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**Ontario Geological Survey
Miscellaneous Paper 91**

**Annual Report of the
Regional and
Resident Geologists
1979**

**Edited by
C.R. Kustra**

1980



Ontario

**Ministry of
Natural
Resources**

**Hon. James A. C. Auld
Minister**

**Dr. J. K. Reynolds
Deputy Minister**

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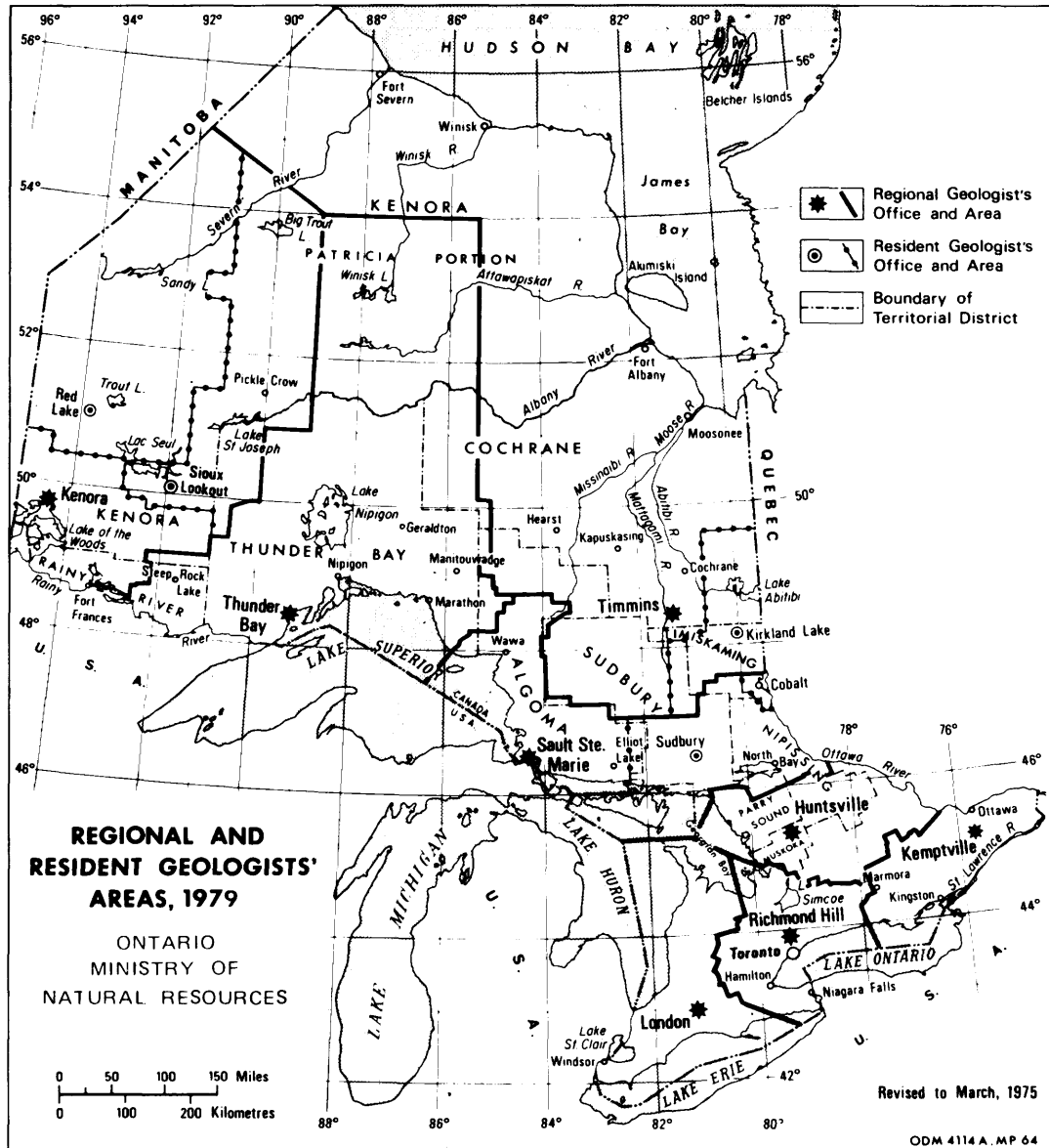
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PREFACE

This report, summarizing the activities of Regional and Resident Geologists for the year 1979, is an account of mining and exploration activities in Ontario prepared from information collected and filed in 1979. For the convenience of the reader, listings of new additions to the Assessment Files records, and reports of government survey and university sponsored projects are provided.

Regional and Resident Geologists are located in various centres of the Province to provide geoscience information and advice to the public on the geology and mineral deposits of Ontario. Each Regional and Resident Geologist maintains a library of published and unpublished reports including publications of the Ontario Geological Survey, other government agencies, records of exploration activity submitted for assessment work credit, company prospectuses and reports from the files of the Ontario Securities Commission, reports of property visits made by the Regional or Resident Geologist and other staff geologists, and information received directly from companies and individuals.

A number of staff changes occurred in 1979. L. Luhta was appointed Resident Geologist at Timmins; Dr. P.E. Giblin was transferred to Sudbury as Resident Geologist and G. Bennett, formerly of the Precambrian Geology Section, Ontario Geological Survey, was appointed Resident Geologist at Sault Ste. Marie; M. Durocher and D. Janes were appointed Resident Geologists at Red Lake and Sioux Lookout respectively. A new Resident Geologists office, established at Tweed, is staffed by Dr. P.W. Kingston.



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TABLE OF CONTENTS

	Page
NORTHWESTERN REGION	
1979 Report of Northwestern Regional Geologist and Kenora Resident Geologist	1
1979 Report of Red Lake Resident Geologist	13
1979 Report of Sioux Lookout Resident Geologist	23
NORTH CENTRAL REGION	
1979 Report of Northern Central Regional Geologist	38
NORTHERN REGION	
1979 Report of Northern Regional Geologist and Timmins Resident Geologist	62
1979 Report of Kirkland Lake Resident Geologist	77
NORTHEASTERN REGION	
1979 Report of Northeastern Regional Geoloist and Sault Ste. Marie Resident Geologist	97
1979 Report of Sudbury Resident Geologist	103
ALGONQUIN REGION	
1979 Report of Algonquin Regional Geologist	117
EASTERN REGION	
1979 Report of Eastern Regional Geologist	123
CENTRAL REGION	
1979 Report of Central Regional Geologist	127
SOUTHWESTERN REGION	
1979 Report of Southwestern Regional Geologist	139

LIST OF PUBLICATIONS (back pocket)

1979 Supplement to Bulletin 25, List of Publications.
Ontario Geological Survey, Ministry of Natural Resources.

CONVERSION FACTORS FOR MEASUREMENTS IN ONTARIO GEOLOGICAL SURVEY PUBLICATIONS

If the reader wishes to convert imperial units to SI (metric) units or SI units to imperial units the following multipliers should be used:

CONVERSION FROM SI TO IMPERIAL			CONVERSION FROM IMPERIAL TO SI		
<i>SI Unit</i>	<i>Multiplied by</i>	<i>Gives</i>	<i>Imperial Unit</i>	<i>Multiplied by</i>	<i>Gives</i>
LENGTH					
1 mm	0.039 37	inches	1 inch	25.4	mm
1 cm	0.393 70	inches	1 inch	2.54	cm
1 m	3.280 84	feet	1 foot	0.304 8	m
1 m	0.049 709 7	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	1.609 344	km
AREA					
1 cm ²	0.155 0	square inches	1 square inch	6.451 6	cm ²
1 m ²	10.763 9	square feet	1 square foot	0.092 903 04	m ²
1 km ²	0.386 10	square miles	1 square mile	2.589 988	km ²
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
VOLUME					
1 cm ³	0.061 02	cubic inches	1 cubic inch	16.387 064	cm ³
1 m ³	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m ³
1 m ³	1.308 0	cubic yards	1 cubic yard	0.764 555	m ³
CAPACITY					
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	4.546 090	L
MASS					
1 g	0.035 273 96	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 75	ounces (troy)	1 ounce (troy)	31.103 476 8	g
1 kg	2.204 62	pounds (avdp)	1 pound (avdp)	0.453 592 37	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	907.184 74	kg
1 t	1.102 311	tons (short)	1 ton (short)	0.907 184 74	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	1016.046 908 8	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	1.016 046 908 8	t
CONCENTRATION					
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

1 ounce (troy)/ton (short)	20.0	pennyweights/ton (short)
1 pennyweight/ton (short)	0.05	ounce (troy)/ton (short)

NOTE—Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries published by The Mining Association of Canada in cooperation with the Coal Association of Canada.

1979 Report of Northwestern Regional Geologist and Kenora Resident Geologist

R.C. Beard¹ and S. Rivett²

Contents

Introduction	1
Regional Geologist's Activities	1
Stratigraphic Control of Uranium Mineralization in the Hawk Lake - Richard Lake Area	3
Sampling to Assess the Potential of Large Tonnage/Low Grade Uranium Deposits in the Vermilion Bay Area	3
Mining Activity	4
Exploration Activity	4
Gold	4
Base Metals	4
Uranium	4
Other Minerals and Commodities	5
Potential for Small Gold Mining and Milling Operations	5
Kenora Aggregate Inventory	6
Property Examinations	6
Errington Prospect	7
Wind Bay Prospect	7
Ontario Geological Survey Activities	7
Mineral Exploration Assistance Program (MEAP)	8
Northern Ontario Engineering Geology Terrain Study (NOETS)	8
Research by Other Agencies	8
University Theses	8
Ontario Geoscience Research Grant Program	8
Recent Publications and References	8

Tables

1 - Summary of Claims Recorded and Assessment Work Credits Received, Kenora Mining Division	5
2 - Estimated Reserves of Potentially Mineable Gold Bearing Material in the Kenora Mining Division	6
3 - Maps and Reports Issued by the Ontario Geological Survey	12
4 - Exploration Activity in 1979	12
5 - Assessment Work and Other Information Received in 1979	10

Figures

1 - Kenora Resident Geologist's District	2
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2 Resource Geologist.

Introduction

Staffing in the Kenora Office in 1979 consisted of R. Beard, Regional Geologist, S. Rivett, Resource Geologist, and Sharon Clancy, Secretary. A. MacTavish was employed on contract to prepare Data Series Maps, and one student technician was employed through the summer under the Experience '79 program.

Regional Geologist's Activities

As in previous years the main thrust of the regional geological program was to provide a professional-technical advisory service and a technical library for the mining public, to encourage and assist mineral exploration. Due to the high interest in the gold deposits of the Kenora District during the year, a significant portion of the geological staff's time and effort was spent in this activity.

The amount of time spent in field investigations during the summer season was somewhat limited because of other commitments. The following producing mines in the Northwestern Region were visited by the Regional Geologist: Mattabi Mines Limited; Sturgeon Lake Mines Limited (Falconbridge Copper Limited); South Bay Mine (Selco Mining Corporation Limited); Thierry Mine (Union Miniere Exploration and Mining Corporation Limited); Griffith Mine (Steel Company of Canada Limited); Vermilion Bay Quarry (Universal Granite Company Limited). The Lyon Lake Mine (Mattagami Lake Mines Limited, under development) was also visited as were the properties of Goldlund Mines Limited (currently undergoing underground sampling, and surface and underground diamond drilling) and the property of Maybrun Mines Limited. Several properties undergoing active exploration and a number of other inactive mineral showings were also examined and reported upon.

Geological field tours and visits to mining operations were organized for industry and government geological personnel on three occasions.

A week-long "Workshop on the Geology of the Ontario-Minnesota Boundary Area" at Fort Frances was co-organized by the Regional Geologist, and C.E. Blackburn, field geologist with the Ontario Geological Survey. Attending were 20 earth scientists from the Ontario Geological Survey, the Geological Survey of Canada, the Min-

NORTHWESTERN-KENORA

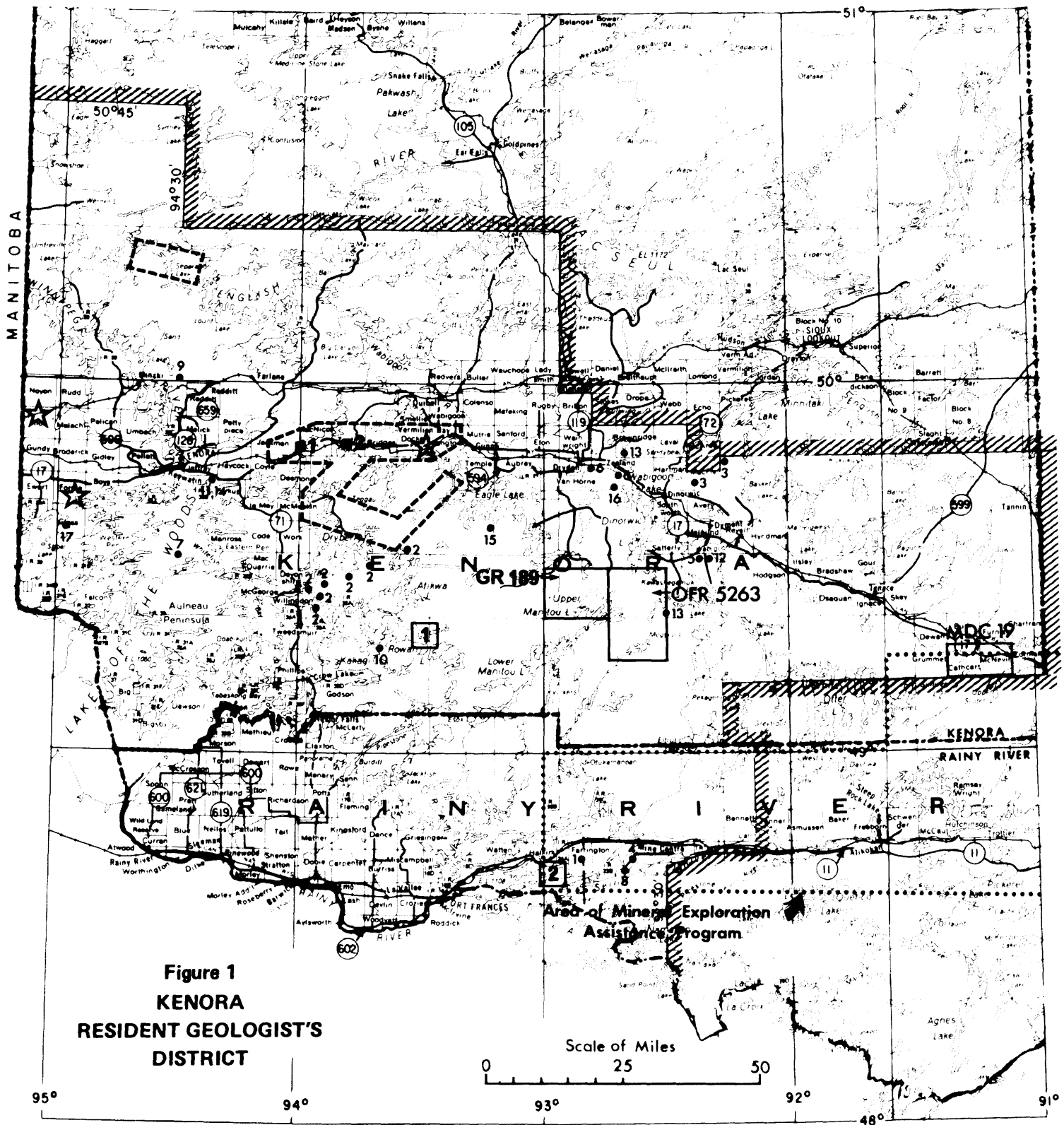


Figure 1
KENORA
RESIDENT GEOLOGIST'S
DISTRICT

- ★ Operating quarries
- Exploration activity in 1979 (keyed to Table 4)
- 1 Property examination described in report
 - 1. Errington prospect
 - 2. Wind Bay prospect
- Special Field Project by Regional staff
 - 1. East Hawk-Foot Lake radiometric-magnetic survey
 - 2. Petursson Lake sampling

EXPLANATION

- Open File Work Sheets (radiometric surveys)
- Map or report issued by the Ontario Geological Survey in 1979 (keyed to Table 3)
 - OFR - Open File Report
 - GR - OGS Report
 - MDC - Mineral Deposit Circular
- ▨ Boundary of Resident Geologist's District

nesota Geological Survey, the Minnesota Department of Natural Resources, the United States Geological Survey, Lakehead University, University of Minnesota at Duluth, the University of Western Ontario, and the Royal Ontario Museum. A one day technical session was followed by three days of field trips on both sides of the international border.

Two special field projects were undertaken during the year by the Kenora staff. These were 1) a combined radiometric-magnetic reconnaissance survey in the Vermilion Bay area in an attempt to relate uranium mineralization to magnetic iron formation horizons, and 2) a rock sampling program to assess the potential for large tonnage - low grade uranium deposits in the Vermilion Bay area. These projects are described below.

An inventory of the documented and calculated reserves of potentially mineable gold-bearing material in the Kenora Mining Division was carried out, in an attempt to assess the potential of the area for small mining and milling operations.

As part of the land use planning process now underway within the Ministry, Kenora staff prepared for publication two background documents for the West Patricia Planning Area. These documents, entitled "Bedrock and Surficial Geology" and "Mineral Resources," will be published in early 1980 by the Ministry of Natural Resources. A total of 25 mineral potential evaluations were prepared for internal resource planning and management purposes including such plans as district land use plans, lake management plans, timber cutting and scarification plans, severences and subdivision proposals, and road or route proposals. Numerous other background papers and planning documents were reviewed by the geological staff.

One OGS field party was visited and assisted during the year, and 24 Data Series Maps were completed for publication.

As part of the Ministry's public information program, lectures and field trips on the geology and mineral resources of the area were provided to five student groups. The Kenora staff also provided geological displays and took part in three MNR Open House presentations.

Stratigraphic Control of Uranium Mineralization in the Hawk Lake - Richard Lake Area

At Hawk Lake, 28 miles west of Vermilion Bay, uranium mineralization is associated with a magnetite-rich horizon in mafic volcanics (Beard and Rivett 1979). Four miles to the east, uranium mineralization at the New Campbell Island Mines Limited property is found in narrow sills of pegmatite within mafic volcanic tuffs. The pegmatites contain significant amounts of coarse magnetite.

At Foot Lake, situated between these two prospects, a narrow, six inch wide zone of spotty uraniferous magnetite was discovered recently during a routine property ex-

amination. All of these occurrences appear to be roughly on strike with each other.

Stratigraphically controlled uranium deposits, associated with iron formations locally exhibiting anatexis, have been described elsewhere in the literature, and were noted by Beard and Rivett (1979). The possibility that some of the Vermilion Bay uranium deposits are also stratigraphically controlled was investigated by the Kenora staff in 1979.

Combined magnetometer/scintillometer surveys were carried out in the vicinity of the Hawk Lake and Foot Lake occurrences in an attempt to correlate the uraniferous zones with one or more horizons of magnetite iron formation, and to trace the favourable zones. Since the favourable horizons were believed to be quite narrow (10 cm to 1 m wide), continuous readings were taken along numerous reconnaissance lines at irregular spacing.

It was found that the magnetite zones could not be traced out along strike between the deposits. Although the main magnetite zone is up to 5 m wide at the Hawk Lake occurrence, this zone apparently narrows to 30 cm or less within several metres. Detailed, controlled magnetometer and scintillometer surveys will be required to confirm whether uraniferous zones can in fact be correlated with magnetite-rich horizons.

Sampling to Assess the Potential for Large Tonnage/Low-Grade Uranium Deposits in the Vermilion Bay Area

The uranium deposits of the Kenora area are all of the metamorphic or "pegmatite" type, and are typically very irregular and discontinuous in grade and morphology. The uranium mineralization is usually concentrated in very irregular and patchy pegmatitic phases which are unevenly distributed within lower background parent granites. Assay values for the higher grade pegmatite zones generally range from 0.1 lbs/ton or less U_3O_8 to 40 lbs/ton or more U_3O_8 (Regional Geologist's Files, Kenora).

Most of the exploration effort, to date, has been directed to detecting and delineating relatively small, high-grade (greater than 2 lbs/ton U_3O_8) zones of mineralization that could be mined by conventional underground methods. There is little documented evidence to indicate that any serious attempt has been made to evaluate the potential for bulk mining of large, low-grade mineralization.

In an attempt to determine if sufficiently high grades might be obtained over open pit widths, the Petursson Lake occurrence (Beard and Rivett 1979) west of Vermilion Bay was selected for a preliminary testing program. One outcrop approximately 35 feet wide by 50 feet long was noted to have anomalously high radioactivity across much of its exposed surface. This outcrop was associated with a series of linear, discontinuous radiometric anomalies that had been traced out for a length of over

NORTHWESTERN—KENORA

350 m by Sherritt Gordon Mines Limited in 1977.

The outcrop was sampled by a series of 12 short (+ 6') drill holes, at 10 foot intervals, on lines 10 feet apart. A hand-held GSC-type drill was used, and assaying was carried out by the Geoscience Laboratories of the Ontario Geological Survey.

The highest assay obtained in this sampling was 0.96 lbs/ton U_3O_8 in one hole. The average grade across a 30-foot by 30-foot grid, calculated from 12 short holes, was 0.15 lbs/ton U_3O_8 .

Based upon this limited test work, the potential for large tonnage - low grade operations in this area and for this particular type of deposit do not appear encouraging at this time. Similar, but more refined, sampling programs should be carried out on several other deposits to further confirm the results of the current study. Candidate areas might include deposits in the Umfreville Lake area north of Kenora, and one or more of the high-background, uranium bearing granitic intrusives (?) in the Favourable Lake area, north of Red Lake.

Mining Activities

In 1979, no metallic mineral production was recorded from any of the mining properties in the Kenora Mining Division, nor were any major mining properties under active development. The Maybrun Mine Limited property at Atikwa Lake, east of Sioux Narrows, remained on standby throughout the year.

Granite tombstone blanks were again quarried at the Universal Granite Company Quarry near Vermilion Bay. The Rush Bay Quarry west of Kenora produced in excess of 25,000 sq. ft. of decorative stone during the year (Rush Bay Quarry, personal communication). This stone, consisting of felsic tuff (sericite schist), is marketed largely in the Brandon-Dauphin area of Manitoba. It is moderately to highly fissile and the colour varies from dark-grey to red to green to yellow.

Rock ballast for the Canadian National Railroad was quarried at the White Quarry, near the Manitoba border. No quarrying operations were reported at the Hawk Lake Quarry east of Kenora.

Production of horticultural peat from the Barwick area near the Minnesota border also continued during 1979.

Exploration Activity

Despite the renewed interest in the gold deposits of the Kenora Mining District in 1979, the overall level of exploration activity continued to decline significantly. This was reflected by 31% decrease in the amount of work submitted for assessment credit (Table 1). This decline in overall activity largely resulted from decreased exploration for both uranium and base metals. The fall off in uranium interest is principally due to the discovery and development of new, high-grade deposits in western Canada

while the decline in base metal exploration is due to the cyclical nature of exploration ventures.

Only gold activity showed a significant increase. This was largely reflected in an increase in staking activity rather than in an actual increase in the amount of work carried out on the ground. A total of 968 claims were recorded in 1979, up 20% from the previous year.

Geographically, exploration work carried out during the year is rather evenly distributed across the area.

Gold

As noted above, many of the old gold deposits of the area received attention in 1979. At least one major company and several other smaller companies and groups initiated research and exploration programs to assess the potential of the area for small gold mining and milling operations. These, as well as other companies and individuals, also carried out property examinations and exploration programs on specific properties in the area.

Diamond drilling and/or geophysical and geological surveys were noted on the Corrigan Prospect, Ambrose (Gull Island) Prospect, Tycoon Occurrence, Tabor Prospect, and Van Houten Prospect.

Stripping, trenching, and/or sampling was also noted on the Pine Portage Prospect, Treasure Prospect, Avery Lake Occurrence, Sullivan Prospect, Sakoose Mine, McKenzie-Gray Occurrence, Electrum Prospect, and Hatmaker Lake Occurrence.

Base Metals

Several major companies continued systematic, integrated programs for base metals in the area. The overall level of this type of activity was, however, somewhat reduced from previous years. Work in 1979 was noted in the general vicinity of Sioux Narrows, in the Kenora area, in the Bee Lake area north of Kenora, in the Wabigoon Lake and Eagle Lake areas, and in the Gullwing Lake area north of Dryden. Major companies engaged in programs of this type included Selco Mining Corp. Ltd., Rio Tinto Canadian Exploration Limited, Geophysical Engineering Limited, Sherritt Gordon Mines Limited, and Beth-Canada Mining Company.

No significant discoveries were reported as a result of this work.

Geophysics and diamond drilling were also carried out on several previously known occurrences east of Fort Frances, mainly by George Armstrong.

Uranium

Limited activity was noted in 1979. Trenching and geophysical survey were continued on the Richard Lake uranium deposit of New Campbell Island Mines Ltd. This

TABLE 1 | SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT RECEIVED
KENORA MINING DIVISION

YEAR	CLAIMS RECORDED	ASSESSMENT WORK RECEIVED (DAYS)				Totals
		Diamond Drilling	Geophysical	Geological	Other	
1979	968	9,992	10,659	1,420	2,097	24,168
1978	808	22,299	7,576	2,143	2,916	34,934
1977	1,495	15,405	11,366	1,760	5,307	33,838
1976	1,380	25,030	21,367	5,960	2,685	55,042
1975	1,677	23,584	31,059	940	1,233	57,266
1974	2,653	29,496	18,049	3,070	1,519	52,134
1973	1,920	20,910	13,019	1,798	1,175	36,902
7 yr.						
Total	10,901	146,716	113,545	17,091	16,932	294,284

work reportedly extended the mineralized zone eastward from the underground workings, but no further drilling was reported.

Surface trenching and geophysical surveys were also reported in the Ena Lake area north of Kenora and in the Vermilion Bay area.

Other Minerals and Commodities

Interest continued in lithium- and tantalum-bearing pegmatites during the year, especially in the area north of Dryden. The Mavis Lake deposit in Brownridge Township was tested by Selco Mining Corporation Limited, with three diamond drill holes. Surface sampling in 1978 gave assays in the range of 0.005 to 0.25 percent tantalum. Each of the three holes drilled in 1979 cut spodumene-bearing sections as follows: Hole M-1, 2.8 feet with 5 percent spodumene; Hole M-2, 0.5 feet with 10 percent spodumene; Hole M-3, 35.2 feet with 15-20 percent spodumene and rare crystals of tantalite. (Regional Geologist's Files, Ontario Ministry of Natural Resources, Kenora).

Additional sources of both horticultural peat and decorative stone were sought by present producers of these commodities, to facilitate possible expansion of existing operations.

Potential for Small Gold Mining and Milling Operations

Although there are no producing gold mines in the Kenora area at the present time, the area does have a long and colourful history of mining, dating back to the turn of the century. During the period 1890 to 1910 the Kenora area accounted for about 55 percent of the gold production of Ontario. A recent gold compilation by the regional geologist has documented 27 past producing gold mines, 66 prospects reporting extensive underground or

surface exploration work, and over 220 other occurrences reporting the presence of gold.

Gold deposits of the area are generally high-grade and relatively narrow. Although no major gold mines comparable to the Red Lake mines, have yet been discovered in this area except for the Wendigo Mine which produced over 67,000 oz. of gold and 14,000 oz. of silver (Source Mineral Deposits Records, Kenora Regional Geologist's Office); this is not surprising when it is considered that production and development work on most of the deposits was carried out around the turn of the century, when gold prices were low and mechanization limited.

With current high gold prices many of these old properties are now attracting attention, since high capital expenditures are not required for large milling and refining facilities. Major companies, however, tend to avoid deposits of this size, due to the small cash flows generated.

A number of small deposits in the area could be developed on a relatively small scale, using either on-site portable mills (taking ore from several nearby deposits under one control), or somewhat larger scale, custom milling facilities (accepting ore from greater distances and more diverse sources). This type of small scale mining could lead to the development of one or more major deposits in the area, as has been the case in other major gold camps in the past.

Although data on most of the deposits of the area, including the past producers, is very sparse, some approximate reserve estimates have been prepared by the regional geologist to give an indication of the potential of the area. These calculations indicate approximately 2.3 million tons of potentially mineable material in 94 separate deposits. The Kenora Mining Division has been further subdivided into 4 separate areas, each of which could be served by a central mill. Each of these four areas have been estimated to contain at least 500,000 tons (Table 2).

Most of the tonnage figures shown have been calculated from limited data, and should be considered approximate. Only a portion of the total gold mineralization in the area has been included. Many other mineralized

NORTHWESTERN—KENORA

TABLE 2 Estimated Reserves of Potentially Mineable Gold Bearing Material in the Kenora Mining Division.

AREA	PAST PRODUCTION		TOTAL ESTIM. RESERVES OF GOLD BEARING MATERIAL OF POSSIBLE ORE GRADE	NO. OF DEPOSITS INCLUDED IN CALCULATIONS
	Tons of Ore	Oz. of Gold		
Shoal Lake/ Lake of the Woods	395,292	128,106	722,000	32
Mine Centre	32,660	15,806	673,000	18
Manitou/Eagle/ Wabigoon Lakes	70,772	18,739	581,000	29
Kakagi/Rowan/ Straw Lakes	71,527	19,612	315,000*	15
TOTALS	570,241	182,263	2,291,000*	94

* Does not include reserves at Maybrun Mine of 4,179,825 tons.

zones are known, especially in the 220 odd occurrences, for which there is insufficient data to make any calculations. Thus, the total reserves in the area are likely much larger.

Several companies and groups are seriously investigating the possibility of small mining and milling operations in the area; some have begun to acquire ground. To date, most interest has centred in the western Lake of the Woods, Kakagi Lake and Mine Centre areas. Other areas having potential for this type of development include eastern Lake of the Woods, Manitou Lakes, and the Dinorwic area.

Kenora Aggregate Inventory

An aggregate inventory program was contracted out by the Ministry to Geo-Analysis Limited, who had carried out the earlier engineering geology terrain evaluation covering the Kenora area for the Engineering and Terrain Geology Section, Ontario Geological Survey. The results of this inventory program, which was completed in November 1979, confirmed a projected short supply, noting little potential for single large deposits of good quality material, but also noting that "numerous small deposits of highly variable quality likely occur". The maps accompanying the report outline the areas where these are most likely to be found.

The report recommends that:

- a study be conducted to locate a suitable bedrock type with a view to establishing a quarry to supply granular A and B crushed aggregate
- development work should be undertaken to determine the lateral extensions of existing large scale pits
- an extensive back-hoe test pit exploration program be initiated in the winter months to test poorly drained localities suspected to be underlain by aggregate material

d) with respect to land-use planning guidelines, a flexible policy should be established for the foreseeable future to allow continued development of small local supplies since these sources are considered critical and non-renewable. Firm rehabilitation procedures should be adopted, the practice of utilizing abandoned pits for domestic refuse should be stopped, and hydrogeologic studies should be initiated to determine the suitability of any site for this use.

This consultant's report will be placed on open file by the Ontario Geological Survey in early 1980.

Property Examinations

In 1979, the following mining properties or mineral occurrences were examined by the Kenora staff:

Base metals:

- Port Arthur Copper Prospect, Mine Centre area
- Squaw Lake-Canoe Lake Copper Occurrence, Shoal Lake area
- Wind Bay Zinc Occurrence, Halkirk Township

Gold:

- Blindfold Lake Occurrence, Kirkup Township
- Bonanza Mine, Van Horne Township
- Cronlund Occurrence, Lake of the Woods
- Gull Island Prospect, Lake of the Woods
- Hawmandale Occurrence, Jaffray and Haycock Townships
- Hay Island Prospect, Lake of the Woods
- Mascotte Occurrence, Phillips Township
- Neda Occurrence, Willingdon Township
- Pine Portage Prospect, Kirkup Township
- Redeemer Mine, Van Horne Township
- Sakoose Mine, Tabor Lake area
- Thrasher Occurrence, Bigstone Bay
- Trojan Occurrence, Phillips Township

White Claim, Hilly Lake, Jaffray Township
 Uranium:
 Ena Lake Occurrence, north of Kenora
 Petursson Lake Occurrence, Tustin Township
 Snook Lake Occurrence, north of Kenora
 Information concerning these properties is on file at the Kenora Regional Geologist's Office. Two of the more interesting prospects are described below.

Errington Prospect

This gold prospect, located at the east end of Rowan Lake, east of Sioux Narrows, was discovered in 1936 by Albert Gauthier, who carried out an extensive program of surface trenching and diamond drilling in 1937. In 1947, the property was optioned by Mid-Central Mining Company Ltd., who carried out approximately 5,000 feet of diamond drilling in at least 12 holes.

Although the results of this earlier work are rather sketchy, Mr. Gauthier (personal correspondence, Kenora Regional Geologist's Office) noted that earlier workers calculated a tonnage and grade on the No. 4 vein to be 24,000 tons grading 0.73 oz. Au/ton over a length of 450 feet, to a depth of 240 feet and with a width of 32 inches. Assay results from one drill hole gave 0.29 oz. Au/ton over 12.8 feet.

Thomson (1938) describes the gold mineralization as occurring in quartz veins associated with felsite dykes. They generally lie either within the felsite or along the contact of these dykes with the greenstones. "There are two varieties of quartz within the vein; one type is white, the other is smoky and contains chloritic inclusions along fracture plains. A small amount of pyrite, pyrrhotite, chalcocopyrite, and sphalerite occurs in the darker coloured quartz, and a little visible gold may be found."

The property was reexamined by Kenora staff in 1979. Although insufficient time was spent on the property to allow significant geological observations, grab and chip samples were taken and were assayed by the Geoscience Laboratories of the Ontario Ministry of Natural Resources. Four grab samples from the rock dump and from exposures of quartz veins in the old trenches assayed 0.08 to 0.09 oz. Au/ton; one chip sample of quartz vein material across a width of 3 feet ran 0.86 oz. Au/ton.

Wind Bay Prospect

This base metal property is located in Halkirk Township near Wind Bay, on the Peninsula between Seine Bay and Swell Bay. The property was first investigated by Noranda Mines Limited in 1967, when several pits were opened up on an outcrop of mineralized porphyritic felsic volcanic. Further prospecting and test pitting by M. Hupchuk in 1969 revealed zinc mineralization in chlorite schist, 300 feet east of the original prospect. (Harris

1974). The claims are currently held by G. Armstrong who completed seven diamond drill holes on the property during 1979. This drilling was concentrated in the area west of Wind Bay, testing the mineralization contained in chloritic schist zones.

Harris (1974) noted that the mineralized chlorite schist was probably derived from a hornblende gabbro by shearing along a fault zone, and was coincident with an east-northeast trending lineament that can be traced westward from the showing at Wind Bay for about 4000 feet. The same lineament can be traced eastward to Lochart Lake, a distance of about 4 miles. At Lochart Lake, drilling by Selco Exploration Company Limited in 1967 and G. Armstrong in 1976 also intersected low-grade mineralization in what appears to be a continuation of the same chloritic fault zone. Two miles further east Canadian Nickel Company Limited drilled a number of holes in 1976 and 1977 which also intersected mineralization in a similar environment. Few assays are available from the Inco drilling but one hole, 46846-0, gave an intersection of 82 feet of 0.13 percent copper and 0.47 percent zinc (Assessment Files, Kenora Regional Geologist's Files).

The current drilling program by Armstrong traced the mineralized zone for 6000 feet west from Wind Bay. Sulphide mineralization, as observed in drill core, occurs in zones of irregularly layered chlorite schist that are locally very talcy. The sulphides, mostly pyrrhotite with some sphalerite and chalcocopyrite, average 5 to 10 percent. The pyrrhotite occurs largely as narrow conformable blebs and seams while chalcocopyrite is more irregular, often filling late fractures. The sphalerite is dark and usually finely disseminated.

In the only hole logged by regional geologist's staff to date, mineralization was noted to occur in two separate talc chlorite zones, 30 to 40 feet wide, separated by about 120 feet of barren, light grey felsic lapilli-tuff.

Assays were available for only this one hole at the time of writing. The first mineralized zone is 22 feet wide and assays 0.32 percent copper and 2.16 percent zinc. The second zone, separated from the first by 126 feet of relatively barren rock, is 41 feet wide and runs 0.09 percent copper and 1.09 percent zinc (G. Armstrong, personal communication) Armstrong reports similar mineralization, based upon visual estimation, in another four of the seven holes drilled to date.

The work by Selco, Inco, and most recently by Armstrong, therefore indicates the possibility of a zone of low-grade zinc-copper mineralization up to eight miles long.

Ontario Geological Survey Activities

Field parties from the Precambrian and Mineral Deposit Sections of the Ontario Geological Survey were active in the Kenora Mining Division during the 1979 field season.

P. C. Thurston (Precambrian Section) examined the Maybrun Mine Property east of Sioux Narrows with the

NORTHWESTERN—KENORA

purpose of developing a trace element method of detecting syngenetic copper mineralization in mafic flows (Thurston 1979).

N.F. Trowell (Precambrian Section) commenced detailed geological mapping of Code, Work, McMeekin, and LeMay Townships. The area lies just north of the town of Sioux Narrows (Trowell 1979).

C. E. Blackburn (Precambrian Section) began detailed geological mapping in the Kawashegamuk Lake area, about 30 km southeast of Dryden (Blackburn 1979).

I. G. Sutherland (Mineral Deposits Section) examined the High Lake and Canoe Lake stocks. The purpose of these examinations is to document fully the nature and extent of mineralization in and around the stocks, to determine the relationships between stocks and wall rock, and to assess their economic potential. (Colvine and Sutherland 1979).

Mineral Exploration Assistance Program (MEAP)

A total of six projects falling within the Kenora portion of the Atikokan MEAP area were approved for 1979-80. These include work by K.M. Carlson and E. Pearson in the Reed Lake area, Spanex Resources Limited and Ed Vic Exploration in the Grassy Lake area, G. Armstrong in Halkirk and Farrington Townships, and A.G. Huber in the Little Turtle River area.

Northern Ontario Engineering Geology Terrain Study (NOETS)

This program entered phase III in 1979, with studies by James Neilson and Associates being carried out for NTS areas 52J, 52K, and 52L. Basic engineering terrain maps at a scale of 1:100 000 will show types of ground cover, topography, landforms, and drainage and will be accompanied by comprehensive technical reports.

Research by Other Agencies University Theses

Geological theses, related to the Kenora Mining Division believed to be in progress during 1979, are as follows:

M.Sc. Theses

1. R. Bald (University of Manitoba), Prevolcanism, Archean sialic crust Gundy-Tannis Lake area, northwest Ontario.

2. G. Beakhouse (McMaster University), Trace element and geochronology, Cedar-Clay Lakes and Minaki-Redditt areas.

3. E.K. Ucakuwun (University of Manitoba), The Mavis-Gullwing Lakes pegmatite district near Dryden, northwest Ontario.

B.Sc. Thesis

1. F.M. Forsgren (University of North Dakota) Gold Deposits, Hilly Lake area near Kenora.

Ontario Geoscience Research Grant Program

G.R. Edwards and R.W. Hodder (University of Western Ontario) are currently investigating the geochronological relationships between evolution and mineralization in a felsic volcanic-plutonic complex at Phinney-Dash Lakes east of Nestor Falls (Edwards and Hodder 1979).

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TABLE 5
Assessment Work and Other Information Received in 1979.

Air - Airborne
Assess - Assessment Work
Au - Gold
BM - Basemetals
5 DDH (620) - 5 Diamond Drill holes totalling 620' MEAP
EM - Electromagnetic Survey

Geol - Geological Survey
Geochem - Geochemical Survey
IP - Induced Polarization Survey
Mag - Magnetometer Survey
- Mineral Expl. Assistance Program Report

Pros - Prospective
Rad - Radiometric Survey
Res - Resistivity Survey
SA - Sampling
Tr - Trenching
U - Uranium

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Bad Vermillion Lake	52C/10 NE	Andowan Mines	Fe, Au	Pros	Pros	1957	63.3606.08	DD-1
Bliss Lake	52C/15 SE	Andowan Mines	Fe, Au	Pros	Pros	1957	63.3606.08	R-1
Brooks Lake	52F/4 NE	Martin, R. Claim Group	Au	Other	Geol	1974		G-2
Brownridge Twp.	52F/15 SE	Selco Mining Corp. Ltd.	BM	Assess	3 DDH (499)	1979		M-6
Buchan Bay	52F/11 NE	Sukava, A.	BM	Assess	EM, Mag	1979	2.2939	Q-3
			BM	Other	1 DDH (291)	1979		Q-4
Butler Lake	52F/10 NE	Euro-Dollar Development Ltd.	BM	Assess	2 DDH (1514)	1979		K-1
		Hudbay Mining Ltd.	BM	Assess	2 DDH (790.7)	1978		I-3
Contact Bay	52F/10 NW	Hudbay Mining Ltd.	BM	Assess	4 DDH (1413)	1978		JJ-3
Eagle Rock Lake	52F/2 NW	Noranda Expl. Co. Ltd.	BM	Other	IP, Res	1970		A-8
Farrington Twp.	52C/10 NW	Armstrong, G.	BM	Assess	1 DDH (640)	1978		H-12
			BM	Assess	1 DDH (426)	1979		H-13
Grassy Lake	52C/10 NE	Cone, R.C., Jr.	Au	Assess	Tr	1979		EE-1
		Ed-Vic Explorations	Au	Assess	EM	1978	2.2880	Z-4
Halkirk Twp.	52C/11 NE	Armstrong, G.	BM	Assess	4 DDH (1733)	1978		A-5
			BM	Other	Geol, Mag	1975	63.3564	A-6
		Hupchuk, M.	BM	Assess	1 DDH (218)	1978		N-4

Table 5 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Halkirk-Farrington Twp.	52C/10 NW	Armstrong, G.	BM	MEAP	12 DDH (5411)	1978		H-11
Heronry Lake	52F/4 NW	Martin, R. Claim Group	Au	Other	Geol	1974		O-1
Kirkup Twp.	52E/9 NW	President Mines Ltd.	Au	Assess	Tr	1979		SS-1
		Stinson, J.	Au	Assess	Tr	1979		RR-1
Laval Twp.	52F/15 SE	Selco Mining Corp. Ltd.	Au, BM	Assess	1 DDH (238)	1978		M-5
Little Turtle Lake	52C/15 SE	Andowan Mines Ltd.	Au	Pros		1957	63.3606, 08	R-1
MacNichol Twp.	52F/13 SW	Rollmac Expl. Corp. Ltd.	U	Assess	Geol., Rad, Mag	1978	2.2905	BB-3
Osbourne Bay	52F/11 SE	Sukava, A.	BM	Other	3 DDH (794)	1979		E-1
Sand Lake	52L/2 SE	Anschutz Uranium Corp.	U	Assess	Geol., Rad	1976	2.2405	H-2
Silvery Lake	52F/13 SW	Fairservice, R.	U	Assess	Geol., Rad, Mag	1977	2.2768	AA-3
Snowshoe Bay	52E/11 SE	Deacon, J.	Au	Other	6 DDH (1490)	1947		N-1
Tabor Lake	52F/9 SW	Shoal Lake Gold Mines	Au	Other	2 DDH (1162)	1961		J-2
		Ekstrom, R.	Au	Assess	EM, Mag	1979	2.2927	W-1
Temple Twp.	52F/14 SW	Redden, J.	Au	Assess	Tr	1979		X-1
		F.O.B. Mining Expl. Ltd.	U	Assess	SA	1974-77	2.2668	E-6
			U	Assess	Geol., Rad	1977	2.2668	E-7
Tustin Twp.	52F/13 SW	Fairservice, R.	U	Assess	SA	1977	2.2668	E-8
			U	Assess	Mag, Rad, Geol	1977	2.2699	AA-2
Wapageisi Lake	52F/8 SW	Selco Mining Corp. Ltd.	BM	Assess	EM, Mag	1978	2.2771	G-1
			BM	Assess	1 DDH (288)	1979		G-2
Watten Twp.	52C/11 NE	Armstrong, G.	BM	Other	Geol., Mag	1975	63.3564	A-6
Wiley Bay	52E/10 SE	Hopkins, A.	Au	Assess	1 DDH (301)	1979		M-1
Zealand Twp.	52F/15 SE	Euro-Dollar Development Ltd.	BM	Assess	1 DDH (675)	1979		P-1

NORTHWESTERN-KENORA

TABLE 3 MAPS AND REPORTS PERTAINING TO THE KENORA MINING DIVISION, ISSUED BY THE GEOLOGICAL BRANCH OF THE ONTARIO MINISTRY OF NATURAL RESOURCES IN 1979.

MISCELLANEOUS PAPERS

MP 79
MP 84
MP 87

OPEN FILE REPORTS

OFR 5263
OFR 5272

GEOSCIENCE REPORTS

189

COLOURED MAPS

Map 2199

MINERAL DEPOSIT CIRCULARS

MDC 19

TABLE 4 Exploration Activity in 1979.

The following is a list of individuals and companies known to be engaged in exploration within the Kenora Mining Division in 1978, and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figure 1.

Individual or Company	Activity
1. Armstrong, G.	Diamond drilling in Farrington Township.
2. Barrie Explorco Ltd.	Diamond drilling and geophysical surveys in Willingdon Township, Lobstick Bay, and Fisher Lake areas.
3. Beth-Canada Mining Co.	Geophysical survey in MacFie Township; and airborne electromagnetic survey in the Keikewabik Lake area.
4. Cone, R.C., Jr.	Trenching in the Grassy Lake area.
5. Ekstrom, R.L.V.	Geophysical surveys in the Tabor Lake area.
6. Euro-Dollar Development Ltd.	Geophysical and induced polarization surveys in Butler Lake, Zealand Township and Van Horne Township; geology and diamond drilling in Butler Lake and Zealand Township; and geochemistry in the Butler Lake area.
7. Hopkins, Albert	Diamond drilling in the Wiley Bay area.
8. McTavish, Ken	Trenching in the Bad Vermilion Lake area.
9. Minorex Ltd.	Geological, magnetometer and radiometric surveys in the Minaki and Sand Lake areas.
10. Nolan Lake Explorations Inc.	Geophysical survey in the Rowan Lake area.
11. President Mines Ltd.	Trenching in Kirkup Township.
12. Redden, J.W.	Trenching in the Tabor Lake area.
13. Selco Mining Corp. Ltd.	Diamond drilling in the Wapageisi Lake area and Brownridge Township.
14. Stinson, John	Trenching in Kirkup Township.
15. Sukava, A.	Geophysical surveys in Buchan Bay; diamond drilling in Buchan and Osbourne Bay areas.
16. Sweany, D.	Geophysical surveys in the Butler Lake area.
17. Tibbo, Harold G.	Diamond drilling and assaying in the Shoal Lake area.

1979 Report of Red Lake Resident Geologist

M.E. Durocher¹ and D.A. Panagapko²

Contents

Introduction	13
Resident Geologist's Activities	13
Mining Activity	13
Campbell Red Lake Mines Limited	13
Dickenson Mines Limited	16
The Griffith Mine	16
Selco Mining Corporation Limited	16
Exploration Activity	16
Mineral Exploration Assistance Program	17
Ontario Geological Survey Activities	17
Research by Other Agencies	17
Recent Publications and References	17

Tables

1-Claims recorded and assessment work received	18
2-Maps and reports issued by the Ontario Geological Survey ..	19
3-Exploration Activity in 1979	22
4-Assessment work and other information received in 1979	20,21

Figures

1,2 Red Lake Resident Geologist's District	14,15
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Introduction

The Red Lake Resident Geologist's Office is presently staffed by M. Durocher, Resident Geologist, D.A. Panagapko, Resource Geologist, and C.D. Van Leeuwen, secretary. J.C. Gibson was assigned to this office on a contract basis from January to August. One Experience '79 student was employed for 8 weeks during the summer.

Radiometric maps and profiles for an additional 6 NTS areas (52J, 52O, 52P, 53A, 53B, 53G) were released August 23, 1979, as a part of the Federal-Provincial Uranium Reconnaissance Program.

As a result of the September 14, 1978 release of airborne electromagnetic and magnetic survey data, some follow-up programs were carried out by the mining industry during 1979.

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Resident Geologist's Activities

As in previous years, a technical advisory service was provided to companies and individuals engaged in mineral exploration within the Red Lake Mining Division. Visitors and written requests for information totalled about 250 during this past year.

Selected mineral properties in the Red Lake and Confederation-Woman Lake metavolcanic belts were visited and examined.

Data series maps for Bateman Township, Gerry Lake, Karas Lake, Bruce Lake, and South of Otter Lake areas were published in 1979 (see Figure 2), and initial compilation work was completed for an additional 7 areas.

Assistance and technical comments were provided for several Ministry programs and land use studies, including the West Patricia Land Use Plan and various lake plans and management strategies.

Visits were made to the four producing mines.

Assistance and logistical support was extended to five Ontario Geological Survey field parties active in the district in 1979.

Lectures and field trips were organized for several local student groups.

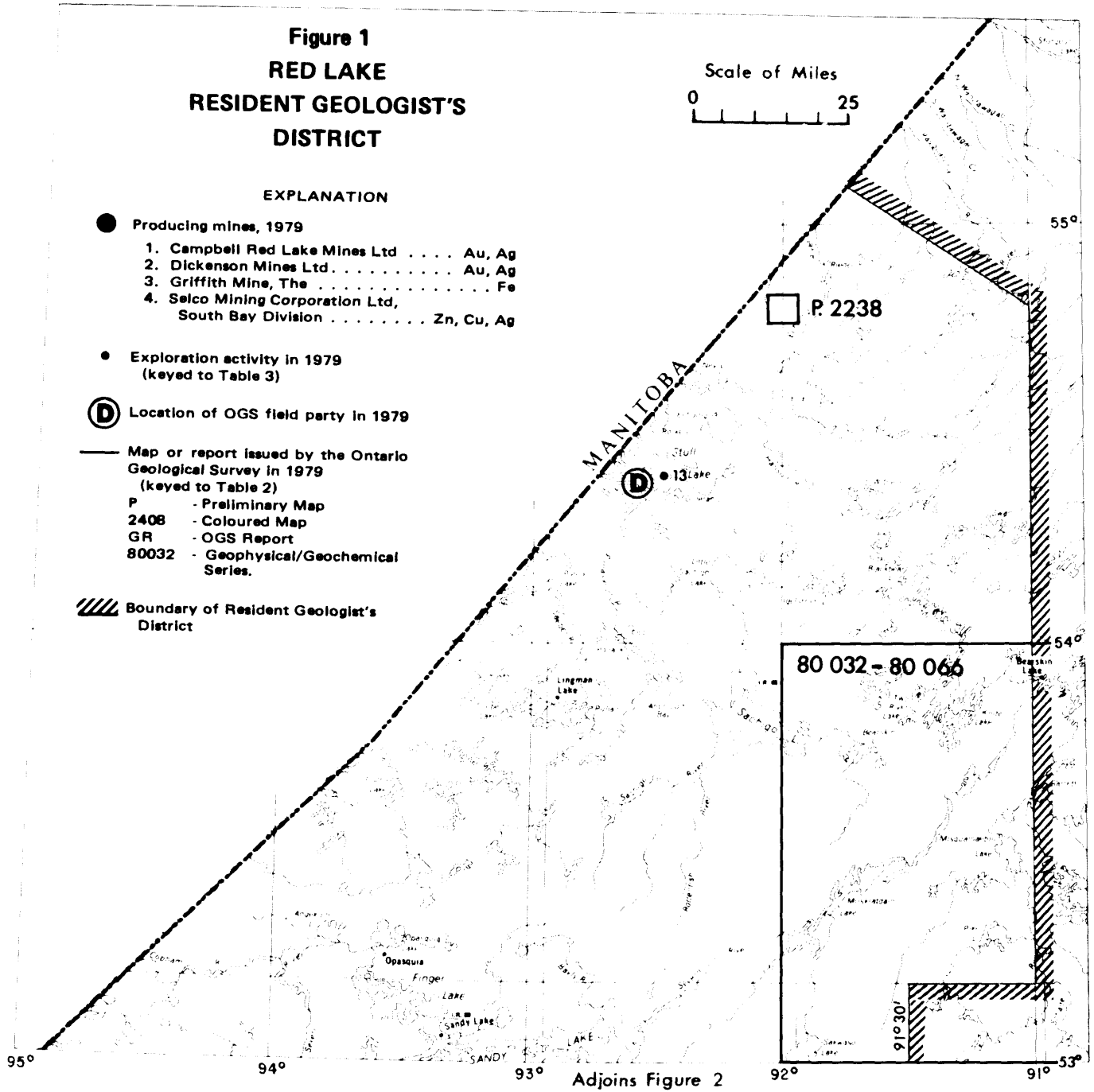
Mining Activity

Four mines were in continuous production during 1979 (see Figure 2). The continued improvement in gold prices should yield better returns for the two operating gold mines as compared to 1978, and is also generating programs for possible revival or initiation of gold production on some former gold producers and major prospects.

A summary of the main developments of the various operations follows. The co-operation of the mine managers of each operation in supplying information is gratefully acknowledged.

Campbell Red Lake Mines Limited

Campbell Red Lake Mines Limited operated continuously through 1979 and milled an average 822 tons per day on a total of 300,178 tons of ore yielding 185,005 ounces of gold. The comparable figures in 1978 were 823 tons per



Adjoins Figure 1

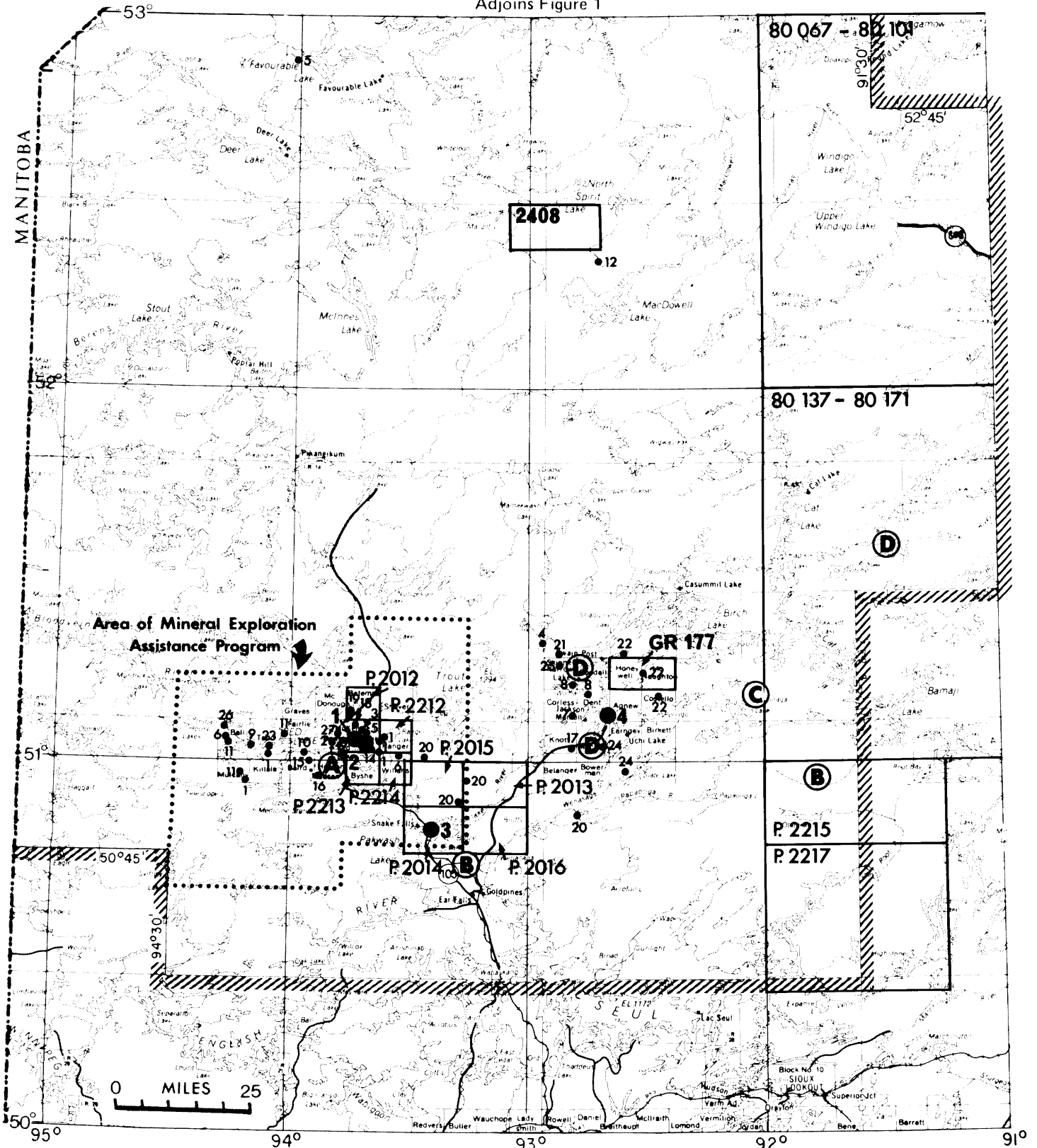


Figure 2

NORTHWESTERN — RED LAKE

day milled, 300,502 tons total milled, and 183,546 ounces of gold produced. Thirteen thousand feet of drifting and raising exposed enough ore to increase reserves to 1,840,000 tons grading 0.66 ounces of gold per ton. At year end, 340 employees were on the payroll.

The company is planning to increase tonnage to 390,000 tons milled per year by 1982. This will involve capital expenditures underground, in the mills, and in the townsite. S.M. Reid is mine manager.

Dickenson Mines Limited

Dickenson Mines Limited, including Robin Red Lake Mines Limited, milled an estimated 119,194 tons of ore for a daily average of 342.5 tons to yield approximately 43,865 ounces of gold and 3,795 ounces of silver in 1979.

By comparison, 1978 production was 110,438 tons milled at 303 tons per day to yield 59,957 ounces of gold. Employment averaged 241 during 1979. R.P. Tapper is the mine manager.

A shaft sinking contract is in progress, and as of November 30, 1979 there has been a 423.9 foot advance in contract shaft sinking, a 169.9 foot advance in contract station cutting, a 247.5 foot advance, in contract drifting, and a 121.1 foot advance in contract raising.

The Griffith Mine

The Griffith Mine, a wholly owned subsidiary of The Steel Company of Canada Limited and managed by Picklands Mather and Company, is situated at Bruce Lake, 50 km southeast of Red Lake. Milling of an estimated 5,304,300 tons (natural) of ore gave an estimated production of 1,500,000 tons (natural) of pellets containing 66.72 percent iron (dry) and 3.56 percent silica. Total ore, waste, and overburden removed in open pit mining is estimated at 12,576,400 long tons. The SL/RN direct reduction kiln did not operate during 1979 due to the low price of scrap steel.

Other developments on the property included 1,849 feet of diamond drilling carried out for the purpose of bank stability studies. During the summer of 1979, 639,713 cubic yards of lake bottom material was dredged to allow further development of the south pit. Movement of ore from the south pit will commence in 1980. In 1979, capital expenditures were made to recover fine ore from the flotation tailing, and the flotation circuit was put under automatic control. It is expected that both of these appropriations will increase the plant iron recovery.

During 1979, no exploration work was carried out at the Griffith Mine.

A total of 474 employees were on the payroll as of year end. J.D. Jeffries is mine manager.

Selco Mining Corporation Limited

The South Bay Division of Selco Mining Corporation Limited operates a zinc-copper-silver mine located in the southeastern part of Dent Township, 80 km northeast of Ear Falls. From January 1, 1979 to November 30, 1979, 135,654 tons of ore were milled at a head grade of 1.50 percent copper, 10.60 percent zinc and 1.89 oz. of silver per ton to yield 7,300 tons of copper concentrate and 23,428 tons of zinc concentrate. Smelting recovered 3,700,220 pounds of copper, 24,818,334 lb. of zinc and 160,574 oz. of silver.

Mining of the No. 12 orebody continued by means of three cut and fill stopes. A total of 220 m of development will have been completed by this year end, and this work is being done to develop a shrinkage stope on the 1450 sub-level. The exploration drift on the 1950 level was extended a further 112 m and a diamond drilling program to reach for ore at depth was completed.

The average work force during the year was 135 and the mine manager is D.W. Thompson.

Exploration Activity

Mineral exploration activity continued at approximately the same level as in 1978.

In 1979, a total of 1068 claims were recorded in the Red Lake Mining Division. This represents a 12 percent decrease as compared with 1978 figures (see Table 1).

Assessment work filed in 1979 increased 23 percent, with 62,869 days recorded, as compared with 50,997 days in the previous year.

This figure can be broken down as follows: diamond drilling 22,108 days, geological surveys 3154 days, and geophysical surveys 38,380 days. Comparisons between these figures and those for previous years can be made by consulting Table 1.

No new orebodies were discovered in 1979. However, Redcon Gold Mines Limited had located a promising gold-bearing zone on its Balmer Township property situated about 3.5 km north of the Campbell Red Lake Mine. This quartz-carbonate zone, thought to be some 1,500 feet long and up to 40 feet in width, has been explored by 19 diamond drill holes totalling 8,650 feet. Additional geophysics and diamond drilling are planned, as soon as results to date have been evaluated. (Northern Miner, Dec. 6, p.28).

Staking activity was concentrated in the southern part of the Red Lake Mining Division, primarily in the general Red Lake area, the Shabumeni-Casummit Lakes area, and the Woman-Confederation-Uchi Lakes area (information from Mining Recorder's Office, Red Lake).

Minorex Limited is currently undertaking a geological, geophysical, and diamond drilling program on four areas that were staked as a result of the September 14, 1978 release of airborne electromagnetic and magnetic survey data covering the immediate Red Lake area.

Wilanour Resources Limited is presently re-evaluating the Cochenour-Willans property (past producer), and the associated Annco, Wilmar, and Consolidated Marcus properties. The exploration program currently underway includes electromagnetic and magnetic surveys and geological mapping, as well as a thorough analysis of all available data.

A summary of known mineral exploration activity in the Red Lake Resident Geologist's District during 1979 is given in Table 3, and locations are shown on Figure 1 and 2.

Mineral Exploration Assistance Program

The Ontario Government's Mineral Exploration Assistance Program (MEAP) to date has provided in excess of \$582,000 for contracts approved within the MEAP boundaries shown in Figure 2 since the program was initiated in August of 1971.

During the fiscal year ending March 31, 1979, a total of eight contracts were approved and work was completed on 6 of the projects involved, for a total MEAP expenditure of almost \$68,000 (Burr and Sun, 1979)

Of special note, Redcon Gold Mines (MEAP RL-61) has recently announced the discovery of a gold-bearing quartz carbonate horizon, some 1,500 feet in length and up to 40 feet in width, on its Balmer Twp. claim group. Drilling results are currently being evaluated and additional work is planned in the near future. (Northern Miner Dec. 6, p.28).

Sixteen MEAP contracts have been approved for fiscal 1979-80.

Ontario Geological Survey Activities

The following projects were carried out by the Precambrian Geology Section of the Ontario Geological Survey in 1979 (for location of projects, see Figures 1 and 2):

Detailed (1 inch to 880 feet) mapping of Heyson Township was completed, thus completing a two-year project with Byshe, Willans, and Ranger Townships being mapped the previous year (Pirie 1979a). As a part of the Red Lake Synoptic Project (Pirie 1979b), Dome Township was remapped at a scale of 1 inch to 1000 feet (Area A).

A study of rare element-bearing granitoid pegmatites was initiated at two different localities (area B), namely the Sandy Creek beryl occurrence and the Roadhouse River Lithium property (Breaks 1979).

Detailed mapping of the Ferdinand Lake map-area (area C) was completed (Wallace 1979).

Four felsic volcanic centres (area D) were mapped and sampled to evaluate their economic potential (Thurston 1979a).

For additional information on the above listed projects, the reader is invited to consult the Summary of Field Work, 1979 by the Ontario Geological Survey (OGS Miscellaneous Paper 90).

Dr. V.K. Prest of the Engineering and Terrain Geology Section continued mapping of the surficial geology in the Red Lake-Ear Falls area, the objective being to outline areas of high aggregate potential.

Research by Other Agencies

In conjunction with the Ontario Geological Survey's Geoscience Research Grant Program, C.J. Hodgson and H. Helmstaedt of Queen's University continued their study of the gold mineralization at the Campbell Red Lake and Dickenson Mine properties. This involved very detailed petrological mapping of selected ore zones in both mines, along with an analysis of the structure of the veins.

Presently, their research involves the sampling of vein material and wallrocks in order to define broad geochemical anomalies and alteration patterns. (Hodgson and Helmstaedt 1979; Hodgson *et al.* 1979).

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NORTHWESTERN — RED LAKE

TABLE 1 Summary of Claims Recorded and Assessment work credit received, Red Lake Mining Division.

	Claims Recorded	Claims Active	Diamond Drill (Man Days)	Geophys. Surveys (Man Days)	Geological Surveys (Man Days)	Total All Work (Man Days)
1979	1,068	3,221	21,108	38,380	3,184	62,869
1978	1,207	3,916	25,574	14,793	2,480	50,997
1977	2,324	4,261	12,994	45,080	620	59,196
1976	2,705	4,332	18,680	23,578	380	46,544
1975	1,368	2,957	29,377	12,714	960	44,717
1974	1,339	3,648	47,362	5,660	3,040	57,719
1973	1,616	4,009	60,027	20,474	Nil	83,227
1972	2,219	5,588	34,261	14,858	5,216	56,866
1971	1,541	8,486	73,019	50,920	2,243	127,567
1970	3,971	11,759	73,866	329,065	17,606	427,093
1969	10,999	14,772	49,377	66,032	2,384	120,906
1968	2,451	4,784	15,367	48,800	1,228	64,967

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TABLE 2 Maps and Reports pertaining to the Red Lake Mining Division, issued by the Ontario Geological Survey of the Ontario Ministry of Natural Resources in 1979. "List of Publications" (back pocket) for details.

GEOSCIENCE REPORT

GR 177

MISCELLANEOUS PAPERS

MP 77 (1978 supplement)
MP 81
MP 84
MP 87
MP 90

OPEN FILE REPORTS

OFR 5264
OFR 5272
Open File Worksheets

Airborne & ground radiometric survey data, geological descriptions, and assays for the OGS follow-up investigations of radiometric anomalies in the following areas (for viewing only in the Resident Geologist's Office, Red Lake):

Carroll Lake	52M
North Spirit Lake	53C
Deer Lake	53D
Island Lake	53E
Opasquia Lake	53F
Stull Lake	53K

MISCELLANEOUS PUBLICATIONS

Rocks and Mineral Information 1979

COLOURED MAPS

Map 2199
Map 2201
Map 2408

PRELIMINARY MAPS - GEOLOGICAL SERIES

P.2212
P.2213
P.2214
P.2215
P.2217
P.2238

PRELIMINARY MAPS - DATA SERIES

P.2012
P.2013
P.2014
P.2015
P.2016

PRELIMINARY MAPS - GEOPHYSICAL/GEOCHEMICAL SERIES

80 032-80 171

TABLE 4 Assessment Work and other information received in 1979.

Abbreviations

Assess.	-Assessment Work	Mag.	-Magnetometer Survey
Au	-Gold	MEAP	-Mineral Exploration Assistance Program
BM	-Base Metals	Mo	-Molybdenum
DDH(6) 2915'	-6 Diamond drill holes totalling 2915'	Rad.	-Radiometric Survey
EM	-Electromagnetic Survey	Tr.	-Trenching
GL	-Geological Survey	U	-Uranium
HEM	-Horizontal Loop Electromagnetic	VLF	-Very Low Frequency Electromagnetic

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Avis Lake	52K/16	St. Joseph Explorations Ltd	BM	Assess.	Mag., EM, GL.	1978	2.2757	52K/NE
						1978	2.2823	52K/NE
Armstrong Lake	53C/7	New Jersey Zinc Exploration Co. (Canada) Ltd.	BM	Assess.	Mag.	1977	2.2831	53C/SE
Baird Tp.	52K/13	Orelock Exploration Ltd.	Au	MEAP RL-58	Mag., EM., GL. DDH(2) 607'	1978	63.3586	Baird Tp.
Ball Tp.	52M/1	Hermiston, Wayne L.	Au	Assess.	DDH(1) 444'	1979		Ball Tp.
Balmer Tp.	52N/4	Dickenson Mines Ltd.	Au	MEAP RL-62	DDH(4) 3912'	1978	63.3575	Balmer Tp.
		Onaping Resources Ltd	Au	Prospectus Assess.	Mag.	1979		Balmer Tp.
						1978- 2.2990		Balmer Tp.
		Peterson, Charles W.	Au	MEAP RL-63	Tr.	1978	63.3559	Balmer Tp.
Borland Lake	53D/16	Redcon Gold Mines Ltd	Au	Meap RL-61	DDH(6) 2915'	1979	63.3574	Balmer Tp.
		Union Oil Co. of Canada Ltd. U	U	Assess.	Rad., GL.	1978	2.2858	53D/16
Dent Tp.	52N/2	Frank, Raymond A.- Sherritt Gordon Mines Ltd. Joint Venture	BM	Assess.	Mag., EM., GL.	1977	2.2642	Dent Tp.
		Teck Explorations Ltd.	BM	Assess.	DDH(1) 260'	1979		Dent Tp.
Dome Tp.	52N/4	Coniagas Mines Ltd.	Au	Assess.	Mag.	1945	63.14	Dome Tp.
		Craibbe-Fletcher Gold Mines Ltd.	Au	Assess.	Mag., DDH(4) 1735'	1945	63.11	Dome Tp.
		Follansbee Red Lake Gold Mines Ltd.	Au	MEAP RL-59	Mag., EM., (VLF), EM(HEM), GL.	1978	63.3572	Dome Tp.
		Kostynuk, Alexander	Au	Assess.	DDH(2) 217'	1978		Dome Tp.
		Iatonic Red Lake Gold Mines Ltd.	Au	Assess.	Mag.	1946	63.63	Dome Tp.
		Loisan Red Lake Gold Mines Ltd.	Au	Assess.	Mag.	1946	63.47	Dome Tp.
Fredart Lake	52K/15	Consolidated Copper-Lode Developments Inc.	BM	Assess.	DDH(2) 1002'	1977		52K/NE
Fredart, Gerry Lakes	52K/15,	Selco Mining Corp. Ltd..	BM	Assess.	Mag., EM.	1977-	2.2774	52K/NE

Table 4 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Gerry Lake	52K/14	Selco Mining Corp. Ltd	BM	Assess.	DDH(5) 1385'	1977-78		52K/NW
Gillieran Lake	53K/8	Noranda Exploration Co. Ltd.	BM	Assess.	Mag.	1978	2.2770	53K/SE
Granite Bay of Sandy Lake	53F/3	Ogden, Michael	Au	Assess.	DDH(3) 1054'	1979		53K/SE
				Assess.	Assays	1977-78		53F/SW
Honeywell Tp.	52N/2	Geophysical Engineering Ltd.	BM	Assess.	Mag., Tr., GL.	1979	2.2944	53F/SW
				Assess.	DDH(1) 160'	1978		Honeywell Tp.
Karas Lake	52K/14	Selco Mining Corp. Ltd	BM	Assess.	DDH(6) 2797'	1977-79		52K/NW
Mattson Lake	53C/7	Hanna Mining Co., The	BM	Assess.	EM., GL.	1976	2.2762	53C/NE
				Assess.	DDH(6) 1682'	1977		53C/NE
McDonough Tp.	52N/4	Conlee Red Lake Gold Mines Ltd.	Au	Assess.	Mag.	1947	63.112	McDonough Tp.
Mitchell Tp.	52N/2	Selco Mining Corp. Ltd	BM	Assess.	DDH(1) 276'	1979		Mitchell Tp.
Mitchell, Bowerman Tps.	52N/2	St. Joseph Explorations Ltd.	BM	Assess.	Mag., EM.	1978-79	2.2914	Mitchell Tp.
Rapson Bay	53K/8	Noranda Exploration Co. Ltd.	BM	Assess.	DDH(2) 747'	1979		53K/SE
Root Lake	52J/13	Noranda Exploration Co. Ltd.	BM	Assess.	GL.	1977	2.2870	52J/NW
Setting Net Lake	53C/13	Caspian Resources Ltd.	Mo	Assess.	DDH(4) 3092'	1978	63.3580	53C/NW
Shabumeni Lake	52N/7	Geophysical Engineering Ltd.	BM	Assess.	DDH(1) 200'	1978		52N/SE
Skinner Tp.	52N/2	Teck Explorations Ltd.	BM	Assess.	DDH(3) 612'	1979		Skinner Tp.
Slate Lake	52K/15	St. Joseph Explorations Ltd.	BM	Assess.	Mag., EM.	1978	2.2758	52K/NE
				Assess.	GL.	1978	2.2973	52K/NE
South of Otter Lake	52K/14	Selco Mining Corp. Ltd.	BM	Assess.	DDH(15) 5402'	1977 (parts resubmitted)		52K/NW
				Assess.	Mag., EM.	1979	2.2971	52K/NW
Stull Lake	53K/7	Noranda Exploration Co. Ltd.	BM	Assess.	DDH(2) 750'	1979		53K/SE
Todd Tp.	52M/1	Soltermann, Rene H.	Au	MEAP RL-64	DDH(2) 441'	1978	63.3585	Todd Tp.
Uchi Lake and Earney Tp.	52N/2	Selco Mining Corp. Ltd	BM	Assess.	DDH(3) 1254'	1978-79		Earney Tp.
Costello Tp.	52N/1	Sherritt Gordon Mines	BM	Assess.	DDH(2) 350'	1979		Costello Tp.
McNaughton Tp.	52N/1	Sherritt Gordon Mines	BM	Assess.	DDH(4) 1123'	1979		McNaughton Tp.
Satterly Lk.	52N/8	Sherritt Gordon Mines	BM	Assess.	DDH(4) 711'	1979		52N/8
Mitchell Tp	52N/2	St. Joseph Expl. Ltd.	BM	Assess.	DDH(1) 166'	1979		Mitchell Tp.

NORTHWESTERN-RED LAKE

TABLE 3 Exploration Activity in 1979.

The following is a list of individuals and companies known to be engaged in exploration within the Red Lake Mining Division in 1979, and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figure 1.

INDIVIDUAL OR COMPANY	ACTIVITY
1. Beth-Canada Mining Co.	Exploration in Balmer, Byshe, Killala, Mulcahy, Ranger, and Willans Tps.
2. Bonanza Red Lake Explorations Inc.	Ground mag. and diamond drilling in Dome Tp.
3. Campbell Red Lake Mines Ltd.	Ground mag. and EM, geology and diamond drilling in Balmer Tp.
4. Cominco Ltd.	Exploration in Shabu Lake area.
5. Dickenson Mines Ltd.	Exploration in Balmer Tp.; ground geophysics and trenching in Favourable Lake area.
6. Dome Exploration (Canada) Ltd.	Ground geophysics in Ball and Willans Tps.
7. Frank, R.A.	Exploration in Corless Tp.
8. Geophysical Engineering Ltd.	Diamond drilling in Dent and Skinner Tps.
9. Hermiston, W.L.	Exploration in Ball Tp.
10. Howes, T.	Exploration in Baird Tp.
11. Minorex Ltd.	Exploration in Ball, Fairlie, Mulcahy, and Todd Tps; diamond drilling in Ball Tp.
12. New Jersey Zinc Exploration Co. (Canada) Ltd.	Trenching and diamond drilling in Armstrong Lake area.
13. Noranda Exploration Co. Ltd.	Ground geophysics and diamond drilling in Stull Lake and Rapson Bay areas.
14. Onaping Resources Ltd.	Ground geophysics, geology, and diamond drilling in Balmer Tp.
15. Orelock Explorations Ltd.	Exploration and diamond drilling in Baird Tp.
16. Peterson, C.W.	Exploration and trenching in Heyson Tp.
17. Powley, M.	Exploration in Knott Tp.
18. Redcon Gold Mines Ltd.	Ground geophysics and diamond drilling in Balmer and Bateman Tps.
19. Sabina Industries Ltd.	Exploration in Bateman Tp.
20. Selco Mining Corp. Ltd.	Exploration in Gerry, Otter, South of Otter, Little Bear, and Bluffy Lake areas.
21. Shannon, L.	Exploration in Shabu Lake Area.
22. Sherritt Gordon Mines Ltd.	Exploration in McNaughton and Costello Tps., and Shabumeni Lake area.
23. Soltermann, R.H.	Diamond drilling in Todd Tp.
24. St. Joseph Explorations Ltd.	Ground geophysics in Mitchell Tp. and Slate Lake area.
25. St. Mary's Exploration Ltd.	Exploration in Skinner Tp.
26. Stupack, W.	Exploration in Ball Tp.
27. Wilanour Resources Ltd.	Ground mag. and EM and geology in Dome Tp.
28. Wood, R.	Diamond drilling in Dome and Heyson Tps.

1979 Report of Sioux Lookout Resident Geologist

D.A. Janes¹ and A.A. Speed²

Contents

Introduction	23
Resident Geologist's Activities	23
Mining Activity	26
Industrial Minerals	26
Mineral Exploration Activity	26
Properties Visited, Under Evaluation and/or Exploration	27
1. Belmore Bay Occurrence	27
2. Floregold Occurrence	27
3. Goldlund Mines Limited	28
4. Pidgeon Molybdenum Mines Limited (Rio Tinto Canadian Exploration Limited)	28
5. Powell Occurrence	29
6. Quytta Occurrence	29
7. Thompson Prospect	29
Recommendations for Exploration	31
Minnitaki Lake Gold Area	31
Mavis Lake-Gullwing Lake Area	31
Bamaji Lake Area	31
Ontario Geological Survey Activities	31
Research by Other Agencies	32
Masters Theses	32
Bachelor Theses	32
Recent Publications and References	32

Tables

1-Claims Recorded and Assessment Work Credit Received, Patricia Mining Division from 1974 to 1979	27
2-Bulk Sample Assay Values Floregold Red Lake Mines	28
3-Assay Values Thompson Prospect	30
4-Maps and Reports Issued by the Ontario Geological Survey in 1979	33
5-Exploration Activity in 1979	34
6-Assessment Work and Other Information Received in 1979	35

Figures

1,2-Sioux Lookout Resident Geologist's District	24,25
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Introduction

The Sioux Lookout office was staffed from January to July by A. A. Speed, Resource Geologist and Mrs. E. Fraser, secretary. D. A. Janes joined the staff in late July as Resident Geologist.

Exploration for base metals continued in the Houghton-Hough Lakes area and around the established mining sites of Sturgeon and Pickle Lakes. Exploration activity for base metals continued in the Sandybeach Lake area.

The recent expansion of gold exploration has sparked interest in the Minnitaki Lake and Pickle Lake areas with underground exploration planned or in progress at two sites and drill programs planned or in progress at several others.

Molybdenum exploration around the Lateral Lake stock is in full swing with an extensive winter program planned.

Uranium exploration has not been evident in the area and uranium properties in Bluett Lake and Bamaji Lake areas have not been worked recently.

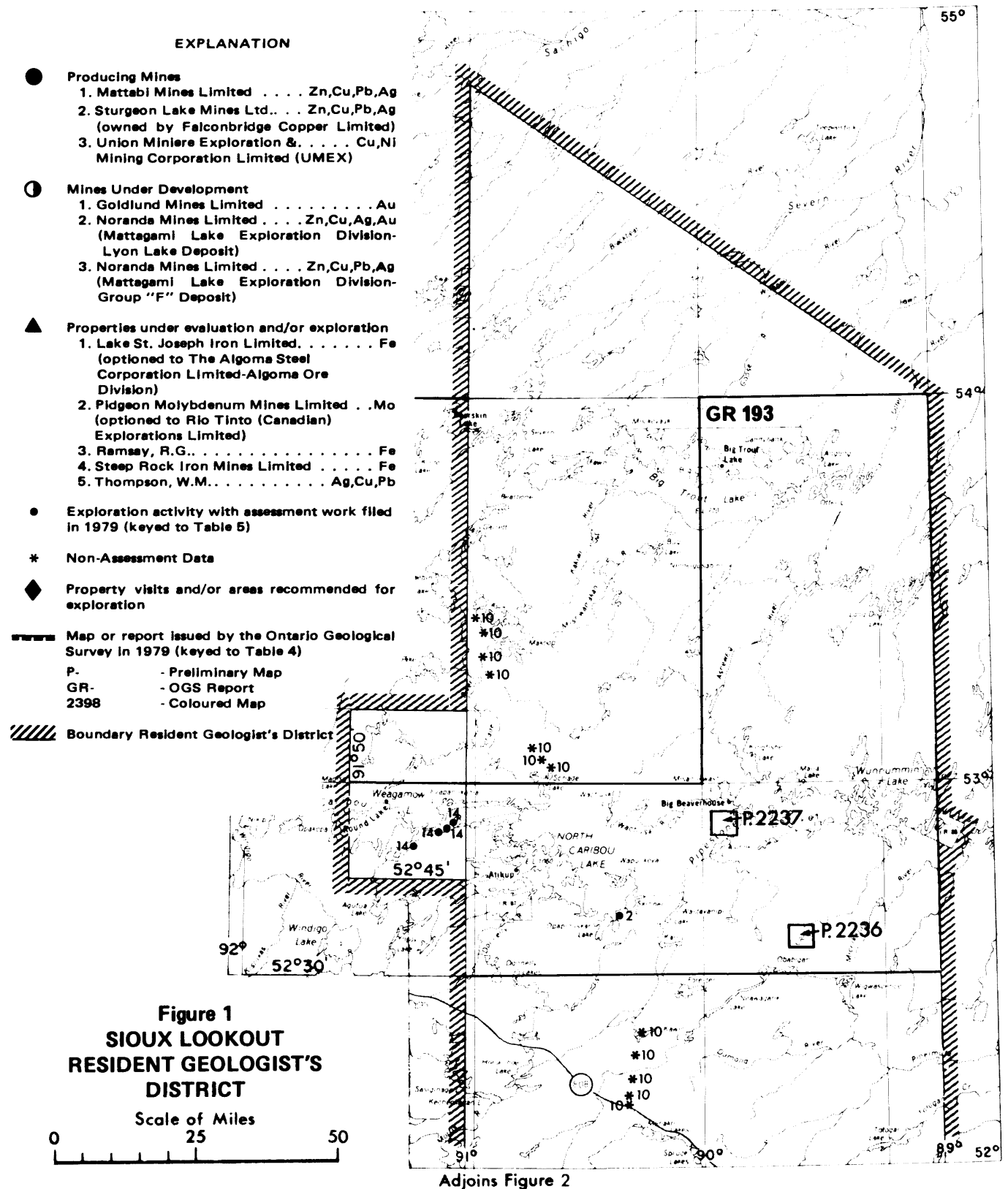
Recent areal mapping by the Ontario Geological Survey has improved the geological data base in the southern and central regions of the district. A decided increase in exploration interest in these areas has been noted.

The most interesting events of the year have been the pre-production development at the Goldlund gold property, expanded development work at the Pidgeon Molybdenum property and the development to production of the Lyon Lake and "F" zone properties at Sturgeon Lake. The resumption of full production of Thierry Mine at Pickle Lake has been very encouraging.

Resident Geologist's Activities

Three operating base metal mines were visited during the year: the open pit and underground workings of Mattabi Mines Limited, the Lyon Lake Mine and "F" orebody of Noranda Mines Limited, Lyon Lake Division in the Sturgeon Lake area, and the Thierry Mine of Union Miniere at Pickle Lake. Several visits were made to Goldlund Mines where underground development and decline development are underway.

NORTHWESTERN-SIOUX LOOKOUT



Adjoins Figure 1

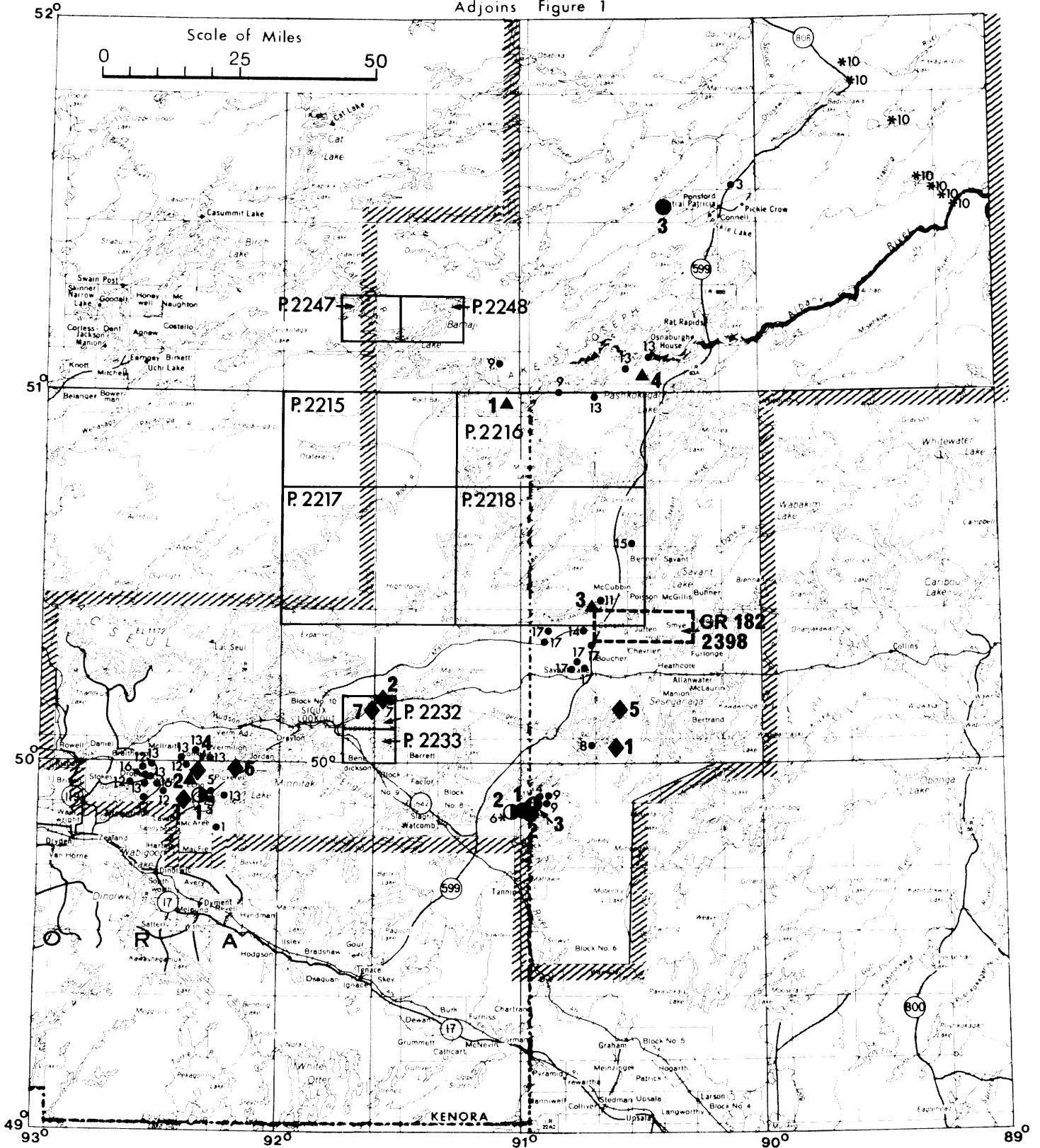


Figure 2

NORTHWESTERN — SIOUX LOOKOUT

The position of Resident Geologist was vacant between January and August of 1979 so that staff activities during the field season were curtailed.

Geological and mineral resource data were gathered for the West Patricia Land Use Plan and some time was spent on the Lac Seul Management Study.

The tight aggregate supply position in the immediate area of Sioux Lookout has involved added workload in pit examinations and inventory in order to conserve and possibly expand known reserves. This is a continuing problem and steps to improve the situation will be taken in the New Year.

Eighteen data series compilation maps were completed during the year and are presently in press. Geological and mineral identification lectures were given to high school groups in Dryden, Sioux Lookout and Ignace. Office personnel visited two Junior Ranger camps, giving talks and conducting field trips. A. Speed attended four public information programs held by the Ministry of Natural Resources at Dryden, Kenora, Ignace and Sioux Lookout.

Mining Activity

Three mines remained in production in 1979. The Thierry Mine in the Pickle Lake area and Mattabi Mine and Sturgeon Lake Mine in the Sturgeon Lake camp. The Lyon Lake Mine and the "F" deposit of Noranda Mining Company at Sturgeon Lake are being developed for production in 1980 and 1981 respectively.

Thierry Mine, owned and operated by Union Miniere Exploration and Mining Corporation Limited, has increased production to approximately 3,300 tons per day in contrast to the circa 2,000 tons per day during the period of reduced production. Most ore is produced from underground with the eventual goal of an entirely underground operation when existing stock-piles are exhausted.

Mattabi Mines Limited is operating at near design capacity of 3,000 tons per day. Open pit ore will soon be exhausted and underground development by decline from portals in the open pit is underway. When the conversion to underground operations is complete, the mill production rate will drop to approximately 2,500 tons per day of which the Mattabi Mine will supply approximately 1,000 tons per day.

The Lyon Lake Mine is undergoing development toward production with a target date of mid 1980. Installation of crushing and conveying on the 1,000 foot level is in progress. When in operation the Lyon Lake Mine is designed to produce ore at 1,400 tons per day which will be trucked and stockpiled at Mattabi.

One waste bench was removed from the C zone of the "F" group. Mining will be done during the summer months and the ore stock-piled at Mattabi. Ore production will start in 1981. Daily production will be at 400 tons per day during the mining period.

Sturgeon Lake Mines is due to cease operations in mid 1980 due to exhaustion of ore reserves.

Industrial Minerals

Potting Soil

Manufacture of potting soil was initiated in 1979, using a source of peat approximately 30 miles south of Sioux Lookout. Mr. D. H. Atkinson, of Sioux Lookout, has established a company known as Du-Nor Products which produces 4 litre bags of the soil for distribution locally as well as outlets in Thunder Bay.

The industry has a potential production rate of 400 bags per hour, however, it is only operating on a part-time basis at the present time.

Rock Ballast

Rock ballast was produced from the Watcomb Quarry during 1979 by Blackstone Paving, a British Columbia Company. From quarry permit returns, 59,223.8 cubic yards of crushed rock and gravel were produced for maintenance and construction of rail beds and sidings on the C. N. R. mainline in northwestern Ontario.

Sand and Gravel

A large amount of aggregate was used in the Sioux Lookout area during the 1979 construction season. Reconstruction and upgrading of Highways 72 and 664, and improvements to the Sioux Lookout Airport, accounted for the majority of the aggregate consumption in the area. Total amounts of aggregate used are unavailable at the present time.

Mineral Exploration Activity

The increased level of claim staking experienced in 1978 has been reduced to normal levels. However, assessment work on existing claims is being maintained at a high level.

Towards the end of 1979, the recent rapid increase in gold price gave rise to considerable interest in older properties on Minnitaki, Pickle and Sturgeon Lakes. Considerable staking has occurred on and around these properties and it is expected that a higher level of staking will occur during the winter and spring.

The following statistics of Table 1 were compiled for the Patricia Mining Division for 1979.

TABLE 1 Claims Recorded and Assessment Work Credit Received in Patricia Mining Division from 1974 to 1979.

Year	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophysical Survey (Man Days)	Geological Survey (Man Days)
1974	1,011	3,223	5,659	38,049.0	6,255	102
1975	1,019	2,489	3,903	38,492.7	18,953	1,858
1976	1,185	1,120	3,958	27,111.0	11,555	185
1977	1,261	1,320	3,760	17,880.1	13,931	946
1978	2,018	765	5,094	33,371.3	57,501	600
1979	1,012	1,061	5,045	30,869*	27,605.4*	1,949*

* 11 month total, January 1 to December 1

Properties Visited, Under Evaluation and/or Exploration

Belmore Bay Occurrence

This property (Figure 2, Property Visit1) is located some 57.5 air miles east of Sioux Lookout on the north shore of Belmore Lake (previously known as Mud Lake), approximately 1,500 feet east of Belmore Bay of Sturgeon Lake. The main showings, a shaft and a large pit, are located on mining location H. W. 748. Mr. Hannula of Thunder Bay presently owns this claim and a number of others in the Belmore area.

The only written report of this property is given by Moore (1911, p.153) in which he reports a shaft 260 feet deep sunk near Mud lake (sic) and a three-stamp mill erected on the shore of the lake by the Belmore Bay Mining Company. Other than this information by Moore very little is known about the property.

During a recent visit to the property, the main shaft was found near the north shore of Belmore Lake and also a second shaft (or very deep pit) was located approximately 1,000 feet north-northeast of the No. 1 shaft.

The No. 1 shaft, was sunk on a quartz vein varying in width from 12 inches to 18 inches. The quartz vein striking approximately 165 degrees and dipping about 80 degrees to the west, occurs in a sheared, fine to medium-grained mafic to intermediate flow rocks.

The quartz, occurring in the dump or muck pile from the No. 1 shaft, can be described as white, sugary, "bull" quartz. The quartz is mineralized with biotite and chlorite, some fuchsite, and sparce pyrite, with a few specks of chalcopyrite and pyrrotite.

A grab sample of quartz taken from the No. 1 shaft dump and assayed by the Geoscience Laboratories, Ontario Geological Survey, Toronto, yielded 0.12 ounces Au/ton, 110ppm Cu, and 0.18 ounces of Ag/ton.

Grab samples of quartz and quartz-carbonate material collected at the No. 2 shaft or pit were mineralized

with tourmaline, fuchsite and/or epidote and very sparse pyrite. The quartz is white and massive, and no visible gold was seen. The origin of the quartz and quartz-carbonate material at this shaft location is unknown as no quartz was seen in the excavation. This may have been due to the high water level in the excavation. A grab sample from this shaft location was assayed by the Geoscience Laboratories, Ontario Geological Survey and yielded 1.29 ounces Au/ton 40ppm Cu, and 0.09 ounces Ag/ton.

Floregold Occurrence

The Floregold occurrence (Figure 2, Property Visit 2) is located some 17 miles east-northeast of Sioux Lookout, approximately 1 mile southwest of McDougall Mills on the C. N. R. mainline.

The original discovery was made by J. Paquette and associates and staked in 1937. The property was optioned to Prospectors Airways who performed surface work on the No. 1 vein or "main break" in 1938. Between 1938 and 1940 the property was sampled by various interested mining groups. In 1940, the property was optioned by Coniagas Mines Limited who performed some 2,100 feet of diamond drilling, mostly on the "main break" zone.

In 1941, the property was bulk-sampled by Coniagas Mines Limited. The assay results of the bulk sampling done by this company are unavailable. However, about 1950, Floregold Red Lake Mines Limited optioned the property and drilled 9 diamond drill holes (for a total length of 3,228.4 feet) and 5 x-ray holes (for a total length of 195.2 feet). Also bulk sampling of the No. 1 vein was done with the results listed in Table 2 (data from Sioux Lookout Resident Geologist's Assessment Files).

At the present time the showing is held by R. Moretti of Sioux Lookout, who with a partner D. McKay have done limited stripping and trenching.

TABLE 2 Bulk Sample Assay Values from Floregold Red Lake Mines

Lot Number	Location	Average Width	No. Pounds Dry Weight	Assay Result Au. oz./ton
1	From 44' to 95' No. 1 Picket Line (vein quartz)	2.5'	17,778	0.481
2	From 240' to 254' No. 1 Picket Line (vein quartz)	1.5'	1,168	0.035
3	From 240' to 254' No. 1 Picket Line (wall rock)	1.5'	401	0.01
4	From 344' to 373' No. 1 Picket Line (vein quartz)	2.0'	9,012	0.544

A visit was made to the property in May of 1979 during which the main or No. 1 vein was found. Two other veins or zones are mentioned in reports occurring to the northwest of the "main break". The area to the northwest was searched thoroughly but neither of these veins was found. However, four piles of old diamond drill core were found just north of the main showing, and upon examination, were found to consist of quartz diorite, of both fine and coarse-grained varieties, and mafic metavolcanic rock. A few specks of pyrite were observed occurring sparsely throughout the diamond drill core.

The main showing consists of a series of parallel to sub-parallel quartz veins which occur in a highly sheared mafic metavolcanic rock of andesite to basalt composition. This shear zone is near a contact with a fine-grained quartz diorite to the north of the showing.

The quartz veins and shear zone outcrop on the south-east side of a low ridge which trends northeast-southwest. The main quartz vein strikes N47°E to N48°E and has a variable dip of 59 degrees to 63 degrees to the northwest. Variations in strike and dip occur due to gentle folding in both vertical and horizontal planes.

The shear zone which carries the quartz veins has been exposed for a length of approximately 600 feet. The main quartz vein(s) have a maximum width of 3.5 to 4 feet, but pinch and swell sporadically along the entire length of the exposure.

The veins observed in the shear zone consist of white quartz barren of any visible mineralization. The contacts of the veins and associated quartz stringers are bounded by carbonate and/or ankerite alteration in the country rock. No sulphide mineralization was noted anywhere by the senior author, although pyrite was reported occurring "sparingly in the schist along the vein walls." Visible gold was reported to have been seen in a glassy blue quartz, however no quartz of this colour was seen by the senior author.

At the time of the visit to the property the old trenches were partially filled with water and/or organic debris which made observation of the quartz vein system difficult. Considerable stripping of overburden in the middle portion of the shear zone and in the areas of the old trenching would be required to determine if the vein system is indeed continuous through the entire shear zone.

Although this old gold showing may not in itself constitute an economically viable gold deposit, the area has the potential to warrant additional exploration for gold and base metals.

Goldlund Mines Limited

During 1979 Goldlund Mines Limited (Figure 2, Property Visit 3) have continued with a surface and underground drilling program to prove up ore reserves. During the year 18,144 feet of underground drilling was completed and surface drilling totalled 11,900 feet. Late in the year a decline was started; it is planned to extend for 1300 feet at -17 percent and at year's end had been driven approximately 200 feet. The decline will pass through the ore body at the 200 level. Approximately 50 people are employed on site of which 20 are Goldlund employees and the remainder are contractor employed.

In preparation for an early 1980 decision on production, a limited program of access road improvement has been completed. Contracts for rehabilitation of the high voltage power line will be signed in January.

Pidgeon Molybdenum Mines Limited (Rio Tinto Canadian Exploration Limited)

Rio Tinto and Dickenson Mines announced a joint program to extend ore tonnage at Pidgeon Molybdenum

Mines (Figure 2, Property Visit 4). Drilling and geophysical surveys were started in late 1979 after freeze-up on the Echo Township property and additional claims were staked. At year end the drilling program was in progress to extend the ore zones to depth. The evaluation program has been extended to include the northern contact of the Lateral Lake granitic stock with mafic volcanics. Underground development on the existing adit is not planned at present.

Powell Occurrence

The Powell property (Figure 2, Property Visit 5) is located Arm of Sturgeon Lake. The property is presently held by S. Johnson of Sioux Lookout.

Very little information exists on this property and the only written report is by Moore (1911, p.150-151). He describes the rocks on this property as "a complicated mixture of quartz-porphry, gray schist and greenstone" with the quartz vein lying "sometimes in one rock and sometimes in the other, and in places along the contact of the two." Moore (1911, p.151) further describes the quartz vein:

It varies in width from 2 to 15 inches, and frequently breaks up into stringers, especially at the contact between different types of rock. The quartz is well mineralized with pyrite and chalcopyrite, the latter frequently altered to malachite and azurite. We had no difficulty in finding good samples of gold at depth of 20 feet. These gold specimens are doubtless due to the secondary enrichment process, as they occur in association with the secondary carbonate of copper.

A number of grab samples were taken by the authors from the vicinity of the main shaft during a brief visit to the property. Two selected samples were sent to the Geoscience Laboratory, Ontario Geological Survey, Toronto for assay. Both samples assayed were quartz and quartz-carbonate vein material. Selected grab sample No. P-1 revealed 1.54 percent Cu and 0.39 ounces Au/ton. Selected grab sample No. P-2 yielded 4600 ppm Cu and 0.53 ounces Au/ton.

Two open shafts were located on the property and one open pit or third shaft. The depth of the three excavations is unknown.

Quyta Occurrence

This property (Figure 2, Property Visit 6) is located approximately one mile north along a bush trail leading from Highway 72, 18 miles south of Sioux Lookout. Mr. R. Fair-service of Dryden, Ontario presently holds 43 claims just north of Highway 72, including the old Quyta gold showing.

The first description of this property is given by Chisholm (1951, p.8) in which he states:

A wide porphyry dike has been traced for a distance of 3,000 feet in a northeasterly direction across the central part of the property. . . It is elliptical-shaped and is about 400 feet in width at

the widest part. Where exposed by cross-trenches near No. 1 post of claim Pa 10444, the dike is a dark-green to grey porphyry of intermediate to basic composition with numerous white quarter-inch albite phenocrysts.

A series of diagonal quartz tension-fractures from 1 to 3 inches in width are exposed in the trenching. Their predominant strike is N30°E, and they dip at 45°W. They are spaced 4 or 4 feet apart. Visible gold was noted in one of the fractures associated with sparse cubic pyrite mineralization. Sericitic alteration extends out from the walls for several inches. The fractures appear to be more plentiful towards the south side of the dike at the contact with amygdaloid andesite. There is strong evidence of shearing in the andesite in a northeasterly direction. The company officials report that some of the quartz stringers and accompanying alterations in the trenches gave high assays in gold in picked grab samples.

During 1950, Quyta Gold Mines Limited dug a total of 8 trenches on former claims Pa 10441, 10442, 10443 and 10444. In 1950 and 1951 the company drilled 13 holes for a total length of 6,271 feet (Sioux Lookout Resident Geologist's Assessment Files).

A visit was made to this property in June, 1979 by one of the authors. Four large trenches, partially filled with water and organic debris, were found approximately the middle of what was formerly the old Quyta property.

The property is extensively drift covered and thus outcrop is scarce. The trenches were dug on quartz stringers and veins ranging in size from less than one-half inch up to ten inches in width. The quartz veins and stringers occur in country rock, which in some places looks like a porphyritic mafic flow, and in other places, a mafic to intermediate tuff. The quartz veins and stringers are of the milky-white variety and are irregularly distributed, strike in all directions and have variable dips. The only mineralization observed was sparse pyrite mineralization in the volcanic rocks close to the contact with the quartz veins.

Since no assay values were submitted with the Quyta company logs, it is difficult to assess the gold potential of this property. However, copper mineralization (chalcopyrite) mentioned in one of the Quyta Gold Mines Limited drill logs (Sioux Lookout Resident Geologist's Assessment Files) could indicate the presence of base-metal mineralization on the property.

An extensive exploration program of the area with linecutting and geophysical surveys is scheduled for this winter with follow-up diamond drilling of any anomalous zones in the future.

Thompson Prospect

The W. M. Thompson prospect (Figure 2, Property Visit 7) is located approximately 16 miles east of Sioux Lookout near the Rosnel Siding of the C. N. R. mainline. Mr. Thompson of Sioux Lookout has recently (September, 1979) restaked this property.

The property has undergone a considerable amount of exploration by Mr. Thompson as well as interested mining companies. Mr. Thompson's work consists mostly of trenching and some short diamond drill and x-ray drill holes.

TABLE 3 Assay Values from Thompson Prospect

Sample Number	Location and Rock Type	Au (oz/ton)	Ag (oz/ton)	Cu (%)	Pb (%)	Zn (%)
T1GS (Grab Sample)	NE part Trench 1; quartz vein material and sericite schist visible gn, cp, py, black mineral (textrahedrite?)	0.06	0.12	0.57	trace	trace
T1GC (Chip Grab Sample)	SW part Trench 1; carbonatized quartz vein and sericite schist	0.04	5.00	0.05	0.11	0.03
T1SG (Selected Grab Sample)	SW part Trench 1; carbonatized quartz vein material	0.12	5.56	0.06	0.22	0.02
T2SG (Selected Grab Sample)	Trench 2; sheared and carbonatized quartz-eye sericite schist-malachite staining, some cp and py	trace	0.26	0.11	trace	nil
T2GC (Chip Grab Sample)	Trench 2; sheared and carbonatized quartz-eye sericite schist	trace	0.10	0.02	trace	nil
T3SG (Selected Grab Sample)	Trench 3; sheared and carbonatized quartz-eye sericite schist-malachite staining	0.22	12.54	0.13	0.26	0.33
T3G (Grab Sample)	Trench 3; sheared and carbonatized quartz-eye sericite schist	trace	0.20	0.49	trace	trace

Asarco Exploration Company Limited optioned the property in 1970, and performed geological mapping and ground electromagnetic and magnetic surveys. Two, 200-foot holes were drilled by Asarco, 500 feet apart, to test the mineralized zone.

In 1975, New InscO Mines Limited drilled 5 diamond drill holes, for a total length of 1,504 feet, testing the mineralized zone at depth. Four of these holes intersected the mineralized zone. Based on New InscO Mines Limited drill hole data, the occurrence consists at depth of disseminated pyrite, chalcopyrite, and sphalerite within carbonatized quartz-sericite schist (Sioux Lookout Resident Geologist's Assessment Files).

During a recent visit to the property (July, 1979) one of the authors accompanied by R. O. Page of the Precambrian Geology Section, Ontario Geological Survey, sampled three mineralized areas where trenching had been performed by Mr. Thompson.

The property occurs in a band of extrusive metavolcanic rocks which vary from mafic to felsic in composition. The major mineralized zone occurs in sheared felsic rocks which can be described as carbonatized quartz-eye sericite schist. There are four main rock types in the area: massive intermediate - to - mafic lavas; intermediate lavas and tuffs; felsic lavas and tuffs and an intrusive, dark-green quartz diorite.

The schistosity of the volcanic rocks in the area of the showing strikes east-northeast to northeast and the dip of the rocks is about 80 - 85 degrees to the north.

The sheared and carbonatized quartz-eye sericite schist occurs at the contact between mafic and felsic metavolcanic rocks. The "quartz-eyes" vary from a milky white colour to a dull blue colour. In some places the shearing appears to have been so intense that there are very few if any quartz-eyes visible in the rock.

In the most northeasterly part of the exposed shear zone a trench has been dug, and for the purposes of this report is called Trench 1. This trench has been dug on a quartz carbonate vein which remains as a pod or boudin within the shear zone.

Some 600 feet southwest of Trench 1 a second trench (Trench 2) has exposed about a 6-foot wide zone of sheared and carbonatized quartz-eye sericite schist.

Trench 3, located approximately 1,000 feet southwest of Trench 2 has exposed about a 2-foot wide portion of the shear zone. The rock type here is similar to that found in Trench 2. Trenches 2 and 3 do not contain any quartz vein material observed in Trench 1.

A number of grab, chip, and select grab samples were taken at each of the three mineralized trenches and Table No. 3 summarizes the results of the assays performed on the individual samples.

Since assay values of the diamond drilling carried out by both Asarco and New InscO were not reported, it was hoped the representative samples of mineralization and rock type taken during this visit would provide a better basis for determining the potential value of this property. Since significant silver and gold values were obtained from some of the sample a more detailed drilling program may be warranted to determine if the shear zone is continuous for the strike distance between the exposed mineralized zones.

A 30 element qualitative spectrographic analysis was also performed on the selected grab samples, results of which are available in the Sioux Lookout Resident Geologist's office.

Recommendations for Exploration Minnitaki Lake Gold Area

Minnitaki Lake and the neighbouring Abram and Vermilion Lakes are structurally related to faults which form part of a larger system which has been traced from Miniss River in the north to Eagle Lake in the southwest. Where this fault system or zone crosses favourable host rocks, as on Minnitaki, Wabigoon and Eagle Lakes, a number of gold occurrences have been found. On Minnitaki Lake in particular a number of vein showings and stockwork gold occurrences appear to be related to this fault zone. The Goldlund and Burnthut Island properties have proven ore reserves which will undoubtedly be extracted in the foreseeable future. A number of other occurrences have had insufficient work done on them to prove ore grades (Quyta, Neepawa Island).

Little is known about many of the occurrences which were found before drilling became a normal exploration tool. At least two of the larger deposits (Goldlund, Burnthut) are known to be related to fracturing related to late stage faulting and for a third (Quyta) this is a tenable hypothesis. It would appear that an exploration program based on the expected fracture patterns in the more competent rocks of the area, especially crosscutting intrusives which are cut by major faults, would have an excellent chance of finding additional occurrences.

One point noted in a general way is that shallow dipping to sub-horizontal fractures in the region between Franciscan Lake and Sandybeach Lake frequently contain marginal alteration and sparse sulphide mineralization. These fractures which are similar to the mineralized zones at Goldlund Mines Limited, may be a useful prospecting target.

Mavis Lake-Gullwing Lake Area

Generally speaking, granitoid areas are normally assigned a low potential and low priority for mineral exploration in the Superior Province.

Exceptions to this have been areas of the English

River sub-province where economic concentrations of lithophile elements such as lithium, cesium, tantalum and beryllium have been found. An area of granitoid rocks bordering on volcanic-sedimentary rocks of the Wabigoon Belt hosts occurrences of these elements and should be considered a high potential area. This area extends from Dryden in the south to the Lateral Lake stock in the north and parallels the granitoid-greenstone belt contact. Deposits containing lithium (in spodumene), cesium (as pollucite) and tantalum (in wodginite) are known. In the pegmatitic suite a zonation from south to north may be represented by the lithium occurrences of Mavis Lake and highly fractionated cesium-tantalum pegmatite of Tot Lake. For these potential deposits, an exploration program based on litho-geochemistry of the trace elements barium, rubidium, lithium and cesium would seem to be the best approach. In addition, the Lateral Lake molybdenum deposits and occurrences (Pidgeon Molybdenum Mines) have some potential for added exploration in this area. One possibility for the southern part of this region is the association of tin with the tourmaline-muscovite granite near Dryden. One large float boulder of cassiterite was found in the area and while this boulder may not be locally derived and is probably pegmatitic in origin, the association of muscovite-tourmaline granites and tin is well known. Prospecting may be hindered by overburden thickness but the possibility of economic tin concentrations in pegmatitic or greisen phases of these unusual granites should not be overlooked.

In summary this area offers an unusual target for litho-geochemical prospecting programs with the known potential for lithium, cesium, tantalum, tin and possibly molybdenum.

Bamaji Lake Area

Early exploration in the Manaji Lake area was based on gold and molybdenum. Recently the emphasis has changed to uranium. Current developments in uranium supply/demand ratios and the recent radical increase in gold price would suggest that increased emphasis on gold exploration would be advisable. The reported association of good gold values with the sedimentary "calc-silicate" horizons would suggest this as an excellent exploration target especially if the association of gold and uranium can be shown to exist. While the uranium occurrences may be sub-economic, they may prove an excellent indicator of gold mineralization.

Ontario Geological Survey Activities

Detailed mapping was done in the Lateral Lake area by R. O. Page of the Precambrian Geology Section. This work was done to improve knowledge of the mafic to felsic volcanics which have high economic potential for

base metals. In addition the work covered areas of known gold and pegmatitic potential and the Lateral Lake molybdenum deposit.

H. Wallace spent some time in the Fry Lake-Slate Falls area following up on uranium and gold mineralization.

Research by Other Agencies

Field work for graduate and undergraduate theses projects in the Sioux Lookout area was conducted by students of several universities. Some of the projects which have resulted in published reports are listed below.

Masters Theses

Dusanowskyj, T. H.
A Gravity Study of the Sturgeon Lake Metavolcanic-Metasedimentary Belt; University of Toronto, Toronto, Ontario.

Lavin, O. P.
Lithogeochemical Discrimination Between Mineralized and Unmineralized Cycles of Volcanism in the Sturgeon Lake and Ben Nevis Areas of the Canadian Shield; Queen's University, Kingston, Ontario.

McConnell, J. W.
Geochemical Dispersion in Wallrocks of Archean Massive Sulphide Deposits; Queen's University, Kingston, Ontario.

Vollrath, J. D.
A Geochemical Study of Four Precambrian Granites in Northwestern Ontario; Carlton University, Ottawa, Ontario.

Bachelors Theses

Christie, B.
The Bamaji Lake Uranium-Thorium Occurrence; University of Toronto, Toronto, Ontario.

Desnoyers, D. W.
Geology of the Northwestern Portion of Lac Seul, Northwestern Ontario; Carlton University, Ottawa, Ontario.

Hiscott, R. N.
A Petrochemical and Petrological Investigation of an Archean Volcanic Sequence, Superior Province Canada, Brock University, St. Catharines, Ontario.

Recent Publications and References

- Allis, R. G. and Garland, G. D.
1979: Heat Flow Measurements Under Some Lakes in the Superior Province of the Canadian Shield; Canadian Journal of Earth Sciences, Vol. 16, no. 10, p.1951-1964.
- Blackburn, C. E.
1979: Wabigoon Fault: A Major Structural Break in Northwestern Ontario? *in* Abstracts with Programs, Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.39.
- Bond, W. D.
1979: Geology of Conant, Jutten and Syme Townships (Savant Lake Area); District of Thunder Bay, Ontario Geological Survey Report 182, 113p. Accompanied by Map 2398 scale 1:31 680 or 1 inch to ½ mile.
- Breaks, F. W., Bond, W. D., Stone, Denver and Desnoyers, D. W.
1979: Operation Miniss-Tully Lakes, Root Lake Sheet, Districts of Kenora and Thunder Bay, Ontario Geological Survey Preliminary Map P. 2215 Geological Series, scale 1:63 360 or 1 inch to 1 mile. Geology 1976.
- 1979: Operation Miniss-Tully Lakes, Lake St. Joseph-Miniss Lake Sheet, Districts of Kenora and Thunder Bay; Ontario Geological Survey Preliminary Map P.2216 Geological Series, scale 1:63 360 or 1 inch to 1 mile. Geology 1976.
- 1979: Operation Miniss-Tully Lakes, Chamberlain Narrows (Lac Seul) Sheet, Districts of Kenora and Thunder Bay; Ontario Geological Survey Preliminary Map P.2217, Geological Series, scale 1:63 360 or 1 inch to 1 mile. Geology 1976.
- 1979: Operation Miniss-Tully Lakes, Hooker-Fitchie Lakes Sheet, Districts of Kenora and Thunder Bay, Ontario Geological Survey Preliminary Map P.2218, Geological Series, scale 1:63 360 or 1 inch to 1 mile. Geology 1976.
- Chisholm, E. O.
1951: Recent Activities in the Sioux Lookout Area; Ontario Department of Mines, Preliminary Report 1951-1, 11p. (accompanied by a sketch map).
- Colvine, A. C. and Sutherland, I. G.
1979: Archean Porphyry Deposits in Ontario; *in* Abstracts with Programs, Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.44.
- 1979: Early Precambrian Porphyry Deposits; p.230-232 *in* Summary of Field Work 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.
- Dunlop, D. J.
1979: A Regional Paleomagnetic Study of Archean Rocks from the Superior Geotraverse Area, Northwestern Ontario; Canadian Journal of Earth Sciences, Vol.16, no.10, p.1906-1919.
- Friske, P., Poulsen, K. M. and Franklin, J. M.
1979: The Beidelman Bay Porphyry Copper-Gold Occurrences, Northwestern Ontario; *in* Abstracts with Programs Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.51.
- GAC/MAC/GSA
1979: Abstracts with Programs: 1979 Joint Annual Meeting of the Geological Association of Canada, The Mineralogical Association of Canada and The Geological Society of America, Laval University, Quebec, 91p.

- Meyn, Hans and Palonen, Pentti
1979: Stratigraphy of the Iron-Bearing Sedimentary Rocks at Western Lake St. Joseph, Northwestern Ontario; *in* Abstracts with Programs Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.67.
- Moore, E. S.
1911: The Sturgeon Lake Gold Field, Ontario Division of Mines Annual Report, Vol.20, pt. 1, p.133-157.
- Page, R. O.
1979: Lateral Lake Area, District of Kenora; p.92-96 *in* Summary of Field Work 1979, by the Ontario Geological Survey, edited by V. G. Milne, O.L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.
- Page, R. O. and Moller, E. B.
1979: Zarn Lake Area (North Part), District of Kenora; Ontario Geological Survey Preliminary Map P.2232, Geological Series, scale 1:15 840 or 1 inch to ¼ Mile. Geology 1978.
- 1979: Zarn Lake Area (South Part), District of Kenora, Ontario Geological Survey Preliminary Map P.2233, Geological Series, scale 1:15 840 or 1 inch to ¼ Mile. Geology 1978.
- Palonen, P. A. and Speed, A. A.
1979: 1978 Report of Sioux Lookout Resident Geologist; p.24-35 *in* Annual Report of the Regional and Resident Geologists, 1978, edited by C. R. Kustra, Ontario Geological Survey, Miscellaneous Paper 84, 135p.
- Patterson, G. C.
1979: Sulphide Mineralogy and Alteration at the Thierry Mine, Pickle Lake, Ontario; *in* Abstracts with Programs, Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.72.
- Shegelski, R. J.
1979: Algoman Iron Formations-A Review *in* Abstracts with Programs, Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.78.
- Sutherland, I. G. and Colvine, A. C.
1979: The Geology and Mineralization of the Pickerel Arm, Canoe Lake and High Lake Bodies; p.233-243 *in* Summary of Field Work 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.
- Urquhart, W. E. S. and West, G. F.
1979: Aeromagnetic Anomaly Pattern in the English River Gneiss Belt, Superior Province; Canadian Journal of Earth Sciences, Vol.16, no. 10, p.1920-1932.
- Wallace, H.
1979: Slate Falls Area (Western Part), District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2247, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.

TABLE 4

MAPS AND REPORTS PERTAINING TO THE PATRICIA MINING DIVISION, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY OF THE MINISTRY OF NATURAL RESOURCES IN 1979. SEE "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

GEOLOGICAL REPORTS

GR 182

GR 193

MISCELLANEOUS PAPERS

MP 84

MP 87

MP 90

MISCELLANEOUS PUBLICATIONS

Rocks and Minerals Information, 1979

PRELIMINARY MAPS

P. 2215

P. 2216

P. 2217

P. 2218

P. 2232

P. 2233

P. 2247

P. 2248

1979: Slate Falls Area (Eastern Part), District of Kenora (Patricia Portion); Ontario Geological Survey Preliminary Map P.2248, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1977, 1978.

Watkinson, D. R.

1979: Uranium Mineralization in the Prairie Lake Alkalic Rock-Carbonate Complex Northwestern Ontario; *in* Abstracts with Programs, Geological Association of Canada and Mineralogical Association of Canada, Vol. 4, p.&5.

TABLE 5 **Exploration Activity in 1979.**

Number on Figure	Individual or Company	Activity
1.	Beth-Canada Mining Company	Airborne magnetic and electromagnetic surveys, and induced polarization survey, in the Keikewabik Lake area.
2.	Dome Exploration (Canada) Limited	Ground electromagnetic and magnetometer survey in the Zeemel and Skinner Lakes areas.
3.	Dora Explorations Limited	Ground electromagnetic survey in the Tarp Lake area.
4.	Falconbridge Nickel Mines Limited	Diamond drilling in the Sixmile Lake area.
5.	Goldlund Mines Limited	Diamond drilling in Echo Township.
6.	Mattagami Lake Mines Limited	Diamond drilling in the Bell Lake, Penassi Lake, Sixmile Lake and Valora Lake areas.
7.	Moretti, R.	Rock trenching and soil stripping in the Sharron Lake area.
8.	Nixon, J. R.	Diamond drilling in the Fourbay Lake and Squaw Lake areas.
9.	Noranda Exploration Company Limited	Diamond drilling in the Sixmile Lake and Johnston Bay (Lake St. Joseph) area.
10.	Polar Gas (EBA Engineering Consultants Limited)	Soils test drilling in the Bugbee Lake, Candler Lake, Cawston Lake, Crerar River, MaKoop Lake, Menako Lake, Nekikamog Lake, North Caribou Lake, Patte Lake, Pikokowug Lake, Skinner Lake, Snowflake Lake and NTS units S2 P/11 NW, S2 P/13 SE, S3 B/8 NW, S3 G/2 NE, S3 G/2 SE areas.
11.	Ramsay, R. G.	Beneficiation studies on the iron deposit in the Grebe Lake and McCubbin Township area.
12.	Rio Tinto Canadian Exploration Limited	Diamond drilling in Breithaupt, Drope, Echo, Lomond, McIlraith and Webb Townships.
13.	Selco Mining Corporation Limited	Diamond drilling and ground electromagnetic and magnetometer surveys in Breithaupt and McIlraith Townships. Diamond drilling in Lomond Township, Kabik Lake, Pickerel Township and Dawson Lake area. Ground magnetometer and electromagnetic surveys in the Carling Island (Lake St. Joseph), Dawson Lake and Doran Lake areas. Ground electromagnetic and magnetic surveys in Drope and Webb Townships.
14.	St. Joseph Explorations Limited	Ground electromagnetic and magnetometer surveys in the Armit Lake, Keeyask Lake, Randall Lake, South Weagamow Lake and Grebe Lake and McCubbin Township areas. Geological survey in the Keeyask Lake, and Randall Lake areas.
15.	Surveymin Limited	Diamond drilling in the Solitude Lake area.
16.	Tantalum Mining Corporation Limited	Diamond drilling in Webb Township.
17.	Union Miniere Exploration and Mining Corporation Limited	Airborne electromagnetic and magnetometer survey in the Evans, Houghton, Watin Lakes area. Diamond drilling in the Evans Lake and Houghton Lake areas. Ground Magnetometer and electromagnetic survey in the Evans Lake and Grebe Lake-McCubbin Township areas. Detailed airborne electromagnetic and magnetic survey in the Evans Lake area.

TABLE 6

Assessment Work and Other Information Received in 1979

PATRICIA MINING DIVISION

SYMBOLS AND ABBREVIATIONS

Au-gold	sp-sphalerite	b-boulders, bouldery	IP-Induced Polarization Survey
Ag-silver	mag-magnetite	p-peat, muck	STD 3-75-soils test drilling
Cu-copper	hem-hematite	t-till	3 holes 75 foot total
Fe-iron	gn-galena	rtr-rock trenching	Mag-Ground Magnetometer Survey
Pb-lead	cp-chalcopyrite	tr-trace amounts	VEM-Vertical Loop Survey
Zn-zinc	gf-graphite	DD 10-12,640 - diamond drilling	VLF-Very Low Frequency Survey
S-sulphides	c-clay, clayey	10 holes 12,640 foot total	HEM-Horizontal Loop Survey
py-pyrite	m-silt, silty	Assess-Assessment Data	Geol-Geological Survey
po-pyrrhotite	s-sand, sandy	Non-Assess. - Non-Assessment Data	AEM-Airborne Electromagnetic Survey
mo-molybdenite	g-gravel, gravelly	BS-Beneficiation Studies	AM-Airborne Magnetometer Survey

Local	NTS	File Name	Commodity Found	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Armit Lake	52 J/7 NW	St. Joseph Explorations Limited		Assess.	Mag, HEM	1979	2.2936	38 (52J/7NE)
Bell Lake	52 G/15 SW	Mattagami Lake Mines Limited	py,Cu,Zn	Non-Assess.	DD 5-3,909.5	1970 1972		36
Breithaupt Township	52 F/15 NE	Rio Tinto Canadian Exploration Limited	py,po,cp	Assess.	DD 3-582	1979		11
	52 F/15 NE	Selco Mining Corporation Limited	po,py,cp	Assess.	DD 1-276	1979		12
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2960	13
Bugbee Lake	53 B/1 NW	Polar Gas (EBA Engineering Consultants Limited)	p,s,b,m,t	Non-Assess.	STD 2-34	1977		1 (52P/6NE)
Candler Lake	53 B/8 SW	Polar Gas (EBA Engineering Consultants Limited)	p,s,g	Non-Assess.	STD 1-20	1977		1 (52P/6NE)
Carling Island (Lake St. Joseph)	52 O/2 SE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2784	12
Cawston Lake	52 P/13 NE	Polar Gas (EBA Engineering Consultants Limited)	s,m,g	Non-Assess.	STD 1-20	1977		1 (52P/6NE)
Crerar River	52 P/11 SW	Polar Gas (EBA Engineering Consultants Limited)	p,s,m,g	Non-Assess.	STD 3-54	1977		1 (52P/6NE)
Dawson Lake	52 J/15 NW	Selco Mining Corporation Limited	po, py,Cu Zn, Ag(tr)	Assess.	DD 1-250	1978		3
	52 J/15 NW	Selco Mining Corporation Limited		Assess.	Mag, HEM	1977	2.2786	4
Doran Lake	52 J/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2785	6
Drope Township	52 F/15 NE	Rio Tinto Canadian Exploration Limited	py,po,cp(tr)	Assess.	DD 5-1633	1979		11
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2962	15
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2962	16
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1979	2.2962	17
Echo Township	52 F/16 NW	Goldlund Mines Limited	po,py,sp	Assess.	DD 4-1159	1979		34, 36
	52 F/16 NW	Rio Tinto Canadian Exploration Limited	py,po,mo(tr)	Assess.	DD 1-337	1979		37
Evans Lake	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited		Assess.	AM, AEM	1978	2.2764	12 (52J/7SW)
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited		Assess.	AM, AEM	1979	2.2765	62

NORTHWESTERN-SIOUX LOOKOUT
Table 6 continued

Local	NTS	File Name	Commodity Found	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited		Assess.	DD 10-6,873	1978		63,64,65,67
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	py,po,cp,sp	Assess.	DD 3-2,824	1979		69,71
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited	py,mag,po,cp,gn,sp	Assess.	DD 1-587	1977		72
	52 J/7 SE	Union Miniere Exploration & Mining Corporation Limited		Assess.	Mag, VLF	1977	2.2977	73
Fourbay Lake	52 J/2 SW	Nixon, J. R.	py	Assess.	DD 2-342	1978		54
Grebe Lake & McCubbin Township	52 J/7 NE	Ramsay, R. G.	Fe	Assess.	BS	1977	2.2622	39
	52 J/7 NE	St. Joseph Exploration Limited		Assess.	Mag, HEM	1979	2.2936	38
	52 J/7 NE	Union Miniere Exploration & Mining Corporation Limited		Assess.	Mag, VLF	1978	2.2916	37
Houghton Lake	52 J/7 SW	Union Miniere Exploration & Mining Corporation Limited		Assess.	AM, AEM	1978	2.2764	12
	52 J/7 SW	Union Miniere Exploration & Mining Corporation Limited		Assess.	DD 2-1134	1979		14,15
Johnston Bay	52 O/3 SE	Noranda Exploration Company Limited	py,po,Cu	Assess.	DD 1-321	1978		13
Kabik Lake & Pickerel Township	52 F/16 NE	Selco Mining Corporation Limited	py,cp(tr)	Assess.	DD 4-942	1978		35
Keeyask Lake	53 B/14 NE	St. Joseph Explorations Limited		Assess.	Mag, HEM	1978	2.2891	2
	53 B/14 NE	St. Joseph Explorations Limited		Assess.	Mag, HEM,	1978	2.2890	3
Keikewabik Lake	52 F/16 SE	Beth-Canada Mining Company		Assess.	AM	1978		10
	52 F/16 SE	Beth-Canada Mining Company		Assess.	AEM	1978	2.2889	11
Lomond Township	52 F/16 NW	Rio Tinto Canadian Exploration Limited	py,po,gf,cp,gn,sp	Assess.	DD 4-1458	1979		37
	52 F/16 NW	Selco Mining Corporation Limited	gf,po,py,cp(tr),sp(tr)	Assess.	DD 1-355	1979		35
	52 K/1 SW	Selco Mining Corporation Limited	Cu,Zn,Au,Ag	Assess.	DD 2-692	1979		25
	52 K/1 SW	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2961	28,39,40
Makoop Lake	53 G/7 NW	Polar Gas (EBA Engineering Consultants Limited)	p,m,s,t,c	Non-Assess.	STD 3-59	1977		1 (52P/6NE)
McIlraith Township	52 F/15 NE	Selco Mining Corporation Limited	po,py,cp(tr)	Assess.	DD 3-1075	1978		10
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978	2.2960	13
	52 F/15 NE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978 1979	2.2963	14
	52 F/16 NW	Rio Tinto Canadian Exploration Limited	po,py,cp,gf	Assess.	DD 8-2369	1979		37
	52 F/16 NW	Selco Mining Corporation Limited	py	Assess.	DD 1-297	1979		33
	52 F/16 NW	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978 1979	2.2963	42
	52 K/1 SE	Selco Mining Corporation Limited		Assess.	Mag, HEM	1978 1979	2.2963	29
Menako Lake	53 B/1 SE	Polar Gas (EBA Engineering Consultants Limited)	p,s,g	Non-Assess.	STD 2-39	1977		1 (52P/6NE)
Nekikamog Lake	53 G/7 SW	Polar Gas (EBA Engineering Consultants Limited)	p,c,m,s	Non-Assess.	STD 2-28	1977		1 (52P/6NE)

Table 6 continued

Local	NTS	File Name	Commodity Found	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
North Caribou Lake (Northeast Part)	53 B/15 SE	Polar Gas (EBA Engineering Consultants Limited)	p,s,m	Non-Assess.	STD 1-23	1977		1 (52P/6NE)
Patte Lake	52 P/6 NE	Polar Gas (EBA Engineering Consultants Limited)	p,m,s,c,t	Non-Assess.	STD 2-64	1977		1
Penassi Lake	52 G/14 NE	Mattagami Lake Mines Limited	po,py,cp,sp	Non-Assess.	DD 18-23,666	1970 1972 1973 1974		1 (52P/6NE)
Pikotowug Lake	52 P/13 NW	Polar Gas (EBA Engineering Consultants Limited)	s,g	Non-Assess.	STD 1-20	1977		1 (52P/6NE)
Randall Lake	53 B/14 SE	St. Joseph Explorations Limited		Assess.	Mag, HEM	1978	2.2890	3 (53B/14NE)
	53 B/14 SE	St. Joseph Explorations Limited		Assess.	Mag, HEM	1978	2.2822	9
Sharron Lake	52 J/4 NE	Moretti, R.		Assess.	rtr	1979		8
Sixmile Lake	52 G/15 NW	Falconbridge Copper Mines Limited	py,po,cp(tr)	Assess.	DD 1-1248	1978		107
	52 G/15 NW	Mattagami Lake Mines Limited		Non-Assess.	DD 10-12,640	1970 1972 1973 1974		106
	52 G/15 NW	Noranda Exploration Company Limited	py,po,cp(tr)	Assess.	DD 2-1254	1979		108
	52 G/15 NW	Noranda Exploration Company Limited	py,gf,po,cp	Assess.	DD 4-1311	1978		109,110
Skinner Lake	53 B/9 NW	Dome Exploration (Canada) Limited		Assess.	Mag, VEM,	1977	2.2669	15 (53B/9SW)
	53 B/9 NW	Polar Gas (EBA Engineering Consultants Limited)	p,m,c	Non-Assess.	STD 1-20	1977		1 (52P/6NE)
Snowflake Lake	52 P/11 SE	Polar Gas (EBA Engineering Consultants Limited)	p,c,m,s	Non-Assess.	STD 1-22	1977		1 (52P/6NE)
Solitude Lake	52 J/10 SE	Surveymin Limited	po,py,sp,cp	Assess.	DD 2-500	1978		20
South Weagamow Lake	53 B/14 SW	St. Joseph Explorations Limited		Assess.	Mag, HEM	1978	2.2822	9 (53B/14SE)
Squaw Lake	52 J/2 SE	Nixon, J. R.	py,hem	Assess.	DD 1-268	1978		45
Tarp Lake	52 O/9 SE	Dora Explorations Limited		Assess.	VLF	1979	2.2976	36
Valora Lake	52 G/14 SE	Mattagami Lake Mines Limited	py,po,cp,sp, mag,gn,Cu,Pb, Zn,Au, Ag	Non-Assess.	DD 32-28,338	1970 1972 1973 1974		93
Watin Lake	52 J/6 SE	Union Miniere Exploration & Mining Corporation Limited		Assess.	AM, AEM	1978	2.2764	12 (52J/7SW)
Webb Township	52 F/16 NW	Rio Tinto Canadian Explorations Limited	py,po,hem,cp	Assess.	DD 2-684	1979		37
	52 F/16 NW	Tantalum Mining Corporation Limited		Assess.	DD 3-512	1978 1979		38
Zeemel Lake	53 B/9 SW	Dome Exploration (Canada) Limited		Assess.	Mag, VEM,	1977	2.2669	15
	52 P/11 NW	Polar Gas (EBA Engineering Consultants Limited)	p,s,m,g	Non-Assess.	STD 4-79	1977		1 (52P/6NE)
	52 P/13 SE	Polar Gas (EBA Engineering Consultants Limited)	p,m	Non-Assess.	STD 3-75	1977		1 (52P/6NE)
	53 B/8 NW	Polar Gas (EBA Engineering Consultants Limited)	p,s,m,g	Non-Assess.	STD 4-99	1977		1 (52P/6NE)
	52 G/2 NE	Polar Gas (EBA Engineering Consultants Limited)	p,s,g	Non-Assess.	STD 1-20	1977		1 (52P/6NE)
	53 G/2 SE	Polar Gas (EBA	p,s,m,t	Non-Assess.	STD 2-35	1977		1 (52P/6NE)

1979 Report of North Central Regional Geologist

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and B. Schnieders⁴**

Contents

Introduction	38
Regional Geologist's Activities	38
Mining and Exploration Activity	39
Uranium Exploration	40
Gold Exploration	40
Platinum Group Metals Exploration	40
Base Metal Exploration	40
Tantalum-Lithium Exploration	45
Property Descriptions	45
Peterson-Shalesky Feldspar Occurrence	45
Wilson (Roche Longlac Gold Mines Limited) Gold Occurrence	45
Gulf Minerals Canada Limited Prospect	45
Lundmark Limestone Occurrence	46
Ternowesky (Good Morning Lake Fault Breccia) Uranium Occurrence	46
Ontario Geological Survey's Activities	46
Research by Other Organizations	47
Recommendations for Exploration	47
Atikokan Project	47
Property Examinations	48
Snow Lake Occurrence (1)	48
Wilson's Occurrence (2)	48
Atiko Occurrence (3)	48
Sawdo Occurrence (4)	48
Mayflower Gold Mine (5)	49
Elizabeth Mine (6)	49
Bill Lake Occurrence (7)	49
Gehl Lake Occurrence (8)	50
Mills Creek Occurrence (9)	50
Plateau Lake Occurrence (10)	50
Hayne's Shebandowan Occurrence (11)	50
Shabagua Occurrence (12)	50
Atikokan Iron Mine (13)	51
White Lily Gold Mine (14)	51
Minto Gold Mine (15)	51
Pettigrew Gold Mine (16)	51
Jack Lake Mine (17)	51
Day Lake Occurrence (18)	52
Agnico-Eagle Occurrence (19)	52
Olcott Occurrence (20)	52
Bull Quartz Occurrence (21)	52

Partridge Occurrence (22)	52
Pipeline Occurrence (23)	53
Little Falls Occurrence (24)	53
Recommendations for Exploration in the Atikokan Area	53
References and Recent Publications	53

Tables

1 - Summary of Claims Recorded and Assessment Work Credit Received, Thunder Bay Mining Division	39
2 - Maps and Reports issued by the Ontario Geological Survey	55
3 - Exploration Activity in 1979	56
4 - Assays of Samples Collected	59
5 - Assessment Work and Other Information Filed in 1979	60

Figures

1,2, and 3 - North Central Region	41,42,43
4 - Atikokan Project	44

Introduction

The Regional Geologist's Office is staffed by K. G. Fenwick, Regional Geologist, J. F. Scott, Resource Geologist, C. R. Larsen, geologist in charge of the Atikokan Project, J. K. Mason, R. Dubyk, B. Schnieders, C. McConnell, J. Watt, B. MacRae and M. Matthews, Geological Assistants assigned to various projects, and A. R. Downton, Secretary. W. MacRae, Geological Assistant, was responsible for the Atikokan Gold Study until April of 1979. R. Stewart, E. Soldera and C. Wiktowy were Experience '79 students hired during the summer.

Regional Geologist's Activities

Consultation on various aspects of geology, mineral and aggregate potential and exploration activities in the region was carried out with the general public, prospectors and personnel from mining companies, universities and government agencies. Visits were made to five field parties of the Ontario Geological Survey and familiarization

¹ Regional Geologist, Ontario Ministry of Natural Resources, Ontario Government Building, 435 James Street S., Box 5000, Thunder Bay, Ontario, P7C 5G6

² Geologist

³ Resource Geologist

⁴ Geological Assistant

tours of the Caland Mine, Steep Rock Iron Mine, Montane Contractors Limited's property (Northern Empire Mine) and J. E. Ayrhart Mining Development's property were undertaken. K. G. Fenwick also visited the Foote Mineral Lithium Mine in North Carolina.

The office staff continued to be involved in strategic land-use planning by providing geoscience input to lake development plans, proposed land and park reserves, environmental assessment plans, road placements, proposed electrical generating sites and transmission line locations, earth science inventories, proposed townsites and park master plans.

The Experience '79 program, produced three slide shows with written commentaries on geological features around the City of Thunder Bay. They are: The Geology of Kakabeka Falls, The Geology of Mount McKay and The Geology of The Sibley Peninsula. These shows were designed for presentation to schools and as lecture aids. The shows are available for loan to schools and organizations at no charge.

Lectures on regional geology were provided to schools and Junior Ranger Camps in the area.

Mining and Exploration Activity

In 1979, the number of staked claims recorded in the Thunder Bay Mining Division was up from years 1976 and 1977 but down slightly from 1978. The increase in 1978 was due to the increased exploration for uranium in the area south of Lake Nipigon. Although diamond drilling activity is at it's lowest peak since 1964, there has been a substantial increase in recorded assessment work credit for geophysical and geological surveys.

The location of the assessment work credits (Table 5) and exploration activity (Table 3) are shown on Figures 1, 2 and 3. Areas receiving the most attention were the Calm - Lac des Mille Lacs Lakes area west of Thunder Bay; the area underlain by the Late Precambrian sedimentary rocks of the Sibley Group west of Nipigon; the Beardmore-Geraldton area; the Rosspore-Marathon area; and the Marshall-O'Sullivan-Onaman Lakes area.

In August of 1979, Steep Rock Iron Mines Limited shipped the last load of pellets from their plant near Atikokan. Mining operations ended in January of 1979. A total of 63,131,431 tons of ore was produced from this mine from 1944 to 1979. The company plans to keep the pellet plant intact and keep money in reserve with a view to developing the Bending Lake iron deposit northwest of Atikokan (Chronicle Journal, Mar. 24, 1979, p. 3).

Caland Ore Company Limited ceased work in their open pit and ore preparation area in November of 1979. The company intends to terminate their pelletizing plant operation in April of 1980. In 1979, 1,852,576 tons of crude ore was mined and processed. A total of 38,689,098 tons of ore were mined from the Caland pit from 1960 to 1979.

On June 5, 1979, Inco Limited's Shebandowan Mine was re-opened. It had been down since November 12,

1978 because of a strike at Inco's smelting operation in Sudbury.

Two properties were in the development stage in 1979. These are described as follows.

J. E. Ayrhart Mining Development Limited commenced mining operations in June of 1979 on a lead-zinc-silver property. The main showing is located in the central southeastern portion of Walsh Township (formerly Tp. 80) and is on the west side of Dead Horse Creek, approximately 700 m north of Highway 17. Dead Horse Creek is 45 km by road east of the town of Terrace Bay. A road has been built into the property and the site has been cleared. Stock-piling of hand-cobbed ore has begun.

Surface sampling indicates 7.28 percent zinc, 1.45 percent lead and 8.27 ounces per ton silver for a length of 78 m (257 feet) and a width of 1.13 m (3.7 feet). Low values were encountered in the drill holes (Shklanka 1969, p. 305).

A 50-ton daily capacity portable flotation mill has been ordered (Northern Miner, Sept. 6, 1979, p. 1,10).

The company may also mill ore grade material from the Hannam property, located south of Highway 17 at Dead Horse Creek. Indicated reserves here include the No. 1 zone - 35,000 tons of 21.65 ounces Ag per ton, 19.87 percent Pb and 9.08 percent Zn; and the No. 2 zone-36,000 tons.

Montane Contractors Limited has optioned the Northern Empire Mine, a former gold producer, located 2 km northeast of Beardmore. The mine was dewatered in the summer of 1979 to the 80-foot level. Forty tons of ore were extracted from a high grade zone on the west side of the shaft and shipped by truck to Pamour's mill in Timmins. They estimate that they can take out 2 tons per vertical foot of 3.0 ounces per ton gold ore can be mined to the 450-foot level (E. Nelson, personal communications).

TABLE 1 SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT RECEIVED THUNDER BAY MINING DIVISION

Year	Claims Recorded	Diamond Drilling (Man Days)	Geophysical Surveys (Man Days)	Geological Surveys (Man Days)
1979	3,099	11,528	69,612	14,727
1978	3,517	20,182	20,589	6,206
1977	1,964	24,879	25,601	4,870
1976	2,364	52,551	29,504	4,600
1975	3,436	38,652	52,020	4,700
1974	3,305	37,130	26,061	4,300
1973	2,253	49,575	24,320	7,450
1972	3,442	61,512	53,757	4,776
1971	4,627	63,775	53,028	7,456
1970	5,830	103,559	83,389	6,078

NORTH CENTRAL

Uranium Exploration

Many claims were staked for uranium in 1978 in the area along the north shore of Lake Superior. During the 1979 field season, Shell Canada Resources Limited, Uranerez Exploration and Mining Limited, Norcen Energy Resources Limited, Essex Mineral Company, Lacana Mining Corporation, M. W. Rennick, David S. Robertson and Associates, Asarco Exploration of Canada, Gulf Minerals Canada Limited, K. Sperle, New Inscro Mines Limited and W. G. Wahl Limited conducted exploration work on claim groups.

Gold Exploration

Due to the high price of gold, many old gold mines and occurrences are being reassessed in the North Central Region.

Corporate Oil and Gas Limited has optioned the old Mayflower Mine near Flanders K. MacTavish. R. Moffat of Atikokan, incorporated a company, the Fern Elizabeth Gold Exploration Company, to work the old Elizabeth Mine, optioned from M. Wicheruk. Lynx-Canada Explorations Limited optioned a gold property (9 claims) in the Dawson Road Lots from prospectors W. Morehouse and D. Petrunka. Nahanni Mines Limited acquired an option on an 800-acre gold prospect (Sunbeam Mine) in the Atikokan area from Surveymin Limited. J. E. Ayrhart Development Company Limited optioned a gold property from M. Wicheruk at Hill Lake in Hutchinson Township. Dome Exploration (Canada) Limited has a working option on Metalore Resources' gold-silver property at Wilkinson Lake in Elmhirst Township.

During 1979, drilling programs for gold were carried out by: Camflo Mines Limited at Snodgrass Lake in Moss Township; V. Stenlund, prospector, north of Heron Bay in Pic Township; Elwood Fournier, prospector, on one claim east of Dog River; Sol Cowan on the old Empress Mine property in Syne Township.

Lynx-Canada Exploration Limited is doing a feasibility study on milling the tailings at the old Tashota-Nipigon Gold Mine. The company states that there are 50,000 tons of tailings that average 0.06 to 0.08 ounces gold per ton.

Band-Ore Gold Mines Limited are attempting to option a gold property, west of village of Shebandowan. A 1947 report indicated an estimated tonnage of 687,499 tons of 0.265 ounces gold per ton to the 500-foot level in five parallel zones (Regional Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Atiko Gold Mines Corporation is planning to reactivate the old Sapawe Gold Mine located 24 km east of Atikokan. This mine, in operation from 1964 to 1966, produced 4,547 ounces of gold and 1315 ounces of silver from 33,013 tons of ore, averaging 0.14 ounces gold per ton.

Consolidated Louanna Gold Mines Limited dewatered the mine shaft on their O'Sullivan Lake property this

summer. Sampling and geological mapping of the underground workings were done. Probable and possible tonnage and grade are estimated at 113,129 tons averaging 0.352 ounces gold per ton.

J. Cryderman undertook a reassessment of a gold property, the old Sand River Mine, in Eva Township.

The Reserve Lake gold property of the Zulapa Mining Corporation Limited, 13 km east of Fort Hope, was diamond drilled in 1963 and reported to contain 170,000 tons averaging 0.28 oz. gold per ton to 300 foot, with additional tonnage indicated to 700 foot (1973-74 Canadian Mines Handbook, Zulapa Mining Corporation Limited, p. 360).

Platinum Group Metals Exploration

Placer Development Limited optioned 93 claims in the Marathon area from D. Fairbairn. The company plans a winter drill program and a geophysical survey.

The Anaconda Company reassessed their leased property north of Marathon. The company plans to upgrade the road into the property and re-establish base and grid lines. The deposit contains in excess of 30 million tons averaging between 0.45 percent and 0.50 percent total copper with significant platinum and palladium values (G. A. Barber, written communications).

K. Kuhner and E. Nelson have an occurrence on the northeastern shore of Laurion Lake. A grab sample ran 0.15 percent combined platinum group metals (K. Kuhner, personal communication).

Boston Bay Mines owns a platinum-palladium property in the Lac des Iles area. Boston Bay is controlled by Belleterre Quebec Mines and is seeking financing to ring the property into production. The planned mining method will be open pit and a 3,000 ton per day operation appears feasible (Northern Miner, Oct. 4, 1979, p. 15). A new major drilling program is being proposed.

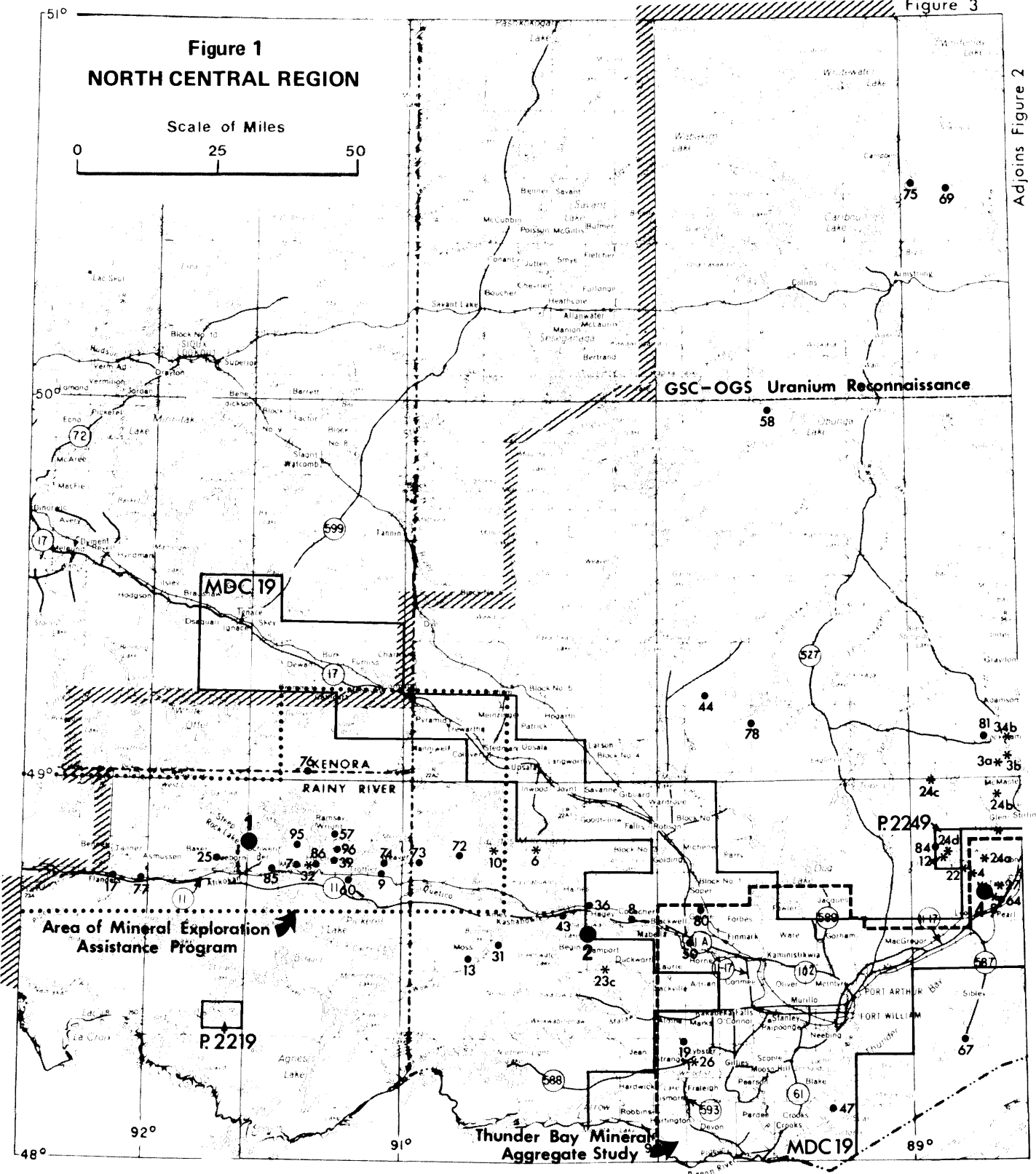
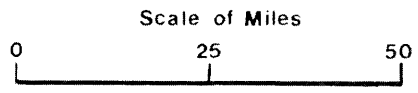
Base Metal Exploration

The Boliden Group, which owns about 29 percent of the Great Lakes Nickel Company, may undertake another feasibility study on bringing the copper-nickel property southwest of Thunder Bay into production (Northern Miner, May 3, 1979, p. 13).

Abitibi-Price Incorporated has optioned 55 claims, located 4 km west of Onaman Lake, from D. Thorsteinson and N. Cox. A newly discovered copper-gold-silver occurrence was located on claim TB 386385. The company is planning a drilling program this winter.

Gulf Minerals Canada Limited optioned 32 claims from Belore Mines Limited in the area south of Burchell Lake and plans a winter drilling program. For a brief description of this property see Fenwick *et al.* (1977, p. 43-44).

**Figure 1
NORTH CENTRAL REGION**



EXPLANATION

- Map or report issued by the Ontario Geological Survey in 1979 (keyed to Table 2)
- P - Preliminary Map
- 2411 - Coloured Map
- GR - OGS report
- OFR - Open File Report

- Boundary of North Central Region
- Exploration activity in 1979 (keyed to Table 3)
- * Assessment work filed in 1979 (keyed to Table 4)

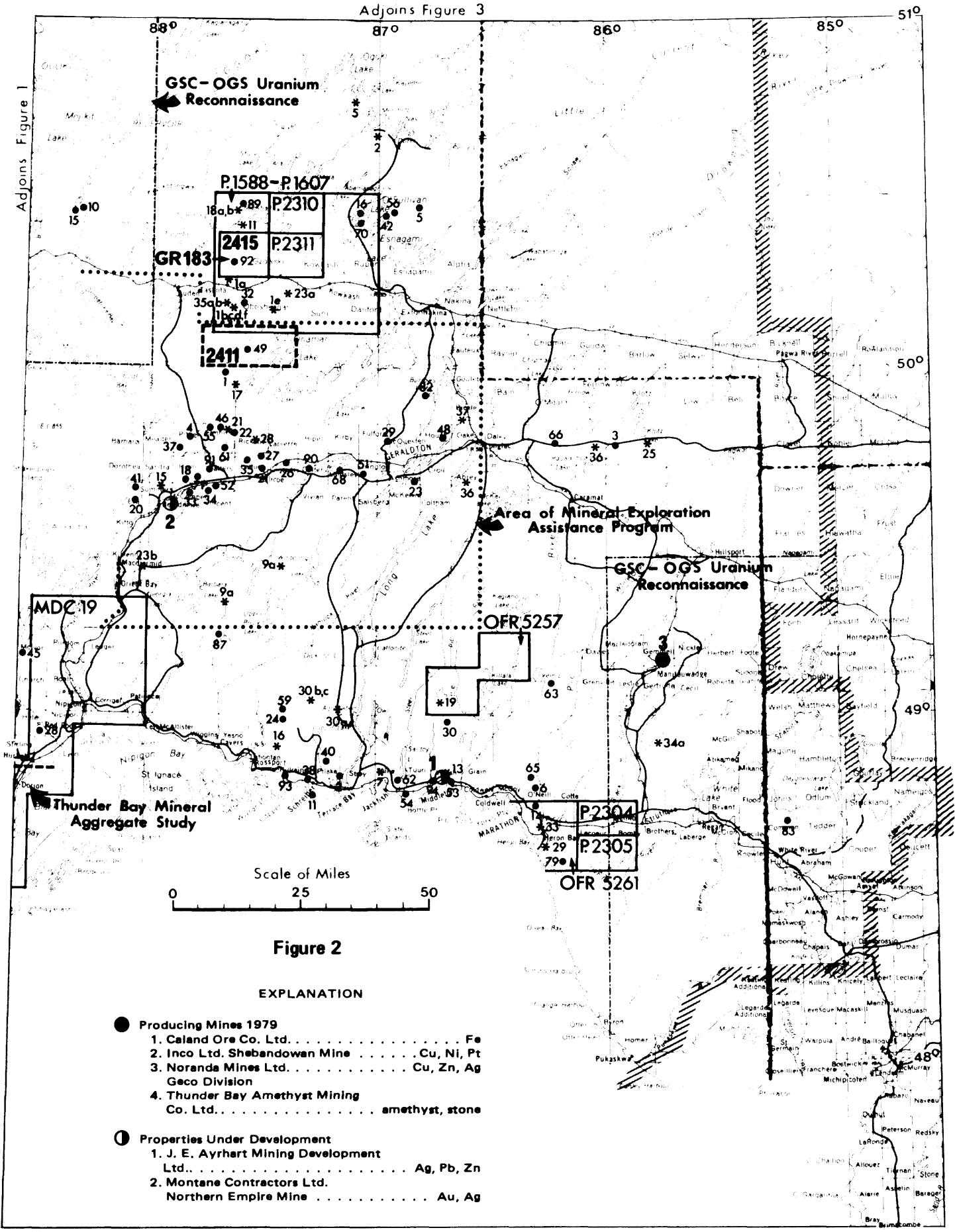


Figure 2

EXPLANATION

- Producing Mines 1979
 1. Caland Ore Co. Ltd. Fe
 2. Inco Ltd. Shebandowan Mine Cu, Ni, Pt
 3. Noranda Mines Ltd. Cu, Zn, Ag
Geco Division
 4. Thunder Bay Amethyst Mining
Co. Ltd. amethyst, stone

- Properties Under Development
 1. J. E. Ayrhart Mining Development
Ltd. Ag, Pb, Zn
 2. Montane Contractors Ltd.
Northern Empire Mine Au, Ag

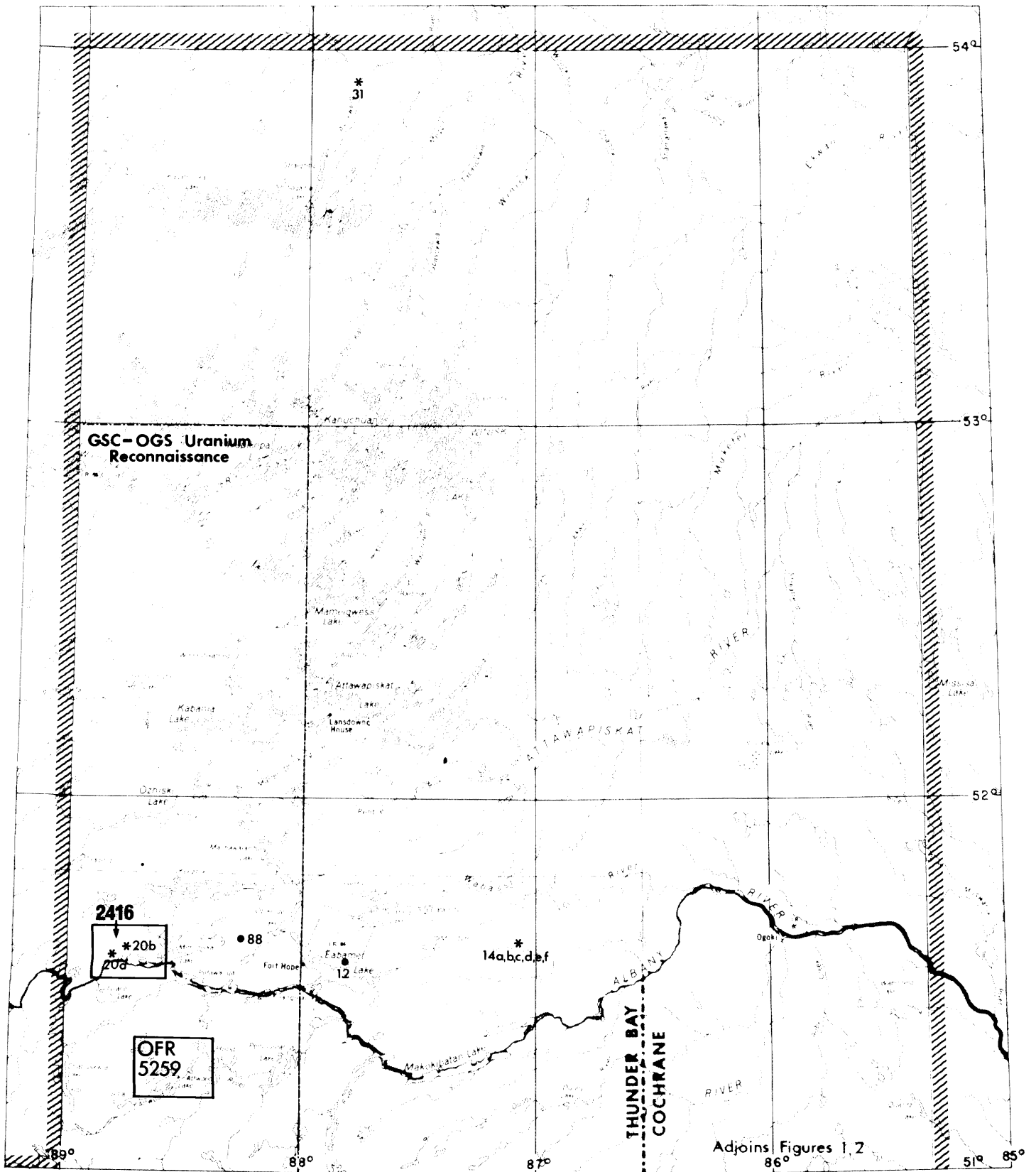
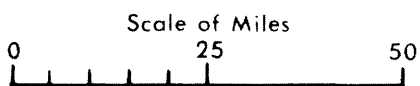


Figure 3
NORTH CENTRAL REGION

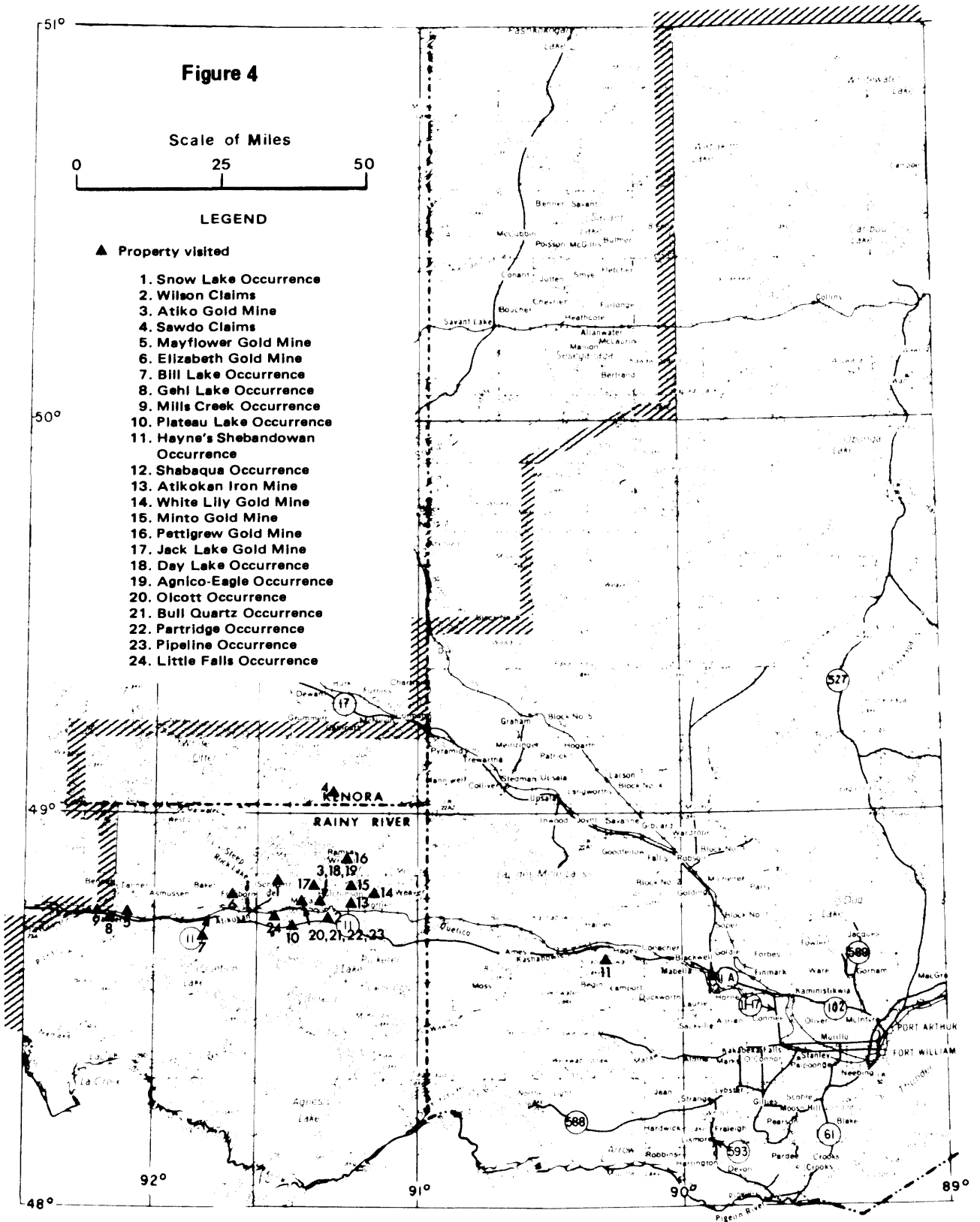


EXPLANATION

- Exploration activity in 1979 (keyed to Table 3)
- * Assessment work filed in 1979 (keyed to Table 4)
- ▨ Boundary of North Central Region
- Map issued by the Geological Branch in 1979 (keyed to Table 2)
- 2416 - Coloured Map
- OFR - Open File Report

Adjoins Figures 1, 2

NORTH CENTRAL



During 1979, drilling programs for base metals were carried out by: J. Stinson in the Kabamichigama Lake area; New Jersey Zinc Exploration Company Limited in the Howard-Miminiska Lakes area; Abitibi-Price Company Limited northwest of Marshall Lake; Hollinger Mines Limited in Oboshkegan Township and Placer Development Limited east of Long Lake.

Other companies that were actively exploring for base metals in the region were: Rio Tinto Canada Exploration Limited in the Campbell-Caribou Lakes area; Shell Canada Resources Limited in Longlac area; Inco Metals Company in the Schreiber area; Falconbridge Copper Limited in the Winston Lake area; Cominco Limited in the area north of Melchett Lake; Sherritt-Gordon Mines Limited and Steep Rock Iron Mines Limited in the area of McCaul and Hutchinson Townships; and Hanna Mining Company in the Calamity Lake area.

Tantalum-Lithium Exploration

Due to a tight supply situation, the price of tantalum pentoxide has risen from \$20 a pound in 1978 to a high of \$75 a pound in late 1979 (*Globe and Mail*, Nov. 12, 1979, p. B5). Since lithium and tantalum commonly occur together, a number of lithium occurrences were re-examined for their tantalum potential by several companies.

Tantalum Mining Corporation of Canada Limited optioned two lithium occurrences in Lilypad Lake area from R. J. Campbell. Geological mapping, a geochemical survey and staking were done in this area this summer. A winter drill program is planned.

Bird River Mines Company Limited staked the old Tebishogeshik lithium deposit (Pye 1968, p. 56) south of Zigzag Lake. A detailed sampling program was initiated. Channel samples across the lithium-bearing pegmatites averaged between ½ and 1 lb tantalum per ton. The best assay gave 7 lbs per ton tantalum across 3.5 feet (John Donner, written communication).

Cominco Limited has been cutting lines, sampling and doing detailed geological mapping on their lithium occurrences, north of Lake Nipigon.

Property Descriptions

Peterson-Skalesky Feldspar Occurrence

In 1979, T. Peterson and P. Skalesky, of Thunder Bay, staked a feldspar occurrence, approximately 52 km northwest of the City of Thunder Bay. The showing is located in the N of Concession V, Lot 6 of Goldie Township.

The occurrence consists of a northerly striking pegmatite feldspar dike that has intruded mica schists and gneisses. The dike has an exposed strike length of 220 m and an exposed width of 21 m as measured near the main trench. The feldspar is coarsely crystalline with some individual crystals almost 30 cm across. Minor

amounts of muscovite, garnet and quartz are present and are usually concentrated near feldspar crystal boundaries.

An analyses by the Geoscience Laboratories, Ontario Geological Survey, of two grab samples from the main trench yielded the results shown in Table 4a.

Several manufacturers of porcelain and ceramic products have shown interest in the property.

Wilson (Roche Longlac Gold Mines Ltd.) Gold Occurrence

A Gold showing, staked by Mr. Sandy Wilson of Geraldton, is located in the southeast part of Ashmore Township. The property was formerly known as the Roche Longlac Gold Mines Limited.

The geology of the claim group has been described by Horwood and Pye (1951). The main showings consist of silicified shear zones that transect metavolcanics, diorite and an albite porphyry. There are two main zones, the "Daley Vein" and "Blacksmith Vein". The Roche Longlac shaft is located on the Daley vein. Both shear zones were extensively trenched in the 1930s.

Sixteen grab samples were taken by our staff along the length of the veins. Analyses by Geoscience Laboratories, Ontario Geological Survey ranged from "trace" to 0.12 ounces per ton Au; from "trace" to 0.74 ounces per ton Ag; from 6 ppm to 1700 ppm copper with an arithmetic average of 298 ppm. Average values for lead and zinc were 100 ppm and 62 ppm respectively. A map showing the sample locations is available at the Thunder Bay Regional Geologist's Office.

The trenches were partially filled with water and debris and would have to be cleaned out if a systematic sampling program is to be done.

Gulf Minerals Canada Limited Prospect

Gulf Minerals Canada Limited staked four claims (TB 518380 to TB 518383 incl.) north of Walsh Township and 22 km north along the Deadhorse Creek Forest access road from Highway 17.

Granitic rocks underlie most of the claim group. A brick-red radioactive syenite dike, intruding the granitic rocks, is exposed in a gravel pit located on the east side of the road at distance 22 km. The dike has an apparent width of 18 feet, strikes 140 degrees and dips 20 degrees to the north. The dike contains small inclusions of its host rock. A crenulated biotite schist occurs in the central portion of the pit, but it is uncertain whether this rock is in place.

Three grab samples of the syenite dike analysed by the Geoscience Laboratories, Ontario Geological Survey, gave the results shown in Table 4b.

NORTH CENTRAL

Lundmark Limestone Occurrence

The Lundmark limestone occurrence is situated on mining claim TB 518523 on the southwestern shore of Wabikon Lake in the vicinity of Mile 70, Spruce River Road (Highway No. 527). Access can be gained by means of a gravel pit road, east off Highway No. 527, that terminates within 370 m of the south end of the lake. An old road connects the most easterly gravel pit with Wabikon Lake at which point a trail follows the west shore to the occurrence.

The occurrence was originally staked in 1964 by F. Koosel of Thunder Bay, who drilled three short diamond drill holes. The ground is presently held by H. Lundmark of Thunder Bay.

The showing consists of a white to reddish white carbonate rock of the Rosspart Formation of the Sibley Group. The reddish white carbonate outcrops at the lake-shore and has a maximum exposed vertical thickness of 3.0 m. This material grades upward into a more pure white carbonate. Exposures are limited to three small outcrops. Calcareous mudstone and shale outcrops just south of the showing. Horizontal banding of vari-coloured mudstone was noted in this unit with colours ranging from white to red. Diabase, which is exposed to the west, overlies the Sibley Group.

Two samples were analysed by the Geoscience Laboratories, Ontario Geological Survey. The reddish white carbonate is a dolomite containing 95 to 98 percent dolomite with minor calcite. The white carbonate is a limestone composed of 60 to 65 percent calcite and 30 to 35 percent brucite with minor dolomite.

Ternowesky (Good Morning Lake Fault Breccia) Uranium Occurrence

The Good Morning Lake radioactive fault breccia, is situated 55 km northeast of Thunder Bay, in Dorion Township, 4 km south of Innes Lake and 4 km west of Ouimet Canyon. The showing, which is situated 200 m west of the Innes Lake Road, occurs on mining claim TB 457188 at the northwest end of a claim group held by J. Ternowesky that straddles the Good Morning Lake Fault.

The following information has been taken from Yule (1979):

"The fault strikes 330 degrees and predates late Keweenawan fractures which strike 60 degrees.

Fine to coarse grained altered wallrock and siliceous fragments within a hematitic ground mass make up the fault zone. A relatively fresh homogeneous quartz monzonite intrusion hosts the fault breccia. The breccia has been described as being of two types: a sericitic quartz breccia and hematitic quartz breccia. The central zone of the breccia unit is highly silicified. There is a gradational

decrease in the amount of alteration, hematitization and sericitization outward from the breccia into slightly altered quartz monzonite. Quartz veining occurs in all units. A radiometric survey using a McPhar TV-1 was conducted on a five metre grid and results indicate high uranium/thorium ratios but erratic zones of radioactivity, caused by uranium, within, and along the contact of, the hematitic quartz breccia. Radioactive concentrations have been detected using autoradiographs on samples of hematite-enriched fractures within the hematitic quartz breccia. Assays of grab samples by the Geological Survey of Canada and the Geoscience Laboratories, Ontario Geological Survey, indicated that the uranium mineralization was erratic. Values ranged from 0.13 to 1.27 lb per ton U_3O_8 . Uranium-bearing fractures crosscut the breccia, implying uranium enrichment was a later event. It appears that uranium mineralization is mineralogically associated with phosphate.

"Franklin (1978) has suggested that local apatite-bearing uraniferous pegmatites are the source for the mineralization".

Ontario Geological Survey's Activities

W. D. Bond commenced a two year detailed mapping project in the Melchett Lake area, 64 km north-northwest of Nakina.

S.L. Fumerton initiated mapping of the Righteye Lake area, 3 km west of Atikokan, which includes Asmussen, Baker and part of Freeborn townships.

M.W. Carter has begun a three year mapping project in the Schreiber area, and has completed the western portion of that area.

The Fungler Lake area, 30 km northwest of Armstrong, was mapped in detail by R.H. Sutcliffe.

S.E. Amukun mapped in detail the Klob Lake area, 30 km east of Longlac.

The Geophysics/Geochemistry Section undertook experimental airborne geochemical surveys using the Barringer Research SURTRACE system in the Marshall Lake area, 64 km northwest of Nakina, and in the Marathon area. Northway Survey Corporation Limited, contracted by the Ontario Geological Survey and under the supervision of D. H. Pitcher, completed an aeromagnetic survey in 1978, in the Marshall-O'Sullivan Lakes area.

S. Wilkinson continued the gold portion of a mineral deposits study initiated by W. MacRae (1978) in the Atikokan area. P. J. Whittaker completed the second year of an Ontario chromite deposit study investigating the Shebandowan Nickel Deposit, the past producing deposits at Puddy-Chrome Lakes, 171 km north of Thunder Bay, and the Crystal Lake gabbro, Pardee Township, 46 km southwest of Thunder Bay.

Research by Other Organizations

Graduate theses recently completed that deal with the region, include:

1. CHEADLE, Scott—Magnetic Survey of the Barnum Lake Pluton, Thunder Bay, Ontario; B.Sc. Thesis, Lakehead University.

2. DUNNING, Gregory R.—The Geology and Platinum-Group Mineralization of the Roby Zone, Lac Des Iles Complex, Northwestern Ontario; 1979, Carleton University, M.Sc. Thesis, 129 p.

3. MANUNULA, Timoth—Geology and Mineralogy of the Little Pig Vein, Mainland Belt Silver Region Thunder Bay District; B.Sc. Thesis, Lakehead University.

4. ROGERS, James—The Southeastern Margin of the Mackenzie Granite: Northwestern Ontario; B.Sc. Thesis, Lakehead University.

5. WHITTAKER, Peter J.—Geology of the East Central Port Coldwell Complex from the Pic River to Red Sucker Cove; 1979, McMaster University, M.Sc. Thesis, 249p.

6. YULE, Gordon Richard—Investigations of the Good Morning Lake Radioactive Fault Breccia: Innes Lake Area, Dorion Township Noarhwestern Ontario; B.Sc. Thesis, 1979, Lakehead University, 93 p.

Graduate theses in progress in the region include:

LAKEHEAD UNIVERSITY

1. CHEADLE, Scott—Structural and Geophysical Investigations of Plutonic Bodies in Northwestern Ontario; M.Sc. Thesis.

2. FARMER, Randy—Structural and Stratigraphic Studies in Pelitic Sediments, Gorham Township, Thunder Bay; B.Sc. Thesis.

3. JAGO, Bruce—Some Aspects of the Geology of the Southwest Margin of the Coldwell Alkaline Complex, Northwestern Ontario Part I; B.Sc. Thesis.

4. KENNEDY, Myra—Study of Metamorphic Rocks in the Quetico Belt, Northwestern Ontario; B.Sc. Thesis.

5. LUCKO, Michael—Mineralogy of Archean Pegmatites, Quetico Belt, Northwestern Ontario; B.Sc. Thesis.

6. MASON, John—The Stratigraphy of Archean Strata in the Kaministikwia Area; M.Sc. Thesis.

7. MCGILL, Murray—Some Aspects of the Geology of the Southwest Margin of The Coldwell Alkaline Complex, Northwestern Ontario Part II; B.Sc. Thesis.

8. PARKER, Jack—Geology of Archean Metasediments in the Finmark area, Northwestern Ontario; B.Sc. Thesis.

UNIVERSITY OF TORONTO

9. STOTT, G.—The Structural Analysis of the Central Part of the Shebandowan Metavolcanic-Metasedimentary Belt; Ph.D. Thesis.

10. TROWELL, T.—Snow Lake Occurrence, Atikokan Area; B.Sc. Project.

CARLETON UNIVERSITY

11. MORTON, P.—Genesis of Ore at the Shebandowan Mine; Ph.D. Thesis.

Dr. F. Schwerdtner and J. Morgan, University of Toronto, are studying the structure of granitic rocks in the Atikokan area.

Dr. P. Robin and E. Sawyer, University of Toronto, are investigating migmatites in the Kashabowie area.

Dr. D. H. Watkinson and Dr. P. R. Mainwaring, Carleton University, are studying "Chromite in Ontario-Geological Setting of Chrome Lake-Puddy Lake, Loch Erne-Shebandowan Chromitites, and Chromite Chemistry".

Dr. K. Card, Geological Survey of Canada, mapped the bedrock geology along the Kimberly-Clark road between Terrace Bay and Longlac, traversing the Wawa, Quetico and Wabigoon Belts.

Recommendations For Exploration

1. The known lithium occurrences should be reassessed for their tantalum and cesium potential.

2. From a review of Franklin (1970) and Coates (1972), the Disraeli Lake Plug, as defined by Franklin (1970, p. 94), appears to have potential for copper and/or copper-nickel. This mafic intrusion should be evaluated for a high tonnage, low grade type of deposit similar to the Great Lakes Nickel deposit in Pardee Township or the Boston Bay Mines deposit near Lac des Iles.

Franklin (1970) postulates that the Disraeli Lake Plug could be the source of the copper mineralization found in the Sibley Group stromatolites in the vicinity of Disraeli Lake.

Franklin describes the plug as follows:

"The plug which corresponds in shape to Disraeli Lake is elliptical, with a long axis of 3 miles and a short axis of 1½ miles. Preliminary samples from the margin and center of the plug indicate a central zone of peridotite surrounded in turn by olivine gabbro which is rimmed by monzonite. . ."

Coates (1972) describes a disseminated sulfide mineral occurrence within the plug near the southwestern shore of Disraeli Lake. The sulfides consist of chalcopyrite and pyrrhotite.

Atikokan Project

In April of 1979, a special 2 year project in the Atikokan area was set up by the Regional Geologist's Office in Thunder Bay. This project was funded by the Ministry of Northern Affairs and staffed by C. R. Larsen, Geologist, and B. R. Schnieders, Geological Assistant. The aim of the project is to assist prospectors by providing consultative advice on mineral deposits.

In 1979 and 1980, the two major employers in the Atikokan area, Steep Rock Iron Mines Limited and Caland Ore Company Limited will close. Many of the mine workers are weekend prospectors and may be an untapped source of information on the mineral occurrences in the area. These prospectors were informed by an advertisement in the local paper that a geologist (C.R. Larsen) was available to visit any mineral occurrences that they have located. He would document the occurrences and give

NORTH CENTRAL

advice and assistance, if needed. Below are the descriptions of the property visits made in 1979. Locations of the properties are shown in Figure 4. Unless otherwise noted, all assays recorded below were performed by the Geoscience Laboratories, Ontario Geological Survey.

Property Examinations

Snow Lake Occurrence (1)

The excavation in Schwenger Township, for Ontario Hydro's proposed Atikokan Generating Station uncovered sulphide mineralization approximately 200 m northwest of Snow Lake. Discovered by a worker on the site, the visible mineralization consists of pyrite, chalcopyrite, galena, sphalerite, and arsenopyrite in a narrow series of quartz-carbonate veins hosted by a sheared granitoid. This series of veins is about 2 m wide and 45 m long, and strikes sub-parallel to the southeast shearing. Grab samples of vein and host material submitted gave the results below for assay. The results are shown in Table 4c.

This occurrence was investigated by Wilkinson, as part of a special project by the Mineral Deposits Section, Ontario Geological Survey, to investigate the gold mineralization in the Atikokan area. He states that locally the vein is composed of up to 20 per cent sulphide minerals (Wilkinson 1979, p.210). A report on this project is in progress.

The Snow Lake occurrence is located on a parcel of land under licence of occupation number 9039 to Ontario Hydro, and is, therefore, not open for staking at this time.

Wilson's Occurrences (2)

Two small occurrences, located on TB claims 385666, 385605, 385591 and 385562, about 2 km northwest of the junction of Highways 11 and 623, were visited. The claims are owned by G. Wilson and H. Blair.

A series of quartz veins are situated conformably within the hosting east-west trending metasedimentary belt. Although exposure was poor the veins appear to have a maximum width and strike length of 1 m and 10 m respectively. They consist of white, sugary to milky quartz, contain no visible sulphides, and generally exhibit very limited evidence of shearing. Assay results on a single grab sample indicate only a trace of gold and silver.

Approximately 3/4 km east-northeast of these quartz veins, a small outcrop (5 m by 10 m) of coarse grained (up to 1 cm) pyroxenite or hornblendite was noted in a large swamp. No visible sulphides are present in the outcrop, however, due to the poor exposure, the size and potential of the intrusion was not determined. A grab sample assayed trace Cu, 0.04 percent Ni, no Pt, and trace Pd.

A coarse-grained (up to 1.5 cm) pegmatite dike was found on this property. This dike is about 7 m wide and has an exposed strike length of 12 m. It is composed of

white quartz and feldspar and large (2 cm) "books" of muscovite. Assay results on a single grab sample indicated that lithium was not present.

Atiko Gold Mine (3)

The Atiko Gold Mine, formerly the Sapawe Gold Mine is located approximately 16 km east-northeast of Atikokan, in McCaul Township.

Gold was originally discovered on the property, around the turn of the century. In 1950, E. Corrigan and D. R. Young diamond drilled 10 holes (Regional Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). In 1960, Lindsay Exploration Limited optioned the property and did extensive exploratory and developmental work. In 1963 the name was changed to Sapawe Gold Mines Limited; a mill was installed, and production commenced (Riddell 1963, p. 62). Production continued until 1966 when both mining and milling ceased. When this operation terminated, 33,016 tons of ore had been milled for a total production of \$173,420 (Riddell 1967, p. 51).

In 1974, this ground was acquired by the Atiko Gold Mines Corporation Limited, an affiliate of Bayard Resources of Montreal. Magnetic and detailed geological surveys were completed on the property, that year. The following year, some of the mine buildings were rebuilt, and 28 additional claims were staked. However, work was discontinued at this point due to financial restraints (Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay). Recently, the company has been active on the property. To this point, however, the activity has been limited to mine rehabilitation cost estimates.

The gold-bearing quartz veins of the Atiko Gold Mine are situated in the contact zone between the granitic rocks of the Marmion Lake granitoid to the north and the volcanic rocks of the Sapawe Lake metavolcanic belt to the south. The contact zone contains sheared and brecciated rocks of both types. The mineralized veins appear to be associated with an extensive east-west trending shear zone that dips steeply northwards. Two types of quartz veining appear to be present on the property. One is a milky white quartz, and the other a blue quartz. Gold mineralization appears to be associated with the latter veins, that vary in width up to 1.5 m and in length to 60 m, (Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay).

Many tonnage and grade estimates have been given for this property. The Canadian Mines Handbook (under Sapawe Gold Mines Limited) lists 30,000 tons of 1.0 ounces per ton Au.

Grab samples of both types of vein material and the sheared host assayed as shown in Table 4d.

Sawdo Claims (4)

The Sawdo claims consist of 84 claims in the Lumby Lake area, 35 km northeast of Atikokan. The staked area in-

cludes rocks of the Lumby Lake metavolcanic belt, the granitic rocks to the south, and the contact zone between these two rock types.

Three geological environments were encountered that have potential for gold and silver. The first consists of numerous quartz-carbonate veins within an extensive shear zone spacially associated with the metavolcanic-granitic rock contact. These veins found in 4 different sites throughout the property, vary in width from 0.5 m to 1.3 m, strike between 210 and 230 degrees and dip 75 to 90 degrees.

A grab sample of the vein material from each of the 4 sites assayed trace Au and Ag.

The second favourable setting is an extensive shear zone, located west of Lumby Lake, between Morris and Cawing Lakes. This occurrence is referred to by Woolverton (1960), as the L. C. Anderson property. In 1951 Noranda Mines Limited did an electromagnetic survey, diamond drilling, mapping, and trenching on the property. Woolverton reported assays of 0.034 ounces per ton Au, 0.57 ounces per ton Ag, 0.25 percent Cu and 0.22 percent Zn, over a 20-foot width.

The sulphide mineralization occurs in sheared metavolcanics striking 260 degrees and dipping 70 degrees. A grab sample collected by the authors assayed 0.06 ounces per ton Au, 2.52 ounces per ton Ag and 3.66 percent Cu.

The third favorable setting consists of two brecciated iron carbonate lenses, about 2 m thick and 5 m long, stratigraphically within a micaceous chloritic schist unit, within a metavolcanic sequence. The two lenses are about 1 km apart, and are probably within the same metavolcanic unit (schist). The lenses are randomly cross-cut by quartz veinlets and locally contain disseminated pyrite and chalcocopyrite. Two grab samples assayed trace Au and Ag.

Also examined on the Sawdo claims was a narrow (0.7 m to 3.0 m) intermediate to felsic pyrite-rich metavolcanic unit. The pyrite varies from fine-grained crystals to microcrystalline aggregates. Although no massive or economic sulphides were observed within this unit, the unit appears to be continuous, and could possibly be massive sulphide-bearing at some point along strike.

Mayflower Gold Mine (5)

The Mayflower Mine is located approximately 30 km west of Atikokan, about 500 m north of Highway 11. Claims TB 475153, 475154, 475155, 475157 and 475178, presently held by K. McTavish, from Fort Frances, cover the mine property.

A 30 m shaft was sunk on the property, around the turn of the century. In 1946, the mine was dewatered, and approximately 1000 m of diamond drilling were undertaken. Gold assays of 0.50 ounces per ton over 0.9 m, 0.10 ounces per ton over 1.5 m, 0.23 ounces per ton over 0.75 m, and 5.96 ounces per ton over 0.39 m, were reported from the drilling, (Beard *et al.* 1976).

Numerous quartz veins, spacially associated with

the contact between mafic metavolcanics and a small granitoid intrusion (quartz porphyry), cut both rock types. The veins vary in width from 0.3 m to 3 m and generally strike about 85 degrees. Accessory minerals include carbonate, pyrite, chalcocopyrite, sphalerite and galena.

Six large (up to 10 m by 4 m) trenches were excavated on the property this summer.

This property is described by Wilkinson (1979) who reports that mineralization also occurs in banded chert, and that scheelite is present as an accessory mineral.

Elizabeth Mine (6)

The Elizabeth Mine consists of claims TB 385606 to 385609, presently held by R. Moffatt. These claims are located about 2 km northeast of the north end of Modred Lake, approximately 10 km northwest of Atikokan.

Gold was discovered on the property in 1900. By 1902, a 10 stamp mill was constructed; No. 1 shaft had been sunk to 28 m, with a level at 24 m, and No. 2 shaft was 72 m deep, inclined at 75°E for the first 19.5 m, then vertical, with levels at 19.5 m, 40.8 m and 70.8 m. This work was done by Anglo-Canadian Gold Estates Limited. Between 1911 and 1914, Elizabeth Gold Mines Limited extensively drifted and crosscut on No. 2 shaft (Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay). In 1935, Elizabeth Gold Syndicate dewatered and re-examined the mine (Moore 1939, p. 24). Limited surface diamond drilling and trenching has occurred on the property up until 1956. Recently, some trenching and geological mapping has been carried out in the vicinity of this occurrence.

Production of gold from the mine in 1912 was 50 tons of ore worth \$400.00 (Moore 1939, p. 24).

Gold mineralization occurs within a series of quartz-carbonate veins associated with the contact between granitic rocks of the Dashwa Lake Batholith and volcanic rocks of the Steep Rock Lake metavolcanic belt. The veins generally strike north-northeast, parallel to the contact, dip nearly vertical and are extremely variable in width and exposed strike length. Visible mineralization includes pyrite, chalcocopyrite and galena.

Many grade and tonnage estimates have been reported on the Elizabeth Mine property. Moore (1939) reports 20,000 tons of ore grading 10 dollars per ton gold had been blocked out in 1903. 1935 assay sheets from the mine indicate gold and silver values as high as 9.38 ounces per ton, and 21.99 ounces per ton respectively (Regional Geologists Files, Ministry of Natural Resources, Thunder Bay).

Eight grab samples, including volcanic material, granitic material and vein material were submitted for assay, but the results are not available yet.

Bill Lake Occurrence (7)

This occurrence is located on open ground approximately 18 km southwest of Atikokan, about 2 km east of

NORTH CENTRAL

the north end of McQuat Lake. It consists of two mafic to ultramafic intrusions, hosted by Archean metasediments. The intrusions, elongated east-west trending bodies about 50 m apart in a north-south direction, are each 400 m long and 40 m wide and are composed of hornblende, pyroxene, minor feldspar, and locally disseminated pyrite, pyrrhotite and chalcopyrite. The grain size varies to a maximum of about 1 cm. Six grab samples were collected and submitted for assay but the results are not available yet.

Gehl Lake Occurrence (8)

This occurrence is located about 32 km west of Atikokan, on the north shore of Gehl Lake. The claims (TB475209 and TB475210), covering this showing, are owned by W. Murray.

The occurrence consists of a brecciated quartz vein, 75 m long and 1 m wide, within a 2 m wide shear zone in a metasedimentary host rock. It varies in strike from 268 degrees to 300 degrees and dips 70 degrees to vertical. The vein material varies from milky white to sugary white to smokey quartz and contains disseminated pyrite and chalcopyrite. Carbonate locally cuts the vein. Two 2 m by 2 m pits were noted.

Ten grab samples of all rock types present were assayed for Au, Ag and Cu. The highest assay results were 0.01 ounces per ton Au, 0.24 ounces per ton Ag and 0.59 percent Cu.

Mills Creek Occurrence (9)

The Mills Creek occurrence is located approximately 32 km west of Atikokan, 6 km west of Flanders and ½ km north of Highway 11, on open ground.

The occurrence consists of an extensive brecciated volcanic carbonate unit, randomly intruded by cross-cutting quartz and carbonate veinlets. It is located on the northern portion of the Quetico Fault zone. Both the volcanic carbonate unit and the veinlets contain disseminated pyrite, chalcopyrite and arsenopyrite. The sulphides are more concentrated in the veinlets. This unit is iron-rich and, exhibits reddish weathering.

Five grab samples were submitted for assay but the results are not available yet.

Plateau Lake Occurrence (10)

This occurrence is located about ½km south of Plateau Lake, 10 km east of Atikokan.

A small mafic intrusive plug approximately 300 m long and 100 m to 200 m wide, intrudes east-west striking early Precambrian metasediments. The mineralization, locally associated with this gabbro-pyroxenite plug, varies from disseminated to nearly massive sulphides and consists of pyrite, pyrrhotite, chalcopyrite and pentlandite.

The property's exploration history includes trenching, limited diamond drilling and a geophysical survey. Three pits, the deepest of which was 5 m deep, were noted.

A magnetic anomaly and Pb, Zn, Cu and Ni geochemical anomalies appear to be associated with the mafic plug.

K. Kuhner owns mining claim TB 465571 which covers the occurrence. Previous analyses indicate up to 1 percent Ni and 1.5 percent Cu, (Shklanka 1969) and 0.03 ounces per ton Pt and 0.02 ounces per ton Pd, (Regional Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Ten grab samples were collected by the author for assay. The results were not received in time for publication.

Hayne's Shebandowan Occurrence (11)

This occurrence is located on the east shore of Martin Bay, Middle Shebandowan Lake. Claim 484660, owned by W. Hayne, covers the occurrence. It appears as a molybdenum, lead, copper, gold and silver occurrence on map 2128, (Hodgkinson 1968).

This occurrence consists of a very shallow northward dipping, east-west striking, narrow (maximum width of 30 cm), brecciated quartz vein. The vein is hosted by an extensively sheared biotite granite. The sheared zone appears to be at least 10 m wide. Assays of \$7.20 Au per ton, 3.3 ounces per ton Ag, and 0.52 percent Cu from the vein material, and \$0.40 Au per ton, trace Ag, and 0.8 percent Cu, from the sheared host material, have been reported, (Watson 1928). Previous work on this property includes a small pit (2 m by 1.5 m) and minor trenching.

Five grab samples of the vein material and 1 of the sheared host, were submitted for analysis but the results are not available yet.

Shabaqua Occurrence (12)

The Shabaqua occurrence is located on the Dawson Road (Lot 80, Concession A), about 55 km west of Thunder Bay and 1.5 km north of the Shabaqua railway station on the CNR line.

Mineralization consists of pyrite, chalcopyrite, malachite and azurite in a brecciated calcite-quartz vein. The vein is in a 1 m wide shear zone and hosted in an intermediate to mafic metavolcanic unit within the Shebandowan metavolcanic belt. The vein varies in width from 5 to 25 cm, strikes 145 degrees and is traceable for about 15 m. Two small pits (50 cm deep) were located along the length of the vein.

Two samples, one of the vein and one of the shear zone material were collected for assay but the results are not available yet.

Atikokan Iron Mine (13)

The Atikokan Iron Mine property is located on patented claims E10, E11 and E12, approximately 2 km east of Sapawe Lake, which is 200 km west of Thunder Bay. The ground is presently held by M. Lewis.

The Atikokan Iron Mine operated between 1907 and 1911 under the Atikokan Iron Company Limited, during which time 90,680 tons of ore were mined using 5 tunnels, 3 shafts with crosscuts and 2 open cuts. The mine ceased operations in 1912 due to impurities in the ore. Exploration on the property since the mining include, diamond drilling and ground and airborne geophysics by Kemins Exploration Limited, and Monteagle Minerals Limited (Regional Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Ore reserves of 1.7 million tons grading 53.7 percent iron have been reported (Shklanka 1968, p. 299).

The Atikokan Iron Mine is situated on a magnetite, pyrite and pyrrhotite lense, with minor chalcopryrite, and is approximately 1160 m long and 100 m wide. This deposit is one of a number of similar lenses of the Atikokan Iron Range. These lenticular bodies outcrop intermittently for 26 km along the Quetico Fault, which separates rocks of the Sapawe Lake metavolcanic belt to the north from metasediments to the south.

Five samples of the pyrite from the mine contained an average trace element concentration of 1,964 ppm cobalt, 2,352 ppm copper, 1,354 ppm nickel and 319 ppm zinc; five samples of the pyrrhotite contained an average of 781 ppm cobalt, 3,001 ppm copper, 1,670 ppm nickel, and 248 ppm zinc; and nine samples of the magnetite contained an average of 159 ppm cobalt, 169 ppm copper, 159 ppm nickel and 184 ppm zinc (Fenwick 1979, p. 42).

This deposit, as well as the others of the Atikokan Iron Range, has base metal and cobalt potential.

White Lily Gold Mine (14)

The White Lily Gold Mine property is located on patented claims BJ101, 102, 103 and WT16 and 17, and is near the northwest shore of Upham Lake which is northwest of Crooked Pine Lake. The property is owned by G. R. Duncan and Company Limited.

In 1906, a 24 m shaft was sunk on claim BJ101, and a 2-stamp mill was erected (Hawley 1929). Two ounces of Au, and 4 ounces of Ag were produced in 1933 (Shklanka 1969).

The gold-bearing quartz vein is located in the contact zone between the metavolcanics of the Sapawe-Lac des Mille Lacs metavolcanics belt and a small granitoid intrusive. The vein is up to 1 m wide and is exposed for 12 m.

Remnants of the mine and mill buildings, the shaft, the mine dump, which contains quartz, sheared metavolcanics and granitoid, numerous trenches and pits were noted. No recent work was evident.

Seven grab samples of various dump material were submitted for assay. Traces of Ag were detected, but Au values varied from trace to 0.03 ounces per ton.

Minto Gold Mine (15)

The Minto Gold Mine is located on M. Wicheruk's claims TB51826 and 51836 to 51837, in northeastern Hutchinson Township, approximately 27 km east-northeast of Atikokan.

A quartz vein, striking about 30 degrees, is hosted by a sheared grey, hornblende-biotite granitoid (Marmion Lake granitoid). The vein has a maximum width of 4 m and a strike length of about 100 m. Visible mineralization includes disseminated pyrite, chalcopryrite and arsenopyrite.

A shaft (sunk to 20 m in about 1903; Hawley 1929), the dump, and remnants of the old mine buildings remain. No recent work was evident.

A single grab sample from the dump, indicated trace amounts of gold and no silver.

This property was also visited by Wilkinson who states that another quartz vein (north vein) is located about 404 m northeast of the shaft. This vein is 3.5 m wide and 135 m long (Wilkinson 1979).

Pettigrew Gold Mine (16)

The Pettigrew Gold Mine is located on patented claim BG24, of a group of patented claims BG25, BG36 and BG37. These claims are located in Ramsay Wright Township, approximately 30 km northeast of Atikokan, and are presently owned by the Ministry of Government Services, Province of Ontario.

Visible pyrite, arsenopyrite and minor chalcopryrite, occur in a series of northeast striking small quartz veins, the largest of which is 1.4 m wide and 16 m long (Wilkinson 1979). The veins are hosted by a sheared grey granitoid (Marmion Lake Granitoid).

Two shafts were sunk to depths of 7 m and 31 m, in the 1890s, (Bow 1899).

Two shafts, the dumps and remnants of the old mine buildings remain. Four grab samples from the dumps contained a maximum of 0.06 ounces per ton Au and 0.12 ounces per ton Ag.

This property was also investigated by Wilkinson, (1979).

Jack Lake Mine (17)

The Jack Lake Mine is located on leased claim FF 15086, presently owned by Michael Wicheruk and by Dr. Zoffman. It is situated on the southeast shore of Tyrrell Lake, approximately 16 km northeast of Atikokan.

Gold was discovered on the property before the turn of the century, and in 1899 an 8.4 m long open cut, and a

NORTH CENTRAL

13.5 m shaft had been sunk on this occurrence (Bow 1900). In 1900, the Jack Lake Gold Mining Company deepened the shaft to 57.6 m. Levels were established at 30.6 m, and a second level at 56.1 m (Carter 1901).

In 1945, Jack Lake Mines Limited, conducted 6000 m of diamond drilling on the property. Fidelity Mining Investments Limited acquired the ground in 1961, and diamond drilled 699.2 m (Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay).

The mineralized quartz-carbonate vein exists within a 3 m wide shear zone, in grey-green gneissic granitoid (Marmion Lake granitoid). Visible mineralization includes pyrite and arsenopyrite. The authors also located several flecks of visible gold in the dump material. The vein strikes 45 degrees, dips nearly vertical and is exposed intermittently over a strike length of about 100 m, with a maximum width of 4.5 m. A tonnage and grade estimate of 99,050 tons averaging 0.454 ounces per ton Au was reported (Canadian Mines Handbook, 1962).

Seventy authors collected 7 grab samples (both vein and sheared host) were collected for assay from various sites along the vein and from the dump. The results are shown in Table 4e.

This property was also investigated by Wilkinson (1979). His report is in progress.

Day Lake Occurrence (18)

The Day Lake occurrence consists of an east-west striking quartz vein located approximately 1 km west of the Atiko Gold Mine, or about 15 km east-northeast of Atikokan. The vein pinches and swells to a maximum width of 3 m, along a shear zone that has a traceable strike length of about ½ km. This quartz vein is situated in the contact zone between the metavolcanics of the Sapawe-Lac des Mille Lacs metavolcanic belt and the Marmion Lake granitoids. The host rocks, therefore, consist of sheared and brecciated mafic metavolcanics and granitic rocks. Four grab samples assayed nil silver and trace gold.

This occurrence has been mapped by the staff Atiko Gold Mine Limited, and recently has been investigated by Wilkinson (1979).

The Day Lake occurrence is on ground presently held by Atiko Gold Mines Limited.

Agnico-Eagle Occurrence (19)

The Agnico-Eagle occurrence is situated on patented claims FF 3713, 3714, 3720 and 4502. These claims are located in southern McCaul Township, approximately 15 km east of Atikokan, and are presently held by Agnico-Eagle Mines Limited.

The property was extensively diamond drilled by Jack Lake Mines Limited in 1946. This company reported gold assays approaching 1.0 ounces per ton over 75 cm (Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay).

Visible mineralization of pyrite, chalcopyrite, and malachite, occurs in a small (10 m by 10 m) quartz-carbonate stockwork within a shear zone, hosted by metavolcanics. The host rock is intermediate to mafic in composition, and appears to be locally tuffaceous.

Two small (3 m by 1 m) trenches were noted on the occurrence. The assays of four grab samples of the quartz-carbonate stockwork material are shown in Table 4f.

Olcott Occurrence (20)

The Olcott occurrence, also known as the Jackson claims is located in southeast McCaul Township, approximately 12 km east of Atikokan. Claim K 364927, presently held by B. Staines, covers the occurrence.

Quartz-carbonate veins strike parallel to the intermediate to mafic metavolcanic host rocks, and occupy shear zones up to 5 m in width. Visible mineralization of pyrite, arsenopyrite, and minor chalcopyrite, exist within both the vein and sheared host material, but is more common in the host. Three quartz vein exposures were observed. Two of the veins are about 25 m apart, (southern exposure) and the third is approximately 200 m (northern exposure) to the northeast. The strike length and width of the veins were not obtainable due to poor bedrock exposure. The occurrence has been previously trenched and recently diamond drilled to a very limited extent. Analytical work in 1938 indicated up to 0.34 ounces per ton Au.

Six grab samples of the Olcott occurrence were assayed (Table 4g). Samples from the southern exposure were assayed by Thunder Bay testing Limited, Thunder Bay.

From these assay results, it appears that the gold is associated with the sheared host rather than the vein material.

This occurrence was also investigated by Wilkinson (1979).

Bull Quartz Occurrence (21)

This occurrence is located on open ground in southeast McCaul Township, approximately 13 km east of Atikokan.

A milky white quartz vein, striking parallel to the hosting mafic metavolcanics, is about 1 m wide, and is exposed for a strike length of 10 m. The vein is sheared and locally brecciated, and contains minor carbonate and pyrite. Assays of three grab samples indicate trace gold and silver.

Partridge Occurrence (22)

This occurrence is located on open ground, along the Northern and Central Gas Company pipeline in south-central McCaul Township.

Several quartz veins, up to 50 cm wide, are situated conformably within sheared intermediate to mafic metavolcanics. Visible mineralization within both vein and sheared host material, include minor pyrite, chalcopyrite and pyrrhotite. Assays of two grab samples indicate 0.01 ounces per ton Au and a trace of Ag.

Pipeline Occurrence (23)

A small molybdenum occurrence is located on Claims TB 385693 to TB 385696, presently owned by D. Beckett. These claims are located in southeast McCaul Township.

Blasting for the Northern and Central Gas Company pipeline revealed visible molybdenite along narrow quartz stringers in a granitoid host. The extent of the mineralization was not evident.

Little Falls Occurrence (24)

The Little Falls occurrence is located on patented claim E110, approximately 5 km east of Atikokan, on the north bank of the Atikokan River.

This claim is part of a group of claims owned by The Hanna Mining Company (Northern Iron Ore Mines Limited), referred to as the Garland property.

Mineralization varies from disseminated to nearly massive sulphides, and consists of pyrite, pyrrhotite, chalcopyrite and minor sphalerite. The mineralized zone is exposed over an area of 1 m by ½ m and is randomly cross-cut by carbonate veinlets. It appears that this mineralization is a facies of the Atikokan iron formation. Two small magnetite outcrops were located about 100 m east of this occurrence. The iron formation is located within the Quetico Fault zone, and is hosted by highly sheared mafic metavolcanics. Minor trenching was encountered on the property.

Two grab samples were collected for assay (Table 4h).

Recommendations for Exploration in the Atikokan Area

Gold has been receiving the most exploration attention in the Atikokan area over the last year. Considering the geology and the market value of this precious metal, gold probably has the most immediate potential in the Atikokan area at this time.

Two primary geological environments exist within the Atikokan area that have a good potential for hosting gold. The first is a stratigraphically controlled, brecciated iron carbonate volcanic unit in the Lumby Lake area. This unit is impregnated with randomly oriented quartz stringers and exhibits a diagnostic rusty red weathered surface. Although preliminary analytical work has not yet indicated that gold mineralization exists within this particular unit,

further work is required to fully evaluate this unit's potential. However, any of the metavolcanic belts of the Atikokan area, could potentially host a similar carbonate unit that may possibly be gold bearing. These metavolcanic belts should be thoroughly investigated for gold hosted in this manner.

The second primary gold potential geological environment in the Atikokan area are the numerous quartz or quartz-carbonate veins, primarily those that are hosted by: a) sodium rich granites; b) mafic metavolcanics; and c) rocks of the contact zone between these two rock types. This last environment, quartz or quartz-carbonate veins within the contact zone between sodic granite and metavolcanics has, in the author's opinion, the most gold potential of the three vein environments. This is based on recent theories that suggest that large granitic plutons supplied the heat, and possibly fluids, that "baked" the gold out of the surrounding country rock, and allowed it to concentrate in the vein structures. It seems probable, therefore, that the gold may be most concentrated where both the heat and the gold source are jointly maximized, which in the author's opinion, is the contact zone. It has been suggested, recently (Fyfe, W. S., personal communication), that gold bearing vein structures are usually associated with sodium rich granites, rather than their calcium or potassium rich equivalents. Fenwick (1976) and Pirie (1978) described rocks of the Marmion Lake Batholith as albite-rich leucocratic trondhjemites; a sodium rich granitoid. It is suggested by the author, therefore, that the contact zone between the Marmion Lake Batholith, and the three surrounding metavolcanic belts (Sapawe Lake, Lumby Lake, and Finlayson Lake), is a primary exploration target for gold. This contact zone, in the Sapawe Lake area, is not sharp, but can be up to 1 km wide. Other gold exploration targets of the vein type include, in order of priority, quartz or quartz-carbonate veins within the large sodic granitoids (Marmion Lake Batholith), within the metavolcanic belts, within the other large granitic plutons, and finally, within the other rock types of the area.

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TABLE 2: MAPS AND REPORTS PERTAINING TO THE THUNDER BAY MINING DIVISION, ISSUED IN 1979 BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports
GR 183

Open File Reports

OFR 5257
OFR 5259
OFR 5261
OFR 5262
OFR 5264
OFR 5267

Preliminary Maps

P. 1588 - P. 1607 inc.
P. 2219
P. 2249
P. 2304
P. 2305
P. 2310
P. 2311

Coloured Maps

2411
2415
2416

Mineral Deposits Circular

MDC 19

Mineral Resources Branch Publications

MPBP 7
Thunder Bay, Mineral Aggregate Study

Geophysical/Geochemistry Series Maps

NTS 42C, 42F(S/2) - 80 000 to 80 015, inclusive
NTS 53A - - 80 102 to 80 136, inclusive
NTS 52P - - 80 172 to 80 206, inclusive
NTS 521 - - 80 207 to 80 241, inclusive

Miscellaneous Papers

MP 84
MP 87
MP 90

TABLE 3

Exploration activities in 1979

Number on Figure	Individual or Company	Type of Work
1.	Abitibi-Price Inc.	Optioned claim group, diamond drilling, exploration work, west of Onaman Lake
2.	Acker, Walter	Exploration work, gold occurrence, Priske Township
3.	Albert, Onesime	Claim staking, trenching, diamond drilling, northeast of Pagwachuan Lake
4.	Algoma Development Company	Trenching, stock-piling gold-copper ore, Pifher Township
5.	Amax Explorations Inc.	Prospecting, geological mapping, east of Sullivan Lake
6.	Anaconda Company, The	Re-established grids and base-lines, copper-platinum-palladium occurrence, O'Neill Township
7.	Atiko Gold Mines Corporation	Road improvements, re-assessing gold occurrence (Sapawe Mine), McCaul Township
8.	Band-Ore Gold Mines Limited	Re-assessing gold occurrence, Conacher Township
9.	Beth-Canada Mining Company	Line-cutting, geophysical survey, Weaver Township
10.	Bird River Mines Company Limited	Claim staking, assaying, tantalum-lithium occurrence, north of Ombabika Bay, Lake Nipigon
11.	Brown, Bill	Re-assess literature on gold occurrence (North Shore Gold Mine), Priske Township
12.	Brown, Phillip	Consultant's report, gold occurrence, Eabamet Lake area
13.	Camflo Mines Limited	Geophysical survey, diamond drilling, gold occurrence, Moss Township
14.	Chubb, Fredrick	Claim staking, Pic Township
15.	Cominco Limited	Geological mapping, assaying, lithium occurrence, north of Ombabika Bay, Lake Nipigon
16.	Consolidated Louanna Gold Mines Ltd.	Dewatered shaft, underground geological mapping and sampling program, O'Sullivan Lake area
17.	Corporate Oil and Gas	Power stripping, assaying, geophysical survey, gold occurrence (Mayflower Mine), west of Flanders
18.	Cowan, Sol	Claim staking, gold occurrence, Irwin Township
19.	Crivici, Anton	Prospecting, trenching, copper-zinc-lead occurrence, Strange Township
20.	Cryderman, J. R.	Exploration work, gold occurrence (Sand River Mine), Eva Township
21.	Desautels, Gilles	Claim staking(56), Leduc Township
22.	Dome Exploration Ltd.	Optioned New Metalore Resources' gold-silver occurrence, Elmhirst Township
23.	Draper, Foster	Claim staking, exploration work, Ashmore Township
24.	Falconbridge Copper Limited	Geological and geophysical surveys, northeast of Yesno Township
25.	Fern Elizabeth Gold Exploration Company	Claim staking, geological survey, trenching, assaying, gold occurrence (Elizabeth Mine), Freeborn Township
26.	Fiset, Denis	Claim staking (83), Legault Township
27.	Fiset, Denis	Claim staking (52), Leduc Township
28.	Fournier, Elwood	Trenching, prospecting, Hele Township
29.	Gulch Resources Limited	Airborne geophysical survey, gold occurrence (Maylac Mine), Fulford Township
30.	Gulf Minerals Canada Limited	Claim staking, prospecting, north of Walsh Township
31.	Gulf Minerals Canada Limited	Optioned 34 claims from Belore Mines Limited, base-metal prospect, south of Burchell Lake
32.	Hollinger Mines Limited	Prospecting, geological and geophysical surveys, diamond drilling, Oboshkegan Township
33.	Hopkins, Albert	Claim staking, prospecting, geological and geophysical surveys, trenching, diamond drilling, gold occurrence McComber Township
34.	Hopkins, Albert	Linecutting, geophysical survey, diamond drilling, Vincent Township
35.	Hopkins, Albert	Claim staking, prospecting, Leduc Township

Table 3 continued

Number on Figure	Individual or Company	Type of Work
36.	Hudson Bay Exploration and Development Limited	Claim staking, airborne geophysical survey, north of Hagey Township
37.	Ike Burns Exploration Corporation	Claim staking, Pifher Township
38.	Inco Limited	Exploration work, Priske Township
39.	J. E. Ayrhart Development Company Limited	Optioned claim group, gold occurrence, trenching, sampling, Hutchinson Township
40.	J. E. Ayrhart Development Company Limited.	Claim staking, prospecting, Priske Township
41.	Jerome, Albert	Claim staking, silver occurrence, Eva Township
42.	Kerr Addison Mines Limited	Geophysical survey, assaying copper occurrence, O'Sullivan Lake area
43.	Kerr Addison Mines Limited	Geophysical survey, Haines Township
44.	Kuhner, Knut & Nelson, Eric	Trenching, sampling, copper-nickel-platinum group metals occurrence, west of Lac des Iles
45.	Lacana Mining Corporation	Geological mapping, investigation of uranium geochemical anomalies, McIvor Township
46.	Lafontaine, A.	Diamond drilling, Elmhirst Township
47.	LeCocq, Charles	Exploration work, silver-copper occurrence (Prince Mine), Prince Location
48.	Levesques, Noel	Claim staking, gold occurrence, Houck Township
49.	Lynx Canada Explorations Limited	Assessing feasibility of milling tailings at Tashota-Nipigon Mine for gold, Onaman Lake area
50.	Lynx Canada Explorations Limited	Optioned claim group, geological survey, assaying, gold occurrence, Dawson Road Lots
51.	Lynx Canada Explorations Limited	Claim staking, gold occurrence (Magnet Consolidated Mine) Errington Township
52.	Maki, Neel	Exploration work, Vincent Township
53.	McCabe, Roland	Exploration work, lead-silver-zinc occurrence, Walsh Township
54.	McCullough, David	Claim staking, Tuuri Township
55.	Middaugh, Richard	Exploration work, molybdenum occurrence, Elmhirst Township
56.	Moses, Alphonse	Claim staking, O'Sullivan Lake area
57.	Nahanni Mines Limited	Exploration work, gold occurrence (Sunbeam Mine), Ramsay Wright Township
58.	Nelson, Ernest	Claim staking, assaying, platinum group metals occurrence, west of Obonga Lake
59.	Noranda Exploration Co. Ltd.	Claim staking, exploration work, northeast of Yesno Township
60.	Noranda Exploration Co. Ltd.	Geophysical Survey, Eva Lake area
61.	Noranda Mines Ltd. Mattagami Lake Exploration Division	Claim staking, geochemical survey, Elmhirst Township
62.	Noranda Mines Ltd. Mattagami Lake Exploration Division	Geological mapping, prospecting, Syine and Tuuri Townships
63.	Nowosad, William	Relocating trenches, prospecting, copper occurrence, Vein Lake area
64.	Petrunka, Dave	Claim staking, amethyst occurrence, McTavish Township
65.	Placer Development Limited	Optioned claim group, diamond drilling, geophysical survey, assaying, north of O'Neill Township
66.	Placer Development Limited	Geophysical Survey, diamond drilling, northwest of Pagwachuan Lake
67.	Q. C. Explorations Limited	Intend to proceed with program of mill testing bulk samples, feasibility report, silver occurrence, Silver Islet
68.	Quellet, Simon	Claim staking (86), Lindsley Township
69.	Randa, Ty	Claim staking, Linklater Lake area
70.	Randa, Ty	Claim staking, O'Sullivan Lake area
71.	Rentz, Ewald	Claim staking, sampling, gold occurrence, Irwin Township
72.	Rio Tinto Canadian Exploration Ltd.	Claim staking, west of Lac des Mille Lacs

NORTH CENTRAL

Table 3 continued

Number on Figure	Individual or Company	Type of Work
73.	Rio Tinto Canadian Exploration Ltd.	Claim staking, south of Bedivere Lake
74.	Rio Tinto Canadian Exploration Ltd.	Claim staking, Weaver Township
75.	Rio Tinto Canadian Exploration Ltd.	Exploration Work, Caribou Lake area
76.	Sawdo, Phillip	Claim staking, prospecting, wire witching, sampling, north of Marmion Lake
77.	Shell Canada Resources Ltd.	Claim staking, Calm Lake
78.	Sheridan, J. P.	Claims surveyed for lease, palladium-platinum-copper-nickel occurrence, Lac des Iles area
79.	Shiralli, Rocco	Stripping, claim staking, molybdenum occurrence, south of Pic Township
80.	Skalesky, P. & Peterson, T.	Claim staking, trenching, exploration work, road building, feldspar occurrence, Goldie Township
81.	Skalesky, P.	Claim staking, marl occurrence, west of Cockeram Township
82.	Smith, Ronald	Claim staking, molybdenum occurrence, Burrows Lake
83.	Sperle, Kasper	Claim staking, Common Township
84.	Starr, Eugene	Geological report, assaying, prospecting, uranium occurrence, Greenwich Lake area
85.	Steep Rock Iron Mines Limited	Claim staking, geophysical survey, Schwenger Township
86.	Steep Rock Iron Mines Limited	Optioned claim group, geophysical survey, copper-nickel-cobalt occurrence, Hutchinson Township
87.	Stinson, John	Diamond drilling, trenching, sulphide occurrence, east of Cosgrave Lake
88.	Tantalum Mining Corporation of Canada Limited	Claim staking, diamond drilling, geochemical survey, west of Opikigen Lake
89.	Texasgulf Canada Ltd.	Claim staking, north of Marshall Lake
90.	Thiboutit, Arthur	Claim staking (75), Colter Township
91.	Thornsteinson, David	Prospecting, bull-dozer work, Walters Township
92.	Thornsteinson, David	Claim staking, west of Czowski Township
93.	Toronto Mining Corporation	Purchased Zenmac Mill, Killraine Township
94.	Turner, Gordon	Exploration work, assaying, uranium occurrence, Walsh Township
95.	Wicheruk, Mitch	Claim staking, sampling, gold occurrence (Jack Lake Mine), McCaul Township
96.	Wicheruk, Mitch	Claim staking, gold occurrence (Minto Mine), Hutchinson Township

TABLE 4 Assays of samples collected

	1.	2.									
a			b	Sample No.	Uranium ppm	Thorium ppm	Zirconium ppm	Beryllium ppm	Niobium ppm		
SiO ₂	66.5%	65.1		F-150-79	37	40	2500	10	700		
Al ₂ O ₃	18.5	19.6		F-151-79	24	30	500	5	600		
Fe ₂ O ₃	0.00	0.00		F-152-79	14	130	300	4	1000		
MgO	0.02	0.19									
CaO	0.10	0.16									
Na ₂ O	3.43	3.08									
K ₂ O	10.6	12.0	c	Sample No.	Au (oz/T)	Ag (oz/T)	Cu (%)	Pb (%)	Zn (%)	Mo (%)	Mn (%)
LOI	1.0	0.10		1. (vein material)	Trace	2.08	1.12	1.18	Nil	-	-
CO ₂	-	0.07		2. (vein material)	Trace	Trace	13.8	Trace	0.12	-	-
TiO ₂	0.00	0.00		3. (vein material)	0.01	Trace	Trace	Trace	Nil	-	Trace
P ₂ O ₅	0.10	0.09		4. (vein material)	Trace	Trace	0.16	Trace	0.42	-	0.04
S	-	<0.01		5. (vein material)	Trace	Trace	2.18	Trace	Nil	Trace	Trace
MnO	0.02	0.00		6. (vein material)	Trace	Trace	1.57	Trace	Nil	Trace	Trace
	100.27	100.4		7. (host material)	Trace	Trace	Trace	Trace	Trace	Trace	0.03
				8. (host material)	Trace	Trace	Trace	Trace	Trace	-	0.03

1. Sample collected by office staff
2. Sample submitted by Skalesky and Peterson

e	Sample No.	Location	Au (oz/ton)	Ag (oz/ton)	d	Sample No.	Au (oz/ton)	Ag (oz/ton)
	1 (vein)	30 m SW of Shaft	0.01	Trace		1 (blue quartz)	0.02	Trace
	2 (sheared host)	30 m SW of Shaft	Trace	Trace		2 (white quartz)	0.05	0.29
	3 (host)	30 m SW of Shaft	Trace	Trace		3 (sheared host)	0.01	Trace
	4 (vein)	mine dump	0.88	0.52				
	5 (sheared host)	mine dump	Trace	Trace				
	6 (vein)	mine dump	0.17	0.05				
	7 (vein)	120 m SW of Shaft	0.21	Trace				

f	Sample No.	Au (oz/ton)	Ag (oz/ton)	Cu (%)
	1	Trace	Trace	0.56
	2	0.24	0.84	4.72
	3	0.01	Trace	0.03
	4	0.01	Nil	-

g	Sample No.	Rock Type	Au (oz/ton)	Ag (oz/ton)	h	Sample # 1	Sample # 2
	1)	sheared host material	0.14	Trace		Sulphide material	Carbonate material
	2) Southern Exposure	vein material	Trace	Nil		Au - 0.01 oz/ton	Au - 0.01 oz/ton
	3)	vein & sheared host material	0.17	0.01		Ag - trace	Ag - 0.39 oz/ton
	4)	vein material	0.01	N.D.		Cu - 0.57%	
	5) Northern Exposure	sheared host material	0.12	Trace		Zn - 0.11%	
	6)	vein material	Trace	Trace		Ni - 0.03%	
						Co - 0.05%	

N.D. = not detected

NORTH CENTRAL

TABLE 5

Assessment Work and other information received in 1979

ABBREVIATIONS

Air Assess.	Airborne Survey	BM	Base Metals (Cu, Zn, Pb)
5 ddh 1766'	Assessment Work	Cu	Copper
Geol.	5 diamond drill holes totalling 1766 feet	U	Uranium
Geochem.	Geological Survey	Ag	Silver
Geophy.	Geochemical Survey	Amy	Amethyst
Rad.	Geophysical Survey	St	Building Stone
Mag.	Radiometric Survey	Phos.	Phosphates
EM	Magnetometer Survey	Au	Gold
I.P.	Electromagnetic Survey	Co	Cobalt
	Induced Polarization Survey	Mo	Molybdenum

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	MAP
Metcalfe Lake(M1408), Gzowski Twp.(M1939), Oboshkegan Twp.(M1413), Willet Lake(M1407)	42L4/NE, 42L5/SE	Amax Minerals Explor.	BM	Assess	Air Mag.	1979	1a
Oboshkegan Twp. (M1413)	42L4/NE	Amax Minerals Explor.	BM	Assess	Air Mag.	1979	1b
Coughlan Lake(M1409), Metcalfe Lake (M1408)	42L4/NE/SE	Amax Minerals Explor.	BM	Assess	Air Mag.	1979	1c
Metcalfe Lake (M1408)	42L4/NE	Amax Minerals Explor.	BM	Assess	Air Mag.	1979	1d
Oboshkegan Twp. (M1413)	42L4/NE	Amax Minerals Explor.	BM	Assess	Geol.	1979	1e
Oboshkegan Twp.(M1413), Gzowski Twp.(M1939), Metcalfe Lake(M1408), Willet Lake(M1407)	42L4/NE, 42L5/SE	Amax Minerals Explor.	BM	Assess	Geol.	1979	1f
Melchett Lake Area (M2532) (M2534)	42L10/NW	Anaconda Iron Ore	Fe	Assess	Geol.	1979	2
Cockeram Twp. (M1825)	52A15/NE	Asarco Exploration	U	Assess	Air. Rad., Mag.	1979	3a
McMaster Twp.(M1826)	52A15/NE	Asarco Exploration	U	Assess	Air. Mag.	1979	3b
Cockeram Twp. (M1825)	52A15/NE	Asarco Exploration	U	Assess	Air. Mag.	1979	3b
McMaster Twp.(M1826)	52A15/NE	Asarco Exploration	U	Assess	Air. Mag.	1979	3b
Dorion Twp. (M1701)	52A15/SE	Bayko, John H.	Pb, Zn, U	Assess	Geol.	1979	4
Kapikotongwa-Kayedon Lake Area (M1400)	42L14/SE, 42L11/NE	Cominco Limited	BM	Assess	Geol.	1979	5
Henderson Lake Area (M2399)	52B16/SW	Conwest Exploration Co. Ltd.	BM	Assess	3 ddh 738'	1979	6
SyineTwp. (M1930)	42D15/SW	Cowan, Sol	Au, Ag	Assess	1 ddh 101'	1979	7
McTavish Twp. (M1812)	52A10/NE	Duncey, Arthur	Amy	Assess	1 ddh 147'	1979	8
Gathering Lake Area (M2861)	42E6/NW	Essex Minerals Company	BM	Assess	EM, Mag.	1979	9a
Arrell Lake Area (M2504)	42E5/E5	Essex Minerals Company	BM	Assess	EM	1979	9b
Boot Bay Area (M2448)	52B15/SE	Eurocan Ventures Ltd.	BM	Assess	Mag., EM	1979	10
Summit Lake Area (M1406)	42L5/NE	Giant Gripp Mines Inc.	BM	Assess	2 ddh 604'	1979	11
Greenwich Lake Area (M2621)	52A15/SW	Greenwich Lake Explor.	U	Assess	21 ddh 4024', Assays	1979	12
Walsh Twp. (M1928)	42D15/SE	Gulf Minerals Can. Ltd.	U	Assess	Geol., 2 ddh 849'	1979	13
Calamity Lake Area (M2724)	42M11	Hanna Mining Company	BM	Assess	Mag., EM	1979	14a
Calamity Lake Area (M2724)	42M11	Hanna Mining Company	BM	Assess	EM, Mag.	1979	14b
Calamity Lake Area (M2724)	42M11	Hanna Mining Company	BM	Assess	EM, Mag.	1979	14c
Block Lake Area (M2753)	42M11/SE	Hanna Mining Company	BM	Assess	Geol.	1979	14d
Crump Lake Area (M2758)	42M11/NE	Hanna Mining Company	BM	Assess	EM	1979	14e
Calamity Lake (M2724)	42M11/NW/NE	Hanna Mining Company	BM	Assess	Air EM., Geol.	1979	14f
Crump Lake (M2758)	42M11/NW/NE	Hanna Mining Company	BM	Assess	Air EM., Geol.	1979	14f
Summers Twp. (1905)	42E12/NW	Jones, E. V. and Sijpkens, J. P.	Au, Ag	Assess	Geol.	1979	15

Table 5 continued.

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	MAP
Pays Plat Lake Area (M2522)	42D14/NW	Longlac Mineral Explor. Ltd.	Mo, Cu	Assess	4 ddh 1004'	1979	16
Coughlan Lake Area (M1409) Castlewood Lake Area (M1850)	42E13/NE	Lynx Canada Explor. Ltd.	Au, Ag, Cu	Assess	EM., Mag., Geochem.	1979	17
Summit Lake Area (M1406)	42L5/NE	Mattagami Lake Mines Ltd.	BM	Assess	EM., Mag., Geol.	1979	18a
Summit Lake Area (M1406)	42L5/NE	Mattagami Lake Mines Ltd.	BM	Assess	4 ddh 1659'	1979	18b
Killalala Lake (M2681)	42E2/SE	New Inesco Mines Ltd.	U, phos.	Assess	Assay, Mag., Geol. (Sections) 15 ddh - 5154'	1979	19
Snowdrift Lake Area (M3186)	52P10/SW	New Jersey Zinc Explor. (Canada) Ltd.	BM	Assess	2 ddh 867'	1979	20a
Miminiska Lake Area (M2324)	52P10/SE	New Jersey Zinc Explor. (Canada) Ltd.	Au, Ag	Assess	5 ddh 564'	1979	20b
Kaby Lake Area (M1873)	42E13/SE	New Metalore Resources Ltd.	Au, Ag	Assess	12 ddh 2573.5', Assays	1979	21
Greenwich Lake Area	52A15/SE	New Senator Rouyn Ltd.	U	Assess	Trenching	1979	22
Oboshkegan Twp. (M1413)	42L3/NW	Noranda Explor. Ltd.	BM	Assess	Mag., EM	1979	23a
Kilkenny Twp. (M1780)	52H8/NE	Noranda Explor. Ltd.	Li	Assess	EM., Mag.	1979	23b
Lampert Twp. (M1790)	52B9/SE	Noranda Explor. Ltd.	BM	Assess	Geol.	1979	23c
Dorion Twp. (M1701)	52A15/SE	Norcen Energy Resources Ltd.	U	Assess	Geol., EM., Rad.	1979	24a
McMaster Twp. (M1926)	52A15/NE	Norcen Energy Resources Ltd.	U	Assess	Geol.	1979	24b
Anders Lake (M2624), Leckie (M2641)	52A15/NW	Norcen Energy Resources Ltd.	U	Assess	Geol.	1979	24c
Greenwich Lake Area (M2611)	52A15/SW	Norcen Energy Resources Ltd.	U	Assess	Geol.	1979	24d
Klotz Lake Area (M2868)	42F13/SW	Otto, H. H., & Otto, L. J.	BM	Assess	7 ddh 1030'	1979	25
Lybster Twp. (M1800)	52A5/SW	Redden, J. W.	Ag	Assess	Geol.	1979	26
McTavish Twp. (M1812)	52A10	Rennick, M. W.	U	Assess	Geol., Geochem., Rad.	1979	27
Kaby Lake Area (M1873)	42E13/SE	Rickaby Mines Ltd.	BM	Assess	1 ddh 110'	1979	28
Mussy Lake Area (M29)	42D9/SE	Schiralli, Rocco	Mo	Assess	Air. Mag.	1979	29
Upper Aguasabon Lake (M2519)	42E3/SE	Selco Mining Corp. Ltd.	Mo	Assess	EM., Mag.	1979	30a
Upper Aguasabon Lake (M2519)	42E3/SE	Selco Mining Corp. Ltd.	Mo	Assess	1 ddh 367'	1979	30b
Gravel River-Rope Lake Areas (M2522)	42E3/SW	Selco Mining Corp. Ltd.	Mo	Assess	EM., Mag.	1979	30c
Sourdough Rapids (M3237)	43E13/SW	Soganaqueb, Solomon	Cu, Ni	Assess	Rad., Mag., Geol.	1979	31
McCaul Twp. (M2382)	52B14/SW	Staines, L. B.	Co	Assess	3 ddh 718'	1979	32
Pic Township (M1860)	42D9/NW	Stenlund, Victor	U	Assess	1 ddh 440'	1979	33
Glen Twp. (M 1926)	52A15/NE	Uranerz Explor. & Mining Ltd.	U	Assess	Air. Mag., Rad.	1979	34a
Cockeram Twp. (M1825)	52H2/SE	Uranerz Explor. & Mining Ltd.	U	Assess	Air. Mag., Rad.	1979	34b
Metcalfe Lake (M1408)	42L4/NE	Yzerdraat, W.	BM	Assess	Mag.	1979	35a
Metcalfe Lake (M1408)	42L4/NE	Yzerdraat, W.	BM	Assess	Geol., Rad.	1979	35b
Coltham Twp. (M1680), Croll Twp. (M1687), Fernow Twp. (M1713), Castlebar L. (M2477), Klotz L. (M2868), Laponen L. (M2470), McBean L. (M1622), Pagwachuan L. (M2294)	42E10	Shell Canada Resources	BM	Assess	Air. Mag.	1979	36
Alfred L. (M1811), Houck Twp. (M1756), Longlac Area (M2506)	42E15/NW, SE, 42E16/NE	Hudson Bay Explor. & Co. Ltd.	BM	Assess	34 ddh 7681'	1979	37

1979 Report of Northern Regional Geologist and Timmins Resident Geologist

L. Luhta¹

Contents

Resident and Resource Geologist's Activities	62
Exploration Activity	62
Base Metal Exploration	62
Precious Metal Exploration	63
Uranium Exploration	69
Ontario Geological Survey Activities	69
Research by Other Agencies	69

Tables

1 - Maps and Reports Issued by the Ontario Geological Survey	69
2 - Exploration Activity in 1979	70
3 - Assessment Work and Other Information Received in 1979, Porcupine Mining Division	71
4 - Additions to Regional Diamond Drill Core Library, 1979	76

Figures

1,2,3,4 - Timmins Resident Geologist's District	64,65,66,67
5 - Timmins Area	68

Resident and Resource Geologists' Activities

Present staff at the Timmins office include: L. E. Luhta, Resident Geologist, D. S. Hunt, Resource Geologist and K. Burke, Secretary.

In addition to routine consultative office duties, staff members were involved in:

1. preparation of Data Series Maps, primarily from assessment file data;
2. property examinations including mineral occurrences and producing mines;
3. conducting and attending geological field trips;

¹ Regional Geologist, Ontario Ministry of Natural Resource, 60 Wilson Avenue, Timmins, P4N 3W2.

4. participating in geological discussion group sessions;
5. providing geological input to lake plans, municipal and other land-use plans;
6. participating in development of the Northeastern Ontario Strategic Land-Use Plan, and District Land-Use Plans;
7. retrieval and storage of samples from 5545 m of exploration diamond drill core (see Table 4).

Exploration Activity

Although emphasis was placed on the search for base metals in the Timmins area, there was a significant renewed interest in gold exploration due to that metal's increase in value. The most active companies in the Timmins area were: Texasgulf Exploration Limited, Rosario Resources Canada Limited, Utah Mines and Amax joint venture, and Granges Exploration AB.

Base Metals Exploration

Compilation and area reconnaissance projects were carried out by Falconbridge Nickel Mines Limited and Getty Mines Limited.

Northeast of Timmins, Mattagami Lake Exploration carried out geophysical surveys and drilling in Little and Duff Townships (21; Table 2); and Shell Canada Resources Limited completed geophysics and drilling in Mann and Hanna Townships (27). Noranda Exploration Company Limited drilled one hole in Mann Township (23).

Northwest of Timmins, Amoco Canada Petroleum Company Limited drilled four holes in Geary and Mahaffy Townships (1); Teck Exploration Limited drilled three holes in Reid and Macdiarmid Townships (11); and Hollinger Mines Limited drilled two holes in Moberly Township (16). Gulf Minerals Canada Limited drilled 182 overburden holes on an extensive claim block in Thorburn, Reid, Mahaffy and Loveland Townships (15). Rosario Resources Canada Limited completed geophysical surveys and drilled two holes in Reid and Mahaffy Townships (26); and Texasgulf Exploration Limited completed geo-

physics and drilling in Reid and Carnegie Townships (28). Utah Mines Limited, in a joint venture with Amax Minerals Exploration, drilled five holes in Thorburn, Moberly, Geary and Macdiarmid Townships (31).

Teck Exploration Limited drilled two holes in Montcalm Township. (11).

West of Timmins, Conwest Exploration Company Limited drilled five holes in Turnbull Township (7) and Teck Exploration Limited drilled two holes in Godfrey Township (11). Cominco Ltd. carried out a base metals exploration program in northern Bristol Township (6).

South of Timmins, Rosario Resources Corporation Limited drilled four holes in southwestern Whitney Township (26); and in Eldorado Township Utah Mines Limited and Texasgulf Exploration Limited carried out drilling programs (28, 30).

Rio Tinto Canada Exploration Limited carried out a program consisting of airborne and ground geophysics, geology and diamond drilling in Dublin, Onaping and Shelley Townships north of Sudbury (25).

In the Swayze Volcanic Belt Granges Exploration AB carried out geophysical surveys and 6,000 feet of diamond drilling in Greenlaw and Tooms Townships (14). Texasgulf Exploration Limited drilled six holes in Cunningham Township (28). The Utah Mines Limited-Amax Minerals Exploration joint venture drilled one hole in Kenogaming Township (31).

Hubbay Mining Limited in the second year of a three-year program on an Exploratory Licence of Occupation in the McAlpine Township area, carried out geophysical surveys and drilled 17 holes (17).

In the Guilfoyle Township area, Shell Canada Resources Limited carried out geophysical surveys and diamond drilling (27).

Mattagami Lake Exploration carried out programs consisting of airborne and ground geophysics and diamond drilling in Casselman and Slack Townships, and in the Hurdman Township area (21).

Noranda Exploration Company Limited drilled three holes in the Atkinson Lake Area. (23).

Precious Metal Exploration

With the price of gold doubling from the end of 1978 to the end of 1979, a number of companies both large and small became interested in carrying out gold exploration programs in the Timmins area. The outlook for 1980 is even more encouraging with respect to exploration for gold. Gold producers also increased their exploration programs. Briefly discussed below are some of the programs carried out.

Amoco Canada Petroleum Company has made an agreement with Dome Mines and Campbell Red Lake Mines to do further work on its large gold deposit in the Detour Lake area 200 km northeast of Timmins. The discovery was made in late 1974 and previous work has out-

lined 10 million tons at an average grade of 0.204 ounces Au per ton. The program started at the end of October with Campbell Red Lake Mines as operator and crews are presently drifting in ore on the 400 and 340 foot levels with a very detailed sampling program being done on all new development. Underground definition drilling is also being carried out with the drilling results and development sample results being compared. 10,000 feet of underground development and between 18,000 and 24,000 feet of diamond drilling is scheduled for 1980 to establish the physical parameters of the deposit (Personal communication, Campbell Red Lake Mines).

Texasgulf Canada Limited started a decline to assess the Owl Creek gold deposit in Hoyle Township 3.5 km west of the Company's concentrator. Texasgulf has an agreement in principle with INCO for underground exploration and possible development of the property (Northern Miner, Nov. 15, 1979).

Low gold and copper values were encountered by drilling on a property held by Texasgulf in Chester Township (28). Extensive stripping and surface sampling was also done. This property is currently being evaluated for a source of siliceous flux for the company's new copper smelter (Northern Miner, Nov. 8, 1979).

Texasgulf carried out a program of overburden drilling on the Allerston claims in Bristol Township as part of a gold exploration program (28).

Canadian Crest Gold Mines Limited completed 350 feet of horizontal development and 220 feet of vertical development on the former Young Shannon gold mine in Chester Township. No underground production has yet been started although 3600 tons of open pit material was milled by their small mill on site (Personal communication, Canada Crest Gold Mines Limited).

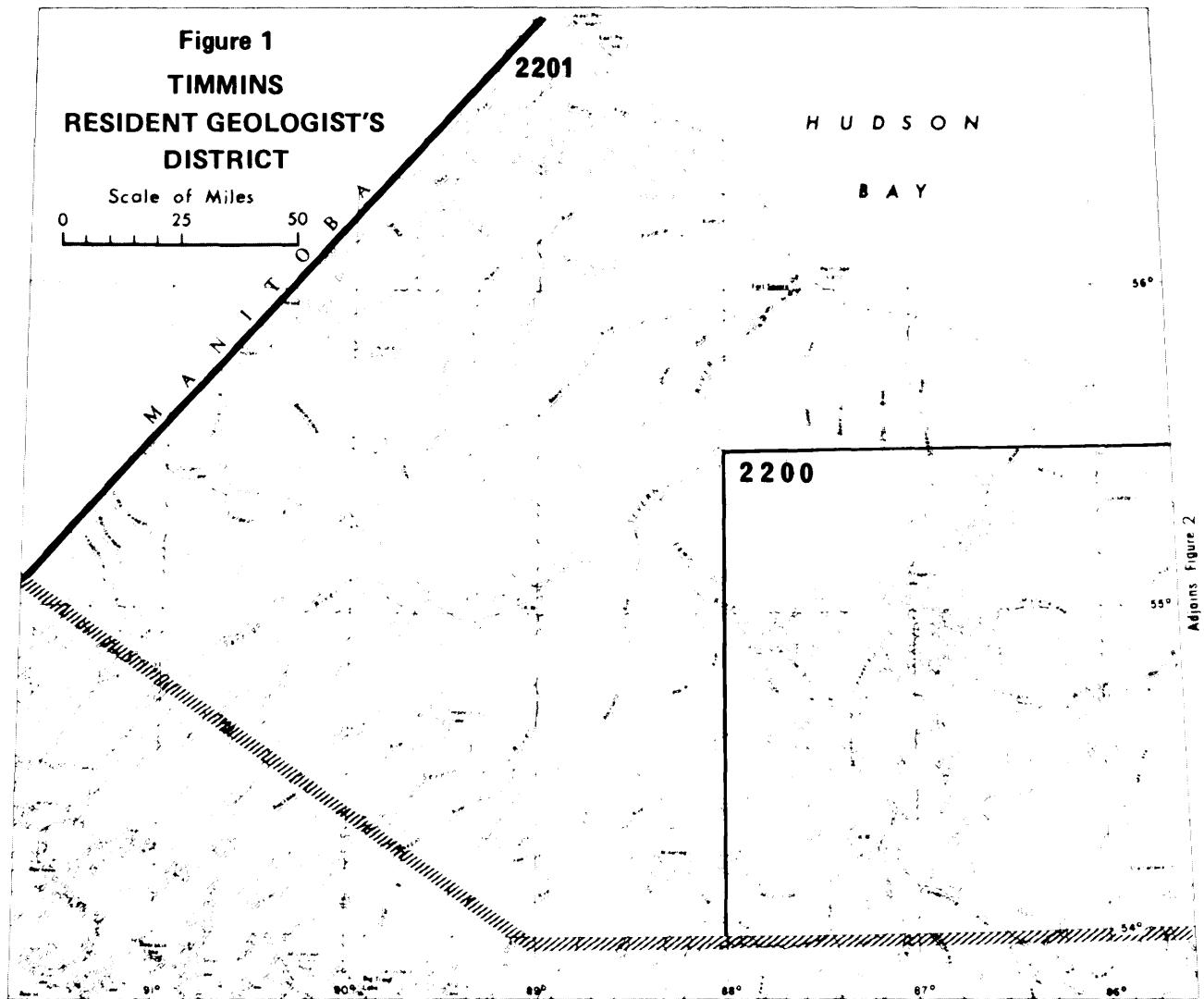
Baxter Minerals sank a 185-foot vertical shaft and completed 200 feet of horizontal development on its gold deposit in Chester Township. A 50-ton capacity portable mill is currently being installed on the property (Personal communication, Baxter Minerals).

Diamond drilling was done by Augdome on its gold property in Tisdale Township (Northern Miner, Nov. 8, 1979) (3).

Northgate Exploration entered into a joint venture agreement with Orofino Mines regarding the latter company's gold property in Silk and Horwood Townships. A program of line cutting has started in preparation for a program of geophysics, geochemistry, geology and drilling (Northern Miner, Nov. 15, 1979).

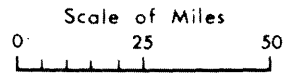
J. V. Bonhomme of Timmins purchased the property of the former DeSantis Gold Mine in Ogden Township (4). A geophysical program has been carried out on the property (Personal communication, J. V. Bonhomme).

Rosario Resources Canada Limited conducted a diamond drill program in Whitney Township. The company also carried out a geophysical program on Allerston claims in Hoyle Township close to Texasgulf's Owl Creek gold deposit. A geophysical program was also done in Murphy Township with respect to gold exploration (Personal communication, Rosario Resources Canada Limited) (26).



2200
2201

Figure 2 TIMMINS RESIDENT GEOLOGIST'S DISTRICT



EXPLANATION

● Exploration activity in 1979 (keyed to Table 2)

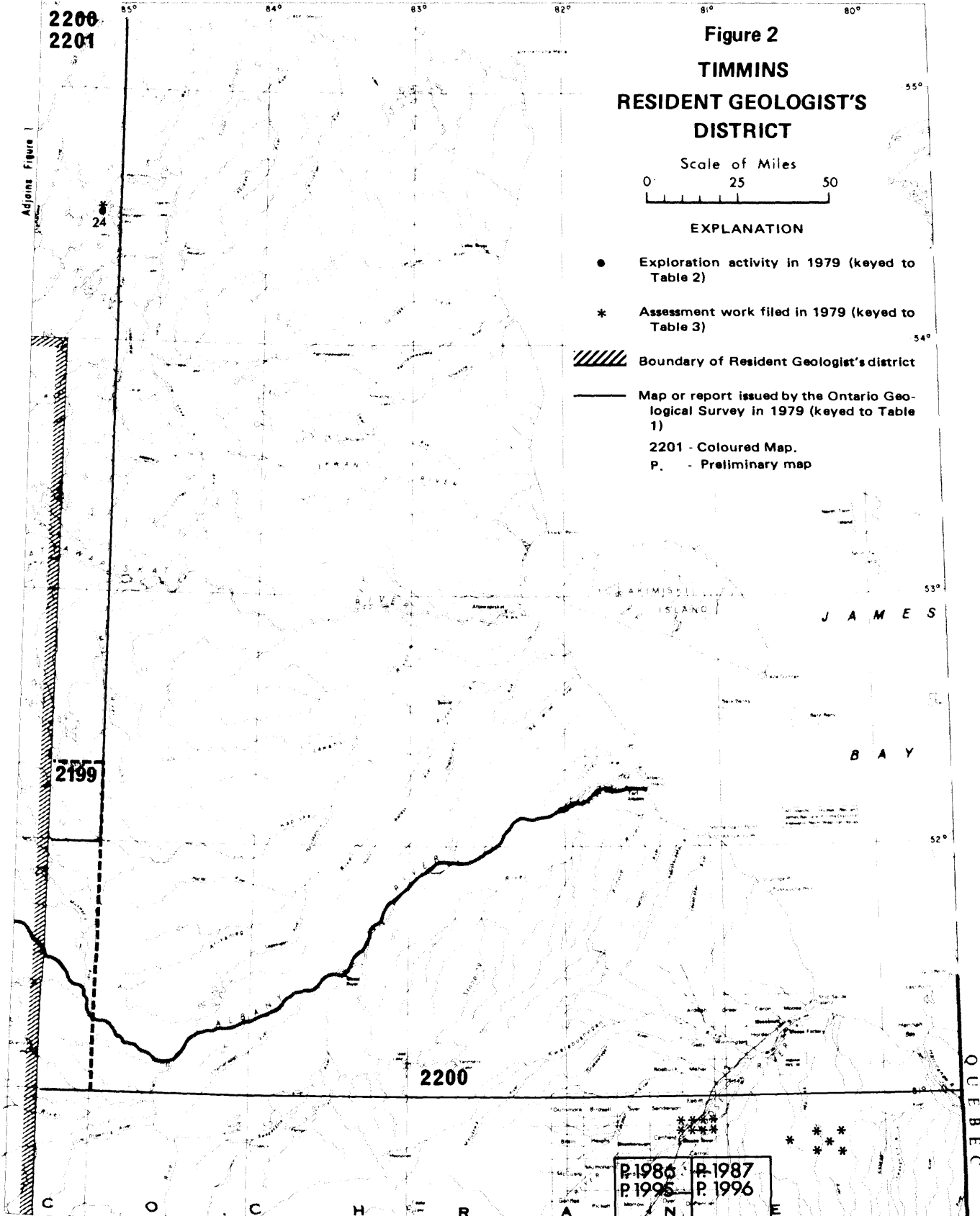
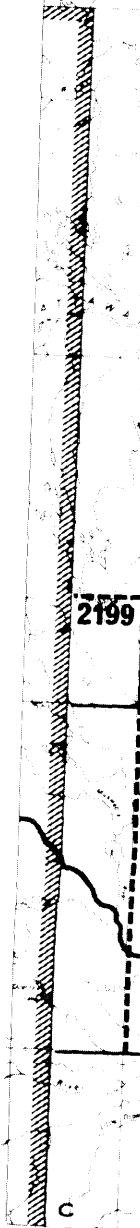
* Assessment work filed in 1979 (keyed to Table 3)

▨ Boundary of Resident Geologist's district

— Map or report issued by the Ontario Geological Survey in 1979 (keyed to Table 1)

2201 - Coloured Map.
P. - Preliminary map

Adjoins Figure 1



P-1986 P-1987
P-1995 P-1996

Adjoins Figures 3 and 4

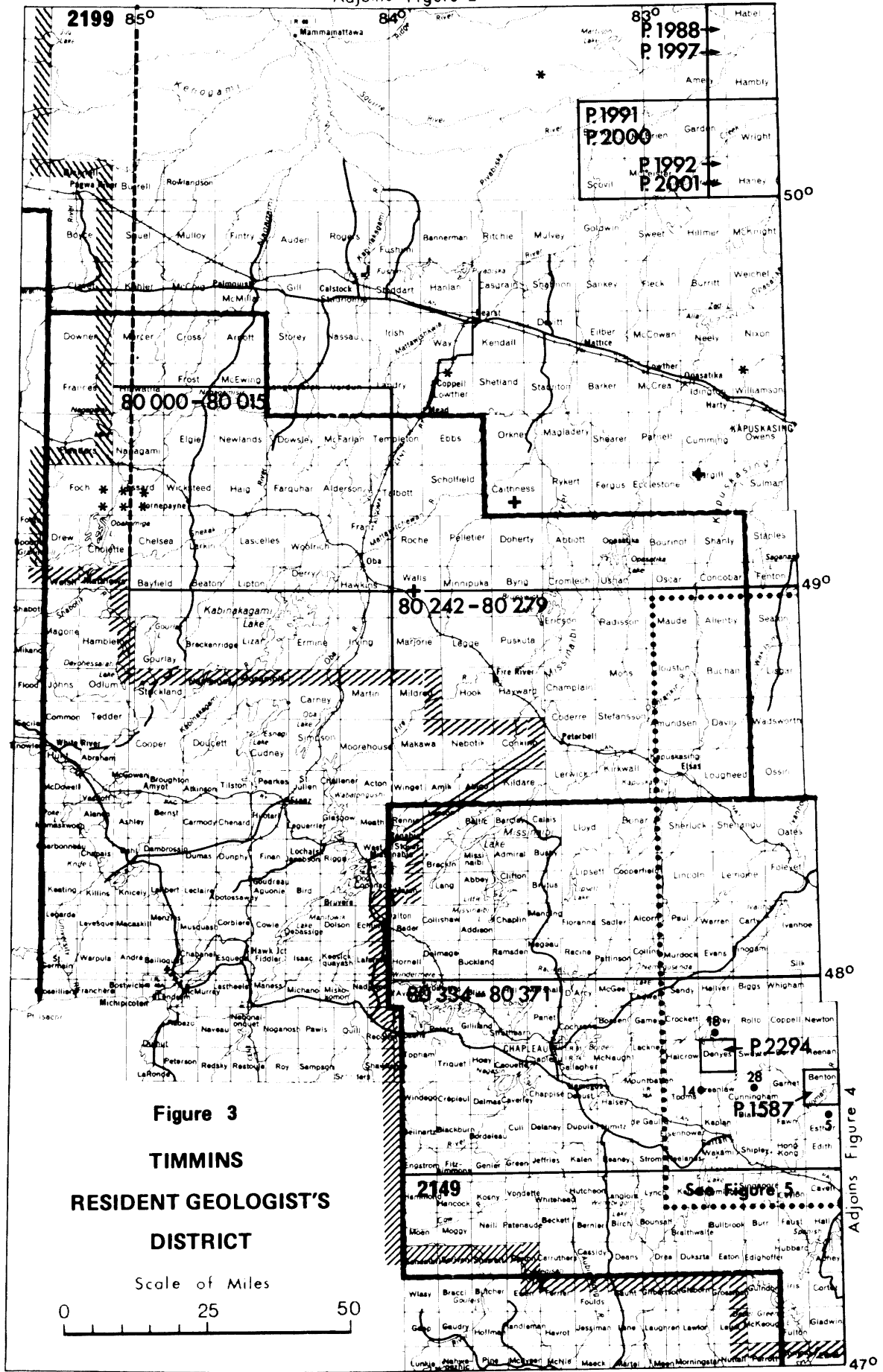


Figure 3
TIMMINS
RESIDENT GEOLOGIST'S
DISTRICT

Scale of Miles
 0 25 50

Adjoins Figure 4

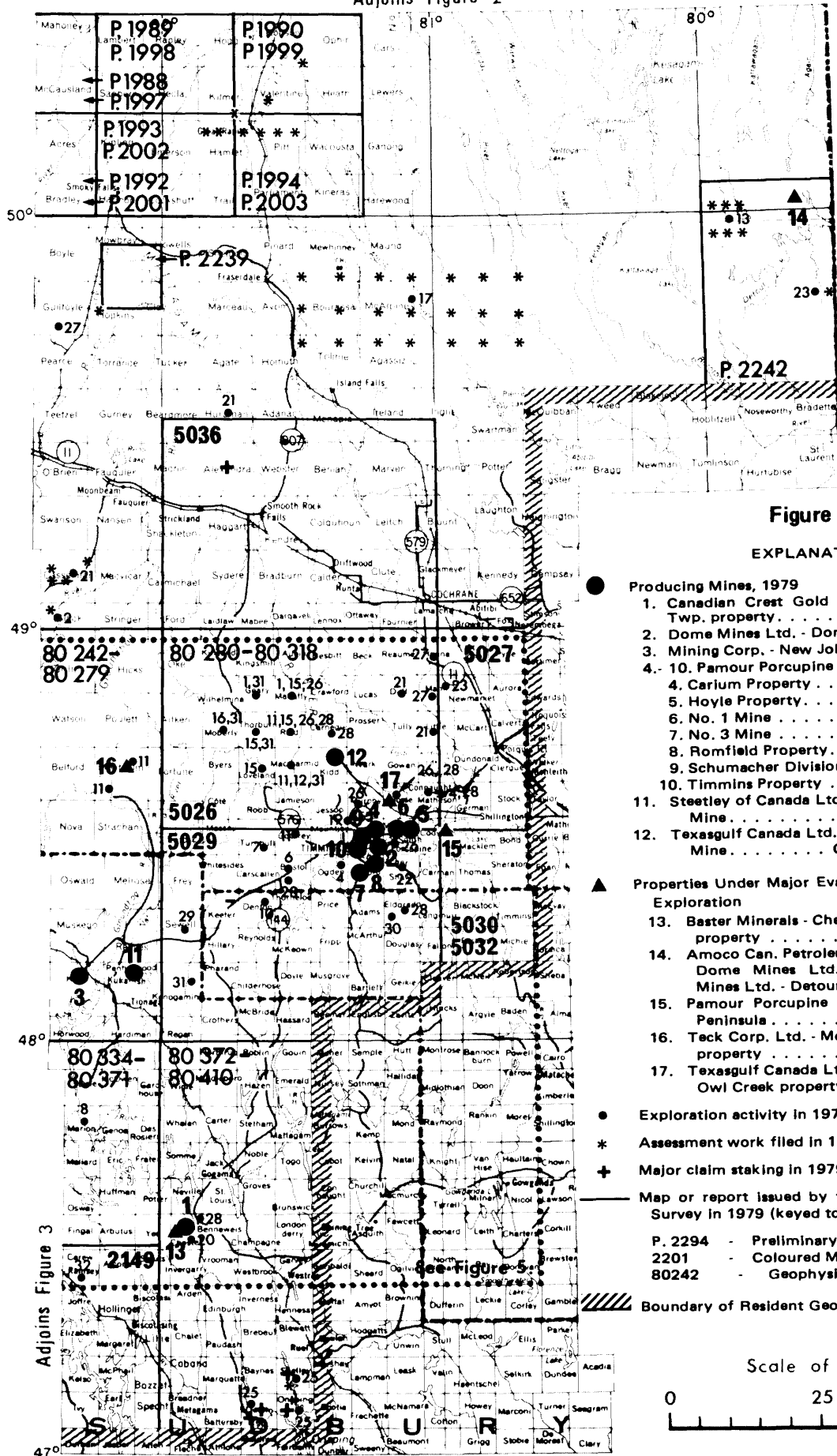


Figure 4

EXPLANATION

Producing Mines, 1979

- 1. Canadian Crest Gold Mines Ltd. - Chester Twp. property Au, Cu
- 2. Dome Mines Ltd. - Dome Mine Au, Ag
- 3. Mining Corp. - New Joburke Mine Au, Ag
- 4. 10. Pamour Porcupine Mines Ltd.
- 4. Carium Property Au, Cu, Mo
- 5. Hoyle Property Au, Ag
- 6. No. 1 Mine Au, Ag
- 7. No. 3 Mine Au, Ag
- 8. Romfield Property Au, Ag
- 9. Schumacher Division Au, Ag, Cu
- 10. Timmins Property Au, Ag
- 11. Steelley of Canada Ltd. - Penhorwood Mine talc
- 12. Texasgulf Canada Ltd. - Kidd Creek Mine Cu, Zn, Ag, Pb, Cd, Sn

▲ Properties Under Major Evaluation and/or Active Exploration

- 13. Baster Minerals - Chester Twp. property Au, Cu
- 14. Amoco Can. Petroleum Co. Ltd., Dome Mines Ltd., Campbell Red Lake Mines Ltd. - Detour Gold Property Au, Cu
- 15. Pamour Porcupine Mines Ltd. - Porcupine Peninsula Au, Ag
- 16. Teck Corp. Ltd. - Montcalm Twp. property Ni, Cu
- 17. Texasgulf Canada Ltd., INCO Ltd. Owl Creek property Au

● Exploration activity in 1979 (keyed to Table 2)

* Assessment work filed in 1979 (keyed to Table 3)

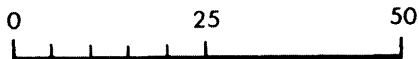
⊕ Major claim staking in 1979

— Map or report issued by the Ontario Geological Survey in 1979 (keyed to Table 1)

- P. 2294 - Preliminary Map
- 2201 - Coloured Map
- 80242 - Geophysical/Geochemical Series

▨ Boundary of Resident Geologist's district

Scale of Miles



Adjoins Figure 3

See Figure 5

NORTHERN—TIMMINS

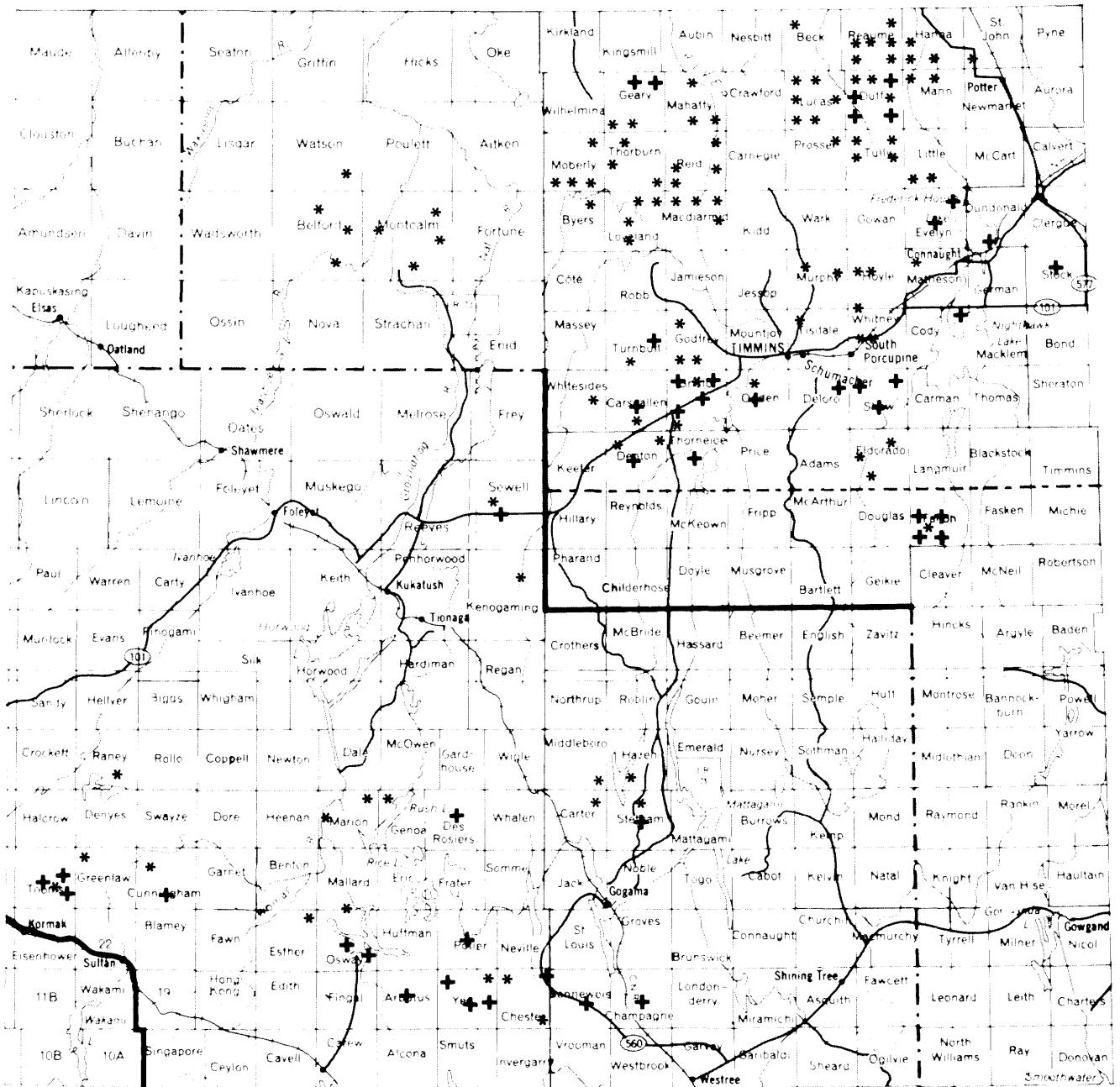


Figure 5

* Assessment work filed in 1979 (keyed to Table 3)

+ Major claim staking in 1979

Uranium Exploration

Prospection Ltd. completed its exploration program on ground covered by an exploration Licence of Occupation in the Hudson Bay Lowlands. The area includes a large part of the Proterozoic inlier in the Sutton Lake-Nowashe Lake area southeast of Winisk. Two holes were drilled in 1979 to complete their program.

Ontario Geological Survey Activities

G. M. Siragusa carried out mapping and an investigation of previous exploration work done in Esther, Osway, Huffman and Arbutus Townships on the Jerome Area, District of Sudbury.

R. P. Sage studied two alkalic rock-carbonatite complexes. The Borden Township carbonatite located in the Chapleau area was examined and the core of the Magagami River alkalic rock complex in the Hearst area was extensively sampled.

Detailed mapping of the northeastern half of the Shawmere Anorthosite Complex within Carty, Lemoine, Oates, Foleyet and Ivanhoe Townships was done by L. Riccio.

Mapping of the surficial geology of the Nassau Lake map-area, district of Cochrane, at a scale of 1:50 000 was carried out by M.L.T. Crosbie.

C. M. Tucker completed the mapping of the surficial deposits in the Timmins area at a scale of 1:50 000.

As part of the Uranium Reconnaissance Program, results of Federal-Provincial airborne gamma-ray spectrometer surveys were released. Areas covered by the survey within the northern region include: NTS sheet 42B, Foleyet; NTS sheet 42A, Timmins; NTS sheet 41O, Chapleau; and NTS sheet 41P, Gogama. Also as part of this program results of a Federal-Provincial lake sediment geochemical survey covering the eastern shore of Lake Superior were released. This included a part of NTS sheet 42F, Hornepayne (south half).

Multifrequency electromagnetic data was compiled by D. H. Pitcher over an area covering the southern and eastern parts of the Cretaceous Basin, James Bay Lowlands for the purpose of mapping the electrical properties of the subsurface unconsolidated material as an aid to lignite exploration in the area.

A gravity survey of the Gowganda, Shining Tree, and Gogama areas was completed by V.K. Gupta and D. R. Wadge.

J. A. Fyon and J. H. Crocket continued research on geological and geochemical properties of gold deposits as a guide to gold mineralization in the Porcupine Camp.

A two-year comparative petrogenetic study of six to ten talc-magnesite and asbestos deposits in the Timmins-Kirkland Lake area was started by U. and D. Kretschmar.

The Ontario Centre for Remote Sensing (Ontario Ministry of Natural Resources, Lands and Waters Group)

completed field work for a physiographic and wetlands classification within the James Bay Lowlands, District of Cochrane.

Research By Other Agencies

(1) Laurentian University. R. E. Whitehead, R. A. Cameron, and J. F. Davies: Gold Exploration using CO₂, H₂O and Alkalic "Anomalies".

(2) University of Toronto. R. Ernst and G. Cygan: Paleomagnetic studies on the northwest trending diabase dykes of the MacKenzie III Swarm across the Kapuskasing Structural Zone.

(3) University of Toronto. Sarah Sawyer: Distribution of Nickel and precious metals in the Alexo, Sothman, Hart, McWatters deposits and the Dundonald Sill.

(4) University of Toronto. R. G. Roberts and R. D. Harris: Volcanic and Tectonic Setting of Gold Veins and their Relationship to Hydrothermal Alteration.

(5) University of Western Ontario. D. Robinson: Field Relations and Geochemistry of Ni associated with Ultramafic and Mafic rocks of the Redstone deposit.

TABLE 1 MAPS AND REPORTS PERTAINING TO THE PORCUPINE MINING DIVISION, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES, JANUARY TO NOVEMBER, 1979

Miscellaneous Papers

M.P. 84
M.P. 87
M.P. 90

Mineral Deposit Circular

M.D.C. 18

Open File Reports

O.F.R. 5262
O.F.R. 5267
O.F.R. 5270
O.F.R. 5276
O.F.R. 5279

Coloured Maps

2199
2200
2201
2393
2419
5026
5027
5029
5030
5032
5036

Preliminary Maps

P. 1587
P. 1986 through P. 2003
P. 2239
P. 2242
P. 2294

Ontario Geoscience Study

Study 20

Federal-Provincial Uranium Reconnaissance Program Maps

80 000 through 80 015
80 242 through 80 318
80 334 through 80 410

NORTHERN—TIMMINS

TABLE 2

Exploration activity in 1979

Number on Figure	Individual or Company	Activity
1	Amoco Can. Petroleum Co. Ltd.	DD
2	Arsenault, R.	DD
3	Augdome Corp.	DD
4	Bonhomme, J. V.	DD and other exploration
5	Burton, M.	DD
6	Cominco Ltd.	exploration
7	Conwest Expl. Co. Ltd.	DD
8	Domego Resources Ltd.	GL
9	Falconbridge Nickel Mines Ltd.	area reconnaissance
10	Gambit Cons. Expl. Ltd.	DD
11	Geophysical Engineering Ltd. (Teck Expl. Ltd.)	DD
12	Gervais, L.	DD
13	Gold Shield Syndicate	GP
14	Granges Expl. AB	GP, DD
15	Gulf Minerals Can. Ltd.	OVD
16	Hollinger Mines Ltd. (Joint venture with Imperial Oil Ltd.)	DD
17	Hudbay Mining Ltd.	GP, DD
18	J-Dex Expl. Ltd.	GL, DD
19	Kavula, A.	DD
20	Lytle, L.	GL, GP, DD
21	Mattagami Lake Mines Ltd. (Mattagami Lake Expl.)	GP, DD, AGP
22	McKinnon, D.	sTr
23	Noranda Expl. Co. Ltd.	DD
24	Prospection Ltd.	DD, GC, down-hole RA logging
25	Rio Tinto Can. Expl. Ltd.	AMag, GP, GL, DD
26	Rosario Resources Can. Ltd.	GP, DD
27	Shell Can. Resources Ltd.	GP, DD
28	Texasgulf Expl. Ltd.	sTr, GL, GP, DD, OVD
29	Tremblay, R.	rTr
30	Utah Mines Ltd.	DD
31	Utah Mines Ltd. (joint venture with Amax Minerals Expl.)	OVD, DD
32	Wright, W.	prospecting

TABLE 3

Assessment work and Other Information received in 1979

Dec. 1, 1978 to Nov. 30, 1979

Porcupine Mining Division

Abbreviations

AEM	-	airborne electromagnetic survey
AFMAG	-	audio frequency magnetic survey
AMag	-	airborne magnetometer survey
ARA	-	airborne radiometric survey
Au	-	gold
CEM	-	Crone CEM electromagnetic survey
Cu	-	copper
DD	-	diamond drilling (the numbers following "DD" indicate the number of holes drilled and the total length drilled, respectively)
GC	-	geochemical survey or geochemical study
GL	-	geological survey
Grav	-	gravity survey
HEM	-	horizontal loop electromagnetic survey
IP	-	induced polarization survey
Mag	-	magnetometer survey
magn	-	magnetite
Ni	-	nickel
OVD	-	overburden drilling (the numbers following "OVD" indicate the number of holes drilled and the total length drilled, respectively)
Qtz	-	quartz
RA	-	radiometric survey
Res	-	resistivity survey
rTr	-	trenching
sTr	-	stripping
U	-	uranium
VEM	-	vertical loop electromagnetic survey
VLF	-	very low frequency electromagnetic survey
XRD	-	X-ray diffraction

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Agassiz Twp.	42H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977,1978	83.1-128 83.1-125	T-1900
Atkinson Lake Area	32E/13	Noranda Exploration Co. Ltd.	base metals, Au	assessment	DD-2-933 ft.	1979		T-1735
Atkinson Lake Area	32E/13	Noranda Exploration Co. Ltd.	base metals, Au	assessment	DD-1-379 ft.	1979		T-1763
Avon Twp.	42H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977,1978	83.1-128 83.1-125	T-1900
Beck Twp.	42A/14, 42A/15	Shell Can. Resources Ltd.	base metals	assessment	DD-2-352 ft.	1977		T-1895
Belford Twp.	42B/9	D. R. Derry Ltd.	base metals	assessment	OVD-25-3,637 ft.	1976,1977	2.2514	T-1903
Bourassa Twp.	42H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977,1978	83.1-128 83.1-125	T-1900
Bristol Twp.	42A/5NE	Geophysical Engineering Ltd.	base metals, Au	assessment	AEM, AMag	1978	2.2841	T-1752
Bristol Twp.	42A/5NE	Holmer Gold Mines Ltd.	Au	assessment	Mag, VLF	1978	2.2816	T-842
Bristol Twp.	42A/5NE	The International Nickel Co. of Can. Ltd.	base metals, Au	assessment	IP, Res.	1977	2.2517	T-1789
Byers Twp.	42A/12NW	Hollinger Mines Ltd.	base metals	assessment	Mag, VLF, HEM	1976,1977, 1978	2.2789	T-1788
Canfield Twp.	42I/14SW	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m	1978	83.1-127	T-1904
Carroll Twp.	42I/14S	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m	1978	83.1-127	T-1904
Carter Twp.	41P/13S	Gogama Uranium Syndicate	U	assessment	ARA	1977	2.2505	T-1893
Carscallen Twp.	42A/5	Gold Shield Syndicate	Au	assessment	Mag, VLF	1978	2.2957	T-1926
Casselman Twp.	42G/15W	Mattagami Lake Mines Ltd.	base metals	assessment	DD-1-326 ft. DD-4-1,269 ft. HEM, Mag	1978 1979	2.2928	T-1826

NORTHERN—TIMMINS

Table 3 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Casselman Twp.	42G/1	Mattagami Lake Mines Ltd.	base metals	assessment	DD-1-296 ft.	1979		T-1921
Chester Twp.	41P/12SW	Can. Crest Gold Mines Ltd.	Au, Cu	assessment	AMag	1978	2.2731	T-1751
Chester Twp.	41P/12SW	Lytle, L.K.	Au, Cu	assessment	DD-1-101 ft.	1979		T-1934
Chester Twp.	41P/12SW	Texasgulf Can. Ltd.	Cu,Au,Qtz.	assessment	VLF, HEM sTr	1978, 1979	2.2825	T-1842
Cunningham Twp.	410/10NE	Texasgulf Can.Ltd.	base metals	assessment	DD-5-1,028 ft. DD-1-251 ft.	1979		T-1776
Denton Twp.	42A/5SE	Can. Nickel Co.Ltd.	base metals,Au	assessment	Mag	1978	2.2839	T-1834
Denton Twp.	42A/5SE	Gambit Cons. Expl. Ltd.	Au, base metals	assessment	DD-3-902 ft.	1979		T-1865
Dublin Twp.	41P/3, 41P/4	Rio Tinto Can. Expl. Ltd.	base metals	assessment	AMag	1979	2.3011	T-1927
Duff Twp.	42A/14SE	Rosario Resources Can. Ltd.	base metals	assessment	HEM, Mag, Grav.	1977,1978	2.2589,2.2871	T-1827
Duff Twp.	42A/14, 42A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag, HEM	1977	2.2574, 2.2829	T-1905
Ebbitt Twp.	42I/14N	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m	1978	83.1-127	T-1904
Eldorado Twp.	42A/6SE	Hudson Bay Expl. & Dev. Co. Ltd.	base metals	assessment	DD-1-140.6 m HEM	1978	2.2877	T-1899
Eldorado Twp.	42A/6SE	Texasgulf Can.Ltd.	base metals	assessment	VLF	1978,1979	2.2883	T-1917
Eldorado Twp.	42A/6SE	Utah Mines Ltd.	Ni, Cu	assessment	DD-6-2,284.5 ft.	1978		T-1785
Esther Twp.	410/9NW	Burton, M.	base metals	assessment	DD-1-123 ft.	1979		T-1920
Fallon Twp.	42A/6SE	Meunier, D.	base metals	assessment	DD-1-262 ft.	1978		T-1933
Foch Twp.		Brinex Ltd.	base metals	assessment	Mag, HEM DD-6-2,436 ft.	1978	2.2864	T-1919
Geary Twp.	42A/13SE	Amex Minerals Expl.	base metals	not assessment	DD-1-533 ft.	1979		T-1896
Geary Twp.	42A/12NE	Amex Potash Ltd.	base metals	assessment not assessment	HEM, VEM, Mag DD-1-625 ft.	1978 1979	2.2695	T-1896
Genoa Twp.	410/9NE	Noranda Expl.Co. Ltd.	base metals	assessment	Mag, HEM	1978	2.2955	T-1888
Genoa Twp.	410/16	Texasgulf Can.Ltd.	base metals	assessment	HEM, Mag, VLF	1978	2.2826	T-1908
Godfrey Twp.	42A/5NE	Geophysical Engineering Ltd.	base metals	assessment	AEM, AMag, DD-1-431 ft.	1978, 1979	2.2841	T-1752
Godfrey Twp.	42A/5NE	Texasgulf Can.Ltd.	base metals	assessment	GL	1977	2.2898	T-1867
Greenlaw Twp.	410/10NW	Granges Expl.AB	base metals	assessment	DD-1-753 ft.	1978		T-1774
Hamlet Twp.	42I/4N	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m down-hole RA logging	1978	83.1-127	T-1904
Hanna Twp.	42A/14, 42A/15	Shell Can.Resources Ltd.	base metals	assessment	Mag, HEM	1977	2.2575 2.2829	T-1906
Hanna Twp.	42A/14, 42A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag, HEM	1977,1979	2.2576 2.2974	T-1907
Hawley Lake Area		Prospection Ltd.	U	assessment	AFMAG, Mag, Res, Track Etch, RA, IP, down-hole RA logging, GC, DD-11-1,802.48 m	1978,1979	83.1-125	T-1831
Hazen Twp.	41P/13E	Gogama Uranium Syndicate	U	assessment	ARA	1977	2.2505	T-1893
Hobson Twp.	42I/5E, 42I/6W	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m down-hole RA logging	1978	83.1-127	T-1904
Homuth Twp.	42H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC,AEM	1977,1978	83.1-128, 83.1-125	T-1900

Table 3 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Hopkins Twp.	42G/16SE	Shell Can. Resources Ltd.	base metals	assessment	CEM, Mag	1977	2.2776	T-1912
Hopper Lake Area	32E/13	Gold Shield Syndicate	Au, base metals	assessment	Mag, VLF	1978	2.2897	T-1924
Hoyle Twp.	42A/11	Rosario Resources Can. Ltd.	base metals	assessment	Mag.	1978,1979	2.2937	T-1928
Kenogaming Twp.	42A/4NW	Amax Minerals Expl.	base metals	assessment	DD-1-605 ft.	1979		T-1868
Kilmer Twp.	42I/4NE, 42I/5SE	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m down-hole RA logging	1978	83.1-127	T-1904
Lessard Twp.		Brinex Ltd.	base metals	assessment	Mag, HEM, DD-6-2,436 ft.	1978	2.2864	T-1919
Little Twp.	42A/10NW, 42A/11NE	Noranda Mines Ltd.	base metals	assessment	DD-3- 1,910 ft.	1978		T-1922
Loveland Twp.	42A/12, 42A/13, 42A/14	Gulf Minerals Can. Ltd.	base metals	assessment	OVD-182-17,492.5 ft.	1979	2.2972	T-1929
Lowther Twp.	42G/12S	Noranda Expl.Co. Ltd.	base metals	assessment	Mag, VLF	1978	2.2726	T-1897
Lucas Twp.	42A/14, 42A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag, HEM	1977	2.2574, 2.2829	T-1905
Macdiarmid Twp.	42A/11NW, 42A/12NE	Amax Minerals Expl.	base metals	not assessment	DD-2-957 ft.	1979		
Macdiarmid Twp.	42 A/11, 42 A/12	Geophysical Engineering Ltd.	base metals	assessment	DD-1-435 ft.	1979		T-1910
Macdiarmid Twp.	42 A/11, 42 A/12	Geophysical Engineering Ltd.	base metals	assessment	DD-1-347 ft. Mag, HEM	1978,1979	2.2922	T-1911
Macdiarmid Twp.	42 A/11NW	Gervais, L.	base metals	assessment	HEM DD-1-745 ft.	1978,1979	2.2738	T-1902
Macdiarmid Twp.	42 A/11, 42 A/14	Great Plains Development Co.Ltd.	base metals	assessment	HEM, Mag	1978	2.2708	T-1914
Mahaffy Twp.	42 A/14 SW	Amoco Can. Petroleum Co. Ltd.	base metals	not assessment	DD-2-1,078 ft.	1979		T-1918
Mahaffy Twp.	42 A/12, 42 A/13, 42 A/14	Gulf Minerals Can. Ltd.	base metals	assessment	OVD-182-17,492.5 ft.	1979	2.2972	T-1929
Mahaffy Twp.	42 A/13SE	Rosario Resources Can. Ltd.	base metals	assessment	DD-2-942 ft. HEM, Mag	1978,1979	2.2894	T-1841
Mallard Twp.	410/9NW	Noranda Expl. Co. Ltd.	base metals	assessment	DD-1-397 ft.	1977		T-1786
Mann Twp.	42A/14SE	Noranda Expl. Co. Ltd.	base metals	assessment	DD-1-438 ft.	1979		T-1871
Mann Twp.	42 A/14SE	Rosario Resources Can. Ltd.	base metals	assessment	HEM, Mag, Grav.	1977	2.2589	T-1827
Mann Twp.	42 A/14, 42 A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag	1977	2.2574	T-1905
Mann Twp.	42 A/14, 42 A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag., HEM	1977,1979	2.2576 2.2974	T-1907
Marberg Creek Area	42I/16	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m down-hole RA logging	1978	83.1-127	T-1904
Marion Twp.	410/16SW	Domego Resources Ltd.	base metals,Au	assessment	GL	1979	2.3037	T-1932
Marion Twp.	410/9NE	Noranda Expl.Co.Ltd.	base metals	assessment	Mag, HEM	1978	2.2955	T-1888
Marion Twp.	410/16	Texasgulf Can.Ltd.	base metals	assessment	HEM, Mag, VLF	1978	2.2826	T-1908
Matheson Twp.	42 A/11SE	Bonhomme, J.V.	Au	assessment	DD-1-977 ft.	1979		T-261
Maund Twp.	42 H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977,1978	83.1-128, 83.1-125	T-1900
McAlpine Twp.	42 H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977, 1978	83.1-128, 83.1-125	T-1900

NORTHERN—TIMMINS

Table 3 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Mewhinney Twp.	42 H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977, 1978	83.1-128, 83.1-125	T-1900
Middleboro Twp.	41P/13SE	Gogama Uranium Syndicate	U	assessment	ARA	1977	2.2505	T-1893
Moberly Twp.	42 A/13SE	Amex Minerals Expl.	base metals	not assessment	DD-1-461 ft.	1979		T-1883
Moberly Twp.	42 A/12 NW	Hollinger Mines Ltd.	base metals	assessment	Mag, VLF, HEM, DD-2-1,311 ft.	1976,1977, 1978,1979	2.2789 2.2966	T-1788
Montcalm Twp.	42 B/9	D.R. Derry Ltd.	base metals	assessment	OVD-25-3,637 ft.	1976,1977	2.2514	T-1903
Montcalm Twp.	42 B/9	Geophysical Engineering Ltd.	base metals	assessment	DD-13-3,676.9 m	1977		T-1835
Murphy Twp.	42 A/11, 42 A/14	Great Plains Development Co.Ltd.	base metals	assessment	HEM, Mag	1978	2.2708	T-1914
Murphy Twp.	42 A/11	Rosario Resources Can. Ltd.	base metals	assessment	Mag	1978, 1979	2.2937	T-1928
Ogden Twp.	42 A/6NW	Bonhomme, J.V.	Au	assessment	Mag, VEM	1978	2.2875	T-1916
Onaping Twp.	41 P/3, 41 P/4	Rio Tinto Can. Expl. Ltd.	base metals	assessment	AMag	1979	2.3011	T-1927
Osway Twp.	410/9NW	Noranda Expl.Co. Ltd.	base metals	assessment	DD-1-397 ft.	1977		T-1786
Pinard Twp.	42 H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977,1978	83.1-128, 83.1-125	T-1900
Pitt Twp.		Kerr-Addison Mines Ltd.	U	assessment	DD-461.7 m, OVD-8-913.3 m, down-hole RA logging	1978	83.1-127	T-1904
Prosser Twp.	42 A/14, 42 A/15	Shell Canada Resources Ltd.	base metals	assessment	Mag	1977	2.2574	T-1905
Raney Twp.	410/15 NW	J-Dex Expl.Ltd.	base metals, Au	assessment	DD-8-1,450 ft.	1978,1979		T-2180
Reaume Twp.	42 A/14 NE	Geophysical Engineering Ltd.	base metals	assessment	DD-2-803 ft.	1978		T-1784
Reaume Twp.	42 A/14 SE 42 A/15	Rosario Resources Can. Ltd.	base metals	assessment	Mag	1977	2.2575	T-1906
Reaume Twp.	42 A/14, 42 A/15	Shell Can. Resources Ltd.	base metals	assessment	Mag	1977	2.2576	T-1907
Reid Twp.	42 A/13 SE	Geophysical Engineering Ltd.	base metals	assessment	DD-1-450 ft.	1978		T-1898
Reid Twp.	42 A/11, 42 A/12	Geophysical Engineering Ltd.	base metals	assessment	DD-1-435 ft.	1979		T-1910
Reid Twp.	42 A/12, 42 A/13, 42 A/14	Gulf Minerals Can. Ltd.	base metals	assessment	OVD-182-17,492 ft.	1979	2.2972	T-1929
Reid Twp.	42 A/11, 42 A/14	Great Plains Development Co.Ltd.	base metals	assessment	HEM, Mag	1978	2.2708	T-1914
Reid Twp.	42 A/13SE	Rosario Resources Can. Ltd.	base metals	assessment	DD-2-942 ft., HEM, Mag	1978,1979	2.2894	T-1841
Reid Twp.		Texasgulf Can.Ltd.	base metals, Au	assessment	OVD-5-1,893 ft., GC	1976	2.2750	T-1762
Reid Twp.	42 A/11NW	Texasgulf Can.Ltd.	base metals	assessment	Mag, HEM	1977,1978	2.2832	T-1869
Ridge Lake, Area So. of	42 J/6	Uranium Ridge Mines Ltd.	U	not assessment	correspondence, metallurgical studies, specimen analysis, XRD, DD plan	1966,1971		T-1235
St. John Twp.	42 A/14, 42 A/15	Shell Canada Resources Ltd.	base metals	assessment	Mag	1977	2.2575	T-1906
Sanderson Twp.	42I	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m OVD-8-913.3 m down-hole RA logging	1978	83.1-127	T-1904
Sewell Twp.	42 A/4NW	Tremblay, R.	base metals	assessment	rTr	1979		T-1925

Table 3 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
Shelley Twp.	41 P/3, 41 P/4	Rio Tinto Can. Expl. Ltd.	base metals	assessment	AMag	1979	2.3011	T-1927
Slack Twp.	42 G/1SW	Arsenault, R.	base metals	assessment	DD-1-280 ft.	1979		T-1935
Southbluff Cr. Area, Centre Pt.	42 I/15	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m, OVD-8-913.3 m, down-hole RA Logging	1978	83.1-127	T-1904
Stetham Twp.	42 P/13SE	Gogama Uranium Syndicate	U	assessment	ARA	1977	2.2505	T-1893
Sunday Lake, Area West of	32 L/4	Gold Shield Syndicate	Au, base metals	assessment	Mag, VLF	1978	2.2897	T-1924
Thorburn Twp.	42 A/12 NE	Amax Potash Ltd.	base metals	assessment	HEM, VEM, Mag DD-1-625 ft.	1978,1979	2.2695	T-1896
Thorburn Twp.	42 A/13 SE	Geophysical Engineering Ltd.	base metals	assessment	DD-1-370 ft.	1978		T-1901
Thorburn Twp.	42 A/12, 42 A/13, 42 A/14	Gulf Minerals Can. Ltd.	base metals	assessment	OVD-182-17,492.5 ft.	1979	2.2972	T-1929
Tisdale Twp.	42 A/11SW	Kavula, A.	Au, base metals	assessment	DD-1-240 ft.	1979		T-1642
Tolmie Twp.	42 H	Hudbay Mining Ltd.	base metals	assessment	AMag, VLF, VEM, HEM, Mag, GC, AEM	1977, 1978	83.1-128 83.1-125	T-1900
Tooms Twp.	410/10 NW	Granges Expl. AB	base metals	assessment	DD-2-403 ft.	1978		T-1772
Tully Twp.	42 A/14 SE	Gold Shield Syndicate	base metals, Au	assessment	Mag, VEM	1978	2.2872	T-1915
Tully Twp.	42 A/11, 42 A/14	Great Plains Development Co. Ltd.	base metals	assessment	HEM, Mag	1978	2.2708	T-1914
Tully Twp.	42 A/11 NE, 42 A/14 SE	Noranda Mines Ltd.	base metals	assessment	DD-2-1,219 ft.	1978		T-1923
Tully Twp.	42 A/14, 42 A/15	Shell Canada Resources Ltd.	base metals	assessment	Mag	1977	2.2574	T-1905
Tully Twp.	42 A/14 SE	Western Mines Ltd.	base metals	assessment	OVD-19-1,885 ft.	1978	2.2842	T-1885
Turnbull Twp.	42 A/5 NE	Conwest Expl. Co. Ltd.	base metals, Au	assessment	DD-5-2,422 ft.	1979		T-1658
Valentine Twp.	42 I/55E	Kerr-Addison Mines Ltd.	U	assessment	DD-4-461.7 m, OVD-8-913.3 m, down-hole RA logging	1978	83.1-127	T-1904
Watson Twp.	42 B/9NW, 42 B/16SW	Noranda Expl. Co. Ltd.	base metals	assessment	DD-1-403 ft.	1978		T-1844
Whitesides Twp.	42 A/5NW	Smith-Morrison property	base metals	assessment	GL, HEM	1978	2.2827	T-1913
Whitney Twp.	42 A/6NE	Allerston, R.	talc, magn., base metals	assessment	AMag, AEM, DD-4-1,644 ft., rTr, GC, GL, Mag, HEM, Grav	1976,1977 1978,1979	2.2833, 2.2845, 2.3012, 2.2923	T-1052
Whitney Twp.	42 A/6 NE	Meunier, D.	Au	assessment	DD-1-102 ft.	1978		T-1875
Williamson Twp.	42 G/10SE	Shell Can. Resources Ltd.	base metals	assessment	Mag, HEM	1978	2.2788	T-1909
Yeo Twp.	41 P/12SW	Can. Crest Gold Mines Ltd.	Au, Cu	assessment	AMag	1978		T-1751

NORTHERN—TIMMINS

TABLE 4 Additions to Regional Diamond Drill Core Library, January to November, 1979

Location	Company or Individual	Hole Number
Gowan Twp.	Allerston, R.	1
		2
		3
		4
		G-77-1
		G-77-2
Macdiarmid Twp.	Gervais, L.	79-1
		79-1
		79-1
		79-1
		79-1
Mahaffy Twp.	Amoco Can. Petroleum Co. Ltd.	29-1
		30-1
Mahaffy Twp.	Rosario Resources Can. Ltd.	RM-79-1
		RM-79-2
Mann Twp.	Rosario Resources Can. Ltd.	78-1
		78-2
Reid Twp.	Rosario Resources Can. Ltd.	RM-79-1
		RM-79-2
Sutton Lake Area	Prospection Ltd.	78-1B-3
		78-1B-4
		78-1B-5A
		78-1B-6
		79-1D-1
		79-1D-2
Tisdale Twp.	Meunier, D.	1
Whitney Twp.	Allerston, R.	W-78-9
		W-78-10
		W-78-11
		W-78-12
		W-78-15
		W-78-16
		W-79-1
		W-79-2
		W-79-3
		W-79-4
Whitney Twp.	Rosario Resources Can. Ltd.	79-5
		79-6
		79-7

1979 Report of The Kirkland Lake Resident Geologist

H. L. Lovell¹ and F. R. Ploeger²

Contents

Introduction	77
Resident Geologist's Activities	78
Mining Activity	78
Cobalt Area	78
Agnico-Eagle Mines Limited	78
Beaver-Temiskaming Mine	78
Coniagas-Tretheway Mine	78
Penn Mill	78
Canadaka Mines Limited	78
Bailey Mine	78
University Mine	79
Cleopatra Mine	79
Teck Corporation Limited	79
Silverfields Mine	79
Silver Summit Mill	79
Canadian Smelting and Refining (1974) Limited	79
Silver Refinery	79
Gowganda Area	79
Baxter Minerals Limited	79
Rusty Lake Mine	79
Agnico-Eagle Mines Limited	79
Castle-Tretheway	79
Raise Contracting Limited	79
Siscoe Mine of Sandy K Explorations Limited	79
Kirkland Lake Area	79
Dominion Foundries and Stell Limited-Cliffs of Canada Limited	79
Adams Mine	79
Kerr Addison Mines Limited	79
Willroy Mines Limited	79
Macassa Division Mine	79
Matachewan Area	79
Extender Minerals of Canada Limited	79
Pamour Porcupine Mines Limited	84
Matachewan Consolidated Mine	84
United Asbestos Incorporated	84
Matheson-Holtyre Area	84
Hedman Mines Limited	84
Munrow Township Mine and Matheson Mill	84
Pamour Porcupine Mines Limited	84
Ross Mine	84
Property Examinations	84
Card Lake Copper Mines Limited Gold Prospect (1)	84

Black Township	84
Peter Ginn Gold Prospect (2)	84
Hislop Township	84
D. James Copper-Gold Occurrence (3)	84
Arnold Township	84
Lee Geo-Indicators Limited Gold Prospect (4)	85
Powell Township	85
R.C. McAllister Silver Prospect (6)	85
Lorrain Township	85
Edward McCullough Gold Occurrence (7)	85
McVittie Township	85
Midrium Copper-Molybdenum Prospect (8)	86
Cairo Township	86
Robert Sheedly Copper-Gold-Silver Occurrence (9)	86
Alma Township	86
John Sirola Gold Prospect (10)	86
Grenfell Township	86
G.S. Welsh Copper-Molybdenum Occurrence (11)	86
Powell Township	86
Ontario Geological Survey Activities	86
Research by Other Agencies	87
Recommendations for Exploration	87
References	88

Tables

1 - Claims Recorded and Assessment Work Credit Received ..	78
2 - Comparison of Ryan Lake Property	89
3 - Maps and Reports issued by the Ontario Geological Survey	91
4 - Assessment Work and Other Information Received in 1979	92

Figures

1,2,3 - Resident Geologist's District	80,82,83
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Introduction

Mining claim staking rose to its highest level since 1974, due primarily to the rising price of gold. A secondary reason is the federal-provincial Kirkland Lake Initiatives Program, for which the main stimulus to exploration was provided by the September 27 release of airborne magnetic and electro-magnetic maps. Exploration for silver and cobalt, despite their all-time high prices, increased only moderately because of the removal, from the recording of

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NORTHEASTERN—KIRKLAND LAKE

new claims, of the Gowganda-Elk Lake-Silver Centre area and the Cobalt and Matachewan areas until the settlement of the Bear Island Indian Caution.

The following table of statistics for the Larder Lake Mining Division covers all the Kirkland Lake Resident Geologist's area except the Cobalt area:

Resident Geologist's Activities

Permanent staff consisted of a Resident Geologist and a Resource Geologist, supplemented by several support staff.

Activities of the Resident Geologist's Office included:

1. Editing a geological map and Miscellaneous Paper on Bayly Township
2. Continuing work on a geological map and Miscellaneous Paper on Gauthier Township
3. Preparation of data series maps for 35 townships
4. Examination of and reporting on 35 active and inactive mineral properties
5. Evaluation of bedrock mineral potential and aggregate potential for a number of land-use plans.
6. Evaluation of the placer gold mining potential of the Vermilion Valley, and the bedrock gold mining potential of the Sesekinika area.
7. Compiling tonnages, grades and locations of gold reserves that might become viable feed for custom milling in the Kirkland-Larder Lakes area
8. Revising guidelines for mineral exploration in Northern Region Provincial Park Reserves
9. Examination and collection of about 2500 m of diamond drill core; drafting plans for diamond drill core storage facilities.
10. Visiting five Ontario Geological Survey field parties
11. Guiding economic geological field trips in the Kirkland Lake and Cobalt areas for mineral explorationists, government and university geologists and Junior Rangers
12. Responding to 1800 inquiries from the mining and exploration industries, foreign and Canadian governments personnel, university geologists, and the general public

Mining Activity

Eleven mines, eight mills and one refinery operated during 1979, producing gold-silver bullion; gold-silver ore containing by-product copper; silver-cobalt concentrates; refined silver; iron ore pellets; serpentine filler; and barite. Also many sand and gravel pits operated.

TABLE 1 Summary of claims recorded and assessment work credit received, Larder Lake Mining Division

	Claims Recorded	Claims Cancelled	Claims Active	Diamond Drilling (Man Days)	Geophys. Surveys (Man Days)	Geological Surveys (Man Days)
1979	4 261	1 452	8 157	29 713	25 352	4 960
1978	1 710	2 065	5 348	32 602	36 100	8 887
1977	1 826	2 834	5 703	37 101	45 436	1 802
1976	2 350	2 979	6 712	47 723½	42 147	6 220
1975	2 916	5 010	7 341	45 880	38 047	6 738

Cobalt Area

Agnico-Eagle Mines Limited

Beaver-Temiskaming Mine

A little silver-cobalt ore was mined from the 1460-foot (442 m) sub-level.

Conlagas-Tretheway Mine

Production continued from open cuts at about the same rate as in 1978, with the cut-off grade for ore at about three ounces of silver per ton (103 grams per metric tonne).

Penn Mill

The mill operated during its normal season, i.e. the warm months, milling Agnico-Eagle Mines silver-cobalt ore from the Cobalt and Gowganda areas.

Canadaka Mines Limited

Exploratory diamond drilling was done underground in the South Giroux-Hargrave and Bailey mines.

Bailey Mine

The water pumps were brought to surface, mining having been completed in 1978, and the workings allowed to flood. Some of the surface mine dump was milled in 1979.

Conisil-South Giroux Mine

Some silver ore from South Giroux and Hargrave areas was mined and milled.

University Mine

A small amount of silver ore was mined and milled.

Cleopatra Mine

A small amount of ore was hoisted to surface and milled.

Teck Corporation Limited

Silverfields Mine

Production amounting to about 240 tons (218 metric tonnes) per day continued during 1979. At this rate ore reserves are sufficient for mining another two years, having been extended for one year partly by decreasing the cut-off grade to three ounces of silver per ton (= 103 grams per metric tonne).

Silver Summit Mill

The mill continued processing Silverfields mine production into silver concentrates.

Canadian Smelting and Refining (1974) Limited

Silver Refinery

Concentrates obtained mainly from the Cobalt area mines were refined into bars of "reduced" (99.5 percent) silver bullion and by-product copper residue and a small amount of arsenic trioxide. Silver was also recovered from lead anode dross from the Texasgulf refinery at Timmins.

Gowganda Area

Baxter Minerals Limited

Rusty Lake Mine

The shaft and two levels of this past silver-cobalt producer were de-watered, preparatory to exploration underground.

Agnico-Eagle Mines Limited

Castle-Trethewey Mine

Castle No. 3 shaft was de-watered to provide access to the 70-foot (21 m) level, from which a small tonnage of silver ore was mined and hauled to the Penn mill at Cobalt.

Raise Contracting Limited

Siscoe Mine of Sandy K Explorations Limited

The Lower Bonsall shaft of this past producer of silver and cobalt was de-watered, and exploration underground was begun.

Kirkland Lake Area

Dominion Foundries and Stel Limited-Cliffs of Canada Limited

Adams Mine

Production of iron pellets amounted to 1 222 772 long tons (1 242 336 metric tonnes) in 1979. The pellets were shipped approximately 415 miles (668 km) by rail from the Adams Mine to the Dofasco steel plant at Hamilton. In 1979, ore reserves in the Roche (north) pit were expanded from 2 700 000 to 7 300 000 long tons (2 743 200 to 7 416 800 metric tonnes) of crude iron ore, partly by exploration diamond drilling and partly by re-calculating reserves considering mining to greater depths.

Kerr Addison Mines Limited

Tons milled were reduced in 1979 to 192 936 (175 029 metric tonnes) and by the year end the number of employees was reduced to 330. At the gold price prevailing at the end of 1979, ore reserves are increased sufficiently to provide two more years of production.

Willroy Mines Limited

Macassa Division Mine

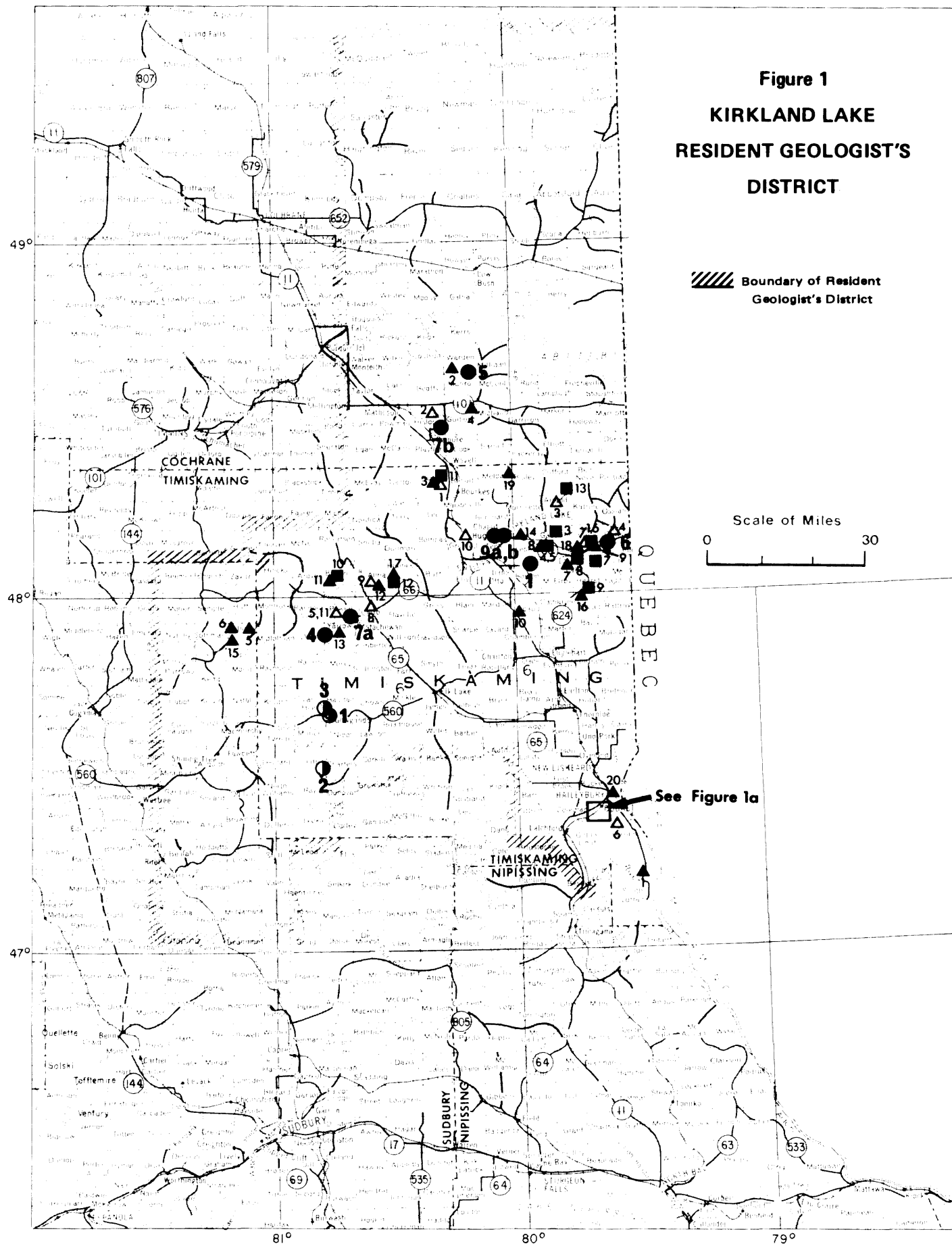
Production and milling amounted to about 325 tons (295 metric tonnes) per day, as in 1978. Ore reserves were increased slightly above those of 1978, amounting to enough for about four years production at present rates and grade of 0.5 ounce of gold per ton (17 grams per metric tonne) (George Nemcsok, personal communication). Development levels were: the 2375 and 3000-foot (724 and 914 m) levels eastward into the Grozelle claim fraction belonging to Lamaque Mining Company Limited; and westward on the Macassa-Tegren-Gracie levels 4200, 4750, 5150, 5700 and 6100 feet (1280, 1448, 1570, 1737 and 1859 m). Willroy Mines Limited acquired the Davis claim and began stoping operations.

Matachewan Area

Extender Minerals of Canada Limited

Mining was carried out throughout 1979 except when snow cover was deep. A gently sloping decline was driven from near Mistinikon Lake shore along the extension of the main barite vein below the open cut. The mill operated throughout the year.

Figure 1
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT



EXPLANATION

- Producing Mines
 1. Adams Mine (Dominion Foundries and Steel Co. Ltd) Fe
 2. Agnico-Eagle Mines Ltd
 - a. Beaver-Timiskaming mine Ag,Co,Pb,Cu
 - b. Coniagas-Tretheway mine Ag,Co
 3. Canadaka Mines Ltd
 - a. Bursary mine dump* Ag,Co
 - b. Cleopatra mine Ag,Co
 - c. Conisil South Giroux mine Ag,Co
 - d. Deer Horn mine dump* Ag,Co
 - e. Kerr Lake mine dump* Ag,Co
 - f. Lawson mine dump* Ag,Co
 - g. University mine Ag,Co
 - h. University Incline dump* Ag,Co
 4. Extender Minerals of Canada Ltd barite
 5. Hadman Mines Ltd serpentine filler
 6. Kerr Addison Mines Ltd Au
 7. Pamour Porcupine Mines Ltd
 - a. Matachewan Consolidated mine Au,Ag,Cu
 - b. Ross mine Au,Ag,Cu
 8. Teck Corporation Ltd. - Silverfields mine Ag
 9. Willroy Mines Ltd
 - a. Kirkland Minerals property Au,Ag
 - b. Macassa mine Au,Ag
- Mines Under Development
 1. Agnico-Eagle Mines Ltd. - Castle mine Ag,Co
 2. Baxter Minerals Ltd. - Rusty Lake mine Ag,Co
 3. Raise Contracting Ltd. - Lower Bonsall mine Ag,Co
- ★ Refinery
 1. Canadian Smelting and Refining (1974) Ltd. Ag
- ▲ Properties Under Evaluation or Active Exploration
 1. Agnico-Eagle Mines Ltd. Ag,Co
 2. Amax Minerals Exploration base metals
 3. Card Lake Copper Mines Ltd Au
 4. Cominco Ltd Au
 5. Essex Minerals Company (Halliday Project) base metals
 6. Essex Minerals Company (Radio Lake Grid) base metals
 7. Falconbridge Copper Ltd. base metals
 8. International Nickel Company of Canada Ltd. Au
 9. Kerr Addison Mines Ltd. Au
 10. Long Lac Mineral Exploration Ltd. Au
 11. Manitou Lake Gold Mines, Inc. Au
 12. Minorex Ltd. Cu,Zn,Ag
 13. Newmont Exploration of Canada Ltd Au
 14. Northgate Exploration Ltd. (Lebel Lode property) Au
 15. Northgate Exploration Ltd. (Allerston property) base metals
 16. Rio Tinto Canadian Exploration Ltd. (Lincoln-Nipissing project) Au
 17. Rio Tinto Canadian Exploration Ltd. (Loki project) Cu, Au
 18. Rio Tinto Canadian Exploration Ltd. (Swansea project) Au
 19. Rosario Resources Canada Ltd. base metals
 20. Teledyne Canada Ltd. Co,Ag
- MEAP Projects (project numbers in parenthesis)
 1. Amalgamated Larder Mines Ltd. (KL-126) Au
 2. Canadaka Mines Ltd. (CG-141) Ag,Pb,Cu
 3. Casan Mining Ltd. (KL-106) Au
 4. International Nickel Company of Canada Ltd. (KL-100) Au
 5. International Nickel Company of Canada Ltd. (KL-114) Au
 6. Kerr Addison Mines Ltd. (KL-113) Au
 7. MacGregor, R.A. (KL-108) Larder Au, base metals
 8. MacGregor, R.A. (KL-110) Au
 9. MacGregor, R.A. (KL-111) Au, base metals
 10. Manitou Lake Gold Mines, Inc. (CG-132) Au
 11. McKinnon, D. (KL-120) Au
 12. Minorex Ltd. (CG-125) Cu,Zn,Au
 13. Noranda Exploration Company Ltd. (KL-98) base metals
- △ Properties examined.

COBALT AREA

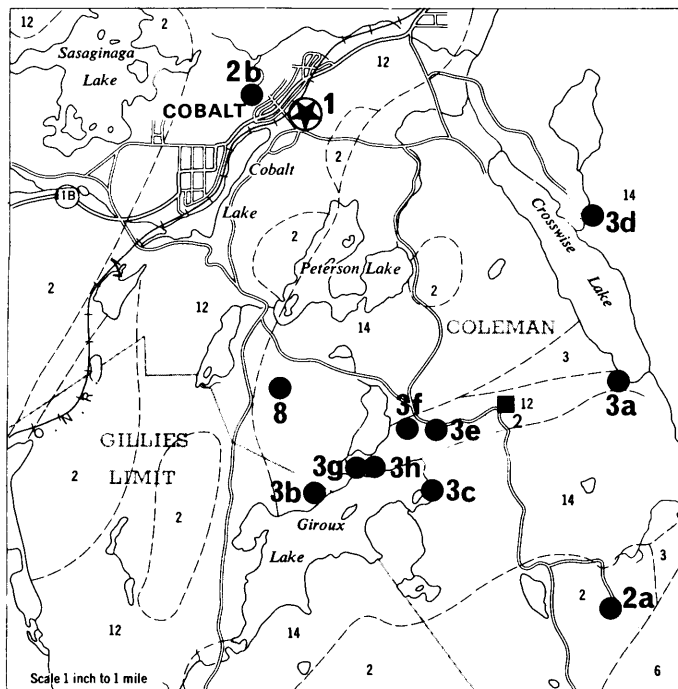


Figure 1a (from ODM Map 2188)

Figure 2
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT

EXPLANATION

* Assessment work filed in 1979
 (keyed to Table 4)

+ Major claim staking activity in
 1979

--- Areas withdrawn from staking
 through Bear Island Indian
 Caution

////// Boundary of Resident
 Geologist's district

Scale of Miles

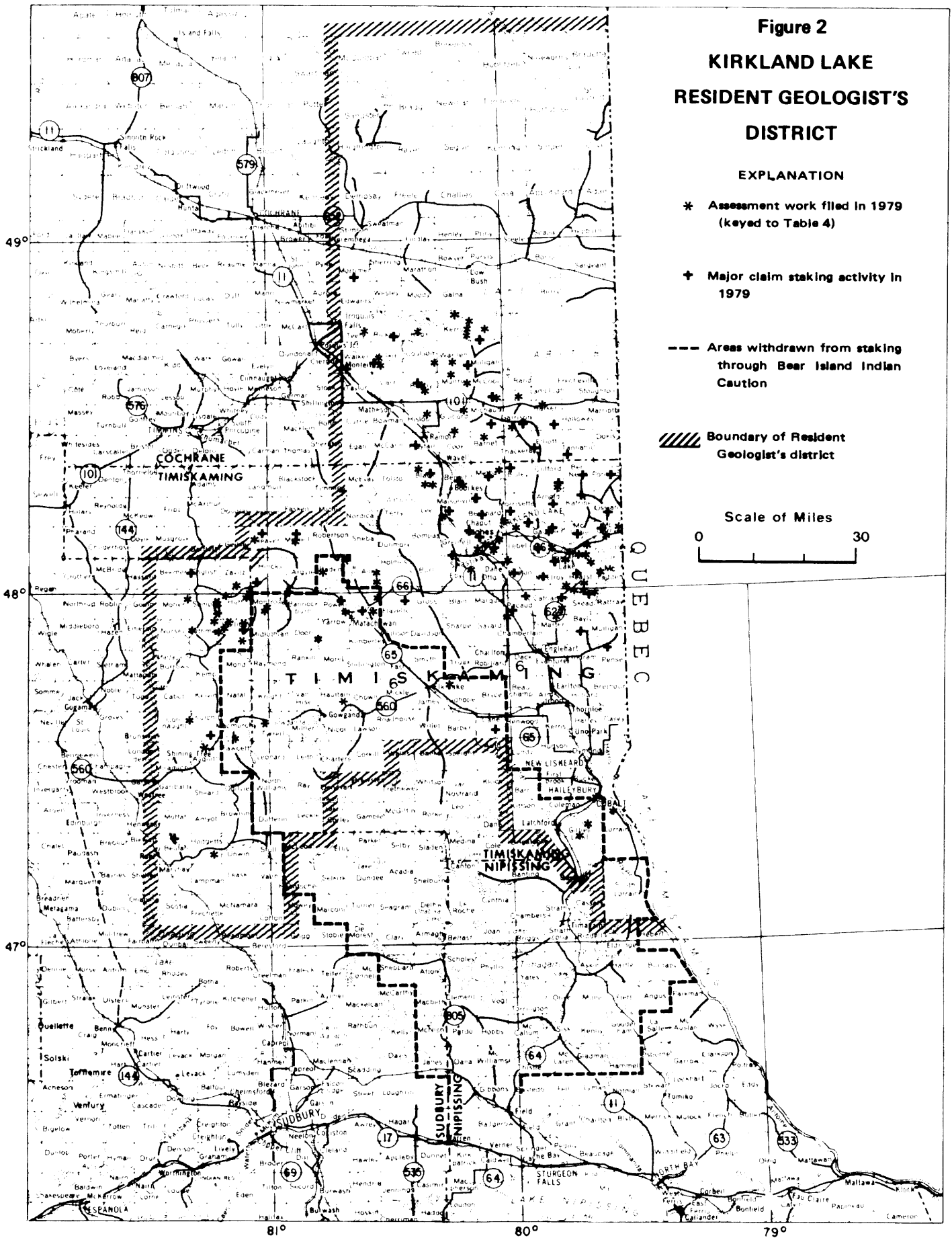


Figure 3
KIRKLAND LAKE
RESIDENT GEOLOGIST'S
DISTRICT

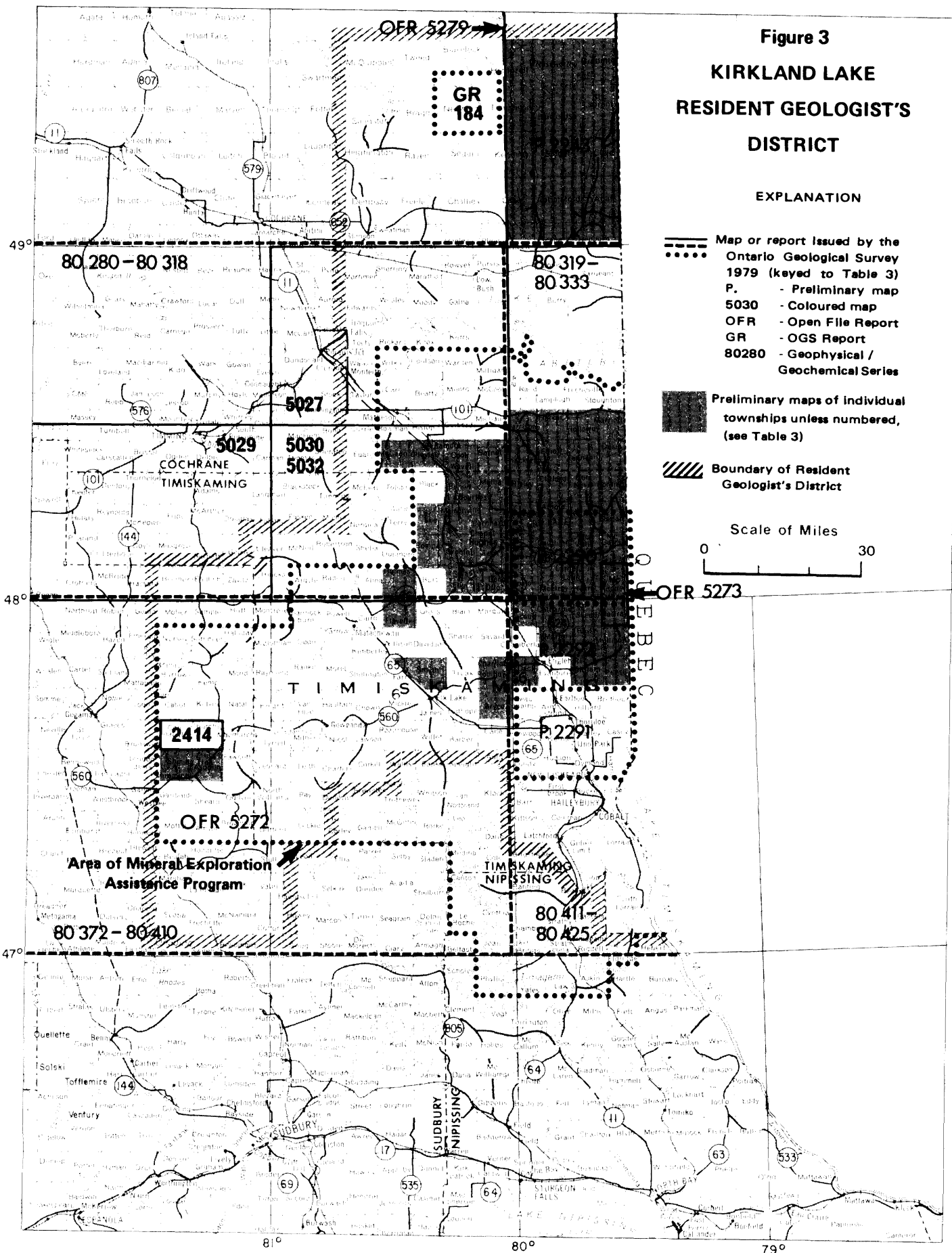
EXPLANATION

- Map or report issued by the
- Ontario Geological Survey
- 1979 (keyed to Table 3)
- P. - Preliminary map
- 5030 - Coloured map
- OFR - Open File Report
- GR - OGS Report
- 80280 - Geophysical / Geochemical Series

■ Preliminary maps of individual townships unless numbered, (see Table 3)

▨ Boundary of Resident Geologist's District

Scale of Miles



NORTHEASTERN—KIRKLAND LAKE

Pamour Porcupine Mines Limited

Matachewan Consolidated Mine

Open pit production was started up at the former Matachewan Consolidated underground mine in August. The ore was trucked about 100 miles (160 km) to the Porcupine area Pamour No. 1 mine site to be milled. Production to the end of 1979 amounted to about 20 000 tons of ore grading on average more than 0.1 ounce of gold per ton (18 144 metric tonnes at 3.4 grams per metric tonne).

United Asbestos Incorporated

The mining claims and surface plant were kept on a standby basis.

Matheson-Holtyre Area

Hedman Mines Limited

Munro Township Mine and Matheson Mill

Open pit mining of serpentine filler continued, and the ore was trucked to the mill. The mill operated except during periods of slow sales, at which times it was shut down in order to run down the inventory. Sales of the product increased slightly in 1979. Hedman Mines Limited bought back its control from Gulf & Western Industries Incorporated, and re-negotiated the debt.

Pamour Porcupine Mines Limited

Ross Mine

Production decreased somewhat compared to its peak year 1978, when the open pit mining supplemented ore obtained underground. The 3150-foot (960 m) level was extended 300 feet (91 m) out from the station, which was cut in 1978.

Property Examinations

Card Lake Copper Mines Limited Gold Prospect (1)

Black Township

Country rocks are Kinojevis Group iron-rich tholeiitic basalts (pillowed, variolitic, aquagene tuff and other varieties) and interbedded calc-alkalic dacite probably transitional to the overlying Blake River Group. Gold is present in upper parts of flows; in magnetic mafic (chloritic) tuff containing laminae rich in very fine grained pyrite and a little epidote; in intrastratal pale grey pyritic cherty carbonate tuffaceous shears; and in white quartz-carbonate veins containing cubes of pyrite, a few blebs of chalcopryrite, and pink (hematite-stained) carbonate. The ratio of gold to silver in assays averaged 8:1 (D. Bell, personal communication).

Peter Ginn Gold Prospect (2)

Hislop Township

Interbedded greywacke, slate, turbidites, spherulitic and pillowed mafic volcanics and talc-chlorite schist are cut by hornblende syenite and feldspar porphyry. Gold occurs near the contacts of these feldspathic intrusions, and along "breaks".

Current rock work in backhoed soil trenches has exposed rusty (carbonate-rich) bedrock containing small amounts of disseminated pyrite, cut by numerous greenish grey alteration stringers and by quartz gash veins. In places the quartz veins contain a few angular inclusions of wallrocks and have greenish black chloritic borders. This gash veined rock resembles somewhat the "Plymouth Rock" at the Ross mine three kilometres to the southeast. Some of the stripped greywacke is highly fractured (particularly east-west) and displays fresh surfaces bleached pale yellowish grey-green and rusty, brown-weathered surfaces, both as a result of carbonatization. The rocks appear to be at a north-south flexure in the regional trend of gold-bearing formations striking generally northwest towards here from the New Kelore gold deposit one kilometre to the southeast.

D. James Copper-Gold Occurrence (3)

Arnold Township

Blake River Group mafic to intermediate massive, crystal tuffaceous and porphyritic (white feldspar) volcanics occupy part of the south limb of an east-west syncline, close to the synclinal axis. Pyritic swirled lenses 1 cm thick do not follow fractures, but rather form an integral part of the volcanics, i.e. are syngenetic. Chalcopryrite and sphalerite are present in quartz-carbonate veins and, along some fractures, narrow (2 mm) veins are composed predominantly of chalcopryrite. A right lateral offset was observed across an east-west striking quartz-carbonate vein.

Host rocks of the metallic minerals and veins are mostly medium grained and massive, although some have colloform shaped paler grey areas 1 to 15 cm in diameter interspersed with greenish black chloritic "interstitial" material. White and buff coloured angular to rounded carbonatized fragments in the greenish grey crystal tuff are associated with chalcopryrite and bornite-bearing carbonate-quartz veins, with sulphide fragments in the crystal tuff. The carbonate is coarsely crystalline, with crystals up to 3 cm long. Wallrocks of the carbonate-quartz veins contain a little pink feldspar, present as streaks in the veins and a few blebs of chalcopryrite. Malachite coats some fractures.

According to D. James (personal communication) the highest assays from the showings are about 2 percent Cu, 1.7 percent Zn, and 0.34 ounce gold per ton.

Lee Geo-Indicators Limited Gold Prospect (4)

McGarry Township

Anomalous gold concentrations in basal till were traced, back up the direction from which the glacier advanced, to an area underlain by a variety of rock types.

To the north Kinojevis Group rocks consist mainly of greyish green magnetic iron-rich tholeiitic basalt tuffs and flows stained green by epidote, white by carbonate and red by hematite along fractures and between pillow selvages and breccia fragments. Some ferruginous carbonate and pyritic lenses are intercalated.

Interbedded with the northern (upper) parts of the Kinojevis Group are rocks resembling the Blake River Group magnesium-rich calc-alkalic basalts. These basalts are greenish grey flows with 10 to 15 percent white feldspar phenocrysts, some darker inclusions, and hornblende pseudomorphs after pyroxene.

South of the Kinojevis Group are rocks that host gold-pink "Timiskaming Group trachyte" which may be hematitized dacitic tuff and sub-arkose. In some parts of these rocks, quartz is almost as abundant as feldspar, which is characteristically lath-shaped. Dark chloritic angular to rounded fragments also are present, along with talc, sericite and red ochre. Quartz-carbonate gash veins horsetailing from sericite shears contain chalcopyrite and gold (H.A. Lee, personal communication). Reddish syenitic intrusions cut all other rock types and contain feldspar, quartz, greenish black chloritic subrounded inclusions. Locally, fractures contain epidote and are pink stained.

Still farther south, underlying the Ontario Northland Railway tracks, are banded talc-chlorite rocks of the Piché Group containing a little chrome muscovite; these are interbedded with pale green (magnesian?) tholeiitic basalt.

South of the ONR tracks is Timiskaming Group fluvialite conglomerate containing jasper pebbles.

Majestic Construction Copper-Molybdenum Prospect (5)

Powell Township

An area of intense silicification, potash metasomatism and quartz veining occurs on both sides of a length of contact between a small syenite (feldspar porphyry) stock and Timiskaming Group arkosic country rock. Some of the rocks have undergone minor phyllic alteration (yellowish green sericite and clay minerals). The feldspar porphyry appears to have been emplaced and subsequently fractured, hydrothermally veined and potash-metasomatized. The potash alteration (distinguished in part by reddening hematitization of feldspars) and associated silicification extends into the wallrocks from quartz veins, as emphasized by differential weather-

ing. Narrow (3 mm) bluish grey quartz veins and related silicified areas contain chalcopyrite and molybdenite, the latter particularly along vein walls and fracture slips. Wider, younger crosscutting quartz veins contain chalcopyrite and bornite. Third generation quartz veins contain chalcopyrite, galena and sphalerite (Sinclair 1979).

R. C. McAllister Silver Prospect (6)

Lorain Township

North of the prospect Nipissing Diabase dips northwest under Middle Precambrian Cobalt Group sedimentary rocks. Northwest of the Big Fissure shaft is Nipissing Diabase containing a large inclusion of early Precambrian basement tuff. A brecciated quartz vein and several silver-bearing carbonate veins and stringers cut the diabase. During 1979, two angle holes were diamond drilled from south to north to intersect a recently trenched east-west trending vein system that dips steeply south. A second trench, located to the east, follows a north-south trending vein system. Wallrocks are medium grained Nipissing Diabase, a pegmatitic differentiate of the diabase, and a varied texture rock transitional between the diabase and the pegmatite. "Flats" i.e. gently dipping carbonate stringers branch from the main east-west vein system, which itself is made up of decomposing (rusty, leached, crumbly) carbonate. Some of the carbonate is pink coloured. Pink colouration typically denotes the peripheral, arsenopyrite-bearing zone of lenticular veins that can bear high-grade silver and cobalt in central parts of the veins.

Edward McCullough Gold Occurrence (7)

McVittie Township

Current bulldozer stripping, backhoe trenching and bedrock blasting expose quartz-sericite-carbonate-talc rock that, where sheared, contains gold-bearing fine-grained pyrite and is cut by quartz-carbonate stringers bearing rare chalcopyrite and visible gold. The stratigraphic section including these gold-bearing rocks, as exposed shows, from north to south:

Bright green (chrome muscovite) carbonate rock (altered ultramafic flow)

Pale green carbonate rock grading into banded (possibly bedded) talc-chlorite-carbonate schist with minor chrome muscovite.

Greywacke containing chloritic planes of schistosity, contorted gash veins and alteration patches of quartz-carbonate, and blue quartz-carbonate lenses between chlorite and sericite laminae. Typically, walls of quartz veins, lenses and bands parallel to the schistosity are rusty (ferruginous carbonate) and are bounded by sericite slips even in predominantly chloritic rock.

Midrim Copper-Molybdenum Prospect (8)

Cairo Township

A syenitic (feldspar porphyry) intrusion more than 100 m in diameter cuts Timiskaming Group arkose, conglomerate and mudstone a few hundred metres southeast of the Cairy syenitic stock. The medium-grained feldspar porphyry is coloured various hues of red and contains potash-rich feldspar phenocrysts and 5 percent partially chloritized hornblende. It contains amphibole-biotite inclusions and is cut by aplite dikes.

Principal veins include bluish grey quartz veins bearing chalcopyrite; younger, whiter quartz-carbonate veins containing pink calcite, purple fluorite, chalcopyrite bor-nite, and chloritic inclusions; and quartz veins bearing anhedral tourmaline and rare visible gold. Poorly mineralized epidote-hornblende quartz veins cut areas of metamorphically recrystallized Timiskaming Group sedimentary rocks. The metallic mineral-bearing veins cut feldspar porphyry and extend into Timiskaming Group sedimentary rocks. Sulphides typically occur along median lines of the veins, indicating that emplacement of the vein constituents may have occurred in the sequence of wallrock alteration first, followed by precipitation of gangue quartz and carbonate, and subsequent precipitation of metallic minerals. Malachite and azurite bloom occur particularly along fractures.

Diamond drilling in 1966 by Midrim Mining Company Limited intersected appreciable lengths of core (e.g. 40 m) containing low grade copper, molybdenum and gold (0.15 percent Cu, 0.05 percent MoS₂, and a few specks of visible gold).

Robert Sheedy Copper-Gold-Silver Occurrence (9)

Alma Township

Quartz veined silicified medium-grained syenite host rock of a fracture zone 2 m wide was recently exposed by trenching for a length of 25 m. Aplite dikes, lower in mafic minerals and darker red coloured than the syenite, are nearby. Quartz veins a maximum of 5 cm wide and steep to shallow dipping contain calcite, fluorite, chalcopyrite, galena, and in places high grade gold and silver.

John Sirola Gold Prospect (10)

Grenfell Township

A shaft, 265 feet (80 m) deep with three levels, is sunk in bedrock. Development muck in the waste dump is primarily Kinojevis Group with lesser quantities of a fine grained pale grey, somewhat soft, disseminated pyrite-bearing, slightly sericitic mixture of banded ash tuff and mud with laths or broken fragments of white feldspar. Also

present are aquagene tuff and pink and white feldspar porphyry dike rock that is a typical late differentiate of tholeiitic basalt.

White quartz-carbonate veins contain small amounts of epidote, red feldspathic material, scheelite, pyrite, chalcopyrite and visible gold. In the shaft area, the main quartz-carbonate vein system curves off a northeast-trending fault, but as the fault is approached the vein system increasingly parallels the fault, indicating dragging movement.

G. S. Welsh Copper-Molybdenum Occurrence (11)

Powell Township

Surface work (stripping) has been done on the Welsh claims about 900 m east of the Matachewan area barite mill of Extender Minerals Limited.

Most of the host rocks exposed are composed mainly of brownish red feldspar porphyry which appears to be an intrusive, containing partly digested inclusions composed mainly of chlorite and amphibole. The mafic content of the feldspar porphyry, both as inclusions and as discrete grains, may originate partly from nearby hornfels skarns that grade away from the feldspar porphyry into greenstone volcanic and greywacke sedimentary country rocks. The hornfels contains streaky lenses of biotite.

Alteration includes some reddened feldspar, indicating oxygen and potash enrichment reminiscent of gold ore wallrocks at the Young-Davidson and Matachewan Consolidated past producers 4 km south. Also, pale pink feldspars occurring along fracture and quartz-carbonate vein walls, as well as actinolite, may have been derived from the Early Precambrian mudstone (slate) that forms some of the country rock here. Other alteration minerals present are epidote and garnet.

Relatively high amounts (3 to 4 percent) of disseminated pyrite and blebs and vein-wall lenses of chalcopyrite and molybdenite in feldspar porphyry and in hornfels appear to have been brought in and (or) remobilized by the feldspar porphyry intrusives. This environment resembles that of a cupola.

Ontario Geological Survey Activities

Work by L. S. Jensen continued on the Larder Lake synoptic mapping project, Districts of Cochrane and Timiskaming.

Work by John Wood on the regional geology of the Cobalt Embayment, Districts of Sudbury, Nipissing and Timiskaming entered its second year.

Firstbrook Lake area, District of Timiskaming was mapped geologically by G. W. Johns.

Abitibi Alteration Study was begun by E. C. Grunsky.

Kirkland Lake area stratigraphic mapping, District of Timiskaming, a three-year project, was begun by M. S. Downes.

Quaternary geology of the Kirkland Lake (42 A/1) and Ramore (42 A/8) areas, Districts of Cochrane and Timiskaming, was mapped by C. L. Baker, who also did a preliminary assessment of aggregates in the Cobalt area.

The second of a three-year field project was completed by V. K. Gupta and D. R. Wadge of a Gravity Survey of the Gowganda, Shining Tree and Gogama areas, Districts of Timiskaming and Sudbury.

A four-year Geochemical Reconnaissance Basal Till Survey and Related Research in the Kirkland Lake area, District of Timiskaming was begun by I. Thomson and D. Guindon.

An airborne Electromagnetic-Magnetic survey of the Kirkland Lake area, Districts of Timiskaming and Cochrane was flown and the maps released under the supervision of D. H. Pitcher and R. Barlow.

The Metallogenic Development of the eastern part of the Southern Province of Ontario was investigated by D. G. Innes and A. C. Colvine.

Styles of Chromite mineralization in Ontario were studied by P.J. Whittaker.

Uranium deposits of the Cobalt Embayment were studied by H.D. Meyn.

Metallogenetic Relationships of Base Metal occurrences in the Cobalt area were studied by G. C. Patterson.

Research by Other Agencies

Laurentian University

1. D. Gamble: Trace elements in the quartz veins, and effects of wall-rock alteration (major elements) in the Macassa gold-silver mine at Kirkland Lake

McMaster University

2. L. A. Tihor: Gold distribution in the Kirkland Lake-Larder Lake area, with emphasis on Kerr Addison-type ore deposits

University of Saskatchewan

3. L. S. Jensen: Archean rocks of the area from Lake Abitibi to Kirkland Lake

University of Toronto

4. M. Jackson: Mafic volcanic rocks of Lava Flow Mountain, Ramore area

5. I. Smith: The Kinojevis Group tholeiite-Blake River Group calc-alkaline contact near Ramore

6. A. J. Naldrett: Platinum group elements in magmatic sulphide deposits

7. D. W. Strangway: Magnetism and stratigraphy, Blake River volcanics

Recommendations for Exploration

"Exploration for porphyry copper-type deposits in the Shield has been very limited, hence it is difficult to be cer-

tain of their distribution and economic potential. Perhaps simple recognition of deposits which in many ways are similar to younger, economically important deposits, will be sufficient incentive to do more work" (Kirkham 1972).

Porphyry copper deposits, by definition (Kirkham 1972), are typically large tonnage, low-grade deposits of veinlet and fracture-controlled hypogene mineralization associated with felsic to intermediate epizonal intrusions. Findlay (1975) identified Precambrian porphyry deposits as being associated with small plutons that were emplaced at high levels in volcanic sequences. A number of Precambrian porphyry copper-type deposits have been identified in Precambrian rocks of Ontario and Quebec (Colvine 1978; Colvine and Sutherland 1979; Kirkham 1972): Setting Net Lake (Ontario), High Lake (Ontario), McIntyre mine (Ontario), Garth Lake (Quebec), Talbot property (Quebec), Biedelman Bay (Ontario), Matachewan area (Webb and Ryan Lake deposits) (Ontario), Don Rouyn Mine (Quebec), Savard Property (Bourlamaque Batholith) (Quebec), Grandray Mine (Quebec). Early Precambrian low-grade copper and molybdenum occurrences in the Matachewan area exhibit similarities to porphyry copper deposits in younger rocks of the Canadian Cordillera. Table 2 lists similarities exhibited between the Ryan Lake property of the Matachewan area and the Copper Mountain-Ingerbelle deposits of British Columbia.

Hollister (1975) states that porphyry copper mineralization developed in areas of thin continental crust tend to have anomalously high by-product gold. This may explain the occurrence of the gold-silver deposits in pyritic syenite of the Young-Davidson and Matachewan Consolidated mines, which are early Precambrian in age and therefore presumably were emplaced when the crust was thin. Other low grade Cu, Au and (or) Mo mineralized areas in the Matachewan area which have been worked on in the past include: the C.W. Brunet showing in MacMurchy Township; the G.S. Welsh and Majestic Construction properties in Powell Township; the Midrim and Texasgulf occurrences in Cairo Township; and the Upper Beaver former producer in Gauthier Township.

Syenitic stocks associated with the Timiskaming Group volcano-sedimentary belt extend from Shining Tree and Matachewan through Kirkland Lake to Virginiatown near the Quebec-Ontario boundary. Associated with the Timiskaming Belt in Kirkland Lake is another sub-parallel belt to the north extending east from the Matheson area towards Quebec. Many of these syenite stocks are associated with known deposits and occurrences of Cu-Mo-Au-Ag mineralization.

Geophysical methods such as induced polarization and resistivity are often able to detect the disseminated sulphides within these deposits. In areas of poor outcrop where geological mapping and conventional prospecting are impossible, geochemical surveying may be more practical for discovering and evaluating porphyry-related deposits. Basal till sampling using reverse circulation rotary drilling, float tracing, biogeochemical surveys and esker reconnaissance are geochemical techniques that could be applied.

NORTHEASTERN—KIRKLAND LAKE

Prospecting in the area today, as in the past is mainly directed towards discovery of massive sulphide deposits and green carbonate-quartz vein related gold deposits. Syenitic and felsic stocks for the most part have been overlooked as potential porphyry-type deposits and therefore should be more thoroughly explored.

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TABLE 2 **Comparison of the Ryan Lake Property to the Copper Mountain stock**

Copper Mountain Ingerbelle, B.C. (MacAuley, 1973)	Ryan Lake, Ontario (includes observations by Sinclair, 1979)
The Copper Mountain stock is 5 X 2½ miles in areal extent; with interior syenite, intermediate zone monzonite, and outer zone diorite-gabbro	The Cairo Township stock is a zoned intrusion 5 X 5 miles in areal extent; from quartz syenite at the centre to mafic syenite at the contact
Intrusive centres are controlled by faults active over a long period of time (deep seated faults act as channel ways for mineralization)	The Cairo stock is cut by the NW-trending Montreal River Fault (which extends between Cobalt and Timmins areas and is one of a fault system that has been active periodically for more than 2000 million years)
Associated volcanics are high K ₂ O andesites and agglomerates (shoshonites)	Associated volcanic rocks are Timiskaming high K ₂ O igneous rocks
Mineralization is in the form of disseminated sulphides (chalcopyrite and pyrite) and fracture fillings	Mineralization is in the form of copper and molybdenum sulphides in quartz veins, fractures and disseminations
Production: (1925 to 1957) 6 million pounds Cu, 187,000 oz Au, and 4.3 million oz Ag	Production: (1950 to 1964) 5 million pounds Cu, 11,393 pounds Mo, 1,352 oz Au and 36,141 oz Ag

NORTHEASTERN—KIRKLAND LAKE

Table 2 continued

Copper Mountain
Ingerbelle, B.C.
(MacAuley, 1973)

Ryan Lake, Ontario
(includes observations by
Sinclair, 1979)

Alteration is mainly in
the form of albitization,
along with epidote,
chlorite, biotite, scapolite
and calcite

Alteration consists of silicifi-
cation, chloritization and
hematization (biotite and epidote
alteration have been recorded
900 m (3000 ft) to the east)

Island arc affiliations

Abitibi greenstone belt has island
arc characteristics

90% of the ore is in the
tuffs and agglomerates.
10% is in small irregular
masses of monzonite and
diorite

Most of the production is from
mafic and ultramafic volcanics
in contact with syenite stocks

TABLE 3

MAPS AND REPORTS PERTAINING TO THE KIRK-
LAND LAKE RESIDENT GEOLOGIST'S DISTRICT,
ISSUED BY THE ONTARIO GEOLOGICAL SUR-
VEY, MINISTRY OF NATURAL RESOURCES, IN
1979

OGS REPORTS

Report 184

OGS STUDY

Study 20

MISCELLANEOUS PAPERS

MP 77 MP 87
MP 84 MP 90

OPEN FILE REPORTS

OFR 5264 OFR 5273
OFR 5272 OFR 5279

MINERAL POLICY BACKGROUND PAPER

MPBP 6 MPBP 8
MPBP 7 MPBP 9

MINERAL DEPOSITS CIRCULAR

MDC 18

COLOURED MAPS

Map 2393 Map 5029
Map 2414 Map 5030
Map 5027 Map 5032

FEDERAL-PROVINCIAL MAPS

80 280 to 80 318 inclus.
80 319 to 80 333 inclus.
80 372 to 80 410 inclus.
80 411 to 80 425 inclus.

PRELIMINARY MAPS

P.797 (rev.)	P.884	P.2009	P.2245
P.827 (rev.)	P.885	P.2021	P.2250 - 2277 (inclus.)
P.829 (rev.)	P.886	P.2022	P.2282
P.830 (rev.)	P.888	P.2023	P.2283
P.850 (rev.)	P.892 (rev.)	P.2024	P.2284
P.859 (rev.)	P.893 (rev.)	P.2038	P.2285
P.862 (rev.)	P.894 (rev.)	P.2039	P.2286
P.867	P.895 (rev.)	P.2040	P.2287
P.868	P.896 (rev.)	P.2049	P.2288
P.869 (rev.)	P.897	P.2050	P.2289
P.873 (rev.)	P.898 (rev.)	P.2051	P.2290
P.874 (rev.)	P.903	P.2052	P.2291
P.876	P.2004	P.2053	P.2292
P.878 (rev.)	P.2005	P.2208	P.2312
P.882 (rev.)	P.2006	P.2243	
P.883 (rev.)	P.2007	P.2244	

NORTHEASTERN—KIRKLAND LAKE

TABLE 4 Assessment work and other information received in 1979

Kirkland Lake Resident Geologist's District						
Abbreviations				Commodities		
A	-	Assay values	IP	-	induced polarization	Ag - silver
AEM	-	airborne EM	Mag (2)	-	magnetometer (number of areas covered by survey)	asb - asbestos
AM	-	airborne Mag	MEAP	-	Mineral Exploration Assistance Program	Au - gold
ARa	-	airborne radiometric	OSC	-	Ontario Securities Commission	Co - cobalt
Asses.	-	assessment work	Ov DH	-	overburden drill hole	Cu - copper
C	-	correspondence	Pros.	-	prospectus	Mo - molybdenum
DDH (2)	-	diamond drill hole (number of holes)	R	-	resistivity	Ni - nickel
DH (perc.)	-	percussion drill holes	Ra	-	radiometric	Pb - lead
EM (2)	-	electromagnetic (number of areas covered by survey)	rTr	-	rock trenching	U - uranium
Gc	-	geochemical	sTr	-	soil trenching or stripping	Zn - zinc
GL	-	geological	u/g	-	underground work	
Gr	-	gravity	VEM	-	vertical loop EM	
HEM	-	horizontal loop EM	VLF-EM	-	very low frequency EM	
			XN	-	section (drill hole)	

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
ALMA, HOLMES	42-A-2	Minorex Limited		Assessment	DDH (6)	1978	
ALMA, HOLMES	42-A-2	Minorex Limited	Cu,Zn,Ag	MEAP CG-125	Turam Em, GL,sTr, DDH (7)	1979	MEAP CG-125
ALMA	42-A-2	Sylva Exploration Ltd. (Beaverdam Group)		Assessment	SP	1979	2.2917
ASQUITH	41-P-11	Annett, Roy		Assessment	DDH	1979	
ASQUITH	41-P-11	Sullivan, Wm. J.	Au	Assessment	DDH	1979	
BADEN	41-P-2	Manitou Lake Gold Mines Inc. (See also Hames, C.M.)	Au	CG-132	VLF-EM, Mag, DDH (10)	1978	CG-132
BARNET	42-A-8	Larche, J. P.		Assessment	HEM	1979	2.2940
BEATTY	42-A-9	Amex Minerals Exploration "Beatty 1"		Assessment	GL	1978	2.2919
BEATTY	42-A-9	Gulf Minerals Canada Ltd.		Assessment	DDH	1979	
BENOIT	42-A-8	Culhane, P.		Assessment	rTr	1979	2.2978
BERNHARDT, LEBEL, MORRISSETTE & TECK	42-A-1	Haas-Warner Mining Ltd. (see also Deloye, E.C.; Kirana Kirkland Gold)		Donation	u/g	1979	
BERNHARDT, LEBEL, MORRISSETTE & TECK	42-A-1	Haas-Warner Mining Ltd. (see also Deloye, E.C.; Kirana Kirkland Gold)		Assessment	DDH (2)	1979	
BLACK	42-A-8	Canray Resources Ltd.		Assessment	Mag, VLF-EM	1979	2.2900
BLACK	42-A-8	Card Lake Copper Mines Ltd.		Assessment	DDH (4), VLF-EM, Mag, c.s.	1979	2.2991
BLACK	42-A-8	McKinnon, D.	Au	MEAP KL-120	GL	1978	MEAP KL-120
BOSTON	32-D-4	Parsons, G. E.		Assessment	Ra	1978	2.2920
CAIRO	41-P-15	Garbutt, Fred J.		Assessment	GL, Ra	1979	2.2989
CAIRO	41-P-15	Sylva Exploration Ltd. "Cairo Group"		Assessment	VLF-EM, UEM, Mag	1979	2.2908
CATHARINE, MARTER	31-M-13	Allsopp, Arnold	Cu,Zn,Ag	Assessment	Mag	1978	2.2930
CATHARINE	31-M-13	Link, D. S.; Link, W. O.		Assessment	DDH(3)	1979	
CATHARINE, HEARST, MCELROY, MCFADEN, KATTRAY, SKEAD	31-M-13 32-D-4	MacGregor, R. A. "Air 1"		Assessment	Mag, VLF-EM, HEM	1978	2.2790
CHURCHILL	41-P-11	Texasgulf Canada Ltd.		SEE UNDER CONNAUGHT TOWNSHIP			
CLAEVER	42-A-3, 2	Amex Exploration Inc.	Cu,Zn,Au, Ag	Assessment	HEM, GL, rTr	1977 1978	2.2286 2.2286
CLIFFORD	32-D-5	Noranda Exploration Co. Ltd.		Assessment	Mag, IP, GL, DDH(3)	1977	2.2856 2.2565
ODLEMAN	31-M-5	Canadaka Mines Ltd. (Drummond-Hargrave - #1611 - North Drummond)	Ag,Pb,Cu	MEAP KL-98 MEAP CG-141	GL DDH (13)	1977 1979	MEAP KL-98 MEAP CG-141
COLEMAN	31-M-5	Malouf, Michael		Assessment	DDH	1979	
COLEMAN	31-M-5	Malouf, Michael		Assessment	GL	1979	

Table 4 continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
CONNAUGHT & CHURCHILL	41-P-11	Texasgulf Canada Ltd.	Cu,Zn	Assessment	GL VLF-EM	1977 1979	2.2617 2.2673
COULSON	42-A-9	Amex Minerals Exploration "Coulson 1"		Assessment	AM, AEM	1979	2.2949
EBY	42-A-1	Harrington, Patrick		Assessment	DDH	1979	
GARRISON	32-D-5	Amex Minerals Exploration "Garrison 1"		Assessment	AEM, AM	1979	2.2952
GAUTHIER	32-D-4	Casan Mining Limited	Au	MEAP KL-106	Gc, sTr, rTr	1978	MEAP KL-106
GAUTHIER	32-D-4	Casan Mining Limited (Roberts, G. L.)	Au	Assessment	GL, Ra	1978	2.2761
GAUTHIER	32-D-4	International Nickle Co. of Canada Limited "Canico Diamond Drill"			SEE UNDER LEBEL TOWNSHIP		
GAUTHIER	32-D-4	International Nickle Co. of Canada Limited "Canico Lebel - Gauthier Project"			SEE UNDER LEBEL TOWNSHIP		
GAUTHIER	32-D-4	International Nickle Co. of Canada Limited "Canico Lebel - Gauthier Project" "overburden drilling"			SEE UNDER LEBEL TOWNSHIP		
GAUTHIER	32-D-4	LaCasse, Lucien & MacGregor, R. J. (see also MacGregor, R. J.)		Assessment	Mag	1979	2.2909
GILLIES LIMIT	31-M-5	Home, K. P.		Assessment	DDH	1979	
GILLIES LIMIT	31-M-5	St. Joseph Exploration Ltd. (Bradley-Scheak Option)		Assessment	HEM, Mag	1978	2.2732
GUIBORD	42-A-9	Amex Minerals Exploration "Guibord 1"		Assessment	AM, AEM	1979	2.2950
GUIBORD, MUNRO	42-A-9	Blake, Fred		Assessment	DDH (2)	1979	
GUIBORD, MICHAUD	42-A-8, 9	Cominco Ltd. (Gib Property)	Au	Assessment	OV DH GL, Gc, DDH	1977 1978	2.2682 2.2682
GUIBORD, MICHAUD	42-A-8, 9	Cominco Ltd. (Gib Property)	Au	Assessment	DDH (6)	1979	
HALLIDAY, HUTT, MOHER, MONTROSE, SEMPLÉ, SOTHMAN, ZAVITZ	42-P-14, 42-A-3	Essex Minerals Company "English Project"		Assessment	DDH GL	1979 1978	
HALLIDAY	41-P-14	Essex Minerals Company "Grassy River Grid"			SEE UNDER HUTT TOWNSHIP		
HALLIDAY	41-P-14	Essex Minerals Company "Grassy River West Grid"		Assessment	Mag, HEM	1978	2.2804
HALLIDAY, SOTHMAN	41-P-14	Essex Minerals Company "Halliday Project"		Assessment	HEM, Mag	1978	2.1803
HALLIDAY, SOTHMAN	41-P-14	Essex Minerals Company "Halliday Project"		Assessment	DDH (8), HEM, Gc	1978	
HALLIDAY	41-P-14	Essex Minerals Company "Radio Lake Grid"		Assessment	Mag, HEM	1978	2.2805
HALLIDAY	41-P-14	Essex Minerals Company "Radio Lake Grid"		Assessment	DDH (4) GL	1979 1978	
HALLIDAY	41-P-14	Essex Minerals Company "Relic Lake Grid"		Assessment	Mag, HEM	1978	2.2805
HALLIDAY	41-P-14	Essex Minerals Company "Relic Lake Grid"		Assessment	GL	1978	
HALLIDAY	41-P-14	Northgate Exploration Limited (Allerston Option)		Assessment	GL, Mag, HEM	1977	
HARKER	32-D-12	Amex Minerals Exploration "Harker 1"		Assessment	GL	1978	2.2896
HAULTAIN	41-P-10	Mindeen Minerals Ltd.		Assessment	VLF-EM, Mag	1978	2.2854
HEARST	32-D-4	Colex Exploration Inc.		Assessment	VLF-EM	1978	2.2857
HEARST, MCELROY	32-D-4	Falconbridge Copper Ltd.	Cu,An	Assessment	DDH (9)	1979	
HEARST	31-M-13, 32-D-4	MacGregor, R. A. "Air 1"			SEE UNDER CATHARINE TOWNSHIP		
HEARST	32-D-4	MacGregor, R. A. "Larder Group 1"		MEAP KL-108	VLF-EM	1978	MEAP KL-108
HEARST, MCVITTIE	32-D-4	MacGregor, R. A. "Group 2 East"		Assessment	VLF-EM, Mag	1978	2.2860
HEARST	32-D-4	MacGregor, R. A. "Group 3"			SEE UNDER MCFADDEN TOWNSHIP		
HEARST	31-M-13, 32-D-4	MacGregor, R. A. "Group B1"			SEE UNDER SKEAD TOWNSHIP		
HEARST, MCVITTIE	32-D-4	MacGregor, R. A. "Larder Townsite Property"		MEAP KL-110	GL	1979	MEAP KL-110
HEARST, MCVITTIE	32-D-4	MacGregor, R. A. "Larder Townsite Property"		Assessment	rTr	1979	2.2906
HEARST	32-D-4	Robbins, C. D. (Quoddy Investment Company) (Kerr Addison Mines Ltd. Option)	Au	Assessment	VLF-EM	1978	2.2869
HEARST, MCVITTIE	32-D-4	Sudbury Contact Mines Ltd.	Au	Assessment	DDH	1979	
HISLOP	42-A-9	Ginn, A. P.		Assessment	DDH (3)	1979	
HODGETTS	41-P-3	Rio Tinto Canadian Exploration Ltd. (Card Lake Option)		Assessment	GL, Mag, IP	1978	2.2866
HOLMES	42-A-2	Minorex Limited			SEE UNDER ALMA TOWNSHIP		
HUTT	41-P-14	Essex Minerals Co. "East Central Block V"			SEE UNDER SEMPLÉ TOWNSHIP		
HUTT	41-P-14, 42-A-3	Essex Minerals Co. "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
HUTT, HALLIDAY	41-P-14	Essex Minerals Co. "Grassy River Grid"		Assessment	DDH Mag, HEM, GL	1979 1978	

NORTHEASTERN—KIRKLAND LAKE

Table 4 continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
HUTT	41-P-14	Essex Minerals Co. "Hydro Grid"			SEE UNDER SEMPLE TOWNSHIP		
HUTT	41-P-14	Essex Minerals Co. "Hydro Block"			SEE UNDER SEMPLE TOWNSHIP		
HUTT	41-P-14	Essex Minerals Co. "Upper Redwing Lake Grid"		Assessment	Mag, HEM, GL	1978	
HUTT	41-P-14	Essex Minerals Co. "Wellington Lake Grid"		Assessment	Mag, HEM, GL	1978	
HUTT	41-P-14, 42-A-3	Essex Minerals Co. "Wicks Road Grid"		Assessment	Mag, HEM, GL	1978	
HUTT	41-P-14	Essex Minerals Co. (Wicks Road, Upper Redwing, Wellington Lake Grids)		Assessment	Mag, HEM	1978	2.2806
KERRS, WARDEN	42-A-9, 16	Denison Mines Ltd.	Au	Assessment	R, Seis., GL, Mag	1977	2.2632
KERRS	42-A-9	Dome Exploration (Can.) Ltd. (Camp Creek Group)		Assessment	VLf-EM, Mag	1978	2.2819
KERRS	42-A-9	Noranda Exploration Co. Ltd.		Assessment	HEM, Mag	1978	2.2746
KNOX	42-A-9	Dome Exploration (Can.) Ltd.		Assessment	HEM, Mag, VLf-EM	1978	2.2780
LEBEL	42-A-1	Haas-Warner Mining Ltd. (see also Deloye, E. C.; Kirana Kirkland Gold)			SEE UNDER BERNHARDT TOWNSHIP		
LEBEL, GAUTHIER	32-D-4	International Nickle Company of Canada Ltd. "Canico Diamond Drilling"	Au	MEAP KL-100	DDH	1977	MEAP KL-100
LEBEL, GAUTHIER	32-D-4	International Nickle Company of Canada Ltd. "Canico Lebel - Gauthier Project"	Au	MEAP KL-100	Mag	1978	MEAP KL-100
LEBEL, GAUTHIER	32-D-4	International Nickle Company of Canada Ltd. "Canico Lebel - Gauthier Project"	Au	Assessment	Mag, GL	1978	2.2861
LEBEL, GAUTHIER	32-D-4	International Nickle Company of Canada Ltd. "Canico Lebel - Gauthier Project"	Au	MEAP KL-114	Mag, IP, GL, Gc	1979	MEAP KL-114
LEBEL, GAUTHIER	32-D-4	International Nickle Company of Canada Ltd. "Canico Lebel - Gauthier Project"	Au	Assessment	OV DH (48), Mag, Xn	1977	
LEBEL, TECK	42-A-1	Kirana Kirkland Gold Mines Ltd. (see also Deloye, E. C.; Haas-Warner Mining Ltd.) (Labelle-Kirkland)	Au	Donation	u/g	1936	
LEBEL	32-D-4	Martin, T.		Assessment	DDH	1979	
LEBEL	32-D-4	Martin Thos.; LaLonde, Jos.		Assessment	DDH	1979	
LEBEL	32-D-4	Northgate Exploration Limited (Lebel Lode Property)		Assessment	Mag	1978	2.2985
LORRAIN	31-M-5	McAllister, R. C.	Cu	Assessment	DDH (3), rTr	1979	
MAISONVILLE	42-A-1	Pain, Sidney A.		Donation	u/g	1958	
MAISONVILLE	42-A-1	Sullivan, Thomas	Au	Assessment	DDH (2)	1978	
MARSHAY, SCOTIA	41-P-3	Rio Tinto Canadian Exploration Ltd. "Onaping Lake Area"		Assessment	AM	1979	2.3011
MARTER	31-M-13	Allsopp, Arnold			SEE UNDER CATHARINE TOWNSHIP		
MELBA	42-A-8	Rosario Resources Canada Ltd.		Assessment	DDH	1979	
MICHAUD	42-A-8, 9	Cominco Ltd. (Gib Property)			SEE UNDER GUIBORD TOWNSHIP		
MOHER	41-P-14, 42-A-3	Essex Minerals Company "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
MOHER, SEMPLE	41-P-14	Essex Minerals Company "Little Redstone Grid"		Assessment	Mag, HEM	1978	2.2797
MOHER, SEMPLE	41-P-14	Essex Minerals Company "Little Redstone Grid"		Assessment	GL	1978	
MONTROSE	41-P-14, 42-A-3	Essex Minerals Company "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
MONTROSE	41-P-14, 15	Essex Minerals Company "Seven Inch Lake Grid"		Assessment	Mag, HEM	1978	2.2798
MONTROSE	41-P-14, 15	Essex Minerals Company "Seven Inch Lake Grid"		Assessment	GL	1978	
MONTROSE	41-P-14, 15	Essex Minerals Company "Ward Lake Grid"		Assessment	Mag, HEM	1978	2.2798
MONTROSE	41-P-14, 15	Essex Minerals Company "Ward Lake Grid"		Assessment	GL	1978	
MORRISETTE	42-A-1	Haas-Warner Mining Ltd. (see also Deloye, E. C.; Kirana Kirkland Gold)			SEE UNDER BERNHARDT TOWNSHIP		
MUNRO	42-A-9	Amex Minerals Exploration "Munro 1"		Assessment	AEM, Mag	1979	2.2953
MUNRO, WARDEN	42-A-9	Amex Minerals Exploration "Munro 2"		Assessment	GL	1979	2.2988
MUNRO, GUIBORD	42-A-9	Blake, Fred			SEE UNDER GUIBORD TOWNSHIP		
MCCOOL	42-A-9	Amex Minerals Exploration		Assessment	AEM, AM	1979	2.2948
MCELROY	32-D-4	Falconbridge Copper Ltd.			SEE UNDER HEARST TOWNSHIP		
MCELROY	31-M-13, 32-D-4	MacGregor, R. A. "Air 1"			SEE UNDER CATHARINE TOWNSHIP		
MCFADDEN	31-M-13, 32-D-4	MacGregor, R. A.			SEE UNDER CATHARINE TOWNSHIP		
MCFADDEN, HEARST	32-D-4	MacGregor, R. A. "Group 3"		MEAP KL-108	VLf-EM	1978	MEAP KL-108
MCGARRY	32-D-4	Lee Geo-Indicators Ltd.	Au	Assessment	VLf-EM, Mag	1979	2.2982

Table 4 continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
MCGARRY	32-D-4	Walker, James	Au	Assessment	DDH (2)	1979	
MACMURCHY	41-P-11	Teck Corporation (Triton Group)		Assessment	Mag, VLF-EM	1979	2.2881
MCNEIL	42-A-2	King-Weekly Mining Claims		Assessment	DDH (3)	1979	
MCVITTIE	32-D-4	Amalgamated Larder Mines Ltd. "Kerr Addison Option"		MEAP KL-126	DDH (2)	1979	MEAP KL-126
MCVITTIE	32-D-4	Kerr Addison Mines Ltd. (Amalgamated Larder Option)	Au	MEAP KL-113	DDH (2), Xn	1978,79	MEAP KL-113
MCVITTIE	32-D-4	MacGregor, R. A. "Group 2 East"			SEE UNDER HEARST TOWNSHIP		
MCVITTIE	32-D-4	MacGregor, R. A. "Larder Townsite Property"			SEE UNDER HEARST TOWNSHIP		
MCVITTIE	32-D-4	Sudbury Contact Mines Ltd.			SEE UNDER HEARST TOWNSHIP		
PACAUD	31-M-13, 41-P-16	Long Lac Mineral Exploration Ltd.	Au	Assessment	DDH (4), Mag, VLF-EM	1979	
POWELL	41-P-15	Sylva Explorations Ltd.		Assessment	Gc, HEM, VLF-EM, SP	1979	2.2918
RAND	32-D-12	Noranda Exploration Company Ltd.		Assessment	GL, Mag	1978	2.2478
RATTRAY	31-M-13, 32-D-4	MacGregor, R. A. "Air 1"			SEE UNDER CATHARINE TOWNSHIP		
RATTRAY, SKEAD	31-M-13 32-D-4	MacGregor, R. A. "Ratray Group"		Assessment	Mag, VLF-EM	1977	2.2791
RAYNER LAKE	42-A-9	Noranda Exploration Company Ltd.		Assessment	VLF-EM	1979	2.3008
RAYNER LAKE	42-A-9	Rio Tinto Canadian Exploration Ltd. "Randa Option"		Assessment	HEM, Mag	1979	2.2945
SCOTIA	41-P-3	Rio Tinto Canadian Exploration Ltd. "Onaping Lake Area"			SEE UNDER MARSHAY TOWNSHIP		
SEMPLE	41-P-14	Essex Minerals Company Ltd. "East Central, Block IV"	Cu,Pb,Zn	Assessment	DDH	1979	
SEMPLE, HUTT	41-P-14	Essex Minerals Company Ltd. "East Central, Block V"	Cu,Pb,Zn	Assessment	DDH	1979	
SEMPLE	41-P-14, 42-A-3	Essex Minerals Company Ltd. "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
SEMPLE, HUTT	41-P-14	Essex Minerals Company Ltd. "Hydro Block"		Assessment	DDH, GL, HEM	1979	
SEMPLE, HUTT	41-P-14	Essex Minerals Company Ltd. (Hydro Grid)		Assessment	Mag, HEM	1978	2.2802
SEMPLE	41-P-14	Essex Minerals Company Ltd. "Little Redstone Grid"			SEE UNDER MOHER TOWNSHIP		
SEMPLE, SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Pountney Lake Grid"		Assessment	GL, HEM	1978	
SEMPLE, SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Pountney Lake Grid" (see also Essex Minerals Co., English Project)		Assessment	HEM, Mag	1978	2.2800
SKEAD	31-M-13,	MacGregor, R. A. "Air 1"			SEE UNDER CATHARINE TOWNSHIP		
SKEAD, HEARST	31-M-13, 32-D-4	MacGregor, R. A. "Group B1"		MEAP KL-111	VLF-EM	1979	MEAP KL-111
SKEAD	31-M-13, 32-D-4	MacGregor, R. A. "Group F1"		Assessment	VLF-EM	1978	2.2807
SKEAD	31-M-13,	MacGregor, R. A. "Group G1"		Assessment	Gc, rTr	1979	2.2887
SKEAD	31-M-13	MacGregor, R. A. "Group G1"		Assessment	Mag	1979	2.2998
SKEAD	31-M-13, 32-D-4	MacGregor, R. A. "Group G1"	U	Assessment	VLF-EM	1978	2.2787
SKEAD	31-M-13	MacGregor, R. A. "Group G1"		Assessment	GL	1978	2.2855
SKEAD	31-M-13, 32-D-4	MacGregor, R. A. "Ratray Group"	Cu,Zn,Au	MEAP KL-111	GL	1978	MEAP KL-111
SKEAD	31-M-13	Rio Tinto Canadian Exploration Ltd. "MacGregor Option"		Assessment	DDH (5)	1979	
SKEAD	31-M-13	Rio Tinto Canadian Exploration Ltd. "MacGregor Option"		Assessment	DDH (3)	1979	
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Cork Lake Grid"		Assessment	Mag, HEM	1978	2.2801
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Cork Lake Grid"		Assessment	GL	1978	
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Edelston Lake Grid"		Assessment	Mag, HEM	1978	2.2801
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Edelston Lake Grid"		Assessment	GL	1978	
SOTHMAN	41-P-14, 42-A-3	Essex Minerals Company Ltd. "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Halliday Project"			SEE UNDER HALLIDAY TOWNSHIP		

NORTHEASTERN—KIRKLAND LAKE

Table 4 continued

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Pountney Lake Grid"			SEE UNDER SEMPLE TOWNSHIP		
SOTHMAN	41-P-14	Essex Minerals Company Ltd. "Pountney Lake Grid" (see also Essex Minerals Co., English Project)			SEE UNDER SEMPLE TOWNSHIP		
TECK	42-A-1	Forbes, C.; Leahy, M.		Assessment	VLF-EM, Mag	1978	2.2689
TECK	42-A-1	Haas-Warner Mining Ltd. (see also Deloye, E. C.; Kirana Kirkland Gold)			SEE UNDER BERNHARDT		
TECK	42-A-1	Jomi Minerals & Expediting Ltd. "Dymont-Kidston Claims, Groups 1 & 11"		Assessment	VLF-EM, Mag	1979	2.2903
TECK	42-A-1	Kirana Kirkland Gold Mines Ltd. (see also Deloye, E. C. & Haas-Warner Mining Ltd.) (Labelle-Kirkland)			SEE UNDER LABEL TOWNSHIP		
TECK	42-A-1	Newmont Exploration of Canada Ltd.		Assessment	Mag, VLF-EM	1978	2.2775
TECK	42-A-1	Newmont Exploration of Canada Ltd. "Duffy Project"		Assessment	DDH (5)	1978	
TECK	42-A-1	Queenston Gold Mines Ltd. (Teck Project)	Au	Assessment	VLF-EM, GL	1978	2.2815
TECK	42-A-1	Queenston Gold Mines Ltd. (Teck Project)		Assessment	DDH (2)	1979	
TEEFY	42-A-10, 15	Cominco Limited		Assessment	Mag, HEM, Gr	1978	2.2721
TUDHOPE	41-P-9	Northern Silver Fox Resources Inc.	Ag,Co,Cu	Assessment	VLF-EM, Mag, Ra	1978	2.2783
TYRRELL	41-P-10, 11	Stubbs, Darlene		Assessment	Gc	1978	2.2794
WARDEN	42-A-9	Amax Minerals Exploration "Munro 2"			SEE UNDER MUNRO TOWNSHIP		
WARDEN	42-A-9	Amax Minerals Exploration "Warden 1"		Assessment	AEM, AM	1979	2.2954
WARDEN	42-A-9, 16	Denison Mines Ltd.			SEE UNDER KERRS TOWNSHIP		
WILKIE	42-A-9, 10	Hollinger Mines Ltd.		Assessment	AEM	1978	2.2834
WILKIE	42-A-9, 10	Hollinger Mines Ltd. "Group 1"		Assessment	DDH	1977	
WILKIE	42-A-9, 10	Hollinger Mines Ltd. "Group 4"		Assessment	DDH	1979	
YARROW	41-P-15	Harvey, Leo Roger Joseph		Assessment	DDH	1979	
ZAVITZ	42-A-3	Essex Minerals Company Ltd.		Assessment	Mag, HEM	1978	2.2799
ZAVITZ	41-P-14, 42-A-3	Essex Minerals Company Ltd. "English Project"			SEE UNDER HALLIDAY TOWNSHIP		
ZAVITZ	42-A-3	Essex Minerals Company Ltd. "Zavitz Grid"		Assessment	GL	1978	

1979 Report of The Sault Ste. Marie Resident Geologist

G. Bennett¹ and E.J. Leahy²

Contents

Introduction	97
Resident Geologist's Activities	97
Mining Activity	97
Exploration Activity	99
Recent Developments and Suggestions to Prospectors	99
Ontario Geological Survey Activities	100
Recent Publications	100
References Cited	101

Tables

1. Assessment Work and Other Information Received in 1979	101
2. Exploration Activity in 1979	102
3. Maps and Reports Issued by the Ontario Geological Survey	100

Figures

1. Sault Ste. Marie Resident Geologist's District	98
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Introduction

The continuing expansion programs of Denison Mines Limited and Rio Algom Mines Limited in the Elliot Lake area remains the most positive aspect of the mining activities of the Sault Ste. Marie Mining District.

The decline in claim staking continued in 1979, with a total of 541 claims staked as of December 18, 1979. This compares with 724 claims staked in 1978 and 1,008 claims staked in 1977. Sixty-one claims were also staked in townships controlled by Algoma Central Railway. This is an increase from the 14 claims staked on A.C.R. land in 1978.

Resident Geologist's Activities

The staff in the Sault Ste. Marie office consists of G. Nivins, Secretary; E. J. Leahy, Resource Geologist; and G. Bennett. G. Bennett assumed duties as Resident Geologist for the Sault Ste. Marie Mining Division in November 1979.

E.J. Leahy acted as a member of the Steering Committee concerning the implementing of a province-wide filing and microfilm study for reports submitted by the mining industry. He is also a member of the Sault Ste. Marie District Land Use Planning Steering Committee.

While acting as field geologist in the Northeastern Region, G. Bennett carried out detailed mapping and a preliminary geochemical study of an unusually large breccia body in Plummer Additional Township (A, Figure 1). Some of the results of that work is described in the following section. The study of Huronian volcanic rocks was continued (Bennett 1979).

J. Kral, a geological assistant, carried out a reconnaissance survey to locate rock outcrops and gravel pits on St. Joseph's Island.

Mining Activity

The Algoma Ore Division of the Algoma Steel Corporation Limited continued production of siderite iron ore from the George W. MacLeod Mine at Wawa. About 1 680 000 tons of sinter was produced during 1979.

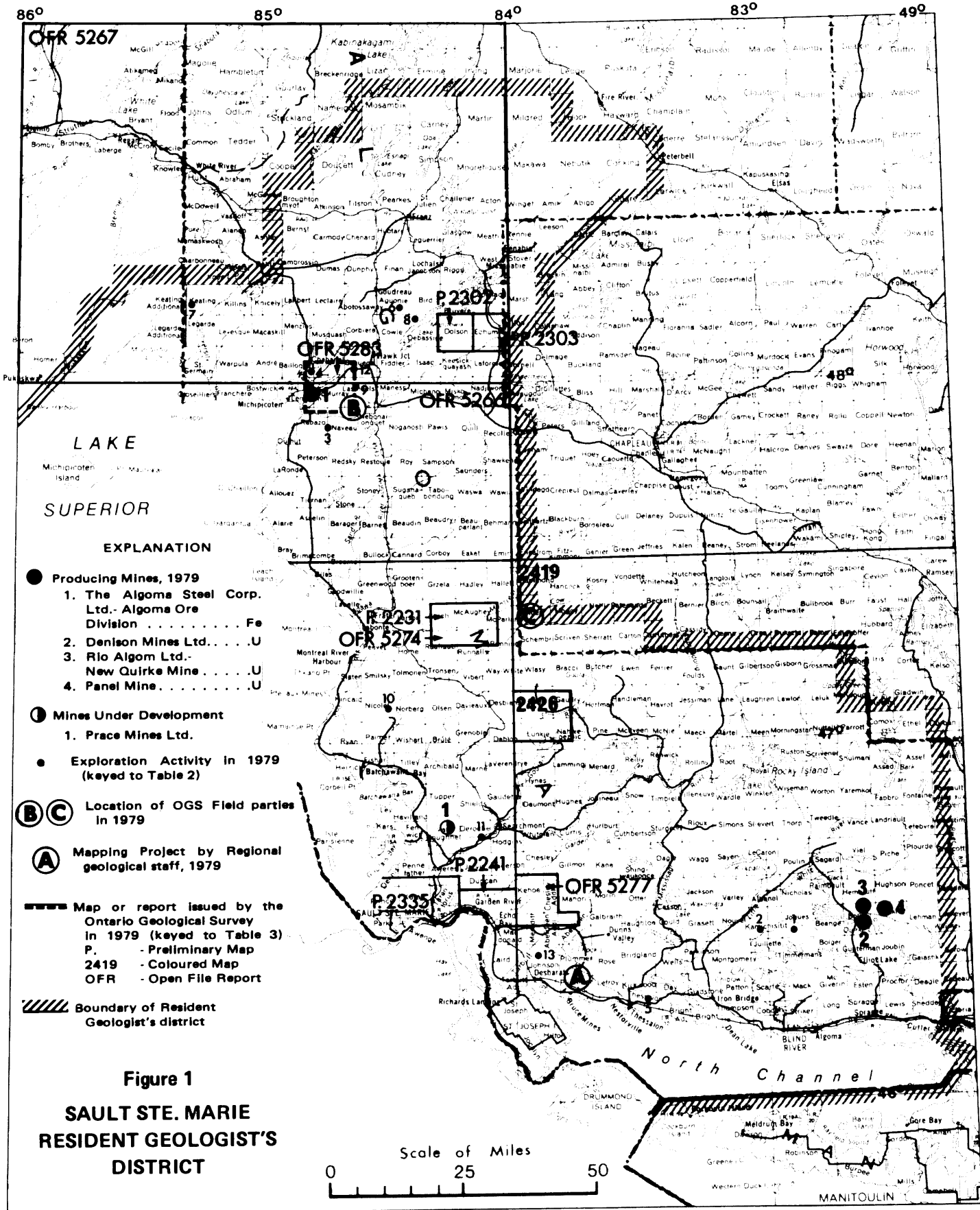
Denison Mines Limited and Rio Algom Limited continued production of uranium oxide at Elliot Lake. The Panel Mine (Rio Algom Limited) began production in late 1978. Major expansion programs are continuing.

In 1979 the Prace Mining Company completed about 400 feet (120 m) of underground development at its silver-lead deposit in Vankoughnet Township. A small mill was constructed and some stockpiled ore was milled.

Rising metal prices has resulted in a re-evaluation of past producers and developed properties. Rengold Mines Limited is undergoing refinancing with the object of reopening the company's former gold producer in Leeson Township. The DK Syndicate (funded by DeKalb Petroleum Limited) has acquired all the mining property of the former Tribag Mining Company in the Batchawana area. Pursides Gold Mines Limited, which holds a gold property near Wawa, is being considered for reorganization and refinancing (Northern Miner, April 13, 1979). Ego Resources Limited is re-evaluating its copper-gold property in the Wawa area (Northern Miner, October 8, 1979).

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² Resource Geologist.



Exploration Activity

1979 saw a trend away from uranium exploration towards more exploration for gold, silver and base metals in the Sault Ste. Marie Mining District (P. E. Giblin, personal communication, 1979). Rising metal prices, particularly gold and silver, resulted in renewed interest in the gold deposits of the Wawa area. Algoma Steel Corporation (Algoma Ore Division) began a geological mapping program of their extensive holdings in the Wawa area.

Amax Exploration Incorporated carried out a trenching program on a previously known molybdenite prospect in Lastheels Township, east of Wawa.

The argentiferous galena occurrences near Sault Ste. Marie have been the subject of renewed interest. (See following section of this report entitled "Recent Developments and Suggestions to Prospectors").

Table 2 gives a summary of exploration activities in the district. The locations of the activities are shown on Figure 1.

Recent Developments and Suggestions to Prospectors

The major increase in silver prices over the past year was no doubt a major factor in the renewed interest in the old silver prospects near Sault Ste. Marie.

In 1979 a claim group including the Kerr-Scott and Kirby-Legge prospects, held by Yves Desjardins of Sault Ste. Marie, was optioned by Mattagami Lake Exploration Limited (11, Figure 1). Geological and ground electromagnetic surveys were begun in late fall. Several north-south striking quartz-carbonate veins carrying argentiferous galena, sphalerite, chalcopyrite, arsenopyrite and pyrite are known of the property. In the late thirties about 21 tons of hand-cobbed material shipped to Trail, B.C. assayed 47.50 percent lead, 7.50 percent zinc and 7.15 ounces per ton silver. Assays of over sixty ounces of silver per ton and up to 0.312 ounces of gold per ton are reported in the assessment files at the Resident Geologist's Office, Sault Ste. Marie.

The veins in Deroche Township occur in Early Precambrian mafic metavolcanics and in sedimentary rocks of the Gowganda Formation. Argentiferous galena veins, some carrying chalcopyrite as well, are also known to occur in the Early Precambrian granitic terrain northeast of Sault Ste. Marie.

The Prace Mining Company Property in Vankoughnet Township, about 16 miles (26 km) north of Sault Ste. Marie, (D, Figure 1) encloses a N60 degrees W striking vein of argentiferous galena which dips about 70 degrees to the south. The vein, which generally carries little gangue material, consists mainly of argentiferous galena and tetrahedrite, with subsidiary pyrite, chalcopyrite, sphalerite and pyrrhotite (Robinson 1977). Some assays of concentrates from the 100 ton per day (rated) capacity mill

are reported to exceed 100 ounces of silver per ton of concentrate.

The vein is emplaced in a shear zone, which for most of its observed length, separates Nipissing gabbro from laminated argillites of the Gowganda Formation.

The argentiferous galena veins of the Sault Ste. Marie area, although of relatively modest size, have a high potential value which is increasing with silver prices. Their generally narrow widths inhibit successful surface prospecting but ground electromagnetic surveys may be a worthwhile exploration method in areas where known showings exist, or where ground of high potential can be delineated.

During the summer of 1979 the writer mapped in detail an unusually large breccia body in Plummer Additional Township, which was first reported by Frarey (1977) (A, Figure 1). Many of the features of the breccia were described earlier by Bennett (1979). This report is intended to supplement that description.

Disseminated grains, thin seams and blebs of pyrite occur at several localities in the western half of the breccia zone and in the altered zone west of the breccia. Thirteen samples of pyritiferous breccia and albitized mudstone forwarded to the Geoscience Laboratory of the Ontario Geological Survey for analysis for gold and silver were also given a 30 element semi-quantitative spectrographic scan. The results indicated a maximum of 0.02 ounces of gold per ton (3 samples) with two samples giving 0.01 ounces of gold per ton and the remainder giving trace gold. The silver content was trace (seven samples) while the remainder were nil. Two samples collected by D. G. Innes of the Mineral Deposits Section gave 0.34 and 0.20 ounces of silver per ton. Other metals were not detected in significant amounts by the spectrographic scan.

Seven occurrences of anomalous radioactivity (up to 10X background) were noted within the breccia during mapping. The highest analysis obtained was 30 ppm uranium (0.06 lbs. per ton) and 40 ppm thorium (0.08 lbs. per ton). A sample of albitized gabbro with up to 30X background radioactivity gave 88 ppm uranium (0.2 lbs. per ton).

The gold-silver and uranium values returned by samples from the albitized breccia, although not in themselves of very high grade, are indicative of anomalously high concentrations of these metals in albitized breccias. Innes and Colvine (1979) report significant gold, silver and copper values from similar albitized breccias in the Sudbury area and point out that they are legitimate exploration targets.

In 1979 the Ontario Geological Survey and the Geological Survey of Canada released the results of a co-operative study of lake sediment and water geochemistry for an area which included much of the western half of the Sault Ste. Marie District (see Figure 1). Two open file reports (ODM-GSC 1979a and ODM-GSC 1979b) each with 16 maps include data on the content of Zn, Cu, Pb, Ni, Co, Ag, Mn, As, Mo, Fe, and U in lake sediment as well as the U, and F content and Ph of lake water.

NORTHEASTERN—SAULT STE. MARIE

The reports have been especially useful to scientists of Environment Canada at Sault Ste. Marie who are engaged in the study of acid rain. The pH data in particular has allowed specific problem areas to be identified and has aided in the selection of headwater lakes for detailed studies.

Ontario Geological Survey Activities

R.P. Sage mapped McMurray and Lastheels Townships in the Wawa area during the summer of 1979. Mapping was done at ¼ mile to the inch (1:15 840) (B, Figure 1).

The Rotunda Lake-Percy Lake map-area was mapped by B. C. Wilson at a scale of ¼ mile to the inch (1:15 840). The area is located about 62 miles (100 km) north-northeast of Sault Ste. Marie (C, Figure 1).

Brief descriptions of the results of the above work are published in the Summary of Field Work, 1979, Ontario Geological Survey, Miscellaneous Paper 90.

Recent Publications

Card, K.D.

1979: Regional Geological Synthesis, Central Superior Province; Geological Survey of Canada, Paper 79-1A, Current Research, p. 87-90.

Coker, W.B. and Shilts, W.W.

1979: Lacustrine Geochemistry Around the North Shore of Lake Superior: Implications for Evaluation of the Effects of Acid Precipitation; Geological Survey of Canada, Paper 79-1C, Current Research, p.1-15.

Erdosh, G.

1979: The Ontario Carbonatite Province and its Phosphate Potential; Economic Geology, Vol. 74, p.331-338.

Hester, K.D.

1979: Current Developments of Rio Algom, Elliot Lake; Canadian Mining and Metallurgical, Bulletin, Vol. 72, no. 304, p.181-188.

Johnson, T.C.

1979: Silica in Lake Superior: Mass Balance Considerations and a Model for Dynamic Response to Eutrophication; Geochimica et Cosmochimica Acta, Vol. 43, p. 77-91.

LaRocque, E., and Pakkala, E.

1979: Current Leaching and Product Recovery Practice at Denison Mines Limited; Canadian Mining and Metallurgical, Bulletin, Vol. 72, no. 304, p.172-176.

Massey, N.W.D.

1979: Keweenaw Paleomagnetic Reversals at Mamainse Point, Ontario: Fault Repetition or Three Reversals?; Canadian Journal of Earth Sciences, Vol. 16, no. 2, p.373-375.

McLennan, S.M., Fryer, B.J. and Young, G.M.

1979a: The Geochemistry of the Carbonate-Rich Espanola Formation (Huronian) with Emphasis on the Rare Earth Elements; Canadian Journal of Earth Sciences, Vol. 16, no. 2, p.230-239.

1979b: Rare Earth Elements in Huronian Sedimentary Rocks; Composition and Evolution of the Post-Kenoran Upper Crust; Geochimica et Cosmochimica Acta, Vol. 43, p.375-388.

Moffat, D.

1979: Characterization and Disposal of Radioactive Effluents from Uranium Mining; Canadian Mining and Metallurgical Bulletin, Vol. 72, no. 806, p.152-156.

Morris, W.A.

1979: A Positive Contact Test between Nipissing Diabase and Gowganda Argillites; Canadian Journal of Earth Sciences, Vol. 16, no. 3, Part 1, p.607-611.

Pearson, W.N.

1979: Copper Metallogeny, North Shore Region of Lake Huron, Ontario; Geological Survey of Canada, Paper 79-1A, Current Research, p.289-304.

Raicevic, D.

1979: Decontamination of Elliot Lake Uranium Tailings; Canadian Mining and Metallurgical, Bulletin, August, p.109-115.

Ruzicka, V.

1979: Uranium and Thorium in Canada, 1970; Geological Survey of Canada, Paper 79-1A, Current Research, p.139-155.

Stenning, G.

1979: High Volume Ventilation at Denison Mines Limited; Canadian Mining and Metallurgical, Bulletin, Vol. 72, no. 801, p.95-99.

Theis, N.J.

1979: Uranium-Bearing and Associated Minerals in Their Geochemical and Sedimentological Context, Elliot Lake, Ontario; Geological Survey of Canada, Bulletin 304, 50p.

TABLE 3 MAPS AND REPORTS PERTAINING TO THE SAULT STE. MARIE MINING DIVISION, ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1979. "SEE LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS

OPEN FILE REPORTS	PRELIMINARY MAPS
OFR 5266	P.2231
OFR 5267	P.2235
OFR 5274	P.2241
OFR 5277	P.2302
OFR 5283	P.2303
MINERAL DEPOSITS CIRCULAR	MISCELLANEOUS PAPERS
MDC 19	MP84
	MP87
FINAL COLOURED MAPS	
2419	
2426	
FEDERAL-PROVINCIAL URANIUM RECONNAISSANCE PROGRAM	
Chapleau Sheet (410) Maps 80334 to 80371	
Foleyet Sheet (42B) Maps 80242 to 80279	

References Cited

- Bennett, G.
1979: The McGregor Road Breccia Zone, Plummer Additional Township, and Huronian Volcanism, Districts of Algoma and Sudbury; p.82-85 in Summary of Field Work, 1979, by the Ontario Geological Survey; edited by V. G. Milne, O. L. White, R. B. Barlow, and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.
- Frarey, M.J.
1977: Geology of the Huronian Belt Between Sault Ste. Marie and Blihd River, Ontario; Geological Survey of Canada Memoir 383, 87p.
- Innes, D.G. and Colvine, A.C.
1979: Metallogenic Development of the Eastern Part of the Southern Province of Ontario; p.184-189 in Summary of Field Work, 1979 by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow, and C. R. Kustra; Ontario Geological Survey, Miscellaneous Paper 90, 245p.
- OGS-GSC
1979: Regional Lake Sediment and Water Geochemical Reconnaissance Data Eastern Shore Lake Superior, Ontario NTS 41K, 41N, Ontario Geological Survey Open File Report 5266, 56p., 16 maps. Scale 1:250 000.
- 1979b: Regional Lake Sediment and Water Geochemical Reconnaissance Data Eastern Shore Lake Superior, Ontario; NTS 42C, 42F (S-2); Ontario Geological Survey Open File Report 5267, 85 p., 16 maps. Scale 1:250 000.
- Robinson, D.J.
1977: The Prace Pb-Zn-Ag Deposit; unpubl. B.Sc. Thesis, University of Western Ontario, London, Ontario, 54p.

TABLE 1 **Assessment Work and other information received in 1979**

Sault Ste. Marie Mining Division

Abbreviations

A	- Airborne	IP	- Induced Polarization
Assess.	- Assessment Work	Mag	- Magnetometer
CS	- Core Samples	OSC	- Ontario Securities Commission
D	- Donated by Company or Individual	Pros.	- Prospectus
DDH	- Diamond Drill Hole	RA	- Radioactive, Radiometric
DN	- Dip Needle Survey	SA	- Assaying
EM	- Electromagnetic	Tr	- Trenching
G	- Ground	VLF	- Very Low Frequency
GL	- Geological		

Township or Claim Map Area	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File No.	Local File No.
Abotossaway	Superior Acid & Iron Ltd.	Pyrite	D	R) & L)-Performance	1956,1969		SSM-1772
Aguonie	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Buckles	Superior Northwest Inc.	U	Assess.	AMag & ARA	1977	2.2820	SSM-1979
Chabanel	Canabec Explorations Inc.	Base Metals	Assess.	GVLf EM	1977	2.2580	SSM-1953
Corbiere	Holdsworth Mining Co. Ltd.	Au	D	22 DDH (11,488.5')	1918,19		SSM-278
Cowie	Reed Property	Au	D	GL	1930		SSM-1980
Davieaux	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Esquega	Reed Property	U	D	GL	1930		SSM-1980
Finan	Algoma Ore Properties Ltd.	Fe	D	GL, 4 DDH (2,393')	1954		SSM-2025
	Gulf Minerals Canada Ltd.	Base Metals	Assess.	GL	1977	2.2709	SSM-1892
	Gulf Minerals Canada Ltd.	Base Metals	Assess.	GEM	1978	2.2706	SSM-1892
Gaiashk	North American Nuclear Ltd.	U	Assess.	ARA & AMag	1977	2.2755	SSM-1792
	Superior Northwest Inc.	U	Assess.	AMag & ARA	1977	2.2820	SSM-1979
Gladstone	Midpines Explorations Inc.	Cu	Assess.	5 DDH (1,142.6')	1977,78		SSM-1912
Gunterman	MacGregor, R. A.		Assess.	GVLf EM	1978	2.2862	SSM-1859
Jacobson	Gulf Minerals Canada Ltd.	Base Metals	Assess.	GL	1977	2.2709	SSM-1892
	Gulf Minerals Canada Ltd.	Base Metals	Assess.	GEM	1978	2.2706	SSM-1892
Jogues	Fort Norman Explorations Inc.	U	Assess.	3 DDH (4,443')	1978		SSM-1915
Joubin	North American Nuclear Ltd.	U	Assess.	ARA & AMag	1977	2.2755	SSM-1792
	Superior Northwest Inc.	U	Assess.	AMag & ARA	1977	2.2820	SSM-1979
Kamichisitit	Ram Petroleum Ltd.	U	Assess.	1 DDH (5,759')	1978,79		SSM-1986
Killins	Algoma Ore Properties Ltd.	Fe	D	GMag & GRA	1954,55		SSM-1977
	Acme Gas & Oil Company Ltd.	Base Metals	D	Mag & VLF EM & Soil Surv. SA	1969		SSM-970

NORTHEASTERN—SAULT STE. MARIE

Table 1 continued

Township or Claim Map Area	File Name	Commodity Sought	Type of Report	Type of Work Performed	Date of Work	Toronto File No.	Local File No.
Knically	Algoma Ore Properties Ltd.	Fe	D	GMag & GRA	1954,55		SSM-1977
Lastheels	International Ranwick Mines Ltd.	U	D	Pros.	1958,1964		SSM-945
Lehman	Superior Northwest Inc.	U	Assess.	AMag & ARA	1977	2.2820	SSM-1979
Macaskill	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Naveau	Gemmell, J. W.	Au,Base Metals	Assess.	GVLf & GEM	1978	2.2753	SSM-1974
	Canabec Explorations Ltd.	Au,Base Metals	Assess.	GVLf & GEM	1979	2.2921	SSM-2021
Olsen	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Rabazo	Gemmell, J. W.	Au,Base Metals	Assess.	GVLf & GEM	1978	2.2753	SSM-1974
	Canabec Explorations Ltd.	Au,Base Metals	Assess.	GVLf & GEM	1979	2.2921	SSM-2021
	Canabec Explorations Ltd.	Au,Base Metals	Assess.	3 DDH (1,1625')	1979		SSM-2021
St. Joseph Is.	Ont. Ministry of Natural Resources		D	R)Reconnaissance S.	1979		SSM-2019
Schembri	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Scriven	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Slater	Campbell, R.	U	D	Historical Notes, Theano Point	1948		SSM-2012
Stover	Carbrew Explorations Ltd.	Au	Assess.	1 DDH (318')	1978		SSM-1978
Tronsen	Algoma Ore Properties Ltd.	U	D	GMag & GRA	1954,55		SSM-1977
Plan M-8, Abbie Lake	Noranda Explorations Co. Ltd.	Base Metals	Assess.	GEM & GMag	1978	2.2904	SSM-1935
Plan M-12, David Lake	Noranda Explorations Co. Ltd.	Base Metals	Assess.	GEM & GMag	1977,78	2.2734	SSM-1935

TABLE 2 Exploration Activity in 1979

The following is a list of individuals and companies known to be engaged in exploration within the Sault Ste. Marie Mining Division in 1979, and the type of work undertaken in each case.

Number on Figure 1	Individual or Company	Activity
1	Joint Venture - Cessland Corp. Ltd., Augdome Corp. Ltd., Resolute Petroleum Ltd., and Fort Norman Explorations Ltd.	Drilling, uranium prospect, Jogues Township.
2	Raylloyd Mines and Explorations Ltd.	Drilling, uranium prospect, Kamichisitit Township.
3	Canabec Explorations Ltd.	Drilling and geophysical survey, gold prospect, Rabazo and Naveau Townships.
4	Algoma Steel Corporation Ltd.	Mapping and prospecting, Wawa area.
5	Kerr-Addison Mines Ltd.	Prospecting, Thessalon area.
6	Falconbridge Copper Ltd.	Reconnaissance geology and prospecting, Wawa area.
7	Noranda Mines Ltd.	Drilling, base metals, Keating Township.
8	Algoma Steel Corporation Ltd.	Staking, mapping, copper showing, Debassige Township.
9	Amax Explorations Inc.	Trenching, molybdenite prospect, Lastheels Township.
10	DK Syndicate	Surface exploration, Tribag Mine, Nicolet and Norberg Townships.
11	Mattagami Lake Exploration Ltd.	Geological mapping and electromagnetic survey, silver prospect, Deroche Township.
12	Firespur Explorations Ltd.	Trenching, mapping and geophysics, Cu-Ni prospect, Esquega Township.
13	Triangle Explorations Ltd.	Drilling, uranium prospect, Johnson Township.

1979 Report of Sudbury Resident Geologist

J.M. Martins¹, R.E. Horst², and P.E. Giblin³

Contents

Introduction	103
Resident Geologist's Activities	103
Mining Activities	103
Copper-Nickel	103
Iron	109
Uranium	109
Industrial Minerals	109
Exploration Activities	109
Ontario Geological Activities	110
Some Recent Publications	110
McLean-Watt Gold Property	111

Tables

1 - Maps and Reports Pertaining to the Sudbury Resident Geologist's District Issued by the Ontario Geological Survey in 1979	108
2 - Exploration Activity in 1979	114
3 - Assessment Work and Other Information Received in 1979	115
4 - Trace element, rare earth and carbon analysis of samples from the McLean-Watt gold property	116
5 - Major element analysis of samples from the McLean-Watt property	115

Figures

1 - Sudbury Resident Geologist's District	104
2 - Sudbury Resident Geologist's District	105
3 - Sudbury Nickel Irruptive Area	106
4 - McLean-Watt Property (east-west zone), Scadding Township	107

Introduction

Mining activity in the area was high lighted by the resumption of normal operations at Inco Metals Company, a division of INCO Limited, following an 8½ month strike, and by the reopening of several mines operated by Falconbridge Nickel Mines Limited which had been closed in 1978.

1 Resource Geologist, Ministry of Natural Resources, 1112 The Kingsway, Sudbury, P3B 2E5.

2 Senior Geologist, Ministry of Natural Resources, 458 Central Ave., London, N6B 2E5.

3 Resident Geologist, Ministry of Natural Resources, 1112 The Kingsway, Sudbury, P3B 2E5.

Canadian Alloys Division of INCO Limited began production of coinage strip at a new plant near Sudbury. Development of a new quarry for the production of crushed dolomite aggregate was started on Manitoulin Island by Seeley and Arnill Construction Limited.

Less positive developments were the closure of the Moose Mountain Mine of National Steel Corporation of Canada, and the announced phasing-out of operations at Agnew Lake Mines Limited.

The Sudbury District continued to experience a reduced level of exploration activity in 1979, with only 694 claims recorded during the year.

A new and promising gold discovery was made late in 1978 in Scadding Township, 35 km northeast of Sudbury, by P. C. McLean and D. R. Watt.

Resident Geologist's Activities

During most of 1979 the Sudbury office was without a Resident Geologist following the resignation of W. O. Karvinen at the end of 1978. R. E. Horst continued as Resource Geologist until the end of August. In November P. E. Giblin took over as Resident Geologist, and J. M. Martins commenced duties as Resource Geologist. Y. M. Paquette continued to fill the position of Secretary.

In addition to normal duties the staff was engaged in a detailed study of the McLean Gold Showing in Scadding Township, and in various land use planning projects.

Mining Activities

The reduced production and processing of copper-nickel ores in 1978 due to depressed markets and labour disputes came to an end, and 1979 saw a positive change for the two major operators in the Sudbury area, INCO Limited (Inco Metals Company) and Falconbridge Nickel Mines Limited.

Copper-Nickel

Sudbury's major operators run three principal businesses: primary metals; electrical energy and related pro-

NORTHEASTERN—SUDBURY

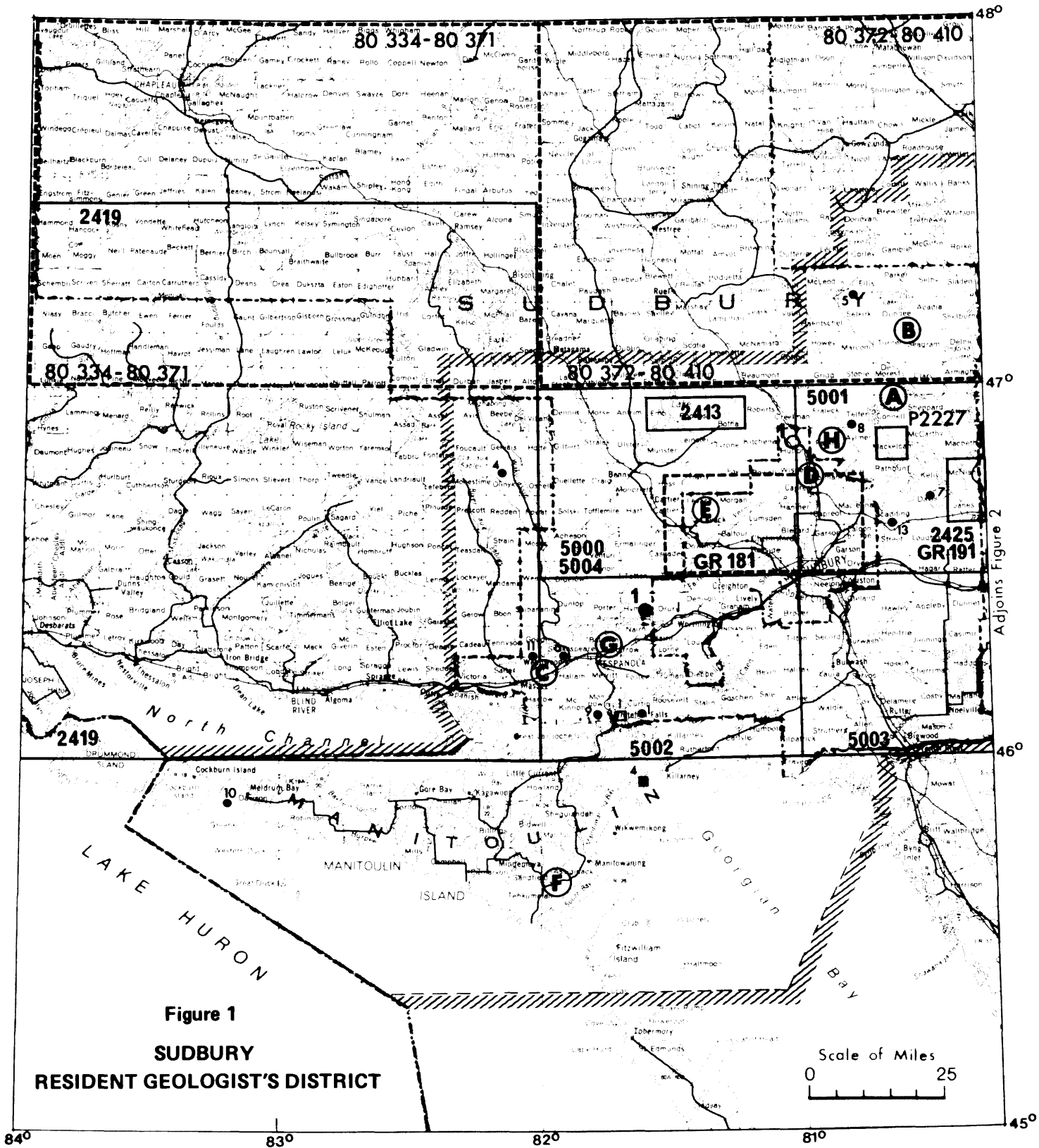


Figure 1
SUDBURY
RESIDENT GEOLOGIST'S DISTRICT

Adjoins Figure 2

EXPLANATION

- Exploration activity in 1979 (keyed to Table 2)
- Ⓐ Location of OGS field party in 1979.
- ▨ Boundary of Resident Geologist's district.
- ==== Map or report issued by the Ontario Geological Survey (keyed to Table 1)
- P. - Preliminary Map.
- 2413 - Coloured Map.
- GR - OGS Report.
- 80334 - Geophysical/Geochemical Series.

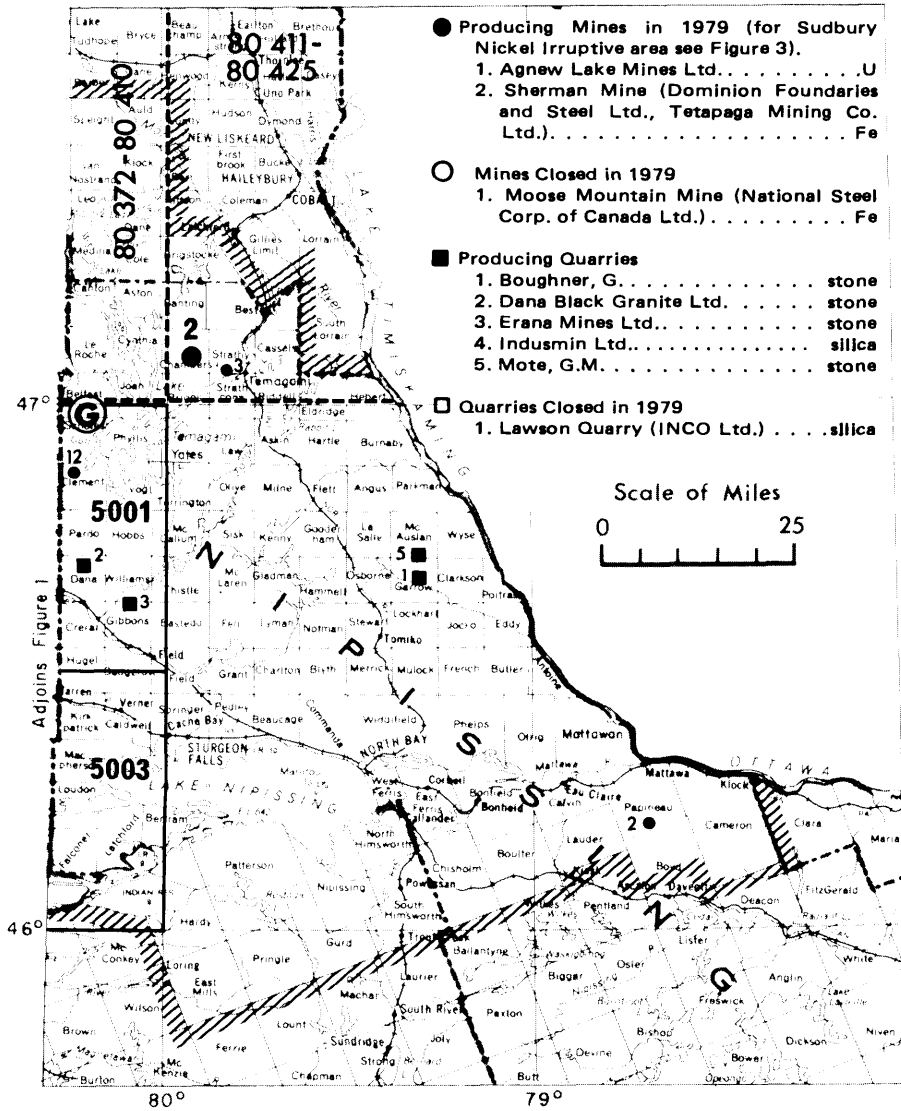


Figure 2
SUDBURY RESIDENT GEOLOGIST'S DISTRICT

NORTHEASTERN—SUDBURY

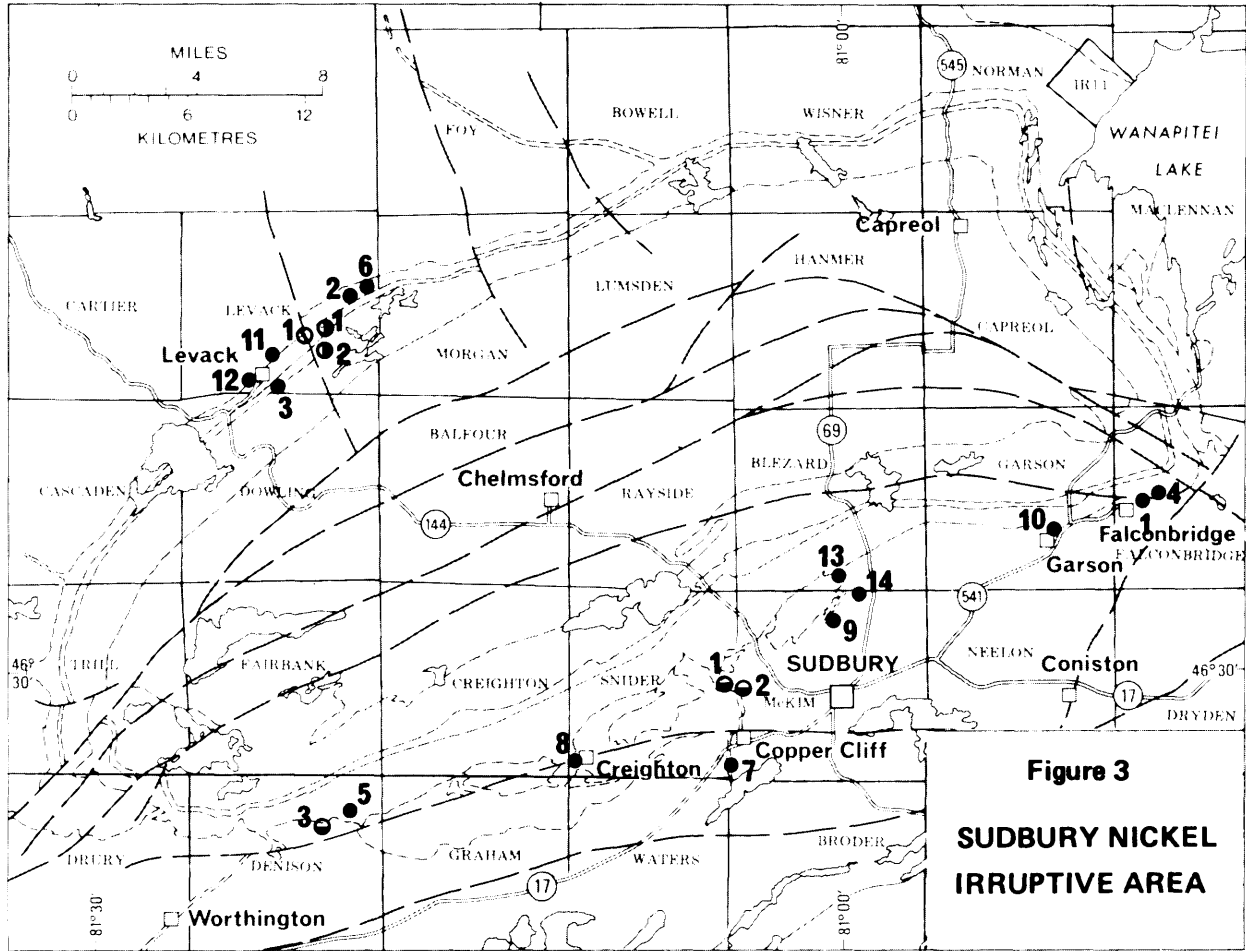


Figure 3
SUDBURY NICKEL
IRRUPTIVE AREA

EXPLANATION

- **Producing Mines**
 - Falconbridge Nickel Mines Ltd. Ni,Cu,Pt,Co,Au,Ag
 - 1. Falconbridge Mine
 - 2. Strathcona Mine
 - 3. Onaping Mine
 - 4. East Mine
 - 5. Lockerby Mine
 - INCO Ltd. (Inco Metals Co.) . . . Ni,Cu,Pt,St,Te, Co,Au,Ag,Fe
 - 6. Coleman Mine
 - 7. Copper Cliff South Mine
 - 8. Creighton Mine
 - 9. Froid Mine
 - 10. Garson Mine
 - 11. Levack Mine
 - 12. Levack West Mine
 - 13. Little Stobie Mine
 - 14. Stobie Mine
- **Mines under development**
 - Falconbridge Nickel Mines Ltd.
 - 1. Fraser Mine
 - 2. North Mine
- ◐ **Mines on Care & Maintenance Basis**
 - INCO Ltd. (Inco Metals Co.)
 - 1. Clarabelle No. 2 open pit
 - 2. Copper Cliff North
 - 3. Green Hill
- ⊙ **Other**
 - Falconbridge Nickel Mines Ltd.
 - 1. Fecunis ore traded to INCO in 1978 in exchange for Levack Mine ore adjacent to Strathcona Mine

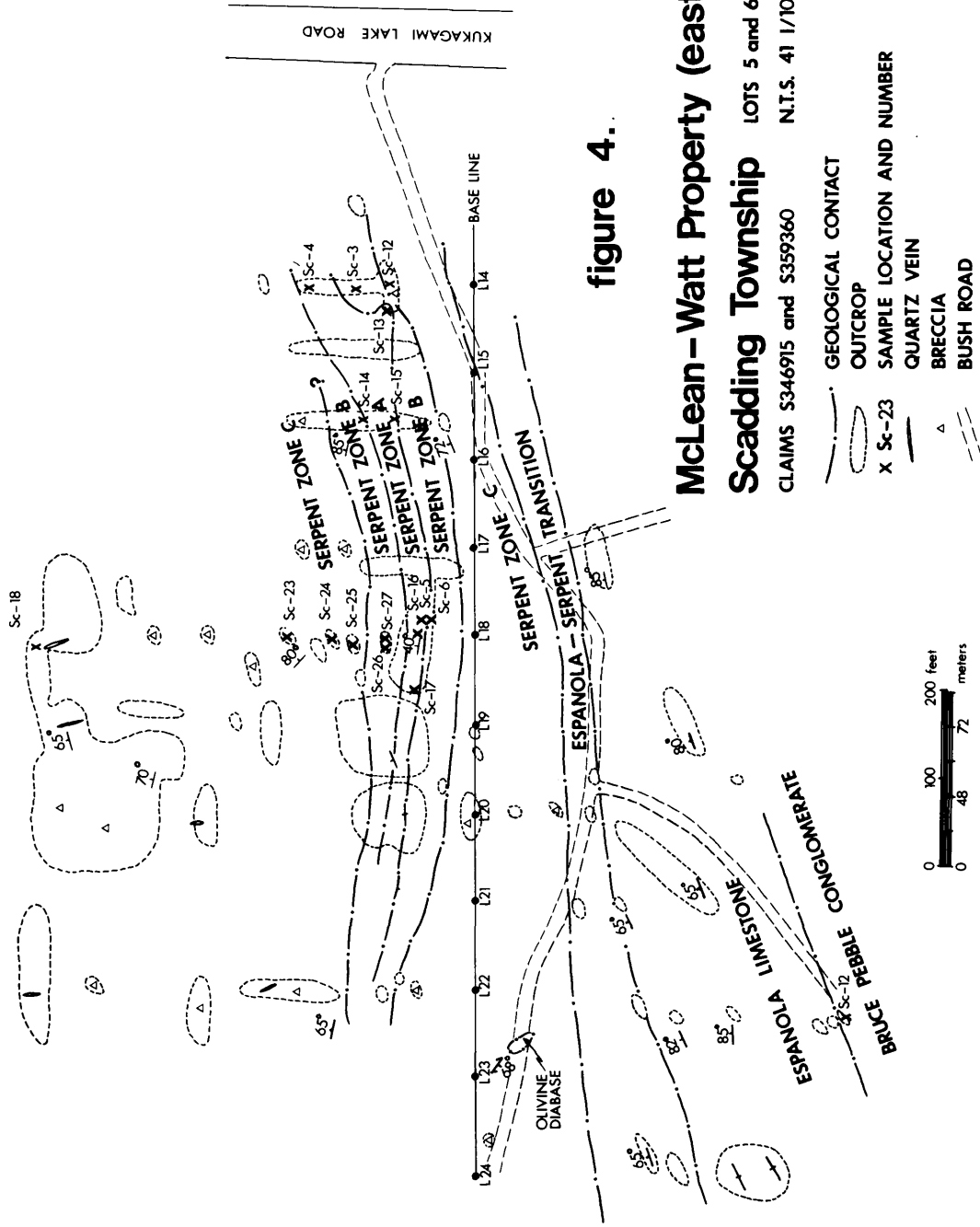


figure 4.

McLean - Watt Property (east - west zone)

Scadding Township LOTS 5 and 6, CONCESSION II
CLAIMS S346915 and S359360 N.I.S. 41 1/10

- GEOLOGICAL CONTACT
- OUTCROP
- X Sc-23 SAMPLE LOCATION AND NUMBER
- △ QUARTZ VEIN
- △ BRECCIA
- BUSH ROAD

By Rae Horst, July 1979

NORTHEASTERN—SUDBURY

ducts; and formed metals. Nickel, copper, cobalt, gold, silver, platinum, palladium, iridium, rhodium, lead, iron, zinc, cadmium, selenium, and tellurium are produced by INCO and Falconbridge.

INCO Limited resumed operations after an 8½ month strike which ended in June. Operations had returned to normal by November. Ore was derived from 9 mines: the Coleman, Copper Cliff South, Creighton, Frood, Garson, Levack, Levack West, Little Stobie, and Stobie Mines (for locations see Figure 3). The company plans to continue production at current levels to maintain an annual production rate of 270-300 million pounds of nickel, and to keep inventory levels at 2-3 months supply. Projections for 1980 are for the extraction of 48 000 tons of ore per day, 5 days a week, with an overall grade of 2.5 - 2.75 percent combined nickel-copper. INCO reserves in Sudbury are recorded as approximately 325 million tons of ore containing 4.8 million tons of nickel and 4.0 million tons of copper (Inco Metals Company, Media Information bulletin, September 18, 1979).

No major changes in production methods occurred during the year, although there is an overall trend toward electrification of equipment.

The iron ore recovery plant (which produces iron ore pellets and chemical grade nickel oxide) was shut-down from July to September as a result of a strike by employees of Canadian Industries Limited, which uses by-product sulphur dioxide from the plant to make sulphuric acid.

In September INCO officially opened its Canadian Alloys Division rolling mill in Walden, near Sudbury. The plant, built at a cost of \$25 million, produces strip for coinage and other applications.

The company plans to make capital expenditures over the next 4 years of the order of \$41 million a year for its mines and \$3.5 million a year for its mills.

At the beginning of 1979 Falconbridge Nickel Mines Limited had only two mines in operation (Falconbridge and Strathcona), a legacy of the cutbacks of 1977 and 1978. Improvements in market conditions have prompted the company to reopen shut-down facilities, and 100 percent production will be achieved in 1980. At the end of 1979 Onaping Mine was back in production and Lockerby Mine is scheduled to be reopened at this time. The facility will operate at 60 percent capacity, increasing to 100 percent by the end of 1980. Ore will be shipped to the Strathcona Mill in Onaping Falls for processing. Work at East Mine continues and will increase to full production by 1980. North Mine will also be reactivated next year. Fraser Mine will be developed to production in 1981. The underground exploration program in the Craig ore zone adjacent to Onaping Mine is being expanded, and the development of the rich copper zone at Strathcona continues.

The Smelter Environment Improvement Project (SEIP) completed in 1978 continues to operate successfully, with the second of the two electric furnaces being heated up in December to be brought on line in early 1980.

During the summer the Falconbridge smelter was shut-down for 2 weeks, and other parts of the operation for 3 weeks, as compared with 6 weeks in 1978. The Falconbridge Mill, which was operating on a 5-day week, was increased to a 7-day operation during the second half of the year. It has a capacity of 3000 tons per day and Strathcona Mill operates at 8500 tons per day capacity.

The proven and probable reserves in Sudbury mines owned by Falconbridge are quoted as 78 808 000 tons averaging 1.4 percent nickel and 0.78 percent copper (Canadian Mines Handbook, 1979-80).

TABLE 1

MAPS AND REPORTS PERTAINING TO THE SUDBURY RESIDENT GEOLOGIST'S DIVISION ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1979

ONTARIO GEOLOGICAL SURVEY REPORTS

Report 181
Report 191

MISCELLANEOUS PAPERS

MP 82
MP 83
MP 84
MP 87
MP 90

MINERAL DEPOSITS CIRCULARS

MDC 18
MDC 19

PRELIMINARY MAPS

F.2227

GEOPHYSICAL/GEOCHEMICAL SERIES MAPS

80334 - 80371
80372 - 80410
80411 - 80425

COLOURED MAPS

5000
5001
5002
5003
5004
2413
2419
2425

ONTARIO MINERAL POLICY BACKGROUND PAPER

Paper No.7

Iron

Moose Mountain Mine and pelletizing plant near Capreol, owned by National Steel Corporation of Canada Limited, ceased operations in May. An international glut of iron and the low quality of the ore produced at the open pit facility were cited as reasons for the closure (Northern Miner, March 28). The mine had a life expectancy of 12-14 years with an annual production of 650 000 tons of pellets. The stockpile at closure was 100 000 tons for final delivery. Two hundred and fifty people were laid off.

The remaining iron producer in the region, Dofasco's Sherman Mine, continues production. It is one of only 5 remaining iron producers in Ontario and has the lowest grade iron formation in the country, with 20.5 percent recoverable magnetic iron of the total 25 percent soluble iron content. The life of the mine is projected at 25 years. Four open pits surround the processing plant located north of Temagami. Mining in North Pit will finish by the end of 1979. West and South pits are at present being stripped. Mining of East Pit is scheduled to begin in 1983. Annual production from the Sherman Mine is about 1 million tons of pellets.

Uranium

The only uranium producer in the region, Agnew Lake Mines Limited, is ceasing operations. Kerr Addison Mines Limited, which controls Agnew Lake, announced in September that mining activities will be gradually curtailed over six months, and then discontinued. The property will be placed on a salvage leach basis to recover uranium from existing broken rock. Since initial operations began in June 1977, production has averaged less than 40 percent of designed capacity due to the low rate of extraction of uranium from the ore. Costs have consistently exceeded market prices. Four hundred and thirty-five jobs will be lost although some workers will be offered employment with Noranda group operations elsewhere.

Industrial Minerals

The Lawson Quarry, situated 65 km southwest of Sudbury, has been producing silica for use as flux in INCO's Copper Cliff smelter for over 30 years. In July INCO shut down the quarry, citing metallurgical and economic reasons for the closure. The employees will be transferred to other area operations. INCO will now transport sand from the Garson sand pit for use as flux in the smelter.

Indusmin Limited continues to quarry Bar River Formation quartzite on Badgeley Island in Georgian Bay. The product is used in the manufacture of glass, and also in the steel industry. Production has averaged 400 000 tons annually since the quarry was opened in 1970. The

projected life expectancy is 28 years, with reserves of 14 000 000 tons (Canadian Mines Handbook, 1979-80).

Seeley and Arnill Construction Limited carried out drilling on a dolomite deposit located in Dawson Township, at the west end of Manitoulin Island. The company is developing a quarry and constructing loading facilities at the site. It is planned to ship crushed dolomite aggregate to southern Ontario.

Decorative stone was quarried intermittently by several operators in River Valley and North Bay areas.

Exploration Activities

INCO Limited and Falconbridge Nickel Mines Limited carried out surface exploration for copper-nickel deposits at several localities in the vicinity of Sudbury. The former company announced that it plans continuing expenditures in the Sudbury area of between \$7 million and \$8 million a year in an on-going exploration program.

Most other exploration activity was concentrated on gold deposits.

P. C. McLean and D. R. Watt announced the discovery of a new gold occurrence in Scadding Township, 35 km northeast of Sudbury. Gold mineralization occurs in chloritized, carbonatized rocks of the Serpent and Espanola Formations, within what appear to be diatreme breccia bodies. One occurrence on the property is described in more detail by R. E. Horst in another section of this report. In 1979 approximately 3300 m of diamond drilling were completed on the property.

Several of the long-known gold occurrences in the area received further attention. Groundstar Resources Limited carried out drilling on the gold-copper-cobalt prospect of the former Norstar Mine in Davis Township. International Obaska Mines Limited carried out drilling at the site of the McMillan Mine, a former gold producer located in Mongowin Township. Adits of the Shakespeare Mine, a former gold producer in Shakespeare Township, were reopened by J. Galbraith in preparation for further exploration. Aggressive Mining Limited carried out drilling on a base and precious-metals prospect in Curtin Township.

Some work was directed towards evaluation of the placer gold deposits of the Vermilion River near Sudbury. Several companies expressed interest in evaluating the tailings and waste rock dumps of former gold mines in the Espanola-Sudbury-Lake Wanapitei area.

Relatively little interest was evident in exploration for uranium. In a uranium exploration program INCO Limited drilled a deep hole in the Huronian section north of Lake Wanapitei in Telfer Township.

Seeley and Arnill Construction Limited carried out drilling on a dolomite prospect in the Silurian Amabel Formation located in Dawson Township, at the west end of Manitoulin Island.

Ontario Geological Survey Activities

Several field parties from the Precambrian Geology Section operated in the region in 1979. B. O. Dressler completed the mapping of McConnell Township initiated in 1977. Two thirds of Demorest and most of Telfer townships were also mapped (A, Figure 1).

The first phase of a program to study Huronian stratigraphy within the Cobalt Embayment was carried out by J. Wood (B, Figure 2). G. Bennett examined an area of Huronian volcanism near Massey (C, Figure 1). An area 28 km north of Sudbury was mapped by T. L. Muir, and included the townships of Wisner and Norman. The north half of Capreol Township was also mapped (D, Figure 1). B. O. Dressler began a 4-year project involving a detailed study of the footwall of the Sudbury Irruption, and of the ore-bearing sublayer. During the 1979 field season two sectors in the North Range, and one in the East Range were studied (E, Figure 1).

M. D. Johnson of the Engineering and Terrain Geology Section continued the special project on Manitoulin Island to assess the limestone and dolostone resource capacity. During the summer of 1979 the geological mapping of the Paleozoic rocks in the southern and eastern parts of the Island was completed (F, Fig.1). Six diamond drill holes were scheduled for the fall of this year to augment the ten cored in 1978.

In the Mineral Deposits Section D. G. Innes and A. C. Colvine continued their investigations of the metallogenic development of the eastern part of the Southern Province (G, Fig. 1,2). H. D. Meyn commenced a two-year special project to examine the uranium deposits north-west of Lake Wanapitei and in the southern part of the Cobalt Embayment (H, Figure 1).

Some Recent Publications

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- Bennett, G., and Innes, D. G.
1979: Huronian Volcanic Rocks, North Shore Lake Huron, Ontario. p.8 *in* Abstracts, Technical Sessions, 25th Annual Institute on Lake Superior Geology, Duluth, Minnesota, 42p.
- Card, K. D.
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1978: Benny Greenstone Belt; *Canadian Geophysical Bulletin*, Vol. 31, p.126.
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1978: Paleogeological Succession Leading to a Late Ordovician Biostrome on Manitoulin Island, Ontario; *Canadian Journal of Earth Sciences*, Vol.15, p.1987-2005.
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- Crockett, J. H.
1979: Platinum-Group Elements in Mafic and Ultramafic Rocks: a Survey; *Canadian Mineralogist*, Vol.17, p.391-401.
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- Long, D. G. F.
1978: Depositional Environments of a Thick Proterozoic Sandstone: The (Huronian) Mississagi Formation of Ontario, Canada; *Canadian Journal of Earth Sciences*, Vol.15, p.190-206.
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- Naldrett, A. J.
1979: Nickel Sulphide and Platinum-Group-Element Deposits; *Canadian Mineralogist*, Vol.17, p.141-145.
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McLean-Watt Gold Property

Introduction

Two types of gold mineralization associated with Nipissing Diabase have been detected in Scadding Township - those in quartz-carbonate veins and those associated with breccia pipes. An OGS project was begun in May, 1979 to investigate the second type of gold occurrence and through detailed mapping of several deposits to establish an exploration model. One property chosen for examination is located in Scadding Township, 5 km north of the railroad track and west of Kukagami Lake Road in lots 5 and 6 of Concession II. The claims are currently held by the McLean-Watt group under option from Gulf Minerals Canada Limited.

Previous Work

In 1973 Gulf conducted airborne radiometric, magnetometer and electromagnetic surveys over the property. Diamond drilling carried out by Gulf in the period 1973 indicated 34,000 tons of material grading 0.303 ounces of gold per ton within an east-west trending chlorite breccia zone on claims S346915 and S359360. From 1975 to 1978 drilling, first by Gulf and later by the McLean-Watt group, delineated a new northwest trending zone of mineralization 600 feet west of the original deposit. By October 1978 gold values had been found over a length of 1400 feet. Results of surveys and drill logs are available in the assessment files of the Sudbury Resident Geologist's office. Additional drilling in the fall of 1979 by the McLean-Watt group extended the northwest zone of mineralization (personal communication, P.C. McLean, December 1979). This study is confined to the east-west zone.

Regional Geological Setting

Scadding Township was mapped in 1956-1959 by J. Thomson and in 1978-1979 by B. Dressler both of the OGS. Early Precambrian mafic metavolcanics, metasediments, biotite-plagioclase gneisses, granitic rocks, and diabases underlie part of western Scadding Township.

These are unconformably overlain by Middle Precambrian sedimentary rocks of the Huronian Supergroup consisting of:

- (i) Mississagi Formation quartz pebble conglomerate, arkose and quartz-sandstone in southern Scadding Township
- (ii) Bruce pebble conglomerate in eastern and central Scadding Township
- (iii) Espanola limestone and siltstone and Serpent arkose in central Scadding Township
- (iv) Gowganda arkose and greywacke in central and northern Scadding Township

The sedimentary rocks were intruded by Nipissing-type gabbro - a medium to coarse gabbro forming irregu-

larly shaped bodies, sills and dikes. One dike or sill is exposed less than one mile west, as well as ¼ mile south of the McLean-Watt property. A probable extension of this gabbro underlies the northwest and possibly the east-west mineralized zone of the McLean-Watt property.

The Huronian sediments south of Lake Wanapitei were presumably deposited in a paleovalley resulting from a major rift trending southeast from the lake terminating against the Grenville Front.

Detailed Geology (Figure 4)

The east-west zone of the McLean-Watt Property was mapped on a scale of 1 inch to 100 feet with a base line running east-west and cross lines spaced at 100 foot intervals. The strike is 75 degrees with an average dip of 68 degrees to the northwest.

No faults were obvious from surface mapping although P.C. McLean has interpreted several from drill data. In some cases interdigitating facies relationships at the Espanola-Serpent contact and resistance to weathering of certain units may be alternative interpretations to faulting.

The Serpent Formation outcrops on the north and central portions of the grid and is in gradational contact with the Espanola limestone further south. The Bruce Formation is also exposed on the southern portion of the grid.

An olivine diabase dike outcrops on L 23S, 0+50 feet S. Nipissing Diabase consisting of 40-60 percent pyroxene, 20-40 percent plagioclase, minor quartz and chlorite, intruded the Serpent and Espanola formations of the northwest zone but was not encountered in the shallower east-west zone drilling.

Rock Description (Figure 4)

Serpent Formation

Gold mineralization is most strongly concentrated in a highly chloritized, base metal-rich zone (Zone A) paralleling strike, approximately 100 feet north of the base line. North and south of Zone A the alteration decreases and two gradational zones (B and C) are distinguishable.

ZONE A

Zone A consists of two interbedded rock types: (i) a highly altered chlorite-, quartz-, base and precious metal-rich rock and (ii) well-bedded Zone B rocks (described in the next section). The first rock type is very coarsely crystalline and consists predominantly of chlorite (45 - <50 percent of the groundmass) and quartz in veins or as part of a coarsely recrystallized sometimes myrmekitic quartz-plagioclase groundmass (<50 percent of the groundmass). Opaques are sometimes poikilitic with quartz, plagioclase and chlorite inclusions and compose approximately 2 percent of the groundmass but up to 30 percent of the total rock. Minor carbonate, biotite,

NORTHEASTERN—SUDBURY

rounded apatite, and detrital zircons with subhedral outlines are also present. Zone A may be a more intensely altered phase of Zone B which consists of siliceous siltstone or siliceous subgreywacke where greywacke is defined as a feldspar-quartz sandstone with a pelitic matrix of more than 15-20 percent and subgreywacke is low in feldspar, rock chips or less angular grains. Alternately Zone A may contain more silt than B making it more susceptible to alteration and a better host for base and precious metals.

ZONE B (WELL-BEDDED SERPENT)

Zone B is typically well-bedded, white, grey or even pink, chloritic siliceous metasubgreywacke and rarely chloritic metasiltstone of the Serpent Formation. It consists of alternating laminae of sand- and silt-sized grains where the silt component is highly mineralized and chloritized. The rock is typically composed of 41 percent chlorite, 17 percent quartz, 4 percent plagioclase, 20 percent silt, 3 percent opaques, >15 percent stilpnomelane after biotite, minor apatite and ankerite. The stilpnomelane forms randomly oriented, radiating structures concentrated in the finer grained laminae. Veins of coarsely crystalline quartz, plagioclase, chlorite, ankerite, apatite, biotite, pyrite (rimmed by chlorite) and magnetite also occur. In some places the ankerite margin breaks down to calcite releasing Fe. Hematization occurs along some fractures. Brecciation and grain size increase while chlorite and opaques decrease toward Zone C.

ZONE C

Zone C consists of a pink, brecciated, siliceous meta-arkose and more commonly feldspathic metaorthoquartzite of the Serpent Formation. Angular breccia fragments are of cobble size. The groundmass comprises 80-95 percent of the total rock and consists of coarse-grained, subequal amounts of recrystallized quartz and plagioclase, tourmaline, and >1 percent opaques. Relict, rounded hematite-rich quartz and plagioclase clasts are visible. Porphyroblasts, comprising less than 20 percent of the total rock are ankerite (3 percent to 46 percent), chlorite (<5 percent), quartz (46 percent) and apatite.

The Espanola-Serpent Transition and Espanola Limestone

Calcareous feldspathic sandstone and siliceous limestone of the Espanola-Serpent transition typically contain 30 percent carbonate, 30 percent quartz and plagioclase, 40 percent amphibole (tremolite or actinolite) and apatite. Percentages of carbonate increase toward the south. Magnetite comprises 30 percent to 40 percent of some 6-8 inches thick beds and is more strongly concentrated along veins with euhedral ankerite, chlorite, apatite, pyrite and other opaques.

Mineralization

Gold with pyrite, chalcopyrite, pyrrhotite, arsenopyrite, magnetite, galena, minor silver, and very low palladium are most abundant in Zone A of the Serpent Formation and decrease towards Zone C. Low gold values were also reported in the Espanola-Serpent transition in McLean's northwest but not east-west trending zone. Trace element, rare earth and carbon analysis results are shown in Table 4.

Samples from highly altered Zone A rocks are not representative of true mineralization since the grain-size is extremely coarse and mineralization is patchy.

Chemical Analyses

The average composition of rocks in Zones B and C is compared in Table 5 indicating an increase in silica but a decrease in FeO, Fe₂O₃, TiO₂, MnO, S and H₂O+ from Zone B to C. This is due to either or both an enrichment of Zone B rocks by solutions from Nipissing Diabase at depth or a difference in the rock composition of Zones B and C.

Conclusions

- (i) Chloritization and mineralization is directly proportional to increased silt content in the Serpent Formation.
- (ii) Silt content decreases from Zone A to C.
- (iii) The pink Serpent colour results from fine Fe particles in the original quartz, plagioclase and silt grains and from remobilization of hematite along fractures.
- (iv) Brecciation results in rocks with a coarse-grained recrystallized quartz and plagioclase matrix and is typical of Zone C.
- (v) Zone A and B rocks with a silty matrix react plastically to temperature and pressure and are typically well-bedded.
- (vi) The environment of deposition of Zone A sediments probably favoured the unloading of heavy minerals such as subhedral zircons.
- (vii) Quartz, plagioclase, ankerite, chlorite, apatite, magnetite pyrite and other opaques were remobilized along fractures.

Mode of Origin

The probable depositional environment of the siliceous subgreywacke and siltstone facies (Zones A and B) of the Serpent Formation with its gold, magnetite, zircon, apatite, pyrite, pyrrhotite, chalcopyrite, galena and other heavy minerals was low-energy, lagoonal. A higher energy nearshore environment was host to the Serpent feldspathic orthoquartzite and siliceous arkose whereas the

Espanola limestone facies developed further offshore. These sedimentary rocks were intruded by Nipissing Diabase along a path of least resistance - the siliceous subgreywacke and siltstone near the Espanola-Serpent contact. Although no good Nipissing Diabase outcrops in the east-west mineralized zone, solutions from diabase at depth apparently penetrated the siltstone-siliceous subgreywacke facies. It is probably no coincidence that chemical compositions of Zone A rocks are very similar to those of Nipissing Diabase. Heat, pressure and solutions from the Nipissing Diabase remobilized and concentrated minerals indigenous to Serpent siliceous subgreywacke and siltstone and introduced metal-rich solutions that further enriched the sedimentary rocks. Some base metal deposition probably resulted from carbonate reduction. Metamorphosed Espanola limestone or organic carbon indigenous to the siltstone were possible carbonate sources. The intrusion caused brecciation, groundmass recrystallization and fracture-filling by quartz, carbonate, pyrite, magnetite, apatite, minor chlorite and minor gold within the brittle Serpent siliceous arkose and feldspathic orthoquartzite.

Thus the McLean-Watt deposit resulted from remobilization of indigenous low gold concentrations in Serpent siltstone and siliceous subgreywacke as well as enrich

ment from Nipissing Diabase.

Exploration Target

The exploration target is Serpent siltstone and siliceous subgreywacke (located near the Espanola-Serpent contact) intruded by Nipissing Diabase. The facies is poorly exposed since it weathers readily but has been mapped in Roberts, Foster and Scadding Townships.

Field indicators of the target are:

- (i) brecciated, pyritiferous or ankeritic Serpent white or pink siliceous arkose or feldspathic orthoquartzite
- (ii) chloritized Serpent sedimentary rock or
- (iii) massive to well-bedded, dark grey to black siliceous subgreywacke or siltstone of the Serpent Formation.

The hypothesis was tested northwest of Spar Lake where Nipissing Diabase is exposed near the Espanola-Serpent contact. Outcrop is poor, but low gold values (0.01 to 0.05 ounces per ton) increasing toward the Espanola-Serpent contact, occur in ankerite-rich feldspathic orthoquartzite with quartz veining. Similar geological environments are developed in younger rocks, for example the Gowganda Formation at the McMillan Gold Mine in Mongowin Township.

TABLE 2

Exploration activity in 1979

The following is a list of companies and individuals known to have conducted exploration within the Sudbury Resident Geologist's district in 1979, exclusive of exploration work on the Sudbury Nickel Irruptive. The numbers correspond to the numbered areas on Figures 1 and 2.

Number on Figure	Individual or Company	Activity
1.	Aggressive Mining Ltd.	Drilling, base and precious metals prospect, Curtin Township
2.	Bischoff, C. T.	Drilling, iron prospect, Papineau Township
3.	Cliffs of Canada Ltd.	Drilling, Strathcona and Strathy townships
4.	Crossan, P.	Drilling, Olinyk Township
5.	Demonsky, P.	Prospecting, decorative stone prospect, Ellis Township
6.	Galbraith, J.	Reopening of adits, gold prospect, Shakespeare Township
7.	Groundstar Resources Ltd.	Drilling, gold-copper-cobalt prospect, Davis Township
8.	INCO Ltd.	Drilling, uranium prospect, Telfer Township
9.	International Obaska Mines Ltd.	Drilling, gold prospect, Mongowin Township
10.	Seeley and Arnill Construction Ltd.	Drilling, dolomite aggregate prospect, Dawson Township
11.	Tintina Silver Mines Ltd.	Drilling, Gough Township
12.	Vaillancourt, R. A.	Drilling, gold-copper prospect, Clement Township
13.	Watt, R. R., and McLean, P. C.	Drilling, gold prospect, Scadding Township

TABLE 3 **Assessment Work and other information received in 1979**

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.
Clement	41 I/16	Vaillancourt, R. A.	Au, Cu	Assess.	DD 2-360'	1979	
Foster	41 I/4	Tamminen, T. & Alanen, Wm.	W	Assess.	GL	1978	2.2863
Gervais	41 J/16	Crossan, Pat		Assess.	DD 2-155'		
Gough	41 J/8	Tintina Silver Mines Ltd.	Cu	Assess.	DD 2-253'		
Mongowin	41 I/4	Burns Exploration Corp, Ike	U,Au	Assess.	GP	1978	2.2814
Nairn	41 I/5	Hollinger Mines Limited	Cu,Ni	Assess.	GL,GP,RA,EM	1978	2.2879
Nairn	41 I/5	Westfield Minerals Ltd.	U	Assess.	GL,GP,RA	1978	2.2581
Olinyk	41 J/16	Crossan, Pat		Assess.	DD 1-64'	1979	
Papineau	31 L/2	Bischoff, C. T.	Magnetite	Assess.	DD 1-105'	1979	
Roberts, Creelman	41 I/14	Ingamar Exploration Ltd.	U	Assess.	GL	1978	2.2853
Scadding	41 I/10	Watt, D. R.	Au	Assess.	DD 3-450'	1979	
Strathcona	31 M/4	Cliffs of Canada Ltd.	Fe	Assess.	DD 1-207'	1979	
Strathcona	31 M/4	Savard, Lionel	Cu,Au,Ag	Assess.	DD 3-1,308'	1978	
Strathcona	31 M/4	St. Joseph Explorations Ltd.	Cu,Au,Ag,Pb,Zn	Assess.	DD 2-429.15'	1978	
Strathy	31 M/4	Cliffs of Canada Ltd.	Fe	Assess.	DD 1-666'	1979	

TABLE 5 **Major element analysis of Samples from the McLean - Watt Property**

Sample #	Rock Name	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O	TiO ₂	P ₂ O ₅	MnO	CO ₂	S	H ₂ O+	H ₂ O-
Sc-3	chloritized siliceous subgreYWacke	62.7	11.5	9.46	1.75	1.71	.53	5.77	.22	.45	.12	.01	.32	7.70	.88	.39
Sc-13	"	46.5	16.9	3.70	13.2	7.39	0.30	4.20	0.00	.75	.12	0.06	.64	.26	5.64	.74
Sc-14	"	59.4	15.3	.20	10.4	3.26	.37	6.21	.05	.60	.15	.04	.20	.12	2.93	.39
Sc-26	"	51.5	16.0	3.50	14.6	4.15	.26	4.40	0.00	.64	.19	.05	.13	.04	4.55	.43
Sc-27	chloritized siliceous metasiltstone	64.6	15.0	0.00	1.66	2.49	3.44	7.84	.11	.61	.15	.05	3.65	.08	.37	.44
Sc-1	Chloritized siliceous SubgreYWacke	62.6	15.1	1.09	2.58	5.96	1.44	6.46	.46	.60	.14	.02	.72	.44	1.98	.29
Sc-23	feldspathic orthoquartzite	71.8	14.4	0.00	.83	1.82	.38	7.58	.48	.35	.12	.01	.37	.01	.14	.49
Sc-24	"	69.2	16.7	0.00	.83	.87	.92	9.64	0.08	.36	.20	.01	.80	.01	.06	.47
Sc-25	"	77.0	13.0	.04	1.41	.74	.51	5.81	.06	.29	.11	.02	.69	.01	.35	.35

1979 Report of The Algonquin Regional Mineral Resource Coordinator

D.J. Villard¹

Contents

Introduction	117
Regional Mineral Resource Coordinator's Activities	117
Mining Activity	117
Exploration Activity	119
Recommendation for Exploration	119
Ontario Geological Survey activities	119
Ministry of Natural Resources Activities	119
Recent Publications and References	119

Tables

1 - Maps and Reports issued by the Ontario Geological Survey	122
2 - Assessment Work and Other Information Received in 1979	120

Figure

1 - Algonquin Region	118
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Introduction

In 1979, the Regional Mineral Resource Coordinator and Resource Geologist initiated a detailed mapping project in the Parry Sound area, which will be completed in the summer of 1980. The remainder of their time was spent in administrative work.

Exploration activity in the Region declined slightly this year. Value of mineral production increased.

Several Ontario Geologic Survey crews were again active in the Region this summer. These are described below.

Regional Mineral Resource Coordinator's Activities

In 1979, about 50 percent of the geological staff's time was spent mapping in the Parry Sound area. This area hosts several base metal deposits, two of the more significant being the Wilcox and the McGowan Mines. The

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map sheet is bounded by Latitudes 45°07'30'' and 45°22'30'' and Longitudes 80°00' and 80°30'. North and south boundary relationships of the Parry Sound greenstone belt, as well as regional and detailed geological settings of the base metal deposits, have or will be determined from this project. Information collected to date is available for viewing and discussion at the Ontario Ministry of Natural Resources Algonquin Regional Office in Huntsville.

An aggregate consumption study for the Region was completed in the spring of 1979. In this study, the requirements for mineral aggregates to the year 2025, for each Municipality in the Region, were estimated. This information will enhance considerably the quality of mineral input to land use planning.

The problem of Muskoka-Haliburton area aggregates for use in concrete exposed to freeze-thaw conditions, in the presence of de-icing chemicals, is still under study by the Ministry of Transportation and Communications. Efforts to date have resulted in improvement of test results, but to an insufficient degree to lift the ban. Further adjustments are being made in hope of solving the problem by March 1980.

Mining Activity

The Madawaska Mine operated continuously throughout 1979, maintaining a capacity production of 1500 tons of uranium ore per day based on a five day mine and mill work week.

Chromasco Limited has completed the upgrading of its crushing and calcining facility enabling a capacity feed of magnesium ore to the furnaces. Indusmin Limited and IMC Chemical Group (Canada) Limited produced nepheline syenite in Methuen Township. Dochart Brick and Tile produced tile from its clay deposit near Arnprior.

The Mill Lake quarry near Parry Sound is currently marketing a ½ inch veneer stone to be applied as a facing on wallboard using a resinous adhesive. Most of the remaining quarries in the Region produce veneer and flagstone, with lesser production of marble for stucco.

Sodalite from the Princess quarry and rose quartz and beryl from Quadville were produced for mineral collectors again this year.

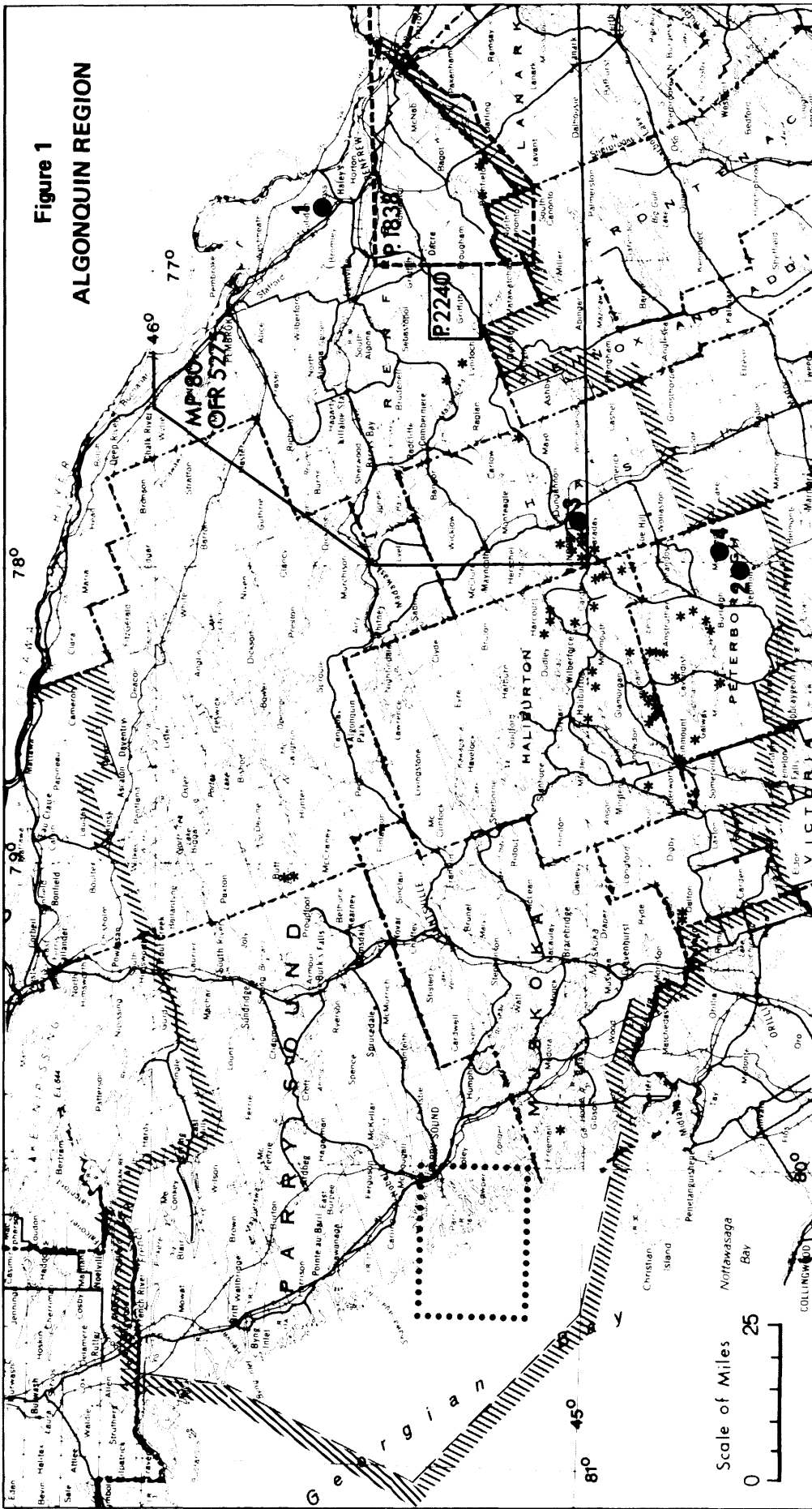


Figure 1

ALGONQUIN REGION

EXPLANATION

Map or report issued by the Geological Survey in 1979 (keyed to Table 1)

- P. - Preliminary Map
- OFR - Open File Report
- MP - Miscellaneous Paper

Regional Office detailed mapping project

Boundary of Algonquin Region

● Producing mines, 1979

1. Chromacco Ltd. Mg, Ca, Ti, Sr, Ba, Zr
2. Indusmin Ltd. neph, syenite
3. Madawaska Mines Ltd. U
4. IMC Chemicals Group (Canada) Ltd. . . neph, syenite

* Assessment work filed in 1979 (see Table 3)

Exploration Activity

Staking activity was down significantly from 1978 with only 299 claims recorded. Exploration activity is very difficult to monitor in this Region because of staff constraints and the high percentage (60 percent) of patented land.

Uranium exploration was once again centred in the Bancroft area, with a few companies examining the marbles in parts of Renfrew County.

Zinc exploration was carried out in scattered parts of Renfrew, Haliburton, and Victoria Counties. Several companies were also involved in copper-zinc exploration in the Parry Sound area.

Rare Earth Resources Limited is currently opening the Halo Mine, Bancroft area, for underground exploration and bulk sampling of this uranium property. A similar program will be carried out on the Blue Rock Cesium Mine property with a production decision expected by August of 1980 for the two properties.

Recommendations for Exploration

Since region geological staff work was concentrated in the Parry Sound area, 1979 exploration suggestions are restricted to this area.

In the Parry Sound greenstone belt, base metal deposits occur with, or spacially associated within, or are felsic fragmental rocks. Although textures of these rocks may be obscured, whole rock analyses generally reveal the original composition, if garnet-bearing samples are avoided. Several of the base metal deposits are within or associated with 8.3 m to 20 m thick units of garnet-biotite-hornblende gneiss containing 20-50 percent garnets. These garnet bearing units are believed to be the metamorphic relicts of exhalites. These units therefore could be used as a guide to base metal mineralization.

Ontario Geological Survey Activities

P. J. Barnett completed the mapping of the Quaternary deposits of the Bancroft area (NTS 31F/4). He also initiated field mapping in the Pembroke area (NTS 31F/14).

E.G. Bright completed a detailed geological mapping project in the Centre Lake area (31E/1-SE1/4).

T.R. Carter and A. C. Colvine conducted field studies on base-metal associations within the Grenville Province. (NTS 31C/12, 13, 14; 31D/9, 10, 15, 16; and parts of 31E/1, 2).

J.W. Mollard & Associates Limited is conducting an engineering terrain study of over half of the Region covering National Topograph System Areas 31E, 31F-W1/2, and 41H-E1/2.

Ministry of Natural Resources and Other Activities

R. Keevil, at the Leslie M. Frost Natural Resources Centre, lectured at four junior ranger camps. The bedrock geology map of the Centre has been completed and can be viewed there. A diamond drill has been obtained and will be used as an aid in teaching and to evaluate geophysical anomalies on the mining claim demonstration area.

T. Shevchenko (Parks Groups) completed bedrock mapping in the Centennial Lake Park Reserve in Broxham Township, and along water courses in Brown and Wilson Townships (north of Parry Sound). T. W. D. Edwards completed detailed Quaternary mapping in a two kilometre corridor along the Madawaska River from McFees Bay to Griffith. C. Spek completed a study of selected sites related to the Champlain Sea in the Ottawa valley. She has also conducted site examinations of a number of mineral collecting sites in Bancroft and Pembroke districts.

Recent Publications and References

- Barnett, P.J.
1979: Quaternary Geology of the Bancroft (31F/4) Area, Hastings, Renfrew, Lennox and Addington Counties; p. 136-137 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.
- 1979: Quaternary Geology of the Pembroke (31F/14) Area, Renfrew County; p. 138-139 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.
- Bright, E.G.
1979: The Centre Lake Area, Haliburton and Hastings Counties; p.86-88 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.
- Carter, T.R. and Colvine, A.C.
1979: The Geology and Preliminary Metallogenetic Classification of Metallic Mineral Deposits of the Grenville Province of Southeastern Ontario; p. 199-207 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.
- Dence, M.R.
1979: Skeleton Lake, Ontario — Evidence for a Paleozoic Impact Crater; Canadian Journal of Earth Sciences, Vol. 16, no. 2, p.256-263.
- Ferguson, D.W.
1979: The Port Cunnington Complex, Central Ontario; Unpubl. B.Sc. thesis, University of Western Ontario, London, Ontario.
- Masson, S. and Gordon, J.B.
1979: Uranium Mineralization and Its Controls in the Immediate Bancroft Area, p.190-191 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V. G. Milne, O. L. White, R. B. Barlow and C. R. Kustra, Ontario Geological Survey Miscellaneous Paper 90, 245p.

ALGONQUIN

TABLE 2 Assessment Work and other Information received in 1979

Abbreviations								
D.D. (2-715')	-	Diamond drilling, 2 holes, 715 feet total	Geol.	-	Geological survey	Rad.	-	Radiometric Survey
EM	-	Electromagnetic survey	Geophys.	-	Geophysical survey	Str.	-	Stripping
Geochem	-	Geochemical survey	Mag.	-	Magnetic survey	Tr.	-	Trenching
			MEAP	-	Mineral Exploration Assistance Program			
Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
HALIBURTON CO. CARDIFF TWP.	31D/16	Kerr Addison Mines Ltd.	Uranium	Geophys.	Mag.	1978		Cardiff 197
	31D/16	W. S. Vaughan	Uranium	Geol.	Geol.	1978	2.2867	Cardiff 198
	31C/13	Chukuni Gold Mines Ltd.	Uranium	Geol.	Geol.	1977	2.2663	Cardiff 199
	31E/1	Carbrew Explorations Ltd.	Uranium, Fluorite Molybdenite	Drill Logs	D.D.H. (3-912')	1978		Cardiff 200
	31E/1	Opawica Explorations Inc.	Uranium	Property	Assays	1978		Cardiff 201
HALIBURTON CO. DYSART TWP.	31E/2	Charles Wm. Pegg	Uranium	Drill Logs	D.D.H. (6-755')	1979		Dysart 1
HALIBURTON CO. GLAMORGAN TWP.	31C/16	St. Joseph Explorations Ltd.	?	Geophys.	VLF-EM	1978	2.2843	Glamorgan 17
	31D/16	Charles Wm. Pegg	Uranium	Drill Log	D.D.H. (1-127')	1979		Glamorgan 18
	31C/16	St. Joseph Explorations Ltd.	?	Drill Log	D.D.H. (1-99m)	1979		Glamorgan 19
HALIBURTON CO. GLAMORGAN TWP.	31C/16	St. Joseph Explorations Ltd.	?	Drill Log	D.D.H. (1-102m)	1979		Glamorgan 20
	31C/16	St. Joseph Explorations Ltd.	?	Drill Log	D.D.H. (1-99m)	1979		Glamorgan 21
HALIBURTON CO. HARCOURT TWP.	31E/1	Golden Goose Gold Mines Ltd.	?	Sketch	Str.	1978		Harcourt 8
	31E/1	Golden Goose Gold Mines Ltd.	?	Sketch	Tr.	1978		Harcourt 9
	31E/1	Golden Goose Gold Mines Ltd.	?	Sketch	Str.	1978		Harcourt 10
HALIBURTON CO. LUTTERWORTH TWP.	31D/15	Jorex Limited	Uranium	Geophys.	Rad.	1978	2.2865	Lutterworth 4
HALIBURTON CO. MONMOUTH TWP.	31E/1	Charles Wm. Pegg	Uranium	Drill Log	D.D.H. (1-117')	1979		Monmouth 103
	31D/16	St. Joseph Explorations Ltd.	?	Geophys.	Mag.	1978	2.2837	Monmouth 104
HALIBURTON CO. SNOWDON TWP.	31D/15	St. Joseph Explorations Ltd.	Zinc	Drill Logs	D.D.H.(2-324m)	1978		Snowdon 12
	31D/15	St. Joseph Explorations Ltd.	Zinc	Drill Logs	D.D.H.(3-365.9m)	1978		Snowdon 13
	31D/15	A. Hopkins	Uranium	Property	Assays	1977		Snowdon 14
	31F/4	Roger Mercier	Uranium	Sketch	Tr.	1978		Faraday 62
HALIBURTON CO., FARADAY TWP.	31F/4	Roger Mercier	Uranium	Sketch	Assays	1978		Faraday 63
	31F/4	Robert L. Ekstrom	Uranium	Drill Logs	D.D.H. (1-124')	1979		Faraday 64
	31E/1	Carday Uranium Mining	Uranium	Geophys.	EM	1979	2.2981	Faraday 65
	31E/1	Carday Uranium Mining	Uranium	Geophys.	Mag.	1979	2.2981	Faraday 66
	31F/4	Roger Mercier	Uranium	Geophys.	EM, Mag.	1978	2.2931	Faraday 67
	31F/4	Roger Mercier	Uranium	Geophys.	EM, Mag	1978	2.2931	Faraday 68

Table 2 continued

Location	NTS	File Name	Commodity Sought	Type of Report	Type of Work	Year	Toronto File No.	Local File No.
HASTINGS CO. MAYO TWP.	31F/4	A. H. Clark	?	Sketch	Tr.	1978		Mayo 8
MUSKOKA DIST. FREEMAN TWP.	31E/4	Cable Copper Mines Ltd.	Uranium	Drilling	D.D.H. (4-310.5')	1979		Freeman 23
NIPISSING DIST. BUTT TWP.	31E/11	J. V. Lupo	Uranium	Sketch	Tr.	1978		Butt 15
	31E/11	J. V. Lupo	Uranium	Sketch	Tr.	1978		Butt 16
PETERBOROUGH CO., ANSTRUTHER TWP.	31D/16,9	Imperial Oil Limited	Uranium	Drill Logs	D.D.H.(28-2708.3')	1978		Anstruther 73
	31D/16,9	Imperial Oil Limited	Uranium	Geophys.	Rad.	1978		Anstruther 74
	31D/16	Copper Lake Explorations Ltd.	Uranium	Geol.	Geol.	1977	2.2612	Anstruther 75
	31D/16	Copper Lake Explorations Ltd.	Uranium	Geoph.	Rad.	1977	2.2612	Anstruther 76
	31D/16	Copper Lake Explorations Ltd.	Uranium	Geochem	Soil Gas	1977	2.2612	Anstruther 77
	31D/9	Wm. D. Blott	Uranium	Drill Log	D.D.H. (1-125')	1979		Anstruther 78
	31D/9	Wm. D. Blott	Uranium	Drill Log	D.D.H. (1-120')	1979		Anstruther 79
PETERBOROUGH CO., CAVENDISH TWP.	31D/16	Albert J. Connolly	?	Sketch	Str.	1978		Cavendish 77
	31D/16	Mountview Explorations Inc.	Uranium	Drill Logs	D.D.H. (5-928')	1979		Cavendish 78
PETERBOROUGH CO., GALWAY TWP.	31D/15	Thomas D. Pearson	?	Sketch	Manual (?)	1978		Galway 26
RENFREW CO., BAGOT TWP.	31F/2	Can. Occidental Petroleum Ltd.	Copper Lead Zinc Nickel	Geol. Geochem	Geol. Lake Sediment, Soils, Rocks	1977	2.2644	Bagot 3
	31F/2	Can. Occidental Petroleum Ltd.	Copper Lead Zinc Nickel	Geol. Geochem.	Geol. Lake Sediment, Soils, Rocks	1977	2.2644	Bagot 4
RENFREW CO., BLITHFIELD TWP.	31F/2	Nicholas Axiotis	Uranium	Geophys.	Mag.	1978	2.2700	Blithfield 12
RENFREW CO., LYNDOCH CO.	31F/6	Littlem Limited	?	Sketch	Tr.	1978		Lyndoch 18
	31F/6	St. Joseph Explorations Ltd.	Zinc	Geophys.	Mag., EM	1978	2.2838	Lyndoch 19
VICTORIA CO., DALTON TWP.	31D/14	Robert N. Cloughley	Silver	Drill Log	D.D.H. (1-140')	1979		Dalton 4
	31D/14	Robert N. Cloughley	Silver	Drill Log	D.D.H. (1-224')	1979		Dalton 5
VICTORIA CO. SOMERVILLE TWP.	31D/10,15	Jorex Ltd.	Uranium	Drilling Geol.	D.D.H.(11-1975') Geol.	1979		Somerville 2

ALGONQUIN

TABLE 1 MAPS AND REPORTS PERTAINING TO THE ALGONQUIN REGION ISSUED BY THE ONTARIO GEOLOGICAL SURVEY IN 1979. SEE "LIST OF PUBLICATIONS" (BACK POCKET) FOR DETAILS.

Miscellaneous Papers

MP 80

Preliminary Maps

P 1838

Open File Reports

5260
5275

1979 Report of Eastern Regional Mines Coordinator

A.E. McKay¹ and A.F. Young²

Contents

Introduction	123
Exploration and Mining Activities	123
The Industrial Minerals Program	123
Aggregate Resources	125
Geological Mapping	125
Mineral Education Programs	125
Ontario Geological Survey Activities	125

Table

1 - Assessment Work and other information received in 1979	126
--	-----

Figure

1 - Eastern Region	124
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Introduction

The Regional Geologist's office is staffed by Dr. M.A. Klugman, Regional Mines Coordinator; T.W. Fletcher, Mineral Resources Manager; and A.E. McKay, Resource Geologist. In September, the position of Resident Geologist was filled by Dr. P.W. Kingston. Dr. Kingston will be dealing with the Precambrian for the entire Eastern Region and is located in Tweed. A number of temporary staff were on contract for specific projects and six students were employed for the summer in the Experience '79 program.

During 1979, interest in industrial minerals and aggregate resources greatly increased. The bulk of the work of the regional mineral resources staff focused on advising industry on exploration and development of these resources. The Regional Mines Coordinator has been deeply involved in developing industrial minerals policy for the Province of Ontario.

Programs in geological mapping and mineral education continued this year. The aim for this work is toward educating the public on topics of geology through interpretive displays and through talks.

¹ Resource Geologist, Eastern Region, Concession Road, Kemptville.

² Contract Geologist, Eastern Region.

Contact was maintained with government agencies including the Ministries of Environment, Transportation and Communications, Labour, Housing, and Industry and Tourism; the St. Lawrence Parks Commission; Ontario Hydro; and Energy Mines and Resources, Canada. Consultant companies, municipalities, exploration companies, prospectors, and members of the public sought information from this office.

Exploration and Mining Activities

Claims staked this year numbered 180, about the same as in 1978; 96 claims were cancelled.

With the dramatic rise in the price of gold, attention has been directed to gold prospecting. Some prospecting for near deposits is occurring, but most of the interest is directed to former producing properties and their tailings.

The release of a report on the silica sand potential in Eastern Ontario created an interest in that commodity and encouraged a number of companies and individuals to review the silica situation resulting in some diamond drilling.

Ram Petroleum Limited leased a tremolite property in Palmerston Township. A pilot project was initiated to test the use of tremolite in asphalt. The company is constructing a mill to process tremolite. Flake mica and talc may also be beneficiated from this operation.

Interest in uranium continued in Eastern Ontario. The Agnes & Jenny Exploration Company planned to conduct some diamond drilling in Palmerston Township Gulf Minerals Canada Limited and Eldorado Nuclear Limited were active in Leeds County in the search for uranium (Ottawa Journal, December 15, 1979, p.1).

The W.R. Barnes calcium carbonate property expanded its operations at Perth to fulfill expanding market demands.

The Industrial Minerals Program

The prime objective of the Industrial Minerals program in the Region is to generate interest in industrial mineral commodities. Funded by the Ministry of Treasury and Economics, and Intergovernmental Affairs, the program

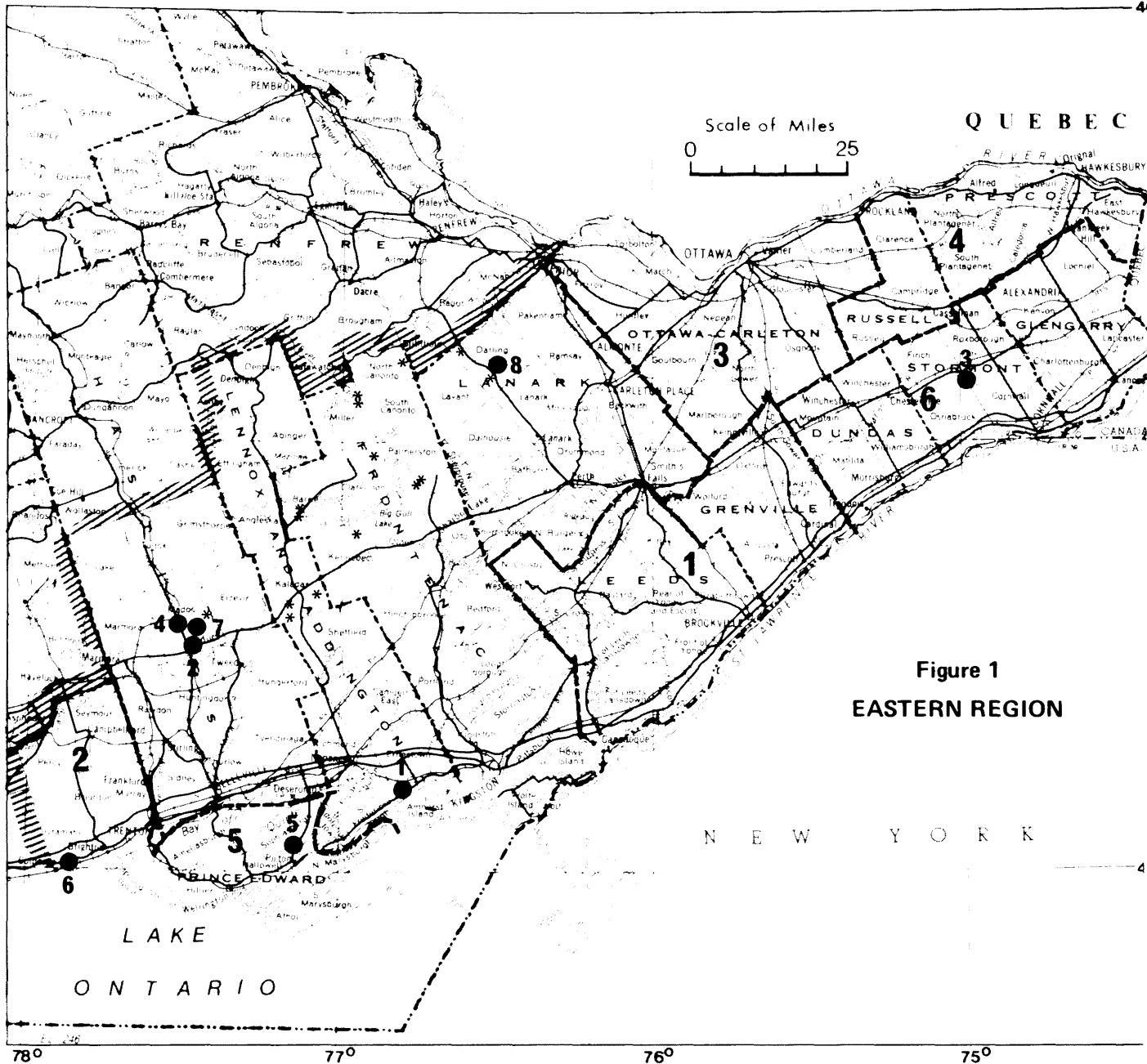


Figure 1
EASTERN REGION

EXPLANATION

- Producing mines (excepting clay and aggregate extractive operations).
 - 1. Canada Cement Lafarge Ltd. limestone (cement)
 - 2. Canada Talc Industries Ltd. talc
 - 3. Diamond Peat Moss. peat
 - 4. Grenville Aggregates marble
 - 5. Lake Ontario Cement Co. Ltd. limestone (cement)
 - 6. St. Lawrence Cement Co. Ltd. limestone (cement)
 - 7. Stoklosar Marble Quarries (1969) Ltd. marble
 - 8. William R. Barnes Co. Ltd. calcium carbonate
- * Assessment work filed in 1979 (keyed to Table 1)
- Aggregate Assessment Studies
 - 1. Leeds and Grenville
 - 2. Northumberland
 - 3. Ottawa-Carleton
 - 4. Prescott-Russell
 - 5. Prince Edward
 - 6. Stormont-Dundas Glengarry
- ////// Boundary of Eastern Region

examines a number of mineral commodities to determine their geological setting, potential tonnage, amenability to beneficiation and processing, pertinent logistics, grade and marketability, and the economics and possible viability. The commodities studied are and will be those that will allow expansion within that sector of the industry so as not to hurt other Ontario producers, and possibly will be competitive with foreign suppliers.

The main focus of the Industrial Mineral program fell on the silica sand study initiated in 1978. The results of the study were published as Open File Report 5265, Silica Sand Potential in Eastern Ontario. The report spurred much interest in the deposits with the result that silica suppliers and consumers renewed old leases, negotiated new leases, in the hope that sources could be established in eastern Ontario.

Within the Grenville Province, the industrial mineral program took the form of an overview of the potential of mica and vermiculite deposits within the region, since all of the regions consumption in these commodities is imported. These studies will be expanded in 1980 to outline the extent and possible economics of the deposits.

On a smaller scale independent studies were undertaken by regional mineral resources staff. A number of producers and interested parties made enquiries about commodities such as talc, mica, calcium carbonate and lime.

Aggregate Resources

The demand from Municipal Governments within the Eastern Region for geologic input was high in 1979. Requests for information were fulfilled with data collected during aggregate assessments by regional staff.

Aggregate assessment reports of Grenville, Dundas, Stormont, Glengarry, Prescott and Russell Counties were completed this year and will be published early in 1980. These studies located all granular deposits, established an economic boundary to the deposits, and determined the quality and quantity of material available for extraction that has not been sterilized by road construction, housing, and industrial development.

Preliminary aggregate assessment studies have been done in Frontenac and Lennox and Addington Counties. The final assessment of these counties will be carried out in 1980. These reports have aided the Ministry and planners in protecting a sufficient quantity of material to supply the area's future needs.

Aggregate assessments are being undertaken to determine the depth, gradation, and quality of the granular deposits in the region. In order to obtain this information a drilling, geophysical and testing program has been incorporated into the studies. The geophysical field survey was established to give possible depth and type of material using a FS 3 seismic unit and an EM 31. The computed results were used to determine areas that should

be drilled to obtain samples for testing and depths of economic deposits.

Geological Mapping

A cooperative project with the St. Lawrence Parks Commission continued again this year. Mapping of the bedrock and surficial geology has begun south of Highway 401 between Gananoque and Kingston.

Technical guidance was provided to the Regional Parks staff in their mapping of Bon Echo Provincial Park. The report and map will be used in the Parks interpretive program.

The Resident Geologist at Tweed began a geological compilation of the Kingston sheet, NTS 31C. Initial data assembly from earlier geological maps had been done earlier from this office but further refinement of the mapping for this portion of the Grenville province is necessary.

Mineral Education Programs

Staff from this office assisted again with the Mineral Education Field Course in Madoc given by E.B. Freeman of the Ontario Geological Survey, Geoservices Information Office.

The three Junior Ranger camps in this Region were visited by regional staff.

A third interpretive geological display consisting of rock samples and photographs was made for the Silver Lake Provincial Park.

Construction of a scale model based on a former gold mine in the Eastern Region started. The model will be on display in several provincial parks to acquaint park users with the history of mining in the region and to familiarize them with mining operations.

Ontario Geological Survey Activities

Detailed mapping of the Precambrian geology of the Sharbot Lake area in Frontenac County was completed in 1979 by J.M. Wolff. This area adjoins the areas previously mapped in the Grenville structural province by Wolff.

D.M. Carson mapped the Paleozoic geology of the Peterborough-Campbellford area. The eastern half of the map area lies in the Eastern Region.

T.R. Carter and A.C. Colvine continued their mineral deposit studies to determine the geology of mineralization in this part of the Grenville province. Areas which show the greatest economic potential can be outlined from this work.

TABLE 1 Assessment Work and other information received in 1979.

LOCATION	NTS	FILE NAME	COMMODITY SOUGHT	TYPE OF REPORT	TYPE OF WORK	YEAR	TORONTO FILE NO.	LOCAL FILE NO.
Barrie	31C/14	Henry F. Cook	sulphides	Assess.	SA	1978	2.2885	Barrie 37
Barrie	31C/14	Henry F. Cook	sulphides	Assess.	5DDH-257	1979		Barrie 38
Clarendon	31C/15	St. Joseph Explorations Ltd.		Assess.	GC, GL	1978	2.2926	Clarendon 10
Darling	31F/2	Canadian Occidental Petroleum Ltd.		Assess.	GC, GL	1977	2.2644	Darling 5
Darling	31F/2	Peter T. Barnes	mb	Assess.	1 DDH-451	1979		Darling 6
Grimsthorpe	31C/13	Bill Shough	Au, sulphides	MEAP	SA	1979		Grimsthorpe 2
Kaladar	31C/11	Canadian Occidental Petroleum Ltd.	BM	Assess, MEAP	GC, GL	1978	2,2727	Kaladar 17
Kaladar	31C/11	C. Roger Young		Assess.	3 DDH-663	1979		Kaladar 19
Kaladar	31C/11	G.R. Gutlett		Assess.	2 DDH-431	1979		Kaladar 20
Kennebec	31C/15	Clarendon Mining Corp. Ltd.	U	Assess.	7 DDH-1249	1979		Kennebec 4
Madoc	31C/12	Earl C. Sager		Lease				Madoc 33
Miller	31F/2	R.J. Wright	U, BM	Assess.	EM, Mag, RA.	1978	2.773	Miller 3
Miller	31F/2	Geophysical Engineering	U	Assess. MEAP	GP, TR	1978	63.3568	Miller 4
North Canonto & Blithfield	31F/2	Nick Axtotis		Assess	Air, Mag, TR	1978	2.2700	North Canonto 2
Palmerston	31C/15	Ram Petroleum Limited		Lease				Palmerston 40
Palmerston	31C/15	Groundstar Resources Limited	U	Assess.	6 DDH-1021	1979		Palmerston 41

GC - Geochemical Survey
 GL - Geological Survey
 GP - Geophysical Survey
 Mag - Magnetometer Survey
 Mb - Marble

Air - Airborne Survey
 Assess - Assessment work
 BM - Base Metals
 6DDH-1021 - 6 diamond drill holes totalling 1021 feet
 EM - Electromagnetic survey

MEAP - Mineral Exploration Assistance Program
 RA - Radiometric Survey
 SA - Sampling, Assaying
 TR - Trenching
 U - Uranium

1979 Annual Report of The Central Regional Geologist

Mahendra Narain¹ and Murthy Ghandikota²

Contents

Introduction	127
Regional Geologist's Activities	127
Resources and Land Use Planning	127
Consultation Services	129
Pits and Quarries	129
Property Examinations	129
Staking and Exploration Activities	130
Recommendations for Exploration	130
Mining and Related Industrial Activity	130
Regional Geological Evaluation Projects	132
Public Awareness Programs	132
Activities of the Ontario Geological Survey	132
Geoscience Research in the Central Region	136
Recent Publications and References	136
Other Articles of Interest	136

Tables

1 - Licenced Quarries and Pits in Central Region	129
2 - Estimated Aggregate Production in Central Region	133
3 - Aggregate Production in Central Region during 1978	137
4 - Maps and Reports issued by Ontario Geological Survey	138

Figure

1 - Central Region	128
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Introduction

The Regional Geologist's Office at Richmond Hill continued providing information and geoscience consultative services to various government agencies, private consulting firms, the aggregate industry and the general public, through the staff in the Region and the five District Offices at Lindsay, Midhurst, Maple, Cambridge and Fonthill. Consultation to various programs of the Ministry and other government agencies in regard to land use has been on the increase in the past year.

The geoscience library services at the Region have considerably improved due to an increase in the demand

1 Regional Geologist
2 Resources Geologist

for library consultations. Reprints of articles of interest from mining publications have been added to the library. Many new publications and textbooks of interest have been acquired. Library and consulting services are available to the general public or interested parties.

Mining activity at the three gypsum mines continued as usual. Two mines are planning expansion of their operations. There are 843 licenced pit and quarry operations in the Region.

The Regional Geologist administered the geological programs related to geoscience information and mineral resources management. This involved collection and dissemination of geological and mining economic data.

The staff included Murthy Ghandikota, Resources Geologist and Pat Taylor, Secretary.

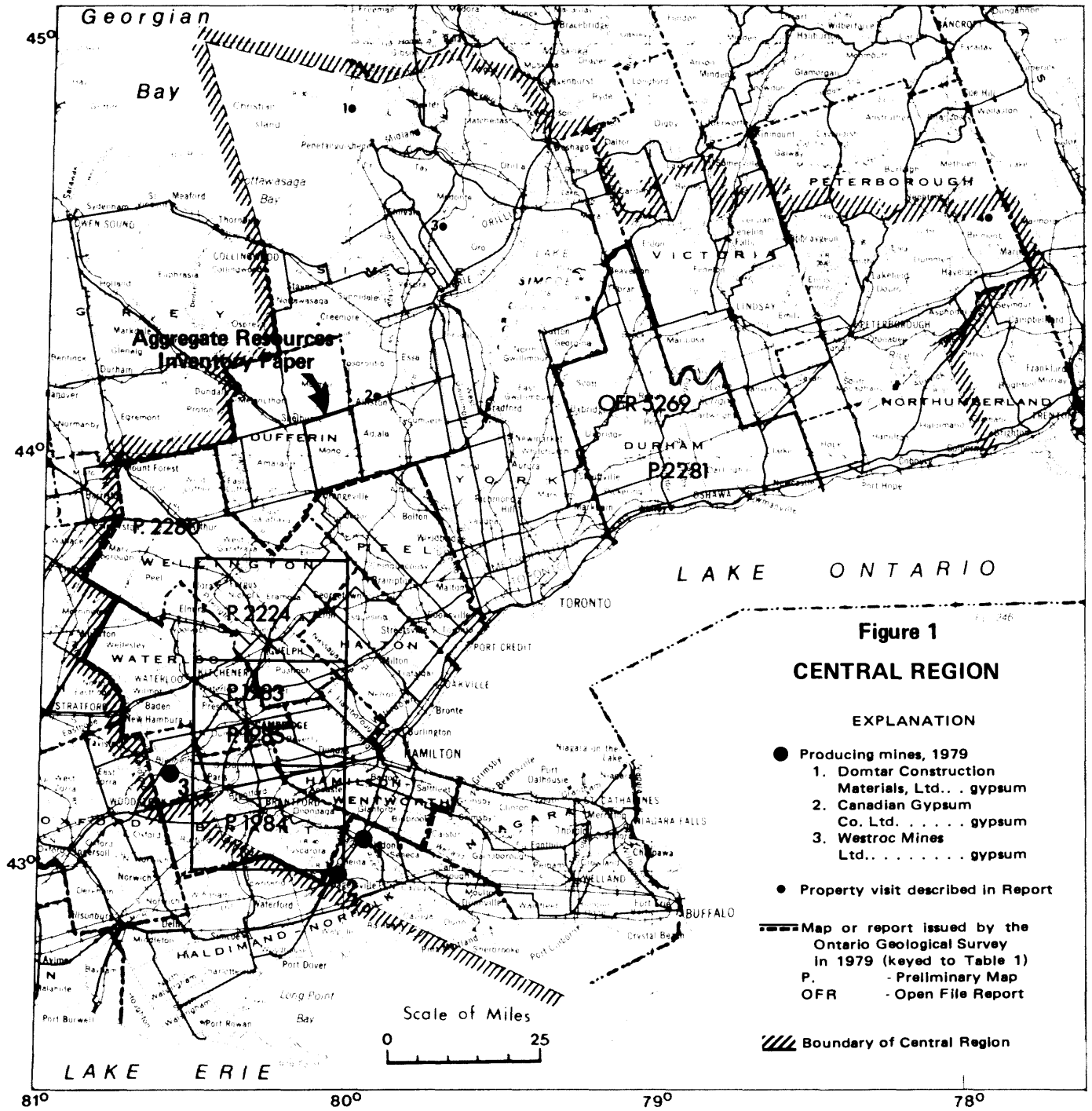
Regional Geologist's Activities Resources and Land Use Planning

The Regional/District Strategy, Niagara Escarpment Plan, Canada-Ontario, Rideau-Trent-Severn Corridor Plan exercises continued through the year and inputs to these were made as and when necessary. The latest Niagara Escarpment Plan proposals are under active review in the Region. Also, the Target Testing Method for the Coordinated Program Strategy (SOCPS) of this ministry in Southern Ontario, has been reviewed at different stages and the Technical Report No. 2 is now being reviewed for accuracy of data. The Regional Geologist continued to supervise geological workshops convened to discuss technical problems encountered by both regional and district staff.

A good part of the Regional Geologist's time was spent in preparation for the Ontario Municipal Board (OMB) hearing on the Official Plan for the Region of Durham and on the negotiations carried out prior to the OMB hearings between the Ministry and the Durham Region staff.

The following are some projects and reports for which geological review, comments and information were provided by the Regional and District staff:

Copeland Forest Study; Ganaraska Forest Study; C.O.R.T.S. Corridor Framework Plan; N.E.C. Proposed Plan; Draft Township Aggregate Inventory Reports; District Strategy Reports; C.L.O.C.A. Watershed Inventory Report; Awenda Provincial Park Conservation Authority Watershed Planning Guidelines



White Paper on The Planning Act; Provincial Land Use Planning Guidelines; Balsam Lake Provincial Park; Proposed Mineral Aggregate Guidelines; O.C.R.A. Sensitive Areas Report; West Luther Planning Area; the Courtrice Urban Area Plan; the Newtonville Hamlet Plan; the Lake Scugog Secondary Plan; the Bridge North Secondary Plan; Official Plans and By-laws reviewed for: County of Victoria, Region of Durham, York, Halidmand-Norfolk, Hamilton Wentworth, Waterloo and Halton, Townships of Flamborough, Wainfleet, Smith, Otonabee, North Monaghan, Bexley, Emily, Fenelon and Drummer, and Towns of Halton Hills, Haldimand, Lincoln, Fort Erie, Caledon, Oakville, Cities of Burlington, Brampton, Niagara Falls, Thorold, Welland and Port Colborne.

Consultation Services

The Regional Office at Richmond Hill and the District Offices at Lindsay, Midhurst, Fonthill, Maple and Cambridge continued providing consultation on problems related to geology and mineral resources legislation. Public and consultant inquiries were on the increase during the year. Information was provided to the Municipal Planning Boards; Ministries of Transportation and Communications, Housing, Labour and the Conservation Authorities; Ontario Hydro; Niagara Escarpment Commission and various programs within the Ministry. The consultation consisted of mineral potential, rocks and mineral identification, location of available lands for prospecting, possibilities of mineral potentials in different areas throughout the province, watertable problems. Students, as usual, required information on various mineral commodities to prepare project reports. Many inquiries were received on mineral resources legislation and its implications to companies, individuals and environments. There were many inquiries related to legislation proposed under The Aggregate Act and The Mining Lands Act.

Pits and Quarries

The Regional Geologist provided input to the proposed Aggregates Act (Bill 127) and provided consultation required on problems related to The Pits and Quarries Control Act, 1971. Both the Region and the Districts reviewed and provided input to the proposed Mineral Aggregate Resource Guidelines.

Property Examinations

The Regional Geologist and staff visited several properties in the Region. The important visits were made to the Copeland Forest Property, Awenda Provincial Park and Earl Rowe Provincial Park. The purpose of these visits was to provide consultation on mineral potential at Cope-

land and interpretation of geomorphology and surface deposits in the two parks.

1. Earl Rowe Provincial Park - The park is located about one mile west of the Town of Alliston. Most of the park area consists of a flat lying glaciolacustrine plain flanked on the north and south by glacial till. Remnants of raised beaches of historic Lake Algonquin are the distinct geological features in this park.

2. Awenda Provincial Park - This park is situated north of Penetanguishene on the shore of Georgian Bay. The topography of the park is marked by several raised shorelines, sand dunes and bouldary sand plain. The most significant feature of this park is the historical-archeological sites.

3. Copeland Forest Property - The property is situated near the junction of Highways 400 and 93. This property has been acquired by the Ministry to develop as a showcase of integrated resource management in the Huronia District. The property is ideally located in the Toronto Centred Region for recreational and educational use by the residents of the most populous area in the province. An assessment of the mineral resource potential of the site indicated mainly deposits of fine sand. These deposits contribute to present landforms on the site and any large scale extraction of sand would effectively change the topographic and drainage character of the property. This resource is not in too much demand and also surrounding properties have similar or better mineral resources. Therefore, large scale extraction is not contemplated at this site.

4. Northumberland Mines Limited Property - The property is located on the NW¼ and NE¼ of Lot 31, Concession VI in the northern part of Belmont Township. It is underlain by white, pink and grey Grenville marble. Both high calcium and dolomitic marble are present. Diopside and tremolite are present in some places, but there are wide bands of high purity marble. A narrow amphibolite

TABLE 1 Licenced Quarries and Pits in the Central Region.

DISTRICT	LICENCED QUARRIES	LICENCED PITS
Maple	9	143
Huronia	9	171
Niagara	17	17
Cambridge	19	201
Lindsay	12	245
TOTALS	66	777

CENTRAL

dike containing traces of chalcopyrite was seen cutting across the marble beds. The rocks are well exposed in a large open field area and their width is estimated to be over 1000 feet. Four diamond drill holes, each 300 feet in length, have been drilled.

A small quarry measuring 15 feet by 12 feet with a 10-foot hole has been opened in the side of a hill on the property exposing white course grained calcium marble which has been used for terrazzo chips.

This deposit of high calcium marble is of potential commercial interest due to scarcity of this type of material for artificial whitening products. The iron content in the dolomite is low enough to be an asset and will allow it to be used in the manufacture of glass.

Staking and Exploration Activities

No new claims were recorded in Belmont Township. In this township there are 13 unpatented mining claims, three of which are open for staking; two patented claims for mining rights only, six claims held by a licence of occupation (Note: L.O. are not issued anymore) and four mining leases for mining rights only. One mining claim was cancelled in 1979.

Two of the four mining leases cover lands in the NW¼ and NE¼ of Lot 31, Concession VI and are held by Northumberland Mines Limited. The leases are in part underlain by high-purity high calcium limestone and high-purity dolomite. Adjoining the leases are four unpatented mining claims. It is reported that Northumberland Mines Limited has granted to Preussag Canada Limited the exclusive option to explore these properties. Preussag will undertake a feasibility study of producing 35 000 to 50 000 tons annually of marketable premium grade calcium carbonate products. They will also have the exclusive right for 24 months to commit the properties to production. Analysis of rock samples by the Ontario Research Foundation, indicate that the high-purity limestone can be utilized in the manufacture of specialty products in the filler, glass, paint, plastic and paper industries.

A small group of Havelock and Toronto business men have begun making on-site tests at the former gold producing property at Cordova Mines in Belmont Township (D. Billings, personal communication). The group have been working with the Ontario Research Foundation in perfecting a cyanide heap-leaching process for treatment of gold ores and tailings. This process has worked well in some countries for recoveries from low grade ores that were uneconomic to treat by conventional milling methods. The experimentation using tailings began in late summer and will continue in 1980. The mill tailings have been reported to assay as high as 0.303 ounces gold per ton. The underground data indicates a minimum 200 000 tons of ore, which includes 25 000 tons of broken ore. The ore values are between 0.12-0.25 ounces gold per ton.

The other two mining leases for mineral rights only are in the N½ and SE½ of Lot 27, Concession I, Belmont

Township. These leases are owned by Metalridge Mining Corporation Limited, Toronto. No exploration activity has been conducted on the property since the late 1960s. The assessment work conducted included geological mapping, a magnetometer survey, 5300 feet of diamond drilling and a geochemical soil survey. Exploratory work has indicated a sulphide deposit consisting primarily of pyrrhotite and traces of chalcopyrite, sphalerite and magnetite in a host rock of graphitic schist. Some of the above exploration covered adjoining claims in Marmora Township but the most promising area appears to be in Belmont. A feasibility study on the viability of producing iron and sulphur was undertaken in 1970 (Mining Recorder's Office, Eastern Ontario).

Recommendations for Exploration

In light of current exploration and geological information on adjoining townships in the Algonquin Region, the northeastern part of the Lindsay District should receive more attention, particularly for uranium and base metals.

A gamma ray survey, released by the Federal-Provincial governments in 1978, indicated some interesting anomalies in the northern part of the Region. These need attention and testing.

The rocks in the Townships of Matchedash, Rama and Orillia are also of interest for uranium, base metals and high purity limestone.

Mining and Related Industrial Activity

The Central Region is still the largest producer of structural materials in the Province. Mining activity in this region consists of the extraction of sand, gravel, shale, dolostone, sandstone, limestone, gypsum and some peat.

There are three operating gypsum mines and all three mines expanded their operations during 1979. These mines are operated by Westroc Industries Limited, near Drumbo, Canadian Gypsum Mines Limited at Caledonia, and Domtar Construction Materials Limited at Hagersville.

The number of licenced operations under The Pits and Quarries Control Act, 1971 was 843 in 1979. The production of aggregates showed some increases over 1977. In 1978 the production was estimated at 68.5 million tons (District Offices, Central Region).

Generally, the depressed level of construction activity in 1979 reflected on the demand for construction aggregates. Prospects for 1980 aggregate production indicate little increase in physical volume but a significant increase in dollar value due to many factors.

Transportation costs are a major part of the delivered costs of construction aggregates and increased fuel prices will make a significant impact on these costs. Also,

the increased costs of licencing aggregate properties, mining, environmental protection, rehabilitation, etc., will have some impact on the overall cost of construction aggregates. All these factors will significantly influence the production of aggregates in the future.

The following are the highlights of a selected few mining operations in the Central Region. Data was provided by the respective operators.

The Westroc Industries Limited mine near Drumbo started production in December 1978. The company is mining a six-foot bed of gypsum by employing the room and pillar method of mining. During 1979, two new machines, an electric hydraulic roof bolter and a battery powered Una-Trac Scoop, were purchased to increase the efficiency of the mining cycle. The company expects to complete the Emergency Escape Shaft by mid-1980 and anticipates production to continue on a two shift basis.

The National Sewer Pipe Limited, manufactures a range of vitrified clay sewer pipes 4 inches to 36 inches in diameter; flue lining 8 inches X 8 inches to 24 inches X 24 inches, clay drain tiles 4 inches to 12 inches in size. They also manufacture corrugated plastic tubing 4 inches and 6 inches diameter and coupling for plain and vitrified clay pipe. The company's operations did not run at full capacity in 1979.

Highland Creek Sand and Gravel Company Limited The year 1979 marked the last full season of operations for the Highland Creek plant. Originally constructed about 1914, it was one of the oldest permanent gravel processing plants in Ontario. Located on the glacial Lake Iroquois beach deposits, the plant used this source of raw materials for many years until fully depleted. Since then raw materials have been trucked in from other pits in Scarborough, Pickering and Uxbridge. More recently part of the raw material came in by rail from pits owned in Manvers Township. It is anticipated that this plant will be dismantled in 1980, whereupon part of the property will be retained as a Distribution Yard for construction aggregates produced at outlying plants and brought in by both truck and rail for the Toronto market area. Progressive rehabilitation of this plant area started in 1968 and a substantial portion shows no trace of its former extractive operations. The remaining rehabilitation will be completed within two years when the rehabilitated land will become available for industrial and commercial development; a good example of multiple and sequential land use.

Steed and Evans Limited The company operates two major pits. The "Heidelberg Pit" is relatively a new operation producing about 700,000 tons of material to date. A large part of this production is used by the company to supply its construction operations and the asphalt plant. There is some on-going rehabilitation at this site.

The "Fonthill Pit" is nearly depleted with only a few years of reserves available. The company estimates approximately 400,000 tons of material has been produced from this site. Aggregates are sold to customers and are also used by the company's construction operations in the Niagara Falls area. Rehabilitation plans for the site call for a 9 hole public golf course to be opened in 1980.

Franceschini Bros. Construction Limited This company operates pits in the Brampton - Caledon and Mississauga areas and a sales yard at Cawthra Road in Mississauga. An expansion of the company's Caledon operation is under consideration.

Premier Concrete Products The company operates two major operations. The "Alton Pit - Town of Caledon" is a gravel operation from which the company produces crushed, washed and sized aggregates primarily for the ready-mix concrete and concrete product industries. The deposit at this site is almost depleted and the operations were carried out at a reduced level of production throughout 1979. The company has performed extensive rehabilitation over the years and has recently planted 40 000 trees at the site. Attractive rolling grazing land and stocked ponds mark this site as an excellent example of current rehabilitation practices. "Erin Pit - Township of Erin" is licenced but still in the original use - a producing dairy farm. The site is a prime gravel deposit and current plans call for development work to proceed through 1980-81. The company expects to start production from this site to coincide with the closure of the Alton operations.

King Paving and Materials The company operates four quarries and two gravel pits in Central Region. Mostly, the materials produced by the company are used in the construction industry, however, the company also supplies some products to the agricultural and the steel industries. A brief description of their operations follows.

"Nelson Crushed Stone", Burlington, is a 500-acre quarry in operation since 1954. It is a major supplier to the Toronto-Hamilton area of construction aggregates, concrete stone and armour stone.

"Kilbridge Pit" Burlington is a 100-acre gravel pit supplying pit run and crushed granular A and B materials.

"Lincoln Quarries", Beamsville, a 100-acre quarry supplies granulars and concrete stone to the Niagara Peninsula.

"Oak Park Sand & Gravel", Paris, is a 515-acre sand and gravel pit shipping to the Paris, Brantford and Hamilton area.

"Limestone Quarries", is a 1250-acre quarry located at Uthoff near Orillia. This quarry services a local market in north central Ontario. Nowever, a large part of the material is shipped by rail to yards at Milliken and Rouge Valley in Scarborough. It is a major supplier of construction aggregate to the north and eastern Toronto area.

CENTRAL

"Oneida Crushed Stone", Hagersville, 1979 was the first year of operation for this new quarry. A 500-acre site with ample reserves of good quality dolomite suitable for all construction aggregates as well as concrete and asphalt uses. This quarry was established as a supplier to the new industrial area of Nanticoke on the north shore of Lake Erie and the area extending east of Hamilton.

Armbro Aggregates, a division of Armbró Materials and Construction Limited of Brampton, are one of the province's major suppliers of construction aggregates. Their largest gravel extraction and processing plant is located on Highway 10 just south of Caledon. At this site the material is crushed, screened, washed and stock-piled into approximately thirty different products. These are supplied to municipalities, contractors, ready mix plants, asphalt plants and private citizens throughout the Region of Peel, Metropolitan Toronto, and adjacent municipalities. Approximately two and one-half to three million tons of aggregates are produced annually, with an on-site production staff of up to sixty people.

The second gravel extraction facility of this company is located in north-central Brampton. This site is called Bovaird's Pits and produces up to one million tons per year of crushed and uncrushed road gravels, as well as sandfill. These are sold mostly within the Region of Peel.

The third producing site owned by this company in the Central Region is the Vinemount Quarry. This limestone quarry is located approximately one mile south-east of the hamlet of Vinemount in the Town of Stoney Creek. Approximately two hundred thousand tons of road aggregates are produced here annually, and are sold in the Grimsby-Hamilton area.

At the present time, Armbró Aggregates is not planning any major expansion at these locations.

Tables 1 and 2 show the breakdown of licenced operations by the districts and the aggregate production by the Townships in the Central Region.

Regional Geological Evaluation Projects

Abandoned Pits and Quarries Study

All districts in the Region continued work on updating or completing studies started in 1978. Lindsay and Niagara Districts have enlarged the scope of their studies which are expected to be ready in 1980. The districts have identified 600 and 100 potential sites respectively.

Regional/District Strategies

The draft background mineral resources reports of all the five districts are now complete and have been reviewed in the Region. The reports are now being studied for their use in conjunction with the reports on other Ministry programs and the Southern Ontario Coordinated Program

Strategy.

Niagara Escarpment Plan

The Region is now in the process of reviewing the plan proposals in relation to the Ministry's original mineral resources input and the reduced size of the planning area.

Township Aggregate Inventory Reports

The Lindsay District staff started work on four reports relating to the City of Oshawa, the Towns of Newcastle and Whitby, and the Township of Scugog. The Oshawa report has been completed and submitted for publication to the Ontario Geological Survey. The Maple District staff have completed six draft reports pertaining to the Towns of Markham, Newmarket, Richmond Hill, Aurora and Vaughan, and the Townships of King, Georgina and East Gwillimbury. These reports have been submitted to the Ontario Geological Survey for publication.

Public Awareness Programs

E.B. Freeman of the Ontario Geological Survey, organized the basic mineral exploration course and the special topics course held in Toronto. He conducted three field trips, and gave geological talks at Humber College, Rock and Mineral Clubs, High Schools and to a group of visiting foreign geologists. Geological presentations were also made to Junior Ranger camps in Huronia, Lindsay and Maple Districts.

The Lindsay District staff gave guest lectures on geology, mineral resources and planning to groups of teachers and students in their district. They also participated in three television programs.

Activities of the Ontario Geological Survey

T.R. Carter and A.C. Colvine of the Mineral Deposits Section conducted field studies in the southern portion of the Grenville Supergroup to determine the geological setting of mineralization and to establish metallogenetic relationships in order to help delineate areas of the greatest economic interest.

D.M. Carson of the Engineering and Terrain Geology Section mapped an area covered by eight NTS map sheets at the scale of 1:50 000 in the Peterborough-Campbellford area. The rocks, largely limestone and shales, are of Middle Ordovician age and lap onto the Precambrian rocks in the northern part of the map area.

J.A. Westgate completed the mapping of the Markham area. The stratigraphic studies along the Scarborough

TABLE 2 Estimated Aggregate Production in the Central Region.

CAMBRIDGE DISTRICT

TOWNSHIP	1976	1977	1978
	TONS	TONS	TONS
Brantford	200,915	1,543,502	1,638,264
S. Dumfries	661,644	383,514	305,922
Onandaga	142,897	17,898	3,651
Tuscarora			
City of Burlington	3,519,677	2,447,775	3,261,210
Town of Halton Hills	2,226,779	4,417,563	2,070,400
Town of Milton	4,245,534	343,060	5,438,542
Town of Oakville			
Town of Ancaster	288,577	238,607	190,615
Town of Dundas			
Flamborough	518,168	2,538,230	3,289,553
Glanbrook			
Stoney Creek	600,505	538,089	624,926
City of Cambridge		741,599	469,617
N. Dumfries	1,204,467	1,341,183	1,177,113
City of Kitchener		959,483	1,012,678
City of Waterloo	3,048,948	101,562	23,164
Wellesley	952,484	939,455	942,439
Wilmot	182,261	135,114	117,404
Woolwich	330,190	773,434	645,032
Arthur	89,119	82,769	132,394
Eramosa	53,227	106,245	119,750
Erin	78,994	89,535	93,292
W. Garafraxa		53,245	57,234
Guelph	738,055	279,563	104,892
W. Luther	51,475	58,459	68,332
Maryborough	81,212	61,920	28,744
Nichol			
Peel	18,377	43,014	51,641
Pilkington	340,408	325,204	593,445
Puslinch	1,650,211	1,773,613	1,787,154
E. Luther	60,794	44,535	44,011
Blandford-Blenheim	91,987	235,238	226,374
TOTALS	21,376,905	20,613,408	24,517,793

NIAGARA DISTRICT

TOWNSHIP	1976	1977	1978
	TONS	TONS	TONS
Town of Dunnville	205,000	196,000	285,000
Town of Fort Erie	583,000	541,000	525,000
Town of Haldimand	1,361,000	1,256,000	1,303,000
Town of Lincoln	1,575,000	1,253,000	1,174,000
City of Niagara Falls	1,239,000	1,073,000	1,040,000
Town of Niagara-on-the-Lake	475,000	419,000	534,000
Town of Pelham	1,126,000	859,000	801,000
City of Port Colborne	1,254,000	1,271,000	1,461,000
Town of Thorold			
Township of Wainfleet	293,000	334,000	474,000
TOTALS	8,111,000	7,202,000	7,597,000

CENTRAL

Table 2 continued

LINDSAY DISTRICT

TOWNSHIP	1976	1977	1978
	TONS	TONS	TONS
Twp. of Alwick	106,520	63,765	43,101
Twp. of Asphodel	528,557	427,209	368,015
Twp. of Belmont	306,827	337,273	364,849
Twps. of Bexley & Carden	8,706	97,260	249,780
Vil. of Bobcaygeon	14,184	12,022	12,792
Twp. of Cavan	50,909	211,248	125,896
Twp. of Douro	75,563	105,594	32,479
Twp. of Dummer	212,056	184,772	251,836
Twp. of Eldon	96,949	106,058	43,530
Twp. of Emily	324,741	487,963	337,481
Twp. of Ennismore	189,826	296,583	93,286
Twp. of Fenelon	682,894	670,919	510,718
Twp. of Haldimand	155,684	72,700	143,413
Twp. of Hamilton	240,497	221,332	334,331
Twp. of Harvey	126,811	67,002	87,732
Vil. of Havelock	3,183	8,645	14,475
Twp. of Hope	52,541	78,853	70,675
Twp. of Manvers	1,325,638	1,286,897	1,715,238
Twp. of Mariposa	453,730	384,504	366,893
Town of Newcastle:			
Former Twp. of Clarke	264,446	443,763	487,363
Former Twp. of Darlington	1,126,127	878,358	1,323,989
Twp. of N. Monaghan	15,000	184,025	68,683
Twp. of Ops	8,888	14,145	
Twp. of Otonabee	221,456	164,615	178,074
City of Peterborough		2,286	
Twp. of Scugog:			
Former Twp. of Cartwright	160,135	281,609	402,549
Former Twp. of Reach	374,064	1,019,635	878,418
Twp. of Smith	457,177	358,323	398,337
Twp. of S. Monaghan	3,906	10,167	13,686
Twp. of Verulam	97,599	153,943	318,311
Town of Whitby	436,218	437,154	450,380
TOTALS	8,120,832	9,068,622	9,686,310

Table 2 continued

MAPLE DISTRICT

TOWNSHIP	1976	1977	1978
	TONS	TONS	TONS
Brock	1,073,400	1,145,018	1,260,928
Pickering	469,400	426,965	411,190
Uxbridge	3,825,700	3,305,053	3,435,756
East Gwillimbury	313,300	434,973	234,911
East York	88,200	110,116	104,658
Georgina	379,100	564,600	362,435
King	2,130,600	1,611,936	1,705,816
Markham			
Richmond Hill			
Vaughan	2,014,400	1,596,686	1,689,361
Whitchurch-Stouffville	2,657,400	3,208,352	3,837,269
Brampton	1,515,500	1,519,024	1,757,291
Caledon	5,531,600	4,848,363	5,248,649
Mississauga	797,300	726,842	713,095
TOTALS	19,121,600	18,196,755	19,373,170
<u>HURONIA DISTRICT</u>			
Adjala	444,687	307,999	634,926
Amaranth	3,689	2,850	69,424
Essa	53,626	65,536	56,455
Flos	175,453	326,169	225,894
E. Garafraxa	185,179	467,600	286,340
W. Gwillimbury	47,813	32,381	49,410
Innisfil	276,981	304,040	206,028
Mara	335,489	352,162	221,858
Matchedash	NIL	NIL	7,150
Medonte	140,984	205,998	148,430
Melancthon	93,870	69,111	40,001
Mono	580,447	711,828	377,797
Mulmur	159,559	80,905	85,674
Nottawasaga	229,022	307,486	351,420
Orillia	2,315,262	2,282,619	2,320,631
Oro	241,118	393,007	389,476
Rama	48,426	50,378	55,401
Sunnidale	306,706	263,766	273,661
Tay	637,984	542,425	718,907
Tecumseth	42,461	100,251	67,347
Tiny	223,010	115,394	227,815
Tosorontio	25,230	98,883	105,450
Vespra	381,688	535,050	429,063
TOTALS	6,948,684	7,615,838	7,348,558

CENTRAL

ough Bluffs and the river valleys, indicate that the Halton Till is thin over most of the area and is underlain for the most part by sand and gravel. The outer limit of the till has been recognized just to the southeast of Aurora.

D.R. Sharpe initiated a project to prepare a compilation map of the surficial geology of Metropolitan Toronto and surrounding area at a scale of 1:50 000.

Maps and reports of areas within the Region published during 1979 by the Ontario Geological Survey are shown in Figure 1 and listed in Table 4.

Geoscience Research in the Central Region

Graduate Thesis Recently Completed:

Derivation of a quantitative lithofacies depositional model for the Caledon outwash - a Pleistocene braided stream deposit; by J.Z. Fraser, 1979, University of Toronto, M.Sc. thesis, 317p.

Recent Publications and References

Carter, T.R. and Colvine, A.C.

1979: The Geology and Preliminary Metallogenetic Classification of Metallic Mineral Deposits of the Grenville Province of Southeastern Ontario; p.199-207 *in* Summary of Field Work 1979 by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245 p.

Carson, D.M.

1979: Paleozoic Geology of the Peterborough Campbellford Area, Southern Ontario. p.146-148 *in* Summary of Field Work 1979, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.

Sharpe, D.R.

1979: Urban Geology of Metropolitan Toronto. p.140-142 *in* Summary of Field Work, 1979, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245 p.

Westgate, J.A.

1979: Quaternary Geology of the Markham Area, York and Durham Regional Municipalities. p.135 *in* Summary of Field Work 1979, by the Ontario Geological Survey, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245 p.

Other Articles of Interest

Ford, K.L. and Charbonneau, B.W.

1979: Investigation and Regional Significance of Airborne Gamma Ray Spectrometry Patterns in the Sharbot Lake Area, Eastern Ontario; *in* Current Research, Part B, Geological Survey of Canada, Paper 79-1B, p.207-222.

Kerswill, J.A. and McConnell, J.W.

1979: The Grenville of Labrador: A Possible Target for Uranium Exploration in Light of Geological and Geochemical Investigations *in* Current Research, Part B, Geological Survey of Canada; Paper 79-1B, p.329-339, 1979.

Davidson, A., Britton, J.M., Bell, K. and Blenkinsop, J.

1979: Regional Synthesis of the Grenville Province of Ontario and Western Quebec; *in* Current Research, Part B, Geological Survey of Canada, Paper 79-1B, p.153-172.

Stanley W.E. and Farrow, J.E.L.

1979: Management of Socio-Economic Impact Analysis for Resource Development; *in* The Canadian Mining and Metallurgical Bulletin, Vol. 72, p.50-54.

Energy, J.J.

Canadian Developments in the Use of Wastes and By-Products; *in* The Canadian Mining and Metallurgical Bulletin, Vol. 72, p.88-94.

Aitcin, P.C. and Cossette, M.

1979: Lightweight Concretes with Aggregates Made From Asbestos Mine Tailings; *in* The Canadian Mining and Metallurgy Bulletin, Vol. 72, p. 95-96.

Gomes, J.M. (and others)

1979: Recovering By-Product Heavy Minerals from Sand and Gravel, Placer Gold, and Industrial Mineral Operations; U.S. Department of the Interior, 1979, p.15 (Bureau of Mines, R.I. 8366). Washington, U.S.A.

TABLE 3 **Aggregate Production in the Central
Region during 1979.**

<u>MNR Region</u>	<u>District</u>	<u>Volume (s. ton)</u>	<u>Value (\$)</u>
Central	Cambridge	24,857,641	47,272,886
	Huronina	8,023,827	11,157,143
	Lindsay	10,057,508	26,615,883
	Maple	18,313,265	30,981,061
	Niagara	7,336,156	17,357,487
		68,588,397	133,384,460
		68,588,397	133,384,460

Source: Mineral Statistics Data Base. Data collected directly by Mineral Statistics Section (MSS), Mineral Resources Branch, by means of Annual Census.

Note: The statistical universe was expanded by MSS in 1979 during the collection of the 1978 Census. As a result, the sample is now much larger. It is more representative of the actual universe of Sand and Gravel producers. The statistical universe will be further improved in 1980 and hopefully will yield even more reliable estimates of the actual production.

Aggregate includes sand, gravel and crushed stone. Data on other commodities produced in the Region are not available at this time.

CENTRAL

TABLE 4 Maps and Reports pertaining to the Central Region issued by the Ontario Geological Survey of the Ontario Ministry of Natural Resources in 1979. See "List of Publications" (back pocket) for details.

GEOLOGICAL CIRCULAR
GC 13 (reprint)

MISCELLANEOUS PAPERS

MP 79
MP 83
MP 84
MP 87
MP 90

OPEN FILE REPORTS

OFR 5260
OFR 5264
OFR 5269

AGGREGATE RESOURCES INVENTORY PAPER

ARIP 1

MISCELLANEOUS PUBLICATIONS

Rock and Minerals Information 1979

PRELIMINARY MAPS

p. 1983
p. 1984
p. 1985
p. 2224
p. 2280
p. 2281

COLOURED MAPS

2392
2441

MINERAL RESOURCES BRANCH PUBLICATIONS

MPBP 6
MPBP 8
MPBP 9
From Pits to Playgrounds, Aggregate Extraction and
Pit Rehabilitation in Toronto - An Historical Review.

1979 Report of Southwestern Regional Geologist

P.A. Palonen¹, R.E. Booth-Horst² and P.N. Hymus³

Contents

Introduction	139
Ontario Geological Survey Activities	139
Oil and Natural Gas	139
Industrial Minerals	140
Pits and Quarries	140
Thesis Projects and Other Research	142
Ph.D. Research	142
M.Sc. Research	142
B.Sc. Research	142
References	142

Table

1 - Permanent Staff Assigned to the Section	143
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Figures

1 - Southwestern Regional Geologist's Area	141
2 - Oil and Gas Exploration Drilling	142

Introduction

As part of the de-centralization program of the Ontario government the entire Petroleum Resource Section was moved from Toronto to the Southwestern Regional office in London. The administrative, engineering and enforcement functions are now carried out from the Regional office. Geologic functions such as exploration, information, well records, and remote terminal access to the computerized Ontario Well Data System are performed at the Petroleum Resources Laboratory. Section personnel are responsible for all mineral resources related activities within the Region as well as petroleum exploration in the entire province. Inspectors, responsible for enforcing the Petroleum Resources Act are located in London, Merlin, Wallaceburg, Aylmer West and Simcoe.

¹ Chief Geologist, Petroleum Resources Laboratory, 458 Central Ave., London.

² Senior Geologist, Petroleum Resources Laboratory.

³ Aggregate Resources Inspector, Aylmer District.

Ontario Geological Survey Activities

Two field parties of the Engineering and Terrain Geology Section were active during the summer of 1979 in Southwestern Region. The Quaternary geology of the Wallaceburg, St. Clair Flats and Chatham areas was mapped by W.D. Fitzgerald (A in Figure 1). The surficial materials (Fitzgerald 1979) in the areas are described as Late Wisconsin till covered by lacustrine clay and an alluvial deltaic complex. Aggregate potential is reported to be low. Mapping will be continued into the Chatham area in 1980.

A second Quaternary project was completed near Owen Sound under the direction of B.H. Feenstra (B in Figure 1). Quaternary geology is strongly influenced by Paleozoic outcrop comprising the Niagara Escarpment. Surficial material (Feenstra 1979) consists mainly of an ablation till sheet broken by drumlin, eskers and beach deposits of the Bighead Valley. Aggregate resources in the area are described as limited, with the baymouth bar across the Bighead Valley nearing depletion.

An engineering geology and terrain study has been initiated covering the area bounded by Latitude 46° and 45° N and Longitude 77°30' and 81° W. The project is designed to evaluate the engineering properties of soils to determine their suitability for construction, road building and other uses.

Oil and Natural Gas

Most petroleum and natural gas exploration and development in Ontario is conducted in the Southwestern Region. Minor exploration has taken place in the Hudson Bay Lowlands and the Ottawa River Valley in the past. A total of 217 wells were drilled in 1979 excluding 8 lost holes and 1 re-entry. The drilling showed a significant increase from 96 741.7 m drilled in 1978 to 120 597.0 m in 1979. The figures represent an increase of 22 percent for wells drilled and 25 percent for total length drilled.

The significant increase in exploration and drilling activity in 1979 (Fig. 2) was due to:

1. long term interest in petroleum because of anticipated price increase and ready markets in Ontario
2. pressure on companies to justify conversion of expiring Exploratory Licenses of Occupation to Leases in Lake Erie and

SOUTHWESTERN

3. new exploration capital available to small companies because of price increases.

Petroleum rights in southern Ontario are held by private landowners. The increased exploration, combined with spacing and other regulations governing locations of drilling sites, have made it extremely difficult for large and small companies to acquire land for major programs in the areas of highest potential. Future exploration programs by both large and small companies will of necessity be directed at deeper targets or into areas of unevaluated potential.

During the past year 72 exploratory and 133 development wells were completed showing increases of 13 percent in the exploratory class and 34 percent in the reserves development class over 1978. In addition, 12 wells were completed for other purposes. These included 2 for brine production, 5 for petroleum products storage, 2 for gas storage and 1 for observation purposes.

Offshore drilling for natural gas in Lake Erie increased 38 percent from the previous year with 117 wells completed as gas producers or plugged and abandoned. By the end of 1979 a total of 1340 wells had been drilled in Lake Erie.

Of the 117 lake wells drilled in 1979, 28 are classified as exploratory and 89 as development of known fields. Nine exploratory tests were successful as were 37 of the development wells. The overall success ratio for wells drilled was 39 percent. Total length drilled in Lake Erie amounted to 63 459.9 m compared to 47 028.8 m during the previous season. This represents an increase of 35 percent over the previous year. One of the major companies involved in Lake Erie is planning a two week extension of their drilling program for the 1980 season.

All of the available gas rights in Lake Erie are held by seven operators. Approximately 1.1 million hectares were under disposition. These were divided between 1.0 million hectares under Licenses of Occupation and 0.1 million hectares under Lease.

A total of 91 wells comprising 57 137 m were drilled from land based rigs. Seven of 44 Exploratory and 36 of 44 development wells were successful, giving a success ratio of 49 percent for land based operations. The combined land and lake success ratio for Ontario in 1979 was 43 percent. Seven wells including 2 exploratory, 1 re-entry and 4 development wells were completed as oil producers. No oil production is permitted from the Great Lakes. Forty-six gas producers were completed on land and 82 in the lake. These lake wells were divided between 70 development and 12 exploratory wells.

In the lake, gas was discovered in the Silurian in 3 new field wildcat wells (T.D. 534-687m), 3 new pool wildcats (T.D. 446-750m) and in 3 extensions (T.D. 432-455m). On land, a gas field in Cambrian strata of Welland County, Wainfleet Township (T.D. 1008.8 m) and two Silurian reef gas pools in Ashfield Township, Huron County (T.D. 607 and 687 m) were discovered. New oil pools were discovered in a Silurian reef in Lambton County, Plympton Township (T.D. 742 m) and in Cambrian rocks in Oxford County, Blenheim Township (T.D. 907.5 m). Oil was also found in the Ordovician of Essex County, Gosfi-

eld North Township when the O.K. West No. 2 well was deepened from 763.5 to 1017.4 m. Total oil production from Ontario wells for 1979 is estimated at 92 200 cubic metres. This is reduced slightly from the previous years production of 93 000 cubic metres.

Industrial Minerals

Two underground salt mines continued to operate in the Region for the full year. The Canadian Rock Salt Company Limited produced approximately 2.2 million metric tonnes of salt from their Windsor operation. Most of this production was from the underground mining facility and was marketed as road salt. Smaller amounts of pure salt were produced by brining for use as chemicals and in water softener. The mine utilizes a conventional room and pillar method because the deposit is well-defined and uniform. Drilling and blasting of a 6 m face is followed by roof bolting of the upper 1 m of salt. Trackless LHD equipment transfers the salt to a primary jaw crusher and conveyor belt to a hopper for hoisting to surface. The daily production rate of 9000 metric tonnes is maintained by a staff of 340 employees. Manager of the mine is Mr. R. Upham.

Domtar Chemicals Limited also produced approximately 2.2 million metric tonnes of salt from an underground operation at Goderich. A 10.5 m face is mined in a method similar to the Windsor operation. A workforce of 310 employees maintain a daily production rate of about 9000 metric tonnes. Mr. W. Coglin is manager.

The combined production of the two mines amounted to about 30 million dollars worth of minerals. The major part of the total production is in the form of granular road salt marketed mainly in Ontario and Quebec.

Pits and Quarries

Of the approximately 900 operational sand, gravel and clay pits and stone quarries in production in southwestern Ontario in 1978, 424 were licensed operations under the Pits and Quarries Control Act, 1971. All the licensed pits and quarries are located in the 80 designated townships throughout the Region. The total amount of aggregate extracted in 1978 was 20 296 730 metric tonnes. No major changes in production figures are anticipated for 1979. The total amount of money spent on rehabilitation of existing licensed pits and quarries was 615 053.56 dollars. This represents a slight increase over 1977. During the year many amendments and suggestions were reviewed in preparation for the proposed Aggregates Act 1979 which is expected to be passed in 1979-1980.

EXPLANATION

- **Operating Mines**
 1. Domtar Chemical Ltd.
 2. Canadian Rock Salt Co. Ltd.
- ☀ **Important Gas Discoveries 1979**
 1. Shell Ashfield 7-1-111 ED
 2. Fitzgerald Ashfield 5-IX WD
 3. Consumers' 13627 Lake Erie 156-1 (Offshore Elgin)
 4. Bowman Dev. Wainfleet 7-4-III
 5. Anschutz No. 1A Lake Erie 67-Q (Offshore Haldimand)
 6. Consumers' et al 13631 Lake Erie 181-M (Offshore Elgin)
 7. Consumers' 13615 Lake Erie 220-D (Offshore Kent)
 8. Consumers' 13624 Lake Erie 221-T (Offshore Kent)
 9. Anschutz No. 2 Lake Erie 244-G (Offshore Elgin)
 10. Consumers' 13629 Lake Erie 182-G (Offshore Elgin)
 11. Anschutz No.2 Lake Erie 64-R (Offshore Haldimand)
 12. Anschutz No.4 Lake Erie 64-G (Offshore Haldimand)
- **Important Oil Discoveries 1979**
 1. Bluewater Plympton 5-19-VI
 2. Davey No. A Blenheim 5-VII
 3. O.K. West No.2 Gosfield No. 13-IX
- **Brine Wells for Salt Recovery**
 1. Dow Chemical No. 57 Moore 24-XII
 2. Dow Chemical No. 60 Moore 24-XII
- **Petroleum Products Storage**
 1. Dow BR No. 1 Moore 25-XI
 2. Dow BR No. 3 Moore 25-XI
 3. Dow Br No. 4 Moore 25-XI
 4. Bow Br No. 5 Moore 25-XI
 5. Dow BR No. 6 Moore 25-XI
 6. Tec W'port No. 9A Sombra 14-XIV
 7. Tec W'port No. 11 Sombra 14-XIII

..... Fieldwork by OGS

////// Boundary of Southwestern Region.

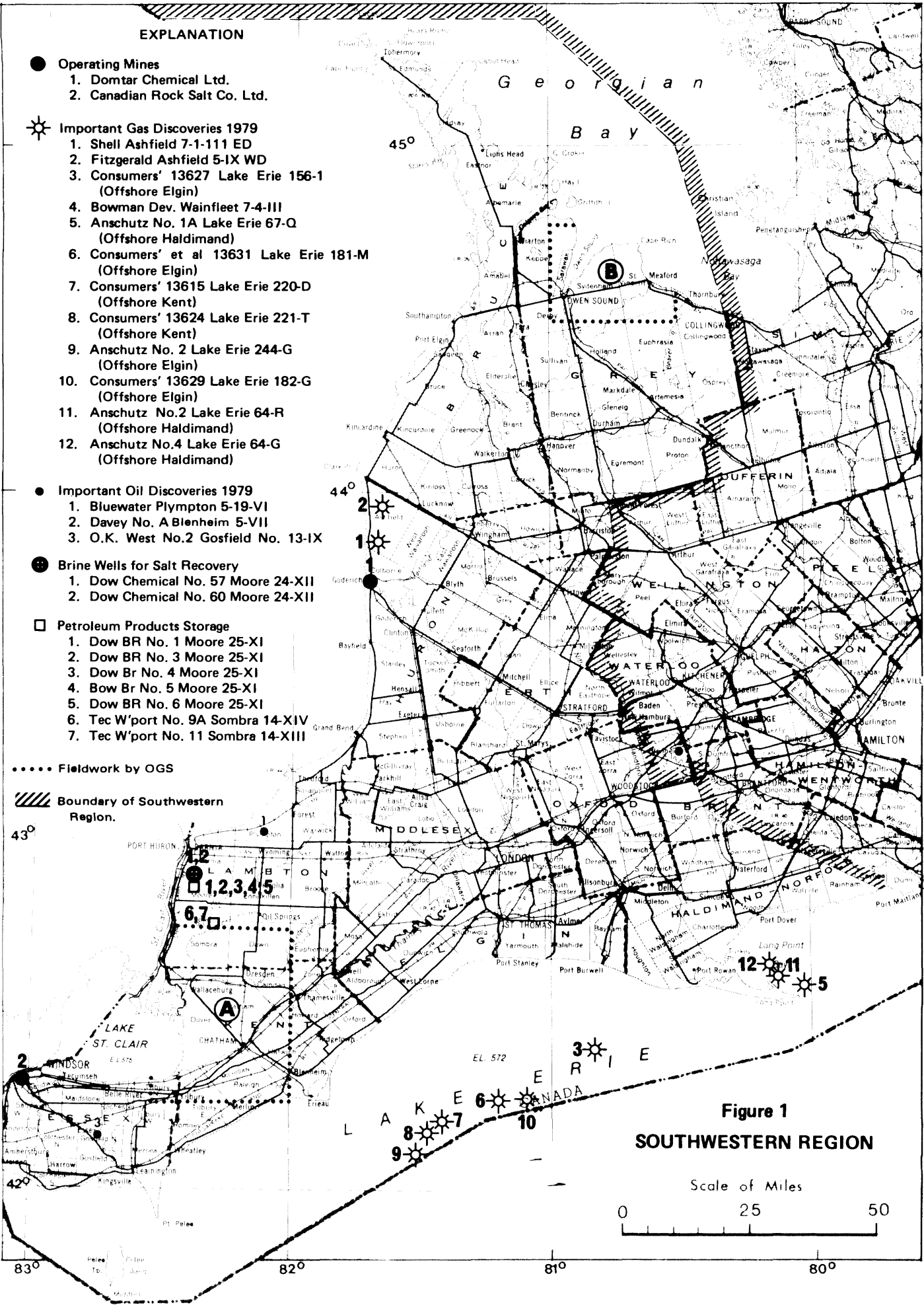
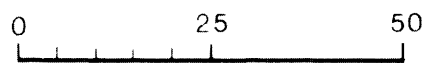


Figure 1

SOUTHWESTERN REGION

Scale of Miles



SOUTHWESTERN

Thesis Projects and Other Research

Numerous students from southern Ontario universities are working on geoscience research projects in Southwestern Region.

Ph.D. Research

Broster, B. - University of Western Ontario. Compositional Variation in Till Along East Shore of Lake Huron.

Gomez-Trevion, E. - University of Toronto. Electrical Resistivity Surveys Across Reefs in southwestern Ontario.

M.Sc. Research

Sado, E. - University of Waterloo. Quaternary stratigraphy of the Lucan Area North of London.

Legall, F. - University of Waterloo. Stages of Oil Generation in Paleozoic Traps of Southwestern Ontario.

B.Sc. Research

Hill, R. - University of Western Ontario. Descriptive Stratigraphy of a Guelph Reef-Complex-Lake Erie.

Robinson, R.M. - University of Windsor. Study of Precambrian Rock Types Underlying Paleozoic Stratigraphy of Southern Ontario.

Klein, D. - University of Windsor. Biostratigraphy of the Formosa Reef.

Gunter, W.R. - University of Windsor. Weathering Effects on Queenston Shale.

Nicholson, J. - University of Waterloo. Study of Terminus Reef Textures.

Blowes, D. - University of Waterloo. Study of Springvale Sandstone.

References

Feenstra, B.H.

1979: Quaternary Geology of the Owen Sound (41A/10) Area, Grey County; p. 133-134 in Summary of Field Work, 1979, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.

Fitzgerald, W.D.

1979: Quaternary Geology of the Wallaceburg (40J/9), St. Clair Flats (40J/10E), and Chatham (40J/8) Areas, Lambton and Kent Counties; p. 131-132 in Summary of Field Work, 1979, edited by V.G. Milne, O.L. White, R.B. Barlow and C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 90, 245p.

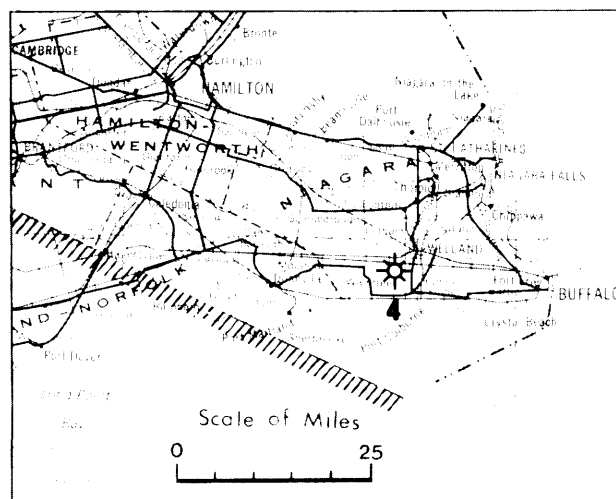


Figure 1a

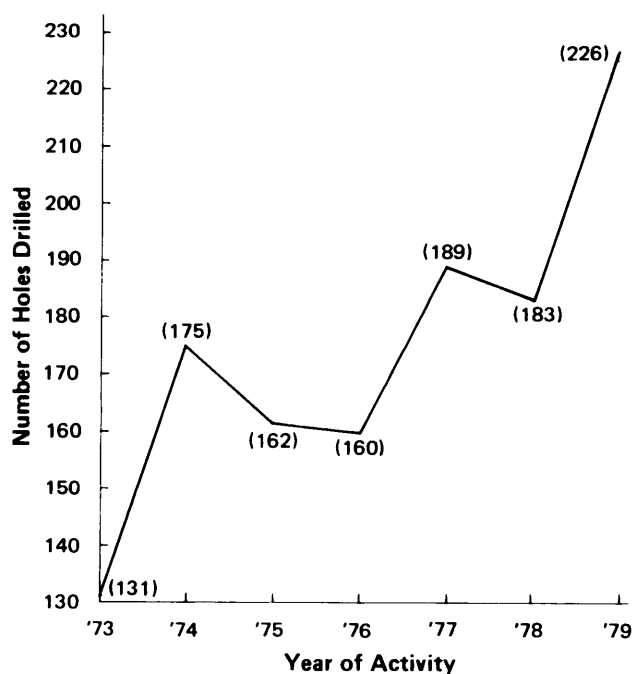


Figure 2 Oil and Gas Exploration Drilling

TABLE 1 **Permanent Staff assigned to the Section**

Regional Office 1106 Dearness Dr. 681-5350	R.G. Bryant	P. Eng.	Section Supervisor
	S. Keen	P. Eng.	Reservoir Engineer
	P. Wright		Geol. Assistant
	R. Laceby		Draftsman
	I. Cameron		Draftsman
B. Rush		Secretary	
Petroleum Resources Laboratory 458 Central Ave. 433-8431	P.A. Palonen	Ph.D.	Chief Geologist
	R.E. Booth-Horst	M. Sc.	Senior Geologist
	M. Campbell		Technician
	C. Hesselms		Secretary

