beyond the mine workings which are 575 feet deep and 620 feet along strike (Hopkins 1916, p.196).

Janes (1952, p.37) states:

> "...The pyrite, coarsely granular, made a high percentage of fines. Gangue material was mainly calcite with minor quartz. A small amount of pyrrhotite is present with an increasing amount toward the footwall of the lenses."

The following represents a trace element analysis of a mineralized sample (Sangster 1970, p.110):

1500 ppm Ti, ND. Cr, 1400 ppm As, Tr, Pb, 14 ppm Zn, 24 ppm Cu, 430 ppm Ni, 148 ppm Co, ND V. According to Fraleck (1907, p.157), a smelter was erected on the property to extract gold from barren pyrite when the mine was first opened.

DEVELOPMENT HISTORY

1877: The American Madoc Mining Company opened the Hungerford Mine and erected a smelter to extract gold from pyrite (Janes 1952, p.37) (Hopkins 1916, p.196).

1903: The Nicholas Chemical Company re-opened the mine (Hopkins 1916, p.196)

1905-1916?: The Nicholas Chemical Company mined the deposit until at least 1916 (Hopkins 1916, p.196).

REFERENCES

Fraleck, E.L.	1907,	p.157-8
*Hewitt, D.F.	1964	p.20, Map 2053
Hewitt, D.F.	1967	p.8
Hopkins, P.E.	1916	p.196
Janes, T.H.	1952	p.37
Sangster, A.L.	1970	p.90.91,95,96,110,116
Wilson, A.G.W.	1912	p.63-6

13. HUNGERFORD WESTERN EXTENSION PYRITE OCCURRENCE

COMMODITY
Pyrite

ROCK ASSOCIATION
Host : Quartz-feldspar-muscovite schist
Other : Hornblende gneiss

CLASSIFICATION
IE1 Stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS

The Hungerford Western Extension pyrite occurrence is located in the northeast corner of Hungerford township approximately 7 kilometres northeast of Tweed (NTS 31C/11). It is accessible from highway 37 at Tweed by a paved country road leading to Sulphide. The occurrence is approximately 300 metres north of the access road, 1 road kilometre west of Sulphide. The deposit can be located on ODM map 2053 (Hewitt 1964)

Lots 21, 22 Con XII, Hungerford township, Hastings county
NTS KALADAR 31 C/11 1:50,000
Latitude 44°31'19" N Longitude 77°14'55" W
UTM Zone 18, 4 932 100 N, 321,300 E

SIZE AND GRADE

An exploratory trenching program revealed a pyrite lens 16 to 18 feet wide and approximately 500 feet along strike (Fraleck 1907, p.159). This occurrence may be an extension of the mineralized zone at the Hungersford Mine located approximately 1 kilometre to the east. The estimated grade of mineralization ranges from 42 to 44 percent sulphur (Fraleck 1907, p.159).

DESCRIPTION

According to Fraleck (1907, p.159) and Hopkins (1916,p.197), the occurrence consists of two mineralized lenses, only one has been explored (Fraleck 1907,p.159 and Hopkins 1916, p.197). This deposit is similar to other pyrite occurrences in the area, particularly the Hungerford Mine. Janes (1952, p.37-8) states:

" Thus property, around 1906, was trenched at regular intervals along the strike of the mineralized zone. The western lens, from surface trenching, was opened up for 500 feet and showed, near the line between lots 21 and 22, width of 16 to 18 feet of pyrite ore estimated to contain 42 to 44 percent sulphur. Calcite was reported as the only gangue impurity. There is no record of work on the eastern lenses, presumed to be extensions of the Hungerford mine orebodies.

Pyrite was also found to the south of the C.P.R. tracks, which cross the southern end of the property, where the gossan band is about 40 feet wide. No work is reported on this zone."

DEVELOPMENT HISTORY

1906: Surface trenching by unknown operators uncovered a pyritic zone approximately 18 feet by 500 feet (Hopkins 1916, p.197).

REFERENCES

Fraleck, E.L.	1907, p.159-160
*Hewitt, D.F.	1964, Map 2053
Hewitt, D.F.	1967, p.8
Hopkins, P.E.	1916, p.197
Innes, J.H.	1952, p.37-38
Wilson, A.G.W.	1912, p.66

14. <u>ONTARIO SULPHUR MINE</u> (Past Producer)

<u>COMMODITY</u>
Pyrite

<u>ROCK ASSOCIATION</u>
Host: Pelitic metasedimentary rock
Other: Marble

<u>CLASSIFICATION:</u>
IE1: Stratabound, sedimentary hosted, pyrite

<u>LOCATION AND ACCESS</u>

The Ontario Sulphur Mine is located in the northeast corner of Hungerford township approximately 6.5 kilometres northeast of the town of Tweed (NTS 31C/11). It is accessible on foot from an abandoned railway line which crosses a paved country road joining Tweed to Sulphide. The mine is situated a short distance north of the railway line, about 600 metres northeast of the intersection with the road. The deposit is indicated on ODM Map 2053 (Hewitt 1964).

Lot 21, Con XI, Hungerford township, Hastings county
NTS KALADAR 31 C/11 1:50,000
Latitude 44°30'44"N Longitude 77°14'58'W
UTM Zone 18, 4931 000N, 321 200 E

<u>SIZE AND GRADE</u>

The Ontario Sulphur Mine is situated along the "Hungerford Fahlband", a relatively narrow pyritiferous or gossan zone that extends for approximately 3 kilometres. It ranges in width from 6 to 30 feet and has been mined to a depth of 250 feet and 190 feet along strike. By 1911, 4821 long tons of ore averaging 36.5 percent sulphur were shipped from the mine (Wilson 1912, p.67). An unspecified amount and grade of ore was mined from the deposit in 1913.

<u>DESCRIPTION</u>

The Ontario Sulphur Mine is situated on the north flank of a major northeast-trending structure known as the Clare River syncline (Sangster 1971, p.90). The deposit is situated near the closure of the syncline which opens to the northeast. The folded sequence is composed of interbedded marble, amphibolite and biotite-hornblende gneiss units all bounded by granite gneiss (Figure 6). Few pillow structures were found in the amphibolite indicating a mafic volcanic origin (Sangster 1970, p.91). The hornblende gneiss is less basic in composition and contains a conglomerate unit indicating a sedimentary origin. The hornblende gneiss grades into the quartz-feldspar-biotite gneiss which in turn comes into contact with a marble unit.

The Ontario Sulphur Mine is hosted in a narrow, extensive band of pyrite schist concordant to and bounded by a hornblende gneiss unit. The host rock is similar in composition to the quartz feldspar-biotite gneiss but muscovite and phlogopite are the dominant micaceous minerals. Accessory minerals include apatite, sphene, calcite and zircon (Sangster 1970, p.95). Sangster suggests that the host rock was initially a reworked and transported acid tuff.

The mineralized zone is a lens-shaped body which pitches to the southeast (Hopkins 1916, p.197). The mineralization of the mine dump consists of disseminated euhedral to anhedral grains of pyrite (Sangster 1970, p.95). The total width of the deposit ranges from 6 to 30 feet. No other sulphide minerals were reported in this deposit. Duplicate trace element analyses of two samples of pyrite gave the following range of results: 8-152 ppm Cu, ND-58 ppm Pb, 10-260 ppm Zn, ND-560 ppm Ni, ND-22 ppm Co, ND-5000 ppm As, ND-128 ppm Cr and Nd-580 ppm V (Sangster 1970, p.110).

DEVELOPMENT HISTORY

1908: Ontario Sulphur Mines Limited developed and mined the deposit until 1911. The workings consist of a shaft approximately 250 feet in depth and drifts at the 100 and 200 feet levels which run for 225 and 250 feet respectively. A total of 4,821 long tons of ore averaging 36.5 percent sulphur were shipped from the mine.

1913: The Sulphide Chemical Company dewatered the mine, constructing a new head frame and resumed mining. An unspecified amount and grade of ore was mined from the first level of the west stope and a raise was constructed from the second level to the surface, at the east stope.

REFERENCES

Janes, T.H.	1952, p.38
*Hewitt, D.F.	1964, p.20, Map 2053
Hewitt, D.F.	1967, p.8
Hopkins, P.E.	1916, p.197
Sangster, A.L.	1970, p.90, 91, 95, 110
Sutherland, T.F.	1914, p.174

15. DONAHUE CREEK OCCURRENCE

COMMODITY:
Copper, Zinc

ROCK ASSOCIATION
Host: Quartzite
Other: Marble

CLASSIFICATION
1B1: Stratiform, sedimentary hosted, Cu, Zn?

LOCATION AND ACCESS

The Donahue Creek occurrence is located in the southeast corner of Kaladar township, approximately 4.5 kilometres southeast of Kaladar (31 C/11). The mineralized zones are found north of Donahue Creek between Otter and Lingham Lakes. The occurrence is accessible by logging roads, 3 road kilometres east of their junction with Highway 41. It can be located on ODM Map 2053 (Hewitt 1964) and OGS Map 2432 (Wolff 1981).

Lots 4,5, Con. IX, Kaladar township, Lennox and Addington County
NTS KALADAR 31 C/11 1:50,000
Latitude: 44°37'20"N, Longitude 77°04'20"W
UTM Zone 18 4 942 858 N, 335 603E

SIZE AND GRADE

The Donahue Creek occurrence is represented by 2 showings 1.5 kilometres apart. Significant base metal mineralization was detected at the east showing only, where a selected sample analyzed 2.88 percent copper and 0.16 showing consist of 3 trenches about 15 feet in length. Glenshire Mines Limited completed two drill holes near the trenches and reported at 34 foot intersection containing 5 to 15 percent pyrite and pyrrhotite (McCannell 1976 p.12). The analyses of the core gave values not exceeding 0.019 percent Ni, 0.090 percent Zn, 0.06 ounces per ton Ag, and no detectable gold (McCannell 1975).

DESCRIPTION

The occurrence is situated near the south boundary of a major, north-east trending structure called the Clare River Syncline (Sangster 1970, p.90). The rocks are composed of a sequence of interbedded marble, metagreywackes, quartzites and metavolcanic rock units that are folded to form a shallow-plunging syncline opening to the northeast. The structure is approximately 40 km long and 5 kilometres wide and bounded by granite, granitic gneiss and pegmatite.

The rocks in the locality of the occurrence are comprised of interbedded impure quartzite, marbles and minor pegmatite. These units are near the south boundary of the syncline and are conformable with the northeast trending structure. McCannell (1977, p.8) writes:

> "...The gossan zone occurs in a quartzite type sediments and lies along the north side of a crystalline limestone band which extends in a northeast direction... The zone is up to one foot in thickness...".

The host rock is a light grey, fine-grained foliated impure quartzite which contains muscovite, biotite and minor garnet (McCannell 1975).

Mineralization: The mineralized zone is a conformable sulphide zone within the quartzite host unit. McCannell (1977, p.8) writes:

"...Pyrite and pyrrhotite occur as disseminations in the quartzitic rocks and range from 5 to 20 percent of the material making up the rock. The occasional fleck of chalcopyrite and very minor sphalerite is sometimes associated with the pyrite and pyrrhotite."

DEVELOPMENT HISTORY

- 1952: New Jersey Zinc Exploration Company (Canada) Limited examined the property (Glenshire Mines Limited).
- 1974: H. Bergman and S. Mourin of Toronto acquired 12 claims covering the property (Glenshire Mines Limited).
- 1975: H. Bregman and S. Mourin financed a VLF survey and a limited magnetometer survey for the property. Glenshire Mines Limited acquired the property and carried out a geological survey, soil sampling survey and trenching activities. Six diamond drill holes totalling 1030 feet were completed (McCannel 1976).
- 1977: Glenshire Mines Limited carried out a soil sampling survey and excavated a number of trenches (McCannel, 1977, p.1).

REFERENCES

Glenshire Mines Limited	1975, Geoscience Data Centre, Toronto
*Hewitt, D.F.	1964, Map 2053
McCannell, J.D.	1975, Geoscience Data Centre, Toronto
" "	1976, " " " "
" "	1977, " " " "
*Wolff, J.M.	1981, Map 2432
Wolff, J.M.	1982, p.80,81

16. SPRY ZINC OCCURRENCE

COMMODITY: Zinc, silver

ROCK ASSOCIATION:
Host: Dolomitic marble
Other: Siliceous dolomitic marble, calcitic marble, sandstone.

CLASSIFICATION
IA1: Stratiform, carbonate hosted, zinc

LOCATION AND ACCESS

The Spry Zinc occurrence is located in the southern part of Kaladar township approximately 4.5 kilometres south of Kaladar (NTS 31 C/11). It is accessible from a vehicle trail running northeast from Highway 41 to a point 6.0 road kilometres south of Kaladar. The trail passes south of McFarlands Lake and joins to a secondary all-weather road at the southeast end of Racoon Lake. The deposit is north of the vehicle trail approximately 1.3 road kilometres from Highway 41. It can be located on O.D.M. maps 51d (Harding, 1944) and 2053 (Hewitt, 1964).

Lot 3, Con. VII, Kaladar township,
Lennox and Addington county.
NTS KALADAR 31 C/11 1:50,000
Latitude: 44°34'30" N, Longtitude: 77°06'34" W.
UTM Zone 18, 4 941 500 N, 332 600 E

SIZE AND GRADE

The major zone of sphalerite mineralization occurs along strike for a distance of approximately 1730 feet (Dowhaluk 1966) or 500 m (Carter 1980, p.172). Dowhaluk (1966) produced a map indicating 3 discontinuous zones of sphalerite and zinkenite mineralization further along strike southwest of the major zone. These zones have lengths of 600, 200 and 350 feet. Specific mineral showings occur over widths of up to 26 feet feet in the major zone and 2 feet in the minor showings. Carter reported that the major showings consist of two trenches with dimensions 5m by 2m by 1m deep and 7m by 0.5 m by 0.5m deep.

The following are analyses of channel samples taken from the best mineralized trench starting from the northwest end: 2.5 feet - 1.02 percent Zn, 2.0 feet - 15.4 percent Zn, 3.0 feet - 0.08 percent Zn, 4.0 feet - 0.12 percent Zn, 1.0 feet - 0.58 percent Zn, 1.0 feet - 12.40 percent Zn and 2.0 feet - 0.33 percent Zn (Dowhaluk, 1966, p.2). Carter (1980, p.172) collected a chip sample over a length of 5m at the same trench and obtained the following analysis: 3.88 percent Zn, 10 ppm Pb, less than 0.1 ounces per ton Ag. In a previous visit, he collected a selected grab sample from the trench which analyzed 19.8 percent Zn, 78 ppm Pb, 186 ppm Cu and 840 ppm Cd. The following are analysis of selected grab samples from 3 trenches in the major zone of mineralization: sample K-1:18.21 percent Zn, 0.01 percent Pb and 0.10 ounces per ton Ag, sample K-2:18.21 percent Zn, 0.14 ounces per ton Ag, and sample K-3: 29.29 percent Zn, 0.007 percent Pb and 0.04 ounces per ton Ag (McCannel 1975). The assessment reports and the investigation by Carter indicate sporadic occurrences of zinkenite ($PbS.Sb_2S_3$) which appear to contain significant values of Ag and trace Au. These showings are within the secondary mineralized zones reported by Dowhaluk (1966). Six channel samples taken over widths of 2 feet or less analysed 0.30 to 2.40 ounces per ton Ag and up to 0.01 ounces per ton Au (Dowlahuk 1966). A grab sample from one of these showings analysed 7.07 ounces per ton Ag and 0.07 ounces per ton Au. The following are analyses of zinkerite mineralization sampled by Glenshire Mines Limited (McCannel 1975) and Carter (1980, p.172) respectively: #K-4:11.18 ounces per ton Ag, 0.08 ounces per ton Au, 0.55 percent Pb, #80 TRC-32: 0.60 ounces per ton Ag, 0.01 ounces per ton Au, 9600 ppm Pb, 5000 ppm Sb and 9000 ppm Zn.

DESCRIPTION

General Geology: The Spry Zinc occurrence is situated in the central zone of a major northeast trending structure referred to as the Clare River Syncline (Sangster 1971, p.90). The rock sequence is composed of interlayered marble, siliceous metasedimentary rocks and mafic volcanic rocks all bounded by granitic gneiss. The Spry occurrence is hosted in the marble sequence near the core of syncline.

The generalized geologic map produced by Sangster (1971, p.140) shows the stratigraphic sequence of the area centred over the host units of the mineralization. The strike of the bedding is approximately 60° and the beds dip steeply to the southeast. The sequence of units over a 1 kilometre width from southeast to northwest consists of amphibolite, quartz-feldspar-biotite gneiss, pyritic gneiss, calcitic marble, silicate-bearing and silicate-free dolomite marble and calcitic marble with minor quartzite. In the accompanying map by Carter (Figure 7) the host unit of the mineralization is a siliceous dolomitic marble unit flanked on either side by dolomitic marble units which in turn are followed by calcitic marble. The calcitic marble unit on the southeast side of this sequence is bounded by sandstone which is apparently equivalent to the pyritic gneiss unit referred to by Sangster. Carter describes the host rock as a white to light grey, fine-to-medium grained siliceous dolomitic marble. The well layered appearance of the rock is caused by the presence of narrow, discontinuous layers (1-2 cm wide) of quartz and tremolite within the dolomite. Sphalerite mineralization occurs in disseminated grains which form narrow layers ranging in width from a few millimetres to 10 centimetres. The dolomite marble unit

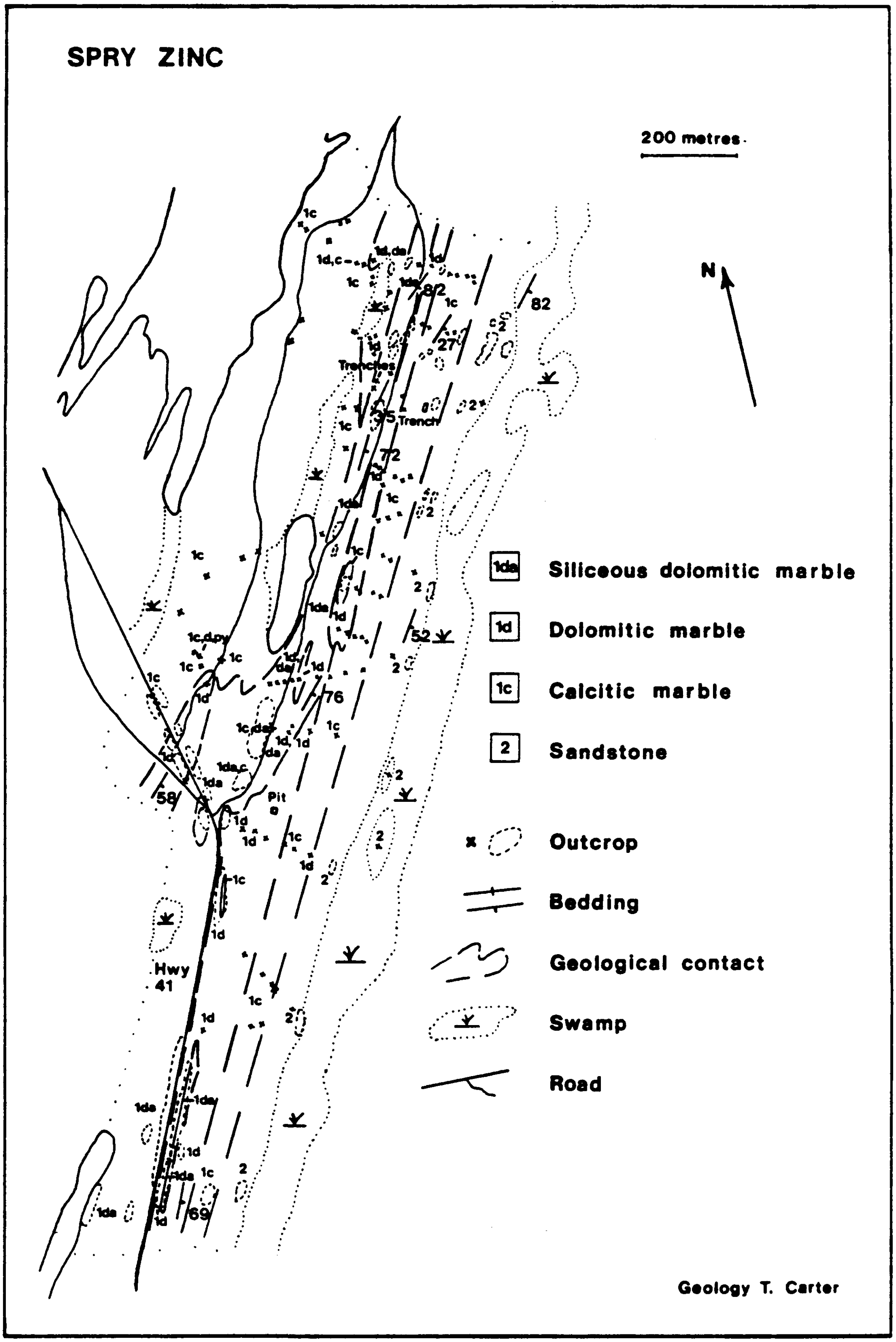

Figure 7: Geology of the Spry Zinc Deposit.

is a grey to white, massive to well layered, medium grained rock. The layers are 1-3 cm thick and are discernible by colour variations. The calcitic marble is composed of a light grey, massive to poorly-layered, medium- to coarse-grained rock containing a minor percentage of graphite and tremolite. The quartzite is awhite to grey, well bedded and foliated rock composed chiefly of quartz, feldspar and biotite. This rock has a granular appearance and may be classified as a quartzo-feldspathic or wacke sandstone. The quartzite also contains up to 5 percent disseminated pyrite and a few lenses and veins of coarse grained quartz. A black, well foliated and bedded, medium grained amphibolite unit grades into the quartzite. This unit is composed essentially of hornblende and plagioclase with a minor percentage of disseminated grains and narrow stringers of pyrite and chalcopyrite. Table 6 lists modal compositions of the various units. Table 7 lists whole rock geochemical analyses of the three major units.

Mineralization: The zinc mineralization occurs as sphalerite and is hosted in a siliceous dolomitic marble approximately 30 m in width in the locality of the main showings. Sphalerite occurs in brown or grey grains which vary in size from >0.5 to 3.0 mm in diameter. The density of disseminated sphalerite varies to form narrow, concordant layers ranging in width from a few millimetres to a few centimetres. The bands are exposed in one trench over a width of approximately 5 metres and sphalerite has been detected on surface outcrops over a distance of at least 150 metres along strike. The layers of mineralization are not evenly distributed across the best mineralized trench and channel samples generally assay less than 1.0 percent zinc except for two zones which analyzed 15.4 percent zinc over 60 cm and 12.4 percent zinc over 30 cm. A thin section of mineralized siliceous dolomitic marble (80-TRC-190) contains up to 40 percent sphalerite with 40 percent dolomite,20 percent tremolite and minor talc, Sphalerite occurs in yellow coloured grains up to 3.0 mm (diameter) and forms subtle bands within the section. A number of small showings of zinkenite ($PbS.Sb_2S_3$) occur over a relatively extensive zone along strike of the siliceous dolomitic marble hosting the zinc mineralization and in adjacent dolomitic marble units. This zone appears to extend at least as far west as highway 41. Thesemineralized zones are described as conformable bands up to 7 cm wide composed of massive to disseminated zinkenite with minor sphalerite and pyrite in zones generally less than 2 feet wide. Disseminated zinkenite was also found in quartz veinlets.

DEVELOPMENT HISTORY

1952: Mr. W.C. Spry discovered the showings and carried out a limited amount of trenching. H. Knight and J. McLasky obtained the property and completed 5 short drill holes (Dowhaluk 1966).

Table 6: Estimated modal compositions (in percent) of thin sections of host rocks

	80-TRC-24	-25	-26	-28
Dolomite	>90			
Calcite			95	
Quartz	< 5	48		
Plagioclase		35	< 5	43
Muscovite		10		
Hornblende				55
Biotite		5		
Tremolite	5			
Opaques	minor	2	1	2

80-TRC-24 = dolomitic marble
80-TRC-25 = quartzite
80-TRC-26 = calcitic marble
80-TRC-28 = amphibolite

Table 7: Major element chemical compositions (in percent) of selected rock types from the Spry Zinc occurrence

	80-TRC-24	80-TRC-26	80-TRC-29
SiO_2	2.29	2.09	42.00
Al_2O_3	0.34	0.35	0.33
Fe_2O_3	0.29	0.02	0.10
FeO	0.0	0.0	0.0
MgO	21.00	3.17	16.70
CaO	29.30	49.20	22.40
Na_2O	0.06	0.03	0.03
K_2O	0.01	0.0	0.0
MnO	0.05	0.01	0.06
TiO_2	0.09	0.0	0.27
P_2O_5	0.03	0.04	0.02
CO_2	47.40	44.10	16.30
S	0.0	0.0	0.01
H_2O^+	0.0	0.0	0.12
H_2O^-	0.42	0.64	0.44
Total	101.28	99.65	98.78

80-TRC-29 - siliceous dolomitic marble

1966: H. Dowlahuk mapped the area and sampled the showings.
1975: Glenshire Mines Limited resampled mineral showings on the property (McConnel 1975).

REFERENCES

Carter, T.R.	1980,	p.172.
Dowlahuk, H.	1966,	Geoscience Data Centre, Toronto
*Harding, W.D.	1944,	p.51-74, Map 51d
*Hewitt, D.F.	1964,	Maps 2053, 2054
McCannel, J.D.	1975,	Geoscience Data Centre, Toronto
Sangster, A.L.	1970,	p.70

17. CROWE RIVER PROSPECT

COMMODITY
Copper

ROCK ASSOCIATION
Host: Metagreywacke
Other: Quartzite, metagabbro

CLASSIFICATION:
IB2: Other geological association, copper

LOCATION AND ACCESS

The Crowe River prospect is located in the southwest quadrant of Lake township, approximately 11.5 kilometres east of Blue Mountain in Methuen township and 15.5 kilometres west of Millbridge in Tudor township (NTS 31 C/12). The property is accessible from a vehicle trail extending for approximately 9 kilometres north of Vansickle, Lake township. It is also accessible from a vehicle trail leading to Whetstone Lake from a system of gravel roads connected to Millbridge. The prospect is shown on ODM map 2106 (Laakso 1968).

Lots 14,15,16,17 Con. III Lake township
Hastings county
NTS BANNOCKBURN 31 C/12 1:50,000
Latitude 44° 42'09" Longitude 77°48'30"
UTM Zone 18, 4 953 500 N, 277 500E

SIZE AND GRADE

The Crowe River occurrence is composed of 3 major copper showings and an associated showing of magnetite mineralization. The north showing consists of a series of discontinuous zones of chalcopyrite mineralization up to 10 feet wide and 50 feet long. Workings consist of 4 shallow trenches in a zone approximately 200 feet in length. The following are core analyses from 6 of the drill holes in the locality of the showing: 2.65 percent Cu over 10 feet, 2.45 percent Cu over 13 feet, 2.28 percent Cu over 11.5 feet, 1.15 percent Cu over 9.7 feet, 0.10 percent Cu over 0.7 feet and 0.68 percent Cu over 1.6 feet (Harper and Holbrooke 1960, p.12-13). The first 4 analyses represent the entire mineralized zone in separate drill holes. The south showing is exposed in a trend 11 feet long and is estimated to contain 1 percent copper; minor chalcopyrite mineralization was detected in 3 drill holes (Harper and Holbrooke 1960, p.13).

At the river showing only one of the five original drill holes intersected significant mineralization; the core assayed 2.08 percent Cu over 24 feet (Harper and Holbrooke 1960, p.13). Workings at the magnetite showing in the east half of lots 16 and 17, Concession III consist of five trenches along a zone of mineralization 40 feet wide and 1000 feet long (Harper and Holbrooke 1960, p.13-14). This zone is estimated to contain less than 20 percent iron and minor chalcopyrite and chalcocite.

DESCRIPTION

General Geology: The Crowe River prospect consists of 3 major showings of chalcopyrite and one of magnetite mineralization associated with fault zones in metagreywacke on paragneiss units (Harper and Holbrooke 1960, p.12). According to the geological report by Laakso (1968, p.7) and the accompanying geological map 2106, the host rocks belong to the Oak Lake Formation which lies west of the Lake syncline, a folded sequence of metavolcanic rocks, and minor paragneisses and marbles (Big Burnt Lake Formation). A number of small basic intrusions, notably the Whetstone Lake Gabbro occur near the boundary between the Oak Lake and Big Burnt Lake Formations. The axial trace of the Lake Syncline and the bedding orientations of the Oak Lake Formation are distorted in part by the Capeway and Freen Granites but they generally trend north-south. The geological maps indicate a fault in the paragneiss host rocks parallel to the boundary between the formations.

The description of the local geology and mineralization at the showings is taken from assessment reports by Harper and Holbrooke (1959, 1960). Essentially, the showings occur in breccia and shear zones within a conformable, well-bedded sequence of metasedimentary rocks and within a small mafic intrusive body. The bedding is generally north-south with steep easterly dips. The sedimentary sequence is composed of metamorphosed greywackes, argillites and pebble conglomerates, quartzites and minor marble units. The rocks are cut by a system of north-south trending faults apparently related to the major fault indicated on the geological maps by Laakso (1968). The mineralization at the north showing is hosted in discordant fracture zones within a metagreywacke and argillite host rock. The south showing consists of a mineralized breccia zone within metagreywacke and quartzite. The river showing occurs within a fractured meta-pyroxenite body on the east shore of the Crowe River. North of these showings, a magnetite-chalcopyrite deposit was discovered in an altered metagreywacke or paragneiss host. Chlorite and sericite alteration was recognized at this showing.

Mineralization: Copper mineralization in the north, south and river showings consists of massive chalcopyrite in narrow streaks which occupy fractures or are found with quartz veinlets in zones of brecciated host rock. (Harper and Holbrooke 1960, p.12). The mineralized zones are small with widths and lengths not exceeding 12 and 200 feet respectively. The magnetite deposit contains streaky magnetite mineralization in a zone of altered metagreywacke with minor associated pyrite, chalcopyrite and chalcocite (Harper and Holbrooke 1960, p.13-4).

DEVELOPMENT HISTORY

1955: The Crowe River prospect was discovered by Mr. I. Sopha (Harper and Holbrooke 1960, p.4).

1956: The Crowe River showings were staked by Mr. I. Sopha. The property was prospected in more detail and 11 trenches were excavated over the showings. Five diamond drill holes totalling 320 feet were completed (Sopha, 1958).

1957: Alsof Mines Limited acquired the claims from Mr. I. Sopha, however no work was done on the property and the claims were allowed to lapse. Mr. I. Sopha completed 2 diamond drill holes totalling 106 feet (Sopha 1958).

1959: The claims covering the property was restaked and then acquired by Macklin Mines Limited. A geological mapping program was completed (Mineral Deposits File).

1960: Merlin Mines Limited carried out a ground magnetometer and electromagnetics survey and tested showings and conductors with 9 diamond drill holes totalling 1032 feet (Harper 1960).

1962: Alsof Mines Limited completed 1 drill hole 196 feet in length. The hole was drilled in the locality of the river showing (Lloyd 1962).

REFERENCES

Crowe River Deposit,		, Geoscience Data Centre, Toronto
Harper, H.G.	1960,	" " "
Harper, H.G., and Holbrooke, G.L.	1959	" " "
	1960,	
Lloyd, E.W.	1962,	
*Laakso, R.K.	1968,	36p, Map 2106
Sangster, A.L.	1970,	p.255
Sopha, I.	1958,	

18. KATHERINE LEAD MINE

COMMODITY

Lead, zinc, silver

ROCK ASSOCIATION

Host: Quartzite, paragneiss
Other: Marble

CLASSIFICATION

IA2 Unconformable, carbonate vein-hosted, lead

LOCATION AND ACCESS

The Katherine Lead Mine is located in the southeast corner of Lake township, approximately 5 road kilometres west of the village of Millbridge, in southwestern Tudor township. It is accessible from secondary roads leading west from Millbridge which is 1 road kilometre west of highway 62. The deposit is indicated on ODM maps 2106 (Laakso 1968) and 1957b (Hewitt and Satterly, 1957).

Lot 8 Concession XI, Lake township, Hastings county
NTS Bannockburn 31C/12 1:150,000, 1:50,000
Latitude: 44°40'52"N Longitude: 77°39'44"W
UTM Zone 18, 4950750N, 289000E

SIZE AND GRADE

The major workings at the Katherine Lead Mine consist of a main shaft, a shallow secondary shaft and an open cut. Thomson (1943, p.54) reports that the main shaft is 125 feet deep with 250 feet of drifting at the 100 feet level. Mees (1936) reports additional workings consisting of 2 intersecting trenches, one 20 feet by 150 feet by 20 to 40 feet deep and a pit with dimensions 15 feet by 18 feet by 14 feet deep.

The vein on the north face of the drift was reported to be 12 inches wide, on the south face it is 28 inches wide with a galena content of 28 percent (Thomson 1943, p.54). De Kalb (1901, p.130) noted that the vein contained sphalerite and argentiferous galena averaging 10 ounces per ton Ag, however, Mees (1936) reports only trace silver in a sample from the mine. De Kalb (1901, p.130) states that the vein ranges in width from 1 to 4 feet and Mees (1936) indicates a length of 1500 feet.

A second shaft, with dimensions 9 feet by 18 feet by 18 feet deep was opened on a 9 foot wide vein, approximately 0.5 miles south of the main shaft (De Kalb 1901, p.130). The vein contained up to 15 percent galena with a trace amount of silver (Mees, 1936). This showing contains no sphalerite mineralization (Thomson 1943, p.54).

A trench was opened for 75 feet and intermittently for 200 feet over a mineralized vein approximately 500 feet south of the main shaft (Mees 1936). Thomson (1943, p.54) reports that the vein averages 4 inches wide with a maximum width of 7 inches.

DESCRIPTION

General Geology: The geology map by Laakso (1968) indicates that the mine occurs within a sequence of marbles. The marbles contain minor intercalated units of quartzo-feldspathic and pelitic gneiss and are intruded by two gabbroic bodies and a small granitic stock. These marbles occur in the southeast corner of Lake township and continue into the southwest part of Tudor township. Laakso (1968, p.17-18) states:

"The southeastern Lake marbles are generally grey or blue grey, well bedded, and fine-to-medium grained .... The marble is calcareous; coarse silicate impurities are rare. Fine-grained argillaceous material is found commonly segregated into impure layers; these layers weather less than purer marble. Near lineaments, which are common in this part of the township, white coarse calcareous marble is found.

The fine-grained marbles in the extreme southeastern part of the township contain interbeds of fine-grained quartz-rich paraschists, which approach micaceous quartzites in composition."

Alcock (1930, p.157-8) writes:

" The exposures in the vicinity of the property are well-banded, grey quartzites and sedimentary gneisses and mica-schists of the Grenville series. As exposed on one of the main trenches, they strike east and west magnetic and dip 50 degrees north. They are locally drag-folded.

The deposit is a vein striking northwest...
In the winter of 1925 some new work was done about 500 feet southeast of the main shaft. The vein at this place was opened for a length of 70 feet. It has a strike of south 55 degrees east magnetic and a dip of 70 degrees
De Kalb (1901, p.130) describes the deposit as a mineralized vein within a diorite.

Mineralization: The mineralized zone at the main shaft consists of galena, sphalerite, barite and coarse-grained calcite (Laakso 1968, p.28). An associated vein, about 500 feet southeast of the main shaft was described by Alcock (1930, p.158):

"...The gangue is calcite and barite showing good crustification. Galena occurs in bunches and seams in the vein."

The mineralization at the south shaft is described by De Kalb (1901, p.130): "...The vein here is less highly mineralized, having however, a width of 9 feet, with 6 ore-bearing streaks, containing galena, but no zinc."

DEVELOPMENT HISTORY

1899: The property was first opened (Adams and Barlow 1910, p.349).

1900: The British Mining and Development Company of Ontario Limited sank a shaft 125' deep and completed 100 feet of lateral drifting. (De Kalb 1901, p.130).

1905: The mine was acquired by the Stanley Smelting Company, and reworked for a short period. Lateral drifting was reported to total 200 feet. (Corkhill 1906, p.91, Alcock 1930, p.158).

1925: A limited amount of surface stripping was carried out near the main shaft. (Alcock 1930, p.158).

1937: The property was taken over by Katherine Lead Mines Limited. A new headframe and buildings were erected however little development was reported (Thomson 1943, p.54, Katherine Lead Mines Limited).

REFERENCES

Adams, F.D. and Barlow, A.E.	1910, p.349
Alcock, F.J.	1930, p. 157-8
Corkhill, E.T.	1906, p.91
De Kalb, C.	1901, p.129
Gibson, T.W.	1902, p.58
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Katherine Lead Mines	1942, Geoscience Data Centre
*Laakso, R.K.	1968, p.27-28, Map 2106
Sangster, A.L.	1970, p.272
Sergiades, A.O.	1968, p.31
Shklanka, R.	1969, p.141
Thomson, J.E.	1943, p.54.

19. CRYSLER LEAD PROSPECT

COMMODITY: Lead

ROCK ASSOCIATION
HOST: Vein calcite
OTHER: Marble, metagreywacke, metasiltstone, diorite.

CLASSIFICATION IA2: Unconformable, carbonate hosted, lead

LOCATION AND ACCESS

The Crysler Lead prospect is located in the southeast corner of Limerick township, approximately 2 kilometres southwest of Gunter in Cashel township (NTS 31 C/13). It is accessible by vehicle trails from two all-weather gravel roads which join Gunter to Highway 62 via St. Olga (Limerick township) and Gilmour (Tudor township). The main shaft is accessible by a vehicle trail which joins the access roads along the Limerick-Cashel township boundary. The shaft is 100 metres from the north shore of Little Wadsworth Lake, approximately 350m west of the township boundary. A short trail leads directly to the shaft. The prospect is indicated on O.D.M. map 2167 (Lumbers, 1969).

Lots 1, 2 Con.II, Limerick township, Hastings county.
NTS COE HILL 31 C/13, 1:50,000
Latitude: 44°52'05"N, Longitude: 77°34'00"W
UTM Zone 18 4 971 300 N, 397 300 E.

SIZE AND GRADE

The Crysler lead prospect consists of a mineralized vein 0.5 to 8.0 feet wide (5 foot average) and at least 1660 feet long. In a assessment report for Bouzan Gold Mine, Mr. C. O. Stee (1948, p.3) states that the vein can be traced into adjoining properties for at least an equal distance. Workings consist of at least 4 trenches (totalling 925 feet), several pits and one mine shaft of unknown depth (Lumbers, 1969, p.91). Stee (1948, p.3) mentions two trenches, one 375 feet long, the other 150 feet long and 1 to 3 feet deep. The vein was drilled by Bouzan Gold Mines Limited (19 holes, 3247 feet) and was intersected up to a depth of 200 feet (Darling, 1949, p.3). The width of the vein and grade of mineralization is variable, the best drill intersection assayed 0.267 percent Pb over a core length of 3.33 feet (true vein width 2.7 feet). A sample of galena-bearing vein material collected from the dump near the shaft contained argentiferous tetrahedrite and assayed 5.70 oz/ton Ag (Lumbers, 1969, p.92).

DESCRIPTION

General Geology: The Crysler Lead prospect consists of a mineralized calcite vein which cross cuts interbedded marbles, clastic siliceous metasediments and calcareous sandstones and siltstones of the Dungannon Formation (Lumbers, 1969, p.33). The sequence is cut by late mafic dikes and sills. The Dungannon Formation occupies the east part of Limerick and west part of Lake townships and forms the west boundary of the Tudor metavolcanic sequence. The country rocks in the area strike northeast and dip vertically to steeply northwest. The vein strikes N60°W and is vertical. It varies in width from 0.5 to 8 feet and can be traced at intervals for about 4,000 feet (Lumbers, 1969, p.92).

Mineralization: Lumbers (1969, p.92) writes:

> ".....In approximate order of relative abundance, minerals identified in the vein are: calcite, barite, galena, quartz, pyrite and rarely, fluorite and sphalerite. Most of the galena is concentrated in the central drusy part of the vein and forms massive pockets and streaks 2 to 3 inches wide, and coarse-grained crystal aggregates. Some fine-to medium-grained galena crystals and crystal aggregates are sparsely disseminated in other parts of the vein".

Lumbers also reported minor amounts of argentiferous tetrahedrite and Carter observed minor pyrrhotite mineralization.

DEVELOPMENT HISTORY

pre 1930:	A number of open cuts and pits were excavated along the vein by unknown operators (Alcock, 1930, p.159).
pre 1943:	A trench was opened up for 375 feet along the strike of the vein. A mine shaft was excavated, no depth determinations were reported. In 1943, the property was held by Mr. W. A. McMurray (Thomson, 1943, p.55).
1948-49:	Bouzan Gold Mines Limited carried out stripping and trenching activities to further expose the vein. Lumbers, (1962, p.91.) stated that a total of 925 feet of trenching was completed on the property. A total of 19 drill holes (3247') were drilled (Lumbers, 1969, p.91).

REFERENCES

Alcock, F. J.	1930, p.158-159
Darling, G. B.	1949, Geoscience Data Centre, Toronto
*Lumbers, S.B.	1969, p.91-92, Map 2167
Sangster, A.L.	1970, p.271
Shklanka, R.	1969, p.141
Stee, C. O.	1948, Geoscience Data Centre, Toronto
Thomson, J.E.	1943, p.55
	1952, p.15

20. MACASSA COPPER-NICKEL PROSPECT

COMMODITY
Copper, nickel

ROCK ASSOCIATION
Host: Metapyroxenite
Other: Gabbro, diorite

CLASSIFICATION:
ICI. Gabbro-hosted, copper-nickel

LOCATION AND ACCESS

The prospect is located in the west-central partof Limerick township about 2.3 kilometres southeast of the village of Ormsby (NTS 31 C/13). An overgrown bush road provides vehicle access to the prospect from Highway 62, passing through a stripped area on the mineralized zone about 1.3 kilometres west of highway (Figure 8). The Coe Hill branch line of the Canadian National Railway passes through the northern end of the property. The prospect is located on ODM map 2167 (Lumbers 1969)

Lots 28, 29, Con. VI, VII, Limerick township, Hastings county

NTS COE HILL 31 C/13,	1:50,000	
Latitude 4°52'20"N	Longitude 77°43'10"W	
UTM Zone 18	4 972 100 N,	285150E

SIZE AND GRADE

Mineralization at the Macassa copper-nickel prospect consists of erratically disseminated pyrrhotite, pentlandite, chalcopyrite, and pyrite contained within a band of metapyroxenite in a mafic intrusion. The mineralized zone forms a reverse L shape, with an aggregate length of about 320 metres, and varies in width from less than 4 metres to 34 metres, averaging approximately 17 metres. The mineralized zone narrows down and pinches out to the north, while electromagnetic surveys indicate the Southwest end may continue further south (Long Lac Mineral Exploration Ltd., Unpublished Files). Diamond drilling indicates that the mineralized zone continues to a depth of at least 365 metres, and is open below this depth.

Differing reserve estimates have been made of the mineralized zone. According to P.D. Timms, of Long Lac Mineral Exploration Ltd. (Northern Miner, May 27, 1971, and Oct. 14, 1971) the deposit contains an estimated 1.8 million tons grading 0.91% Ni, 0.26% Cu, and 0.06% Co to a depth of 365 metres. Previous, and currently accepted estimates (Northern Miner, May 14, 1970; Financial Post Current Information Card, March 7, 1981) indicate the presence of 3,894,000 tons grading 0.825% Ni, 0.253% Cu, and 0.054% Co to the 335 metre horizon. Only trace amounts of gold and silver are reported. About 1200 metres to the south a further 1.2 million tons of mineralization grading about 0.3% Ni have been indicated by diamond drilling of a second mineralized zone termed the H+I Zone (Long Lac Mineral Exploration Ltd., Unpublished Files). A representative chip sample collected by the author in a bulldozed area on the main mineralized zone contained, upon assay, 2240 ppm Cu, 1.54 percent Ni, and less than 5 ppm each of platinum and palladium.

GEOLOGY

The following description is taken largely from Lumbers (1969).

The Macassa copper-nickel deposit occurs within the northeast corner of the Thanet Complex, a composite intrusion. Three intrusive units have been recognized by Lumbers (1969), including 1. gabbro and minor diorite; 2. diorite and minor gabbro; and 3. tonalite and quartz-bearing diorite. Pyroxenite dikes are associated with all three intrusive units, but are usually closely associated with gabbro and diorite. Pyroxene in the gabbro, diorite, and quartz diorite is usually uralitized and plagioclase is often completely saussuritized. The pyroxenite is commonly altered to a complex mixture of serpentine, chlorite, talc, amphibole, carbonate, and iron-titanium oxide minerals. Mineralization at the Macassa deposit is confined to a band of metapyroxenite within an apophysis of gabbro, diorite, and metapyroxenite that extends northwards into mafic volcanics and rusty-weathering siliceous metasediments (Fig.8). Contacts of the intrusive rocks dip at 60 to 85 degrees west to northwest, parallel to the dip of the country rocks. A few dikes and sill-like bodies of tonalite, diorite, and metapyroxenite occur within the country rocks. A second, partly mineralized metapyroxenite unit (not shown) within the Thanet complex was intersected by four of the diamond drill holes, but its extent is not known.

The metapyroxenite is generally in sharp contact with its wall rocks, but locally it grades into gabbro and diorite. Within the metapyroxenite, the mineralized zone is distinguished by a sulphide content greater than ten percent and by a dark grey gangue composed largely of talc and minor actinolite. The mineralized zone and the metapyroxenite are either in sharp contact or the mineralized zone grades into sparsely mineralized actinolite-talc schist and metapyroxenite over a few centimetres to a metre. The contact of the mineralized zone with other rock types is sharp or is marked by a narrow silicified zone generally less than 30 cm wide. The metapyroxenite unit and the mineralized zone vary in width both along strike and down the dip and branching is common, especially down the dip (Fig. 9).

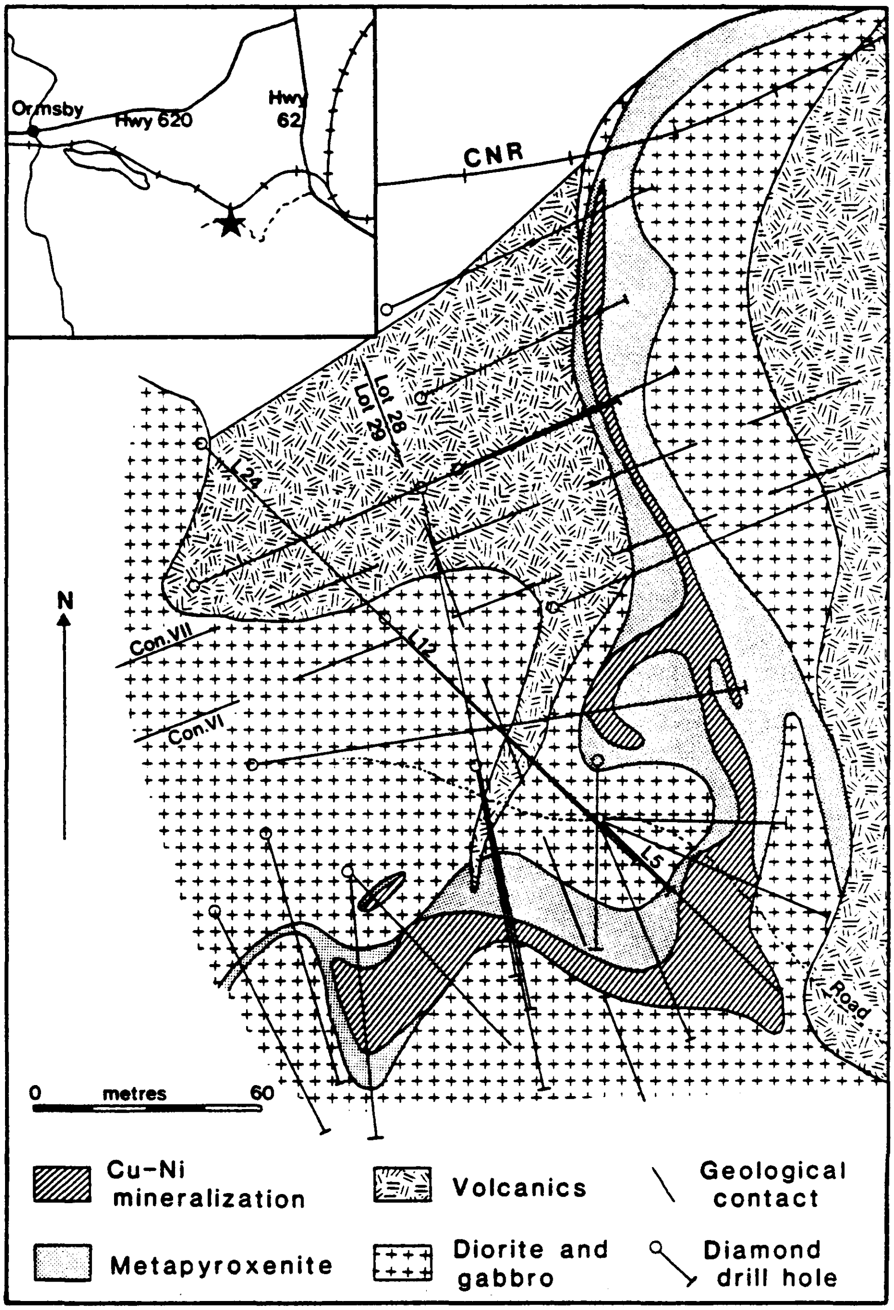

Figure 8: Geology of the Macassa Deposit (Adapted from Lumbers, 1969).

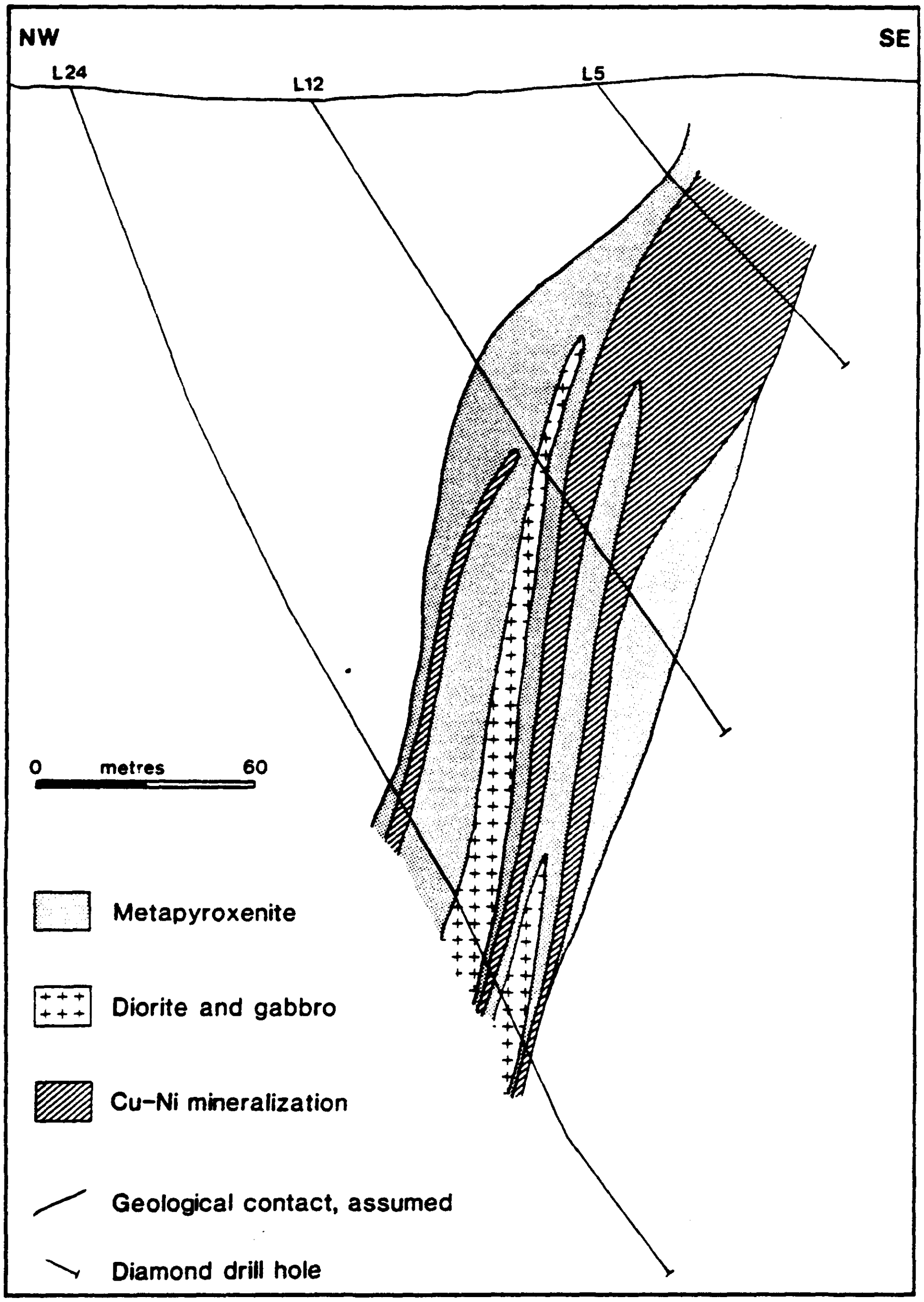

Figure 9: Cross-section of the Macassa Deposit.

The mineralized zone contains 10 to 80 percent fine to medium-grained sulphide minerals, including, in order of abundance, pyrrhotite, pentlandite, pyrite, chalcopyrite, and trace amounts of cubanite and sphalerite. Pentlandite usually occurs as fine flames and lamellae in pyrrhotite, but some fine-grained pentlandite is interstitial to the pyrrhotite. Pyrite usually forms less than ten percent of the sulphides and occurs as separate grains intergrown with pyrrhotite, as inclusions in pyrrhotite and pentlandite, and as narrow rims on pyrrhotite grains. Chalcopyrite generally forms less than five percent of the sulphides and commonly replaces pyrrhotite and pentlandite and forms inclusions in pyrite. Chalcopyrite veinlets occur locally in the mineralized zone. Veinlets composed of various mixtures of pyrite, chalcopyrite, and pyrrhotite occur in carbonatized and silicified metapyroxenite, and in gabbro and diorite near the mineralized zone.

DEVELOPMENT HISTORY

1961-1962: Copper-nickel mineralization was discovered on the property during the summer of 1961 by Macassa Gold Mines Ltd. as a result of an electromagnetic survey of an aeromagnetic high. An access road was constructed in late 1961 and by mid 1962, 23 diamond drill holes had been completed totalling 4,157 metres (Lumbers 1969).

1970: On Dec. 31, 1970, Macassa Gold Mines Ltd was acquired by Willroy Mines Ltd.

1973: A bulldozer was used by Willroy Mines Ltd to expose portions of the mineralized zone at the surface (Long Lac Mineral Exploration Ltd, company Files).

1961-1973: In addition to the work cited above the following work was completed; the specific dates are uncertain. Geological, IP, magnetometer, and Ronka surveys, and a detailed feasibility study including metallurgical testing and engineering studies were completed. During this time a total of 65 diamond drill holes totalling 14,722 metres were completed. This figure includes the previously mentioned drilling. (Long Lac Mineral Exploration Ltd, Company Files).

1973: The property was optioned by Willroy Mines Ltd to another company on a royalty deal. The option was dropped and ownership reverted to Willroy Mines Ltd.

1981: Willroy Mines Ltd owns 4000 acres of land in Limerick Township, including the copper-nickel deposit.

REFERENCES

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21. FRONTENAC LEAD MINE (Draper Lake Frontenac Lead-Zinc Mines Ltd., Forbes Galena Mine)(Past Producer)

COMMODITY Lead, Zinc, silver

ROCK ASSOCIATION
Host: Marble

CLASSIFICATION
IA2: Unconformable, carbonate hosted, lead

LOCATION AND ACCESS

The mine is located in the central part of Loughborough township, the No. 1 shaft is approximately 1.5 kilometers west of Perth Road and the No. 3 shaft is 2.2 kilometers northwest of the town. (NTS 31C/7). The shafts are accessible by a gravel road leading west from Perth Road and an accessory vehicle trail leading to Indian Lake. A Canadian National Railway line crosses the vehicle trail south of Indian Lake, near the No. 1 shaft. The No. 3 shaft is indicated on ODM Map 2054 (Hewitt 1964).

Lot 15, 16, Concession IX, Loughborough Township,
Frontenac County
NTS SYDENHAM 31C/7
Latitude 44°28'29"N Longitude 76°31'07"W
UTM Zone 18, 4 925 500N, 379 200E

SIZE AND GRADE

The workings consist of 3 mine shafts and a number of trenches and pits over 2 vein systems.

The No. 1 shaft is located on a vein 1500 feet long and 1 to 22 feet wide (Alcock 1930, p.144). It is 313 feet deep and approximately 3000 feet of drifting was completed on 6 levels. (Mulliette 1957, p.8). There are at least 3 surface trenches across the vein south of the shaft. (Uglow 1916, p.20). In the period 1866-70, approximately 2000 tons of ore grading 12 to 15 percent galena was extracted. (Vennor 1869, p.165). In 1875, 2000 tons of ore containing 12 percent galena was mined. (Baker 1916, p.31). Eckman (1947, p.8) states:

"In 1926-27 Forbes Galena Mines Ltd. extended and sampled the 300-foot level north of No. 1 shaft and reported a shoot 200 feet in length that averaged 3.02 percent lead across drift width; 120 feet of this shoot averaged 3.76 percent lead. A 40-ton bulk sample taken from the 100-foot level just south of the shaft averaged 2.02 percent lead."

Shaft Nos. 2 and 3 occur on the north vein which is 1000 feet long and 1 to 44 feet wide (ave. 10 feet). (Thomson 1952, p.4,5). The No. 2 shaft is 80 feet deep and is connected to a 150-foot long adit north of the shaft. (Mulliette 1958, p.8). About 500 tons of material grading 5 to 10 percent Pb and 2 to 4 percent Zn were mined. (Corkhill 1907, p.79). A 50-ton sample of mineralization assayed 18.12 percent Pb, 8.10 percent Zn and 1.20 ounces per ton Ag. (Eckman 1947, p.3). Shaft No. 3 is 150 feet deep with 500 feet of drifting at the 133-foot level, 250 feet in either direction. (Alcock 1930, p.144, Mulliette 1958, p.8). A raise was driven through the vein to the surface north of the shaft. About 4,700 tons of material was mined from the shaft and 38,527 pounds of lead was extracted from a portion of the ore by the Kingston Smelting Company. Approximately 2 tons of material were collected from 6 surface trenches over a distance of 380 feet along the vein; the analytical results are shown in Table 8. (Thomson 1952, p.7). The results of a diamond drill program by New Camulet Mines Limited indicated the following weighted average assay for 5 intersections over a strike length of 1000 feet and a true width of 10.9 feet: 1.7 percent Pb, 0.16 percent Zn, nil Ag and Au. (Eckman 1948, p.6). The core recovery was reported to be 76 percent.

DESCRIPTION

General Geology: Hewitt's (1964) regional geology map 2054 indicates that the mineralized veins cross cut Grenville marbles and biotite-amphibole gneisses approximately 3 kilometres north of the boundary with the Paleozoic cover rocks. These rocks are part of a folded, northeast trending sequence of marbles and paragneisses situated between two small intrusive bodies.

The local geology is described by Alcock (1930, p.142-3): "...the sedimentary gneisses are grey rocks, very micaceous and in places highly siliceous passing into quartzite. Associated with them in places are grey pyroxenites.... Locally the gneisses are injected 'lit per lit' by granite, giving an intimate mixture of igneous and altered sedimentary material. The strike of the series is about north 30 degrees east and the dip varies from 65 degrees northwest to vertical. A band of reddish granite cuts across the property between No. 1 and No. 2 shafts.... Pegmatite dykes intersect both the limestone and the gneisses." (Figure 10).

The mineralized zones are located in 2 major quartz veins separated by 3000 feet of overburden. The north vein is 1000 feet long and 1 to 44 feet wide (ave. 10 feet) and is oriented approximately N30°W dipping 80° northeast. The south vein is 1500 feet long, 1 to 22 feet wide (average 10 feet) and trends N70°W with a dip 80°N. (Eckman 1947, p.1,2, Thomson 1952, p.5). A diamond drill program completed by New Camulet Mines indicates a cross fault and a downthrown block north of the south vein. The fault marks the boundary between the gneisses to the south and

Table 8: Assays of base metals (in percent) and precious metals (in oz/ton) in samples from mineralized trenches at the Frontenac Lead Mine

Trench	Width (feet)	Pb	Zn	Ag	Au
1	13	1.92	0.45	0.08	Nil
2	11	10.90	0.65	0.40	0.02
3	10	0.74	0.50	Nil	Nil
4	15	1.36	Nil	Nil	Nil
5	18	4.82	0.30	0.28	Nil
6	8	3.64	0.70	0.24	Nil

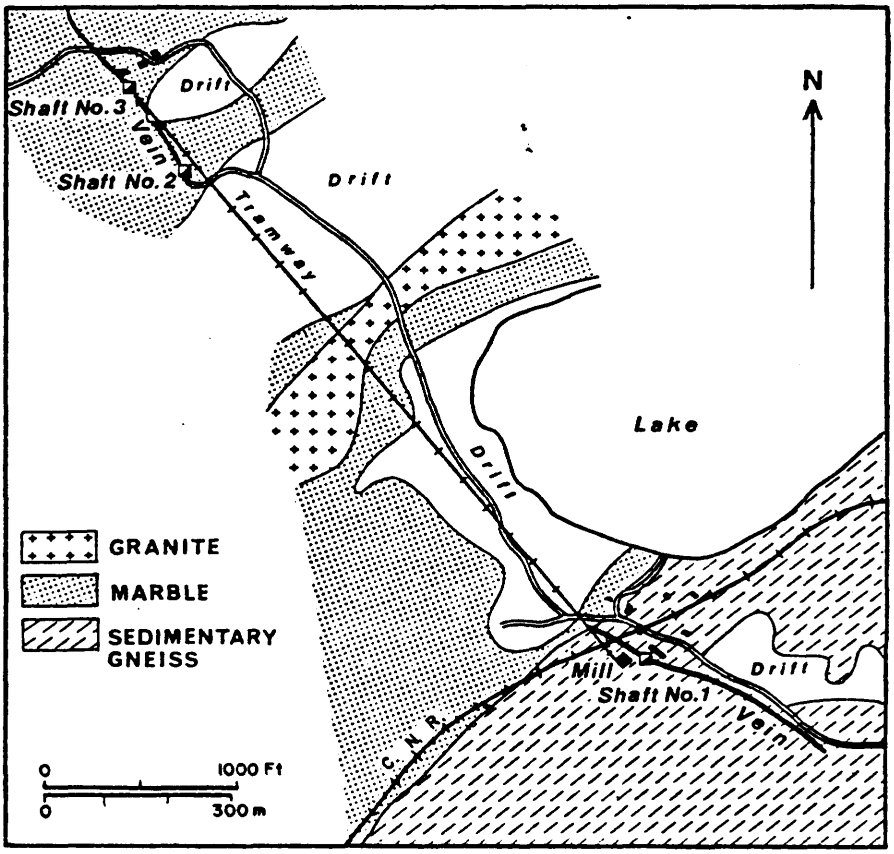

Figure 10 : Geology of the Frontenac Lead Deposit (Adapted from Alcock, 1930).

marbles with overlying Cambrian sandstone to the north. A northwest trending fault zone (1200 feet long) and small sparsely mineralized calcite stringers were detected in the Cambrian sandstone cap rock, however, no veins or fault zones were intersected over the remaining distance between the veins. (Eckman 1948, p.5,6).

Mineralization: The following descriptions are taken from Mulliette (1958, p.10) and Alcock (1930, p.144). Galena, sphalerite, pyrite, graphite and marcasite occur in descending order of abundance. The north vein contains galena and lesser amounts of yellow-brown sphalerite and pyrite in mineralized bands separated by coarsely crystalline calcite. Most of the sulphide mineralization occurs near the footwall side of the vein. The sulphides are fine- to coarse-grained, massive to granular or crypto-crystalline masses. Vein openings contain celestite and marcasite. The south vein contains galena in disseminated grains and in clusters. The mineralization is not uniformly distributed within the veins and is found in "chutes" or zones which parallel the "crustification" of the veins. Low silver values (<1.25 oz/ton) were detected in the galena.

DEVELOPMENT HISTORY

1866-1870:	No. 1 shaft was sunk to 80 feet and 2000 tons of ore was mined by unknown operators, possibly J.M. Macher.
1875-1880:	The Frontenac Lead Mining and Smelting Company excavated the No. 1 shaft to a depth of 267 feet and mined 2000 tons of ore from 5 levels at 50 feet intervals. A smelter was constructed in Kingston.
1882:	The mine and smelter were closed.
1903-1905:	No. 2 shaft was sunk to 80 feet and 500 tons of ore was mined.
1911-1912:	No. 3 shaft was sunk to 150 feet, 500 feet of drifting was completed and 2,200 tons of ore mined by North American Smelting Co. Ltd. A mill was constructed at the No. 1 shaft.
1913:	2,500 tons of ore were mined.
1916-1917:	38,527 pounds of lead were produced by the Kingston Smelting Company, operated by the India Lake Lead Mining Company.
1924:	No. 3 shaft was dewatered and examined by J. Savage and J.E. Hadman.
1925:	No. 1 shaft was dewatered by Payne Weber and Company.
1926-1927:	No. 1 shaft was deepened to 313 feet, and 120 feet of drifting was completed on the 300 foot level by Forbes Galena Mines Ltd. The No. 3 shaft was dewatered and examined.
1947-1948	17 diamond drill holes (3,108 feet) were completed by New Calumet Mines Limited.

1915-1952: 11 diamond drill holes (3356 feet) and trenching and stripping activities were completed by Draper Lake Frontenac Lead-Zinc Mines Ltd. The No. 3 shaft was dewatered and sampled at the 150 foot level.

1958: 2046 feet of diamond drilling was completed by Lake Kingston Mines Ltd. A bulk surface sample was analyzed.

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Eckman, P.	1947, " " "
Eckman, P.	1948, " " "
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*Hewitt, D.F.	1964, p.15, Map 2054
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	1898, p.234
	1904, p.94
Mulliette, M.R.P.	1958, Geoscience Data Centre, Toronto
Thomson, J.E.	1952, p.4,5,7
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Sangster, A.L.	1970, p.272
Shklanka, R.	1969, p.132-133
Slaght, A.	1891, p.240
Sutherland, T.F.	1914, p.176
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22. BANNOCKBURN PYRITE MINE (Past Producer)

COMMODITY
Pyrite

ROCK ASSOCIATION
Host: Quartz-muscovite schist
Other: Marble

CLASSIFICATION
IE1 stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS

The Bannockburn Pyrite Mine is located approximately 2 kilometres southeast of the village of Bannockburn in the northeast part of Madoc township (NTS 31C/12). It is accessible from an old trail, 1 road kilometre east of highway 62 approximately 1.5 kilometres south of Bannockburn. The mine is located on ODM map 2154 (Hewitt 1968) and 1957b (Hewitt and Satterly, 1957).

Lot 25, Con. VI, Madoc township, Hastings county
NTS Bannockburn 31 C/12 1:50,000
Latitude 44° 37' 40"N Longitude 77°31'57"W
UTM Zone 18 4 944 500 N, 299 100 E

SIZE AND GRADE

The mine consists of 2 separate ore bodies, the north zone was reported to be 8 to 15 feet wide and the south zone 8 to 15 feet wide and 160 feet long. Workings on the north deposit consist of an open pit 32 feet by 85 feet deep with levels at 64, 113, and 175 feet (Hewitt 1968, p.25). Wilson (1912, p.63) reported that the mine produced approximately 580 tons of material per month over a six year period. He states: "Some from open pit graded from 46 to 48 percent of sulphur, and some from the south lens did not run higher than 37 percent".

GENERAL GEOLOGY

General Geology: The area near the mine in the north part of Madoc township is underlain by a folded sequence of aluminous metasedimentary rocks, marbles and mafic metavolcanic rocks. The mine occurs within the clastic sedimentary rocks near the contact with dolomitic and calcitic marbles. Few small intercalated units of marble and a gabbroic lens occur near the deposit as well. According to the geology map by Hewitt (1968), the aluminous metasedimentary rocks are pelitic rocks which are classified as paragneisses, metagreywackes, argillites and schists. The marbles extend south from the host sequence and contain few units of pelitic and mafic metavolcanic rocks. The clastic and carbonate metasedimentary rocks are bounded to the east by amphibolites which belong to the Tudor volcanic sequence (Hewitt 1968, p.4). West of the deposit, the metasedimentary rocks are intruded by the

Gawley Creek Syenite, a small, coarse-grained, biotite-hornblende syenite body.

The geology in the vicinity of the Bannockburn Pyrite mine was mapped by Carter (Figure 11). The mine workings are hosted in a grey, strongly foliated, fine-grained quartz-muscovite schist. Weathered surfaces of this rock are buff to reddish brown. Wilson (1912, p.63) writes:

> "The south lens and enclosing schists strike slightly west of north until west of the open pit, when a fold of a 90° angle turns the strike to a little north of east. The south lens dips with the country rock to the east and the open pit in a similar manner dips to the south."

The quartz-muscovite schist is bounded by calcitic and dolomitic marbles which contain structural features indicating folding with fold axes plunging north. Calcitic marbles are more common north of the quartz-sericite schist and dolomitic marbles dominate the outcrops of carbonate rock south and west of the mine workings. Carter described the calcitic marble as a dark grey, massive to well layered, very fine-grained to aphanitic carbonate rock. The dolomitic marbles are very similar in appearance and in places show well developed beds or layers 2 to 10 mm in thickness. Few small quartz veinlets were observed within the marbles.

Mineralization: Carter noted that the mineralization at the mine dump consists of massive to disseminated, fine-grained pyrite. The host quartz-muscovite schist contains zones composed of almost pure white, granular fine-grained quartz.

A thin section of the host (80-TRC-75) is composed of quartz, sericite and dolomite with a minor amount of opaque minerals and chlorite (Table 9). Most of the section is composed of fine-grained (0.2 mm), equigranular quartz separated in part by oriented fine-grained, muscovite grains. In places, the muscovite is concentrated in narrow bands almost perpendicular to the preferred orientation. Dolomite occurs in irregular masses (<1.0 mm) and in veinlets slightly oblique to the foliation. Minor amounts of fine, opaque minerals and chlorite are also present.

Table 9: Estimated Modal Composition (in percent) of a Thin Section of Quartz-Muscovite Schist, Bannockburn Pyrite Mine

	80-TRC-75
Quartz	60
Muscovite	30
Dolomite	8-10
Opaques	1
Chlorite	minor

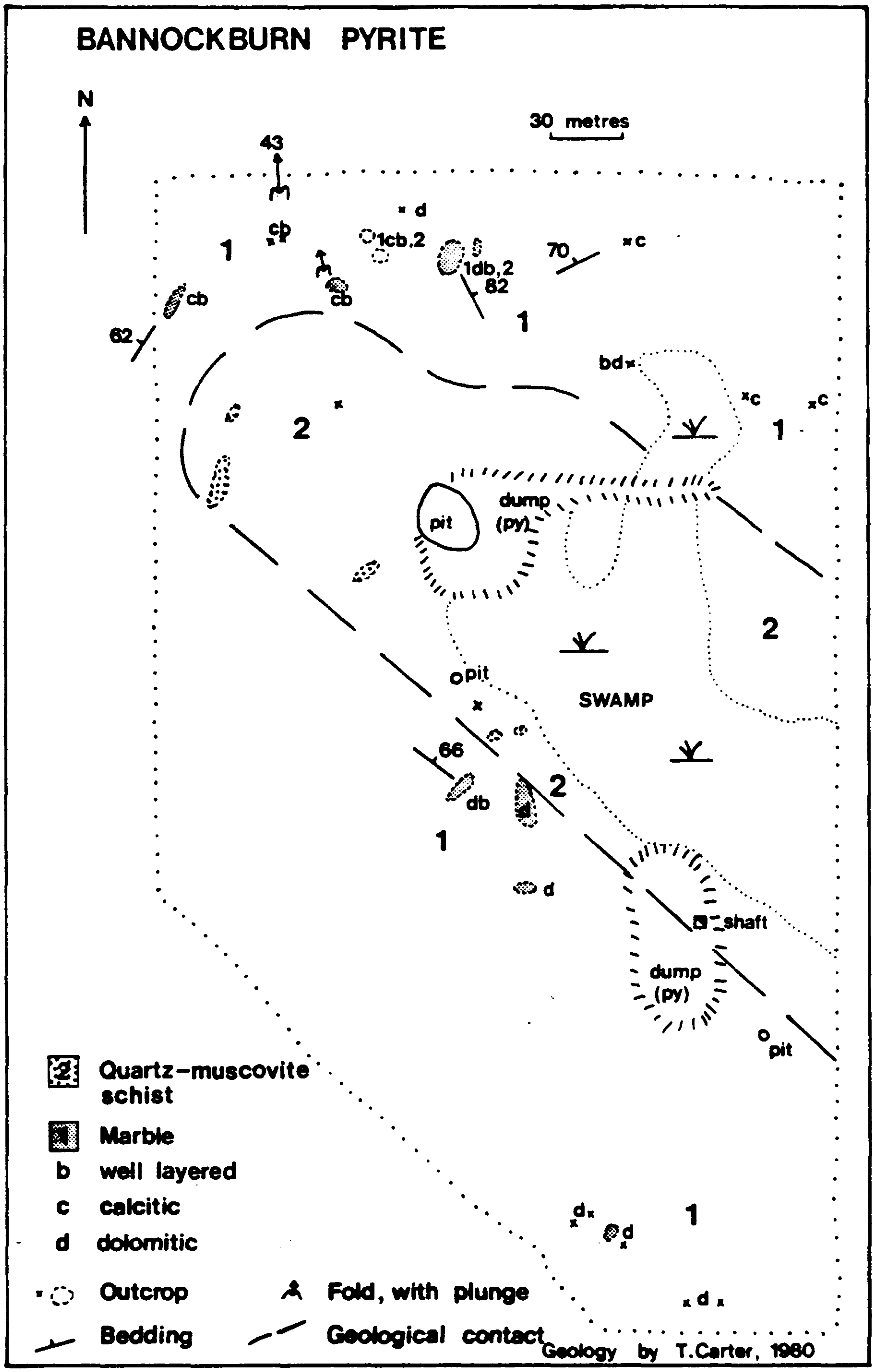

Figure 11: Geology of the Bannockburn Pyrite Deposit.

Geochemistry: Two rock samples were collected by Carter and analyzed at the O.G.S. Laboratories. A representative sample of the host rock (80-TRC-75) was analyzed for major and trace elements and a sample of massive pyrite (79-TC-56) for gold and silver. The results are shown in Table 10.

DEVELOPMENT HISTORY

1898: The deposit was discovered by Stephen Wellington. Eleven carloads of oxidized material (limonite) were shipped to the Hamilton Iron and Steel Company. Thomas Burnside and W. Coe prospected the property and obtained the mining lease (Wilson 1912, p.62).

1900: The American Madoc Mining Company acquired the mining lease and excavated an open pit 32 feet by 85 feet by 84 feet deep. The deposit was named the Jarman pyrite mine.

1901-1907: A shaft was opened to a depth of 275 feet with levels at 64, 113 and 175 feet (Hewitt 1968, p.25).

1918-1919: An unknown amount of development was completed. The deposit was named the Mundic mine (Hewitt, 1968, p.1,25).

REFERENCES

Hewitt, D.F.	1967, p.9-10
*Hewitt, D.F.	1968, 45p, Map 2154
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Sangster, A.L.	1970, p.88
Shklanka, R.	1969, p.135
Wilson, A.W.G.	1912, p.62-3

TABLE 10: Whole Rock Chemical Compositions (in percent) Trace Element Contents (in ppom) of Quartz-Muscovite Schist and Gold and Silver Values (in ounces/ton) of Massive Pyrite.

	80-TRC-75		80-TRC-75
SiO_2	73.8	Ba	470
Al_2O_3	11.5	Co	7
Fe_2O_3	1.13	Cr	6
FeO	3.16	Cu	36
MgO	2.38	Li	31
CaO	1.06	Ni	11
Na_2O	0.32	Pb	10
K_2O	2.39	Zn	54
TiO_2	0.93		
P_2O_5	0.14		79-TR-56
MnO	0.00		
Co_2	0.75	Au	<0.01
S	0.01	Ag	<0.1
H_2O^+	2.16		
H_2O^-	0.20		
Total:	99.9		

23. BLAKELY PYRITE MINE (Past Producer)

COMMODITY: Pyrite

ROCK ASSOCIATION:
Host: Quartz-sericite-pyrite schist
Other: Garnetiferous, hornblende amphibolite, felsic metavolcanic rocks.

CLASSIFICATION:
IE1: Stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS:

The Blakely Pyrite Mine is located in the southeast part of Madoc township approximately 8 kilometres northeast of Madoc and 2 kilometres south of Queensborough. (NTS 31 C/11). The mine is accessible from Hunt Club Road which crosses Highway 7, 5.6 kilometres east of the junction with Highway 62. It is 75 metres east of the access road at a point 6.4 road kilometres north of Highway 7. The location is indicated on ODM map 2154 (Hewitt, 1968).

Lot 11, Con XI, Madoc township, Hastings county.
NTS KALADAR 31 C/11 1:50,000
Latitude: 44°34'34"N Longitude:77°25'05"W
UTM Zone 18, 4 938 500 N, 308 000 E.

SIZE AND GRADE

Most of the following information is taken from reports by Fraleck (1907, p.161) and Miller and Knight (1914, p.101). The ore consists of several massive pyrite lenses up to 15 feet wide and 50 feet long and a banded siliceous pyrite zone of unspecified extent. At least 65 "carloads" of high grade pyrite (45 percent sulphur) were shipped. An unknown amount of siliceous pyrite ore (35 percent sulphur) was also mined. Workings consist of 2 shafts and at least two trenches. The main shaft was excavated to a depth of 135 feet, with 100 feet of drifting at the 50 foot level;the other shaft is 30 feet deep. A pit near the main shaft was opened over a pyrite lens containing disseminated chalcopyrite. C. P. Verschuren (Ministry Geologist, Tweed Office) collected a mineralized sample from a pit 70m south of the main shaft. The sample analyzed 1.3 oz/ton Ag, 0.03 oz/ton Au, 0.34 percent antimony, 0.205 percent arsenic and 8.96 percent zinc. Verschuren reported that Syngenore Exploration Limited intersected a narrow (15cm) mineralized zone assaying 297.1 oz/ton Ag, 0.46 oz/ton Au, 2.15 percent Cu, 5.40 percent Pb and 3.79 percent antimony. Another hole intersected massive and banded pyrite (4.6cm) assaying 0.04 oz/ton Au. West of the main shaft, a trench (0.6m by 15m by 1.3m deep) exposes a quartz vein containing pyrite, chalcopyrite and argentiferous jamesonite.

DESCRIPTION

General Geology: The Blakely Pyrite Mine occurs in a sequence of metasedimentary and metavolcanic rocks which form the Queensborough syncline. Hewitt (1968, p.17) writes:

"...The Queensborough syncline has its axis trending northwest about 2 miles west of Queensborough. The Tudor basic volcanics are folded around the nose of the syncline, which pitches northwest. The nose is occupied by the Queensborough acid volcanic centre, which is composed of felsite, rhyolite, schist, pyritiferous slate and massive pyrite lenses. The central part of the syncline is occupied by marble".

C. P. Verschuren mapped the area around the Blakely Pyrite and Canadian Sulphur Ore Company mines and identified the following units: (see Figure 12)

(1) mafic metavolcanic rocks
(2) intermediate metavolcanic rocks
(3) felsic metavolcanic rocks
(4) agglomerate
(5) dolomitic marble
(6) calcitic marble
(7) garnetiferous hornblende amphibolite and
(8) rusty schists (see Figure 12)

The following information is derived from an unpublished report written by C. P. Verschuren.

1. Mafic metavolcanic rocks:

The mafic volcanic unit is a fine-to medium-grained, moderately foliated rock comprised of plagioclase, quartz and actinolite with minor biotite, epidote, chlorite, carbonate, iron oxide and sulphides. Locally pillow structures occur with tops facing west. Whole rock analysis of the samples from this unit are listed in (CV-804, 805 and 819). These rocks are part of the Hermon Group and are referred to as the "Tudor volcanics" (Lumbers, 1968, p.9).

2. Intermediate metavolcanic rocks:

The intermediate volcanic unit is a dark grey, weakly to strongly foliated rock comprised of fine-grained plagioclase and quartz with lesser amounts of coarser grained biotite, chlorite, carbonate and epidote. Graphite is the major opaque mineral and minor hornblende occurs locally. Relict subhedral grains of plagioclase and quartz are distinguishable in thin section. A whole rock geochemical analysis of this unit is listed in Table 11 (CV-808). This unit stratigraphically overlies the mafic metavolcanic rocks.

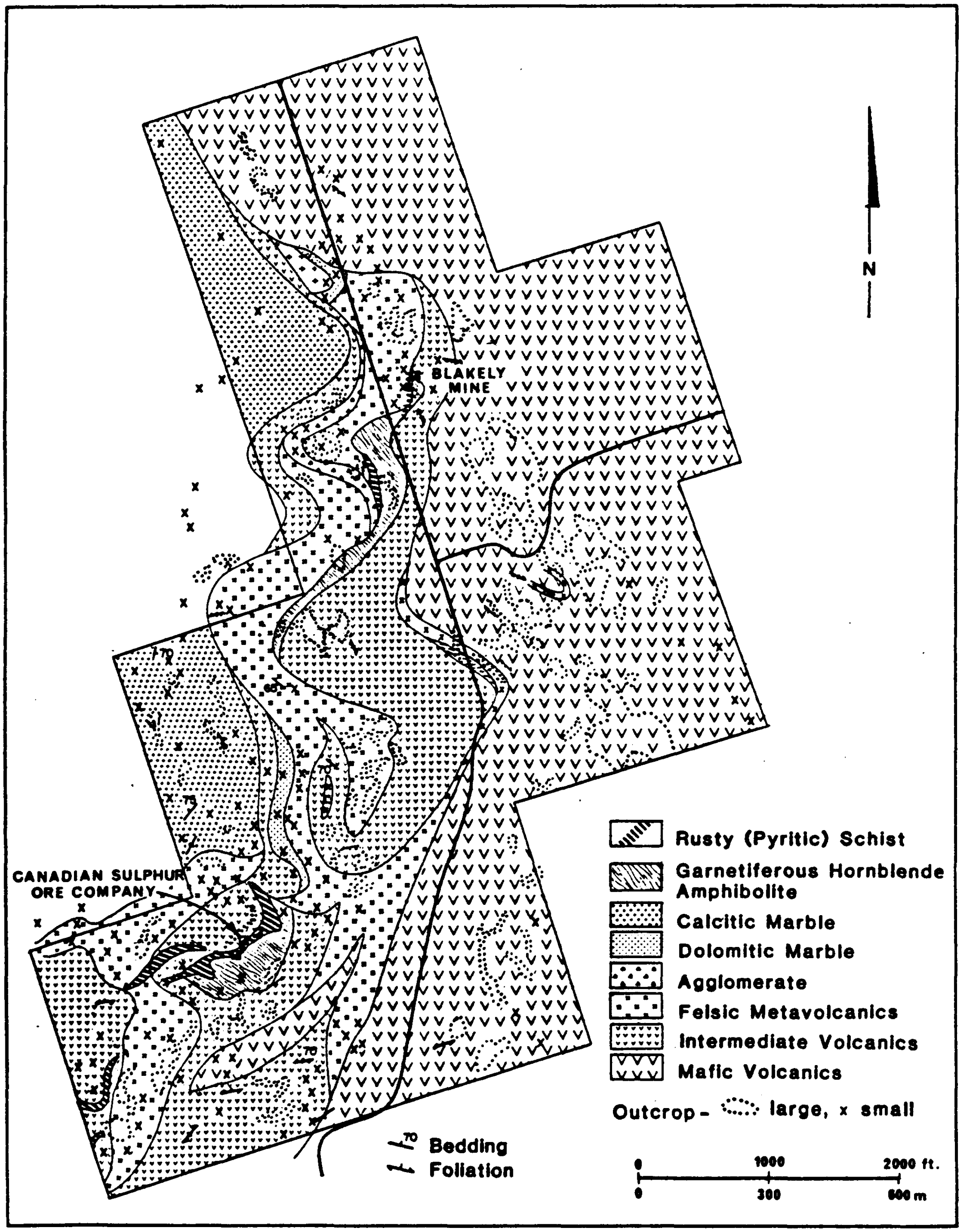

Figure 12: Geology of the vicinity of the Blakely and Canadian Sulphur Ore Deposits (Adapted from Verschuren, 1983).

3. Felsic metavolcanic rocks:

The felsic volcanic unit is a white, grey (to pink) massive to finely laminated rock comprised of very fine-grained quartz and plagioclase with minor muscovite zoisite, tourmaline, actinolite, chlorite and biotite. This unit is commonly brecciated and locally contains up to 20 percent sericite. Relict feldspar phenocrysts were observed in thin section. A whole rock analysis of this unit is listed in Table 11 (CV-807,809,814). These rocks occur within the intermediate metavolcanic unit.

4. Felsic to intermediate lapilli tuff:

This unit consists of subrounded to subangular fragments (1 to 5cm) of felsic and intermediate volcanic rock in a fine-to medium-grained matrix of mafic composition. The fragments show no preferred orientation. It occurs within the felsic metavolcanic unit.

5. Dolomitic marble:

The dolomitic marble is a grey to buff coloured, fine-to coarse-grained rock which is thinly bedded in places. It is cut by numerous quartz-carbonate stringers. Dolomitic marble occurs intercalated with intermediate and felsic metavolcanic rocks and as thin beds within calcite marble.

6. Calcitic marble

The calcitic marble is grey-blue in colour and is thinly bedded. It forms a thick succession which is locally interbedded with minor siliceous clastic metasedimentary rocks. This unit occurs in the central part of the Queensborough syncline, in the area near the Blakely Pyrite and Canadian Sulphur Ore Company mines.

7. Garnetiferous hornblende amphibolite:

The rock unit is a grey to black, massive to moderately foliated amphibolite comprised of grains (porphyroblasts) of garnet, hornblende, chlorite and carbonate in a fine-grained matrix of plagioclase and lesser quartz. Minor biotite, graphite and pyrite are also present. The garnetiferous hornblende amphibolite has a close spatial relationship with the Blakely Pyrite and Canadian Sulphur Ore Company mines and other pyrite deposits in the region. A sample analyses of this unit at the Blakely Pyrite mine is listed in Table 11 (CV-816).

TABLE 11: Major Element Geochemical Analyses of Rock Units at the Canadian Sulphur Ore Company and Blakely Pyrite Mines

Sample No.	CV-804	CV-805	CV-819	CV-808	CV-807	CV-809	CV-814	CV-811
Rock Type	M	M	M	I	F	F	F	RS
SiO_2	50.54	48.58	50.79	53.07	83.90	85.91	78.47	78.29
TiO_2	1.74	1.41	2.05	3.15	0.23	0.30	0.20	1.05
Al_2O_3	14.47	16.95	13.08	17.70	11.09	5.51	13.10	14.09
Fe_2O_3	16.90	11.50	15.90	13.46	0.48	3.64	1.73	0.78
FeO	12.59	8.04	11.50	0.00	0.00	0.00	0.52	0.00
MnO	0.21	0.14	0.23	0.11	0.00	0.05	0.06	0.00
MgO	5.30	8.28	5.84	5.33	0.08	1.11	1.16	0.59
CaO	8.56	9.81	8.54	2.65	0.86	1.62	1.79	0.16
Na_2O	2.75	3.09	3.89	1.90	1.82	0.00	1.89	0.00
K_2O	0.38	0.59	0.23	1.77	1.25	1.16	0.98	4.15
P_2O_5	0.14	0.10	0.13	0.14	0.00	0.09	0.00	0.00
CO_2	0.04	0.10	1.21	1.70	0.12	2.09	0.07	2.96
S	0.13	.08	0.11	0.03	0.28	0.84	0.10	0.09
L.O.I.	0.20	1.10	1.60	3.40	1.20	2.90	1.50	2.70
TOTAL	99.56	97.71	99.52	96.68	99.28	99.99	98.63	99.65

ROCK TYPE ABBREVIATIONS

M - Mafic Metavolcanic
I - Intermediate Metavolcanic
F - Felsic Metavolcanic
RS - Rusty Schist

The rusty schist is a grey to black, fine-grained, strongly foliated unit composed of variable amounts of quartz, sericite, pyrite and graphite. Zones of disseminated graphite and disseminated and banded pyrite occur parallel to the foliation. This unit hosts the massive and banded siliceous pyrite mined at the Canadian Sulphur Ore and Blakely Pyrite mines. The rusty schist unit is generally narrow and discontinuous and conforms to local structural trends. A whole rock chemical analysis of a sample of this unit is listed in Table 11 (CV-811).

Local Geology: Verschuren described the deposit as massive lenses and banded and disseminated zones of pyrite within the rusty schists at the contact between felsic metavolcanic and garnetiferous hornblende amphibolite units (Figure 12). The rocks at the mine site trend north-south and are steeply dipping. Mineralization consists largely of pyrite with minor sphalerite, jamesonite, chalcopyrite and arsenopyrite. Significant gold and silver values were detected in few samples of small, highly mineralized zones on surface and in drill core (see Size and Grade). The Syngenore report states that native silver and magyagite [$Au(Pb,Sb,Fe)_8(S,Te)_{11}$] were identified in a section of drill core from one hole.

DEVELOPMENT HISTORY:

1904-1908:
- The British American Development Company operated the Blakely Pyrite Mine.
- 2 shafts were opened (No. 1: 135 feet deep, 175 feet of drifting, No. 2: 30 feet deep).
- at least 65 carloads of ore were shipped by 1906 (Corkill, 1905, p.79, Fralek, 1907, p.160-161).

1956:
- B. L. Long drilled 4 holes (163'), and intersected a pyritiferous schist zone with disseminated sphalerite, arsenopyrite, pyrite chalcopyrite and pyrrhotite (Lang, 1956).

1960:
- E. C. Sager drilled 2 holes (220') and intersected a zone of disseminated pyrite (Sayer, 1960).

Late 1960's:
- Syngenore Explorations Limited carried out an exploration program in the area. Diamond drilling activities were also carried out.

1973-1974:
- Freeport Canadian Exploration Company carried out a ground electromagnetic and magmatic survey over the area. (Moreau, 1973)

1978:
- E. C. Sager drilled one hole (310.5'), no significant mineralization was detected (Sager, 1978)

REFERENCES

Corkhill, E.T.	1905, p.79
Fraleck, E. L.	1907, p.160-161
*Hewitt, D. F.	1968, p.17, Map 2154
Land, B. L.	1956
Lumbers, S. B.	1968, p.9
Miller, W.G. and Knight, C.W.	1914, p.100-101
Moreau,....	1973, Geoscience Data Centre, Toronto
Sager, E.C.	1960 Geoscience Data Centre, Toronto
	1978, Geoscience Data Centre, Toronto
Sangster, A.L.	1970, p.69, 79-81
Syngemore Explorations Limited	1967, Unpublished Report

24. CANADIAN SULPHUR ORE COMPANY (WELLINGTON) MINE (Past Producer)

COMMODITY: Pyrite

ROCK ASSOCIATION;
Host: Quartz-sericite pyrite schist
Other: Quartzite, garnitiferous hornblende amphibolite; felsic to mafic metavolcanic rocks

CLASSIFICATION:
IE1: Stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS

The Canadian Sulphur Ore property is located in the southeast part of Madoc Township approximately 7 kilometres northeast of Madoc and 3 kilometres south of Queensborough (NTS 31C/11). The property is accessible from the Hunt Club Road which crosses Highway 7, 5.6 kilometres east of the junction with Highway 62. The deposit is 4.8 road kilometres north of Highway 7 and 0.4 kilometres (on foot) west of the access road. The mine site is shown on O.D.M. map 2154 (Hewitt 1968).

Lot 9, Con. X, Madoc township, Hastings County
NTS KALADAR 31C/11, 1:50,000
Latitude: 44°33'52" Longitude: 77°25'22"
UTM Zone 18, 4 937 200 N, 307 600E

SIZE AND GRADE

The following information is taken from an unpublished report written by C.P. Verschuren, Ministry Geologist at the Tweed Office:

According to Fraleck (1907), the pyrite mineralization outcropped in an area 500 feet long by 200 feet wide. Massive pyrite mineralization, averaging 46-49 percent sulphur, occurs as lenticular bodies with dimensions approximately 1m to 9m in width and 20m in length. Banded siliceous pyrite constitutes the lower grade ore, averaging up to 35 percent sulphur (Miller and Knight 1914, p.98). The dimensions of these zones are not known. Miller and Knight (1914, p.99) reported that the deposit was free of copper, nickel, gold, lead and arsenic with the exception of minor occurrences of pyrrhotite with little chalcopyrite and trace amounts of nickel and gold. Carter collected a sample of a massive pyrite felsic metavolcanic unit which assayed <0.01 oz/ton Au, <0.1 oz/ton Ag, 10 ppm As, 5.1 ppm Sb, 77 ppm Cu and 0.01 oz/ton Au, <0.1 oz/ton Ag respectively.

Workings consist of 3 shafts and 2 pits. Shafts No. 1 and No. 2 are 75 and 100 feet deep respectively. Pit No. 3 is 60 feet deep by 25 feet by 60 feet deep and pit No. 4 is

25 feet in diameter and 75 feet deep. Shaft No. 3, beside pit No. 3 was excavated to a depth of 460 feet with six drift levels. The total production from the mine is not known.

DESCRIPTION

The Canadian Sulphur Ore Company Mine occurs within a synclinal structure referred to as the Queensborough Syncline (Hewitt 1968, p.17). The axis of the syncline trends at approximately 110° and plunges steeply to the southeast. C.P. Verschuren examined the area around the Canadian Sulphur Ore and Blakely Pyrite mines and identified the following rock sequence: (1) mafic metavolcanic rocks; (2) intermediate metavolcanic rocks; (3) felsic metavolcanic rocks; (4) felsic to intermediate lapilli tuff; (5) dolomitic marble; (6) calcitic marble; (7) garnitiferous hornblende amphibolite and (8) rusty schist (Fig. 12). These units are described in the report on the Blakely Pyrite mine.

The workings are situated within the pyritic schist between the garnetiferous hornblende amphibolite and intermediate metavolcanic rock units. Verschuren describes the north-south cross section through the mineralized zone as follows: quartzite in the footwall; banded pyritic quartzite (8 feet); sparsely mineralized quartzite (5 feet); massive pyrite (17 feet); and pyrite schists in the hanging wall. This sequence is oriented east-west and dips steeply to the south.

Mineralization: Massive pyrite occurs as lenticular bodies up to 9m wide and 20m long. Locally the lenses are brecciated and cemented with aggregates of quartz, calcite and secondary pyrite. The pyrite is fine- to medium-grained and occurs as a mosaic of equant grains. Banded siliceous pyrite zones are composed of disseminated grains and bands of pyrite supported in a mosaic of quartz with minor sericite and graphite. Miller and Knight (1914, p.99) reported minor pyrrhotite and chalcopyrite mineralization (with trace nickel and gold) in pits located west of the mine shafts.

DEVELOPMENT HISTORY

The Canadian Sulphur Ore Company operated between 1908 and 1919. At the time of closing, the development work consisted of 3 shafts and 2 production pits. The pyrite ore was shipped by rail to the Grasselle Chemical Company in Hamilton, Ontario and to the Nickols Chemical company at Sulphide, Ontario. In 1913, the mine employed approximately 50 men and was equipped to produce 50 to 100 tons of ore (40 percent sulphur) per day.

1906: - the property was discovered by Mr. Stephen Wellington and several pits and trenches were opened

1908: - Shafts No. 1 and No. 2 were sunk and one carload of ore was shipped.

1909: - The property was purchased by the Canadian Pyrite Syndicate.
- One shaft was excavated to a depth of 50 feet with a drift at that level, the other shaft was 20 feet deep.
- Five hundred tons of ore was shipped (Corkhill 1909, p.136)

1910: - The property was purchased by the Canadian Sulphur Ore Company
- An unspecified amount of ore was shipped during the summer

1912: - Power was supplied to the mine by the Seymour Power Company

1913: - Pits Nos. 3 and 4 were excavated and the No. 3 shaft was opened to a depth of 120 feet, with levels at 50 and 120 feet. Approximately 100 ft of drifting was completed at the 120 foot level (Corkhill 1913, p.136)

1919: - Mine closed, No. 3 shaft was 460 feet deep and had 6 developed levels

Current status: The potential mineral rights are held by Mr. E.C. Sager of Madoc Township

REFERENCES

Corkhill, E.T.	1909, p.136
	1911, p.109
	1912, p.160
	1913, p.136
Fraleck, E.L.	1907, p.
*Hewitt, D.F.	1968, p.26, Map No. 2154
Long, B.W.	1956,
Miller, W.G. and Knight, C.W.	1914, p.97-100
Moreau, M.J.	1973,
Sager, E.	1960
Sutherland, T.F., Collins, E.A., McMillan, J.G. and Bartlett, J.	1917, p.135
Sutherland, T.F., Collins, E.A., Storel, J.N. and Webster, A.R.	1918, p.
	1919, p.133
	1920, p.

25. ELDORADO COPPER MINE

COMMODITY
Copper

ROCK ASSOCIATION
Host: Dolomitic marble
Other: Magnetite-talc-carbonate skarn, granite

CLASSIFICATION
IB2: Other geological association, copper

LOCATION AND ACCESS

The Eldorado Copper Mine is located in the central part of Madoc township, approximately 0.8 kilometres west of the town of Eldorado on Highway 62 and 200 metres north of the Canadian National Railway line (NTS 31C/12). The deposit is accessible on foot from the railway line which passes through Eldorado. It is located on ODM map 2154 (Hewitt 1968).

Lot 17, Con. V, Madoc township, Hastings county
NTS BANNOCKBURN 31 C/12 1:50,000
Latitude 44°35'05N Longitude 77°31'45"W
UTM Zone 18, 4 939 700 N, 299 200 E

SIZE AND GRADE

The deposit was originally named the Coe Iron Mine and hematite ore was mined from an open pit to a depth of 75 feet (Corkhill 1906, p. 90). The deposit was renamed the Eldorado Copper Mine and chalcopyrite, pyrite and chalcocite ore was mined from a shaft extension to a depth of 150 feet. Levels were opened at 110 feet, 130 feet and 150 feet with drifting lengths of 105 feet, 170 feet and 175 feet respectively. In 1906, the shaft was abandoned and production continued from an open cut along a steep incline. The zone was approximately 36 feet long by 7 to 10 feet wide and 300 feet deep. Copper ore averaged 4 to 10 percent copper (Corkhill 1906, p.91). The Ontario Copper Company produced 234,000 pounds of copper matte containing 23 ounces of gold, 182 ounces of silver and 109,000 pounds of copper (Skhlanka 1967, p.138-9).

DESCRIPTION

The Eldorado Copper Mine is situated within a sequence of folded dolomitic marbles which dominate the central area of Madoc township. These marbles contain intercalated units of metasedimentary and mafic volcanic rocks and a few small granitic intrusions related to the Gawley Creek Syenite and the Deloro Granite in the northwest and west central part of the township respectively. The marbles are bounded on the east by a segment of the Tudor volcanic sequence (Hewitt, D.F. 1968, p.4). Ordovician limestone outliers are scattered throughout the area.

The Eldorado Copper Mine occurs within dolomitic marble at the contact with a very small granitic intrusion related to the Deloro granite. Host rocks at the deposit strike east-west and dip steeply to the north. Carter described the host rock as a white, massive, aphanitic dolomitic marble. Weathered surfaces are reddish brown and the rock contains numerous quartz veins with minor ankerite and pyrite. Carter described the intrusion as a pink, fine-grained granite and the contact zone at the north end of the deposit as a massive magnetite-talc-carbonate skarn.

Mineralization: This deposit was originally mined for hematite under the name of the Coe Iron Mine.

Corkhill (1906, p.90) states:

"This mine which originally opened for iron, but which has for the last couple of years been worked for copper... The ore is chalcopyrite and was found at a depth of 75 feet displacing the hematite, which constituted the ore body to this depth. Some very fine samples of chalcocite are also found in the ore. The north or hanging wall of the ore body is granite, and the south or foot wall crystalline limestone. The ore body runs east and west in a wide open fissure in the contact between the granite and limestone...The ore body, which occurs as a shoot, dips to the northeast." In the next report, Corkhill (1907, p.76) states: "...At a depth of 75 feet the vertical shaft was discontinued and all mining has since been confined to sinking on the ore body. The ore body occurs in a shoot about 36 feet in length by 7 to 10 feet in width."

According to a recent investigation by Carter, disseminated blebs of pyrite and chalcopyrite were visible in the quartz vein material at the deposit. He noted that fragments of limonite found at the dump may represent original iron ore material. Minor malachite mineralization has also been reported (Rose 1959, p.62).

DEVELOPMENT HISTORY

1901-1903:	The Coe or Moore iron mine was opened. Hematite ore was mined from an open pit to a depth of 75 feet.
1903-1906:	The deposit was renamed the Eldorado Copper Mine and copper ore was mined from the deposit from a shaft below the 75 foot level of the pit.
1906:	The shaft was abandoned and ore was extracted from an open cut to a depth of 300 feet (Shklanka 1969, p.138-9). The Medina Gold Mining Company erected a copper smelter on the property (Corkhill 1907, p.76).

1907:	The Eldorado Copper Mine was owned by the Ontario Copper Company (Corkhill 1907, p.76). Mining activities ceased in this year.
1956:	Picton Uranium Mines Limited dewatered the shaft and re-examined the deposit (Shklanka 1969, p.128-9).

REFERENCES

Corkhill, E.T.	1906, p.90-1
	1907, p.76
*Hewitt	1968, p.4, Map 2154
Miller, W.G. and Knight, C.W.	1914, p.108-9
Rose, E.R.	1958, p.60-2
Sangster, A.L.	1970, p.255-6
Shklanka, R.	1969, p.138-9

26. HOLLANDIA LEAD MINE (Past Producer)

COMMODITY

Lead

ROCK ASSOCIATION:

Host: Marble, metagreywacke

CLASSIFICATION

IA2: Unconformable, carbonate vein-hosted lead

LOCATION AND ACCESS

The principal workings of the former Hollandia Lead mine are located in the north central part of Madoc township, approximately 3.5 kilometres north of Bannockburn (NTS 31 C/12) (Figure 13). The deposit can be reached via a gravel road that extends northeast from Highway 62 at a point approximately 0.9 km north of the village of Bannockburn. The workings are located northwest of the gravel road approximately 3 km from Highway 62. A short dirt road leads to the main workings. The mine is located on ODM Map 2154 (Hewitt 1968) and 1957b (Hewitt and Satterly 1957).

Lot A, Con. VI, Madoc township;		Hastings County	
NTS BANNOCKBURN	31 C/12	1:50,000	
Latitude:	44°40'20"N	Longitude:	77°32'25"W
UTM Zone 18	4 949 450 N,	198 650 E	

SIZE AND GRADE

Mineralization at the deposit consists principally of erratically dispersed grains and elongate masses of galena contained in a calcite vein cutting Grenville country rocks. The vein has been traced over a strike length of about 175 metres by a series of pits and shafts and diamond drill holes. Uglow (1916) reports that the vein occurs discontinuously in outcrops over a strike length of about one mile but diamond drilling completed by Teck Exploration Ltd. indicates the vein terminates or continues only intermittently beyond the principal workings of the former mine. Exposed portions of the vein vary in width from 10 cm to about 1 metre. Alcock (1930) reports the vein had an average width of 4 feet (1.2 m) and was up to 10 feet (3 m) wide.

The vein has been developed by underground workings to a depth of about 27 metres. According to Alcock (1930) the part of the vein between shaft number 2 southeast (Fig.13) and shaft number 2 northwest (not shown) has been stoped out to surface and high-grade ore was produced from the upper 20 to 40 feet (6-12 m). The lead content of samples taken along the drifts is reported to have varied from one to twelve percent (Alcock 1930). The diamond drilling by Teck Explorations Ltd. indicates continuation of the vein to a

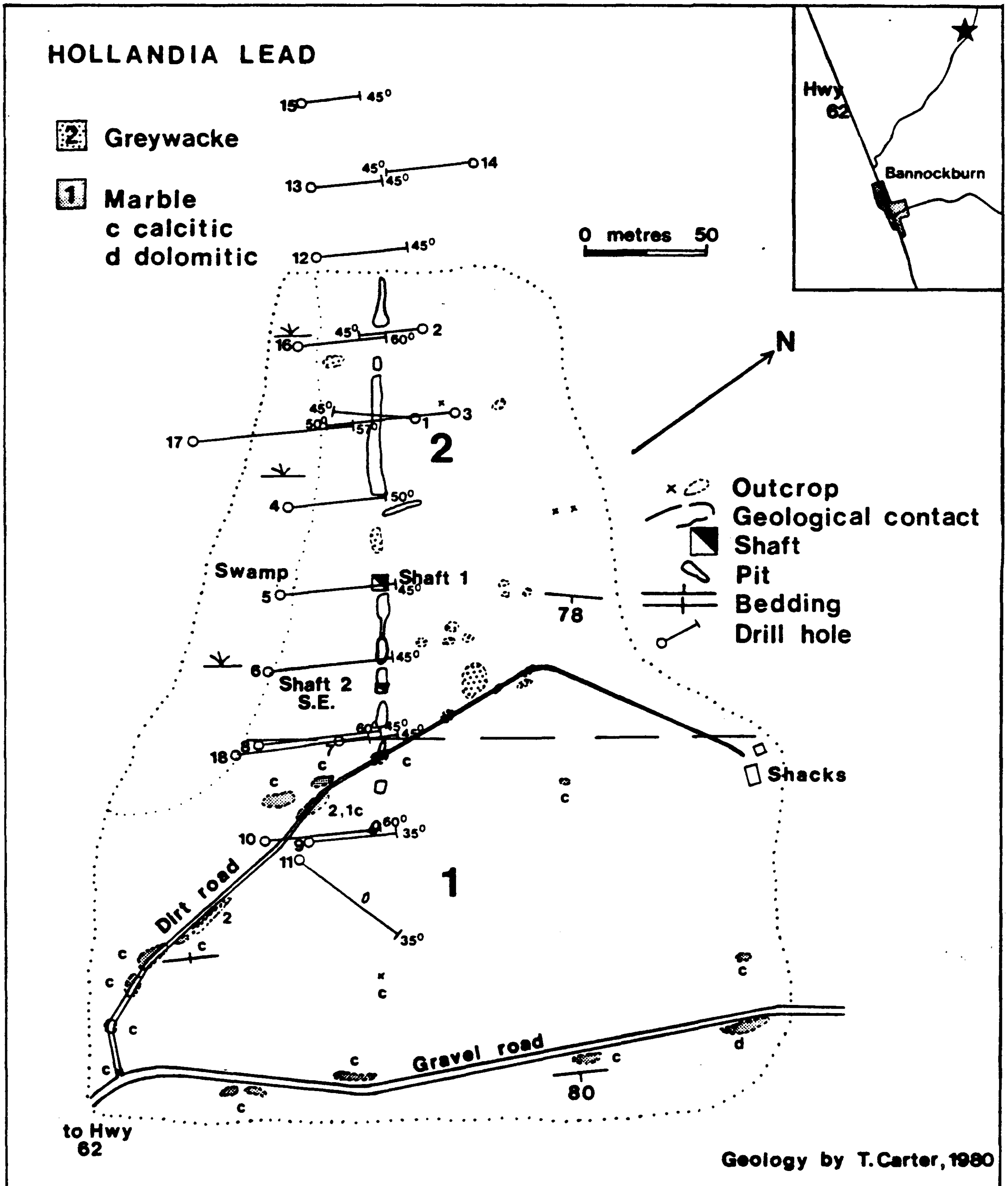

Figure 13: Geology of the Hollandia Lead Deposit.

depth of at least 60 metres and mineralized calcite vein material was intersected at a maximum vertical depth of approximately 90 metres in drill hole no. 17. The lead content of diamond drill vein intersections varies from nil to 31.76 percent, with minor amounts of silver (see Table 12), illustrating the erratic distribution of mineralization.

GEOLOGY

The Hollandia lead deposit occupies a cross-cutting vein near the contact between sequences of marble and siliceous clastic sedimentary rocks. The two sequences are in sharp contact, striking northeasterly and dipping steeply (87 degrees) to the southeast. The metaclastic rocks are light to dark grey, thinly layered (2 mm - 3 cm), and very fine-grained, and often are rusty-weathering due to the presence of fine-grained disseminated pyrite. They probably represent metamorphosed greywackes. The marbles are calcitic to locally dolomitic in composition and are grey in colour, aphanitic to very fine grained, and are usually well-layered. Thin interbeds of metaclastic rocks are common.

Mineralization is confined to a well-defined calcite vein which strikes northwest, approximately perpendicular to the strike of the country rocks, and dips vertically or steeply (85°) to the southwest. Exposed and mineralized portions of the vein are confined to the metaclastic rocks. Coarse-grained, pink to white calcite is the principal vein mineral with subordinate amounts of galena and rare barite, sphalerite, and pyrite. The galena occurs either as scattered grains or as thin (1-5 cm) massive layers conformable with the banding. According to Alcock (1930) large tabular masses of galena that were mined from the vein usually occurred near the footwall. Exposed portions of the vein exhibit a well-developed banding parallel to the contacts due to variations in grain size and zones of discoloration. Elongate, angular fragments of broken country rocks are common in the vein near the contacts.

Numerous relationships, including the cross-cutting nature of the vein, indicate it occupies a late fault zone. The calcite vein is bounded by micaceous schist and breccia zones in many of the diamond drill intersections and exposed portions of the vein are often bounded by a narrow, rusty zone of crushed rock. The breccia consists of angular fragments of country rock cemented by coarse-grained calcite. Uglow (1916) noted that the walls of the vein are often smooth and slickensided.

Principal exposures: The vein is well exposed between shaft no. 1 and No.2 SE by a series of pits or open stopes. The best exposure is in the stope beside shaft no. 2 SE. Two other shafts occur northwest of shaft no. 1 but these are caved and waterfilled and could not be positively identified by the author.

TABLE 12: Mineralized diamond drill intersections, Hollandia lead deposit. Results obtained from unpublished files of Teck Explorations Ltd.

Drill-hole No.	Interval (Feet)	Length (Feet)	%Pb	oz Ag/ ton
1	113 -119.4	6.4	31.76	0.62
2	37.4- 39	1.6	-	-
2	85.5- 87.2	1.7	3.32	-
3	237.4-243	5.6	0.91	trace
4	154 -156	2	2.04	trace
4	156 -158.4	2.4	0.05	trace
5	189.5-191.5	2.0	-	-
5	204.2-206.0	1.8	0.35	
6	209.6-212.0	2.4	16.28	0.76
7	72.7-73.3	0.6	1.08	trace
8	193.9-194.4	0.5	0.21	trace
8	195.0-196.1	1.1	4.80	trace
17	357.5-360.7	3.2	0.29	-
17	360.7-363.3	2.6	1.16	-

DEVELOPMENT HISTORY

1898: Twenty tons of hand cobbed ore were produced from open cuts by L. Meyer and R.C. Van der Meulen.

1903-1906,1916: Four shafts sunk to 90 feet (#1), 132 feet (#2 SE), 65 feet (#2 NW), and 40 ft (#3 NW). The no. 1 shaft was the main shaft, with drifts driven 181 feet east and 159 west from the bottom of the shaft. The part of the vein between #2 SE and #2 NW was stoped out to the surface. A total of 2,653,365 pounds of lead valued at $111,097 were produced by the Ontario Mining and Smelting Co. (1903-1905) and Stanley Smelting Co. (Shklanka 1969).

1956: Eighteen diamond drill holes totalling 3810 feet (1161 m) drilled by Teck Exploration Co. Ltd.

1966: Soil geochemical and ground magnetometer surveys south of the minesite by Pennaroya Canada Ltd.

1980: Geological mapping of mine property at scale of one inch to 130 feet by Can Prospect.

REFERENCES

Alcock, F.J	1930, p.155-157
DeKalb, C.	1899, p.32
Gibson, T.W.	1904, p.11,94
Gibson, T.W.	1905, p.15,79
*Hewitt, D.F.	1968, p.24, Map 2154
Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Sangster, A.L.	1970, p.272
Shklanka, R.	1969, p.139
Thomson, J.E. et al.	1954, p.6.
Uglow, W.L.	1916, p.23-24

27. BONTER PROSPECT

COMMODITY
Copper, nickel

ROCK ASSOCIATION
Host: Pyroxenite

CLASSIFICATION
IC1: Gabbro hosted, copper-nickel

LOCATION AND ACCESS

The Bonter prospect is located in the north-central part of Marmora township approximately 11.5 kilometres north of the town of Marmora and 1.5 kilometres southeast of the twin Sister Lakes (NTS 31C/12). The prospect is accessible on foot by a trail leading to the Twin Sister Lakes from a secondary gravel road and a paved country road leading northwest from Marmora. The deposit is approximately 1.0 kilometre east of the trail.

Lot 27 Con. V, Marmora township, Hastings county
NTS Bannockburn 31C/12 1:50,000
Latitude: 44°35'21"N Longitude 77°43'29"W
UTM Zone 18, 4 940 700N, 283 700E

SIZE AND GRADE

Thomson (1946, p.17) reports the following description by M.E. Wilson:

> "...in 1925, a pit 20 feet long, 10 feet wide and 15 feet deep, and four east-west trending surface rock crosscuts, 50 to 100 feet long, 5 to 10 feet wide, and up to 15 feet deep, had been excavated within an area 150 feet by 125 feet... Average samples across a width of 60 feet in the longest crosscut contained 1.34 percent copper and 0.42 percent nickel. An average sample across 60 feet in the next crosscut to the north contained 2.39 percent copper and 0.48 percent nickel."

Table 13 represents assays of the best drill intersections from 6 holes totalling 1921 feet (Thomson 1950, p.2). A grab sample from the north trend assayed 0.22 percent nickel and 0.35 percent copper and a chip sample assayed 0.47 percent nickel and 1.86 percent copper (Thomson 1950, p.3).

Thompson (1957, p.5) states:
"...In 1953 drilling, three holes cut core lengths up to 250 feet of mineralization; assays were below 1 percent combined copper and nickel".
This drill program consisted of 7 holes totalling 3,607 feet.

Table 13: Assay Results of Selected Drill Intersections on the Bonter property

Hole No.	Core Length (feet)	Copper (percent)	Nickel (percent)
1	176	0.26	0.45
4	39	0.54	0.35
5	9	2.15	0.55
	28	0.66	0.61
	30.7	0.28	1.11

DESCRIPTION

The Bonter prospect occurs in a small mafic intrusion within a band of paragneiss in the north part of Marmora township. Small mafic intrusions also occur in the paragneisses further east, in the marbles to the south and in the mafic volcanic sequence to the north. M.E. Wilson describes the deposit in Thompson (1946, p.17):

"The deposit of copper and nickel occurs on the Bonter property in a mass of igneous pyroxenite (augitite) intruding greywacke....

"In these openings, notably in the northern part of the area, the pyroxenite contains pyrrhotite and chalcopyrite disseminated and in fracture."

DEVELOPMENT HISTORY

1925: Five open pits were excavated on the Bonter property. Samples were assayed across 60-foot lengths in two trenches. (Thomson 1946, p.17).

1943: The Consolidation Mining and Smelting Company of Canada Limited carried out geophysical surveys and completed a diamond drill program consisting of 6 holes totalling 1921 feet. (Thomson 1950).

1953: The property was held by East Rim Nickel Mines Limited and optioned to Ontario Nickel Mines Limited. Ontario Nickel Mines completed 7 drill holes totalling 3609 feet. Thomson et al., 1957, p.5).

REFERENCES

Sangster, A.L. 1970, p.180-187

Shklanka, R. 1969, p.140

Thomson, J.E. 1946, p.17

1950, Geoscience Date Centre, Toronto

1957, p.5

28. CAVERLY OCCURRENCE

COMMODITY
Zinc, Copper

ROCK ASSOCIATION
Host: Argillite

CLASSIFICATION
IB1: Stratiform sedimentary hosted, copper-zinc

LOCATION AND ACCESS

The occurrence is located in the northwest corner of Marmora township, approximately 4.5 kilometres northeast of Cordova Mines and 1.5 kilometres southwest of the Twin Sister Lakes (NTS 31C/12). It is accessible on foot from gravel roads leading north and east from Cordova Mines.

Lot 26, Con. II, Marmora township, Hastings county
NTS BANNOCKBURN 31C/12 1:50,000
Latitude: 44° 34' 30" Longitude: 77°46'00"
UTM Zone 18 4 939 250N, 280 330E

SIZE AND GRADE

Carter (1980, p.172) states that the mineralized zone is at least 300 m in length and 100 m wide. Three diamond drill holes (1169 feet) were completed by Conigas Mines Limited. All but 20 feet of core from one hole were analysed (106 samples, generally 10 foot lengths) for Cu, Zn and Ag (Ritchie 1969). Table 14 lists the range of metal values for samples from each hole. Table 15 lists the analyses obtained by Carter on a representative chip sample (80 TRC-240) and a selected sample (80 TRC - 241) of well mineralized pyritic argillite at the east end of the zone.

DESCRIPTION

Carter (1980, p.172) noted that the Caverly, Myers and Deer Lake occurrences are located adjacent to each other in the same general stratigraphic level. The rocks in this area form an extensive sequence of thinly bedded argillite, siltstones and sandstones at the top of a thick succession of mafic metavolcanic rocks. Carter examined the occurrence and observed a well-exposed arcuate zone of rusty argillites and quartzose sandstones containing scattered sulphide-rich lenses. (Ritchie (1969, p.3) states:

"The silicified and mineralized argillites of the locality are severely contorted, though the general strike of the environment is east and the dip is nearly vertical. At the observed outcrops, the small drag folds are enveloped by a large flexure that plunges southerly."

TABLE 14: Range of metal values obtained from core samples by Conigas Mines Limited

	DDH 6922-1 (410')	DDH 6922-2 (414')	DDH 6922-3 (414')
Cu (percent)	0.04 - 0.16	0.02 - 0.12	0.01 - 0.08
Zn (percent)	0.11 - 1.49	0.10 - 1.49	nil - 1.71
Ag (oz/ton)	0.07 - 0.33	0.07 - 0.33	tr - 0.25

TABLE 15: Metal contents of selected samples from mineralized pyrite argillite

	80 TRC-240	80 TRC - 241
Cu (ppm)	88	286
Zn (ppm)	2820	2310
Pb (ppm)	60	76
As (ppm)	42	63
Sb (ppm)	1.1	2.8
Ag (0z/ton)	<0.1	<0.1
Au (oz/ton)	<0.01	<0.01

Drill logs indicate that the host rock contains both quartz and calcite veins (Ritchie 1969).

Mineralization: Ritchie (1969, p.2) writes:

> "...In order of abundance, the recognizable metallic minerals are pyrite, pyrrhotite, magnetite, sphalerite and chalcopyrite. The sphalerite is both black and brown ...The chalcopyrite is usually associated with the pyrrhotite rather than with the pyrite."

The sulphides are described as disseminated grains, veinlets and conformable ribbons which comprise up to 25 percent of the core. Chlorite alteration was reported in part of the mineralized zone intersected by one drill hole (Ritchie, 1969, p.3).

DEVELOPMENT HISTORY

1967:	Mr. C.R. Young drilled 1 hole (104 feet) on the occurrence (Ritchie 1969, p.3).
1969:	Coniagas Mines Limited completed 3 drill holes (1169 feet) through the mineralized zone and analyzed 106 core samples (Ritchie 1969).

REFERENCES

Carter, T.R. 1980, p.172
Ritchie, C.T. 1969, Geoscience Data Centre, Toronto.

29. MYERS RUSTY SCHIST OCCURRENCE

COMMODITY
Zinc, copper

ROCK ASSOCIATION
Host: Argillite
Other: Marble

CLASSIFICATION
IB1: Stratiform sedimentary hosted copper, zinc.

LOCATION AND ACCESS
The occurrence is located in the northwest corner of Marmora township, approximately 4.5 kilometres north of Cordova Mines and 2.0 kilometres east of Cordova Lake (NTS 31 C/12). It is accessible from Cordova Mines on foot from a gravel road along the boundary between Belmont and Marmora townships.

Lot 27, Con. I Marmora township,
Hastings county
NTS BANNOCKBURN 31 C/12 1:50,000
Latitude: 44°35'30"N Longitude 77°47'00"W
UTM Zone 18, 4 941 140N, 279 070E

SIZE AND GRADE

Miller (1957, p.4) states that the mineralized zone is 500 feet long and 20 feet wide. Carter (1980, p.172) describes the deposit as a horseshoe-shaped layer about 350 m long and 30 to 50 m wide. Table 16 lists the analyses of representative chip samples from the central (80 TRC-247) and east end (80 TRC-248) of the zone.

DESCRIPTION

General Geology: According to Miller (1957, p.2) the geology of the area isdominated by a sequence of mafic volcanic rocks, clastic metasedimentary rocks and marbles. The mafic volcanic rocks are comprised of massive, chloritic andesitic flows and tuffs which are amphibolitized in places. Clastic metasedimentary rocks consist of interbedded quartzites and finely laminated graphite and biotite rich argillites and tuffs. The marbles are grey or white, coarse-grained and calcitic in composition. Miller writes:

> "...The rocks have been deformed into a syncline plunging N70°E at about 50 degrees. The axial plane strikes N60°E and dips 80 degrees SE.
> ...The syncline is related to the Oak Lake anticline northwest of the map area..."

Carter (1980, p.172) states that the Myers, Caverly and

Deer Lake occurrences are located adjacent to each other at the same general stratigraphic level.

TABLE 16: Metal values of selected samples from the Myers Rusty Schist occurrence

	80 TRC-247	80 TRC - 248
u (ppm)	670	68
n (ppm)	2900	217
b (ppm)	40	20
s (ppm)	94	118
b (ppm)	1.8	1.8
g (0z/ton)	<0.1	<0.1
u (oz/ton)	<0.01	<0.01

Carter noted that the mineralized zone forms a horseshoe-shaped layer within black, aphanitic argillite at the contact with calcitic marbles. An outcrop of pink, aphanitic massive rhyolite was also identified near the showing.

Mineralization: Carter reports 10 to 20 percent disseminated, fine-grained (0.5 mm) pyrite in rusty schists. Miller (1957, p.4) describes the mineralized zone as thin (1/8 inch), discontinuous alternating layers of massive pyrrhotite, graphite and biotite-rich siltstone. This zone is localized within a drag fold conformable with the bedding. Minor sphalerite (1 percent) occurs with the pyrrhotite (Miller, 1957, p.4).

DEVELOPMENT HISTORY

1957: The Texas Gulf Sulphur Company completed detailed geological and ground electromagnetic and magnetometer surveys over an area which includes the Myers rusty schist occurrence (Miller and Clayton, 1957).C.R. Young and J.D. Cumming

1965: completed one drill hole (135 feet) on the property (personal files, C.R. Young).

REFERENCES

Carter, T.R.	1980, p.172
Miller, L.J. and Clayton, R.W.	1957, Geoscience Data Centre, Toronto

30. BERTRIM OCCURRENCE

COMMODITY
Pyrite

ROCK ASSOCIATION
Host: Quartzite
Other: Marble metagreywacke

CLASSIFICATION:
IE1: Stratabound, sedimentary hosted, pyrite

LOCATION AND ACCESS

The occurrence is situated in the central part of Olden township, approximately 5 kilometres northeast of Mountain Grove (NTS 31 C/15). It is within 250 metres south of Highway 7, at a point 5 road kilometres east of the junction with the access road to Mountain Grove. The deposit is indicated on ODM Maps 2053 (Hewitt 1964) and 1947-5 (Harding 1951).

Lot 15 Con VI, Olden township, Frontenac county
NTS SHARBOT LAKE 31 C/15, 1:50,000
Latitude: 44°45'25"N, 76°47'38"W
UTM Zone 18, 4 957 300 N, 358 000E

SIZE AND GRADE

Harding (1951, p. 57-58) reports a mineralized zone 50 feet wide and at least 200 feet long. Workings consist of a 200 foot trench along the strike of the zone and a number of cross trenches and pits at the eastern extension of the mineralization. Unspecified gold values were reported.

DESCRIPTION

General Geology: According to published geological maps of the area, the occurrence in situated in a northeast trending sequence of interlayered para-amphibolite, paragneiss and marbles. The sequence is bounded to the north by granitic gneisses and to the south by felsic and mafic intrusive rocks.

The local geology is described by Harding (1951, p.57-58):

"...The mineralized zone is composed largely of quartzite with a little limestone and intrusions of granite and quartz veins. The zone is flanked on the north by crystalline limestone and greywacke and on the south by overburden. All the beds in the vicinity strike generally east-west. They dip south at angles ranging between 45 and 85 degrees...

...The mineralization was confined almost entirely to pyrite which occurred abundantly in both the sediments and vein quartz as blebs and disseminations."

DEVELOPMENT HISTORY

1936: Stripping, trenching, blasting and sampling activities were carried out by C.W. Greenland. One trench is reported to be 200 feet in length (Harding, 1951, p.58).

REFERENCES

*Harding, W.D. 1951, p.57-58, Map 1947-5
*Hewitt, D.F. 1964, p. 16, Map 2053
1967, p. 7
Sangster, A.L. 1970, p.104

31 LONG LAKE ZINC MINE (Past Producer)

COMMODITY
Zinc

ROCK ASSOCIATION
Host: Calcitic, marble
Other: Gabbro

CLASSIFICATION:
IA1: Stratiform, carbonate hosted, zinc

LOCATION AND ACCESS

The former Long Lake zinc mine is located in the south central part of Olden township, approximately 8 km by road northwest of the village of Parham (NTS 31C/10) It is accessible via a series of paved and gravel roads extending between Parham and the village of Mountain Grove, and lies approximately 670 metres west of the Long Lake post office, 120 metres north of a gravel concession road (Figure 14). The deposit is shown on OGS Map 2449 (Wolff 1981)

Lot 3 Con V, VI Olden Township; Frontenac county
NTS TICHBORNE 31 C/10 1:50,000
Latitude: 44°41'20" N Longitude 76°46'20"W
UTM Zone 18, 4 949 775 N, 359 575 E

SIZE AND GRADE

The Long Lake zinc deposit has supported small-scale mining operations by different operators several times since its discovery in 1897. Early production included more than 100 tons of ore removed in 1901; between 1902 and 1907 about 3442 tons of zinc ore valued at $41,550 were shipped from the property; and in 1949 a total of 240 tons of zinc concentrates and 15 tons of lead concentrates were reported to have been produced, although there is no record of these having been sold. This early production was obtained from several small lenses of zinc mineralization occurring within two, separate, parallel horizons. The mineralized lenses are reported to have been roughly circular in section, varying from 1.5 to 30 metres long, and a few centimetres to 4.3 metres wide. The largest single body mined is reported to have been 4.3 metres wide and 27 metres long, and was mined to a depth of about 12 metres (Alcock 1930). Workings during these early periods of development are reported by Alcock (1930) to have included 5 shafts, varying in depth from 18 to 38 metres, about 100 metres of drifting, mainly in ore, 3 open cuts up to 18 metres long and 12 metres deep, and 25 pits and trenches varying in depth from 1 to 9 metres. An additional 90 metres of drifting was completed in 1949 (Thomson 1952).

On March 1, 1973, Lynx-Canada Explorations Ltd. in partnership with Canadian Reynolds Metals Ltd. commenced mining of three newly discovered ore lenses (A,B, and C) west of the previously mined orebodies, using an underground ramp for access and modern trackless mining equipment. Between March 1, 1973, and the closing of the mine on December 31, 1974, a total of 94,631 short tons of ore averaging 11.6 percent zinc were mined and milled (Ministry of Natural Resources, Mineral Resources Branch, Mineral Statistics Section, Toronto). According to Wolff (1982) the A zone was the richest with a zinc content locally exceeding 40 percent. The B zone, the largest of the three, graded approximately 23 percent zinc and was 100 metres long, 4 to 5 metres wide, and extended about 30 metres vertically. The C zone was the smallest and lowest grade.

GEOLOGY

The Long Lake zinc deposit occurs within a remnant of calcitic marble which forms a xenolith within a large gabbroic intrusion termed the Mountain Grove Mafic Intrusion by Wolff (1982). The marble remnant has total strike length of about 1 km and is up to 180 metres wide. Layering in the marbles strikes northeast and generally dips steeply to the northwest. Several lenses of gabbro, elongate parallel with layering, occur within the marble remnant. Discontinuous, cross-cutting dikes of granite cut both the marble and the gabbro, and in at least one place a granitic dike cuts a layer of zinc mineralization.

These types of marble were distinguished by the author in the Long Lake marble remnant; 1. Very coarse-grained (1cm), massive, calcitic marble. 2. Laminated calcitic marble; and 3. Layered, siliceous calcitic marble. Each type forms locally well-defined horizons that are gradational into each other over short distances. The coarse-grained marble is composed almost entirely of white calcite and is typified by its coarse grain size (10-80 mm), massive nature, and lack of impurities. It occurs throughout the Long Lake marble remnant but is best developed in the eastern part of the belt. The laminated calcitic marble has very regular, well defined, white and grey layers 0.5 to 5 cm thick. The grey layers are generally finer-grained (3-5 mm) than the white layers (5-8 mm) and contain abundant (5-20 percent), very fine (0.5 mm), disseminated flakes of biotite and phlogopite. Dolomite and tremolite are minor constituents. The layered, siliceous calcitic marble is characterized by thin (0.5 to 50 cm) siliceous layers and lenses contained within either coarse-grained or laminated calcitic marble. The siliceous layers and lenses contain abundant fine-grained (1-3 mm) diopside, tremolite, and occasional quartz, in variable proportions, in addition to calcite. The siliceous layers often pinch and swell along strike, in a manner similar to boudin structures.

The surrounding mafic intrusive rocks are dominated by massive to foliated, black, fine to medium-grained (1-4 mm) gabbro which grades locally into anorthositic gabbro. Pink, fine to coarse-grained, massive to foliated monzonite occurs as scattered irregular lenses and dikes within the gabbros. The gabbros are composed principally of a granoblastic intergrowth of plagioclase and hornblende with accessory magnetite. Relict pyroxene is rare and unrecrystallized laths of plagioclase are locally common. The monzonite is composed principally of feldspar, with minor quartz. Large augens of K-feldspar are common. Foliations in all the above intrusive rocks are conformable with the Long Lake marble remnant.

Granitic dikes intrude the mafic intrusive rocks and are probably associated with a large granitic intrusion which outcrops immediately northeast of the marble remnant. The granite forms a pink, massive to weakly foliated, medium grained rock, with local pegmatitic and aplitic phases, which also form dikes.

Mineralization: Mineralization at the Long Lake zinc deposit consists principally of sphalerite, with accessory pyrite and pyrrhotite, and minor galena, chalcopyrite, and molybdenite, contained within conformable lenses in the Long Lake marble remnant. At surface, narrow conformable lenses of reddish-weathering, disseminated to massive sulphides are exposed in outcrops and in pits and trenches in several places (Figure 14). These mineralized lenses usually consist of stringers 1 to 2 centimetres wide traceable for only a few metres along strike containing sparsely disseminated, fine- to medium-grained (1-4 mm) sphalerite with minor pyrite and rare galena and sphalerite. Several such stringers sometimes occur parallel to each other, separated by barren marble. The largest mineralized lens observed by the author is 10 cm wide, can be traced along strike for about 15 metres, and contains up to 60 percent disseminated sulphides. Abundant, fine-grained, disseminated diopside, and occasional tremolite and quartz occur within the sulphide lenses in addition to calcite. The lenses usually lie within laminated calcite marble and, less commonly, coarse-grained massive calcitic marble. Siliceous lenses occur in the marble along strike from the mineralized lenses.

Early mining development of the deposit was confined to several lenses of massive sulphides occurring in two general horizons about 25 metres and 60 metres south of the north contact, in the western part of the marble remnant. According to Uglow (1916) the ore formed a series of thickened and flattened conformable lenses that varied from circular in section to cigar-shaped, pitching to the east or west down the strike. Each particular body pinched or swelled several times along its length. Individual lenses were usually entirely separate, with sometimes a narrow stringer of disseminated sulphides connecting large lenses. The coarser-grained ore consisted essentially of sphalerite, while fine and medium-grained ore generally consisted of

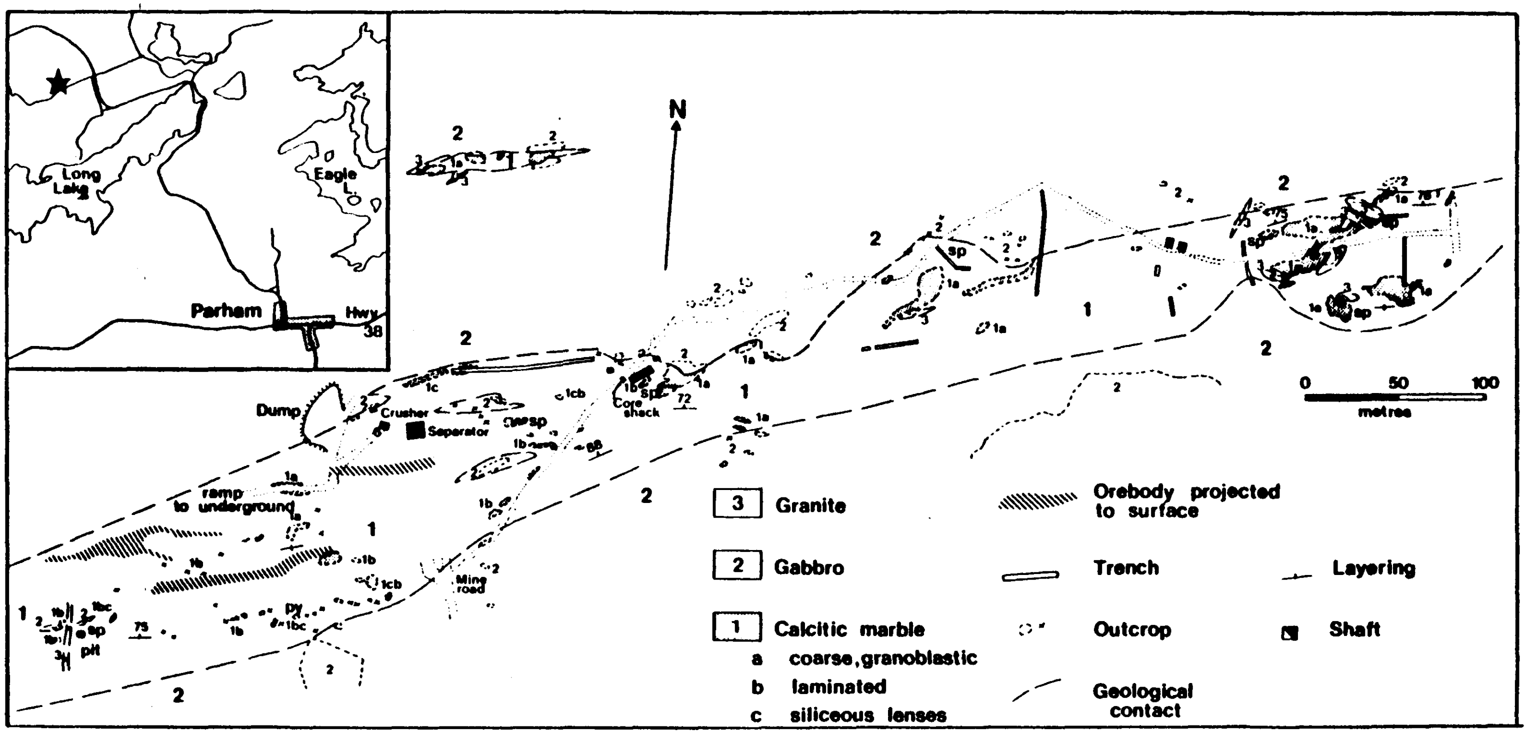

Figure 14: Geology of the Long Lake Zinc Deposit (Adapted from Wolff, 1969).

mixtures of sphalerite and other sulphides. Massive pyrite and pyrrhotite, devoid of sphalerite, were often abundant on the outside edges and extensions of ore zones.

> "Apart from the ore horizons, diopside and quartz are not abundant. Around the edges of the ore "lenses" and especially along a general horizon in which ore occurs, localities rich in diopside are common. It is not unusual to find an outward transition in the plane of the banding of the limestone from zinc ore to a zone of iron sulphide disseminations and then finally to a zone of mixed calcite and diopside grains." (Uglow 1916a, p.237).

The recently mined (1973-1974) orebodies formed massive, steeply plunging lenses to lying conformably within marble to the west of the previously mined orebodies. Orebody shapes, mineralogy, and geologic associations were similar to the earlier known orebodies, as described above. Silicate minerals were again noted to be intimately associated with the mineralization and were reported to include grossulatite and chondrodite (Brown 1976) in addition to diopside and quartz. Some narrow cross-cutting veins containing colloform overgrowths of sphalerite, pyrite, marcasite, and calcite were exposed and have been interpreted to be post-metamorphic in origin (Cone 1976; Brown 1976). Except for these late veins, textures of the ore minerals in polished sections (Cone 1976; Brown 1976) are indicative of metamorphic recrystallization with no preservation of primary depositional features. This is consistent with the previously described macroscopic features of the Long Lake zinc deposit, all of which indicate the deposit has been metamorphosed along with its host rocks.

DEVELOPMENT HISTORY;

- 1897 : Report of first work done on this property (Uglow 1916a).
- 1901: First significant discovery of zinc mineralization made by Leslie Benn on land owned by Howard Ritchie. Benn sank a pit and removed more than 100 tons of ore (Harding 1951).
- 1902-1913: The land was subsequently bought by James Richardson and Sons who owned the property for nearly 50 years. During this time 5 shallow shafts 18 to 47 metres deep and numerous pits and trenches were excavated. Shipments of zinc ore were made in 1902-1904, 1906, and 1907, totalling 3,442 tons valued at $41,550 (Thomson 1952; Shklanka 1969).
- 1914-1915: The property was optioned by the Long Lake Zinc Company which dewatered the old workings and completed about 300 metres of diamond drilling (Shklanka 1969).
- 1927: Some of the pits and shafts were dewatered, and examined by M.E. Wilson of the Geological Survey of Canada (Alcock 1930).

1947-1950: In 1947 the mine was leased from the owners, James Richardson and Sons, by Rochette Gold Mines Ltd, who subsequently reorganized as Consolidated Rochette Mines Ltd in 1950. In 1949 a 35 tpd mill was installed and an unsuccessful attempt was made to process oxidized ore from surface dumps. One of the old shafts was dewatered and about 90 metres of drilling in mineralized lenses was completed. A total of 240 tons of zinc concentrate and 15 tons of lead concentrate were reported to have been produced, but apparently was not sold. In 1950 a total of 25 diamond drill holes were completed (Thomson 1952).

1966: The property was optioned by Mid-South Explorations Ltd who carried out surface exploration (Shklanka 1969).

1970-1974: Lynx-Canada Explorations Ltd (45%) in partnership with Canadian Reynolds Metals Ltd (55%) purchased the mining rights and leased the surface rights on the recommendation of Dr. W.D. Beaton of Montreal. Initial diamond drilling consisted of 25 holes totalling about 1830 metres and resulted in the discovery of a number of lenses of massive sulphides (Brown 1976).

The second phase of drilling consisted of 66 holes totalling 5651 metres and outlined the mineralized zones in detail. Ore reserve estimates varied but the most optimistic indicated 84,750 tons grading 21.6 percent Zn with minor lead and silver. Subsequent drilling involved 68 holes totalling 5041 metres (Wolff 1982). In addition a total of 114 underground diamond drill holes were completed during production from the mine, totalling about 1370 metres (Brown 1976).

Magnetic, induced polarization, spontaneous polarization, gravity, and soil geochemical surveys were completed in conjunction with exploration of the deposit. Telluric and electromagnetic (EM16) surveys were conducted after definition of the orebodies was complete.

Production commenced on March 1, 1973, at a rate of about 200 to 300 tons per day. Mining was by trackless equipment using a peripheral ramp for access to the orebodies. Maximum depth reached during mining was 35 metres. Ore was crushed and beneficiated to approximately 20 percent zinc in a heavy media concentrator on site. The concentrate was then shipped to the Balmat mill of St.Joe Minerals Corporation in New York State. The mine closed on December 31, 1974 (Brown 1976; Wolff 1982; Mikkelborg 1973).

Total production amounted to 94,631 short tons of ore averaging 11.6 percent zinc (Ministry of Natural Resources, Mineral Resources Branch, Mineral Statistics Section) from which were recovered approximately 22.3 million pounds of zinc (The Financial Post, 1976, p.119).

1981: The author visited the mine site and vicinity in the summer of 1981. The mine workings were flooded and all openings were fenced or sealed. The heavy media separator was still on the site and apparently in good condition. All other buildings and equipment had been removed.

REFERENCES

Alcock, F.J.	1930,	
Brown, A.C.	1976,	32p.
Cane, R.D.	1976,	
Harding, W.D.	1951,	
Mikkelborg, E.	1973,	p.64-65
The Financial Post	1976,	p.119
Thomson, J.E.	1952,	
Uglow, W.	1916a,	p.231-245
Uglow, W.	1916b,	p.44-47
*Wolff, J.M.	1979,	174p.
Wolff, J.M.	1982,	76p.
*Wolff, J.M. and Smith, D.A.	1981,	Map 2449

32. SHARBOT LAKE MINES LIMITED PROSPECT

COMMODITY: Nickel, copper

ROCK ASSOCIATION
Host: Gabbro

CLASSIFICATION
ICI: Gabbro hosted, copper-nickel

LOCATION AND ACCESS

The prospect is located in the central part of Olden township, approximately 4 kilometres east of Mountain Grove (NTS 31C/10). It is accesible by all-weather gravel roads running between Mountain Grove and O'Reilly Lake. The deposit is 2.3 road kilometres south and east of the intersection between the access road and an abandoned Canadian Pacific Railway line (2 kilometres east of Mountain Grove). The prospect is shown on O.G.S map 2249 (Wolff and Smith, 1981).

Lot 10, Con. VI, Olden township, Frontenac county
NTS TICHBORNE 31C/10, 1:50,000
Latitude: 44°43'30"N Longitude: 76°47'55"W
UTM Zone 18, 4 955 100 N, 359 400 E

SIZE AND GRADE

A diamond drill program delineated a sulphide rich zone 228m long, 46m wide and 312m deep (maximum). A 5.5m long section of core from one hole assayed 0.3 percent Ni, 0.3 percent Cu, and 0.14 percent Co. A grab sample from a trench assayed 1.0 percent Ni, 0.75 percent Cu and 0.1 percent Co. (Wolff, 1982, p.66).

DESCRIPTION

The Sharbot Lake Mines Limited prospect is situated in the north part of the Mountain Grove Basic Intrusive Complex in the south part of Olden township. Wolff (1982 p.30) writes:

> "....The body has a crude "Z" shape and is sandwiched by intrusive rocks of unit 11 (McLean Granite Pluton), to the east, south and west. The maximum dimension (north-south) of this mafic body is 7 kilometres. On the northern boundary, unit 10 (Mountain Grove Mafic Intrusion) is in contact with unit 2 (Mafic to intermediate) metavolcanics, and an embayment of unit 4 (carbonate metasediments) forms the western boundary.....".

The rocks in the vicinity of the prospect are massive medium-to coarse-grained gabbro and anorthositic gabbro. Mineralization consists of disseminated sulphides, with low concentrations of nickel, copper and cobalt.

DEVELOPMENT HISTORY

1956: Sharbot Lake Mines Limited carried out stripping and trenching activities. (Wolff, 1982, p.66)

1957: Sharbot Lake Mines completed 17 drill holes (13,000 feet) and delineated a sulphide-bearing zone with low concentrations of copper, nickel and cobalt. (Wolff, 1982, p.66)

REFERENCES

Sangster, A.L.	1970, p.190-193
Wolff, J. M.	1982, p.66
*Wolff, J. M. and Smith D. A.	1981, Map 2249

33. SMITH, W.J. OCCURRENCE

COMMODITY
Zinc

ROCK ASSOCIATION
Host: Calcitic marble
Other: Dolomitic marble, paragneiss

CLASSIFICATION
IA1: Stratiform, carbonate hosted zinc

LOCATION AND ACCESS

The occurrence is located in the southwest part of Olden township, approximately 4 kilometres south of Mountain Grove (NTS 31 C/10). It is accessible on foot from a vehicle trail joined to a secondary gravel road servicing the southwest corner of the township. The showings are about 500 m north of Little Beaver Lake. The occurrence is indicated on ODM Maps 2449 (Wolff, 1981) and 1947-5 (Harding, 1951).

Lot 8 Con II, Olden Township Frontenac County
NTS TICHBORNE 31 C/10 1:50,000
Latitude: 44°42'04"N Longitude 76°50'43"W
UTM Zone 18 4 951 200 N, 353 800E

SIZE AND GRADE

The workings consist of 3 pits excavated in the mineralized zone over a distance of 50 feet (Harding 1951, p.91). Lynx-Canada Exploration drilled 4 holes revealing a zone of 1 percent Zn over 30 metres (Wolff 1982, p.64).

DESCRIPTION

General Geology: Wolff's (1982, Map 2449) geological map of the Long Lake area indicates that the deposit occurs in a large irregular body of calcitic marble. The marbles are bounded on the north and east by the Mountain Grove gabbroic intrusion, on the south by the McLean Pluton (granitic) and on the west by mafic metavolcanic rocks and minor clastic, siliceous gneisses and schists. The occurrence is one of a number of carbonate hosted sphalerite deposits within the southwest part of Olden township.

Carter (1980, p.171) reports that the major rock types in the vicinity of the occurrence consist of calcitic marbles with minor dolomitic marble, siliceous paragneiss and leucocratic granite. The host rock is a white-to-grey coloured, fine- to coarse-grained, well-layered (folded) calcitic marble with minor disseminated muscovite, tremolite and dolomite. Locally, the calcitic marbles contain large lenses and layers of massive, fine to medium-grained dolomitic marble and angular fragments of fine to medium-grained, layered siliceous paragneiss. Near the showings, the host rocks contain layers (1 to 50 cm thick) and lenses of tremolite rich dolomitic marble and are cut by numerous fine-grained leucocratic granite dikes and sills.

Mineralization: Carter describes the mineralization at one showing as 4 narrow (0.5 to 2.0 cm) conformable layers of disseminated sphalerite over a width of approximately 7 metres. The sphalerite is very fine-grained (0.2 to 1.0 mm) and comprises 5 to 35 percent of the mineralized layers. A second showing consists of zinc mineralization at the boundary between lensoidal fragments of paragneiss and calcitic marble. This zone is approximately 80 cm wide and locally may contain up to 40 percent medium-grained sphalerite. The gangue material is white, fine-to-medium-grained calcitic marble.

DEVELOPMENT HISTORY

1947: The mineralized zone was first described by Harding (1951, p.91) who reported 3 pits excavated by unknown operators.

1973: Lynx-Canada Exploration Limited drilled 4 holes (962 feet) near a mineralized zone (Lynx-Canada Explorations Ltd, 1973).

REFERENCES

*Harding, W.D.	1951, p.91, Map 1947-5
*Hewitt, D.F.	1964, p.16, Map 2053
Lynx-Canada Explorations Limited	1973, Geoscience Data Centre, Toronto
Sangster, A.L.	1970, p.123.
*Wolff, J.M.	1982, p.64, Map 2449

34. LONG POINT OCCURRENCE

COMMODITY
Lead

ROCK ASSOCIATION
Host: Marble
Other: Pegmatite

CLASSIFICATION
IA2: Unconformable, carbonate-hosted, lead

LOCATION AND ACCESS

The occurrence is located in Rear of Leeds and Lansdowne township, approximately 5.0 kilometres south of Lyndhurst and 0.75 kilometres northeast of Long Point (NTS 31 C/9). It is accessible on foot from a gravel road which passes through Long Point and joins to a paved road at Lyndhurst. The location is indicated on ODM Map 2054 (Hewitt 1964), and GSC Map 1182A (Wynne-Edwards 1967).

Lots 2,3,4,5,6 Con. VIII, Rear of Leeds and Lansdowne township, Leeds county
NTS WESTPORT 31 C/9, 1:50,000
Latitude: 44°30'26"N Longitude 76°06'25"W
UTM Zone 18, 4 928 600 N, 412 000E

SIZE AND GRADE

The mineralization occurs within a system of calcite veins in a marble host rock. The major vein has an average width of 2 feet and extends for 0.25 miles. A second mineralized vein 0.5 to 1.0 feet wide branches into 4 parallel veins over a zone 1000 feet wide (Logan 1863, p.688). At least 15 shafts and pits were excavated in a linear belt over a distance of 4000 feet. One shaft was opened to a depth of 50 feet and a total of at least 1500 feet of drifting was completed from the shafts (Wynne-Edwards 1967, p.123).

DESCRIPTION

General Geology: Hewitt's geological compilation map (Map 2054, 1964) indicates that the prospect occurs on the north side of the Frontenac axis. The rocks in the region are comprised of thick folded sequences of interlayered marble, granite gneiss and quartzo-feldspathic and pelitic metasedimentary rocks intruded by the Lindhurst Granite pluton. In the area of the showings, the marbles trend northeast and are steeply dipping.

The mineralization occurs in a system of northwest trending calcitic veins which crosscut marble and white pegmatite.

The veins are described as fracture fillings and have no associated wall rock alteration (Wynne-Edwards 1967, p.123).

> Mineralization: Wynne Edwards 1967, p.123-124) writes: "....Galena is the only abundant sulphide, and occurs with small amounts of chalcopyrite, celestite and barite, in crystalline masses up to an inch in diameter, scattered through coarsely crystalline calcite gangue."

Disseminated galena also occurs in the marble host rock adjacent to the veins (Logan 1863, p.688).

DEVELOPMENT HISTORY

1854:	A shaft 50 feet deep was excavated on lot 3, Concession VII (Logan 1863, p.688).
pre 1863:	An unspecified number of shafts were opened on lot 2, Concession VII by unknown operators. One shaft was excavated on lot 4, Concession VIII by Mr. Foley and company (Logan 1863, p.688).
1875:	Several shafts were opened on lots 3,4 and 5, Concession VII and at least 1500 feet of drifting was completed. A small amount of lead was produced from a smelting furnace (Wynne-Edwards 1967, p.123).
pre 1927:	A total of 15 shafts and pits were reported on the property (Brownwell 1927).

REFERENCES

Alcock, F.J.	1930, p.141-142
Ells, R.W.	1903, p.138A
*Hewitt, D.F.	1964, p.27, Map 2054
Logan, W.E.	1859, p.48-49
Logan, W.E.	1863, p.688
Murray, A.	1852, p.82-83
Sangster, A.L.	1970, p.272
Shklanka, R.	1969, p.196
Thomson, T.E.	1950, p.12
Thomson, T.E.	1952, p.14
Uglow, W.L.	1916, p.28
*Wynne-Edwards, H.R.	1967, p.123-124, Map 1182A

Lansdowne Lead Vein

35. SLAVE LAKE ZINC PROSPECT

COMMODITY: Zinc

ROCK ASSOCIATION:
Host: Calcitic marble
Other: Granite, amphibole-biotite-plagioclase gneiss

CLASSIFICATION:
IA1: Stratiform, carbonate hosted, zinc

LOCATION AND ACCESS

The Slave Lake Zinc prospect is located in the east-central part of Sheffield Township, about 12.5 kilometres northeast of Tamworth (NTS 31C/10). An all-weather gravel access road runs from Enterprise to Parham. The prospect is accessible from a vehicle trail which passes south of Slave Lake and joins the access road approximately 10 road kilometres north of the CPR crossing in northeast Camden East Township. It is located on ODM map 1053 (Hewitt 1964)

Lot 10 Con. XVI, Lots 10, 11 Con. XV,
Sheffield township,
Lennox and Addington county

NTS TICHBORNE 31C/12	1:50,000
Latitude: 44°34'09"N	Longitude: 76°53'02"W
UTM Zone 18 4 936 600 N	350400 E

SIZE AND GRADE

Carter (1981, p.199) identified 6 mineralized zones on the Slave Lake Zinc deposit (Figure 15). Zone 1 is exposed intermittently over a distance of about 400 feet (Kingston 1967). Kingston's sketch map locates nine pits and trenches, the size of the workings and width of the mineralized zones from N to S are:

3' by	6' by	1'	deep,	6" zone,
3' by	3' by	1'	deep,	8" zone,
14' by	3' by	2'	deep,	6"-2' zone
10' by	10' by	12'	deep,	5'-6' zone
8' by	3' by	1.5'	deep,	2"-10" zone
25' by	5' by	4'	deep,	4"-3' zone
16' by	4' by	4'	deep,	2"-8" zone
8' by	3' by	2'	deep,	earth filled
5' by	3' by	1'	deep,	2"-4" zone.

Zone 2 is a mineralized zone at least 4 wide, exposed by a pit 15' by 8' by 10' deep. Zone 3 consists of disseminated sphalerite in a band 8" to 12" wide exposed by a trench 10' by 3' by 6' deep. Zone 4 contains disseminated mineralization and is exposed by two pits 30' by 6'-12' by 3'-6' deep and 15' diameter by 8' deep. Zone 5 is exposed by 6 pits or shafts over a distance of about 500 feet. Carter reported that the workings were up to 10' in diameter and up to 15' deep to the water levels. Well mineralized rocks occur in the rock dumps at the 3 north workings. Development reports state the 4 shafts were excavated to depths raNging from 18' to 53' (Northern Miner Press, 1939; Rickaby 1949). Zone 6 is exposed by an L-shaped trench 55' by 10' by 6' to 8' deep; mineralization occurs in a 4" wide band along part of the trench wall.

A chip sample of mineralization at zone 2 analyzed 19.6 percent Zn, 42pp,m Pb and 0.1 oz/ton Ag, a grab sample from the rock dump contained 44.4 percent Zn, 17ppm Pb, 430 ppm Cu and 980 ppm Cd (Carter 1981, p.199).

DESCRIPTION

Geology: Carter (1981, p.198) writes:

"....The zinc deposit occurs within narrow north-to-northeasterly trending belt of marble that is completely contained within the Hinchinbrooke 'Gneiss', a large circular granitic intrusion. Calcitic and minor dolomitic marble, granite and amphibole-biotite-plagioclase-gneiss are exposed in the vicinity of the deposit (Figure 15). The calcitic marble is a white, medium- to coarse-grained (2 to 6 mm) rock composed essentially of calcite with accessory dolomite, graphite, phlogopite, serpentine, and tremolite-actinolite. The marble is massive to poorly layered, the layers being defined by variations in grain size and shades of grey. Dolomitic marble occurs in only a few outcrops and is similar to the calcitic marble in appearance. The granite is a pink, fine-to medium-grained (1 to 3 mm) foliated to massive rock. It is characterized by augen of pink feldspar 15 to 25 mm long. The amphibole-biotite-plagioclase gneiss is a grey to black, fine-grained (0.5 to 2mm), massive to poorly foliated rock. The mafic mineral content varies from 15 to 50 percent. It may represent the metamorphosed equivalent of either mafic volcanic rocks or pelitic clastic sediments.

The geological relationships of the different rock types are complex (Fig. 15). The marble forms northwest-striking units within granite that are closed around northwest-trending axes. The amphibole biotite-plagioclase gneiss generally occurs as isolated xenoliths within the granite and forms a mappable unit in the east. Layering in the marbles and foliations in the granite generally dip consistently to the southwest at 20 to 85 degrees, with only local variations.

Further structural studies are warranted...
"Estimated modal compositions and whole rock chemical compositions of samples of the hinchinbrooke intrusion and gneiss are listed in Tables 17 and 18.
Mineralization: Carter (1981, p.198-199) writes:

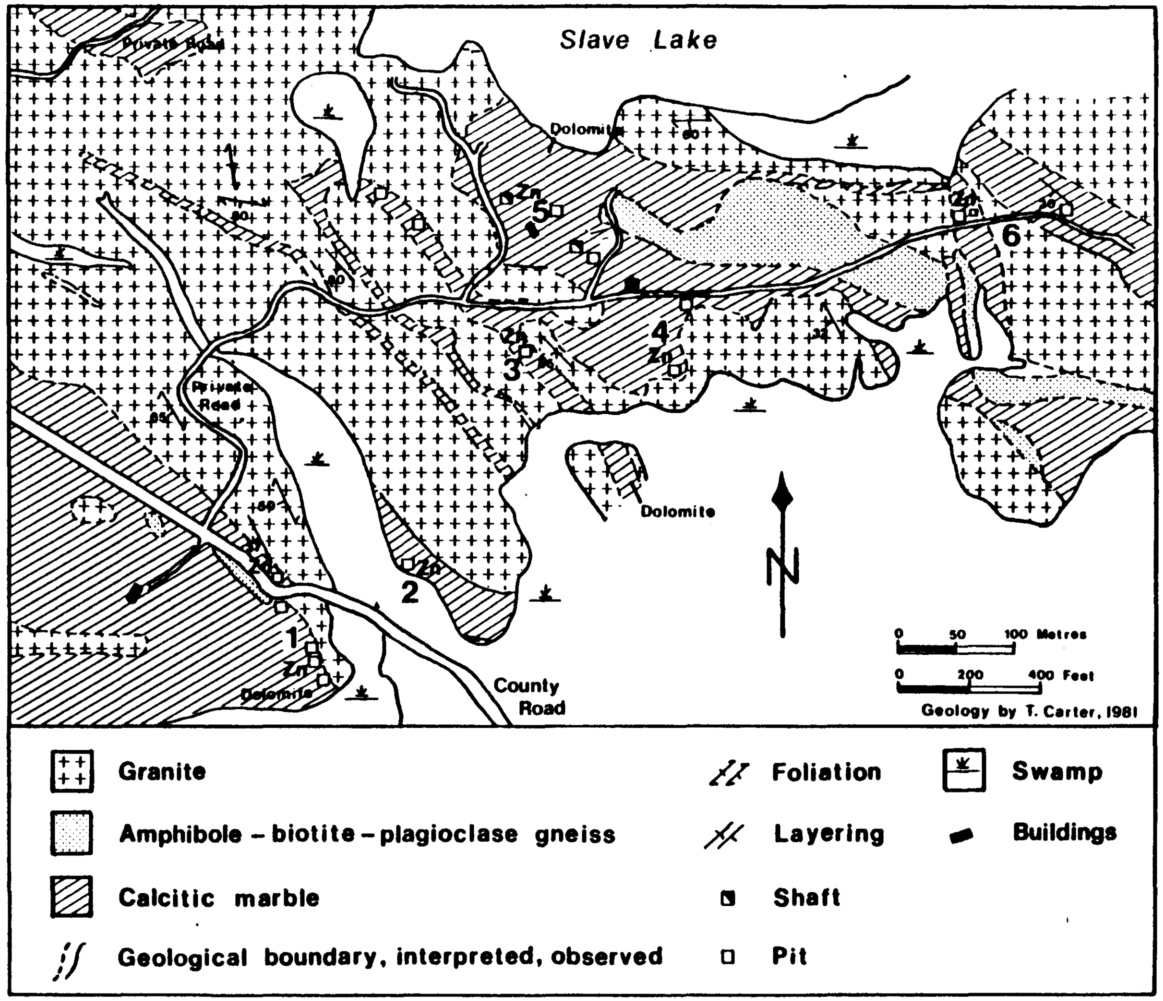

Figure 15: Geology of the Slave Lake Zinc Deposit.

TABLE 17: Estimated modal compositions (in percent) of thin sections of selected rocks from the Slave Lake Zinc Prospect

	Syenitic 80-TRC-36	Pelitic metaclastic -37
Plagioclase	55	70
K-spar	5	-
Hornblende	25	15
Biotite	5	10
Chlorite	5	-
Opaques	5	5
Zircon	minor	minor
Carbonate	minor	minor

TABLE 18: Major element chemical compositions (in in percent) of selected rock units from the Slave Lake Zinc prospect

	Syenite 80-TRC-36	Pelitic Metaclastic 80-TRC-37
SiO_2	52.50	50.60
Al_2O_3	18.60	17.00
Fe_2O_3	3.55	3.73
FeO	5.18	5.91
MgO	2.77	2.82
CaO	5.46	5.98
Na_2O	5.37	5.00
K_2O	2.88	2.78
MnO	0.15	0.16
TiO_2	1.68	2.46
P_2O_5	0.63	1.16
CO_2	0.21	0.37
S	0.12	0.06
H_2O^+	0.28	0.28
H_2O^-	0.32	0.37
Total:	99.70	98.68

"There are six different mineralized zones at the deposit (Fig. 15). Mineralization consists of sparsely disseminated to nearly massive medium-to coarse-grained (2 to 5 mm), dark brown sphalerite and subordinate pyrite in calcitic marble. The sulphides usually form well-defined conformable layers averaging 10cm in thickness and containing approximately 30 percent sphalerite. A chip sample across such a layer in Zone 2 contained 19.6 percent Zn, 42 ppm Pb and less than 0.1 ounce of Ag per ton. A grab sample of massive sulphide mineralization collected from a dump in Zone 2 contained 44.3 percent Zn, 17 ppm Pb, 430 ppm Cu and 980 ppm Cd. The maximum exposed width of zinc mineralization at the deposit is 2 m, in a pit in zone 4. Lengths of the mineralized zones are usually not as well defined but in zone 1 zinc mineralization was observed sporadically over a strike length of at least 100m."

Kingston (1967) reports small amounts of galena, chalcopyrite and pyrite associated with sphalerite in Zone 1.

A polished thin section shows the massive, medium-grained (0.5 to 3.0 mm) texture of the mineralized zone largely composed of carbonate (65%) and evenly disseminated sphalerite (35%). The section also contains small, irregular grains of chalcopyrite (1%) associated with sphalerite and minor disseminated pyrite and pyrrhotite.

DEVELOPMENT HISTORY

before 1916: 2 pits were opened on the occurrence by unknown operators (Uglow 1916, p.48)

1935: Mr. G.A. Beausoleil acquired the property, carried out some preliminary exploration work and transferred his interest to Miss C.L. Beausoleil.

1936-1937: Lennox Mines Limited bought the property and sold it to Lennox Mines Company Limited. One shaft was excavated to a depth of 50 feet, and 60 feet of drifting was completed. Two other shafts were also deepened. About 1000 feet of diamond drilling was completed.

1938-1948:
- -An unspecified amount of trenching was carried out by Lennox Mines Co. Ltd.
- -in 1947-48, a diamond drill program brought the total amount of drilling up to 5000 feet. At this time, the shaft was dewatered and surface mapping and prospecting was carried out.

1967 : -Mr. P.W. Kingston produced a geological map of the property.

REFERENCES

Carter, T.R.	1981, p.198-199
*Hewitt, D.F.	1964, p.31, Map 2053
Kingston, P.W.	1967, Geoscience Data Centre, Toronto
Lennox Mines Co. Ltd.	1949, Geoscience Data Centre, Toronto
Shklanka, R.	1969, p.196
Uglow, W.L.	1916, p.48

36. BLACKBURN OCCURRENCE

COMMODITY
Lead, Zinc, Silver

ROCK ASSOCIATION
Host: Marble, metagreywacke

CLASSIFICATION:
IA2: Unconformable, carbonate vein-hosted lead

LOCATION AND ACCESS

The Blackburn occurrence is situated in the southern part of Tudor Township near the southwest corner of Wolf Lake, approximately 5.0 kilometres northeast of Bannockburn (NTS 31 C/12). It is accessible by gravel roads joining Wolf Lake to Highway 69, at a point approximately 1 road kilometre north of Bannockburn. The occurrence is indicated on ODM Map 2168 (Lumbers, 1969).

Lot 11 Con II, Tudor Township
Hastings County
NTS BANNOCKBURN 31 C/12 1:50,000
Latitude: 44°41'14"N Longitude: 77°32'02"W
UTM Zone 18 4 951 100 N, 299 200E

SIZE AND GRADE

The workings at the Blackburn occurrence consist of 2 pits, a 30 foot trench and a shallow shaft (Lumbers, 1969, p.88). A grab sample of the mineralized vein assayed 4.04 percent Pb, 0.50 percent Zn and 0.10 oz/ton Ag (Lumbers, 1969, p.89).

DESCRIPTION
General Geology: Lumbers' geological map (Map 2168, 1969) indicates that the occurrence is located within marbles on the west side of the boundary with the Tudor metavolcanic formation. The marbles are interlayered with clastic siliceous metasedimentary rocks. All of the rocks in the area are folded and units are generally oriented north-south with steep or vertical dips.

The mineralization occurs in a narrow calcite vein (up to 1 foot wide) which cuts vertically dipping, fine-grained marble with minor, interbedded feldspathic metagreywacke units generally less that 20 feet thick. The vein is oriented N18°W and is vertical (Alcock, 1930, p.159, Lumbers, 1969, p.88).
Mineralization: Lumbers (1969, p.88) states that the calcite vein contains sparsely disseminated, euhedral crystals of galena up to 1/2 inch across. Vein material in the dump was reported to contain disseminated crystals of quartz, barite, galena, chalcopyrite, pyrite and minor sphalerite.

DEVELOPMENT HISTORY

pre 1925: A pit 7 feet in depth was excavated by unknown operators (Alcock, 1930, p.159)

1961: Lumbers (1969, p.88) reports 2 pits, one 30 foot trench and a filled shaft. The operators were not identified.

1970-1971: Great India Explorations Limited acquired the property from H. Bergman and S. Mousin. The property was examined for the company by J.D. McConnell (Great Indian Explorations Limited, 1970).
The company drilled 4 holes (966 feet) however no significant mineralization was reported (Great Indian Explorations Limited, 1971).

REFERENCES

Alcock, F.J.	1930,	p.159
Great Indian Explorations Ltd	1970, 1971,	Geoscience Data Centre, Toronto
*Lumbers, S.B.	1969,	p.88-89, Map 2168
Sangster, A.L.	1970,	p.275
Shklanka, R.	1969,	p.142

37. RAMSAY WILLIAM OCCURRENCE

COMMODITY
Lead, Zinc

ROCK ASSOCIATION
Host: Marble, metagreywacke

CLASSIFICATION
IA2: Unconformable, carbonate hosted, lead

LOCATION AND ACCESS

The occurrence is located in the southeast part of Tudor Township, approximately 1.0 kilometre southeast of Millbridge and 5.0 road kilometres north of Bannockburn (NTS 31 C/12). It is accessible on foot a short distance west of Highway 62 at a point about 1.0 road kilometre north of the junction with the south access road to Millbridge. The occurrence is indicated on ODM map 2168 (Lumbers 1969).

Lots 11, 12, E of Hastings Road, Tudor township,
Hastings county
NTS BANNOCKBURN 31 C/12 1:50,000
Latitude: 44°41'00N Longitude 77°35'03"W
UTM Zone 18 4 950 800 N, 295 200 E

SIZE AND GRADE

The occurrence consists of a system of mineralized calcite and quartz veins with the following dimensions:0.5 to 4.0 feet wide, 930 feet long, 3 feet wide 200 feet long, and 330 feet long (Lumbers 1969, p.89). Workings consist of 3 shallow trenches and at least 5 pits. Three grab samples from the excavation assayed 1.46 to 9.18 percent lead, 0 to 0.42 percent zinc and trace gold and silver (Lumbers 1969, p.89-90).

DESCRIPTION

General Geology: Lumbers' geological map (No. 2168, 1969) indicates that the mineralized veins occur near the boundary of thick, folded sequences of marbles and clastic siliceous metasedimentary rocks. These rock sequences are bounded to the north by the Tudor Gabbro and to the east by the Tudor volcanics and the Lingham Lake mafic intrusive complex. The resultant bedding features in the area are oriented north to northeast and are steeply dipping or vertical.

Rocks in the vicinity of the occurrence consist of a northeast trending, steeply dipping (NW) sequence of interbedded fine-grained marble, feldspathic metagreywacke, calcareous feldspathic metagreywacke and porphyroblastic actinolite-rich metasediments. The vein system strikes approximately N80°W and dips vertically. The system consists of a major calcite vein and two associated zones of en echelon calcite and quartz veins (Lumbers, 1969, p.89). In 1980, Carter visited the workings and observed narrow, discordant and concordant barren veins of quartz and calcite in well layered marble and calcareous metaclastic rocks.

Mineralization: Lumbers writes:

" In places, particularly in the central parts, the calcite veins, which are drusy and contain angular inclusions of the country rocks, show carb structures with either a central cavity containing crystals of calcite, quartz, barite and sulphide minerals, or a central zone of interlocking calcite crystals... In appropriate order of relative abundance, minerals present in the calcite veins are: calcite, barite, galena, quartz, pyrite, sphalerite, and rarely, pale green fluorite. Most of these minerals are found as subhedral to euhedral, coarse-grained crystrals and crystal aggregates, but some massive pockets of galena are present locally... The quartz veins which are drusy locally and rarely contain inclusions of the country rocks are confined mainly to the metagreywacke and porphyroblastic actinolite metasedimentary units and tourmaline is commonly present as coarse-grained crystals and crystalline aggregates in the veins and as fine-grained disseminated crystals and massive aggregates in the adjacent country rocks..... In their relative order of abundance, minerals present in the quartz veins are: quartz, calcite, tourmaline, pyrite, chalcopyrite, and rarely, galena and sphalerite.

DEVELOPMENT HISTORY

pre 1961: Three trenches and at least five pits were excavated by unknown operators (Lumbers 1969, p.89).

REFERENCES

Lumbers, S.B. 1969, p.89-90, Map 2168
Shklanka, R. 1969, p.142

38. TRIANA OCCURRENCE

COMMODITY:
Nickel, Copper

ROCK ASSOCIATION
Host: Metapyroxenite

CLASSIFICATION
IC1: Gabbro hosted, copper-nickel

LOCATION AND ACCESS

The occurrence is located in the southeast corner of Tudor township, approximately 8 kilometres west of Millbridge and 8.5 kilometres northeast of Bannockburn (NTS 31 C/12). The deposit is accessible on foot 0.8 kilometres northeast of the Craig mine which can be reached by a vehicle trail passing south and east of Wolf Lake. The trail leads from a gravel road joined to Highway 62 immediately north of Bannockburn. The Triana occurrence is indicated on ODM map 2168 (Lumbers 1969).

Lots 2,3	Con III, IV	Tudor Township, Hastings County	
NTS	BANNOCKBURN 31 C/12		1:50,000
Latitude	44° 42'34" N	Longitude 77°30'07"W	
UTM Zone 18	4 953 500 N	301 800E	

SIZE AND GRADE

The workings consist of 10 shallow trenches. Six grab samples collected from the trenches contained from 0.02 to 0.48 percent Ni, trace to 0.16 percent Cu and nil to 0.01 oz/ton Au (Lumbers 1969, p.76). Core samples from 4 short drill holes (175 feet total) assayed up to 0.44 percent Cu and 0.95 percent Ni (Triana Exploration Limited, 1957). Samples of mineralized core from 3 holes (340 feet) drilled by Louada Exploration and Development Company Limited assayed up to 0.35 percent Cu and 0.90 percent Ni (Lumbers 1969, p.76).

DESCRIPTION

General Geology: The geological map of Tudor Township (Lumbers, 1969, Map 2168) indicates that the deposit is situated within ultramafic rocks in the southwestern part of the Lingham Lake Complex. Lumbers (1969, p.76) writes:

" With the exception of the most southerly trench, which is in a gabbro, all the trenches are in metapyroxenite and metaperidotite, and most are within that part of the ultramafic rocks richest in metaperidotite. In general, the ultramafic rocks are poorly exposed and existing outcrops are intensely weathered. Magnetite is commonly an abundant accessory mineral in the metaperidotite and both the metaperidotite and metapyroxenite contain abundant talc and serpentine. Where mineralized at the 10 trenches, the mafic rocks contain a few discontinuous quartz veins only a few inches wide, irregularly distributed silicified zones, and 5 to 20 percent disseminated, fine-to medium-grained sulphide minerals which in order of abundance consist of pyrrhotite, pentlandite, chalcopyrite, and pyrite. Penlandite is found as microscopic, exsolution flames and lamellae in the pyrrhotite. Chalcopyrite rarely forms more than 5 percent of the sulphide minerals and pyrite which generally forms less than 2 percent of the sulphide minerals appears to be absent in many of the trenches.

DEVELOPMENT HISTORY

1957: Triana Exploration Limited carried out a ground magnetometer and geological survey over the mineralized zone. A total of 10 shallow trenches and 4 short drill holes (175 feet) were completed (Triana Exploration Limited 1957, Lumbers 1969, p.76).

1967: Louada Exploration and Development Company Limited drilled 3 holes (340 feet) in the mineralized zone. (Louada Exploration and Development Company Limited, 1967).

REFERENCES

*Lumbers, S.B.	1969,	p.76-77, Map 2168
Louada Exploration and Development Company Limited	1967,	Geoscience Data Centre, Toronto
Sangster, A.L.	1970,	p.181-187
Shklanka, R.	1969,	p.142
Triana Exploration Limited	1957,	Geoscience Data Centre, Toronto

39. ROSE ISLAND ZINC OCCURRENCE

COMMODITY:
Zinc

ROCK ASSOCIATION
Host: Calcitic, marble
Other: Mafic metavolcanic rock

CLASSIFICATION
IA1: Stratiform, carbonate hosted, zinc

LOCATION AND ACCESS

The Rose Island occurrence is located in the west-central part of Wollaston township approximately 3.0 kilometres west of Coe Hill (NTS C/13). It is exposed by a road cut on a gravel road north of Highway 620 and Snow Lake, approximately 3.5 road kilometres west of Coe Hill.

Lot 22, Con. X, Wollaston township, Hastings county
NTS COE HILL 31 C/13 1:50,000
Latitude: 44°51'54"N Longitude: 77°52'48"W
UTM Zone 18, 4 971 750 N, 272 450 E.

SIZE AND GRADE

Carter reported minor zinc mineralization in a road cut. One sample (80 TRC-141) assayed 355 ppm Zn, 10 ppm Pb and 0.1 ounces/ton Ag.

DESCRIPTION

Hewitt's geological map (Map 2020, 1962) indicates that the occurrence is situated within the Dungannon Formation near the east boundary of the Wollaston Granite. The Dungannon Formation consists of laminated calcitic marble and contains zones of interbedded feather amphibolite and granular para-amphibolite which constitute the Deltor Feather Amphibolite Member (Hewitt 1962, p.33). The rocks in the area trend north-south and are steeply dipping or vertical.

Carter examined the showing and described the host rock as a grey, medium-grained (1-2 mm), well layered calcitic marble. The marbles contain narrow layers of rusty schists and siliceous bands. Mineralization at the road cut consists of narrow (1 mm) stringers of disseminated, fine-grained (0.5 - 1.0 mm) dark grey sphalerite. Approximately 10 m south of the road a narrow layer (1 cm) of disseminated sphalerite occurs in a siliceous band within the marble near the contact with mafic volcanic (amphibolite) rocks.

DEVELOPMENT HISTORY

1980: The occurrence was investigated by Carter of the Ontario Geological Survey.

REFERENCES

*Hewitt, D.F. 1962, p.33, Map 2020.

TABLE A: Minor Base Metal and Pyrite Occurrences

40 Buckhorn Mines Occurrence	Barrie Township Lot 23,24 Con.IX Lot 23 Con. X	IE2 Variable geological association, pyrite	Pyrite	Dolomitic marble	- Pyrite, tourmaline and graphite in quartz veins. - 2 trenches, N half Lot 24 Con.IX - other trenches Lot 23, Con. IX near dolomitic marble. - trenching and stripping on Lot 23, Con. X	*Meen, V.B. (1944, p.40) *Moore, J.M. and Morton, R.L. (Map P2278)
41 Burridge Road Occurrence	Bedford Township Lot 19, Con. VIII	IA2 Unconformable, carbonate vein-hosted lead	Galena Pyrite	Marble	- Galena and pyrite stringers - Pit, 12' deep	Harding W.D. (1951,p.71) Shklanka, R. (1969, p.135)
42 A. Crozier Occurrence	Bedford Township Lot 19, Con. VIII	IA2 Unconformable, carbonate vein-hosted lead	Galena	Marble	- Galena is found in calcite, veins - vertical shaft, 12' by 5 ' by 30' deep	Harding, W.D. (1951,p.71-2) Shklanka, R. (1969, p.135)
43 Rupert Crozier Occurrence	Bedford Township Lot 20, Con. VI	IA2 Unconformable, carbonate vein hosted lead	Galena	Marble	- Galena in calcite veins - shallow pit (early 1900's)	Harding, W.D. (1951, p.70) Shklanka, R. (1969, p.135)
44 James Murphy Occurrence	Bedford Township Lot 14, Con. V	IA2?Unconformable, carbonate vein hosted lead	Galena	Marble	- Galena, barite and calcite mineralization identified Pit of unspecified dimensions	Harding, W.D. (1951, p.67) *Hewitt, D.F. (1967, ODM Map 2054) Shklanka, R. (1969, p.135)

45 John Murphy Occurrence	Bedford Township Lot 13, Con.V	IA2 Unconformable, carbonate vein hosted lead	Galena, pyrite	Marble	- Galena, barite, pyrite in calcite vein system 4' x 30', vertical - Pit 8' deep	Harding, W.D. (1951, p.67) *Hewitt, D.F. (1964, ODM Map 2054) Shklanka, R. (1969,p.135)
46 Leo Murphy Occurrence	Bedford Township Lot 12, Con. IV	IA2 Unconformable carbonate vein-hosted lead	Galena	Marble	- Galena in marble - Pit 8' deep	Harding, W.D. (1951,p.67) *Hewitt, D.F. (1964, ODM Map 2054) Shklanka, R. (1969, p.135)
47 Patterson Occurrence	Bedford Township Lot 21, Con. VIII	IA2 Unconformable carbonate vein-hosted lead	Galena	Marble	- Galena in calcite vein - Shaft 25' deep (1850's)	Harding, W.D. (1951, p.72) *Hewitt, D.F. (1964. ODM Map 2054) Shklanka, R. (1969, p.135)
48 Hinchcliffe Lake Occurrence	Cashel Township Lot 28, Con. III	IA2 Unconformable carbonate vein-hosted lead	Galena	Marble	- Galena veinlets and disseminated grains and minor barite in 2' wide calcite vein - 2 pits, dimensions unspecified	*Lumbers, S.B. (1968,p.40, Map 2142) Shklanka, R. (1969,p.141)

	NAME	LOCATION	CLASSIFICATION	MINERALS	HOST ROCK	REMARKS	REFERENCES
49	Little Salmon Lake Occurrence	Cashel Township Lot 23, Con. VIII	IE2 Variable Geological association, pyrite	Pyrite, pyrrhotite	Marble, metagreywacke	- Fine-to medium-grained, massive veins of pyrite in a quartz matrix - Rusty schists in marble - Trench 40 feet long over mineralized zone 10 feet by 30 feet - Sample of 75 % pyrite assayed 38.33 % sulphur	Fraleck, E.L. (1907,p.163) Hewitt, D.F. (1967, p.7) *Lumbers, S.B. (1968, p.37, Map 2142) Thomson, J.E. (1943, p.65) Wilson, A.G.W. (1912,p.70)
50	Trumble Occurrence	CashelTownship Lot 29, Con.IV	IA2? Unconformable, carbonate vein-hosted lead	Galena, pyrite, sphalerite	Marble, meta-greywacke,diorite	- Disseminated galena in 1 m wide calcite vein, minor barite, pyrite sphalerite. - one sample 2.5 oz/ton Ag. - 2 trenches, 100' of stripping	*Lumbers, S.B. (1968,p.38, Map 2142) Shklanka, R. (1969, p.141) Thomson, J.E. (1943, p.54)
51	Clarendon Occurrence	Clarendon Township Lots 26, 27, Con. IX	IA2? Unconformable, carbonate vein-hosted lead	Galena	Marble	- Galena in quartz veins (pit) - Galena sample assayed 59.7 oz/ton Ag	Ells, R.W. (1901, p.68J) *Hewitt, D.F.(1964, Map 2053) Shklanka, R. (1969,p.135) *Smith, B.L. (1956, Map 1956-4)
52	Minktrack Lake Occurrence	Clarendon Township Lot 25, Con.XIV	IE2: Variable geological association, pyrite	Pyrite, pyrrhotite	Biotite-quartz-carbonate schist	- Rusty schist zone along a major fault	*Hewitt, D.F. (1964, Map 2053) Hewitt, D.F. (1967, p.5) *Smith, B.L. (1958,p.35, Map 1956-4)
53	Mississippi Occurrence	Clarendon Township Lot. 25, Con.VIII	IE2: Variable geological association, pyrite	Pyrite, pyrrhotite	Biotite-quartz-carbonate schist	- Rusty schist zone	*Hewitt, D.F. (1964, Map 2053) Hewitt, D.F. (1967, p.5) *Smith, B.L. (1958, p.35, Map 1956-4)
54	Stalker Occurrence	Clarendon Township Lot 42, Con. VI	IE2: Variable geological association, pyrite	Pyrite	Paragneiss	- Lenticular body, with test pits	*Smith, B.L. (1956, Map 1956-4) Wilson, A.G.W. (1912,p.71)
55	Swamp Creek Occurrence	Clarendon Township Lot 26, Con. VII	IE2: Variable geological association, pyrite	Pyrite pyrrhotite	Biotite-quartz-carbonate schist	- Rusty schist zone	*Hewitt, D.F. (1964, Map 2053) *Smith, B.L. (1956, Map 1956-4)

56	Turtle Lake Occurrence	Clarendon Township Lot 26,Con.XIII	IE2: Variable geological association, pyrite	Pyrite pyrrhotite	Biotite-quartz-carbonate schist	- Rusty zone along a major fault	*Hewitt, D.F. (1964, Map 2053) Hewitt, D.F. (1967, p.5) *Smith, B.L. (1956, Map 1956-4)
57	Lot 23, Con. III Occurrence	Dungannon Township Lot 23, Con. III	IC1?:Gabbro hosted, copper	Chalcopyrite pyrite bornite	Amphibolite and marble	- Pyrite with minor chalcopyrite and bornite in 3-4 foot wide calcite vein - shaft 35 feet deep	Adams, F.D. and Barlow, A.E. (1910, p.346) Hewitt, D.F. and James, W. (1956, p.43)
58	Robson Claims Occurrence	Grimsthorpe Township Lots 29, 30, Con. XX	IA2?:Uncomformable carbonate vein-hosted lead	Galena	Quartz vein?	- The property was claimed in 1948 - Sample of galena in a quartz vein assayed 3 percent Pb, 20 oz/ton Ag	Robson Occurrence (Geoscience Data Centre, Toronto).
59	Wadsworth Lake Occurrence	Grimsthorpe Township Lots 31-33 Con. XIX-XX	IB2:Other geological association, copper	Pyrrhotite chalcopyrite pyrite	Intermediate to felsic meta-volcanic rock	- 5 drill holes were completed over a magnetic anomaly by Stratmat Ltd - Disseminated pyrrhotite and minor chalcopyrite and pyrite were found in 3 holes.	Robson, B. (1954, Geoscience Data Centre, Toronto)
60	Duncan Lake Occurrence	Hinchinbrooke Township Lot 22, Con. III	IE2:Variable geological association, pyrite	Pyrite	Granitic gneiss	- Pyrite was reported in a shear zone	*Hewitt, D.F. (1964, Map No. 2053)
61	Lot 33, Con. XII Occurrence	Hungerford Township Lot 33, Con. XII	IB2: Other geological association, copper	Chalcopyrite pyrite	Dolomitic marble	- A small amount of chalcopyrite and pyrite mineralization was reported in a dolomitic marble containing minor tremolite and mica	MacFarlane, T. (1866, p.105)

62	North Brook Occurrence	Kaladar Township Lot 32, Con. XII	IB2: Other geological association, copper	Pyrite, chalcopyrite bournonite	Dolomitic marble	- Sulphide minerals associated with quartz veins in marble. - workings consist of pits and trenches excavated in 1939. - other minerals include azurite and malachite	Harding, W.D. (1942, p.72) *Hewitt, D.F. (1964, Map No. 2053)
63	Big Clear Lake (Clark Occurrence	Kennebec Township Lot 10, Con.X	IE2: Variable geological association, pyrite	Pyrite	Quartzite - Metavolcanic contact	- Christie Lake Mines Ltd. completed a Mag and EM survey and outline conductor with mag anomalies. N. Clark completed 3 diamond drill holes totalling 226m. Trace Cu and 0.16 percent Ni were detected.	*Meen, V.B and Harding, W.D., (1942, Map No. 51d) *Hewitt, D.F. (1964, p.14, Map No. 2053) Hewitt, D.F. (1967, p.6)

65	Lot 11, Con.11, Occurrence	Kennebec Township W 1/2 Lot 11, Con. 11	1B2: Other geological association, copper	Chalcopy-rite, pyrrhotite, pyrite	Marble, metagreywacke, quartzite	- before 1940, a 10 foot deep pit was opened, exposing mineralized marble with lenses of greywacke a quartzite. Beds strike E-W, Dip 80°S. - In 1975 Glenshire Mines Ltd. intersected minor chalcopyrite, pyrite and sphalerite in two drill holes. (Wolff, J.M. 1982, p.79).	*Harding, W.D. (1944, p.74, Map 51d) *Wolff, J.M. (1982, p.79, Map 2432).

64 Kennebec Occurrence	Kennebec Township Lot 9, Con. I	IE2: Variable geological association, pyrite	Pyrite	Para-amphibolite?	-Geology maps indicate a metasedlemntary host -No specific information about the occurence has been reported.	*Meen, V.B. and Harding, W.D. (1942, Map No. 51d) *Hewitt, D.F. (1964, p.14, Map 2053) Hewitt, D.F. (1967, p.6)
66 Donahue Vein Occurrence	Lake Township Lot 10, Con. XI	IA2: Unconformable, carbonate vein-hosted lead	Galena	Marble	-According to Vennor (1969, p.163) the vein strikes northeast and has a vertical dip. It is up to 24 inches in width and contains scattered and irregular patches of galena. -No recent investigations have been reported.	Adams, F.D. and Barlow, A.E. (1910, p.348) Alcock, F.J., (1968, p.28) *Laakso, R.K. (1968, p.28, Map 2106) MacFarlane, T. (1866, p.104) Vennor, H.G. (1870, p.163)
67 Lot 8, Con. X Occurrence	Lake Township Lot 8, Con. X	IA2?: Unconformable, carbonate vein-hosted lead	Galena	Marble	-Two pits (15 feet apart) were excavated in a vein oriented N35°W -The vein was reported to be 2 feet wide with a 10 inch zone of galena.	Alcock, F.J. (1930, p.62) MacFarlane, T. (1866, p.105)
68 Steen Lake Occurrence	Lake Township Lot 30, Con. VII	IB2?: Other geological association, copper	Chalcopyrite	Mafic, meta-volcanic rock, amphibolite schist, skarn zone?	-The workings consist of two pits. A grab sample assayed 3.0 % Cu, 0.03 percent Ni, and Trace Ag. -Syngenore Explorations Ltd. carried out a ground MAG and EM survey over the area.	*Laakso, R.K. (1968, p.24, Map 2106) Shklanka, R. (1969, p.141) Thomson, J.E. (1943, p.17)
69 Snooks Occurrence	Loughborough Township Lot 7, Con. XIV	IE2: Variable geological association, pyrite	Pyrite	Marble	-Gossan zone in marble -massive pyrite zone 7 feet wide, disseminated zone 25 feet wide	*Hewitt, D.F. (1964, Map 2054) Hewitt, D.F.(1967, p.6) Wilson, A.G.W.(1912, p.70)
70 Davis Occurrence	Madoc Township Lot 10, Con. IX	IE2: Variable geological association, pyrite	Pyrite	Marble	-A 10 foot deep test pit was excavated in marble.	Janes, T.H. (1952,p.39) Hewitt, D.F. (1968, p.26) Wilson, A.W.G. (1912, p.69)
71 Farrell Mine Occurrence	Madoc Township Lot. 9, Con. VII	IE2: Variable geological association, pyrite	Pyrite	Marble	-A small dump beside a 25-foot shaft was reported to contain pyrite mineralization analysed 40.65 percent sulphur. The zone is approximately 5 feet wide.	Janes, T.H. (1952, p.39) Hewitt, D.F. (1968, p.26)

72	Webber Occurrence	Madoc Township Lot 29, Con. V, VI		Pyrite, sphalerite galena	Paragneiss	- The occurrence is a mineralized quartz vein, 18 inches to 3 feet wide which strikes northeast. - One pit was excavated, 10 feet by 10 feet by 15 feet deep. The mineralization consists of pyrite with minor sphalerite and galena.	Alcock, F.J. (1930, p.161) Shklanka, R. (1969, p.141) Thomson, J.E. (1943, p.55)
73	Methuen Occurrence	Methuen Township Lot 2, Con.I	IA2: Unconformable, carbonate vein-hosted lead	Galena	Marble	- A pit 70 feet by 50 feet deep was excavated in a 12-inch wide galena bearing calcite vein. The marble strikes N20°E and dips southeast. The vein strikes N65°W and dips vertically (Hewitt, 1961, p. 160).	Alcock, F.J. (1930, p.163) *Hewitt, D.F. (1961, p.160, Map 1960e) Venor, H.G. (1970, p.164)
74	MacDonald, E. Occurrence	Olden Township Lot 14, Con.II	IE2: Variable geological association, pyrite	Pyrite	Marble	- Before 1945, A. MacDonald excavate a number of pits exposing disseminated pyrite in marbles and other metasediments.	*Harding, W.D. (1951, p.57, Map 1947-5)
75	McKnight, W.M Occurrence	Olden Township Lot 10, Con.IV	IE2: Variable geological association, pyrite	Pyrite, pyrrhotite	Quartzite	- a 3m deep pit was excavated in a rusty gossan zone of an inclusion of metasedimentary rock in the Mountain Grove mafic intrusion. - Trace Ni and Au values were reported.	*Harding, W.D. (1951, p.57, Map 1947-5) *Hewitt, D.F. (1964,p.16, Map 2053) Shklanka, R. (1969, p.135) Thomson, J.E. (1957, p.8) *Wolff, J.M. (1982, p.66, Map 2432)

76	Crain Occurrence	Oso Township Lot 31, Con. IV	IB2: Other geological association, copper	Chalcopyrite pyrite	Mafic metavolcanic rocks	- Minor chalcopyrite and pyrite in a quartz-calcite vein exposed in a pit 10 feet deep.	*Harding, W.D. (1951,p46, Map 1947-5) *Hewitt, D.F. (1964,p.17, Map 2053)
77	Foley Occurrence	Sheffield Township Lot 8, Con.XIV	IE2: Variable geological association, pyrite	Pyrite, pyrrhotite, molybdenite	Marble	- A pit 80 feet by 40 feet by 10 to 15 feet deep was excavated in a xenolith of marble - The mineralization consists of small masses and disseminated grains of pyrite and pyrrhotite with pyroxene, calcite, mica and minor molybdenite.	*Hewitt, D.F. (1964, p.31, Map 2053) Hewitt, D.F. (1967,p.15) Wilson, A.G.W. (1912, p.71)
78	Lot 15, W of Hastings Road Occurrence	Tudor Township Lot.15, W of Hastings Rd.	IE2: Variable geological association, pyrite	Pyrite, pyrrhotite	Marble	- Galena-bearing calcite veins in marbles are exposed in excavations. - one drill hole (104.5 feet) was completed, only minor pyrite and pyrrhotite was reported.	Lumbers, S.B. (1969, p.94)

79	Lot 23, Con.B Occurrence	Tudor Township Lot. 23, Con.B	IA2: Unconformable, carbonate vein-hosted, lead	Galena	Marble	- A 2 inch wide galena bearing calcite vein oriented at N85°W cross cuts marbles	Lumbers, S.B. (1969, p.93) MacFarlane, T. (1866, p.104)
80	Lot 28, Con.B Occurrence	Tudor Township Lot. 28, Con.B	IA2: Unconformable, carbonate vein-hosted, lead	Galena	Marble	- Before 1866, a 37 foot deep shaft was excavated into a calcite vein mineralized with barite and galena. - 6 tons of galena were mined, 4.25 tons (66 % Pb) were shipped to New York	Alcock, F.J. (1930, p.162) Lumbers, S.B. (1969, p.93) MacFarlane, T. (1866, p.104) Shklanka, R. (1969, p.141) Vennor, H.G. (1870, p.163)
81	Lot 30, Con.B Occurrence	Tudor Township Lot 30, Con.B	IA2:?Unconformable, carbonate vein-hosted, lead	Galena	Marble	- An 80 foot long trench was excavated over a vein trending N75°W and dipping 80°NE. - The vein is up to 8 inches wide and contains barite, calcite and minor galena.	Alcock, F.J. (1930, p.162) Lumbers, S.B. (1969, p.93) Shklanka, R. (1969, p.142)
82	Lot 33, Con.III Occurrence	Tudor Township Lot 33, Con.III	IA2:?Unconformable, carbonate vein-hosted,lead	Galena	Marble	- material from the dump of an old pit consists of calcite vein fragments with minor barite and galena	*Lumbers, S.B. (1969, p.93, Map 2168)
83	Lot 34, Con IV Occurrence	Tudor Township Lot 34, Con.IV	IA2: Unconformable, carbonate vein-hosted, lead	Galena	Marble	- MacFarlane (1866, p.104) reports a calcite vein containing "4 inches of galena".	Lumbers, S.B. (1969, p.94) MacFarlane, T. (1866, p.104) Shklanka, R. (1969, p.142)
84	Lombard Occurrence	Tudor Township Lot 29, Con.XIV	IA2: Unconformable, carbonate vein-hosted, lead	Galena, pyrite	Marble, metagreywacke	- one shaft was opened in 1859, abandoned in 1867 (42 feet deep) - calcite vein contained irregularly dispersed galena mineralization which decreased in grade with depth. - barite and pyrite were found in the mine dump.	Alcock, F.J. (1930, p.163) *Lumbers, S.B. (1969, p.91, Map 2168) Shklanka, R. (1969, p.142) Thomson, J.E. (1943, p.57) Vennor, H.G. (1870, p.162-163)
85	Murphy Mine Occurrence	Tudor Township Lots 30,31,32 E. of Hastings	IA2: Unconformable, carbonate vein-hosted, lead	Galena	Marble, metagreywacke	- In 1867 the Hastings Lead Mining Company sunk a shaft 125 feet deep on a vein oriented N60°W, 80°SE (dip) - The vein was 8 inches wide and contained a zone of galena 2 to 3 inches wide.	Alcock, F.J. (1930, p.163) Lumbers, S.B. (1969, p.94) MacFarlane (1866, p.105) Shklanka, R. (1919, p.142) *Thomson, J.E. (1943, p.57, Map 52b) Vennor, H.G. (1870, p.162)

86	Reelman Occurrence	Tudor Township Lots 9, Con. A or B	IA2?:	Unconformable, carbonate vein-hosted lead	Galena	Marble, metagreywacke?	- In 1924, G. Reelman excavated a shaft 7 feet by 11 feet by 23 feet deep. A shafthouse was built and 5 tons of lead ore was shipped.	Lumbers, S.B. (1969, p.93) Shklanka, R. (1969, p.141) Sutherland, T.F. et al. p.165)
87	Roberts Occurrence	Tudor Township Lots 4,5, Con.B	IA2:	Unconformable, carbonate vein-hosted lead	Galena, pyrite	Metaquartzite, metagreywacke	- In 1925, a mineralized (10-inch wide) calcite vein was exposed over a length of 200 feet by trenches, pits and a 50-foot deep shaft. - The vein is oriented northwest. - Mineralization consists of galena and pyrite.	Alcock, F.J. (1930, p.160) Lumbers, S.B. (1969,p.92-93) Shklanka, R. (1969, p.141) *Thomson, J.E. (1943, p.57, Map No. 52b)
88	Stewart Occurrence	Tudor Township Lots 1,2, Con.A	IA2:	Unconformable, carbonate vein-hosted lead	Galena	Metagreywacke	- A mineralized calcite vein (few inches to 3 feet wide) oriented N45°W has been traced for 250 feet by pits, trenches and a shaft 20 feet deep. - Galena mineralization is sporadic, in one place a 5-inch zone of galena occurs in a 10-inch wide vein.	Alcock, F.J. (1930, p.160-161) *Lumbers, S.B. (1969, p.88, Map No. 2168) Shklanka, R. (1969, p.141) Thomson, J.E. (1943, p.57)
89	Wright Occurrence	Tudor Township Lots.11,12, W of Hastings Rd.	IA2:	Unconformable, carbonate vein-hosted lead	Galena	Metagreywacke, marble	- A number of trenches and pits expose sparsely mineralized calcite - (Qtz) veins. - Disseminated, coarse-grained galena and barite were reported in a vein 2 feet wide. - 3 drill holes (220 feet) intersected minor pyrrhotite, pyrite chalcopyrite and galena.	Lumbers, S.B. (1969, p.90) Shklanka, R. (1969, p.142) Wright, W. (1960, Geoscience Data Centre, Toronto)

INDEX OF MOLYBDENUM DEPOSITS
(Keyed to map p.2737 in pocket)

Name	Township	Status	Classification
1. Clow	Hinchinbrooke	O	IIA2
2. Marisette	Kaladar	O	IIA2
3. Ronadlson	Kennebec	O	IIA2
4. Kring	Miller	O	IIA2
5. Shannon	Miller	O	IIA2
6. Merkley	North Crosby	O	IIA1
7. Avery	Olden	O	IIA1
8. Gray	Olden	O	IIA1
9. MacDonnell	Olden	O	IIA1
10. Smith	Olden	O	IIA3
11. Varette (Silver)	Olden	O	IIA3
12. Calvert	Sheffield	O	IIA3
13. Chisholm Molybdenite Mine	Sheffield	O	IIA1
14. Dwyer	Sheffield	O	IIA1
15. Keller	Sheffield	O	IIA1, IIA2
16. Spratt	Sheffield	O	IIA1
17. Wager	Sheffield	O	IIA1
18. Drader	Hinchinbrooke	O	IIA2
19. Godfrey	Hinchnbrooke	O	IIA2
20. Sills	Hinchinbrooke	O	IIA2
21. Corak	Oso	O	IIA3?
22. Burns	Sheffield	O	IIA1
23. Oberkerk and Molony	Sheffield	O	IIA1

1. CLOW OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Pegmatite
Other: Granite gneiss

CLASSIFICATION
IIA2: Unconformable-to-conformable pegmatite hosted.

LOCATION AND ACCESS

The Clow occurrence is located approximately 1.5 km south of the town of Parham and 60 m south of Clow Lake (NTS Tichborne 31C/10). The deposit is accessible on foot approximately 500 m east of Highway 38.

Lot 22 Concession III, Hinchbrooke Township, Frontenac County.
NTS TICHBOURNE 1C/10 1:50,000
Latitude 44°38'33"N Longitude 76°42'35"W
UTM Zone 18, 4944450N, 364400E

SIZE AND GRADE

Pyrite, pyrrhotite and molybdenite is exposed in two pits approximately 0.6 kilometres apart. Minor molybdenite was found in the eastern pit. The pegmatite host is less than 25 feet wide, the mineralized zone is not described.

DESCRIPTION

The Clow occurrence lies in an east-west trending pegmatite zone at least 0.8 kilometres long. Harding (1951, p.60) reports:

"The country rocks consist of granite gneiss. The mineralized band, which in some places is as much as 25 feet wide, consists largely of quartz and other pegmatite material. The mineralization consists mostly of pyrite."

In the following passage, Harding (1951, p.60) describes the mineralization in the west and east pit near highway 38 and south of Clow Lake respectively.

"Large quantities of pyrite are exposed in the west pit. The east pit contains pyrite, pyrrhotite, and a little molybdenite. Samples of the best-mineralized material from each pit were assayed for gold. No gold values were obtained."

DEVELOPMENT HISTORY

1934: Two 8 foot pits were excavated by unknown operators (Harding 1951, p.60).

REFERENCES:

Harding, W.D. 1951, p.60
Johnston, F.J. 1968, p.24

2. MARISETTE OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Pegmatite
Other: Granite gneiss

CLASSIFICATION

IIA2 Unconformable-to-conformable pegmatite hosted.

LOCATION AND ACCESS

The Marisette occurrence is located approximately 5.5 km south of Flinton and 6.7 km west of Kaladar in Kaladar township (NTS 31C/11). The deposit is accessible on foot from a secondary gravel road at a point 5.3 road kilometres south from Flinton. It is 800 m east of the access road just east of Flinton Creek in the northeast quadrant of Lot 13 Concession II. The occurrence is located on ODM map No. 51d (Harding 1944) and Map 2053 (Hewitt 1964).

Lot 13 Concession II, Kaladar Township, Lennox and Addington County
NTS KALADAR 31 C/11 1:50,000
Latitude 44°38'30°N Longitude 77°12'32"W
UTM Zone 18, 4945300N, 324,800E

SIZE AND GRADE:

Harding (1974, p.3) reported a molybdenite-bearing pegmatite of mineralogical interest only.

In 1981 Mr. R. Young intersected 25 feet of pegmatite in a drill hole. No molybdenum was reported in the drill log submitted for assessment.

DESCRIPTION

Harding (1944, p.72) writes:
" A molybdenite-bearing pegmatite dike cutting granite gneiss was discovered by Mr. Marisette on the northeast part of lot 13, Concession II in 1939".

DEVELOPMENT HISTORY

1939: Discovered by Mr. Marisette (Harding, 1944, p.72).
1981: One 67 m diamond drill hole was completed by Roy Young (Young, 1981).

REFERENCES

*Harding, W.D.	1944,	p.72, Map No. 51d
*Hewitt, D.F.	1964,	p.30, Map 2053
Johnston, F.J.	1968,	p.24
Vokes, F.M.	1963,	p.169
Young, C.R.	1981,	Geoscience Data Centre, Toronto

3. RONALDSON OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Pegmatite - quartz lenses

CLASSIFICATION
IIA2 Unconformable-to-conformable pegmatite hosted

LOCATION AND ACCESS

The Ronaldson occurrence lies 6.0 km northeast of Kaladar. It is accessible on foot approximately 1.7 km north from Highway 7 at the county boundary between Lennox, Addington and Frontenac (NTS 31C/11). The probable location of the deposit is north of a narrow swamp in the west half of Lot 5 Concession I. The location is shown on ODM Map 51d (Harding 1944) and Map 2053 (Hewitt 1964).

Lot 15, Concession I, Kennebec Township, Frontenac County.
NTS Kaladar 31C/11 1:50,000

Latitude: 44°41'12"N	Longitude: 77°04'01"W
UTM Zone 18, 4950000	336200E

SIZE AND GRADE

Wolff reports (1982, p.79), "Invariably the mineralization is in the form of molybdenite and occurs in white, crosscutting pegmatite dikes. These dikes range from 0.5 m to 3 m in width... The molybdenite occurs as massive to scattered flakes and the mineralization is not continuous along the strike length of these dikes."

There are no reports on the size or grade of the mineralized zone.

DESCRIPTION

Wolff (1982, p.79) and Harding (1944,p.74) describe molybdenite mineralization within white pegmatite dikes or quartz lenses enclosed in pegmatite dikes. A detailed geological map produced by Hudson's Bay Exploration and Development Company for assessment credits in 1977, shows no contact relationships between the dikes and the country rock. The map indicates that the pegmatite dikes intrude granitic gneiss and/or phlogopite schist.

DEVELOPMENT HISTORY

1944: The first report of the Ronaldson occurrence described shallow trenching by unknown operators (Harding 1944, p.74).

1977: The Hudson's Bay Exploration and Development Company completed a detailed geological map and a radiometric survey (Douglas 1977).

REFERENCES

Douglas, G.B.	1977,	Geoscience Data Centre, Toronto
*Harding, W.D.	1944,	p.72, Map 51d
*Hewitt, D.F	1964,	p.14, Map 2053
Vokes, F.M.	1963,	p.169
Wolff, J.M.	1982,	p.78-79

4. KRING OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Pegmatite

CLASSIFICATION
IIA2 Unconformable-to-conformable pegmatite hosted

LOCATION AND ACCESS

The Kring occurrence is located in the south central part of Miller Township approximately 3.0 km north of Plevna, Clarendon township (NTS 31C/15). The deposit is accessible from Highway 506 at Plevna by all-weather gravel roads. Its probable location is on lot 5 of the northeast range, within 700 m of a road which passes south of Kring Lake. The occurrence may be located on ODM Map 2053 (Hewitt 1964).

Lot 5 northeast range, Miller Township, Frontenac County
NTS SHARBOT LAKE 31C/15 1:50,000
Latitude: 44°59'32"N Longitude: 76°59'07"W
UTM Zone 18 4983800N, 343500E.

SIZE AND GRADE

Walker (1911, p.44) reported molybdenite mineralization in four pits within a pegmatite dike. The mineralized dike had a maximum width of 8 feet and low grade of mineralization.

DESCRIPTION
Walker (1911, p.44) writes "...molybdenite occurs in pegmatite, which follows the northeasterly strike of the gneisses of the region. The pegmatite forms a dike which has a maximum width of 8 feet. Pink feldspar is the chief mineral - sulphides, generally, are absent with the exception of molybdenite. Four pits have been opened on the pegmatite dike, and while molybdenite has been found in all of the pits the quantity is not very encouraging."

DEVELOPMENT HISTORY
1901: 4 pits were opened up on the pegmatite (Walker, 1911, p.44).

REFERENCES
*Hewitt, D.F. 1964, Map 2053
Johnston, F.J. 1968,
Parsons, A.L. 1917, p.305
Walker, T.L. 1911, p.44

5. SHANNON OCCURRENCE

COMMODITY
Molybenum

ROCK ASSOCIATION
Host: Pegmatite
Other: Granite Gneiss?

CLASSIFICATION
IIA2: Unconformable-to-conformable, pegmatite hosted

LOCATION AND ACCESS

The Shannon occurrence is located in the south central part of Miller township, approximately 2.5 km north of the town of Plevna, Clarendon township (NTS 31C/15). The deposit is accessible from Highway 506 at Plevna by all-weather gravel roads; its probable location is in lot 5 of the southwest range, within 600 m of a road which passes south of Kring Lake.

Lot 5 southwest range, Miller Township, Frontenac County

NTS SHARBOT LAKE	31C/15	1:50,000
Latitude	44°59'33"	Longitude 77°59'06"W
UTM Zone 18	4 983500N	343500E

SIZE AND GRADE

Parsons (1917,p.305) reported material grading approximately 1 percent molybdenite near a pit in a 6 to 8 foot wide pegmatite dike. Workings consist of 3 pits. "The more westerly pit is about 12 feet square and was filled with water. The middle pit is about 30 feet long and about 20 feet deep at the deepest portion, while the more easterly one has about the same dimensions as the middle one. Molybdenite was seen in the second and third pits......" (Parsons 1917, p.305).

DESCRIPTION

The workings are within a pegmatite dike which cuts gneiss. Hewitt's compilation map 2053 (1964) shows the country rocks as granite gneiss or pegmatite.

DEVELOPMENT HISTORY

before 1917: 3 pits were completed by G.C. Shannon, one pit is 25 feet square, the other two, 30 feet long and up to 10 feet deep - (Parsons 1917, p.305).

REFERENCES
Parsons, A.L. 1916, p.305
*Hewitt, D.F. 1964, Map 2053

6. MERKLEY OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Granite, syenite, marble and pyroxenite

CLASSIFICATION
IIA1: Stratabound, skarn hosted

LOCATION AND ACCESS

The Merkley occurrence is shown on NTS sheet 31C/9 about 2 km north of the town of Westport in North Crosby township (NTS 31C/9). The deposit is located east of a two lane paved road running north from Westport. It is located ODM map 2054 (Hewitt, 1964).

Lot 14 Concession V, North Crosby township, Leeds county
NTS WESTPORT 31C/9 1:50,000
Latitude: 44°41'58"N Longitude: 76°23'54"W
UTM Zone 18, 4 950 300N, 389 200E

SIZE AND GRADE

Walker (1911, p.45) reported two pits were excavated. The occurrence did not appear to be of economic importance; neither the grade nor the size of the zone were recorded.

DESCRIPTION

Walker's description (1911, p.45) follows: "Some twenty years ago on the farm of Mr. Samuel Merkley, two pits were dug on the east side of the road. It was believed at the time that the rocks contained lead; but it was later learned that the lead grey mineral was molybdenite. Since then, no work has been done. The association of rocks is a common one - an igneous intrusive granite or syenite, crystalline limestone with considerable dark greenish rock largely made up of pyroxene and scapolite. The pits have been poorly filled up, but sufficient of the walls and of the excavated material may yet be observed. This occurrence does not appear to be of economic importance".

DEVELOPMENT HISTORY

1891: Two pits were excavated by unnamed operators (Walker 1911, p.45).

REFERENCES

*Hewitt, D.F. 1964, p.27, Map 2054
Johnston, F.J. 1968, p.47
Parsons, A.L. 1917, p.308-309
Walker, T.L. 1911, p.45

7. AVERY OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Calcitic and dolomitic marble
Other: Granite and pegmatite

CLASSIFICATION
IIA1: Stratabound, skarn hosted

LOCATION AND ACCESS

The Avery Occurrence is located in the eastern part of lot 24, concession IX of Olden township, approximately 7.8 kilometres northwest of the town of Sharbot Lake, Oso township. The deposit is accessible on foot from all-weather gravel roads and vehicle trails off Highway 7, north and west of the town of Sharbot Lake. It is approximately 500 m west of the interconnecting segment of the Bolton Lakes and 200 m east of a vehicle trail passing west of the lakes. The location is indicated on ODM Map 2053 (Hewitt 1964).

Lot 24, Concession IX, Olden township, Frontenac county
NTS SHARBOT LAKE 31C/15 1:50,000
LATITUDE: 44°48'47"N Longitude: 76°46'18" W
UTM ZONE 18, 4963500 N, 359900 E.

SIZE AND GRADE

Harding (1951, p.90) reports minor disseminated molybdenite in amounts "too small to be of economic interest" from two shallow pits in limestone.

DESCRIPTION

Harding (1951, p.90) writes: "The country rock consists of folded white crystalline limestones and dolomites, which are cut by masses of granite and pegmatite. The beds strike a few degrees north of east and dip from 30° to 50° SE.

Two shallow pits about 50 feet apart have been sunk in the limestone. A few flakes of molybdenite were disseminated in the massive limestone. The largest crystals exposed were about 1 inch in diameter. A very small amount of graphite is also disseminated in the limestone. The mineralization may be attributed to emanations from nearby granite intrusions. The amount of molybdenite exposed is too small to be of economic interest.

Detailed maps by the Keevil Mining Group shows the marble unit (approximately 100 m wide) bounded by granite and white pegmatite. (Koskitalo 1969).

DEVELOPMENT HISTORY

The Avery occurrence was discovered about the time of the first world war and two shallow pits were blasted by unknown operators (Harding 1951, p.90).

1968:- the area around the Avery occurrence was claimed by Substantial Development Limited (Koskitalo 1969).

1969:- line cutting, trenching and detailed geological mapping was completed by Substantial Development
- the property was optioned by the Keevil Mining Group (Koskitalo 1969).

1970:- geological and ground radiometric surveys were carried out by Substantial Development Limited for the Uranium Syndicate (Koskitalo 1970).

REFERENCES

Harding, W.D.	1951, p.90
*Hewitt, D.F.	1964, p.16, Map 2053
Johnston, F.J.	1968, p.24
Koskitalo, L.O.	1969, Geoscience Data Centre, Toronto
" "	1970,
Vokes, F.M.	1963, p.169

8. GRAY OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Metagreywacke
Other: Marble, Granite gneiss

CLASSIFICATION
IIA1: Stratabound - skarn hosted

LOCATION AND ACCESS

The Gray occurrence is located approximately 3 km north of Mountain Grove, Olden township and 11 km west of Sharbot Lake, Oso township (NTS Sharbot Lake 31C/15). A vehicle trail passes through a gravel pit north of an all weather gravel road located 1.0 km east and 0.5 km north of the intersection between Highway 7 and the access to Mountain Grove. The presumed location of the deposit is approximately 2.0 road km from the Highway 7-Mountain Grove access intersection. See O.D.M. Map 2053 (Hewitt 1954), and 1947-5 (Harding 1951).

Lot 19, Concession IV, Olden Township, Frontenac County
NTS SHARBOT LAKE 31C/15 1:50,000
Latitude: 44°45'58"N Longitude: 76°50'14"W
UTM Zone 18 4 958 400N 354 600E

SIZE AND GRADE: No description of size and grade exists.

DESCRIPTION

Harding (1951, p.89) writes: "A few scattered flakes of molybdenite were identified in a band of greywacke about 3 feet wide about half a mile north-northeast of the house on the farm of Percy Gray, on the southwest quarter of lot 19, concession IV, Olden township. The band of greywacke is flanked by Grenville crystalline limestone. The beds strike northwest and dip almost vertically. The amount of molybdenite exposed is very small and is of mineralogical interest only".

DEVELOPMENT HISTORY
The Gray occurrence was first reported by Harding (1951, p.89).

REFERENCES

Harding, W.D. 1951, p.89, Map 1947-5
*Hewitt, D.F. 1964, p.16, Map 2053
Johnston, F.J. 1968, p.24
Vokes, F.M. 1963, p.168

9. MACDONNELL OCCURRENCE

COMMODITY

Molybdenum

ROCK ASSOCIATION

Host: Marble, Granite, Syenite

CLASSIFICATION

IIA1: Stratabound, skarn hosted.

LOCATION AND ACCESS

The Macdonnell occurrence lies 6.3 km southeast of Mountain Grove in Olden Township (NTS 31C/10). It is accessible on foot from all-weather gravel roads leading to Mountain Grove. The deposit is approximately 200 m northeast of a point on a gravel road 0.8 road kilometres south of the junction with the road leading to O'Reilly Lake. It is located on OGS Map 2449 (Wolff 1982) and on Map 2053 (Hewitt 1964).

Lot 7, Concession VI, Olden Township, Frontenac County

NTS TICHBOURNE 31C/10	1:50,000
Latitude: 44°43'07" N	Longitude: 76°46'12" W
UTM Zone 18, 4953000N	359800E

SIZE AND GRADE

A 108 kg shipment of material assayed at 0.4 % molybdenite was sampled from a 4 m by 2 m pit (Eardley-Wilmot 1925, p.65). Wolff (1982, p.67), writes: "This deposit has no apparent extension and has been exhausted."

DESCRIPTION

Harding (1951, p.89-90) reports:
"Scattered flakes of molybdenite occur in a shallow pit, where an inclusion of crystalline limestone is exposed in pink granite and syenite on the farm of Alfred Neadow, lot 7, concession IV, Olden township. The molybdenite occurs both in the limestone and in the adjacent granite".

An earlier description by Eardley-Wilmot (1925, p.65) says: "A five foot pit 12 feet long has been dug in a small patch of limestone and pegmatite near a granite contact. The ore is associated with pink feldspar and pyroxene, very little pyrites and no mica being observed. In 1915 Mr. G.M. Macdonnell sent 238 pounds of 0.4 percent MoS_2 ore to the Mines Branch testing laboratories, Ottawa."

DEVELOPMENT HISTORY

1915: Mr. G.M. Macdonnell blasted a 2 m by 4 m pit. A 108 kg sample of material was assayed at 0.4 % molybdenite (Parsons 1917, p.309).

1957: Corval Corporation Limited carried out a geochemical and geological survey over the area primarily in search of copper. No additional molybdenite mineralization was reported in this locality (Angus 1957).

REFERENCES

Angus, W.L.	1957, Geoscience Data Centre, Toronto
Eardley-Wilmot, V.L.	1925, p.65
Gwillim, J.C.	1920, p.116
Harding, W.D.	1951, p. 89-90
*Hewitt, D.F.	1964, p.16, Map 2053
Johnston, F.J.	1968, p. 22
Vokes, F.M.	1963, p. 168
*Wolff, J.M.	1982, p. 67, Map 2449.

10. SMITH OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Amphibolite
Other: Granite, Marble

CLASSIFICATION

IIA3: Stratiform, amphibole paragneiss hosted

LOCATION AND ACCESS

The Smith occurrence is located approximately 6.8 km southeast of Mountain Grove in Olden township (NTS 31C/10). It is accessible on foot from an all weather gravel road joined to Mountain Grove. The deposit is approximately 300 m southeast of the western junction of the road which passes between O'Reilly and Leggat Lakes. It is located on OGS map 2449 (Wolff 1982) and ODM Map 2053 (Hewitt 1964).

Lot 6, Concession 6, Olden township, Frontenac county
NTS Tichborne 31 C /10 1:50,000
Latitude 44°42'38" N Longitude 76°46'11"W
UTM Zone 18 4952100 N 359800E

SIZE AND GRADE

The Smith occurrence lies in a hornblende-rich lens within a granitic host rock. A pit 6 m by 1 m by 2 m deep was excavated over a very local mineralized zone. Shipments of 450 and 68 kg of material assayed 0.27 % and 0.6 % molybdenite respectively.

DESCRIPTION

Eardley-Wilmot writes (1925, p.65):

"The adjoining lot to the south of the Macdonnell property was worked in 1916 by Ed Smith, of Perth, who states that there is a wide granite-limestone contact vein half a mile long. According to J.C. Gwillim this occurrence is in a patch of Grenville rocks in a granite gneiss. The pit which is 20 by 4 feet and 8 feet deep, is in a hornblende rock, granite occurring a few feet to the north and south of it.

In May, 1917, 1,000 pounds of 0.27 per cent ore, and in June, 150 pounds of 0.6 per cent ore were sent to the Mines Branch, Ottawa. The grade of these shipments, as well as the opinion of the engineers, would indicate the improbability of obtaining good ore, in the immediate neighbourhood of where work has been done."

DEVELOPMENT HISTORY

1917: A 6 m by 1 m by 2 m pit was excavated in the mineralized zone by Mr. Ed Smith. Two shipments of 450 and 68 kg were assayed at 0.29 and 0.6 % molybdenite respectively. (Eardley-Wilmot 1925, p.65).

REFERENCES

Eardley-Wilmot, V.L.	1925, p.65
Gwillim, J.C.	1920, p.117
Harding, W.D.	1951, p.89
*Hewitt, D.F.	1964, p.16, Map 2053
Johnston, F.J.	1968, p.22
Vokes, F.M.	1963, p.168
*Wolff, J.M.	1982, p.67, Map 2449.

11. VARETTE (SILVER) OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Serpentinized amphibolite
Other: Granite, syenite

CLASSIFICATION
IIA3: Stratiform, amphibole paragneiss hosted

LOCATION AND ACCESS

The Varette occurrence is located in the south central part of Olden township, approximately 4.3 kilometres north of the town of Parham, Hinchinbrooke township (NTS 31C/10). The deposit is accessible on foot from all weather gravel roads joined to Parham. It is near the northwest shore of Eagle Lake in the southeast part of Lot 2, Concession VII. The occurrence may be located on O.D.M. map 1947-5 (Harding 1951)

Lot 2 Concession VII, Olden township, Frontenac county
NTS TICHBORNE 31C/10 1:50,000
Latitude: 44°41'43"N Longitude: 76°43'28"W
UTM Zone 18, 4950350N, 363350E

SIZE AND GRADE

A 500 pound sample of material analyzed at 0.80 percent MoS_2 was shipped to the Mines Branch in Ottawa and milled to produce a sample assaying 67.6 percent MoS_2, with the recovery of 82.6 percent of the molybdenite (Berry 1963). The relatively low percentage MoS_2 concentrate was attributed to fine intergrowths of serpentine with molybdenite. The deposit was tested by 2 diamond drill holes which indicated that the host rock was continuous for approximately 40 feet in depth (Silver 1962). The grade of mineralization in the drill core was estimated to range from 0.01 to 5.0 percent molybdenite (Silver 1962).

DESCRIPTION

Molybdenite is hosted in serpentinized amphibolite or metagabbro. Harding's (1951) geological map shows the mafic host rock as a small lens on the north side of a narrow band of gabbro, marble and metagreywacke or paragneiss, all bounded by granitic rocks. Drill core indicates the presence of brecciated granite beneath the host rock of the Varette deposit (Silver 1962).

DEVELOPMENT HISTORY

1962: a 500 pound sample of mineralized rock was assayed at 0.80 % MoS_2 by the Mines Branch, Ottawa (Berry, 1963). Two diamond drill holes 25 and 50 feet deep were completed by Mr. D.M. Silver (Silver 1962).

REFERENCES

Berry, J.F.	1963,	p.
*Harding, W.D.	1951,	Map 1947-5
Johnston, F.J.	1968,	p.24
Silver, D.M.	1962,	Geoscience Data Centre, Toronto.

12. CALVERT OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Quartz-pyroxene rock

CLASSIFICATION
IIA3: Stratiform, amphibole paragneiss hosted

LOCATION AND ACCESS

The Calvert occurrence is located approximately 8 km northeast of the town of Tamworth in the south part of Sheffield township (NTS 31 C/.10). It is accessible from Tamworth by all-weather gravel roads and a vehicle trail from Carroll Lake north to Sixth Depot Lake. The approximate location of the occurrence is 2.5 road km north of Carroll Lake. It is located on ODM Map 2053 (Hewitt 1964).

Lot 9,10, Concession XII, Sheffield township, Lennox and Addington county.
NTS TICHBORNE 31C/10 1:50,000
Latitude 44°32'30" N, Longitude 76°55'50"W.

SIZE AND GRADE

Eardley Wilmot (1925, p.78) states:
"As a result of surface stripping, one ton of 0.91 percent ore was sent to the Mines Branch, Ottawa, from which 13 pounds of pure molybdenite was extracted.

DESCRIPTION

There are no reports on the Calvert occurrence, however, test samples sent to the Mines Branch in Ottawa were described by Parsons (1916, p.115-116) as follows:

"The greater part of the molybdenite was in small flakes disseminated through a gangue consisting mainly of quartz and pyroxenite. There was very little pyrite and no mica associated with the molybdenite."

As far as can be judged from such a small sample, the ore is adaptable to the flotation process and a fair recovery of the molybdenite could be expected."

DEVELOPMENT HISTORY

1916: approximately 130 kg of material assayed at 0.89 percent molybdenite was shipped to the Mines Branch in Ottawa for analysis.

1917: Mr. Kelly of Tamworth was hired by the Cameron Mining Company. After surface stripping, one ton of material at 0.91 percent molybdenite was tested by the Mines Branch in Ottawa. Approximately 13 pounds of molybdenite was extracted (Eardley-Wilmot 1925, p.78).

REFERENCES

Eardley Wilmot, V.L.	1925, p.78
Johnston, F.J.	1968, p.50
*Hewitt, D.F.	1964, p.31, Map 2053
Parsons, C.S.	1916, p.115-116
Vokes, F.M.	1963, p.169.

13. CHISHOLM MOLYBDENITE MINE (Past Producer)

COMMODITY:
Molybdenum

ROCK ASSOCIATION:
Host: Marble
Other: Granite

CLASSIFICATION:
IIA1: Stratabound, skarn hosted

LOCATION AND ACCESS

The Chisholm molybdenite mine is located on NTS sheet 31C/10 about 10.5 km north-east of Tamworth, in the southeast corner of Sheffield township. An all weather access road runs from Enterprise to Parham. The mine lies east of this road, 6.5 road km north of the CPR crossing in northeast Camden township. The mine is shown on ODM map 2053 (Hewitt, 1964).

Lot 5, Concession 14 Sheffield township, Lennox and Addington county

NTS TICHBOURNE	31C/10	1:50,000
Latitude	44°32'16"N	Longitude 76°52'45"W
UTM Zone 18,	4933100 N, 350700 E	

SIZE AND GRADE

Molybdenite ore at the Chisholm mine was extracted from a pit 6 m deep with surface dimensions approximately 45 m by 24 m (Karvinen 1973). About 10,000 tons were excavated and 343 tons of mineralized rock produced 8,000 pounds of pure molybdenite (Eardley-Wilmot, 1925, p.80). Grades ranged from 1.00 to 5.8 percent MoS_2; the mineralized material was high graded by hand picking or milling processes. A mill feed from the original stockpile assayed 0.46 percent MoS_2 (Eardley-Wilmot, 1925, p.79).

Development stopped at the Chisholm mine after 1915. There is no mention of the lateral, and total vertical extent of the mineralized zone.

DESCRIPTION

General Geology: The mineralized zone at the Chisholm Mine lies at the southern end of a narrow, sinuous marble band within the Sheffield granite gneiss. The band is discontinuous and extends for approximately 10 kilometres along the gravel access road, south of Fifth Depot Lake.

Karvinen (1973) described three major rock types at the mine site: marble, granite gneiss and scapolite skarn (Figure 16). The marble consists of white, coarse-grained calcite with a minor component of graphite, muscovite and diopside. Minor dolomitic marble was also reported. Granite gneiss surrounds and in part underlies the marble.

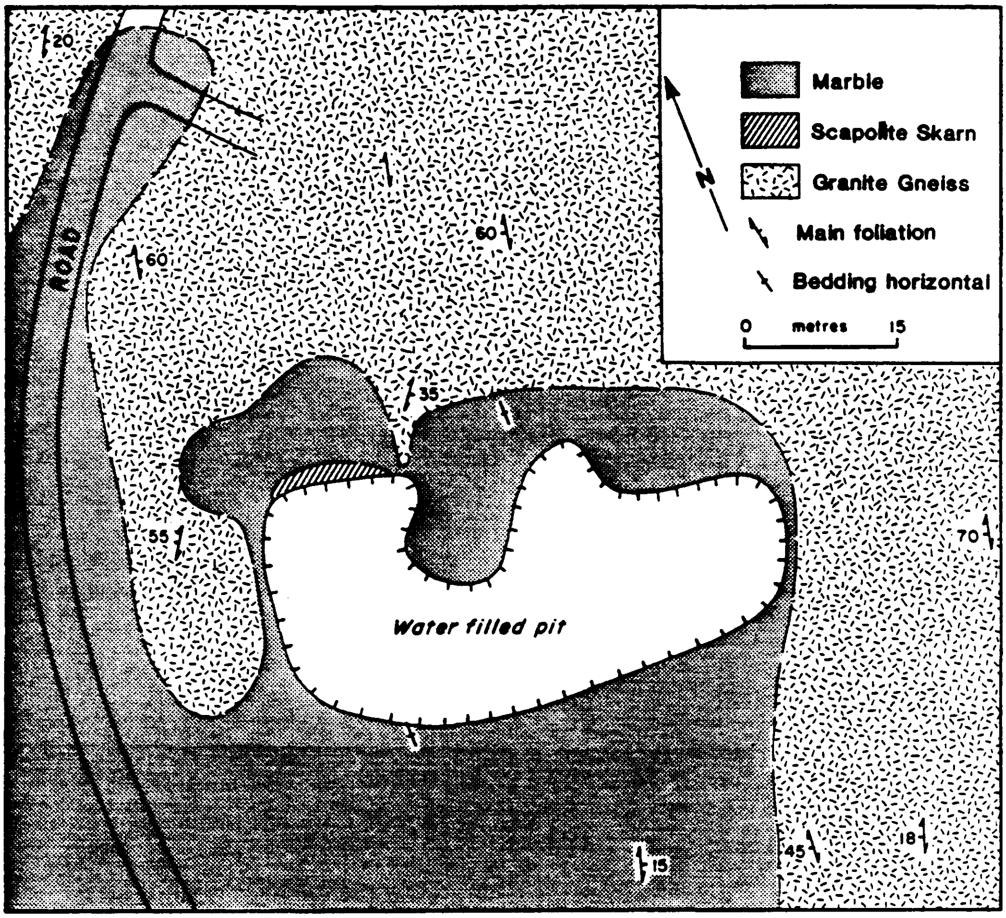

Figure 16: Geology of the Chisholm Molybdenite Deposit (Adapted from Karvinen, 1973).

It consists of a pink, fine-grained foliated rock containing microcline, plagioclase, quartz and accessory magnetite and biotite. Karvinen (1973), reports that molybdenite-bearing scapolite skarn outcrops in the northwest corner of the pit only; it is a very coarse-grained, massive inhomogeneous rock composed of scapolite and diopside with minor sphene, phlogopite and apatite and in places calcite, tremolite and chlorite. Pyrrhotite, pyrite and minor molybdenite occur locally within the skarn where they may comprise 20 to 60 percent of the rock.

Karvinen (1973), Parsons (1917) and Simon (1916) have suggested that the marble unit is flat-lying cap on the mineralized zone which lies at or near the contact to granite gneiss. A lower contact with the granite gneiss has never been observed or otherwise verified. In 1979, 1980, government geologists found the pit flooded.
Mineralization: Molybdenite occurs as large grains in sulphide-rich zones within the skarn (Karvinen 1973, Eardley-Wilmot 1925). These zones contain 20 to 60 percent pyrrhotite and minor pyrite. Lesser fine-grained molybdenite is also found in the sulphide-poor zones of the skarn. Simon (1916) and Gwillim (1928) reported on earlier stages of development. Simon (1916) states:

"In No. 1 pit, the ore body is more or less broken up by horses of crystalline limestone. The southwest side of the pit, however, is almost solid sulphides over a width of 30 feet. On the northeast side of the pit and on the hanging wall side, the sulphides and pyroxenite occur in pockets through the limestone. In pit No. 2, the entire bottom of the pit is clean sulphides and pyroxenite vein material".

The molybdenite occurs associated with pyrrhotite,. pyrite and pyroxenite ..... The crystal flakes of molybdenite average 1/4" to 1" in diameter, although much larger flakes are obtained".
Gwillim (1920, p.117-8) states:

"......The ore body proper appears to outcrop in several places as a rusty iron-stained pyroxenite; but at most places the edges of the pits show a capping of crystalline limestone, while their deeper portions are in the more altered material containing much pyrite, with subsidiary pyrrhotite. The molybdenite occurs with the iron sulphides....... The bottom and lower portions of the sides of the pits, beneath the crystalline limestone, appear to be promising ground, although evidently not well mineralized with molybdenite, except in two or three places...

It is probable that ore-bearing ground similar to that already excavated will be found beneath these pits and also under the few feet of limestone capping which shows on their edges. There is no certainty regarding the depth of the ore-bearing ground..."

Tonnages and average grades of shipments (Eardley-Wilmot 1925, p.80) are listed below:

Table 19: Grades and Tonnages of Ore Shipments, from the Chisholm Molybdenite Mine

Tons Ore	Percent MoS_2
85	1.76
18	1.40
235	1.00
5	5.8

In addition, 80 tons of pyrites were sold to the Grasselli Chemical Company (Eardley-Wilmot 1925, p.80).

DEVELOPMENT HISTORY

1904:
- Mr. A.W. Chisholm excavated a pit 50 feet in diameter and 10 feet deep.
- 600 tons of rock were mined and 85 tons of picked ore (1.75 percent MoS_2) was sold in the United States for $1,275.

1915:
- a second pit was opened beside the original working and widened to 80 feet in diameter and 10 to 15 feet deep.
- Mr Chisholm shipped 18 tons of material to Ottawa for analysis; the average grade was 1.4 percent MoS_2.

1916:
- International Molybdenum Company of Renfrew optioned the property and sent 235 tons of material (selected from existing stockpiles) to their concentrator in Renfrew.

1917:
- Mr. Chisholm and Mr. Seybold erected a small cobbing plant with a capacity of 25 tons/10 hours.
- 5 tons of crude concentrate shipped to the Mines Branch assayed 5.8 percent molybdenite.
- 80 tons of pyrite were sold to the Grasselli Chemical Company.
- 40 ton concentrator was erected, an unknown quanitity of tailings from the cobbing plant was treated.

1919:
- The property was owned by the Sheffield Molybdenite Mining Company Limited.
- No mining activity was reported.

1937:
- Mr. W.J. Brown of Montreal held the property.
- No mining activity was reported.

REFERENCES

Eardley-Wilmot, V.L.	1925, p.78
Gwillim, J.C.	1920, p.117-118
*Hewitt, D.F.	1964, p.31, Map 2053
Johnston, F.J.	1968, p.48
Karvinen, W.O.	1973
Parsons, A.L.	1917, p.310-311
Timm, W.B.	1916, p.88-89, 105-110
Walker, T.L.	1911, p.43-44
Vokes, F.M.	1963, p.169-170.

14 DWYER OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Marble

CLASSIFICATION
IIA1: Stratabound, skarn hosted

LOCATION AND ACCESS

The Dwyer occurrence is located in the southeast part of Sheffield township, approximately 12 km northeast of Tamworth (NTS 31C/10). It is accessible from an all-weather gravel road which passes through the southeast part of Sheffield township and joins Enterprise in Camden township to Parham in Hinchinbrooke township. The approximate location of the deposit is 7.5 road kilometres north from the intersection of the access road and the Canadian Pacific Railway line in the northeast corner of Camden township. The occurrence is located on O.D.M. Map 2053 (Hewitt 1964).

Lot 8, Concession XV, Sheffield township, Lennox and Addington county
NTS Tichborne 31C/10 1:50,000
Latitude 44°33'14" N Longitude 77°52'46"W
UTM Zone 18, 4 934 900 N, 350 700E

SIZE AND GRADE

Parsons (1917, p.311) reported minor disseminated molybdenite in a pit with approximate dimensions 2.5 m by 3 m by 3 m deep.

DESCRIPTION

The only report on the Dwyer occurrence by Parsons (1917, p.311), states:

"On the farm of Timothy Dwyer, lot 8, concession XV, a pit has been opened up about 8 by 10 feet and ten feet deep, in a crystalline limestone. A few flakes of molybdenite were seen which were associated with pyrite, quartz and tourmaline. Pyroxene was not prominent at this pit, though it was present in small quantities. This property was not being worked at the time."

DEVELOPMENT HISTORY

Before 1917: a pit with dimensions 2.5 m by 3 m by 3 m deep was excavated by unknown operators (Parsons 1917, p.311).

REFERENCES

*Hewitt, D.F. 1964, p.31, Map 2053.
Parsons, A.L. 1917, p.311

15. KELLER OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Granite gneiss, pegmatite
Other: Marble (limestone)

CLASSIFICATION
IIA1: Stratabound, skarn hosted
IIA2: Unconformable-to-conformable pegmatite hosted

LOCATION AND ACESS

The Keller occurrence is located midway between South Cranberry and West Lakes approximately 10 kilometres northwest of Tamworth in Sheffield township (NTS 31C/10). It is accessible by a vehicle trail which runs between Carroll and Sixth Depot Lakes. The trail begins north of Carroll Lake and is joined to Tamworth by all weather gravel roads. The deposit is approximately 5 road kilometres north of Carroll Lake. The occurrence is located on O.D.M. map 2053 (Hewitt 1964).

Lot 12 Concession XIII, Sheffield township, Lennox and Addington county
NTS TICHBORNE 31C/10 1:50,000
LATITUDE 44°33'22"N LONGITUDE 76°54'54'W
UTM Zone 18, 4 935 200 N, 347 900 E.

SIZE AND GRADE

Parsons (1917, p.311) states approximately 160 pounds of pure flake molybdenite was collected from 5 pits of unspecified dimensions.

DESCRIPTION

Eardley-Wilmot (1925, p.78) writes:

"There appears to be three series of deposits, one of which is on a contact between granite-gneiss and limestone. The molybdenite occurs in seams and fine cracks along this contact, but the mineral does not penetrate far into the rock. Another deposit is in a pegmatite dike within the gneiss, where the molybdenite is confined principally to quartz stringers, together with feldspars, pyrite, and calcite. The richest deposit is in the granite gneiss about 50 feet from the contact; it seems, however, to be only a local concentration."

DEVELOPMENT HISTORY
1916: The O'Brien's Greenfield Company of Superior, Washington excavated 5 pits on the farm of A. Keller. About 160 pounds of pure flake molybdenite was recovered from the workings. (Parsons 1917, p.311).

REFERENCES

Eardley Wilmot, V.L.	1925, p.78
*Hewitt, D.F.	1964, p.31, Map 2053
Johnston, F.J.	1968, p.47-48
Parsons, A.L.	1917, p.311
Vokes, F.M.	1963, p.169.

16. SPRATT OCCURRENCE

COMMODITY

Molybdenum

ROCK ASSOCIATION

Host: Marble, granite gneiss?

CLASSIFICATION

IIA3: Stratabound, skarn hosted

LOCATION AND ACCESS

The Spratt occurrence is located in the southeast part of Sheffield Township, approximately 12 km northeast of the town of Tamworth (NTS 31C/10). It is accessible from an all-weather road which passes through the southeast part of Sheffield township and joins Enterprise in Camden township to Parham in Hinchinbrooke township. The deposit is located approximately 7.5 road kilometres north from the intersection of the access road and the Canadian Pacific Railway line in the northeast corner of Camden township. It is located on ODM 2053 (Hewitt 1964)

Lot 8, Concession XV, Sheffield township,
Lennox and Addington county
NTS TICHBORNE 31 C/10 1:50,000
LATITUDE 44°33'35N LONGITUDE 77°52'34"W.
UTM Zone 18, 4 935 550 N, 351 000 E.

SIZE AND GRADE

Parsons (1917, p.311) stated that little molybdenite was observed on the walls of an excavation 3 m by 6m by 3 m deep. He also observed a small pile containing "a ton or two of low-grade ore".

DESCRIPTION

Parson (1917, p.311) writes:

"Another deposit was opened up on the farm of Matthew Spratt, lot 8 , concession XV, by L.L. Cailloux, but work had been discontinued. An open cut about 10 feet wide by 20 feet long and more than 10 feet deep had been excavated. The bottom of this trench was filled with water, and it was not possible to make a thorough examination. Very little molybdenite was to be seen on the walls of the cut,..... The minerals associated with the molybdenite were pyrite, quartz, tourmaline, pyroxene, calcite and dolomite."

Eardley-Wilmot (1925, p.,311) refers to the mineralization as :" an oxidized zone along the contact of gneiss and limestone..."

DEVELOPMENT HISTORY

1916: Mr. L.L. Cailloux excavated a pit with dimensions 3 m by 6 m by 3 m deep, on the farm of Matthew Spratt (Parsons 1917, p.311).

REFERENCES

Eardley-Wilmot, V.L.	1925, p.80-81
*Hewitt, D.F.	1964, p.31, Map P.2503
Johnston, F.J.	1968, p.50
Parsons, A.L.	1917, p.311
Vokes, F.M.	1963, p.170

17. WAGER OCCURRENCE

COMMODITY
Molybdenum

ROCK ASSOCIATION
Host: Quartz-pyroxene rock
Other: Marble, granite gneiss

CLASSIFICATION
IIA1: Stratabound, skarn hosted

LOCATION AND ACCESS

The Wager occurrence is situated in the east central part of Sheffield township about midway between Sixth Depot Lake and the southern end of Fifth Depot Lake (NTS 31C/10). It is approximately 14 kilometres northeast of Tamworth and 14.5 kilometres north of Enterprise. It is accessible from an all-weather gravel road which passes through the southeast part of Sheffield township and joins the town of Enterprise in Camden township to Parham in Hinchinbrooke township. The deposit is approximately 1 kilometre west of the southern tip of Fifth Depot Lake. It is located on ODM Map 2053 (Hewitt, 1964).

Lot 15, Concession XVI, Sheffield Township
Lennox and Addington county
NTS TICHBORNE 31C/10 1:50,000
Latitude 44°35'26"N Longitude 76°53'45"W
UTM Zone 18, 4939000N, 349500E

SIZE AND GRADE

Eardley Wilmot (1925, p.81) states:
"...work consisting of trenching in about half a dozen places and three open cuts was done... No shipments were made, except 286 pounds of 0.89 percent ore which was sent to the Mines Branch, Ottawa, for testing purposes."

DESCRIPTION

Eardley-Wilmot (1925, p.81) writes:
"On a contact of gneiss and crystalline limestone there is a narrow band of quartz and pyroxenite in which molybdenite in small flakes occurs. The band has been traced for a distance of about 1500 feet."

DEVELOPMENT HISTORY

1915: Several trenches and 3 open cuts of unspecified dimensions were excavated for Mr. R. Gamble and Mr. J.H. Cameron. A total of 286 pounds averaging 0.89 percent MoS_2 was sent to the Mines Branch in Ottawa.

REFERENCES

Eardley-Wilmot, V.L.	1925, p.81
*Hewitt, D.F.	1964, p.31, Map 2053
Johnston, F.J.	1968, p.48, 49
Parsons, A.L.	1917, p.311
Voke	

TABLE B: Minor Molybdenum Occurrences

	NAME	LOCATION		CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
18	Drader Occurrence	Hinchinbrooke Township Lot 18, Con. X	IIA2	Unconformable to conformable, pegmatite hosted, molybdenum	Molybdenite	Pegmatite	- Disseminated flakes of molybdenite were reported in a lens of pegmatite in granite gneiss	*Harding, W.D. (1951, p.90, Map 1947-5) *Hewitt, D.F. (1964, p.13, Map 2053) Johnston, F.J. (1968,p.24)
19	Godfrey Occurrence	Hinchinbrooke Township Lot 4, Con. II	IIA2	Unconformable to conformable, pegmatite hosted, molybdenum	Molybdenite Pyrite Pyrrhotite	Pegmatite	- In 1934, 2 pits were sunk in a pegmatite dike containing pyrite, pyrrhotite and molybdenite	*Harding, W.D. (1942, Map 1947-5) Johnston, F.J. (1968, p.24)
20	Sills Occurrence	Hinchinbrooke Township Lot 26, Con. VIII	IIA2	Unconformable to Conformable, pegmatite hosted, molybdenum	Molybdenite	Pegmatite	- Disseminated molybdenite mineralization was reported in a pegmatite dike which cuts granitic gneiss.	*Harding, W.D. (1951, p.60, Map 1947-5) *Hewitt, D.F. (1964, p.13, Map 2053) Johnston, F.J. (1968, p.24)
21	Corak Occurrence	Oso Township Lot 15, Con. II	IIA3?	Stratiform, amphibole para-gneiss hosted, molybdenum	Molybdenite	Paragneiss?	- In 1939 Molybdenite mineralization was reported in a zone which extend across Highway 7, North of Sharbot Lake.	*Harding, W.D. (1947, Map 1947-5)
22	Burns Occurrence	Sheffield Township Lot 4, Con. XV	IIA1	Stratabound, skarn hosted, molybdenum	Molybdenite	Marble, granite	- A molybdenite-bearing sulphide zone was reported at the contact between marble and granite. The occurence was exposed by trenching and stripping in 1915	Eardley-Wilmot, W.L. (1925, p.116) *Hewitt, D.F. (1964, p.31, Map 2053) Sutherland, T.F. et al. (1916, p.135)
23	Oberkerk and Molony Occurrence	Sheffield Township Lots 10, 11 Con. XIII	IIA1	Stratabound, skarn hosted, molybdenum	Molybdenite	Marble, granite gneiss	- Molybdenite occurs in an oxidized contact zone between marble and granitic(?) gneiss	Eardley-Wilmot, W.L. (1925, p.115) *Hewitt, D.F. (1964, p.31, Map 2053)

INDEX OF GOLD AND SILVER DEPOSITS
(Keyed to map p.2737 in pocket)

Name	Township	Status	Classification
1. O'Donnell (N)	Anglesea	O	IIIA1
2. O'Donnell (S)	Anglesea	O	IIIA1
3. Ultimate Energy	Anglesea	O	IIIA1
4. Big Dipper	Barrie	P	IIIA1
5. Gough	Barrie	P	IIIA1
6. Helena	Barrie	P	IIIA1
7. Kashwakamak	Barrie	O	IIIA1
8. Mazinaw Base Metals	Barrie	O	IIIA2
9. Natto	Barrie	O	IIA1
10. Ore Chimney	Barrie	P	IIIA1
11. Star	Barrie	PP	IIIA1
12. Cordova	Belmont	PP	IIIA1
13. Ledyard	Belmont	P	IIIA1
14. Boerth	Clarendon	P	IIIA1
15. Webber	Clarendon	P	IIIA1
16. James	Elzevir	O	IIIA1
17. Silver King	Elzevir	P	IIIA1
18. Gilmour	Grimsthorpe	PP	IIIA1
19. Addington	Kaladar	?	IIIA1
20. Dome	Kennebec	P	IIIA1
21. Emery	Kennebec	O	IIIA1
22. Gold Base	Kennebec	O	IIIA1
23. McMurray	Limerick	O	IIIA1
24. Bannockburn	Madoc	P	IIIA1
25. Richardson	Madoc	P	IIIA1
26. Sophia	Madoc	PP	IIIA1
27. Ackerman	Marmora	P	IIIA1
28. Cook	Marmora	PP	IIIA1
29. Dean & Williams	Marmora	PP	IIIA1
30. Deloro	Marmora	PP	IIIA1
31. Gatling Five Acre	Marmora	PP	IIIA1
32. Pearce	Marmora	PP	IIIA1
33. Soverign	Marmora	PP	IIIA1
34. Picamine	Palmerston	O	IIIA1
35. Craig	Tudor	PP	IIIA1
36. Kennefic	Anglesea	O	IIIA1
37. O'Donnell II	Anglesea	O	IIIA1

Name	Township	Status	Classification
38. Lot 13, Con. I	Barrie	O	IIIA1
39. Mill	Barrie	O	IIIA1
40. Ore Mountain	Barrie	O	IIIA1
41. Pay Ore	Barrie	O	IIIA1?
42. Pay Rock	Barrie	O	IIIA1
43. Cashel Copper	Cashel	O	IIIA1
44. Lot 20, Con. I	Cashel	O	IIIA1
45. Lot 23, Con. IX (Cook)	Clarendon	O	IIIA1
46. Lot 16, 17, Con II	Dungannon	O	IIIA1
47. Turriff	Dungannon	O	IIIA1
48. Bany	Elzevir	O	IIIA1
49. Cobalt-Frontenac Ltd.	Grimsthorpe	O	IIIA3
50. Palmotter	Grimsthorpe	O	IIIA3
51. West Black River	Grimsthorpe	O	IIIA1
52. Ewing	Kaladar	O	IIIA1
53. Mitchie	Kaladar	O	IIIA1?
54. Stone	Kaladar	O	IIIA1
55. Sopha-Miller	Lake	O	IIIA1?
56. Higman	Limerick	O	IIIA1
57. Empire	Madoc	O	IIIA1
58. Fox	Madoc	O	IIIA1
59. St. Joe	Madoc	O	IIIA1
60. Campbell-Blomfield	Marmora	O	IIIA1
61. Consolidated	Marmora	O	IIIA1
62. Demars	Marmora	O	IIIA1
63. Gawley No. 1	Marmora	O	IIIA1
64. Gawley No. 2	Marmora	O	IIIA1
65. Gillen	Marmora	O	IIIA1
66. Gladstone	Marmora	O	IIIA3
67. Hawkeye	Marmora	O	IIIA1
68. Neill	Marmora	O	IIIA1
69. Robinson	Marmora	O	IIIA1
70. McKnight	Olden	O	IIIA1
71. Mountain Grove	Olden	O	IIIA3
72. Raymond, I.	Olden	O	IIIA3

Name	Township	Status	Classification
73. Bourke, R.T.	Oso	O	IIIA3
74. Lot 14, Con. I	Oso	O	IIIA3
75. Mcveigh	Oso	O	IIIA3
76. Morrow	Oso	O	IIIA1
77. Tysick	Oso	O	IIIA3
78. Canadian	Rawdon	O	IIIA1
79. Lot 12., Con. II	South Sherbrooke	O	IIIA1
80. Glannire	Tudor	O	IIIA3
81. Lingham Lake	Tudor	O	IIIA1
82. Lot 4, Con. XIV	Tudor	O	IIIA3
83. Lot 5, Con. IV	Tudor	O	
84. Lot 7, Con. X	Tudor	O	IIIA1
85. Miora River	Tudor	O	IIIA1
86. Quinlan Lake	Tudor	O	IIIA1
87. Sheppard	Tudor	O	
88. Snow Road	Tudor	O	IIIA1
89. Rollins	Wollaston	O	IIIA3

1. O'DONNELL III (NORTH) OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION:
Host: Vein quartz
Other: Mafic metavolcanic rocks

CLASSIFICATION
IIIA1: Concordant to discordant quartz; quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS:

The occurrence is located in the southeastern part of Anglesea township, approximately 3.5 kilometres south of Cloyne and 1.7 kilometres north west of Bishop Corners (NTS 31C/14). It is accessible on foot from a gravel road running west from Highway 41 (immediately south of Bishop Corners) to Slave Lake. The occurrence is approximately 1.0 kilometres north of the access road, at a point 1.8 road kilometres from the highway. The occurrence is located on ODM Map 2053 (Hewitt 1954), 51d (Meen and Harding 1942) and O.G.S. Map P.2278 (Moore and Morton 1980).

Lot 6, Con. III, Anglesea Township, Lennox and Addington County
NTS Mazinaw Lake 31C/14, 1;50,000
Latitude: 44°47'01"N Longitude: 77°11'46"W
UTM Zone 18 4 961 100 N, 326 300 E

SIZE AND GRADE

Meen (1944, p.38) reported that the mineralized zone occurs within a quartz vein and shear system. Cross trenches have exposed the shear zone for approximately 700 feet and the mineralized veins for 600 feet. Carter reported that the shear zones are up to 10m wide and the quartz veins range in width from a few inches to 7 feet. Workings consist of 13 trenches and one pit (Figure 17). Carter observed two drill hole collars on the property, however no drill records are available. Hurst (1927, p.110) collected a chip sample of sulphide mineralization at the pit which assayed 0.14 oz/ton Au, 0.56 oz/ton Ag, 8.40 percent As and 4.60 percent Zn. Carter collected chip samples across trenches 1 and 2 (80 TRC-165) and trench 3A (80 TRC-169), assays are listed in Table 20.

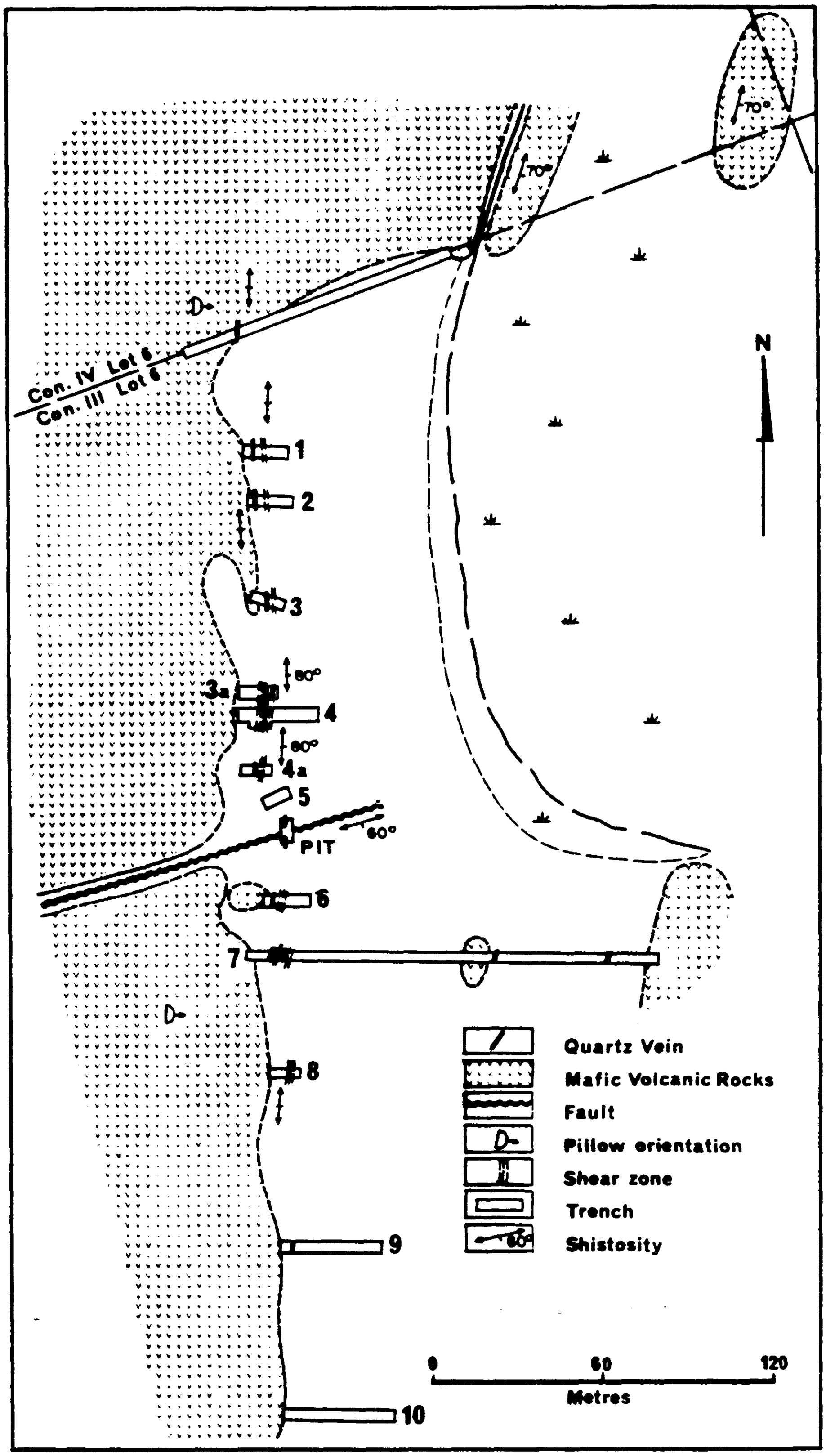

Figure 17: Geology of the O'Donnell N Gold Deposit (Adapted from Meen, 1944, p.36).

TABLE 20: Trace element analyses of chip samples of mineralized quartz veins, O'Donnell III Occurrence

	Au (oz/ton)	Ag (oz/ton)	As (ppm,%)	Sb (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
80TRC-165	0.04	0.14	1010	81	710	2160	3300
80TRC-169	0.04	<0.10	6.507	350	435	1460	280

DESCRIPTION

The O'Donnell III occurrence is situated within an extensive sequence of mafic metavolcanic rocks referred to as the Tudor Formation (Lumbers 1969). Hewitt's regional geological map (Map 2053) shows that the stratigraphic foliation of the metavolcanic rocks near the northwest boundary of Elsevir Granite is generally oriented north-south with a vertical dip. According to Moore and Morton (980, Map P.2278), the volcanic rocks are basaltic pillowed flows, pillow breccias, autoclastic breccias, amphibolite and hornblende schist.

Meen's (1944, p.36) geological sketch map of the occurrence indicates that the mineralization is found in quartz veins and a shear zone within mafic pillowed flows (Figure 17). The mineralized zone is oriented N3°W to N6°E and dips 80°E to vertical (Meen 1944, p.38). Carter describes the country rock as a dark green to black, fine- to medium-grained mafic metavolcanic rocks. The mineralized zone consists of sulphide bearing lenses and vein of coarse-grained, white quartz and rusty shear zones. Mineralization: The mineralization at the deposit consists of arsenopyrite, pyrite, galena, sphalerite, chalcopyrite and meneghinite (Hurst 1927, p.110,, Meen 1944, p.33). Carter reports that the best mineralized zone is exposed in trench 3A (figure 17) which contains an irregular zone or lens of massive arsenopyrite and minor disseminated galena 30 to 40 cm in width. Trench 4 contains massive arsenopyrite in a zone 10 inches wide (Meen 1944, p.38). Carter observed disseminated blebs and stringers of pyrite, chalcopyrite, sphalerite and arsenopyrite in mineralized veins in trench 2. Polished thin sections of mineralization from these veins show a small percentage of sulphides (5%) consisting of irregularly distributed, fine, anhedral grains of sphalerite, pyrite, chalcopyrite and arsenopyrite. Chalcopyrite occurs as small grains associated with sphalerite and as small irregular veinlets. Pyrite is found in subhedral to anhedral grains and may occur in more than one phase of mineralization. Arsenopyrite occurs in disseminated, subhedral grains (3.0 mm) and crystal aggregates and in irregular masses associated with the grains. The grains form discontinuous bands in one section. The gangue is composed of massive fine-grained quartz, altered feldspar and minor biotite, chlorite and carbonate. One section contains aggregates of very fine-grained tourmaline closely associated with arsenopyrite.

DEVELOPMENT HISTORY

before 1927: A 15-foot shaft and several small pits were excavated. One sulphide-bearing sample assayed at the Mine Branch, Ottawa, contained significant gold and silver values. The property was owned by Mr. H. O'Donnell (Hurst 1927, p.110).

before 1942: A total of 13 trenches and 1 pit were reported on the property. The identity of the operators was not reported (Meen 1944, p.38).

before 1980: At least 2 drill holes were completed by unknown operators. There is no record of the drill program.

REFERENCES

Carter, T.R.	1980	p.171
Gordon et al. Lovell, H.L.	1979	p.46
*Hewitt, D.F.	1964	p.28, Map 2053
Hurst, M.E.	1927	p.110
Lumbers, S.B.	1969	p.31
Meen, V.B.	1944	p.33,36,38
*Meen, V.B.	1944	Map No. 51d
*Moore, J.M. and Morton, R.L.	1980	Map P.2278
Shklanka, R.	1969	p.196
Sangster, A.L.	1970	p.235

2. O'DONNELL I (SOUTH) OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION:
Host: Vein quartz
Other: Mafic metavolcanic rock

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, and quartz-ankerite vein-hosted Au, Ag and As

LOCATION AND ACCESS.

The occurrence is located in the southeast corner of Anglesea township, approximately 5 kilometres south of Cloyne and 2 kilometres southwest of Bishop Corners (NTS 31 C/14). It is accessible on foot from a gravel road running west from Highway 41 (immediately south of Bishop Corners) to Slave Lake. The workings are approximately 0.6 kilometres south of the gravel access road from a point 2 road kilometres from Highway 41. The occurrence is located on ODM maps 2053 (Hewitt, 1964), 51d (Meen and Harding, 1942) and O.G.S. map P2278 (Moore and Morton, 1980).

Lot 8 Con. II Anglesea township, Lennox and Addington county
NTS MAZINAW LAKE 31C/14 1:50,000
Latitude: 44°46'13"N, Longitude: 77°11'44"W
UTM Zone 18, 4 959 550 N, 326 250 E

SIZE AND GRADE

Carter reported a trench 50m by 1.5m by <0.5m deep opened along the mineralized vein. A chip sample (80TRC-209) collected across a 60 cm wide vein assayed <0.01 ounces/ton Au, 0.10 oz/ton Ag, 590 ppm As, 57 ppm Sb, 30 ppm Cu, 1440 ppm Pb and 230 ppm Zn. Meen (1944, p.38) reported a second trench on a vein near the centre of the lot.

DESCRIPTION

General Geology: Hewitt's regional geology map (Map 2053) indicates that the deposit occurs within part of an extensive sequence of mafic metavolcanic rocks (Tudor Formation) which are intruded by a number of intrusive bodies, notably the Elzevir Granite. The occurrence is situated near the northeast border of the Elzevir Granite where the general "stratigraphic foliation" of the volcanic rocks is oriented north-south with a vertical dip. The O.G.S. preliminary geological map P2278 (Moore and Morton, 1980) defines the volcanic rocks as basalt flows, pillow flows, pillow breccias, autoclastic breccias, amphibolite and hornblende schist.

At the occurrence, Carter describes the country rocks as dark grey, weakly to strongly foliated, very fine-grained mafic metavolcanics. Shear zones contain abundant biotite and often have a rusty appearance. A drill hole oriented 270°/45° was located near the showing. The core (150 feet) is composed of strongly foliated, rusty mafic metavolcanic rock cut by few small quartz veinlets. Mineralization: The mineralization is hosted within a vein conformable with a shear zone oriented 05°/70°E. The vein varies in width from 30 to 80cm and is composed of white, coarse-grained quartz with erratically scattered blebs and stringers of arsenopyrite, chalcopyrite, galena, sphalerite and pyrite. Meen (1944, p.39) reported that one sample with considerable quantities of meneghinite assayed 0.2 oz/ton Au. Two polished thin sections of the vein contain up to 8 percent irregularly disseminated galena, arsenopyrite, pyrite, pyrrhotite and chalcopyrite. Grain size ranges from <0.5 to 4.0 mm. Arsenopyrite and pyrite generally form subhedral grains and are not closely associated with the other sulphides. Galena, sphalerite, pyrrhotite and chalcopyrite occur in irregular and unevenly distributed grains.

DEVELOPMENT HISTORY

pre 1939: -Hugh O'Donnell carried out trenching activities on a vein in the centre of lot 8, Con II, (Meen, 1944, p.38).

1939: -Hugh O'Donnell opened a 160 foot long trench along the strike of a mineralized vein in the south part of the lot (Meen, 1944, p.38-39).

pre 1980: -One diamond drill hole (150 feet) was completed by unknown operators.

REFERENCES

Gordon et al. 1979, p.46
*Hewitt 1964, p.28
Meen, V.B. 1942, p.38-39
*Meen, V.B. and Harding, W.D. 1942, 51d
*Moore, J.M. and Morton, R.L. 1980, Map P2278
Sangster, A.L. 1970, p.230

3. ULTIMATE ENERGY AND RESOURCES OCCURRENCE

COMMODITY: Gold, Silver

ROCK ASSOCIATION:
Host: Vein quartz
Other: Greywacke, arkosic quartzite

CLASSIFICATION:
III A 1: Concordant to discordant quartz, quartz-ankerite, vein-hosted Au, Ag, and As.

LOCATION AND ACCESS

The occurrence is located in the southeast part of Anglesea Township, approximately 3.0 kilometres south of Cloyne and 2.0 kilometres northwest of Bishop Corners (NTS 31 C/14). It is accessible from a vehicle trail and a gravel road which extends west from the junction between Highways 41 and 506. The workings are about 1.5 road kilometres west of the intersection and 0.5 road kilometres south of the gravel road, a short distance east of the vehicle trail. The original trench site is located on O.D.M. Map 51d (Meen and Harding 1944).

Lot 6 Con. IV, Anglesea Township, Lennox and Addington County
Latitude: 44°47'30"N Longitude: 77°11'40"W
UTM Zone 18 4 962 000 N 326 500 E

SIZE AND GRADE

An assessment report for Ultimate Energy and Resources Limited indicates that the vein system is exposed by 10 surface trenches over a distance of about 300 metres (Gill, J.C. 1979). The mineralized zone is comprised of a shear zone with quartz veins ranging in width from 1.5 feet to 8 feet. A total of 10 drill holes (1445 feet) were completed within the same vicinity and an additional 2 holes (318 feet) were drilled 1300 feet south of the trenches. The two best mineralized samples were collected from surface showings which assayed 8.92 and 1.19 percent Cu, 5.82 and 0.95 oz/ton Ag and 0.02 and 0.01 oz/ton Au respectively. A total of 33 core samples were analyzed; the highest metal values reported were <O .005 oz/ton Au and 0.036 percent Cu.

DESCRIPTION

General Geology: The occurrence consists of a mineralized quartz vein system within sheared metasedimentary rock units interlayered with mafic volcanic rocks of the Tudor volcanic sequence. It is located in the same general area as the O'Donnell gold showings in the Tudor formation near the northeast boundary of the Elzevir Granite complex. The Ultimate Energy occurrence is on strike with the O'Donnell III (North) occurrence, 1500 feet to the south. The rocks in this area strike NNE and dip nearly vertical.

The ground between these occurrences is reported to be flooded.

The geology of the occurrence is described in an assessment report for Ultimate Energy and Resources Limited (Gill 1979, p.12) as follows:

> "The rocks exposed by stripping and trenching consist essentially of medium- to coarse-grained, greyish, arkosic quartzite. Some of the rock verges on greywacke or on impure quartzite containing biotite and argillaceous material. Most of the rocks exhibit shearing and alteration and these conditions are particularly prevalent in the vicinity of the vein portions. Mineralized sections also show silicification. Light- to dark-green sections in some of the drill core appear to have been originally impure limestone: These sections are marked by the development of lime silicates such a diopside."

Two drill holes located in the southern part of the property intersected interlayered mafic to intermediate metavolcanic flows and quartzitic greywacke units. The quartz veins are oriented approximately north-south and are generally vertical. The veins vary in width from 2 inches to 8 feet and average about 1.5 to 2.0 feet.

Mineralization: Gill (1979, p.11, 12) writes:

> "The mineralization is mainly pyrite and arsenopyrite with occasional pyrrhotite and chalcopyrite. Some of the arsenopyrite is quite massive, but on the whole, the sulphides tend to have a random distribution through the vein quartz. In places, flecks of disseminated pyrite and chalcopyrite occur in the host rock without any quartz accompaniment.....
> ....Flecks of visible gold are reported to have been seen on the quartz but the writer did not see this type of mineralization....."

DEVELOPMENT HISTORY

1940-1941: A trench was excavated in a quartz vein containing arsenopyrite. The operator was not identified (Meen, V.B. 1944, p.39).

1975: Mr. L.F. Smith drilled 2 holes (totalling 318') through a volcanic-sedimentary sequence containing trace pyrite and chalcopyrite mineralization (McConnell, J.D. 1975).

1978: Ultimate Energy and Resources Limited staked 4 claims on Lots 6, 7, Concession IV. A total of 9 trenches were opened and 10 drill holes (1445 feet) were completed (Gill, J.C. 1979).

1979: Ultimate Energy and Resources re-examined the property and carried out an E.M. (VLF) Survey, however the results were not reported (Gill, J.C. 1979).

REFERENCES

Gill, J.C.	1979,	Geoscience Data Centre, Toronto
McCannel, J.D.	1975,	" " " "
Meen, V.B.	1944,	p.39
*Meen, V.B. and Harding, W.D.	1944,	Map 51d

4. BIG DIPPER PROSPECT

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Calcitic marble, granite

CLASSIFICATION:
IIIA1: Concordant to discordant quartz and quartz ankerite vein-hosted Au, Ag and As

LOCATION AND ACCESS

The Big Dipper prospect is located in the central part of Barrie township, approximately 4 kilometres northeast of Myers Cave, 0.5 kilometres north of the shore of Mississagagon Lake and 1.5 kilometres southwest of the west end of Rockslide Lake (NTS 31C/14). It is accessible from a vehicle and foot trail, approximately 3,500 m east from the Star of the East mine.

The Star of the East mine is located midway between McCausland and Mississagagon Lakes and is accessible by a gravel road leading west from Highway 41 south of Mazinaw Lake (see Star Mine).

The Big Dipper Prospect is located on ODM Map 2053 (Hewitt 1964), Map No. 51d (Meen and Harding 1942) and O.G.S. Map P.2278 (Moore and Morton 1980).

Lots 10,16 Con. X	Barrie Township, Frontenac County
NTS MAZINAW LAKE	31C/14 1:50,000
Latitude 44°52'18"N	Longitude: 77°06'00"W
UTM Zone 18, 4 970 850 N	334 250 E

SIZE AND GRADE

Carter's investigation indicates that the mineralization is contained within a discontinuous vein or vein system up to 40 cm wide and 100 m long.

The local geology map (Figure 18) shows workings consisting of 4 shafts and 3 trenches. Carter's field description relates the 2 easterly shafts to a single showing referred to in previous reports. Corkhill (1906, p.90) states that the east shaft was 9' by 6' by 62' deep and the next shaft (100 feet southwest) was excavated to a depth of 30 feet. Corkhill also reported a 300 foot adit on Lot 4, Concession X, however Meen (1944, p.47) located it on Lot 10, Concession X.

According to the ODM Statistical Files for the Big Dipper Mining and Milling Co. Ltd., 17 ounces of gold were recovered from 52 tons of rock in 1907 and 1909. In 1980,

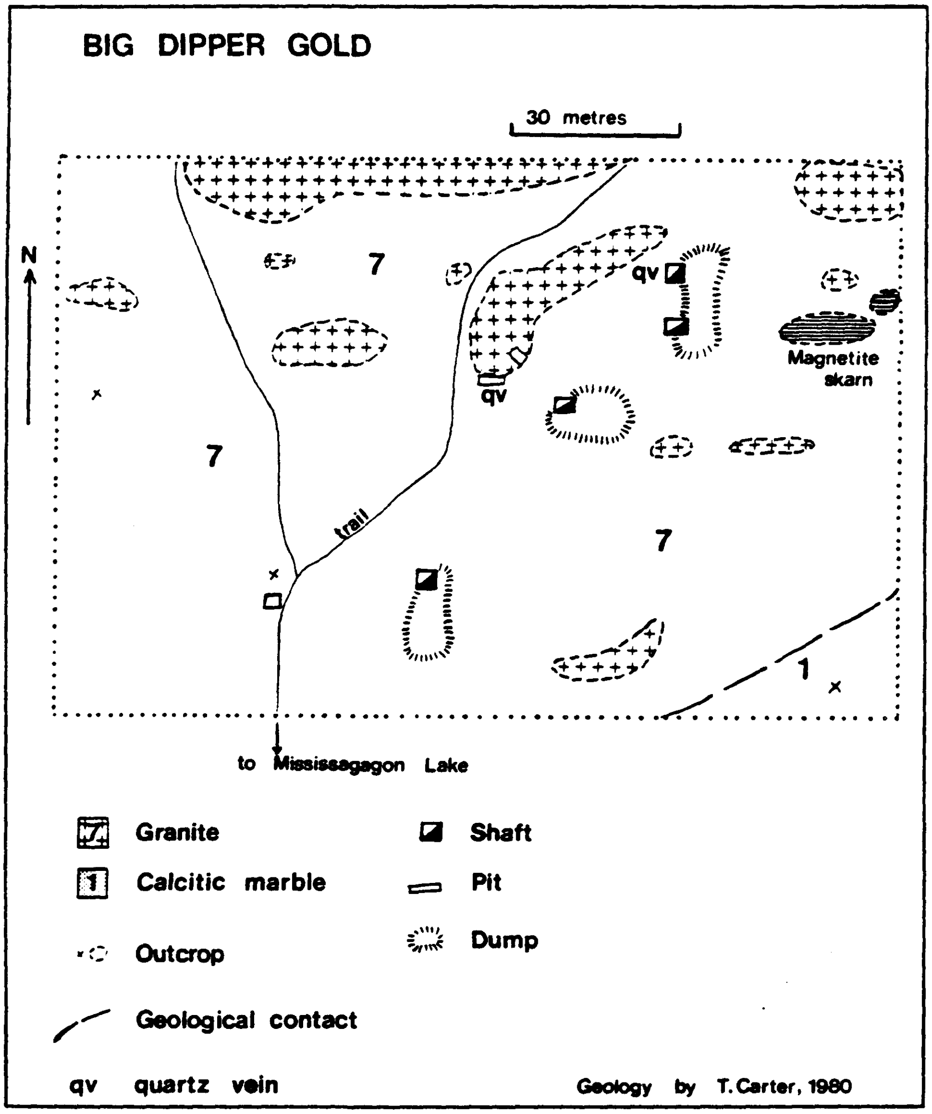

Figure 18: Geology of the Big Dipper Gold Deposit.

Carter analyzed 5 samples of mineralized material (Table 21). Sample 80 TRC-222 and -230 are chip samples of quartz veins near one shaft and in a pit. Samples 80 TRC-224, -225 and -229 are random samples of the rock dump; -229 was collected from the west shaft area.

DESCRIPTION

General Geology: The occurrence consists of a mineralized vein or vein system within granitic rocks at the north contact of an extensive belt of marbles, clastic metasedimentary and metavolcanic rocks. The belt extends from the east side of the Elzevir Granitic Pluton, northeast through Barrie and Clarendon Townships and beyond the north part of Palmerston Township.

Carter's geological sketch map indicates that the workings are opened up on quartz veins in granite a short distance north of the marble contact, however calcitic marble and fine-grained granite are also found in the rock dumps (Figure 18). A zone of magnetite skarn occurs within the granite, about 320 m east of the east shafts. In an early report, Corkill (1906, p.90) described the contact as a zone of strongly foliated, medium-grained rock containing approximately 20% quartz, 75% feldspar and 5% biotite. The chilled phase is dark grey, massive and aphanitic in appearance. Calcitic marble samples are pink, white or grey, coarse grained, poorly layered rocks with abundant tremolite-actinolite and biotite. The skarn is a dark green, massive, fine-grained rock with disseminated to massive concentrations of magnetite. A number of quartz veins are exposed in surface workings. One shaft exposes a steeply dipping vein oriented approximately east-west which cuts across the foliation of the granite. This major vein zone is up to 40cm wide and is composed of rusty, strongly fractured coarse-grained quartz with minor pyrite and little jamesonite or boulangerite. Tourmaline and locally abundant magnetite also occur within the veins.

DEVELOPMENT HISTORY

1905: - The Big Dipper Mining and Milling Company Limited was incorporated and obtained a property on Lots 4 to 21, Concession X.
- A 300 foot adit was opened on Lot 4 (10?), Concession X, 2 shafts were excavated to depths of 62' and 30' on Lot 16, Concession X (Corkill 1906, p.90, Meen 1944, p.47).

1907: - additional work was carried out on Lot 4 (10?) Concession X (Corkhill, 1908, p.83)
- 1 ounce of gold ($20) was milled from 2 tons of material (O.D.M. Statistical Files)

1909: - The company recovered 17 ounces of gold ($340) from 50 tons of material in a "10-stamp" mill (O.D.M. Statistical Files)

before 1942: a shaft was opened south of the previous workings (Meen 1944, p.47).

TABLE 21: Big Dipper prospect: partial analyses of mineralized samples

Sample Number	Au (oz/ton)	Ag (oz/ton)	As (ppm)	Sb (ppm)	Cu (ppm)
80-TRC-222	1.04	0.34	2	33	32
80-TRC-224	0.01	0.1	10	0.8	51
80-TRC-225	0.01	0.1	44	1.0	5.7
80-TRC-229	0.01	0.1	2	1.4	8
80-TRC-230	0.58	0.12	59	3.0	80

REFERENCES

Carter, T.R.	1979	p.200, 201
Corkhill, E.T.	1906	p.89-90
	1908	p.83
Gordon, J.B., Lovell, H.L., De Grijs, Jan and Davie, R.J.	1979	p.33
*Hewitt, D.F.	1964	p.10, Map No. 2053
Kindle, E.D.	1936	p.115
Meen, V B.	1944	p.47
*Meen, V.B. and Harding, W.D.	1942	Map No. 51d
*Moore, J.M. and Morton, R.L.	1980	Map P.2278
Sangster, A.L.	1970	p.230

5. GOUGH (HARDIE) OCCURRENCE

COMMODITY: Gold, Silver

ROCK ASSOCIATION;
Host: Vein quartz
Other: Quartzite, marble

CLASSIFICATION:
III A 1: Concordant to discordant quartz, Quartz-ankerite, vein-hosted Au, Ag and As

LOCATION AND ACCESS

The Hardie occurrence is located in the east-central part of Barrie township, between the northeast end of Mississagagon Lake and Blue Lake (NTS 31C/14). It is 8.3 kilometres northeast of Myers Cave and is accessible by farm roads leading north and west from Highway 506, around the northeast end of Mississagagon Lake. The access road joins Highway 506, 8,8 road kilometres northeast of Myers Cave and 0.7 road kilometres southeast of the Barrie - Clarendon township boundary. The occurrence is about 0.4 kilometres west of the farm road, at a point 0.9 road kilometres north of the highway. It is located on ODM Map 51d (Meen, 1944)

Lot 3, Con. IX, Barrie township, Frontenac county.
NTS MAZINAW LAKE 31C/14, 1:50,000
Latitude: 44°53'13"N Longitude: 77°02'05"W
UTM ZONE 18, 4 972 200 N, 339 300 E.

SIZE AND GRADE:

According to an assessment report submitted by Mr. D.S. Hardie (1980), the occurrence is found in 2 parallel quartz vein systems approximately 1000 feet long and spaced 300 feet apart. The north vein ranges in width from a few inches to several feet and gold mineralization has been detected in trenches within a zone 500 feet long. The south vein system contains veins up to 8 inches wide and silver and gold mineralization was detected intermittently for 650 feet along the proposed strike.

At Ieast 4 trenches were opened on the north vein system. The trenches immediately east and west of the access road are 8 feet by 4 feet by 2 feet deep and 20 feet by 5 feet by 5 feet deep respectively. Trenches further west are 10 feet by 5 feet by 2 feet deep and 70 feet by 5 feet by 5 feet deep. The dimensions of trenches on the south vein system are not reported, however sketch maps indicate they are generally larger than those mentioned above. Six short drill holes (totalling 161 feet) were completed, five holes were drilled on the north vein system (3 at the access road working) and one additional hole midway between the vein systems, west of the access road.

A total of 71 rock geochemical assays are listed in assessment reports, the best assays were obtained from samples collected from several trenches on the vein systems (see Table 22). Carter collected and analysed a selected sample (79 TC-12) and a random ship sample (80 TRC - 216) of the mineralized zones within the south vein system (See Table 23).

Table 22: Gold and Silver Analyses of Selected Rock Samples from the Gopugh occurrence

Sample Location/Type	oz/ton Au	Oz/ton Ag
North Vein (Road workings, west side of road)		
/ grab sample	2.40	--
/ bulk sample	5.70	0.94
/ bulk sample	2.56	0.25
/ bulk sample	2.99	--
/ 6" channel sample	1.81	Nil
/ 48" channel sample	0.62	1.18
(West Trench)		
/ 12" channel sample	1.42	Tr.
/ 24" channel sample	1.09	1.52
/ 72" chip sample	1.69	--
/ grab sample	1.12	0.72
South Vein (Three Trenches)		
/ 8" channel sample	0.12	46.75
/ 24" channel sample	0.01	1.87
/ grab sample	0.06	6.34

TABLE 23: Precious metal (oz/ton) and trace element contents (ppm) of 2 mineralized samples. from the Gough occurrence

Sample	Au	Ag	As	Sb	Cu	Pb	Zn
80 TRC-216	<0.01	0.40	540	2430	36	8960	315
79 TRC-12	<0.01	<0.1	6600	300	330	350	3950

DESCRIPTION

General Geology: The occurrence is located in a sequence of interbedded marbles and siliceous metasedimentary rocks which forms part of a thick, extensive belt of metasedimentary and metavolcanic rocks extending from Barrie township, northeast beyond Palmerston township. The stratigraphy in this area is isoclinally folded, bedding generally strikes northeast and is steeply dipping. The axis of the major syncline (Fernleigh Syncline) parallels the trend of the belt and passes south of occurrence.

The assessment reports indicate that the mineralization occurs in 2 quartz vein systems hosted in quartzite and marble. The original showings, which provide intermittent exposures of the south vein system, were recently investigated by Carter (Figure 19). Workings exposed irregular quartz veins and lenses up to 30 cm wide which are concordant with the country rock, a white, fine-grained schistose dolomitic marble. The strike and dip of the marble and quartz veins are approximately N 58°E/vertical (Meen 1944, p.41). Carter also observed poorly layered, light grey dolomitic marble and dark grey medium-grained calcitic marble near the showings. Near the south vein system, the marbles are bounded to the north by a staurolite-rich pelitic schist unit and narrow quartzite units which grade into thickly bedded, fine-grained greywackes. A thin section of a sample of pelitic schist collected by Carter contains numerous staurolite and biotite pyrophyroblasts (1-7 mm diameter) in a well foliated matrix of fine-grained muscovite, quartz and opaque minerals. A recent assessment report (Hardie 1980) indicates gold mineralization in the north vein system which occurs within a quartzite unit in contact with the pelitic schist. Drill sections show that the quartzite units are generally less than 5 feet thick and are interbedded with pelitic schists and greywackes. A narrow, northeast trending quartz porphyry dike intrudes the greywackes north of the contact zone. The north vein system consists of irregular mineralized quartz veins which vary from a few inches to 8 feet wide. The assessment report states that the vein systems have been detected intermittently for a distance of approximately 1000 feet along strike.

Mineralization: Carter reported that the mineralization in the south vein system consists of erratically dispersed, irregular grains of pyrite, sphalerite, arsenopyrite and boulangerite up to 5 mm in diameter. Two thin sections of the mineralized veins contained chalcopyrite as well. Hardie (1980) reported that high silver assays were obtained from zones heavily mineralized with tetrahedite. According to Hardie's report, the gold bearing north vein system contains mineralization consisting of chalcopyrite, pyrite, hematite and black tourmaline.

DEVELOPMENT HISTORY

1938: A number of pits were excavated on the south vein system by unknown operators (Meen, 1944, p.41).

1980-1981: Mr. D.A. Hardie carried out an exploration program consisting of trenching and diamond drilling (6 holes, 161 feet) and assayed at least 71 rock geochemical samples (Hardie 1980, 1981).

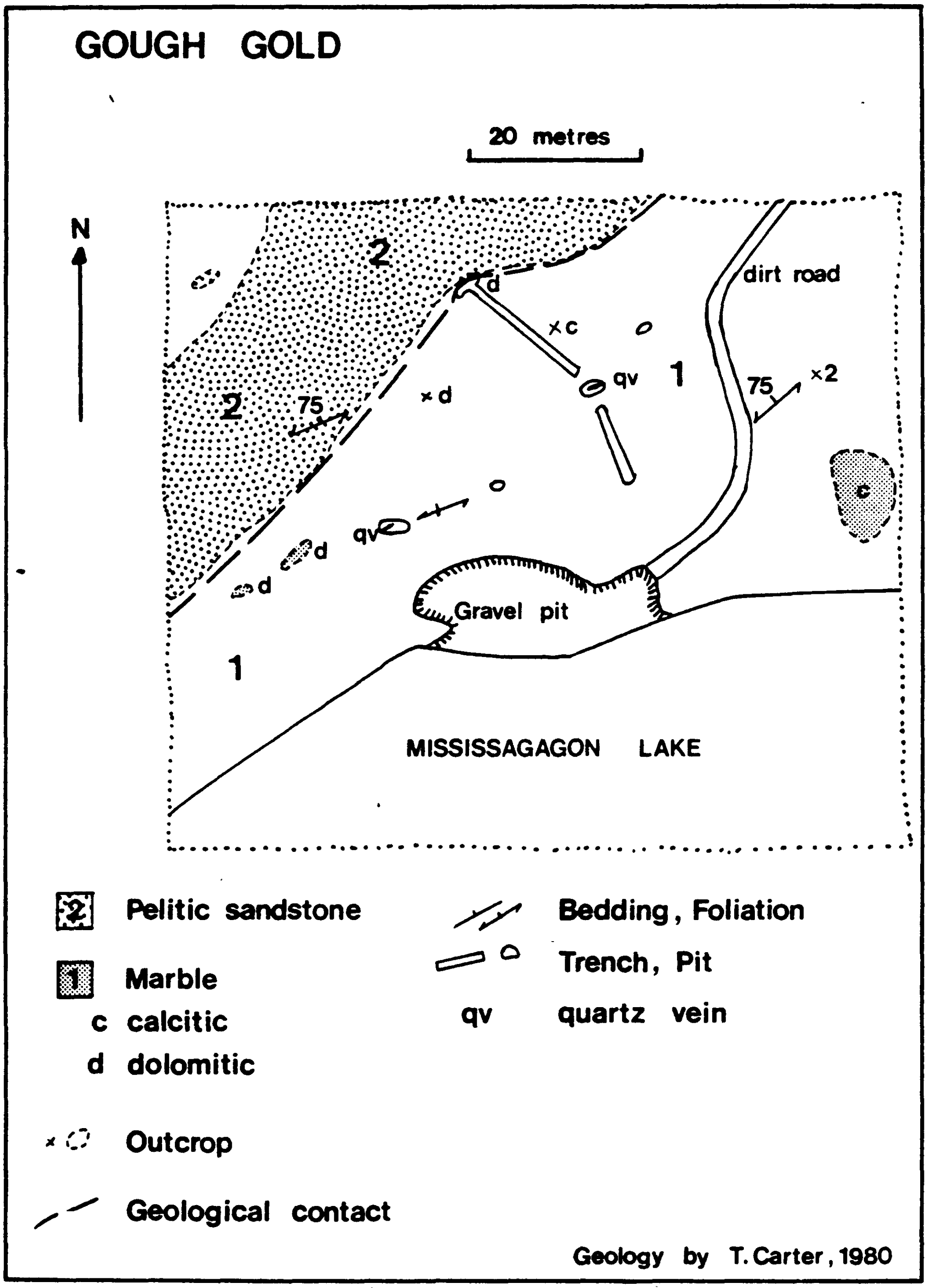

Figure 19: Geology of the Gough Gold Deposit.

REFERENCES

Carter, T.R.	1980,	P. 171
Gordon, J.B. et al.	1979,	p.41
Hardie, D.A.	1980,	Geoscience Data Centre, Toronto
	1981,	" " "
*Meen, V.B.	1944,	p.41, Map 51d
Sangster, A.L.	1970,	p.230

6. HELENA PROSPECT

COMMODITY

Gold

ROCK ASSOCIATION

Host: Vein quartz, carbonate
Other: Calcitic and dolomitic marble, granite

CLASSIFICATION:

IIIA1: Concordant to discordant, quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Helena prospect is located in the central part of Barrie township, approximately 1.5 kilometres southeast of Myers Cave (NTS 31C/14). It is accessible by a dirt road which runs south from Highway 506 to the northwest shore of Kashwakamak Lake. The road begins approximately 1.4 road kilometres east of Myers Cave and the mine workings are about 1.1 road kilometre south of the highway, immediately east of an old marble quarry. The mine site is indicated on topographic map (NTS 31C/14), O.D.M. Map 51d (Meen and Harding 1942) 2053 (Hewitt 1967) and O.G.S. Map P.2278 (Moore and Morton 1980).

Lot 20, Con. VI, Barrie Township, Frontenac County
NTS MAZINAW LAKE 31C/14 1:50,000
Latitude 44°50'22"N Longitude 77°06'15"W
UTM Zone 18, 4 967 100 N, 333 800 E

SIZE AND GRADE

The mineralized zone consists of a system of irregular quartz veins exposed intermittently in workings over a distance of 300m. Carter reported widths of up to 60 cm however the extent of veins could not be determined.

The original workings consisted of 3 shafts spaced 600 feet and 300 feet apart along a line bearing northeast (De Kalb, 1901, p.117). The relative locations of the 3 shafts in Figure 20 are not consistent with De Kalb's report, indicating that at least one shaft was opened at a later time and one of the original shafts may be located south of the sketch area. According to De Kalb (1901, p.117), the east shaft has a cross section of 10 feet by 12 feet and is 185 feet deep. The other shafts have cross sections of 16 feet by 12 feet and reach a depth of 125 feet along an incline of 45° NW). An east-bearing drift extends for 25 feet from the bottom of the south shaft. Carter's sketch map (Fig. 20) shows a least 10 small pits and trenches in the vicinity. an abandoned marble quarry is located about 200 feet west of the shafts.

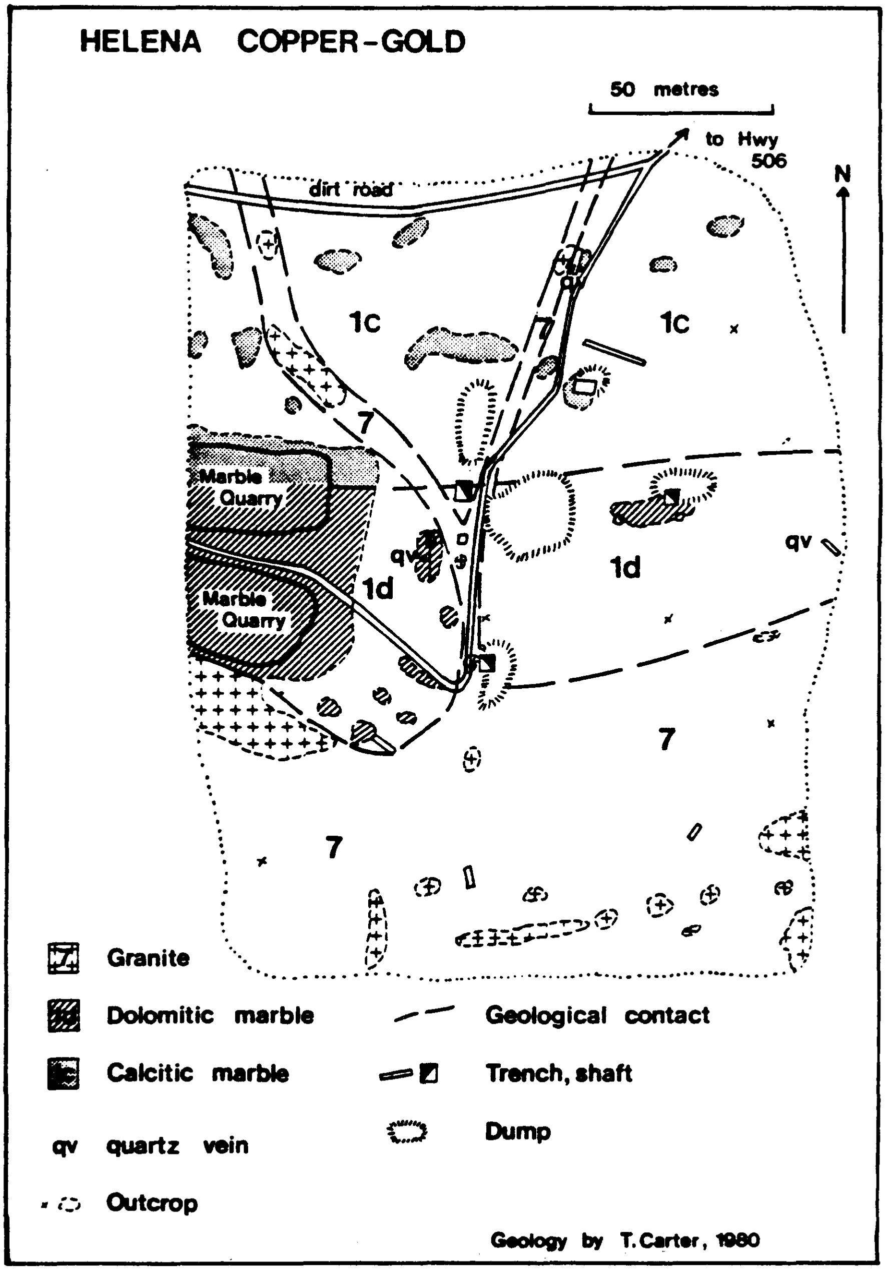

Figure 20: Geology of the Helena Gold-Copper Deposit.

Government geological reports indicate that the mineralized zone consists of copper and gold bearing quartz veins, however, no assay values are reported. Carter collected and assayed two chip samples across mineralized veins (80-TRC-182, -188) and one chip sample of a mineralized, molybdenite bearing granite rock (80-TRC-187). The results are listed in Table 24 below.

Table 24: Partial chemical analyses, Helena Prospect

Sample	Au (oz/ton)	Ag (oz/ton)	As (ppm)	Sb (ppm)	Cu (ppm)	Mo (ppm)
80-TRC-182	<0.01	<0.1	12	1.1	795	-
80-TRC-187	<0.01	<0.1	15	1.2	184	85
80-TRC-188	<0.01	<0.1	4	0.5	192	-

DESCRIPTION

General Geology: On a regional scale, Hewitt's geological map (1964, Map 2053) shows the prospect situated within a northeast-trending belt comprised of marbles, clastic sedimentary rocks and minor mafic metavolcanic rocks. The belt ranges in width from about 6 to 15 kilometres and extends northeast from the southwest part of Barrie Township, through Clarendon and beyond Palmerston townships. The sequence is tightly folded and major axial traces trend northeast. The workings are located about 0.8 kilometres south of a long, narrow northeast trending belt of younger Flinton Group rocks, centred by the Fernleigh Syncline (Moore and Morton 19809, Map P. 2278). A small granitic intrusion outcrops approximately 0.5 kilometres south of the prospect.

Carter's local geology map (Figure 20) locates the shafts within an east-west trending dolomitic marble unit bounded on the north by calcitic marbles and on the south by granite. A branching dike extending from the granite crosscuts the marble. Two of the shafts are situated along the contact between the dike and dolomitic marble. The dolomitic marble is white, massive and very fine-grained; the calcitic marble is pink to white, massive and medium-grained. Marbles, particularly the dolomitic variety contain cross cutting tremolite veinlets. In thin section, the dolomitic marble contains about 95 percent massive, fine-grained dolomite and minor disseminated tremolite in fine, anhedral grains. The intrusive rock is a grey, massive, fine-to medium-grained granite which contains about 5 percent biotite. Whole rock chemical compositions of these major rock types are listed in Table 25. Carter also collected samples of biotite "skarn" and tremolite schist from the rock dumps near the shafts. The biotite skarn is a dark green massive to weakly foliated aphanitic rock containing narrow lenses and layers of fine grained biotite. In thin section, the skarn has a massive, very fine-grained matrix of quartz and feldspar with 35 percent combined biotite; and chlorite and minor opaques in fine, unevenly disseminated grains. The chlorite grains are fine-grained (0.1-1.0mm) acicular and form part of the groundmass. Biotite grains are randonly oriented and range in size from 0.5 to 3.0mm. The tremolite schist is a green, massive to foliated, coarse grained rock commonly associated with the calcitic marble. Tremolite content ranges from 30 to 50 percent, the remainder is predominantly carbonate and quartz. Tremolite grains are usually acicular and range in length from 3 to 5 mm. Estimated modal compositions of the biotite "skarn" and dolomitic marble are listed in Table 26.

Table 25: Major element compositions, the Helena prospect

	Dolomitic Marble 80-TRC-184	Calcitic Marble 80-TRC-185	Granite 80-TRC-186
SiO_2	3.73	3.44	66.20
Al_2O_3	0.20	0.15	17.40
Fe_2O_3	0.26	0.0	0.45
FeO	0.0	0.0	1.05
MgO	21.60	1.05	1.25
CaO	28.70	51.50	3.41
Na_2O	0.03	0.04	4.21
K_2O	0.0	0.0	2.72
MnO	0.04	0.0	0.03
TiO_2	0.04	0.02	0.72
P_2O_5	0.02	0.03	0.15
CO_2	45.60	42.90	1.58
S	0.0	0.0	0.18
H_2O^+	0.0	0.0	0.48
H_2O^-	0.83	0.34	0.40
Total %	101.05	99.47	100.23

Table 26: Estimated Modal Compositions, Helena Prospect

	Biotite Skarn 80-TRC-177	Dolomite Marble 80-TRC-184
	%	%
Quartz and Feldspar	65-70	-
Dolomite	-	95
Biotite	15	-
Chlorite	15-20	-
Tremolite	-	5
Opaques	2	-

Mineralization: The mineralization generally consists of weakly to heavily disseminated pyrite and chalcopyrite in quartz-carbonate veinlets which crosscut the marbles. Rock dump samples indicate zones of massive, coarse grained sulphide as well. Finely disseminated sulphides also occur in tremolitic zones (veinlets) and with fine-grained granite phases. A polished thin section of mineralized vein contains an estimate of 70 percent quartz, 10 percent carbonate, 12 percent pyrite, 3 percent chalcopyrite and minor pyrrhotite and sphalerite. The gangue is fine-grained (2.0 mm) and massive, the sulphide grains range in size from <0.5 to 2.5 mm and are usually anhedral and pitted. Polished thin sections of granite samples contain the same sulphide minerals and in addition, trace amounts of very fine-grained arsenopyrite. A polished section of mineralized amphibolite contains disseminated magnetite in addition to the sulphides identified in the other samples.

DEVELOPMENT HISTORY

1901: Three shafts were excavated on the prospect by M. Seitz and Mr. A.M. Chisholm (de Kalb 1901, p.117).

before 1942: An unspecified amount of work was carried out (Meen 1944, p.48).

before 1979: At least 1 additional shaft and 10 pits and trenches were observed by T. Carter during a recent investigation of the property.

REFERENCES

De Kalb	1901, p.117-118
*Hewitt, D.F.	Maps Nos. 2053
Meen, V.B.	1944, p.47-48
*Meen, V.B. and Harding, W.D.	1944, Map No. 51d
*Moore, J.M. and Morton, R.L.	1980, Map P.2278
Shklanka, R.	1969, p.135

7. KASHWAKAMAK OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION:
Host: Vein quartz
Other: Dolomitic marble.

CLASSIFICATION:
III A 1: Concordant to discordant quartz quartz-ankerite vein-hosted Au, Ag, and As.

LOCATION AND ACCESS

The occurrence is located in the south-central part of Barrie township near the south shore of Kashwakamak Lake (NTS 31 C /14). It is approximately 4 kilometres east of Myers Cave and 5 kilometres north of Harlowe. Access to the workings is provided by a short cottage road connected to a gravel road which runs north from Harlowe and northeast along the south shore of Kashwakamak Lake. The cottage road runs north of the gravel road at a point about 6 road kilometres from Harlowe. The main showing is indicated on O.G.S. Map P2278 (Moore and Morton, 1980) and an additional 3 workings are shown on ODM Map 51d (Meen and Harding, 1944).

Lots 13, 14,, Con. VI, Barrie township, Frontenac county
Lot 15, Con. V
NTS MAZINAW LAKE 31C/14 1:50,000
Latitude: 44°50'26"N, Longitude: 77°04'23"W
UTM Zone 18, 4 967 100 N 336 150 E

SIZE AND GRADE

The Kashwakamak occurrence covers 4 mineralized localities near the major showing on the south half of Lot 14, Concession VI (Meen, 1944, p.40). The major showing consists of 4 pits (up to 35 feet deep) over a 400' distance along the strike of the vein. The conformable vein ranges in width from 4 to 18 inches. Another showing at the north end of lot 14, concession VI consists of pits excavated over a narrow mineralized quartz vein. Nearby, on the northwest part of lot 13, concession VI, a third showing is marked by a few old pits and a trench located on a number of narrow mineralized quartz veins. Four short drill holes (totalling 130') intersected minor sphalerite and galena mineralization near this showing. The last locality occurs on lot 15, concession V approximately 150 feet south of the lake. Stripping activities exposed a mineralized quartz vein (1 to 3 inches wide) over a distance of 75 feet.

DESCRIPTION

The Kashwakamak occurrence is situated a short distance north of the contact between marbles and mafic volcanic rocks, on the south side of an extensive belt of siliceous and carbonate metasedimentary rocks and mafic volcanic rocks. The belt extends from Barrie township, northeast beyond Palmerston township. The entire sequence is isoclinally folded and the general trend of the bedding and major axial traces parallel the trend of the belt.

Meen (1944, p.40) reported that the showings are found in dolomitic marble, a few hundred feet north of the contact with the volcanic fragmental rocks. In this area, the marbles are intruded by numerous granite and lamprophyre dikes.

The main showing consists of a concordant quartz vein 4" to 18" wide, containing chalcopyrite, tetrahedrite and brown tourmaline. Meen's (1944, p.40) report also states that visible gold was reported. A concordant granitic dike intrudes the dolomite marble 50 feet northwest of this showing.

The showing in the north end of lot 14, concession VI is a narrow quartz vein (oriented N70°E/80°N) mineralized by tetrahedrite, pyrite and chalcopyrite. A concordant massive lamprophyre dike occurs near the vein.

The mineralized zone in the northwest corner of lot 13, concession VI consists of a narrow quartz vein (oriented N80°W) mineralized by sphalerite and tetrahedrite. A diamond drill assessment report submitted by Hardie (1966) indicates that disseminated galena and sphalerite mineralization occurs near the showing.

The showing on lot 15, concession V is a narrow quartz vein (1 to 3 inches wide) containing pyrite and chalcopyrite mineralization.

DEVELOPMENT HISTORY

before 1939:
- A number of pits and trenches were opened up on lots 13, 14, concession VI.
- Operators unknown. (Meen, 1944, p.40).

1939:
- Camgar Mining Syndicate Limited completed additional trenching and stripping programs (Meen, 1944, p.40).

1966:
- A Hardie drilled 2 holes (79 feet) near the showing on lot 13, concession VI.

1974:
- G. W. Bryans completed 2 holes (41 feet) near the showing on lot 13, concession VI.

REFERENCES

Gordon, J. B. et al.	1979, p.40
*Hewitt, D.F. .	1964, Map 2053
Meen, V.B.	1944, p.40
*Meen, V.B. and Harding, W.D.	1944, Map 51d
*Moore, J.M. and Morton, R.L	1980, Map P2278
Sangster, A.L.	1970, p.228, 238-242
Shklanka, R.	1969, p.135

8. MAZINAW BASE METAL (MYERS CAVE) OCCURRENCE

COMMODITY: Silver, lead, zinc

ROCK ASSOCIATION:
Host: Vein quartz and carbonate
Other: Dolomitic and calcitic marble, conglomerate, metagreywacke

CLASSIFICATION: IIIA2: Stratabound quartz-dolomite vein-hosted Au, Cu, Zn, Pb, Sb

LOCATION AND ACCESS

The Mazinaw Base Metals occurrence is located in the central part of Barrie township between Lakes Mississagagon and Kashwakamak, approximately 4.5 kilometres northeast of Myers Cave (NTS 31C/14). It is immediately north of Highway 506, approximately 12.5 road kilometres northeast of the intersection with Highway 41. The deposit is located on O.D.M. Maps 51d (Meen 1944) and 2053 (Hewitt 1964) and OGS map P2278 (Moore, J.M. Jr. and Morton, R.L. 1980).

Lots 9,12 Con. VIII, Barrie Township, Frontenac County
NTS MAZINAW LAKE 31C/14, 1:50,000
Latitude: 44°52'00"N Longitude: 77°04'20"W
UTM Zone 18, 4 969 900 N, 336 300 E

SIZE AND GRADE

The workings consist of 4 shallow shafts and a number of pits and trenches. Uglow (1916, p.11) indicated that the mineralized lenses were up to five feet wide.

Ells (1905, p.67J) reports:" Several assays of the ore from this place were made in the laboratory of the Ontario Geological Survey, the percentage of silver, in one case from a sample from lot 12 of rather coarsely crystalline galena, being 137.883 ounces to the ton of 2000 pounds and a trace of gold, while a sample from lot 9 of the same range gave 119.583 ounces of silver to the ton but no gold." Carter analyzed a mineralized sample (79TC6) and obtained the following results: <0.01 Au, <0.1 Ag, 2300 ppm As, 2700 ppm Sb, 179 ppm Cu, 5800 ppm Pb and 6.5 percent Zn.

DESCRIPTION

Geology: The Mazinaw Base Metal occurrence is situated within the Flinton Group metasedimentary rocks which define a major structure known as the Fernleigh Syncline (Moore and Thompson 1972, p.223).

Bedding orientations and axial traces within the unconformably overlying Flinton Group rocks generally trend northeast. This structure extends from Anglesea township, northeast through Barrie and beyond Clarendon township (Moore and Thompson 1972, p.222). At the deposit, south of Mississa a on Lake, the sequence is about 0.7 km wide. The occurrence is located on the north side of the Fernleigh Syncline, at the contact between the dolomitic marbles of the Myers Cave Formation and the clastic metasedimentary rocks of the Bishop Corners Formation (Moore and Morton 1980, Map P.2278).

The geology in the vicinity of the occurrence was first described by Uglow (1916, p.11).

"The rocks consist of a steeply-dipping series of pre-Cambrian sediments striking about N50°E, magnetic and consisting of finely crystalline, bluish, slaty limestone, sheared pseudo-conglomerate and mica schist. The series is intruded in several places by granite, and it is in the general vicinity of the intrusives that the ore mineral occur."

Carter recognized 3 rock types from the rock dump on lot 12: a dark grey, massive aphanitic dolomitic marble, a grey, massive to poorly layered fine to medium-grained calcitic marble and a greywacke. The greywacke outcrops north of the showing and is described as a dark grey, thickly bedded, fine-grained rock with abundant garnet and minor staurolite. The mineralization occurs in a network of quartz and carbonate veins within the dolomitic marble. Individual veins vary in width from a few millimetres to 10 cm. At least 2 stages of veins can be recognized, the first set is parallel to the banding of the host rock and the later, cross-cutting stage occupies fractures and joints. Early stage veins are composed of quartz and dolomite, late stage veins are dominantly quartz with minor carbonate.

Mineralization: Argentiferous galena was reported in the first property description of the occurrence (Ells 1905, p.67J).

Carter reported that the best mineralization is exposed in pits and rock dumps which contain rocks with abundant disseminated blebs of pyrite and dark sphalerite in quartz and carbonate veins. Also reported were narrow, discontinuous lenses of massive, coarse-grained sphalerite which are conformable with the host rock and unrelated to the vein systems. A polished thin section of a mineralized vein sample collected by Carter (80-TRC-137) contained up to 8 percent pyrite, 2 percent arsenopyrite with minor sphalerite, chalcopyrite and jamesonite or boulangerite. Pyrite occurs as subhedral to anhedral grain disseminated throughout the section. Disseminated fine, rounded grains of sphalerite forms a diffuse band within the gangue minerals and pyrite. Chalcopyrite occurs in small, irregular blebs and fine veinlets within the gangue and sphalerite. Few small, irregular grains of jamesonite or boulangerite are disseminated throughout. The gangue is composed of quartz (30 %), carbonate (40 %) and muscovite (20 %). Most of the sulphide and sulphosalt minerals occur within medium-grained quartz-carbonate-muscovite bands and veinlets which cross cut bands of fine-grained carbonate and muscovite.

DEVELOPMENT HISTORY

pre 1901: One shaft was opened by unknown operators (Ells 1905, 67J)

pre 1916: Four shallow shafts were present on the property, the operators are not known (Uglow 1916, p.11).

1937: Mazinaw Base Metals Ltd. excavated trenches and a shaft to a depth of 30 feet (Meen 1944, p.41).

1942: Minemakers Limited of Toronto owned the property, no development was reported (Mineral Deposits Files, Geoscience Data Centre, Toronto).

1943: The Melbourne Prospecting Syndicate of Toronto owned the property, no development activities were reported (Mineral Deposits Files. Geoscience Data Centre, Toronto).

1968: The Hudson Bay Exploration and Development Company completed one drill hole 534 feet in length (Hsokhanpha 1968).

1971: G.W. Bryans completed one drill hole 83 feet deep (Bryans 1974).

1974: G.W. Bryans completed one drill hole 101.5 feet deep (Bryans 1974).

REFERENCES

Alcock, F.J.	1930	p,153-154
Bryans, G.W.	1974	Geoscience Data Centre, Toronto
Carter, T.R.	1980	p.171
Carter, T.R. and Colvine, A.C.,	1979	p.200
Ells, R.W.	1905	p.67
Hewitt, D.F.	1964	Maps 2053, 2054
Hsokhanpha,	1968	Geoscience Data Centre, Toronto
Meen, V.B.	1944	p.41
*Moore, J.M. Jr. and Morton, R.L.	1980	Map P.2278
Moore, J.M. Jr. and Thompson, P.H.	1972	p.222-223
Sangster, A.L.	1970	p.230, 239-?
Uglow, W.L.	1916	p.11

9. NATTO OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION:
Host: Vein quartz
Other: Dolomitic marble, mafic metavolcanics flows

CLASSIFICATION;
IIIA1: Concordant to discordant quartz and quartz-ankerite vein hosted Au, Ag and As.

LOCATION AND ACCESS

The Natto occurrence is located in the southwest corner of Barrie township, approximately 4 kilometres southeast of Cloyne and 4 kilometres west of Harlowe (NTS 31C/14). It is accessible by a gravel road running east from Highway 41 at Bishop Corners. The property is about 3 road kilometres from the highway however the specific location of the mineralized zone was not reported. A power line crosses the property diagonally from the southwest to the northeast corners (See OGS Preliminary Map P2278, Moore and Morton, 1980)

Lots 28, 30-32, Con. III, Lot 32, Con. IV, Barrie Township, Frontenac county.
NTS MAZINAW LAKE 31C/14, 1:50,000
Latitude: 44°48'00" Longitude: 77°08'00"W
UTM Zone 18, 4 962 500 N, 331 000 E

SIZE AND GRADE

In the report of the Natto Mining Corporation, (Bell, 1962) the author describes the showing as 2 mineralized quartz veins. The veins are parallel to one another and are spaced 60 feet apart. The north vein is 3 to 7 feet wide and the south vein ranges in width from 4 to 8 feet. A number of trenches and pits indicate continuity for 600 to 800 feet along strike.

TABLE 27 lists assay values of 5 samples collected over a distance of 600 feet. A recent assessment report (Hartikainen and Shough 1980), states that 27 pits and trenches were excavated on quartz veins and dikes on the property. The trenches range in size from 3 feet by 2 feet by 2 feet deep to 12 feet by 10 feet by 10 feet deep. Assays of 16 samples of quartz veins and associated country rocks ranged from trace amounts to 0.02 oz/ton gold and trace silver.

Table 27: Gold assays of Selected Mineralized Samples from the Natto Occurrence

Sample Number	Chip Sample width/ Relative Location	Oz/ton Au
1	3.5'/West End Showing	0.03
2	5.7'/110' E of #1	0.56
3	3.1'/300' E of #1	1.76
4	5.2'/500' E of #1	0.14
5	4.5'/600' E of #1	0.02

DESCRIPTION

Geology: The Natto occurrences is situated near the contact between marbles and metavolcanic rocks in the southwest part of Barrie township. Hewitt's regional geological map (1964, Map 2053) illustrates that the area is at the southwest end of a thick, folded marble sequence which forms part of an extensive belt with siliceous metasedimentary rocks and metavolcanic rocks. The belt is up to 12 kilometres wide and extends for at least 40 kilometres northeast, beyond Palmerston township.

The property is underlain predominantly by dolomitic marbles and mafic metavolcanic rocks. The marbles are south of the northwest-trending contact with the metavolcanic rocks which pass through the central part of the property. The marbles contain clastic metasedimentary units (tuffaceous wacke, siltstone) at the north end of the marble zone. The metavolcanic rocks are composed of basaltic and andesitic flows (commonly pillowed) and contain numerous northwest trending dacitic and andesitic porphyry dikes and sills. Bedding features are generally oriented northeast and are steeply dipping. A small area in the northwest corner of the claim group is underlain by a segment of Fernleigh syncline, a long narrow northwest trending structure of younger metasedimentary rocks (Flinton Group) which unconformably overlie the older rocks dominant in the region (Moore and Morton 1980, p.11). These Flinton group sediments contain muscovite schist, garnet-biotite schist, quartzite, dolomitic marble pelites and graphitic schists (Moore and Morton 1980, Map P.2278).

Bell (1963) describes the prospect as 2 mineralized quartz veins which cut across the major contact between the dolomitic marble and mafic volcanic rocks. The veins are parallel (60 feet apart) and are oriented east-west with dips 65° to 75° N. The north and south veins vary in width from 3 feet to 7 feet and 4 feet to 8 feet respectively and their continuity was reported to be 600 feet to 800 feet along strike. Assays of 0.14, 0.56 and 1.76 oz/ton gold were obtained from chip samples taken along a 400 foot distance along strike, however the vein was not specified (Bell 1963). A recent assessment report (Hartikainen and

Shough 1980) describes a trenching and sampling program which tested numerous quartz veins and dikes on the property. Of the 25 analyses reported, only low values of gold (trace to 0.02 oz/ton) and silver (trace) were detected, however the original prospect was not sampled.

Mineralization: The mineralization at the original showing consisted of pyrite and minor arsenopyrite (Bell 1963). Elsewhere on the property, minor pyrite, tetrahedrite, chalcopyrite, bismuthinite and sphalerite were identified in quartz veins and dikes (Hartikainen and Slough 1980).

DEVELOPMENT HISTORY

1936: - The property was examined by Mr. J.A. Bell (Bell 1963).

pre 1962: - A number of pits and trenches was opened up on the occurrences by unknown operators (Bell 1963)

1962 - 1963: - The Natto Mining Corporation acquired the property and sampled the showings.
- Significant gold values were obtained from several chip samples across a vein over a distance of 400 feet (Bell 1963).

1980: - Mr. I.J. Hartikainen excavated at least 27 pits and trenches over other quartz veins and dikes on the property. Only minor gold and silver values were detected in sample assays (Hartikainen and Shough 1980).

REFERENCES

Bell, J.A. 1963, Mineral Development Sector Files: Natto

Gordon, J.B. et al. 1979, p.40

Hartiakainen, I.J. and Shough, W.C. 1980, Geoscience Data Centre, Toronto

*Hewitt, D.F. 1964, Map 2053

*Moore, J.M. and Morton, R.L. 1980, Map P2278

10. ORE CHIMNEY PROSPECT

COMMODITY
Gold, silver

ROCK ASSOCIATION
Host: Vein quartz
Other: Mafic metavolcanic rock

CLASSIFICATION:
IIIA1: Concordant to discordant, quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Ore Chimney prospect is located in the south-west corner of Barrie township, approximately 7.8 kilometres southwest of Myer's Cave and 2.0 kilometres southeast of Bishop Corners (NTS 31C/14). It is accessible on foot from the gravel road connecting Harlow to Highway 41. The shaft is approximately 400m north of the intersection between the road and a powerline, 1.8 road kilometres east of the highway. The location of the prospect is shown on the topographic map (NTS MAZINAW LAKE 31C/14), ODM Geological Maps No. 51d (Meen and Harding 1942), No. 2053 (Hewitt 1964) and OGS preliminary map P.2278 (Moore and Morton 1980).

Lots 34,35 and 36, Con. I, Barrie Township, Frontenac County
NTS MAZINAW LAKE 31C/14 1:50,000
Latitude 44°46'38"N Longitude 77°09'06"W
UTM Zone 18, 4 960 250 N, 329 750 E

SIZE AND GRADE

The mineralization is associated with a steeply dipping relatively planar quartz vein or vein system within a narrow shear zone in mafic metavolcanic rocks. The vein ranges in width from 0.5' to 10' (average 3.5') and has been developed along a strike length of 645' and to a depth of 525' (Logan 1932). Drill holes have intersected the vein 250' (Campbell 1932, 1957, p.15). The mineralized zone was reported to increase from 50' by 2' on the 150' development level to 100' by 4' on the 400' level (Campbell 1937, p.5). It was also detected on the 500' level and in a drill intersection at a depth of 600' (Campbell 1957, p.14).

The workings consist of an unspecified number of pits and trenches and a shaft with 7 drift levels. The shaft is 405' deep with levels at 108', 150', 250', 300', 332' and 400'. About 265' northeast of the shaft on the 400' level, a steeply inclined (85°S) winze was excavated to 525' with a drift at the 500' level. Total lengths of drifts and crosscuts on the 108', 150', 250', 332', 400' and 500' levels are 72 feet, 560 feet, 714 feet, 53 feet, 600 feet and 175 feet respectively. These workings total 2174 feet (Ore Chimney, Mineral Deposits Files, Geoscience Data Centre, Ontario Geological Survey, Toronto).

In 1932, the mine was dewatered and the mineralized zone was extensively sampled. A total of 800 samples were collected over a length of 50', 55', 75' and 100' on the 150', 250', 400' and 500' levels, respectively. Estimated average gold and silver values for these levels are as follows: 150':0.10 oz/t Au, 18 oz/t Ag, 250':0.10 oz/t Au, 11.5 oz/t Ag, 400':0.30 oz/t Au, 9.8 oz/t Ag, 500':0.37 oz/t Au, 1.7 oz/t Ag, winze:0.35 oz/t Au, 4.0 oz/t Ag (Campbell 1932). In a previous drill program (1929), one hole intersected the mineralized zone at 605'. The 3.25' true width assayed 0.158 oz/t Au, 7.8 oz/t Ag, 3.2% Pb and 1.9% Zn (Ore Chimney Mineral Deposits Files, Geoscience Data Centre, Ontario Geological Survey, Toronto).

A rough estimate of 11,000 tons of material averaging 0.20 oz/t Au, and 5.64 oz/ton Ag was calculated over an average width of 4 feet between depths of 100 and 500 feet (Ore Chimney, Mineral Deposits File, Geoscience Data Centre, Ontario Geological Survey, Toronto.

Analyses of Carter's rock dump samples are listed in Table 28.

Table 28: Partial Chemical Analyses from the Ore Chimney Deposit

	Au (oz/ton)	Ag (oz/ton)	As (ppm)	Sb (ppm)	Cu (ppm)	Pb (ppm/%)	Zn (%)
80-TRC-129	0.07	3.17	132	134	1260	9800	1.63
80-TRC-130	0.12	12.42	80	420	2450	2.54	7.05

DESCRIPTION

General Geology: The Ore chimney deposit is situated in the southwest corner of Barrie township within a unit at the contact between the Tudor metavolcanic rocks of the Hermon Group and the unconformity overlying Bishop Corner's Formation (metaclastic rocks) of the Flinton Group. This locality is about 2 kilometres north of the North Brook batholith and 5 kilometres west of the Elzevir Granite complex (Hewitt 1964, Map 2053).

The geology of the area, shown in Figure 21 (Meen 1944) indicates the relationship between the Greenstone unit (Tudor volcanics) and the quartzite and conglomerate units (Bishop Corners Formation). Meen (1944, p.44) writes:

> "... No veins were observed on the surface in the vicinity of the shaft, which is located in shear greenstone which strikes N45° to 55°E and has a vertical dip. Nearby are large outcrops of Hastings

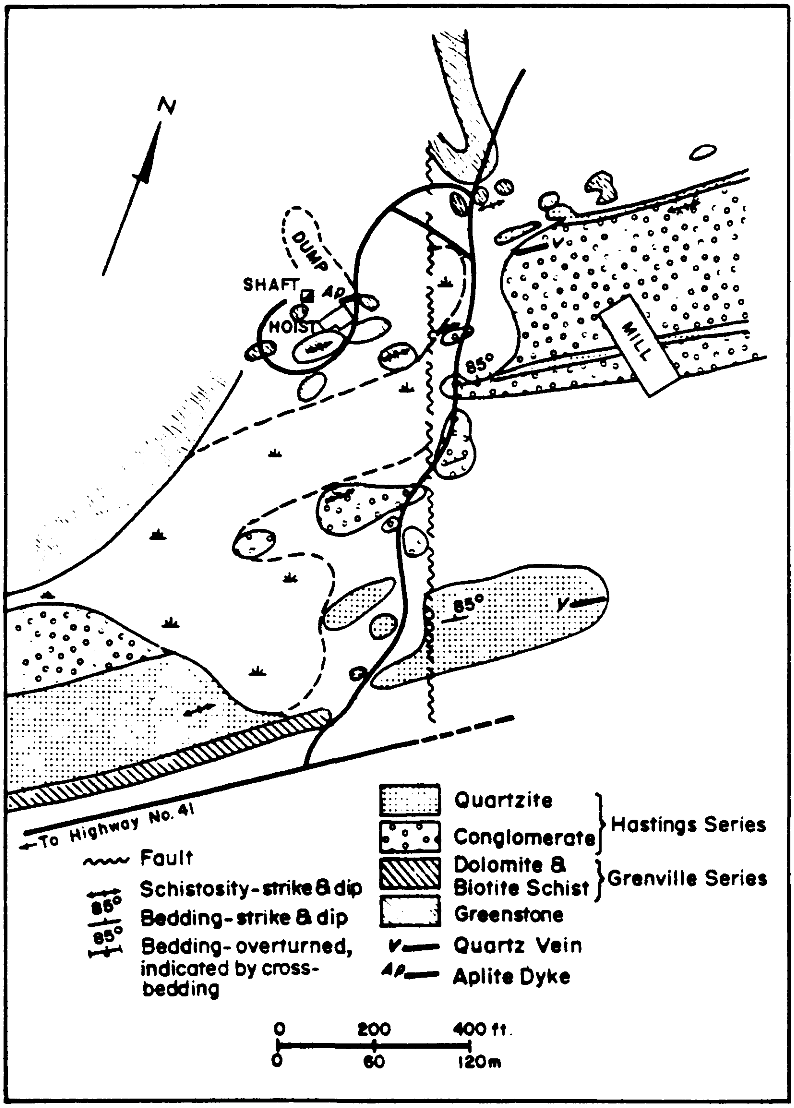

Figure 21: Geology of the Ore Chimney Gold Deposit (Adapted from Meen 1944, p.43).

conglomerate and quartzite, the bedding of white strikes N35° to 50°E, depending on local folding, with a dip from 85°N to vertical. The top of beds, determined by observations of cross bedding, are to the south. A study of the contact between the volcanics and the Hastings sediments indicates a fault, which probably strikes about N20°N and displaces the contact to the east of the fault about 400 feet north. Any vein or ore zone in the mine might be expected to be offset 400 feet north about 250 feet northeast of the shaft...."
A detailed map of the deposit produced by Dillon (1985) is shown on Figure 22. Dillon writes: ".... The gold-silver-lead-zinc mineralization occurring at the Ore Chimney Mine is hosted in a quartz-vein system localized within sheared hornblende-biotite-garnet schist (Ore Chimney Formation) near the contact between underlying mafic metavolcanics of the Tudor Formation and uncomformably overlying quartzite and quartz-pebble conglomerate of the Bishop Corner's Formation, Flinton Group.

The general geology of the Ore Chimney property (Figure 22) shows mafic metavolcanics to the northwest overlain by mafic metasediments, quartzite and quartz pebble conglomerate to the southeast. The central part of the volcanic-sediment contact zone forms an S-shaped pair of folds whose axial plane appears parallel to the regional foliation trend. The main shaft of the property is situated near the apex of the fold.

All rocks exposed on the property are moderately to well foliated on planes trending 050° to 085° and dipping steeply (075° to 090°) to the north. Primary structures have been preserved particularly in pillowed mafic metavolcanics and well cross-bedded quartzites. Pillow structures northwest of the shaft indicate flow tops face to the northwest. Cross-bedding preserved within Flinton Group meta-quartzites indicate tops to the southeast, so that across the unconformity, the units are back to back.
Minor S-folding occurs within metasedimentary units in the south part of the property. Their axial planes trend parallel to the regional foliation directions trending 050 to 085° and they plunge steeply (065 to 080°) to the northeast. No faulting was observed to offset units on the property...."

Mineralization: Mineralized samples collected from the mine dump are essentially coarse-grained quartz, quartz-ankerite vein fragments with locally abundant galena, sphalerite, pyrite, pyrrhotite and chalcopyrite. The sulphides occurs as disseminated blebs and grains and as veinlet, commonly arrested parallel to the vein contacts. In a report for Bey Mines Limited, Campbell

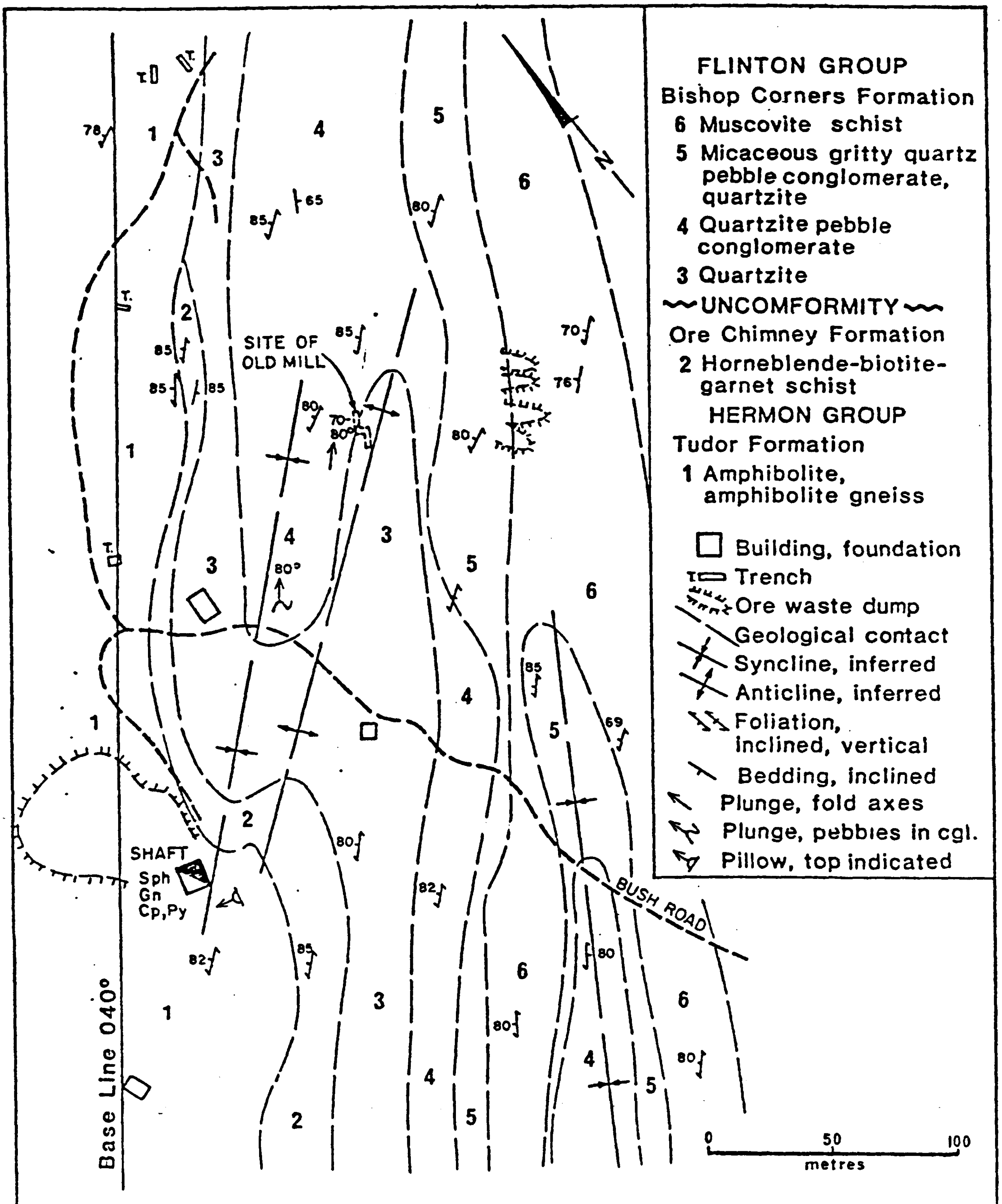

Figure 22: Geology of the Ore Chimney Mine Area (Adapted from Dillon 1985, p.31).

(1932) quotes part of a report by the Ore Dressing and Metallurgical Laboratories of the Department of Mines, Ottawa.

> ".....The metallic minerals observed in the section are sphalerite, galena, tetrahedrite, chalcopyrite, and marcasite are abundant and tetrahedrite is common but forms only a small percentage of the mineral aggregate. Pyrite is rather common in the sections studied and arsenopyrite is rare."

In an earlier report for Bey Mines Limited, Johnson (1929) writes:

> ".... The gold associated with sulphides such as galena, zinc blende and chalcopyrite, occurs in quartz and also in minute openings in shattered rock. Quite a lot of native gold was noticeable in quartz associated with calcite on the 500-foot level.
> We are getting some native gold associated with galena, also native silver was observed associated with galena, chalcopyrite and zincblende in the raise above the 400 foot level near the winze.
> As in the case of most deposits, pyrite is the most abundant sulphide, chalcopyrite seems to be present where the gold values are highest in the sulphides. The mineral tourmaline ... has been recognized in several places on the workings....".

DEVELOPMENT HISTORY

1909:- The Ore Chimney Mining Company Limited was formed and acquired the property (Meen 1944, p.42).

1909-1917:- total development: 405' shaft,
level 108'; 25' cross cut accessed 23' drifting
level 150'; 40' cross cut accessed 206' drifting
level 300'; 31' cross cut
level 332'; 44' cross cut
level 400'; 62' cross cut, accessed 40' drifting
(Sutherland et al. 1917, p.136)

1915: - a 20-stamp mill was erected

1923: - 108' level; 40' drifting
- 150' level; 350' drifting
- 250' level; 150' drifting
- 400' level, 80' drifting
(Sutherland et al. 1925, p.91)

1925: - 150' level: raise 75'
- 400' level: 135' drifting, stope 50' long x 30' high
(Sutherland et al. 1926, p.160).

1927: - winze opened up for 125' below the 400' level
- new level at 500'; 180' drifting
(Sutherland et al. 1928, p.128)

1928: - Big Mines Limited acquired the property

1929-1930: - Geological and geophysical surveys were carried out by the Radiore Company of Canada for Bey Mines Limited
- surface stripping over the mineralized zone
- 3 diamond drill holes (2372') were completed from surface, the mineralized zone was intersected in one hole at 605' (Campbell 1937, p.2,10).

1932: - mine was dewatered, 800 samples from the development levels were analyzed
- 165 lbs ore was analyzed at the Ore Dressing and Metallurgical Laboratory, Department of Mines, Ottawa (Campbell 1937, p.6).
- 3 drill holes totalling 1000' were completed from a crosscut on the 400' level (Campbell 1957, p.18).

1934-1935: - improvements on headframe, buildings, construction of power dam (Campbell 1937, p.1).

1941: - Mr. R.W. Clark acquired the property by a mortgage foreclosure

1941-1943: - Webbwood Copper Mining Syndicate Limited, attempted to dispose lead and zinc from the mine dump.

1944: - East Webb Mines Limited was formed, and acquired the property

1950-1951: - minor surface work was completed

1956: - Cavalier Mining Company Limited acquired the mine, renovated the headframe, and a few buildings
- completed surface geological mapping, and 8 diamond drill holes total;ling 4667' (Campbell 1957, p.11,15).

1961: - Cavalier Mining Company charter was cancelled

1963: - Mr. R.W. Cruickshank completed 1 drill hole (600') on the property (Cruickshank 1963).

1977: - Mr. G. Gayle acquired the property (Globe and Mail, August 11, 1972)

1981: - Cox Mining Limited dewatered and rehabilitated the shaft, and sampled the dump. The development was abandoned and the shaft capped (Kingston et al. 1981, p.131).

1982: - Lyndex Exploration Limited acquired the property (Kingston et al. 1982, p.161).

1983: - Mr. A. Banner acquired the surface and mining rites, and dewatered the workings to the 150' level for resampling (Kingston et al. 1983, p.186).

REFERENCES

Alcock,	1930, p.154
Campbell, C.A.	1932, 10p
	1937, p.1,2,5,10
	1957, 18p
Corkhill, E.T.	1913, p.135-136
Dillon, E.P.	1985, p.29-32
Gordon, J.B. et al.	1979, p.33
*Hewitt, D.F.	1964, Map 2053
Johnson, G.	1929, 6p
Logan, W.J.	1932, 3p.
Kingston, P.W. et al.	1981, p.131
	1982, p.161
	1983, p.186
Meen, V.B.	1944, p.42-44
Moore, J.M. and Morton, R.L.	1980, p.71-75
Sutherland, T.F et al.	1914, p.173
	1915, p.159
	1916, p.129
	1917, p.136-137
	1918, p.134
	1920, p.116
	1925, p.91
	1926, p.160
	1927, p.121
	1928, p.128

11. STAR MINE (Past Producer)

COMMODITY: Gold

ROCK ASSOCIATION;
Host: Vein quartz
Other: Dolomitic marble

CLASSIFICATION;
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted, Au, Ag and As.

LOCATION AND ACCESS:

The Star gold mine is located in the south central part of Barrie township, approximately 2.5 kilometres northwest of Myers Cave (NTS 31C/14) It is accessible from Highway 41 from an all-weather gravel road and a vehicle trail which run east from the highway at a point about 3.0 road kilometres north of Cloyne. The gravel road passes south of Mazinaw Lake and east along the north side of the Mississippi River where a vehicle trail continues to the mine site; a total of 3.5 kilometres. The mine is located on the NTS map, O.D.M. Maps 2053 (Hewitt 1964) and 51d (Meen and Harding 194) and OGS Map P.2278 (Morton and Moore 1980).

Lots 24, 25, Con. X, Barrie Township, Frontenac County
NTS MAZINAW LAKE 31C/14, 1:50,000
Latitude: 44°51'42"N Longitude: 77°08'22"W
UTM Zone 18, 4 969, 600 N, 330 950 E

SIZE AND GRADE

The mineralization occurs within two parallel quartz vein systems spaced about 120' apart, striking N75°E and dipping 85°NW (Meen 1944, p.46). Reports indicate that the vein systems are 4 to 6 feet wide, and in trench D (Figure 23) the zone consists of 11 stringers over a width of 12 feet (Corkhill 1905, p.77; Meen 1944, p.46). Most surface workings expose the vein systems over a strike length of about 500 feet and the shaft follows one system to a depth of 213 feet (Meen 1944, p.45).

Workings consist of at least 10 surface trenches and one major shaft (Figure 23). The shaft is inclined 80°N for 100 feet and is vertical to a depth of 213 feet (Meen 1944, p.45). The following development represents about 500' of drifting and crosscutting on four levels" at 35', a drift 42'E; at 74', drifts 48'E, 54'W and a crosscut 47'N about 30'E of the shaft; at 108', drifts 8'E and 22'W; at 200', a drift 75'W and a crosscut 196'S (Corkhill 1906, p.89; 1907, p.74).

A total of 134 ounces of gold were produced from 976 tons of milled rock, a recovery grade of 0.14 oz/ton Au (Star of the East Mine, O.D.M. Statistical Files). Samples of pyrite concentrate from the tailings at the mill assayed 0.34 oz/ton Au (Meen 1944, p.47) and 0.18 oz/ton Au (Table 29: 80-TRC-218). Analyses of chip samples across vein zones in trench C and D are listed in the table under 80-TRC-220 and 80-TRC-224, respectively.

Table 29: Assays of Tailings and Chip Samples from the Star Mine (in ppm unless otherwise indicated)

	80-TRC-218	-220	-234
Au (oz/ton)	0.18	<0.01	0.04
Ag (oz/ton)	<0.1	<0.1	<0.1
As	144	4	1
Sb	10	1.6	0.4
Cu	190	7	<5

DESCRIPTION:

General Geology: Hewitt's regional geological compilation map (Map 2053) shows the Star mine on the north side of an extensive thick, folded sequence of marbles, metavolcanics and clastic metasedimentary rocks. The belt extends northeast from the southwest part of Barrie township and is bounded to the north and south by the Mazinaw Lake Granite and the Northbrooke-Cross Lake Batholiths. The OGS preliminary map of the area, P2278 (Moore and Morton, 1980) indicates that the metavolcanic rocks north of the marbles are intruded by small concordant igneous intrusions and together form a 0.5 km wide sequence along the south boundary of the Mazinaw Lake Granite. Moore and Morton (1980, p.75-76) write ..."

The mineralization is in dolomitic marble, with dacitic pyroclastics interlayered, about 60m south of a large thickness of andesite flows and pyroclastics. Limited data suggest the beds face south, thus the carbonates rest on the metavolcanics. To the south are relatively pure dolomite, tremolite-dolomite calcite marbles.

The dolomite varies from grey and buff to pink or green, massive or layered, and contain subordinate quartz, calcite, actinolite or tremolite. Dacitic pyroclastic layers vary from 3 cm to 2 m thick.

They are composed of biotite, quartz and plagioclase with lesser amounts of hornblende, dolomite and tremolite...'

A detailed geological map of the property adapted from Meen (1944, p.45) is shown in Figure ... Meen (1944, p.47) writes: "The deposit is in the Grenville dolomite, about 3 chains south of the contact with agglomerate and tuff and about 14 chains south of the contact of the latter with the later granite. The agglomerate and tuff are intruded by a number of granite sills parallel to the schistosity, and the narrow aplite dikes occur in the dolomite. At least one fault, striking N45°W is present in the showings. The effect of this is to displace the dolomite-agglomerate contact to the south on the northeast side of the fault. This is of particular interest in connection with the continuation of the veins of trench D to the east. These are not observed in the agglomerate outcrop, 75 feet east, and it must be inferred that the fault is post ore.....

...For the most part the work consists of a number of trenches or two parallel quartz veins about 120 feet apart, striking N60° to 75°E and dipping 85°NW. These veins occur in crystalline dolomite, which has the same strike and dip. The dolomite ranges from fine to coarse in texture and from white to rose-pink in colour. A considerable amount of actinolite occurs as sheaves and rosettes in the white dolomite and with the quartz. The quartz veins are narrow and lens-like, in places disappearing completely..."

In Carter's investigation of trenches A to E (Figure 23), the host rock is described as white to grey, fine to coarse-grained well layered dolomitic marble with minor interbeds of calcitic marble and lenses of coarse-grained tremolite. The vein zone is a system of parallel, discontinuous, quartz veins which are conformable with the layering in the host rock. Veins contain abundant coarse-grained actinolite and tremolite and very fine-grained tourmaline, particularly along the boundaries. Disseminated pyrite occurs within the quartz veins and the adjacent host rocks.

Mineralization: Meen (1944, p.46) states:

"Pyrite, chalcopyrite, scheelite, tourmaline and actinolite occur in the veins. A few small particles of bismuthinite were seen in trench G in the north-south vein. Scheelite was not identifiable during the course of the field work in 1939, but it was later reported by the owners and, in 1943, was identified by the provincial geologist. It occurs in small quantities in the tourmaline-bearing quartz veins and was also seen in the adjacent crystalline dolomite. ...No native gold was observed, but it must be present because it was caught in the amalgamation process."

Morton and Moore (1980, p.76) write:

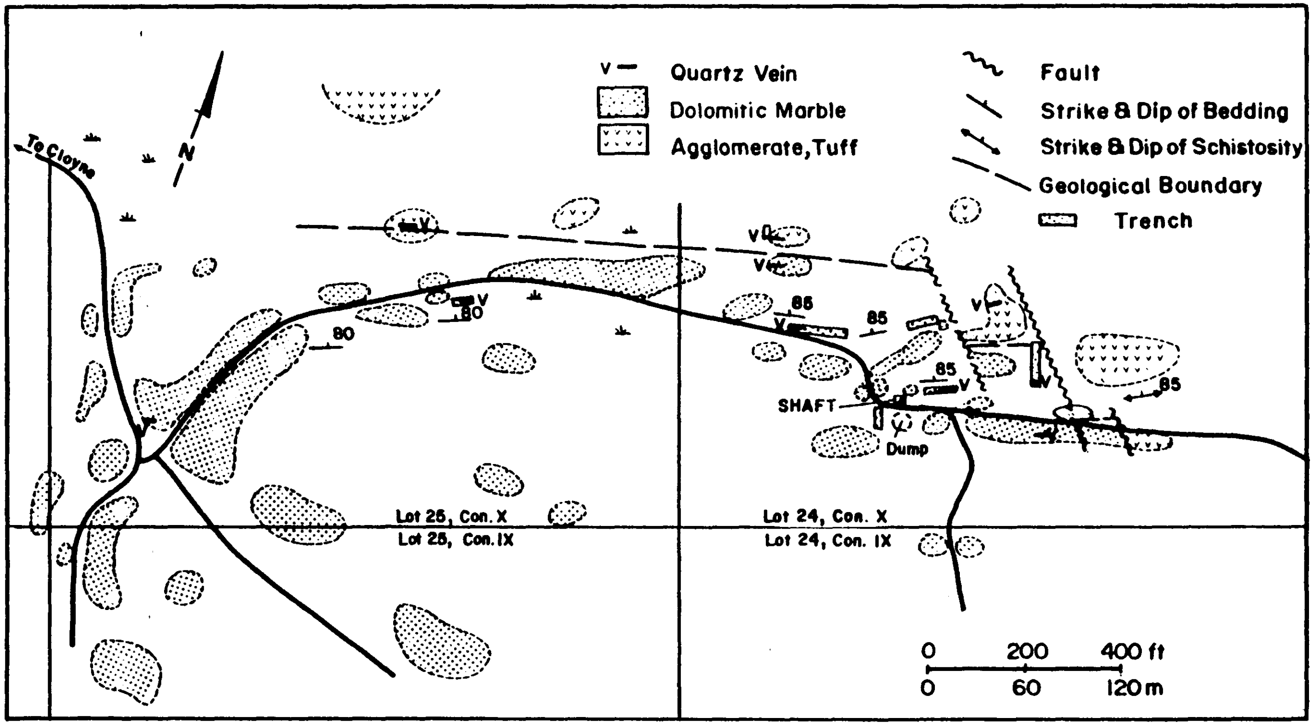

Figure 23: Geology of the Star Gold Deposit (Adapted from Meen, 1944, p.45).

"...Pink, chalcopyrite, scheelite, tourmaline, actinolite and bismuthinite are associated with the quartz veins. As well pyrite, chalcopyrite and sphalerite occur as disseminations in tuffs and adjacent marbles. Scheelite is also associated with pyrite in a fine-grained, green tremolite-talc-dolomite schist. North of the main trenches meta-andesite flows and pyroclastic rocks are pyrite-rich and in places have ben replaced by tourmaline, epidote, chlorite, biotite and quartz."

A polished thin section of a sample of vein material from trench C contains up to 7% pyrite and minor pyrrhotite and chalcopyrite.

Pyrite occurs in a diffuse band of disseminated anhedral grains (4.0 mm); pyrrhotite forms small (1.0 mm) irregular mottled grains with minor associated chalcopyrite. The gangue is composed of fine-grained quartz (65%) with bands of fine- to medium-grained (0.2 to 3.0 mm) carbonate (15%) and later tremolite (10%). Minor biotite (2%) and very fine-grained disseminated tourmaline also occur in diffuse bands within the section.

DEVELOPMENT HISTORY

1904:- The Star of the East Gold Mining and Milling Company opened 3 pits (up to 30' deep) on the south vein.
- a shaft 18' by 11' by 180' deep was sunk on the north vein, 50' drifts were mined east and west at the 74' level
- a 10-stamp mill and other buildings were erected on the property (Corkhill 1905, p.77).

1905:- 958 tons of material were milled, producing 128 ounces of gold ($1850) (O.D.M. Statistical Files, Star of the East Gold Mining and Milling Company).

1906:- the shaft was deepened to 213 feet.
- at the 35' level on east drift was mined for 42'
- at the 74' level a north cross-cut was mined for 44' (approximately 30' east of the shaft)
- at the 108' level drifts were opened east for 8' and west for 22'
- at the 200' level a crosscut was opened north for 80' (Corkhill 1906, p.89)

1907:- a 196' cross-cut was excavated to the south vein and a 75' drift was mined in a westerly direction
- some drifting was carried out on the first level (Corkhill 1907, p.74).
- 18 tons of material were milled to produce 6 ounces of gold (O.D.M. Statistical Files, Star of the East Gold Mining and Milling Company)

1935: - the deposit was acquired by Mr. J.V. Driscoll and W.J. Seitz of Toronto
1936: - E.L. MacVeigh sampled surface workings and reported encouraging gold values over narrow zones (Meen 1944, p.47)
1977: - Surface prospecting was carried out on the property held by Mrs. V. Cannon of Cloyne (Moore and Morton 1980, p.75).

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Carter, T.R. and Colvine, A.C.	1979	p.200-201
Corkhill, E.T.	1905	p.76-77
	1906	p.88-89
	1907	p.74
Gordon, J.B. et al.	1979	p.33
*Hewitt, D.F.	1964	Maps Nos. 2053,2054, p.10
Meen. V.B.	1944	p.31,33,34,44-47
*Meen, V.B. and Harding, W.D.	1942	Map No. 51d
Moore, J.M. and Morton, R.L.	1980	p.75-77, Map P.2278
Sangster, A.L	1970	p.230
Young, A.C.	1937	p.17

12. CORDOVA GOLD MINE (Past Producer)

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein quartz-carbonate
Other: Gabbro

CLASSIFICATION
IIIA1: Concordant to discordant quartz and quartz-ankerite vein hosted Au, Ag and As.

LOCATION AND ACCESS

The Cordova mine is located about midway along the boundary between Belmont and Marmora townships (NTS 31 C/12). It is located about 13 km by road northwest of Marmora, immediately southwest of the village of Cordova Mines. The mine is readily accessible by paved roads from both villages. The workings of the former mine are extensive and occupy parts of lots 20 and 21, Con. I, Belmont township and the west half of lot 20, Con. I, Marmora township. The main shaft (No. 3) is located at the coordinates below. The mine is also located on O.D.M. Map 1957b (Hewitt and Satterly 1957) and OGS Map P2488 (1982, Bartlett, J.R., Moore, J.M. and Murray, M.J.).

Lots 20, 21, Con. I Belmont Township, Peterborough county
Lot 20, Con. I, Marmora Township, Hastings county
NTS BANNOCKBURN 31 C/12, 1:50,000
Latitude: 44°32'19"N Longitude 77°46'54"
UTM Zone 18, 4 935 250N 279000E

ECONOMIC FEATURES

The Cordova gold mine has been the object of several mining and/or exploration programs since its discovery in 1890. Production by different operators in the years 1892-1893, 1898-1903, 1912-1917, and 1939-1940 amounted to 22,774 oz of gold and 687 oz of silver from 120,670 tons of ore milled (Ministry of Natural Resources, Statistical Files). There has been only minor production of gold concentrates, recovered from tailings, since that time. The property is currently owned by Lasir Gold Inc. Production from the related Ledyard deposit was valued at $236, from 55 tons milled in 1893-1894 (Satterly, 1943).

The Cordova deposit has been explored by 10 shafts (Fig.26), a limited amount of diamond drilling, and a substantial amount of underground drifting, raising and crosscutting. Plans of the underground workings are presented by Satterly (1943). The No. 1 shaft is 125 metres deep with five levels, the no.2 shaft is 56 metres deep, connected to the no. 3 shaft on the second level, and the no. 3 shaft (inclined) is 320 metres deep with nine levels, with an inclined winze to the tenth level, 341 metres below the surface (Tower, 1940). The other shafts are shallow, with little or no underground development.

Mineralization is contained within quartz-ankerite-feldspar veins in shear zones. Several mineralized shear zones have been outlined in the vicinity of the mine with most of the development confined to the Main vein (Fig.26 The width of the individual shear zones ranges from about 30 cm to more than 12 metres, the average being about 2 metres (Satterly, 1943). A number of wide orebodies were mined out in the upper levels of the mine prior to 1935. According to Carter (1903) ore zones being mined at that time from the No. 1 shaft varied from 2.4 to nearly 18 metres in width. However, the extensive development carried out by the Consolidated Mining and Smelting Co. of Canada Ltd. between 1935 and 1940 disclosed a number of orebodies of only moderate tonnage and grade (Satterly, 1943).

In January 1939, the ore reserves were estimated by the Consolidated Mining and Smelting Co. of Canada Ltd as 77,130 tons with 0.175 oz Au per ton, with 50,000 tons of probable ore of similar grade and 50,000 to 100,000 tons possible ore (Cominco Ltd. company files). The company recovered 3487 oz of gold from 33,434 tons of ore milled between October, 1939 and July 31, 1940 (Satterly, 1943) for a recovered grade of 0.104 oz Au per ton. Remaining reserves consequently total approximately 44,000 tons grading between 0.104 and 0.175 oz Au per ton, with 50,000 tons probable and 100,000 tons possible ore.

There is a substantial amount of broken rock believed to be development ore stockpiled on the surface near the No.1 and No.3 shafts, and a large amount of tailings from the milling operations (Figure 25). Orvana Mines Ltd. conducted a systematic program of measuring and sampling these dumps in 1964. Two tailings ponds were identified; one was built prior to 1918 and the other by the Consolidated Mining and Smelting Co. Ltd in 1939-1940. The ponds were sampled using a power auger. A total of 105 samples were collected from the Consolidated Mining and Smelting Co. Ltd tailings pond and these averaged 0.02 oz Au per ton. The results of the other sampling programs are are presented in Table 30 and indicate a total of 21,700 tons of broken ore and tailings on surface dumps averaging 0.17 oz Au per ton (H.G. Harper, unpublished geological report for Orvana Mines Ltd, 1965).

Lasir Gold Inc. has recently estimated the ore dumps to contain approximately 15,000 to 20,000 tons containing about 0.06 oz Au per ton. Approximately 1000 tons of tailings were outlined by the company which were estimated to contain an average of 0.33 oz Au per ton based on surface sampling of the pond. A small tonnage of tailings was test milled on the mine-site in a small pilot plant with recovery of a concentrate consisting of about 800 lb of charcoal grading 151 oz Au per ton (Walter Hood, Lasir Gold Inc., personal communication, 1982).

The tailings pond sampled by Lasir Gold Inc. was examined by the author in 1980 and found to consist of a hummocky pile of stratified sand. Samples collected by the author and analysed by the Geoscience Laboratories of the Ontario Geological Survey contained: i) 0.69 oz Au per ton and trace Ag in dark grey, magnetite-rich sand, ii) 0.11 oz Au per ton and trace Ag in reddish-brown, oxidized, magnetite-rich sand near the surface of the pond, and iii) 0.14 oz Ag per ton in magnetite-free, yellow tailings. A representative chip sample of broken ore from the ore stockpile at the No. 3 shaft contained 0.25 oz Au per ton.

Production figures indicate there should be at least 100,000 tons of tailings on the mine site. Only a portion of these, containing significant amounts of gold, have been accounted for, consequently location of these tailings should be a priority in any exploration program. In addition there has been little systematic exploration of veins other than the Main vein at the deposit. There is also a large unexplored block of ground above the sixth level between the No.1 and No.3 shafts which has never been explored.

GEOLOGY

The gold deposits occur entirely within, but near the northwest margin of a large gabbroic intrusion. Intercalated calcitic and dolomitic marble and siliceous clastic sedimentary rocks are exposed to the north and east of the pluton (Figure 24). Marble and mafic volcanic rocks occur to the west and southwest and Paleozoic limestones unconformably overlie the intrusion to the south.

The gabbro is composed of variable proportions of plagioclase and hornblende. Lithologic variations defined by differences in texture and grain size have been described by Thomas and Cherry (1981) and are indicated on Figure 24. Four units have been defined: 1. fine to medium-grained, black to dark green, massive gabbro, 2. medium-grained, well foliated gabbro, 3. pegmatitic gabbro, and 4. anorthositic gabbro. Massive gabbro (unit 1) is surrounded by and is gradational into foliated gabbro (unit 2) which forms a rim between it and the country rocks. Foliation in the foliated gabbro is defined by alternating monomineralic layers of hornblende and plagioclase and is believed to be a primary layering. The foliation defines a bowl shape and may indicate that the foliated gabbro is older than the massive gabbro. Pods of pegmatic gabbro intrude both units 1 and 2. Anorthositic gabbro occurs as small pods in both units 1 and 2. In

Table 30: Composite Summary of results of sampling of surface dumps and tailings ponds by Orvana Mines Ltd. (H.G. Harper, unpubl. report for Orvana Mines Ltd., 1965). Grade is in oz. Au per ton.

	Tailings Pond	No. 3 shaft	No. 1 shaft
No. of samples	-	120	193
Estimated tonnage	6400	6500	8800
Average grade	0.144	0.200	0.164

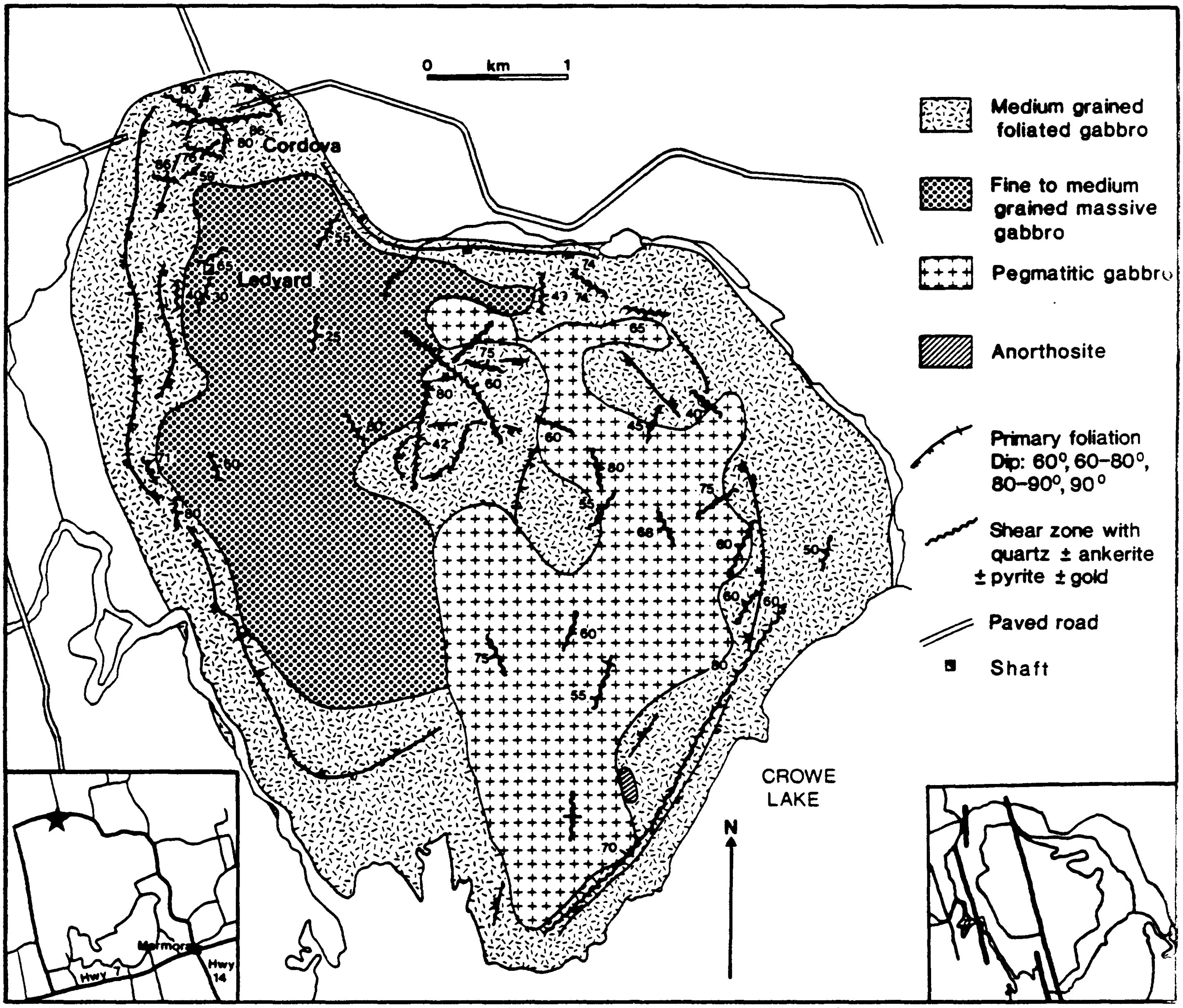

Figure 24: Geology of the Cordova Gold Deposit (Adapted from Thomas and Cherry, 1981, p.252).

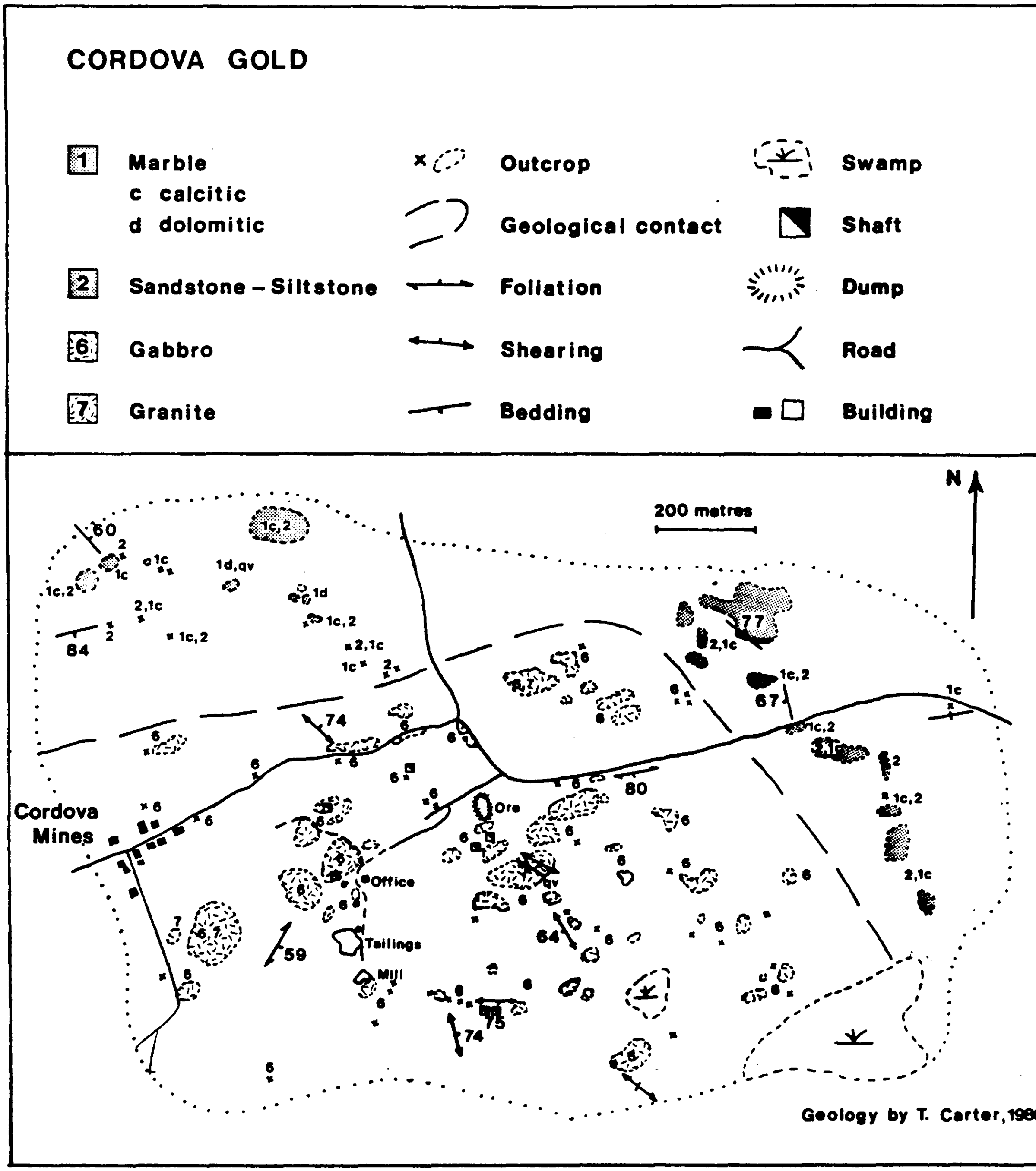

Figure 25: Geology of the vicinity of the Cordova Gold Deposit.

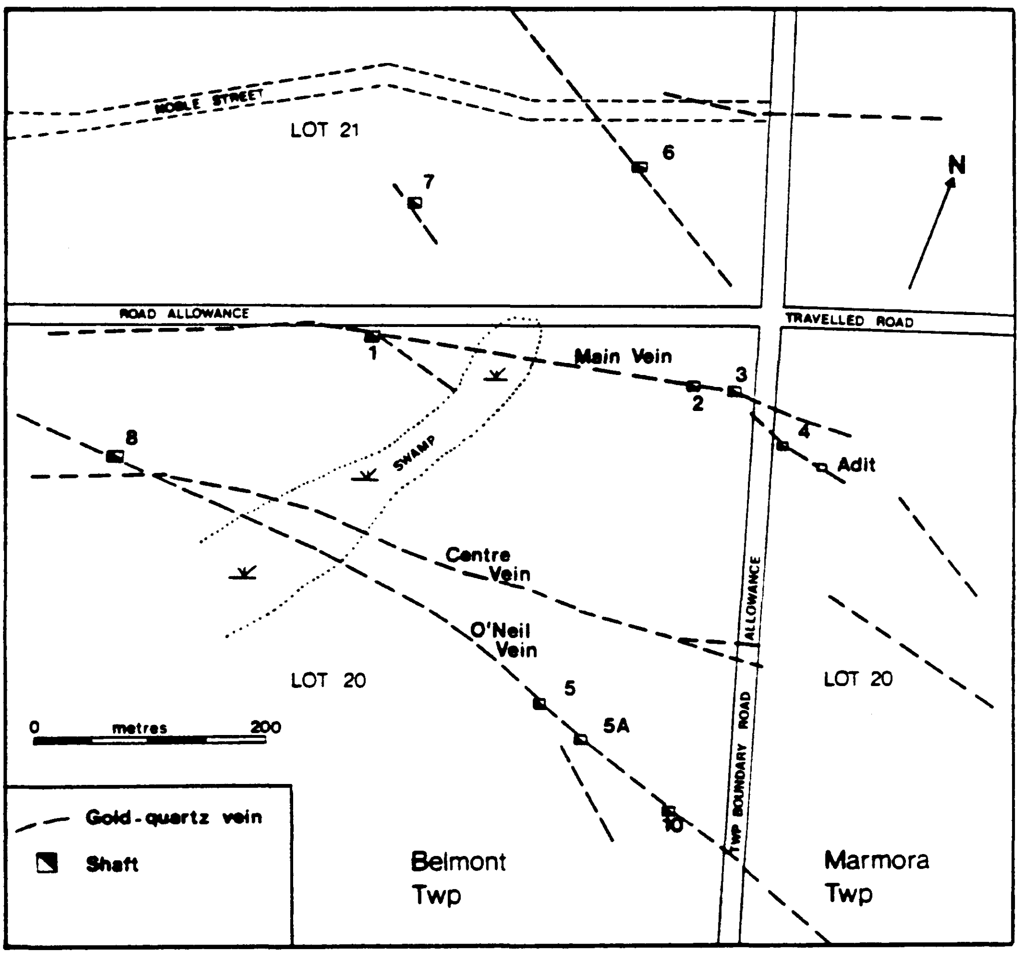

Figure 26: Geology of part of the Cordova Gold Deposit (Adapted from the Prospectus of Cordova Gold Mines Ltd. 1983)

addition to the above four units, many randomly oriented granitic dikes 10 cm to 3 metres in width intrude the gabbros. All of the dikes, as well as the anorthosite and pegmatite, are interpreted to be late stage differentiates of the gabbroic intrusion.

Shear zones cut all phases of the gabbro and occur throughout the pluton, but are most abundant in the northern and eastern parts of the pluton. These shear zones have variable attitudes but, according to Thomas and Cherry (1981), generally strike east in the northern tip of the intrusion and north to northeast elsewhere. Most are steeply dipping (65 to 90 degrees) with striations on the shear planes pitching at 45 to 60 degrees to the south or east. The shear zones exposed at surface are often curved to some degree along strike. The wave-like form of the shear zones and the steeply pitching striations suggest a largely dip-slip movement (Thomas and Cherry, 1981).

The shear zones vary from about 30 cm in width to 50 metres. The shearing within the zones is irregular due to branching and contortion but is persistent along strike. According to Satterly (1943) underground work at the Cordova mine indicates at least one shear zone is less persistent on its dip than it is along its strike. The shearing across individual zones may be uniformly developed or may consist of a central core of more highly sheared rock flanked by poorly foliated, aphanitic material (Thomas and Cherry, 1981). The gabbro is commonly altered to biotite and chlorite within the zones.

Mineralization: Gold bearing vein material confined to shear zones in gabbro constitute the mineralized zones at the Cordova and Ledyard gold deposits. Gold mineralization is known to occur in all the shear zones in the vicinity of the Cordova mine, over much of their exposed lengths (see Fig.26). However, to date, only the Main vein has been found to contain workable orebodies.

The Main vein, or shear zone, strikes approximately east-west and dips steeply to the south. Orebodies developed within it from the No. 1 shaft strike from N60° to N70°E and N80°W and generally dip from 60 to 70 degrees south. Many of the orebodies in the vicinity of shaft No. 1 occur at or near the intersection of two shear zones trending N80°W and N65°E. Orebodies also occurred where there were contortions and variations in the shearing, as in old stoped areas near No. 1 and No. 3 shafts (Satterly 1943).

A reconstruction of the structure relationships of the shear zones, the orebodies and the gross form of the Cordova gabbro has been briefly outlined by Springer (1982) who points out that, if the orebodies occupy a plunge intersection as old records imply, a calculated value of 65°/170° is obtained for their orientation. From the work of Thomas and Cherry (1981) Springer suggests that the gabbro is block faulted, and that the easterly, barren segment lies at a different structural level (inset Fig. 43).

Quartz is the principal vein mineral with subordinate amounts of ankerite and feldspar, including plagioclase and orthoclase. Pyrite is the principal metallic mineral, with minor amounts of pyrrhotite. The vein material is very variable in its mode of occurrence. Satterly (1943) and the author observed i) large massive lenses of quartz conformable with the shear planes, ii) series of closely spaced, parallel veins of quartz, ankerite, and feldspar conformable with shear planes, and iii) irregular zones of branching veins and lenses. A fourth type, described by Satterly (1943) consists of replacement of sheared gabbro by vein material. All four types of vein material occur in the ore zones. A fifth type of vein material, which contains
conformable with shear planes, and iii) irregular zones of branching veins and lenses. A fourth type, described by Satterly (1943) consists of replacement of sheared gabbro by vein material. All four types of vein material occur in the ore zones. A fifth type of vein material, which contains
only minor gold mineralization, occurs on the 9th level of the Cordova mine. It consists of lenses of quartz and carbonate mineralized with pyrrhotite (Satterly 1943). Inclusions of sheared gabbro occur within all types of vein material, giving it a banded appearance.

Native gold was reported by the former operators of the Cordova and Ledyard mines and is quoted by Blue (1894), Miller (1902). Gold is apparently largely confined to pyrite, as evidenced by the following:

1. Samples of massive pyrite collected at the Ledyard mine by the author contained 0.76 oz Au per ton and 0.10 oz Ag per ton. Chip samples of quartz vein material collected nearby contained only trace to 0.01 oz Au per ton.

2. The better ore mined from the Cordova deposit is reported to have contained up to 50 percent pyrite (Satterly, 1943).

Springer (1982) discusses vertical zonation in the Cordova and Leyland bodies, and records assays from pyrite, pyrrhotite and blue quartz at Cordova
only minor gold mineralization, occurs on the 9th level of the Cordova mine. It consists of lenses of quartz and carbonate mineralized with pyrrhotite (Satterly 1943). Inclusions of sheared gabbro occur within all types of vein material, giving it a banded appearance.

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2. The better ore mined from the Cordova deposit is reported to have contained up to 50 percent pyrite (Satterly, 1943).

DEVELOPMENT HISTORY

1890-1893: Gold was discovered by H.T. Strickland in 1890. In 1891 the property was acquired by a syndicate comprised of Messrs. Carscallen, O'Neil, Strickland, and Burnham who sunk the No. 1 shaft to a depth of 32 metres, excavated several open cuts, and raised about 1000 tons of ore. The property was optioned by Middleton Crawford on Oct. 7th, 1982 for one year. Mr. Crawford constructed a mill and is reported to have removed about $5,000 worth of gold (Blue, 1893).

1898-1903: The property was optioned and later purchased from A.W. Carscallen by the Cordova Exploration Co. Ltd. (de Kalb 1899, 1900). Eight shafts of varying depth were sunk, with most work being confined to the No. 1, 2, and 3 shafts on the Main vein. The No. 1 shaft was extended to 125 metres with four levels, the No. 2 shaft was sunk to 56 metres, and the No. 3 shaft (inclined) was completed to a depth of 99 metres, with three levels. The No. 2 and No. 3 shafts were connected at the second level. A 10 stamp mill was constructed and expanded to 30 stamp capacity in 1901 (Carter 1902, 1903; Miller 1902; Cominco Ltd, Company Files). During the period 1898-1903 a total of 17,101 oz of gold are reported to have been produced from 70,185 tons of sorted ore milled (Mineral Deposit Files, Ontario Geological Survey, Toronto).

1911-1917: The mine was purchased by Cordova Mines Ltd. in 1911. The No. 3 shaft was deepened, two new levels were started and a large amount of stoping completed. The mill was overhauled and several test runs on ore were made, with recovery of a total of 2,186 oz of gold and 537 oz of silver from 16,491 tons of ore milled between 1912 and 1917 (Ministry of Natural Resources, Statistical Files). When operations ceased in 1917 the No. 3

inclined shaft was 152 metres deep with 732 metres of drifts on five levels. The No. 1 shaft was 125 metres deep with 550 metres of drifts on five levels. There were also small amounts of cross-cuts and raises. (Cominco Ltd., Company Files).

1933-1940: In 1933 the mine was dewatered and sampled by the Consolidated Mining and Smelting Co. of Canada Ltd, and in 1935 they purchased the property. Development work included the deepening of the No. 3 shaft to 320 metres (inclined) with the establishment of five new levels and sinking of an inclined winze to a depth of 341 metres. A large amount of drifting, raising, crosscutting, and diamond drilling were completed. A 100 tons per day mill was operated from Oct. 23 1939 to July 29, 1940. A total of 3487 oz of gold and 150 oz of silver were produced from 33,434 tons ore milled (Mineral Deposit Files, Ontario Geological Survey, Toronto).

1948: Surface rights were sold to H.R. Bowen (Cominco Ltd., company files).

1954: Mineral rights were sold to H.R. Bowen (Cominco Ltd., company files).

1964-1965: Property was acquired by Orvana Mines Ltd. Initial program consisted of a ratio resistivity survey to locate shear zones with subsequent drilling of 10 diamond drill holes totalling 622 metres to test anomalies. Results were discouraging except for one intersection of 1.2 metres averaging 0.23 oz Au per ton. Six additional diamond drill holes totalling 184.4 metres were drilled to test known vein structures. Surface ore dumps and tailings ponds were systematically sampled and measured (H.G. Harper, unpublished geological report, Orvana Mines Ltd., 1965).

1980-1982: Property bought by Cordova Gold Syndicate, now known as Lasir Gold Inc. Heap leaching tests were conducted on part of a surface stockpile of development ore and a small tonnage of tailings were processed in a small pilot plant with recovery of a concentrate consisting of 800 lb of charcoal containing 151 oz Au per ton (personal communication, Walter Hood, Lasir Gold Inc.). Feasibility study on reopening of the mine for production completed.

REFERENCES

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*Bartlett, J.R. et al.	1982, Map P2488
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	1903, p.111-112
Corkhill, E.T.	1913, p.135
De Kalb, C.	1899, p.40-41
	1900, p.92-93
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Miller, W.G.	1902, p.188-193
Satterly, J.	1943, p.36-40
Sinclair, D.G.	1937, p.96
Slaght, A.	1891, p.224
	1898, p.89
Thomas, P.B. and Cherry, M.E.	1981, p.251-253
Tower, W.O.	1941, p.104

13. LEDYARD PROSPECT

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Gabbro

CLASSIFICATION:
IIIAI: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Ledyard prospect is located in the east central part of Belmont township, approximately 10 kilometres northwest of Marmora and 1.2 kilometres southeast of Cordova Mines (NTS 31C/12). The locality is accessible from a paved road joining Marmora on Highway 7, to Cordova Mines. The prospect can be reached on foot along the Marmora-Belmont township boundary line, approximately 1.0 kilometres south of the intersection between the access road and township line. It is indicated on G.S.C. Map 560A (Wilson 1940) and O.G.S. Map P. 2488 (Bartlett et al. 1982).

E 1/2 Lot 19, Con. I,
Belmont Township, Peterborough County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°31'55"W Longitude 77°46'43"N
UTM Zone 18, 4 934 500 N, 279 200 E

SIZE AND GRADE

The Ledyard prospect comprises of a number of mineralized quartz veins reported over a total distance of approximately 450 yards (Blue 1894, p.51; 1897, p.58). The major gold-bearing vein at the east end of the prospect is trenched at least 100 feet along strike, widths range from 4 to 6 feet on surface to 18 feet at a depth of 100 feet.

Carter's detailed geological map shows the shaft and at least 15 pits and trenches. The shaft was excavated to a depth of 100 feet and is vertical except for the segment between 22' and 42' which is inclined 68°. At the 22 foot level, a drift 4.5' by 10' extends east for 26 feet. An 85 foot long crosscut from the bottom of the shaft intersects the vein at depth (Slaght 1895, p.234; Blue 1897, p.58). The second major showing previously referred to as the Burnt Knoll occurrence (Blue 1894, p.51) is described by Carter as a crescent-shaped trench up to 6m wide and 6m deep.

Table 31 lists approximate assay values of samples collected during the development period (Blue 1894, p.51,52). Table 32 lists gold values of samples recently collected by Carter. In 1893 and 1894, 55 tons of mineralized rock were milled to produce $236 or 13.8 ounces of gold (ODM Statistical Files, Ledyard Gold Mines Co.).

TABLE 31: Approximate gold assays, Ledyard Prospect

Sample	Sample Location/Description	Quantity	Approximate Grade (Oz/Ton Au)
Shaft	/ pyrite and quartz	7	16.8
Shaft	/ rock dump	1	4.7
Shaft	/ mill test	3 tons	1.3
Shaft	/ 100' level	several	0.7 (ave)
Burnt Knoll	/ min. qtz. vein	3	4.6 (ave)
Burnt Knoll	/ quartz + pyrite	25 lbs.	4.6
Other Occur-rence	pyrite, chalcopyrite/ / quartz	6	1.35 (ave)

TABLE 32: Partial Chemical Analyses of whole rocks, Ledyard Prospect

Sample No.	Au (oz/ton)	Ag (oz/ton)	As (ppm)	Sb (ppm)	Cu (ppm)
80-TRC-119 Chip sample, wall rock, 20m	<0.01	<0.1	30	0.4	25
80-TRC-120 Chip sample of vein and shear zone	0.03	<0.1	18	0.3	34
80-TRC-121 grab sample, sheared gabbro	<0.01	<0.1	48	0.3	85
80-TRC-123 chip sample, qtz. vein, 1.5m	0.01	<0.1	17	0.3	71
80-TRC-124 chip sample, footwall	<0.01	<0.1	4	0.4	94
80-TRC-125 (Rock dump sample)	0.76	0.10	19	0.2	38

DESCRIPTION

General Geology: The Ledyard prospect occurs in the north part of the Cordova Mafic Intrusive complex which straddles the central part of the Belmont-Marmora township line. The surface exposure of the intrusive is roughly oval-shaped, approximately 10 kilometres long and 5 kilometres wide. O.G.S. geological map P.2488 (Bartlett et al. 1982) and O.D.M. map 1957b (Hewitt and Satterly, 1957) show the complex bounded on the north and east by marbles and on the west by mafic volcanic rocks. The south boundary is marked by the edge of the Paleozoic rock cover. A geological map of the intrusive (Figure 24) indicates that the deposit occurs within the fine-to medium-grained, massive gabbro phase. Thomas and Cherry (1981, p.251-253) provide a general description of the geology and mineraliztion of the Cordova Gabbro.

Carter's detailed study indicates that the prospect consists of a number of mineralized quartz-ankerite veins in shear zones within the gabbroic intrusion (Figure 27). The vein at the major showing is oriented 250° and sips south at 45°, it varies in width from 4 to 6 feet at the surface to 18 feet at a depth of 100 feet. In other workings, quartz and ankerite occur in irregular lenses and subparallel veins. The veins are bounded by sheared gabbro, a black or dark green, very fine-grained chloritic schist. Fragments of the schist locally occur within veins. The massive gabbro is generally dark green, fine- to coarse-grained (2mm to 10mm) and is pegmatitic in places. Numerous veins and dikes of granite crosscut the gabbro. Tables 33 and 34 list the estimated modal percentages and chemical compositions for samples of sheared and massive gabbro. Much of the pyroxene and plagioclase in the massive gabbro altered to chlorite and epidote respectively. In the sheared gabbro, pyroxene and epidote are absent; chlorite and carbonate are the dominant minerals.

Mineralization:

Blue (19894, p.51) writes:

"....The vein varies in width from four to six feet, and shows free gold at 25 feet. At the bottom of the shaft, it is divided by a horse, so that the walls are 12 feet apart. It is largely composed of a white, cellular quartz with iron and copper pyrite in cavities, showing free gold, the decomposition products having leached out largely; but a portion of the quartz is stained with iron, holding iron pyrites decomposed in part with limonite.....".

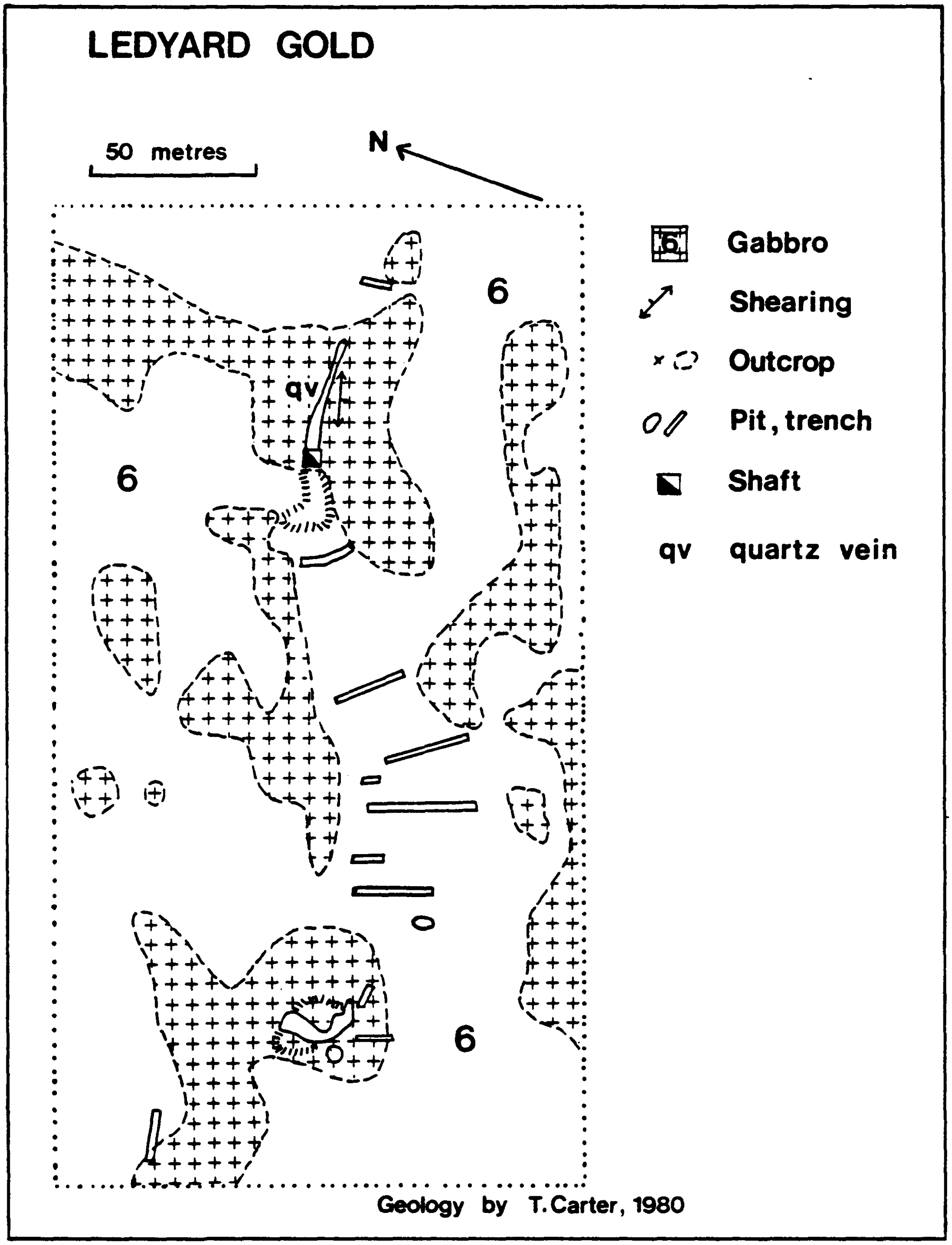

Figure 27: Geology of the Ledyard Gold Deposit.

Table 33: Estimated modal compositions of thin sections, Ledyard Prospect

	Sheared Gabbro 80-TRC-126 %	Massive Gabbro 80-TRC-127 %
Augite		30
Chlorite	35	25
Plagioclase	15	15-20
Carbonate	30	2
Epidote		15
Biotite	10	5
Actinolite	5	
Quartz	<5	5
Opaques	<1	

Table 34: Major element chemical compositions, Ledyard Prospect

	Sheared Gabbro 80-TRC-126 %	Massive Gabbro 80-TRC-127 %
SiO_2	40.00	46.00
Al_2O_3	13.10	17.10
Fe_2O	2.55	3.48
FeO	6.80	5.59
MgO	9.17	9.24
CaO	9.37	8.76
Na_2O	0.34	2.42
K_2O	2.09	0.26
MnO	0.16	0.12
TiO_2	1.15	0.92
P_2O_5	0.12	0.09
CO_2	9.84	0.57
S	0.01	0.02
H_2O+	3.60	3.21
H_2O-	0.57	0.60
Total	98.87	98.38

Carter noted that the mineralization consisted of disseminated and minor chalcopyrite within white coarse-grained quartz-ankerite veins and the adjacent sheared gabbroic rocks. Pyrite occurs as scattered blebs, lenses, pods and distinct euhedral grains which are usually elongate parallel with the vein contacts. Sheared gabbroic fragments within the veins often contain the highest percentage of sulphides. Thin sections of the vein material indicate that coarse-grained quartz is dominant, with lesser amounts of carbonate and minor fine-grained biotite and muscovite. Two polished thin sections contain up to 7 percent disseminated subhedral to euhedral pyrite ranging in size from <0.1 to 15mm. Trace amounts of fine, irregular blebs of chalcopyrite also occur within the gangue. Few very fine grains of gold (0.06mm) were found in contact with the pyrite in one section.

DEVELOPMENT HISTORY

1893 - Mr. T.D. Ledyard discovered the prospect and formed the Ledyard Gold Mine Company Limited (Blue 1984, p.51, Slaght 1895, p.234)
- A trench 40' long was opened up on the main vein and a shaft 8' by 11' was excavated to a depth of 45' (Brumell, 1894, p.79A; Blue 1894, p.51).
- pits were excavated on vein systems about 150 yards west at the shaft (Blue 1894, p.51).
- 37 tons of hand picked ore were shipped from the mine (Brumell 1894, p.79A), - 3 tons of ore were milled and approximately 3.9 ounces of gold were recovered (O.D.M. Statistical Files, Blue 1896, p.18).

1894 - The shaft was excavated to a depth of 60'. A draft 4.5' by 10' was extended for 26' east of the shaft at the 22' level (Slaght 1895, p.234).
- a mill was set up and a 700' tramway serviced the shaft and other workings further west. Prospecting in the vicinity was continued, several new showings were trenched (Slaght 1895, p.235).
- 52 tons ore were milled producing about 9.9 ounces of gold (O.D.M. Statistical Files; Blue 1896, p.18)

1895 - Shaft extended to a depth of 75 feet. Drift at 22 feet raised to the surface.
- New 20 TPD mill was installed. Mine was idle for part of the year (Slaght 1896, p.263).

1896-1897 - The shaft was deepened to 100 feet. The vein was intersected at depth by an 85 foot crosscut. Additional buildings were erected at the mine site (Blue 1897, p.58).
- trenches were opened on new showings in the vicinity.

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	1896, p.18
	1897, p.58
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	1896, p.263
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*Wilson, M.E.	1940, Map 560A

14. BOERTH PROSPECT

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Paragneiss, calcitic marble

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Boerth prospect is located in the central part of Clarendon township, about 3.4 kilometres west of Ardoch and 4.0 kilometres northeast of Fernleigh (NTS 31C/15). It is accessible on foot from a 1 kilometre secondary gravel road which runs north from Highway 506 (to Swangers Lake), 3 road kilometres east of Fernleigh. The prospect is about 1 kilometre northeast of the north end of Swangers Lake, a short distance south of a power line. Highway 506 joins Highway 41 about 22 kilometres west of Fernleigh; this junction is 19 kilometres north of the intersection between Highway 41 and 7. The prospect is located on O.D.M. Maps 2053 (Hewitt 1969) and 1956-4 (Smith 1956) and OGS Map P2487 (Pauk and Mannard 1980).

Lot 29, Con. VIII, Clarendon Township, Frontenac County
NTS SHARBOT LAKE 31C/15 1:50,000
Latitude 44°55'40"N Longitude 76°57'00"W
UTM Zone 18, 4 976 550 N, 346 100 E

SIZE AND GRADE

The Prospectus of Ganda Silver Mines Limited (1964) describes the prospect as a belt of mineralized quartz veins covering an area approximately 2000 feet by 300 feet. The best mineralized section is centred about the "Hattie B" shaft in a wedge-shaped zone 600 feet by 200 feet (maximum width). Quartz veins in this zone vary in width from 0.5 feet to 3.0 feet and extend for up to 140 feet along strike. Drill intersections were recorded up to a depth of 200 feet. About 200 feet west of the Hattie B zone, a mineralized vein averaging 0.8 feet wide is exposed for a length of 134 feet.

De Kalb (1900, p.93) reported that the original workings consisted of two shafts spaced about 160 feet apart. The Hattie B shaft is inclined 65° and is 120 feet deep with drifts 28 feet south and 25 feet north at the 75 foot level. The "Uncle Sam" shaft is 35 feet deep. Figure 28 shows the locations of the shafts and trenches at the main workings. The Prospectus of Ganda Silver Mines Ltd. (1964) reports a 100 foot adit about 1800 feet east of the

Hattie B shaft. Two additional shafts 40 feet and 25 feet deep were opened between the adit and Hattie B shaft. A number of pits and trenches also occur in this area. The prospectus also mentions the Webber shaft and related trenches located about 2000 feet west of the Hattie B. zone.

Table 35 lists assays of samples collected from veins in the Hattie B zone (No. 1 to 9, Hattie B, Nugget 1,2) and from other veins within the Boerth claim group (No. 10,11, L11-154, Dick and Addit). Table 36 lists assays of 4 chip samples from veins in and around the workings shown on Carter's geological map. A diamond drill assessment report submitted by B. Robson (1952) indicate intersections of 1.17 oz/ton Au over 1 foot, 0.37 oz/ton Au over 0.4 feet and 0.56 oz/ton over 2 feet.

Table 35: Chip Sample Assays, the Boerth prospect

Vein No.		Number of Samples	Average vein width (feet)	Average assay (oz/ton Au)
1	(S)	21	1.0	0.06
2	(D)	2	0.4	0.39
3	(S)	9	1.1	0.94
3	(D)	3	1.7	0.64
4	(S)	12	0.9	0.09
4A	(S)	7	1.0	0.31
4	(D)	4	0.8	0.19
5	(S)	1	2.0	0.25
5	(D)	3	0.9	0.10
6	(S)	7	1.0	0.77
6	(D)	4	1.0	0.18
7	(S)	3	0.9	2.10
7	(D)	2	0.5	0.22
8	(D)	1	0.5	0.28
9	(D)	1	1.8	0.32
Hattie B	(S)	4	2.2	1.60
Hattie B	(D)	4	1.8	0.26
Nugget	(S)	2	0.4	0.97
Nugget 1	(D)	2	0.9	1.20
Nugget 2	(D)	1	2.4	0.82
10	(S)	2	1.6	1.05
11	(S)	2	0.3	0.55
L11-154	(S)	3	0.8	1.12
Dick	(S)	6	2.3	1.06
Addit	(S)	2	1.0	0.74

(S) and (D) are surface and drill samples. Multiple surface vein samples were taken at 5 foot intervals along strike. Drill intersections vary in depth from 25 feet to 200 feet.

Table 36: Partial Chemical Analyses, the Boerth prospect

	80-TRC-154	80-TRC-157	80-TRC-161	80-TRC-163
Au (oz/ton)	1.42	0.01	1.96	0.26
Ag (oz/ton)	0.14	<0.1	<0.1	<0.1
As (ppm)	14	2500	1400	1420
Sb (ppm)	1.0	9.9	4.7	8.2
Cu (ppm)	57	55	12	55
Pb (ppm)	<10	<10	<10	<10
Zn (ppm)	10	9	6	8

DESCRIPTION

General Geology: The Boerth prospect occurs within part of an extensive belt of interbedded marbles from the southwest part of Barrie Township, through Clarendon and Palmerston Townships. Rocks in this region are tightly folded with steeply dipping units which strike northeast-southwest. Pauk's preliminary map (P.2487, 1982) locates the prospect on the axis of an inferred antiform trending northeast. This structure parallels the Fernleigh syncline which is centred on a narrow belt of overlying Flinton group rocks. The prospect is within 0.5 kilometres of the north boundary of the Flinton group rocks.

A detailed map (Figure 28) shows a northeast trending sequence of interbedded calcitic marble and metaclastic rocks. Units strike northeast with dips ranging from 90° to 65°S. Major units range in width from about 5m to 90m. Calcitic marbles form white, fine to very fine-grained, well layered units. The layering is defined by bands and lenses of fine grained quartz, tremolite, feldspar and muscovite and by a variation in the grain size of carbonate (<0.5 to 2.0mm). Layers of silicate minerals vary in thickness from 1mm to 1m, in places they form beds of siliceous, pelitic metaclastic rock. Conformable lenses of coarse-grained calcite with minor quartz are locally abundant. Grey, massive, aphanitic dolomite forms a minor component of the carbonates. The pelitic metaclastics are grey, aphanitic to medium-grained, well bedded rocks (2mm to 10cm thick) oriented 80°/65°S. These rocks are tightly folded and the cleavage cross-cuts bedding. Pelitic metaclastic units are garnetiferous in places and grade into well-bedded siliceous metaclastic units. The siliceous variety is a light grey, very fine-grained (<0.5mm) strongly foliated, quartz-feldspar-muscovite-biotite paragneiss which locally contains up to 20 percent disseminated pyrite. Estimated modal compositions of the metaclastic rocks are listed in Table 37. In thin section, the fine banding within the pelitic metaclastics is defined by hornblende-rich layers and the variation in the grain size of the quartz rich zones. The siliceous variety has a foliation imparted by the alignment of biotite flakes and a banded appearance due to the grain size variation in the quartz-rich zones.

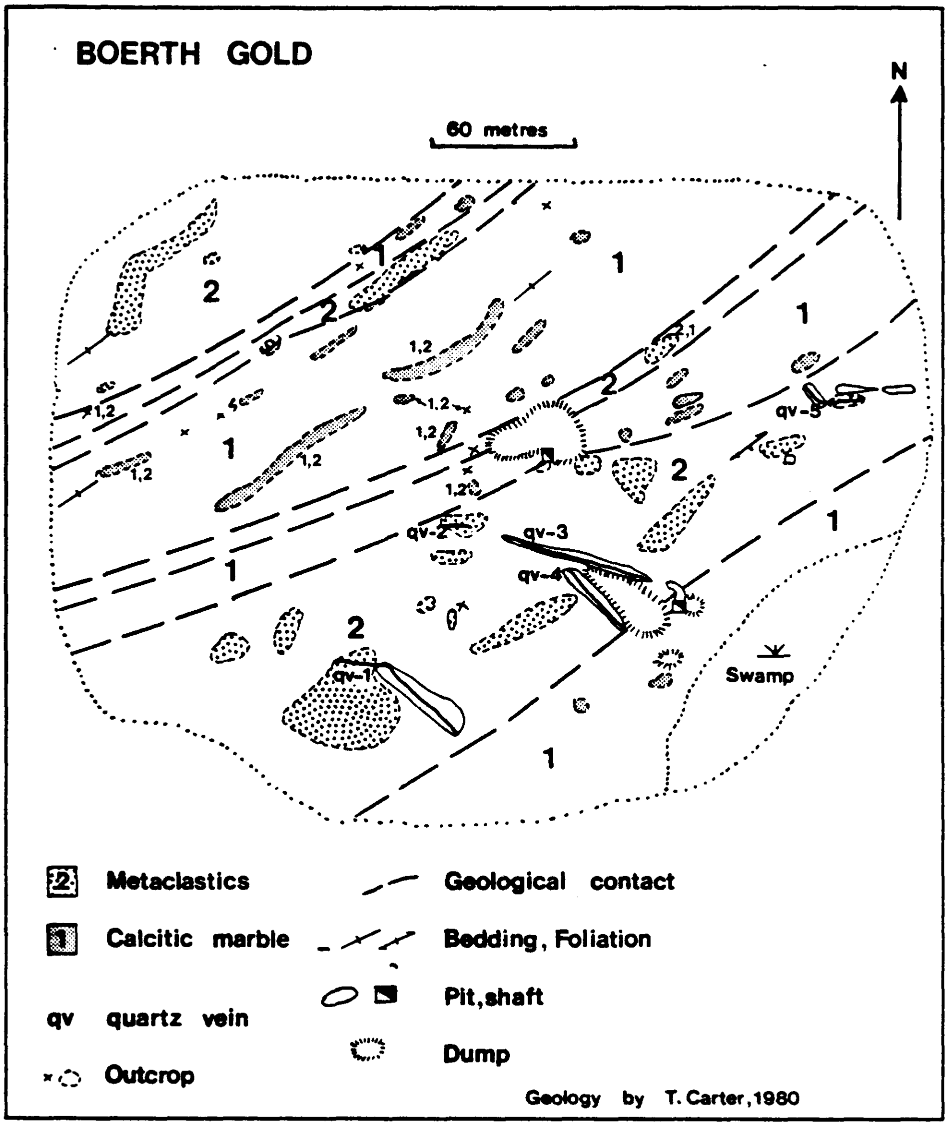

Figure 28: Geology of the Boerth Gold Deposit.

Table 37: Estimated modal compositions, Boerth prospect

	Pelitic Metaclastic 80-TRC-156 %	Siliceous Metaclastic 80-TRC-160 %
Quartz	50	40 - 45
Feldspar	25 - 30	15 - 20
Biotite		25
Hornblende	10 - 15	
Carbonate	5	15
Muscovite	5	minor
Chlorite		minor
Opaques	1	minor

Figure 28 locates the major veins exposed on surface within the metaclastic host unit. The shafts are located on the north and south contacts of this unit with the calcitic marbles. The exposed veins are generally discordant with the local bedding (80°/65°S) and are oriented at 140°/76°S, 100°/40°S and 80°/40°S. These veins pinch and swell and may range on thickness from about 10cm to 50cm.

Mineralization: Sparsely disseminated blebs and grains of pyrite and arsenopyrite and streaks and veinlets of pyrite were the only mineralization observed within the trenches. Three polished thin sections of mineralized veins contain very fine tourmaline, and minor pyrrhotite and chalcopyrite. Visible gold was reported in drill core (Robson 1952). The highest grades were generally associated with arsenopyrite and tourmaline mineralization (Miller 1902, p.203). The veins are generally composed of 90-95 percent quartz and up to 5 percent carbonate, tourmaline and/or sulphides. Pyrite, the most abundant sulphide, forms anhedral to subhedral grains up to 2.0mm in diameter. Arsenopyrite usually forms finer subhedral-euhedral grains. Chalcopyrite and pyrrhotite are present in trace amounts, generally in very small, irregular disseminated grains. Tourmaline occurs in veinlets as very fine-grained aggregates and in finely disseminated grains.

Further work on this property has been conducted by P. Barron and is reported in the 1983 Summary of Field Work by the Ontario Geological Survey. A fuller description is in press and will appear as an Open File Report.

Development History

1898 - Mr. H.J. Boerth acquired a patented claim over the deposit
- A group of Detroit residents formed Boerth Mining Co. of Ontario Ltd.

1899 - Two shafts sunk (1) Hattie B - inclined at 65°SW, sunk to a depth of 120 feet, 53 feet of drifting on the 75 foot level; (2) Uncle Sam shaft 160 feet south of Hattie B, sunk to 35 feet, 10 stamp mill erected 1700 feet east of the Hattie B shaft.

1900 - Production of 13 oz of gold values at $208.00 (MNR Statistical Files, Toronto)

1901 - Property acquired by Clarendon Mining Co. of Ontario Ltd. No information available on amount or type of work completed.

1901-
1915 - The following old workings are described by A.C.A. Howe (1964) as having probably been excavated during this time period.

1. An adit 100 feet long 1800 east of the Hattie B shaft and a pit 15' deep above the adit.
2. Two shafts, 40 feet and 25 feet deep between the Hattie B and the adit.

Further work on this property has been conducted by P. Barron and is reported in the 1983 Summary of Field Work by the Ontario Geological Survey. A fuller description is in press and will appear as an Open File Report.

3. Numerous pits, trenches, and open cuts.

1915 - It is reported by local residents that the mill was torn down.

1950 - Property staked by Bruce Robson.

1952 - Three diamond drill holes totalling 167m (547 feet) completed by B. Robson.

1963-
1969 - The Boerth property was optioned from Robson by New Providence Investments Limited and then Ganda Silver Mines Ltd. in 1963 and 10 adjoining claims were staked. In 1964, 12 more claims were staked and two patented claims optioned. During this time the company: completed geological mapping of the Boerth claim, channel sampled all open cuts, pits, and shafts, stripped and trenched to locate new veins, completed 41 diamond drill holes totalling 6000 feet to May 25, 1964.

REFERENCES

Barron, P.S.	1983, p.276-281
Carter, T.R.	1980, p.171,173
Carter, W.E.H.	1902, p.236
DeKalb, C.	1900, p.93-94
Ganda Silver Mines	1964
Gordon, J.B. et al.	1979, p.33-34
Hewitt, D.F.	1964, p.12, Map 2053
Hurst, M.E.	1927, p.111
Kindle, E.D.	1936, p.115
Miller, W.G.	1902, p.203
Pauk, L.	1982, p.76-78
Pauk, L. and Mannard, G.	1980, Map 2487
Robson, B.	1952
Smith, B.L.	1956, p.38-39
Wells, J.W.	1899, p.288

15. WEBBER OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein Quartz
Other: Biotite paragneiss

CLASSIFICATION
IIIA1: Concordant to Discordant, Quartz, Quartz-ankerite, vein-hosted Au, Ag and As.

LOCATION AND ACCESS:

The Webber occurrence is located in the central part of Clarendon township, approximately 3 kilometres northwest of Fernleigh and 4 kilometres west of Ardoch. (NTS 31C/15). It is accessible on foot from a 1 kilometre gravel road which runs north of Highway 506 (to Swaugers Lake), 3 road kilometres east of Fernleigh. The showing is approximately 200m north of the northeast end of Swaugers Lake. The occurrence is located on O.D.M. Maps 2053 (Hewitt, 1969) and 1956-4 (Smith, 1956) and OGS Map P2487 (Pauk and Mannard, 1980)

Lot 28, Concession IX, Clarendon Township,
Frontenac County.
NTS Sharbot Lake 31C/15 1:50,000
Latitude: 44°55'23"N Longitude: 76°57'36"W
UTM Zone 18 4 976 050 N 345 300 E

SIZE AND GRADE

The occurrence is hosted in a vertical quartz vein 1 foot in width. Workings consist of a shaft and a 200 foot long trench opened along the vein (Smith, 1951, p.5). Ganda Silver Mines Limited drilled 6 holes (1054') on the prospect, 4 beneath the showings. The best assay results reported are from core samples of the vein: 0.52 oz/ton Au over 3.7' and 0.02 oz/ton Au over 2.5' (Ganda Silver Mines Ltd., 1963). Five drill holes (861.5') were completed by unknown operators. A total of 24 core sample analyses were reported, the best intersections are 1.07 oz/ton Au over 1.6', 0.06 oz/ton Au over 1.5' and 0.02 oz/ton Au over 3.1' (Firth, 1954).

DESCRIPTION

Hewitt's regional geological map (1964, Map 2053) shows that the deposit occurs within a sequence of paragneisses near the contact with a discontinuous unit or lens of marble. These rocks form part of an extensive, folded sequence of metavolcanic, clastic and calcareous metasedimentary rocks. The belt is up to 12 kilometres wide and extends for at least 40 kilometres from the east side of Barrie township, northeast beyond Palmerston township.

The occurrence is hosted in a conformable quartz vein within paragneisses, a short distance north of the contact with dolomitic marbles. The vein is about 1 foot wide and is oriented N 65°/Vertical (Smith, 1958, p.39). Drill core samples of the country rock are gray, fine-grained biotite paragneisses interlayered in places with narrow marble units. Conformable quartz and calcite stringers and veins contain up to 5 percent pyrite and arsenopyrite. Little significant mineralization was detected in core samples, however one zone (1.6') assayed 1.07 oz/ton Au and 0.29 oz/ton Ag (Firth, 1954).

DEVELOPMENT HISTORY

pre 1951: -a shaft and a 200' long trench were opened on the mineralized vein.
-significant gold values were reported.
-operators unknown (Smith, 1951, p.5).

1963: -Ganda Silver Mines Limited drilled 6 holes (totalling 1054') near the workings.
-best drill sections assayed 0.52 oz/ton Au over 0.7' and 0.02 oz/ton Au over 2.5' (Ganda Silver Mines Ltd., 1963).

1980: Selco Mining Corporation Limited conducted a geological and soil sampling survey over the area, no anomalies were reported (Sinclair, 1980).

REFERENCES

Firth, N.	1954, Geoscience Data Centre, Toronto
Ganda Silver Mines Limited	1963, Geoscience Data Centre, Toronto
Gordon, J. B. et al.	1979, p.41
*Hewitt, D.F.	1964, Map 2053
Pauk, L.	1982, p.104-105
*Pauk, L. and Mannard, G.	1982, Map P2487
Sinclair, I. G. L.	1980, Geoscience Data Centre, Toronto
Smith, B. L.	1951, p.5
*Smith, B.L.	1958, P.39, Map 1956-4

16. JAMES JOSEPH OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein quartz

CLASSIFICATION;
IIIA1: Concordant to discordant, quartz, quartz-ankerite vein hosted Au, Ag and As.

LOCATION AND ACCESS

The James occurrence is located in the south part of Elzevir Township, approximately 11.5 kilometres east of Madoc and 7.0 kilometres north of Tweed (NTS 31C/11). The major workings are located immediately south of Highway 7 and west of the Skootmatta river, 12 road kilometres from Madoc. The village of Actinolite is immediately east and south of the occurrence., At least two additional pits occur on the Clapp property in lot 2, on the opposite side of the Madoc-Actinolite road. The major workings are located on ODM Maps 51d (Meen, V.B. and Harding, W.D. 1942) and 2054 (Hewitt 1964).

Lots 2,3 Con. IV, Elzevir Township, Hastings County
NTS KALADAR 31C/11 1:50,000
Latitude 44°32'53"N Longitude: 77°19'42"W
UTM Zone 18, 4 935 250 N, 315000E

SIZE AND GRADE

The James occurrence consists of a number of excavations in mineralized quartz veins in a zone approximately 400 feet wide and 0.5 miles long (Hurst 1927, p.108). Mineralized zones contain up to 25 percent quartz, in veins and irregular lenses up to 3.5 feet wide. Wells (1902, p.102) states: "...there are at least four distinct occurrences, one of which appears to be nearly 100 feet wide...."

There are at least seven significant workings over a distance of about 2500 feet, five of these are shafts ranging in depth from 20 feet to 423 feet (Hurst 1927, p.107-109, Wells 1902, p.102).

A mineralized sample from a rock dump at a pit about 700 feet east of Actinolite assayed 0.01 oz/ton Ag and 0.04 oz/ton Au. At the deepest shaft 250 feet west of this pit, selected mineralized samples were reported to contain up to about 1 oz/ton Au (Hurst 1927, p.108). Earlier reports indicate that the mineralization averaged about 0.09 oz/ton Au and 12 percent As (Wells, p.102, Gibson, p.14).

DESCRIPTION

Elzevir township is situated within and around the Skootamata Formation, a sequence of metaclastic rocks related to the Flinton Group metasediments in an area between the Elezevir Granite in the north and the Addington Pluton in the south (Moore and Thompson 1980, p.1687, Hewitt 1964, Map 2053). This area is near the west end of an extensive belt of Flinton Group rocks, immediately east of an isolated sequence called the Black River Syncline (Moore and Thompson 1980, p.1688). The Skootamatta Formation separates the Tudor metavolcanics near the southwest boundary of the Elzevir Batholith from a narrow zone of Hermon-Mayo Group marbles at the northwest boundary of the Addington Pluton. Moore and Thompson (1980, p.1692) state......"Because the Skootamata clastics overlie a variety of pre-Flinton units, they may represent the last phase of pre-Flinton deposition or the beginning of Flinton sedimentation. However, their local heterogeneity is not typical of the base of the group elsewhere, and an unconformity may separate them from overlying, more uniform formations..."

In the locality of the occurrence, the Skootamatta formation is about 400 m wide and is composed largely of volcanic pebble conglomerate and associated rocks (Moore and Thompson 1980, p.1688, 1691). A few workings are also located in the Tudor metavolcanics as indicated by an early report:

"The rocks exposed in the mineralized belt consist of hornblende schist, the volcanic member of the Grenville series, and hornblende-mica schist, forming a transition zone between the volcanic and conglomerate of the Hastings series. The mineral deposits consist of numerous irregular aggregates and veins of quartz up to 3 1/2 feet wide occurring either in the hornblende-mica schist or in the hornblende schist near its contact with the hornblende-mica schist" (Hurst 1927, p.108).

Mineralization: Hurst (1927, p.108) writes:

....The quartz in places, especially along its contact with the schist, carries some mispickel, but the proportion of this mineral in any of the openings seen by the writer is too small."

Wells (1902, p.102) states:

"The ore bodies contain large quantities of mispickel associated with quartz and a little iron pyrites...."

The arsenopyrite mineralization contains minor gold and silver.

DEVELOPMENT HISTORY

1872: 5 shafts 20' to 42' deep were excavated by Mr. Flint (Hurst 1927, p.107)

1899: Mr. Jones, owner of the property, tested a small quantity of arsenopyrite mineralization at the Toronto Smelting Company's smelter in Madoc (Wells 189, p.288).

1901: Two pits were opened on the Clapp property, Lot 2., Con. IV (Hurst 1927, p.107, Kindle 1936, p.115).

REFERENCES

Gibson, T.W.	1902, p.14
Gordon, J.B. et al.	1979, p.43
*Hewitt, D.F.	1964, p.19, Map 2053
Hurst, M.E.	1927, p.107-109
Kindle, E.D.	1936, p.115, 118
*Meen, V.B. and Harding, W.D.	1942, Map 51d
Miller, W.G.	1902, p.200
Moore, J.M. Jr. and Thompson, P.H.	1972, p.222-229
	1980, p.1885-1707
Sangster, A.L.	1970, p.244
Wells, J.W.	1899, p.288
" "	1902, p.102

17. SILVER KING PROSPECT

COMMODITY: Gold, silver

ROCK ASSOCIATION

Host: Vein quartz
Other: Granite

CLASSIFICATION

IIIA1: Concordant to discordant, quartz, quartz-ankerite vein hosted Au, Ag and As.

LOCATION AND ACCESS

The Silver King prospect is located in the northwest corner of Elzevir township, about 9 kilometres northeast of Madoc and 8.5 kilometres north of Queensborough (NTS 31C/11). The prospect is accessible from a paved road leading to Queensborough, which runs north from Highway 7 about 9.5 road kilometres east of Madoc. At a point about 6.5 road kilometres north of the highway, access is provided by a gravel road which continues north, east and north for a distance of 9.0 road kilometres. The final 1.5 kilometres to the shaft is marked by a vehicle trail. The deposit is located on ODM maps 2053 (Hewitt 1964).

E1/2 Lot 25 Con.III, W1/2 Lot 25, Con. IV,
Elzevir Township, Hastings County
NTS KALADAR 31 C/11 1:50,000
Latitude: 44°40'08"N Longitude 77°23'30"W
UTM Zone 18 4 948 700 N 310 400 E

SIZE AND GRADE

The Silver King prospect occurs in a system of quartz veins within a steeply dipping shear zone. The zone is 5 to 15 feet wide and has been traced for 700m feet along strike (Thomson 1951). Individual quartz veins and stringers range up to 3 inches in width.

Thomson (1951) writes:

" A vertical shaft has been sunk on the vein to a reported depth of 100 feet. It is said there is no drifting or crosscutting. Northeast of the shaft a section of the sheared zone has been stripped for 100 feet. Southwest of the shaft a rock trench has been cut along the vein zone for a length of about 130 feet. Southwest of the shaft a rock trench has been cut along the vein zone for a length of about 130 feet."

The following are reported assay values recorded in Thomson's report. A mineralized sample of vein material from the open cut assayed 0.26 oz/ton Au, 17.02 oz/ton Ag and 11.88 percent Pb. A sample of mineralized schist from the "footwall" contained 0.28 oz/ton Au; a 6 inch wide mineralized zone in the "hangingwall" assayed 0.08 oz/ton Au, 5.30 oz/ton Ag and 7.94 percent Pb. One representative sample across a 10 foot wide section of the shear zone contained 0.11 oz/ton Au, 1.65 oz/ton Ag and 2.87 percent Pb. Two carloads of material 40,310 lbs and 32,082 lbs assayed 0.20 oz/ton Au, 5.10 oz/ton Ag and 0.18 oz/ton Au, 8.17 oz/ton Ag respectively. Thomson's sample of mineralization from the mine dump and a chip sample across 7 feet of the shear zone north of the mine shaft analyzed 1.99 oz/ton Ag, 0.02 oz/ton Au and 1.09 oz/ton Ag, 0.04 oz/ton Au respectively (Thomson 1951).

DESCRIPTION

Geology: The Silver King prospect is located at the west side of the Elzevir Granite or batholith, a large intrusive body which underlies most of the Elzevir township and parts of the neighbouring townships of Grimsthorpe, Anglesea and Kaladar (Hewitt 1964, Map 2053). The Elzevir granite is bounded by mafic rocks of the Tudor metavolcanics except in the southeast area, where a narrow belt of Flinton Group metasediments separates it from the Northbrook Batholith (Wolff 1981, Map 2432).

The prospect is approximately 2 kilometres southeast of the nearest contact with mafic metavolcanic rocks of the Tudor volcanics. Thomson (1951) describes the deposit as a silicified shear zone within a massive, grey granite. The zone ranges in width from 5 to 15 feet and extends for 700 feet. It is oriented N50° to 56°E and dips 72° to 85° southeast.

Mineralization: A small percentage of fine-grained pyrite and chalcopyrite occurs within the sheared granitic rock and a small amount of galena was observed in the veins. Bornite mineralization was also reported. Assay values indicate that the mineralized zone contains significant concentrations of gold and silver (Thomson 1951).

DEVELOPMENT HISTORY

1906: - two carloads of material were shipped to the Balbach Smelting and Refining Company (Thomson 1951).

1911: - the property was operated by the Silver King Mining Company (Thomson 1951)

1934: - undetermined amount of drilling completed by Fred Chubb (Thomson 1951).

before 1951: a vertical shaft was opened to a depth of 100 feet.

- a trench was excavated along the vein for a distance of 130 feet southwest from the shaft (Thomson 1951).

REFERENCES

*Hewitt, D.F.	1964, p.19, Map 2053
Sangster, A.L.	1970, p.247
Shklanka, R.	1969, p.141
Thomson, J.E.	1951, Geoscience Data Centre, Toronto

18. GILMOUR MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz, and carbonate
Other: Mafic metavolcanics, aplite dikes

CLASSIFICATION:
IIIA: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The mine is located in the northwest corner of Grimsthorpe township, approximately 6 kilometres northeast of Gilmour and 4.5 kilometres south of Gunter (NTS 31C/13). Gilmour ia about .15 kilometres east of Highway 62, 35 road kilometres south of Bancroft. The deposit is accessible by a 5 km trail which runs south from a dirt road about 7 road kilometres northeast of Gilmour. Vehicles need four wheel drive. The deposit is located on the 1:50,000 sheet Coe Hill (NTS 31C/13) and O.D.M. geological maps 51d (Meen and Harding 1941) and 1957b (Hewitt and Satterly 1957).

Lot 30, Con. XIV, Grimsthorpe Township, Hastings County
NTS COE HILL 31C/13 1:50,000
Latitude 44°50'36"N Longitude 77°32'10"W
UTM Zone 18, 4 968 450 N, 299 550 E

SIZE AND GRADE

The Gilmour Mine mineralized quartz veins are part of the dominant vein system in the locality. A the mine site, the major veins are generally 3' to 5' wide. The "St. Cloud" vein between shafts No. 1 and No. 4 ranges in width from 4' on the first level (75') to 13' on the 2nd level (125') (Gilmour Gold Syndicate 1935). Mining indicated continuous veins over a strike length of at least 230' and to a minimum depth of 340', in 2 major shafts and about 1200 feet of drifts and crosscuts. The No. 1 shaft is vertical and 340' deep, the No. 4 shaft inclined 60° is 260' deep. Most drifts are located between the shafts on 3 levels at depths of 75', 125' and 250'. At least 2 additional shafts were started and abandoned after a limited amount of development (Gilmour GOld Syndicate 1935).

At least 24 separate pits and trenches were excavated and sampled in the area, particularly in the claim east of the mine. Trench descriptions, locations and associated sample assays are given in an assessment report (Sutherland 1980.

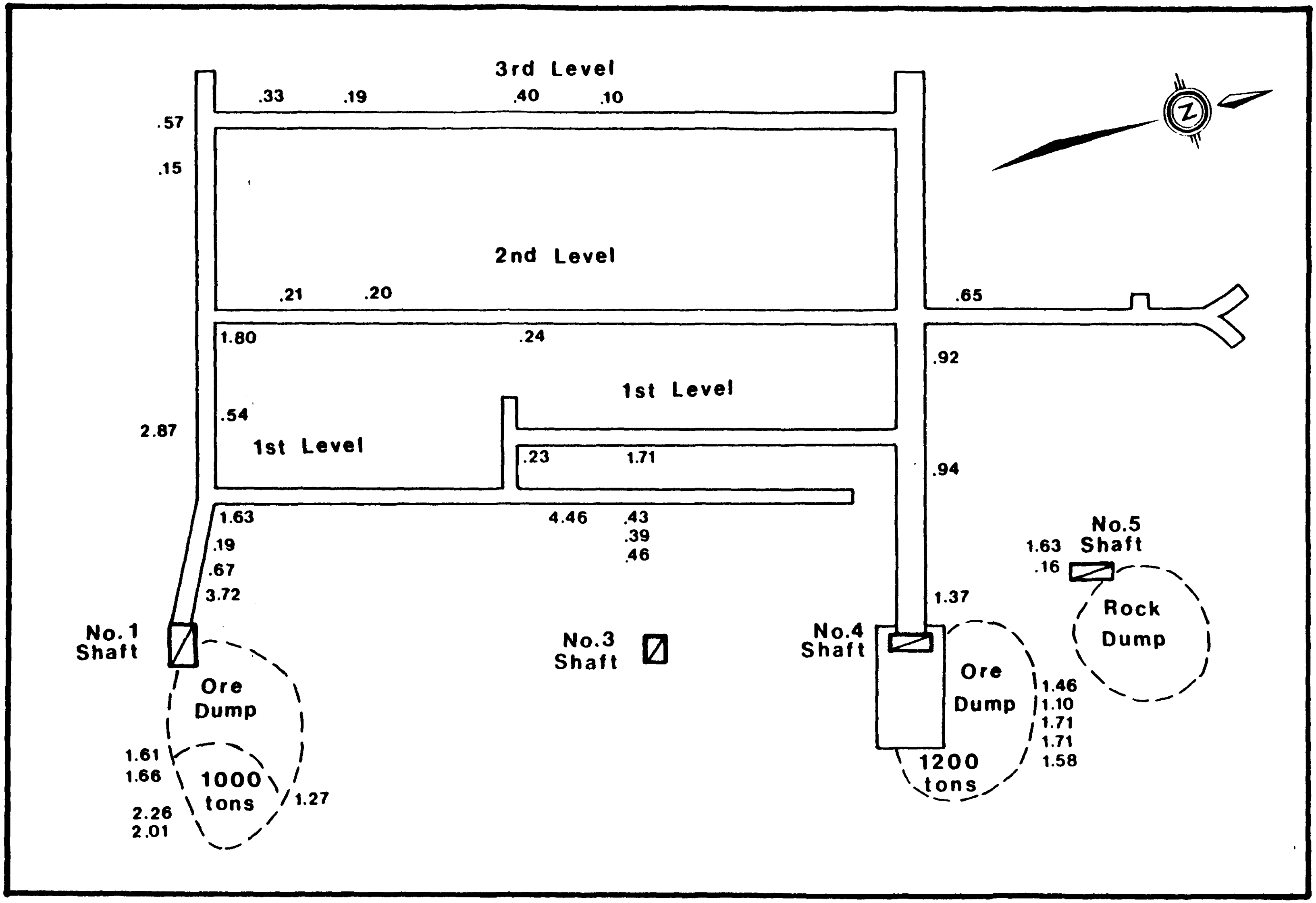

Figure 29: Schematic Plan of the Gilmour Gold Deposit, with Assay Values (Adapted from Gilmour GoldSyndicate, Prospectus, 1935).

One hundred and seventy two ounces of gold were reported from 550 tons of ore between 1909 and 1910 (Gordon et al. 1979, p.34). In another report, the mine production from 1909-1914 is quoted as $24,348 of gold and roughly equivalent to 1178 ounces at $20.67/ounces (Hopkins 1922, p.15).

Gilmour Gold Mines hoisted 500 tons of material from the workings in 1935 (Sinclair 1937, p.109).

The Gilmour Gold Syndicate evaluated the mine workings in 1935. Figure 29 is a schematic plan with assay values of samples (Gilmour Gold Syndicate 1935). In 1979 (Should and Buchanan 1979, Sutherland 1980) 39 rock samples were collected from the mine dump, tailings and from trenches on the adjacent claims for assessment work. Trench assays ranged from trace to 0.27 oz/ton Au, with one value of 0.46 oz/ton Au. Rock dump samples ranged from 0.01 to 0.44 oz/ton Au; two mill tailings samples assayed 1.05 and 1.71 ounces oz/ton Au. Sample descriptions, locations and assays are included in the assessment reports. Table 38 lists assays of 3 mineralized sampled collected by Carter.

Table 38: Assays from the Gilmour Mine

	Au oz/ton	Ag oz/ton	As (ppm)	Sb (ppm)	Cu (ppm)
80-TRC-144 Mill slag	1.14	<0.1	1500	23	1360
80-TRC-145 Rock Dump, Shaft 1	0.10	<0.1	30	0.6	59
80-TRC-146 Chip Sample, Vein Shaft 4	<0.01	<0.1	4	0.2	11

DESCRIPTION

General Geology: The Gilmour Mine is situated within the Tudor Formation, an extensive sequence of mafic to intermediate metavolcanic rocks. Meen (1944, p.27) writes:

> "...In Grimsthorpe and Elzevir townships and the western part of Anglesea, volcanics are folded between numerous intrusive masses. Very little can e said about the structure except that these bodies are synclinal troughs. Original structures are almost completely absent in these townships, and frequently definite schistosity is also lacking. The change in strike of schistosity was, however, noted in a few places and has been indicated on the accompanying map. The synclinal structure is apparent in the northwestern part of Grimsthorpe township where, in a section running northwest from the Gilmour mine, the succession of rocks

is: massive basic volcanics, volcanic fragmentals, siliceous sediments, and limestone. The strike of the schistosity and bedding of these rocks is about N. 35°E.; and the dips, although vertical in places, are generally steeply to the northwest. The above succession is identical with that observed in the synclinal structure in the central part of Barrie township.

Meen (1944, p.48) describes the geology of the mine as follows:

"...The rocks exposed on the surface are greenstone schists, some of which are carbonatized. The strike of the schist ranges from N20°E to N30°E, and the dip is about 45°NW. A number of narrow quartz veins were seen in the vicinity of the shafts .... The strike of the quartz veins is in general between N60°E and S70°E with an almost vertical dip. A little pyrite was seen in one or two of these ....".

A number of aplite or rhyolite dikes up to 1.2m wide intrude the country rocks locally (Sutherland 1980). At the mine veins large from a few centimetres to 13' wide and extend laterally and vertically for at least 230' and 340' respectively. In the claim east of the mine workings, trenches intermittently expose a mineralized vein system over a distance of 600 feet. This system 2" to 12' wide has gold values ranging from trace to 0.27 oz/ton Au (Sutherland 1980). Canter describes the dominant rock type from the mine dump s dark green, schistose mafic metavolcanics extensively carbonatized and weathering red-brown. Narrow quartz-ankerite veins (1-10mm) parallel the schistosity in some samples. Mineralized veinlets and lenses up to 5cm wide, of white and smoky quartz and coarse-grained ankerite, crosscut the host rock. These veins have fine- to medium-grained biotite-rich boundaries and contain minor disseminated sulphides. In thin section the country rock is 60 percent massive calcite, fine- to medium-grained with up to 30 percent fine evenly disseminated talc which imparts a foliation to the rock. Finely disseminated subhedral tourmaline grains and crystal aggregates occur in talc-rich zones of the section. Associated with tourmaline are minor opaque minerals.

Mineralization: The veins contain disseminated pyrite, pyrrhotite, chalcopyrite, bornite, free gold and tourmaline. The dsistribution of free gold and chalcopyrite is generally erratic.

DEVELOPMENT HISTORY

1902-1906: - The mine was opened and a small amount of excavation was completed at one shaft by Mr. F. Landenberger (Corkhill, E.T., 1909, p.133),

1907: - The Gilmour Mining Company (Ltd.) was formed and acquired the property.

1909-1910: - The Gilmour Mining Company reopened the mine and sank a shaft to a depth of 85'. A total of 210' of drifting was completed and a number of surface pits were excavated. A "5 stamp" mill was erected and approximately 550 tons of ore were milled producing 172 ounces of gold (Corkhill 1909, p.133).

1911-1914: - The Gilmour Mining Company sank 2 shafts to depths of about 250' and 360' (Gilmour Gold Mines 1935).

- Three levels of 75', 125' and 250'were developed and approximately 1000 feet of drifting and 75' of crosscutting was completed. (Sinclair et al. 193, p.109).
- up to 2000 feet of lateral work was reported.
- a total of approximately 1175 ounces of gold recovered from the deposit (Hopkins 1972, p.15).

1934-1936: - the Gilmour Gold syndicate acquired the property in 1984 an carried out an investigation of the mine (Gilmour Gold Syndicate, Prospectus 1935).

- in 1935 the property was transferred to Gilmour Gold Mines Ltd.
- a 100 ton mill and other mine buildings were erected (Sinclair et al. 1937, p.109-110).
- material from the old mine dumps was milled and limited development was carried out on a major shaft (No. 4) and minor shaft (No. 2). About 500 tons of material was hoisted from the No. 4 shaft (Gilmour Gold Mines 1935; Sinclair et al. 1937, p.109).
- sampling was carried out within the mine shaft and drifts (Gilmour Gold Mines 1935).
- in 1936 the mill continued to process material from the previous mine dump and from the first drift level (Northern Miner, July 20, 1936).

1936-1939: - Cataroqui Gold Mines acquired the property (Sinclair et al. 1940, p.89)

- in 1938, the mine was dewatered and the workings examined (Meen 1944, p.48).
- in 1939 about 1200 feet of diamond drilling was completed, no body of commercial ore was outlined. (Meen 1944, p.48,49).

1978-1980: - Mr. W. Shough and K. Buchanan acquired the 24 claims covering most of the property at the mine site

- an unspecified number of pits and trenches were excavated and at least 45 rock samples from the trenches and rock dump were assayed (Sutherland, H.H., 1979, 1980)

REFERENCES

Corkhill, E.T.	1909, p.133
Gordon, J.B. et al.	1979, p.34
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Hopkins, P.E.	1922, p.15
Meen, V.B.	1944, p.48-49
*Meen, V.B. and Harding, W.D.	1942, Map No. 51d
Sinclair, D.G. et al.	1937, p.109-110
Sinclair, D.G. et al.	1939, p.89-90
Shough, W. and Buchanan, R.	1979
Sutherland, H.H.	1979, 1980
Gilmour Gold Syndicate	1935
Gilmour Gold Mines	1935

19. ADDINGTON GOLD MINE (Past Producer)

COMMODITY: Gold

ROCK ASSOCIATION

Host: Vein quartz-carbonate
Other: Mafic metavolcanics, quartzite, conglomerate

CLASSIFICATION

IIIA1: Concordant to discordant, quartz and quartz-ankerite vein hosted Au, Ag and As.

LOCATION AND ACCESS

The Addington gold mine is located in the north-central part of Kaladar Township, approximately 9km north of Kaladar and midway between the villages of Flinton and Northbrook (NTS 31C/11). A private dirt road, provides vehicle access to the workings of the former mine. The road intersects a paved sideroad leading to Flinton, at a point about 1.6 km west of Highway 41. The deposit is located on ODM maps 51d (Meen and Harding 1944) and 2053 (Hewitt, 1964) and OGS map 2432 (Wolff, J.M. 1981).

Lots 24, 25, Con. VI, Kaladar townships, Lennox and Addington county
NTS Kaladar 31C/11 1:50,000
Latitude: 44°42'50"N Longitude: 77°10'50"W
Zone 18, 4 953 275N, 327275E

ECONOMIC FEATURES

The Addington gold mine has been the object of several small mining and/or exploration programs since its discovery in 1881. Up to the end of 1921 total production is reported to have been valued at $10,000 (about 480 ozs of gold) (Harding 1944). The Cobalt-Frontenac Mining Company Ltd. produced 15 oz of gold in 1919 and 50 oz of gold and 26 oz of silver in 1922, from an undisclosed quantity of ore (Ministry of Natural Resources Statistical Files, Toronto). There has been no production since.

The deposit has been explored to a depth of approximately 220 metres by a large number of diamond drill holes and a substantial amount of underground development. Underground development completed to May, 1982 totalled 221.1 metres of raising, 2262.1 metres of drifting, and 1054.7 metres of crosscutting, on six developed levels, accessible via an inclined shaft to the fifth level, with a vertical winze from the fifth to the seventh levels. Most of the work was completed by Addington Mines Ltd. between 1936 and 1939. The property is currently under option to E & B Exploration Inc. from the owner, Cominco Ltd.

Mineralization is contained within a vein zone which has been virtually continuously opened up by surface and underground workings over a strike of 1130 metres north from a point about 300 metres south of the shaft (Fig.30). A limited amount of diamond drilling has also intersected mineralized vein material at scattered intervals south of this point. Four 'ore' zones , termed the A,B,C, and D orebodies respectively from south to north, have been outlined within the main mineralized zone. The orebodies form pipe-shaped lenses with vertical dimensions generally exceeding lateral dimensions, and with average widths of perhaps 3 to 4 metres. Widths of the ore bodies are erratic, varying from less than 2 metres to nearly 15 metres in places, and gold values vary from trace to nearly 1 oz Au per ton over comparable widths. The ore zones generally have assay limits, grading into sub-ore grade material both along strike and down-dip.

1. The A orebody lies immediately south of the shaft and has been developed to some extent by lateral underground workings on the first, third, fourth, and fifth levels, and by raises on the third and fifth levels, with numerous diamond drill intersections. It extends for an average length of 55 metres and averages 3 to 3.7 metres wide. On the first level it is about 6.1 metres wide but has an apparent width of only 1.5 metres on the fifth level. There are an estimated 94,000 tons of ore grading 0.14 oz Au per ton within the orebody. The zone is open below the fifth level.

2. The B orebody commences about 46 metres north of the shaft, separated from the A orebody by intervening vein material estimated to grade 0.07 oz Au per ton. It has been tested in workings on the third, fourth, and fifth levels, with several diamond drill intersections. The orebody has been assumed to apex above the third level and extends down to at least the fifth level, but does not persist to the seventh level. Its known vertical extent is about 91 metres, it averages about 30 metres in length, and has an average width of about 3.7 metres. Ore reserves are estimated at 41,000 tons grading 0.18 oz Au per ton.

3. The C orebody lies nearly 300 metres north of the shaft. It has been explored at surface in the Jerome pit, in the main drifts on the third and fifth levels, and by diamond drill holes. On the third level it has a length of about 61 metres. In 1939 it was assumed by Addington Mines Ltd. personnel to persist from the surface to below the fifth level. Reserve estimates made on this basis are 96,000 tons grading 0.16 oz Au per ton. However, according to Bell (1949), there has been sufficient development on only the third level to justify ore estimates. Bell calculates an ore reserve of only 30,000 tons grading 0.16 oz Au per ton based on a projection of the ore zone 15 metres above and below the third level.

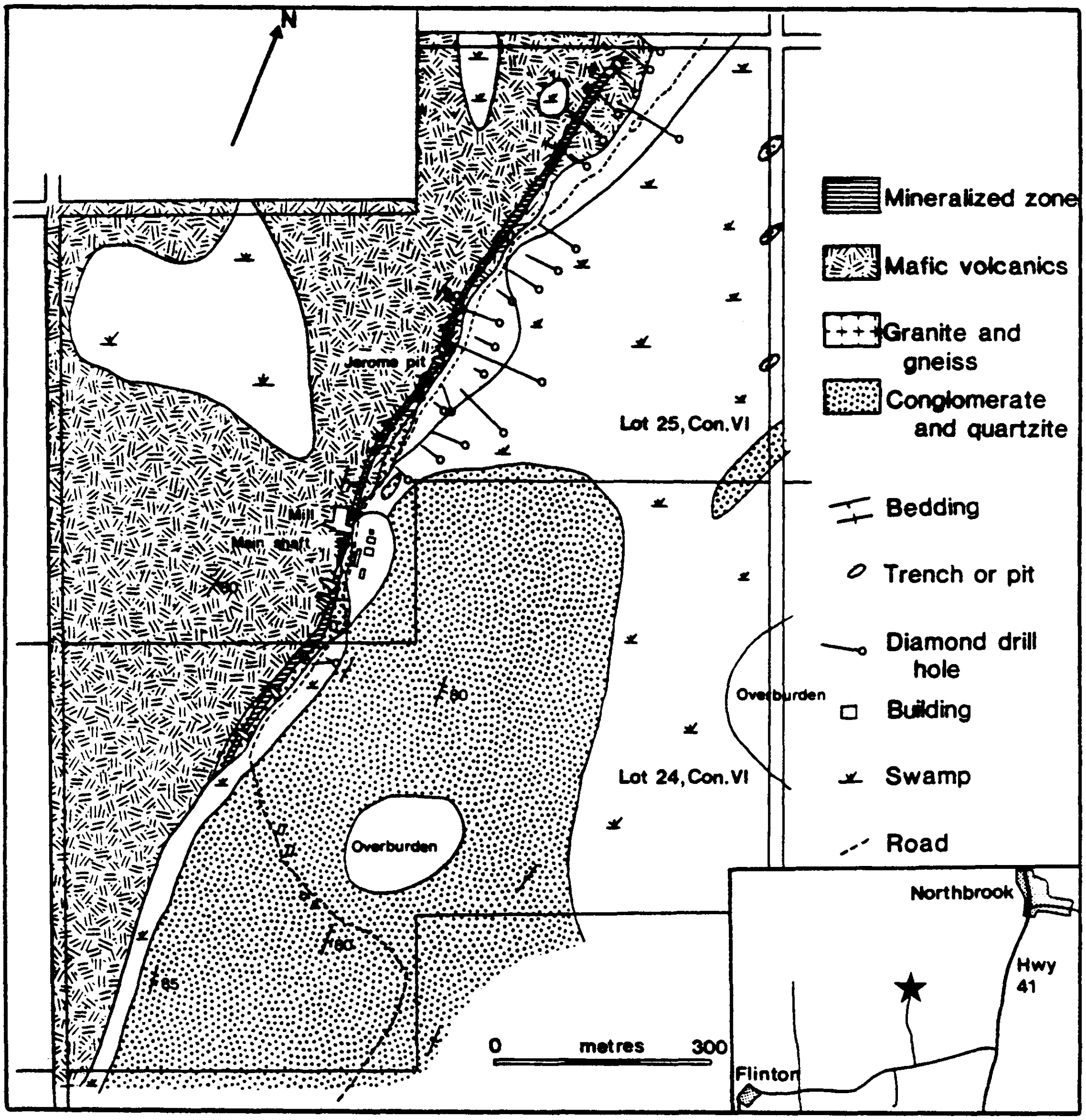

Figure 30: Geology of the Addington Gold Deposit (Adapted from Harding, 1944, p.70).

4. The D orebody is located 685 metres north of the shaft about 30 metres west of and paralleling the main vein zone. Gold bearing vein material was exposed in surface pits and scattered but fair gold values intersected in surface diamond drill holes. Drifting on the third level makes ore grading 0.19 oz Au per ton across an average width of 2.7 metres for a length of 41 metres. Bell (1949) estimated ore reserves as 11,000 tons grading 0.19 oz Au per ton based on projections of the zone 15 metres above and below the third level. Addington Mines Ltd. personnel estimated an ore reserve of 25,000 tons grading 0.19 oz Au per ton in 1939.

In total, Bell (1949) estimates developed ore reserves to be 176,000 tons grading 0.15 oz Au per ton, or 200,000 tons grading 0.13 oz Au per ton with 15 percent dilution but without cutting high assays. Addington Mines Ltd. personnel, in 1939, estimated an ore reserve of 256,000 tons grading 0.16 oz Au per ton, with 103,000 tons possible ore grading 0.08 oz Au per ton.

The above information is derived principally from company files of Cominco Ltd and an unpublished geological report by L.V. Bell (1949), also on file with Cominco Ltd.

GEOLOGY

The former Addington gold mine lies at the contact between a northeast trending belt of Hermon Group metavolcanic rocks and a belt of Flinton Group metasedimentary rocks to the east striking in a similar direction (Fig.29). The Flinton metasediments are preserved in a narrow syncline, 600 metres wide at this point, bounded by a large granitic intrusion to the east. A second, but narrower, infolded belt of Flinton metasediments lies within the volcanics immediately to the west.

The metavolcanic rocks are black, foliated, fine to coarse-grained amphibolites. Hornblende is the principal mineral constituent with lesser amounts of plagioclase and minor quartz. Definite pillow structures are preserved in these rocks in the northwestern part of the property (Bell, 1949) and along strike to the north.

Quartzite and conglomerate comprise the two principal metasedimentary rocks exposed in the mine area. The quartzite is a white to grey rock consisting predominantly of fine-grained (1-2 mm) equigranular quartz with minor hematite, magnetite, biotite, and sericite. Cross-bedding and graded bedding are common. The conglomerates generally consist of a clast-supported framework of well-rounded, well sorted pebbles with a quartzite matrix. The pebbles consist predominantly of quartzite, often with well preserved bedding laminations. Quartzite forms the base of the sedimentary sequence, occurring along the contact with the metavolcanics and forming the hanging wall of the

TABLE: 39 Summary of underground development completed by Addington Mines Ltd.

	Drifting (metres)	Crosscutting (metres)	Raising (metres)
1st level	9.1	-	-
3rd level	1048.1	518.7	89.8
4th level	268.3	134.2	45.4
5th level	589.0	233.0	85.9
7th level	240.6	46.3	-
Totals:	2155.1	932.2	221.1

Elevation of mine levels (in metres)

shaft collar	271.9
first level	248.4
second level	220.7
third level	194.5
fourth level	163.4
fifth level	132.3
seventh level	57.6

mineralized zone. According to Bell (1949) the quartzite varies from about 50 to 100 metres in width, thinning to the north, and is in sharp contact with conglomerate to the east. Grit horizons occur locally and schistose derivatives of the quartzite, including sericite schist and quartz-biotite schist, are developed near the contact with the metavolcanic rocks.

Several bands of hornblende-biotite, biotite, and hornblende-biotite-garnet schist representing shear zones oriented parallel to the volcanic/sediment contact, occur on the mine property. The main zone occurs along the contact itself, extending throughout the length of the property, and is expressed as a narrow, well defined valley on the surface. The schists have gradational contacts with the volcanic and sedimentary rocks, consequently the location of the contact can often only be approximated. Biotite schist is most common along the eastern margin of the schist zone and is transitional from hornblende-biotite schist within the zone into quartzites which near the contact are commonly quartz-biotite schists. A band of hornblende-biotite-garnet schist occurs within the volcanics in the north part of the property, adjacent and parallel to the main zone. It commences a short distance north of the shaft. Near the north boundary of the property several lenticular bands of hornblende-biotite schist occur within the volcanics and one within the sediments.

The contact zone schist, or shear zone, strikes N10°E and dips at about 65° E. Schistosity within the sediments and volcanics strikes in a similar direction, with dips of 65 to 70 degrees east in the volcanics and averaging about 75 degrees in the sediments. The slight steepening of the schistosity on the east side of the contact and the sheared nature of the contact zone suggests the contact may be faulted, although at present the amount or sense of movement is not evident. Bell (1949) concluded this to be a normal fault with the down thrown block lying to the east. The contact shear zone is intersected by at least two steeply dipping to vertical faults (not indicated on Fig. 30), which branch northeasterly from the contact shear zone into the sediments (Bell 1949). The No. 1 fault is marked by a minor valley on the surface and intersects the contact shear zone about 215 metres south of the shaft. It intersects the A orebody at the fifth level in the underground workings and has the effect of thinning and steepening it. Continuity of the orebody below the fault is not known, and amount and sense of movement along the fault is uncertain. The No. 2 fault occurs south of and parallel to the No. 1 fault and does not intersect any of the known ore zones. The relationship of the orebodies to the Flinton unconformity is discussed by Springer (1982). New observations from this property are recorded by Dillon (1983). Lithological units which can be recognized in the Flinton Group are cut off by the fault zone, suggesting that the fault is a distinctly discordant structure. The ore bodies relate to the sheared fault zone, less clearly to the basal unconformity of the Flinton Group.

Mineralization: Mineralization at the Addington gold deposit is confined to the shear zones, with the principal ore lenses occurring within the contact shear zone. Lenses and stringers of quartz are irregularly distributed throughout the zones, with a tendency for concentration within certain sections. The lenses usually coincide with shear planes, but sometimes transect them. Subordinate carbonate, biotite, tourmaline, scheelite, magnetite, and ilmenite occur in association with the quartz lenses and stringers. Pyrite is the principal sulphide mineral, with lesser amounts of arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, and galena. The sulphides are sparsely disseminated within the vein material, with a tendency for concentration along the walls of the quartz lenses and veins. Native gold is reported to occur free in the gangue, in fractures in arsenopyrite, or in association with magnetite (Bell 1949).

The contact shear zone is virtually continually mineralized north from a point about 300 metres south of the shaft. This northern portion of the contact shear zone constitutes the principal mineralized zone at the deposit and contains the A,B, and C orebodies. Additional significant mineralization, including orebody D, occurs in a a parallel, subsidiary band of hornblende-biotite-garnet schist west of the main contact zone near the north boundary of the property. Scattered lenses of sparsely mineralized vein material also occur in the southern portion of the contact zone.

The four orebodies form pipe-shaped lenses within the shear zones with their apparent down-dip continuity approximately twice that along their strike. The orebodies are gradational into sub-ore grade material along strike and down dip. There is no apparent reason for localization of the orebodies within the shear zones.

<u>History of Development</u>

1881: Mineralization discovered; property known as the "Golden Fleece" (Harding 1944).

1887-1915: Two shallow shafts were sunk and a ten stamp mill was erected. Initial work was by the Adelaide Mining Co. of Baltimore, and later by the A.B.P. Mining Co under an option agreement (Harding 1944).

1915-1922: The property was acquired by the Cobalt-Frontenac Mining Co in 1915 (Sutherland 1916). The two existing shafts on the property were deepened, one to 18 metres, and the other, an inclined shaft, to 30 metres with a level at this depth. A vertical winze was sunk an additional 20 metres from the bottom of the inclined shaft. A total of 107 metres of drifting and 122.5 metres of crosscutting were completed (Sutherland 1923). In 1922 a cyanide plant was constructed (Sutherland 1922). A total of 15 oz of gold was produced in 1919, and 50 oz of gold and 26 oz of silver were produced in 1921 (Ministry of Natural Resources, Statistical Files, Toronto).

1927: Some development work by the Cobalt-Frontenac Mining Co (Rogers and Young 1929).

1928: Property purchased by Rich Rock Gold Mines (Mineral Deposit Files, Ontario Geological Survey, Toronto).

1932: The property was optioned by C.N. Thompson. The inclined shaft was dewatered and a bulk sample of approximately 150 tons or ore was mined and milled, giving an average of $6.00 in gold values per ton (Sinclair 1933).

1935: The property was optioned by the Consolidated Mining and Smelting Co. of Canada Ltd (Harding 1944).

1936-1939: A new company, Addington Mines Ltd, 60 percent owned by Consolidated Mining and Smelting Co, was formed. The main shaft, included at 67 degrees to the east, was extended to the fifth level, 139.6 metres below the shaft collar. A vertical raise connects the fifth level to the seventh level. Seven levels were established, at elevations outlined in Table 29. Development work was confined mainly to the 3rd, 4th , 5th, and 7th levels, and totalled 2155.1 metres of drifting, 932.2 metres of crosscutting, and 221.1 metres of raising. 32 surface diamond drill holes totalling 2690 metres, and 144 underground diamond drill holes totalling 4443.5 meters were completed. Milling tests on ore grading 0.19 oz Au per ton gave recovery of 96.3 percent with 0.007 oz Au per ton in the tailings. Straight cyanidation with grinding to 50 percent 200 mesh was recommended (unpublished company files, Cominco Ltd, Toronto). Operations ceased in October, 1939.

1940: Mill removed (Tremblay 1945).

1969: Cominco Ltd. purchased the property from Addington Mines Ltd (unpublished company files, Cominco Ltd.)

1980-1982: The property was optioned to E & B Explorations Inc. in 1980. Surface sampling, geological mapping, approximately 3000 metres of surface diamond drilling completed by 1981. Work continuing at time of writing with an additional 3000 metres of diamond drilling planned.

REFERENCES

Bell, L.V.	1949, Geoscience Data Centre, Toronto
Corkhill, E.T.	1907, p.76
	1908, p.83
	1913b, p.135
Dillon, E.P.	1983, p.271-275
*Hewitt, D.F.	1964, p.30, Map 2053
*Meen, V.B. and Harding, W.D.	1944, Map 51d
Sinclair, D.G. et al.	1933, p.88-89
	1936, p.97
	1937, p.118
	1938, p.106-107
	1940, p.98
Springer, J.S.	1982, p.211-217
Sutherland D.G. et al.	1916, p.128
	1917, p.126
	1919, p.154
	1920, p.116
	1921, p.131-132
	1922, p.63
	1923, p.83-85
Tower W.O. et al.	1941, p.103-104
*Wolff, J.M.	1982, p.76-78, Map 2432

20. DOME MINE PROSPECT

COMMODITY: Gold

ROCK ASSOCIATION;
Host: Vein Quartz
Other: Dolomitic marble

CLASSIFICATION

IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Dome Mine prospect is located in the northwest corner of Kennebec township approximately 1.3 kilometres south of Harlowe, Barrie township (NTS 31C/14). It is accessible on foot approximately 400 metres west of a gravel road at a point 1.5 road kilometres south of Harlowe. Harlowe is accessible by a gravel road which joins Highway 41 about 2.5 road kilometres south of Bishop Corners. The prospect is located on ODM Maps 2053 (Hewitt 1964) and 51d (Meen and Harding 1942) and O.G.S. Map P.2278 (Moore and Morton 1980).

Lot 32, Concession II	Kennebec Township, Frontenac County
NTS MAZINAW LAKE 31C/14	1:50,000
Latitude: 44°47'07"N	Longitude: 77°05'00"W
UTM Zone 18, 4 960 950 N	335 150 E

SIZE AND GRADE

The mineralization occurs in a silicified rock unit 15' wide and at least 900' long (Harding 1944, p.73). Workings consist of a number of surface pits and trenches. At least 3000' of diamond drilling was completed over a distance of 900' along the zone. An early exploration report states that "substantial" values of gold were detected in surface chip samples. A subsequent survey reported low gold values in drill core and surface samples (Harding 1944, p.73).

DESCRIPTION

A preliminary geological map of the area (Moore and Morton 1980, Map P2278) shows that the prospect occurs within the core of the Flinton Synclinorium, immediately north of the Northbrook Cross Lake Batholith. These rocks are isoclinally folded with major foliation and bedding orientations parallel to the northeast-trending axial traces. The core of the synclinorium is composed of interlayered units of mafic to intermediate metavolcanic rocks and calcitic and dolomitic marbles. The quartz-pebble conglomerates, quartzites and calcitic marbles of the younger Flinton Group sediments surround and unconformably overlie the rocks of the core zone and outline the extent of the synclinorium.

The mineralized zone occurs in a silicified dolomitic marble unit on the north side of the enclosed Hermon Group rocks near the unconformable contact with calcitic marbles and calcareous quartzites of the Flinton Group. Harding (1944, p.73) reported the following extract from an unpublished report by H.C. Rickaby: ".....The deposit occurs in a band of magnesium limestone about 15 feet wide, striking approximately east and west and dipping steeply to the north. The south or footwall side of the deposit consists of impure quartzite with narrow bands of impure limestone. The limestone of the main band has been silicified and much replaced by quartz in the form of numerous narrow stringers or lenses. Associated with the quartz are small quantities of a number of minerals including pyrite, chalcopyrite, chalcocite, galena, specularite and gold. The gold is fine grained, but apparently occurs in small quantities whenever the quartz and other minerals are present in noticeable quantity. The stringers of quartz and other minerals appear to be scattered over the width of the limestone band. A number of chip samples taken from the surface of the showing are reported to have shown substantial values in gold .... Stripping of the deposit had been done over a length of approximately 200 feet showing conditions similar to the above and the limestone band had been located for several hundred feet..."

Harding also reported that Dome Mine Limited drilled the dolomitic marble band for over a length of 900 feet, however only low gold values were detected in drill core samples.

DEVELOPMENT HISTORY

1936: -Hollinger Consolidated Gold Mines Limited excavated a number of pits and trenches and completed an unspecified amount of diamond drilling. A number of chip samples were found to contain significant gold values (Harding 1944, p.73).

1939: -Dome Mines Limited carried out some surface work and drilled several holes (Totalling 3000') along the prospect.
-low gold values were detected in drill core and surface samples (Harding 1944, p.73)

REFERENCES

Gordon, J.B., Lovell, H.L., de Grijs, Jan, and Davie, R.L.	1979, p.41
*Hewitt, D.F.	1964, p.14, Map 2053
*Meen, V.B. and Harding, W.D.	1942, Map No. 51d
*Moore, J.M. and Morton, R.L.	1980, Map P.2278
Sangster, A.L.	1970, p.230

21. EMERY OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION;
Host: Vein quartz
Other: Mafic metavolcanics, quartz-pebble conglomerate

CLASSIFICATION
IIIA1: Concordant to discordant quartz, quartz-ankerite vein hosted Au, Ag and As

LOCATION AND ACCESS

The Emery occurrence is located in the northwest corner of Kennebec township, approximately 2 kilometres south of Harlowe (NTS 31C/14). It is accessible from a secondary road which runs west from an all weather gravel road at a point 2 road kilometres south of Harlowe. The occurrence is a short distance north of the access road, about 0.4 road kilometres from the gravel road. The showing is located on O.D.M. Map No. 51d (Meen and Harding 942) and O.G.S. Map P.2278 (Moore and Morton 1980).

Lot 31 Concession II, III, Kennebec township
Frontenac County
NTS MAZINAW LAKE 31C/14 1:50,000
Latitude: 44°46'43"N Longitude: 77°04'53"W
UTM Zone 18 4 960 250N 335 300 E

SIZE AND GRADE

The occurrence consists of 2 mineralized quartz vein systems in steeply dipping shear zones 15 feet to 35 feet wide (Bell 1963, p.12,13). The south vein is exposed by at least 5 pits and trenches over a strike length of 700 feet. The north vein is trenched at 50 foot intervals over a distance of 450 feet. Table 40 lists assays of 5 chip samples collected from one vein system (Bell 1963, p.13).

TABLE 40: Gold values of chip samples of mineralized veins at the Emery occurrence

Sample Number	Chip sample width (feet)	Au Assay (Oz/Ton)
1	5.5	0.23
2	6.3	0.28
3	8.0	0.54
4	-	0.44
5	9.0	1.57

DESCRIPTION

A recent OGS preliminary geological map shows that the occurrence is located within the Flinton synclinorium, immediately north of the Northbrook-Cross Lake batholith (Moore and Morton, 1980, Map P. 2278). The occurrence consists of a mineralized quartz vein system in shear zones at the contact between mafic metavolcanic rocks and a younger, unconformably overlying lens of quartzite and quartz-pebble conglomerate from the Flinton Group.

Bell (1963, p.12,13) writes:
"... the greenstone next to the contact is intruded by quartz porphyry dikes. Some small lenses of Grenville limestone were noted. The quartz is mineralized with pyrite, arsenopyrite, galena and sphalerite with pyrite predominating. The shear zone and quartz vary from 15" - 35" in width. The strike is approximately E-W...dip steeply north. The writer noted six showings of visible gold during examination..."

DEVELOPMENT HISTORY

before 1936: - A limited amount of trenching and test-pitting was carried out by unknown operators (Bell 1963, p.12).

1963: - Natto Mining Corporation Limited optioned the property from Dr. C. Emery and carried out a preliminary property assessment. Five chip samples assayed significant gold values.

- Workings on the south side vein consisted of 5 pits and a number of intermediate trenches. The north vein was trenched at approximately 50' intervals for 450'. A number of pits were reported to have been completed before 1940 (Bell 1963, p.12).

REFERENCES

Bell, J.A.	1963, Natto Mining Corporation Ltd.
Gordon, J.B. et al.	1979, p.41
*Meen, V.B. and Harding, W.D.	1942, Map No. 51d
Moore, J.M. and Morton, R.L.	1980, Map P.2278

22. GOLD BASE OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein Quartz
Other: Mafic metavolcanic rocks, calcite and dolomite marbles.

CLASSIFICATION
IIIA1: Concordant to Discordant Quartz, quartz-ankerite,vein-hosted Au, Ag and As.

LOCATION AND ACCESS:

The Gold Base occurrence is situated in the north central part of Kennebec Township, approximately 5 kilometres east of Harlowe (NTS 31C/14). It is accessible from an all-weather gravel road which connects Harlowe (Barrie township) to Henderson (Kennebec township). The occurrence is a short distance south of the access road, approximately 3.5 road kilometres northwest of Henderson. The access road joins Highway 41, about 8 road kilometres west of Harlowe. The occurrence is located on O.D.M. Maps 2053 (Hewitt, 1964) and No. 51d (Meen and Harding, 1942) and O.G.S. Map P2278 (Moore and Morton, 1980).

Lot 30 Concession 5 Kennebec township, Frontenac county
NTS Mazinaw Lake 31C/14 1:50,000
Latitude: 44°47'28"N Longitude: 77°01'55"W
UTM Zone 18, 4 961 550 N 339 250 E

SIZE AND GRADE

The mineralized zone ranges in width from a few inches to 5 feet and has been exposed intermittently by pits and trenches for several hundred feet (Harding, 1944, p.73). Harding collected a grab sample that assayed 0.38 oz/ton Au. Carter reported one pit with dimensions 18m by 1.5m by 1.0m deep. A chip sample across 60cm of vein material assayed 0.01 oz/ton Au, less than 0.1 oz/ton Ag, 6 ppm As, 0.2 ppm Sb and 35 ppm Cu.

DESCRIPTION

The OGS preliminary geological map (Moore and Morton, 1980, Map P2378) shows the occurrence located in a rock sequence dominated by mafic metavolcanic rocks, immediately north of the contact with the Northbrook-Cross Lake Batholith. It is about 1 kilometre south of the northeast end of the Flinton Syclinorium.

Carter describes the occurrence as a conformable mineralized quartz vein in intercalated amphibolites and marbles. The vein is composed of white, coarse-grained quartz with rusty fracture surfaces. The vein pinches and swells with a maximum width of about 60cm. A number of veinlets crosscut the schistosity. Mineralization consists of disseminated blebs of pyrite and chalcopyrite with associated gold concentrations. The amphibolites are black, fine-grained schistose rocks. The white, fine-to medium-grained marbles include both the dolomitic and calcitic varieties. An 18m long trench exposes the vein along strike.

DEVELOPMENT HISTORY

1939: Gold Base Mining Corporation Limited optioned the property from Mr. D. Veley and carried out some surface work. (Harding, 1944, p.73).

REFERENCES

Gordon, J. B. et al.	1980, p.41.
Harding, W. D.	1944, p.73
*Hewitt, D.F.	1964, p.14, Map 2053
*Meen, V. B. and Harding, W.D.	1944, Map No. 51d.
*Moore, J. M and Morton, R. L.	1980, Map P2278

23. McMURRAY OCCURRENCE

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein quartz, rusty schist
Other: Metavolcanic flows, tuffs

CLASSIFICATION;
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The McMurray occurrence is located in the southeast corner of Limerick township, approximately 40 kilometres north of Madoc and 5..7 kilometres northeast of Gilmour (NTS 31C/13). It can be reached from the gravel access road to Gilmour and Gunter which joins Highway 62 about 36 road kilometres north of Madoc. The occurrence is accessible by a vehicle trail 300m southeast from the Gilmour access road, at a point east of the north end of Wadsworth Lake, 6 road kilometres northeast of Gilmour. The occurrence is located on ODM map 2167 (Lumbers 1969).

Lot 1 Con.I Limerick Township, Hastings county
NTS COE HILL 31C/13 1:50,000
Latitude 44°51'30"N Longitude 77°33'45"W
UTM Zone 18, 4 970 300 N 297 600 E

SIZE AND GRADE

The McMurray occurrence is located within a partially silicified rusty schist averages 400' wide and extends for at least 2500' (Lumbers, 1969, p.66).

There are 7 pits and 4 trenches within the zone, over a distance of about 2200 feet.

Samples of mineralization from surface workings contained trace gold and silver. Core samples from near the bottom of a 120' drill hole located near the north workings assayed 0.27 oz/ton Au, trace Ag over 1.5 feet, 0.14 oz/ton Au, trace Ag over 1.0 feet and 0.06 oz/ton Au, trace Ag over 1 foot (Lumbers 1969, p.67).

DESCRIPTION

Geology: The McMurray occurrence is situated at the contact between the metavolcanic rocks of the Tudor metavolcanics and the Oak Lake Formation, immediately southeast of the contact with the overlying carbonate rocks of the Dungannon Formation in southeast Limerick township (Lumbers 1969, Map 2167). In this region, the metasedimentary and metavolcanic rock formations are distorted by a number of intrusive complexes, the largest being the Weslemkoon Granite to the east and the Lingham Lake Complex to the south. The Wadsworth Trondhjemite, a small intrusive body outcrops within a kilometre west of the occurrence (Lumbers 1969, Map 2167).

Lumbers (1969, p.65-67) describes the geology of the occurrence as follows:

> "...The north, northeast-trending rusty schist zone which partly follows the contact of the Tudor metavolcanics and the Oak Lake formation, can be traced at intervals for about 3,050 feet from the south half of Lot I., Concession I. Limerick Township, to the central part of lot 33 concession XX, Grimsthorpe Township. Numerous, partly altered remnants of both felsic and mafic metavolcanics are present within the rusty schist zone; altered mafic metatuff, which is present in the central part of the rusty schist zone may be continuous with metatuff of the Oak Lake formation exposed across a swampy area farther to the northeast in the north half of Lot 1, concession I, Limerick Township. Irregularly shaped quartz veins, generally less than a foot wide and quartz vein networks are found locally in the rusty schist zone and the largest veins seen by the author are exposed in the various pits...".

Mineralization: Lumbers (1969, p.65,67) states: "...the rusty schist contains 5 to 10 percent disseminated pyrite and pyrrhotite and, locally massive stringers and lens-like bodies of pyrite, pyrrhotite, and minor chalcopyrite...". Most of the arsenopyrite and gold mineralization is found in the north workings, where the metavolcanic rocks around the quartz veins contain up to 30 percent disseminated arsenopyrite. Little arsenopyrite is found within the quartz veins. These workings also contain sparsely disseminated chalcopyrite and magnetite. A drill hole in this locality intersected a mineralized zone 3.5 feet long, at a depth of 120 feet. The zone consists of massive to disseminated arsenopyrite (5 to 55%) and sparsely disseminated magnetite, pyrrhotite, pyrite and chalcopyrite in quartz veins and silicified metavolcanics. A few showings at the south workings contain sparsely disseminated arsenopyrite in the rusty schists and minor disseminated pyrite within quartz veins. Only trace values of gold and silver were reported from samples of these zones (Lumbers 1969, p.67).

DEVELOPMENT HISTORY

early 1900's: - the Wadsworth Lake Mining Company opened up 5 pits and a number of trenches (Lumbers 1969, p.65)

early 1950's: - Stratamat Mines Limited carried out a geophysical survey and completed an unspecified amount of drilling (Lumbers 1969, p.65)

1958-1960: - Mr. V.A. McMurray excavated 2 pits at the north part of the occurrence and completed an undisclosed amount of diamond drilling (Lumbers 1969, p.65)

1962: - Macassa Gold Mines Limited completed a 310 foot diamond drill hole in the rusty schist zone.
- Mr. V.A. McMurray held an option on the mineral rights to the property (Lumbers 1969, p.65).

REFERENCES

Gordon, J.B. et al. 1979, p.43
*Lumbers, S.B. 1969, p.65-67, Map 2167
Sangster, A.L. 1970, p.244

24. BANNOCKBURN GOLD PROSPECT

COMMODITY: Gold

ROCK ASSOCIATION
Host: Vein quartz-carbonate
Other: Biotite, syenite, metagreywacke

CLASSIFICATION;
IIIAl: Concordant to discordant, quartz, quartz ankerite vein hosted Au, Ag and As

LOCATION AND ACCESS

The Bannockburn gold prospect is located in the northwest corner of Madoc township, approximately 0.5 kilometres west of Bannockburn (NTS 31C/12). The property is accessible by a bush road running west from Highway 62 at Bannockburn. The prospect is shown in O.D.M. Map 2154 (Hewitt 1968) and Map 1957b (Hewitt and Satterly 1957).

Lot 28, Con V, Madoc Township, Hastings county	
NTS BANNOCKBURN, 312C/12	1:50,000
Latitude: 44°38'25"N	Longitude: 77°33'20"W
UTM Zone 18, 4 945 950N	297300E

SIZE AND GRADE

The mineralized vein system at the Bannockburn gold prospect is up to 3 feet wide and is continuous in workings over a distance of 700 feet along strike and to a depth of 75 feet (Hewitt 1968, p.21; Slaght 1896, p.264; 1989, p.89). Drill holes have intersected the vein system for an additional 300 feet along strike (Bannockburn Gold Deposit, Geoscience Data Centre, Toronto).

Major workings consist of a trench which exposes the vein for 700 feet and 4 shallow trenches (Figure 31). The deepest shaft reaches a depth of 75 feet and has a 20 foot long north-bearing drift at the 32 foot level (Slaght 1898, p.,89; Bannockburn Gold Deposit, Geoscience Date Centre, Toronto). The other shafts were excavated to depths of 26 feet, 30 feet and 30 feet (Slaght 1896, p.264). Seven drill holes totalling 1000', were completed on the property on or before August 1965 (Bannockburn Gold Deposit, Geoscience Data Centre, Toronto).

About 3.5 ounces of gold were recovered from the original milling operations (O.D.M. Statistical Files, Bannockburn Mine; Blue 1896, p.18). Several grab samples of vein material from surface pits assayed 0.06 to 0.90 oz/ton Au (Slaght 1896, p.265; Blue 1896, p.18),. Vein material sampled by Hewitt (1968, p.231) assayed 0.17 oz/ton Au. Carter's chip sample across a 1.2 m wide mineralized shear zone and quartz vein assayed 0.01 oz/ton Au, <0.1 oz/ton Ag, 6 ppm As, 0.2 ppm Sb and 35 pm Cu. A

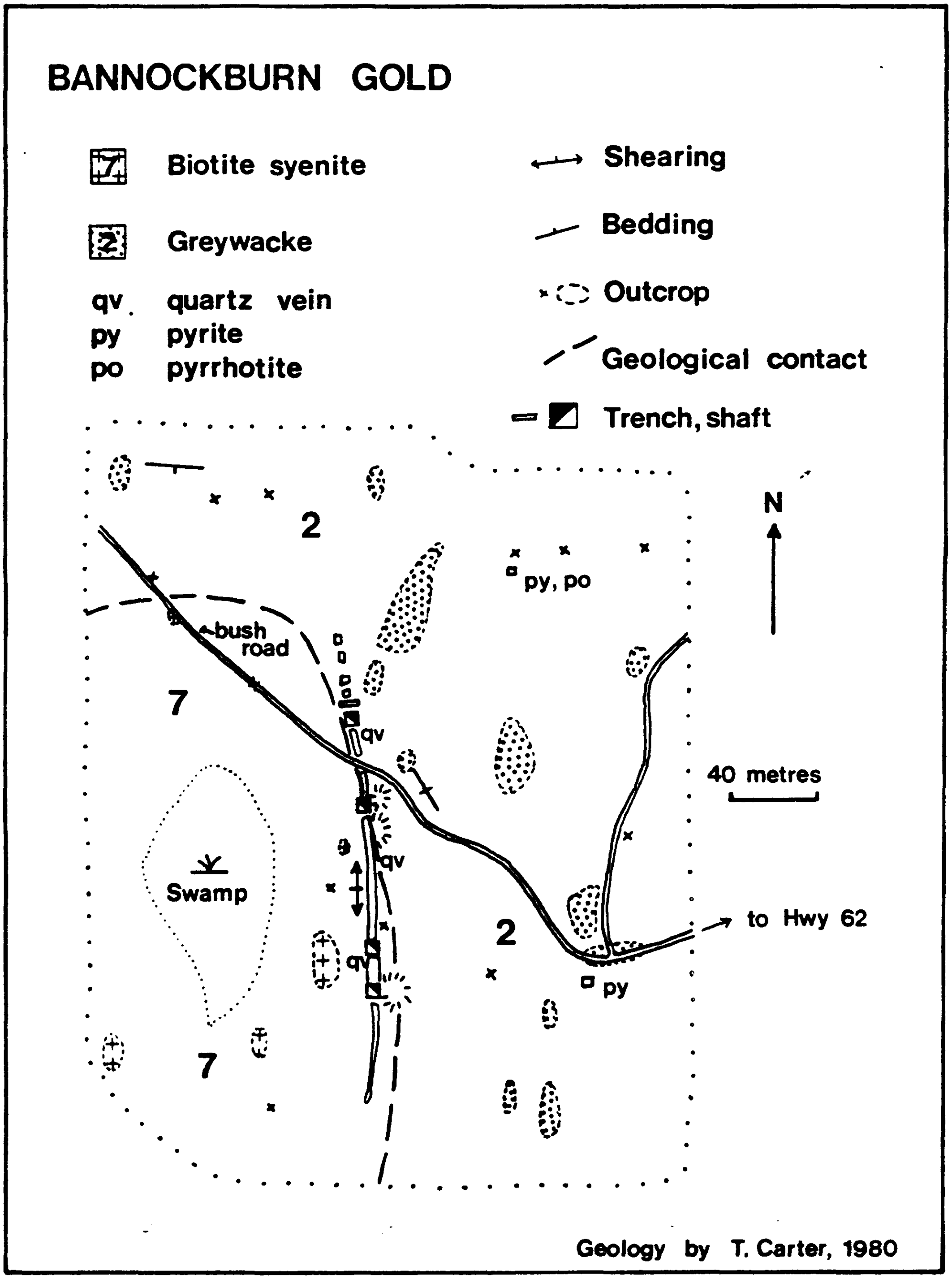

Figure 31: Geology of the Bannockburn Gold Deposit.

report in the Resident Geologist's office states that unspecified gold values were detected in drill core at depth (Bannockburn Gold Deposit, Geoscience Data Centres, Toronto).

DESCRIPTION

General Geology: The O.D.M. geological map of Madoc township (Hewitt 1968, Map 2154) shows the prospect on the boundary of the east extension of a syenite intrusion in the north part of Madoc townships. The intrusion, known as the Gawley Creek Syenite (Hewitt 1968, p.14) is composed of a coarse-grained pink biotite-hornblende syenite. It straddles the north part of the Marmora-Madoc township boundary and measures about 4 miles in both the N-S and E-W directions. The east side of the syenite is bounded by clastic metasedimentary rocks, which combine with a sequence of marbles to separate the intrusion from mafic metavolcanic rocks of the Tudor Formation.

Carter's detailed geological map illustrates the location of the workings along the contact between biotite syenite and metagreywacke (Fig. 31). In the shear zone exposed by the workings, the syenite has become a biotite-carbonate-K-feldspar schist containing lenses and veinlets of quartz and carbonate and disseminated pyrite mineralization. The schist commonly contains distorted augen of K-feldspar. Mineralized quartz and ankerite veins parallel the N-S trending, vertically dipping shear zone. The shear zone is up to 2 m wide and usually contains a series of parallel veins which range in width from 3 to 10 cm. Carter described the unaltered syenite as a black to pink, massive, medium-grained (3-4 mm) rock largely comprised of K-feldspar and biotite with trace pyrite. A thin section of a sample of the syenite contained up to 10 percent hornblende (Table 41); this is consistent with Hewitt's (1968, p.15) statement on the variability of biotite and hornblende in the intrusion.
The whole rock chemical composition of the syenite is given in Table 42. The metagreywacke is a feldspathic metaclastic interlayered with a quartzose component. At the prospect, the feldspathic metaclastics are dark grey, strongly foliated, very fine grained rocks with a variable biotite content. Locally they are banded and contain abundant disseminated pyrite and cross-cutting quartz veinlets. A thin section of the unit shows fine, distorted bands of alternating fine-grained quartz and strongly sericitized feldspar. Biotite, opaques and carbonate form about 10 percent of the section (Table 41). The quartzose component is generally massive and has a fine-to medium grained-texture; the estimated modal composition is listed in Table 41.

Mineralization: The sheared syenite contains pyrite in disseminated subhedral to euhedral grains and massive lenses 1-2 cm wide; in localities near veins, the sulphide content is as high as 30 percent. Mineralized veins are

TABLE 41: Estimated modal compositions (in percent) of rock adjoining Gawley Creek syenite

	80-TRC-81	-82	-83
Quartz	40	95	1
Plagioclase)			10
)	30		
K-Spar)			50
Biotite	4		25
Sericite	20		
Hornblende			10
Actinolite		minor	
Carbonate (calcite)	1	5	minor
Opaques	5	minor	<5

80-TRC-81= feldspathic metaclastic
80-TRC-82= quartzose metaclastic
80-TRC-83= biotite-hornblende syenite

TABLE 42: Major element chemical composition (in percent) of the Gawley Creek syenite

	80-TRC-83
SiO_2	45.40
Al_2O_3	15.90
Fe_2O_3	5.19
FeO	5.59
MgO	5.96
CaO	5.58
Na_2O	2.74
K_2O	4.68
MnO	0.06
TiO_2	2.42
P_2O_5	1.75
CO_2	0.82
S	0.13
H_2O^+	1.34
H_2O^-	0.37
TOTAL:	97.93

composed of white, massive, medium-to coarse-grained quartz and locally ankerite with up to 10 percent disseminated pyrite and minor chalcopyrite and gold. Sulphides are often concentrated along the contacts of veins and in places, form narrow, discontinuous veinlets within the veins. Elsewhere, pyrrhotite and pyrite were observed in a pit east of the main showings (Fig. 31).

Two polished thin sections of mineralization in the sheared syenite and quartz ankerite veins were examined. The sheared syenite consists of irregular grains of feldspar (4mm) within a fine-grained matrix of biotite and muscovite. Most of the sulphide mineralization occurs within the syenite material which contains up to 7 percent disseminated pyrite with minor chalcopyrite and native gold. Pyrite grains are anhedral to subhedral in form and are up to 3.0mm in diameter, few grains are rimmed with hematite. Chalcopyrite occurs in small irregular blebs (0.2 mm) dispersed throughout the section. In one section (80-TRC-86), native gold is found in a few small (0.2 mm) grains along the boundary of pyrite grains and within the silicates. The quartz ankerite veins range in width from 7mm to 2cm and in one section clearly cross-cuts the foliation of the syenite. Aggregates of fine-grained tourmaline occur at the edge of the vein in one section (80-TRC-80).

DEVELOPMENT HISTORY

before 1894: - an unspecified amount of development was completed and a "10 stamp" mill was erected on the property (Slaght 1896, p.263).

1894-1896: - the property was optioned by Mr. F.S. Miller and Mr. F.S.P. Fanchot.
- the mill was rebuilt by 1895, 3.5 ounces of gold was recovered and by 1896, about 100 tons of material were treated (ODM Statistical FIles, Bannockburn Mine; Slaght 1896, p.264-265.
- by 1896, the vein was exposed on surface for 700 feet and 4 shafts were excavated to depths of 26, 30, 45 and 30 feet.
- a 17 foot drift was opened on the 32 foot level of the deepest shaft (Slaght 1896, p.264) and the vein was developed north and south of the shaft.

1897-1898 - Bannockburn Gold Mining Company Limited aquired the property (Gordon et al. 1979, p.34).
- the deepest shaft was excavated to a depth of 75 feet and additional stoping was carried out from the existing workings.
- a new shaft was sunk to a depth of 30 feet in a mineralized quartz vein, approximately west of the original workings (Slaght 1898, p.89).

1965 - Mr. J. McQuigge and Mr. R. Belanger sampled the trenches and reported that 7 drill holes (total 1000 feet) were completed north of the main shaft.
- the report indicates that the shaft was dewatered.
- Visible gold was reported in a number of trenches and the vein system was traced for over 1000 feet (Bannockburn Gold deposit, Geoscience Data Centre, Toronto).

REFERENCES

Bannockburn Gold Deposits	Geoscience Data Centre, Toronto
Blue, A.	1896, p.18
Carter, T.R.	1980, p.171
Gordon, J.B. et al.	1979, p.34
*Hewitt, D.F.	1968, p.14,15,21, Map 2154
*Hewitt, D.F. and Satterly, J.	Map 1957b
Slaght, A.	1896, p.264-265
	1898, p.89-90
Thomson, J.E.	1943, p.32

25. RICHARDSON PROSPECT (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein carbonate, chlorite-epidote gneiss
Other: Dolomitic marble

CLASSIFICATION:
IIIA1: Concordant to discordant quartz and quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Richardson prospect is located in the central part of Madoc township, approximately 0.3 kilometres west of Eldorado and Highway 62 and 300 m north of a branch of the C.P.R. line (NTS 31C/12). The prospect is accessible on foot from Highway 62. It is located on O.D.M. map 2154 (Hewitt 1968) and 1957b (Hewitt and Satterly 1957).

Lot 18, Con. V, Madoc Township, Hastings County
NTS BANNOCKBURN 31C12 1:50,000
Latitude 44°35'19 Longitude 77°31'28"
UTM Zone 18, 4 940 200 N, 299 650 E

SIZE AND GRADE

The mineralized zone was reported to occur within a seam 0.5 to 1.0 feet wide dipping 45°N. The original workings consisted of an inclined shaft 15 feet deep connected to a cavity 12 feet long, 6 feet wide and 6 feet deep (Blue 1894, p.54).

About 75 to 100 ounces of gold were recovered from the deposit during the first year of operation (Young 1937, p.13). One mineralized sample assayed 0.408 oz/ton Au (Selwyn 1890, 34R).

DESCRIPTION

General Geology: The Richardson prospect occurs in the central part of Madoc township, within part of a thick, folded sequence of marbles intercalated with minor metasedimentary and metavolcanic lenses. Hewitt's geological map (1968, Map 2154) shows the sequence of marbles bounded by Tudor metavolcanic rocks on the east and intruded by the Gawley and Deloro plutons on the west side of the township. In several areas, the Grenville series rocks are masked Ordovician outliers limestone from the north edge of the Paleozoic cover. The deposit is located in the marble sequence about 1.8 kilometres northeast of the Deloro pluton, immediately east of a very small, related intrusion.

The geology of the deposit was described by Vennor (1866, p.165-67):

"....an irregular layer of chloritic and epidotic gneiss was overlain by a siliceous ferruginous dolomite, and underlain by a band resembling an impure steatite (talc rich rock) the whole dipping N5°E L45°. The seat of gold appeared to be a crevice of longitudinal ovoid from about four feet below the surface, which was filled with reddish-brown ferruginous earth, in which were scattered fragments of a black carbonaceous matter, the latter showing, when broken, small flakes or scales of the metal. The crevice seemed to be in the schist, at its junction with the dolomite, and presented an attitude conformable with the stratification......"

Shortly afterwards, a 15 foot shaft was sunk along the stratification. Vennor writes:

"...The chlorite and epidote gneiss appeared to be much intermingled with calcspar and bitter-spar, which ran in short, lenticular interlocking patches, each an inch or so thick, in a total width of about eighteen inches at right angles to the stratification, and in place of them there were occasionally small openings partially filled with ferruginous earth as before mentioned, with which black carbonaceous matter was much intermingled..... At this time no trace of the metal was observed in the enclosing rock, but shortly afterwards some very beautiful and rich specimens from the same opening were shown me in which the gold was enclosed in the dolomite and calcspar."
Mineralization: The first description of the mineralization was given by Vennor (1870). "... The seat of gold appeared to be a crevice of longitudinal ovoid form,.... which was filled with reddish-brown ferruginous earth, in which were scattered fragments of a black carbonaceous matter, the latter showing, when broken, small flakes or scales of the metal." "...rich specimens from the same opening were shown me, in which the gold was enclosed in the dolomite and calcspar."

Boyle and Henry (1973, p.282) describe a mineralized sample collected by Vennor as "a dark, calc-silicate rock containing rounded masses and veinlets of a massive, black, appreciably radioactive hydrocarbon, associated with quartz .... this material is seen to contain ragged grains of gold .... and fillers and patches of szomolnokite ($FeSO_4$, H_2O). Gold is not restricted to the hydrocarbon, occurring also in quartz."

"...polished sections of the Richardson fragments are seen to carry disseminated microscopic 'grains' of gold and urania (pitchblende or uraninite), and in fact are literally "shot through" with such grains." The hydrocarbon material contained 0.01 to 0.05 percent thorium and 0.01 to 0.10 percent yttrium, ytterbium, neodymium and lanthanum.

Steacy, Plant and Boyle (1974, p.361) describe two mineralized samples from old collections as follows:

"...They are composed of slightly pinkish, crystalline calcite with muscovite, brannerite, tourmaline, pyrite, native gold and minor uraninite. The muscovite, as compact, fine-grained masses constitutes about one third of the NMNS specimen and less of the other. Tourmaline as black masses and stringers, was noted only on the ROM specimen. Brannerite occurs within the calcite, muscovite and tourmaline as discrete black grains, a few of which appear euhedral, and as irregular masses up to 1.2 cm....Pyrite, as discrete veins, crystals and masses up to 1.5 cm, is relatively abundant in the ROM specimen but almost lacking in the NMNS specimen. Native gold occurs macroscopically in both specimens and is almost invariably associated with the brannerite, although small grains are isolated in the calcite. Uraninite is a minor constituent associated with and, in part veining the brannerite.

A polished section of the NMNS specimen.... shows much of the brannerite to be brecciated and cemented by calcite and veined and replaced by native gold."

DEVELOPMENT HISTORY

1866 - 1868:
- Mr. Powell discovered gold mineralization on the Richardson property
- a shaft was excavated on the showing to a depth of 15'
- property was sold to Lombard and Hardin of Chicago (Blue 1894, p.54-55)

REFERENCES

Bell, R.	1905, p.XXXA
Blue, A	1894, p.53-55
Boyle, R.W. and Steacy, H.R.	1973, p.282-285
Coleman, A.P.	1895, p.35
Gordon, J.B. et al.	1979, p.44
*Hewitt, D.F.	1968, Map 2154
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Kindle, E.D.	1936, p.119
Hopkins, P.C.	1920, p.15
Miller, W.G.	1900, p.199
	1902, p.199
Selwyn, A.R.	1890, p.34R
Steacy, H.R., Boyd, R.W., Charbonneau, B.W. and Grasty, R.L.	1973, p.103-105
Steacy, H.R., Plant, A.G. and Boyle, R.W.	1974, p.360-363
" " "	1974, p.175
Vennor, H.G.	1870, p.165-171
Young, C.A.	1937, p.12-13

26. SOPHIA (DIAMOND) MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Mafic metavolcanics, amphibolite

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Sophia mine is located in the east central part of Madoc township, approximately 9.5 kilometres north-northeast of Madoc and 1.5 kilometres west of Queensborough (NTS 31C/11). It is accessible on foot from a system of gravel roads joining Madoc to Queensborough. The deposit is about 0.5 kilometres north of a road at a point 1.3 road kilometres west of Queensborough. The mine is located on O.D.M. maps 2053 (Hewitt, D.F. 1964) and 2154 (Hewitt, D.F. et al. 1968).

Lots 14,15, Con. X, Madoc Township, Hastings County
NTS KALADAR 31C/11 1:50,000
Latitude 44°35'28"N Longitude 77°26'02"W
UTM Zone 18, 4 940 200 N, 306 800 E

SIZE AND GRADE

The mineralized occurs within two major veins, vein 1 (Mispickel vein) trends N-S and vein 2 (Free Milling vein) trends NW-SE. Vein 1 has width of up to 5 feet and was exposed on surface for 300 feet along strike (Slaght 1898, p.92). Figure 32 shows vein 2 exposed intermittently between two shafts about 125 feet apart.

The major workings consist of 3 shafts, shaft 1 on vein 1 and shafts 2 and 3 on vein 2. Shafts 2 and 3 were opened to a depth of about 100 feet, shaft 1 reaches a depth of 156 feet. Shafts nos. 2 and 3 are connected at the 100 foot level. Most of the development was restricted to two levels of the No. 1 shaft; 100' level" 468' of drifts, 169' of crosscuts, 37' of raises, 135' level: 209' of drifts, 50' of crosscuts and 98' of raises (Tower et al. 1946, p.160-161). In the No. 2 shaft, 30' and 60' of drifting were completed on the 60' and 100' levels respectively (De Kalb 1901, p.117). Figure 32 shows the relationship between the 3 shafts and a 125' NW-bearing trench, located about 300' east of the mill foundation.

In 1900, 50 ounces of gold were recovered from 1500 tons ore, in 1941, 60 ounces of gold and 7 ounces of silver were recovered from 300 tons of ore (O.D.M. Statistical Files,

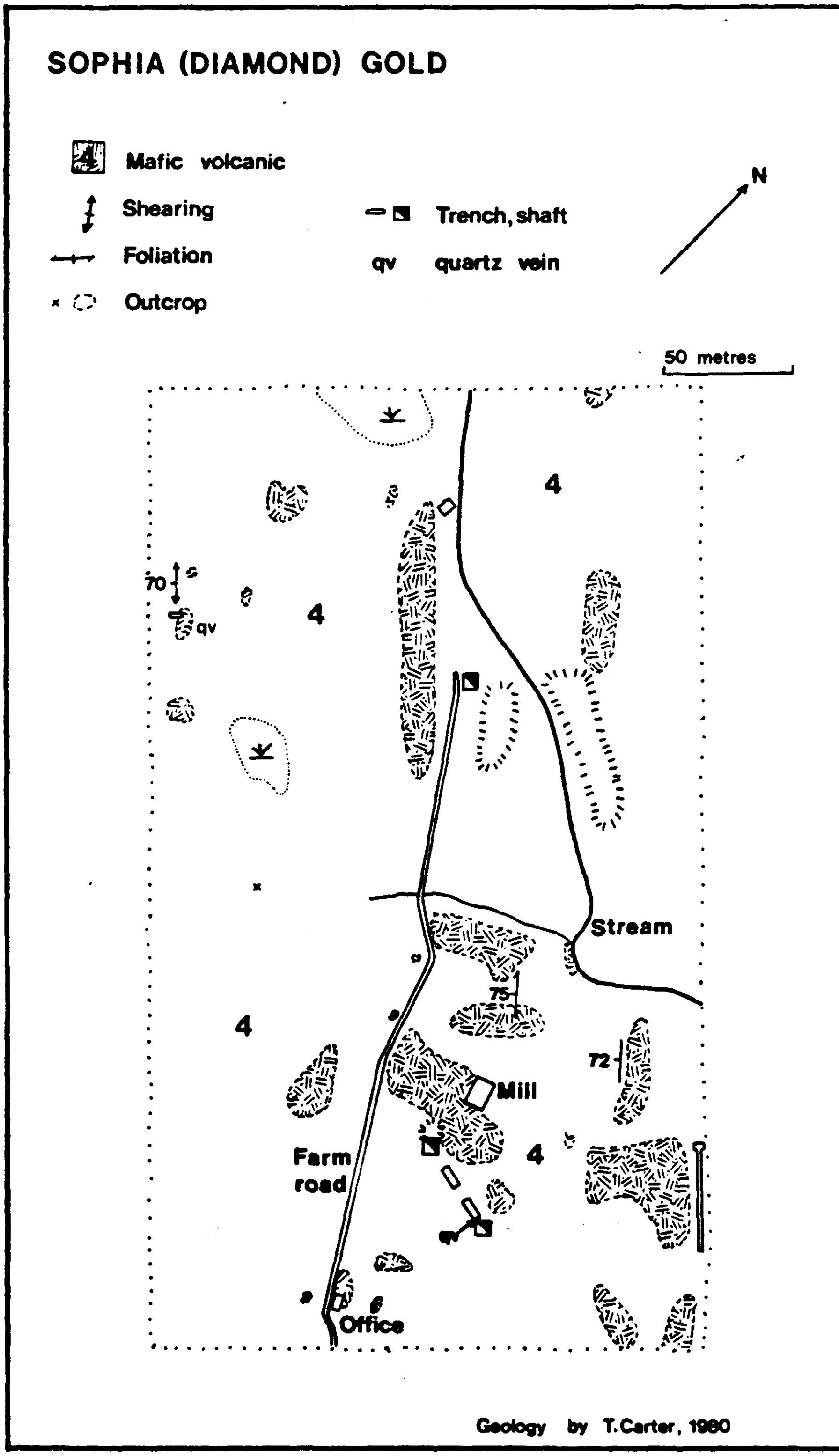

Figure 32: Geology of the Sophia (Diamond) Deposit.

Sophia Mine and Mayboro Milling Company Limited. Table 43: lists chemical analyses of a sample from the rock dump and from the smelter slag.

Table 43: Partial Chemical Analysis of Selected Samples from the Sophia Mine

	Au (oz/ton)	Ag (oz/ton)	As (ppm/%)	Sb (ppm)	Cu (ppm)
80-TRC-87 (grab sample)	0.03	<0.1	1840	11.5	41
80-TRC-90 (slag sample)	0.41	<0.1	11.6	240	148

DESCRIPTION

General Geology: The Sophia mine is located in the mafic metavolcanic rocks of the Tudor Formation (Hermon Group) in the east central part of Madoc township. The Tudor volcanics form an irregular northwest trending belt between the SW boundary of the Elzevir Granite and a thick folded sequence of marbles and metaclastic rocks to the west. Hewitt's geological map (2154, 1968) shows the deposit near the contact with the marbles, immediately east of the NW-trending axis of the Queensborough syncline.

The deposit consists of two mineralized vein systems oriented N-S and NW-SE in mafic metavolcanic rocks. Carter describes the country rock as a dark green, massive to weakly foliated, fine-grained biotite-rich amphibolite., In places the rock grades into a coarse-grained (2mm to 5mm) amphibolite. Vein material consists of veinlets and lenses of white, coarse grained quartz and ankerite which locally contains biotite-rich volcanic fragments. Veins are generally parallel to (rarely crosscutting) the foliation, in places quartz-ankerite lenses occur in en echelon lenses.

Mineralization: Slaght (1898, p.92) writes:

".... an outcropping of quartz vein had been stripped for the distance of 300 feet; and near the middle of the cutting a shaft had been sunk 12 feet, showing a width of vein of five feet, carrying a stringer of a few inches wide of exceptionally rich mispickel ore. On the wall numerous specks of free gold were discovered, and a number of fine specimens of gold have been taken out..."

Samples of the rock dump contain disseminated pyrite and arsenopyrite in quartz ankerite fragments and within biotite-rich host rock inclusions. Trace pyrite, pyrrhotite and chalcopyrite occur in veins within one shear zone exposed by a trench. Two polished thin sections of mineralized vein samples contain anhedral to subhedral crystals and crystal aggregates of arsenopyrite up to 5.0

mm. These grains are fractured and polished surfaces show numerous, small irregularities. Minor chalcopyrite occurs in small irregular blebs (<0.4 mm) and minute fractures within the gangue and arsenopyrite. In one section few small (<0.2 mm), irregular gold grains occur within and beside arsenopyrite grains and within chalcopyrite. Gangue minerals consist of quartz, ankerite and lesser percentages of biotite, feldspar, chlorite and epidote.

DEVELOPMENT HISTORY

1896: - Gold was discovered on the property then held by Mr.W. Diamond (Miller and Knight 1914, p.111, Gibson 1899, p.41).

1898-1899: - Mr. D.E. K. Stewart optioned the property.
- a vein was stripped for 300 feet and a shaft 6' by 7' by 27' deep was opened, - a 30 foot trench was excavated on a vein 150 yards south of the shaft. (Slaght 1898, p.92-93, Gibson 1899, p.41).

1900: - The mine was acquired by Mr. P. McLaren, L. Meyer and C. Meyer, the name was changed to the Sophia Mine.
- Shaft #1 was developed to a depth of 60 feet (by 9' by 18'), drifting commenced at that level.
- Shaft #2 was opened to 105 feet (by 9' by 18') with levels at 60 feet, drifts 20 feet northwest, 10 feet southeast and at 100 feet, drifts 58 feet northwest, 10 feet southeast.
- Shaft #3 developed to a depth of 60 feet (9' by 18').
- a 10 stamp mill and various other buildings were erected at the site (De Kalb 1901, p.117)
- 1500 tons of ore were milled, yielding 50 ounces of gold (Sophia Mine, O.D.M. Statistical Files)

1901: - development was suspended (Miller and Knight 1914, p.111).

1907-1936: - the mine was taken over by the Madoc Mines Company
- shaft #3 was dewatered and the mill overhauled (Miller and Knight 1914, p.111, Corkhill 1908, p.83).
- by 1936, shafts #1 and #3 were developed to the 100 foot level and shafts #2 and #3 were connected by a 140 foot crosscut at the 100 foot level (Sinclair, D.G. et al. 1938, p.186).

1936: - Old Diamond Gold Mines Limited acquired the property
- 2950 feet of diamond drilling was completed and 105 feet of drifting, 135 feet of crosscutting was carried out from the 100 foot level of the #1 (north) shaft (Sinclair, D.G. et al. 1938, p.186).

1937: - drifting and crosscutting activities continued

- surfaces trenches and pits were excavated (Sinclair, D.G. et al. 1939, p.182)
- a total of 413 feet of drifting and 169 feet of crosscutting were completed before 1939 (Tower, W.O. et al. 1941, p.173).

1939-1942:
- the Mayboro Milling Co. Ltd. acquired the property
- shaft #1 was dewatered and a new 15 ton mill was erected.
- the shaft was deepened to 156 feet and a new level was developed at a depth of 135 feet.
- in 1941, 55 feet of drifting and 37 feet of raises were completed on the 100 foot level, 109 feet of drifting and 48 feet of raises were completed on the 135 foot level.
- 300 tons of ore and 1375 tons of waste were extracted
- total development from shaft #1 - 468' drifting, 169' crosscuts and 37' raises on the 100' level
- 209' drifting, 50' crosscuts and 98' raises on the 135' level (Tower, W.O. et al. 1946, p.160-161).
- 60 ounces of gold and 7 ounces of silver were recovered from the ore (Mayboro Milling Co. Ltd., O.D.M. Statistical File).

REFERENCES

Carter, W.E.H.	1902, p.236
Corkhill, E.T.	1908, p.58
De Kalb, C.	1899, p.41
	1901, p.117
Gibson, J.M.	1899, p.41
Gordon, J.B. et al.	1979, p.34, 35
*Hewitt, D.F.	1968, p.21, Map 2154
Hopkins, P.E.	1922, p.15
Kindle, E.D.	1936, p.116-117
Miller, W.G.	1902, p.200
Miller, W.G. & Knight, C.W.	1914, p.113
Sinclair, D.G. et al.	1938, p.186
	1939, p.181
Slaght, A.	1898, p.92-93
Tower et al.	1941, p.173
	1946, p.160-161
Tremblay, M.	1941, p.13
Wells, J.W.	1899, p.288
	1902, p.102

27. ACKERMAN PROSPECT

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz, carbonate
Other: Syenite

CLASSIFICATION:
IIIA: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Ackerman prospect is located in the southeast corner of Marmora township about 1 kilometre southeast of Deloro and 5 kilometres ENE of Marmora (NTS 31C/12). It is accessible by Highway 7, about 5 road kilometres east of Marmora (NTS 31C/12). The deposit is located immediately south of the highway, 0.6 kilometres east of the bridge over the Moira River. It is located on GSC Map 560A (Wilson 1940).

Lot 6, Con. VIII, IX, Marmora Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°30'01"N Longitude 77°36'47"W
UTM Zone 18, 4 930 550 N, 292 250 E

SIZE AND GRADE

The mineralized zone at the Ackerman prospect occurs within a quartz vein system approximately 1500 feet long. The major vein, the Ackerman, trends N-S and dips 45°W. It ranges in width from 1.5' to 2.5' on surface and up to 5.0 feet at depth. Another, the Williams vein, was intersected in a drill hole at a vertical depth of 275' and showed 20' of vein material (Hargraft 1950).

The major workings consist of a 2 compartment shaft, 207' deep, opened along a 45°W incline. At the 170' level, drifts were opened along the vein 257'N and 282'S of the shaft (Shaw, J.W., 1938). Pits and trenches were opened along the vein up to 1000' north and 500' south of the shaft (Hargraft 1950).

The following summarizes an extensive sampling program completed on the mine workings.

- drift level: a section extending 88', from 35; south of the shaft to 41' north of the shaft averaged 0.23 oz/ton Au over a width of 4.0'.
- : a section from 65' to 125' north of the shaft averaged 0.20 oz/ton Au over 4.3'.
- shaft from 170' to 270' averaged 0.20 oz/ton Au over 4.0' (Shaw 1938).

The original mine operation was reported to have milled several hundred tons ore with a recovery grade of 0.24 to 0.44 oz/ton Au (Hargraft 1950). Drill core from the Williams vein assayed 0.26 oz/ton Au over 2.5' at a verticaldepth of 275' (Hargraft 1950). Assays of three mineralized rock dump samples are listed in Table 44.

Table 44: Assays from the mine dump of the Ackerman prospect

	Au (oz/ton)	Ag (oz/ton)	As (%/ppm)	Sb (ppm)	Cu (ppm)
80-TRC-110	0.20	0.16	9.19%	510	7
80-TRC-114	0.14	<0.1	6.60%	270	26
80-TRC-116	0.02	<0.1	5700.	10.7	11

DESCRIPTION

The Ackerman prospect is located in the southeastern corner of Marmora township along the western edge of the Deloro Granite complex whose (Wilson 1940, Map 560A) west boundary is defined by a sequence of calcitic marbles.

The Ackerman prospect is situated in the same geological environment as the Deloro and Cook mines further north (Figure 33). Mineralization is hosted in a N-S trending quartz-ankerite vein system which dips about 45°W. The Ackerman vein is exposed intermittently by trenches for about 1500' and ranges in width from 1.5' to 5.0' (Hargraft 1950). The Williams vein was detected on the property in a diamond drill hole at a depth of 275'. A 2.5 section of th 20' vein intersection was mineralized. The vein occurs in light grey syenite which is sheared locally. In thin section the syenite shows a massive, medium-to coarse-grained texture; it consists of anhedral to subhedra aggregates of alkali feldspar (70%), quartz (15%), biotit (10%), calcite (5%) and minor opaques. A chemical analysis is listed in Table 45.

Table 45: Chemical analysis, syenite from the Ackerman prospect

	80-TRC-115	Wt%
SiO_2		61.60
Al_2O_3		15.80
Fe_2O_3		0.93
FeO		4.62
MgO		0.55
CaO		2.91
Na_2O		5.44
K_2O		3.75
MnO		0.08
TiO_2		0.96
P_2O_5		0.10
CO_2		2.41
S		0.04
H_2O^+		0.36
H_2O^-		0.37
TOTAL		99.92

Vein gangue consists of white, coarse-grained quartz and buff to rusty brown weathered ankerite; small lenses of biotite locally.

Mineralization: Vein mineralization consists of disseminated euhedral grains and massive veinlets of fine-to-medium-grained arsenopyrite. Disseminated pyrite is locally abundant.

DEVELOPMENT HISTORY

before 1932: early development consisted of a shaft about 70' deep. Several hundred tons of ore were removed, mill recovery was reported to be 0.24 - 0.44 oz/ton Au. Operators not known (Hargraft 1950).

1932: surface sampling and trenching outlined a mineralized zone in a 1500' vein system on the property. Operators not known (Hargraft (1950).

1937:- Ackerman Gold Mines Limited was incorporated in September
- a number of buildings were erected and some mine equipment was installed
- a 2 compartment shaft was opened along a 45°W incline to a depth of 170'
- At 170', 12' of crosscutting and 40' of drifting were completed (Sinclair, D.G. et al. 1938, p.81).

1938:- the shaft was deepened to 270' and 600' of drifting was completed at the 170' level (Sinclair, D.G. et al. 1940, p.72).

1942:- Consolidated Mining and Smelting Company drilled 6 diamond drill holes on the property (Hargraft 1950)

1950-1951:- The property was evaluated for Ackerman Gold Mines Limited (Hargraft 1950). An additional 3200' of drilling was completed; however the results were not submitted for assessment (Harding, W.D. 1951, footnote in the above reference; Gordon, J.B. et al. 1979, p.44).

REFERENCES

Gordon, J.B. et al.	1979, p.49
Hargraft, W.S.	1950
Shaw, J.W.	1938
Sinclair, D.G. et al.	1938, p.81
Sinclair, D.G. et al.	1940, p.72
*Wilson, M.E.	1940, Map 560A

28. COOK MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz and carbonate
Other:

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Cook Mine is located in the SE corner of Marmora Township, approximately 1.0 kilometres east of Deloro (NTS 31C/12). It is accessible by trails which lead east of the mine at Deloro. Deloro is located on a paved road, about 1.5 road kilometres north from Highway 7, at a point 3.5 road kilometres east of Marmora. It is located on G.S.C. Map 560A (Wilson 1940).

Lots 7,8,9. Con. IX, Lots 10,11,12, Con. X, Marmora Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°31'00"N Longitude 77°36'45"W
UTM Zone 18, 4 932 200 N, 292 400 E

SIZE AND GRADE

The ore was mined from two major veins spaced about 800 feet apart (Hurst 1927, p.103). The west vein dips 20° to 25° SE and ranged from 0.5' to 1.5' wide; the east vein dips 45°W and was 1.5' to 6.0' wide (Carter 1903, p.111).

The main (No. 1) shaft on the west vein was opened to a depth of 179' along an incline 25°S. Levels at 70' and 80' extended 32'W and 20'E respectively. At the 139' level a winze branches to the west along a 45° incline to a depth of 35 feet (Carter 1903, p.111). Hurst (1927, p.103) reported an inclined shaft (60°W) approximately 80' west of the main shaft and a short adit (50'SE) about 70' northeast of the main shaft. A map in a diamond drill assessment report also shows a shaft located about 250' SE of the No. 1 shaft inclined 45°W (Fox 1974). The No. 4 shaft on the east vein is located about 1500' northeast of the No. 1 shaft. It is excavated to a depth of 120 feet along an incline 45°W. A 45' drift was opened south along the vein from the 90' level (Carter 1903, p.111). In a previous report, Carter described a 10' by 10' pit and a 100' trench in a clay covered, mineralized till, about one quarter of a mile south of the main shaft.

Gold production in 1901, 1902 and 1904 was 44 ounces (175 tons ore), 96 ounces (384 tons ore) and 249 ounces (924 tons ore) respectively. A total of 389 ounces of gold was recovered, the concentration of gold extracted averaged 0.26 oz/ton. The Dean and Williams workings on the claim group were not developed. Of 11 drill holes (1341 feet) near the No. 1 shaft, only one significant zone was encountered in a hole 150 feet southeast of the shaft. One 0.5' section at 78 feet contained 10% sulphides and assayed 0.34 oz/ton Au; another 0.5' section at 80' contained a 1/2" seam of massive pyrite which assayed 0.34 oz/ton Au (Fox 1973). Carter collected a chip sample across the exposed vein system which assayed 0.01 oz/ton Au, <0.1 oz/ton Ag and 8700 ppm As.

DESCRIPTION

The Cook Gold mine occurs within the Deloro Intrusive Complex, an oval-shaped body about 12 kilometres long and 7 kilometres wide which straddles the south half of the Marmora-Madoc township boundary. It is situated within the dominant "granitic" phase of the complex in the southwest part of the body, one kilometre east of Deloro.
Carter describes the deposit as a mineralized quartz vein system which occupies a shear zone within an otherwise massive pink to grey, coarse-grained trondhjemite or diorite. The major vein strikes 128°, and dips 28° south, and ranges in width up to 1 metre. In localities, it forms small lenses within the shear zone. Granitic material near the vein is green-grey and has a fine-grained, foliated texture. Some xenoliths within the vein are pink, aphanitic banded rocks resembling felsic volcanics.
Mineralization: The vein material is composed of white, coarse-grained quartz with minor ankerite. The sulphides consist of disseminated arsenopyrite, pyrite and minor chalcopyrite. Arsenopyrite usually occurs in euhedral grains and is also present within the sheared granite.

DEVELOPMENT HISTORY

1901-
1905 - The Cook Land Company acquired the property and completed all development work (Kindle 1936, p.116).

1901 - a "10-stamp" mill was erected and the west shaft (No.1) was opened (Miller 1902, p.197, Carter 1902, p.234). Forty four ounces of gold were recovered from 175 tons or ore (Cook Mine, O.D.M. Statistical Files). A 10' by 10' pit and a 100' trench was opened in a gold-bearing glacial till about 1/4 mile south of the mine.

1902 - The west shaft (No. 1) was abandoned, and the shaft (No.4) was opened. The east shaft (No. 4) was opened to a depth of 179' on a 25° incline' 32' and 20' of drifting were completed at the 70' and 80' levels respectively, and an inclined winze was opened for 35' at the 139' level. The east shaft was opened along a 45° incline for 120' with a 45' drift at the 90' level. The workings in the glacial till continued (Carter 1903, p.110-111).

- A total of 96 ounces of gold were recovered from 384 tons of material (Cook Mine, O.D.M. Statistical Files).
- The mill burned down in March.

1903 - Development work continued in the vicinity of the west shaft, a 50' adit and an inclined shaft was opened to a depth of at least 25' (Miller 1904, p.93, Hurst 1927, p.103,104).

1904 - A total of 249 ounces of gold were recovered from 924 tons of material (Cook Mine, ODM Statistical Files).

1973 - Mr. Campbell Fox drilled 11 holes (1341 feet) near the original workings (Fox 1973).

1974 - Sudbury Contact Mines Limited acquired the property (Canadian Mines Handbook 2944-75, p.313).

REFERENCES:

Carter, W.E.H.	1902, p.234
	1903, p.110-111
Fox, C.	1979
Gordon, J.B. et al.	1979, p.35
Hopkins, P.E.	1922, p.13
Hurst, M.E.	1927, p.103-104
Kindle, E.D.	1936, p.116
Miller, W.G.	1902, p.197
	1904, p.93
Wells, J.W.	1902, p.102-103

29. <u>DEAN AND WILLIAMS MINE </u>(Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz, carbonate
Other: Granite

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Dean and Williams Mine is located in the southeast corner of Marmora township, approximately 6 kilometres east-northeast of Marmora and 1.5 kilometres southeast of Deloro (NTS 31C/12). It is accessible on foot from the town of Deloro or from Highway 7 which passes to within 0.5 kilometres south of the deposit.

SE 1/4, Lot 7, Con. IX, Marmora Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°30'17N Longitude 77°35'51"W
UTM Zone 18, 4 931 000 N, 293 500 E

SIZE AND GRADE

The mineralized zone at the Dean and Williams Mine occurred within a vein system consisting of a succession of lenses striking north 25° west and dipping 45°E (Hurst 1927, p.104). A number of trenches and pits were excavated over the property for a distance of 350 feet. Vein widths range from 0.5' to 5.0'.

The major workings consist of a 160' deep shaft with drifts to the north and south (Wells 1902, p.103, Hurst 1927, p.104).

Before 1871, 500 ounces of gold were produced from 1000 tons of ore (Young 1937, p.13).

DESCRIPTION

The Dean and Williams mine is located in the south part of the Deloro granite, in the southeast corner of Marmora township. The Deloro granite is an oval-shaped intrusion which straddles the south half of the Marmora-Madoc township boundary.

Hurst (1927, p.104) writes:

"...Mining operations were conducted prior to 1873 on a vein consisting of a succession of lenses striking north 25 degrees west (magnetic) and dipping 45 degrees east. The vein cuts granite and consists of quartz, carrying mispickel, rusty carbonate, biotite, pyrite, chalcopyrite, etc. A series of openings have been made along the outcrop over a length of 350 feet. No quartz is now visible at the most southerly opening, but at the next pit north there is a zone 2 to 3 feet wide in which are quartz veins, the widest being 1 foot. The quartz contains aggregates if mispickel, some of which are several inches wide. In the same pit there is visible: a mass of quartz 3 to 4 feet wide, but narrowing upwardly; an irregular vein, in places 6 inches wide, of quartz-bearing mispickel; and a branch vein 1 foot wide. A shaft extends from the bottom of this pit, is said to be 100 feet deep with drifts to the north and south, and to have been sunk on a vein whose breadth averaged 3 1/2 feet with a maximum of 5 feet and which at the bottom of the shaft consisted largely of mispickel."

DEVELOPMENT HISTORY

Before 1871: - a shaft was excavated to a depth of 160 feet, and an unspecified amount of drifting was completed (Wells 1902, p.103; Hurst 1927, p.104).
- a 10 stamp mill produced 500 ounces of gold from 1000 tons ore (Young 1937, p.13).

1901: - the Cook Land Company reconditioned the mill and treated an unspecified amount of material from the rock dump (Wells 1902, p.103).

REFERENCES

Gordon, J.B. et al.	1979, p.35
Hurst, M.E.	1927, p.104
Kindle, E.D.	1936, p.116
Wells, J.W.	1902, p.103
*Wilson, M.E.	1940, Map 560A
Young, A.C.	1937, p.13

30. DELORO MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz, carbonate
Other: Mafic metavolcanics

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS
The Deloro mine is located in the southeast corner of Marmora township at the east side of the town of Deloro, about 5 kilometres northeast of Marmora (NTS 31C/12). It is accessible by a paved road which runs north from Highway 7 about 3.5 kilometres east of Marmora. The mine is located on ODM Map 1957b (Hewitt and Satterly 1957) and GSC Map 560A (Wilson 1940).
Lot 10, Con. VI, Marmora Township, Hastings County
Lot 9, Con. VIII
W 1/2 Lot 10, NE 1/4 Lot 8, Con. IX
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°30'53"N Longitude 77°37'07"W
UTM Zone 18, 4 932 150 N, 291 850 E

SIZE AND GRADE

The mineralized zone at the Deloro Mine was hosted in a north-trending, west dipping system of quartz-carbonate veins. The major veins had a lateral extent of 100 to 1000 feet and ranged in width from 1 to 5 feet.

Most of the development was concentrated at the Gatling and Tuttle shafts situated about 425 feet apart. The shafts are inclined along the vein attitudes at 40°-55°W. An extensive system of drifts, stopes, winzes and crosscuts connect the shafts on four levels to a depth of about 330 feet. Most of the upper two levels between the shafts were stoped to the surface and filled with waste rock. The deepest shaft, the Gatling, is 342' deep and a fifth drift level was opened at 500' level by a winze from the 4th level. A total of 2,500' of drifting and at least 550' of crosscuts and 150' of winzes were completed within the two shafts. Details of the mine workings are stated in Carter (1902, p.232-233; 1903, p.109) or in the following "Development History".

At least eight other shafts were opened with a total of 517' of vertical and 219' of lateral development (Gordon et al. 1979, p.36).

Total recorded production from 1897 to 1902 was 10,360 ounces of gold from 39, 143 tons ore. In addition about 2,800 ounces of arsenic by-product was produced from 1885 to 1903. One report indicates that $9926 of gold (480 ounces) were produced from the mine before 1884 (Young 1937, p.13).

Approximately 1700 pounds of mineralized material from the original workings assayed between 1.16 and 1.25 oz/ton Au (Selwyn 1874, p.7). The recorded production grade of the mine from 1897 to 1902 is 0.26 oz/ton Au. Table 46 lists assays of various samples collected by Carter. In addition seven fine tailings samples were collected from the tailings pond. Average metal contents are as follows: 5500 ppm Cu, 1300 ppm Ni, 104 ppm Pb, 153 ppm Zn, 1550 ppm Co, 4.65% As, 1030 ppm Sb, 0.83 oz/ton Ag and trace Au (Carter 1981, p.202).

Table 46: Assays from the Deloro Mine

	Au (oz/ton)	Ag (oz/ton)	As (%/ppm)	Sb (ppm)	Cu (ppm)
80-TRC-3 tailings	<0.01	<0.1	4.73%	720	3530
80-TRC-7 chip sample quartz vein	<0.01	<0.1	26	0.6	18
80-TRC-8 chip sample, quartz vein	0.03	<0.1	4.65%	185	18
80-TRC-10 chip sample in skarn	<0.01	<0.1	29	3.9	1980
80-TRC-14 chip sample, quartz vein	<0.01	<0.1	54	1.1	25
80-TRC-16 grab sample, mine dump	0.28	<0.1	1.77%	30	237
80-TRC-20 grab sample, mine dump	0.01	<0.1	3.71%	220	12
79-TRC-43 vein sample	0.15	<0.1	10.5%	-	-

GENERAL GEOLOGY

The Deloro mine occurs along the west edge of the Deloro Intrusive complex (Wilson 1940, Map 560A). The intrusive straddles the Marmora-Madoc township line and forms an oval-shaped body about 12 by 7 kilometres.

Carter's geological map of the Deloro Mine area (Figure 33) shows the workings situated within unsubdivided granite. Further south an altered phase of the intrusion forms distinctive zones near the west contact with calcitic marbles. A syenitic phase of the intrusion is more prevalent elsewhere. Few lenses of skarn occur within 300m northwest and southwest of the major shafts. A small gabbro lens also occurs within the vicinity south of the shafts. Granitic phases include syenite, granite and diorite. The granite is typically pink, massive, medium-grained and well jointed. The aphanitic phase is pink to light grey, very fine grained foliated and in places weakly banded. It generally forms a conformable contact with the marbles, but crosscutting relationships were observed in places. Syenite phases are pink, coarse-grained rocks with a wide range of mafic mineral content. Other granite phases form sharp contacts with the syenites and can usually be identified by their lower mafic mineral content. Thin sections of granitic rock contain up to 40 percent quartz, 50 percent plagioclase and 45 percent K-spar. Hornblende and biotite range from 5-20%. Muscovite, epidote and opaques form less than 5 percent of the rock. Carbonatized granites contain up to 20 percent calcite. Thin sections of syenite phases of the intrusion contain up to 40 percent hornblende, 40 percent plagioclase and 65 percent K-spar. The quartz content is usually less than 10 percent, and biotite, carbonate and opaques form about 5 percent of the syenite.

Tables 47 and 48 list estimated modal percentages and major element chemical analyses of granite and syenite. The gabbro is a greenish, black, massive medium-grained rock composed of plagioclase and amphibole. Xenoliths of skarn within the granites and syenites comprise dark green, massive fine-to medium-grained biotite and diopside with minor accessory calc-silicate minerals. Calcitic marbles are white to dark grey, fine-grained to aphanitic, well layered rocks with lenses of coarse grained calcite and disseminated tremolite and actinolite.

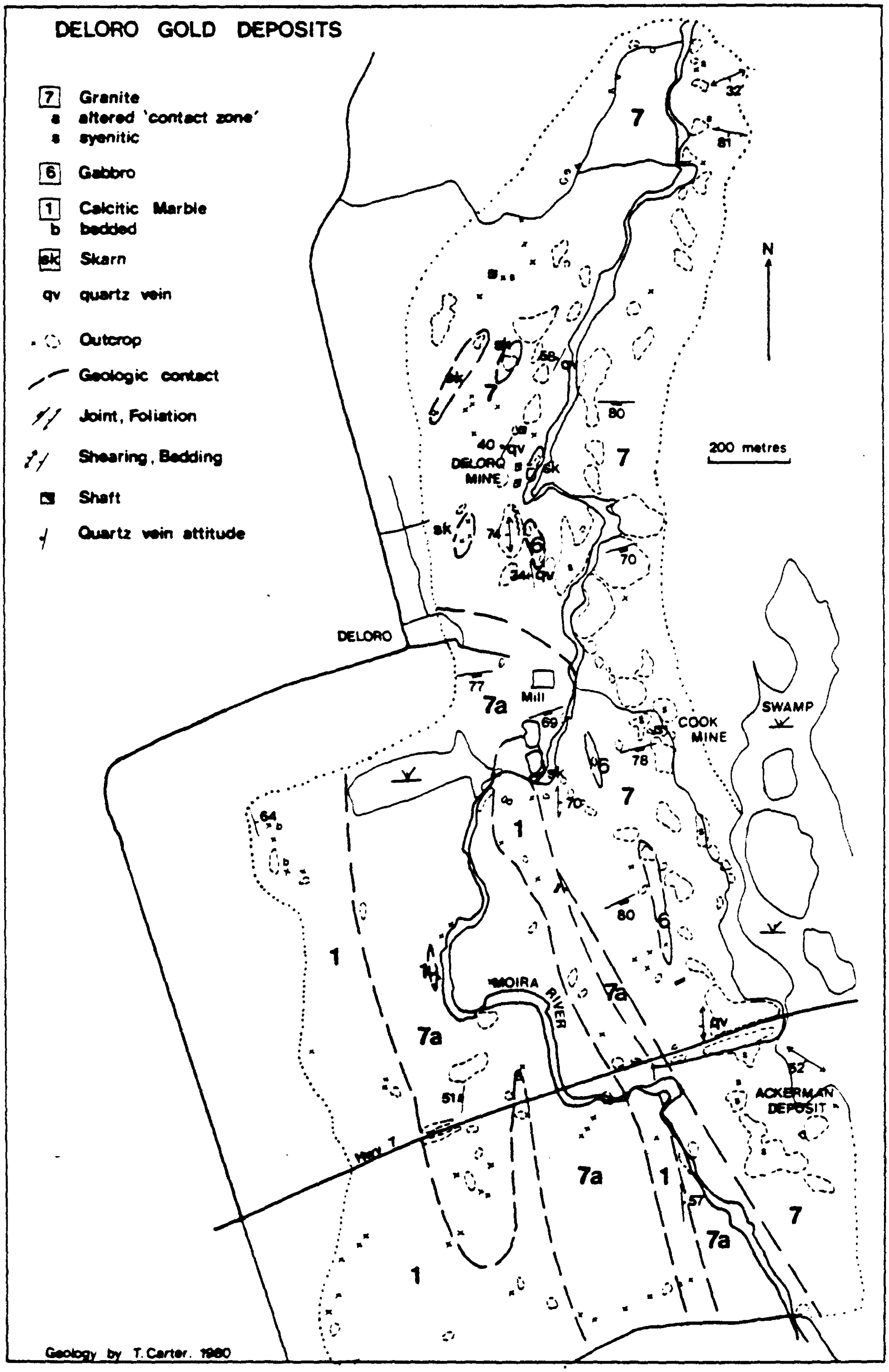

Figure 33: Geology of the Deloro Gold Deposits.

Table 47: Modal compositions at the Deloro mine

	Granite 80-TRC-4 %	Syenite 80-TRC-13 %
Plagioclase	5	40
K-Spar	75	10
Quartz	15	5-10
Biotite	minor	-
Hornblende	-	40
Tremolite	5	-
Opaques	minor	-
Carbonate	minor	-
Zoisite	minor	<5

Table 48: Major element oxides, the Deloro mine

	Granite 80-TRC-04 %	Syenite 80-TRC-13 %
SiO_2	74.00	54.40
Al_2O_3	13.80	15.30
Fe_2O_3	0.65	2.53
FeO	0.57	7.53
MgO	0.24	3.47
CaO	0.71	5.66
Na_2O	3.77	5.00
K_2O	4.99	2.36
MnO	0.01	0.13
TiO_2	0.46	1.68
P_2O_5	0.03	0.22
CO_2	0.60	0.37
S	0.01	0.06
H_2O^+	0.06	0.80
H_2O^-	0.44	0.49
Total:	100.34	100.00

Mineralisation: Early developments reported:

"....There is no sharply defined vein to be seen, but a very irregular shattering of country rock has given space for the deposit of quartz, a little calcite and other carbonates, a varying quantity of arseno-pyrite (mispickel) and a little iron and copper-pyrites. Free gold shows itself occasionally, but not in large nuggets, and generally in the quartz. It is observed that a mixture of fine grained arsenical pyrites with quartz gives the highest gold contents when assayed. Solid, crystalline arsenical pyrites is poor in gold and quartz free from sulphides still poorer..." (Blue A, 1897, p.59).

Eight polished thin sections examined by the writer showed host material of largely massive medium-to coarse-grained quartz with strongly undulatory extinction patterns and lesser ankerite. Arsenopyrite, the commonest sulphide, shows subhedral to euhedral grains which range in size from <0.5 to 2.0 mm, and occur as disseminated grains and massive aggregates in irregular masses and veinlets. Locally two phases of arsenopyrite mineralization are indicated by alteration in the early phase. Pyrite forms fine to medium-grained anhedral grains and crystal aggregates, usually with arsenopyrite. Minor chalcopyrite, occurs as small irregular blebs (<0.5mm) within and beside arsenopyrite grains. Native gold occurs in minute blebs <0.2mm in arsenopyrite, usually closely associated with chalcopyrite. A trace of disseminated sphalerite was present in one section.

DEVELOPMENT HISTORY

before 1871:
- Mr. W.G. Gatling and partners acquired the property
- 3 shafts were opened, Shaft No. 1, 68' deep, Shaft No. 2, 64' deep (80' from shaft No. 1). Shaft No. 3, 20' deep (300' west of No. 1,2).
- a number of buildings were erected on the property
- about 2000 tons of ore was raised
- 1700 lbs of material from two vein systems analysed about 1.16 oz/t Au (E vein) and 1.26 oz/t Au (W. vein). About $4/ton Ag was also recovered (Vennor, H.G., 1872, p.138-139, Selwyn, A.R.C., 1874, p.7)

1873-1880:
- Gatling-Gold and Silver Mining Company opened the "Gatling" shaft
- 12 mineralized samples from the deposit assayed an average 1.91 oz/ton Au (Selwyn 1874, p.7).

1880-1884:
- Canada Consolidated Gold Mining Company erected a 10 stamp mill; an unknown amount of development was completed

1885-1891:
- about 645 tons of refined arsenic oxide were produced by the Canada Consolidated Gold Mining Company (Brumell, H.H. 1888, p.12S)

1892-1894:
- the Hastings Mining and Reduction Company Limited acquired the property
- arsenopyrite rich tailings were treated for extraction of arsenic oxide and gold (Slaght 1893, p.238, 1894, p.56-60)

1895:
- Canadian Consolidated Mining Company acquired the property

1896: - Canadian Goldfields Limited acquired the property
- at this time, the previous workings consisted of two major shaft systems, the Gatling and Tuttle shafts
- The Gatling shaft was opened to a depth of 154' at an incline of 55°W
  - level 1 at 70' consisted of drifts 119'N and 230'S
  - the old "Timber" shaft, 66' N of the Gatling shaft was opened to the 1st level and continued down 79' as a winze to the 2nd level
  - level 2 at 125', drifts extended 47'N and 98'S.
- The Tuttle shaft was opened to a depth of 62' on an incline 64°W.
- at 64' drifts extended 87'N and 85'S (Slaght, A., 1898, p.90)

1897: - Canadian Goldfields Ltd. carried out the following developments:
  - Gatling shaft: Level No. 1, a 38' crosscut was opened 25'N of the "Timber" shaft. The S drift was extended to 340' and joined to the No. 1 level of the Tuttle Shaft. About 155' S of the shaft, a 63' winze joins level 1 and 2. Another winze 260'S of the shaft was opened 15'. Level No. 2: N drift was extended to 155' and a 90'W crosscut was completed 25'N of the shaft. S drift was extended to 279'. Stoping activities began on both levels.
  - Tuttle shaft: drift was deepened to 92'. The shaft was extended to 147', 100'S of the shaft, a 10' winze was started. The N drift was extended by 57', connecting to level 1 of the Gatling system (Slaght, A., 1898, p.90).

1898: - Gatling shaft was deepened to 192', and the Tuttle shaft to 122'
- Gatling level No. 1 east crosscut was extended to 42'
- Gatling level 1. S drift, winze deepened to 65'
- the Gatling level 2, S drift was lengthened to 410'
- Gatling level No. 2, W crosscut was extended to 250'
- the Tuttle level 2 S drift was opened 90'
- Tuttle S drift winze deepened to 21'
- Tuttle workings, cross cut opened 40'
- the "Air" shaft, 360' WNW of the Gatling shaft was opened to 63'
- N level on the Air vein was opened 21'
- S level on the "Open Cut" vein was opened 122', the N was opened 88'
- the "Keswick" shaft, 100' N of the old mill was opened to 50'
- 350 tons ore were extracted from the Tuttle system, 2200 tons from the Gatling workings
- new mill was completed (De Kalb, C., 1899, p.39)

1899: - Gatling shaft deepened to 341', levels at 70', 133', 233' and 333'
- Gatling, level 3, S drift opened 257'
- Gatling level 4, S drift 33'
- Gatling level 2 WE crosscut extended to 356', drifted N 88' and S 112'
- Tuttle shaft deepened to 127'
- Tuttle crosscut extended to 94'
- most drifts in the Tuttle and Gatling shafts were stoped to a height ranging from 10' to 50'
- at least 7 new shafts were opened on the property; Keswick D shaft, 50' deep, Keswick E shaft, 29', Keswick F shaft 50', Hawkeye No. 1 shaft, 165', Hawkeye No. 2 shaft 42', Vein shaft (Gatling West crosscut) w2', Guyline shaft 47' (De Kalb, C., 1900, p.90, 91)
- mill produced 57 tons arsenic byproduct (Gibson, T.W., 1904, p.18)

1900: - Gatling, level 3, S drift extended to 426',
- level 4, S drift extended to 393'
- Gatling level 2, W crosscut, S drift extended to 120'
- Tuttle crosscut level extended to 135'
- Tuttle shaft connected on the fourth level
- "Red" shaft developed on the 40' level (De Kalb, C., 1901, p.116)
- mill produced 303 tons arsenic byproduct (Gibson, W.T., 1904, p.18)

1901:
- new mill was completed, both arsenic and gold were produced
- Gatling, level 3, connected to Tuttle shaft
- Gatling, level 4, 200' S of the shaft, a winze was opened to a depth of 55'
- Tuttle shaft abandoned
- all stopes opened to the surface (from levels 12 and 2) were filled with waste
- Red shaft opened to 155', drifts 95'N, 72'S (Carter, W.E.H., 1902, p.197-198)
- mill produced 695 tons arsenic byproduct (Gibson, T.W. 1904, p.18)

1902-1903:
- Gatling, level 5, drift opened S 83'
- Red shaft, level 1, drifts E 57', W12' level 2 at 150', drift S 117'
- Air shaft opened to 83', level 1, at 42', drift S40'
- mine workings closed (Carter 1903, p.108-109)
- mill produced 1057 tons arsenic byproduct (Gibson, T.W. 1904, p.18)

REFERENCES

Blue, A.	1897, p.58
Brumell, H.P.	1888, p.12S
Carter, T.R.	1981, p.202
Carter, W.E.H.	1902, p.197-198
	1903, p.108-109
De Kalb, C.	1899, p.39
	1900, p.90-91
	1901, p.116
Gibson, T.W.	1904, p.18
Gordon, J.B. et al.	1979, p.35-36
*Hewitt, D.F. and Satterly, J.	1957, Map 1957b
Hurst, M.E.	1927, p.101-102
Kindle, E.D.	1936, p.114,116
Miller, W.G. and Knight, C.W.	1914, p.110
Selwyn, A.R.C.	1874, p.7
Slaght, A.	1893, p.238
	1896, p.264
Vennor, H.G.	1872, p.138-139
Young, A.C.	1937, p.13

31. GATLING FIVE ACRE MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Granite

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Gatling Five Acre mine is located in the southeast corner of Marmora Township, approximately 1.5 kilometres northeast of Deloro and 6 kilometres northeast of Marmora (NTS 31C/12). It is accessible on foot from a 1 kilometre trail which runs east from the Deloro road, less than 1 kilometre north of the town. The mine is located on GSC Map 560A (Wilson 1940).

Lot 10, Con. IX, Marmora Township, Hastings County
NTS BANNOCKBURN 31C12 1:50,000
Latitude 44°31'14"N Longitude 77°36'39"W
UTM Zone 18, 4 932 800 N, 292 500 E

SIZE AND GRADE

The mineralized zone consisted of two major vein systems which are extensions of the ore zones from the Deloro Mine. The "Gatling" vein strikes N-S and dips 55° west; a shaft was opened to a vertical depth of about 50 feet. The "Air" vein strikes NE-SW and dips 60°NW. This vein is developed over strike lengths of 300' and 180' on the 100' and 200' levels respectively. On the 100' level, vein widths ranged up to 15 feet, averaging 4'-5'. A second vein (3'-8' wide) parallels the Air vein about 20' east of the 100' level.

The only development on the Gatling (No.2) vein is a 60' inclined shaft (Hurst 1927, p.103). The Air (No. 1) vein was opened on 3 levels by an inclined shaft 200' deep. At the 78' level, drifts were opened for 185'N and 100'S (De Kalb 1900, p.92, 1901, p.116). The N drift was stoped to a height of about 45' over a length of 125'. At the 100' level, a drift was opened for 100' N of the shaft and was again stoped. In the drift 75' from the shaft, a 20'E crosscut joins a parallel drift which extends 50' in each direction. This drift is stoped to a height of 20' (Carter 1903, p.110). On the 190' level drifts were opened 135'N and 51'S of the shaft. The N shaft was stoped to an unspecified height (Carter 1903, p.110).

Total mine production is as follows:
1900: 610 oz Au from 150 tons ore (0.41 oz/t Au)
1902: 422 oz Au from 1,150 tons ore (0.37 oz/t Au)
1903: 1,321 oz Au from 3,464 tons ore (0.38 oz/t Au)
(ODM Statistical Files, Atlas Arsenic Company Limited)

DESCRIPTION

the southeast corner of Marmora township on the western edge of the Deloro Granite complex (Wilson 1940, Map 560A). In the locality of the mine and other deposits in the Deloro area, the complex consists of granite and syenite and contains few narrow lenses of gabbro and skarn assemblages. Here, the complex is bounded on the west by calcitic marbles (See Figure 33).
Mineralization: Wells (1902, p.103) states that the ore had the same character as that in the Deloro Mine, i.e. ".....The ores consist generally of quartz more or less heavily impregnated with mispickel, with occasional copper pyrite and frequently a large percentage of iron sulphide...".

DEVELOPMENT HISTORY

1895: - The property was initially assessed, an unspecified amount of work was completed (Hurst 1927, p.103)

1899: - The Atlas Arsenic Company Limited was incorporated and acquired the property
- No. 1 shaft opened to 85 feet. At the 78' level, drifts 120'NE and 100'SE, N drift stoped
- No. 2 shaft opened to 60'.
- 10-stamp mill facilities were complete. (De Kalb 1900, p.91-92)

1900: - No. 1 shaft deepened to 100'
- NE drift lengthened by 65', drift stoped to height of 45', for a distance of 125'. A raise opened up to an old surface working.
- power house was erected (De Kalb 1901, p.116-117).
- 610 ounces of gold were recovered from 1500 tons of milled ore (ODM Statistical Files, Atlas Arsenic Company Limited).

1901: - No. 1 shaft opened to over 200'
- 1st level development totals 400' (Wells 1902, p.103).

1902: - Second level opened at 190' (Shaft No. 1)
- drifts 135'N and 51'S. N drift stoped (Carter 1903, p.110).
- 422 ounces of gold were recovered from 1,150 tons ore milled (O.D.M. Statistical Files, Atlas Arsenic Company Limited)

1903: - 1,321 ounces of gold were recovered from 3,464 tons ore (ODM Statistical Files, Atlas Arsenic Company Limited).

1904: - Mining and milling activities ceased (Hurst 1927, p.103).

REFERENCES

Carter, W.E.H.	1903, p.110
De Kalb, C.	1900, p.91-92
	1901, p.116-117
Gordon, J.B. et al.	1979, p.36
Hurst, M.E.	1927, p.103
Wells, J.W.	1902, p.103
*Wilson, M.E.	1940, Map 560A

32. PEARCE (SEVERN) MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite, vein hosted Au, Ag and As.

LOCATION AND ACCESS

The Pearce mine is located immediately southeast of Deloro and approximately 5 kilometres northeast of Marmora (NTS 31C/12). It lies east of Moira River, south of the major tailings pile from the Deloro deposit. Deloro is accessible by a paved road joined to highway 7, at a point 3.5 road kilometres from Marmora. The mine is located on ODM map 1957b (Hewitt, D.F. and Satterly, J. 1957).

E 1/2 Lot 8, Con. VIII, Marmora Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°30'30"N Longitude 77°36'55"W
UTM Zone 18, 4 931 400 N, 292 200 E

SIZE AND GRADE

The workings at the Pearce mine follow a shallow dipping (25° - 40°) mineralized quartz vein. The vein ranges in width from 1 to 8 feet and has been developed to a depth of 185 feet and a strike length of 230 feet (Blue 1894, p.53, Corkhill 1908, p.83, Kindle 1936, p.119).

The workings consist of an inclined shaft excavated to a depth of at least 185 feet. At the 42 foot level, an east drift is open for 27 feet, at 65 feet, a south drift is open for at least 35 feet and stoped to a height of 15 feet. On the major level at 140 feet, drifts extend north for 105 feet and south for 125 feet. A 40 feet section of the south drift is stoped to a height of 45 feet (Blue 1894, p.53, Carter 1902, p.233, Corkhill 1905, p.76, 1908, p.83). The Centaur Mining Company Limited carried out an additional 86 feet of drifting and crosscutting and 70 feet of shaft sinking, however the location of these developments were not specified. The report states that a total of 281 feet of shaft-sinking and 651 feet of drifting and crosscutting were completed (Sinclair 1938, p.111).

The reported mine production totalled 302 oz Au, 60 oz Ag (ODM Statistical Files, Gatling, Pearce and Cleveland Gold Mining Company).

In 1983 recovery from the mill feed averaged $8/oz with a recovery of about 85 to 90% (indicated grade 0.39 oz/ton Au). In 1935 a 2000 pound sample sent to the Mines Branch assayed 0.785 oz/t Au, 0.05 oz/t. Ag and 2.17% As. (Timm, W.B. 1936, p.221-225).

DESCRIPTION

The Pearce mine was developed in a mineralized quartz vein system within the Deloro intrusive complex.

The vein trends east-west and dips 25° to 40° south (Blue A, 1894, p.53). Carter (1902) writes:

".....The development exposes a contact vein varying from one to ten feet wide down the shaft and the drifts, and four feet wide at the shaft bottom, with diorite on the hanging wall or west wall and syenite on the foot, and composed of quartz carrying pyrite and mispickel..."

No current information on the geology of the deposit is available.

DEVELOPMENT HISTORY

1889:- a mineralized sample collected from the "Severn" mine by the G.S.C. assayed 0.175 oz/ton Au, and no Ag (Hoffman 1890, p.31R).

1893:- the property was owned by Mr. Pearce and optioned by the Hastings Mining and Reduction Company.
- an inclined (25°-40°) shaft 7' by 9' by 90' deep was excavated and 27 feet (E) of drifting was completed on the 42 foot level.
- over 300 tons of material was milled (Blue 1894, p.53)
- approximately 100 ounces of gold ($1918) was recovered (O.D.M. Statistical File - Gatling-Pearce, Blue 1894, p.8).

1894:- the property reverted to Mr. Pearce (Blue 1894, p.53)

1900-1903 - the Atlas Gold and Arsenic Mining Company acquired the property (Kindle 1936, p.118-119).
- in 1901, the shaft was excavated to a depth of 165 feet.
  65' level - an S-bearing drift was opened for 35 feet (3' wide, 15' high)
  140' level - an S-bearing drift was opened for 27 feet
  - a W-bearing drift was opened for 10 feet
  - additional structures were built (Carter 1902, p.233-234)

- in 1902
    - 65' level merged into an open stope
    - 140' level - the S-drift was extended to 86', with the ceiling stoped from 15' to 25' in height
    - a N-drift was opened for 110 feet
- the stamp mill was re-opened and the facilities were shared by the Five Acre Mine.
- new hoisting apparatus was installed (Carter 1903, p.110)
- in 1903 development continued and additional material was milled (Miller, W.G. 1904, p.93).

1904 - the Cleveland Mining Company acquired the property and extended the shaft to a depth of 185 feet.
- 320 feet of drifting were carried out from the 60 and 100 foot levels (Corkhill 1905, p.76).

1907 - Mr. H.E. Lawson leased the property from the Cleveland Mining Company
- the S drift at the 140' level was extended to 125'. This drift was stoped to a height of 45' over a distance of 40', starting at a point 75' from the shaft (Corkhill 1908, p.83)

1908 - a total of 302 oz Au and 60 oz Ag were extracted from 239 tons of milled ore (ODM Statistical Files, Cleveland Mining Company)

1935 - The Canadian Straub Mining Machinery Company sent a 1 ton sample of mineralization to the Mines Branch, Ottawa
- the sample assayed 0.785 oz/ton Au, 0.05 oz/ton Ag, 2.17 percent As (Timm 1936, p.221).

1936 - The Centaur Mining Company Limited completed 70' of shaft sinking and 86' of drifting and cross cutting.
- total amount of development 281' shaft-sinking 651' drifting and crosscutting (Sinclair et al. 193, p.11)

REFERENCES

Blue, A.	1894, p.8,53
Carter, T.R.	1980, p.171-173
Carter, T.R. and Colvine, A.C.	1979, p.201-206
Carter, W.E.H.	1902, p.233-234
	1903, p.110
Corkhill, E.T.	1905, p.76
	1908, p.83
Gordon, J.B. et al.	1979, p.36,37
Hoffman, G.C.	1890, p.31R
	1896, p.126S
Kindle, E.D.	1936, p.118-119
Miller, W.G.	1904, p.93
Sinclair, D.G. et al.	1938, p.111
Timm, W.B.	1936, p.221-225

33. SOVEREIGN (CRESENT, POWELL) MINE (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz-carbonate
Other: Granite, calcitic marble

CLASSIFICATION:
IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Sovereign mine is located in the east-central part of Marmora township, about 11 kilometres northeast of Marmora and 5.5 kilometres northeast of Deloro (NTS 31C/12). It is accessible by a paved road which runs north from Highway 7, 3.5 kilometres east of Marmora. The road runs through Deloro to the town of Malone, a total distance of 9 road kilometres. A short vehicle trail leads east from Malone, across the Moira River to the workings, about 0.6 kilometres distance. The mine is located on O.D.M. Map 1957b (Hewitt and Satterly 1957).

Lot 16, 17, Con. XI, Marmora Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°33'43"N Longitude 77°35'53"W
UTM Zone 18, 4 937 350 N, 393 650 E

SIZE AND GRADE

Carter's detailed geological map (Figure 34) shows the workings at the Cameron, Feigle and Gladstone deposits, which collectively make up the Sovereign mine. The Cameron deposit, represented by the westerly showings consists of one major vein about 1 metre wide, oriented 10°/70°W. The vein is exposed intermittently by pits and trenches for a strike length of about 170 metres. A shaft 50 foot deep was excavated on the property during the original development (Vennor 1872, p.140). The large openings east of the Cameron occur at the Feigle deposit which is bounded on the north by the Gladstone. Mineralization within the Feigle deposit occurs in a shallow, subhorizontal vein system in a 20 foot wide zone. Quartz veins ranging from less than 1 inch to 2 feet wide form up to one third of the zone. The mine workings cover an area 350' long by 50' to 100' wide (Hurst 1927, p.105-106). The combined workings of the Feigle and Gladstone deposits cover the north-south trending vein system over a length of about 750 feet. The original workings at the Feigle includes an 80 foot shaft (Stewart 1890, p.110). Workings presently exposed are indicated in Figure 34.

A single, unofficial report claims that $20,000 (about 1110 ounces) of gold were recovered from the Feigle and Gladstone deposits in 1878-1879. Reported mill grades

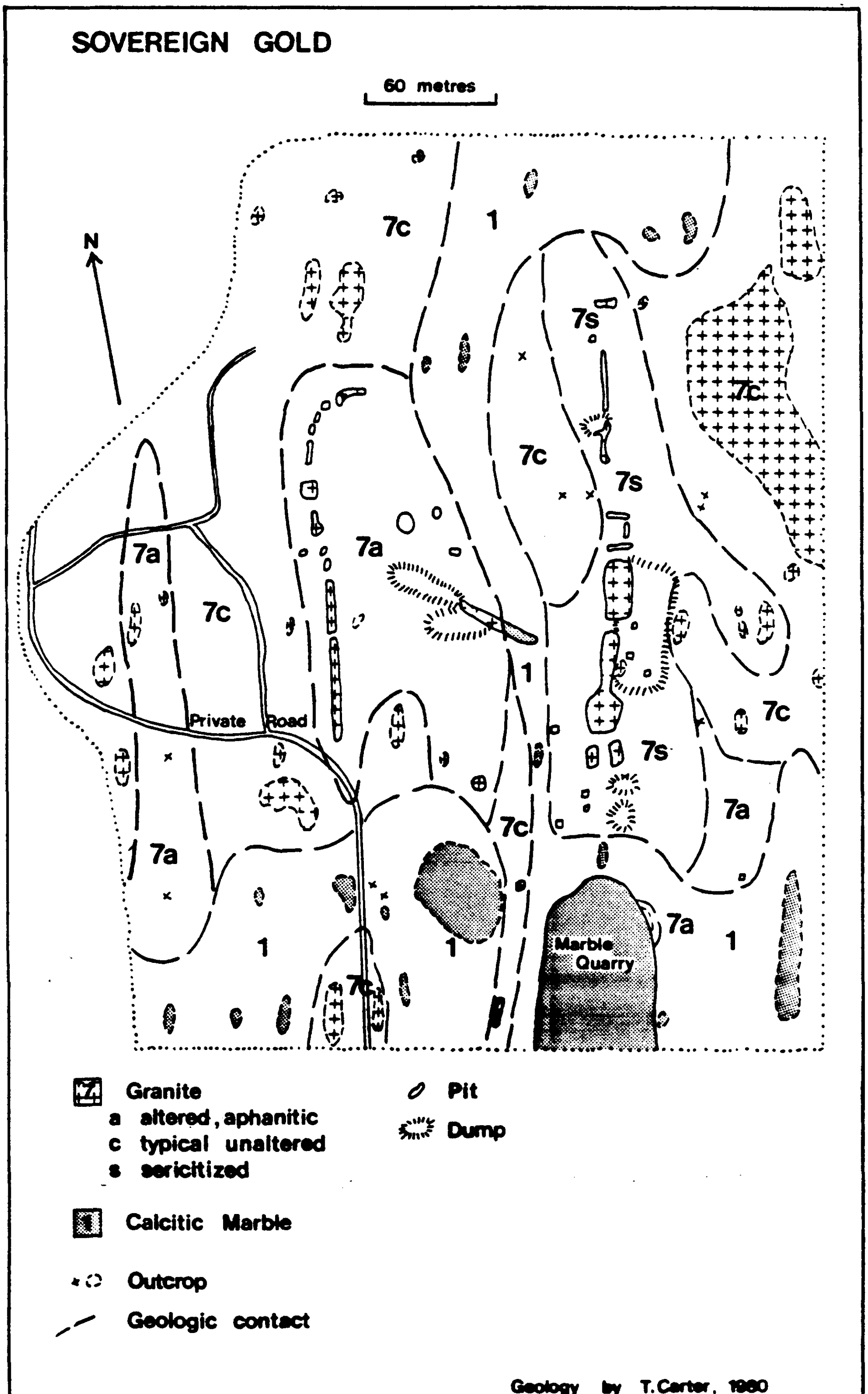

Figure 34: Geology of the Soverign Gold Deposit.

ranged from about 0.17 to 2.8 oz/ton Au (Stewart 1890, p.110). In 1891 and 1892, the Crescent Gold Mining Company produced about $2,000 (103 ounces) of gold from 500 tons ore and $4780 (248 ounces) of gold from 1200 tons ore (O.D.M. Statistical File, Crescent Gold Mining Company, Blue 1894, p.8). In 1900, 42 ounces of gold were recovered from 861 tons of ore (O.D.M. Statistical File, Sovereign Gold Mining Company).

Carter collected 3 mineralized samples from the workings. Assays are listed in Table 49:

Table 49: Assays from the Sovereign Deposits

	Au oz/ton	Ag oz/ton	As (ppm)	Sb (ppm)	Cu (ppm)
80-TRC-101	0.14	<0.1	490	1.0	190
80-TRC-102	0.02	<0.1	100	0.3	45
80-TRC-106	<0.01	nil	2020	4.2	6

DESCRIPTION

General Geology: The Sovereign mine is situated on the northwest boundary of the Deloro Intrusive complex in east central Marmora township (Hewitt and Satterly 1957, Map 1957b). In this area, the complex intrudes a sequence of marbles and minor clastic metasedimentary rocks of the Mayo Group.

Carter's geological map of the deposit includes three variations of the granitic host rock and a calcitic marble unit (Figure 34). The dominant granitic phase (7C) is a homogeneous, pink, massive, medium-grained unaltered granite. In thin section, the rock is rich in orthoclase with little identifiable plagioclase. Biotite and chlorite form 2 percent of the rock. The altered, aphanitic phase (7a) occurs in irregular zones and hosts the "Cameron" workings on the west part of the property. This rock is generally a pink to dark red and green, foliated, fine-grained to aphanitic variety which may be a chilled phase of the intrusion. The foliation is subhorizontal and in places shows compositional banding. In thin section, most of the feldspars are saussuritized and the rock contains a number if quartz-carbonate veinlets. The sericitized granite (7S) occupies one main zone and is the host to the Feigle and Gladstone workings. In thin section, most of the recognizable feldspars are potash feldspars, strongly sericitized. Few feldspars show remnant twinning. The calcitic marble occurs south of the workings and includes a narrow, north-trending band which on surface, separates the Cameron from the Feigle-Gladstone workings. Marbles exposed in a quarry south of the Feigle workings are white, massive and very fine-grained. In thin section, the marble is composed of calcite with minor tremolite and trace opaque minerals. estimated modal percentages and major element chemical analyses of the different units are listed in Tables 50 and 51.

TABLE 50: Estimated Modal Compositions (in percent) of thin sections of selected Rock Units from the Sovereign Deposit

	80-TRC-95	80-TRC-96	80-TRC-97	80-TRC-98	80-TRC-99
Quartz		20	35-40	40	35
Plagioclase)					
)		60	5		35
K-spar)				55	
Sericite					25
Calcite	99	3	10	minor	2
Epidote			40-45		
Biotite				1	3
Chlorite				1	
Hornblende		15			
Tremolite	minor				
Garnet				1	
Zircon					minor
Opaques	<1	2	5	2	minor

80-TRC-95: calcitic marble
80-TRC-96: fine-grained granite
80-TRC-97: fine-grained altered granite
80-TRC-98: unaltered granite
80-TRC-99: sericitized granite

Table 51: Major element chemical compositions (in percent) from the Sovereign Mine

	80-TRC-96	80-TRC-97	800-TRC-98	80TRC-99
SiO_2	62.40	52.30	74.80	71.20
Al_2O_3	13.20	12.60	13.40	13.60
Fe_2O_3	1.74	6.77	1.64	1.50
FeO	4.94	2.35	0.65	2.75
MgO	0.75	2.90	0.18	0.44
CaO	5.37	13.70	0.86	1.71
Na_2O	5.46	0.40	3.79	1.07
K_2O	2.57	3.31	4.36	3.73
MnO	0.08	0.13	0.01	0.05
TiO_2	0.96	0.68	0.39	0.64
P_2O_5	0.07	0.18	0.04	0.01
CO_2	1.02	1.37	0.12	1.43
S	0.02	1.32	0.01	0.14
H_2O^+	0.25	0.52	0.23	0.92
H_2O^-	0.17	0.16	0.06	0.48
Total %	99.00	98.69	100.54	99.67

80-TRC-96 = fine-grained granite
80-TRC-97 = fine-grained, altered granite
80-TRC-98 = granite
80-TRC-99 = sericitized granite

Mineralization:

Stewart (1890, p.110) writes:
".... The rock on both sides is syenite, the vein matter chiefly quartz, with mispickel and some country rock through it.....I simply treated the ore for the free gold. we did not consider the sulphurets rich....".rock through it.....I simply treated the ore for the free gold. we did not consider the sulphurets rich....".

Hurst (1927, p.105-106) writes:
"On the Cameron property .... The vein material piled near the openings consists largely of quartz containing some mispickel, feldspar and tourmaline.....
On the Feigle property .... In the north pit the veins are of quartz containing a small proportion of mispickel, some black tourmaline and aggregates of magnetite...."

Carter reported sparsely disseminated blebs of pyrite and rare arsenopyrite in the quartz vein in the west workings. The wall rock is an aphanitic granite which locally contains abundant disseminated pyrite. In the east workings, the veins were observed to contain very few disseminated blebs and veinlets of pyrite and few grains of arsenopyrite. A polished thin section of quartz vein material contains sparsely disseminated subhedral grains of arsenopyrite (0.5 mm) and minor, fine-grained anhedral pyrite. Sections of mineralized granite samples contain up to 5 percent anhedral pyrite with minor chalcopyrite and pyrrhotite. Other sections of the vein material contain up to 30 percent ankerite and 15 percent chlorite.

DEVELOPMENT HISTORY

1866: a zone of sulphide mineralization was first reported on the property by Mr. H.G. Vennor (1872, p.140).

1867-1871:
- at the Powell mine, a shaft was opened to a depth of 50' and a small quantity of ore was treated at the mill (Vennor 1872, p.140).

1872-1879:
- work continued on the Powell (Cameron) property and the Feigle and Gladstone deposits were opened on the east half of the lot (Stewart 1890, p.110, Hurst 1927, p.106).
- in 1878, Mr. D.E.K. Stewart leased the Feigle mine and later purchased the Gladstone mine. The deposits were worked for 13 to 14 months and approximately $20,000 (1,100 ounces) of gold were recovered. The workings consisted of two shafts 50 feet and 80 feet deep and numerous open pits (Stewart 1890, p.110).

1890-
1893: - The Crescent Gold Mining Company acquired the Powell (Cameron), Feigle and Gladstone properties (Ingall and Brumell 1895, p.125S; Hurst 1827, p.105). A new mill was erected. The inclined shaft at the Feigle deposit was extended to a depth of 90 feet and a limited amount of drifting and stoping was completed. A second shaft was opened to a depth of 65 feet and additional ore was removed from a larger open pit. A number of surface pits were also excavated on the property. (Blue 1894, p.53, Slaght 1892, p.223-224; 1893, p.238).
- In 1891, about $2,000 (103 oz) of gold were recovered from 500 tons of milled ore. In 1892, $4780 (245 oz) of gold were recovered from 1200 tons of ore (Crescent Gold Mining Company, ODM Statistical Files; Blue 1894, p.52)

1900-
1903: - The Feigle (Sovereign) occurrence was acquired by the Sovereign Gold Mining and Development Corporation of Ontario Limited no later than 1902 (Wells 1902, p.102; Miller 1904, p.93).
- a limited amount of development was completed in pre existing pits near the boundary with the Gladstone deposit.

in 1900- a total of 42 ounces of gold were recovered from 262 tons of milled ore (Sovereign Gold Mining Company, ODM Statistical Files).

REFERENCES

Blue, A.	1893, p.238-239
	1894, p.
Gordon J.B. et al.	1979, p.
*Hewitt, D.F and Satterly, J.	1957, Map 1957b
Hurst, M.E.	1927, p.105-106
Ingall, E.D. and Brumell, H.P.H.	1893
	1895, p.125S
Kindle, E.D.	1936, p.192
Miller, W.G.	1904, p.93
Slaght, A.	1892, p.223-224
	1893, p.238-239
Stewart, D.E.K.	1890, p.110
Vennor, H.G.	1872, p.140
Wells, J.W.	1902, p.102

34. PICAMINE OCCURRENCE

COMMODITY: Gold, Copper

ROCK ASSOCIATION:
Host: Quartz vein
Other: Metagabbro, diorite

CLASSIFICATION
IIIA1: Concordant to discordant quartz and quartz-ankerite, vein hosted Au, Ag and As.

LOCATION AND ACCESS

The occurrence is located in the southeast corner of Palmerston township, approximately 3.5 kilometres south of Mississippi Station and 13.5 kilometres north of Sharbot Lake (NTS 31 C/15). It is accessible on foot approximately 0.8 kilometres east of Highway 509 at a point 4.5 road kilometres south of Mississippi Station. The location is indicated on ODM maps 2053 (Hewitt, 1964) and 1956-4 (Smith, 1958).

Lots 1, 2 Con. VIII, IX, Palmerston township, Frontenac county.
NTS SHARBOT LAKE 31 C/15 1:50,000
Latitude: 44°53'32"N, Longitude: 76°40'47"W
UTM Zone 18, 4 972 150 N, 367 350 E.

SIZE AND GRADE

The mineralization occurs in a system of quartz veins, however the major showings are found in 2 major veins which outcrop within 100 feet of one another. The veins range in width from a few inches to 3.5 feet and are exposed by test Thompson, 1949, p.2). According to a prospectus for Picamine Copper Gold Mines Limited (Thompson, 1950, p.10-11) a diamond drill program (totalling 998 feet) indicates that the veins pinch out at depths of 30 to 40 feet. The report states that one area (500 feet by 1000 feet) contains a number of mineralized zones, one with an estimated possible tonnage of 2000 tons. At least 10 trenches and pits were opened on the mineralized veins. Carter reported that the major workings in the centre of the property consist of 2 pits 3m to 4m in diameter and 7m deep connected by a trench 10m long and 3m wide. Earlier reports indicate that the pits were 35 feet deep. In another prospectus for Picamine Copper Gold Mines Limited, Thompson (1949, p.2) states that zones in the veins contain up to 30 percent chalcopyrite. The report lists the following gold values from 7 mineralized samples: 0.12 oz/ton, 0.04 oz/ton, 1.33 oz/ton, 0.01 oz/ton, 0.06 oz/ton, 0.01 oz/ton and 0.79 oz/ton (approximate values based on the price of gold at $36.00/ounce). A 500 pound sample of mineralized material was shipped to the Ore Dressing Plant in Ottawa; the concentrate assayed 32 percent Cu, 30 percent S and 29.5 Fe with low values of Au and Ag.

DESCRIPTION

The Picamine occurrence is situated near the southwest boundary of a large, elongate gabbroic complex which extends from the north part of Oso township, northeast beyond North Sherbrooke and Dalhousie townships. Smith (1958, p.19) writes: "....there is a considerable complexity of rock types ranging from gabbro to granite and pegmatite. The country rock at the deposit was described as a fine-grained diorite and biotite schist, cut by aplite dikes up to 1-2 feet wide (Smith, 1958, p.42). The mineralization occurs in quartz veins (few inches to 3.5 feet wide) oriented at N30°E and dipping 60°S". Mineralization: Mineralization consists of chalcopyrite, pyrite and pyrrhotite in quartz veins with lesser amounts of carbonate. The concentration of mineralization is variable, ranging from zones of weakly disseminated chalcopyrite to segments containing up to 30 percent sulphides (Thompson, 1950, p.10). Carter noted that the sulphide grains generally occur in dispersed, discrete grains and the veins often contained abundant subhedral quartz crystals.

DEVELOPMENT HISTORY

1870's: The initial discovery was made and a few shallow pits were opened by unknown operators. (Thompson, 1949, p.1)

1920's: Two large pits 35 feet deep were excavated by unknown operators (Thompson, 1949, p.1)

1939: A 500 pound sample of mineralized material was sent to the Ore Dressing Plant in Ottawa. Concentrates assayed 32 percent copper (Thompson, 1949, p.2)

1948-1949: The Picamine Prospecting Syndicate carried out some surface development. Picamine Copper Gold Mines Limited acquired the property and carried out geological and geophysical surveys and a diamond drill program (998 feet). (Picamine Copper Gold Mines Limited Prospectus, 1950).

1952: One drill hole (349 feet) was completed on the Riddell property Lot 1 Con. IX. The best mineralized segments of core contained disseminated chalcopyrite and pyrite, and assayed 0.25 oz/ton Ag, trace Au over 1.7 feet, 0.24 oz/ton Ag, trace Au over 5.1 feet and 0.70 oz/ton Ag, trace Au over 4.5 feet.

1957: An assessment report for Corval Corporation Limited states that a geological and soil geochemical survey was carried out in Lot 1, Con. IX. The report mentions that one drill hole was completed by Quebec Metallurgical Industries Limited, however the results were not reported (Angus, 1957, p.4).

1958: A diamond drill assessment report indicates that one barren hole (81 feet) was drilled in the northeast part of Lot 1 Con. IX. The operator was not identified.

REFERENCES

Angus, W. L.	1957,	Geoscience Data Centre, Toronto
*Hewitt, D. F.	1964,	Map 2057
Sangster, B.L.	1970,	p.255
*Smith, B. L.	1958,	p.19-42, Map No. 1956-4
Thompson, C. N.	1949,	Geoscience Data Centre, Toronto
	1950,	" " " "

35. <u>CRAIG GOLD MINE</u> (Past Producer)

COMMODITY
Gold

ROCK ASSOCIATION
Host: Vein quartz
Other: Mafic metavolcanics

CLASSIFICATION:

IIIA1: Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As.

LOCATION AND ACCESS

The Craig mine is located in the southeast corner of Tudor township, approximately 8,5 kilometres northeast of Bannockburn in Madoc township (NTS 31C/12). The mine is east of Wolf Lake and is accessible by a 4.5 kilometre vehicle trail which branches south from the Wolff Lake access road, southwest of the lake. The Wolff Lake access road joins an all-weather road about 4 road kilometres northeast of Highway 62, immediately north of Bannockburn. It is located on ODM geological maps 2168 (Lumbers 1968) and 1957b (Hewitt and Satterly 1957).

Lots 4,5 Con. III, Tudor Township, Hastings County
NTS BANNOCKBURN 31C/12 1:50,000
Latitude 44°42'09N Longitude 77°30'22"W
UTM Zone 18, 4 952 750 N, 301 450 E

SIZE AND GRADE

The mineralized zone is exposed at intervals over a distance of about 990 feet; widths range from 0.5 feet to 6 feet on surface and up to 12 feet at depth (Lumbers 1969, p.63, Miller 1902, p.198)

The mine was developed from 2 shafts 245 feet and 200 feet deep, spaced about 270 feet apart (Lumbers 1969, p.64). Sinclair et al. (1936, p.86; 1937, p.98) reported that 1800 feet and 1260 feet of lateral excavations, respectively, were completed during the first and second phase of mine development. Drifting was carried out from 3 levels at about 50 feet, 125 feet and 225 feet. No complete mine plan is available from published reports, however reports indicate that the shafts are connected at the upper level and 910 feet of drifting was completed from the 225 foot level of the south shaft. In Figure 35, Carter located about 10 pits and trenches. Lumbers (1969, p.64) reported that the major trench at the northwest end of the vein is 250 feet long, up to 9 feet wide and 5 feet deep. Another trench, located 250 feet southeast of the south mine dump, is approximately 20 feet long, 5 feet wide and 4 feet deep.

Bulk samples of material sampled from the original pits assayed about 0.2 oz/ton Au (Slaght 1898, p.92). During the first stage of mine development in 1905-1906, 1850 tons of rock was milled producing 248 ounces of gold (ODM Statistical Files, Craig Mine). The mill concentrate was reported to contain 1.0 to 1.5 percent copper (Corkhill 1906, p.89). Prior to the second stage of development, Craig Gold Mines Limited estimated that 40,000 tons of rock grading 0.88 oz/ton Au was present at the mine (Northern Miner, September 27, 1934). During the second development stage about 5,200 tons of material was hoisted (Sinclair et al. 1938, p.121). A 23.25 ton sample shipped to the Mines Branch in Ottawa assayed 0.05 oz/ton Au (Parsons 1937, p.197). Thomson (1943, p.33) collected grab samples from the north shaft and south shaft mine dump which assayed 0.03 and 0.49 oz/ton Au respectively. A number of additional assays reported from various sources are listed in Table 52.

DESCRIPTION

The Craig Mine occurs in a mineralized quartz veinwithin part of the Tudor Metavolcanic Formation near the southwest boundary of the Lingham Lake Complex (Lumbers 1969, Map 2168). Lumbers (1969, p.41) writes: "The Tudor Metavolcanic Formation is composed mainly of mafic metavolcanics and contains some felsic flows and pyroclastic rocks, and rarely carbonate metasediments and iron formation." The Lingham Lake Complex straddles the Tudor-Grimsthorpe township line and is one of a number of plutons which intrude the Tudor Formation in this area. The complex is composed of metapyroxenite, gabbro, diorite and tonalite.

The geology of the Craig mine is described by Lumbers (1969, p.63) as follows:

Table 52: Assays of Mineralized Samples from the Craig Gold Mine

	Au oz/ton	Ag oz/ton	Cu %	As ppm	Sb ppm
S. shaft, mine dump qtz vein (Carter 1980)	0.12	<0.1	0.06	225	1.8
N. shaft, mine dump, qtz vein chip sample (Carter 1980)	0.28	0.26	0.02	65	0.7
S. shaft, mine dump, qtz. vein (Thomson 1943, p.33)	0.49				
N. shaft, selected grab sample (Thomson 1943, p.33)	0.03				
200' SE of S shaft, vein sample (Lumbers 1969, p.64)	0.65	0.41	0.76		
N shaft, mine dump, qtz. vein (Lumbers 1969, p.64)	0.04	tr	0.17		
S. shaft, vein sample (Lumbers 2969, p.65)	0.20	tr	0.26		
S. shaft, mine dump, grab sample (Lumbers 1969, p.65)	0.11	1.95	0.48		
N. shaft, 0.8' qtz. vein (Gill 1981, p.16)	0.70	0.85	1.47		
N. shaft, 1.5' qtz. vein (Gill 1981, p.16)	0.14	0.13			
N. shaft, 1.2' qtz. vein (Gill 1981, p.16)	0.005	0.06	0.04		
N. shaft, 0.7' qtz. vein (Gill 1981, p.16)	0.08	0.40	0.44		
N. shaft, mine dump, tailings (Gill 1981, p.16)	0.05	0.09	0.03		
S. shaft, mine dump, qtz. vein sample (Gill 1981, p.16)	0.01	0.07	0.03		
S shaft, mine dump, grab sample (Gill 1981, p.16)	0.03	0.15	0.08		

"....The mineralization is in a prominent northwest-trending quartz vein which, locally passes into zones of closely spaced, en echelon quartz veins. On the surface, the vein, which ranges in width from 1/2 to 6 feet, can be traced at intervals for 990 feet and is in contact metamorphosed mafic metavolcanics of the Tudor metavolcanics which form part of the aureole of the Lingham Lake Complex; the vein was traced to within 20 feet of the southern contact of the complex. In the two trenches, slickensides are present in the wallrock metavolcanics, and the quartz vein is sheared locally; where massive, the quartz is generally white, but where sheared, the quartz is usually bluish-grey. Blocks of altered metavolcanics are present in vein material on the three mine dumps. These features suggest that the vein is a fissure filling; 860 feet due west of the vein in lot 5, Concession III, a northwest trending fault zone was found in the metavolcanics in which discontinuous quartz veins and quartz vein networks are developed locally...."

Carter's geological sketch map (Figure 35) show the location of the mine working within the mafic metavolcanic rocks near the contact with the gabbroic intrusive. In thin section a typical sample of massive, fine-grained mafic metavolcanic rock (80-TRC-148) contains up to 75% hornblende and 15% epidote with lesser amounts of disseminated carbonate, quartz, plagioclase and opaques. The sample also contains few irregular quartz-epidote-calcite veinlets. A thin section of the same massive, fine-grained type sampled within the quartz vein (80-TRC-150) contains up to 50% biotite, 25% calcite and 15% quartz, with minor disseminated chlorite and opaques. Estimated modal compositions and whole rock chemical compositions of these samples are listed in Tables 53 and 54, respectively. Silicification and carbonatization of the host rock in the vein zone are apparent in the mineralogical differences between the samples but the whole rock analyses show that the rock is depleted in silica and to a smaller degree in calcium.

Mineralization: Lumbers (1969, p.63) writes: "...These veins rarely contain sparsely disseminated pyrite, pyrrhotite and chalcopyrite, and a grab sample of one mineralized vein collected by the author gave upon assay traces of gold and silver." His samples of mineralization from the mine dumps contained up to 15 percent sulphides. Polished thin sections of mineralized quartz veins collected from the mine dumps by Carter contain up to 2 percent pyrite, 3 percent chalcopyrite and minor pyrrhotite within a gangue of massive, fine- to coarse-grained quartz and minor carbonate (ankerite). Pyrite occurs as anhedral grains (< 1.5 mm) and crystal aggregates in either irregular, discontinuous veinlets or disseminated grains. Chalcopyrite forms irregular blebs up to 4mm in size and occurs with pyrite aggregates within small, irregular

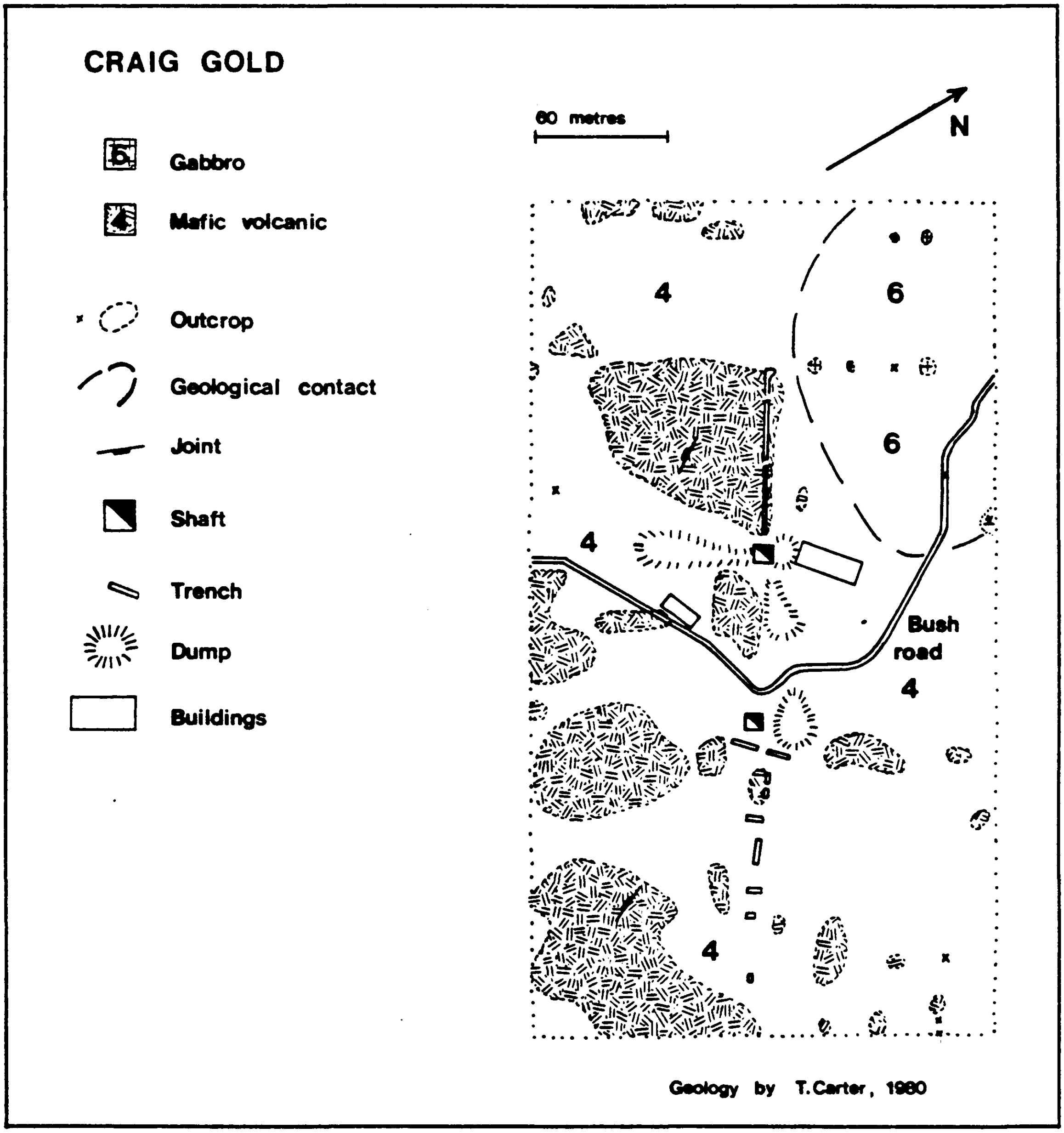

Figure 35: Geology of the Craig Gold Deposit.

Table 53: Estimated modal compositions, Craig Mine

	80-TRC-198 %	80-TRC-150 %
Hornblende	75	
Biotite		50
Carbonate	5	25
Quartz	3	15
Epidote	15	-
Chlorite		5
Plagioclase	minor	
Opaques	2	5

Table 54: Major element chemical compositions, Craig mine

	80-TRC-148	80-TRC-150
SiO_2	47.20	42.00
Al_2O_3	13.80	12.10
Fe_2O_3	2.60	1.20
FeO	10.50	9.80
MgO	8.77	7.54
CaO	10.40	9.50
Na_2O	2.46	0.79
K_2O	0.40	3.53
MnO	0.20	0.14
TiO_2	1.58	1.47
P_2O_5	0.12	0.10
CO_2	0.11	7.83
S	0.06	0.38
H_2O^+	0.42	2.20
H_2O^-	0.74	0.44
Total %	99.36	99.02

veinlets. Few fine, irregular grains of pyrrhotite are dispersed throughout the gangue.

DEVELOPMENT HISTORY

before 1896:- The Craig property was owned by Mr. P. Vanleek, J. Maitland, D. Robbins and the J. Brown estate.
- Two pits were opened to a depth of 10 feet and an unspecified amount of material was milled, grades of about 0.2 oz/ton Au were reported (Slaght 1898, p.92).

1896:- The property was optioned to an unnamed company for a period of 6 months
- A shaft was sunk to a depth of 100 feet, several small shipments of rock were treated. but no encouraging results were reported
- property reverted to the original owners (Slaght 1898, p.92).

1903:- The Craig mine was reopened by Mr. W.A. Hungerford and associates
- an additional plant was constructed (Miller 1904, p.98).

1904-1907:- The mine was owned and operated by the Craig Gold Mining and Reduction Company (Corkhill 1905, p.75).
- by 1906, 2 shafts were excavated to 110' and 150', the 60' level was opened between the shafts and 50' of drilling was completed on the 150' level.
- Report indicates that the shafts were extended to 210' and 165' with 1800' of lateral work (Sinclair et al. 1936, p.86).
- a total of 1850 tons of material was milled producing 248 ounces of gold (O.D.M. Statistical File).

1934-1936:- Craig Gold Mines Ltd. erected new mining equipment and extended the N and S shafts to depths of 245' and 200' respectively.
- About 350' of drifting was completed on the 50' level and 910' on the 225' level. The south shaft was cleared and explored at the 100' level and 5,200 tons of rock were hoisted from the N shaft (Sinclair et al. 1936, p.86; 1937, p.98; 1938, p.121).
- 23 1/4 tons of material grading 0.05 oz/ton Au was shipped to Ottawa for analysis (Parsons, 1936, p.197).

1981:- Craig Gold Mines Incorporated carried out a sampling program on the property (J.C. Gill 1981).

REFERENCES

Carter, T.R.	1980, p.171-173
Carter, T.R. and Colvine, A.C.	1979, p.200-201
Carter, W.E.H. and Miller, W.G.	1904, p.93
Corkhill, E.T.	1905, p.79
	1906, p.89
Gibson, T.W.	1906, p.4
	1907, p.6
Gill, J.C.	1981
Gordon, J.B. et al.	1979, p.37
Hopkins, P.E.	1922, p.15
*Lumbers, S.B.	1969, Map 2168, p.63-65
Miller, W.G.	1902, p.198
Parsons, C.S.	1937, p.197
Sinclair, D.G. et al.	1937, p.98
Sinclair, D.G. et al.	1938, p.120-121
Slaght, A.	1898, p.92
*Thomson, J.E.	1943, p.32-33, Map 52b
Young, A.C.	1937, p.14.

TABLE C: Minor Gold and Silver Occurrences

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
36	Kennefic Occurrence	Anglesea Township Lot 7, Con.V	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Arsenopyrite	Quartz veins in mafic meta-volcanic rocks, gabbro	- Arsenopyrite bearing quartz veins occur in a zone 7' wide striking N20°E (centre lot). - A shaft, 20' deep was opened on the vein system and a pit was excavated on another vein in the south part of the lot. - Low gold values were reported	*Hewitt, D.F. (1964, p.28, Map No. 2053) Hurst, M.E. (1927, p.109-110) *Meen, V.D. (1944, p.30, Map 51d) *Moore, J.M. Jr. and Morton, R.L. (1980, Map P.2278) Sangster, A.L. (1970, p. 229-230) Wells, J.W. (1902, p.105)
37	O'Donnell II Occurrence	Anglesea Township Lot 7, Con.III	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Pyrite, Chalcopyrite	Quartz vein in mafic metavol-canic rocks	- Trench(es) opened up on a N-S trending quartz vein 1.5 to 3.0' wide. - Pyrite and chalcopyrite mineralization observed, unspecified gold and silver values were reported	*Hewitt, D.F. (1964, Map 2053) * Moore, J.M. and Morton, R.L. (1980, Map P2278)
38	Lot 13 Con. I Occurrence	Barrie Township Lot 13, Con. I	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Sphalerite, Pyrite, Pyrrhotite	Vein quartz in mafic meta-volcanic rocks	- Occurrence is hosted in a quartz vein and shear zone within a coarse, massive andesite, approx-imately 400' north of the contact with quartz-ite and metaconglomerate units of the overlying Flinton Group. - The vein strikes N75°E, and dips 80°S (maximum width 30"). - S or hanging wall contains pyrite, pyrrhotite. N. wall contains sphalerite, significant gold values were reported from the quartz-sphalerite zone (Meen 1944, p.42) - Before 1943, the Cobalt-Frontenac Mining Company explored the vicinity and excavated a 12' deep pit on the vein.	Gordon, J.B. et al. (1979, p.40) Hewitt, D.F. (1964, p.10, Map 2053) *Meen, V.B. and Harding, W.D. (1942, Map No. 51d) *Moore, J.M. and Morton, R.L. (1980, Map P.2278) Shklanka, R. (1969, p.135)

39	Mill Occurrence	Barrie Township Lot 36, Con.II	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Tetrahedrite, Arsenopyrite, Pyrite, Chalcopyrite	Quartz vein in dolomitic marble and altered granitic dikes	- A pit 30' by 12' by 6' deep is opened on dolomitic marble cut by 2 dikes and one quartz vein. - A small trench was excavated a short distance SW of the pit. - Dikes are oriented N35°E (1' wide) an N10°W (3' wide) - 6" wide quartz vein along west wall of large dike and quartz stringers in marble contain blebs (up to 1/2 inch) of tetrahedite, pyrite and chalcopyrite - one mineralized sample assayed 0.12 oz/ton Au. - Trenching and stripping by Camgar Mining Syndicate (1939-1940) (Meen 1944, p.39,40).	Gordon, J.B. et al. (1979, p.40) *Meen, V.B. (1944, p.39-40, Map 51d) *Moore, J.M. and Morton, R.L. (1980, Map P. 2278)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
40	Ore Mountain Mines Occurrence	Barrie Township Lot 32, Con. I	IIIA1:Concordant to discordant quartz. Quartz-ankerite vein-hosted, Au, Ag, and As		Quartz Veins? in metavolcanic rocks	- In 1915, Ore Mountain Mining Co. Ltd. opened a shaft 7' by 11' by 10' deep. - According to ODM Map 51d, the shaft occurs in mafic metavolcanic rocks (Meen and Harding 1942)	Meen, V.B. and Harding, W.D. (1944, p.48) *Meen, V.B. and Harding, W.D. (1942, Map 51d) *Moore, J.M. Jr. and Morton, R.L. (1980, Map P.2278) Sutherland, T.F. et al. (1915, p.161)
41	Pay Ore Mines Occurrence	Barrie Township, Lots 35, 36, Con.I	IIIA1?:Concordant to discordant quartz, quartz-ankerite vein hosted Au, Ag and As		Vein quartz?	- In 1914, Pay Ore Mines Ltd. excavated a shaft 7' by 11' by 66' deep (Sutherland et al. 1915, p.161)	Gibson, T.W. (1915, p.59) Sutherland, T.F. et al. (1915, p.161) Sutherland, T.F. et al. (1916, p.129)
42	Pay Rock Occurrence	Barrie Township Lot 16, Con.I	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein hosted Au, Ag and	Native gold	Vein quartz, dolomitic marble	- In 1936, a number of pits and trenches were excavated in a rusty zone within dolomitic marble oriented N72°E/70°S. - A lamprophyrye dike intrudes the marble near the rusty zone. - Native gold was reported in a rusty zone containing numerous, discontinuous quartz veins (Meen 1944, p.42) - Pay Rock Gold Syndicate held 8 claims over the area in 1942.	Gordon, J.B. et al. (1979, p.40) *Hewitt, D.F. (1964, p.10, Map 2053) Meen, V.B. (1944, p.42) *Meen, V.B. and Harding, W.D. (1942, Map 51d) *Moore, J.M. and Morton, R.L. (1980, Map P.2278)

NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
43 Cashel Copper Occurrence	Cashel Township Lot 31, Con. I	IIIA1:Concordant to discordant quartz, quartz-ankerite vein-hosted Au, Ag and As	Galena Chalcopyrite Pyrite Pyrrhotite	Vein quartz in trondhjemite	- 1916-1918 Cashel Copper Mines Ltd. opened a shaft (5.5' by 10.5' by 80' deep) on a mineralized quartz vein at the contact between a small granitic stock and marbles of the Dungannon Formation. - Mineralization consists of chalcopyrite. - Flat-lying quartz veins in a pit south of the shaft contain up to 10 % disseminated galena with minor chalcopyrite, pyrite and pyrrhotite. A grab sample assayed 0.01 oz/ton Au, 0.87 oz/ton Ag.	Gordon, J.B. et al. (1979, p.42) *Lumbers, S.B. (1968, p.39, 40, Map 2142) Shklanka, R. (1969, p.141) Sutherland, T.F. et al. (1917, p. 135) Sutherland, T.F. et al. (1918, p. 133)
44 Lot 20, Con. I Occurrence	Cashel Township Lot 20, Con. I	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Galena, Pyrite, Chalcopyrite	Vein quartz in mafic metavolcanic rocks	Workings consist of 2 trenches in mafic metavolcanic rocks - Major showing a pit 20' by 10' with rock dump containing mineralized quartz vein material from an insitu vein or possibly a float fragment (Thomson 1943, p.31) - Mineralization; massive pockets, disseminated crystals, crystal aggregates of galena with minor intergrown chalcopyrite and disseminated pyrite. - Grab samples assayed 0.04 oz/ton Au, 9.56 oz/ton Ag (Lumbers 1968, p.39), 0.01 oz/ton Au, 5.10 oz/ton Ag (Thomson 1943, p.31). - Second pit 260' E of dump, trench 70'x6'x6' deep exposes a vein zone oriented N 25°W. - Veins are up to 12" wide, contain abundant tourmaline, and disseminated pyrite and chalcopyrite. - Little Au, Ag detected in an assay.	Gordon, J.B. et al. (1979, p.42) *Lumbers, S.B. (1968, p.39, Map 2142) Sergiades, A.O. (1968, p.31) Shklanka, R. (1969, p.141) Thomson, J.E. (1943, p.31)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
45	Lot 23, Con.IX (Cook Occurrence)	Clarendon Township Lot 23, Con.IX	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As.	Arsenopyrite	Vein quartz in diorite	- The country rocks generally trend northeast and are intruded by a feldspar porphyry dike near the showing (Pauk 1982, Map P. 2487). - Mineralization consists of patches of arsenopyrite (<1.5 cm diameter) - Sample assays ranged from 0.19 to 0.87 oz/ton Au, and averaged 14% As (Wells 1902, p.105).	Gordon, J.B. et al. (1979, p.41) *Hewitt, D.F. (1964, p.12, Map 2053) Miller, W.G. and Knight, C.W. (1914, p.105) *Pauk, L. (1982, p.76-77, Map P.2487) *Smith, B.L. (1958, p.39, Map 1956-4) Wells, J.W. (1902, p.105)
46	Lots 16,17, Con. II Occurrence	Dungannon Township, Lots 16, 17 Con. II	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As.	Pyrite	Slate	- Occurrence consists of 2 rusty zones in marble, slate and amphibolite - South zone strikes N70°E, dips 70°S. It is 20' wide and exposed for 180'. The zone consists of black slate with disseminated sulphides. One sample assayed 0.01 oz/ton Au. - A small area over the north zone contains nodules and stringers of pyrite (Thomson 1943, p.31)	Gordon, J.B. et al. (1979, p.42) Thomson, J.E. (1943, p.31)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
47	Turriff Occurrence	Dungannon Township Lot 26, Con. III	IIIA1:Concordant to discordant, quartz, quartz-ankerite vein-hosted Au, Ag and As	Pyrite Arsenopyrite Chalcopyrite	Marble	- Mineralized zone occurs in marble cut by gabbro dikes. - 3 pits were excavated along strike (N70°E) over a distance of 90 feet. The east pit is 25 feet deep. - Mineralization in the rock dump consists of pyrite with minor arsenopyrite and chalcopyrite. Grab sample assayed 0.02 oz/ton Au, 0.25 % Cu. (Thomson 1943, p.31).	Gordon, J.B. et al. (1979, p.43) Thomson, J.E. (1943, p.31)
48	Barry Occurrence	Elzevir Township Lot 5, Con.II	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Gold		- In 1869 Native gold was reported at the showing. - A shallow shaft was excavated (Vennor 1870, p.169)	Gordon, J.B. et al. (1979, p.43) Kindle, E.D. (1936, p.115) Vennor, H.G. (1870, p.169)
49	Cobalt-Frontenac Ltd. Occurrence	Grimsthorpe Township Lot 29, Con. XVIII	IIIA3:Other geological association, gold		Aplite dike	- A number of surface trenches were opened up in a metavolcanic schist intruded by an aplite dike. Marble was also exposed at one pit. - Low gold values were detected in samples of aplite (Meen 1944, p.50)	Meen, V.B. (1944, p.49-50) *Meen, V.B. and Harding, W.D. (1942, Map No. 51d)
50	Palmotter Occurrence	Grimsthorpe Township Lot 20, Con. XIX	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Pyrrhotite Arsenopyrite Pyrite Chalcopyrite Galena	Vein quartz in mafic metavolcanic rocks	- Mineralized quartz veins in foliated amphibolites, mafic metavolcanics - Mineralization includes pyrrhotite, arsenopyrite and pyrite with minor chalcopyrite and galena. - Veins commonly found in shear zones.	Palmotter Occurrence (Geoscience Data Centre, Toronto)
51	West Black River Occurrence	Grimsthorpe Township Lot 29, Con.X	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Pyrite	Vein quartz in biotite gneiss	- A pit was opened on a N-S trending quartz vein (up to 12" wide) which cuts biotite gneiss. - Pyrite mineralization is abundant (Meen 1944, p.50)	Meen, V.B. (1944, p.50) *Meen, V.B. and Harding, W.D. (1942, Map No. 51d)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
52	Ewing Occurrence	Kaladar Township Lot 20, Con IV	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Pyrrhotite	Vein quartz in shear zone between mafic metavolcanic rocks and conglomerates	- J. Ewing worked the occurrence from 1935 - 1937 (Harding, 1944, p.72) - Occurrence is situated at the contact between mafic metavolcanic rocks of the Hermon Group and a quartz-pebble conglomerate unit from the Flinton Group (Wolff 1982, p.78. - Rock units are steeply dipping, and strike northeast. - Mineralization occurs in a 10' wide rusty shear zone containing quartz veins and sulphide mineralization. The zone is exposed by trenches over a distance of 150'. A chip sample over an 8' width of the zone assayed 0.07 oz/ton Au (Harding 1944, p.72). - One drill hole (160') intersected minor pyrrhotite mineralization beneath the surface workings (Woodman 1963).	Gordon, J.B. (1979, p.46) Harding, W.D. (1944, p.72) *Hewitt, D.F. (1968, p.30, Map 2053) *Meen, V.B. and Harding, W.D. (1942, Map No. 51d) Woodman, A.H. (1963, Geoscience Data Centre, Toronto) *Wolff, J.M. (1982, p.78, Map 2432)
53	Mitchie Occurrence	Kaladar Township Lot 15, Con. VII	IIIA1:?Concordant to discordnt, quartz, quartz-ankerite, vein hosted Au, Ag and As	Pyrite	Quartzo-feldspathic sandstone?	- The occurrence is situated on carbonate bearing quartzo-feldspathic sandstone and quartz-pebble conglomerate units of the Flinton Group (Wolff 1982, Map 2432) - T.C. Mitchie drilled 2 holes (524.5') on the occurrence. One hole intersected a 1' wide rock unit composed of fine- to medium-grained quartzo-feldspathic sandstone containing minor mica, hornblende and epidote. The zone assayed trace gold (Mitchie 1972, 1974).	Mitchie, T.C. (1972, 1974, Geoscience Data Centre, Toronto) *Wolff, J.M. (1982, p.75,78,80, Map 2432)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
55	Sopha-Miller Gold Mine Ltd. Occurrence	Lake Township Lots 6, 7, 8 Con. I	IIIAI:?Concordant to discordant, quartz, quartz-ankerite, vein hosted, Au, Ag and As			- Sopha Miller Gold Mines Ltd. erected a headframe and hoist and compressor facilities. - The shaft collar penetrated 8' of the overburden. - Shaft was located over a gold occurrence indicated by a diamond drill hole (Reade 1952, p.68).	Laakso, R.K. (1968, p.24) Reade, M. (1952, p.68)
56	Higman Occurrence	Limerick Township Lot 9, Con. VII	IIIAI:Concordant to discordant, quartz, quartz-ankerite, vein hosted, Au, Ag and As		Vein quartz	- Sulphide-bearing quartz vein in folded sequence of layered metagreywacke and para-amphibolite	Adams, F.D. and Barlow, A.E. (1910, p.346) *Lumbers, S.B. (1969, p.70, Map 2167)
57	Empire Mine Occurrence	Madoc Township Lot 1, Con. VI Lot 2, Con.V	IIIAI:Concordant to discordant quartz, quartz-ankerite, vein hosted, Au, Ag and As	Antimony sulpho-salts Arsenopyrite Pyrite Galena Gold	Vein quartz-calcite	- Quartz-calcite vein in dolomitic marble and chloritic gneiss. - Gray antimony (+ copper) minerals, with minor arsenopyrite, pyrite, galena and gold. - Samples of mineral concentrate assayed over 66 oz/ton Ag and 2 oz/ton Au (Vennor 1870, p.170) - Samples were reported to assay over $400/ton Ag and Au (Kindle 1936, p.117)	*Hewitt, D.F. (1968, Map No. 2154) Kindle, E.D. (1986, p.117) Vennor, H.G. (1870, p.168 - 170)
58	Fox Occurrence	Madoc Township E1/2 Lot 18, Con. V	IIIAI: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag, and As		Vein quartz	- In 1866 a shaft opened on a vein containing minor quantities of gold	Kindle, E.D. (1936, p.117)
59	St. Joe Occurrence	Madoc Township Lot 25, Con.V	IIIAI: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As		Vein quartz	- Mineralization occurs in a vein system which strikes east-west - A 30 foot shaft was sunk before 1898 - Samples assays ranged from 0.10 to 3.5 oz/ton Au (approximate) (Slaght, 1898, p.89)	Gordon, J.B. et al. (1979 p.44) Hewitt, D.F. (1968, p.20 Map No. 2154) Slaght, A. (1898, p.89)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
54	Stone Occurrence	Kaladar Township N1/2 Lot 23 Con. V	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Gold Arsenopyrite Pyrite Chalcopyrite Pyrrhotite Galena Sphalerite	Vein quartz in the contact between metavolcanic rocks and conglomerates	- The mineralized zone is situated within quartz veins and altered rocks at the contact between mafic metavolcanic rocks of the Tudor Formation (Hermon Group) and the quartz-pebble conglomerates of the Flinton Group (Wolff 1982, p.78, Map 2432). - Rock units trend northeast and dip vertically. - In 1939, W. Lessard discovered gold and a variety of sulphide minerals in an 8' wide segment of the vein (Harding 1944, p.72-73) - One drill hole (160.5') intersected minor pyrrhotite mineralization (Woodman 1962).	Gordon, J.B. et al. (1979, p.47) Harding, W.D. (1944, p.72-73) *Hewitt, D.F. (1968, p.30, Map No. 2053) *Meen, V.B. and Harding, W.D. (1942, Map No. 51d) Woodman, A.H. (1962, Geoscience Data Centre, Toronto) *Wolff, J.M. (1982, p.78, Map 2432)
61	Consolidated Occurrence	Marmora Township Lot 5, Con. IX	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Arsenopyrite	Vein quartz	- The Canadian Consolidated Company analyzed a sample of grey-white quartz, mineralized with arsenopyrite; assay value 0.058 oz/ton Au. (Hoffman, 1890, p.32R) - Little work was done on the vein (Stewart, 1890, p.110).	Hoffman, G.C. (1890, p.32R) Stewart, D.E.K. (1890, p.110) *Wilson, M.E. (1940, Map No. 560A).

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
60	Campbell-Blomfield Occurrence	Marmora Township E1/2 Lot 6 Con. VIII	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Arsenopyrite	Vein quartz	- Occurrence is hosted in a quartz vein which trends NW and Dips 30° SW. The footwall is in contact with a slate unit - Vein is at least 6' wide and contains abundant arsenopyrite. High gold values were reported (Wells 1902, p.104) - Property originally named the Malone Mine. The Crescent Gold Mining Company sank 2 shafts to depths of 60' and 12'. 100 tons of arsenopyrite rich material analyzed contain 0.7 oz/ ton Au. (Slaght 1896, p.263, Blue 1896, p.18). - About 1900, the property was owned by Campbell, A.H. and Blomfield, C.J. No work was reported. - Property acquired by Ackerman Gold Mines Ltd. in 1937.	Blue, A. (1896, p.18) Gordon, J.B. et al. (1979, p.44) Kindle, E.D. (1936, p.115) Slaght, A. (1896, p.263-264) Vennor, H.G. (1870, p.268) Wells, J.W. (1902, p.104) *Wilson, M.E. (1940, Map 560A)
62	Demars Occurrence	Marmora Township Lot 24, Con. V	IIIA1:Concordant to discordant, quartz, quartz-ankerite vein- hosted, Au, Ag and As.	Arsenopyrite, Gold	Vein quartz in granite	- Mineralization consists of arsenopyrite and free gold in a quartz-vein zone 66 feet wide. - Mr. M.H. Powell discovered the occurrence in 1889 (Blue 1899, p.53). - Mr. E. Demarse completed some development work and sank several pits in the NW corner of the property in 1891. - In 1893, 2 or 3 additional pits were excavated (Ingall 1893, p.151 SS).	Blue, A. (1894, p.53) Gordon, J.B. et al. (1979, p.44) Hardy, A.S. (1894, p.53) Ingall, E.D. (1893, p.151SS)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
63	Gawley No. 1 Occurrence	Marmora Township E1/2 Lot 18, Con. IX	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Arsenopyrite Pyrite Chalcopyrite	Vein quartz	- Mineralization occurs in a 10' wide quartz vein - Mineralization consists of arsenopyrite chalcopyrite. The gangue minerals are quartz and calcite - Samples assayed approximately 0.34 oz/ton Au, 14% As. - In 1901 Atlas Arsenic Co. Ltd. sank a 100' deep shaft (Wells 1902, p.104).	Gordon, J.B. et al. (1979, p.44) Wells, J.W. (1902, p.104)
64	Gawley No. 2 Occurrence	Marmora Township Lot 9, Con. X	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Arsenopyrite	Vein quartz?	- In 1902 the property was owned by Mr. A. Gawley. - Sample assays ranged from 0.34 to 0.39 oz/ton Au 0.89 to 3.13 oz/ton Ag 12 to 18% As (Wells, 1902, p.104)	Gordon, J.B. et al. (1979, p.44) Wells, J.W. (1902, p.104)
65	Gillen Occurrence	Marmora Township NE1/4 Lot 6, Con. VIII	IIIA1:Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As		Vein quartz	- Mineralized quartz vein (3' wide) in a granite. - A "5-stamp" milliwas operated in 1870 - 1871. 100 tons of material averaged 0.30 oz/ton Au. (Kindle 1936, p.117). - May be part of the Campbell-Blomfield Occurrence.	Gordon, J.B. et al. (1979, p.44) Kindle, E.D. (1936, p.117) Vennor, H.G. (1970, p.168)
66	Gladstone Occurrence	Marmora Township W1/2 Lot 17 Con. XI	IIIA3:Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Arsenopyrite	Vein quartz in metagreywacke	- See Soverign Mine	Gordon, J.B. et al. (1979, p.44) Hurst, M.E. (1927, p.106) Stewart, D.E.K. (1890, p.110

NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
67 Hawkeye Occurrence	Marmora Township E1/2 Lot 10 Con VIII	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As	Arsenopyrite	Vein quartz	- Arsenopyrite-bearing quartz veins cut a sequence of interlayered "slate, felsite and greenstone" (Vennor 1872, p.139) - Two shafts (46' and 30' deep) were excavated by Mr. Jones in 1871. - Canadian Goldfields Ltd. owned the property about 1900.	Gordon, J.B. et al. (1979, p.45) Hardy, A.S. (1890, p.110) Kindle, E.D. (1936, p.118) Oniller. W.G. (1902, p.197) Vennor, H.G. (1872, p.139) *Wilson M. E. (1940, Map 560A)
68 Neill, B. Occurrence	Marmora Township W1/2 Lot 14, Con. X	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Arsenopyrite	Vein quartz	- In 1867, H.G. Vennor traced out a mineralized quartz vein. The vein is located immediately west of a granitic body and is separated from it by a granite-greenstone breccia (Vennor 1872, p.139-140). - Mr. B. Neill excavated a pit on the vein in 1870-1871. - A sample of the vein bearing arsenopyrite assayed about 0.25 oz/ton Au (Vennor 1972, p.139-140). - Another sample containing fine-grained, disseminated arsenopyrite in a quartz-biotite host assayed 0.117 oz/ton Au (Hoffman 1890, p.32 R).	Gordon, J.B. et al. (1979, p.45) Hoffman, G.C. (1890, p.32 R) Vennor, H.G. (1872, p.139-140)
69 Robinson, F. Occurrence	Marmora Township Lot 17, Con IX	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Pyrite Pyrrhotite Arsenopyrite	Quartz, Quartz-carbonate veins	- Veins generally oriented N60°E, occur in marble near a felsite porphyry.	Robinson property (Geoscience Data Centre, Toronto)

NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
70 Lot 12, Con X (McKnight, W) Occurrence	Olden Township NW1/4, Lot 12, Con. X	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag, As	Pyrite Pyrrhotite	Vein quartz in quartzo-feldspathic paragneiss	- Pyrite and pyrrhotite occur in quartz veins and stringers in quartzo-feldspathic paragneiss - In 1959 Cremac Surveys Co. Ltd. drilled a 72m hole, a 0.6m section assayed trace gold.	*Wolff, J.M. (1981, p.75-76, Map P.2373)
71 Mountain Grove Occurrence	Olden Township Lot 14, Con. IV	IIIA3: Other geological association, gold		Quartzite	- Mineralization consists of a rusty weathered zone within quartzites intruded by granitic masses. The quartzite is oriented N75°E and dips 75°SE. - A pit 12' deep was excavated by Mr. A. MacDonald before 1925. - Grab samples of the best-mineralized material assayed trace gold (Harding 1951, p.57).	Harding, W.D. (1951, p.57)
72 Raymond, Ira Occurrence	Olden Township Lot 10, Con.VI	IIIA3: Other geological association, gold	Pyrite	Pyritized Zone in metagreywacke, quartzite	- Rusty pyritized zones and lenses in metagreywackes and quartzites oriented E-W, dipping 80°S. Beds locally contorted - Small amount of blasting was completed before 1945. - Mineralized sample assayed nil Au, minor Ni. - Showing originally reported to contain gold (Harding 1951, p.57).	*Harding , W.D. (1951, p.57, Map 1947-5)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
73	Bourke, R.T. Occurrence	Oso Township Lot 23, Con. I	IIIA3 Other geological association, gold	Pyrite, Chalcopyrite	Granitic dike in marble	- Rocks in the area consist of folded marbles, quartzites, greywackes and metavolcanic rocks intruded by granite. - Showing occurs in a pit exposing a mineralized granite dike in marble. Marble strikes approximately E-W, and dips steeply south. - A 7' deep pit was excavated by Mr. W. Duffy in the early 1900's. - Pyrite, chalcopyrite and malachite occur in quartz-rich zones in the dike. Low gold values were reported from chip samples of the mineralization (Harding 1951, p.58).	Gordon et al. (1979, p.41) *Harding, W.D. (1951, p.58, Map No. 1947-5) Wolff, J.M. (1981, p.74, Map P.2373)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
74	Lot 14, Con.I Occurrence	Oso Township W1/2 Lot 14, Con.I.	IIIA3: Other geological association, gold	Pyrite Pyrrhotite Chalcopyrite	Quartzo-feld-spathic paragneiss	- Mineralization consists of sporadically disseminated pyrite, pyrrhotite and chalcopyrite in quartzo-feldspathic paragneiss and quartzites near cross-cutting granite pegmatite veins. - In 1959 Cremac Surveys Co. Ltd. drilled a 93 m hole, a 0.6 m. section assayed trace Au (Wolfe 1981, p.75).	*Wolff, J.M. (1981, p.75-76, Map P.2373)
75	McVeigh, R Occurrence	Oso Township W1/2, Lot 18 Con. IV	IIIA3: Other geological association, gold	Pyrite	Granite dike in marble	- Occurrence consists of a mineralized fine-grained granitic dike (2' wide) intruding marble. Marble units strike N30°E, dip 60°E. - Showing is exposed in a 13' deep pit excavated by R. McVeigh in 1937. - Dike contains minor disseminated pyrite. Low gold values were reported by R. McVeigh (Harding 1951, p.58-59.	Gordon, J.B. et al. (1979, p.42). *Harding, W.D. (1951, p.58-5 Map No. 1947-5). *Wolff, J.M. (1981, p.74-75, Map P.2373)
76	Morrow, A. Occurrence	Oso Township Lot 15, Con. II	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As.	Pyrite	Vein quartz in quartzite	- Mineralization occurs in a 2' wide quartz vein and in the flat-lying quartzite country rock. - Zone is mineralized with disseminated pyrite. Pit samples analyzed 0.01 oz/to Au. - In 1941-1944 A. Morrow sank a pit 15' long, 3 ' deep. - A second pit (300' north) was excavated in a pegmatite to a depth of 4'. Pyrite graphite and actinolite were identified (Harding 1951, p.58).	Gordon, J.B. et al. (1979, p.41-42) *Harding, W.D. (1951, p.58, Map No. 1947-5) *Wolff, J.M. (1981, p.75, Map P. 2373)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
77	Tysick, D Occurrence	Oso Township Lot 27, Con. VI	IIIA3: Other geological association, gold	Pyrite	Gabbro-Diorite, Marble, Granite	- Mineralization consists of disseminated pyrite within a diorite-gabbro containing small lenses of marble. A narrow granite dike inmtrudes the rocks at the showing. - In 1938 Mr. P. Tysick sank a pit to a depth of 5'. - Low gold values were reported in assays of a mineralized grab sample (Harding 1951, p.60).	Gordon, J.B. et al. (1979, p.49) *Harding, W.D. (1951, p.60, Map 1947-5)
78	Canadian Occurrence	Rawdon Township Lot 4, Con. III	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Galena Pyrite Sphalerite	Quartz-calcite Vein?	- Fine-grained galena and minor pyrite and sphalerite occur with quartz and calcite - One sample assayed 51.04 oz/ton Ag and no detectable Au (Hoffman 1897, p.35R). - The Canadian Company held the property in 1968 (Serglades, A.O., 1968, p.31)	Gibson, T.W. (1902, p.205) Hoffman, G.C. (1897, p.35R) Serglades, A.O. (1968, p.31)
79	Lot 12, Con. II Occurrence	South Sherbrooke N1/2 Lot 12, Con. II	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As	Chalcopyrite Pyrite Galena	Vein quartz	- Sample of transluscent quartz with minor chalcopyrite, pyrite and coarsely crystalline galena assayed 3.50 oz/ton Au, 0.41 oz/ton Ag (Miller, 1902,p.204)	Gordon, J.B. et al. (1979, p. 46) *Hewitt, D.F. (1964, P.25, Map No. 2054) Miller, W.G. (1902, p.204)
80	Glanmire Occurrence	Tudor Township Lot 26, Con. XIII	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As.	Pyrite	Vein quartz	- Occurrence consists of a 10' wide quartz vein with tourmaline and minor disseminated pyrite. Grab sample assayed trace gold and silver. - Showing exposed in a pit 9' by 5' by 10' deep.	*Lumbers, S.B. (1969, p.69-70, Map 2168)
81	Lingham Lake Occurrence	Tudor Township Lot 1, Con.X	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As.	Arsenopyrite Pyrite	Vein quartz	- Quartz vein associated with trondhjemite dikes in quartz diorite, contains less than 10 percent disseminated arsenopyritearsenopyrite and pyrite. Grab sample assayed trace gold and silver.	Lumbers, S.B. (1969, p.68-69, Map 2168)

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82	Lot 4, Con.XIV Occurrence	Tudor Township Lot 4, Con. XIV	IIIA3: Other geological association, gold	Arsenopyrite Pyrite Chalcopyrite	Rhyolite	- Mineralization consists of sparsely disseminated arsenopyrite (up to 10 percent) and minor pyrite and chalcopyrite in mylonitized porphyritic, potassic rhyolite. - Four shallow trenches expose the mineral ization.	Lumbers, S.B. (1969, p.69, Map 2168)
83	Lot 5, Con. XV Occurrence	Tudor Township S1/2 Lot 5, Con.XV	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted Au, Ag and As.	Arsenopyrite	Vein quartz in sheared meta-sedimentary or metavolcanic rock	- Assessment report by R.B. England indicates 3 showings on quartz veins in "grey schists" or "shale". - Arsenopyrite occurs in the quartz vein and at the contact with the schist. - Two mineralized samples assayed 0.06 oz/ton Au, Trace Ag, Trace Cu and 0.03 oz/ton Au, Trace Ag, Trace Cu.	England, R.B. (1970, Geoscienc Data Centre, Toronto) Lumbers, S.B. (1969, Map 2168)

	NAME	LOCATION	CLASSIFICATION	METALLIC MINERALS	HOST ROCK	REMARKS	REFERENCES
84	Lot 7, Con.X Occurrence	Tudor Township Lot 7, Con. X	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein hosted Au, Ag and As	Arsenopyrite	Vein quartz in diorite	- Occurrence consists of a N-S trending quartz vein cross-cutting gneiss and diorite. - 1908, an INCO report indcated a vein containing minor arsenopyrite. One sample assayed approximately 0.1 oz/ton Au (Thomson 1943, p.73).	Gordon, J.B. et al. (1979, p.45) Lumbers, S.B. (1969, p.70) Thomson, J.E. (1943, p.33)
85	Moira River Occurrence	Tudor Township N1/2 Lot 5, Con. XIII	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein hosted, Au, Ag and As	Arsenopyrite	Vein quartz and rhyolite	- A mineralized quartz vein (2' wide) cuts a potassic rhyolite unit. - Working consists of a pit 8' by 5' by 4' deep. - Vein contains disseminated arsenopyrite, the rhyolite country rock contains a few massive stringers (1/8 inch wide) of arsenopyrite. - Grab sample of the mineralized vein assayed 0.01 oz/ton Au, Trace Ag. - Grab sample of massive arsenopyrite from the rhyolite assayed 0.03 oz/ton Au, Trace Ag. (Lumbers 1969, p.68).	Gordon, J.B. et al. (1979, p.45) *Lumbers, S.B. (1969, p.68, Map 2168)
86	Quinlan Lake Occurrence	Tudor Township Lot 2, Con. II	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein hosted, Au, Ag and As	Arsenopyrite Pyrite	Vein quartz in mafic metavolcanic rocks	- A northeast-trending quartz vein (up to 10' wide) in mafic metavolcanic rocks contains disseminated arsenopyrite and minor pyrite and tourmaline. - A grab sample of the vein assayed 0.08 oz/ton Au, Trace Ag. (Lumbers 1969, p.68)	Gordon, J.B. et al. (1979, p. 45) *Lumbers, S.B. (1969, p.68, Map 2168)

87	Sheppard Occurrence	Tudor Township Lot 12, Con. II	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein hosted, Au, Ag and As	Gold	Vein quartz in granite	- A mineralized quartz vein (11' wide) in granite was traced for approximately 200'.A 15' pit was opened on the vein - before 1885. The original owner, Mr. Sheppard reported that traces of gold were observed in the vein and grab samples assayed up to 5 oz/ton Au. (Willmot 1885, p.12L).	Gordon, J.B. et al. (1979, p.45) *Lumbers, S.B. (1969, p.70, Map 2168) Willmot (1885, p.12 L)
88	Snow Road Occurrence	Tudor Township Lot 11, Con. XIII	IIIA1: Concordant to discordant, quartz, quartz-ankerite, vein-hosted, Au, Ag and As.	Pyrite	Quartz-carbonate veins in mafic and felsic metavolcanic rocks	- Mineralized quartz-carbonate stringers and veins up to 1' wide occur within interlayered mafic and felsic metavolcanic rocks. - Mineralization consists of minor disseminated pyrite. - A grab sample analysed trace gold and silver. - Workings include 5 pits, the largest with dimensions 20' by 5' by 15' deep (Lumbers 1969, p.69).	Lumbers, S.B. (1969, p.69, Map 2168)
89	Rollins Occurrence	Wollaston Township N1/2 Lot 16, Con. XIV	IIIA3: Other geological association, gold	Arsenopyrite	Calcitic marble, quartzite, biotite schist	- Irregular bands of arsenopyrite mineralization (4" to 20" wide) occur within a banded sequence of calcitic marble, impure quartzite and biotite schist. - Arsenopyrite also occurs in metamorphosed sandstone near the margin of a stringer of pegmatite. - Workings consist of a 25' shaft and a small pit. - In 1901, 2 carloads of material were shipped to Deloro. Assays averaged 27.2 percent arsenic and trace gold. (Hurst 1927, p.100, Kindle 1936, p.119)	Gordon, J.B. et al. (1979, p.45) Hurst, M.E. (1927, p.100) Kindle, E.D. (1936, p.119)

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Ministry of Natural Resources
Ontario

Hon. Michael Harris
Minister

Mary Mogford
Deputy Minister

Ontario Geological Survey

MAP P.2737

Mineral Deposit Series – Preliminary Map

BASE METAL, MOLYBDENUM, AND PRECIOUS METAL DEPOSITS

MADOC – SHARBOT LAKE AREA

SOUTHERN ONTARIO

Scale 1:125 000

Metres 2000 0 1 2 3 4 5 6 7 8 Kilometres

Miles 2 1 0 1 2 3 4 5 Miles

NTS Reference: 31C
OGS Geological Compilation Map: 2418

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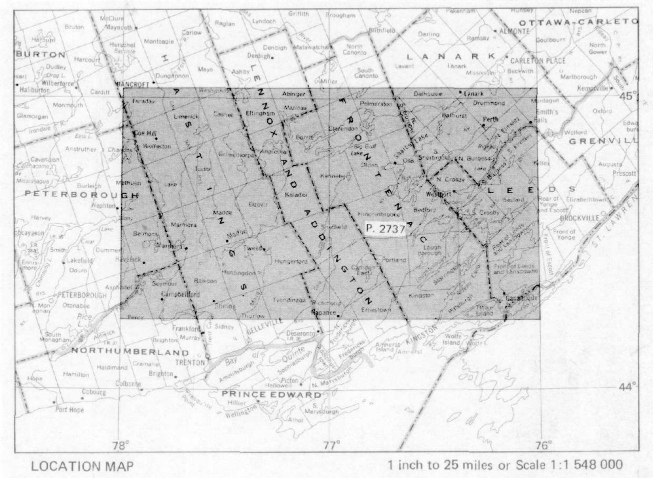

LOCATION MAP

1 inch to 25 miles or Scale 1:1 548 000

PROPERTIES[a]

BASE METALS AND PYRITE

NO.	NAME	STATUS[b]	TOWNSHIP
1.	Barrie Syndicate (International)	O	Barrie
2.	Buffadison	P	Barrie
3.	Stead (Cook)	P	Barrie
4.	Murphy-Hickey	O	Bedford
5.	Robinson	P	Bedford
6.	Thirty Island Lake	P	Bedford
7.	Deer Lake Zinc-Copper-Silver	P	Belmont
8.	Gunter	O	Cashel
9.	Ardoch Zinc (Green Lake)	O	Clarendon
10.	Wilkinson Zinc	O	Hinchinbrooke
11.	Canada Mine	P	Hungerford
12.	Hungerford Mine	PP	Hungerford
13.	Hungerford Western Extension	O	Hungerford
14.	Ontario Sulphur Mine	PP	Hungerford
15.	Donahue Creek	O	Kaladar
16.	Spry Zinc	O	Kaladar
17.	Crowe River	P	Lake
18.	Katherine Lead Mine	PP	Lake
19.	Crysler Lead	P	Limerick
20.	Macassa Copper-Nickel	P	Limerick
21.	Frontenac Lead Mine	PP	Loughborough
22.	Bannockburn Pyrite Mine	PP	Madoc
23.	Blakely Pyrite Mine	PP	Madoc
24.	Canadian Sulphur Ore (Wellington) Mine	PP	Madoc
25.	Eldorado Copper Mine	PP	Madoc
26.	Hollandia Lead Mine	PP	Madoc
27.	Bonter	P	Marmora
28.	Caverly	O	Marmora
29.	Myers Rusty Schist	O	Marmora
30.	Bertrim	O	Olden
31.	Long Lake Zinc Mine	PP	Olden
32.	Sharbot Lake Mines Limited	P	Olden
33.	Smith, W.J.	O	Olden
34.	Long Point	O	Rear of Leeds and Landsdowne
35.	Slave Lake Zinc	P	Sheffield
36.	Blackburn	O	Tudor
37.	Ramsay, W.	O	Tudor
38.	Stewart	O	Tudor
39.	Rose Island Zinc	O	Wollaston
40.	Buckhorn Mines	O	Barrie
41.	Burridge Road	O	Bedford
42.	Crozier, A.	O	Bedford
43.	Crozier, Rupert,	O	Bedford
44.	Murphy, James	O	Bedford
45.	Murphy, John	O	Bedford
46.	Murphy, Leo	O	Bedford
47.	Patterson,	O	Bedford
48.	Hinchcliffe Lake	O	Cashel
49.	Little Salmon Lake	O	Cashel
50.	Trumble	O	Cashel
51.	Clarendon	O	Clarendon
52.	Minktrack Lake	O	Clarendon
53.	Mississippi	O	Clarendon
54.	Stalker	O	Clarendon
55.	Swamp Creek	O	Clarendon
56.	Turtle Lake	O	Clarendon
57.	Lot 23, Con III	O	Dungannon
58.	Robson Claims	O	Grimsthorpe
59.	Wadsworth Lake	O	Grimsthorpe
60.	Duncan Lake	O	Hinchinbrooke
61.	Lot 33, Conc XII	O	Hungerford
62.	North Brook	O	Kaladar
63.	Big Clear Lake (Clark)	O	Kennebec
64.	Kennebec	O	Kennebec
65.	Lot 11, Conc II	O	Kennebec
66.	Donahue Vein	O	Lake
67.	Lot 8, Con X	O	Lake
68.	Steen Lake	O	Lake
69.	Snooks	O	Loughborough
70.	Davis	O	Madoc
71.	Farrell Mine	O	Madoc
72.	Webber	O	Madoc
73.	Methuen	O	Methuen
74.	Macdonald, E.	O	Olden
75.	McKnight, W.M.	O	Olden
76.	Crain	O	Oso
77.	Foley	O	Sheffield
78.	Lot 15, W. of Hastings Road	O	Tudor
79.	Lot 23, Con B	O	Tudor
80.	Lot 28, Con B	O	Tudor
81.	Lot 30, Con B	O	Tudor
82.	Lot 33, Con III	O	Tudor
83.	Lot 34, Con IV	O	Tudor
84.	Lombard	O	Tudor
85.	Murphy Mine	O	Tudor
86.	Reelman	O	Tudor
87.	Roberts	O	Tudor
88.	Stewart	O	Tudor
89.	Wright	O	Tudor

PRECIOUS METALS

NO.	NAME	STATUS[b]	TOWNSHIP
1.	O'Donnell III (N)	O	Anglesea
2.	O'Donnell I (S)	O	Anglesea
3.	Ultimate Energy and Resources	O	Anglesea
4.	Big Dipper	P	Barrie
5.	Gough (Hardie)	O	Barrie
6.	Helena	P	Barrie
7.	Kashwakamak	O	Barrie
8.	Mazinaw Base Metals (Myer's Cave)	O	Barrie
9.	Natto	O	Barrie
10.	Ore Chimney	P	Barrie
11.	Star Mine	PP	Barrie
12.	Cordova Mine	PP	Belmont
13.	Ledyard	P	Belmont
14.	Boerth	P	Clarendon
15.	Webber	O	Clarendon
16.	James Joseph	O	Elzevir
17.	Silver King	P	Elzevir
18.	Gilmour Mine	PP	Grimsthorpe
19.	Addington	PP	Kaladar
20.	Dome Mine	P	Kennebec
21.	Emery	O	Kennebec
22.	Gold Base	O	Kennebec
23.	McMurray	O	Limerick
24.	Bannockburn	P	Madoc
25.	Richardson	P	Madoc
26.	Sophia Mine	PP	Madoc
27.	Ackerman	P	Marmora
28.	Cook Mine	PP	Marmora
29.	Dean and Williams Mine	PP	Marmora
30.	Deloro Mine	PP	Marmora
31.	Gatling Five Acres Mine	PP	Marmora
32.	Pearce Mine	PP	Marmora
33.	Sovereign Mine	PP	Marmora
34.	Picamine	O	Palmerston
35.	Craig Mine	PP	Tudor
36.	Kennefic	O	Anglesea
37.	O'Donnell II	O	Anglesea
38.	Lot 13, Con I	O	Barrie
39.	Mill	O	Barrie
40.	Ore Mountain	O	Barrie
41.	Pay Ore	O	Barrie
42.	Pay Rock	O	Barrie
43.	Cashell Copper	O	Cashel
44.	Lot 20, Con I	O	Cashel
45.	Lot 23, Con IX (Cook)	O	Clarendon
46.	Lots 16,17, Con II	O	Dungannon
47.	Turriff	O	Dungannon
48.	Barry	O	Elzevir
49.	Cobalt-Frontenac	O	Grimsthorpe
50.	Palmotter	O	Grimsthorpe
51.	West Black River	O	Grimsthorpe
52.	Ewing	O	Kaladar
53.	Mitchie	O	Kaladar
54.	Stone	O	Kaladar
55.	Sophia-Miller	O	Lake
56.	Higman	O	Limerick
57.	Empire	O	Madoc
58.	Fox	O	Madoc
59.	St. Joe	O	Madoc
60.	Campbell-Blomfield	O	Marmora
61.	Consolidated	O	Marmora
62.	Demars	O	Marmora
63.	Gawley No. 1	O	Marmora
64.	Gawley No. 2	O	Marmora
65.	Gillen	O	Marmora
66.	Gladstone	O	Marmora
67.	Hawkeye	O	Marmora
68.	Neill	O	Marmora
69.	Robinson	O	Marmora
70.	McKnight	O	Olden
71.	Mountain Grove	O	Olden
72.	Raymond, I.	O	Olden
73.	Bourke, R.T.	O	Oso
74.	Lot 14, Con I	O	Oso
75.	McVeigh	O	Oso
76.	Morrow	O	Oso
77.	Tysick	O	Oso
78.	Canadian	O	Rawdon
79.	Lot 12, Con II	O	South Sherbrooke
80.	Glanmire	O	Tudor
81.	Lingham Lake	O	Tudor
82.	Lot 4, Con XIV	O	Tudor
83.	Lot 5, Con XV	O	Tudor
84.	Lot 7, Con X	O	Tudor
85.	Moira River	O	Tudor
86.	Quinlan Lake	O	Tudor
87.	Sheppard	O	Tudor
88.	Snow Road	O	Tudor
89.	Rollins	O	Wollaston

MOLYBDENUM

NO.	NAME	STATUS[b]	TOWNSHIP
1.	Clow	O	Hinchinbrooke
2.	Marisette	O	Kaladar
3.	Ronaldson	O	Kennebec
4.	Kring	O	Miller
5.	Shannon	O	Miller
6.	Merkley	O	North Crosby
7.	Avery	O	Olden
8.	Gray	O	Olden
9.	MacDonnell	O	Olden
10.	Smith	O	Olden
11.	Varette (Silver)	O	Olden
12.	Calvert	O	Sheffield
13.	Chisholm Molybdenite Mine	PP	Sheffield
14.	Dwyer	O	Sheffield
15.	Keller	O	Sheffield
16.	Spratt	O	Sheffield
17.	Wager	O	Sheffield
18.	Drader	O	Hinchinbrooke
19.	Godfrey	O	Hinchinbrooke
20.	Sills	O	Hinchinbrooke
21.	Corak	O	Oso
22.	Burns	O	Sheffield
23.	Oberkerk and Molony	O	Sheffield

NOTES:

a) Complete property descriptions are provided in Ontario Geological Survey OFR 5548.

b) O = Occurrence, P = Prospect, PP = Past Producer

LEGEND

PHANEROZOIC
CENOZOIC
QUATERNARY
PLEISTOCENE AND RECENT
Sand, gravel, clay

UNCONFORMITY

PALEOZOIC
ORDOVOCIAN
MIDDLE ORDOVICIAN

10
- 10 Unsubdivided Simcoe Group (west of Frontenac Axis)
  Ottawa Group (Middle Ordovician unsubdivided east of Frontenac Axis)
- 10a Lindsay Formation; nodular limestone, shale
- 10b Verulam Formation; biocalcarenite, limestone, shale
- 10c Bobcaygeon Formation; calcarenite, limestone
- 10d Gull River Formation; limestone, dolostone
- 10e Shadow Lake Formation; red and green sandstone, siltstone, shale

EARLY ORDOVICIAN

9
- 9 Unsubdivided Beekmantown Group
- 9a Oxford Formation; dolostone
- 9b March Formation; dolostone, quartz sandstone

CAMBRO-ORDOVICIAN

8
- 8 Unsubdivided Potsdam Group
- 8a Nepean Formation; quartz sandstone
- 8b Covey Hill Formation; feldspathic quartz sandstone

UNCONFORMITY

PRECAMBRIAN[a]
LATE PRECAMBRIAN
LATE MAFIC INTRUSIVE ROCKS

7
- 7 Diabase, diorite, gabbro, amphibolite, in dikes and sills, porphyritic andesite dikes.

ALKALIC INTRUSIVE ROCKS

6
- 6 Nepheline syenite (gneissic to foliated), biotite nepheline syenite.

FELSIC TO INTERMEDIATE INTRUSIVE ROCKS

5
- 5a Granite, adamellite (quartz monzonite), granodiorite, syenite, monzonite, trondhjemite (quartz diorite).
- 5b Pegmatite, leucocratic granite dikes, white pegmatite dikes and sills, minor quartz syenite, syenite pegmatite dikes and sills.
- 5c Orthogneiss, leucocratic homogeneous quartzofeldspathic gneiss ±biotite, hornblende, hypersthene. Includes many areas of paragneiss

EARLY MAFIC INTRUSIVE ROCKS

4
- 4 Diorite, gabbro, peridotite, pyroxenite, anorthosite, quartz diorite (tonalite), orthoamphibolite

GRENVILLE SUPERGROUP
METASEDIMENTARY AND METAVOLCANIC ROCKS
METASEDIMENTARY ROCKS
Clastic Metasedimentary Rocks

3
- 3a Quartzose metasedimentary rocks: Leucocratic quartzofeldspathic paragneiss; quartzite; metaconglomerate; (clean sandstone, arkosic sandstone, conglomerate with silicate matrix); may include some orthogneiss (5c)
- 3b Para-amphibolite: Hornblende-plagioclase paragneiss ±biotite; foliated to gneissic amphibolite; pyroxene-hornblende gneiss; local migmatite (veined gneiss); (feldspathic wacke, feldspathic arenite, shale, argillaceous sandstone, mafic tuffaceous sedimentary rocks, dolomitic wacke, dolomitic shale); may include some metasomatic or igneous amphibolites (4, 1b)
- 3c Aluminous (pelitic) metasedimentary rocks: Dominantly quartz-biotite-feldspar paragneiss containing garnet, cordierite, staurolite, sillimanite, hypersthene, muscovite; aluminous shist; (mudstone, claystone, slate, shale, phyllite); may include subordinate tuff (1a,b)

Calcareous Metasedimentary Rocks

2
- 2a Marble, dolomitic marble: May contain diopside tremolite; grossularite, wollastonite, vesuvianite, phlogopite, brucite; ±thin interbedded quartzite; (limestone, dolomite, marl, calcarenite)
- 2b Calcareous gneiss: Calcsilicate schist and gneiss; calcsilicate marble, skarn; characterized by diopside, tremolite, scapolite, phlogopite ±hornblende, actinolite, plagioclase, biotite ±thin interbedded quartzite and conglomerate with carbonate matrix; includes layers and fragments of rusty, pyritic, and graphitic gneiss; may include minor amphibolite; (pelitic carbonates impure limestone and dolomite, calcareous claystone).

METAVOLCANIC ROCKS
Felsic Metavolcanic Rocks

1a
- 1a Felsic pyroclastic rocks and flows; quartz - feldspar - muscovite - biotite felsic tuffs, agglomerates, and minor flows; garnet - biotite - plagioclase - quartz gneiss; locally includes graphitic pyritiferous rusty-weathering and carbonaceous black shale interbeds; (rhyolite, trachyte, rhyodacite, felsite).

Mafic to Intermediate Metavolcanic Rocks

1b
- 1b Orthoamphibolite; quartz - epidote - plagioclase - hornblende amphibolite; biotitic amphibole gneiss; hornblende gneiss and schist; calcsilicate gneiss; chlorite schist; massive, pillowed, foliated, layered vesicular and fragmental flows, tuffs, and agglomerates of mafic to intermediate composition (greenstone); (basalt, andesite, dacite).

NOTE

a) Order in legend does not imply stratigraphic or geochronological order.

SYMBOLS

■ □	Base metal and pyrite deposits (Cu, Pb, Zn, Ni); (prospect or occurrence, past producer)
● ○	Precious metal deposit (Au, Ag); (prospect or occurrence, past producer)
▲ △	Molybdenum deposit (Mo); (prospect or occurrence, past producer)
	Geological boundary, observed
	Geological boundary, position interpreted
	Fault or lineament
	Syncline
	Anticline

SOURCES OF INFORMATION

Base map and legend from Ontario Geological Survey Map P.2611, Geology and Mineral Deposits of the Kingston Area, by P.W. Kingston, V.C. Papertzian, and D.A. Williams, 1985.

Metric conversion factor: 1 foot = 0.3048 m.

CREDITS

Compilation by J. Malczak, 1984.

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

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Malczak, J.
1985: Base Metal, Molybdenum, and Base Metal Deposits of the Madoc-Sharbot Lake Area, Southern Ontario; Ontario Geological Survey, Map P.2737, Mineral Deposit Series-Preliminary Map, scale 1:125 000. Compilation 1984.