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Ontario

Building Stone Potential in Eastern Ontario

Ontario Geological Survey
Mineral Deposits Circular 30

by P.S. LeBaron, C.P. Verschuren, V.C. Papertzian and P.W. Kingston

1990



This project is part of the five-year Canada-Ontario 1985 Mineral Development Agreement (COMDA), a subsidiary agreement to the Economic and Regional Development Agreement (ERDA) signed by the governments of Canada and Ontario.

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Foreword

Development of the dimension stone industry in eastern Ontario began in the early 1800s with the use of local, easily quarried limestones and sandstones in the construction of buildings and in major projects such as the Rideau canal. Granites, marbles and gneisses have also been quarried as sources of architectural and monumental stone, flagstone, terrazzo chips and ornamental stone.

The current resurgence in the use of building and decorative stone in both the commercial and residential markets offers an opportunity for expansion of the stone industry in eastern Ontario. This study provides both general guidelines for evaluating dimension stone prospects and detailed information on over 200 sites investigated by the Ministry. Results of the study indicate that there is good potential for development of the granites, marbles and limestones of eastern Ontario, particularly as relatively small operations designed to supply markets in southern Ontario.

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V.G. Milne

*Director
Ontario Geological Survey*

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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) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per 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 co-operation with the Coal Association of Canada.

Building Stone Potential in Eastern Ontario

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Abstract

The building stone industry in North America has experienced substantial growth in recent years, and interest in developing local sources of stone has increased correspondingly. Eastern Ontario has historically produced various stone commodities such as terrazzo chips, flagstone, structural stone, monument stone, ornamental stone and architectural stone from Precambrian rocks (plutonic rocks, gneisses and marble) of the Grenville Province and from Paleozoic rocks (sandstone, limestone and dolostone) of the St. Lawrence Platform.

This study, focussing primarily on the plutonic rocks of the Central Metasedimentary Belt of the Grenville Province, but also including numerous marble, and some limestone prospects, has identified several areas with good building stone potential. The prospects, over 200 of which were examined in the field, were evaluated with respect to joint pattern and intensity, colour, texture and deleterious mineral content. Because of the complex metamorphic and structural history of the Grenville Province, areas with limited jointing and consistent colour and texture required by the building stone industry are rare. The most promising area is the high-grade metamorphic terrain of the Frontenac Axis, which hosts eastern Ontario's largest granite dimension stone quarry (Battersea, Storrington Township). However, local areas west of the Frontenac Axis also have good potential for granite and marble building stone development, particularly as relatively small operations to supply markets in southern Ontario.

Résumé

L'industrie de la pierre de construction en Amérique du Nord a connu une expansion importante au cours des dernières années et un intérêt pour l'exploitation des sources locales de pierre s'est développé en conséquence.

L'est de l'Ontario a toujours fourni différents produits en pierre tels que de la pierre concassée, des dalles, de la pierre de taille, de la pierre d'ornement, de la pierre de monument et de la pierre de revêtement architectural. Ces produits sont extraits des roches préambriennes (roches plutoniques, gneiss et marbre) de la province de Grenville et des roches du Paléozoïque (grès, calcaire et dolomie) de la plateforme du St. Laurent.

Cette étude, axée principalement sur les roches plutoniques de la Ceinture Métasédimentaire Centrale de la province de Grenville, a repertorié plusieurs sites avec un bon potentiel pour la pierre de construction, mais porte également sur de nombreuses possibilités pour le marbre et quelques possibilités pour le calcaire. Les sites d'exploration, dont plus de 200 ont fait l'objet d'une étude sur le terrain, ont été évalués quant à la répartition et l'intensité des diaclases, la couleur, la texture et la présence de minéraux délétères. En raison de l'histoire métamorphique et structurale complexe de la province de Grenville, rares sont les sites explorés où les roches sont peu fracturées et dont la couleur et la texture sont uniformes, selon les critères requis par l'industrie de la construction. Le secteur le plus prometteur est le terrain de haut degré métamorphique de l'axe de Frontenac, où est située la plus grande carrière de granite fournissant de gros blocs de taille dans l'est de l'Ontario (Battersea, canton de Storrington). Cependant des secteurs à l'ouest de l'axe de Frontenac ont aussi un bon potentiel pour l'exploitation du granite et du marbre pour la construction, surtout en ce qui concerne de petites exploitations pour alimenter les marchés dans le sud de l'Ontario.

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Part 1. Introduction

This report presents the final results of a multiyear study on the granite and marble building stone potential of eastern Ontario. Some of the information has been previously published in Ontario Geological Survey (OGS) Open File Reports 5556 (Verschuren et al. 1985) and 5585 (Verschuren et al. 1986).

Open File Report 5556 presented a general introduction to the building stone industry (deposit criteria, terminology) and the results of a literature search for building stone occurrences and aggregate quarries in eastern Ontario. This work was followed by field investigations of building stone occurrences which appeared, based on the literature, to have potential for development. In addition, a reconnaissance survey was initiated to examine new areas considered to have building stone potential, based on a study of geological reports. Open File Report 5585 documented the results of the 1985 field work and literature search. In 1986, the reconnaissance survey was completed and samples were obtained for cutting and polishing from prospects considered to have the highest potential for development. All results of the 1986 field work and a summary of the results of previous work are included in this report.

STUDY OBJECTIVES

The building stone industry in North America is experiencing a period of substantial growth, with a return to traditional building styles which make use of natural stone as both structural and decorative material. North American producers are currently expanding and upgrading stone processing facilities in an attempt to become more competitive with foreign suppliers of building stone (Meade 1986). This investment has resulted in reduced finishing costs which, in turn, has generated interest in opening new deposits.

The stone industry in eastern Ontario has produced various commodities including roofing granules, terrazzo chips, slate products, flagstone, construction blocks, ornamental stone and dimension stone. Source rocks for these products are plutonic rocks, marble, slate, sandstone and limestone. The availability of resources and a substantial market in eastern Ontario should encourage the initiation of exploration programs by the private sector.

The purpose of this study is to provide information based on literature searches and field work which will be useful in developing exploration programs for building stone in eastern Ontario. Because of the limited potential for commercial slate in the study area, emphasis has been placed on identifying areas of granite and marble with potential for development.

ORGANIZATION OF THE REPORT

This report is divided into three parts:

Part 1. Introduction—contains background information on the building stone project and on the geology of the study area.

Part 2. The Building Stone Industry—provides a general introduction to various aspects of the industry, describing commodity definitions and uses; market trends and outlook; building stone deposit criteria; quarry economics; and ASTM tests.

Part 3. Building Stone Potential in Eastern Ontario—describes the current state of the industry in eastern Ontario; the results of 1985 and 1986 field work; and provides evaluations of the areas examined and recommendations for exploration.

Detailed reports on each site examined in 1986 are included as an appendix, as is a table summarizing the features of sites examined in 1985. Detailed reports on the 1985 sites are available in OGS Open File Report 5585 (Verschuren et al. 1986).

LOCATION OF THE STUDY AREA

Figure 1 shows the townships in which properties were examined in 1985 and 1986. The western limit of the study area extends roughly from Lake Simcoe to Lake Nipissing, including parts of the eastern shore of Georgian Bay. The eastern boundary extends from the Brockville area to the Pembroke area. The results of the 1985 examinations in the Lake Simcoe to Lake Nipissing area are summarized in this report. A more detailed study of building stone potential in that area, the Ontario Gneiss Segment of the Central Gneiss Belt (Figure 2), is currently being conducted by the Ontario Ministry of Northern Development and Mines, Dorset (Marmont and Johnston 1987).

This report deals primarily with Precambrian rocks of the Central Metasedimentary Belt and, to a lesser extent, the Paleozoic rocks of the St. Lawrence Platform (Figure 2) in the counties of Peterborough, Hastings, Lennox and Addington, Frontenac, Leeds and Lanark.

GENERAL GEOLOGICAL SETTING

The study area is underlain by Precambrian rocks of the Grenville Province, except in the extreme southern and eastern parts where the Grenville is overlain by undeformed Lower Paleozoic sedimentary rocks of the St. Lawrence Platform (Figure 2). The following descriptions are summarized from Wynne-Edwards (1972).

The Grenville Province in central and eastern Ontario has been subdivided into the Ontario Gneiss Segment of the Central Gneiss Belt and the Central Metasedimentary Belt. Some areas of the Ontario Gneiss Segment were examined in 1985, but the primary focus of this report is the Central Metasedimentary Belt.

The Ontario Gneiss Segment is dominated by quartzofeldspathic gneisses with local areas of marble,

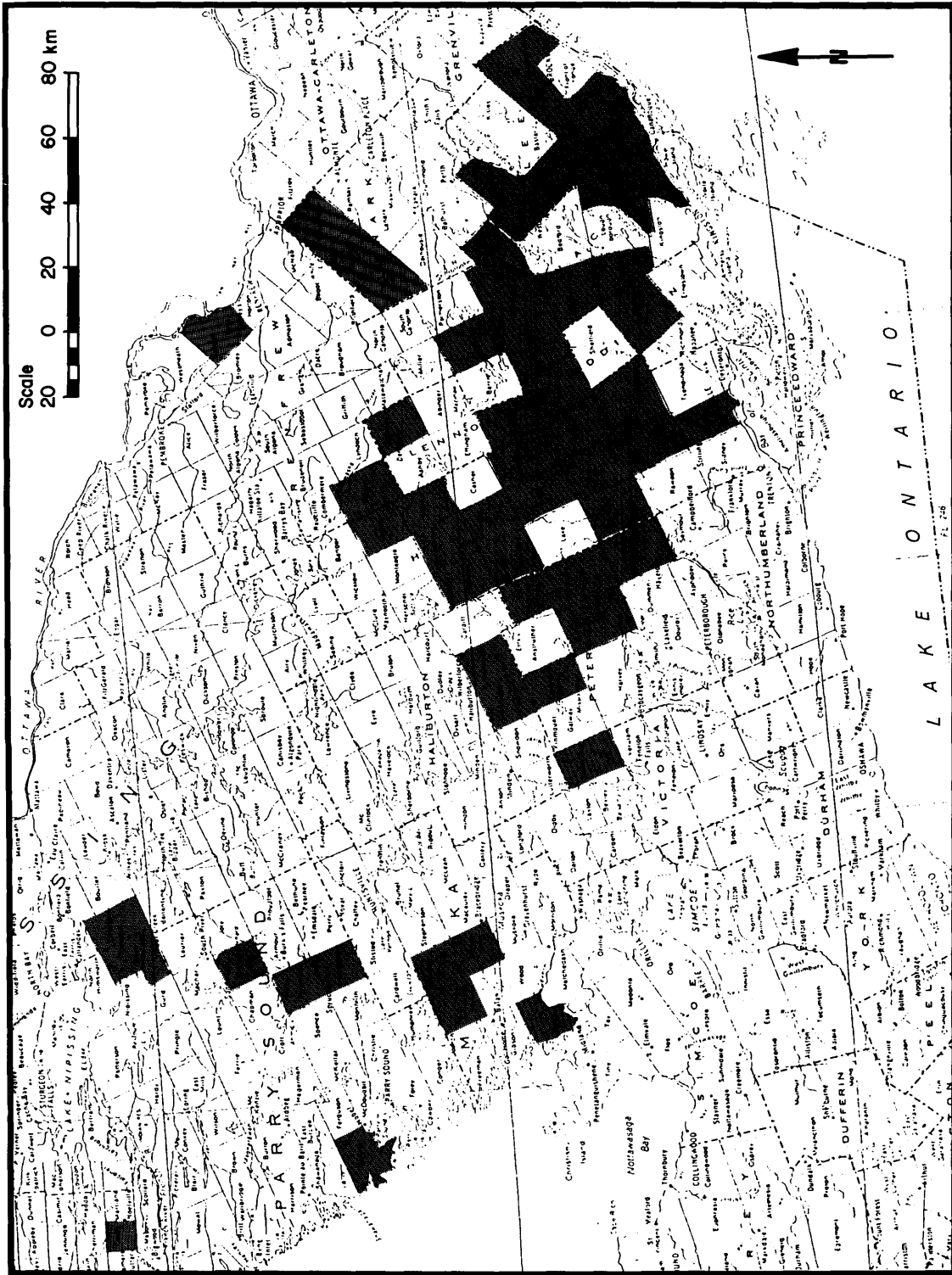
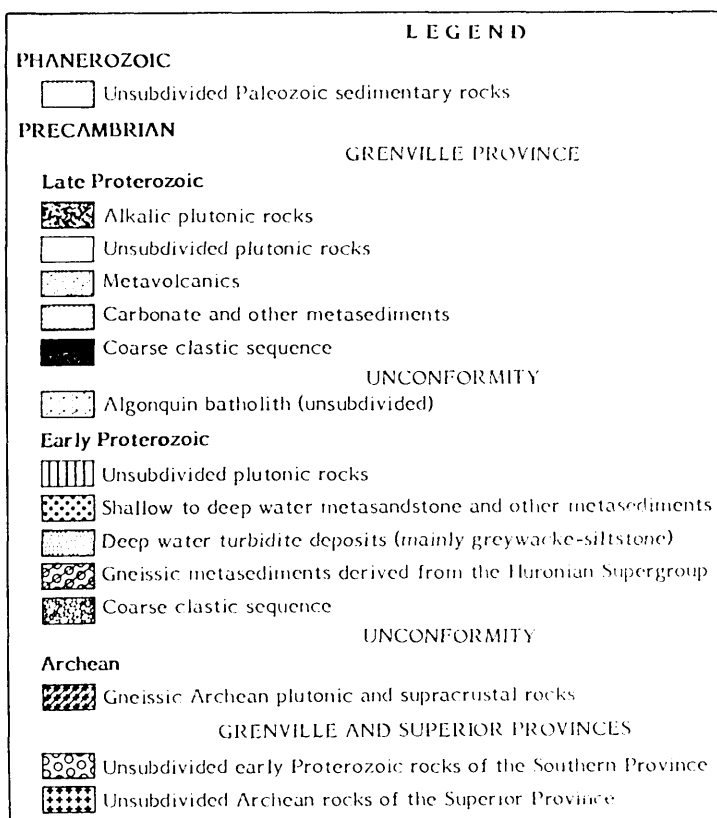
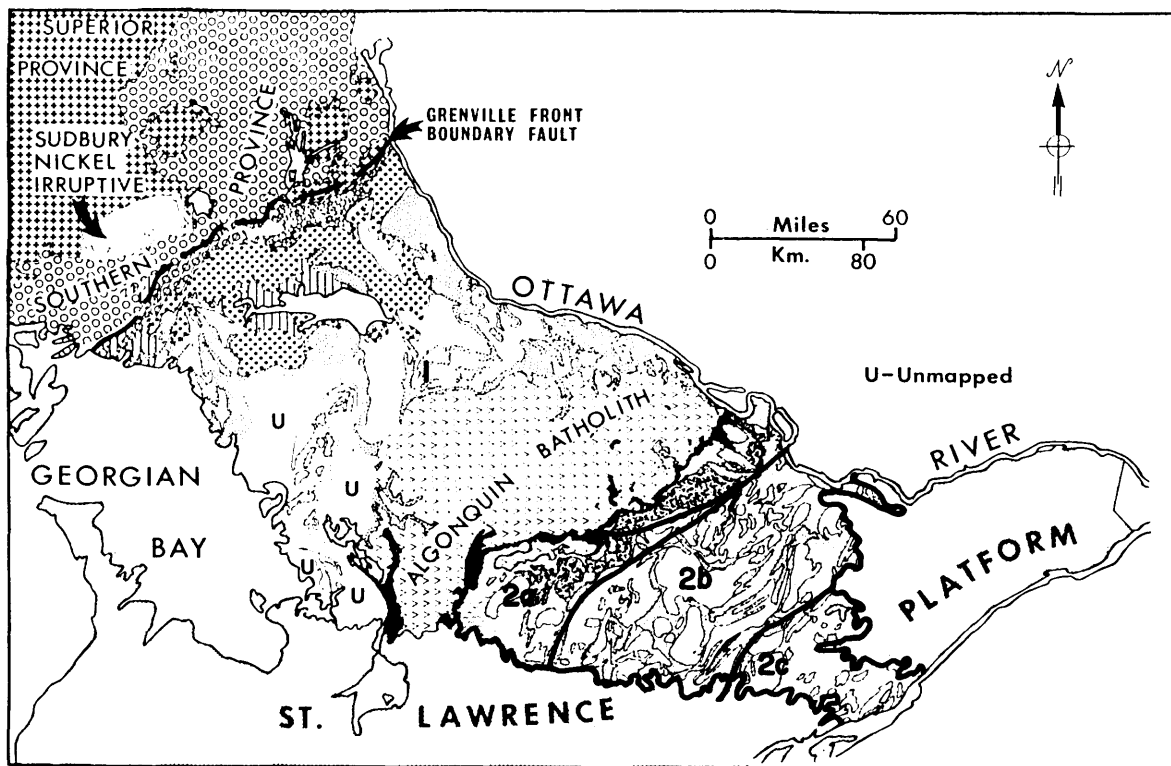


Figure 1. Location of the study area showing townships in which building stone prospects were examined.



GRENVILLE PROVINCE SUBDIVISIONS

- 1 Ontario Gneiss Segment**
- 2 Central Metasedimentary Belt**
 - a. Glamorgan-Cardiff Belt**
 - b. Hastings Basin**
 - c. Frontenac Axis**

Figure 2. Generalized geology (from Sims et al. 1981) and subdivisions of the Grenville Province (after Wynne-Edwards 1972).

quartzite, and paragneiss of the Grenville Supergroup. The grade of metamorphism is generally upper amphibolite facies. The gneisses are intruded by a variety of mafic to felsic plutonic rocks. These igneous complexes are generally highly deformed by regional metamorphism, but are locally massive to weakly foliated.

The Central Metasedimentary Belt hosts the rocks of the Grenville Supergroup, a suite of metamorphic carbonates, calc-silicates, quartzites, paragneisses, amphibolites, and metavolcanic rocks. These have been intruded by mafic to felsic plutonic rocks, some of which appear as large areas of granitic and tonalitic gneiss. Metamorphic grade is amphibolite facies at the north-western margin of the belt, decreasing to greenschist facies at the centre of the belt (the Hastings Basin), and increasing to amphibolite and granulite facies in the southeast (the Frontenac Axis).

Paleozoic rocks of the St. Lawrence Platform that lie within the study area include Potsdam or Nepean Formation sandstone, Shadow Lake Formation shale, Oxford Formation dolomite east of the Frontenac Axis, and limestone of the Gull River and Bobcaygeon formations west of the Frontenac Axis (Hewitt 1972).

PREVIOUS WORK

Descriptions of occurrences and past producers of building stone are given in reports by Parks (1912), Goudge (1938), Carr (1955) and Hewitt (1964a-f).

Geological maps and reports covering most of the study area have been published by the Ontario Geological Survey and the Geological Survey of Canada. References are listed in the property description reports.

Market studies for building stone have been done for northwestern Ontario (Les Consultants Sogir Inc. 1984) and New Brunswick, Nova Scotia and Newfoundland (DPA Group Inc. 1987).

In reviewing these reports, it should be noted that requirements of the building stone industry have changed, therefore, some conclusions which were valid in 1912 or 1955 may require re-evaluation. For example, irregularities such as inclusions or veining which previously have been considered defects may be desirable features in some current building designs, and blocks which were previously considered large at 5 to 10 tons are only about one-half the size now required by the dimension stone industry.

METHODOLOGY

The project began with an inventory of building stone occurrences in eastern Ontario, obtained by reviewing

the available literature and literature published in Verschuren et al. (1986). Properties were then selected for further investigation based primarily on apparent potential with respect to large quarry block size. A reconnaissance survey was also initiated in an attempt to delineate new areas with high building stone potential. Selection of areas was based on a study of geological reports with emphasis placed on identifying massive to weakly foliated, late-tectonic intrusive rocks.

The reconnaissance survey and quarry examinations were done in the summer and fall of 1985 and 1986. Geological information was recorded on data forms, and photographs of most sites were taken. Petrographic descriptions of the 1985 samples were obtained from thin sections; mineralogy of the 1986 samples was determined from hand specimens.

Upon completion of the property examinations, samples were taken from 51 sites considered to have good potential for building stone development. Samples in the order of 0.3 m³ were obtained by plug and feather quarrying and shipped to Oxford Monuments Limited, Woodstock, Ontario where they were cut into 30 by 30 by 4 cm slabs and polished. The polished samples, listed in Appendix E, can be viewed at the Ministry of Northern Development and Mines (MNDM) Drill Core Library, Tweed. Several samples were subjected to ASTM tests, the results of which are included in Appendix D and summarized in Part 3 of this report.

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The co-operation of many local residents in providing access to their properties is appreciated. In particular, the authors would like to thank Bill Houston and Bob Nash of Stoklosar Marble Quarries Ltd., Richard Cloutier of Rideau Red Quarries, Jim Byer of Actinolite, and Roger Young of Havelock.

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Part 2. The Building Stone Industry

COMMODITY DEFINITIONS AND USES

The following terms are commonly used in the stone industry. Rock names often bear little relation to the accepted geological terms.

Ashlar roughly rectangular pieces of stone of nonuniform size (5 to 10 cm thick, up to 0.5 m² in surface area); used for walls, fences and fireplaces.

Architectural Stone thin slabs (1.5 to 3 cm thick) of stone for facing buildings and monuments, also referred to as cladding; also includes interior-exterior flooring. Interior flooring (tiling) is generally 7 to 12 mm thick.

Dimension Stone a natural stone that has been quarried and shaped to certain dimensions for use in the building or monument industries.

Curbing Stone rectangular blocks, usually granite (about 0.15 by 0.45 by 2 m) used as curbing in road and bridge construction.

Flagstone stone which can be split into thin slabs (7 to 10 cm thick); used for sidewalks and patios.

Granite any crystalline igneous rock. Light coloured rocks are generally termed granite and dark rocks (usually gabbro, diabase) are referred to as "black granite". These terms can include volcanic, siliceous sedimentary, and metamorphic rocks as well as all plutonic rocks.

Landscaping Stone decorative rock including crushed, coloured stone, boulders and rough blocks used for sidewalks, driveways, borders and rock gardens.

Marble and Limestone marble is any carbonate rock that can be highly polished while limestone is a carbonate rock that cannot be polished well. The term marble also includes dark green serpentinites, despite their metaigneous nature.

Monumental Stone all natural stone used for the manufacture of statues, tombstones, mausoleums and other monuments. The primary requirements are uniform texture and colour with a lack of flaws.

Ornamental Stone any attractive rock suitable for the manufacture of small objects such as ashtrays and bookends. Rocks with flaws such as veins or inclusions, which are not suitable for architectural or monumental stone, may be marketable as ornamental stone.

Paving Stone rectangular, brick-sized blocks of roughly equal dimensions for sidewalks, driveways and road construction.

Rubble randomly sized and shaped stone used for retaining walls, sea walls, fences, and so on. These uses provide an economical way of disposing of quarry waste rock.

Structural Stone roughly rectangular blocks from less than a few tons to over 25 tons in weight. The primary

requirement is high strength; colour and texture are secondary considerations.

Terrazzo Chips crushed stone, usually coloured marble or limestone, which is embedded in mortar and polished to form terrazzo floors.

THE BUILDING STONE MARKET

The potential for developing a dimension stone industry, in addition to requiring adequate reserves of suitable stone, is dependent upon the market—its size, location, and expectations in terms of commodity type, quality and quantity. A prospective producer must study both the current and potential market conditions, considering that the market is, to a large extent, made by the producers. Demand for a product is dependent, in part, on its availability; a market can be created or expanded by the promotion of new stones and new commodities. For example, the province of Quebec uses 300 000 linear feet of granite curbing per year, the New England States more than one million feet per year, yet Ontario uses none (Les Consultants Sogir Inc. 1984). The reasons for this difference appear to be that the product is not available in Ontario and that Ontario civil engineers have not adequately studied the economic value of granite curbing. Ontario granite producers could create a local market by promoting and making granite available as an alternative curbing material, using the example of Quebec and New England to demonstrate the lower life cycle cost (initial, maintenance and replacement costs over a determined life cycle) of granite.

An analysis of market potential for various building stone commodities in eastern Ontario is beyond the scope of this study. However, a brief overview of recent market trends for the building stone industry in general is presented below.

HISTORIC TRENDS

The building stone market in Canada was relatively stable through the late 1970s. In 1980–81, both volume and value of Canadian shipments of building stone began to increase (Table 1) but this growth was halted by the 1981–82 economic recession as commercial and residential construction activity decreased sharply. The market continued to slump through 1983 but began to recover in 1984 as a result of both increased construction activity and the trend toward greater use of natural stone in architectural designs. Market growth has continued through 1987 as illustrated by the rough stone import and export figures for Canada in Table 2.

The market trend for building stone in general as described above reflects the trend for rough stone, which represents about 75 to 80 percent of the building stone shipments. Demand for monumental stone, in contrast to that for rough stone, has increased each year since 1980 with the exception of 1983 in which very little change occurred. Other uses of stone show a steady de-

TABLE 1. CANADA, TOTAL SHIPMENTS OF BUILDING STONE, 1979-85.

Building Stone	1979		1980		1981		1982		1983		1984		1985	
	(000t)	(\$000)	(000t)	(\$000)	(000t)	(\$000)	(000t)	(\$000)	(000t)	(\$000)	(000t)	(\$000)	(000t)	(\$000)
Rough	256	3094	268	3873	376	6047	230	4828	205	7359	248	9284	280	10 581
(% change from previous year)		+5	+25	+40	+56	-20	-39	-11	+52	+21	+26	+13	+14	
Monumental and Ornamental Stone	30	2410	18	1899	27	3207	38	4002	39	4012	53	5990	58	6527
(% change from previous year)		-40	-21	+50	+69	+25	+41	+3	+0.2	+36	+49	+9	+9	
Other (flagstone, curbstone, paving blocks, etc.)	35	1703	40	1585	33	1134	26	1027	19	900	17	937	25	1387
(% change from previous year)		+14	-7	-17	-28	-9	-21	-30	-12	-10	+4	+48		
Total	321	7207	326	7357	436	10 388	294	9857	263	12 271	318	16 211	363	18 495
(% change from previous year)		+2	+2	+34	+41	-5	-33	-11	+24	+21	+32	+14	+14	

Source: Canadian Minerals Yearbooks 1981 to 1987; Energy, Mines, and Resources Canada.

TABLE 2. CANADA, ROUGH BUILDING STONE EXPORTS AND IMPORTS, 1985-87.

	1985		1986		1987 (Jan.-Sept.)	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
Exports						
Building Stone, Rough	12 511	1657	66 427	2477	119 728	3933
(% increase from previous year)			+ 431	+ 49	+ 80	+ 59
Imports						
Building Stone, Rough	8846	1379	10 622	1853	12 837	1644
(% increase from previous year)			+ 20	+ 34	+ 21	-11

Source: Canadian Minerals Yearbook 1987; Energy, Mines and Resources Canada.

crease in demand until 1985 when a sharp reversal of the downward trend took place.

The United States market followed a similar trend. Both tonnage and value of dimension stone sold or used by producers declined sharply from 1981 to 1982 and recovered in 1984. Demand for finished marble was 72 percent higher in 1984 than in 1983; travertine imports were 133 percent higher, and granite imports 93 percent above the previous year's total (DPA Group Inc. 1987).

MARKET OUTLOOK

The DPA Group Inc. (1987) reported that "discussions with many architects and developers based in central Canada indicate that there is a definite resurgence in the use of natural stone," with the primary markets being Toronto, Ottawa and Montreal. The same report states that officials in the Building Stone Institute of America expect the next four years (1987-90) to be exceptional for stone use and that the Marble Institute of America reports "phenomenal growth" in the industry.

A 1986 survey of 1000 USA architectural firms conducted by the Building Research Bureau also suggests a positive market outlook. Replies to the question of whether the use of natural stone in the firms' buildings will increase, decrease or remain the same over the next five years are as follows (calculated from data in *Dimensional Stone Magazine*, July/August 1986):

	Remain the same	Increase moderately/greatly		Decrease moderately/greatly	
Granite	58.0%	32.5%	6.1%	2.7%	0.7%
Marble	58.0%	28.9%	7.5%	3.8%	1.8%
Limestone	72.8%	22.5%	2.0%	2.1%	0.6%

The increase in demand for stone from the commercial construction market applies to the residential market as well. New developments in stone processing technology have made possible the production of very thin, light-weight stone tiles (7 mm marble for interiors; 1 cm granite and 2 cm marble for exteriors). These thin tiles require lighter, less expensive back-up walls, greatly reducing total construction and installation costs (Powell 1986). New designs for residential buildings are incor-

porating stone tiles for their unique appearance in contrast to manufactured products, as well as for durability and easy maintenance (DPA Group Inc. 1987).

In summary, the growth of the building stone industry is expected to continue based on 1) the architectural trend toward greater use of stone for both aesthetic and structural reasons; 2) advances in stone cutting and processing technology which have made building stone a more competitively priced alternative to steel, concrete, glass and ceramics; and 3) improvements in construction techniques which have lowered installation costs.

BUILDING STONE DEPOSIT CRITERIA

The commodities of the building stone industry are produced from numerous rock types, each with a wide variety of qualities such as colour, texture and hardness. These properties, along with the extractable quarry block size, determine the potential uses of a body of rock with respect to building stone.

The criteria for deposits of various building stone commodities are discussed below.

ARCHITECTURAL AND MONUMENTAL STONE

Granite

The criteria for granite architectural and monumental stone deposits, in approximate order of importance, are: a limited, regular jointing pattern; marketable colour and texture; low deleterious mineral content; and large deposit size. These are described in more detail below.

Fracture and jointing determine the maximum size of blocks that can be quarried. Evaluation of the building stone potential of a granite body must include measurements of the attitude and spacing of major joint sets. The most desirable joint pattern consists of two subvertical, roughly orthogonal sets and a horizontal set, referred to as sheeting. A third subvertical set striking at an angle to the orthogonal set will make quarrying difficult, as will joint sets dipping at less than 75 degrees or intersecting at less than 60 degrees. The minimum spacing required is about 2 m for vertical and 1 m for horizontal joints, as quarry blocks are generally at least 1 by 2 by 1.5 m in size. Sheeting is the result of stress re-

lease due to erosional unloading. These joints usually become more widely spaced with depth, but zones of closely spaced sheets (4 to 20 cm) can occur at depth; sheeting in anorthosites often increases with depth (Nantel 1983). Granite bodies with no vertical joints frequently have close-spaced sheeting and vice versa, a feature related to the dissipation of sheeting stress by movement on pre-existing primary joints (Hills 1972). Many of the granite quarries in Vermont, which produce architectural and monumental stone would not have been developed if not for the exploitation of well-sheeted cap rocks as rough building blocks in the early history of the area. Therefore, even a well-sheeted granite, if the vertical joint sets are satisfactory, may warrant investigation at depth.

A more complete discussion of primary and secondary jointing was presented in Verschuren et al. (1985).

Colour and texture control the price and marketability of a stone, rather than its physical properties such as strength and porosity (Allison 1984). In general, colour and texture of a granite must be consistent in order to fill large orders for stone. The distinction between uniform and consistent texture is important. Monumental granite generally requires an even, fine grain size while architectural granite can be less uniform in texture, exhibiting variable grain size or gneissic banding. The stone, therefore, must be either very uniform in texture or nonuniform in an interesting and consistent manner (Storey 1986).

Textures that are generally considered as flaws, but may in some cases be desirable are: knots—dark masses of mafic minerals; lines—any linear pattern formed by foliation, layering, flowbanding; variable grain size; pegmatite patches; quartz veins; and schlieren.

Colour is determined by mineralogy and grain size. Fine-grained rock is generally darker than a similar coarse-grained rock. Polishing also makes a rock appear darker. Mafic rocks which are dark green on a rough surface often appear black when polished. A good contrast between rough and polished surface colour is desirable in any granite that will receive cut or sandblasted lettering.

White, red, and black granites are the colours currently most in demand. Deep red shades result from high concentrations of hematite. Black granites (commonly gabbro, anorthosite, or diabase) command the highest price because a darker stone shows irregularities in colour and texture more readily than a lighter stone. The proportion of waste rock is therefore higher in a black granite quarry than in a light granite quarry. Waste in the Peribonca River anorthosites of Quebec can be as high as 90 percent (Nantel 1983).

Other colours of granite may be marketable if quarried inexpensively and offered at a competitive price. Domestic replacements for high-priced imports should be pursued, but not to the extent that other granites are excluded as exploration targets.

Deleterious minerals include any mineral that breaks down rapidly due to weathering. Sulphides should be absent or present only in trace amounts. Soft ferromagnesian minerals and altered feldspars weather easily and will not sustain a polish. Excessive biotite (greater than 5 percent) can cause plucking during polishing, and garnet and corundum can cause polishing problems because of their hardness. Magnetite and ilmenite are common in granites, but are resistant to weathering and are generally acceptable.

Deposit size should be sufficient to quarry for at least 20 years. A minimum size is about 1 km² (Storey 1986), but may be smaller for good quality stone being produced for local markets.

Marble and Limestone

The same general criteria used to evaluate granite deposits apply to marble and limestone. Several problems related specifically to eastern Ontario marbles are discussed below.

Joint patterns must allow extraction of large blocks (at least 3 m³), as for granite quarrying.

A very wide range of colours and textures are marketed, most being produced in Italy and several other European countries. European marbles were formed by very low grade metamorphism of thickly bedded (1 to 2 m), extremely pure limestones. Eastern Ontario marbles were formed by low- to high-grade metamorphism (greenschist to granulite facies) of thinly bedded (0.2 to 5 cm) impure limestone and dolostone (Verschuren et al. 1985). For this reason, eastern Ontario marbles cannot be expected to duplicate the qualities of European marbles, but must be promoted and marketed for their own unique colours and textural patterns.

Within areas of low-grade metamorphism, thin bedding and intense folding result in planes of weakness and inconsistent colour and/or texture patterns. Recrystallization at higher grades of metamorphism increases strength along bedding planes and can obliterate primary banding, but weakens bonds between individual grains. This can cause plucking of grains during polishing.

Higher grade metamorphism of impure, siliceous limestone or dolomite produces medium- to coarse-grained marbles containing calc-silicate and magnesium-silicate minerals such as talc, tremolite, forsterite, diopside, periclase, wollastonite and serpentine. This can result in attractive colour and/or texture patterns, but the stone may require granite rather than marble processing equipment because of the silicate mineral content. Similar rocks often result from metasomatic alteration of marbles along fault zones or at intrusive rock contacts.

Dolomitic marble under low grade metamorphic conditions deforms in a brittle manner, while calcitic marbles undergo plastic deformation. This usually precludes the extraction of large quarry blocks from low-grade dolomitic marble, but healing of fractures by late carbonate or silicate material can produce an attrac-

tive stone with good quarry block size potential. Iron-bearing carbonates within the marble or veins may weather to a rusty brown colour, making the stone unsuitable for architectural or monumental purposes.

Limestone is not generally used as architectural or monumental stone because, in the building stone definition, limestone does not polish well. However, some true limestones are marketed as marbles. They are usually fine grained, dark coloured, and thickly bedded.

In general, eastern Ontario marbles are characterized by larger grain size and more variable texture than European marbles. However, a sufficiently large deposit of consistent texture could, if well promoted, provide a domestic alternative to more costly, imported marble.

CURBING AND STRUCTURAL STONE

Curbstone can be produced from granite, sandstone, or limestone, but granite is the dominant type. The granite body must be jointed in a way that allows the rock to be split into long, rectangular sections.

Colour and texture are of less importance. A report published by the Ontario Ministry of Transportation and Communications (Rogers 1985) encouraged the use of granite curbing in highway construction in Ontario. Locally produced granite curbstone can be installed at a total cost comparable with that of less durable poured-in concrete curbing (Les Consultants Sogir Inc. 1984).

Structural stone primarily requires high strength and a joint pattern suitable for extraction of blocks from a few tons to 25 tons in weight. Colour and texture are secondary considerations. Granite is the most commonly used structural stone, but limestone is also an excellent material for structural applications.

STONE FOR OTHER USES

Other uses of stone include ashlar, paving stone, flagstone, landscaping stone, rubble, crushed stone, terrazzo chips, and ornamental stone. The required characteristics of stone for these uses, as implied by the commodity definitions, vary greatly, from ease of splitting (paving and flagstone) to variable colour (terrazzo chips and ornamental stone). Virtually any rock is suitable for at least one of these uses, but the combination of low price and/or low demand generally precludes the opening of a quarry solely for the production of one of these commodities, many of which can be produced from the waste rock of a dimension stone quarry.

QUARRY ECONOMICS

Most quarries are not suited to the exclusive production of large blocks, due to local irregularities in joint pattern or intensity, colour, or texture. The current increasing demand for large panels of architectural stone, requiring large quarry blocks, has led to high-grading, or selective quarrying which involves a higher quarry cost than total extraction. However, total extraction requires a market for rough stone, rubble, ashlar, and so on to be economically viable. This is an important factor in assessing the potential of a stone deposit. A low degree of variation in jointing, colour, and texture is more critical in a market where only a small range of products is sold than in a market where a complete range of products, from architectural stone to rubble, is in demand (Meade 1986).

Any property with potential for the production of architectural and monumental stone should also be considered as a potential source of structural stone, curbstone, ashlar and crushed stone. The entire range of products should be strongly promoted in order to achieve a quarry operation based on total extraction with a low proportion of waste rock, rather than on the less cost-efficient process of selective extraction.

ASTM TESTS

Building stone products must meet specific physical property requirements. These specifications and tests have been developed by the American Society for Testing and Materials (ASTM). Procedures for the tests listed in Table 3 are available from the Society (1916 Race Street, Philadelphia, PA 19103, USA).

TABLE 3. ASTM SPECIFICATIONS FOR BUILDING STONE.

C97-83	Absorption and bulk specific gravity
C99-52	Modulus of rupture
C119-83C	Standard definitions of terms
C120-52	Flexure testing of slate
C121-48	Water absorption of slate
C131-55	Abrasion resistance by Los Angeles Test
C170-50	Compressive strength
C217-58	Weather resistance of natural slate
C218-48T	Combined effort of temperature cycles and wash salt solutions on natural building stones
C241-51	Abrasion resistance of stone subjected to foot traffic
C406-84	Roofing slate
C503-79	Exterior marble
C543-81	Slate blackboards
C568-79	Dimension limestone
C615-80	Granite Building Stone

Part 3. Building Stone Potential in Eastern Ontario

CURRENT PRODUCERS

There are currently 12 companies producing building stone products in eastern Ontario. The commodities produced include monumental and architectural stone, flagstone, ashlar, terrazzo chips, and decorative aggregate. Table 4 lists the companies and products; Figure 3 shows quarry and plant locations.

Other major producers in Ontario include Arris-craft Corp. of Cambridge with dolomitic limestone (marketed as marble) quarries in the Bruce Peninsula and Nelson Granite with granite quarries in Vermilion Bay near Kenora.

There are numerous past producing quarries and test quarries of granite, marble and limestone throughout eastern Ontario, many of which are described in the 1985 and 1986 property examination reports.

RESULTS OF 1985-86 RECONNAISSANCE SURVEY

Data from field work were recorded on data forms and are presented in property examination reports with location maps and photographs. Reports for properties ex-

amined in 1985 have been published in Verschuren et al. (1986) and are not reproduced in this report. However, a table summarizing the features of the 1985 properties with moderate to good building stone potential is included in Appendix A.

Appendix B contains reports on all properties examined in 1986. All properties have been categorized as having good, moderate or poor potential for quarry block size, the most important factor in evaluating a building stone prospect. Property evaluations are discussed below under the following headings:

1. Ontario Gneiss Segment—granite
2. Central Metasedimentary Belt—granite, marble
3. St. Lawrence Platform—Paleozoic rocks

All properties are designated by year-township-site number, for example 86-KAL-004 (1986, Kaladar Township, site number 4)

DATA FORMS

The data forms used in the property examination reports include self-explanatory terms such as colour, grain size, texture, fabric, and so on, but also contain some terms which require further definition.

TABLE 4. EASTERN ONTARIO BUILDING STONE PRODUCERS (from Kingston et al. 1988).

Map Location No.	Company	Township	Rock Type	Commodity	Property Report No. (Appendix A)	
1	Canada Talc Industries Ltd.	Henderson & Conley Mines	Huntingdon	Marble	Dolomitic marble terrazzo chips are produced from this talc mine	
2	Central Ontario Natural Stone		Somerville	Stone	Flagstone	
3	Cornwall Sand and Gravel		Cornwall	Limestone	Limestone blocks for dimension stone are produced from thick upper beds of this crushed stone quarry	
4	Fairmont Granite Ltd. and Granicor	Battersea Granite Quarry	Storrington	Granite	Granite blocks for dimension stone. Blocks are processed at Beebe, Quebec	STO-01
5	Granimar Resources	Straw Hill Quarry	Rear of Leeds and Lansdowne	Granite	Granite waste from former dimension stone producer is used to produce decorative aggregate	RLL-01
6	Karnuk Marble Quarries Ltd.		Cornwall	Dimension Stone	This high technology dimension stone finishing plant produces tiles and panels of marble and granite purchased from quarries in Quebec, Ontario, and the U.S.	
7	MacDonald		Lutterworth	Stone	Flagstone	
8	Ormell Sand and Gravel		Harvey	Limestone	Flagstone is produced from this limestone aggregate quarry	
9	Sloan, N.	Sloan Quarry	Storrington	Sandstone	Sandstone building blocks (ashlar)	
10	Stoklosar Marble Quarries Ltd.		Madoc	Marble	Marble chips (terrazzo)	MAD-01 MAD-04
11	W.R. Barnes Company Limited		Rear of Leeds and Lansdowne	Granite	Decorative aggregate is produced from former dimension stone quarry	RLL-02
12	Windover, N.		Harvey	Limestone	Flagstone	

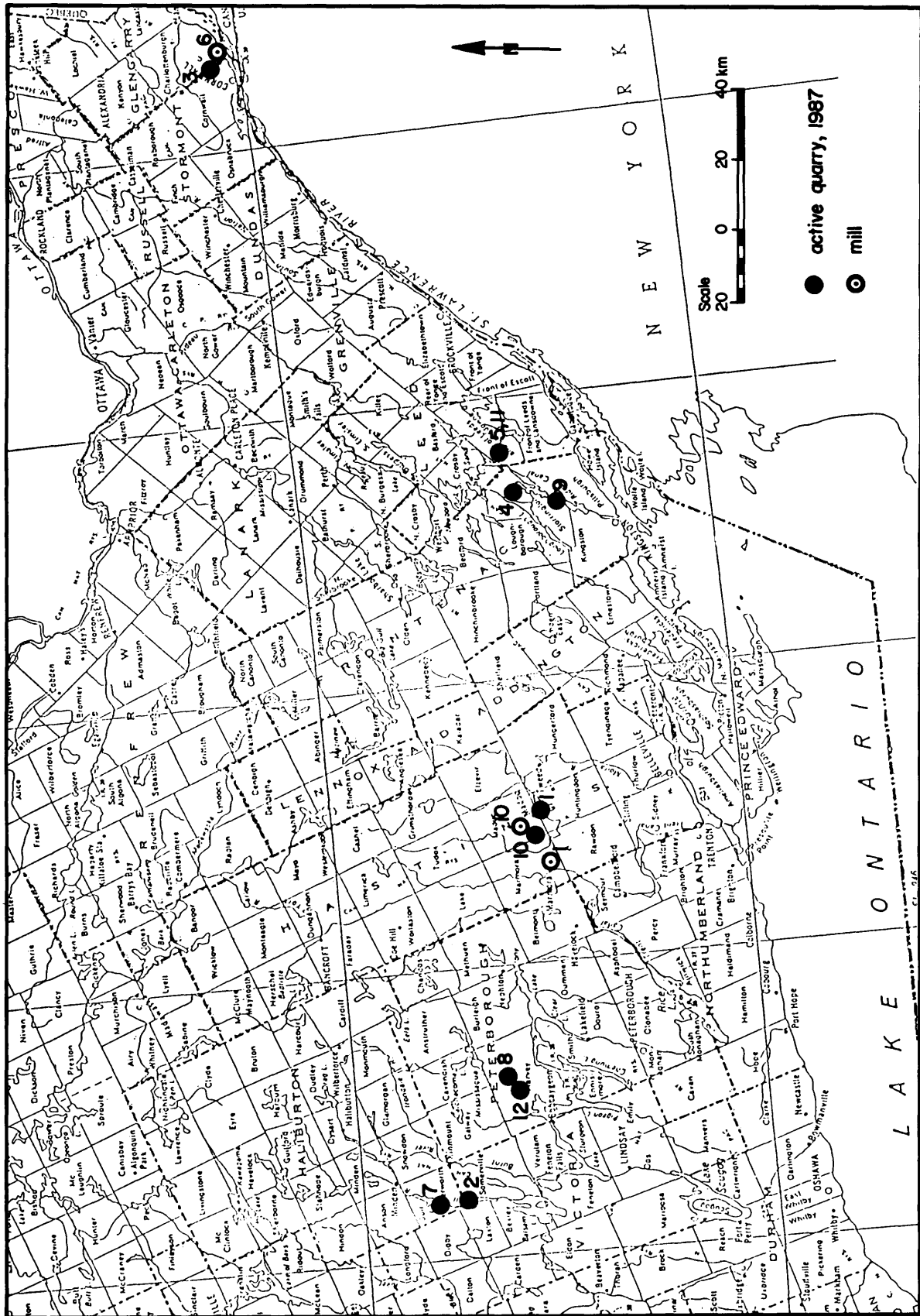


Figure 3. Locations of eastern Ontario building stone producers (see Table 4 for list of building stone producers).

Jointing

Regular Pattern - a pattern of one or more joint sets, recurring joint planes of relatively uniform strike and dip. Orthogonal jointing is a regular pattern composed of two joint sets at about 90 degrees.

Irregular Pattern - randomly oriented joint planes, often discontinuous or curved.

Limited Jointing: average spacing greater than 1.5 m.

Moderate Jointing: average spacing 0.5 to 1.5 m.

Intensive Jointing: average spacing less than 0.5 m.

Orientations of dominant joint sets were recorded where possible, except where the rocks showed irregular, intensive jointing.

Potential for Quarry Blocks

The potential quarry block size depends on the nature and intensity of the joint pattern:

Joint Pattern	Quarry Block Potential
Regular, Limited	Good
Regular, Moderate	Moderate
Regular, Intensive	Poor
Irregular	Poor

Possible Uses

In general, the possible uses are determined by potential quarry block size. Texture, colour and deleterious mineral content may also limit the possible uses of a stone. Rock with good quarry block potential is usually considered as possible architectural and monumental stone. Monumental stone may also be produced from a rock with moderate quarry block potential. Rock with poor quarry block potential has possible uses as ashlar, curbing stone, paving stone, flagstone, ornamental stone, landscaping stone, and rubble, all of which can also be produced from waste rock of an architectural and/or monumental stone quarry.

Use of Explosives

Previous use of explosives may have produced serious fracturing which can affect future quarrying. High velocity explosives used to construct highway roadcuts produce intense fracturing. Low velocity explosives, such as "black powder", are generally less damaging and are commonly used in building stone quarries (Verschuren et al. 1986). Local fracturing due to explosives can lead to underestimation of potential quarry block size of a building stone prospect.

ONTARIO GNEISS SEGMENT

All of the 19 building stone prospects examined in the Ontario Gneiss Segment are granites. Four areas having moderate to good building stone potential are recommended for further investigation and are described below (Verschuren et al. 1986).

NORTH BAY-POWASSAN AREA

Two properties in South Himsworth Township within the granitic to monzonitic Powassan batholith display limited jointing with massive texture and marketable colours (SHIM-01, 02). A third property in Strong Township (STR-01) is a moderately jointed, grey, porphyritic monzonite, possibly the southern extension of the Powassan batholith. The entire Powassan batholith, particularly the more massive interior, is strongly recommended for further exploration.

NOELVILLE-BURWASH AREA

The Cosby batholith (85-COS-01) is a moderately jointed, dark pink to brown, monzonitic intrusion. The margins are intensely deformed and gneissic, but the interior is massive to weakly foliated and shows good building stone potential.

BRACEBRIDGE-PORT CARLING AREA

A garnet-biotite-quartz-feldspar gneiss exposed on Highway 118 west of Bracebridge shows regular jointing which is variable but locally limited in intensity (86-MUS-O2). About 6 km west of 85-MUS-O2, massive to weakly foliated monzonite is exposed along Highway 118 at Brandy Lake. Further investigation of both rock types is recommended.

BAXTER TOWNSHIP

Properties 85-BAX-01 and 03 west of Port Severn are granitic gneiss with regular, limited joint patterns. Mineralogical and textural inconsistencies may limit the potential use of the stone to structural applications. However, the high potential for large quarry blocks in the area suggests that further exploration is warranted.

Several other areas recommended for exploration based on a study of geologic reports are described in Verschuren et al. (1986). Additional work on building stone potential in the Ontario Gneiss Segment is currently being conducted by the Ministry of Northern Development and Mines, Dorset (Marmont and Johnston 1987).

CENTRAL METASEDIMENTARY BELT

Granite

A total of 187 granite prospects were examined in the Central Metasedimentary Belt, 35 in 1985 and 152 in 1986. A table of the properties and their building stone potential is included in Appendix C, listed alphabetically by pluton name, followed by the remaining properties (in unnamed plutons or nonplutonic rocks) listed alphabetically by township. The 1986 property examination reports (Appendix B) are arranged in the same order and include a summary report on each pluton. Figure 4 shows the locations of the plutons examined in 1985 and 1986, listed in Table 5.

Table 6 lists the granite prospects considered to have moderate to good potential for building stone development. It should be noted that the potential of the

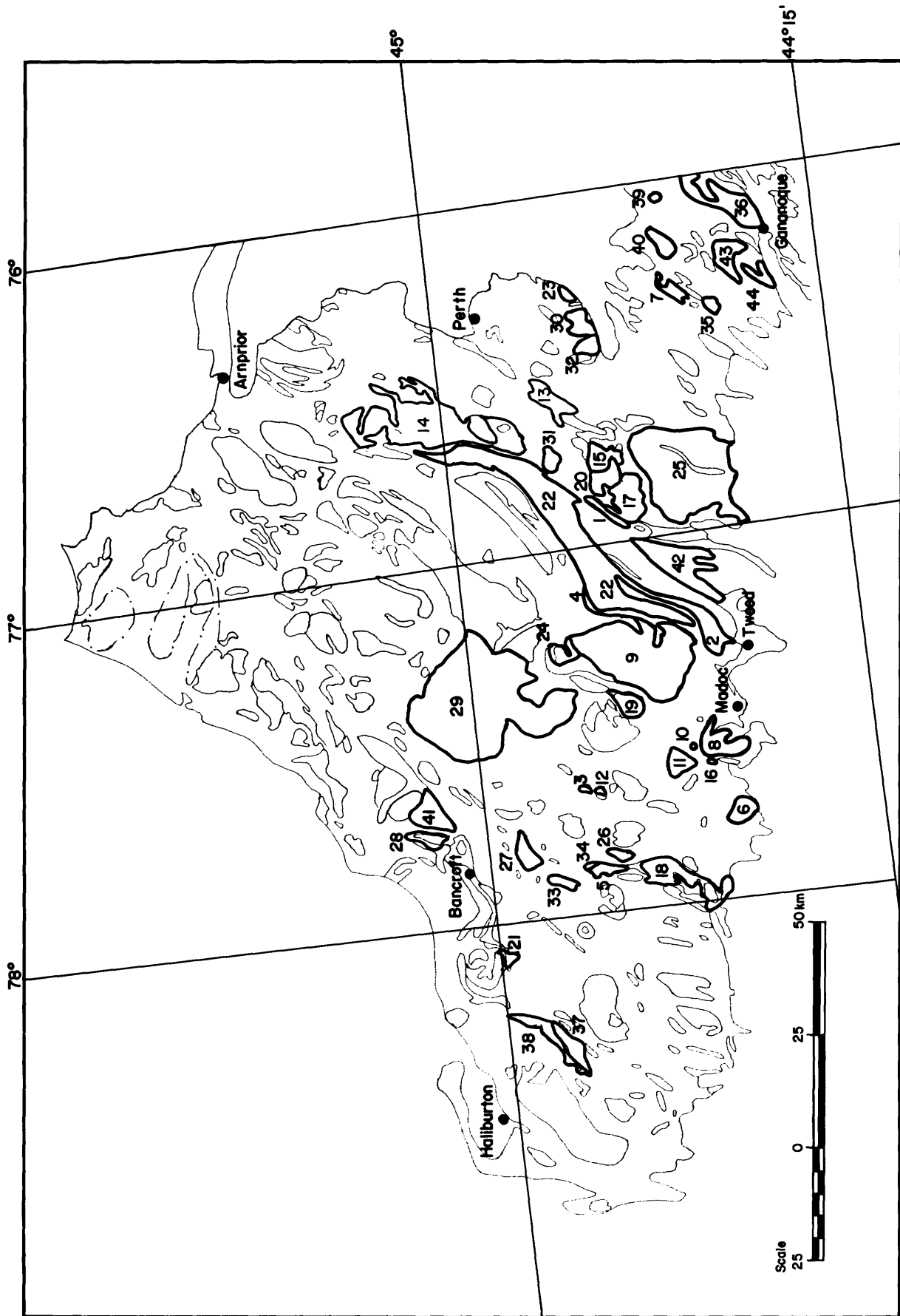


Figure 4. Pluton map of the Central Metasedimentary Belt showing plutons examined in 1985-86 Building Stone Survey (from Geological Survey of Canada Map 1533A - Plutonic Rocks in Ontario).

TABLE 5. PLUTONS EXAMINED, 1985-86 BUILDING STONE SURVEY.

1986		1986	
Pluton No.	Name	Pluton No.	Name
1	Abbotts Hill	26	The Ridge
2	Addington	27	Umfraville
3	Beaver Creek	28	Wadsworth
4	Bishop Corners (Formation)	29	Weslemkoon
5	Coe Hill	30	Westport
6	Cordova	31	White Lake
7	Crow Lake	32	Wolfe Lake
8	Deloro	33	Wollaston Granite
9	Elzevir	34	Wollaston Lake Gabbro
10	Empey		
11	Gawley Creek		
12	Glanmire		
13	Lanark - Oso		
14	Lavant		
15	Leggat Lake		
16	Malone		
17	McLean		
18	Methuen and Belmont		
19	Mount Moriah		
20	Mountain Grove		
21	Newboro		
22	Northbrook		
23	Rideau Lake		
24	Skootamatta Lake		
25	Tamworth, Bellrock, Wilkinson, First Depot		

1985	
Pluton No.	Name
35	Battersea
36	Gananoque
37	Glamorgan
38	Gooderham
39	La Rose Bay
40	Lyndhurst
41	Mallard Lake
42	Sheffield
43	Taylor
44	Pittsburg

TABLE 6. GRANITE PROSPECTS WITH MODERATE TO GOOD BUILDING STONE POTENTIAL, CENTRAL METASEDIMENTARY BELT.

Pluton Name	Township	Property Report	Potential Moderate (M), Good (G)
Battersea	Storrington	85-STO-01*	G
Battersea	Storrington	85-STO-02	M-G
Coe Hill	Wollaston	85-WOL-01*	M
Coe Hill	Wollaston	86-WOL-007*	M
Coe Hill	Wollaston	86-WOL-008*	M
Coe Hill	Wollaston	86-WOL-010	M
Deloro	Marmora	86-MAR-007	M-G
Deloro	Marmora	86-MAR-008	G
Deloro	Marmora	86-MAR-009	M
Deloro	Marmora	86-MAR-010	M-G
Deloro	Marmora	86-MAR-011	M
Deloro	Marmora	86-MAR-013	M
Deloro	Madoc	86-MAD-010	M
Elzevir	Elzevir	86-ELZ-004	M
Gananoque	Front of Leeds and Lansdowne	85-FLL-04*	M
Gooderham	Monmouth	85-MON-01	G
La Rose Bay	Rear of Leeds and Lansdowne	85-RLL-04	M-G
Leggat Lake	Olden	86-OLD-005	M
Lyndhurst	Rear of Leeds and Lansdowne	85-RLL-01	G (active-dimension stone)
Lyndhurst	Rear of Leeds and Lansdowne	85-RLL-06	G
Lyndhurst	Rear of Leeds and Lansdowne	85-RLL-07	G
Lyndhurst	Rear of Leeds and Lansdowne	85-RLL-08	G
Mallard Lake	Dungannon	85-DUN-066	M
McLean	Olden	86-OLD-020	M
McLean	Olden	86-OLD-022	M
Mount Moriah	Grimsthorpe	86-GRI-005	G
Northbrook	Kennebec	86-KEN-004	M
Taylor	Front of Leeds and Lansdowne	85-FLL-01*	G
Taylor	Front of Leeds and Lansdowne	85-FLL-02*	G
Taylor	Front of Leeds and Lansdowne	85-FLL-05	G
	Burleigh	85-BUR-01	G
	Carlow	85-CARL-01	M-G
	Kaladar	85-KAL-01*	M-G
	Olden	86-OLD-025	G
	Raglan	85-RAG-01	G

* Former dimension stone producing quarry.

examination site does not necessarily reflect the potential of the intrusion as a whole. Because of time constraints and the reconnaissance nature of the survey, ease of access was an important factor in locating examination sites, therefore, some intrusions in which poor potential was observed may show higher potential in other parts of the intrusion. However, on a reconnaissance scale, the properties and plutons listed in Table 6 represent areas of least intense jointing, therefore, highest building stone potential. These properties and plutons, shown in Figure 5, can be broadly grouped into five areas based on geological subdivisions of the Central Metasedimentary Belt of Wynne-Edwards (1972) as follows:

1. Frontenac Axis East - Battersea, Gananoque, La Rose Bay, Lyndhurst and Taylor plutons
2. Frontenac Axis West - McLean pluton
3. Hastings Basin Central - Deloro, Elzevir, Mount Moriah and Northbrook plutons; 85-KAL-01, 86-KAL-009, and 85-OLD-25
4. Hastings Basin West - Coe Hill pluton and 85-BUR-01
5. Glamorgan-Cardiff Belt - Gooderham and Mallard Lake plutons; 85-CARL-01 and 85-RAG-01

Brief evaluations of the above areas are given below.

FRONTENAC AXIS EAST

This high-grade (granulite facies) metamorphic region has the highest building stone potential within the study area. The high metamorphic grade reflects temperature and pressure conditions which may have produced partial or complete melting of the rocks, allowing plutonic rocks to intrude with minimal resistance. Thus, the late tectonic intrusions were not highly stressed and have relatively limited joint patterns. The majority of Quebec granite quarries are also within areas of granulite facies metamorphism, suggesting that intrusions and gneisses within high grade metamorphic regions are primary targets for granite dimension stone.

The Frontenac Axis north of Kingston and Gananoque hosts numerous former producers and test quarries as well as the only current producers of dimension granite in eastern Ontario (Battersea quarry, Fairmont Granite Ltd. and the Straw Hill quarry, Granimar Resources).

FRONTENAC AXIS WEST

Three dome-shaped intrusions, the McLean, Mountain Grove and Leggat Lake plutons, lie within this area just east of the boundary between the Hastings Basin and the Frontenac Axis. The metamorphic grade in the area is lower than that in the Frontenac Axis East area. Wolff (1982) suggested that the intrusions are late tectonic in a high temperature regime of medium-grade metamorphism. The Mountain Grove mafic intrusion is the oldest of the three and is the most intensely jointed, showing poor building stone potential. The McLean and Leggat Lake granite plutons represent later stage intrusions

possibly resulting from partial melting of the crust (Wolff 1982) and are less intensely jointed. The McLean pluton appears to have good building stone potential, particularly toward the interior. The Leggat Lake pluton, though more strongly jointed, also warrants further investigation.

HASTINGS BASIN CENTRAL

The central part of the Hastings Basin, including the Deloro, Mount Moriah, Elzevir and Northbrook plutons, represents the lowest metamorphic grade in the Central Metasedimentary Belt. The regional greenschist facies metamorphism has had little effect on the Deloro and Mount Moriah plutons, which are quite massive and equigranular. The larger Elzevir and Northbrook plutons are locally sheared and gneissic, but the reconnaissance survey indicates that massive, homogeneous zones suitable for building stone are present.

While deformation in areas of high metamorphic grade occurs continuously by ductile movement and recrystallization, the cooler, less ductile rocks of the Hastings Basin exhibit less recrystallization and more brittle deformation such as faulting and shearing (Wynne-Edwards 1972). It appears that the Deloro and Mount Moriah plutons are relatively unaffected by the regional metamorphism because the deformation took place in less competent metavolcanics and metasediments surrounding the plutons. For the same reason, smaller plutons or areas of volcanic rock within pressure shadows of intrusions may have building stone potential (85-OLD-25 and 85-KAL-01).

HASTINGS BASIN WEST

The Coe Hill granite is a late tectonic mesozonal intrusion in a zone of amphibolite grade metamorphism. The main fold axes in the area are northeast-southwest, but there is also strongly developed northwest-southeast cross folding (Hewitt 1962). The complex structure may have produced the generally irregular joint patterns seen in the intrusive rocks of the area. The Coe Hill granite hosts two former producers of granite dimension stone which had problems caused by irregular jointing, but the blocks were of a size suitable for monumental stone. Further exploration within the Coe Hill granite is warranted.

The Belmont granite in northwestern Belmont Township hosts a formerly producing quarry which was abandoned due to sheeting problems. However, the massive texture and limited vertical jointing suggest that further exploration in the Belmont granite is warranted.

GLAMORGAN-CARDIFF BELT

The Glamorgan-Cardiff belt of gneiss domes and associated plutons lies along the northwestern margin of the Central Metasedimentary Belt in a zone of amphibolite facies metamorphism. The gneisses are similar to those in the Ontario Gneiss Segment and may represent remobilized basement material (Wynne-Edwards 1972).

The Mallard Lake gabbro is predominantly coarse-grained hornblende-plagioclase gneiss but is lo-

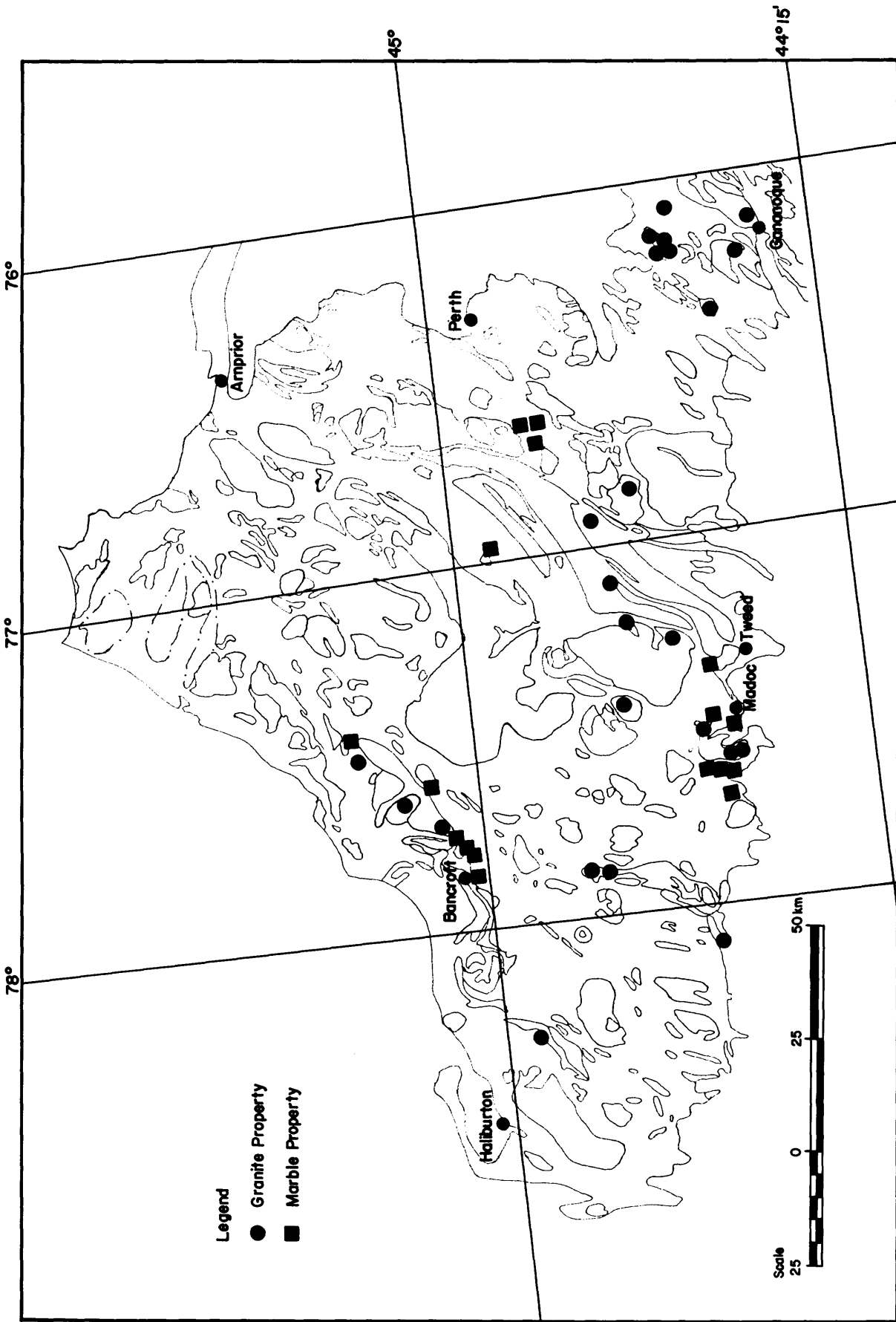


Figure 5. Locations of granite and marble properties with moderate to good building stone potential, Central Metasedimentary Belt.

cally a fresh-looking, massive quartz diorite (Hewitt and James 1956). The Gooderham granite hosts a former producer of monumental and paving stone. The lack of intense jointing at several sites in this belt may be related to the presence of marbles interlayered with gneisses and intrusions. The marble belts are considered by Culshaw (1986) to be zones of intense ductile shear. This deformation may have released a large part of the strain energy, leaving the more competent plutonic rocks relatively unaffected by the deformational stress. Properties 85-MON-01 and 85-RAG-01 have very good quarry block size potential, indicating that additional exploration in this area is warranted.

Marble

Table 7 lists the property reports and quarry block potential for marble prospects examined during the 1985–86 building stone survey. The 1986 property reports are included in Appendix B; 1985 reports are published in Verschuren et al. (1986) and are summarized in Appendix A of this report.

The quarry block potential indicates only the potential for use as architectural or structural stone. Properties with poor quarry block potential may be of interest as sources of crushed stone for landscaping or terrazzo, depending on their colour and texture. Stoklosar Marble Quarries Ltd. currently operates several small

quarries in the Madoc area to obtain a variety of coloured marbles for terrazzo chips.

Marble prospects with moderate to good quarry block potential, shown in Figure 5, are concentrated in three areas: the townships of Madoc–Marmora, Oso, and Dungannon–Mayo. Because of the small number of properties examined, many of which are formerly producing quarries, these areas may represent only a small portion of the Central Metasedimentary Belt with potential for marble building stone development. Properties in Raglan and Clarendon townships, areas with no production history, show good potential for large quarry blocks, therefore, other marble-rich areas in addition to those described below should be examined for building stone potential. The distribution of marble belts in eastern Ontario is shown in Figure 6.

MADOC–MARMORA AREA

Metasomatic alteration of calcitic marbles surrounding the Deloro pluton has produced a wide range of colours including white, pink, green, blue-grey, and black. These are currently quarried only for terrazzo chips, but several sites appear suitable for the production of large quarry blocks.

OSO TOWNSHIP

Pale grey to white, calcitic and dolomitic marbles in this area show moderate quarry block size potential. One quarry has produced an attractive banded marble on a small scale. Further investigation of the Oso Township area is warranted.

DUNGANNON–MAYO AREA

Dolomitic marbles of various colours and textures have been quarried in this area. Some of this stone (85-DUN-01 and 02) was used as interior decorative stone in the parliament buildings in Ottawa. Colours include white, green, brown, grey, and blue in massive, banded, and brecciated textures.

CLARENDON TOWNSHIP

Property 86-CLA-001 shows very good building stone potential in terms of both quarry block size and aesthetic appeal. It is a white and pale-brown banded to fragmental calcitic marble from which a banded or mottled appearance can be obtained, depending on the direction of the cut. Further investigation of this site and of the Clarendon area marbles in general is warranted.

HUNGERFORD TOWNSHIP

The Tweed Marble Quarry (85-HUG-02), operated in the 1960s by the Vermont Marble Company, produced four varieties of marble for architectural uses. White-grey to pale green dolomitic marble of massive, nodular, and weakly banded textures was extracted in blocks ranging from 5 to 15 tons. The quarry appears to have potential for further production, and additional exploration in the area is warranted.

TABLE 7. MARBLE PROSPECTS EXAMINED, 1985–86 BUILDING STONE SURVEY.

Township	Property Report	Quarry Block Size Potential		
		Poor (P)	Moderate (M)	Good (G)
Clarendon	86-CLA-001		G	
Darling	85-DAR-01*		P-M	
Dungannon	85-DUN-01*		M	
	-02*		G	
	-05		P	
	-06		M	
	-06c		P	
	86-DUN-001		P	
Faraday	86-FAR-020*		M	
	-021*		M	
	85-HUG-02*		M-G	
Huntingdon	85-HUN-04		G (active-terrazzo)	
Kennebec	86-KEN-030		P-M	
Madoc	85-MAD-01		P (active-terrazzo)	
	-04*		P	
	86-MAD-030		M	
	85-MAR-02		G	
Marmora	-03*		G	
	-04*		M-G	
	86-MAR-020*		P	
	85-MAY-02		M	
Olden	86-OLD-026		P	
Oso	86-OSO-010		M	
	-011		M	
	-012*		M	
	85-RAG-02		M-G	
Raglan	85-RAG-02		M-G	
Ross	86-ROSS-001		P-M	
Somerville	85-NOR-01		P	

* Former producing quarry.

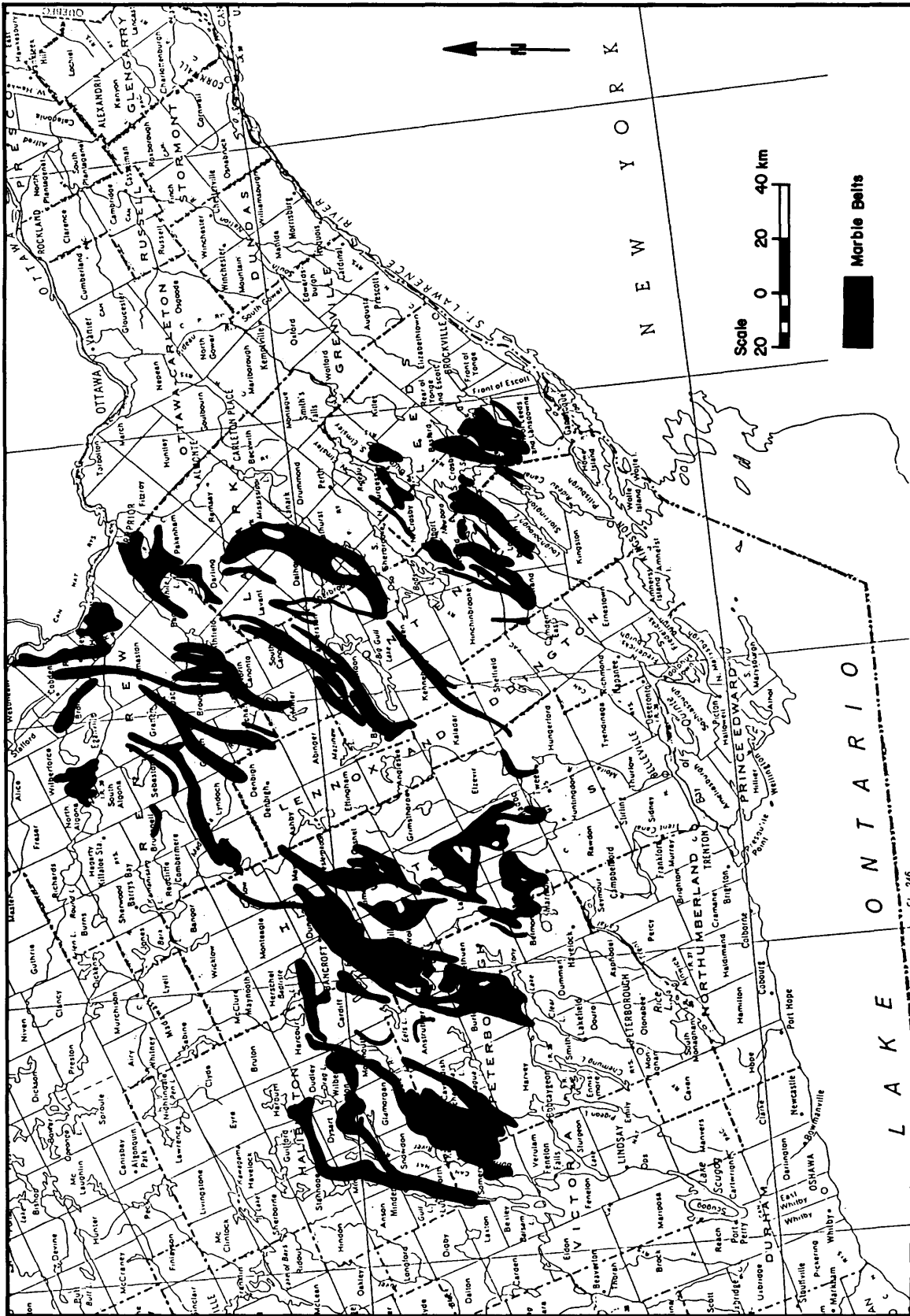


Figure 6. Distribution of marble belts in eastern Ontario (from Grant and Kingston 1989).

RAGLAN TOWNSHIP

White to pale blue-grey, coarse-grained, calcitic marble (85-RAG-02) shows moderate quarry block size potential. Further examination of the area is recommended.

ST. LAWRENCE PLATFORM

Paleozoic Rocks

Limestone properties examined during this study are listed and rated for potential quarry block size in Table 8. These properties, in Paleozoic rocks of the Bobcaygeon and Gull River formations, are all located at formerly or currently producing quarries. Some limestones can be classified as commercial marbles depending on their ability to take and sustain a polish. Three samples of Bobcaygeon Formation limestone polished for this study do not polish sufficiently well to be classified as commercial marble due to irregular, soft, shaly partings. The limestone does, however, have potential as structural building stone, ashlar, flagstone, terrazzo chips, and crushed stone, all of which have been produced from quarries within Gull River and Bobcaygeon limestones.

East of the study area, Bobcaygeon Formation limestone is being quarried as commercial marble. Karnuk Marble Quarries Ltd. of Cornwall produces a black marble tile from dark grey limestone quarried in Cornwall Township. This product is being successfully marketed as a domestic replacement of black marble imported from Spain (Michael DiGirolamo, Karnuk

Marble Quarries Ltd., personal communication, March 1988).

Other Paleozoic rocks within the study area which have been quarried for building stone include thickly bedded dolostone of the Oxford Formation (Beekmantown Group) and Nepean Formation or Potsdam Formation sandstone. Oxford Formation dolostone exposed east of the Frontenac Axis has been used as rough building stone and aggregate. Ashlar is produced from sandstone at the Sloan Quarry in Storrington Township at the western margin of the Frontenac Axis (Hewitt 1972).

Figure 7 shows the Paleozoic stratigraphy within the study area and Figure 8 shows the distribution of these formations. Based on the requirements of thick bedding and lack of shaly partings, the formations with best potential for development as structural building stone or commercial marble are the limestones of the lower Bobcaygeon Formation and the dolostones of the Oxford Formation.

RESULTS OF ASTM TESTS

A total of six granite and three marble samples were submitted to ASTM tests to determine whether the rocks meet ASTM specifications for building stone. The tests were performed by the Mineral Sciences Laboratories of CANMET (Mineral and Energy Technology Division of Energy, Mines and Resources, Canada). Test results are summarized in Table 9. A complete report on test procedures and results by R.L. Chevrier of MSL-CANMET is included in Appendix D.

All samples meet the ASTM requirements for granite and marble building stone with the exceptions of sample 31 from property 85-HUG-02 (Tweed Marble Quarry) which has a slightly lower than required abrasion resistance and sample 71 from 86-OSO-012 which fails to meet the specified value for modulus of rupture. However, a promotional brochure on Tweed Marble (*in* Kingston et al. 1985) lists the abrasion resistance as 19, indicating that physical properties may vary considerably within a deposit due to variations in texture, mineralogy and fracturing. In general, the granites and marbles of the area meet the physical requirements of the building stone industry, and ASTM testing need not be considered until a prospect has been judged to be sufficiently favourable with respect to colour, texture and jointing to warrant a test quarry.

TABLE 8. LIMESTONE PROSPECTS EXAMINED, 1985-86 BUILDING STONE SURVEY.

Township	Property Report	Quarry Block Size Potential		
		Poor (P)	Moderate (M)	Good (G)
Huntingdon	85-HUN-01			G
	-02			G
	-03			M-G
Madoc	85-MAD-02			M
	-03			M
	-05			P
	-07			P
Marmora	85-MAR-01			M
Pakenham	85-PAK-01			M-G
Thurlow	86-THUR-001		P (active-aggregate)	

1985 property reports are summarized in Appendix A.

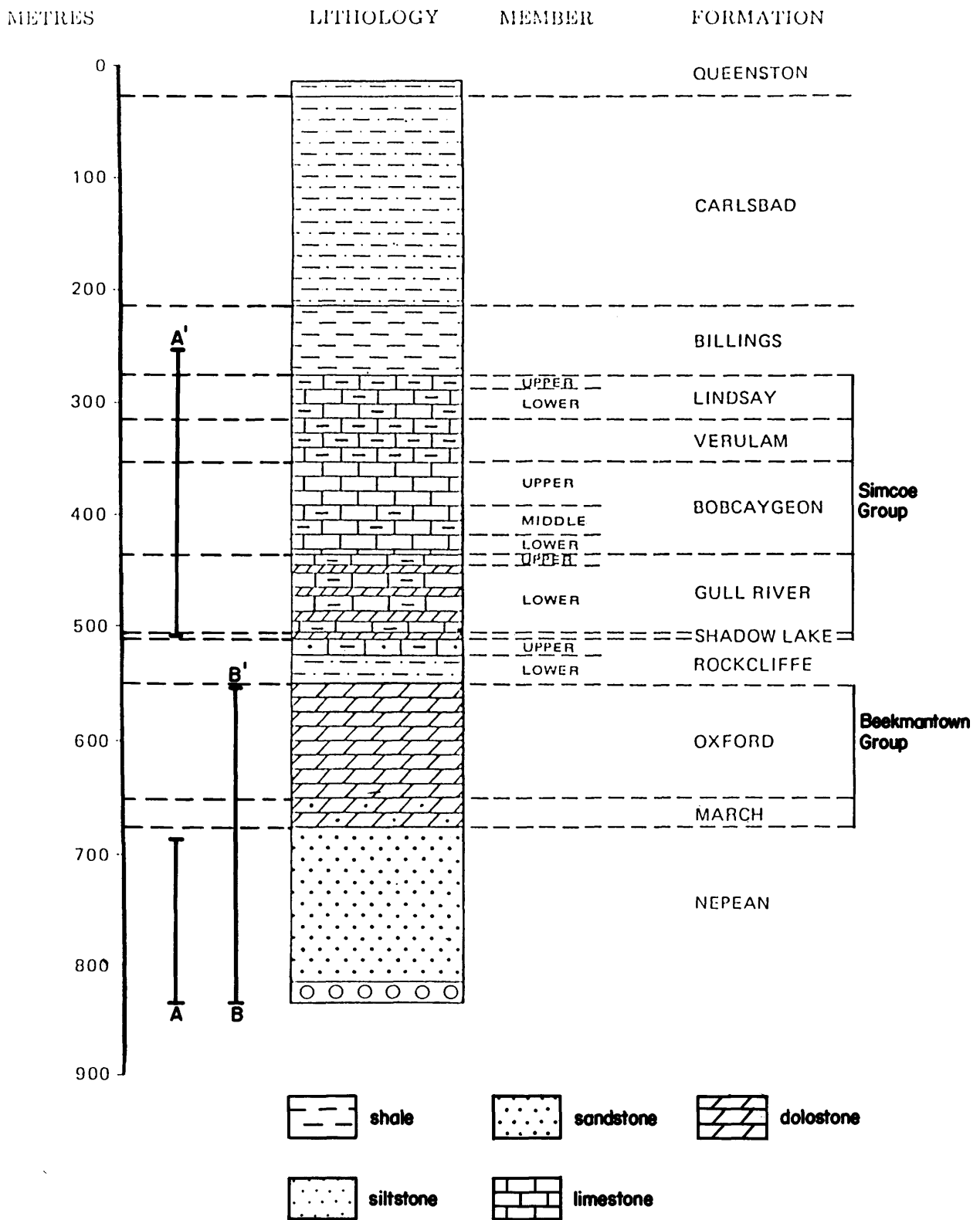


Figure 7. Paleozoic stratigraphy in southeastern Ontario (from Williams and Telford 1986). The column represents stratigraphy of the Geological Survey of Canada, Russel well, near Ottawa. Bars AA' and BB' indicate formations present within the study area west of the Frontenac Axis (AA') and east of the Frontenac Axis (BB').

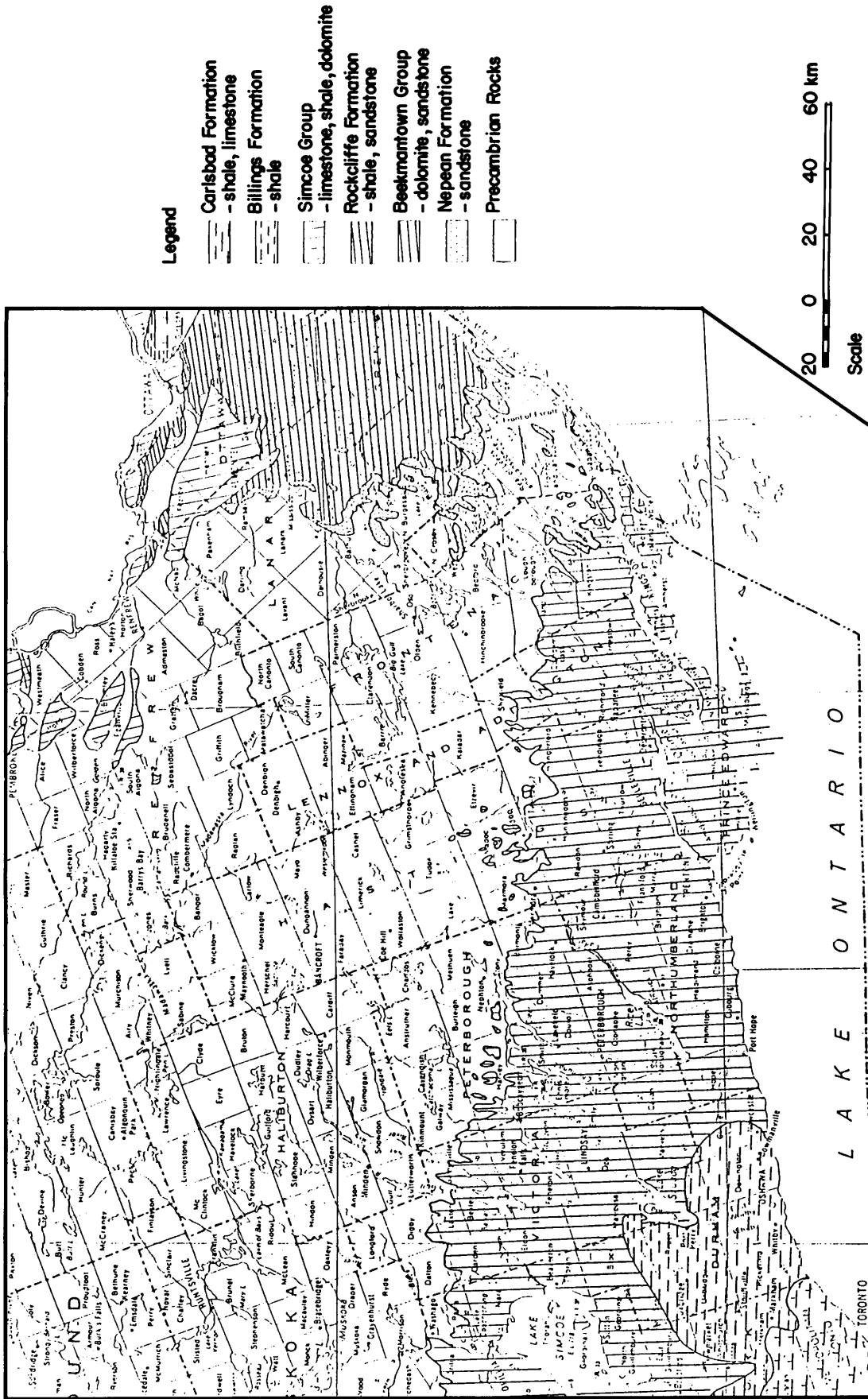


Figure 8. Paleozoic geology map, eastern Ontario (after Hewitt 1972).

Summary

Several areas of Precambrian rock in eastern Ontario have been identified as having good potential for building stone deposits. Although large areas with consistent colour, texture, and joint patterns are rare because of the complex metamorphic and structural history of the Grenville rocks, local metamorphic and/or structural conditions have produced areas with potential for development of building stone deposits of moderate size. With respect to granite, these include areas of high-grade metamorphism (Frontenac Axis) in which high temperatures have allowed the intrusion of plutonic rocks with little resistance, and lower grade areas in which relatively incompetent rocks such as marbles have absorbed tectonic stresses through deformation, leaving the more competent plutonic rocks relatively undeformed (Hastings Basin, Glamorgan-Cardiff Belt).

Marbles of the Central Metasedimentary Belt, particularly the Hastings Basin, locally show good potential for dimension stone as well as for crushed rock and terrazzo chips. Because of inconsistent colours and textures caused by tight folding, the potential for large quarries is not high, but deposits of marketable stone in quantities sufficient to fill the needs of domestic markets are present within the study area.

The increase in demand for building stone in both commercial and residential markets and improvements in stone processing technology have made the development of smaller quarries more economically feasible than in the past. Several areas of moderate to good building stone potential, described in this report, warrant further investigation and other areas in eastern Ontario with similar geologic characteristics should also be considered as exploration targets.

Appendix A. 1985 Property Report Summaries¹

ONTARIO GNEISS SEGMENT

1. Granite properties with limited to moderate jointing

Property No.	Township	Colour	Texture	Rock Type	Status
BAX-01	Baxter	pink-grey	gneissic, variable	granitic gneiss	prospect
BAX-03	Baxter	pink-grey	gneissic, variable	granitic gneiss	prospect
CAR-01	Carling	pink	gneissic, variable	granitic gneiss	prospect
COS-01	Cosby	brown	massive, uniform	quartz monzonite	prospect
MUS-02	Muskoka Lakes	pink	gneissic, uniform	granitic gneiss	prospect
RYE-01	Ryerson	grey	gneissic, variable	granitic gneiss	prospect
SHIM-01	South Himsworth	greenish mauve-brown	porphyritic, uniform	syenite	prospect
SHIM-02	South Himsworth	pink	porphyritic, uniform	quartz monzonite	prospect
STR-01	Strong	grey	gneissic, uniform	porphyritic gneiss	prospect

2. Granite properties with irregular or intensive jointing

BAX-02	Baxter	black	massive, variable	mafic syenite	prospect
BAX-04	Baxter	pink-grey	gneissic, variable	granitic gneiss	prospect
CHI-01	Chisholm	pink-grey	gneissic, variable	granitic gneiss	prospect
CHI-02	Chisholm	pink-grey	gneissic, uniform	granitic gneiss	prospect
MCM-01	McMurrich	green-black	massive, uniform	mafic syenite	prospect
MUS-01	Muskoka Lakes	pink-grey	gneissic, variable	granitic gneiss	prospect
MUS-03	Muskoka Lakes	pink-grey	gneissic, variable	granitic gneiss	prospect
MUS-04	Muskoka Lakes	grey-black	foliated, variable	gabbro	prospect
RYE-02	Ryerson	green-black	massive, uniform	gabbro	prospect
RYE-03	Ryerson	green-black	massive, uniform	gabbro	prospect

CENTRAL METASEDIMENTARY BELT—GRANITE

1. Granite properties with limited to moderate jointing

Property No.	Township	Colour	Texture	Rock Type	Status
BUR-01	Burleigh	mauve-pink	variable, porphyritic, massive	porphyritic granite	prospect
CAR-01	Carlow	grey	massive, foliated	tonalite	prospect
DUN-06b	Dungannon	dark grey	massive, uniform	gabbro	prospect
FLL-01	Front of Leeds & Lansdowne	brown-red	massive, uniform	syenite	past producer
FLL-02	Front of Leeds & Lansdowne	pink	massive, uniform	syenite	past producer
FLL-04	Front of Leeds & Lansdowne	red-brown	massive, uniform	syenite	past producer
KAL-01	Kaladar	grey-green	massive, uniform	ultramafic	past producer
MON-01	Monmouth	pink	massive,	quartz monzonite	prospect
RAG-01	Raglan	pink	gneissic, variable	granitic gneiss	prospect
RLL-01, 02	Rear of Leeds & Lansdowne	pink-red	massive, uniform	granite	active quarry
RLL-04	Rear of Leeds & Lansdowne	grey	weak fol, uniform	quartz diorite	test quarry
RLL-06	Rear of Leeds & Lansdowne	brown	porphyritic, uniform	syenite	prospect
RLL-07	Rear of Leeds & Lansdowne	brown	foliated, uniform	syenite	prospect
RLL-08	Rear of Leeds & Lansdowne	pink	massive, uniform	quartz syenite	test quarry
STO-01	Storrington	pink	massive, uniform	granite	past producer
WOL-01	Wollaston	pink	massive, uniform	quartz syenite	past producer

¹for more detailed property descriptions, see Verschuren et al. (1986).

CENTRAL METASEDIMENTARY BELT—GRANITE

2. Granite properties with irregular or intensive jointing

Property No.	Township	Colour	Texture	Rock Type	Status
CAV-01	Cavendish	pink-brown	foliated, uniform	granite	prospect
CAV-02	Cavendish	grey-black	foliated, uniform	diorite-gabbro	prospect
ELI-01	Elizabethtown	pink-grey	massive, uniform	granite	prospect
ELI-02	Elizabethtown	pink-red	porphyritic massive	granite	prospect
FLL-03	Front of Leeds & Lansdowne	red-brown	massive, uniform	syenite	past producer
FLL-05	Front of Leeds & Lansdowne	grey-green to red	massive, uniform	syenite	past producer
FOE-01	Front of Escott	grey-brown	massive, variable	granite	prospect
FOE-02	Front of Escott	grey-black	massive to foliated	metasediment	prospect
FOY-01	Front of Yonge	brown	massive to foliated	syenite	prospect
GLA-01	Glamorgan	green-grey	foliated, uniform	gabbro	prospect
GLA-02	Glamorgan	grey	foliated, uniform	gabbro	prospect
HUG-01	Hungerford	pink-red	foliated, uniform	granite gneiss	past producer
PIT-01	Pittsburgh	brown	porphyritic variable	syenite	past producer
PIT-02	Pittsburgh	green-grey	gneissic, uniform	gneiss	past producer
RLL-05	Rear of Leeds & Lansdowne	buff-grey	massive, uniform	syenite	prospect
ROY-01	Rear of Yonge	pink-brown	massive, uniform	granite	prospect
STO-02	Storrington	pink	foliated, uniform	granite	prospect
WOL-02	Wollaston	black	massive, uniform	diabase	test quarry
WOL-03	Wollaston	black	massive, uniform	gabbro	prospect

CENTRAL METASEDIMENTARY BELT—MARBLE

1. Marble properties with limited to moderate jointing

Property No.	Township	Colour	Texture	Rock Type	Status
DUN-01	Dungannon	white to pale brown	massive, foliated	dolomitic marble	past producer
DUN-02	Dungannon	pale blue-brown-green	banded	dolomitic marble	past producer
DUN-06	Dungannon	dark grey-brown	massive-bedded	dolomitic marble	prospect
HUG-02	Hungerford	white-green	massive-foliated	dolomitic marble	past producer
HUN-04	Huntingdon	pale green to purple	uniform, massive	calcitic marble	active quarry
MAR-02	Marmora	pale green	massive, uniform	calcitic marble	prospect
MAR-03	Marmora	pale-dark green	foliated, variable	calcitic marble	past producer
MAR-04	Marmora	buff-pink-blue-grey	foliated, variable	calcitic marble	past producer
MAY-02	Mayo	white-brown	banded	dolomitic marble	prospect
RAG-01	Raglan	white to blue-grey	massive-foliated	calcitic marble	prospect

2. Marble properties with irregular or intensive jointing

DAR-01	Darling	white-green-grey	variegated	serpentinized marble	past producer
DUN-05	Dungannon	white-pale green	massive-foliated	dolomitic marble	prospect
DUN-06c	Dungannon	pink-white-green	banded	calcitic marble	prospect
MAD-01	Madoc	dark grey-black	massive to banded	calcitic marble	active quarry
MAD-04	Madoc	white-pink-grey	banded	calcitic marble	past producer
NOR-01	Somerville	white	massive-foliated	dolomitic marble	prospect

Appendix B. 1986 Property Examination Reports— Granite Properties

ABBOTTS HILL INTRUSION

LOCATION Southern Kennebec Township trending northeast into Olden Township near town of Mountain Grove

NTS 31 C/10 QGS Map 2449 Report 216

SAMPLE SITES 86-OLD-007, 86-OLD-008, 86-OLD-009, 86-KEN-007, 86-KEN-008, 86-KEN-009, 86-KEN-010

DESCRIPTION OF AREA

The Abbotts Hill intrusion runs northeast-southwest from Kennebec Township into Olden Township. The length of the intrusion is approximately 15 km along which three dominant rock types are encountered. The first rock type, found in the northern part of the intrusion, is mainly biotite granodiorite but some biotite quartz monzonite does occur. Towards the centre of the intrusion the rock trends toward a biotite trondjemite, and at the southern extent of the intrusion the rock becomes dominantly biotite quartz monzonite.

Three samples were taken from the northern end of the intrusion near Mountain Grove. These samples are 86-OLD-007, 008, 009. The rock here is a foliated, fine- to medium-grained biotite granodiorite that displays an unattractive greyish-brownish-pink colour.

Jointing in this area is very intense and varies from regular to irregular, limiting the potential for extraction of large quarry blocks.

Other deleterious features found in the area include the presence of pegmatite dikes, quartz pods and stringers, aplite dikes and some minor exfoliation. No deleterious minerals were noticed.

To the south of this area four more samples were taken (86-KEN-007, 008, 009, 010). These samples were also mainly biotite granodiorite. All features of this area appear to be similar to those of the northern part of the intrusion. The southern part of the intrusion is mainly biotite quartz monzonite. No samples were taken from this area due to access limitations.

CONCLUSIONS

The Abbotts Hill intrusion does not seem to favour the development of a building stone quarry. The rock found here is not particularly attractive and the intense jointing limits the area as far as large block extraction is concerned.

POTENTIAL

POOR	MODERATE	GOOD
86-OLD-007		
86-OLD-008		
86-OLD-009		
86-KEN-007		
86-KEN-008		
86-KEN-009		
86-KEN-010		

REFERENCE

Wolff, J.M. 1982. Geology of the Long Lake area; Ontario Geological Survey, Report 216, 76p.

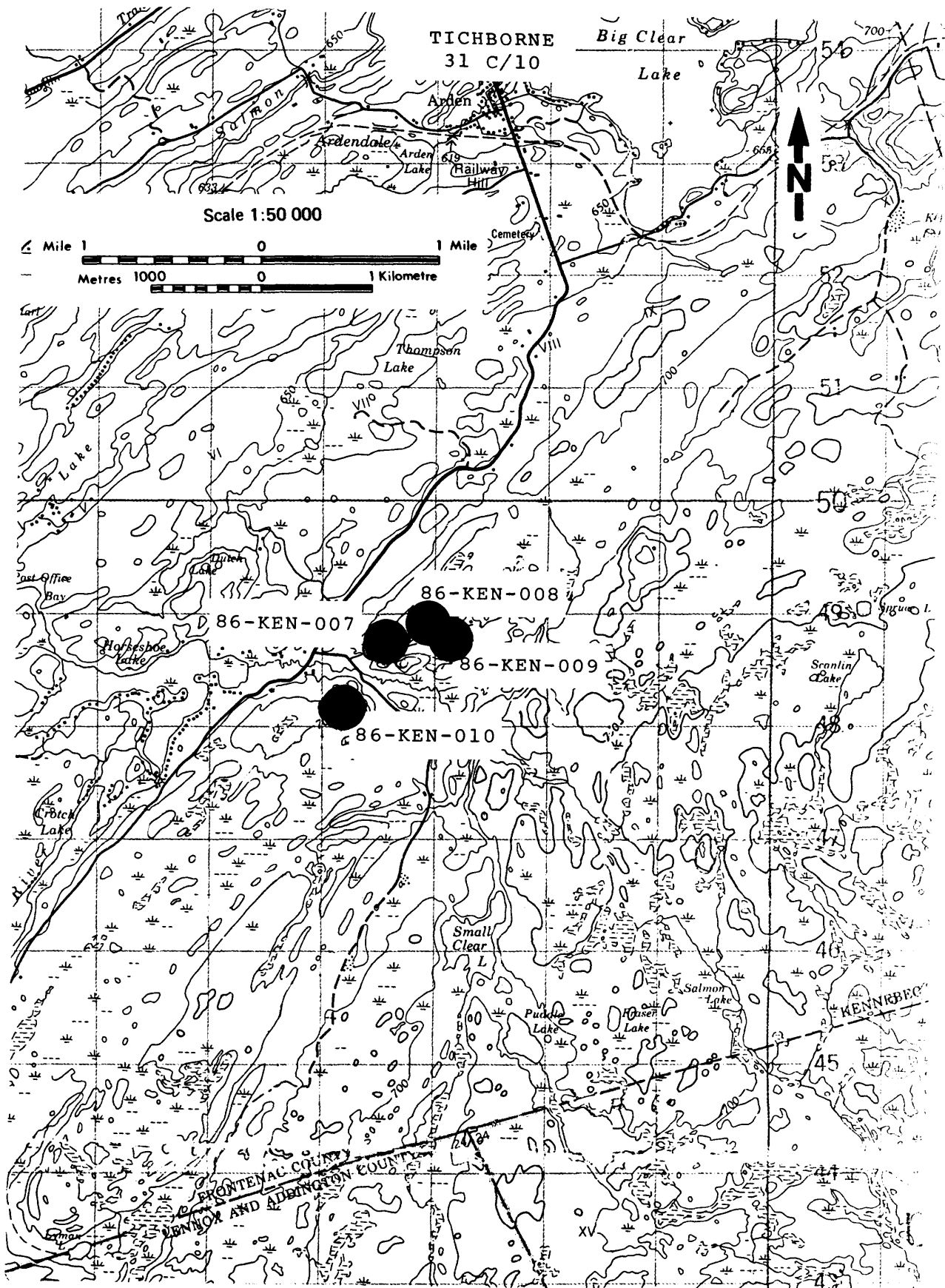


Figure B1. Sample locations, Abbotts Hill intrusion (sheet 1).

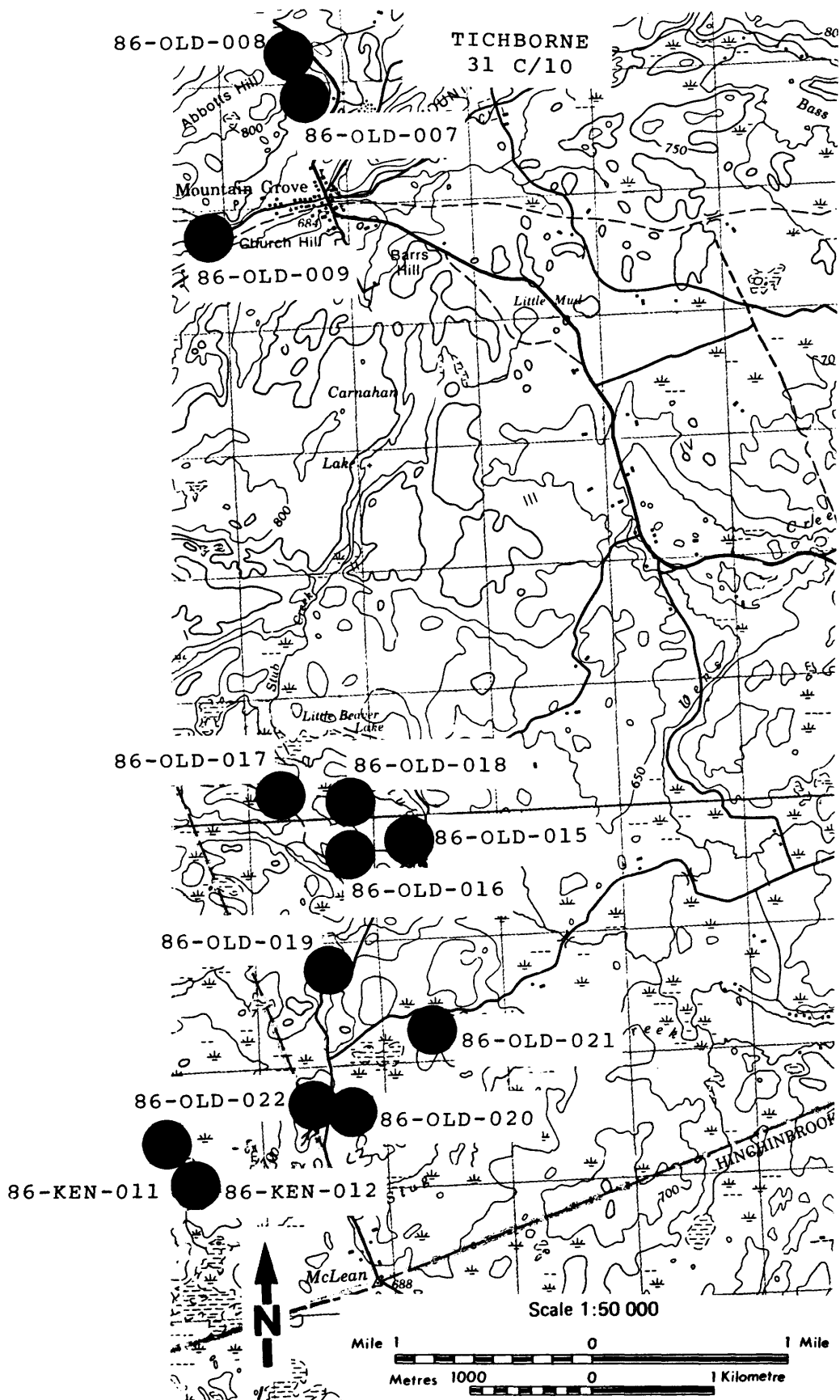


Figure B2. Sample locations, Abbotts Hill intrusion (sheet 2).

86-OLD-007

PROPERTY NO. 86-OLD-007 PLUTON NAME Abbots Hill Intrusion
PROPERTY NAME Abbots Hill 1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Olden LOT 14 CONC. 2
NTS 31 C/10 UTM CO-ORDINATES Easting 353700 Northing 4955900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4452-157-75
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark grey-brown
Weathered Surface Grey-pink
Uniform Variable X
WEATHERING DEPTH 1 mm
GRAIN SIZE fine to medium Uniform Variable X
TEXTURE (gneissic) Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike 140 degrees
Dip 29 degrees E
Formed By Alignment of mafics, gneissosity
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 020 degrees Dip Vertical Spacing <1 m
B) Strike 120 degrees Dip Vertical Spacing <0.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite, quartz, K-spar, plagioclase
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Many pegmatite/quartz pods and stringers.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS The gneissosity has been deformed by macro folding. Intense jointing, numerous pegmatite dikes and quartz veining limit the possibility of procuring quarry blocks.

86-OLD-008

PROPERTY NO. 86-OLD-008 PLUTON NAME Abbots Hill Intrusion
PROPERTY NAME Abbots Hill 2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Olden LOT 14 CONC. 2
NTS 31 C/10 UTM CO-ORDINATES Easting 353550 Northing 49556200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4452-157-75
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink with black
Weathered Surface Pink/grey
Uniform X Variable
WEATHERING DEPTH 2 to 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 140 degrees
Dip 22 degrees SE
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 140 degrees Dip vertical Spacing 0.5 to 2 m
0.7 m avg.
B) Strike 80 degrees Dip vertical Spacing up to 1 m
C) Strike horizontal Dip 0 degrees Spacing 0.1 to 0.5 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Quartz, plagioclase, biotite, K-spar
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Pegmatite dikes, numerous aplite dikes, quartz and granitic stringers, hematite staining.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS The rock contains numerous pegmatitic and aplitic phases, and quartz and granitic stringers and veins. Jointing is intense.



Photo B1. Overall view of outcrop depicting horizontal sheeting and good exposure. 86-OLD-008

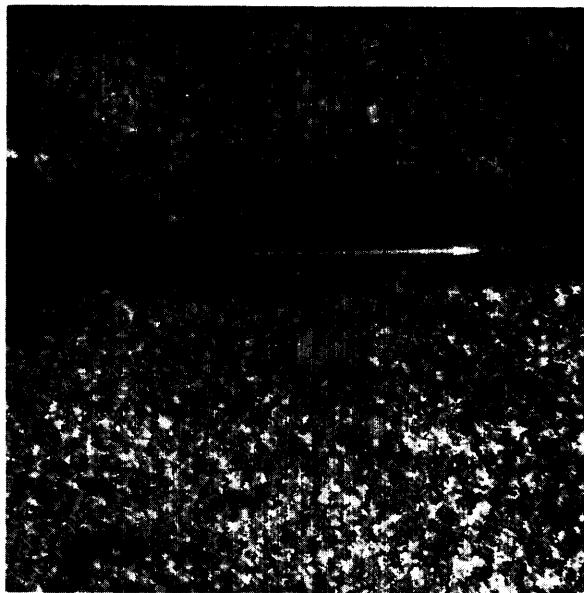
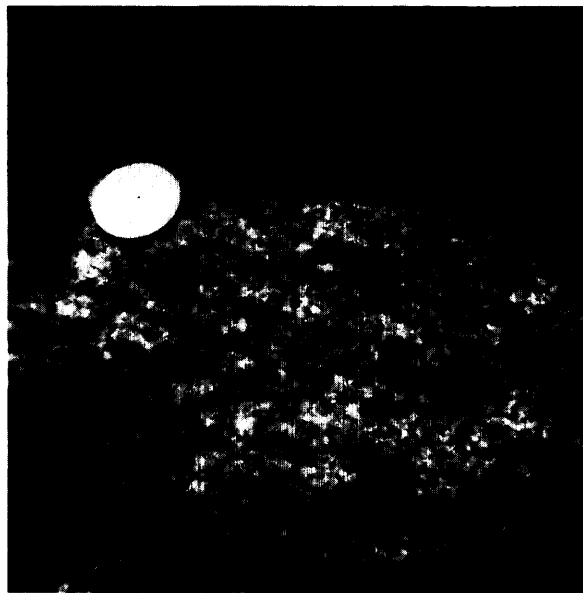


Photo B2. Granitic stringer with biotite quartz monzonite. 86-OLD-008

86-OLD-009

PROPERTY NO. 86-OLD-009 PLUTON NAME Abbotts Hill Intrusion
PROPERTY NAME Abbotts Hill 3 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Olden LOT 15 CONC. 2
NTS 31 C/10 UTM CO-ORDINATES Easting 352850 Northing 4954800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4451-143-104
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Greyish-whitish pink
 Weathered Surface Greyish white
 Uniform Variable X
WEATHERING DEPTH 2 mm
GRAIN SIZE Fine to medium Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Gneissic layering
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 140 degrees Dip 90 degrees Spacing 0.1 to 2 m
 0.5 m avg.
 B) Strike 30 degrees Dip 90 degrees Spacing 0.1 to 2 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Quartz, plagioclase, biotite, K-spar
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins, some pegmatite dikes, minor exfoliation.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Quartz veins and pegmatite dikes are predominant and jointing is intense. Gneissic banding is undeformed and uniform.



*Photo B3. Fresh surface showing gneissic texture, fine to medium grain size, and greyish-white-pink colour.
86-OLD-009*

86-KEN-007

PROPERTY NO. 86-KEN-007 PLUTON NAME Abbots Hill Intrusion
PROPERTY NAME Horseshoe Lake 1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Kennebec LOT 7 CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 346450 Northing 4948750
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-99
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink with black
 Weathered Surface Pink/grey
 Uniform Variable X
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium to fine Uniform Variable X
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 0 degrees
 Dip 30 degrees E
 Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 0 degrees Dip vertical Spacing 0.1 to 1 m
 B) Strike 120 degees Dip vertical Spacing 0.2 to 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite quartz, plagioclase, K-spar, muscovite
DELETERIOUS MINERALS Yes X No Type (pyrite) Percent Trace
OTHER FEATURES Hematite staining, many pegmatitic feldspar quartz pods,
 pegmatite dikes, aplite inclusions, moderate exfoliation.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This outcrop exhibits considerable variation in both mineralogy and
 grain size. Other deleterious features include pegmatite and aplitic phases,
 intense jointing and hematite staining.

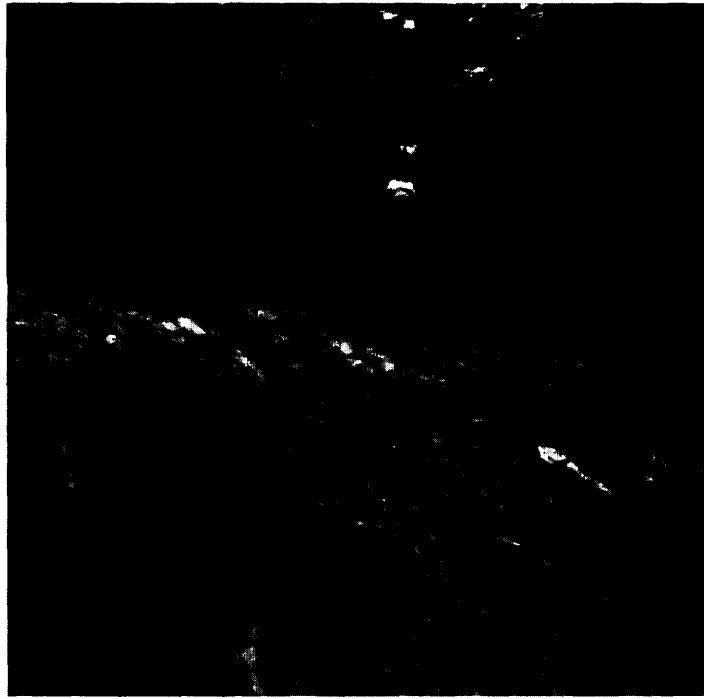


Photo B4. Overall view of outcrop area. Note irregular, closely spaced jointing. 86-KEN-007

86-KEN-008

PROPERTY NO. 86-KEN-008 PLUTON NAME Abbots Hill Intrusion
PROPERTY NAME Horseshoe Lake 2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Kennebec LOT 7 CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 346950 Northing 4948900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-99
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Light pink/grey banded
Weathered Surface Pinkish grey
Uniform Variable X
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 5 degrees
Dip 46 degrees E
Formed By Gneissosity
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 130 degrees Dip NR Vertical Spacing 0.1 to 1 m
B) Strike 5 degrees Dip 46 degrees E Spacing 0.1 to 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite plagioclase, K-spar, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz feldspar pods and veins; moderate exfoliation, staining.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a medium-grained, gneissic granodiorite of the Abbots Hill intrusion. The gneissosity has been deformed on a macro scale. The intense jointing and prevalent pegmatitic phases diminish the building stone potential.

86-KEN-009

PROPERTY NO. 86-KEN-009 PLUTON NAME Abbotts Hill Intrusion
PROPERTY NAME Horseshoe Lake 3 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Kennebec LOT 7 CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 347050 Northing 4948900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-99
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey with black
Weathered Surface Dark grey
Uniform Variable X
WEATHERING DEPTH 2 to 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern (X) Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite, K-spar, plagioclase, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining, pegmatite pods, exfoliation.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS To the west, increasing plagioclase in the rock causes it to lose its "salt and pepper" appearance. Jointing is regular to irregular and spacing is difficult to correlate. Diorite is localized. This rock is a massive, medium-grained, grey granodiorite. Jointing is intense, limiting quarry block size. Few other deleterious features were observed.

86-KEN-010

PROPERTY NO. 86-KEN-010 PLUTON NAME Abbotts Hill Intrusion
PROPERTY NAME Horseshoe Lake 4 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granodiorite
TOWNSHIP Kennebec LOT 7 CONC. 6
NTS 31 C/10 UTM CO-ORDINATES Easting 346100 Northing 4548200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447 130-99
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Light pinkish grey
Weathered Surface Pink and dark grey
Uniform X Variable
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium/fine Uniform X Variable
TEXTURE Foliated to gneissic Uniform Variable X
FABRIC Yes X No. Weak Mod. X Strong Strike 20 degrees
Dip ?
Formed By Alignment of biotite, gneissosity
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 120 degrees Dip vertical Spacing 0.2 to 0.5 m
B) Strike 185 degrees Dip vertical Spacing 0.4 to 0.7 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite, quartz, K-spar, plagioclase
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Aplite inclusions, many quartz-feldspar dikes (2 to 20 cm wide)
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Gneissosity results in pink and grey 1 to 5 cm banding locally.
The rock is intensely jointed and heterogeneous.

ADDINGTON INTRUSION

LOCATION Extends through southern Kaladar, central Kennebec, and northern Olden townships

NTS 31 C/15 QGS Map 2471 Report 228

SAMPLE SITES 86-OLD-003, 86-OLD-004

DESCRIPTION OF AREA

The Addington intrusion in general is a band of foliated to gneissic biotite granite and quartz monzonite about 1 km wide trending northeasterly through several townships. The areas examined in Olden Township both lie within a wide shear zone mapped by Wolff (1985) along the southeastern margin of the intrusion. Although jointing is regular and moderate, pervasive shearing is accompanied by carbonate and clay mineral development, quartz veins, and rusty weathering.

CONCLUSIONS

Although the area examined shows little building stone potential due to shearing, the moderate, regular joint pattern suggests that there may be areas with better potential for quarry blocks toward the centre of the intrusion, away from the shear zone mapped by Wolff (1985).

POTENTIAL

	POOR	MODERATE	GOOD
86-OLD-003			
86-OLD-004			

REFERENCES

Wolff, J.M. 1982. Geology of the Kaladar area, Frontenac, and Lennox and Addington counties; Ontario Geological Survey, Report 215, 94p.

---1985. Geology of the Sharbot Lake area, Frontenac and Lanark counties, southeastern Ontario; Ontario Geological Survey, Report 228, 70p.

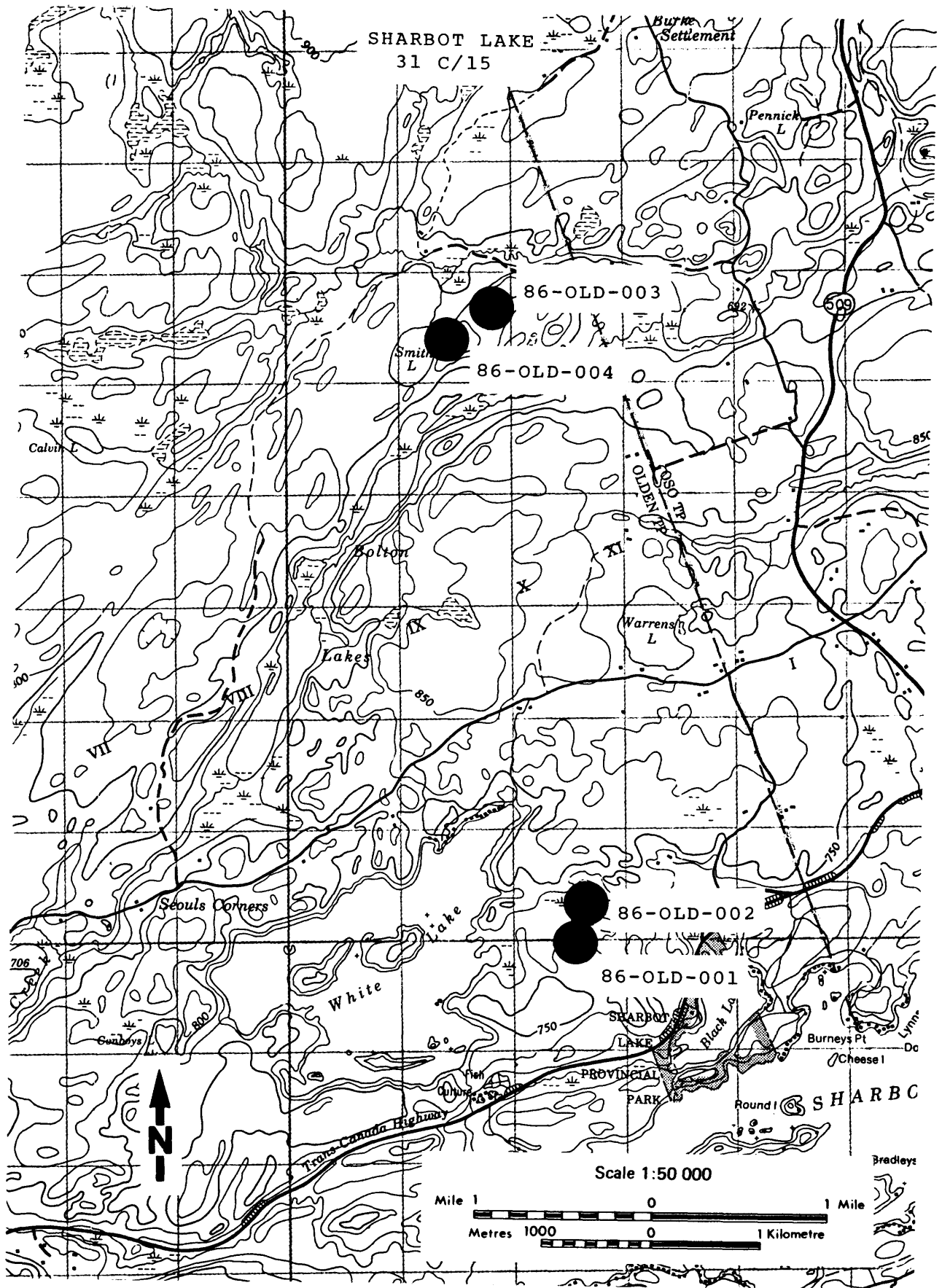


Figure B3. Sample locations, Addington intrusion.

86-OLD-003

PROPERTY NO. 86-OLD-003 PLUTON NAME Addington Intrusion
PROPERTY NAME Smith Lake I COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 26 CONCL. 10
NTS 31 C/15 UTM CO-ORDINATES Easting 361750 Northing 4965650
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4457-189-77
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Red
Weathered Surface Light pink with grey
Uniform X Variable
WEATHERING DEPTH 2 to 8 mm
GRAIN SIZE Medium to coarse Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 10 degrees Dip
Dip 10 degrees E
Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 120 degrees Dip Vertical Spacing 0.2 to 2 m
B) Strike 30 degrees Dip Vertical Spacing 0.5 to 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Carbonate and clay minerals coat the slip planes, (rusty weathering) minor sheeting, pegmatite dikes 15 cm.
POSSIBLE USES Curbing stone, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a moderately foliated, medium-grained, dark red granite. The carbonate and clay minerals present on shear planes weather to a rusty colour. Jointing occurs in regular patterns of moderate spacing, but the shear planes are pervasive and would limit quarry block size.



Photo B5. General view of dark red granite exhibiting regular jointing and good exposure. 86-OLD-003

86-OLD-004

PROPERTY NO. 86-OLD-004 PLUTON NAME Addington Intrusion
PROPERTY NAME Smith Lake II COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 25 CONC. 10
NTS 31 C/15 UTM CO-ORDINATES Easting 361400 Northing 4965350
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4457-189-77
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Red
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH ≤ 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated (planar fabric due to shearing) Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
Formed By Alignment of biotite, quartz, feldspar
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 30 degrees Dip 85 degrees WNW Spacing 2 to 3 m
B) Strike 110 degrees Dip 75 degrees SW Spacing 0.2 to 2 m
Sheet- C) Strike Horizontal Dip 0 degrees Spacing 1 to 2 m avg.
ing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Minor quartz veins and pods.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a medium-grained, well-foliated, red granite. Zones of shearing were also observed in this area. Vertical and horizontal joint sets repeat in a regular nature with a relatively close spacing. This factor, coupled with the presence of quartz veins and pods, limits the building stone potential of this area.



Photo B6. Extensive horizontal, closely spaced, joint sets in a light pink granite. 86-OLD-004

BEAVER CREEK COMPLEX

LOCATION North-central Tudor Township, approximately 2 miles west of Gilmour

NTS 31 C/13 OGS Map 2168 Geological Report 67

SAMPLE SITES 86-TUD-003, 86-TUD-004, 86-TUD-005, 86-TUD-006, 86-TUD-007,
86-TUD-008

DESCRIPTION OF AREA

The Beaver Creek complex consists of variable lithologies. Lumbers (1969) mapped this intrusion as a fine-grained to medium-grained, sometimes amphibole-rich, albite granite and syenite. He also described breccias consisting of fine-grained albite granite and syenite fragments in a matrix ranging from marble (from metasedimentary inclusions) to a chloritic matrix to an amphibole-rich granite and syenite matrix. Mafic intrusive rocks (called diorite, probably equivalent to Lumbers's amphibole-rich albite granite and syenite) and felsic intrusive rocks (primarily K-spar-quartz rocks) named granite or syenite based on the amount of quartz perceived were observed in the field. Also noted were breccias composed of felsic intrusive fragments hosted by sheared, sometimes vuggy and schistose, mafic intrusive or carbonate metasedimentary inclusions. Hybrids of the above lithologies could also occur.

The area examined was primarily in the southern half of the intrusion. A number of small plugs exist between the Beaver Creek complex and the Wadsworth trondjemite north of Gilmour. These consist primarily of albite granite (Lumbers 1969); the three largest can all be approached easily from present roads. Mapping by Lumbers (1969) indicated good exposure (consistent with topographic highs), but variable lithology.

CONCLUSIONS

Work to date indicates that exposure is very poor and lithologies are extremely variable over small distances (100 m) and often unsuitable for building stone purposes (sheared, schistose and brecciated).

In conclusion, further work is not recommended. Building stone potential appears to be low. Uses of Beaver Creek lithologies are restricted, for the most part, to rubble.

POTENTIAL

POOR	MODERATE	GOOD
86-TUD-003		
86-TUD-004		
86-TUD-005		
86-TUD-006		
86-TUD-007		
86-TUD-008		

REFERENCE

Lumbers, S.B. 1969. Geology of Limerick and Tudor townships, Hastings County, Ontario; Ontario Department of Mines, Geological Report 67, 110p.

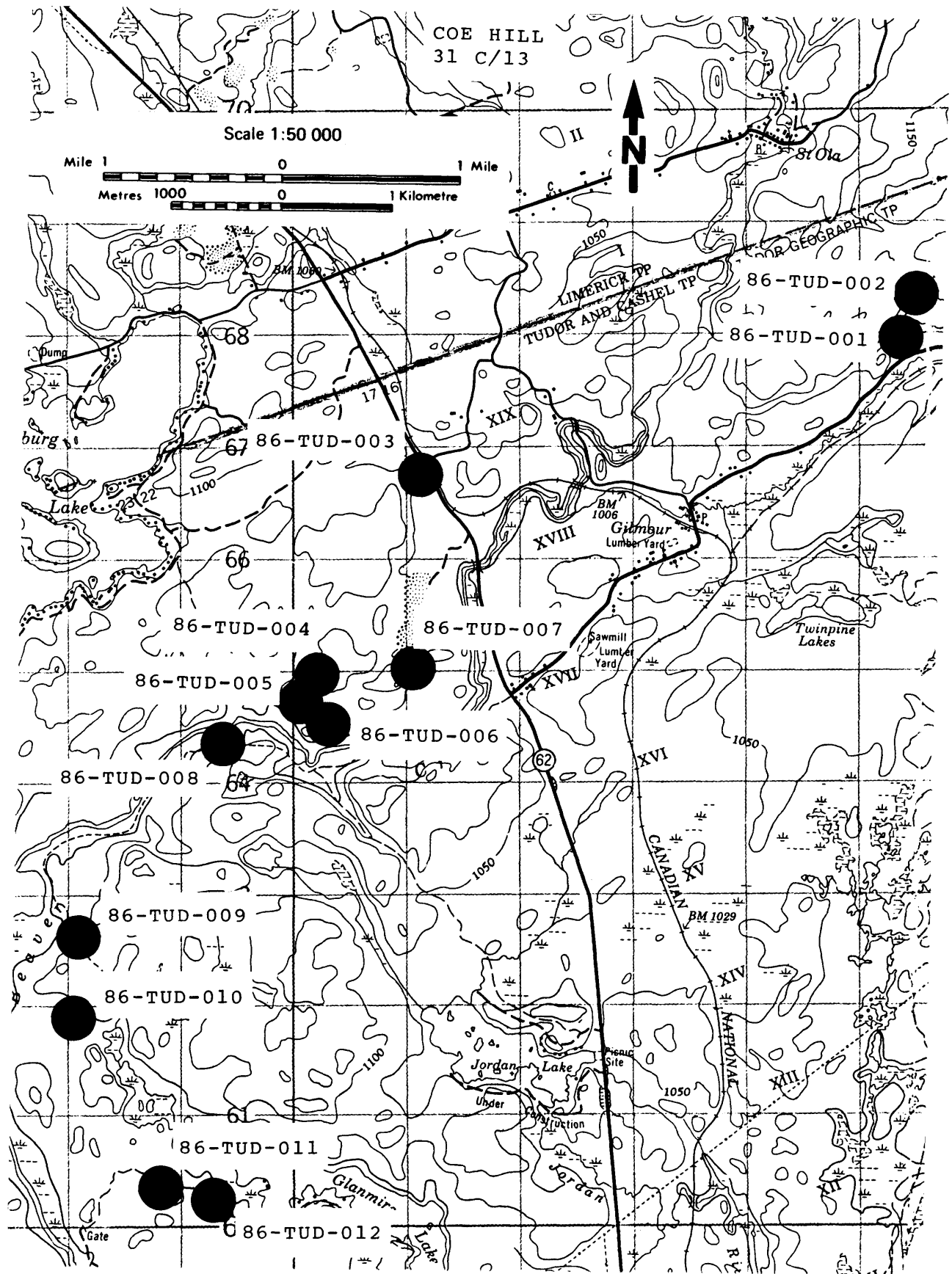


Figure B4. Sample locations, Beaver Creek complex.

86-TUD-003

PROPERTY NO. 86-TUD-003 PLUTON NAME Beaver Creek Complex
PROPERTY NAME Hwy. 62 - Beaver Creek COMMERCIAL STONE NAME Granite
 (Phillips Road)
GEOLOGICAL ROCK NAME Granodiorite Granite
TOWNSHIP Tudor LOT 16 CONC. 19
NTS 31 C/13 UTM CO-ORDINATES Easting 291200 Northing 4966800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4458-190-210
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish grey (to light green where brecciated)
 Weathered Surface Grey
 Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing (X) Intensive Jointing X
 A) Strike 150 degrees Dip vertical Spacing 0.2 to 1 m
 B) Strike subhorizontal Dip Spacing 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite, mafics approx. 25%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare occassional biotite slip planes; rare felsic stringers
 (<1 cm wide), feldspar alteration, brecciation.
POSSIBLE USES Ashlar, paving stone, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS Rock is locally brecciated resulting in unaltered felsic fragments
 hosted by an amphibole-chlorite-rich matrix. This brecciation and intense
 jointing limit the building stone potential of this site.

86-TUD-004

PROPERTY NO. 86-TUD-004 PLUTON NAME Beaver Creek Complex
PROPERTY NAME Beaver Creek 1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Diorite-Gabbro
TOWNSHIP Tudor LOT 21 CONC. 17
NTS 31 C/13 UTM CO-ORDINATES Easting 290150 Northing 4964900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4456-165-35
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Green-black
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Fine (-medium) Uniform Variable X
TEXTURE Massive (to foliated) Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike horizontal Dip 0 degrees Spacing 0.5 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, amphibole; Mafic content: approx. 50%
DELETERIOUS MINERALS Yes X No Type Sulphides Percent 1%
OTHER FEATURES Variable amounts of amphibole; sulphide weathering.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good FairD Poor X
COMMENTS This rock is a massive, medium-grained, green to black diorite (Gabbro). Deleterious features in this rock include moderate to intense irregular jointing and the presence of sulphides.

86-TUD-005

PROPERTY NO. 86-TUD-005 PLUTON NAME Beaver Creek Complex
PROPERTY NAME Beaver Creek-2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Tudor LOT 21 CONC. 17
NTS 31 C/13 UTM CO-ORDINATES Easting 290200 Northing 4964700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4456-165-35
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Bleached white
 Uniform X Variable
WEATHERING DEPTH ≤0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 040 degrees Dip 85 degrees S Spacing 0.2 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, minor quartz, chlorite; Mafics: <0.5%
DELETERIOUS MINERALS Yes X No Type Pyrite (chlorite) Percent ≤1%
OTHER FEATURES Chlorite-coated joints; rusty vugs (1 to 2 cm long); rare quartz veins; pyrite is sparsely disseminated, largest observed concentration was 1 mm diameter.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS The building stone potential of this site is difficult to assess due to poor outcrop exposure. The rock is a medium-grained, massive, pink syenite (with <5% fine-grained biotite). Jointing is irregular and intense. The presence of quartz veins and sulphides further limits the building stone potential of this site.

86-TUD-006

PROPERTY NO. 86-TUD-006 PLUTON NAME Beaver Creek Complex

PROPERTY NAME Beaver Creek-3 COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Intrusive Breccia

TOWNSHIP Tudor LOT 21 CONC. 17

NTS 31 C/13 UTM CO-ORDINATES Easting 290300 Northing 4964550

PROPERTY STATUS Prospect AIR PHOTO NO. 78-4456-165-35

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Dark green (matrix) to pink breccia fragments
 Weathered Surface Bleached grey-green (matrix) to white (fragments)
 Uniform Variable X

WEATHERING DEPTH ≤0.5 cm

GRAIN SIZE Fine-medium (matrix) to fine Uniform Variable X
 (fragments)

TEXTURE Foliated (matrix) to massive Uniform Variable X
 (fragments)

FABRIC Yes X No. Weak X Mod. Strong X Strike 075 degrees
 (variable) Dip 85 degrees N
 Formed By Shearing

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Matrix - Feldspar (mostly plagioclase) and amphibole with abundant chlorite developed where shearing is most intense. Breccia fragments - K-spar, quartz, rare biotite?

DELETERIOUS MINERALS Yes X No Type Chlorite Percent can be 20 to 30%

OTHER FEATURES Breaks easily due to sheared, often vuggy, character. Difficult to obtain fresh surface, always breaks along rusty coated fractures.

POSSIBLE USES Ashlar, crushed stone

OUTCROP EXPOSURE Good Fair X Poor

COMMENTS Exposure is along steep south-facing slope north of access road. Breccia is formed by felsic intrusive fragments (albite syenite according to Lumbers 1969) hosted by a melanocratic, amphibole and chlorite-rich matrix sheared diorite? (amphibole-rich albite syenite according to Lumbers 1969). Felsic fragments can vary considerably in size from centimetres to metres. Breccia is not consistently developed throughout area, local areas are more intensely brecciated and vuggy. Building stone potential is low.



*Photo B7. Felsic intrusive breccia fragments hosted by sheared mafic intrusive rock in a shear zone.
86-TUD-006*

86-TUD-007

PROPERTY NO. 86-TUD-007 PLUTON NAME Beaver Creek Complex
PROPERTY NAME Beaver Creek-04 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Felsic Intrusive
TOWNSHIP Tudor LOT 18 CONC. 17
NTS 31 C/13 UTM CO-ORDINATES Easting 291100 Northing 4965000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4456-165-35
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Bleached pinkish white
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Fine Uniform X Variable
TEXTURE Massive-granular Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong Strike 055 degrees
 Dip 85 degrees S
 Formed By Sheared, brecciated marble inclusions
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 020 degrees Dip 55 degrees W Spacing 0.2 m
 B) Strike 020 degrees Dip 45 degrees E Spacing 0.2 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz; Mafics: \leq 5% local Fe carbonate
DELETERIOUS MINERALS Yes X No Type Fe carbonate Percent \leq 1%
OTHER FEATURES Muscovite-coated joints; large (10s of metres in width),
 sheared, metasedimentary carbonate inclusions nearby.
POSSIBLE USES Limited as building stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS Intense jointing, brecciation and shearing of the rocks at this
 site restrict quarry block extraction.

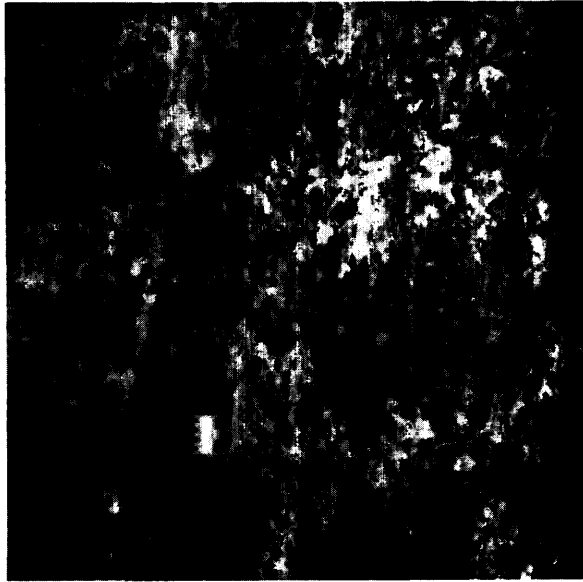


Photo B8. Shear zone—felsic intrusive breccia clasts hosted by sheared, contaminated marble. 86-TUD-007

86-TUD-008

PROPERTY NO. 86-TUD-008 PLUTON NAME Beaver Creek Complex
PROPERTY NAME Beaver Creek-5 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Felsic Intrusive
TOWNSHIP Tudor LOT 22 CONC. 17
NTS 31 C/13 UTM CO-ORDINATES Easting 289350 Northing 4964350
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4456-165-35
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface White to pink
 Weathered Surface Buff grey
 Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Fine Uniform Variable X
TEXTURE Massive to foliated Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike 105 degrees
 Dip 60 degrees S
 Formed By (Mineral alignment quartz-feldspar)
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz; Mafics: <2%
DELETERIOUS MINERALS Yes X No Type Sulphides Percent 1 to 2%
OTHER FEATURES Occasional quartz veins; millimetre-scale Fe carbonate rusty
 vugs, local shearing; significant variation in local lithologies; some
 carbonate-coated fractures.
POSSIBLE USES Limited
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS Quartz veins, carbonate-filled fractures, and local shearing are
 common at this site. The intense irregular jointing further limits the building
 stone potential.

BISHOP CORNERS FORMATION

LOCATION A continuous metasedimentary formation extending from southern Barrie Township, through the western part of Kaladar Township into southeastern Elzevir Township

NTS 31 C/14 QGS Maps 2432, 2053 Report 215

SAMPLE SITE 86-KAL-009

DESCRIPTION OF AREA

The rock sampled is a quartz-pebble conglomerate of the Bishop Corners Formation, a sequence of clastic, silicious metasediments representing the basal unit of the Flinton Group metasediments. The clasts are pebble-size and deformed to flattened, ellipsoidal shapes. Most are grey to white quartzite. The matrix is fine to medium grained, varying from quartzofeldspathic to micaceous in composition. The matrix is generally schistose with a shiny white to grey colour. Intensity of joint patterns and foliation may be variable throughout the strike length of the formation. However, in the area sampled, the joint pattern is regular and moderate.

CONCLUSIONS

The potential for the removal of small quarry blocks combined with the unique appearance of this rock suggest that further investigation of the area is warranted.

POTENTIAL

POOR

MODERATE
86-KAL-009

GOOD

REFERENCE

Wolff, J.M. 1982. Geology of the Kaladar area, Frontenac, and Lennox and Addington counties; Ontario Geological Survey, Report 215, 94p.

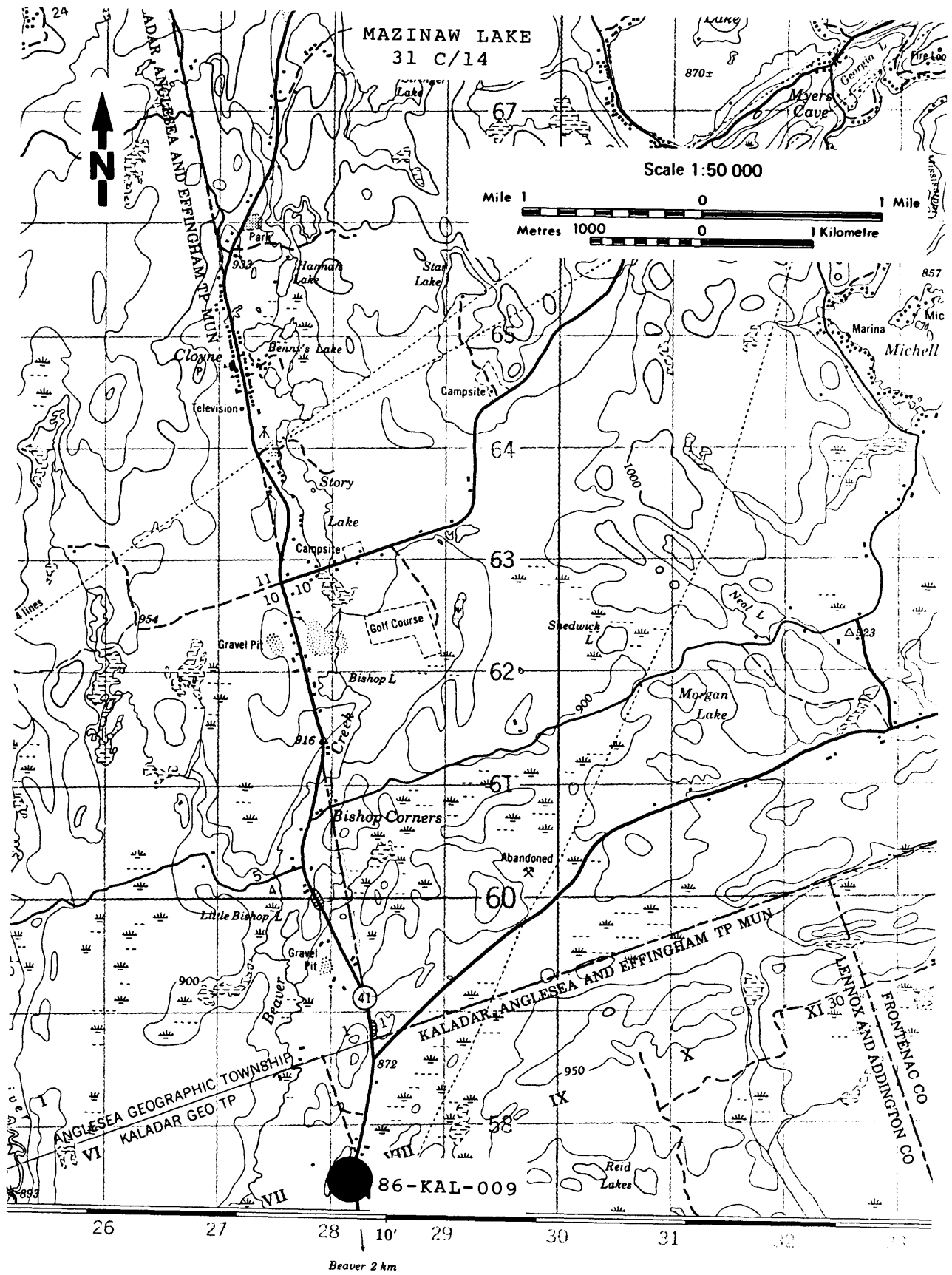


Figure B5. Sample location, Bishop Corners Formation.

86-KAL-009

PROPERTY NO. 86-KAL-009 PLUTON NAME Bishop Corners Formation
PROPERTY NAME Bishop Corners COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Schistose Conglomerate
TOWNSHIP Kaladar LOT 30 CONC. 7, 8
NTS 31 C/14 UTM CO-ORDINATES Easting 328200 Northing 4957500
PROPERTY STATUS Roadcut AIR PHOTO NO. 78-4452-192-1451
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type High velocity
COLOUR Fresh Surface Silver-grey-white
Weathered Surface Silver grey
Uniform Variable X
WEATHERING DEPTH Negligible
GRAIN SIZE Large pebbles in fine-grained groundmass Uniform Variable X
TEXTURE Lineated and foliated Uniform Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
Formed By Lineation and foliation
BEDDING Yes X No Strike 185 degrees Dip 70 degrees SE Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 185 degrees Dip 70 degrees Spacing 1 m
B) Strike 115 degrees Dip 80 degrees Spacing 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Quartz pebbles, mica
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES
POSSIBLE USES Architectural stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This conglomerate shows a definite lineation of quartz pebbles in a fine-grained mica groundmass. The mica is foliated and flows around the quartz pebbles giving the rock a very unique boundinage appearance. The jointing appears to be fairly regular and moderate and might facilitate the removal of blocks of 1 m³ size. Due to blasting along the road, this is difficult to determine for certain. The uniqueness of this stone may encourage further investigation.

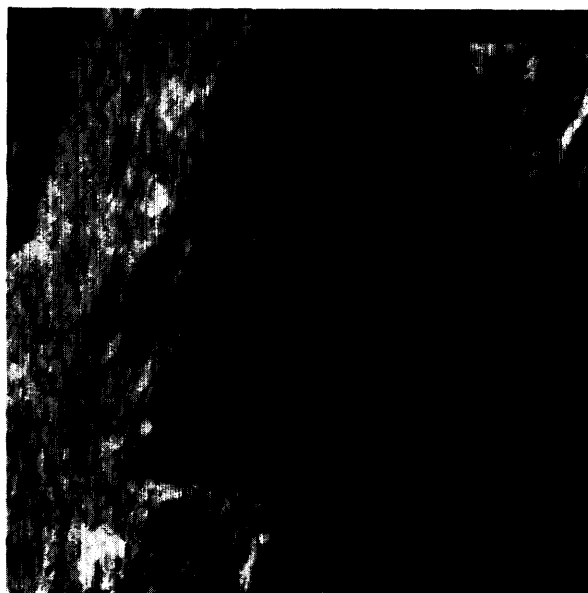


Photo B9. Textural view of quartz-pebble conglomerate. 86-KAL-009

COE HILL GRANITE

LOCATION Wollaston Township, south of Highway 620, west and southwest of Wollaston Lake-Coe Hill

NTS 31 C/13 QGS Map 2020 Geological Report 11

SAMPLE SITES 86-WOL-006, 86-WOL-007, 86-WOL-008, 86-WOL-009, 86-WOL-010

DESCRIPTION OF AREA

Rock samples taken in the Coe Hill Granite are biotite granites in the northern part of the pluton and pink granites to the south. The only notable exception is a diorite sample taken from an inactive quarry in Lot 24, Concession 5. These rocks tend to be medium grained and massive except around the borders of the pluton where slight foliation was noticed. The colour of the rock tends to be quite uniform near the centre of the pluton but near the edges there is a slight variation due to a gneissic foliation.

Jointing in the pluton varies between regular and irregular and is generally moderate with some areas of intense jointing. In areas where horizontal jointing can be seen, it tends to have a spacing of less than half a metre.

Perhaps the most deleterious feature of the pluton as far as building stone is concerned is the presence of quartz veins, pods and stringers throughout much of the area. These quartz features are a limiting factor at the granite quarry (86-WOL-007) that was visited.

The mineralogy of the pluton appears to be mainly quartz, potassium feldspar, plagioclase and biotite.

The southern part of the pluton is characterized by many pegmatite dikes and mafic inclusions which seriously detract from the potential of the area.

CONCLUSIONS

Although this area has been quarried for building stone in the past, it is doubtful that this area has much economic potential at the present time for the removal of large building stone blocks. Some areas may be viable for small-scale operations.

POTENTIAL

POOR	MODERATE	GOOD
86-WOL-006	86-WOL-007	
86-WOL-009	86-WOL-008	
	86-WOL-010	

REFERENCES

Carmichael, D.M. 1970. Intersecting isograds in the Whetstone Lake area, Ontario; Journal of Petrology, v.11, pt.1, p.147-181.

Davidson, A., Britton, J.M., Bell, D. 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.153-262.

Hewitt, D.F. 1962a. Geology of Wollaston Township, Hastings County, Ontario; Ontario Department of Mines, Geological Report 11, p.29-55.

---1962b. Some tectonic features of the Grenville Province of Ontario; Transactions of the Royal Society of Canada, Special Publication 4, p.102.

---1964. Building stones of Ontario part V granite and gneiss; Ontario Department of Mines, Industrial Mineral Report 19, 51p.

Hewitt, D.F. and Satterly, J. 1957. Haliburton-Bancroft area, Province of Ontario; Ontario Department of Mines, Map 1957B, scale 1:126 720.

Laakso, R.K. 1968. Geology of Lake Township, Hastings County, Ontario; Ontario Department of Mines, Geological Report 54, 36p.

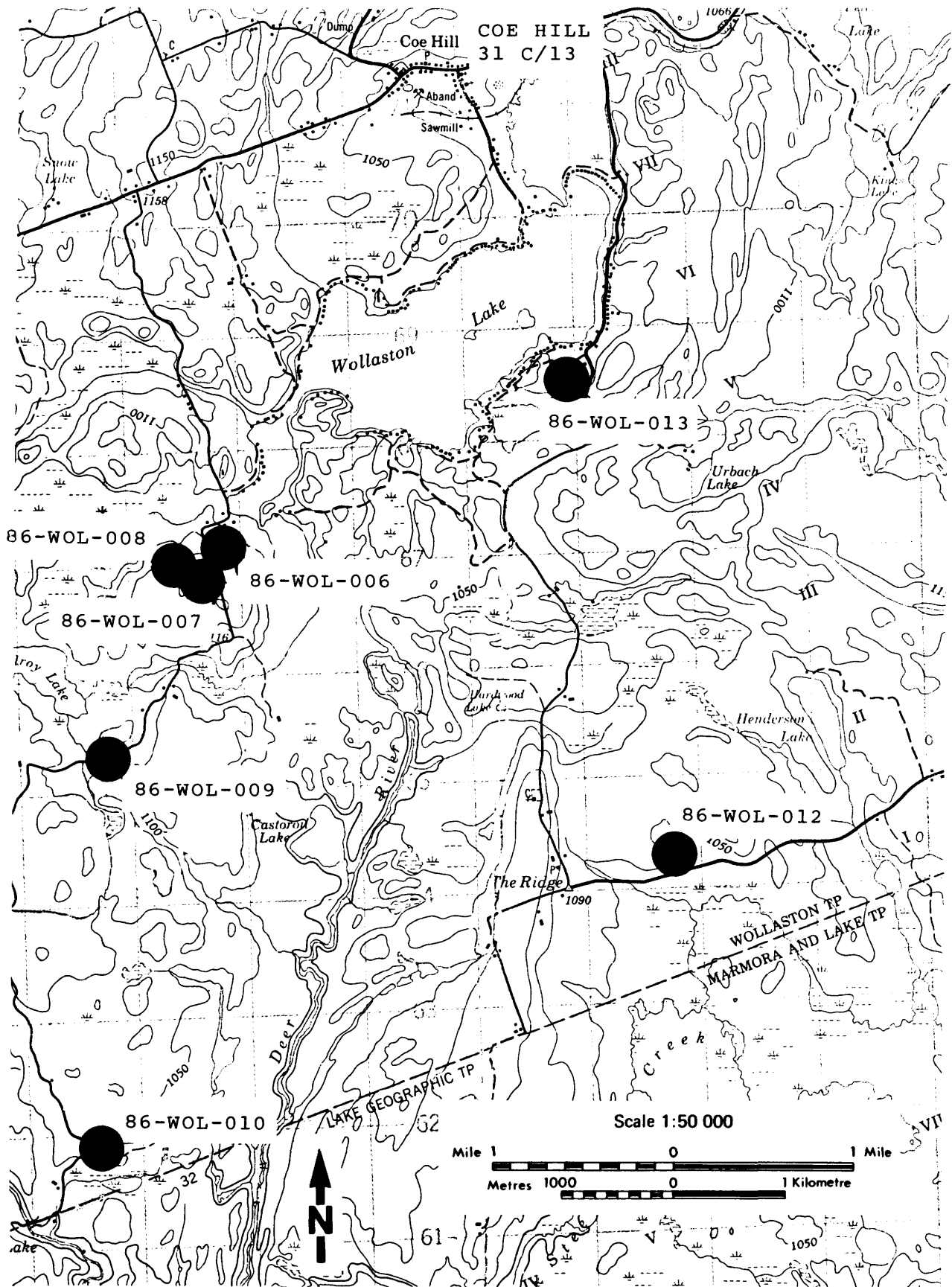


Figure B6. Sample locations, Coe Hill granite.

86-WOL-006

PROPERTY NO. 86-WOL-006 PLUTON NAME Coe Hill Granite
PROPERTY NAME Wollaston Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granite
TOWNSHIP Wollaston LOT 22 CONC. 5
NTS 31 C/13 UTM CO-ORDINATES Easting 373800 Northing 4967100
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4434-9-179
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish brown
Weathered Surface Grey-black
Uniform X Variable
WEATHERING DEPTH 1 mm
GRAIN SIZE Medium-fine Uniform Variable X
TEXTURE Foliated to gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 160 degrees Dip
Formed By Alignment of biotite grains
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 110 degrees Dip Vertical Spacing 3 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar quartz biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This site consists of small outcrop exposures of strongly foliated biotite granite. Jointing is moderate in both regular and irregular joint sets. Quartz veins (approximately 2 cm in width) were observed but are not abundant. One regular joint set has a strike of 110 degrees and a vertical dip with spacing of approximately 3 cm. Potential for building stone development in this area is limited.

86-WOL-007

PROPERTY NO. 86-WOL-007 PLUTON NAME Coe Hill Granite
PROPERTY NAME Granite Quarry COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Wollaston LOT 24 CONC. 5
NTS 31 C/13 UTM CO-ORDINATES Easting 373600 Northing 4966850
PROPERTY STATUS Inactive AIR PHOTO NO. 77-4434-9-179
PRODUCTION HISTORY Former granite quarry
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface Pinkish white
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH Regular
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 143 degrees Dip Vertical Spacing 3 m
B) Strike 80 degrees Dip Vertical Spacing 3 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, biotite, quartz; Mafic content: approx. 20%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Outcrop area displays many felsic stringers which detract from the appearance of the outcrop.
POSSIBLE USES Curbing stone, architectural stone, landscaping stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This area contains medium-grained, massive, pinkish-brown granite. The granite was quarried for building stone material in the past. Quarry was abandoned presumably because of the large number of quartz stringers in the rock.

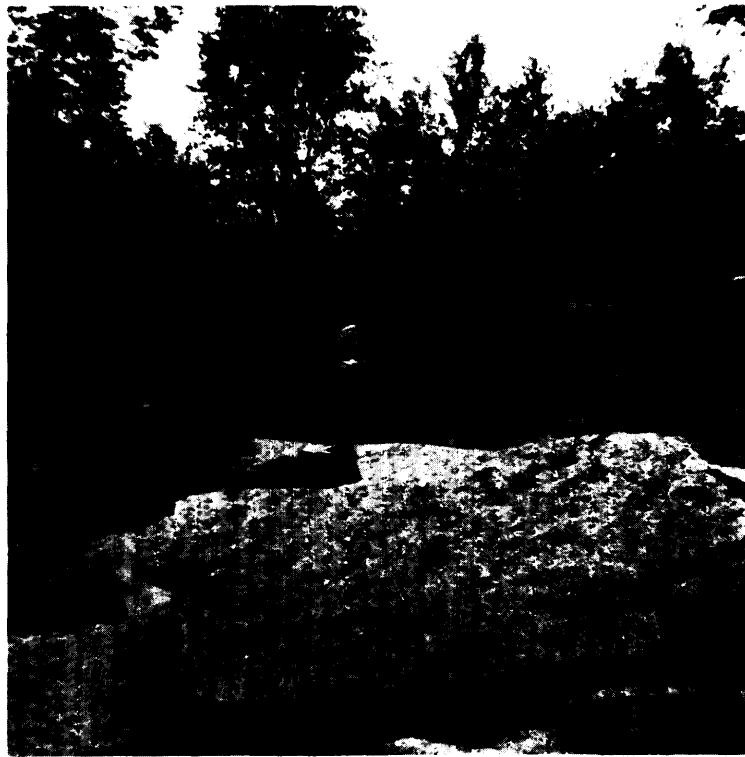


Photo B10. Overall view of quarry exhibiting two benches and pinkish-white colour of the granite. 86-WOL-007



Photo B11. Part of grout pile at the quarry site. 86-WOL-007

86-WOL-008

PROPERTY NO. 86-WOL-008 PLUTON NAME Coe Hill Granite
PROPERTY NAME Diorite Quarry COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Diorite-Gabbro
TOWNSHIP Wollaston LOT 24 CONC. 5
NTS 31 C/13 UTM CO-ORDINATES Easting 373450 Northing 4566950
PROPERTY STATUS Inactive AIR PHOTO NO. 77-4434-9-179
PRODUCTION HISTORY Area was quarried for diorite, probably ashlar or small building stone. No further information available at this time.
USE OF EXPLOSIVES Yes X No Type Black powder
COLOUR Fresh Surface Black
 Weathered Surface Brownish black
 Uniform X Variable
WEATHERING DEPTH 1 to 5 mm
GRAIN SIZE Fine Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair to poor
MINERALOGY Feldspar; Mafic content: approx. 50%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Granitic stringers, horizontal sheeting (approximately 0.5 m spacing).
POSSIBLE USES Ashlar, monument stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This sample is a massive, medium-grained, black gabbro or diorite with rare medium-grained plagioclase phenocrysts. Felsic stringers were observed but were not abundant. Jointing occurs in moderately intensive, irregular patterns.



Photo B12. Horizontal jointing limits potential block size. 86-WOL-008

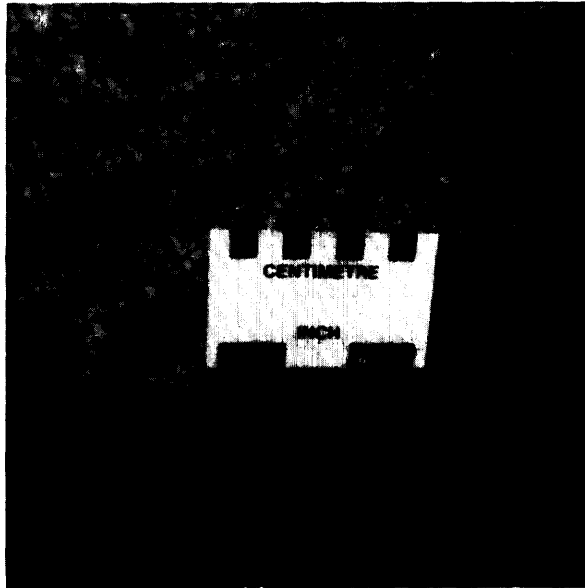


Photo B13. Diorite contact with pegmatite. 86-WOL-008

86-WOL-009

PROPERTY NO. 86-WOL-009 PLUTON NAME Coe Hill Granite
PROPERTY NAME Gilroy Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Wollaston LOT 26, 27 CONC. 4
NTS 31 C/13 UTM CO-ORDINATES Easting 372800 Northing 4965300
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Light pink
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Fine Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 150 degrees Dip 90 degrees Spacing ≤ 1 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes X No Type Bio schist inclusion Percent
OTHER FEATURES Quartz stringers, pegmatite dike (5 cm), many mafic inclusions.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This rock is a fine-grained, massive granite. Deleterious features include a quartz stringer and a pegmatite dike which measures about 5 cm wide. The jointing follows regular and irregular patterns with moderate spacing, however, more exposure is needed to determine the true extent of the jointing. Horizontal jointing was not observed. Numerous mafic inclusions were visible on the surface of the outcrop. These factors limit the building stone potential of this area.



Photo B14. Mafic inclusions found in outcrop. 86-WOL-009

86-WOL-010

<u>PROPERTY NO.</u>	86-WOL-010	<u>PLUTON NAME</u>	Coe Hill Granite		
<u>PROPERTY NAME</u>	SW Corner of Wollaston Township		<u>COMMERCIAL STONE NAME</u>	Granite	
		<u>GEOLOGICAL ROCK NAME</u>	Granite		
<u>TOWNSHIP</u>	Wollaston	<u>LOT</u>	29, 30	<u>CONC.</u>	1
<u>NTS</u>	31 C/13	<u>UTM CO-ORDINATES</u>	Easting 372600	Northing	4961900
<u>PROPERTY STATUS</u>	Prospect	<u>AIR PHOTO NO.</u>	77-4433-15-201		
<u>PRODUCTION HISTORY</u>	Nil				
<u>USE OF EXPLOSIVES</u>	Yes	No	X	Type	
<u>COLOUR</u>	Fresh Surface Pink with black				
	Weathered Surface Grey-pink				
	Uniform	X	Variable		
<u>WEATHERING DEPTH</u>	2 to 5 mm				
<u>GRAIN SIZE</u>	Medium		Uniform	X	Variable
<u>TEXTURE</u>	Slight foliation		Uniform	X	Variable
<u>FABRIC</u>	Yes	X	No.	Weak	X
			Mod.	Strong	
	Formed By Alignment of biotite grains (slight foliation)				
<u>BEDDING</u>	Yes	No	X	Strike	Dip
				Avg. Thickness	
<u>JOINTING</u>	Regular Pattern		X	Irregular Pattern	
	Limited Jointing			Moderate Jointing	X
				Intensive Jointing	X
	A) Strike	100 degrees	Dip	Spacing	3 m
	B) Strike	40 degrees	Dip	Spacing	2 m
	C) Strike	Horizontal	Dip	Spacing	<0.5 m
	D) Strike		Dip	Spacing	
<u>POTENTIAL FOR QUARRY BLOCKS</u>	Poor				
<u>MINERALOGY</u>	Feldspar, quartz biotite; Mafic content: approx. 25 to 30%				
<u>DELETERIOUS MINERALS</u>	Yes	No	X	Type	Percent
<u>OTHER FEATURES</u>	Pegmatite dikes, quartz veins, horizontal jointing spaced at less than 0.5 m, minor exfoliation, aplite dikes observed but rare.				
<u>POSSIBLE USES</u>	Ashlar, curbing stone, crushed stone				
<u>OUTCROP EXPOSURE</u>	Good	Fair	X	Poor	
<u>COMMENTS</u>	This area contains a medium-grained, pink granite which has a relatively high biotite content, a fact which may hamper its polishing potential. Jointing occurs in both regular and irregular joint sets with prodominantly moderate intensity. There are numerous pegmatite dikes in the area as well as Some aplite dikes and quartz veins. These factors limit the building stone potential of the area.				

CORDOVA PLUTON

LOCATION Marmora Township, north of Crowe Lake, east of the Hastings-Peterborough County border; between Cordova Mines and Fidler Rapids of Beaver Creek

NTS 31 C/5, 12 QGS Map P.2613 OFR 5537

SAMPLE SITES 86-MAR-001, 86-MAR-002, 86-MAR-003, 86-MAR-004, 86-MAR-014, 86-MAR-015

DESCRIPTION OF AREA

The rock type in all six sample areas is gabbroic. All sites show intense jointing, variable grain size, and grey-green to black colour. Deleterious features in addition to jointing include hematite coating, pyrite, granitic stringers, quartz pods and sheeting.

CONCLUSIONS

The Cordova pluton has little potential as a source of building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-MAR-001		
86-MAR-002		
86-MAR-003		
86-MAR-004		
86-MAR-014		
86-MAR-015		

REFERENCE

Bartlett, J.R. and Moore, J.M. Jr. 1985. Geology of Belmont, Marmora, and Southern Methuen townships, Peterborough and Hastings counties; Ontario Geological Survey, Open File Report 5537, 236p.

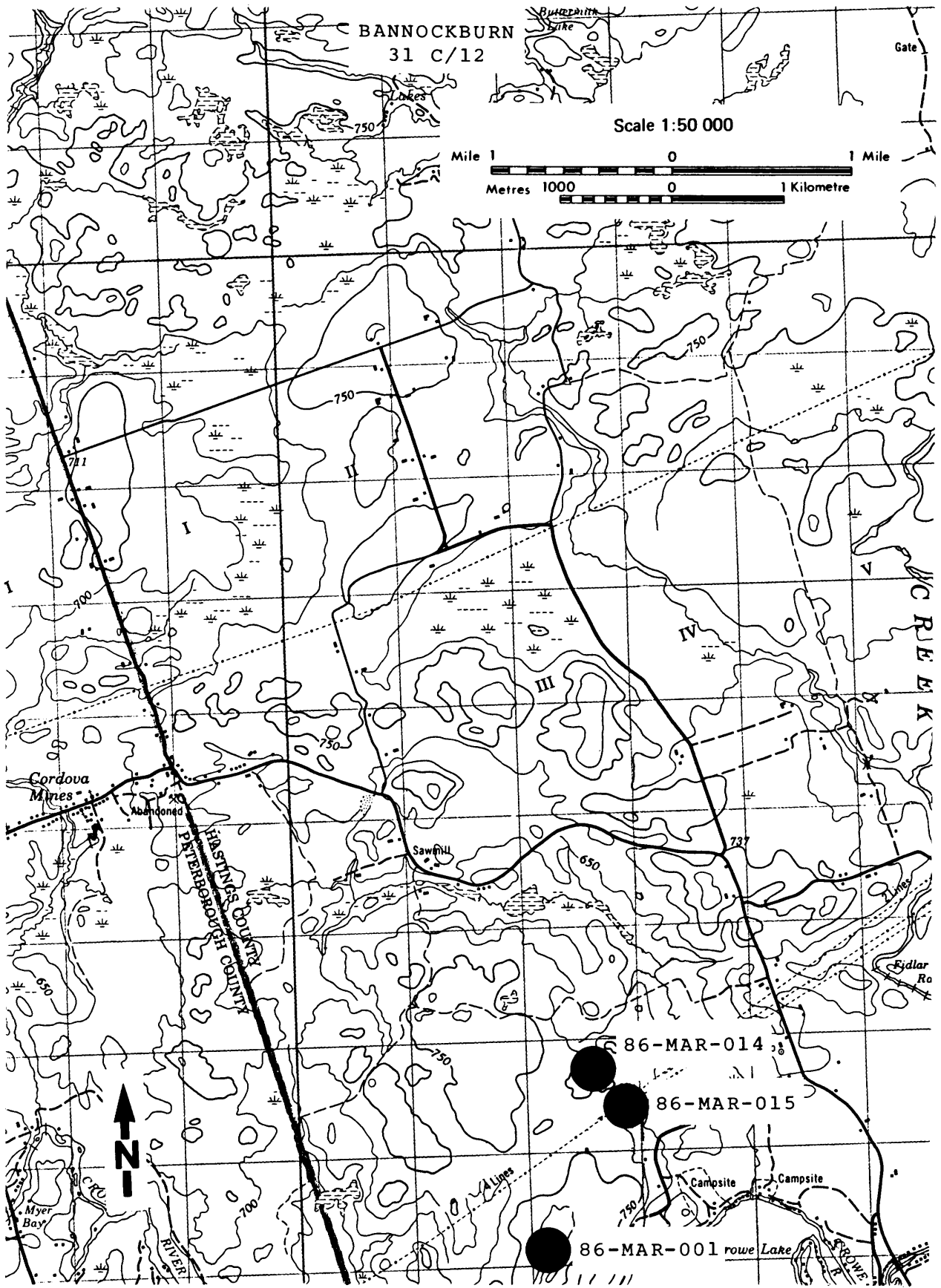


Figure B7. Sample locations, Cordova pluton (sheet 1).

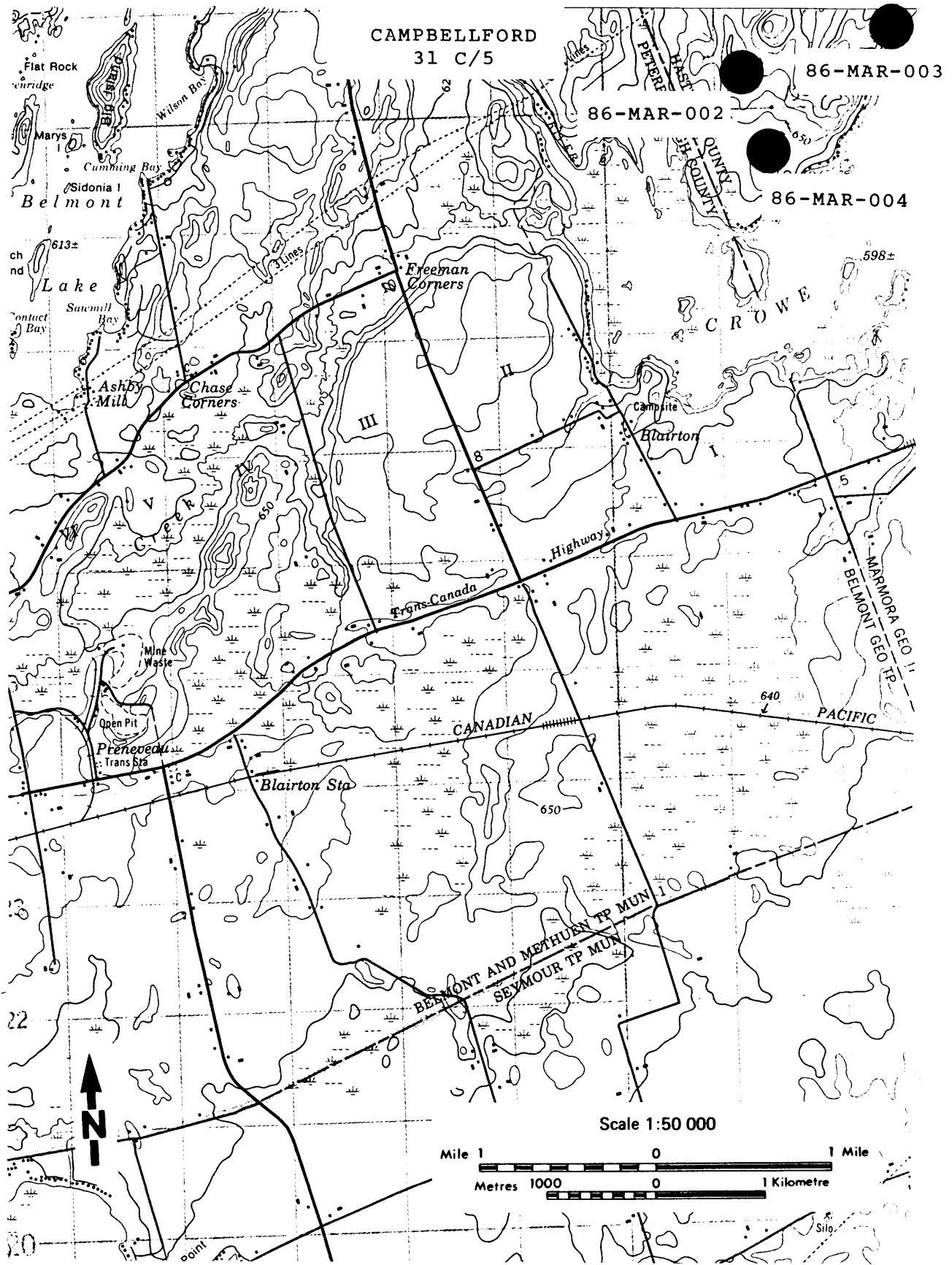


Figure B8. Sample locations, Cordova pluton (sheet 2).

86-MAR-001

PROPERTY NO. 86-MAR-001 PLUTON NAME Cordova Pluton
PROPERTY NAME Crowe Lake I COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Marmora LOT 12 CONC. 2
NTS 31 C/12 UTM CO-ORDINATES Easting 382100 Northing 4931100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435 136-106
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark green
Weathered Surface Grey/black
Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 160 degrees Dip 40 degrees E Spacing 1 to 3 m
B) Strike 115 degrees Dip vertical Spacing 2 to 3 m
C) Strike 85 degrees Dip vertical Spacing 0.2 to 0.7 m
D) Strike horizontal Dip 0 degrees Spacing 0.1 to 1 m
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, feldspar, (chlorite) magnetite
DELETERIOUS MINERALS Yes X No Type Pyrite Percent 1%
OTHER FEATURES Hematite staining/grain size of pyroxene 0.5 to 10 cm/sheeting,
magnetite and pyrite are present.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This area is mineralogically heterogeneous with mafic to more felsic
phases present. The pyroxene is partially altered to chlorite and the rock
contains up to 2% sulphides. Jointing for the most part is intense.

86-MAR-002

PROPERTY NO. 86-MAR-002 PLUTON NAME Cordova Pluton
PROPERTY NAME Crowe Lake II COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Marmora LOT 11 CONC. 1
NTS 31 C/5 UTM CO-ORDINATES Easting 381300 Northing 4930400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-106
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Greenish grey
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 2 to 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, feldspar, \pm carbonate, \pm chlorite, locally altered
to a calc-silicate
DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace
OTHER FEATURES Felsic stringers, 1 m horizontal sheeting.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Quarry block extraction is limited by intense jointing.

86-MAR-003

PROPERTY NO. 86-MAR-003 PLUTON NAME Cordova Pluton
PROPERTY NAME Crowe Hill Estates COMMERCIAL STONE NAME Black Granite
GEOLOGICAL ROCK NAME Pyroxenite
TOWNSHIP Marmora Lot 11 CONC. 2
NTS 31 C/5 UTM CO-ORDINATES Easting 382500 Northing 4930700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-106
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Green/grey
Weathered Surface Grey/black
Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Fine-(medium)-coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 160 degrees Dip Spacing 0.1 to 1 m
B) Strike 70 degrees Dip Spacing 0.1 to 1 m
C) Strike horizontal Dip 0 degrees Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, feldspar, chlorite
DELETERIOUS MINERALS Yes X No Type Sulphide Percent Trace
OTHER FEATURES Grain size is very variable, rusting on some surfaces
sheeting.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS There is intense jointing in both regular and irregular joint set
patterns. Variable grain size is also present at this site.

86-MAR-004

PROPERTY NO. 86-MAR-004 PLUTON NAME Cordova Pluton
PROPERTY NAME Easton (mailbox) COMMERCIAL STONE NAME Black granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Marmora LOT 10 CONC. 1
NTS 31 C/5 UTM CO-ORDINATES Easting 381500 Northing 4929700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-106
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type For roadwork
COLOUR Fresh Surface Dark green
Weathered Surface Grey-green
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 120 degrees Dip vertical Spacing 0.5 to 1 m
B) Strike 20 degrees Dip vertical Spacing 2 m
C) Strike 185 degrees Dip 40 degrees E Spacing 0.5 to 1 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, feldspar
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Sulphides produce 1 cm rusty spots.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This is a medium- to coarse-grained, dark green gabbro. Intense irregular jointing restricts potential quarry block size.



Photo B15. Intense, irregular jointing. 86-MAR-004

86-MAR-014

PROPERTY NO. 86-MAR-014 PLUTON NAME Cordova Pluton
PROPERTY NAME Boundary Road COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Marmora LOT 14 CONC. 2
NTS 31 C/12 UTM CO-ORDINATES Easting 380600 Northing 4932650
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4436-127-134
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Green-grey
Weathered Surface Light grey
Uniform Variable X
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Amphibole, feldspar (quartz)
DELETERIOUS MINERALS Yes X No Type Hematite, sulphides Percent <3
OTHER FEATURES Hornblende phenocrysts, hematite staining and coating.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a medium-grained, grey-green gabbro. The grain size is variable and amphibole phenocrysts are present. Sulphide inclusions and hematite staining were also observed. Jointing occurs in an intense irregular nature. These factors diminish the building stone potential of this area.

86-MAR-015

PROPERTY NO. 86-MAR-015 PLUTON NAME Cordova Pluton
PROPERTY NAME Hydrolite COMMERCIAL STONE NAME Black Granite
GEOLOGICAL ROCK NAME Pyroxenite
TOWNSHIP Marmora LOT 12, 13 CONC. 2
NTS 31 C/12 UTM CO-ORDINATES Easting 382820 Northing 4932450
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4436-127-137
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Green-black
 Weathered Surface Dark grey-green-white
 Uniform X Variable
WEATHERING DEPTH 1 mm
GRAIN SIZE Coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, feldspar (chlorite)
DELETERIOUS MINERALS Yes X No Type Hematite Percent $\leq 55\%$
OTHER FEATURES Aplite dike in quartz pods, felsic stringers, felsic phases.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a coarse-grained, chloritized pyroxenite. It contains numerous felsic stringers and pods and is intensely jointed in both regular and irregular joint patterns. The grain size is variable on an outcrop scale. These factors reduce the building stone potential of this rock.



*Photo B16. Part of the outcrop showing intense jointing and sheeting; field of view is approximately 10 m.
86-MAR-015*

CROW LAKE PLUTON

LOCATION West-central South Crosby Township, extending into eastern Storrington Township, from south of Crow Lake to Sand Lake

NTS 31 C/9 QGS Map P.2611 GSC Bulletin 199

SAMPLE SITE 86-SCRO-001

DESCRIPTION OF AREA

The Crow Lake pluton consists of two northeast-trending bodies with foliations conformable to the surrounding gneisses. The central parts are composed of pyroxene monzonite grading to hornblende-biotite granite at the margins. Magnetite, ilmenite, specular hematite and pyrite occur throughout the monzonite (Currie and Ermanovics 1971).

Outcrops at sample site 86-SCRO-001 show irregular, intense jointing as well as hematite staining and trace pyrite.

POTENTIAL

POOR	MODERATE	GOOD
86-SCRO-001		

REFERENCE

Currie, K.L. and Ermanovics, I.F. 1971. Geology of the Loughborough Lake region, Ontario, with special emphasis on the origin of the granitoid rocks--A contribution to the syenite problem; Geological Survey of Canada, Bulletin 199.

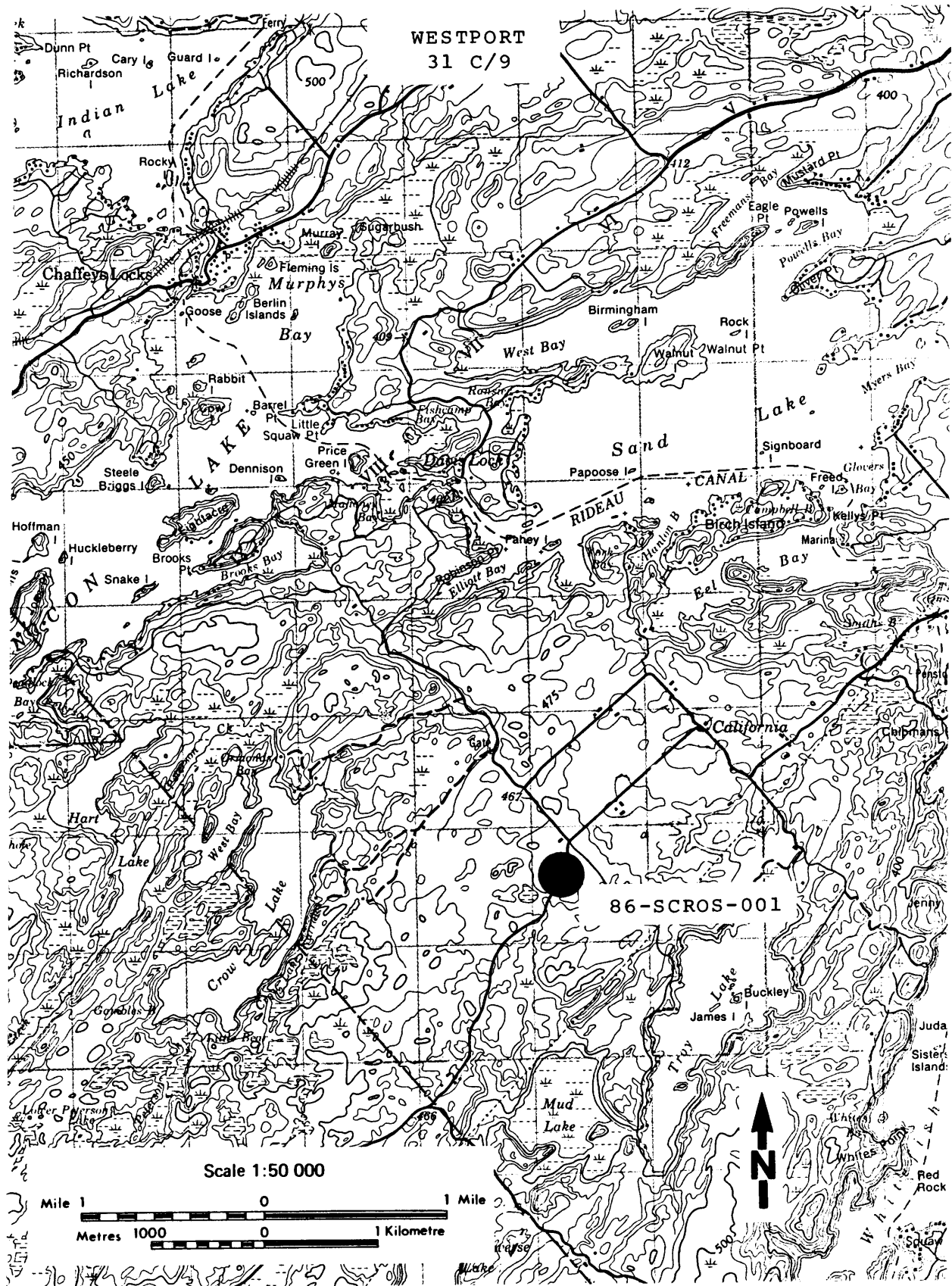


Figure B9. Sample location, Crow Lake pluton.

86-SCRO-001

PROPERTY NO. 86-SCRO-001 PLUTON NAME Crowe Lake Pluton
PROPERTY NAME California COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP South Crosby LOT 7 CONC. 9
NTS 31 C/9 UTM CO-ORDINATES Easting 398300 Northing 4931550
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4437 124-154
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated-porphyritic Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
Formed By Foliation
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 080 degrees Dip 090 degrees Spacing 0.5 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Hematite coating on joint faces, trace sulphides observed,
plagioclase megacrysts abundant (1 cm).
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a medium-grained, moderately foliated brown quartz
monzonite. It contains abundant plagioclase megacrysts. Intensive jointing
is characteristic of this site.



Photo B17. Overall view of outcrop exhibiting extensive jointing. 86-SCRO-001



Photo B18. Fresh surface shows colour, grain size and texture of outcrop. 86-SCRO-001

DELORO PLUTON

LOCATION West-central Madoc Township and east-central Marmora Township, between Highway 7 and the Moira River

NIS 31 C/12, 5 QGS Maps 2154, P.2613 Geological Report 73 OFR 5537

SAMPLE SITES 86-MAR-005 to 86-MAR-013 inclusive; 86-MAD-002 to 86-MAD-007 inclusive; 86-MAD-010

DESCRIPTION OF AREA

The Deloro pluton is about 10 km long and 6 km wide. It consists of three facies, the dominant type being pink, medium- to coarse-grained perthite granite. Along the western margin, in Marmora Township, is a syenitic phase and in the eastern part is a fine- to medium-grained granophyric granite (Hewitt 1968). The granite is generally quite massive, lacking foliation or lineation, and some of the areas examined exhibit limited jointing favourable for quarry operations.

CONCLUSIONS

The southwestern part of the Deloro pluton, in Marmora Township, shows moderate to good potential for building stone. Other parts may warrant further examination, but access problems within the pluton limit the potential for development to the marginal area.

POTENTIAL

POOR	MODERATE	GOOD
86-MAR-005		
86-MAR-006		86-MAR-007
	86-MAR-009	86-MAR-008
		86-MAR-010
	86-MAR-011	
86-MAR-012		
	86-MAR-013	
86-MAD-002		
86-MAD-003		
86-MAD-004		
86-MAD-005		
86-MAD-006		
86-MAD-007		
	86-MAD-010	

REFERENCES

Barlett, J.R. and Moore, J.M. Jr. 1985. Geology of Belmont, Marmora, and Southern Methuen townships, Peterborough and Hastings counties; Ontario Geological Survey, Open File Report 5537, 236p.

Hewitt, D.F. 1968. Geology of Madoc Township and the north part of Huntingdon Township, Hastings County; Ontario Department of Mines, Geological Report 73, 45p.

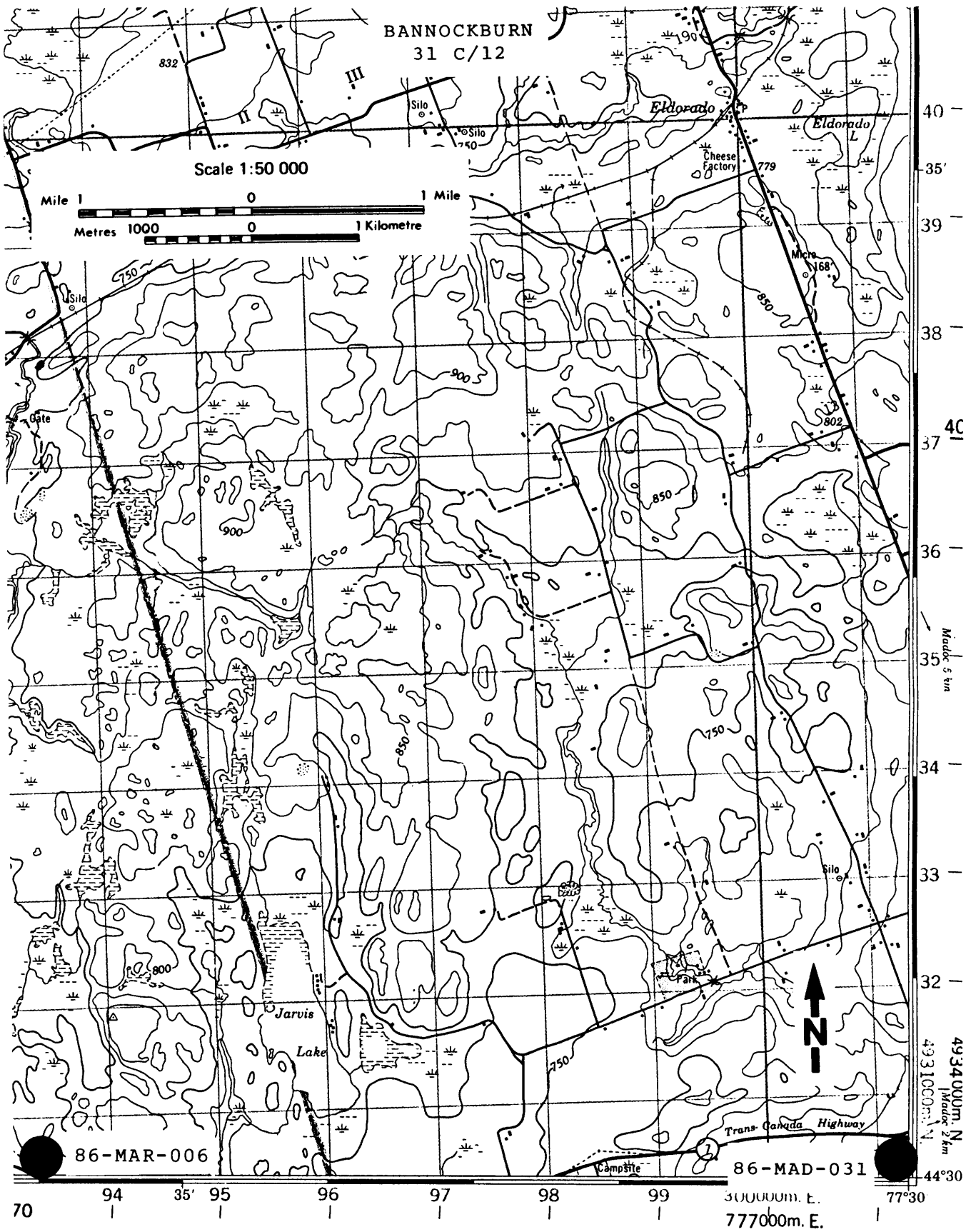


Figure B10. Sample locations, Deloro pluton (sheet 1).

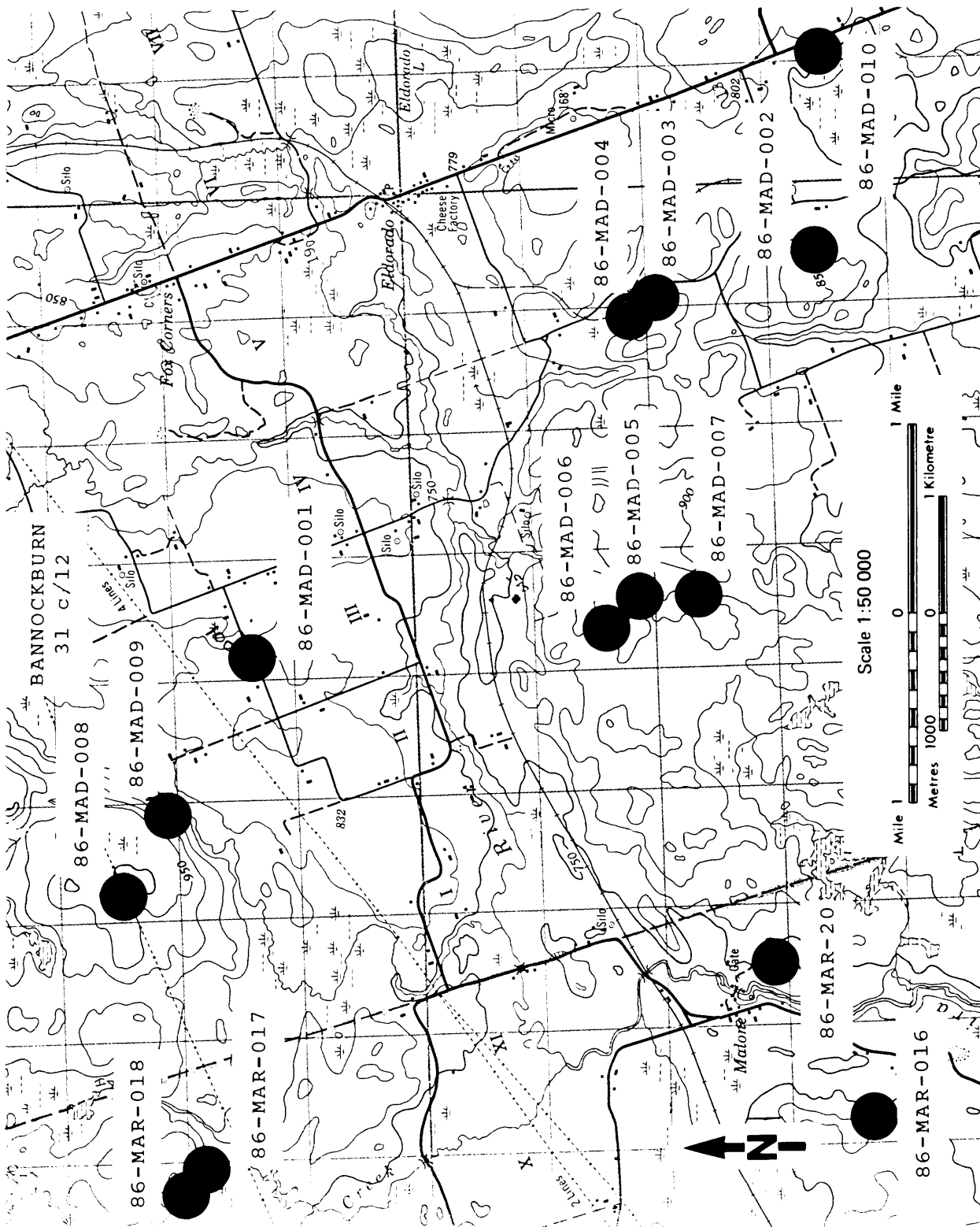


Figure B11. Sample locations, Deloro pluton (sheet 2).

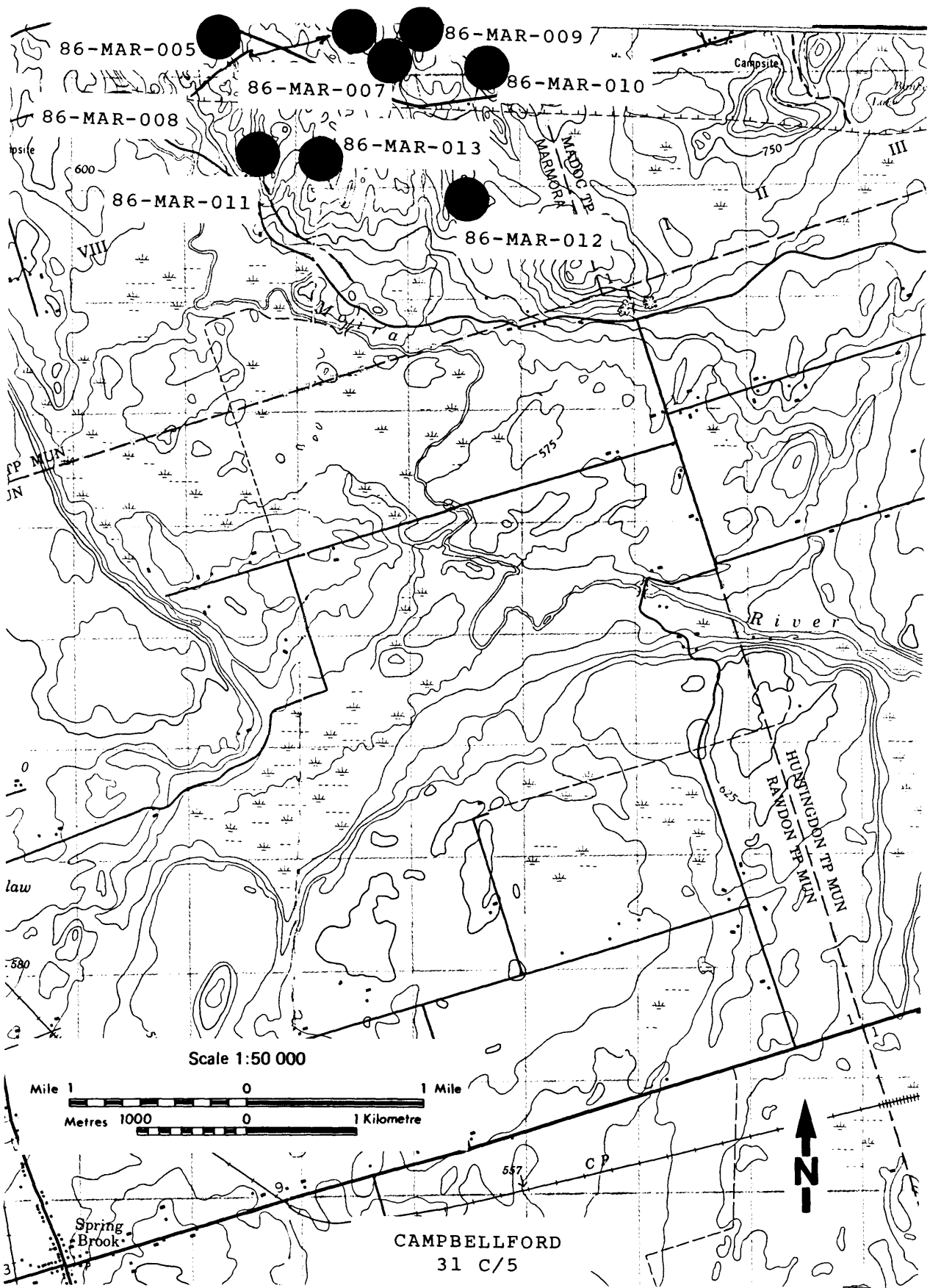


Figure B12. Sample locations, Deloro pluton (sheet 3).

86-MAR-005

PROPERTY NO. 86-MAR-005 PLUTON NAME Deloro Pluton
PROPERTY NAME Mar. South of #7 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 6 CONC. 9
NTS 31 C/5 UTM CO-ORDINATES Easting 393300 Northing 4930350
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-117
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type Explosives used on a roadcut to the north
COLOUR Fresh Surface Pink-brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 65 degrees Dip vertical Spacing 0.1 to 1 m
B) Strike 120 degrees Dip vertical Spacing 0.1 to 1 m
C) Strike 175 degrees Dip vertical Spacing 1 to 2 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining, exfoliation, some hematite staining.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a pinkish-brown, medium-grained granite. The outcrop exposure is good, however, jointing is extensive.

86-MAR-006

PROPERTY NO. 86-MAR-006 PLUTON NAME Deloro Pluton

PROPERTY NAME Hydrocut COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Granite
(Amphibole perthite)

TOWNSHIP Marmora LOT 6 CONC. 9

NTS 31 C/12 UTM CO-ORDINATES Easting 393325 Northing 4930500

PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-117

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Pinkish brown
Weathered Surface Light pink
Uniform X Variable

WEATHERING DEPTH 1 cm

GRAIN SIZE Medium Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 60 degrees Dip vertical Spacing 0.1 to 1 m
B) Strike 140 degrees Dip vertical Spacing 1 to 3 m
C) Strike horizontal Dip 0 degrees Spacing up to 1 m
D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Feldspar, quartz, amphibole

DELETERIOUS MINERALS Yes No X Type Percent

OTHER FEATURES Some minor exfoliation - 1 m benches seen, some mafic knots.

POSSIBLE USES Ashlar, crushed stone

OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a medium-grained, pinkish-brown granite. This site is similar to other areas of the Deloro Pluton in that the outcrop exposure is extensive and the jointing is generally irregular and intensive. Minor exfoliation and rare mafic inclusions were observed.

86-MAR-007

PROPERTY NO. 86-MAR-007 PLUTON NAME Deloro Pluton
PROPERTY NAME Jarvis Lake S.W. COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 5 CONC. 10
NTS 31 C/5 UTM CO-ORDINATES Easting 394800 Northing 4930170
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-119
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Dark pink
Uniform X Variable
WEATHERING DEPTH 0.5 to 1.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
to
Limited Jointing X Moderate Jointing X Intensive Jointing
A) Strike 180 degrees Dip ? Spacing 0.5 to 2 m
B) Strike 120 degrees Dip ? Spacing 1 to 2 m
C) Strike 5 degrees Dip 10 degrees W Spacing 0.2 to 1 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good to fair
MINERALOGY K-spar, quartz, minor amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare aplite dikes 10 to 3 cm, rare quartz veins (1 to 5 cm).
POSSIBLE USES Architectural stone, structural stone, landscaping stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Regular joint sets are spaced at 1 to 3 m intervals and are dissected by poorly defined irregular but generally widely spaced joints. Quartz veining and aplite stringers are not abundant. Subhorizontal sheeting is spaced at .5 to 1.5 m. This area warrants further evaluation.



*Photo B19. Overall view of outcrop. Note good exposure along with 1 to 2 m horizontal benches.
86-MAR-007*

86-MAR-008

PROPERTY NO. 86-MAR-008 PLUTON NAME Deloro Pluton
PROPERTY NAME Jarvis Lake SW #2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT N 1/2 5, S 1/2 6 CONC. 10
NTS 31 C/5, 12 UTM CO-ORDINATES Easting 394450 Northing 4930400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-119
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink (light)
Uniform X Variable
WEATHERING DEPTH 0.1 to 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing X Moderate Jointing X Intensive Jointing
A) Strike 170 degrees Dip vertical Spacing 1 to 3 m avg. 1.5
B) Strike 80 degrees Dip vertical Spacing 1 to 4 m avg. 1 m
C) Strike horizontal Dip 0 degrees Spacing 1 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good
MINERALOGY Amphibole, quartz, K-spar
DELETERIOUS MINERALS Yes X No Type Percent Trace
OTHER FEATURES Irregular hematite staining.
POSSIBLE USES Architectural stone, landscaping stone, structural stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Area looks favourable for the removal of some large quarry blocks, however, horizontal jointing may be a limiting factor. Some surface exfoliation is noted at the 2 cm scale. Area should be investigated further.



Photo B20. Good outcrop exposure along with limited to moderate jointing. 86-MAR-008

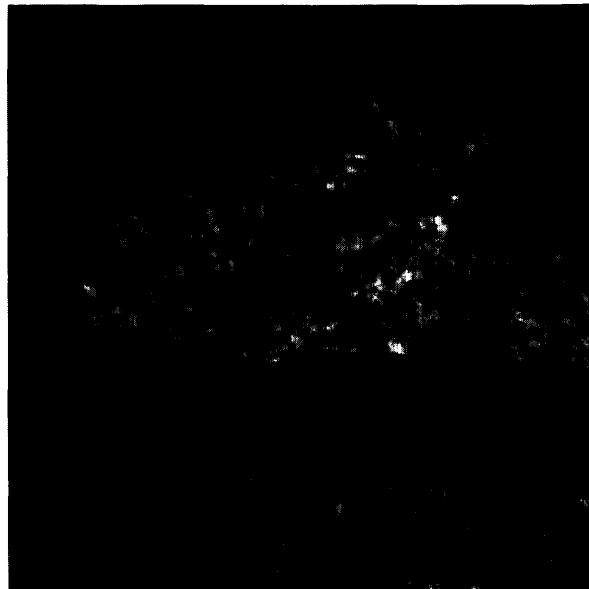


Photo B21. Close-up of pink, medium-grained granite. 86-MAR-008

86-MAR-009

PROPERTY NO. 86-MAR-009 PLUTON NAME Deloro Pluton
PROPERTY NAME Moira River East COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 5 CONC. E 1/2 10
NTS 31 C/5 UTM CO-ORDINATES Easting 395170 Northing 4930400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435-136-119
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern Minor
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 125 degrees Dip vertical Spacing 0.5 to 2 m avg. 1 m
B) Strike horizontal Dip 0 degrees Spacing 1 to 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare hematite staining.
POSSIBLE USES Architectural stone, landscaping stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a medium-grained, massive, pink granite. Jointing is predominantly of a regular repeating nature with moderate spacing and vertical dips. Exfoliation is on the 0.3 m scale.



*Photo B22. A 4 m high scarp along north edge of outcrop with 8 m blocks (average) severed from it.
86-MAR-009*

86-MAR-010

PROPERTY NO. 86-MAR-010 PLUTON NAME Deloro Pluton
PROPERTY NAME Marmora-Madoc COMMERCIAL STONE NAME Granite
 Borderline
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 4 CONC. 11
NTS 31 C/5 UTM CO-ORDINATES Easting 395700 Northing 4930100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4435 136-119
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish brown
 Weathered Surface Pink-grey
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
 Limited Jointing X Moderate Jointing (X) Intensive Jointing
 A) Strike 080 degrees Dip Spacing 2 m
 B) Strike 140 degrees Dip Spacing 2 m
 C) Strike 035 degrees Dip 090 degrees Spacing 0.5 to 2 m
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair to good
MINERALOGY Quartz, biotite, potassium feldspar, hornblende
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some minor exfoliation, benches up to 1.5 m, rare quartz
 pods, hematite patches.
POSSIBLE USES Monument stone, building stone, ashlar, structural stone,
 landscaping stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Outcrop shows fair to good potential for large quarry block
 extraction. Irregular hematite staining and rare quartz pods are present.
 This area warrants further evaluation.

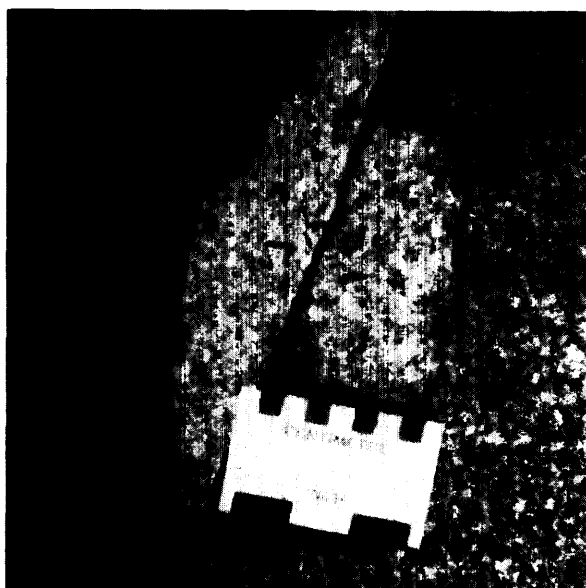


Photo B23. Pinkish-brown, uniform, medium-grained granite. 86-MAR-010

86-MAR-011

PROPERTY NO. 86-MAR-011 PLUTON NAME Deloro Pluton
PROPERTY NAME Moira River COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 4 CONC. 9
NTS 31 C/5 UTM CO-ORDINATES Easting 393700 Northing 4929250
PROPERTY STATUS Prospect AIR PHOTO NO. 79-4434-137-87
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH ≤0.75 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 90 degrees Dip Spacing 1 to 5 m
B) Strike 45 degrees Dip Spacing 2 to 3 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite, hornblende
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some minor surface exfoliation, 1 quartz stringer noticed
extensive hematite staining, mafic inclusions (on the 2 cm scale).
POSSIBLE USES architectural stone, landscaping stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Vertical jointing is predominantly of a regularly repeating nature
of moderate intensity. Exfoliation was also observed. Quartz stringers and
hematite staining are other features which further diminish building stone
potential.

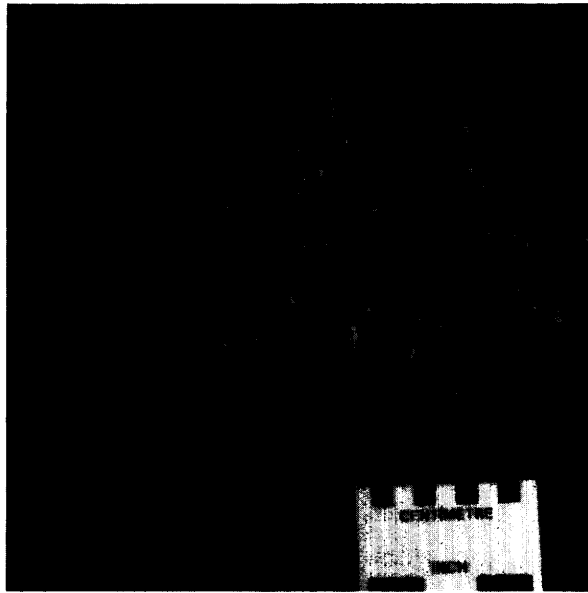


Photo B24. Fresh surface exhibits a pink-brown colour, medium grain size and massive texture. 86-MAR-011

86-MAR-012

PROPERTY NO. 86-MAR-012 PLUTON NAME Deloro Pluton
PROPERTY NAME Moira River COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Marmora LOT 3 CONC. 10
NTS 31 C/5 UTM CO-ORDINATES Easting 394450 Northing 4928900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4434-137-87
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 2 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 30 degrees Dip 90 degrees Spacing 1 to 2 m
B) Strike 115 degrees Dip 90 degrees Spacing 1 to 2 m
C) Strike 170 degrees Dip 90 degrees Spacing 2 m
horizontal D) Strike Dip Spacing <1 m
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, hornblende, biotite
DELETERIOUS MINERALS Yes X No Type Hematite Percent Trace
OTHER FEATURES Quartz veining, specularite coating, <1 m horizontal sheeting.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a massive, medium-grained granite. The colour is reddish brown and has a very fresh appearance. The outcrop exposure is extensive, however, deleterious features diminish the building stone potential of this rock. These features include regular and irregular joint patterns (joint frequency ranging from moderate to intensive), quartz veining and hematite staining.

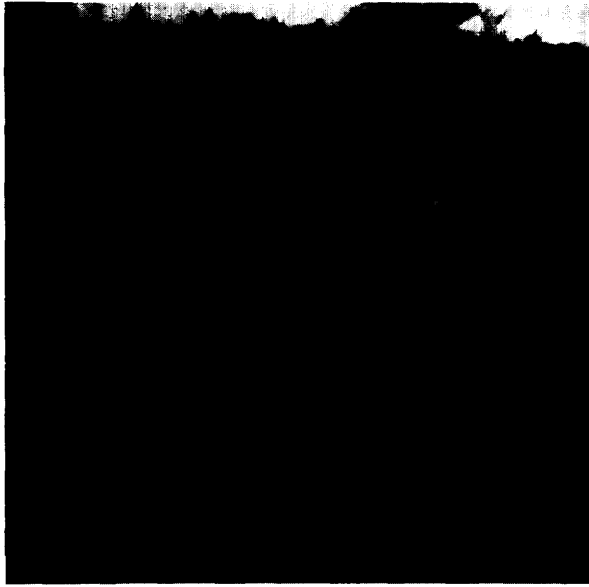


Photo B25. Overall view of moderately to intensely jointed outcrop area. 86-MAR-012

86-MAR-013

PROPERTY NO. 86-MAR-013 PLUTON NAME Deloro Pluton

PROPERTY NAME Marmora North COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Granite (biotite)

TOWNSHIP Marmora LOT 4 CONC. 9

NTS 31 C/5 UTM CO-ORDINATES Easting 394250 Northing 4929200

PROPERTY STATUS Prospect AIR PHOTO NO. 78-4434-137-87

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Reddish brown
 Weathered Surface Pinkish-white
 Uniform X Variable

WEATHERING DEPTH <2 cm

GRAIN SIZE Medium Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing X Moderate Jointing Intensive Jointing
 A) Strike 115 degrees Dip 90 degrees Spacing 0.5 to 3 m
 B) Strike 140 degrees Dip 90 degrees Spacing 1 m
 C) Strike 60 degrees Dip 90 degrees Spacing 3 m
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Fair

MINERALOGY Feldspar, quartz, hornblende

DELETERIOUS MINERALS Yes No X Type Percent

OTHER FEATURES Filled joints (centimetre-scale sheeting).

POSSIBLE USES Architectural stone, landscaping stone

OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a massive, medium-grained reddish-brown granite with few deleterious features with respect to building stone requirements. Limited regular vertical joint sets occur primarily in three orientations with spacing averaging about 1 m. Horizontal jointing also occurs on the 1 m scale but exfoliation was observed on the centimetre scale. Quartz filled joints were also observed.



Photo B26. Jointing occurring on a 1 m scale. 86-MAR-013

86-MAD-002

PROPERTY NO. 86-MAD-002 PLUTON NAME Deloro Pluton
PROPERTY NAME Hematite Road #2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Madoc LOT 12 CONC. 4
NTS 31 C/12 UTM CO-ORDINATES Easting 299420 Northing 4936600
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-80,81
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 0.5 to 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, amphibole
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Horizontal sheeting (on the 10 cm scale).
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This is a medium grained, reddish-brown granite of the Deloro pluton (eastern margin). This outcrop has more amphibole than was observed farther to the east. The rock has a very good colour and is very competent. Unfortunately, the intense irregular fractures limit the potential for building stone development.

86-MAD-003

PROPERTY NO. 86-MAD-003 PLUTON NAME Deloro Pluton
PROPERTY NAME Nelson COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Madoc LOT 14 CONC. 4
NTS 31 C/12 UTM CO-ORDINATES Easting 299090 Northing 4937900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-79,80
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 0.5 to 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
REDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, plagioclase, quartz, amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins (1 to 2 cm width), rare quartz pods (1 by 0.5 feet).
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is medium grained, equigranular with a reddish-brown colour. Quartz veins and pods are present in minor amounts; however, intense jointing limits the building stone potential.

86-MAD-004

PROPERTY NO. 86-MAD-004 PLUTON NAME Deloro Pluton
PROPERTY NAME Nelson's COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Madoc LOT 15 CONC. 4
NTS 31 C/12 UTM CO-ORDINATES Easting 298950 Northing 4938150
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4440-191-96
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-brown
 Weathered Surface Light pink-grey
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 10 degrees Dip vertical Spacing 1 to 2 m
 B) Strike horizontal Dip Spacing 0.3 m
 C) Strike 100 degrees Dip vertical Spacing 0.3 to 1 m
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, amphibole, quartz, plagioclase
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins; 5 mm width.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS The rock from this outcrop is a pink-brown granite of uniform colour and medium grain size. The outcrop is part of the eastern edge of the Deloro pluton and shows intense irregular jointing and moderate regular jointing. Vertical jointing and intense horizontal sheeting (0.3 m) in this outcrop indicate low potential for quarry blocks.

86-MAD-005

PROPERTY NO. 86-MAD-005 PLUTON NAME Deloro Pluton
 PROPERTY NAME Forestry Road COMMERCIAL STONE NAME Granite
 GEOLOGICAL ROCK NAME Granite
 TOWNSHIP Madoc LOT 15 CONC. 2
 NTS 31 C/12 UTM CO-ORDINATES Easting 296600 Northing 4939150
 PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-76,77
 PRODUCTION HISTORY Nil
 USE OF EXPLOSIVES Yes No X Type
 COLOUR Fresh Surface Pink-brown
 Weathered Surface Light pink
 Uniform X Variable
 WEATHERING DEPTH 1 cm
 GRAIN SIZE Medium Uniform X Variable
 TEXTURE Massive Uniform X Variable
 FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
 BEDDING Yes No X Strike Dip Avg. Thickness
 JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
 POTENTIAL FOR QUARRY BLOCKS Poor
 MINERALOGY Feldspar, quartz, amphibole
 DELETERIOUS MINERALS Yes No X Type Percent
 OTHER FEATURES Extreme jointing.
 POSSIBLE USES Ashlar, crushed stone
 OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This rock is a competent, pink-brown, medium-grained granite from the northeast portion of the Deloro pluton. Outcrop exposure is extremely poor and jointing is irregular and intense. These factors diminish building stone potential for this site.

86-MAD-006

PROPERTY NO. 86-MAD-006 PLUTON NAME Deloro Pluton
PROPERTY NAME Eldorado West COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Madoc LOT 16 CONC. 2
NTS 31 C/12 UTM CO-ORDINATES Easting 296350 Northing 4938430
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4440-191-94
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 to 15 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 44 degrees Dip Spacing 0.3 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, plagioclase, quartz, amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare quartz veins (1 cm width). Horizontal sheeting closely spaced - 0.1 to 0.5 m.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a reddish-brown, medium-grained, massive granite. The closely spaced horizontal sheeting, inaccessibility and poor outcrop exposure diminish the building stone potential of this rock.

86-MAD-010

PROPERTY NO. 86-MAD-010 PLUTON NAME Deloro Pluton
PROPERTY NAME Hazzards Corners Road COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Red Granite
TOWNSHIP Madoc LOT 11 NE 1/4 CONC. 5
NTS 31 C/12 UTM CO-ORDINATES Easting 301100 Northing 4936500
PROPERTY STATUS Inactive AIR PHOTO NO. 78-4439-132-84,85
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 35 degrees Dip Vertical Spacing 0.5 m
B) Strike 80 degrees Dip Vertical Spacing 0.5 m
C) Strike 160 degrees Dip Vertical Spacing 1 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY K-spar, quartz, biotite, hornblende
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some horizontal jointing 0.5 m spacing, hematite staining,
some quartz veining.
POSSIBLE USES Ornamental stone, paving stone, ashlar, curbing stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This red granite is not particularly attractive and would be
unsuited for a quarry operation due to irregular jointing pattern. The rock is
a medium-grained, massive, leucocratic granite. Some limited quartz veining and
hematite staining were noted.



Photo B27. Overall view of outcrop exposure. Note vertical and horizontal jointing. 86-MAD-010

ELZEVIR BATHOLITH

LOCATION Most of Elzevir Township and the northwest corner of Kaladar Township

NTS 31 C/11 QGS Map 51D Geological Report AR 51, pt.4

SAMPLE SITES 86-KAL-001, 86-KAL-002, 86-KAL-004, 86-KAL-005, 86-ELZ-001,
86-ELZ-002, 86-ELZ-003, 86-ELZ-004, 86-ELZ-005, 86-ELZ-006,
86-ELZ-007, 86-ELZ-008, 86-ELZ-009

DESCRIPTION OF AREA

Rock types observed within the Elzevir batholith consist predominantly of feldspar (mostly plagioclase, occasionally K-spar) quartz and biotite, and include the following:

1. Massive (sometimes weakly foliated), white, medium-grained granodiorite
e.g., (ELZ-002A, 004, 009, KAL-002)
2. Well-foliated, grey, fine-grained granodiorite
e.g., (ELZ-002B, 005, 006, 007)

Rock type (1) probably has best potential for use as building stone. Rock type (2) may have some application as monument stone due to its darker colour and fine-grained character, but there is a possibility that considerable variation occurs in this unit. The darker colour may be attributed to higher mafic mineral content (more biotite) which would result in a less competent rock that may tend to localize deformation. Differing degrees of deformation or mafic mineral content would create variable colour and texture. Volumetrically, rock type (1) is obviously more significant than rock type (2).

For most outcrops, moderate to intense jointing appears to be the limiting factor (ie., difficult to delineate joint-free areas large enough to produce quarry blocks). In some areas, abundance of mafic inclusions, felsic stringers/dikes and/or quartz veining becomes important, but these features are usually accompanied by intense jointing.

Central portions of the intrusion offer little or no access along with difficult terrain (predominantly swamp). Although the intrusive core should generally produce more desirable massive textures and less jointing, limited exposure and access indicate further investigation is not warranted.

Examination of the Northern portion of the intrusion was not successful due to poor access. Hydro line exposures delineated by airphoto inspection occur just north of McKnight Lake in Grimsthorpe Township (Lots 11, 12, Concession I) and west of Slave Lake in Anglesea Township (Lots 20, 21, Concessions III, IV). Suggested access for the Grimsthorpe exposure is through Cooper from the west and for the Anglesea exposure, through Cloyne, from the east.

Further examination of the southeastern margins of Elzevir batholith is recommended (Lots 6, 7, 8, Concession X and Lots 8, 9, 10, 11, Concession XI - as per Osborne (1931); in particular, Lots 8, 9, Concession XI due to immediate proximity to 86-ELZ-004, the best prospect identified to date in the Elzevir batholith. Systematic detailed ground coverage may be warranted in the area of 86-ELZ-004.

Also recommended for investigation is Lot 6, Concession V (after Parks 1912). Another area of good exposure delineated by air inspection is Lot 20, Concession III along Queensborough Creek. Access is from Concession Road IV.

CONCLUSION

In general, building stone potential in the Elzevir batholith appears poor due to reasons given (jointing, inclusions, quartz, veins, and so on). Most areas would only be suitable for ashlar, paving stone, landscaping stone, or rubble which alone do not justify a quarry operation. The large joint-free areas of 86-ELZ-004 identify the potential for quarry blocks along the southeastern margin as an exception.

POTENTIAL

POOR		MODERATE	GOOD
	86-KAL-001		
	86-KAL-002		
86-KAL004			
	86-KAL-005		
86-ELZ-001			
86-ELZ-002			
	86-ELZ-003		
		86-ELZ-004	
86-ELZ-005			
	86-ELZ-006		
	86-ELZ-007		
	86-ELZ-008		
	86-ELZ-009		

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- Hewitt, D.F. 1968. Geology of Madoc Township and the north part of Huntingdon Township, Hastings County; Ontario Department of Mines, Geological Report 73, 45p.
- Meen, V.B., and Harding, W.D. 1942. Grimsthorpe-Kennebec area, counties of Hastings, Lennox and Addington, and Frontenac, Ontario; Ontario Department of Mines, Map 51D, scale 1:63 360.
- Osborne, F.F. 1931. Non-metallic mineral resources of Hastings County; Ontario Department of Mines, Annual Report, 1930, v.39, pt.6, p.22-59.
- Parks, W.A. 1912. Building and ornamental stones of Canada; Canada Department of Mines, Report no.100.
- Wolff, J.M. 1982. Geology of the Kaladar area, Frontenac, and Lennox and Addington counties; Ontario Geological Survey, Report 215, 94p.

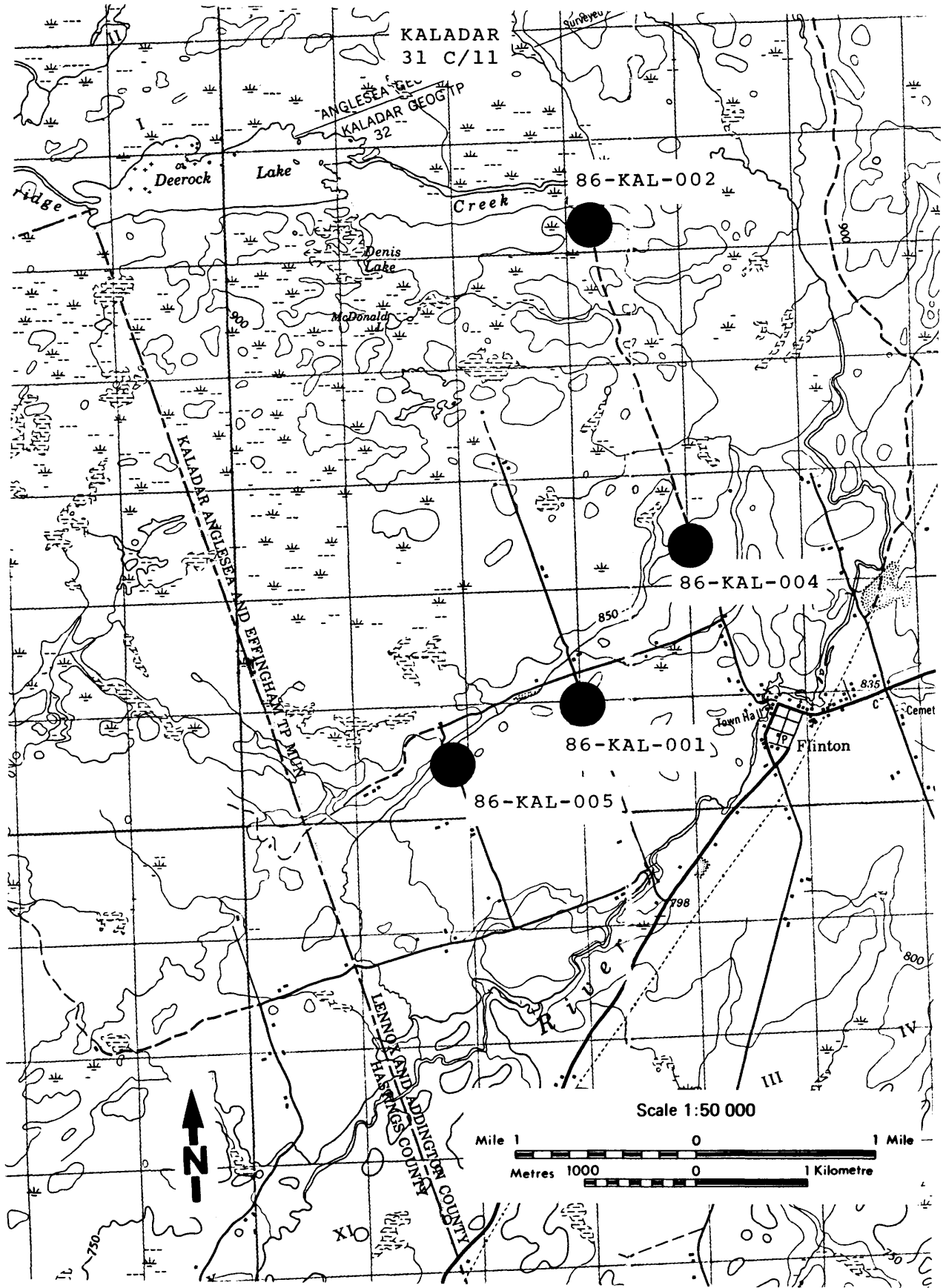


Figure B13. Sample locations, Elzevir batholith (sheet 1).

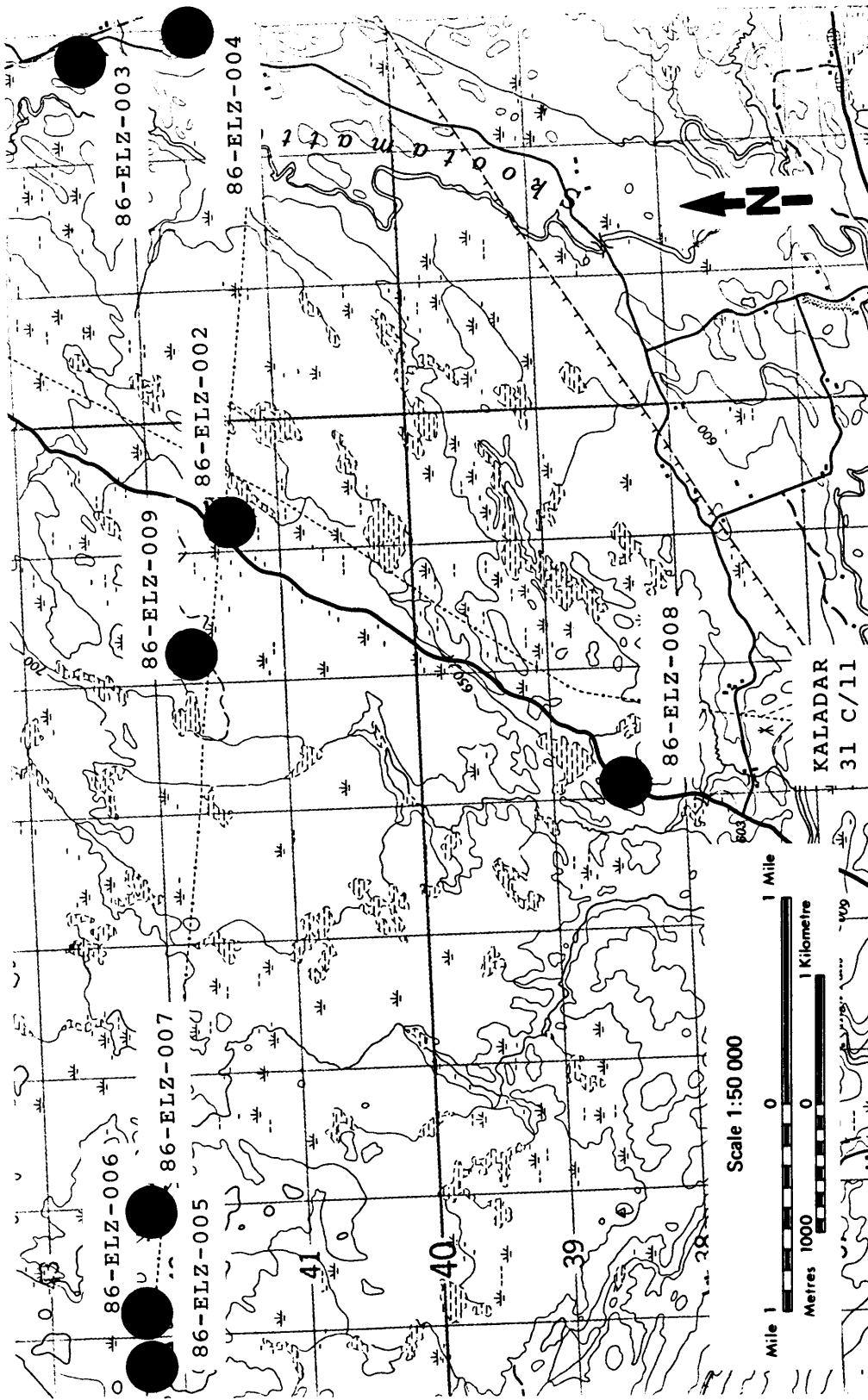


Figure B14. Sample locations, Elzevir batholith (sheet 2).

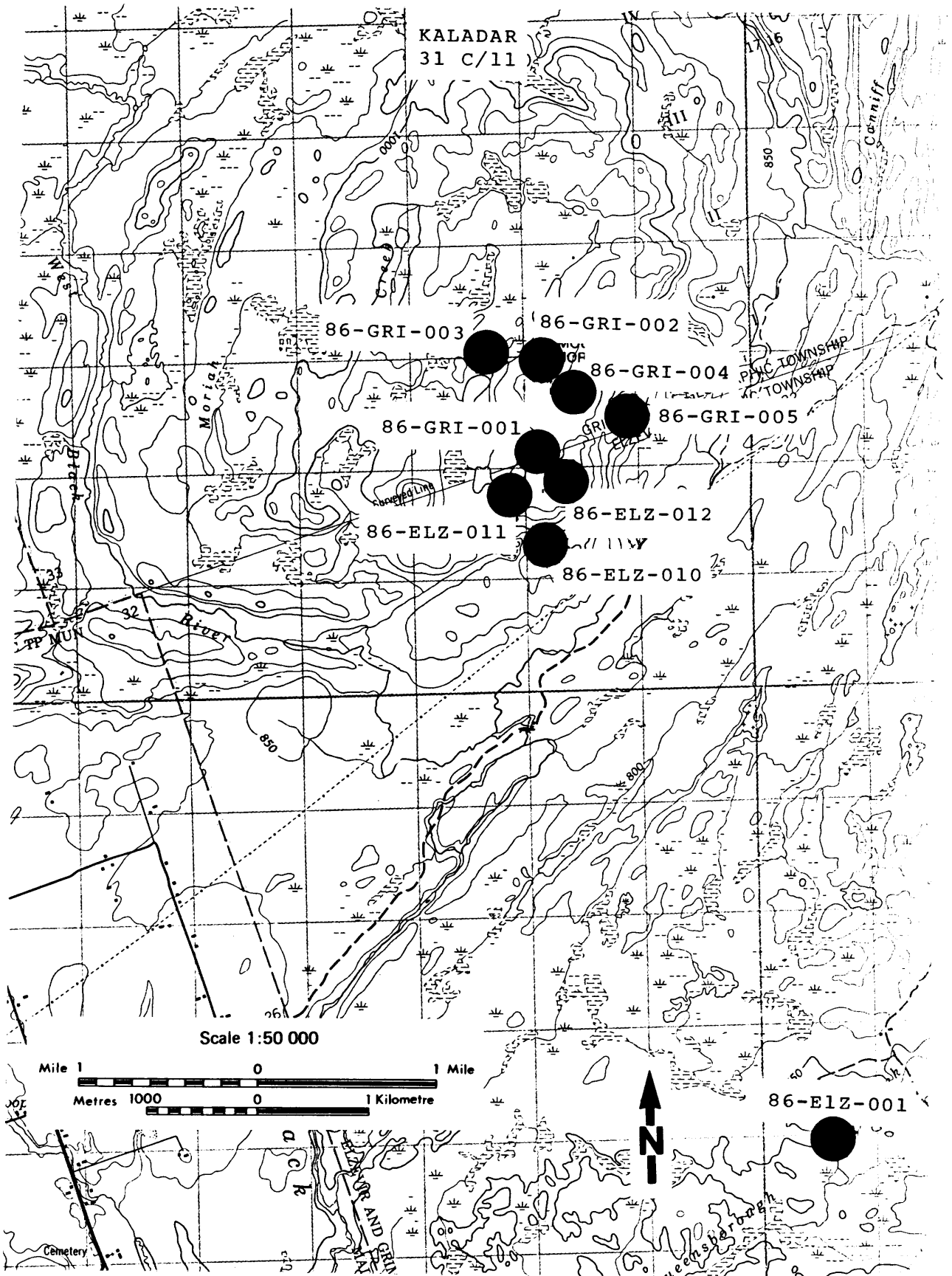


Figure B15. Sample locations, Elzevir batholith (sheet 3).

86-KAL-001

PROPERTY NO. 86-KAL-001 PLUTON NAME Elzevir Batholith
PROPERTY NAME Flinton 1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Kaladar LOT 23 CONC. 1
NTS 31 C/11 UTM CO-ORDINATES Easting 323000 Northing 4950900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-15
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type For roadwork
COLOUR Fresh Surface Grey
Weathered Surface Light grey
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike Dip
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
Limited Jointing Moderate Jointing X Intensive Jointing (X)
A) Strike 103 degrees Dip 48 degrees S Spacing 0.5 to 2 m
B) Strike 05 degrees Dip vertical Spacing 0.3 to 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Limited quartz veining and pods (less than 15 cm in width);
rare but large mafic xenoliths up to 20 m long.
POSSIBLE USES Ashlar, paving stone, landscaping stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS Jointing is moderate to intense with some quartz veining and mafic
inclusions. Outcrop exposure is poor.

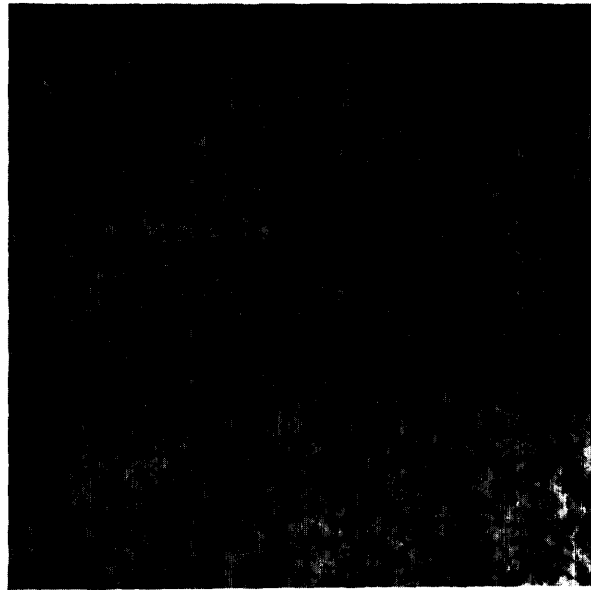


Photo B28. Textural close-up of light grey granodiorite. 86-KAL-001

86-KAL-002

PROPERTY NO. 86-KAL-002 PLUTON NAME Elzevir Batholith
PROPERTY NAME Deerock Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Kaladar LOT 29 CONC. 4
NTS 31 C/11 UTM CO-ORDINATES Easting 323200 Northing 4955300
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4451-143-72
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 95 degrees
Dip 80 degrees N
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing (X)
A) Strike 120 degrees Dip Steep Spacing 0.5 to 1 m
B) Strike 020 degrees Dip Steep Spacing 1 to 3 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining and pods, one mafic inclusion observed.
POSSIBLE USES Paving stone, ashlar, landscaping stone, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS Jointing is moderate and may facilitate the extraction of small quarry blocks. Some quartz veining and rare mafic inclusions are present.

86-KAL-004

PROPERTY NO. 86-KAL-004 PLUTON NAME Elzevir Batholith
PROPERTY NAME Cow Hill COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Kaladar LOT 24, 25 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 324000 Northing 4952300
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4449 129-5
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface White (with biotite flakes) grey
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable (X)
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 85 degrees
 Dip 80 degrees E
 Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Abundant quartz veining and granitic/aplite stringers/dikes/
 pods, mafic inclusions also noted.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS Similar to the other sites visited in the Elzevir batholith. This
 property displays poor potential for building stone due to the abundance of
 quartz veining, felsic stringers, and larger aplite dikes and pods. Mafic
 inclusions were also noted at this site. This is a medium-grained, weakly
 foliated, grey granodiorite.



Photo B29. Quartz stringers in grey granodiorite. 86-KAL-004

86-KAL-005

PROPERTY NO. 86-KAL-005 PLUTON NAME Elzevir Batholith
PROPERTY NAME Flinton-2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Kaladar LOT 23 CONC. 1, 2
NTS 31 C/11 UTM CO-ORDINATES Easting 321900 Northing 4950400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-16
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
Weathered Surface Grey-white
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 150 degrees
Dip Steep
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 175 degrees Dip 060 degrees E Spacing 2 to 3 m
B) Strike 080 degrees Dip 090 degrees Spacing 1 to 2 m
C) Strike 040 degrees Dip 090 degrees Spacing 0.5 to 1.0 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Abundant quartz veins and pods mostly west of road (up to 0.3 m wide), occasional mafic inclusions (0.5 to 3 m wide) minor felsic stringers.
POSSIBLE USES Ashlar, paving stone, small quarry blocks, landscaping stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a medium-grained, weakly foliated, grey granodiorite. Deleterious features include numerous quartz veins and pods, mafic inclusions, minor felsic stringers and inconsistent jointing.

86-ELZ-001

PROPERTY NO. 86-ELZ-001 PLUTON NAME Elzevir Batholith
PROPERTY NAME Queensborough Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Diorite
to Granodiorite
TOWNSHIP Elzevir LOT 22 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 310500 Northing 4946000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4445-106-118
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey (white with biotite flakes)
Weathered Surface Grey
Uniform X Variable (X)
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Foliated (rarely massive) Uniform Variable X
FABRIC Yes X No. Weak X Mod. Strong Strike 105 degrees Dip
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing (X) Intensive Jointing X
A) Strike 83 degrees Dip Spacing 0.5 to 1 m Conjugate
B) Strike 143 degrees Dip Spacing 0.5 to 1 m Joints
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes X No Type Chlorite (alteration Percent Trace
of biotite)
OTHER FEATURES Rare mafic inclusions, quartz veining, felsic stringers
POSSIBLE USES Ashlar, paving stone, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This is a grey granodiorite with a weak foliation. Both regular
and irregular joint patterns are present and joint intensity ranges from
moderate to intense. Joint intensity decreases towards the northeastern part
of the area.

86-ELZ-002

PROPERTY NO. 86-ELZ-002 PLUTON NAME Elzevir Batholith
PROPERTY NAME County Road 2 COMMERCIAL STONE NAME Granite
 (Flinton Road)
 at Hydro line GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 10 CONC. 8
NTS 31 C/11 UTM CO-ORDINATES Easting 319200 Northing 4941400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-85,86
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
 Weathered Surface Grey
 Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium to very fine Uniform Variable X
TEXTURE Massive to foliated Uniform Variable X
FABRIC Yes X No. Weak X Mod. Strong Strike Dip
 Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 130 degrees Dip 065 degrees E Spacing 0.5 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining, felsic stringers
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS The rock in this area is grey to white granodiorite. This area appears to be intensely jointed and shows a wide variation in texture and colour. The western portion of the area contains massive, medium-grained biotite granodiorite while to the east, the rock is fine grained and foliated.



Photo B30. Close-up view depicting both weathered and fresh surfaces. 86-ELZ-002

86-ELZ-003

PROPERTY NO. 86-ELZ-003 PLUTON NAME Elzevir Batholith
PROPERTY NAME Skootamatta River COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 10 CONC. 11
NTS 31 C/11 UTM CO-ORDINATES Easting 322800 Northing 4942400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4440-191-106
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
 Weathered Surface Pinkish Grey
 Uniform Variable X
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing (X)
 A) Strike 100 degrees Dip 90 degrees Spacing 0.5 (to 2 m)
 B) Strike subhorizontal Dip Spacing 0.5 m
 see photo
 C) Strike 120 degrees Dip 80 degrees W Spacing 0.5 to 1.5 m
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining and pods, some horizontal sheeting observed in
 3 m scarp.
POSSIBLE USES Ashlar, paving stone, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a massive, medium-grained, grey granodiorite. Jointing
 is generally intense, however, some areas display a limited potential for small
 quarry blocks. Rare quartz veins and pods are present.



*Photo B31. A 3 m scarp showing subhorizontal sheeting; approximately 100 to 130 m west of road.
86-ELZ-003*

86-ELZ-004

PROPERTY NO. 86-ELZ-004 PLUTON NAME Elzevir Batholith
PROPERTY NAME Flinton Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 8 CONC. 11
NTS 31 C/11 UTM CO-ORDINATES Easting 323000 Northing 4941550
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-90
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive to slightly foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 020 degrees
Dip 70 degrees W
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
Limited Jointing X Moderate Jointing X Intensive Jointing
A) Strike 110-120 degrees Dip 090 degrees Spacing 0.5 to 5.0 m
(subparallel to foliation)
B) Strike 020 degrees Dip 090 degrees Spacing 0.5 to 5.0 m
C) Strike subhorizontal Dip Spacing 1 m
D) Strike subhorizontal Dip Spacing 0.2 to 0.5 m
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Minor quartz veining (rare 10 cm wide to mm scale joint fillings) - one pegmatite dike (1 m wide) observed - minor surface exfoliation.
POSSIBLE USES Potentially small quarry blocks, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This medium-grained, grey granodiorite has a weak foliation. Quartz veins commonly occur subparallel to foliation or subparallel to the major joint sets. Exfoliation is evident in local areas. Major joint sets are widely spaced, however, weakly developed joints are closer spaced and generally form irregular patterns. This area is recommended for further evaluation.



Photo B32. A 2 m high outcrop along access road showing subhorizontal jointing. 86-ELZ-004.

86-ELZ-005

PROPERTY NO. 86-ELZ-005 PLUTON NAME Elzevir Batholith
PROPERTY NAME Barry Farm-1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 15 CONC. 4
NTS 31 C/11 UTM CO-ORDINATES Easting 312750 Northing 4942250
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-86
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark grey to white
Weathered Surface Grey
Uniform Variable X
WEATHERING DEPTH 1 cm
GRAIN SIZE Fine-medium Uniform Variable X
TEXTURE Gneissic to massive Uniform Variable X
FABRIC Yes X No. Weak X Mod. to Strong X Strike Dip
Formed By Gneissic Banding
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 115 degrees Dip 090 degrees Spacing 0.5 to 1.0 m
B) Strike 090 degrees Dip 090 degrees Spacing 0.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Abundant quartz veining (mostly related to 115 degrees
jointing, occasional pegmatite and aplite dikes/stringers, rare mafic inclusions.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS The rock in this area varies between fine-grained, dark grey, well
foliated granodiorite to medium-grained, grey, massive granodiorite. The
textural variation coupled with the intense jointing and quartz veining limits
the building stone potential of this site.

86-ELZ-006

PROPERTY NO. 86-ELZ-006 PLUTON NAME Elzevir Batholith
PROPERTY NAME Barry Farm-2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 14 CONC. 4
NTS 31 C/11 UTM CO-ORDINATES Easting 313150 Northing 4942200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-86
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Greyish
Weathered Surface Grey-pinkish
Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Slightly foliated to massive Uniform X Variable X
FABRIC Yes X No. Weak Mod. X Strong Strike 100 degrees
Dip 80 degrees E
Formed By Mineral alignment - biotite, some quartz and feldspar
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing (X)
A) Strike 095 degrees Dip 090 degrees Spacing 0.5 to 2.5 m avg. 1.7 m
B) Strike 015 degrees Dip 090 degrees Spacing 0.5 to 3.0 m avg. 1.0 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veining, aplite stringers and dikes (0.2 m wide)
extensive exfoliation.
POSSIBLE USES Paving stone, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a slightly foliated grey granodiorite. Quartz veining,
granitic stringers and extensive exfoliation are present in this area. Small
10 by 10 m areas show limited jointing.

86-ELZ-007

PROPERTY NO. 86-ELZ-007 PLUTON NAME Elzevir Batholith
PROPERTY NAME Elzevir Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Elzevir LOT 14 CONG. 5
NTS 31 C/11 UTM CO-ORDINATES Easting 313900 Northing 4942100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4443-187-226
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey-white
Weathered Surface Grey-white
Uniform X Variable (X)
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable (X)
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 025 degrees
Dip 80 degrees E
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing (X)
A) Strike 140 degrees Dip 090 degrees Spacing 0.5 to 1.5 m
B) Strike 085 degrees Dip 070 degrees N Spacing 0.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Abundant felsic stringers (average 1 cm wide), minor quartz
veining, surface exfoliation common (1 to 2 cm thick).
POSSIBLE USES Landscaping stone, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a moderately foliated, medium-grained, grey
granodiorite. Jointing is moderate in local areas. Numerous granitic and
quartz veins and stringers occur throughout area.

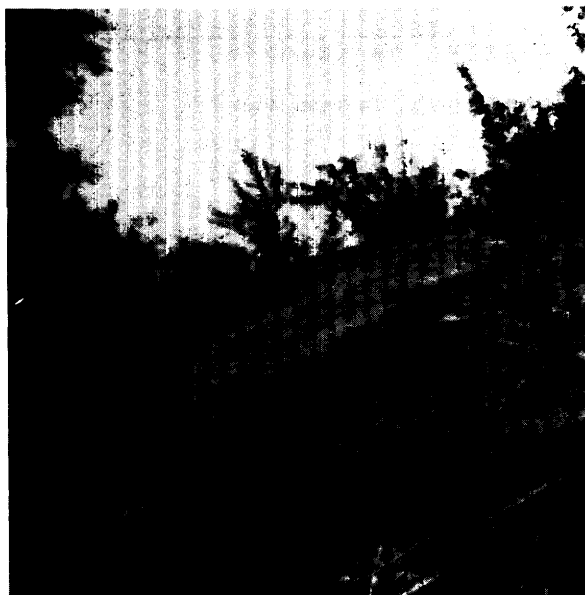


Photo B33. East-facing slope of outcrop. Note exfoliation toward bottom left. 86-ELZ-007

86-ELZ-008

PROPERTY NO. 86-ELZ-008 PLUTON NAME Elzevir Batholith
PROPERTY NAME Theresa 603 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 6,7 CONC. 6
NTS 31 C/11 UTM CO-ORDINATES Easting 317100 Northing 4038450
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4440-191-114
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
Weathered Surface Pinkish white
Uniform X Variable (X)
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 028 degrees
Dip 80 degrees E
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
Limited Jointing Moderate Jointing X Intensive Jointing (X)
A) Strike 120 degrees Dip 090 degrees Spacing 0.5 to 2.0 m
avg. 1 m
B) Strike 040 degrees Dip 090 degrees Spacing 0.3 to 1.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Moderate quartz veining (average 3 cm wide) associated with
joint set at 120 degrees, minor local oblique jointing, felsic stringers.
POSSIBLE USES Landscaping stone, ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a medium-grained, moderately foliated granodiorite.
Jointing occurs in regular joint sets. The quartz veins present in this outcrop
are associated with the 120 degree joint set. Joint spacing is generally less
than 1 m. A 6 m cliff on the west side of the road shows subhorizontal jointing
with 1 to 2 m spacing. Rare oblique jointing is also present.

86-ELZ-009

PROPERTY NO. 86-ELZ-009 PLUTON NAME Elzevir Batholith
PROPERTY NAME Cerqua Hunt Camp COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Elzevir LOT 11 CONC. 7
NTS 31 C/11 UTM CO-ORDINATES Easting 318200 Northing 4941700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-92
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
Weathered Surface Grey
Uniform X Variable (X)
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Slightly foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 160 degrees
Dip Steep
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 130-160 degrees Dip 090 degrees Spacing 0.5 to 1.5 m
(up to 5.0 m) avg. 1 m
B) Strike 060 degrees Dip 090 degrees Spacing 0.5 to 1.0 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Local irregular gneissic banding (mm to cm scale), rare felsic stringers (≤ 1 cm wide), rare mm scale quartz veining.
POSSIBLE USES Landscaping stone, ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This grey granodiorite is slightly coarser than other sample sites in the Elzevir batholith. This site also exhibits lower joint frequency. There is irregular gneissic banding with the rare granitic stringers and quartz veins.



Photo B34. Note granitic stringers (left of pen) and gneissic banding (right of pen). 86-ELZ-009

EMPEY GRANITE

LOCATION Lot 21, Concession 3, Madoc Township (northwest quadrant of Madoc Township)

NTS 31 C/12 QGS Map 2154 Geological Report 73

SAMPLE SITE 86-MAD-001

DESCRIPTION OF AREA

The Empey Granite was described by Hewitt (1988, p.15):

"A small area of coarse-grained pink granite outcrops on lot 21, concession III, Madoc township, near Empey. The granite is composed of interlocking grains of quartz, oligoclase, and microcline microperthite, and minor accessory fluorite, magnetite, muscovite, and biotite. The granite may be related in age to the Deloro pluton."

Intense, irregular jointing was observed at the sample site.

CONCLUSIONS

The Empey granite, although texturally uniform, has little potential as a source of building stone due to intense jointing.

POTENTIAL

POOR	MODERATE	GOOD
86-MAD-001		

REFERENCE

Hewitt, D.F. 1988. Geology of Madoc Township and the north part of Huntingdon Township; Ontario Department of Mines, Geological Report 73, 45p.

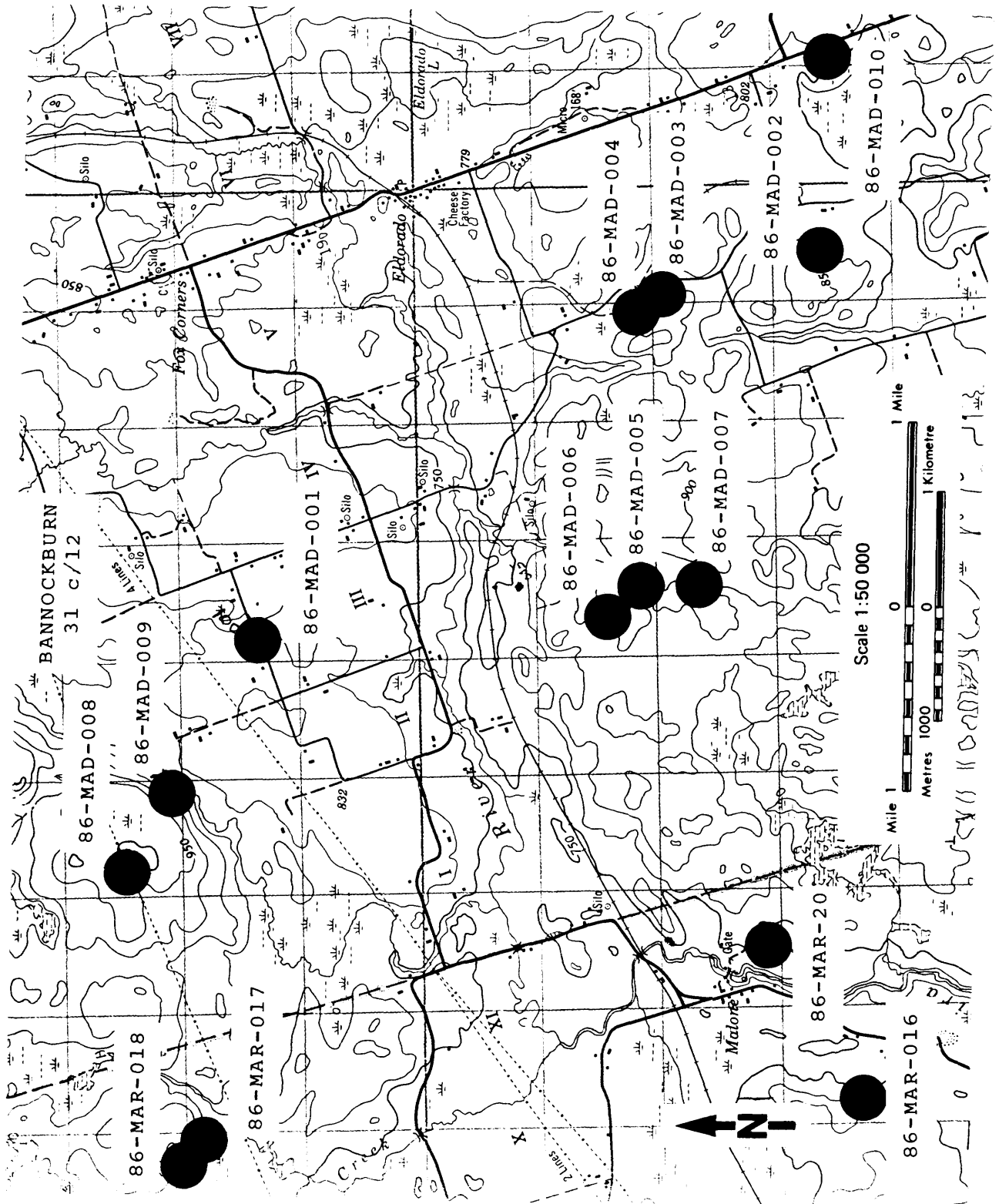


Figure B16. Sample locations, Empey granite.

86-MAD-001

PROPERTY NO. 86-MAD-001 PLUTON NAME Empey Granite
PROPERTY NAME Roadside COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Syenite
TOWNSHIP Madoc LOT 21 CONC. 3
NTS 31 C/12 UTM CO-ORDINATES Easting 296200 Northing 49415350
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-69
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type Roadcut
COLOUR Fresh Surface Dark pink
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium to coarse Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, plagioclase quartz, minor magnetite, green mineral
(alteration of feldspar)
DELETERIOUS MINERALS Yes X No Type Percent 3%
OTHER FEATURES
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a medium- to coarse-grained quartz syenite. The feldspars show evidence of alteration to an indeterminate green mineral. This outcrop has a consistent texture (i.e., few veins or blemishes), however, the secondary alteration and jointing limit the building stone potential of the rock. The use of explosives restricts joint interpretation.

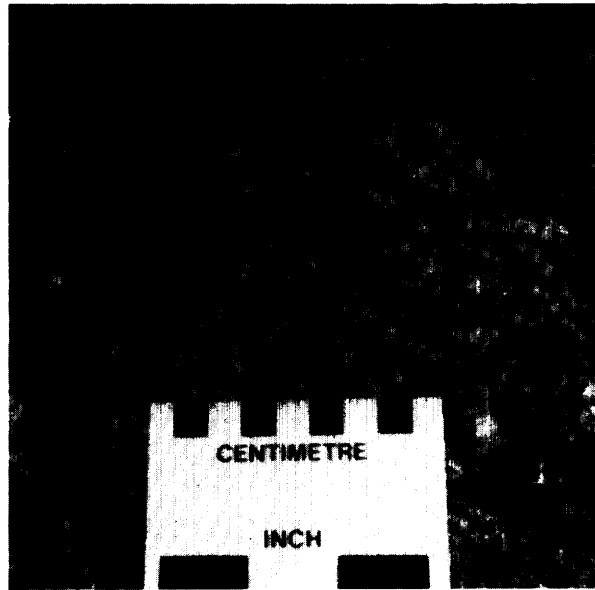


Photo B35. Close-up showing coarse-grained nature of the granite. 86-MAD-001

GAWLEY CREEK SYENITE

LOCATION Northwest portion of Madoc Township and northeast portion of Marmora Township

NTS 31 C/12 OGS Map 2154 Geological Report 73

SAMPLE SITES 86-MAR-017, 86-MAR-018, 86-MAD-008, 86-MAD-009

DESCRIPTION OF AREA

Hewitt (1968, p.14-15) described the Gawley Creek Syenite as follows:

"The Gawley Creek syenite occupies the northwestern part of Madoc township. The syenite pluton is about 4 miles long in a north-south direction and 4 miles wide in an east-west direction. It extends into Marmora township. Most of the pluton is composed of coarse-grained pink biotite-hornblende syenite similar to the Mount Moriah syenite of Grimsthorpe township. Thin section examination indicates that the syenite is composed predominantly of microcline micropertthite and cryptoperthitic oligoclase in large irregular sutured grains. Hornblende and biotite are varietal accessories. Minor accessories include sphene, opaques, apatite, and epidote. Some oligoclase is present in several slides. The eastern end of the syenite pluton in the vicinity of the Bannockburn gold mine is dark-grey coarse-grained biotite syenodiorite that is composed of large crystals of oligoclase with biotite as a varietal accessory. Minor constituents include magnetite, pyrite, apatite, titanite, zoisite, and calcite."

The Gawley Creek syenite contains surprisingly few inclusions, veins, joint fillings or other irregularities. The distribution of minerals is consistent giving the rock a very uniform colour. It was also noted that the colour near the core of the pluton was much better than that of the marginal areas. Grain size is medium and uniform. Jointing tends to be irregular and intense throughout most of the area, however, moderate jointing does occur locally.

CONCLUSIONS

The intensity and irregularity of the jointing limit the potential for large quarry blocks. Chlorite alteration was also observed near the margins of this syenite. These factors detract from the building stone potential at this site.

POTENTIAL

POOR	MODERATE	GOOD
86-MAR-017		
86-MAR-018		
86-MAD-008		
86-MAD-009		

REFERENCE

Hewitt, D.F. 1968. Geology of Madoc Township and the north part of Huntingdon Township; Ontario Department of Mines, Geological Report 73, 45p.

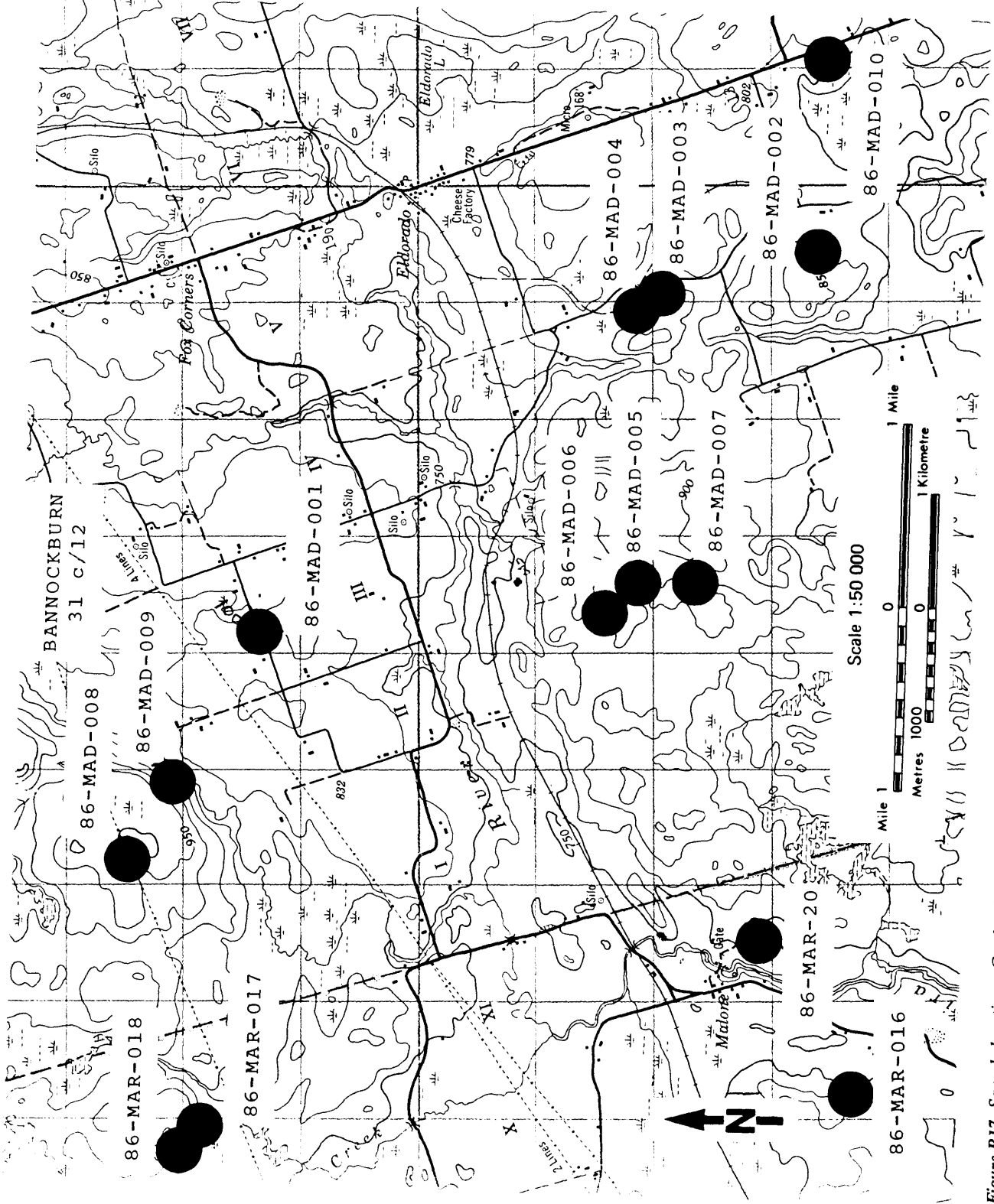


Figure B17. Sample locations, Gawley Creek syenite.

86-MAR-017

PROPERTY NO. 86-MAR-017 PLUTON NAME Gawley Creek Syenite
PROPERTY NAME Gawley Ck-1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Marmora LOT 25 CONC. 10
NTS 31 C/12 UTM CO-ORDINATES Easting 291900 Northing 4941900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-63
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Bleached pink to black
Uniform Variable X
WEATHERING DEPTH 1 to 1.5 cm Slightly .
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz (chlorite)
DELETERIOUS MINERALS Yes X No Type Chlorite, sulphides Percent <5%
OTHER FEATURES Zones with coarse mineral grains, hematite staining.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This rock is a reddish-brown, massive syenite. The grain size is variable at the outcrop scale and the presence of hematite staining creates some variation in colour. The mafics show signs of chloritization. These factors, coupled with the intense irregular jointing limit building stone potential for this site.

86-MAR-018

PROPERTY NO. 86-MAR-018 PLUTON NAME Gawley Creek Syenite
PROPERTY NAME Gawley Ck-2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Marmora LOT 25 CONC. 10
NTS 31 C/12 UTM CO-ORDINATES Easting 291700 Northing 4942000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-63
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
Weathered Surface Pink to grey
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, amphibole (chlorite), (quartz), (magnetite)
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Good benching visible.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a reddish-brown, medium-grained syenite. Chloritized amphiboles, poor outcrop exposure, and moderate, irregular jointing limit the potential for building stone development.

86-MAD-008

PROPERTY NO. 86-MAD-008 PLUTON NAME Gawley Creek Syenite
PROPERTY NAME Hunt Camp Bluff COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Madoc LOT 25 CONC. 1
NTS 31 C/12 UTM CO-ORDINATES Easting 294200 Northing 4942500
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-62-65
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish brown
Weathered Surface Mottled bleached pink
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium grained Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, magnetite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare hematite staining.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This is a pinkish-brown, medium-grained, massive syenite. The chlorite alteration observed near the margins of the Gawley Creek Syenite is not present at this site. Hence, this rock has a fresher appearance. The primary deleterious feature is the moderate to intense irregular jointing. Hematite staining was also observed.

86-MAD-009

PROPERTY NO. 86-MAD-009 PLUTON NAME Gawley Creek Syenite
PROPERTY NAME Cliff Face COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Madoc LOT 24 CONC. 2
NTS 31C/12 UTM CO-ORDINATES Easting 294900 Northing 4942100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4442-142-66
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 1 to 2 cm - extensive in places
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, amphibole, biotite, plagioclase, ± quartz
DELETERIOUS MINERALS Yes X No Type Sulphides Percent <1%
OTHER FEATURES Rock locally hosts vugs lined with biotite.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This outcrop of Gawley Creek Syenite is on a very steep slope which makes it difficult to evaluate. It is intensely jointed and is deeply weathered in places. This outcrop shows little potential for large quarry block extraction.

GLANMIRE COMPLEX

LOCATION Northwest corner of Tudor Township, and west of Glanmire Lake

NTS 31 C/13 QGS Map 2168 Geological Report 67

SAMPLE SITES 86-TUD-009, 86-TUD-010, 86-TUD-011, 86-TUD-012

DESCRIPTION OF AREA

The Glanmire complex appears similar to the Beaver Creek in both character and potential for building stone. Rock types observed include mafic and felsic intrusive rocks or hybrids that are locally sheared, brecciated or contain metasedimentary inclusions. According to Lumbers (1969), the intrusion is comprised mostly of sodic granitic to syenitic rocks. Lumbers has also mapped a narrow, marginal (west side, southern half) mass of potassic granitic/syenitic affinity with the most abundant unit being quartz monzonite.

Like the Beaver Creek, the Glanmire complex exhibits poor exposure and other deleterious features such as variable lithology, inclusions and brecciation (almost the whole of the southern plug is shown as brecciated). The quartz monzonite mass may contain some significant exposure at its southern end (access via Glanmire Lake Road). Rounded, white plagioclase "phenocrysts" 1 cm in size were noted and when cut and polished this may produce an attractive result.

CONCLUSIONS

Overall, the Glanmire complex does not warrant any follow-up (excepting rounded "phenocrysts" if considered desirable). Building stone potential is very limited. Ashlar, paving stone and rubble are the only uses that may be applicable.

POTENTIAL

POOR	MODERATE	GOOD
86-TUD-009		
86-TUD-010		
86-TUD-011		
86-TUD-012		

REFERENCE

Lumbers, S.B. 1969. Geology of Limerick and Tudor townships, Hastings County, Ontario; Ontario Department of Mines, Geological Report 67, 110p.

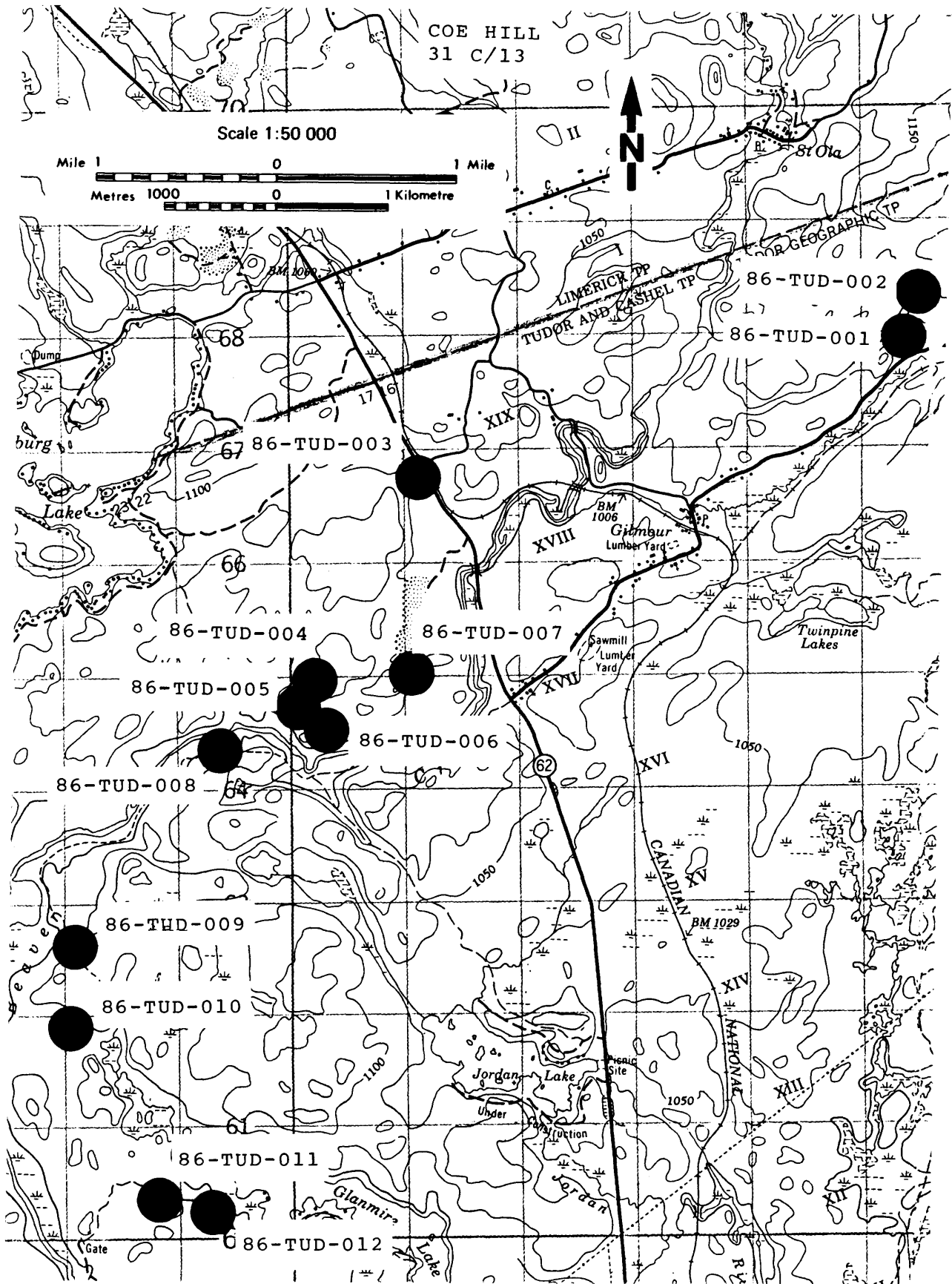


Figure B18. Sample locations, Glanmire complex.

86-TUD-009

PROPERTY NO. 86-TUD-009 PLUTON NAME Glanmire Complex
PROPERTY NAME Glanmire-1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Tudor LOT 27 CONC. 16
NTS 31 C/13 UTM CO-ORDINATES Easting 288100 Northing 4962600
PROPERTY STATUS Prospect AIR PHOTO NO. 69-4433-2-64
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Buff to grey to grey-green
Weathered Surface Bleached grey
Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium to fine Uniform Variable X
TEXTURE Massive Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 175 degrees Dip 75 degrees W Spacing 1 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz
DELETERIOUS MINERALS Yes X No Type Disseminated sulphides Percent 1%
OTHER FEATURES Up to 1 cm rusty vugs (Fe carbonate); altered feldspar,
locally schistose, chlorite-rich metavolcanic inclusions (10 m long outcrop).
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This is a medium- to fine-grained granitic rock. It is generally
massive but is schistose in places. The feldspar component has been sericitized
locally. The rock contains mafic inclusions and Fe-carbonate filled vugs.
Jointing is intensive and outcrop exposure is poor.

86-TUD-010

PROPERTY NO. 86-TUD-010 PLUTON NAME Glanmire Complex
PROPERTY NAME Glanmire-2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Tudor LOT 28 CONC. 15
NTS 31 C/13 UTM CO-ORDINATES Easting 288050 Northing 4961850
PROPERTY STATUS Prospect AIR PHOTO NO. 69-4433-2-64
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey green
 Weathered Surface Whitish grey
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium-coarse Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar quartz, indeterminant mafic minerals; Mafic content:
 approx. 5 to 15%
DELETERIOUS MINERALS Yes X No Type Disseminated sulphides Percent <1%
OTHER FEATURES Chlorite and carbonate-coated joints; rusty fractures -
 occasionally vuggy; 0.5 m wide quartz vein containing sulphides observed,
 hematite staining.
POSSIBLE USES Crushed stone
OUTCROP EXPOSURE Good Fair X Poor X
COMMENTS This is a massive, medium-grained, grey-green granitic rock. The
 feldspar component has been sericitized. Sulphides and magnetite are
 disseminated throughout the rock and the mafic mineralogy was indeterminant in
 hand sample. The rock has a mottled rusty appearance in places from sulphide
 alteration and joint planes were observed to be chlorite and carbonate coated.
 Jointing occurs in an intense irregular pattern.

86-TUD-011

PROPERTY NO. 86-TUD-011 PLUTON NAME Glanmire Complex
PROPERTY NAME Glanmire-3 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Tudor LOT 27 CONC. 14
NTS 31 C/13 UTM CO-ORDINATES Easting 288850 Northing 4960350
PROPERTY STATUS Prospect AIR PHOTO NO. 69-4432-6-275
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Bleached grey-white
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium to rarely coarse Uniform X Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing Inadequate Exposure
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES 0.5 cm aplite stringers; feldspar megacrysts (to 1 cm in length), feldspar alteration
POSSIBLE USES Ashlar, paving stone, rubble
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a massive pink granite which contains a few megacrysts (up to 1 cm in length). The feldspar component has been sericitized to some degree; a phenomenon observed at other sample sites on the Glanmire Complex. The mafic component of this rock is minor (<3% approximately). Poor outcrop exposure limits joint interpretation. The jointing observed occurred in an irregular pattern. Aplite stringers were also observed in this rock.

86-TUD-012

PROPERTY NO. 86-TUD-012 PLUTON NAME Glanmire Complex
PROPERTY NAME Glanmire-4 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Tudor LOT 26 CONC. 13
NTS 31 C/13 UTM CO-ORDINATES Easting 289300 Northing 4960150
PROPERTY STATUS Prospect AIR PHOTO NO. 69-4432-6-275
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Bleached pink-grey
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium (rarely coarse) Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing Inadequate
Exposure
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite, magnetite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Up to 10 to 20 cm wide quartz segregations. Rare rusty vugs,
local quartz veining.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS Poor exposure (2 to 3 m²) along edge of low ridge. Inadequate
for proper assessment. Low development potential due to abundance of cottages
and prominently posted private land.

LANARK-OSO MAFIC INTRUSION

LOCATION Extends from the east side of Sharbot Lake in southern Oso Township through the northern part of South Sherbrooke Township

NTS 31 C/15 QGS Map 2471 Report 228

SAMPLE SITES 86-OSO-001, 86-OSO-002, 86-OSO-003, 86-OSO-008, 86-SSHER-001

DESCRIPTION OF AREA

The Lanark-Oso mafic intrusion outcrops along a northeast trend parallel to the foliation of the enclosing high-grade gneiss. It was described by Wolff (1985, p.34) as "a well-differentiated mafic intrusion containing pyroxenite-peridotite, gabbro, anorthositic gabbro to gabbroic anorthosite, and anorthositic phases." Wolff also stated that only the contacts have been metamorphosed, with little recrystallization evident within the anorthositic phases.

The rock at all sample sites is anorthosite. Deleterious features observed include quartz and granitic stringers, exfoliation, and intense jointing.

CONCLUSIONS

Based on the sample sites examined, the intrusion appears to have little potential for building stone. However, because the rock is described by Wolff as having a generally fresh appearance, further investigation is warranted in the central parts of the intrusion.

POTENTIAL

POOR	MODERATE	GOOD
86-OSO-001		
86-OSO-002		
86-OSO-003		
86-OSO-008		
86-SSHER-001		

REFERENCE

Wolff, J.M. 1985. Geology of the Sharbot Lake area, Frontenac and Lanark counties, southeastern Ontario; Ontario Geological Survey, Report 228, 70p.

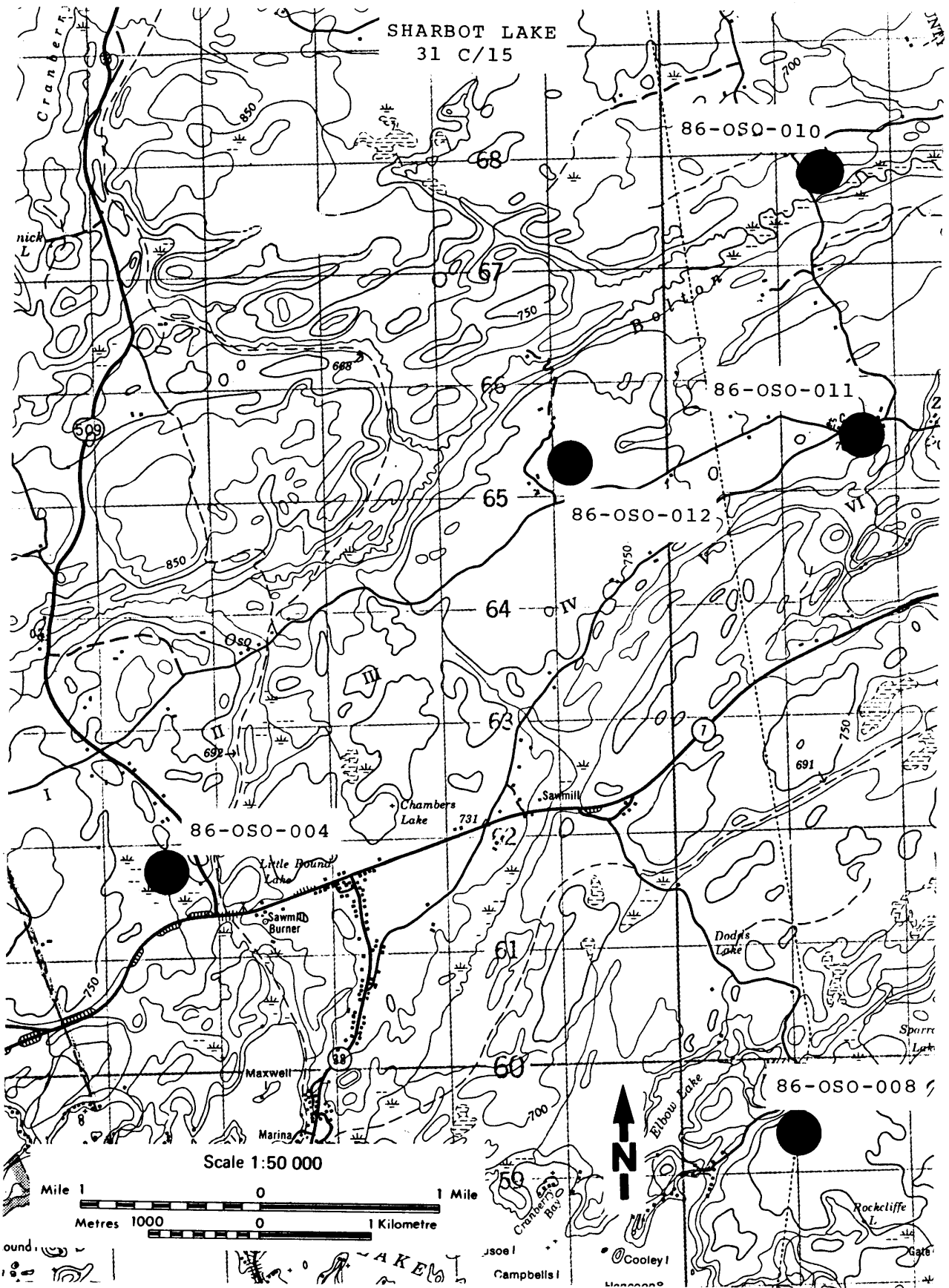


Figure B19. Sample locations, Lanark-Oso mafic intrusion (sheet 1).

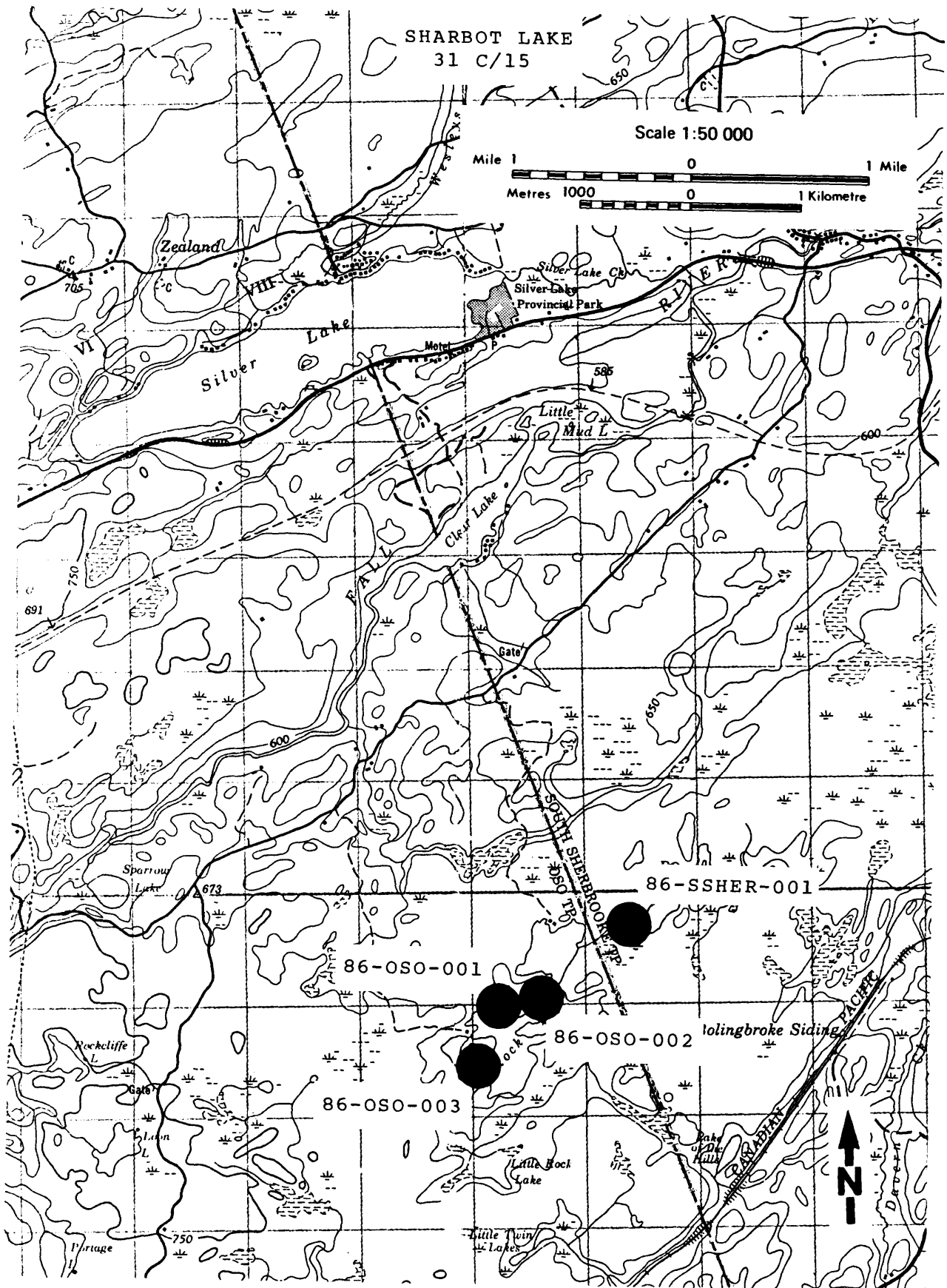


Figure B20. Sample locations, Lanark-Oso mafic intrusion (sheet 2).

86-OSO-001

PROPERTY NO. 86-OSO-001 PLUTON NAME Lanark-Oso Mafic Intrusion
PROPERTY NAME Marshall Cottage COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Oso LOT 8 CONC. 7
NTS 31 C/15 UTM CO-ORDINATES Easting 375300 Northing 4959000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-225
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Violet-black
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, pyroxene, (corundum)
DELETERIOUS MINERALS Yes X No Type Percent
OTHER FEATURES Coarse corundum and pyroxene crystals, granitic stringers.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a medium-grained, violet-black anorthosite with coarse corundum and pyroxene crystals. It is cut by numerous quartz stringers and has intense irregular jointing. These factors limit the building stone potential of the area.

86-OSO-002

PROPERTY NO. 86-OSO-002 PLUTON NAME Lanark-Oso Mafic Intrusion
PROPERTY NAME Marshall #2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Oso LOT 8 CONCL. 7
NTS 31 C/15 UTM CO-ORDINATES Easting 375550 Northing 4959050
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-225
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Violet-black
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, pyroxene, corundum
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Granitic stringers, some exfoliation
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This outcrop is a medium-grained, black anorthosite which contains coarse corundum and diopside crystals. As was observed at other sites of the Lanark-Oso mafic intrusion, this rock contains intense irregular jointing and numerous quartz stringers. Hence, building stone potential is limited.

86-OSO-003

PROPERTY NO. 86-OSO-003 PLUTON NAME Lanark-Oso Mafic Intrusion
PROPERTY NAME Rock Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Oso LOT 7 CONC. 7
NTS 31 C/15 UTM CO-ORDINATES Easting 374950 Northing 4958450
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-225
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey-blue
Weathered Surface Grey
Uniform Variable X
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase feldspar, quartz
DELETERIOUS MINERALS Yes X No Type Sulphides Percent <1%
OTHER FEATURES Quartz stringers, sheeting (intense), coarse corundum, crystals.
POSSIBLE USES Small ornamental objects, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a grey blue, massive anorthosite. It is very competent and has many marketable characteristics. The objectionable features include intense irregular jointing, quartz stringers and rare coarse corundum crystals. These features diminish the building stone potential of this area.

86-OSO-008

PROPERTY NO. 86-OSO-008 PLUTON NAME Lanark-Oso Mafic Intrusion
PROPERTY NAME McGees Pond COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Oso LOT 11 CONC. 4
NTS 31 C/15 UTM CO-ORDINATES Easting 371000 Northing 4959350
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-216
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brownish black
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, quartz, corundum pyroxene
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Numerous quartz stringers, veins, and localized
exfoliation.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This black anorthosite has many appealing features, however, it
also contains numerous quartz veins and stringers and intense irregular
jointing. These factors decrease the potential of building stone development
in this area.



Photo B36. Overall view of outcrop showing extensive jointing and fair outcrop exposure. 86-OSO-008

86-SSHER-001

PROPERTY NO. 86-SSHER-001 PLUTON NAME Lanark-Oso Mafic Intrusion
PROPERTY NAME Deer Lake Inlet COMMERCIAL STONE NAME Anorthosite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP South Sherbrooke LOT 5 CONC. 6
NTS 31 C/15 UTM CO-ORDINATES Easting 376350 Northing 4959700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4458-164-180
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Bluish grey
Weathered Surface Grey to black
Uniform X Variable
WEATHERING DEPTH Negligible
Corundum phenocryst
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive (to weakly foliated) Uniform Variable
FABRIC Yes No. Weak X Mod. Strong Strike 142 degrees Dip
Formed By Elongation plus alignment of mafic inclusions
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
Especially exfoliation
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins, felsic pods, veins are both planar and sinuous,
mafic inclusions, coarse corundum crystals, exfoliation intense.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This is a dark bluish-grey anorthosite of the Lanark-Oso mafic
intrusion. It is medium grained, generally massive, and contains mafic
inclusions which appear to have a parallel alignment. Coarse corundum crystals
are common. Jointing occurs in an intense irregular manner and numerous quartz
stringers and veins are present within this cliff-like outcrop.

LAVANT MAFIC INTRUSION

LOCATION The intrusion extends from northern Oso Township through parts of Palmerston, North Sherbrooke, Dalhousie and Lavant townships

NTS 31 C/15, 31 F/2 **QGS** Map 2471 Report 228

SAMPLE SITES 86-OSO-005, 86-OSO-006, 86-OSO-007, 86-LAV-001

DESCRIPTION OF AREA

The Lavant intrusion is described by Wolff (1985, p.34) as "basically a gabbro body which contains fine-grained gabbro phases, felsic late-stage intrusives, and no anorthosite." Sample sites 86-OSO-005, 006, and 007 from the southern end of the intrusion show intense, irregular jointing and other deleterious features such as quartz pods, biotite-rich zones, pyrite, hematite staining, and felsic dikes. Site 86-LAV-001, in the northern part of the intrusion, shows similar jointing and pyrite content.

CONCLUSIONS

Although only the northern and southern limits of this large intrusion were examined, results indicate a low potential for building stone in the Lavant gabbro.

POTENTIAL

POOR	MODERATE	GOOD
86-OSO-005		
86-OSO-006		
86-OSO-007		
86-LAV-001		

REFERENCE

Wolff, J.M. 1985. Geology of the Sharbot Lake area, Frontenac and Lanark counties, southeastern Ontario; Ontario Geological Survey, Report 228, 70p.

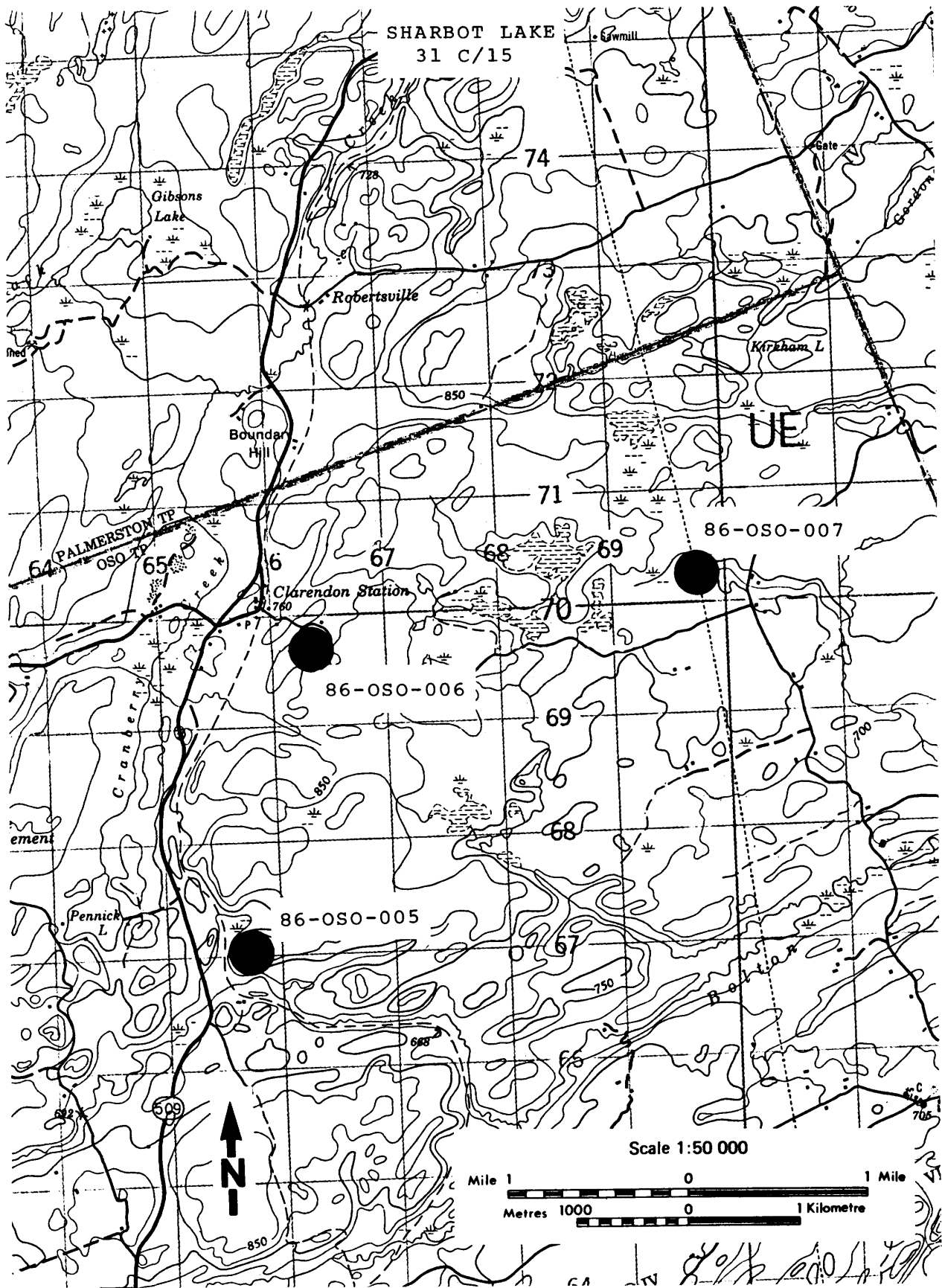


Figure B21. Sample locations, Lavant mafic intrusion (sheet 1).

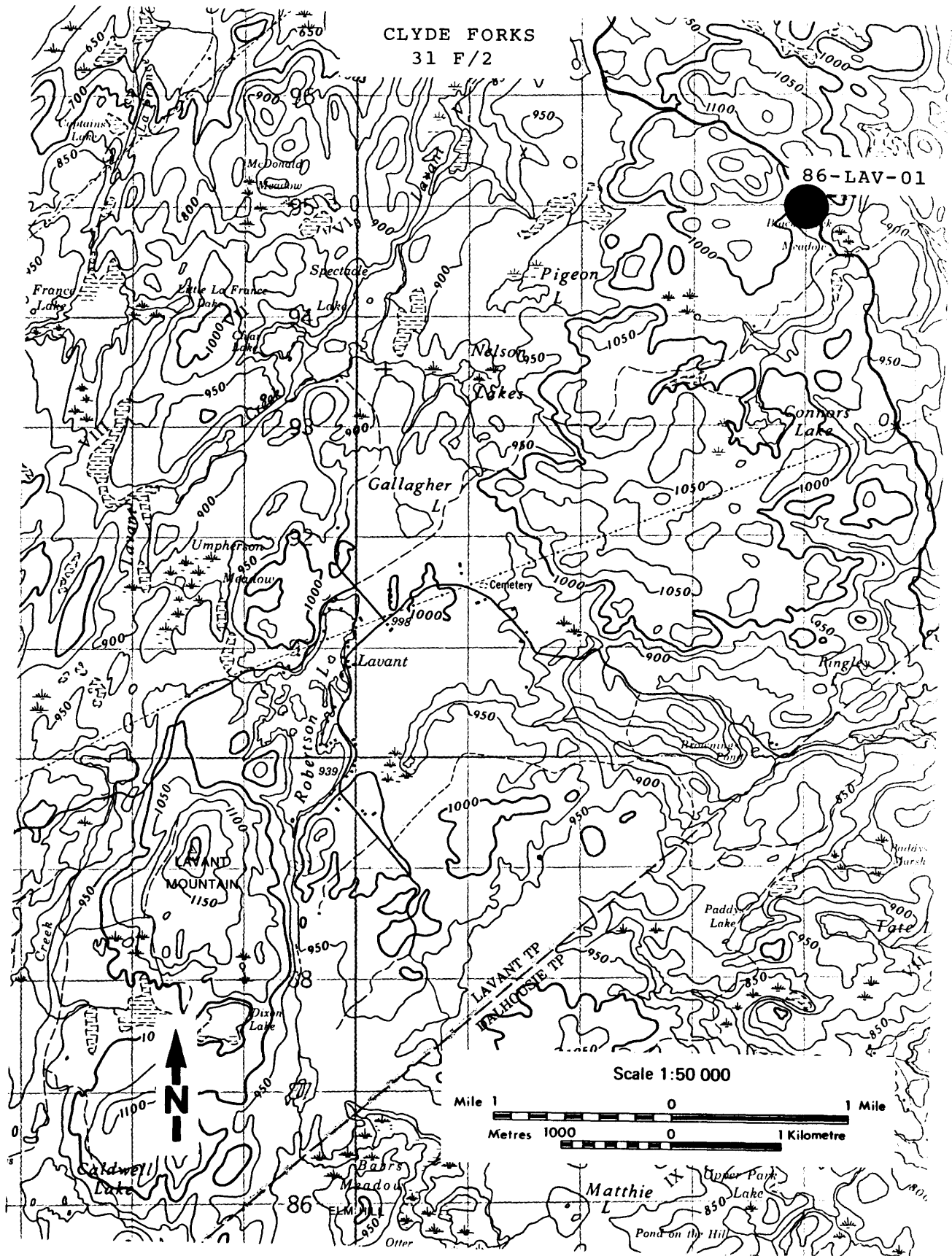


Figure B22. Sample location, Lavant mafic intrusion (sheet 2).

86-OSO-005

PROPERTY NO. 86-OSO-005 PLUTON NAME Lavant Mafic Intrusion
PROPERTY NAME Pennick Lake (East of 509) COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Oso LOT 27 CONC. 3
NTS 31 C/15 UTM CO-ORDINATES Easting 365700 Northing 4967070
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4459-90-122
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark grey
Weathered Surface Light grey
Uniform Variable X
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz, corundum
DELETERIOUS MINERALS Yes X No Type Biotite, sulphides Percent >30%
OTHER FEATURES Groupings of quartz crystals, large biotite crystals (up to 2 cm).
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS The Lavant mafic intrusion at this site consists of metasomatically altered gabbro in which the mafic component has been depleted and carbonate and quartz have been added. The rock colour is inconsistent at the hand sample scale and the presence of sulphides and carbonate make this rock a poor candidate for building stone material.



Photo B37. Outcrop displaying intense vertical and oblique jointing. 86-OSO-005

86-OSO-006

PROPERTY NO. 86-OSO-006 PLUTON NAME Lavant Mafic Intrusion
PROPERTY NAME Clarendon Station COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Diorite
TOWNSHIP Oso LOT 29 CONC. 4
NTS 31 C/15 UTM CO-ORDINATES Easting 386400 Northing 4969800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4461-186-201
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey (light)
Weathered Surface Dark grey
Uniform X Variable
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 120 degrees Dip 90 degrees Spacing 0.5 to 2 m
B) Strike 80 degrees Dip Spacing 0.5 to 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, amphibole, (biotite); Mafic content: approx. 50%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins and stringers.
POSSIBLE USES Ashlar and crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This is a competent grey diorite which represents a portion of the Lavant intrusion. This rock has a fresh appearance but exhibits extensive variation in grain size. The building stone potential of this site is further limited by the intense regular and irregular jointing and the presence of quartz veins and stringers.

86-OSO-007

PROPERTY NO. 86-OSO-007 PLUTON NAME Lavant Mafic Intrusion
PROPERTY NAME Clarendon St. N. COMMERCIAL STONE NAME Granite
 Hydroline GEOLOGICAL ROCK NAME Diorite
TOWNSHIP Oso LOT 30 CONC. 6
NTS 31 C/15 UTM CO-ORDINATES Easting 369750 Northing 4970250
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4461-186-203
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Black and white
 Weathered Surface Light grey
 Uniform X Variable
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Fine Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Amphibole, feldspar
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Hematite coating - felsic dikes and quartz stringers.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This rock is a massive, fine-grained diorite. The grain size and texture is consistent. Felsic dikes and quartz stringers were observed. Hematite staining is present along some joint planes. The intense irregular jointing is the primary feature that limits building stone potential.

87-LAV-001

PROPERTY NO. 86-LAV-001 PLUTON NAME Lavant Mafic Intrusions
PROPERTY NAME Black Creek Meadow COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Lavant LOT 6 CONC. 4
NTS 31 F/2 UTM CO-ORDINATES Easting 374000 Northing 4995050
PROPERTY STATUS Roadcut AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type High Velocity
COLOUR Fresh Surface Violet tinted black
Weathered Surface Dull Grey
Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Fine to coarse Uniform Variable X
TEXTURE Porphyritic Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 125 degrees Dip 10 degrees NW Spacing 1 m
B) Strike Horizontal Dip 10 degrees E Spacing 0.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Pyroxene, plagioclase
DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace
OTHER FEATURES Numerous stringers, pyroxene, phenocrysts.
POSSIBLE USES Ornamental stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This black granite shows little or no potential for building stone due to extensive vertical and horizontal jointing and fine stringers and disseminations of pyrite. The groundmass appears to be almost entirely plagioclase, which surrounds phenocrysts of pyroxene. The rock is not very aesthetically appealing.



Photo B38. View of outcrop showing both vertical and horizontal jointing. Some weathered quartz veins are also visible at top of outcrop. 86-LAV-001

LEGGAT LAKE GRANITE

LOCATION Southeastern Olden Township, between O'Reilly Lake and Long Lake

NTS 31 C/10 OGS Maps 2449, 2053 Report 216

SAMPLE SITES 86-OLD-005, 86-OLD-006, 86-OLD-010, 86-OLD-011, 86-OLD-012,
86-OLD-013, 86-OLD-014

DESCRIPTION OF AREA

The Leggat Lake granite is described by Wolff (1982) as a dominantly quartz monzonite body which is compositionally and structurally related to the McLean granitic pluton located west of Long Lake.

The sample sites represent a north-south section across the western part of the intrusion. All sites except 86-OLD-005 and 006 show irregular, intense jointing and other deleterious features such as quartz pods, pyrite, hematite, and pegmatite dikes. Sites 86-OLD-005 and 006 at the southern margin of the intrusion show moderate jointing, but also contain quartz veins, pegmatite and hematite.

CONCLUSIONS

In general, the building stone potential is poor, but jointing in the southern part of the granite intrusion may allow the extraction of small quarry blocks.

POTENTIAL

POOR		MODERATE	GOOD
	86-OLD-005		
86-OLD-006			
86-OLD-010			
86-OLD-011			
86-OLD-012			
86-OLD-013			
86-OLD-014			

REFERENCE

Wolff, J.M. 1982. Geology of the Long Lake area; Ontario Geological Survey, Report 216, 76p.

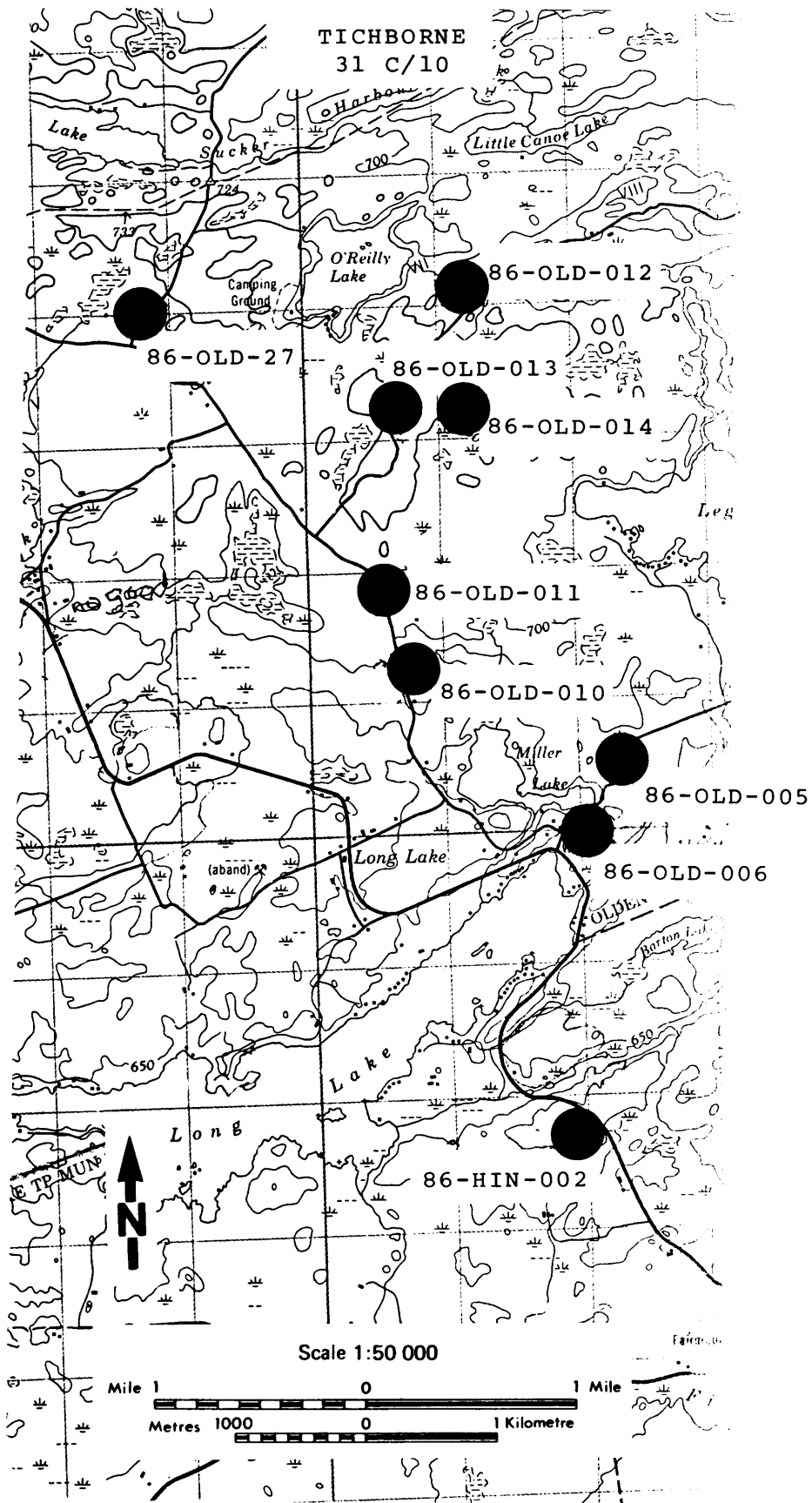


Figure B23. Sample locations, Leggat Lake granite.

86-OLD-005

PROPERTY NO. 86-OLD-005 PLUTON NAME Leggat Lake Granite
PROPERTY NAME Miller Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 2 CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 362300 Northing 4950500
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4449-129-46
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink with grey
Uniform X Variable
WEATHERING DEPTH 1 to 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 120 degrees Dip 50 degrees N Spacing 2 m
B) Strike 0 degrees Dip vertical Spacing 0.5 to 3 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to fair
MINERALOGY Feldspar, biotite, quartz Mafic content: approx. 10%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Sheeting (0.2 to 1 m), hematite staining, quartz veins (to 4 cm in width), granitic stringers.
POSSIBLE USES Small building blocks (crushed stone, ashlar)
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This sample is a massive, medium-grained, pink granite. The biotite tends to occur in small knots (to 1 cm) but generally the texture and colour are consistent. Jointing occurs in regular and irregular patterns with moderate intensity. Sheeting tends to be more intense (average 0.5 m). Quartz veins, felsic stringers and minor hematite staining are also present in this rock.

86-OLD-006

PROPERTY NO. 86-OLD-006 PLUTON NAME Leggat Lake Granite
PROPERTY NAME Abbott Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Monzonite
TOWNSHIP Olden LOT 1 (NW), 2 (SW) CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 362000 Northing 4950000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-60
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Pink
 Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Fine to medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 0 degrees Dip vertical Spacing 3 m
 B) Strike 80 degrees Dip vertical Spacing 3 m
 C) Strike 170 degrees Dip vertical Spacing 2 m
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins, pegmatite dikes, sheeting (0.5 m), minor mafic alteration.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a massive, pink monzonite. The grain size varies from fine to medium grained, even at the hand specimen size. The mafic component is somewhat altered. Jointing occurs in moderate intensity in both regular and irregular patterns. Quartz veins and pegmatite dikes were also observed in the area.

86-OLD-010

PROPERTY NO. 86-OLD-010 PLUTON NAME Leggat Lake Granite
PROPERTY NAME Long Lake North COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 4 midnorth CONC. 6
NTS 31 C/10 UTM CO-ORDINATES Easting 360800 Northing 4951200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4449-129-44
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 120 degrees Dip vertical Spacing 0.1 to 1 m
B) Strike 10 degrees Dip vertical Spacing 0.1 to 2 m
C) Strike Horizontal Dip Spacing 0.5 to 1 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz pods rare, biotite alteration, hematite staining,
minor exfoliation.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a dull pink, medium-grained, massive granite. Colour,
grain size and texture are uniform throughout the rock. The biotite component
shows signs of alteration. Jointing occurs in both regular and irregular
patterns with very close spacing. Further deleterious factors include hematite
staining, rare quartz pods and exfoliation. These factors limit building stone
potential.

86-OLD-011

PROPERTY NO. 86-OLD-011 PLUTON NAME Leggat Lake Granite
PROPERTY NAME Miller Lake Northwest COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 5 CONC. 6
NTS 31 C/10 UTM CO-ORDINATES Easting 360600 Northing 4951850
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4449-129-44
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Pink
 Uniform X Variable
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 126 degrees Dip 90 degrees Spacing 0.1 to 1 m
 B) Strike 40 degrees Dip 90 degrees Spacing 0.1 to 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz; Mafic content: approx. 15%
DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace
OTHER FEATURES Pegmatite, quartz stringer, aplite pod, hematite staining.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This sample is a medium-grained, massive, pinkish-red, quartz monzonite. The primary factor which would tend to diminish building stone potential is the intense irregular and regular joint patterns. Other deleterious features include the presence of pyrite, hematite staining, and felsic stringers and veins.

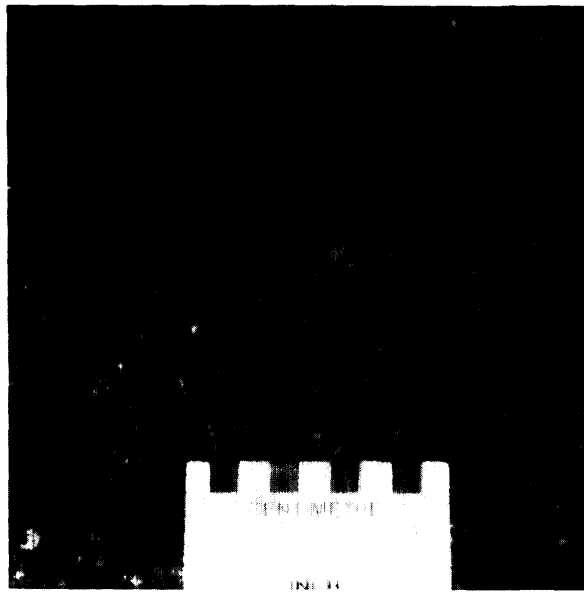


Photo B39. Close-up of medium grain size and massive texture. 86-OLD-011

86-OLD-012

<u>PROPERTY NO.</u>	86-OLD-012	<u>PLUTON NAME</u>	Leggat Lake Granite		
<u>PROPERTY NAME</u>	O'Reilly Lake East	<u>COMMERCIAL STONE NAME</u>	Granite		
		<u>GEOLOGICAL ROCK NAME</u>	Biotite Quartz Monzonite		
<u>TOWNSHIP</u>	Olden	<u>LOT</u>	8, 9	<u>CONC.</u>	7
<u>NTS</u>	31 C/10	<u>UTM CO-ORDINATES</u>	Easting 361200	Northing	4954050
<u>PROPERTY STATUS</u>	Prospect	<u>AIR PHOTO NO.</u>	78-4451-143-114		
<u>PRODUCTION HISTORY</u>	Nil				
<u>USE OF EXPLOSIVES</u>	Yes	No	X	Type	
<u>COLOUR</u>	Fresh Surface Dark pink (dull) Weathered Surface Light pink Uniform X Variable				
<u>WEATHERING DEPTH</u>	1 mm				
<u>GRAIN SIZE</u>	Medium		Uniform	X	Variable
<u>TEXTURE</u>	Foliated		Uniform	X	Variable
<u>FABRIC</u>	Yes	No.	Weak	X	Mod. Strong Strike Dip Formed By Alignment of biotite crystals
<u>BEDDING</u>	Yes	No	X	Strike	Dip Avg. Thickness
<u>JOINTING</u>	Regular Pattern X Irregular Pattern X				
	Limited Jointing Moderate Jointing Intensive Jointing X				
	A) Strike	10 degrees	Dip	37 degrees NW	Spacing 0.1 to 2 m
	B) Strike	125 degrees	Dip	vertical	Spacing 0.5 to 0.5 m
	C) Strike	40 degrees	Dip	58 degrees SE	Spacing 10 m
	D) Strike	Subhorizontal	Dip		Spacing 0.5 m
<u>POTENTIAL FOR QUARRY BLOCKS</u>	Poor				
<u>MINERALOGY</u>	Feldspar, biotite (quartz); Mafic content: approx. 10 to 15%				
<u>DELETERIOUS MINERALS</u>	Yes	No	X	Type Percent	
<u>OTHER FEATURES</u>	Rare pegmatite dikes, rare hematite staining.				
<u>POSSIBLE USES</u>	Crushed stone, ashlar				
<u>OUTCROP EXPOSURE</u>	Good	Fair	X	Poor	
<u>COMMENTS</u>	Rare pegmatite dikes and hematite staining were observed, but these are not serious defects. Intense jointing is the principle factor that limits the building stone potential for this area.				

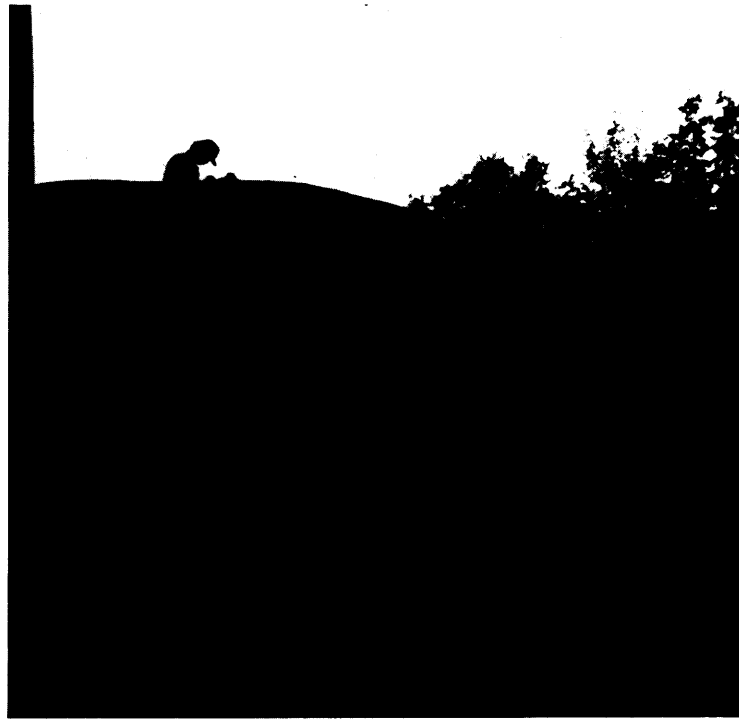


Photo B40. Note intensive, regular and irregular jointing. 86-OLD-012

86-OLD-013

PROPERTY NO. 86-OLD-013 PLUTON NAME Leggat Lake Granite
PROPERTY NAME O'Reilly Lake South COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Monzonite
TOWNSHIP Olden LOT 7 (W 1/2) CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 360700 Northing 4953200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-47
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-red
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH ≤3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive to slightly foliated Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike Dip
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 140 degrees Dip 90 degrees Spacing ≤2 m
B) Strike 50 degrees Dip 90 degrees Spacing 1 to 3 m
C) Strike 100 degrees Dip Spacing 0.1 to 1 m
D) Strike Horizontal Dip Spacing 0.5 m
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite (quartz)
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Sheeting, quartz stringers (rare)
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a pink-red, medium-grained monzonite. It is weakly foliated in places but is generally massive. Jointing follows regular patterns but is intensive (particularly the horizontal sheeting). Quartz stringers were also observed. This area has limited building stone potential despite the fact that exposure is good and deleterious minerals were not present.



Photo B41. Pink monzonite depicting intensive jointing and good exposure. 86-OLD-013

86-OLD-014

PROPERTY NO. 86-OLD-014 PLUTON NAME Leggat Lake Granite
PROPERTY NAME 1 km west of Leggat Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 7 mid-south CONC. 7
NTS 31 C/10 UTM CO-ORDINATES Easting 361200 Northing 4953250
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450 131-47
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish red
 Weathered Surface Light pink
 Uniform X Variable
WEATHERING DEPTH 1 to 3 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 30 degrees Dip vertical Spacing 0.1 to 0.5 m
 B) Strike 0 degrees Dip vertical Spacing 0.1 to 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite; Mafic content: approx. 10%
DELETERIOUS MINERALS Yes X No Type Specularite Percent Trace
OTHER FEATURES Quartz veins, pegmatite dikes, specularite staining, biotite alteration, exfoliation.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This sample is a medium-grained, massive, quartz monzonite from the Mountain Grove felsic intrusion. As seen at other sites in this intrusion, intense irregular jointing is the primary feature which limits building stone development. Other deleterious features include quartz and pegmatite veins, hematite staining, biotite alteration, exfoliation and poor outcrop exposure.

MALONE PLUTON

LOCATION Eastern Marmora Township between the villages of Malone and Deloro

NTS 31 C/12 OGS Map P.2613 OFR 5537

SAMPLE SITE 86-MAR-016

DESCRIPTION OF AREA

Bartlett and Moore (1985, p.75) described the Malone pluton as follows:

"The Malone Pluton consists mainly of very fine-grained, porphyritic alkali-feldspar granite, with phenocrysts generally 0.5-1 mm across, of anhedral quartz and subhedral plagioclase and microcline and/or orthoclase and/or perthite. This pluton may be a high level satellite of the Deloro Granite."

The sample site shows intense, irregular jointing, highly variable texture and colour, quartz pods, iron staining and amphibolite dikes.

CONCLUSIONS

The Malone Pluton has low potential as a building stone prospect.

POTENTIAL

POOR		MODERATE		POOR
86-MAR-016				

REFERENCE

Bartlett, J.R. and Moore, J.M. Jr. 1985. Geology of Belmont, Marmora, and Southern Methuen townships, Peterborough and Hastings counties; Ontario Geological Survey, Open File Report 5537, 236p.

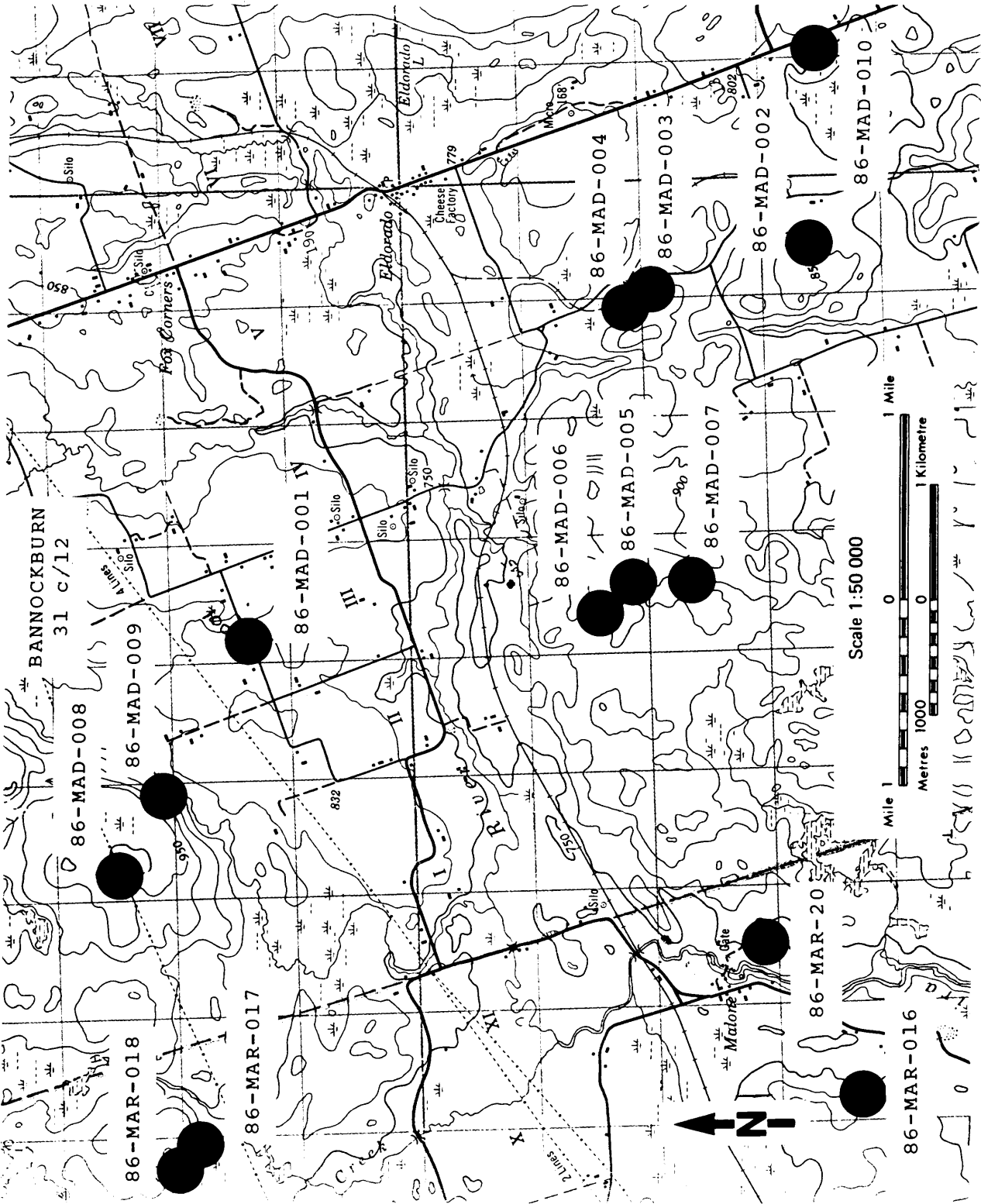


Figure B24. Sample locations, Malone pitton.

86-MAR-016

PROPERTY NO. 86-MAR-016 PLUTON NAME Malone Pluton
PROPERTY NAME Malone Pluton COMMERCIAL STONE NAME Fine-grained granite
GEOLOGICAL ROCK NAME Microgranite
TOWNSHIP Marmora LOT 16 CONC. 10
NTS 31 C/12 UTM CO-ORDINATES Easting 292200 Northing 493637
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4439-132-71
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Extremely variable - pale pink to dark pink
Weathered Surface Extremely variable - pink to black
Uniform Variable X
WEATHERING DEPTH
GRAIN SIZE Fine to medium Uniform Variable X
TEXTURE Porphyritic to foliated Uniform Variable X
FABRIC Yes X No. Weak X Mod. to Strong X Strike Dip
Formed By Alignment of phenocrysts
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, epidote (phenocrysts)
DELETERIOUS MINERALS Yes X No Type Green mineral-possibly Percent 10%
epidote in porphyry
OTHER FEATURES Specularite staining, quartz pods, amphibolite dike
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS The Malone pluton contains rocks which are highly variable in mineralogy and texture. Numerous factors make this property a poor building stone prospect. These include inconsistent mineralogy and texture, quartz pods, specularite staining and the presence of an amphibolite dike. The intense irregular jointing is the major shortcoming with respect to building stone development in this area.

MCLEAN GRANITIC PLUTON

LOCATION Southeast corner of Kennebec Township, southwest corner of Olden Township, northern Hinchinbrooke Township

NTS 31 C/10 QGS Map 2449 Report 216

SAMPLE SITES 86-OLD-015, 86-OLD-016, 86-OLD-017, 86-OLD-018, 86-OLD-019,
86-OLD-020, 86-OLD-021, 86-OLD-022, 86-HIN-002, 86-KEN-011,
86-KEN-012

DESCRIPTION OF AREA

The McLean granitic pluton is an area composed mainly of granite, quartz monzonite, trondhjemite and granodiorite. Due to poor access most samples were taken from outcrops along the side of the road from the village of McLean to Watson Lake. This area is only a very small part of the pluton and should be investigated further, especially to the west (closer to the core of the pluton).

Jointing is generally regular to irregular and intense although areas of moderate jointing occur toward the centre of the pluton. Grain size is dominantly medium, grading to coarse toward the core and the texture is massive. The rocks are composed of quartz, plagioclase (probably andesine), orthoclase, microcline and biotite. The only deleterious mineral noticed in the area was specularite.

Deleterious features locally include quartz veins and pods, aplite pods, rare pegmatites, mafic inclusions near the periphery and minor exfoliation. It is important to note that the severity of these features definitely decreases toward the core.

CONCLUSIONS

The most significant potential for building stone occurs near the centre of the pluton and should be further investigated. Areas toward the periphery tend to have many mafic or metavolcanic inclusions and show very little potential for building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-OLD-015	86-OLD-020	
86-OLD-016	86-OLD-022	
86-OLD-017		
86-OLD-018		
86-OLD-019		
86-OLD-021		
86-HIN-002		
86-KEN-011		
86-KEN-012		

REFERENCES

Harding, W.D. 1951. Geology of the Olden-Bedford area, Frontenac County, Ontario; Ontario Department of Mines, Annual Report, 1947, v.56, pt.6.

Wolff, J.M. 1982. Geology of the Long Lake area; Ontario Geological Survey, Report 216, 76p.

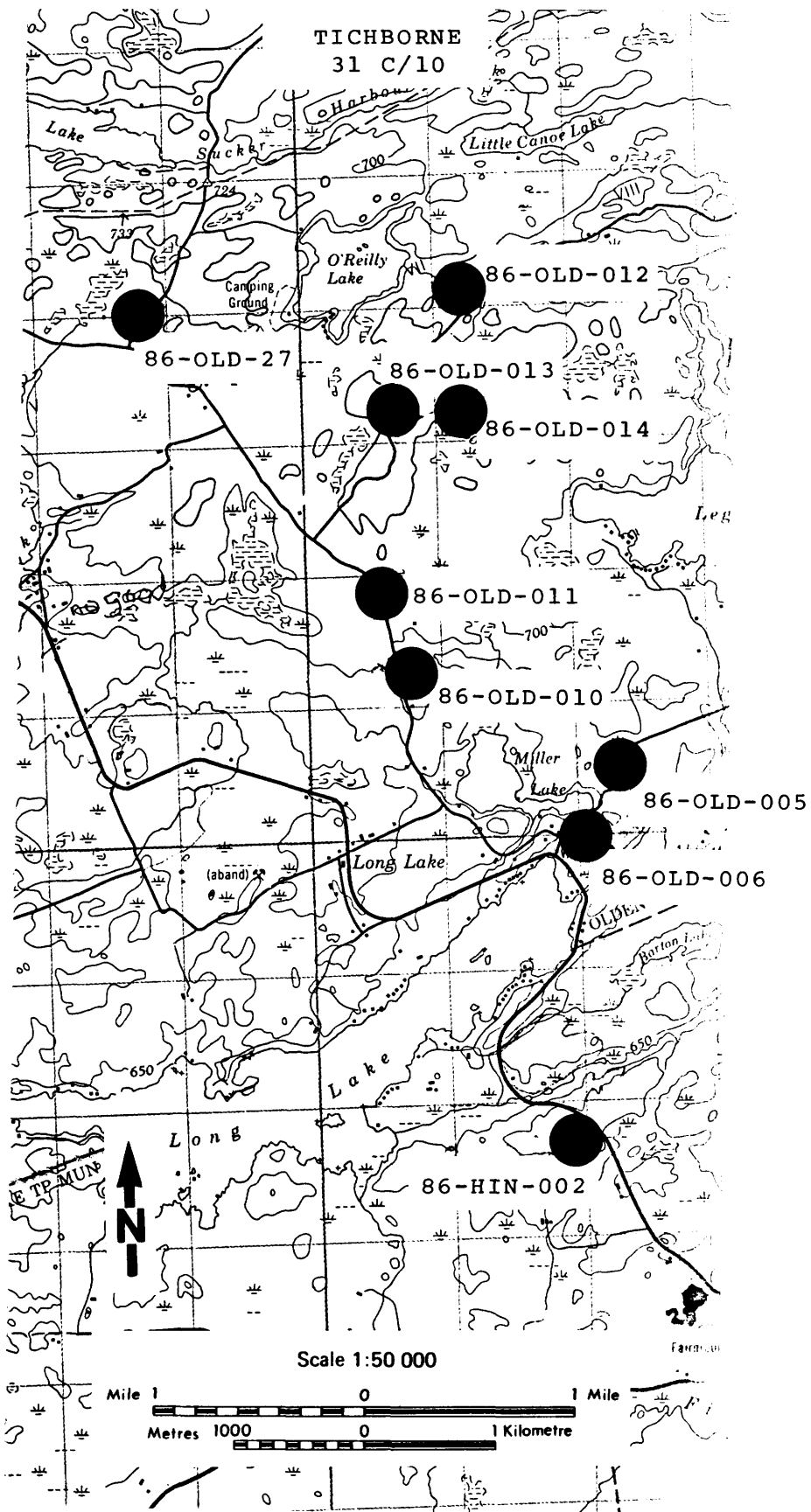


Figure B25. Sample locations, McLean granitic pluton (sheet 1).

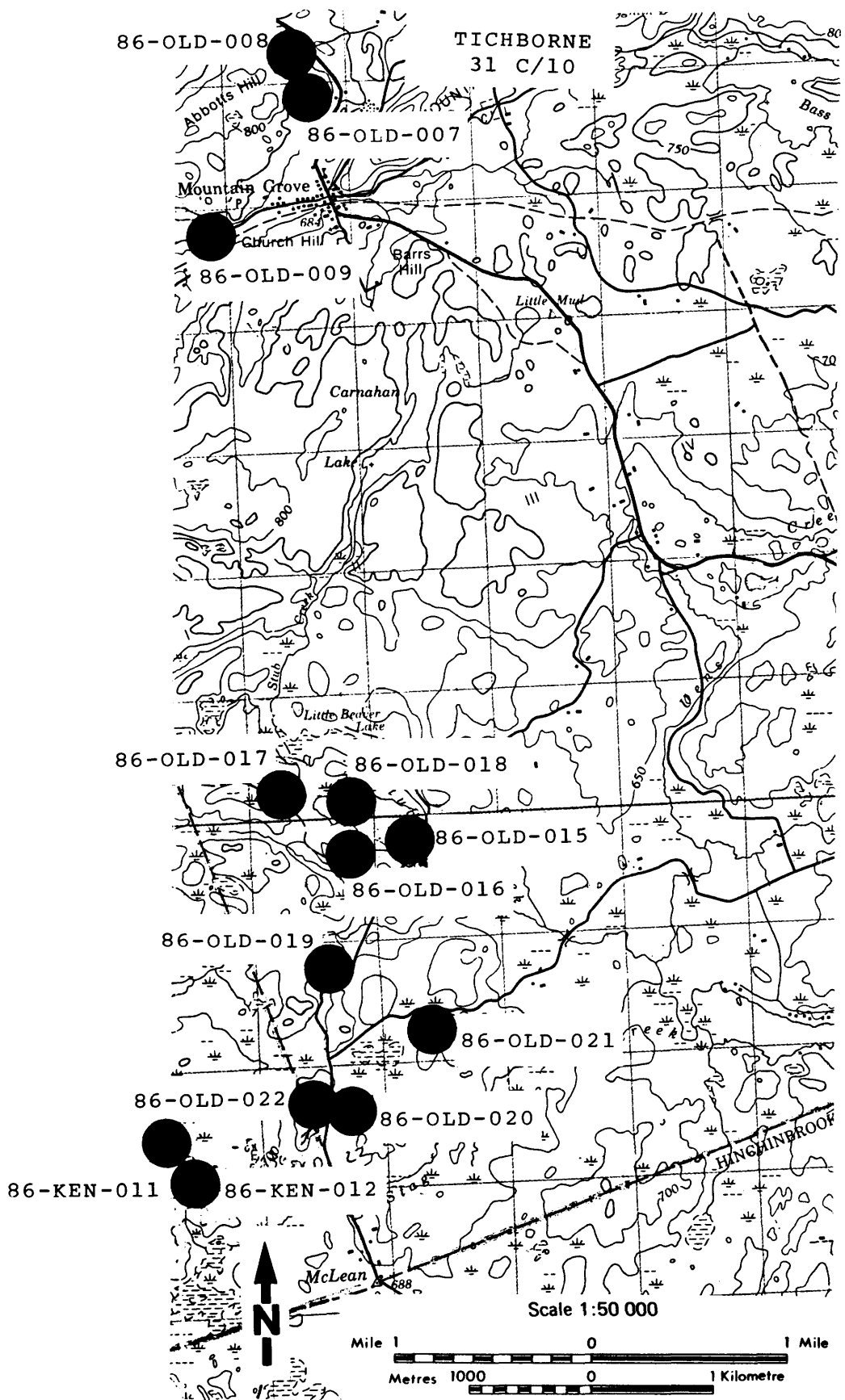


Figure B26. Sample locations, McLean granitic pluton (sheet 2).

86-OLD-015

PROPERTY NO. 86-OLD-015 PLUTON NAME McLean Pluton
PROPERTY NAME Watson Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 6 CONC. 2
NTS 31 C/10 UTM CO-ORDINATES Easting 354250 Northing 4999740
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-51
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Light pink
 Uniform X Variable
WEATHERING DEPTH 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern (X) Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 52 degrees Dip 76 degrees SE Spacing 0.1 to 2 m
 B) Strike Subhorizontal Dip Spacing ≤ 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz
DELETERIOUS MINERALS Yes X No Type Specularite Percent Trace
OTHER FEATURES Minor exfoliation, rare mafic inclusions, quartz veins and pods, hematite staining (especially along joint planes).
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a massive, medium-grained, pink quartz monzonite. It has a fresh appearance and is quite competent. Outcrop exposure is good. This rock contains moderate irregular jointing and numerous deleterious features including mafic inclusions, quartz veins and pods, hematite staining and exfoliation. These factors diminish building stone potential.

86-OLD-016

PROPERTY NO. 86-OLD-016 PLUTON NAME McLean Pluton
PROPERTY NAME Little Beaver Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 6 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353800 Northing 4949700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-51
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light Pink
Uniform X Variable
WEATHERING DEPTH 1 to 3 mm
GRAIN SIZE Medium (coarse) Uniform Variable X
TEXTURE Prophyritic Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz; Mafic content: approx. 15%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Feldspar, phenocrysts
POSSIBLE USES Ashlar, paving stone
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This sample is a porphyritic monzonite to quartz monzonite. The porphyritic texture adds to the appearance of the rock. Few deleterious features were observed, however, the area exhibits intense irregular jointing. This rock may have potential for use in a local market.

86-OLD-017

PROPERTY NO. 86-OLD-017 PLUTON NAME McLean Pluton
PROPERTY NAME Little Beaver Lake II COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 8 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353250 Northing 4950200
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-51
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite, amphibole (magnetite); Mafic content:
approx. 10%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Many metavolcanic inclusions around the area.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This sample is a massive, medium-grained, pinkish-red quartz monzonite. It has a very fresh appearance and contains few deleterious features. (In an area close to this outcrop numerous mafic inclusions were observed.) The principal feature which diminishes building stone potential in this area is the intense irregular jointing.

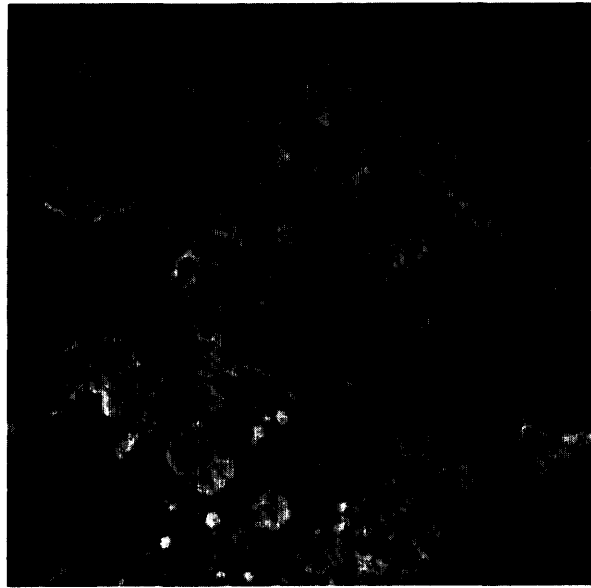


Photo B42. Hammer head rests on mafic xenolith while handle rests on a more granitic zone. 86-OLD-017

86-OLD-018

PROPERTY NO. 86-OLD-018 PLUTON NAME McLean Pluton
PROPERTY NAME Little Beaver Lake 3 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 7 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353800 Northing 4950100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-51
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light pink/grey
Uniform X Variable
WEATHERING DEPTH 3 to 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 30 degrees Dip Vertical Spacing 0.1 to 1 m
B) Strike 150 degrees Dip 70 degrees West Spacing 0.1 to 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite (magnetite)
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Granitic stringers, granite/metavolcanic contact approximately
300 m to the west of this site.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a pink, massive, medium-grained granite of the McLean
pluton. The rock is competent and has a very fresh appearance. It contains a
few quartz stringers and mafic inclusions were observed nearby. The intense
jointing diminishes the building stone potential at this site.

86-OLD-019

PROPERTY NO. 86-OLD-019 PLUTON NAME McLean Pluton
PROPERTY NAME Watson Lake-South-West COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 5 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353600 Northing 4948750
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-51
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Whitish pink
Uniform X Variable
WEATHERING DEPTH 1 mm
GRAIN SIZE Fine to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 140 degrees Dip 60 degrees SW Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite (magnetite) Mafic content: approx. 8%
DELETERIOUS MINERALS Yes X No Type Hematite staining Percent Trace
OTHER FEATURES Hematite staining, aplite and pegmatite dikes, alteration of mafics.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This is a reddish-pink, massive granite which contains some feldspar phenocrysts. The mafics (and possibly the feldspars) show signs of alteration in hand specimen. The fresh surface of this rock has a granular appearance. Jointing follows regular patterns but the joints are closely spaced and oblique. Other deleterious features include hematite staining (abundant) and pegmatite and aplite dikes.

86-OLD-020

PROPERTY NO. 86-OLD-020 PLUTON NAME McLean Pluton
PROPERTY NAME 1.5 km N of McLean COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Olden LOT 3 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353650 Northing 4947650
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-107
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type Roadcut nearby
COLOUR Fresh Surface Pink
Weathered Surface Light pink with grey
Uniform X Variable
WEATHERING DEPTH 2 to 3 mm
GRAIN SIZE Coarse/medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 105 degrees Dip ? Spacing 1 to 3 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Moderate-fair
MINERALOGY Biotite, plagioclase, quartz, K-spar
DELETERIOUS MINERALS Yes X No Type Hematite Percent Trace
OTHER FEATURES Hematite staining, exfoliation.
POSSIBLE USES Small building stone, ashlar, paving stone
OUTCROP EXPOSURE Good X Fair X to Poor
COMMENTS The rock is a very fresh, massive, pink quartz monzonite. The quartz, plagioclase and K-spars all exhibit phenocrysts in uniform concentrations. A small amount of hematite staining was observed on joint faces. This area should further be investigated.

86-OLD-021

PROPERTY NO. 86-OLD-021 PLUTON NAME McLean Pluton
PROPERTY NAME Stag Creek COMMERCIAL STONE NAME Granite
 GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 3 CONC. 2
NTS 31 C/10 UTM CO-ORDINATES Easting 354400 Northing 4948250
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-109
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-black specks
 Weathered Surface Dull Pink
 Uniform X Variable
WEATHERING DEPTH ≤1 cm
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive to foliated Uniform Variable X
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
 Formed By Alignment of biotite
BEDDING Yes No Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike 80 degrees Dip 90 degrees Spacing 0.3 to 2 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite; Mafic content: approx. 25 to 30%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Aplite dikes, mafic inclusions.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a dark pink granite which has a slightly inconsistent grain size and texture. Aplite dikes and mafic inclusions (max. 15 cm wide) are also present in this rock. Jointing and sheeting is intensive. These factors tend to diminish building stone potential in this area.

86-OLD-022

PROPERTY NO. 86-OLD-022 PLUTON NAME McLean Pluton
PROPERTY NAME Road Side COMMERCIAL STONE NAME Granite
 GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 3 CONC. 1
NTS 31 C/10 UTM CO-ORDINATES Easting 353450 Northing 4947650
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4446-119-103
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
 Weathered Surface Light pink
 Uniform Variable X
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Slightly foliated to gneissic Uniform Variable X
FABRIC Yes X No. Weak X to Mod. Strong X Strike Dip
 Formed By Alignment of biotite, gneissic banding
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Feldspar, biotite, quartz ,
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Rare aplite dikes (to 10 cm wide), poor horizontal exposure,
 veins of more siliceous material present (to 0.5 m wide), large outcrop area,
 exfoliation on the 10 cm to 0.5 m scale.
POSSIBLE USES Small building stone, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This site has a large outcrop exposure and moderate vertical jointing. However, numerous veins (aplite, quartz rich and coarse felsic) at various attitudes, exfoliation, and texture which varies from weakly foliated to gneissic at the outcrop scale limit the building stone potential of this site.

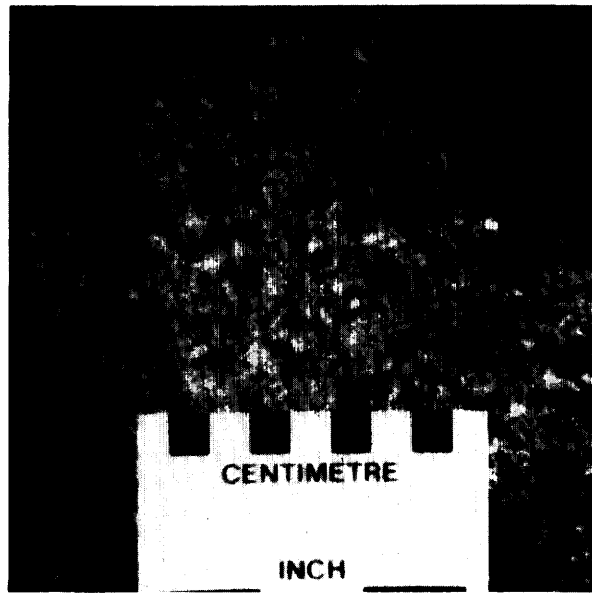


Photo B43. Close-up view of fresh surface showing grain size. 86-OLD-022

86-HIN-002

PROPERTY NO. 86-HIN-002 PLUTON NAME McLean Pluton
PROPERTY NAME Long Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz monzonite
TOWNSHIP Hinchinbrooke LOT 28 CONC. 4
NTS 31 C/10 UTM CO-ORDINATES Easting 361900 Northing 4947750
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447 130-1177
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink and Grey
Uniform Variable X
WEATHERING DEPTH 2 to 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 70 degrees Dip
Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 160 degrees Dip Spacing 2 to 3 m
B) Strike 20 degrees Dip Spacing 2 to 3 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Large aplite dikes (to 3 m wide), quartz veins.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This is a medium-grained, moderately foliated, pink quartz monzonite. This site is near the eastern perimeter of the McLean pluton. Jointing here is intense and occurs in regular and irregular joint patterns. Quartz veins and aplite dikes were also observed in the area. Outcrop exposure is extensive.

86-KEN-011

PROPERTY NO. 86-KEN-011 PLUTON NAME McLean Pluton
PROPERTY NAME McLean - Kennebec COMMERCIAL STONE NAME Granite
 Twp. #1 GEOLOGICAL ROCK NAME Granite
TOWNSHIP Kennebec LOT 3 CONC. 10
NTS 31 C/10 UTM CO-ORDINATES Easting 352050 Northing 4947400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4446-119-102
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brownish pink
 Weathered Surface Bleached pink to grey
 Uniform Variable X
WEATHERING DEPTH
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive to porphyritic Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite (amphibole)
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Rare pegmatite dikes, rare pegmatite pods, areas of coarse
 grained granite relatively common.
POSSIBLE USES Crushed stone
OUTCROP EXPOSURE Good X to Fair X Poor

COMMENTS This site is fairly typical of outcrop mineralogy, texture, and
 jointing near the core of the McLean pluton. The outcrop exposure at this site
 is good and it is easily accessible. The major deleterious features of this
 rock are the variable grain size and irregular jointing. Vertical jointing is
 not predominant, however, horizontal exfoliation is present on the 5 to 10 cm
 scale. The grain size was found to be quite variable even at the hand specimen
 scale.

86-KEN-012

PROPERTY NO. 86-KEN-012 PLUTON NAME McLean Pluton
PROPERTY NAME Beaver Pond COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Kennebec LOT 2 CONC. 10
NTS 31 C/10 UTM CO-ORDINATES Easting 352400 Northing 4947100
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4447-130-107
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink to black
Uniform Variable X
WEATHERING DEPTH 3 to 4 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, biotite, quartz, plagioclase
DELETERIOUS MINERALS Yes X No Type Biotite in clumps Percent Rare
OTHER FEATURES Mafic-rich areas (clumps of biotite crystals)
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This rock is a massive, medium-grained, pink granite. The grain size is more consistent than at sites closer to the intrusion centre and pegmatite phases were not observed. However, the rock at this site contains knots of biotite crystals (maximum observed were 4 cm in diameter). The jointing is not as intense as found towards the intrusion centre but occurs in irregular patterns. Outcrop exposure is poor. These factors diminish the building stone potential for this rock.

METHUEN TRONDHJEMITE AND BELMONT GRANITE

LOCATION A 3 to 4 km wide body extending from the southwest corner to the northeast corner of Methuen Township. A smaller body straddling the Belmont-Methuen Township boundary is grouped with the Methuen trondhjemite. It is referred to as the Belmont Granite by Bartlett and Moore (1985).

NTS 31 C/5, 12, 13 QGS Maps 1960E, P.2613
Geological Report ODM vol.69, pt.8; OFR 5537

SAMPLE SITES 86-BEL-001, 86-MET-001

DESCRIPTION OF AREA

The Methuen trondhjemite, referred to by Hewitt (1961, p.111) as the Methuen granite, is described as follows:

"The largest granitic intrusive is the Methuen granite, which consists mainly of medium- to coarse-grained pink gneissic biotite granite. Some facies are pink biotite granite porphyry with large feldspar phenocrysts (up to 1 inch). A grey, fine- to medium-grained biotite granodiorite occurs as large inclusions in the Methuen granite."

The smaller granitic body south of the Methuen trondhjemite (Belmont Granite) is described by Bartlett and Moore as fine- to coarse-grained leucogranite, porphyritic granite, quartz monzonite, and granodiorite.

Both are considered to be late tectonic intrusions. The Methuen trondhjemite, at sample site 86-MET-001, is foliated with regular, but intense, jointing. The Belmont site is located at the old Fairmont granite quarry and shows a massive texture with moderate, regular jointing, but intense horizontal microfracturing.

CONCLUSIONS

The building stone potential of the Belmont granite and the Methuen trondhjemite at the sites examined is low but investigation of other parts of the intrusions are warranted based on the regular jointing.

POTENTIAL

POOR	MODERATE	GOOD
86-BEL-001		
86-MET-001		

REFERENCES

Bartlett, J.R. and Moore, J.M. Jr. 1985. Geology of Belmont, Marmora, and Southern Methuen townships, Peterborough and Hastings counties; Ontario Geological Survey, Open File Report 5537, 236p.

Carmichael, D.M. 1970. Intersecting isograds in the Whetstone Lake area, Ontario; Journal of Petrology, v.11, pt.1, p.147-181.

Chesworth, W., Shaw, D. and Dostal, J. 1975. Granitoid rocks of the Madoc-Bancroft-Haliburton area of the Grenville Province; in University of Waterloo Field Excursions Guidebook 1975, The Geological Association of Canada, The Mineralogical Association of Canada, and The Geological Society of America, Field Trip 1, p.1-25.

Gillespie, J.E. and Protz, R. 1969. Evidence for the residual character of two soils, one on granite, the other on limestone, in Peterborough County, Ontario; Canadian Journal of Earth Sciences, v.6, p.1217-1225.

Hewitt, D.F. 1956. The Grenville region of Ontario; in The Grenville Problem, Royal Society of Canada, Special Publication 1, p.22-41.

---1961. Nepheline syenite deposits of southern Ontario; Ontario Department of Mines, Annual Report, 1960, v.69, pt.8.

Hewitt, D.F. and Satterly, J. 1957. Haliburton-Bancroft area, Province of Ontario; Ontario Department of Mines, Map 1957B, scale 1:126 720.

Keith, M.L. 1939. Petrology of the alkaline intrusive at Blue Mountain; Geological Society of America, v.50, p.1795-1826.
MacDonald, G. 1970. Geology-Kingston area; Department of Geology, Carleton University, 1968-70.

MacIntyre, R.M., York, D. and Moorhouse, W.W. 1967. Potassium-argon age determinations in the Madoc-Bancroft area in the Grenville Province of the Canadian Shield; Canadian Journal of Earth Sciences, v.14, p.815-828.

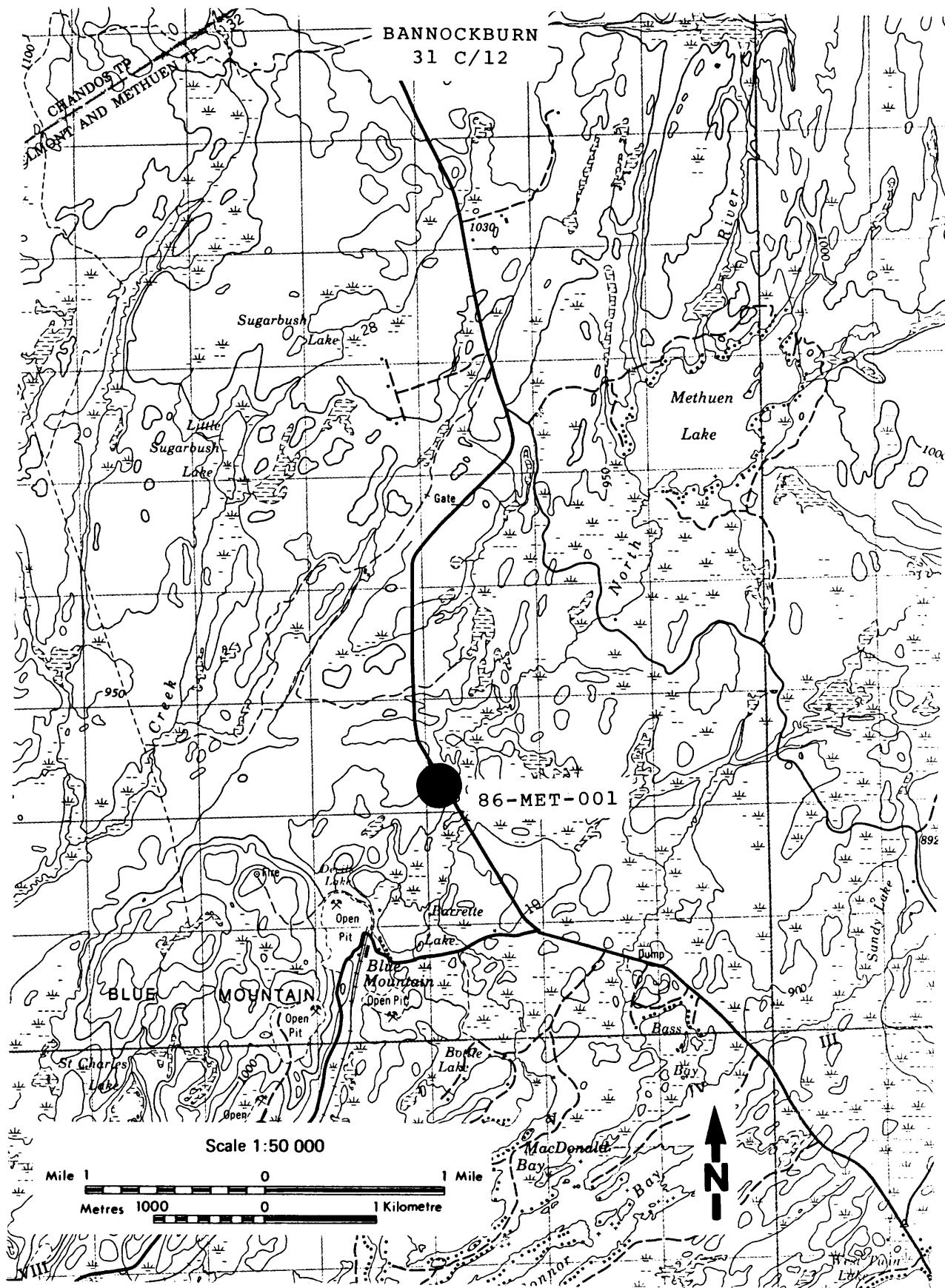


Figure B27. Sample location, Methuen trondhjemite and Belmont granite (sheet 1).

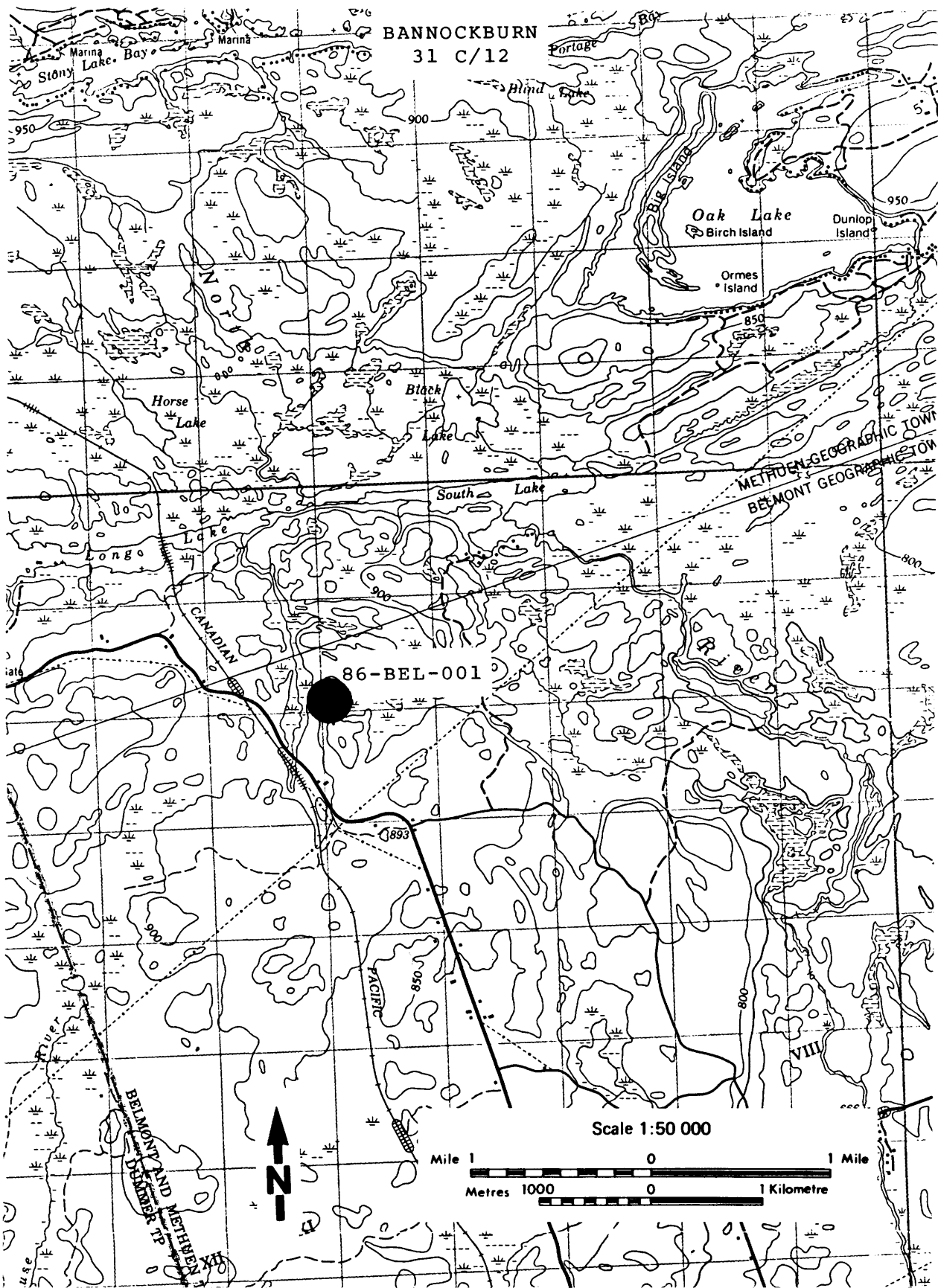


Figure B28. Sample location, Methuen trondhjemite and Belmont granite (sheet 2).

86-BEL-001

PROPERTY NO. 86-BEL-001 PLUTON NAME Methuen Trondhjemite
PROPERTY NAME Fairmont Granite COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Pink Granite
TOWNSHIP Belmont LOT 31 CONC. 10
NTS 31 C/5 UTM CO-ORDINATES Easting 265100 Northing 4938100
PROPERTY STATUS Inactive AIR PHOTO NO.
PRODUCTION HISTORY Fairmont granite quarry
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface Pink
 Weathered Surface Brownish to black
 Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing X Moderate Jointing Intensive Jointing
 A) Strike 130 degrees Dip Spacing 3 to 4 m
 B) Strike 50 degrees Dip Spacing 1.5 m
 C) Strike Dip horizontal Spacing <0.5 m fracturing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good
MINERALOGY K-spar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Minor quartz veining <1 cm, some biotite pods, some areas
 of quarry show extensive sheeting and discontinuous horizontal fractures.
POSSIBLE USES Crushed stone, ashlar, curbing stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This site showed very good potential in terms of colour, texture,
 vertical jointing and lack of deleterious minerals. However, after development
 of the quarry had started, a pervasive, intense, horizontal microfracturing was
 observed, probably related to sheeting. These fractures are more apparent on a
 polished surface and diminish the structural integrity of the stone, thereby
 limiting the building stone potential.



Photo B44. Overall view of Fairmont granite quarry; note limited jointing. 86-BEL-001

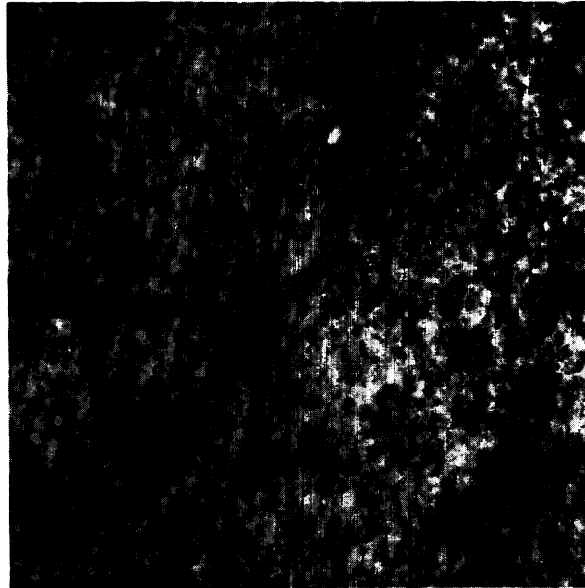


Photo B45. Uniform medium grain size and pink colour. 86-BEL-001

86-MET-001

PROPERTY NO. 86-MET-001 PLUTON NAME Methuen Trondjemite
PROPERTY NAME Blue Mountain COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Methuen LOT 21 CONC. 5
NTS 31 C/12, 13 UTM CO-ORDINATES Easting 267150 Northing 4952250
PROPERTY STATUS Roadside Rockcut AIR PHOTO NO.
PRODUCTION HISTORY 34.7 km north of Havelock on the way to Lasswade (County Road #46)
USE OF EXPLOSIVES Yes X No Type High Velocity
COLOUR Fresh Surface Dark pink
 Weathered Surface Light greyish pink
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Foliation - alignment of mafics
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike Horizontal Dip Spacing ≤ 1 m
 B) Strike 51 degrees Dip Vertical Spacing ≤ 1 m
 C) Strike 125 degrees Dip Vertical Spacing 1 to 1.5 m
 D) Strike 150 degrees Dip Vertical Spacing ≤ 1 m
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, biotite, quartz
DELETERIOUS MINERALS Yes X No Type Percent
OTHER FEATURES Pegmatite banding, extensive sheeting, hematite staining on fractures.
POSSIBLE USES Crushed stone, ashlar, curbing stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This site shows very limited potential for building stone due to abundant pegmatite dikes which reduce the potential size of quarry blocks. The rock has a strongly foliated appearance due to the alignment of biotite. The grain size is medium and the colour on the fresh surface is a dark pink. The area displays extensive sheeting and also horizontal jointing of up to 1 m. This site is a roadcut in the granite within 300 m of the contact with metasediments. Any further investigation of this pluton should be conducted farther to the south.

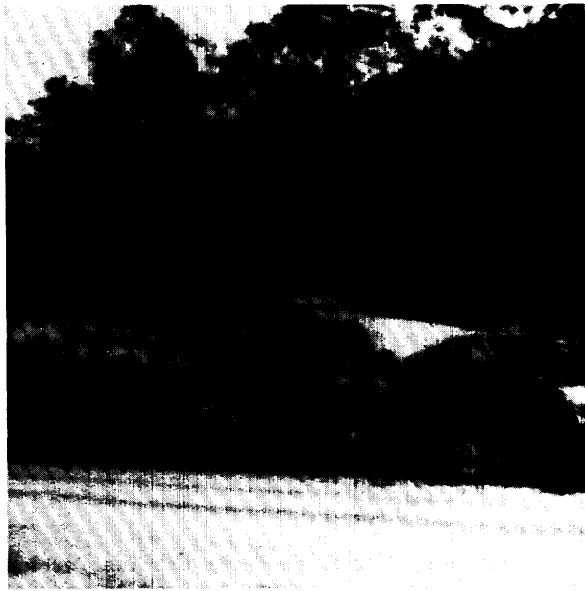


Photo B46. Good outcrop exposure showing vertical and horizontal joint sets. 86-MET-001

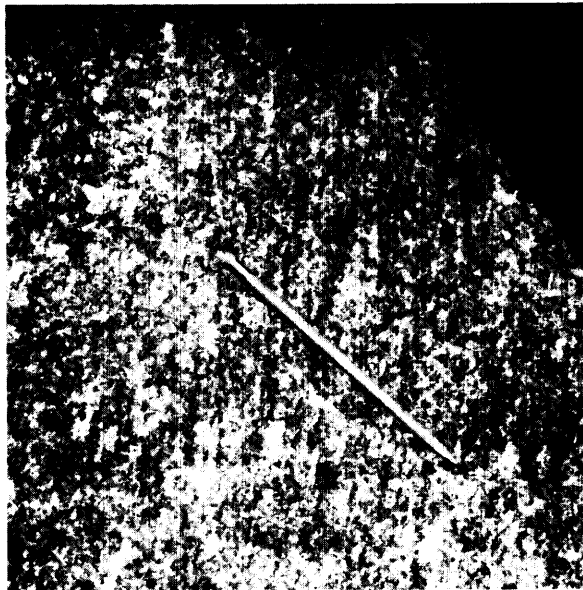


Photo B47. Dark pink granite showing foliated texture and medium grain size. 86-MET-001

MOUNT MORIAH SYENITE

LOCATION Southwest corner of Grimsthorpe Township and extreme northwest corner of Elzevir Township

NTS 31 C/11 QGS Map 51D Geological Report AR 51, pt.4

SAMPLE SITES 86-ELZ-010, 86-ELZ-011, 86-ELZ-012, 86-GRI-001, 86-GRI-002, 86-GRI-003, 86-GRI-004, 86-GRI-005

DESCRIPTION OF AREA

Only one rock type has been encountered to date on Mount Moriah. This is brown, medium- to coarse-grained, massive syenite consisting predominantly of K-spar and hornblende (mostly pyroxene according to Brown and Thivierge 1979). The area examined comprises the southeast quarter of the intrusion.

The southwest margin of the intrusion is identified as a mafic (biotite)-poor syenite late phase (Brown and Thivierge 1979) occurring as an arcuate mass, whereas the remainder of the intrusion is considered an augite/(hornblende) syenite early phase.

CONCLUSIONS

The Mount Moriah syenite shows promise for building stone potential in terms of uniform colour, texture and limited to moderate jointing (exposed 10 to 30 m surface areas can be found). However, horizontal jointing (0.5 to 5.0 m) and poor access are limiting factors. Some potential for large quarry blocks may be realized (86-GRI-005), as well as curbing and possibly architectural stone (86-GRI-004, 003, 002) and rarely, (if finer grained) monumental stone.

POTENTIAL

POOR		MODERATE	GOOD
86-ELZ-010	86-ELZ-011		
86-ELZ-012	86-GRI-001		
	86-GRI-002		
	86-GRI-003		
	86-GRI-004		
			86-GRI-005

REFERENCES

Brown, P.A. and Thivierge, R. 1979. A preliminary report on the Mount Moriah granite; Geological Survey of Canada, Energy, Mines and Resources Canada, for Atomic Energy Canada Ltd., Technical Record - TR-15, 22p.

Hewitt, D.F. 1968. Geology of Madoc Township and the north part of Huntingdon Township, Hastings County; Ontario Department of Mines, Geological Report 73, 45p.

Meen, V.B., and Harding, W.D. 1942. Grimsthorpe-Kennebec area, counties of Hastings, Lennox and Addington, and Frontenac, Ontario; Ontario Department of Mines, Map 51D, scale 1:63 360.

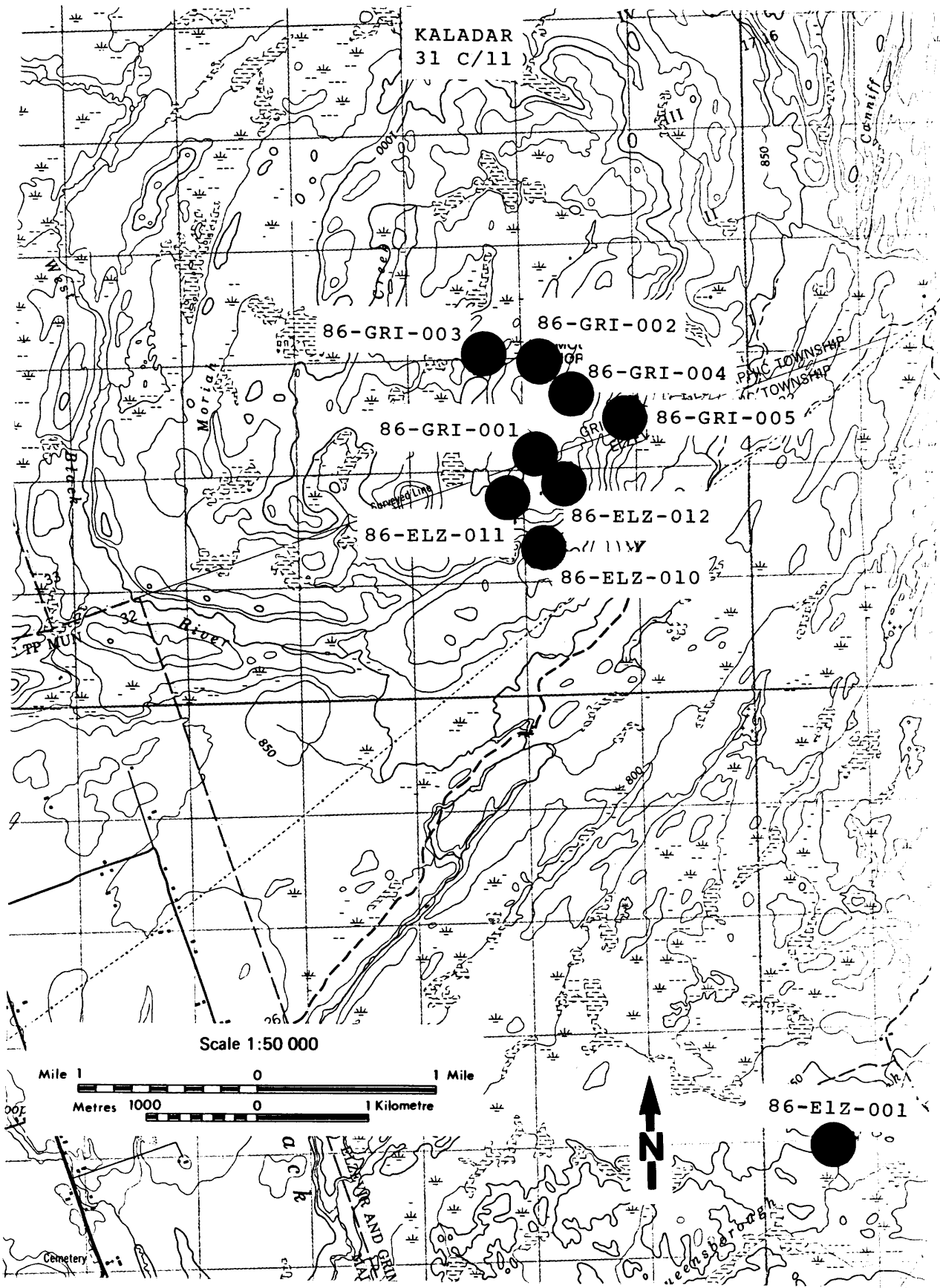


Figure B29. Sample locations, Mount Moriah syenite.

86-ELZ-010

PROPERTY NO. 86-ELZ-010 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME The Flats-1 COMMERCIAL STONE NAME Granite
 (Mount Moriah) GEOLOGICAL ROCK NAME Quartz Syenite
TOWNSHIP Elzevir LOT 31 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 308150 Northing 4951300
PROPERTY STATUS Prospect Air Photo No. 78-4445-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey-brown
 Weathered Surface Grey-brown
 Uniform X Variable
WEATHERING DEPTH ≤0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike 300 degrees Dip 60 degrees NE Spacing 0.5 to 1.0 m
 B) Strike 025 degrees Dip 90 degrees Spacing 1.0 to 3.0 m
 C) Strike Horizontal Dip Spacing 0.3 to 1.0 m
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, K-spar, amphibole, biotite, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Nil
POSSIBLE USES Ashlar, paving stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a massive, medium-grained, dark brown, quartz syenite. The feldspars are slightly altered to clay minerals. The outcrop exposure at this site is extensive, however, the poor access and intense irregular jointing limit the building stone potential of the area.

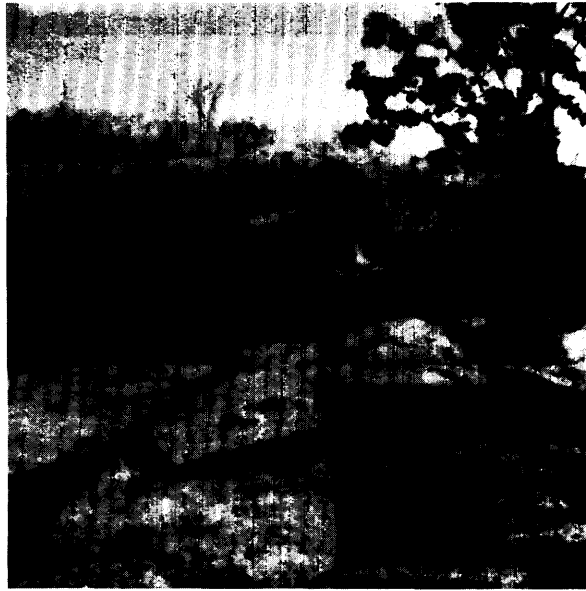


Photo B48. Regular horizontal sheeting along with vertical joint sets. 86-ELZ-010

86-ELZ-011

PROPERTY NO. 86-ELZ-011 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME The Flats-2 COMMERCIAL STONE NAME Granite
 (Mount Moriah) GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Elzevir LOT 32 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 307850 Northing 4951750
PROPERTY STATUS Prospect Air Photo No. 78-4449-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Reddish brown
 Weathered Surface Brownish grey
 Uniform X Variable
WEATHERING DEPTH ≤0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing X Moderate Jointing Intensive Jointing
 A) Strike Horizontal Dip Spacing 1.0 to 1.5 m
 B) Strike 126 degrees Dip 90 degrees Spacing 1.0 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to fair
MINERALOGY Feldspar, biotite, amphibole
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Nil
POSSIBLE USES Some quarry blocks may be viable.
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS The Mount Moriah Syenite at this location is medium grained, reddish brown in colour and massive. Few deleterious features were observed in this rock and jointing occurred in regular sets with moderate spacing. The limited access and poor outcrop exposure are two factors which reduce building stone potential for this area.

86-ELZ-012

PROPERTY NO. 86-ELZ-012 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Mount Moriah- COMMERCIAL STONE NAME Granite
 Benchmark 1215 GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Elzevir LOT 32 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 308300 Northing 4951850
PROPERTY STATUS Prospect Air Photo No. 78-4449-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey-brown
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern (X) Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing (X)
 Intense A) Strike Horizontal Dip Spacing ≤ 0.5 m
 Weak B) Strike 120 degrees Dip Steep (W) Spacing 1.0 to 3.0 m
 Local C) Strike 060 degrees Dip 90 degrees Spacing Wide (5 to 10 m)
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, amphibole, biotite; Mafic content: approx. 20%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Occasional felsic stringers (average 4 cm wide), slight
 amphibole alteration.
POSSIBLE USES Paving stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This sample is a medium-grained, massive, brown syenite. The
 amphibole in this rock is slightly altered to chlorite. Intense horizontal
 jointing and poor access are the principal factors which limit building stone
 potential in this area.

86-GRI-001

PROPERTY NO. 86-GRI-001 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Fools Lake COMMERCIAL STONE NAME Granite
 (Mount Moriah) GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Grimsthorpe LOT 23 CONC. 1
NTS 31 C/11 UTM CO-ORDINATES Easting 308100 Northing 4952150
PROPERTY STATUS Prospect Air Photo No. 78-4449-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown
 Weathered Surface Grey-brown
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing (X) Moderate Jointing X Intensive Jointing
 A) Strike 150 degrees Dip 30 degrees E Spacing 0.3 to 0.8 m
 B) Strike 122 degrees Dip 90 degrees Spacing 1.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair to poor
MINERALOGY Feldspar, hornblende, biotite; Mafic content: approx. 25%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Three 1 to 3 cm wide felsic stringers observed.
POSSIBLE USES Some quarry blocks for architectural stone may be feasible.
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a medium-grained, massive, brown syenite. Vertical jointing occurs in regular joint sets with moderate spacing, however, the horizontal jointing was observed to be more closely spaced. At this time, access to the Mount Moriah syenite is poor. The presence of rare felsic stringers further limit building stone potential for this area.

86-GRI-002

PROPERTY NO. 86-GRI-002 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Firetower-Benchmark COMMERCIAL STONE NAME Granite
 1215' (Mount Moriah) GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Grimsthorpe LOT 22 CONC. 1
NTS 31 C/11 UTM CO-ORDINATES Easting 308200 Northing 4952900
PROPERTY STATUS Prospect Air Photo No. 78-4449-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown
 Weathered Surface Grey-brown
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium (to coarse) Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 105 degrees Dip 90 degrees Spacing 1.0 to 2.0 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to moderate
MINERALOGY Feldspar, amphibole, biotite; Mafic content: approx. 25%
DELETERIOUS MINERALS Yes X No Type Hematite observed Percent Trace
 along one fracture
 plane
OTHER FEATURES One 1 cm wide felsic stringer observed, shallow (1 cm thick)
 exfoliation patches (average 0.5 m²).
POSSIBLE USES Curbing stone, some architectural stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This sample is a medium-grained, massive syenite. Hematite
 stained joint planes and a felsic stringer were observed. Jointing is
 moderately spaced and generally occurs in regular sets. Access to this
 area is poor.

86-GRI-003

PROPERTY NO. 86-GRI-003 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Gypsy Moth Hill (Mount Moriah) COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Grimsthorpe LOT 23 CONC. 2
NTS 31 C/11 UTM CO-ORDINATES Easting 307600 Northing 4953000
PROPERTY STATUS Prospect Air Photo No. 78-4449-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown
 Weathered Surface Grey-brown
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern (X)
 Limited Jointing Moderate Jointing X Intensive Jointing
 Subhorizontal A) Strike 010 degrees Dip 20 degrees E Spacing ≤ 1 m
 Benches
 B) Strike 156 degrees Dip 90 degrees Spacing 1 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to moderate
MINERALOGY Feldspar, amphibole, minor pyroxene
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Limited to moderate felsic stringers (average 1 cm wide); one
 10 cm wide pegmatite stringer observed; ≤ 1 cm thick surface exfoliation
 patches (surface weathering/peeling).
POSSIBLE USES Curbing stone, possibly architectural stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This is a massive, medium-grained, brown syenite. Grain size,
 colour and texture are uniform throughout the outcrop and surface exposure is
 good. Regular joint patterns with moderate spacing were observed. Horizontal
 jointing predominates. The building stone potential of this rock is limited
 primarily by the presence of felsic stringers and exfoliation.



Photo B49. Average 1 m thick benches (subhorizontal sheeting). 86-GRI-003

86-GRI-004

PROPERTY NO. 86-GRI-004 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Road Top COMMERCIAL STONE NAME Granite
 (east of Mt. Moriah
 Firetower) GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Grimsthorpe LOT 22 CONC. 1
NTS 31 C/11 UTM CO-ORDINATES Easting 308450 Northing 4952700
PROPERTY STATUS Prospect Air Photo No. 78-4448-157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown
 Weathered Surface Grey-brown
 Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing X Moderate Jointing X Intensive Jointing
 Subhorizontal A) Strike 010 degrees Dip 10 degrees E Spacing 1.0 m (avg.)
 Benches
 (Sheeting) B) Strike 115 degrees Dip 90 degrees Spacing 1.0 to 5.0 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to moderate
MINERALOGY Feldspar, amphibole, biotite, minor pyroxene
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Sheeting
POSSIBLE USES Curbing stone, possibly architectural stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a brown, medium-grained, massive syenite. Vertical jointing is of a limited to moderate intensity and occurs in regular sets. The horizontal jointing is more closely spaced. Despite the fact that outcrop exposure is good, access to the area is limited which further diminishes its appeal to the building stone industry.

86-GRI-005

PROPERTY NO. 86-GRI-005 PLUTON NAME Mt. Moriah Syenite
PROPERTY NAME Genereaux Hunt Camp 82 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Grimsthorpe LOT 21 CONC. 1
NTS 31 C/11 UTM CO-ORDINATES Easting 308900 Northing 4952500
PROPERTY STATUS Prospect Air Photo No. 78-4445 157-228
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark mauve brown
Weathered Surface Grey-brown
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Coarse-medium Uniform X Variable (X)
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing X Moderate Jointing X Intensive Jointing
A) Strike 010 degrees Dip Shallow E Spacing 1 to 2 m
B) Strike 100 degrees Dip 90 degrees Spacing 1 to 2 m, up to
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good
MINERALOGY Feldspar, amphibole, biotite; Mafic content: approx. 20%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES A 1 cm wide granitic stringer was observed.
POSSIBLE USES Architectural stone, structural stone, curbing stone etc.
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS Some 10 to 30 m² joint-free areas were observed. Jointing is generally regular in pattern, with two major vertical sets and a horizontal to subhorizontal sheeting plane.

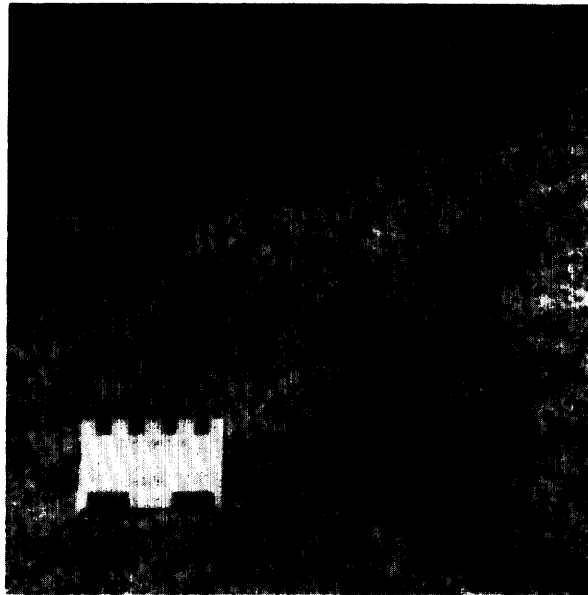


Photo B50. Textural close-up of grey-brown syenite. 86-GRI-005

MOUNTAIN GROVE MAFIC INTRUSION

LOCATION Southwestern Olden Township, north of Long Lake and south of Bass Lake

 NTS 31 C/10 QGS Map 2249 Report 216

SAMPLE SITE 86-OLD-027

DESCRIPTION OF AREA

Wolff (1982, p.30) described the Mountain Grove mafic intrusion as follows:

"Compositionally, the body varies from gabbro and quartz gabbro to anorthosite, monzonite and syenite. Outcrops of these units tend to be small and massive with locally developed penetrative fractures. Individual outcrops may have more than one phase present. Igneous layering or banding, however, is absent and the different phases have irregular contacts. Locally, intrusive breccias between phases are observed."

The rock at site 86-OLD-027 is a massive, black gabbro which is attractive but contains deleterious features including intense, irregular fracturing, pyrite and felsic stringers.

CONCLUSIONS

The Mountain Grove mafic intrusion has little potential as a source of building stone.

POTENTIAL

POOR		MODERATE		GOOD
86-OLD-027				

REFERENCE

Wolff, J.M. 1982. Geology of the Long Lake area; Ontario Geological Survey, Report 216, 76p.

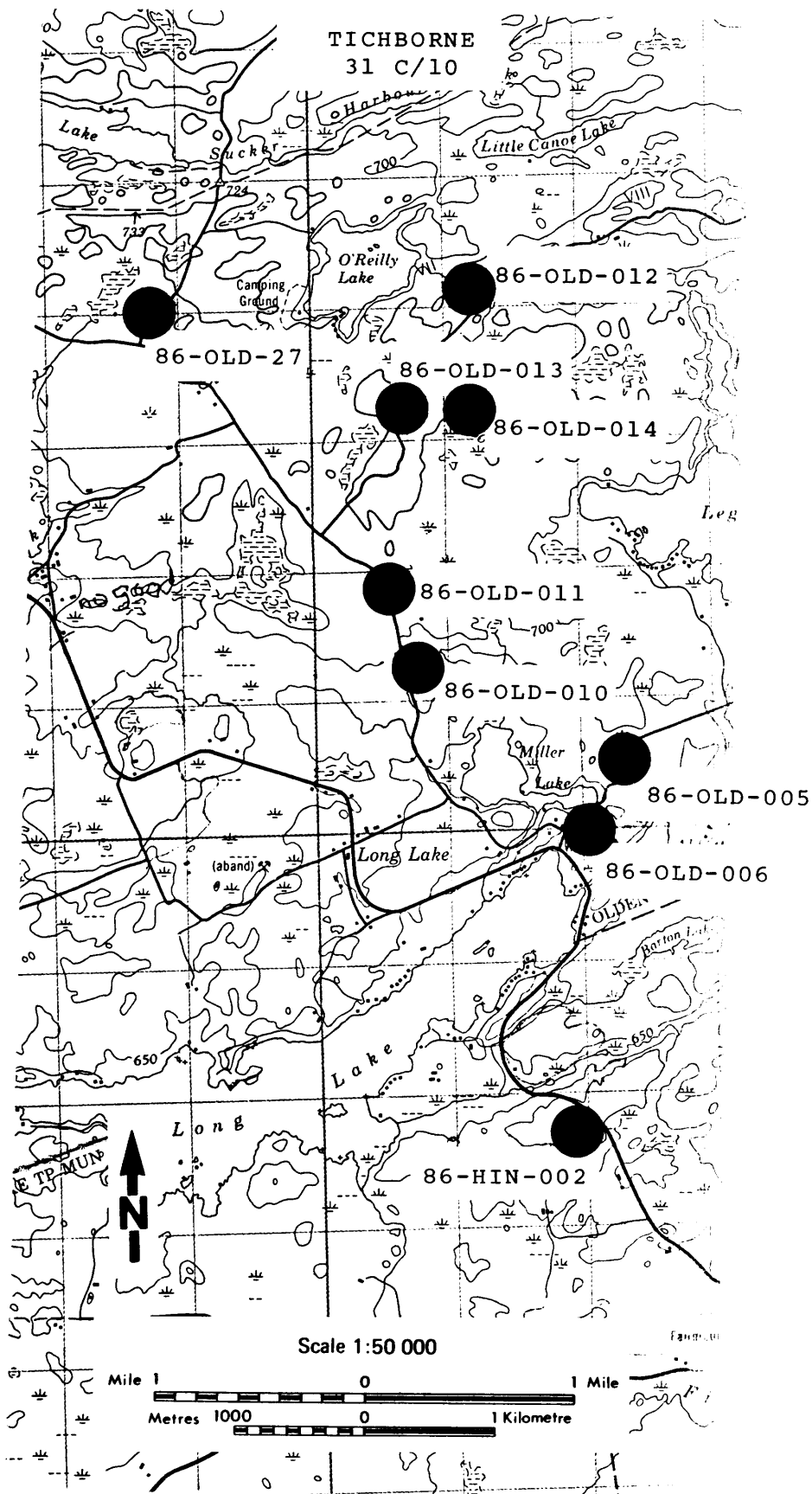


Figure B30. Sample locations, Mountain Grove mafic intrusion.

86-OLD-027

PROPERTY NO. 86-OLD-027 PLUTON NAME Mountain Grove Mafic
Intrusion

PROPERTY NAME Brewers Road COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro

TOWNSHIP Olden LOT 10 CONC. 6

NTS 31 C/10 UTM CO-ORDINATES Easting 358800 Northing 4954000

PROPERTY STATUS Roadcut Air Photo No. 78-4451-143-112

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes X No Type High velocity

COLOUR Fresh Surface Almost black - very dark grey
 Weathered Surface Light grey
 Uniform X Variable

WEATHERING DEPTH 5 mm

GRAIN SIZE Medium to coarse Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 130 degrees Dip Vertical Spacing 0.25 to 0.5 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Plagioclase, pyroxene

DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace

OTHER FEATURES Many felsic stringers were noted in the area.

POSSIBLE USES Ornamental stone, ashlar, paving stone

OUTCROP EXPOSURE Good Fair X Poor

COMMENTS The stone at this site is a dark grey to black gabbro and is quite attractive. The area shows fair outcropping with intense irregular jointing. The rock is uniformly massive and medium to coarse grained. Jointing, felsic stringers and trace amounts of pyrite combine to make this a poor prospect for building stone.

NEWBORO PLUTON

LOCATION North Crosby Township, between Westport and Newboro
NTS 31 C/9 OGS Map 2054 GSC Map 1182A GSC Memoir 346
SAMPLE SITE 86-NCROS-005

DESCRIPTION OF AREA

The Newboro pluton has very limited exposure which made both sampling and evaluation difficult. Access across the centre of the pluton was possible by a hydro line. This was traversed but no outcrop was encountered.

The rock is an attractive red-brown syenite that has a uniform colour, texture and grain size. The jointing is regular but the intensity is indeterminate. Wynne-Edwards (1967, p.84) described the Newboro Lake area as follows:

"The Newboro Lake area is a northeastward extension of the Devil Lake block, but the structures within it are less clearly defined. Layered gneisses with associated fine-grained pink granulite are exposed on islands in Newboro Lake and trend east-northeast to northeast with northwestward dips. North of Scott Island, these rock abruptly swing northwestward towards the Devil Lake anticline and describe an arc about the monzonite body west of Newboro. Concomitantly, the direction of plunge of fold axes changes progressively from northeast in the western part of the area through north, to northwest near Newboro village. The amount of plunge remains roughly constant at about 55 degrees throughout the area, so that the fold axes trace out part of a cone with a vertical axis. The arcuate trend of these gneisses and the change in direction of the fold axes appear to be related to the late stages of deformation in the Rideau Lakes area."

CONCLUSIONS

Due to the highly limited outcrop exposure and the presence of sulphides (1%), this pluton has a very low potential for building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-NCROS-005		

REFERENCES

Hewitt, D.F. 1964. Geological notes for Maps Nos. 2053 and 2054, Madoc-Gananoque area, NTS 31B/5+12, 31C, Ontario; Ontario Department of Mines, Geological Circular 12, 33p.

Wynne-Edwards, H.R. 1967. Westport map-area, Ontario; Geological Survey of Canada, Memoir 346, 142p.

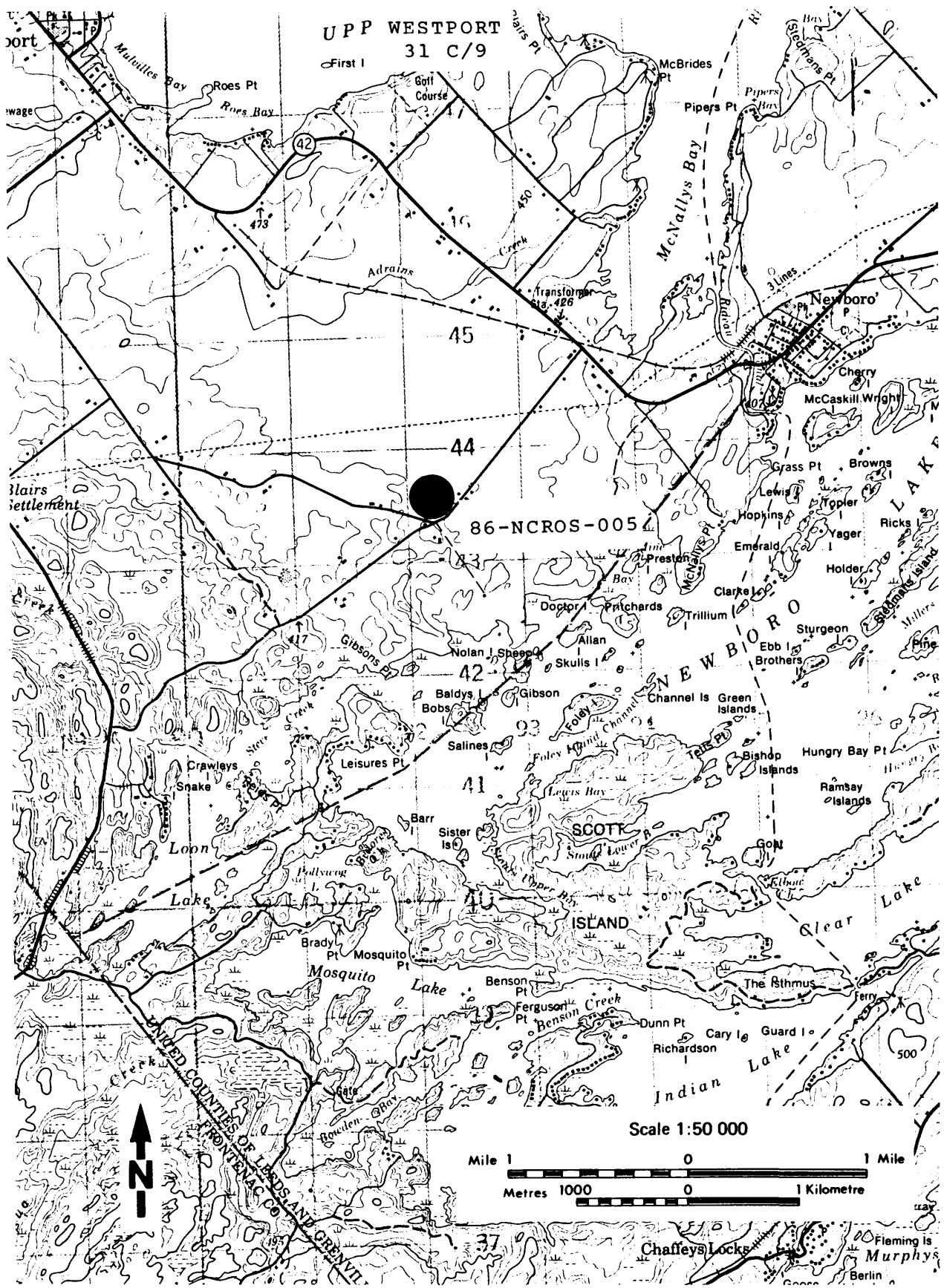


Figure B31. Sample location, Newboro pluton.

86-NCROS-005

PROPERTY NO. 86-NCROS-005 PLUTON NAME Newboro Pluton
PROPERTY NAME Blairs Settlement COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP North Crosby LOT 3 CONC. 7
NTS 31 C/9 UTM CO-ORDINATES Easting 392050 Northing 4943450
PROPERTY STATUS Prospect Air Photo No.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type Roadcut
COLOUR Fresh Surface Reddish brown
Weathered Surface Bleached pink to dark grey
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X (blasting)
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 030 degrees Dip vertical Spacing (blasting)
B) Strike 110 degrees Dip vertical Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, pyroxene (amphibole); Mafic content: approx.
20 to 30%
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Small volume, cut by a silica dike, rare mafic stringers
(2 mm).
POSSIBLE USES Terrazzo chips, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This is a very attractive, reddish-brown syenite which is very
competent and has few flaws. However, the site is adjacent to a large quartz
dike and a zone of pegmatitic material, and the rock locally contains mafic
stringers. Outcrop exposure is poor and blasting has obscured the joint
pattern.

NORTHBROOK BATHOLITH

LOCATION Northeast quarter of Kaladar Township and the northern half of Kennebec Township

NTS 31 C/11 QGS Maps 51D, 2432 Geological Reports 215, AR 51, pt.4

SAMPLE SITES 86-KAL-006, 86-KEN-001, 86-KEN-002, 86-KEN-003, 86-KEN-004, 86-KEN-005, 86-KEN-006

DESCRIPTION OF AREA

Wolff (1982b, p.44) described this batholith as follows:

"This body is structurally very massive, weakly lineated with a locally developed discontinuous gneissosity. The batholith contains many northeast and east-trending lineaments which truncate and cut one another. Faults with obvious offsets tend to have southeasterly trends. Some southeast trending pink-white pegmatite dikes cut the batholith along its southern margin."

Rock types observed within the Northbrook batholith consist of monzonites, specifically quartz monzonites and biotite quartz monzonites. All of these are moderately to strongly foliated (due to alignment of biotite crystals). The northernmost samples appear to be less foliated than the southern sites (86-KEN-001, 002, 003, 004). The average strike of the foliation is 50 degrees and the dip is variable to the south. One site, in Kaladar Township, has a dip of 70 degrees to the west.

The colour of all of the sites in Kennebec Township is generally uniform pink to light pink. The Kaladar site (86-KAL-006) has a brown/black fresh surface which is also uniform.

Jointing is one of the major limiting factors at all of these sites. All sites show irregular and regular jointing and all but one (86-KEN-001) is jointed intensely. Horizontal sheeting is also evident and rarely reaches spacings of over 1 m, averaging approximately 0.5 m.

Other features which hamper the potential for building stone include pegmatite dikes, many quartz stringers, aplite pods and exfoliation. Some sites have areas where large-sized blocks could be removed without jointing problems. These same areas were invariably plagued with the shortcomings listed above.

CONCLUSION

The Northbrook batholith has little potential for large quarry blocks. In areas such as 86-KEN-001 it would be feasible for rock to be removed for ashlar, paving stone or crushed stone, if a nearby market for such could be found.

POTENTIAL

POOR	MODERATE	GOOD
86-KAL-006	86-KEN-002 86-KEN-003 86-KEN-004	86-KEN-001
86-KEN-005		
86-KEN-006		

REFERENCES

Ambrose, J.M. and Burns, C.A. 1956. Structures in the Clare River syncline: a demonstration of granitization; Royal Society of Canada, Special Publication 1, p.42-53.

Brown, R.L., Chappell, J.F., Moore, J.M., Jr. and Thompson, P.H. 1975. An ensimatic island arc and ocean closure in the Grenville Province of southeastern Ontario, Canada; Geoscience Canada, v.2, no.3, p.141-144.

Chesworth, W., Shaw, D. and Dostal, J. 1975. Granitoid rocks of the Madoc-Bancroft-Haliburton area of the Grenville Province; in University of Waterloo Field Excursions Guidebook 1975, The Geological Association of Canada, The Mineralogical Association of Canada, and The Geological Society of America, Field Trip 1, p.1-25.

Harding, W.D. 1944. Geology of Kaladar and Kennebec townships, Lennox and Addington, and Frontenac counties, Ontario; Ontario Department of Mines, Annual Report, 1942, v.51, pt.4, p.51-74.

---1951. Geology of the Olden-Bedford area, Frontenac County, Ontario; Ontario Department of Mines, Annual Report, 1947, v.56, pt.6.

MacDonald, G. 1970. Geology-Kingston area; Department of Geology, Carleton University, 1968-70.

Meen, V.B. 1944. Geology of the Grimsthorpe-Barrie area, Hastings, Lennox and Addington, and Frontenac counties, Ontario; Ontario Department of Mines, Annual Report, 1942, v.51, pt.4, p.1-50.

Moore, J.M. and Thompson, P.H. 1972. The Flinton Group, Grenville Province, eastern Ontario; Proceedings of the 24th International Geological Congress, Montreal, p.221-229.

Psutka, J.F. 1976. Provenance of the plutonic pebbles in the Kaladar metaconglomerate and geology of associated metasediments; unpublished BSc thesis, Carleton University, Ottawa.

Wolff, J.M. 1978. Geology of the Kaladar area, NTS 31C/11NE, Southern Ontario; Ontario Geological Survey, Report 215, 95p.

---1978. Long Lake area, Frontenac County; in Summary of Field Work, 1978, Ontario Geological Survey, Miscellaneous Paper 82, p.119-212.

---1982a. Geology of the Long Lake area; Ontario Geological Survey, Report 216, 76p.

---1982b. Geology of the Kaladar area, Frontenac, and Lennox and Addington counties; Ontario Geological Survey, Report 215, 94p.

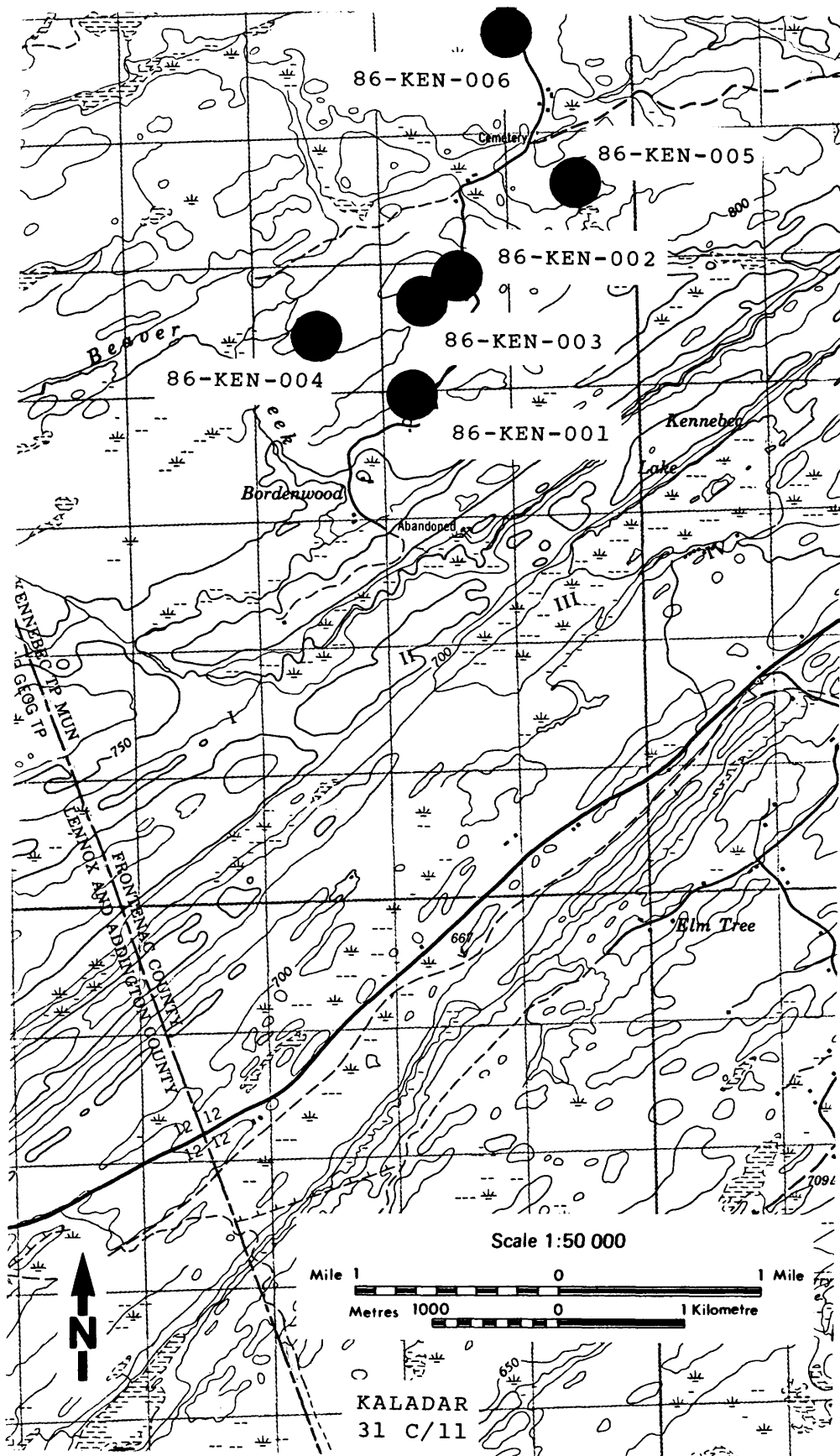


Figure B32. Sample locations, Northbrook batholith (sheet 1).

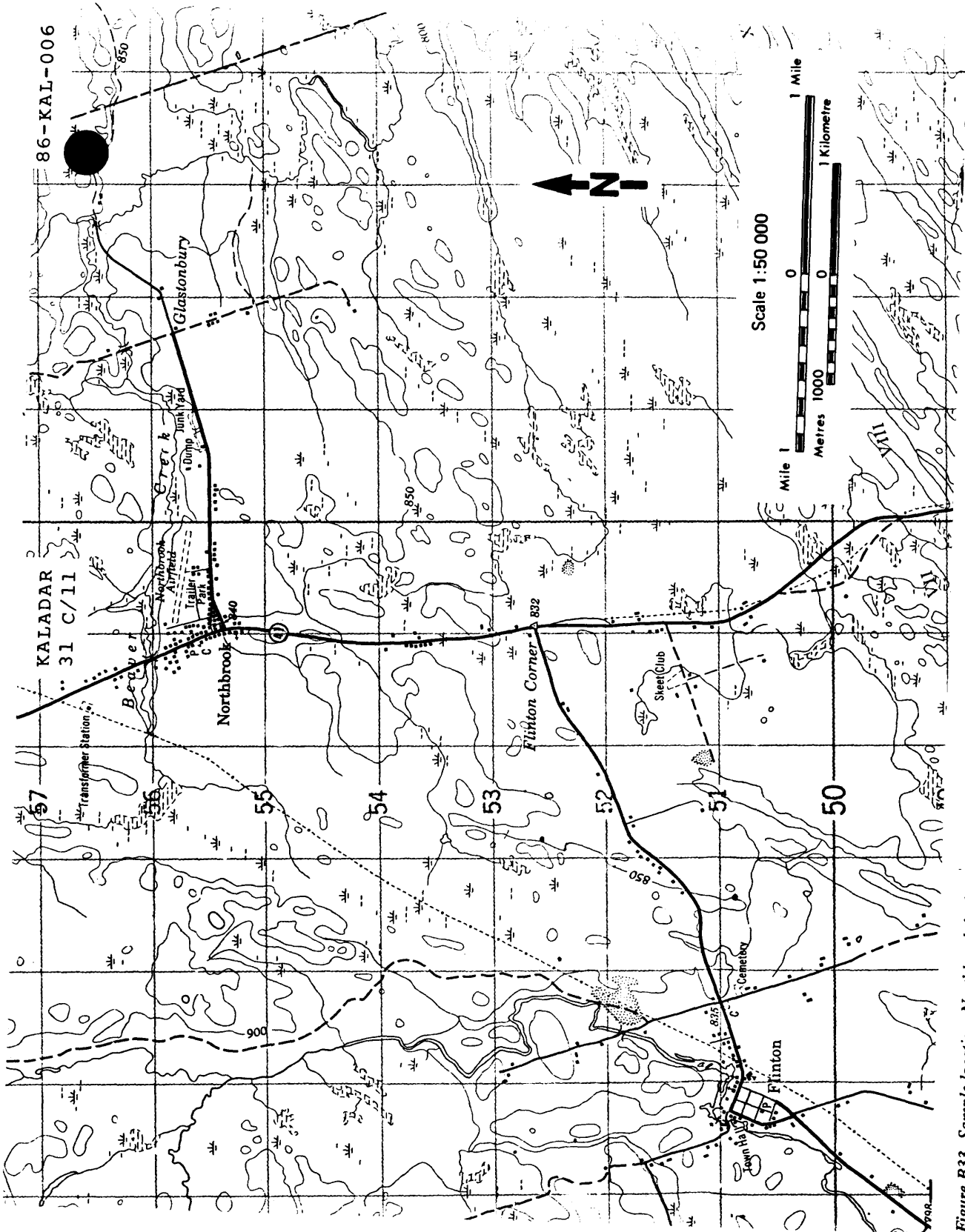


Figure B33. Sample location, Northbrook batholith (sheet 2).

86-KAL-006

PROPERTY NO. 86-KAL-006 PLUTON NAME Northbrook Batholith
PROPERTY NAME Northbrooke 54 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Quartz
Monzonite to Biotite Granite
TOWNSHIP Kaladar LOT 26 CONC. 11
NTS 31 C/11 UTM CO-ORDINATES Easting 333300 Northing 4956600
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4452-157-54
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brown/Black
Weathered Surface Dull Grey
Uniform X Variable
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 50 degrees Dip 70 degrees
west
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Horizontal Dip Spacing 0.5 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Pegmatite dike 1 m wide striking at 160 degrees, some quartz
veins.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a medium-grained, strongly foliated, brownish coloured
granitic rock. Intense irregular jointing, quartz veins and pegmatite dikes
are present at this location.



Photo B51. View of outcrop depicting a number of 1 m benches. 86-KAL-006



Photo B52. View of outcrop showing vertical and horizontal jointing. 86-KAL-006

86-KEN-001

PROPERTY NO. 86-KEN-001 PLUTON NAME Northbrook Batholith
 PROPERTY NAME Skink Hill COMMERCIAL STONE NAME Granite
 GEOLOGICAL ROCK NAME Quartz Monzonite
 TOWNSHIP Kennebec LOT 20 CONC. 3
 NTS 31 C/11 UTM CO-ORDINATES Easting 338200 Northing 4953900
 PROPERTY STATUS Prospect AIR PHOTO NO. 78-4451 143-89
 PRODUCTION HISTORY Nil
 USE OF EXPLOSIVES Yes No X Type
 COLOUR Fresh Surface Pink to black and pink
 Weathered Surface Pink with grey
 Uniform Variable X
 WEATHERING DEPTH 2 mm
 GRAIN SIZE Medium Uniform X Variable
 TEXTURE Gneissic Uniform Variable X
 FABRIC Yes X No. Weak Mod. Strong Strike 60%
 Dip ?
 Formed By Gneissic banding
 BEDDING Yes No X Strike Dip Avg. Thickness
 JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike horizontal Dip Spacing 1 m
 B) Strike 140 degrees Dip 90 degrees Spacing 1 to 4 m varying
 C) Strike 55 degrees Dip 90 degrees Spacing 5 m
 D) Strike Dip Spacing
 POTENTIAL FOR QUARRY BLOCKS Fair
 MINERALOGY Feldspar, quartz, biotite
 DELETERIOUS MINERALS Yes No X Type Percent
 OTHER FEATURES Quartz veins 2 cm thick dipping at 16 degrees east striking at 75 degrees - aplite pods, pegmatitic veining.
 POSSIBLE USES Small quarry blocks for monumental stone, curbing, landscaping, crushed stone, ashlar
 OUTCROP EXPOSURE Good X Fair Poor
 COMMENTS This rock is a medium-grained, pink to pink and black gneissic quartz monzonite. The outcrop exposure at this site is extensive and jointing is limited in local areas. There are some pegmatitic and aplite pods. Horizontal sheeting varies in thickness from 0.3 to 1 m. This area shows some potential for quarry block extraction.

86-KEN-002

PROPERTY NO. 86-KEN-002 PLUTON NAME Northbrook Batholith
PROPERTY NAME Bordenwood Road COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz monzonite
TOWNSHIP Kennebec LOT 21 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 338600 Northing 4954800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4451-143-89
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish red
Weathered Surface Pink with grey
Uniform Variable X
WEATHERING DEPTH 4 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 60 degrees
Dip ?
Formed By Gneissic layering
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X to Intensive Jointing X
A) Strike 140 degrees Dip ? Spacing 0.5 to 6 m
avg. 1 m
B) Strike 30 degrees Dip ? Spacing 3 m
C) Strike horizontal Dip 0 degrees Spacing 0.5 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair to poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES 0.5 m sheeting, granitic stringers and pegmatite dikes (0.5 m).
POSSIBLE USES Ashlar, crushed stone, landscaping stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a medium-grained, pinkish-red gneissic quartz monzonite. The colour varies slightly throughout the outcrop. Joint intensity and horizontal sheeting will restrict potential quarry block sizes. The strong foliation (gneissosity) of this rock may make it particularly suitable for split stone applications.

86-KEN-003

PROPERTY NO. 86-KEN-003 PLUTON NAME Northbrook Batholith
PROPERTY NAME Dean Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Quartz Monzonite
TOWNSHIP Kennebec LOT 21 CONC. 3
NTS 31 C/11 UTM CO-ORDINATES Easting 338400 Northing 4954700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4451-143-89
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Light pink
Weathered Surface Pinkish
Uniform X Variable
WEATHERING DEPTH 0.5 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Gneissic Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike 40 degrees
Dip
Formed By Gneissic layering
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X to Intensive Jointing X
A) Strike 140 degrees Dip vertical Spacing 1 to 10 m
B) Strike 30 degrees Dip vertical Spacing 2 to 3 m
C) Strike 60 degrees Dip 65 degrees E Spacing 0.5 m
D) Strike 185 degrees Dip vertical Spacing 0.5 to 1 m
E) Strike horizontal Dip 0 degrees Spacing 0.5 to 1.5 m
POTENTIAL FOR QUARRY BLOCKS Poor to fair
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz pods and veins (1 to 10 cm wide), stringers, pegmatite
dikes (up to 1 m) moderate exfoliation.
POSSIBLE USES Ashlar, crushed stone, small quarry blocks
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This is a medium-grained, light pink, gneissic quartz monzonite.
Many quartz stringers and pods, ranging from 1 to 10 cm wide are present in this
outcrop. Pegmatitic and aplitic pods are also present. Both regular and
irregular, moderate to intense joint patterns are apparent. Horizontal joint
spacing ranges from about 0.5 to 1.5 m.



Photo B53. Good outcrop exposure along with moderate to intense jointing. 86-KEN-003



Photo B54. Good outcrop exposure along with moderate to intense jointing. 86-KEN-003

86-KEN-005

PROPERTY NO. 86-KEN-005 PLUTON NAME Northbrook Batholith
PROPERTY NAME Bordenwood Cemetery COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Quartz Monzonite
TOWNSHIP Kennebec LOT 22 CONC. 4
NTS 31 C/11 UTM CO-ORDINATES Easting 339550 Northing 4955600
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4452-157-54
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
 Weathered Surface Pink-Grey
 Uniform X Variable
WEATHERING DEPTH <1 cm
GRAIN SIZE Medium to fine Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 45 degrees
 Dip 5 degrees S
 Formed By Gneissic banding
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 140 degrees Dip vertical Spacing 0.5 to 2 m
 B) Strike 20 degrees Dip vertical Spacing 0.7 to 3 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins (1 to 4 cm wide); aplite pods, granitic stringers.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a gneissic, pink quartz monzonite with a medium to fine grain size. Jointing is intensive in both regular and irregular patterns. There are numerous granitic stringers, quartz veins, and aplitic pods present at this location.

86-KEN-006

PROPERTY NO. 86-KEN-006 PLUTON NAME Northbrook Batholith
PROPERTY NAME Henderson Road COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Quartz
Monzonite
TOWNSHIP Kennebec LOT 23 CONC. 4
NTS 31 C/11 UTM CO-ORDINATES Easting 339000 Northing 4956800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4452-157-60
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Greyish with pink spots
Weathered Surface Grey
Uniform X Variable
WEATHERING DEPTH 0.2 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 60 degrees
Dip ?
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 065 degrees Dip Spacing 0.2 to 1 m
B) Strike 140 degrees Dip Spacing 0.3 to 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Pegmatite dikes (up to 2 m wide), small granitic stringers
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a medium-grained, moderately foliated, grey biotite quartz monzonite. Pegmatite dikes, aplite dikes and pods, and quartz stringers are present. There is intense jointing. Horizontal sheeting is wide spread and closely spaced.

RIDEAU LAKE PLUTON

LOCATION North shore of Rideau Lake, mostly within North Burgess Township

NTS 31 C/9 OGS Map 2054 GSC Map 1182A GSC Memoir 346

SAMPLE SITES 86-NBURG-001, 86-NBURG-002, 86-NBURG-003, 86-NBURG-004,
86-NBURG-005

DESCRIPTION OF AREA

The Rideau Lake Pluton is located on the north shore of Rideau Lake and is situated east of the Westport and Wolf Lake plutons.

The rock found in the area is pinkish brown and massive to slightly foliated with predominantly irregular and intense jointing. Major mineral constituents are K-spar, plagioclase, biotite and quartz. Many deleterious features were seen throughout the outcrops visited. These include pegmatite dikes, quartz veins and pods, aplite dikes, and mafic inclusions.

The best site seen in this intrusion is 86-NBURG-005. Outcrop exposure is poor. Jointing is locally moderate, but some areas display intense horizontal sheeting.

CONCLUSIONS

Based on the site examinations, the area appears to have low potential for building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-NBURG-001		
86-NBURG-002		
86-NBURG-003		
86-NBURG-004		
86-NBURG-005		

REFERENCES

- Davidson, A., Britton, J.M., Bell, K. and Blendinsop, 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.153-262.
- Hewitt, D.F. 1964. Geological notes for Maps Nos. 2053 and 2054, Madoc-Gananoque area, NTS 31B/5 + 12, 31C, Ontario; Ontario Department of Mines, Geological Circular 12, 33p.
- Wynne-Edwards, H.R. 1967. Westport map-area, Ontario; Geological Survey of Canada, Memoir 346.

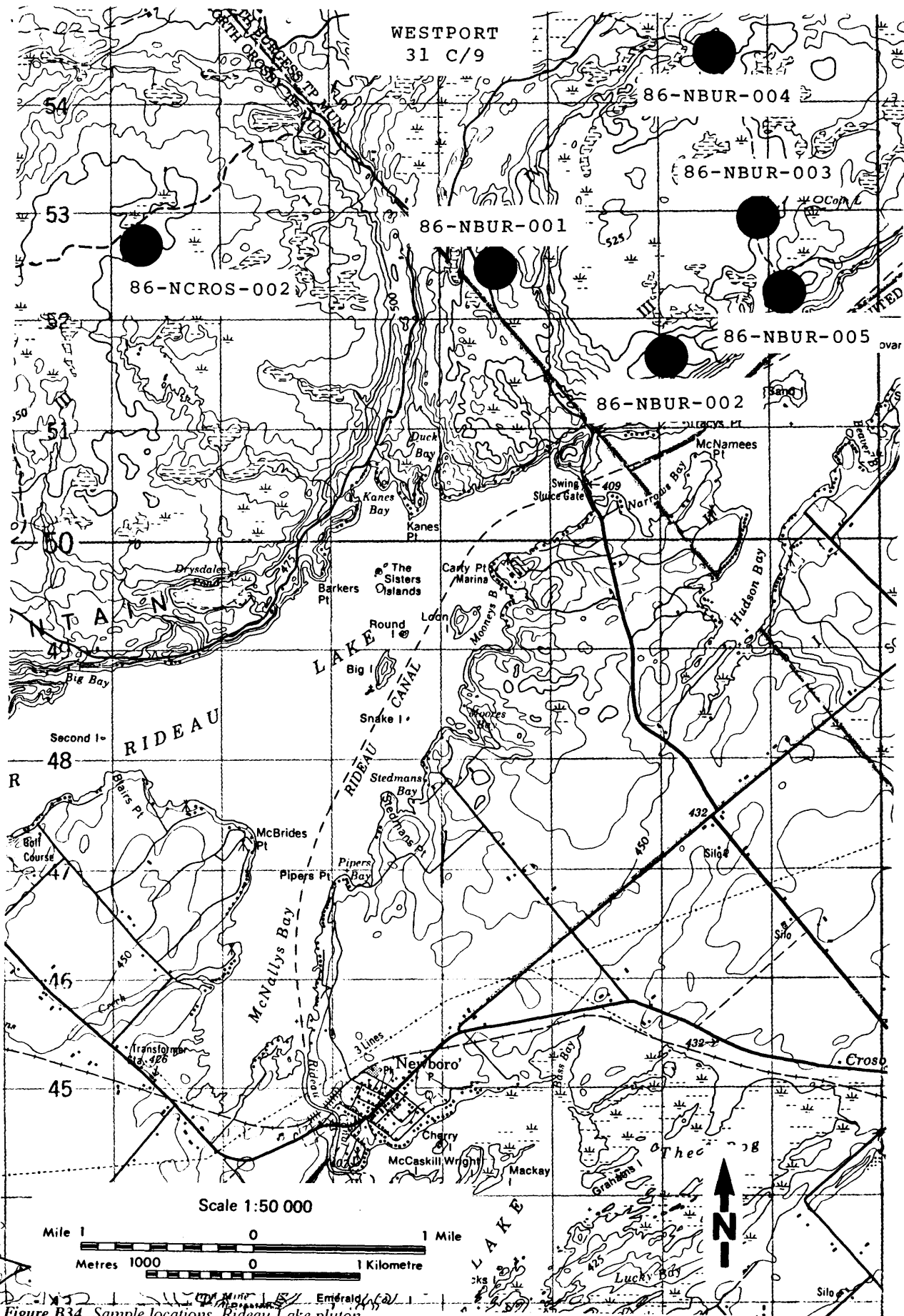


Figure B34. Sample locations, Rideau Lake pluton.

86-NBUR-001

PROPERTY NO. 86-NBUR-001 PLUTON NAME Rideau Lake Complex
PROPERTY NAME The Narrows COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP North Burgess LOT 26 CONC. 4
NTS 31 C/9 UTM CO-ORDINATES Easting 396500 Northing 4952450
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-86
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Brownish orange
Weathered Surface Grey to black
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Foliated Uniform Variable
FABRIC Yes No. Weak Mod. X Strong Strike Dip
Formed By Alignment of the biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite; Mafic content: approx. 30%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Biotite content (20 to 30%), quartz veins, mafic inclusions, pegmatitic and aplite dikes, quartz pods.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This is a brownish-orange biotite-granite which is extensively weathered. Along the 100 m outcrop, aplite dikes, quartz veins, pegmatite and mafic inclusions were observed. The high biotite content limits the potential of this rock for building stone development. The horizontal sheeting is less than 10 cm over much of this site.

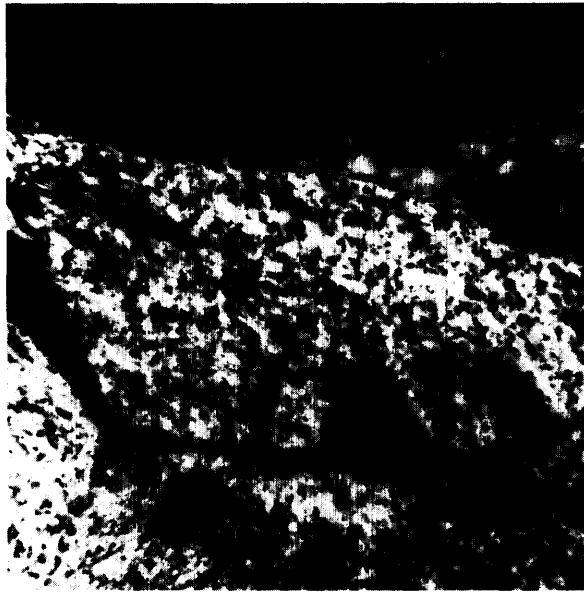


Photo B55. Fresh surface of granite, exhibiting high biotite content. 86-NBUR-001

86-NBUR-002

PROPERTY NO. 86-NBUR-002 PLUTON NAME Rideau Lake Complex
PROPERTY NAME Tracy's Point COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP North Burgess LOT 25 CONC. 3
NTS 31 C/9 UTM CO-ORDINATES Easting 398050 Northing 4951700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-86
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 mm
GRAIN SIZE Coarse Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes No. Weak X Mod. Strong Strike Dip
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 105 degrees Dip 90 degrees Spacing 0.2 to 1 m
B) Strike 40 degrees Dip 90 degrees Spacing 0.2 to 0.5 m
C) Strike Horizontal Dip Spacing 0.1 to 0.5 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite; Mafic content: approx. 25%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare quartz veining
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This site contains low rounded ridges of pink, coarse syenite. The rock is weakly foliated. The coarse biotite crystals, which comprise approximately 25% of the rock, may tend to be plucked during cutting and polishing. A feature of this site which further diminishes its building stone potential is the intensive jointing.

876-NBUR-004

PROPERTY NO. 86-NBUR-004 PLUTON NAME Rideau Lake Complex
PROPERTY NAME Black Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP North Burgess LOT 21 CONC. 4
NTS 31 C/9 UTM CO-ORDINATES Easting 398500 Northing 4954450
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-88
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Red
Weathered Surface Pinkish red
Uniform X Variable
WEATHERING DEPTH
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite; Mafic content: approx. 30%
DELETERIOUS MINERALS Yes X No Type Specularite Percent Trace
OTHER FEATURES Alteration of mafics.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS The outstanding feature of this medium-grained, massive syenite is the deep red colour of the feldspars. Alteration of the mafic component and the intense irregular jointing found in this area limit the building stone potential. Nevertheless, owing to its deep red colour, this rock may have some use in the building stone industry.

86-NBUR-005

PROPERTY NO. 86-NBUR-005 PLUTON NAME Rideau Lake Complex

PROPERTY NAME SW of Sand Island COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Syenite

TOWNSHIP North Burgess LOT 23 CONC. 3

NTS 31 C/9 UTM CO-ORDINATES Easting 399150 Northing 4952250

PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-88

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Pink
 Weathered Surface Light pink
 Uniform X Variable

WEATHERING DEPTH 1 cm

GRAIN SIZE Medium Uniform Variable X

TEXTURE Foliated Uniform X Variable

FABRIC Yes X No. Weak Mod. X Strong Strike Dip
 Formed By Alignment of biotite crystals

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X to Intensive Jointing X
 A) Strike 108 degrees Dip 90 degrees Spacing 0.5 to 1.5 m
 B) Strike 80 degrees Dip 90 degrees Spacing 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Feldspar, biotite; Mafic content: approx. 20 to 25%

DELETERIOUS MINERALS Yes No X Type Percent

OTHER FEATURES Quartz veins, aplite dikes, slight mafic alteration

POSSIBLE USES Ashlar, crushed stone

OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This outcrop contains a medium-grained, moderately foliated, pink syenite that is uniform in colour and texture. Jointing occurs in regular and irregular vertical sets, generally with moderate intensity. The presence of biotite crystals (approximately 20% of the rock, 2 to 5 mm in size) will limit this rock's ability to take a polish. Other deleterious features include quartz veins, aplite dikes and poor exposure.

SKOOTAMATTA LAKE AREA

LOCATION Central Anglesea Township

NTS 31 C/14 OGS Map 2053 Geological Report AR 21, pt.4

SAMPLE SITES 86-ANG-001, 86-ANG-002, 86-ANG-003, 86-GRI-006, 86-GRI-007

DESCRIPTION OF AREA

The Skootamatta Lake area is composed of an area of pink granites and syenites, mafic intrusives and the extreme southern portion of the Weslemkoon granite. The Weslemkoon granite portion is located to the west of Skootamatta Lake in Grimsthorpe Township.

Two samples were taken from the pink granites, 86-ANG-001, 002. Outcrop exposure in the area is very poor and good sites for evaluation are difficult to find. The rock found here is a massive, medium- to coarse-grained pink granite. Both regular and irregular jointing is common and tends to be very intensive. At 86-ANG-001, horizontal jointing was seen to be within a range of 0.1 to 0.5 m. While the rock is fairly attractive, deleterious features such as the jointing and presence of aplite dikes appear to make this area one of low building stone potential.

The area of mafic intrusion is to the north, west and southeast of the lake. One sample was taken from this area (86-ANG-003). This rock appears to be gabbroic anorthosite and is quite attractive, with a violet hue on the fresh surface. The rock is massive, medium to coarse grained and outcrop exposure is quite good.

Close examination of the rock revealed the presence of sulphides, probably pyrite.

Only one major joint set could be identified, striking about 140 degrees with a vertical dip. Spacing of the joints is from 0.5 to 1.0 m. The jointing, sulphide content, and fine stringers of quartz found throughout the area limit the potential for building stone.

Farther to the west, two samples were taken in the extreme southern part of the Weslemkoon granite. Both are massive, medium-grained, grey granite with a salt and pepper appearance on the fresh surface.

Jointing in both areas is regular but fairly intensive with spacing up to about 1.5 m and dipping vertically. Sulphides were noticed at 86-GRI-006 but not at 86-GRI-007. Quartz veining was noticed at both sites but 86-GRI-007 contained pegmatite dikes, aplite pods and some mafic inclusions. Because of the above mentioned features this area shows little potential for building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-ANG-001		
86-ANG-002		
86-ANG-003		
86-GRI-006		
86-GRI-007		

REFERENCES

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.153-262.

Meen, V.B. 1944. Geology of the Grimsthorpe-Barrie area, Hastings, Lennox and Addington, and Frontenac counties, Ontario; Ontario Department of Mines, Annual Report, 1942, v.51, pt.4, p.1-50.

Wahl, W.G. 1960. An interpretive technique for delimiting mineral potential areas based on the magnetic susceptibility of source rocks; Proceedings of the 21st International Geological Congress, pt.2, p.200-215.

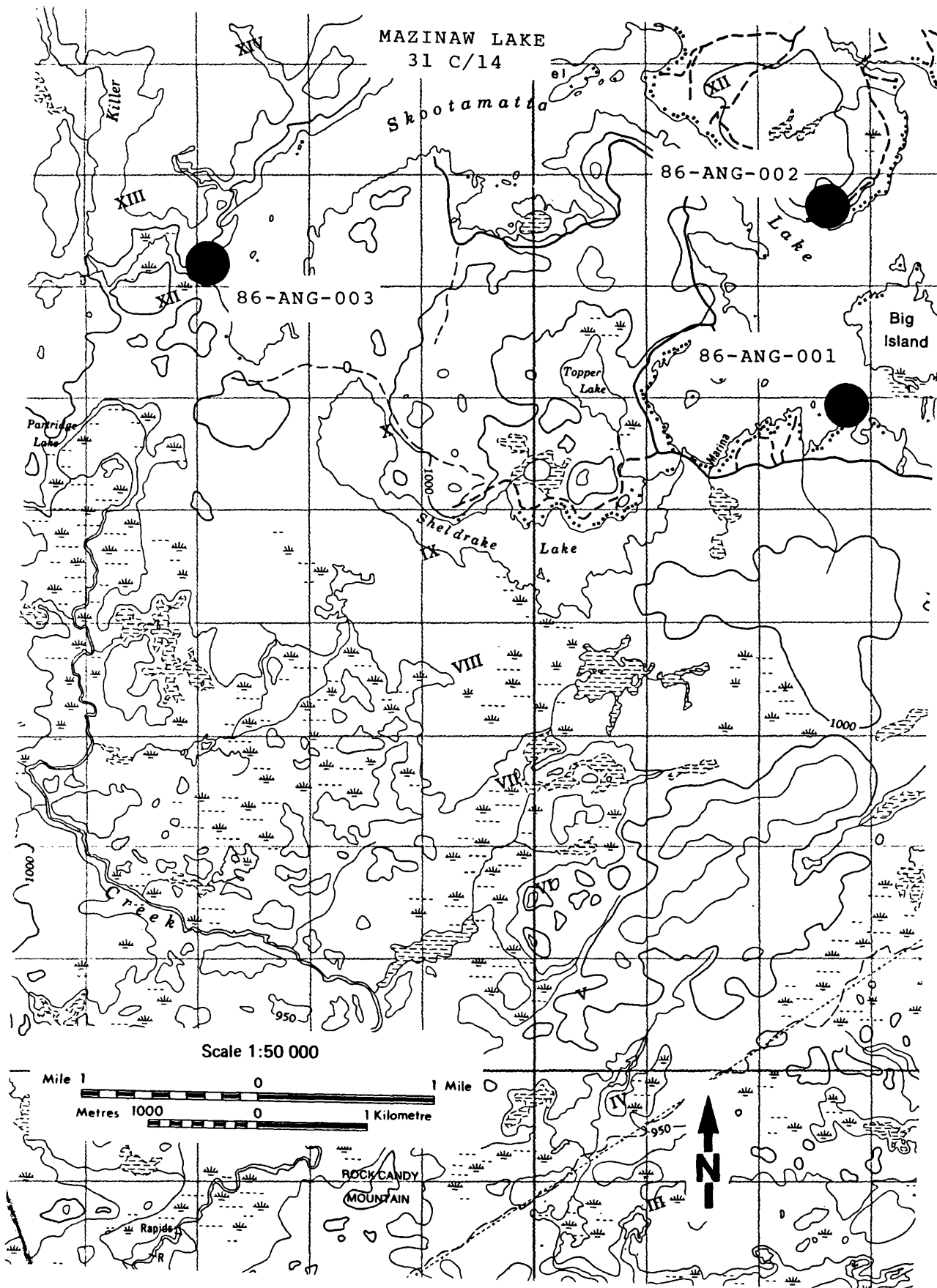


Figure B35. Sample locations, Skootamatta Lake area (sheet 1).

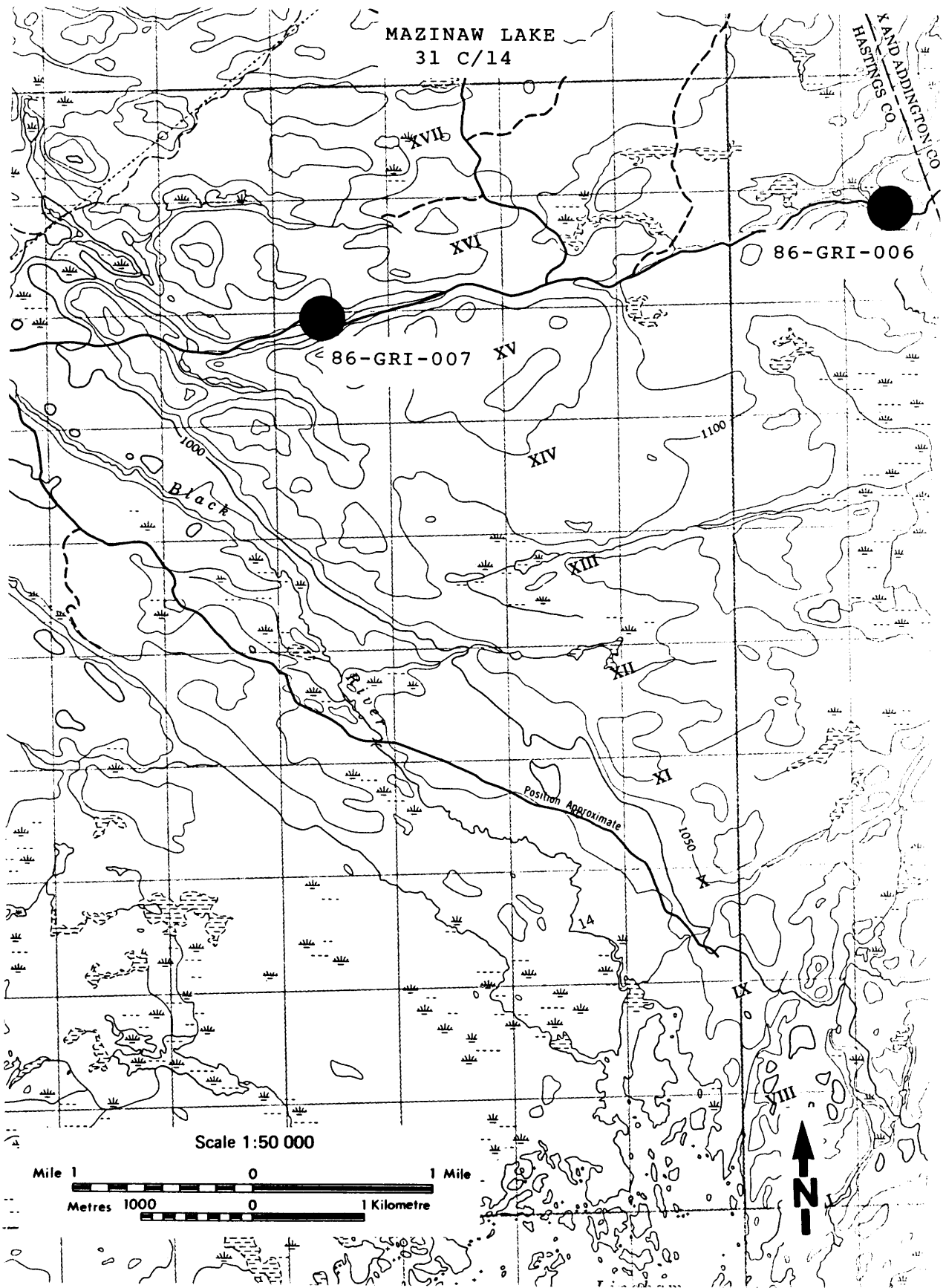


Figure B36. Sample locations, Skootamatta Lake area (sheet 2).

86-ANG-001

PROPERTY NO. 86-ANG-001 PLUTON NAME Skootamatta Lake Granite
PROPERTY NAME Skootamatta Lake #1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Anglesea LOT 11 CONC. 9
NTS 31 C/14 UTM CO-ORDINATES Easting 322800 Northing 4965900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4458-189-121
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink with black
Weathered Surface Pink-grey
Uniform X Variable
WEATHERING DEPTH 1 to 2 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X to
A) Strike Horizontal Dip Spacing 0.1 to 0.5 m
B) Strike 150 degrees Dip Vertical Spacing 1.5 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz; Mafic content: approx. 30%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Coarse biotite crystals (max. 5 mm dia.), exfoliation
horizontal jointing (extensive), rare aplite dikes observed (2 cm wide).
POSSIBLE USES Ashlar, paving stone, crushed stone
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This sample is a massive, medium-grained, pink granite which contains some coarse biotite crystals. Biotite comprises approximately 30% of the rock; this may reduce the ability of the rock to take a polish. Furthermore, outcrop exposure is poor and horizontal jointing is extensive. A regular vertical joint set strikes at 150 degrees and has a spacing of approximately 1.5 m. The presence of an aplite dike is another deleterious feature which limits building stone potential in this area.

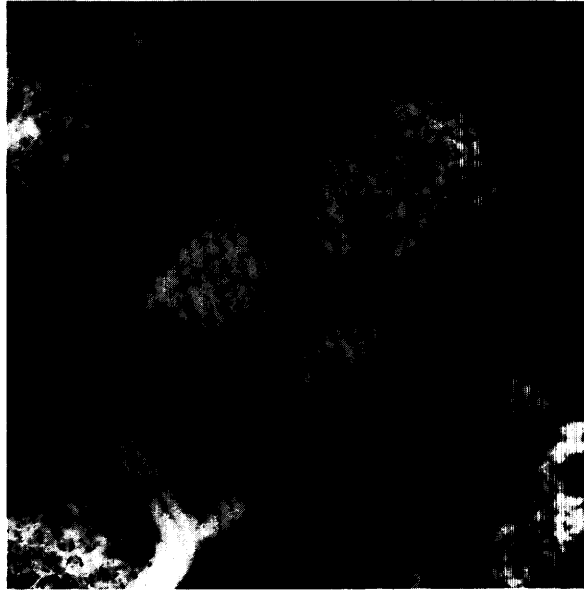


Photo B56. Close-up of pink-grey granite. 86-ANG-001

86-ANG-002

PROPERTY NO. 86-ANG-002 PLUTON NAME Skootamatta Lake Granite
PROPERTY NAME Skootamatta 2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Syenite
TOWNSHIP Anglesea LOT 10 CONC. 11
NTS 31 C/14 UTM CO-ORDINATES Easting 322600 Northing 4967800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4459-190-72
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Red
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Aplite dike, major weathering - blocks falling off.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a red, massive syenite. The nature and intensity of jointing, inconsistent grain size, and poor outcrop exposure diminish the building stone potential of this area. Other deleterious features include aplite dikes and extensive weathering.

86-ANG-003

PROPERTY NO. 86-ANG-003 PLUTON NAME Skootamatta Lake Granite
PROPERTY NAME Killer Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbroic Anorthosite
TOWNSHIP Anglesea LOT 23 CONC. 12
NTS 31 C/14 UTM CO-ORDINATES Easting 317100 Northing 4967300
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4458-189-116
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Violet black
 Weathered Surface Dark grey to black
 Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Medium to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike 140 degrees Dip near vertical Spacing 0.5 to 1 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, amphibole; Mafic content: approx. 40%
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Stringers of quartz, amphibole alteration.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS The rock at this site is a medium- to coarse-grained, violet-black, gabbroic anorthosite. The amphibole has been somewhat altered. The texture is massive and jointing is irregular and intense. Quartz stringers were also observed in this rock. These factors diminish the building stone potential of this area.

86-GRI-006

PROPERTY NO. 86-GRI-006 PLUTON NAME Weslemkoom Granite,
Skootamatta Lake Area

PROPERTY NAME Partridge Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite

TOWNSHIP Grimsthorpe LOT 3 CONC. 15

NTS 31 C/14 UTM CO-ORDINATES Easting 311400 Northing 4968750

PROPERTY STATUS Prospect AIR PHOTO NO.

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Salt and pepper
 Weathered Surface Pinkish grey to black
 Uniform X Variable

WEATHERING DEPTH 1 to 2 m

GRAIN SIZE Medium Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X to Intensive Jointing X
 A) Strike 60 degrees Dip Vertical Spacing 0.5 m to 1.5 m
 B) Strike 140 degrees Dip Vertical Spacing 0.1 m to 1 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Feldspar, quartz, biotite; Mafic Content: approx. 15 to 20%

DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace

OTHER FEATURES Quartz veins, minor feldspar alteration.

POSSIBLE USES Ashlar, crushed stone

OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This sample is a massive, medium-grained granite which has a salt and pepper appearance. Jointing is moderate to intensive and occurs in regular joint sets. Other deleterious features include the presence of quartz veins and sulphides. Outcrop exposure is very good.

86-GRI-007

PROPERTY NO. 86-GRI-007 PLUTON NAME Weslemkoom Granite,
Skootamatta Lake Area

PROPERTY NAME N.E. Black River COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Granite

TOWNSHIP Grimsthorpe LOT 14 CONC. 16

NTS 31 C/14 UTM CO-ORDINATES Easting 306400 Northing 4967900

PROPERTY STATUS Prospect AIR PHOTO NO.

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Salt and pepper to pink salt and pepper
Weathered Surface Grey
Uniform Variable X

WEATHERING DEPTH 1 to 2 mm

GRAIN SIZE Medium Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 160 degrees Dip Vertical Spacing Up to 1 m
B) Strike 110 degrees Dip Vertical Spacing Up to 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Feldspar, quartz, biotite; Mafic content: approx. 20 to 25%

DELETERIOUS MINERALS Yes No X Type Percent

OTHER FEATURES Pegmatite dike, quartz veining, aplite pods, mafic inclusions, rare feldspar megacrysts.

POSSIBLE USES Ashlar, crushed stone

OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This is a massive, medium-grained granite. The colour of this rock varies from a salt and pepper to a pink black and white colour across the outcrop. Rare feldspar megacrysts are present. Jointing is intense and regular. Other deleterious features observed include aplite pods, pegmatite dikes, quartz veins and mafic inclusions.

TAMWORTH, BELLROCK, WILKINSON, FIRST DEPOT MAFIC INTRUSIONS

LOCATION Camden East, Portland, Hinchinbrooke

NTS 31 C/7 QGS Map 2053

SAMPLE SITES 86-CAM-001, 86-POR-001, 86-POR-002, 86-POR-003, 86-POR-004,
86-HIN-001

DESCRIPTION OF AREA

The rocks found in these mafic intrusions include diorite, gabbro, anorthosite, metagabbro and amphibolite.

The first site visited was the Tamworth mafic intrusion just south of the town of Tamworth. The rock found here is a fine- to medium-grained, massive dark grey rock. The jointing in the area is irregular and intense thereby diminishing any building stone potential. Other features found in the area include quartz stringers and pods and black blotches of weathered material that occur commonly throughout the outcrop.

The second intrusion visited was the Bellrock mafic intrusion in Portland Township. The rock found here was anorthositic in composition but not very fresh and also showed significant surface weathering. The jointing seen in the area was both regular and irregular and moderate in intensity with a 1 m spacing, dipping vertically along a 120 strike. The grain size is medium to coarse, the texture is massive, and the rock appears fairly attractive. Some quartz veins and pyrite were seen throughout the outcrops. This area should be further investigated. 86-POR-003 seems to show the most potential. The First Depot Lake mafic intrusion seems to show very little potential. Outcrop exposure is very poor and most outcrops exhibit intense, irregular jointing. The rock is a massive, medium-grained gabbro. The area is surrounded by foliated felsic rocks.

The Wilkinson anorthosite intrusion in Hinchinbrooke Township is a dark greyish-black, massive, coarse-grained, porphyritic rock that is quite attractive. The jointing in the area is both regular and irregular and is generally quite intensive. This area is a very good example of an anorthosite and shows very large plagioclase crystals. One crystal measured 14 by 23 cm. The plagioclase crystals are not fresh and appear to be saussuritized. The area also displays some mafic xenoliths and moderately abundant granitic and quartz stringers. Due to the above factors, this area is deemed to have poor to moderate potential.

POTENTIAL

POOR		MODERATE	GOOD
	86-HIN-001		
86-CAM-001			
86-POR-001			
86-POR-002			
86-POR-003			
86-POR-004			

REFERENCES

Harrison, J.M. 1944. Anorthosites in southeastern Ontario, Canada; Geological Society of America, Bulletin, v.55, pt.2, p.1401-1430.

MacDonald, G. 1970. Geology-Kingston area; Department of Geology, Carleton University, 1968-70.

Harding, W.D. 1951. Geology of the Olden-Bedford area; Ontario Department of Mines, Annual Report, 1947, v.56, pt.6, 100p.

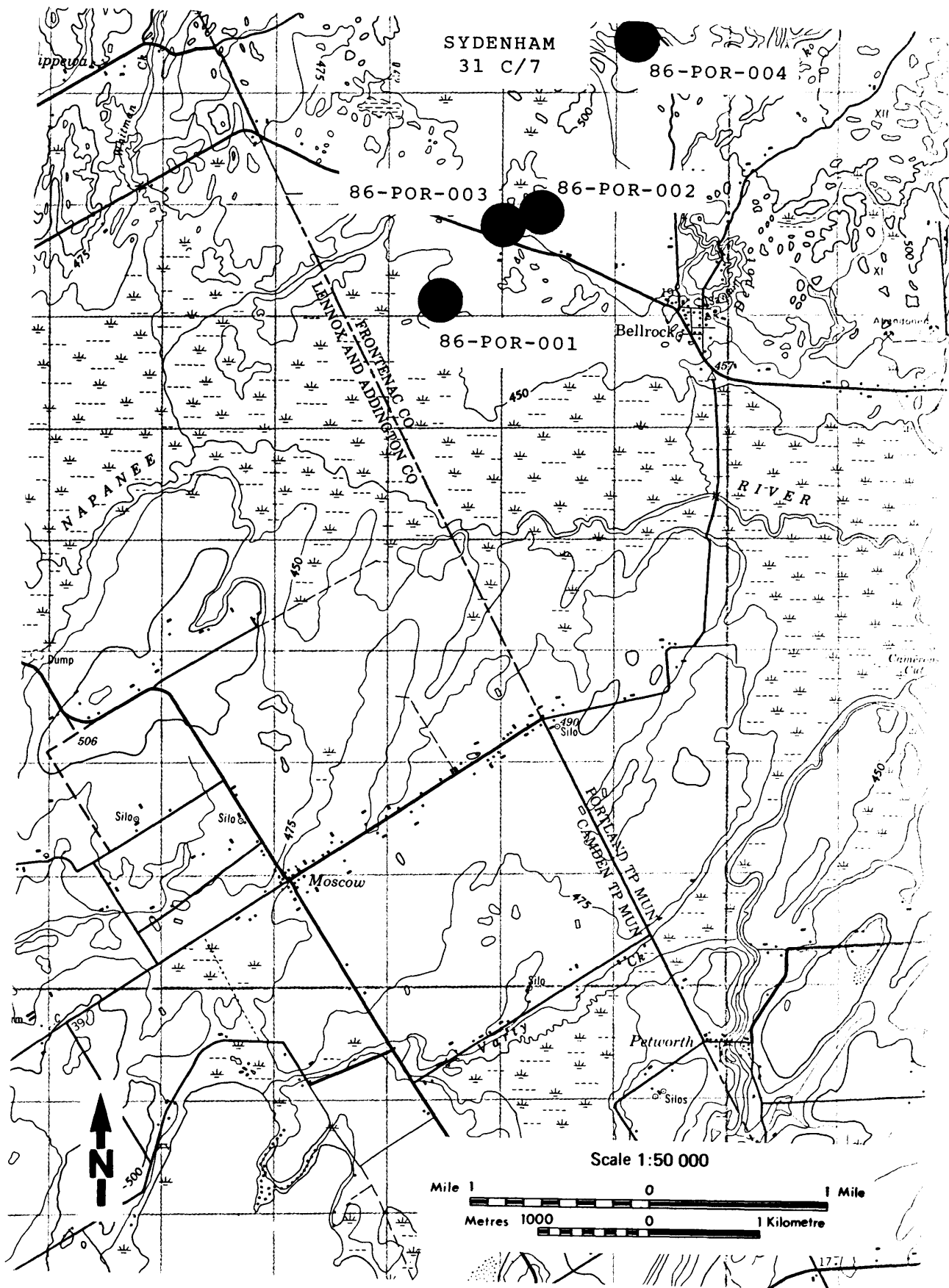


Figure B37. Sample locations, Tamworth, Bellrock, Wilkinson and First Depot mafic intrusions (sheet 1).

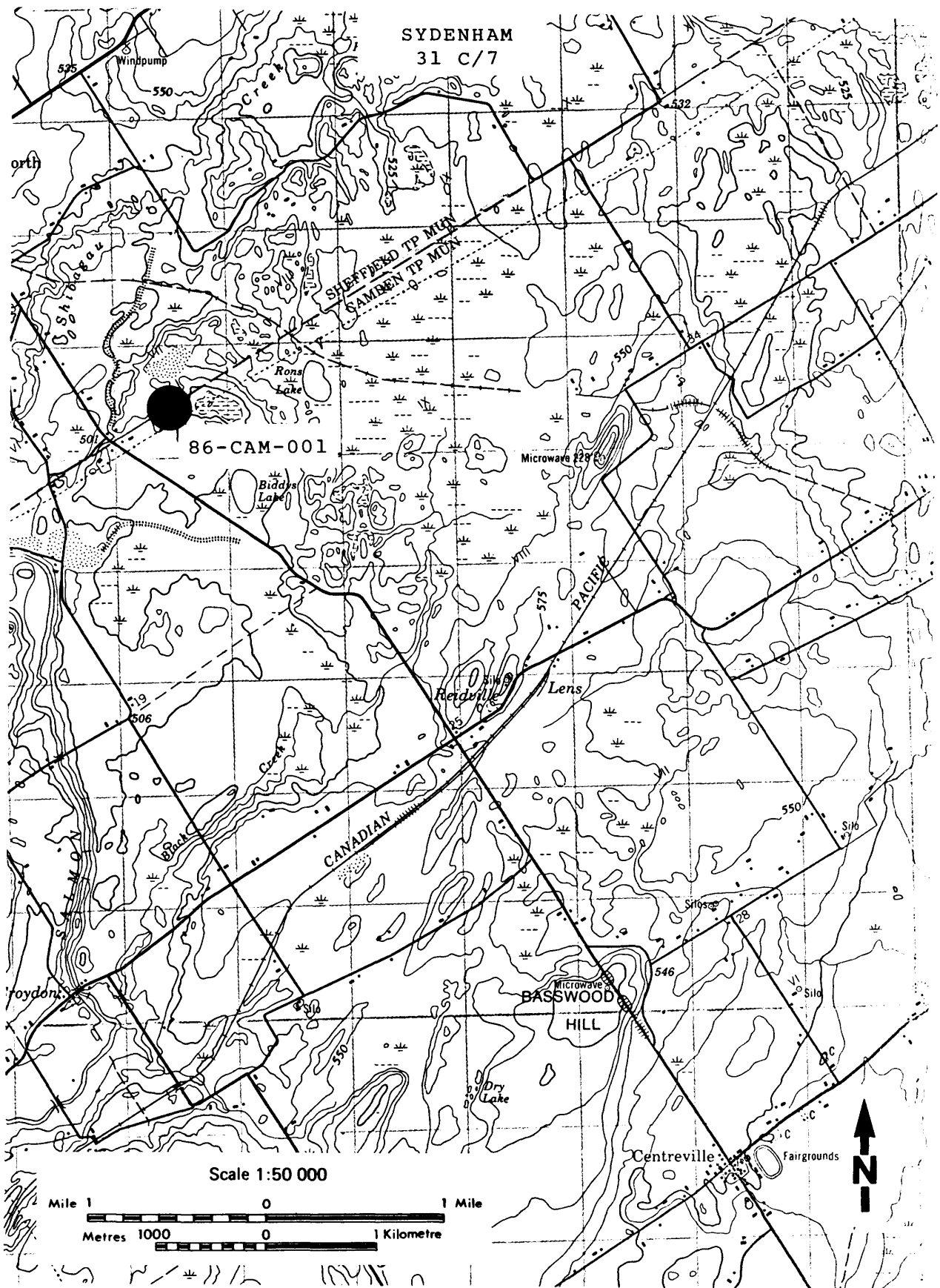


Figure B38. Sample location, Tamworth, Bellrock, Wilkinson and First Depot mafic intrusions (sheet 2).

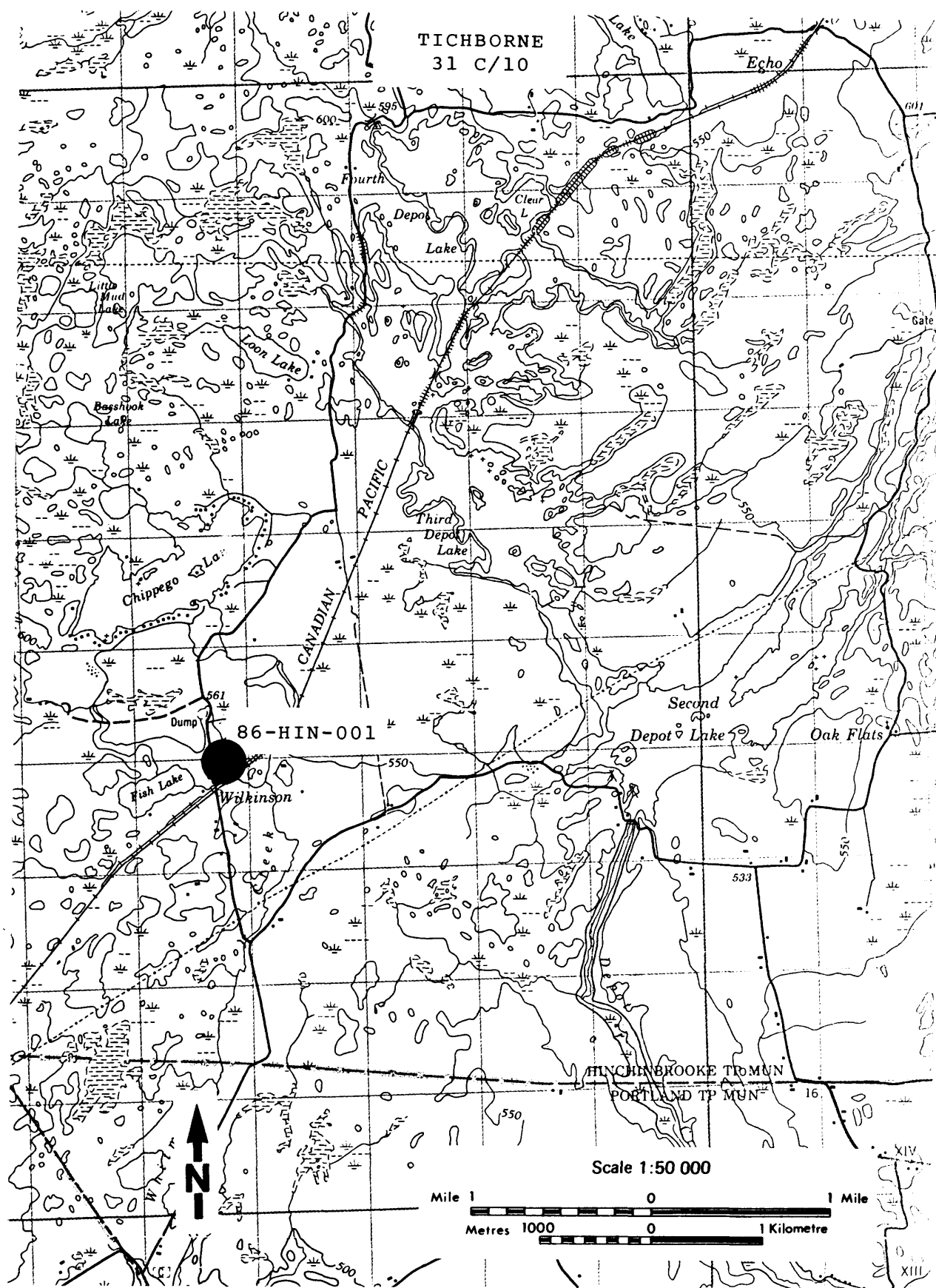


Figure B39. Sample location, Tamworth, Bellrock, Wilkinson and First Depot mafic intrusions (sheet 3).

86-CAM-001

PROPERTY NO. 86-CAM-001 PLUTON NAME Tamworth Mafic Intrusion
PROPERTY NAME Biddy's Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Diorite
TOWNSHIP Camden East LOT 23 CONC. 9
NTS 31 C/7 UTM CO-ORDINATES Easting 343500 Northing 4926400
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark grey
Weathered Surface Light grey
Uniform Variable X
WEATHERING DEPTH 2 to 8 mm
GRAIN SIZE Fine Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY 50 to 60% Mafic
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Black, fine-grained stringers
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a fine-grained dioritic rock. Outcrops are intensely weathered, intensely jointed, and contain numerous stringers, veins, and inclusions. Specularite coatings were also observed. These factors diminish the building stone potential of the rock at this site.

86-POR-001

PROPERTY NO. 86-POR-001 PLUTON NAME Bellrock Mafic Intrusion
PROPERTY NAME Bellrock COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Portland LOT 21,22 CONC. 11
NTS 31 C/7 UTM CO-ORDINATES Easting 357450 Northing 4926100
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark green
 Weathered Surface Pink with grey
 Uniform Variable X
WEATHERING DEPTH 8 mm
GRAIN SIZE Coarse Uniform Variable X
TEXTURE Massive Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 120 degrees Dip Vertical Spacing 4 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, biotite, minor pyroxene
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Chalcopyrite, biotite with hematite staining.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This sample is a dark green, coarse-grained anorthosite which has undergone intense alteration. The area contains regular and irregular joint patterns of moderate intensity. Granitic dikes are associated with one regular joint set. The presence of sulphides and coarse, hematite-stained biotite crystals further diminish building stone potential.

86-POR-003

PROPERTY NO. 86-POR-003 PLUTON NAME Bellrock Mafic Intrusion
PROPERTY NAME Napanee Creek COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Portland LOT 22 CONC. 12
NTS 31 C/7 UTM CO-ORDINATES Easting 358050 Northing 4926850
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark grey-light brown
Weathered Surface Pink-black-whitish
Uniform X Variable
WEATHERING DEPTH 5 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Porphyritic Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 118 degrees Dip vertical Spacing 2 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, biotite
DELETERIOUS MINERALS Yes X No Type Sulphides Percent $\leq 1\%$
OTHER FEATURES Quartz stringers (0.5 cm), surface pitted uniformly,
feldspar alteration (intense).
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This outcrop forms part of the Bellrock mafic intrusion. The rock is an anorthosite with moderately sericitized plagioclase feldspar phenocrysts. Rare quartz and granitic stringers were observed. Sheeting further limits the building stone potential of this site; however, further study of surrounding areas is recommended.

86-HIN-001

PROPERTY NO. 86-HIN-001 PLUTON NAME Wilkinson Anorthosite
PROPERTY NAME Wilkinson COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Anorthosite
TOWNSHIP Hinchinbrooke LOT 5 CONC. 10
NTS 31 C/10 UTM CO-ORDINATES Easting 355750 Northing 4934000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4438-126-167
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dark greyish black
Weathered Surface Brown
Uniform X Variable (X) Greenish to beige
WEATHERING DEPTH up to 1 cm
GRAIN SIZE Coarse Uniform Variable X
TEXTURE Massive to (porphyritic) Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 100 degrees Dip 90 degrees S Spacing 1 m - (0.5 m)
B) Strike 180 degrees Dip 40 degrees W Spacing 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor to moderate
MINERALOGY Plagioclase, biotite,
DELETERIOUS MINERALS Yes X No Type Hematite Percent Trace
OTHER FEATURES Some syenitic to mafic xenoliths observed; moderately abundant granitic stringers and pegmatite dikes (max. 10 m wide). Reddish hematite staining (0.5 m); occasional quartz veining (2 to 3 cm wide); feldspar alteration.
POSSIBLE USES Curbing stone, ornamental stone, landscaping stone, paving stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS Harding (1951) classified this rock as an anorthosite. Much of the original plagioclase has undergone sericitization, however, some plagioclase phenocrysts have retained fresh surfaces. The average size of plagioclase laths is about 3 cm. The sericitized portion of the rock is a light green colour of indeterminate mineralogy. The variation in colour and texture (the result of alteration), the presence of granitic to pegmatitic stringers, and the intense jointing limit the building stone potential of this intrusion.

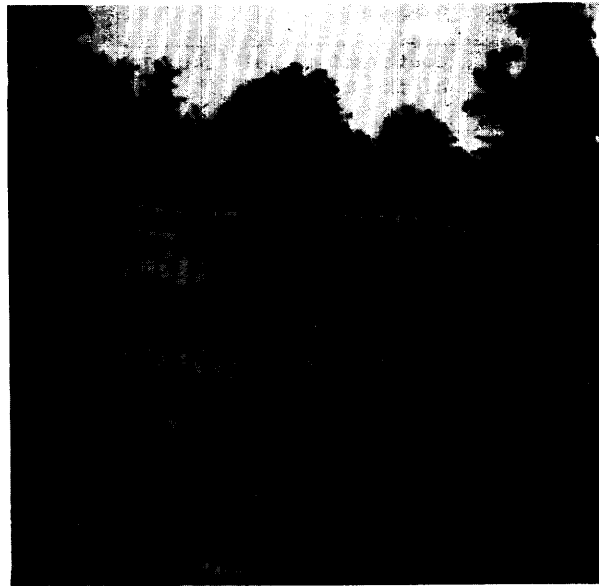


Photo B57. View showing jointing and fair outcrop exposure. 86-HIN-001

THE RIDGE GRANITE

LOCATION South end of Wollaston Township, on the Murphy Corners Road 1 km east of the Ridge

NTS 31 C/13 QGS Map 2020 Geological Report 11

SAMPLE SITE 86-WOL-012

DESCRIPTION OF AREA

The Ridge Granite was described by Hewitt (1962, p.45) as follows:

"A small sill-like body of pink, coarse-grained leucogranite, with accessory biotite and hornblende, occurs on the northeast flank of The Ridge dome."

The sample site shows a red granite with intense irregular jointing, quartz veining, and exfoliation, all of which make the intrusion a poor prospect for building stone.

CONCLUSIONS

The Ridge granite has low potential for building stone.

POTENTIAL

POOR	MODERATE	GOOD
86-WOL-012		

REFERENCES

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.153-262.

Hewitt, D.F. 1962. Geology of Wollaston Township; Ontario Geological Survey, Geological Report 11, p.29-55.

MacDonald, G. 1970. Geology-Kingston area; Department of Geology, Carleton University, 1968-70.

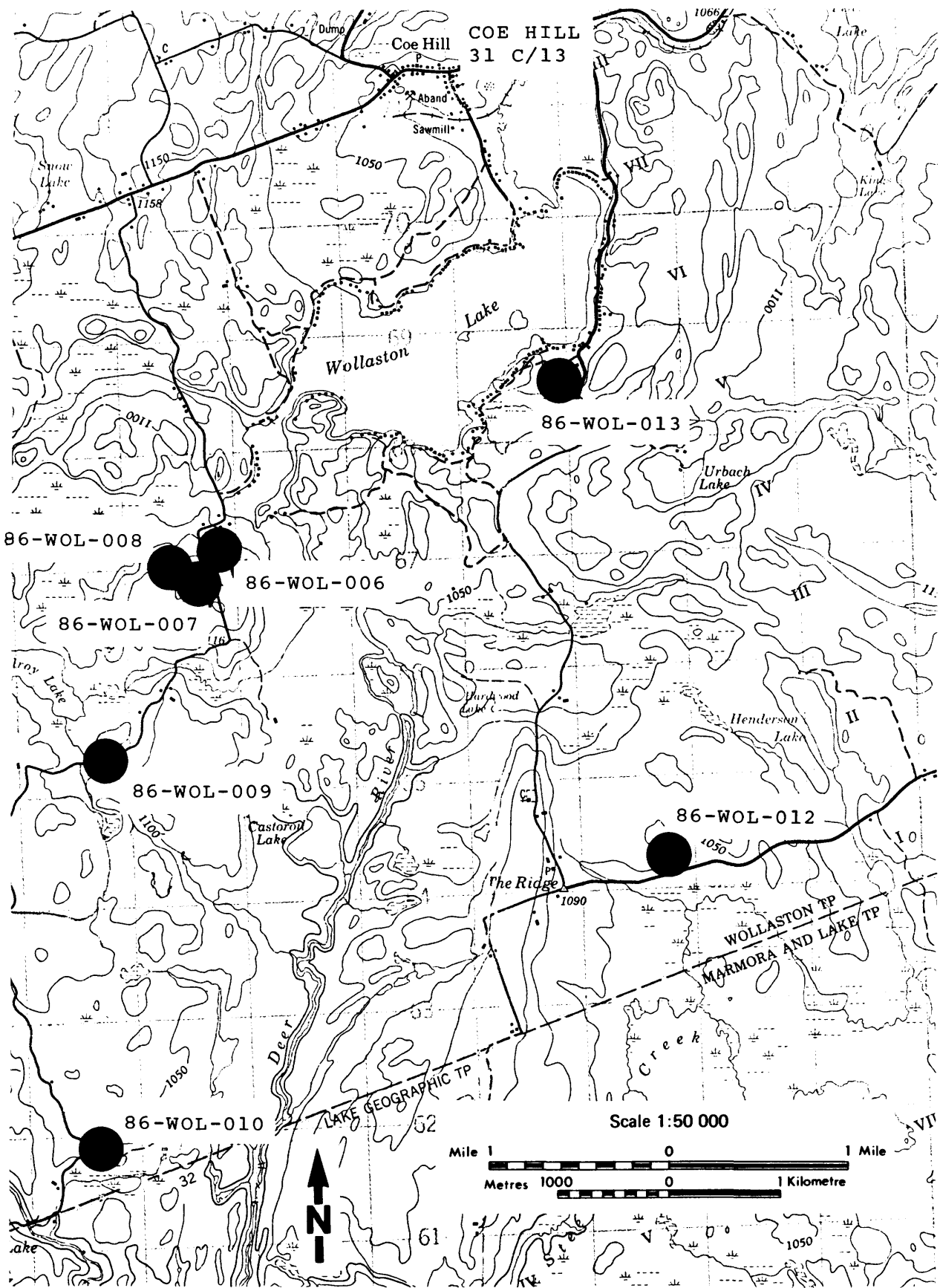


Figure B40. Sample locations, The Ridge granite.

86-WOL-012

PROPERTY NO. 86-WOL-012 PLUTON NAME The Ridge Granite
PROPERTY NAME The Ridge COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Wollaston LOT 16 CONC. 1
NTS 31 C/13 UTM CO-ORDINATES Easting 277750 Northing 4964350
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Red
 Weathered Surface Orange-pink
 Uniform Variable X
WEATHERING DEPTH up to 2 cm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike 56 degrees Dip Vertical Spacing 10 cm to 1 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, quartz, amphibole, plagioclase
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Rare groupings of amphibole crystals (to 1 cm in diameter)
 quartz veins (15 cm width maximum), horizontal exfoliation on the 5 to 10 cm
 scale.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS The proportion of mafic minerals throughout this rock varies to some
 extent. Hence, the colour of this rock is variable. Building stone potential
 is limited by horizontal exfoliation, vertical jointing, and quartz veins. This
 outcrop is fairly typical of the granitic rocks in the Ridge granite.

UMFRAVILLE GABBRO

LOCATION Northwest corner of Wollaston Township, northeast corner of Limerick Township

NTS 31 C/13 OGS Maps 2020, 2167 Geological Reports 11, 67

SAMPLE SITES 86-WOL-004, 86-WOL-005

DESCRIPTION OF THE AREA

The Umfraville gabbro is an area of relatively high elevation compared to the surrounding areas and outcrop exposure is fairly good, as is access via the Ragged Lake Road.

Two areas were sampled, both to the north of Ragged Lake. The first (86-WOL-004) is a greyish-beige, coarse-grained gabbro, the second (86-WOL-005) is possibly a metadiorite or metagabbro.

Jointing in the area is moderate and varies from regular to irregular. The spacing between joints ranges up to 3 m; however, at 86-WOL-004, one joint-free area 9 m wide was encountered. Horizontal sheeting appears to be limited.

Undesirable features of the area include some pegmatite dikes (up to 2 m wide) and rare quartz stringers. At 86-WOL-004, the presence of very fine grained mafic dikes and muscovite reduce the potential for building stone.

CONCLUSIONS

While the rock in this area appears to have enough appeal asthetically for building stone, there are too many factors which render it unsuitable, such as deleterious muscovite in sample 86-WOL-004. In the case of 86-WOL-005, varying grain size and the nature of the jointing limit the potential uses to small blocks such as paving stones.

POTENTIAL

POOR	MODERATE	GOOD
86-WOL-004		
86-WOL-005		

REFERENCES

- Hewitt, D.F. 1956. The Grenville region of Ontario; in the Grenville Problem, Royal Society of Canada, Special Publication 1, p.22-41.
- 1959. Geology of Cardiff and Faraday townships, Haliburton and Hastings counties, Ontario; Ontario Department of Mines, Annual Report, 1957, v.66, pt.3.
- 1962. Geology of Wollaston Township, Hastings County, Ontario; Ontario Department of Mines, Geological Report 11, 59p.
- Hewitt, D.F. and James, W. 1956. Geology of Dungannon and Mayo townships, County of Hastings, Ontario; Ontario Department of Mines, Annual Report, 1955, v.64, pt.8.
- Hewitt, D.F. and Satterly, J. 1957. Haliburton-Bancroft area, Province of Ontario; Ontario Department of Mines, Map 1957B, scale 1:126 720.
- Lumbers, S.B. 1969. Geology of Limerick and Tudor townships, Hastings County, Ontario; Ontario Department of Mines, Geological Report 67, 110p.
- Palmer, H.C., Hayatsu, A., Waboso, C.E. and Pullan, S. 1979. A paleomagnetic and K-Ar study of the Umfraville gabbro, Ontario; Canadian Journal of Earth Sciences, v.16, no.3, (pt.1), p.459-471.
- Pullan, S. 1977. Paleomagnetic study of the Umfraville gabbro of the Grenville Province; University of Western Ontario, Department of Geophysics Report for 1976-77, (Abstract).
- Symons, D.T.A. 1978. Paleomagnetism of the 1180 Ma Grenvillian Umfraville gabbro, Ontario; Canadian Journal of Earth Sciences, v.15, no.6, p.956-962.

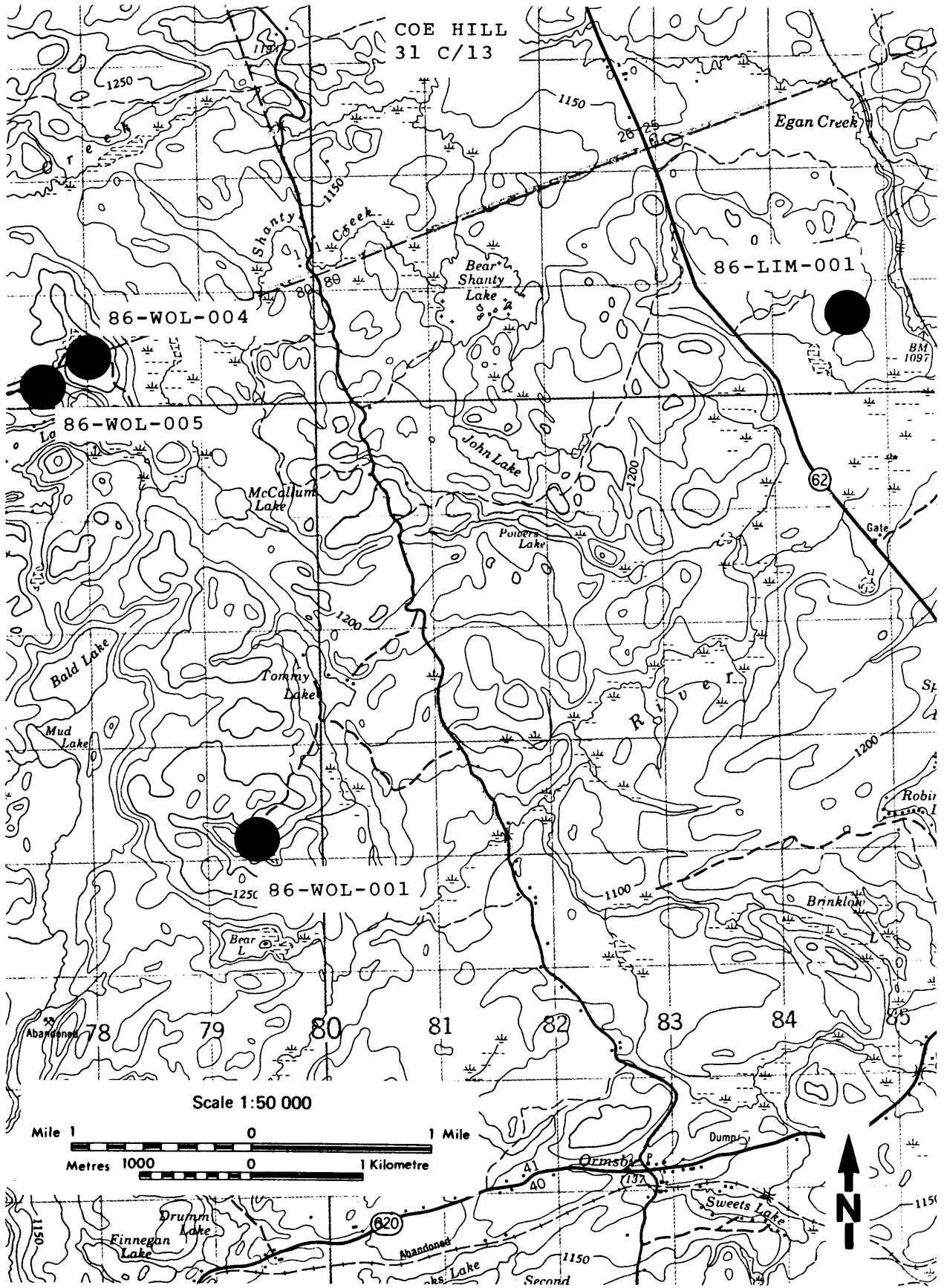


Figure B41. Sample locations, Umfraville gabbro.

86-WOL-004

PROPERTY NO. 86-WOL-004 PLUTON NAME Umfraville Gabbro
PROPERTY NAME Wollaston Faraday Twp. COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro (possibly anorthositic)
TOWNSHIP Wollaston LOT 3 CONC. 16
NTS 31 C/13 UTM CO-ORDINATES Easting 378050 Northing 4980400
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4439-16-161
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Greyish beige
Weathered Surface Grey-pink
Uniform X Variable
WEATHERING DEPTH 1 to 2 mm
GRAIN SIZE Coarse Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 150 degrees Dip Vertical Spacing ≤ 9 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, quartz, muscovite, biotite
DELETERIOUS MINERALS Yes X No Type Muscovite Percent Trace
OTHER FEATURES Pegmatite dikes 2 m wide; quartz stringers (rare); limited horizontal sheeting; mafic dikes.
POSSIBLE USES Ashlar, curbing stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This area is found north of Ragged Lake on the Wollaston-Faraday township line. The outcrop is a coarse-grained, massive, anorthositic gabbro containing plagioclase, quartz, biotite and muscovite. Fresh surface is a greyish beige (uniform) and weathers to a depth of no more than 2 mm. The area is regularly and irregularly jointed. Mafic dikes, quartz stringers and pegmatite dikes were observed. Limited horizontal sheeting was also noted. The features described above limit the potential of this area as a building stone site.

86-WOL-005

PROPERTY NO. 86-WOL-005 PLUTON NAME Umfraville Gabbro
PROPERTY NAME Ragged Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Wollaston LOT 4, 5 CONC. 16
NTS 31 C/13 UTM CO-ORDINATES Easting 377600 Northing 4980200
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4439-16-161
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Black
 Weathered Surface Grey
 Uniform Variable X
WEATHERING DEPTH
GRAIN SIZE Fine to coarse Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 0 degrees Dip Vertical Spacing 2 to 3 m
 B) Strike 120 degrees Dip Vertical Spacing 0.5 to 2 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Hornblende, quartz, feldspar, plagioclase, some biotite
DELETERIOUS MINERALS Yes X No Type Biotite Percent
OTHER FEATURES Granitic dike, surface of outcrop appears somewhat pitted and gouged. Some severe horizontal jointing.
POSSIBLE USES Ashlar, crushed stone.
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS Building stone potential at this area is low due to the nature of the jointing and fracturing, and varying grain size and texture.

WADSWORTH TRONDHJEMITE

LOCATION Northeast corner of Tudor Township, approximately 1 mile northeast of Gilmour

NTS 31 C/13 OGS Map 2168 Geological Report 67

SAMPLE SITES 86-TUD-01, 86-TUD-02

DESCRIPTION OF AREA

Lithologies observed in this intrusion include trondjemite and amphibole-rich trondjemite comprised mainly of plagioclase, quartz and hornblende/biotite. Although compositionally less diverse than the Beaver Creek or Glanmire complexes, the Wadsworth intrusion suffers from poor exposure and moderate to intense jointing.

CONCLUSIONS

Further access may be achieved by boat from the north shore of Wadsworth Lake but does not appear warranted on the basis of expected available exposure and intensity of jointing. The potential for building stone, albeit better than Beaver Creek or Glanmire, is still poor. Uses are limited to paving stone and ashlar.

POTENTIAL

POOR	MODERATE	POOR
86-TUD-001		
86-TUD-002		

REFERENCES

Lumbers, S.B. 1962. Tudor Township, north half, County of Hastings, Ontario; Ontario Department of Mines, Map P.146, scale 1:15 840.

---1969. Geology of Limerick and Tudor townships, Hastings County, Ontario; Ontario Department of Mines, Geological Report 67, 110p.

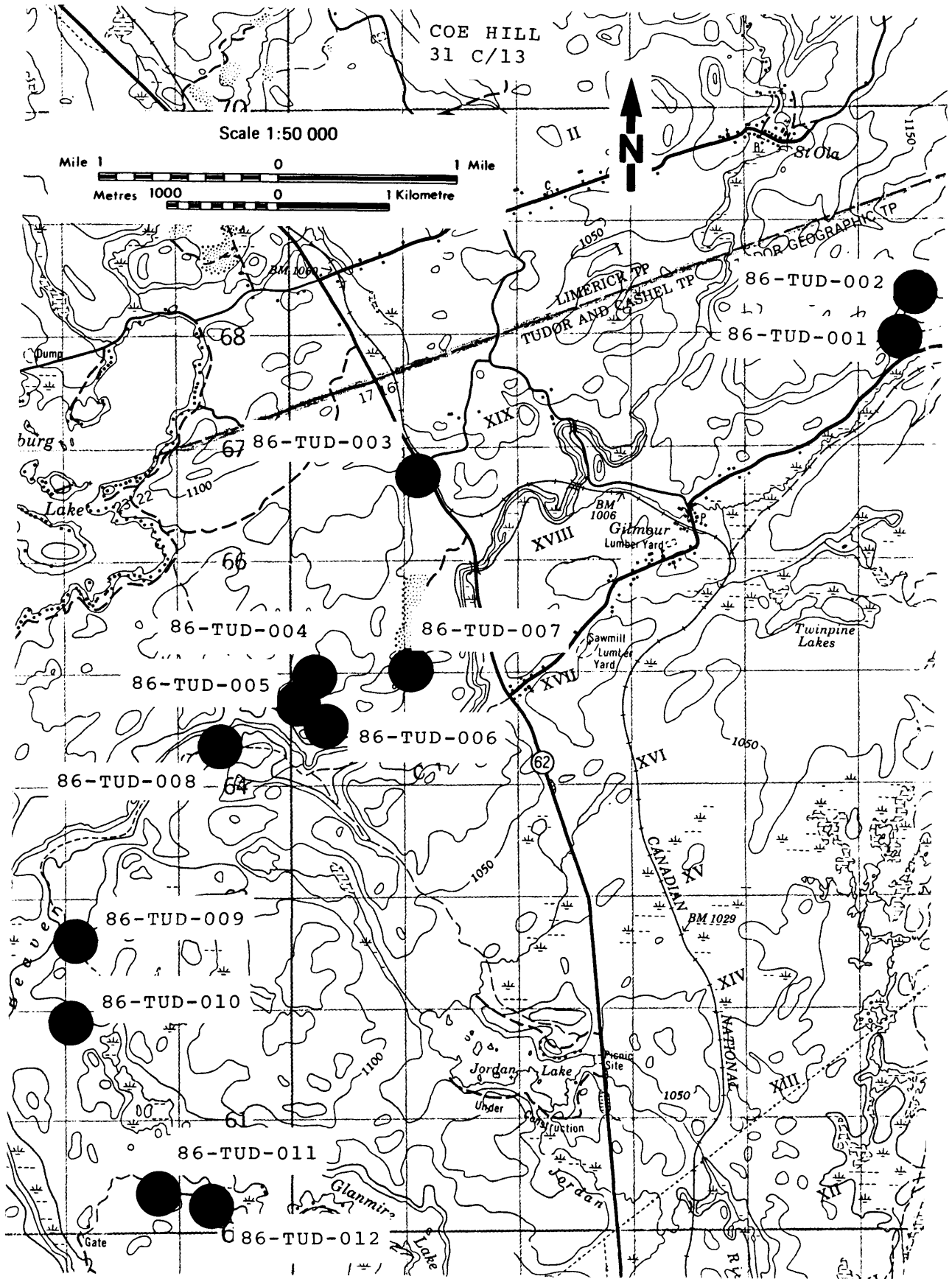


Figure B42. Sample locations, Wadsworth trondhjemite.

86-TUD-001

<u>PROPERTY NO.</u>	86-TUD-001	<u>PLUTON NAME</u>	Wadsworth Trondhjemite
<u>PROPERTY NAME</u>	Westworth Lake-1 (gravel pit)	<u>COMMERCIAL STONE NAME</u>	Granite
		<u>GEOLOGICAL ROCK NAME</u>	Amphibole Trondhjemite
<u>TOWNSHIP</u>	Tudor	<u>LOT</u>	6
		<u>CONC.</u>	19
<u>NTS</u>	31 C/13	<u>UTM CO-ORDINATES</u>	Easting 295400 Northing 4968000
<u>PROPERTY STATUS</u>	Prospect	<u>AIR PHOTO NO.</u>	78-4458-190-215
<u>PRODUCTION HISTORY</u>	Nil		
<u>USE OF EXPLOSIVES</u>	Yes	No	X Type
<u>COLOUR</u>	Fresh Surface	White (with dark hornblende)	
	Weathered Surface	Greyish white	
	Uniform	X	Variable
<u>WEATHERING DEPTH</u>	≤ 0.75 cm		
<u>GRAIN SIZE</u>	Medium	Uniform	X Variable
<u>TEXTURE</u>	Massive	Uniform	X Variable (X)
<u>FABRIC</u>	Yes	No	X Weak Mod. Strong Strike Dip
	Formed By		
<u>BEDDING</u>	Yes	No	X Strike Dip Avg. Thickness
<u>JOINTING</u>	Regular Pattern	X	Irregular Pattern (X)
	Limited Jointing		Moderate Jointing X Intensive Jointing (X)
	A) Strike	160 degrees	Dip 90 degrees Spacing 1 m
Subhorizontal	B) Strike	020 degrees	Dip 20 degrees N Spacing 1 m
	C) Strike	040 degrees	Dip 90 degrees Spacing ?
	D) Strike		Dip Spacing
<u>POTENTIAL FOR QUARRY BLOCKS</u>	Poor		
<u>MINERALOGY</u>	Feldspar, quartz, hornblende		
<u>DELETERIOUS MINERALS</u>	Yes	No	X Type Percent
<u>OTHER FEATURES</u>	One granitic stringer observed.		
<u>POSSIBLE USES</u>	Paving stone, ashlar, landscaping stone		
<u>OUTCROP EXPOSURE</u>	Good	Fair	X Poor
<u>COMMENTS</u>	This rock is a massive, medium-grained amphibole trondhjemite. The rocks are intensely jointed in this area.		



Photo B58. General appearance of outcrop. Note vertical and subhorizontal jointing. 86-TUD-001

86-TUD-002

PROPERTY NO. 86-TUD-002 PLUTON NAME Wadsworth Trondhjemite
PROPERTY NAME Wadsworth Lake-2 COMMERCIAL STONE NAME Granite
 (Boyd Property) GEOLOGICAL ROCK NAME Trondhjemite
TOWNSHIP Tudor LOT 5 CONC. 19
NTS 31 C/13 UTM CO-ORDINATES Easting 295450 Northing 4968400
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4459-190-41
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Grey
 Weathered Surface White
 Uniform X Variable
WEATHERING DEPTH ≤0.75 cm
GRAIN SIZE Medium Uniform X Variable (X)
TEXTURE Massive to weakly foliated Uniform X Variable (X)
FABRIC Yes X No. Weak X Mod. Strong Strike 30 degrees
 Dip 90 degrees
 Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern (X) Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing X
 A) Strike 030 degrees Dip 90 degrees Spacing 0.5 m
 B) Strike 100 degrees Dip 90 degrees Spacing 1 to 2 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Epidotized slip planes observed; penetrative cleavage
 associated with foliation.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a greenish-grey, medium-grained trondhjemite. It
 contains both regular and irregular joint patterns which are closely spaced.
 A penetrative cleavage corresponds to the foliation. Outcrop exposure is
 extremely limited.

WESLEMKOON GRANITE

LOCATION Parts of Grimsthorpe, Cashel, Mayo, Ashby, Effingham, Abinger, and Denbigh Townships

NTS 31 C/14, 31 F/3 OGS Maps 2049, 2142 Geological Reports 26, 71

SAMPLE SITE 86-DEN-001

DESCRIPTION OF AREA

The Weslemkoon batholith was described by Lumbers (1968, p.23-25) as follows: "In plan, the batholith is mushroom-shaped with a roughly circular northern lobe about 22 km in diameter, and a gently curved, elongate southern lobe, about 16 km long and 6 km wide, which extends southward from the south-central part of the northern lobe."

Along the southern and western margins of the northern lobe, discontinuous narrow zones of contaminated gabbro and diorite separate the granitic rocks of the batholith from the surrounding metavolcanics.

Near the margins of the southern lobe, granitized and migmatitic country rocks are absent, and contaminated border phases of the batholith are rare. The northern lobe shows a poorly defined compositional zoning and consists mainly of trondhjemite, granodiorite, and tonalite; sodic granite and granodiorite are concentrated near the western and central parts of the lobe and are partly surrounded by a zone rich in tonalite. Elsewhere in the northern lobe, trondhjemite predominates, but, locally near the margins of the lobe, concentrations of granodiorite are present. Trondhjemite and granodiorite constitute most of the southern lobe, but the areal distribution of these phases is more random than in the northern lobe.

Granitic rocks of the northern lobe are intensely foliated with abundant schlieren and granitic gneisses which are best developed near the marginal and central parts of the lobe. Gneissosity is caused by elongated quartz and plagioclase aggregates and by discontinuous biotite-rich layers only a few millimetres thick. In the southern lobe, the granitic rocks are less intensely foliated than in the northern lobe, and, locally, near the central part of the lobe these rocks are massive. In unweathered outcrops of the granitic rocks within both lobes, compositional layering parallel to the foliation is present and is marked by biotite-rich and biotite-poor layers as much as three feet thick; in places a colour banding is present in which grey bands containing magnetite as the chief accessory iron-titanium oxide mineral alternate with pink bands containing hematite as the chief accessory iron-titanium oxide mineral."

CONCLUSIONS

Sample site 86-DEN-001 is not representative of the batholith as a whole. However, due to marginal contamination, compositional variation and foliation as described by Lumbers, the potential for building stone is low. There may be higher potential in the central part of the southern lobe, where the rock is more massive, but access to this area is poor.

POTENTIAL

POOR	MODERATE	GOOD
86-DEN-001		

REFERENCES

- Evans, A.M. 1964. Geology of Ashby and Denbigh townships; Ontario Department of Mines, Geological Report 26, 39p.
- Lumbers, S.B. 1968. Geology of Cashel Township; Ontario Department of Mines, Geological Report 71, 54p.

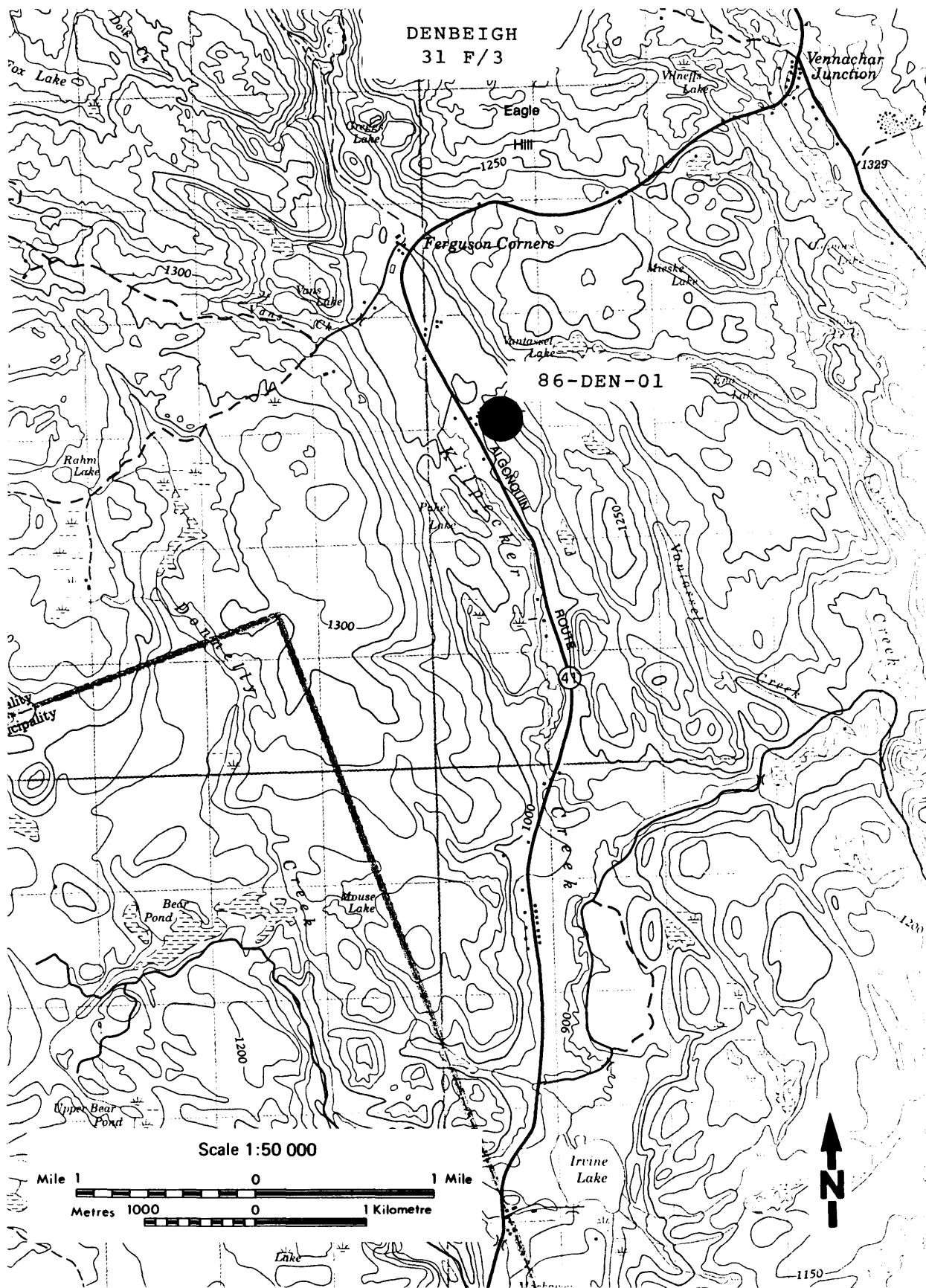


Figure B43. Sample location, Weslemkoon granite.

86-DEN-001

PROPERTY NO. 86-DEN-001 PLUTON NAME Weslemkoon Granite
PROPERTY NAME Cecil Miski COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Denbigh LOT 4 CONC. East Range
NTS 31 F/3 UTM CO-ORDINATES Easting 320600 Northing 4993150
PROPERTY STATUS Inactive AIR PHOTO NO. 78-4505-107-7
PRODUCTION HISTORY Roadcut
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface Salt and pepper - grey-white
Weathered Surface Salt and pepper - grey-white
Uniform X Variable
WEATHERING DEPTH Nil
GRAIN SIZE Fine to medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
Formed By Foliation
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern
Limited Jointing Moderate Jointing Intensive Jointing
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Quartz, biotite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz stringers - small outcrop or drift.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS The granite found on this property is a fine- to medium-grained, foliated, salt and pepper coloured rock consisting essentially of quartz and biotite.

Due to the nature of the outcrop, which appears to be float, jointing cannot be assessed. A bush road has also been constructed through the area and blasting fractures further hinder accurate interpretation of jointing. Small quartz stringers were noted in the rock and this further limits the potential of this area for building stone applications. Possible uses for this stone include ashlar and crushed stone.

WESTPORT PLUTON

LOCATION North shore of Upper Rideau Lake within North Crosby Township

NTS 31 C/9 QGS Map 2054

SAMPLE SITES 86-NCROS-001, 86-NCROS-002

DESCRIPTION OF THE AREA

The Westport pluton is a fairly large granitic body found on the north shore of Upper Rideau Lake. This pluton consists predominantly of pegmatite with very little granite. The rocks that are granitic appear to be aplites or granites with large biotite crystals that would pluck out upon polishing. The rock here is not attractive and the intense jointing indicates low potential for the extraction of large quarry blocks. It is doubtful that further investigation of this area would yield an area with good potential.

CONCLUSIONS

Very low potential for building stone in this pluton.

POTENTIAL

POOR	MODERATE	GOOD
86-NCROS-001		
86-NCROS-002		

REFERENCES

- Baker, M.B. 1923. Geology and minerals of the County of Leeds, Ontario; Ontario Department of Mines, Annual Report, 1922, v.31, pt.6.
- Davidson, A., Britton, J.M., Bell, D. 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.153-262.
- Hewitt, D.F. 1964. Geological notes for Maps Nos. 2053 and 2054, Madoc-Gananoque area, NTS 31B/5 + 12, 31C, Ontario; Ontario Department of Mines, Geological Circular 12, 33p.
- Krogh, T.E. and Hurley, P.M. 1968. Strontium isotope variation and whole-rock isochron studies, Grenville Province of Ontario; Journal of Geophysical Research, v.73, p.7107-7125.
- Wynne-Edwards, H.R. 1957. The structure of the Westport concordant pluton in the Grenville, Ontario; Journal of Geology, v.65, p.639-649.
- 1967. Westport map-area, Ontario; Geological Survey of Canada, Memoir 346.

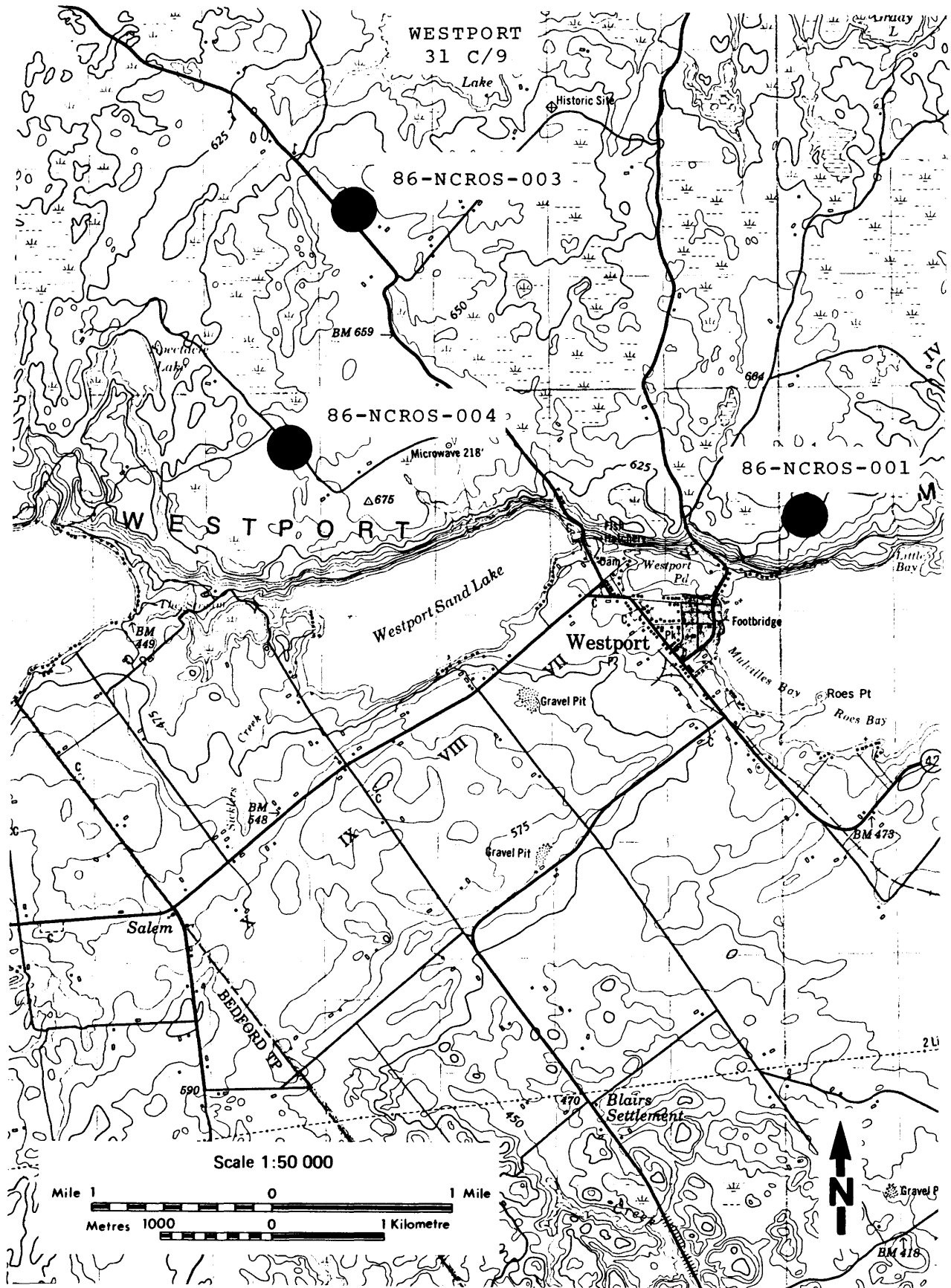


Figure B44. Sample locations, Westport pluton (sheet 1).

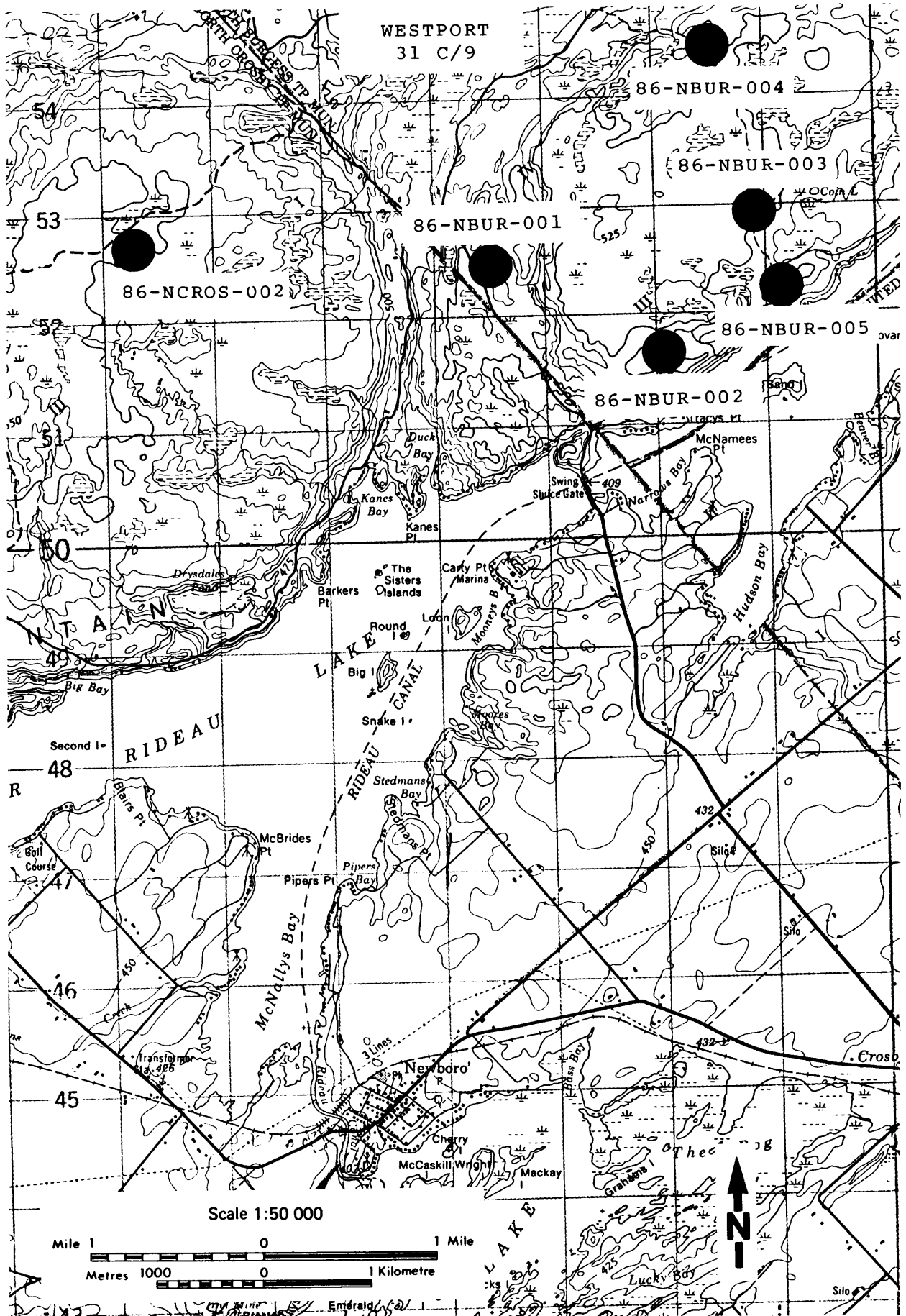


Figure B45. Sample locations, Westport pluton (sheet 2).

86-NCROS-001

PROPERTY NO. 86-NCROS-001 PLUTON NAME Westport Pluton
PROPERTY NAME RVCA COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Monzonite
TOWNSHIP North Crosby LOT 11 CONC. 6
NTS 31 C/9 UTM CO-ORDINATES Easting 390150 Northing 4948900
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-128-92
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink brown
Weathered Surface Light pink
Uniform Variable X
WEATHERING DEPTH 1 to 1.5 cm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 148 degrees Dip Spacing 1 m
B) Strike 58 degrees Dip Spacing 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite; Mafic content: approx. 15 to 20%
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Numerous pegmatite dikes, minor alteration, hematite staining
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This rock is a pinkish-brown, massive monzonite of the Westport pluton. It has a medium grain size but contains some feldspar megacrysts. Pegmatite phases were observed in the area. The building stone potential of this rock is further limited by the presence of intense regular and irregular joint patterns and hematite staining.

86-NCROS-002

PROPERTY NO. 86-NCROS-002 PLUTON NAME Westport Pluton
PROPERTY NAME Core Area COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP North Crosby LOT 13 CONC. 2
NTS 31 C/9 UTM CO-ORDINATES Easting 393250 Northing 4952750
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4450-131-83
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Light pink
Uniform X Variable
WEATHERING DEPTH 1 to 1.5 cm
GRAIN SIZE Fine to coarse Uniform Variable X
TEXTURE Massive porphyritic to gneissic Uniform Variable X
FABRIC Yes X No. Weak X Mod. Strong (X) Strike Dip
Formed By Alignment of biotite + gneissosity
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, quartz, biotite, K-spar
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Numerous quartz pods, pegmatite dikes cover 20% of exposure;
mafic inclusions, quartz veins.
POSSIBLE USES Limited; not suitable for dimension stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This outcrop is a pink granite from the centre of the Westport
pluton. Several areas of the Westport pluton were observed and this site is
representative of the sites evaluated. Inconsistent mineralogy, texture and
grain size characterize this granitic rock, limiting its use for building
stone.

WHITE LAKE FELSIC INTRUSION

LOCATION East-central Olden and west-central Oso Township; north of Sharbot Lake

NTS 31 C/15 QGS Map 2471 Report 228

SAMPLE SITES 86-OSO-004, 86-OLD-001, 86-OLD-002

DESCRIPTION OF AREA

Wolff (1985) described the intrusion as late-stage granitic rocks intruding clastic and carbonate metasediments. The granitic rocks include biotite granite, quartz monzonite, granodiorite, syenite, and porphyritic varieties of the preceding units. They are similar in composition and structural setting to the McLean granite and may be a northeasterly extension of this intrusion. Outcrops at the sample sites exhibit irregular, intense jointing and other deleterious features such as pegmatite dikes, pyrite, and magnetite.

CONCLUSIONS

The White Lake felsic intrusion has low potential as a building stone prospect.

POTENTIAL

POOR	MODERATE	GOOD
86-OSO-004		
86-OLD-001		
86-OLD-002		

REFERENCES

Wolff, J.M. 1985. Geology of the Sharbot Lake area, Frontenac and Lanark counties, southeastern Ontario; Ontario Geological Survey, Report 228, 70p.

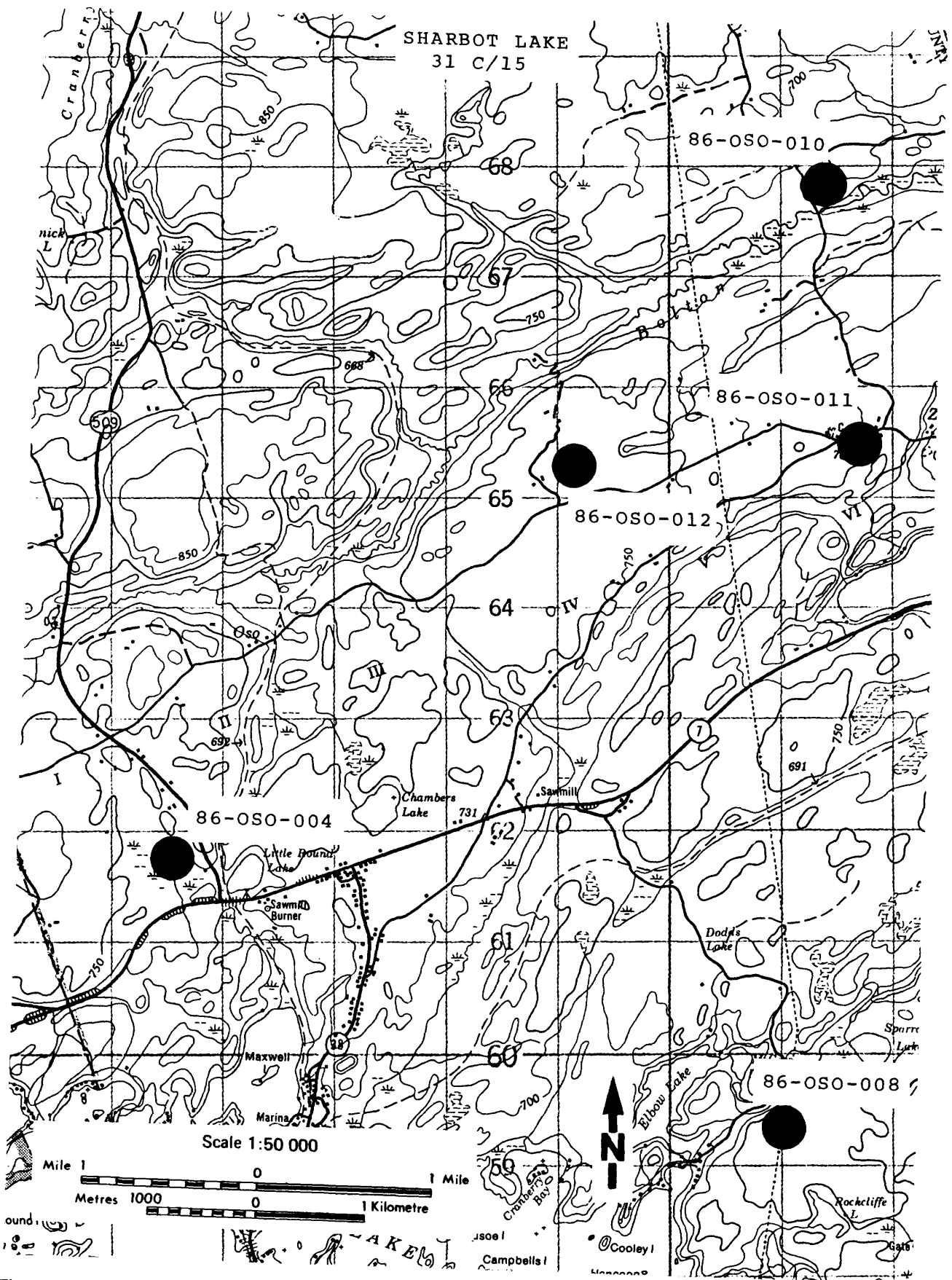


Figure B46. Sample locations, White Lake felsic intrusion (sheet 1).

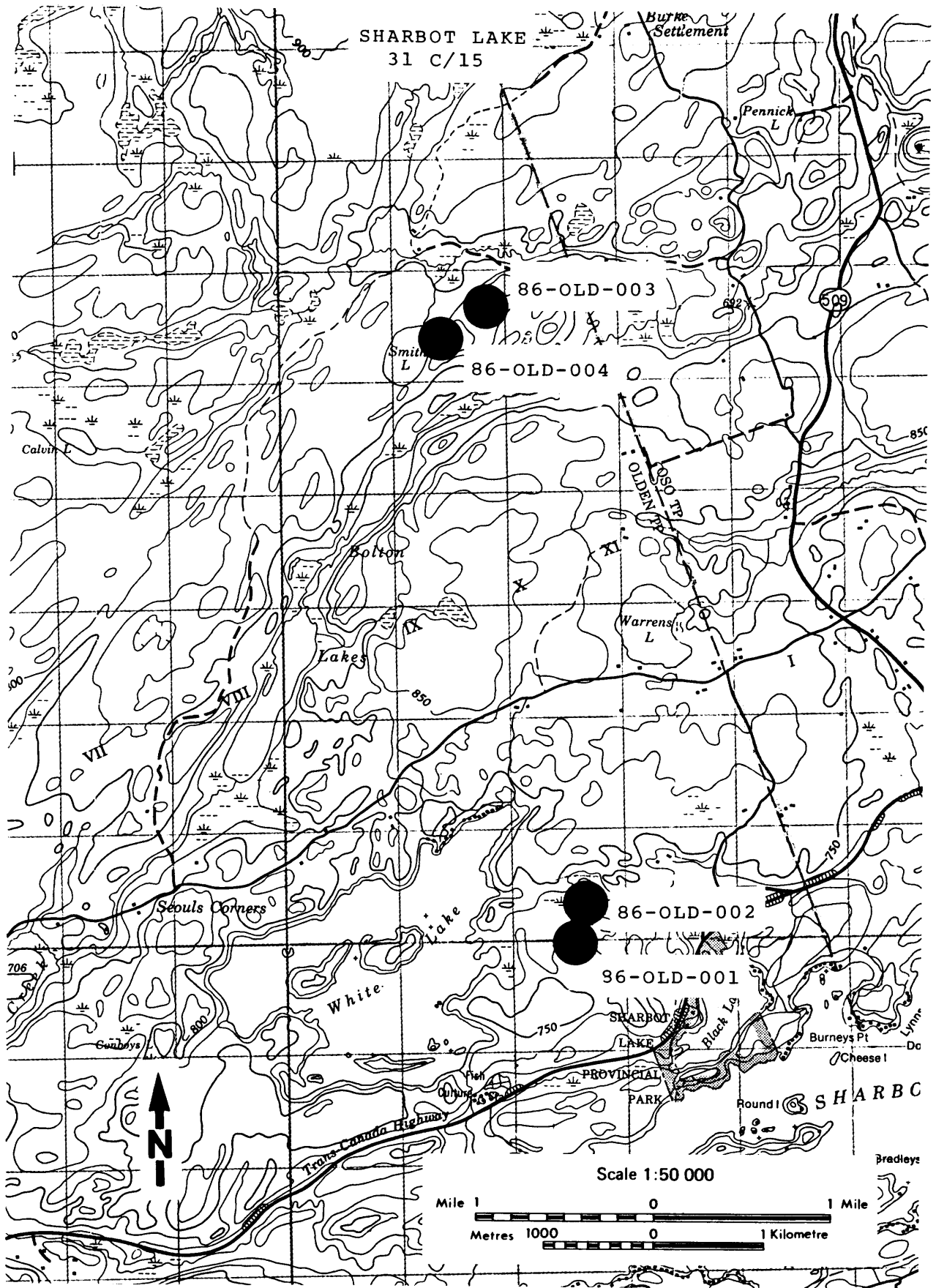


Figure B47. Sample locations, White Lake felsic intrusion (sheet 2).

86-OSO-004

PROPERTY NO. 86-OSO-004 PLUTON NAME White Lake Felsic Intrusion
PROPERTY NAME Little Round Lake 1 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granodiorite
TOWNSHIP Oso LOT 18 CONC. 1
NTS 31 C/15 UTM CO-ORDINATES Easting 365550 Northing 4961800
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4455-164-169
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-brown
Weathered Surface Light pink
Uniform Variable X
WEATHERING DEPTH 4 mm
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive (slight foliation) Uniform X Variable
FABRIC Yes X No. Weak X Mod. Strong Strike 75 degrees Dip
Formed By Foliation alignment of hornblende
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 25 degrees Dip Vertical Spacing 2 to 5 m
B) Strike 100 degrees Dip Vertical Spacing 0.5 to 4 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, amphibole, biotite (epidote)
DELETERIOUS MINERALS Yes X No Type Magnetite Percent 20%
OTHER FEATURES Pegmatite dikes, aplite dikes. 5 cm stringers of amphibole.
POSSIBLE USES Curbing stone, ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This rock is a medium-grained, pinkish-brown granodiorite. It is cut by pegmatite and aplite dikes, and stringers of amphibole. The jointing occurs in closely spaced, regular and irregular joint patterns. These factors detract from the building stone potential of this site.

86-OLD-001

PROPERTY NO. 86-OLD-001 PLUTON NAME White Lake Felsic Intrusion
PROPERTY NAME White Lake I COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 17 CONC. 9
NTS 31 C/15 UTM CO-ORDINATES Easting 362500 Northing 4960000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-211
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Rusty pink
Uniform X Variable
WEATHERING DEPTH >1 cm up to 10 cm thick (very friable)
GRAIN SIZE Medium to coarse Uniform X Variable (X)
TEXTURE Foliated Uniform X Variable
FABRIC Yes No. Weak Mod. X Strong Strike Dip
Formed By Visible foliation planes
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern (X) Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike 360 degrees Dip 70 degrees E Spacing 0.1 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz
DELETERIOUS MINERALS Yes X No Type Sulphides and/or hematite Percent Trace
OTHER FEATURES Occasional hematite coated fractures; rusted out, disseminated sulphides; rare granitic stringers and quartz veins; rubbly weathering and poor exposure.
POSSIBLE USES Rubble
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This outcrop is a well-foliated, deeply weathered, pink granite. The weathering depth is greater than 10 cm. Weathered areas and foliation planes are often rust coloured. The outcrop also contains intense irregular jointing. These factors limit the building stone potential of this area.



Photo B59. Rubbly, rusty weathering of pink granite. 86-OLD-001

86-OLD-002

PROPERTY NO. 86-OLD-002 PLUTON NAME White Lake Felsic Intrusion
PROPERTY NAME White Lake 2 COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Olden LOT 17 CONC. 9
NTS 31 C/5 UTM CO-ORDINATES Easting 362600 Northing 4960300
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4454-163-211
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pinkish brown
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH 2 mm
GRAIN SIZE Medium Uniform X Variable
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, amphibole
DELETERIOUS MINERALS Yes X No Type Sulphides Percent Trace
OTHER FEATURES Intense weathering, intensely jointed.
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This massive, medium-grained granite is intensely jointed and weathered. For these reasons, building stone potential is limited.

WOLFE LAKE PLUTON

LOCATION North Crosby Township, northeast of Wolfe Lake, west of Highway 42 and south of Mash Meadows

NTS 31 C/9 OGS Map 2054

SAMPLE SITES 86-NCROS-003, 86-NCROS-004

DESCRIPTION OF AREA

The Wolfe Lake pluton consists of a highly foliated pink granite and pegmatite dikes. Several sites which were investigated turned out to be large pegmatitic ridges with limited granite exposure. Sample 86-NCROS-003 was taken very close to the centre of the pluton and showed intense irregular jointing, as did 86-NCROS-004. The intense jointing and variable colour and grain size indicate that the Wolfe Lake pluton has very little potential for building stone applications.

POTENTIAL

POOR	Moderate	GOOD
86-NCROS-003		
86-NCROS-004		

REFERENCES

Baker, M.B. 1923. Geology and minerals of the County of Leeds, Ontario; Ontario Department of Mines, Annual Report, 1922, v.31, pt.6.

Davidson, A., Britton, J.M., Bell, K. and Blendinsop, 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.153-262.

Hewitt, D.F. 1964. Geological Notes for Maps Nos. 2053 and 2054, Madoc-Gananoque area, NTS 31B/5 + 12, 31C, Ontario; Ontario Department of Mines, Geological Circular 12, 33p.

Wynne-Edwards, H.R. 1967. Westport map-area, Ontario; Geological Survey of Canada, Memoir 346.

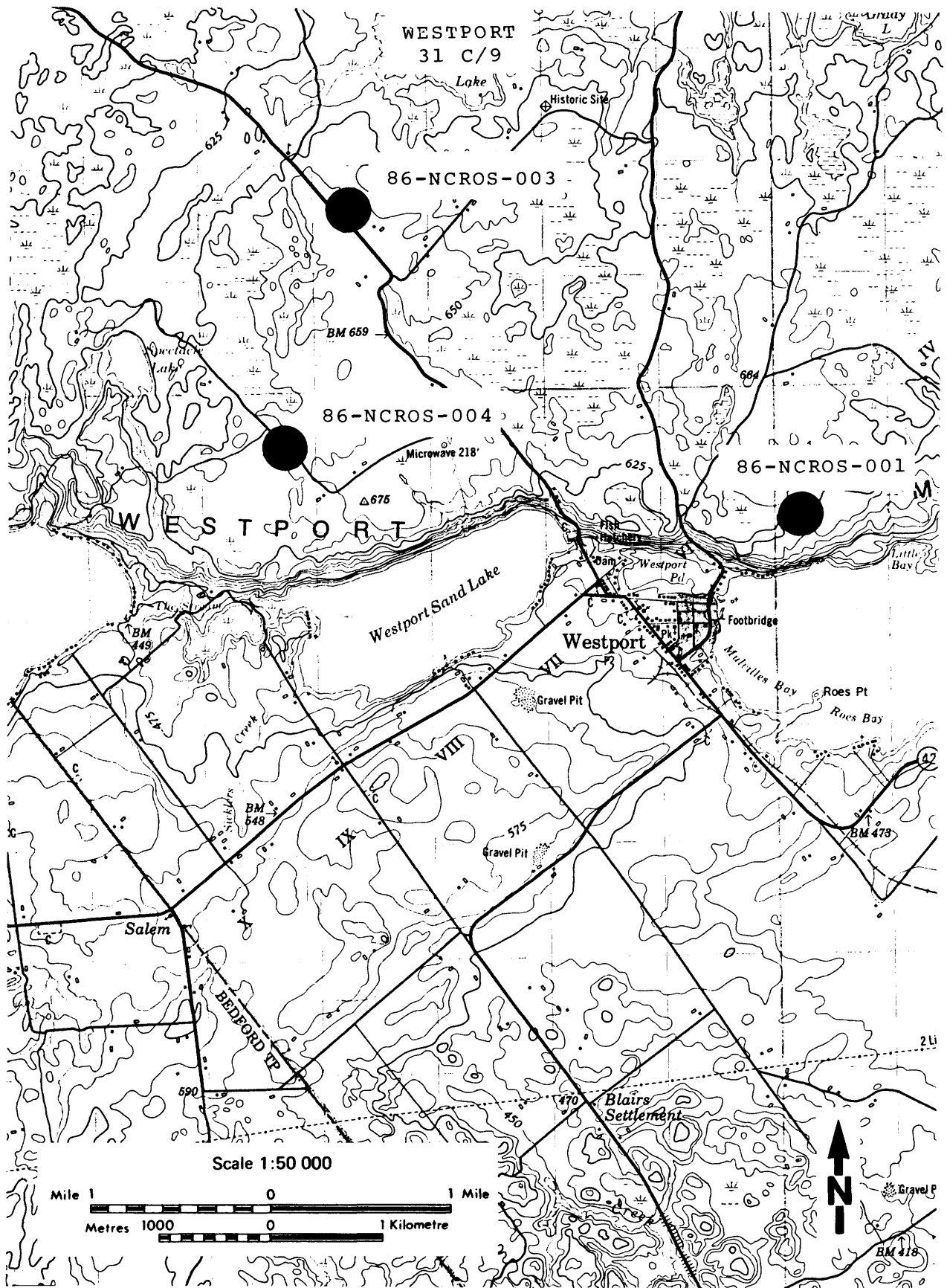


Figure B48. Sample locations, Wolfe Lake pluton.

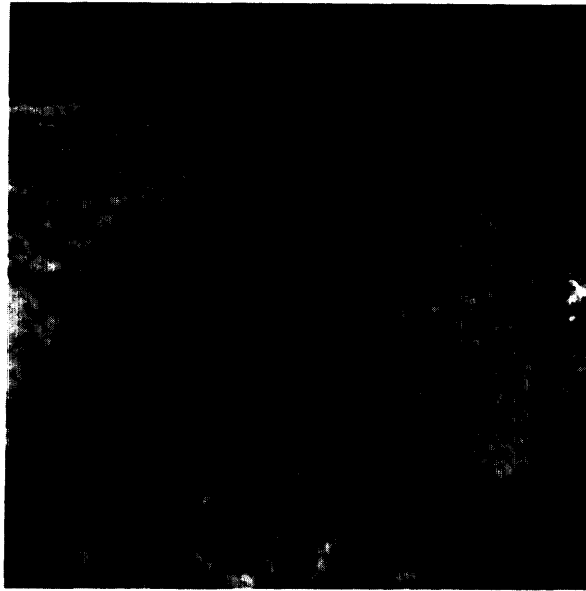


Photo B60. Textural close-up depicting coarse biotite crystals. 86-NCROS-003

86-NCROS-004

PROPERTY NO. 86-NCROS-004 PLUTON NAME Wolfe Lake Pluton
PROPERTY NAME Spectacle Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Monzonite
TOWNSHIP North Crosby LOT 16 CONC. 8
NTS 31 C/9 UTM CO-ORDINATES Easting 385700 Northing 4949600
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4448-88-90
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Pink
Uniform X Variable
WEATHERING DEPTH Extensive
GRAIN SIZE Medium Uniform Variable X
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, sphene; Mafic content: approx. 20 to 30%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Biotite knots, mafic inclusions, pegmatite phases, siliceous inclusions
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This rock is a medium-grained, moderately foliated, bleached, pink monzonite. Medium-grained sphene crystals comprise about 2 to 30% of this rock. The most obvious feature at this site is the extensive weathering, which has produced an incompetent, bleached surface layer. Intense irregular jointing limits the building stone potential for this area.

WOLLASTON GRANITE

LOCATION Wollaston Township, north of Highway 620, 5 km west of Coe Hill

NTS 31 C/13 OGS Map 2020 Geological Report 11

SAMPLE SITES 86-WOL-002, 86-WOL-003, 86-WOL-011

DESCRIPTION OF THE AREA

The Wollaston granite is characterized by pink biotite granite to the north and south and grey, gneissic, biotite granite in the centre. One site was visited in the southern part of the pluton and was recognized as a pink biotite granite with a definite foliation striking toward the north and dipping east. Another site, just south of Cranberry Lake, was seen to be slightly more fine grained and more strongly foliated, almost gneissic. The weathering depth at both of these sites does not appear to be a negative factor.

All areas showed regular and irregular jointing patterns ranging from moderate to intense. The true intensity of the jointing at 86-WOL-002 is difficult to determine because it is a roadcut.

Mineralogy is mainly quartz, potassium feldspar, plagioclase and biotite. In the northern and southern parts of the pluton, quartz pods and stringers were noticed, as well as biotite seams and hematite staining. These features appeared to be absent toward the centre of the pluton. No other deleterious minerals were noticed.

Outcrop exposure in the areas visited is fair.

CONCLUSIONS

The Wollaston granite shows little potential for building stone purposes. Potential quarry size is small and texture over large areas is inconsistent. The centre of the pluton shows more promise than the southern and the northern parts for further investigation.

POTENTIAL

	POOR	MODERATE	GOOD
86-WOL-002			
86-WOL-003			
86-WOL-011			

REFERENCE

Hewitt, D.F. 1962. Geology of Wollaston Township, Hastings County, Ontario; Ontario Department of Mines, Geological Report 11, p.29-55.

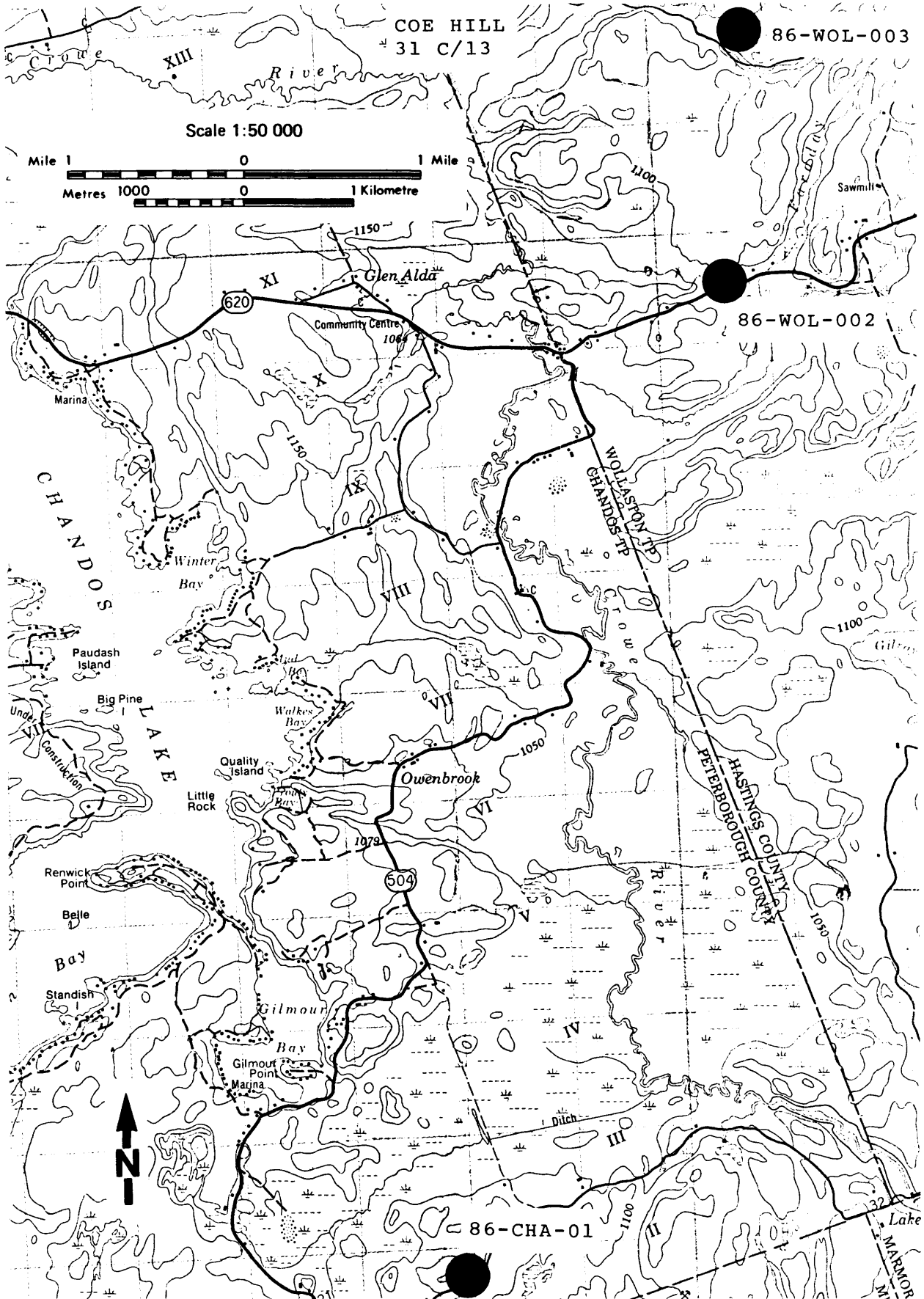


Figure B49. Sample locations, Wollaston granite (sheet 1).

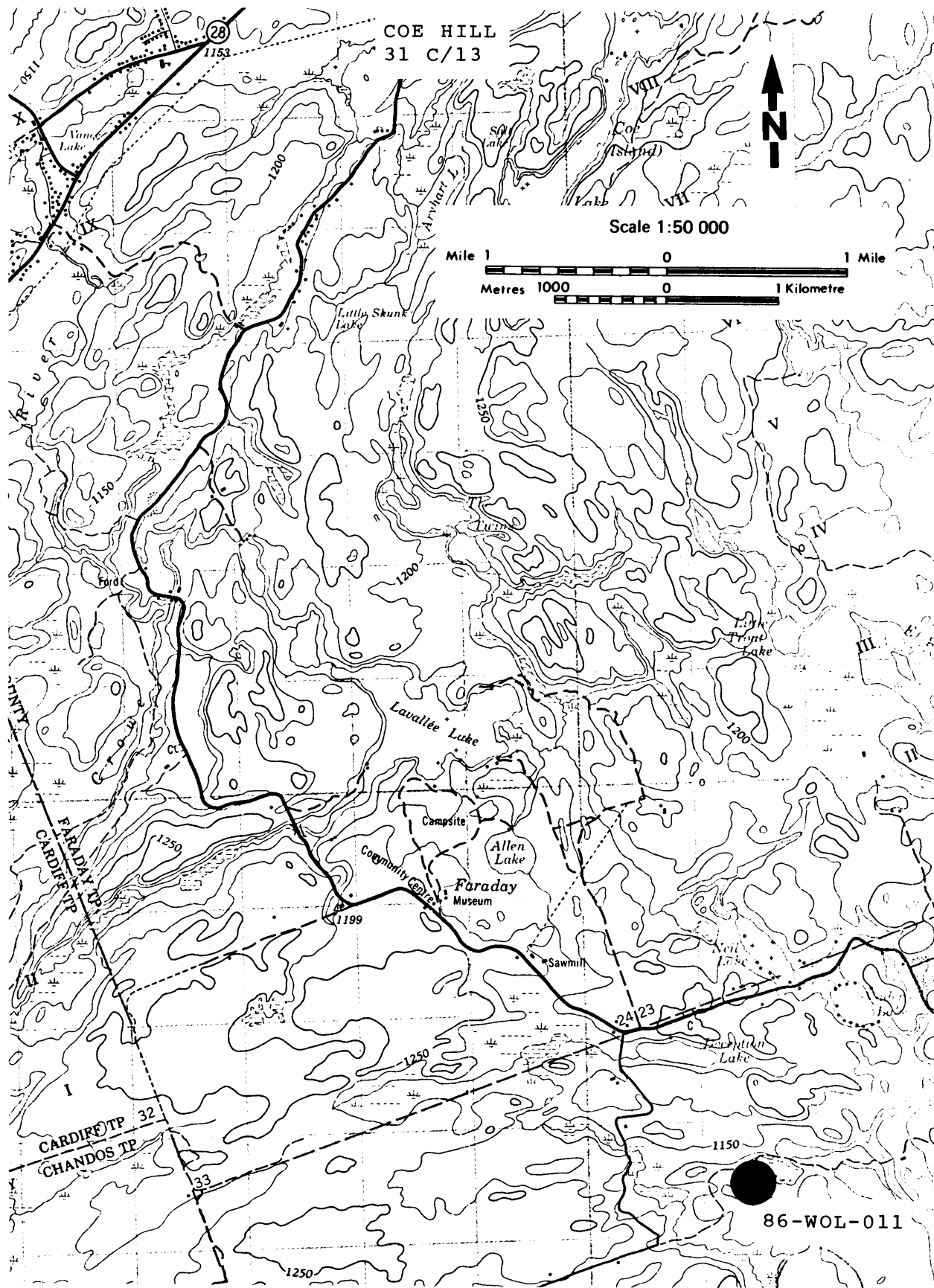


Figure B50. Sample location, Wollaston granite (sheet 2).

86-WOL-003

PROPERTY NO. 86-WOL-003 PLUTON NAME Wollaston Granite
PROPERTY NAME Cranberry Lake COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite to Granite Gneiss
TOWNSHIP Wollaston LOT 25, 26 CONC. 10
NTS 31 C/13 UTM CO-ORDINATES Easting 370800 Northing 4971900
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4436-17-45
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink-black
 Weathered Surface Whitish grey
 Uniform X Variable
WEATHERING DEPTH 1 mm
GRAIN SIZE Fine to medium Uniform X Variable
TEXTURE Foliated to gneissic Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike 0 degrees Dip 65 degrees E
 Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 100 degrees Dip Vertical Spacing ≤ 1 m
 B) Strike 150 degrees Dip 60 degrees W Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY K-spar, quartz, biotite plagioclase
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS The inconsistent texture and irregular jointing at this site indicate low building stone potential.

86-WOL-011

PROPERTY NO. 86-WOL-011 PLUTON NAME Wollaston Granite
PROPERTY NAME Rabbit Hill COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Biotite Granite
Gneiss
TOWNSHIP Wollaston LOT 21 CONC. 15
NTS 31 C/13 UTM CO-ORDINATES Easting 271450 Northing 4976400
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Dull pink
Weathered Surface Light pink
Uniform Variable X
WEATHERING DEPTH 1 to 1.5 cm
GRAIN SIZE Medium grained Uniform X Variable
TEXTURE Gneissic Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike 88 degrees Dip Vertical
Formed By Alignment of biotite crystals
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, biotite, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz veins and pods, hematite staining (especially around
the mafic grains); intense exfoliation; felsic component is an unattractive
bleached colour.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This site is located near the northern margin of the Wollaston
granite. The rock here has a dull or bleached colour. Its appearance is
further degraded by hematite staining. Intense, irregular jointing limits
the building stone potential in this area.

WOLLASTON LAKE GABBRO

LOCATION South part of Wollaston Township, south of Wollaston Lake

NTS 31 C/13 QGS Map 2020 Geological Report 11

SAMPLE SITE 86-WOL-013

DESCRIPTION OF AREA

The intrusion was described by Hewitt (1962, p.41) as follows:

"The Wollaston Lake gabbro is an elongate body 6 km long and up to 1.5 km wide, extending from Wollaston Lake to Castoroil Lake in south-central Wollaston township. Inclusions of gabbro and diorite in the Coe Hill granite indicate that this gabbro body probably extended at least 2 miles farther to the southwest, before the intrusion of the Coe Hill granite.

The body consists of biotitic gabbro, diorite, and metagabbro. The gabbro is medium to coarse grained and consists predominantly of augite and plagioclase, with hornblende, biotite, apatite, and magnetite as accessories. Biotite may occur in porphyroblasts up to 1 inch in diameter."

Sample site 86-WOL-013 shows an intense, irregular joint pattern with numerous quartz and mafic stringers.

CONCLUSIONS

The Wollaston Lake gabbro has little building stone potential.

POTENTIAL

POOR	MODERATE	GOOD
86-WOL-013		

REFERENCE

Hewitt, D.F. 1962. Geology of Wollaston Township; Ontario Department of Mines, Geological Report 11, p.29-55.

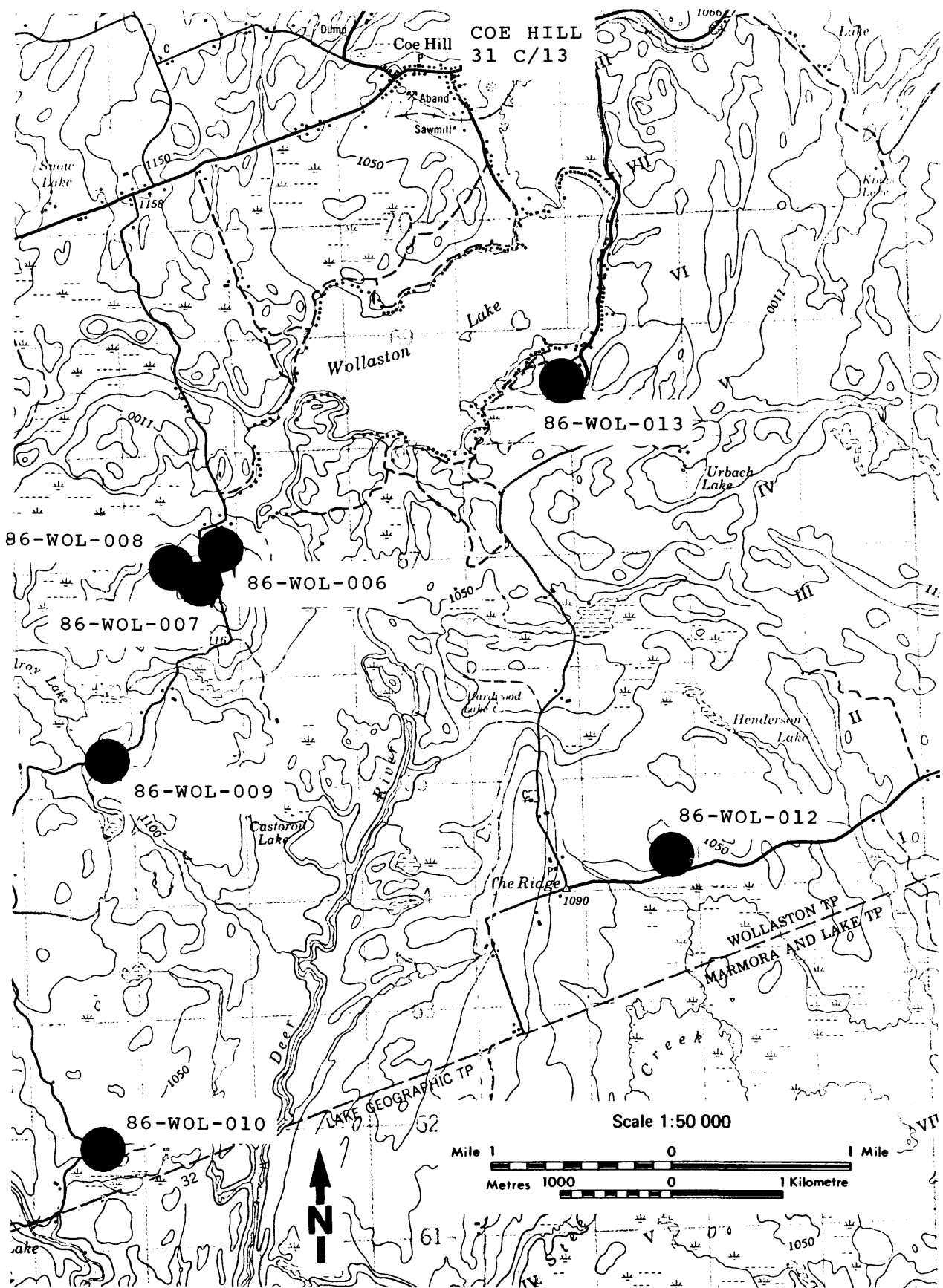


Figure B51. Sample locations, Wollaston Lake gabbro.

86-WOL-013

PROPERTY NO. 86-WOL-013 PLUTON NAME Wollaston Lake Gabbro
PROPERTY NAME Wollaston Lake COMMERCIAL STONE NAME Gabbro
GEOLOGICAL ROCK NAME Gabbro
TOWNSHIP Wollaston LOT 16 CONC. 5
NTS 31 C/13 UTM CO-ORDINATES Easting 276900 Northing 4968500
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4435-74-220
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Salt and pepper
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH Minimal
GRAIN SIZE Medium Uniform Variable X
TEXTURE Massive Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Plagioclase, amphibole; Mafic content: approx. 60%
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Quartz stringers and veins (5 mm to 2 cm width and numerous).
 One aplite dike 10 cm width. Mafic stringers very competent.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This outcrop is part of the Wollaston Lake gabbro. The rock is medium grained, massive and has the typical salt and pepper appearance. The mafics comprise over 60% of the rock, hence, the colour is quite dark. The numerous quartz and mafic stringers as well as the intense irregular jointing limit the potential for building stone development at this site. The grain size is variable at the outcrop scale.

86-CHA-001

PROPERTY NO. 86-CHA-001 PLUTON NAME
PROPERTY NAME Laswade 1 mile E. COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Red Granite
TOWNSHIP Chandos LOT 24 CONC. 2
NTS 31 C/13 UTM CO-ORDINATES Easting 267900 Northing 4960800
PROPERTY STATUS Prospect AIR PHOTO NO.
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Pink
Weathered Surface Grey pink
Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Fine to medium Uniform X Variable
TEXTURE Massive to slightly foliated Uniform Variable X
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing Intensive Jointing X
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Biotite, K-spar, quartz
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Severe horizontal jointing, abundant quartz stringers.
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS The granite found on this property appears to have little potential for building stone applications mainly due to severe horizontal jointing and abundant quartz stringers. The rock itself is massive to slightly foliated and medium to fine grained.

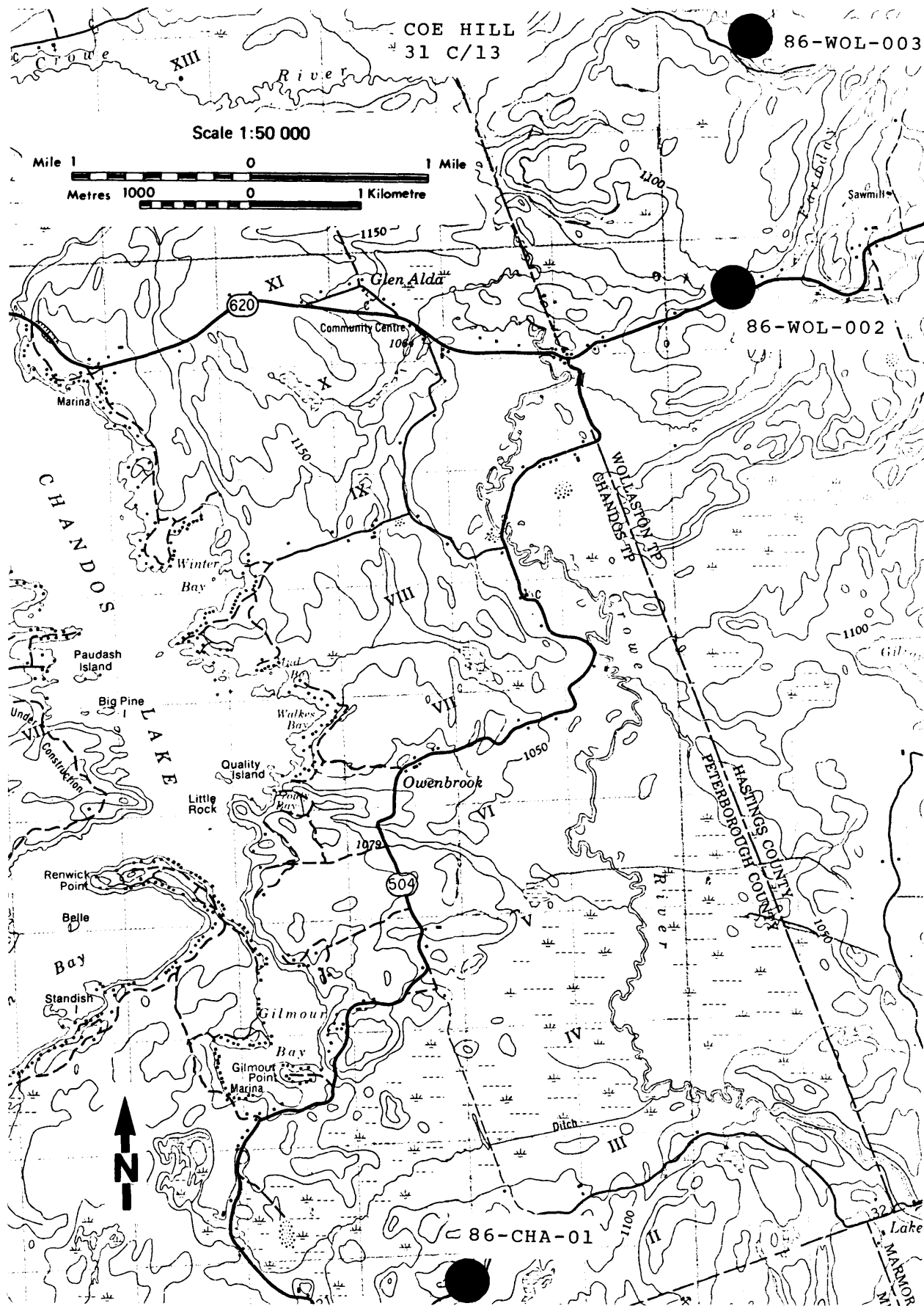


Figure B52. Sample location, Chandos Township.

86-HUN-001

PROPERTY NO. 86-HUN-001 PLUTON NAME
PROPERTY NAME Moira Lake South COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Granite
TOWNSHIP Hungerford LOT 12 CONC. 12
NTS 31 C/6 UTM CO-ORDINATES Easting 304500 Northing 4926500
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4433-139-128
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No Type
COLOUR Fresh Surface Pink (light)
Weathered Surface Brownish pink
Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Medium grained Uniform X Variable (X)
TEXTURE Massive Uniform Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 155 degrees Dip Vertical Spacing 0.1 to 1.0 m
B) Strike 36 degrees Dip 20 NWW Spacing 0.1 to 1.0 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, amphibole, (chlorite)
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES
POSSIBLE USES Crushed stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS The rock from the south-central shore of Moira Lake is a medium-grained granite. The intense jointing and presence of chlorite diminish the building stone potential for this area.

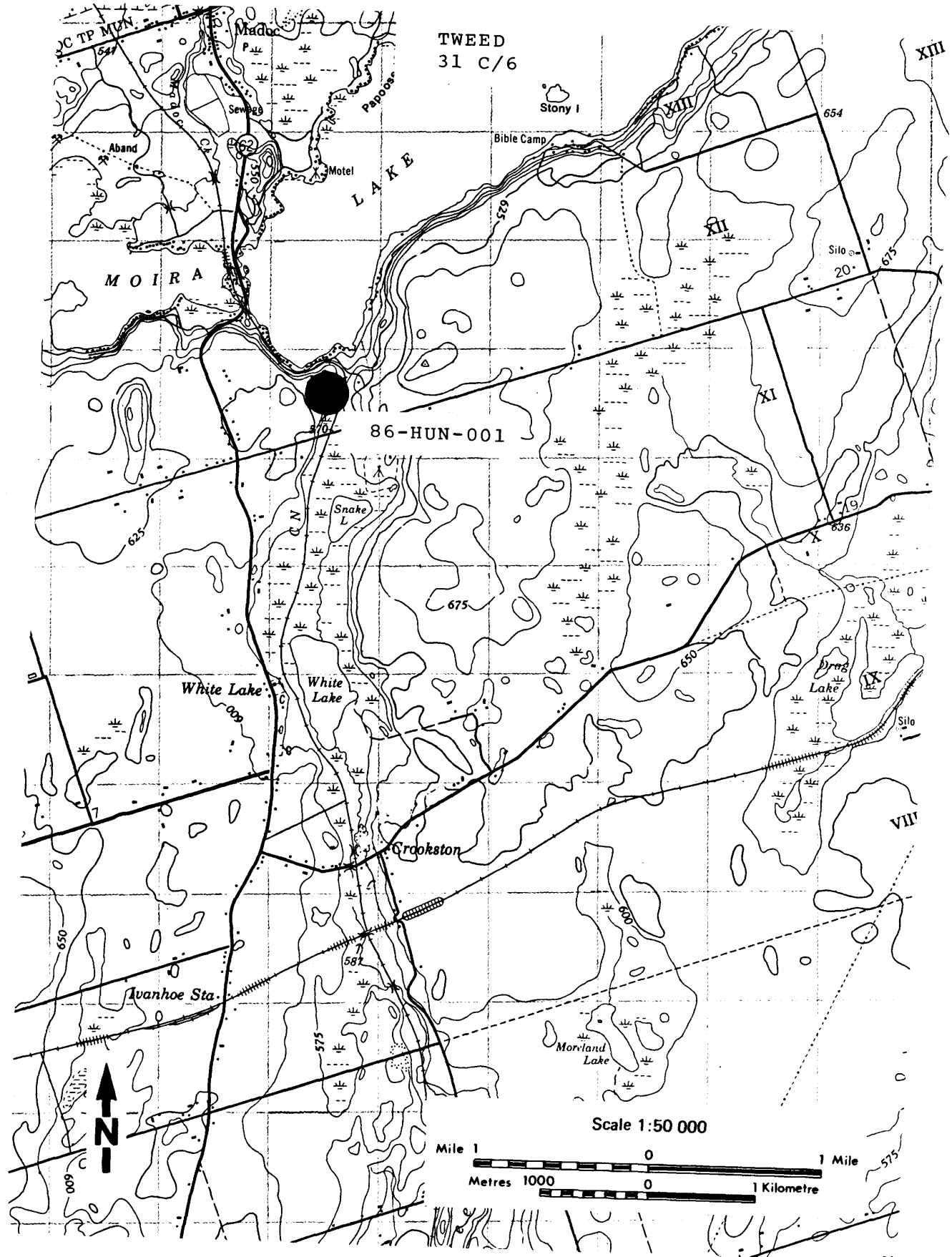


Figure B53. Sample location, Hungerford Township.

86-LIM-001

PROPERTY NO. 86-LIM-001 PLUTON NAME Sinclair Complex
PROPERTY NAME Egancreek B.M. COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Trondhjemite
TOWNSHIP Limerick LOT 23 CONC. 15
NTS 31 C/13 UTM CO-ORDINATES Easting 384600 Northing 4980700
PROPERTY STATUS Prospect AIR PHOTO NO. 77-4439-16-165
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No Type
COLOUR Fresh Surface Light grey
Weathered Surface Brown grey
Uniform X Variable
WEATHERING DEPTH 0.3 cm
GRAIN SIZE Fine to medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 85 degrees
Dip ?
Formed By Alignment of biotite
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern X
Limited Jointing Moderate Jointing X to Intensive Jointing X
A) Strike 140 degrees Dip vertical Spacing 2 to 3 m
B) Strike 30 degrees Dip vertical Spacing 1 m
C) Strike horizontal Dip 0 degrees Spacing 0.5 to 1.5 m
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Feldspar, quartz, biotite
DELETERIOUS MINERALS Yes X No Type Biotite phenocrysts Percent 10%
OTHER FEATURES Quartz pods, biotite knots, quartz veins, sheeting
POSSIBLE USES Ashlar, crushed stone
OUTCROP EXPOSURE Good X Fair Poor
COMMENTS This rock is a fine- to medium-grained, strongly foliated, grey biotite trondhjemite. The outcrop exposure is extensive. Quartz veins and pods, exfoliation planes and moderate to intensive jointing occur at this location.

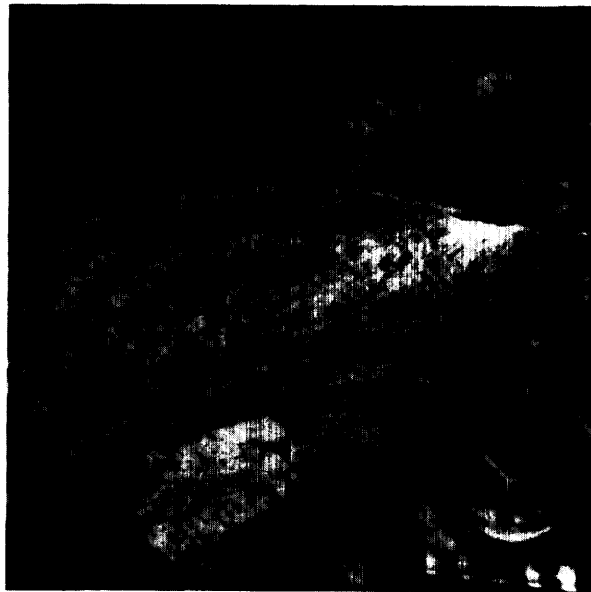


Photo B61. Light grey, fine- to medium-grained trondhjemite. 86-LIM-001

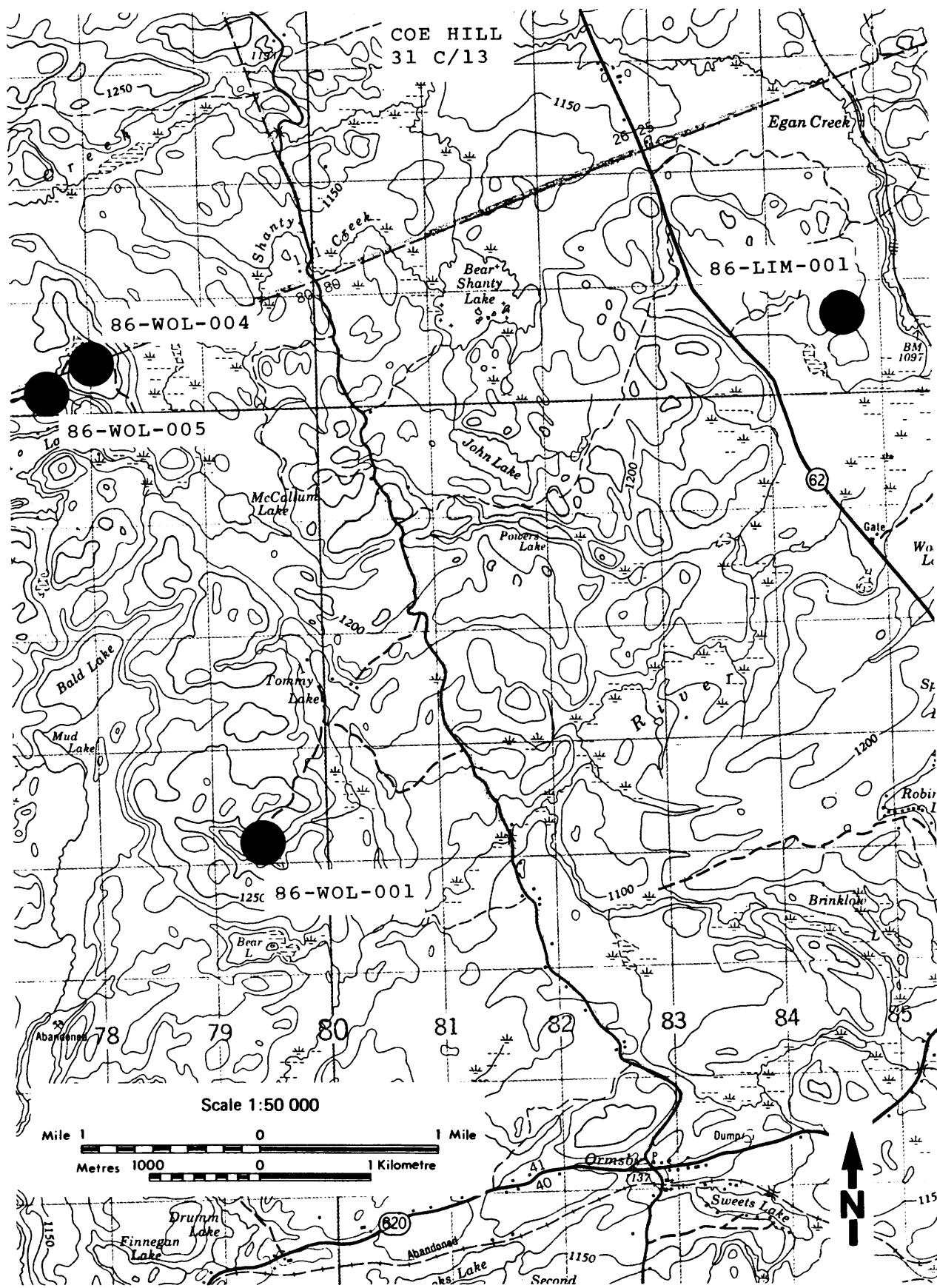


Figure B54. Sample location, Limerick Township.

86-MAD-031

PROPERTY NO. 86-MAD-031 PLUTON NAME
PROPERTY NAME Hwy 23 COMMERCIAL STONE NAME Porphyry
GEOLOGICAL ROCK NAME Granite Porphyry
TOWNSHIP Madoc LOT 2 CONC. 4
NTS 31 C/12 UTM CO-ORDINATES Easting 301200 Northing 4930800
PROPERTY STATUS Inactive-farm AIR PHOTO NO. 78-4435-136-124
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Almost black with pink spots
 Weathered Surface Pink-grey
 Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Fine-grained groundmass Uniform X Variable
TEXTURE Porphyritic Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 65 degrees Dip 60 degrees S. Spacing 0.5 m
 B) Strike 180 degrees Dip 65 degrees W. Spacing 0.5 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair-poor
MINERALOGY K-spar
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some quartz pods and stringers
POSSIBLE USES Ashlar, curbing stone, paving stone, crushed aggregate
OUTCROP EXPOSURE Good Fair Poor X
COMMENTS This outcrop displays a porphyritic andesite consisting of large potassium feldspar phenocrysts in a dark, fine-grained groundmass. The outcrop appears to have irregular, moderate jointing but limited exposure prevents complete analysis of the joint pattern. Some quartz pods and stringers were noted in the area. The rock is very dark, almost black, with pink spots.

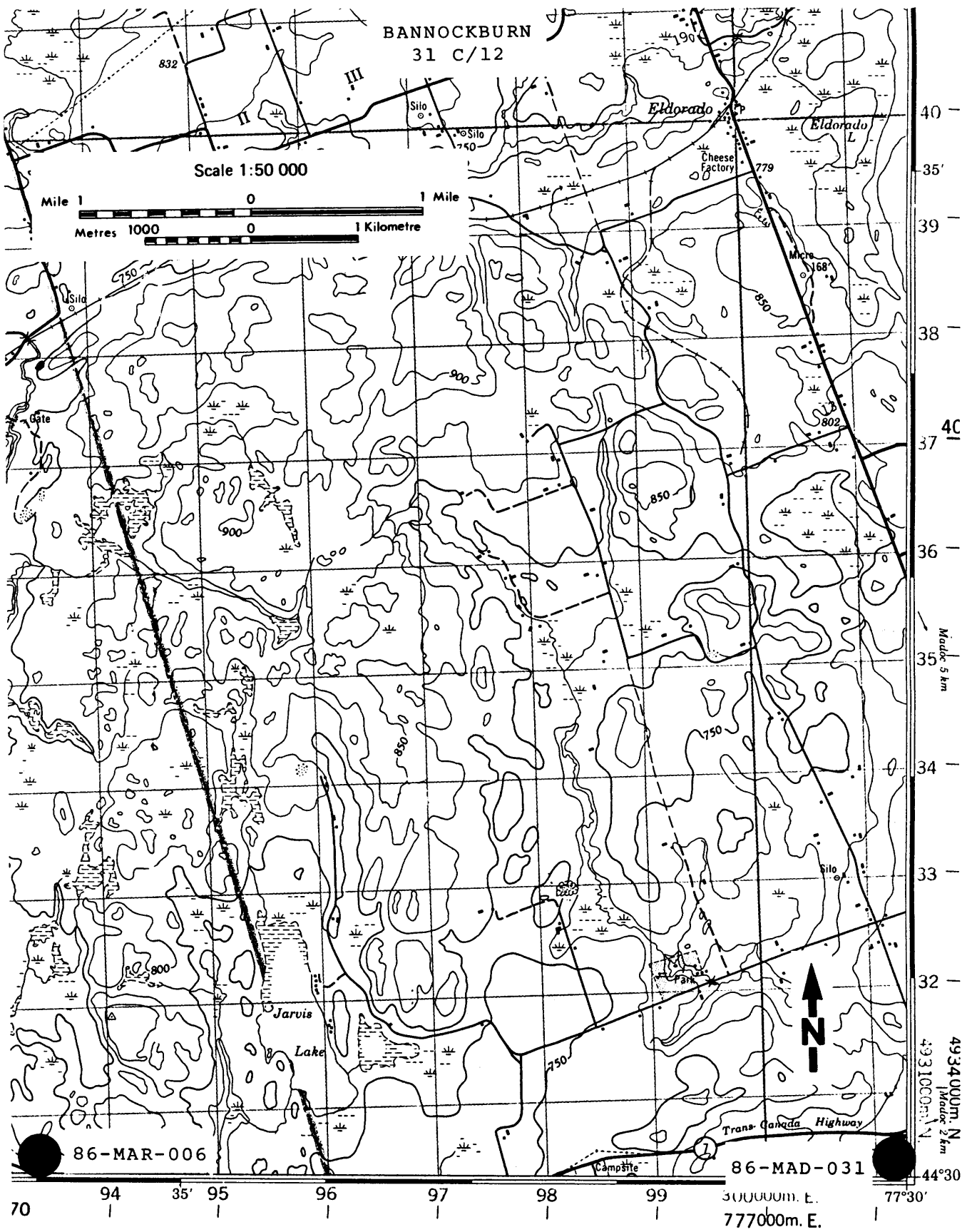


Figure B55. Sample locations, Madoc Township.

86-OLD-025

PROPERTY NO. 86-OLD-025 PLUTON NAME
PROPERTY NAME SW of Gibbs Garage COMMERCIAL STONE NAME Granite
GEOLOGICAL ROCK NAME Pegmatite
TOWNSHIP Olden LOT 17 CONC. 2
NTS 31 C/15 UTM CO-ORDINATES Easting 351800 Northing 4957000
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4453-162-129,130,131
 78-4452-157-72,73,74
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface Whitish grey
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH 1 cm
GRAIN SIZE Coarse Uniform X Variable
TEXTURE Pegmatitic Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 60 degrees Dip Vertical Spacing 2 m
 B) Strike 180 degrees Dip Vertical Spacing 3 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good
MINERALOGY Alkali feldspar, quartz, biotite, garnet
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some quartz stringers
POSSIBLE USES Architectural stone, ornamental stone, structural stone
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This pegmatite is very impressive in both extent and jointing pattern. The outcrop area appears quite large and jointing is very regular and moderate. The grain size is extremely coarse and consists of alkali feldspar, quartz, biotite and garnet. Grain size appears predominantly uniform, as does texture. The colour is mainly very light due to the feldspar and quartz but the garnet and biotite cause darker areas. The outcrop is generally free of deleterious features but some quartz stringers were observed. This area warrants further investigation.

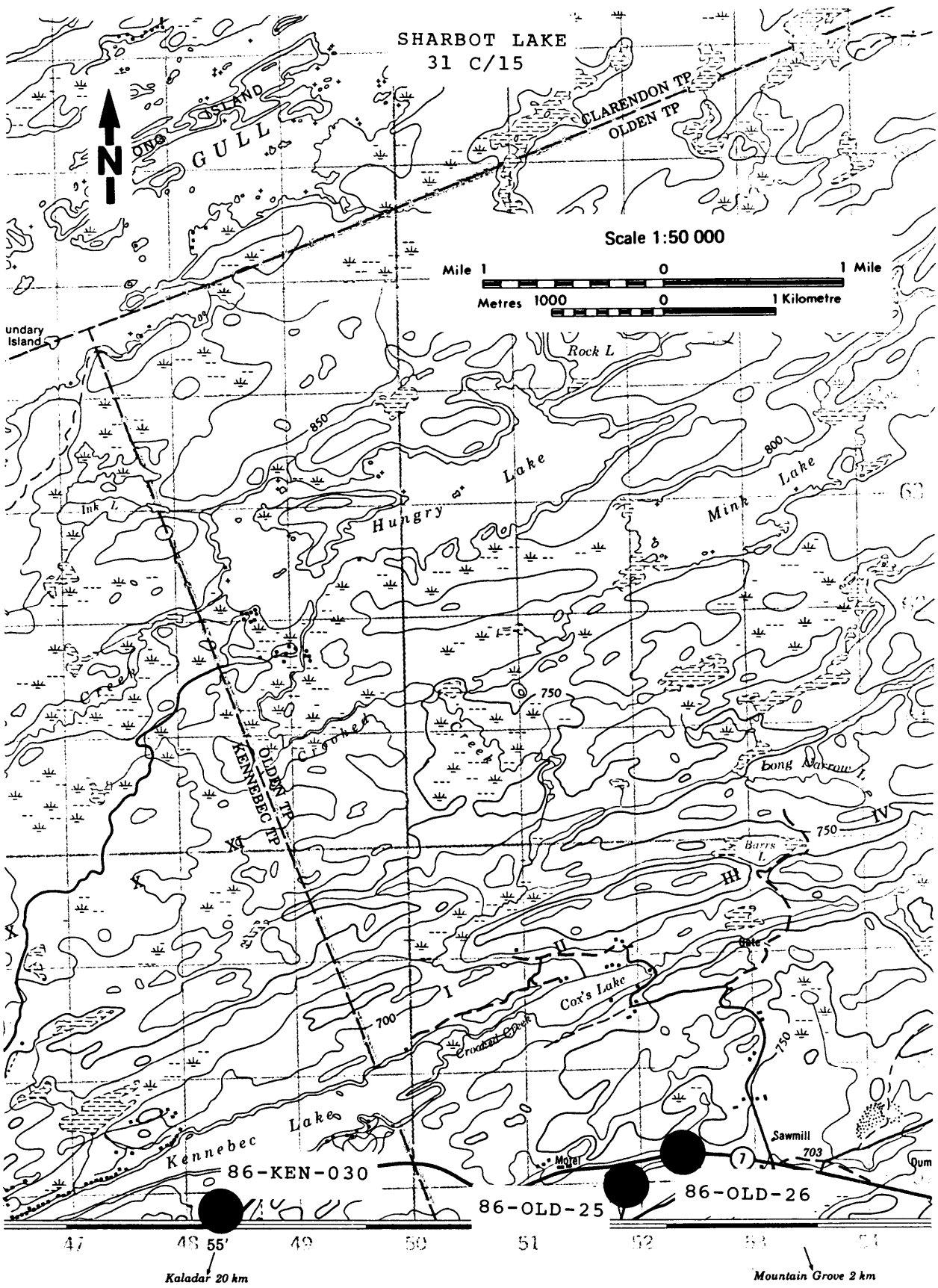


Figure B56. Sample locations, Olden Township.

86-WOL-001

PROPERTY NO. 86-WOL-001 PLUTON NAME Small Intrusion South of Bald and Tommy Lakes

PROPERTY NAME Tommy Lake South COMMERCIAL STONE NAME Granite

GEOLOGICAL ROCK NAME Gabbro/Anorthosite

TOWNSHIP Wollaston LOT 3 CONC. 12

NTS 31 C/13 UTM CO-ORDINATES Easting 379550 Northing 4976200

PROPERTY STATUS Prospect AIR PHOTO NO. 77-4438-16-29

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes No X Type

COLOUR Fresh Surface Black
Weathered Surface Light grey
Uniform X Variable

WEATHERING DEPTH 1 to 2 mm

GRAIN SIZE Medium to coarse Uniform X Variable

TEXTURE Massive Uniform X Variable

FABRIC Yes No. X Weak Mod. Strong Strike Dip
Formed By

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern (X) Irregular Pattern (X)
Limited Jointing Moderate Jointing (X) Intensive Jointing
A) Strike 0 degrees Dip 56 degrees W Spacing 0.1 to 2 m
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Fair for small blocks

MINERALOGY Feldspar, amphibole

DELETERIOUS MINERALS Yes No X Type Percent Trace

OTHER FEATURES Mafic content is variable

POSSIBLE USES Monumental stone, ashlar, crushed stone

OUTCROP EXPOSURE Good Fair Poor X

COMMENTS Outcrop exposure is poor at this location, making assessment difficult. Jointing is both regular and irregular with moderate spacing. Since the stone is black in colour, further evaluation of this area is warranted.

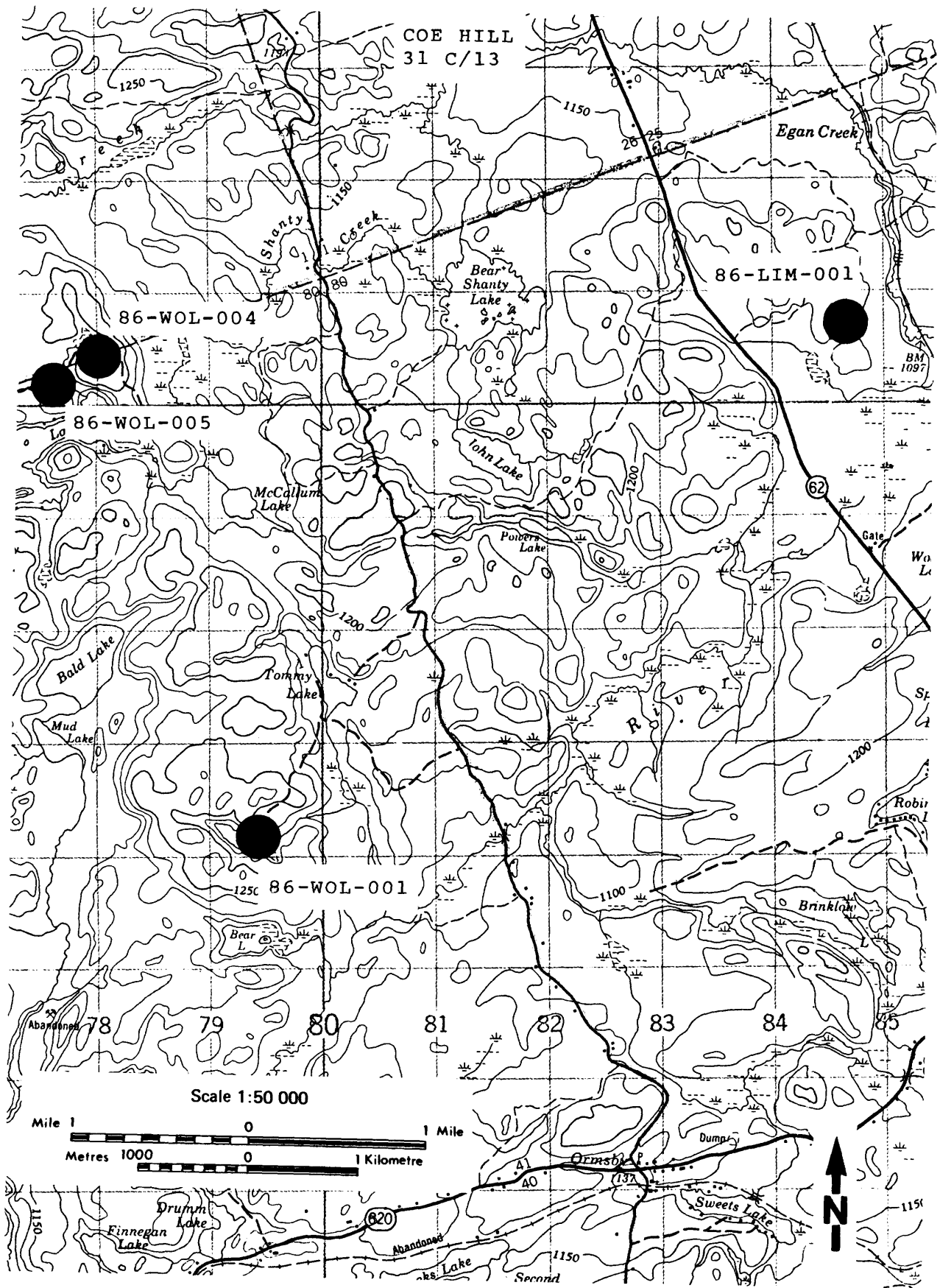


Figure B57. Sample locations, Wollaston Township.

Appendix B. 1986 Property Examination Reports—Marble Properties

86-CL-001

PROPERTY NO. 86-CLA-001 PLUTON NAME
PROPERTY NAME Swamp Creek COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Calcitic Marble
TOWNSHIP Clarendon LOT 31 CONC. E & W Range
NTS 31 C/15 UTM CO-ORDINATES Easting 346250 Northing 4977700
PROPERTY STATUS Prospect AIR PHOTO NO. 78-4465-80-51,52
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type High velocity - roadcut
COLOUR Fresh Surface White-greenish-pink-brown banded
Weathered Surface Grey
Uniform Variable X
WEATHERING DEPTH
GRAIN SIZE Fine to medium to coarse Uniform Variable X
TEXTURE Foliated Uniform Variable
FABRIC Yes X No. Weak Mod. Strong X Strike 55 degrees Dip N
Formed By Foliation
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 75 degrees Dip 55 degrees N Spacing 2 m
B) Strike 140 degrees Dip Vertical Spacing 2 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Good
MINERALOGY Calcite, minor phlogopite and tremolite
DELETERIOUS MINERALS Yes X No Type Pyrite, sphalerite Percent Trace
OTHER FEATURES Stringers of quartz, boudinage and brecciation.
POSSIBLE USES Architectural stone
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS This stone is a highly foliated calcitic marble breccia. Due to stretching of the fragments, textures vary from coarse, fragmental when viewed perpendicular to the foliation, to irregularly banded when viewed parallel to the foliation. Colour also varies from mottled brownish-grey and white at the southern end of the road cut, to pink-grey-white at the northern end. The interesting textures and colours and potential for large quarry blocks suggest that further investigation of this area is warranted.



Photo B62. View showing texture of weathered surface. Pencil for scale. 86-CLA-001

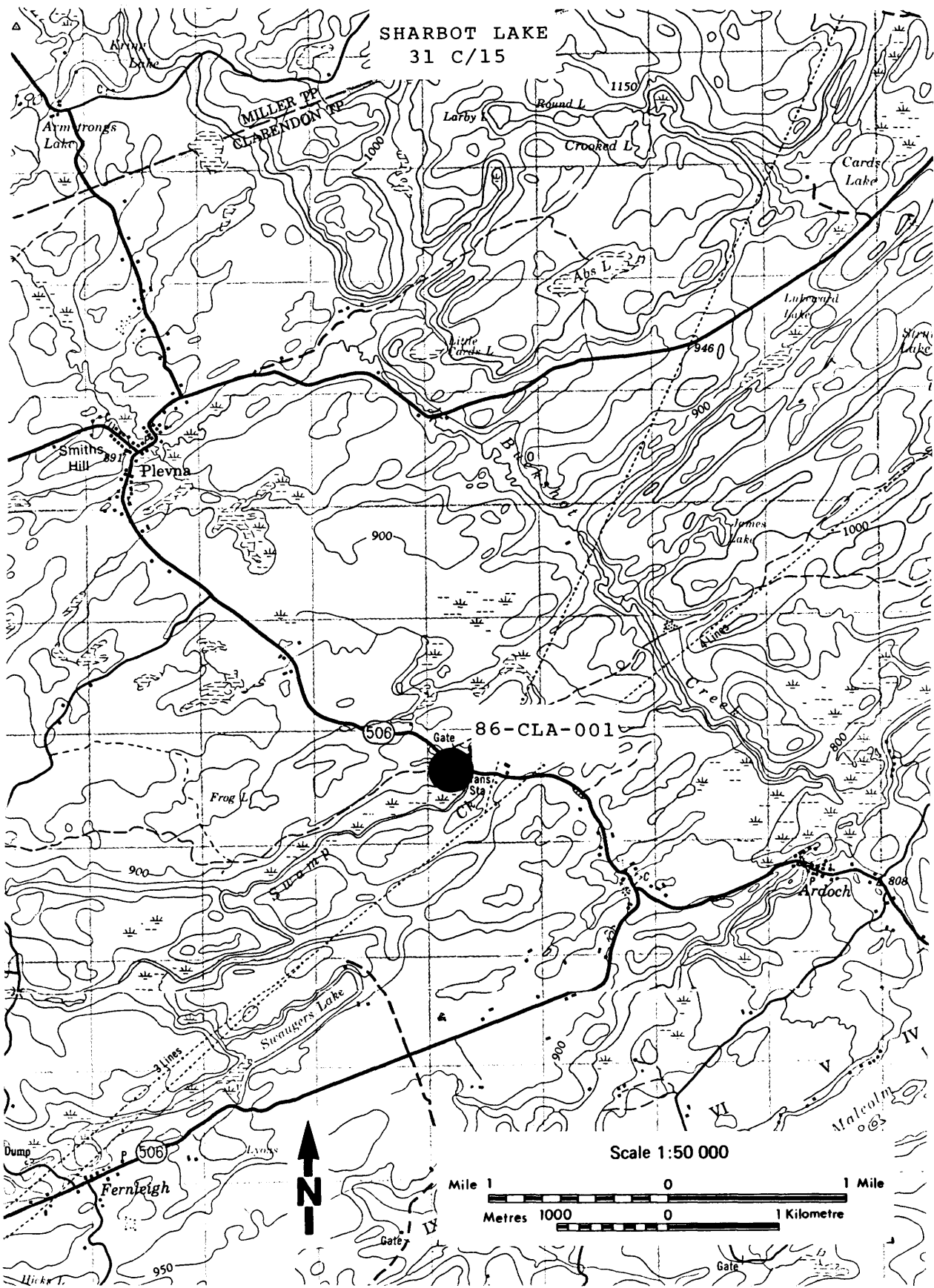


Figure B58. Sample location, 86-CLA-001.

86-DUN-001

PROPERTY NO. 86-DUN-001 PLUTON NAME

PROPERTY NAME L'Amable COMMERCIAL STONE NAME Marble

GEOLOGICAL ROCK NAME Stromatolitic Marble

TOWNSHIP Dungannon LOT 31 CONC. E. Range

NTS 31 F/4 UTM CO-ORDINATES Easting 280200 Northing 4988450

PROPERTY STATUS Prospect AIR PHOTO NO.

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes X No Type High velocity - roadcut

COLOUR Fresh Surface Banded pale grey and brown
Weathered Surface Buff to brown
Uniform X Variable

WEATHERING DEPTH 1 m weathered cap; otherwise negligible

GRAIN SIZE Fine to medium Uniform X Variable

TEXTURE Foliated Uniform X Variable

FABRIC Yes X No. Weak Mod. Strong Strike Dip 10 degrees E
(variable)
Formed By relict bedding-contorted

BEDDING Yes X No Strike Dip Avg. Thickness 1 to 2 cm

JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing X
A) Strike 125 degrees Dip 80 degrees W. Spacing 0.5 m
B) Strike 360 degrees ,Dip 70 degrees E. Spacing 1 m
C) Strike 360 degrees Dip 10 degrees E. Spacing 1 m
D) Strike 65 degrees Dip 50 degrees N. Spacing 2 m

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Calcite, brown bands contain 5 to 10% fine phlogopite; grey bands
1% graphite; minor serpentine.

DELETERIOUS MINERALS Yes X No Type Sulphides Percent 1%

OTHER FEATURES Quartz veining; pitted, rusty weathering (pyrite); 1 m
weathered cap.

POSSIBLE USES Ornamental, terrazzo

OUTCROP EXPOSURE Good Fair Poor X

COMMENTS The polished stone is quite attractive but weathers poorly, limiting
uses to interior ornamental stone or terrazzo.



Photo B63. Banding and jointing in marble roadcut. 86-DUN-001

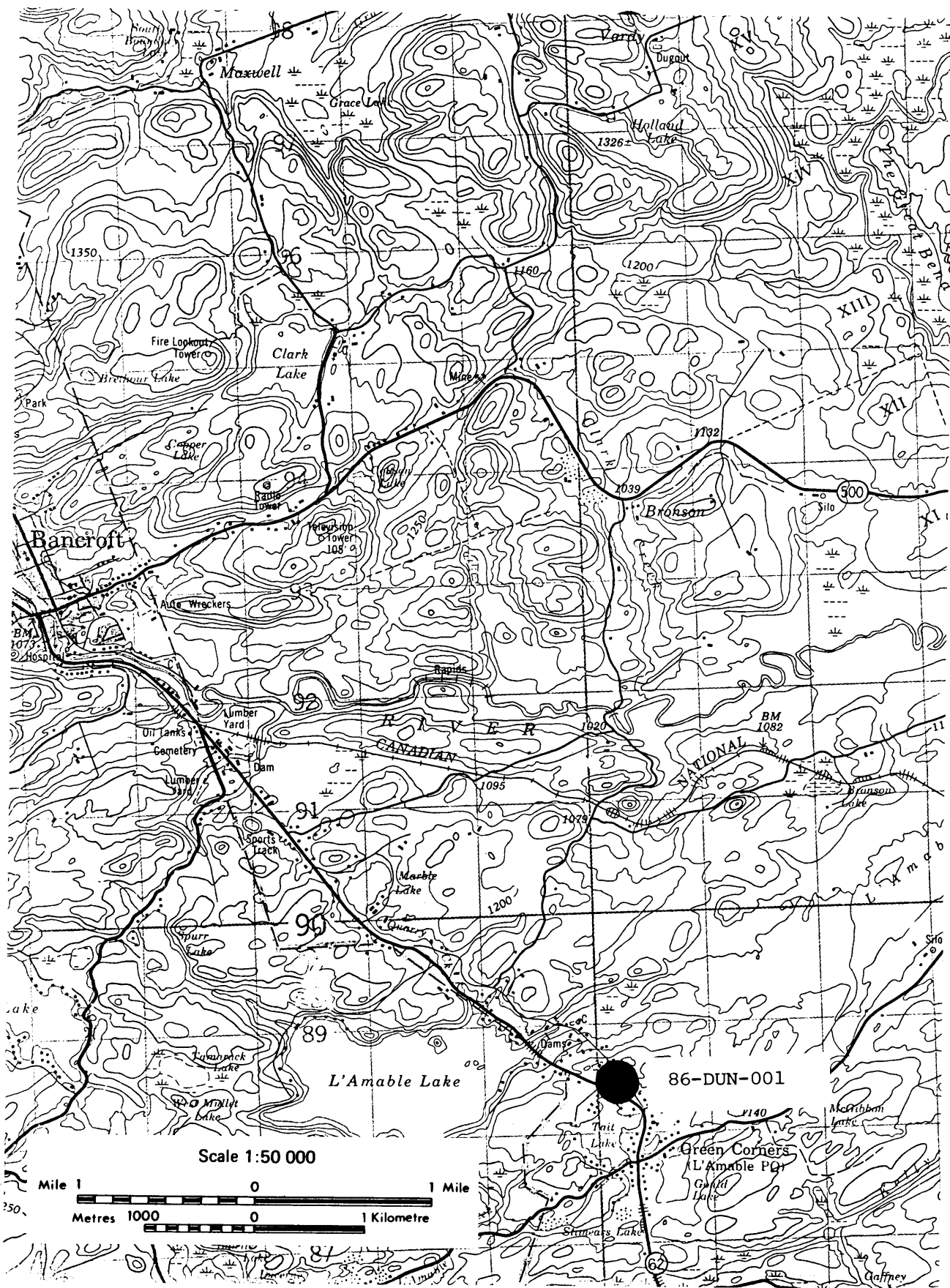


Figure B59. Sample location, 86-DUN-001.

86-FAR-020

PROPERTY NO. 86-FAR-020 PLUTON NAME
PROPERTY NAME Barker Bancroft Brown COMMERCIAL STONE NAME Marble
 Marble
GEOLOGICAL ROCK NAME Brown Breccia
TOWNSHIP Faraday LOT 41 CONC. 9
NTS 31 F/4 UTM CO-ORDINATES Easting 277500 Northing 4989500
PROPERTY STATUS Inactive AIR PHOTO NO.
PRODUCTION HISTORY Former quarry (Barker)
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface White brown patches
 Weathered Surface Brownish grey
 Uniform Variable X
WEATHERING DEPTH Negligible
GRAIN SIZE Fine to coarse Uniform Variable X
TEXTURE Foliated Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Foliation
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 20 degrees Dip 45 degrees NW Spacing 2 m
 B) Strike Horizontal Dip Spacing 1.3 m
 C) Strike 90 degrees Dip 70 degrees Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Calcite
DELETERIOUS MINERALS Yes X No Type Phlogopite Percent <5%
OTHER FEATURES Some large patches of phlogopite.
POSSIBLE USES Architectural stone, ashlar, landscaping stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS The marble breccia found at this site is for the most part a brown and white patchy colour that does not appear very uniform throughout the outcrop area. The rock is foliated and is fine to coarse grained. The jointing is regular and moderate with 2 m spacing. Also present is horizontal jointing at about 1.5 m spacings. The outcrop area is fairly good and accessible from Highway 62. Some fairly large patches of phlogopite were noted and may decrease the potential of the stone. Farther to the south is another quarry face and this area may warrant further investigation.



Photo B64. View showing potential block size from one of the brown breccia pits. 86-FAR-020

86-FAR-021

PROPERTY NO. 86-FAR-021 PLUTON NAME
PROPERTY NAME Bancroft pink marble COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Pink Calcitic Marble
TOWNSHIP Faraday LOT 41 CONC. 9
NTS 31 F/4 UTM CO-ORDINATES Easting 277500 Northing 4989500
PROPERTY STATUS Inactive AIR PHOTO NO.
PRODUCTION HISTORY Former marble quarry (Barker)
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface Pale pink to dark pink with variable white-black bands
Weathered Surface Grey-brown
Uniform Variable X
WEATHERING DEPTH Negligible
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform Variable X
FABRIC Yes X No. Weak Mod. Strong X Strike 30 degrees Dip
Formed By Foliation
BEDDING Yes No X Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 140 degrees Dip Vertical Spacing 1 m
B) Strike Horizontal Dip Spacing 1 m
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Calcite, phlogopite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Some quartz veining, banding variable, as is colour.
POSSIBLE USES Ornamental stone, architectural stone, landscaping stone,
terrazzo chips
OUTCROP EXPOSURE Good Fair X Poor
COMMENTS The rock appears to be quite attractive due to pink, white and black banding. Unfortunately, the banding appears to be variable and large areas of homogeneous texture are difficult to find. Jointing is not optimal and is difficult to determine due to overburden. The attractiveness of this stone is such that the area warrants further investigation. Some quartz veining was noticed in the area.

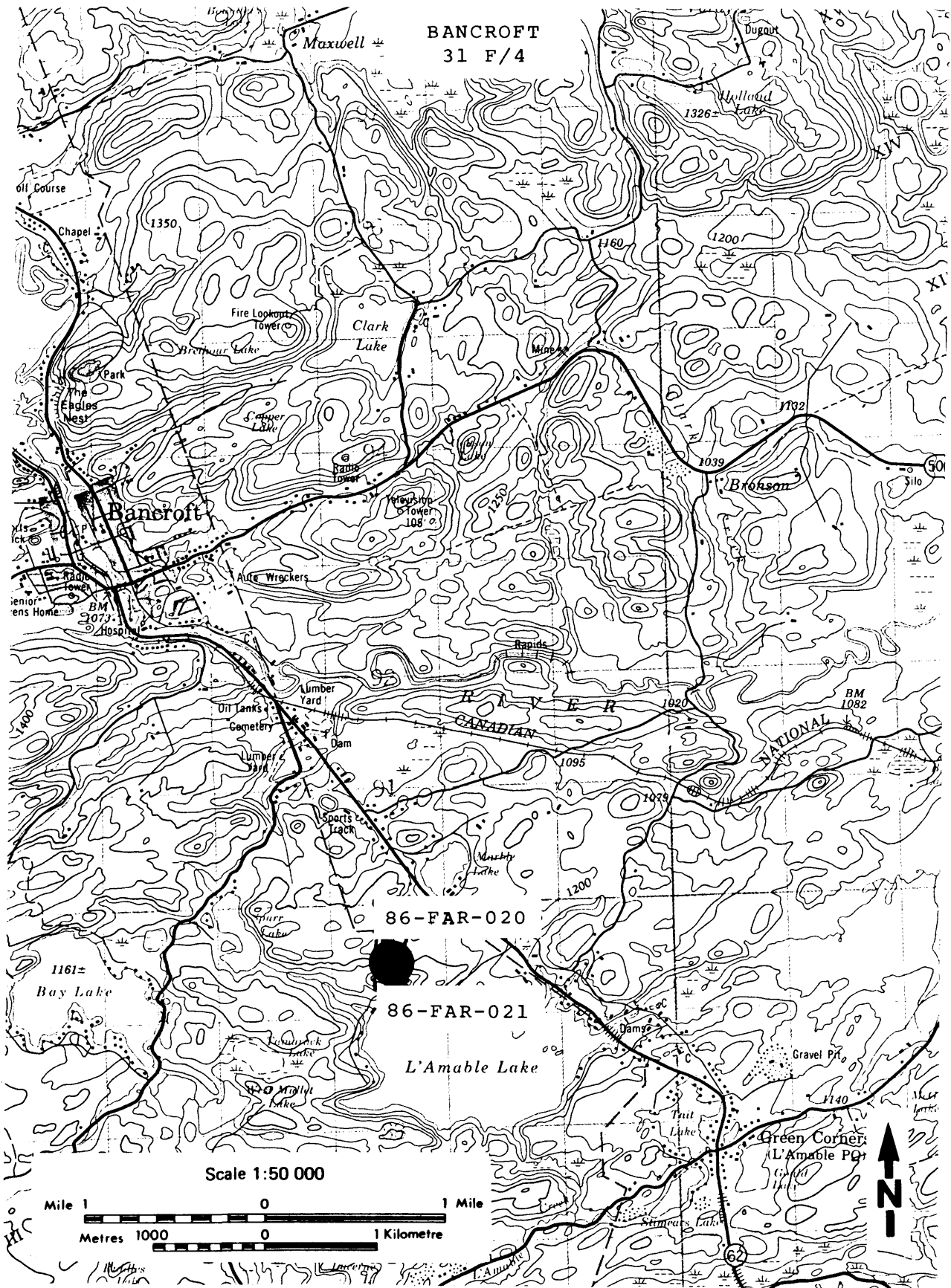


Figure B60. Sample locations, 86-FAR-020, 86-FAR-021.

86-KEN-030

PROPERTY NO. 86-KEN-030 PLUTON NAME
PROPERTY NAME Baker Valley on Hwy. 7 COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Dolomitic Marble
TOWNSHIP Kennebec LOT 19 NW 1/4 CONC. 10
NTS 31 C/15 UTM CO-ORDINATES Easting 348300 Northing 4956900
PROPERTY STATUS Roadcut AIR PHOTO NO. 78-4452-157-70
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type
COLOUR Fresh Surface White
Weathered Surface Dull white greyish
Uniform Variable X
WEATHERING DEPTH Nil
GRAIN SIZE Fine to coarse Uniform X Variable
TEXTURE Foliated Uniform Variable X
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
Formed By Foliation
BEDDING Yes X No Strike Dip Avg. Thickness 1.5 m
JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike Dip Spacing
B) Strike Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair to poor
MINERALOGY Dolomite, tremolite, phlogopite
DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace
OTHER FEATURES Subparallel lineations; local coarse tremolite patches.
POSSIBLE USES Ashlar, structural stone, landscaping stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This rock is a highly foliated dolomitic marble. For the most part it is whitish brown on the fresh surface, the brown being the result of bands of fine-grained phlogopite. The stone may also appear greenish in some spots due to the presence of tremolite. Pyrite is present but only in trace amounts. Jointing appears regular and moderate but the outcrop area appears very limited. The rock is bedded with an average thickness of 1.5 m.

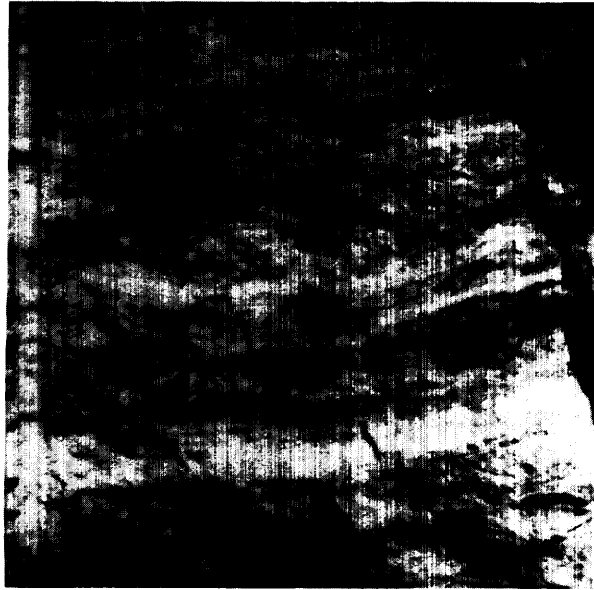


Photo B65. View of roadcut face showing foliation due to phlogopite bands. 86-KEN-030

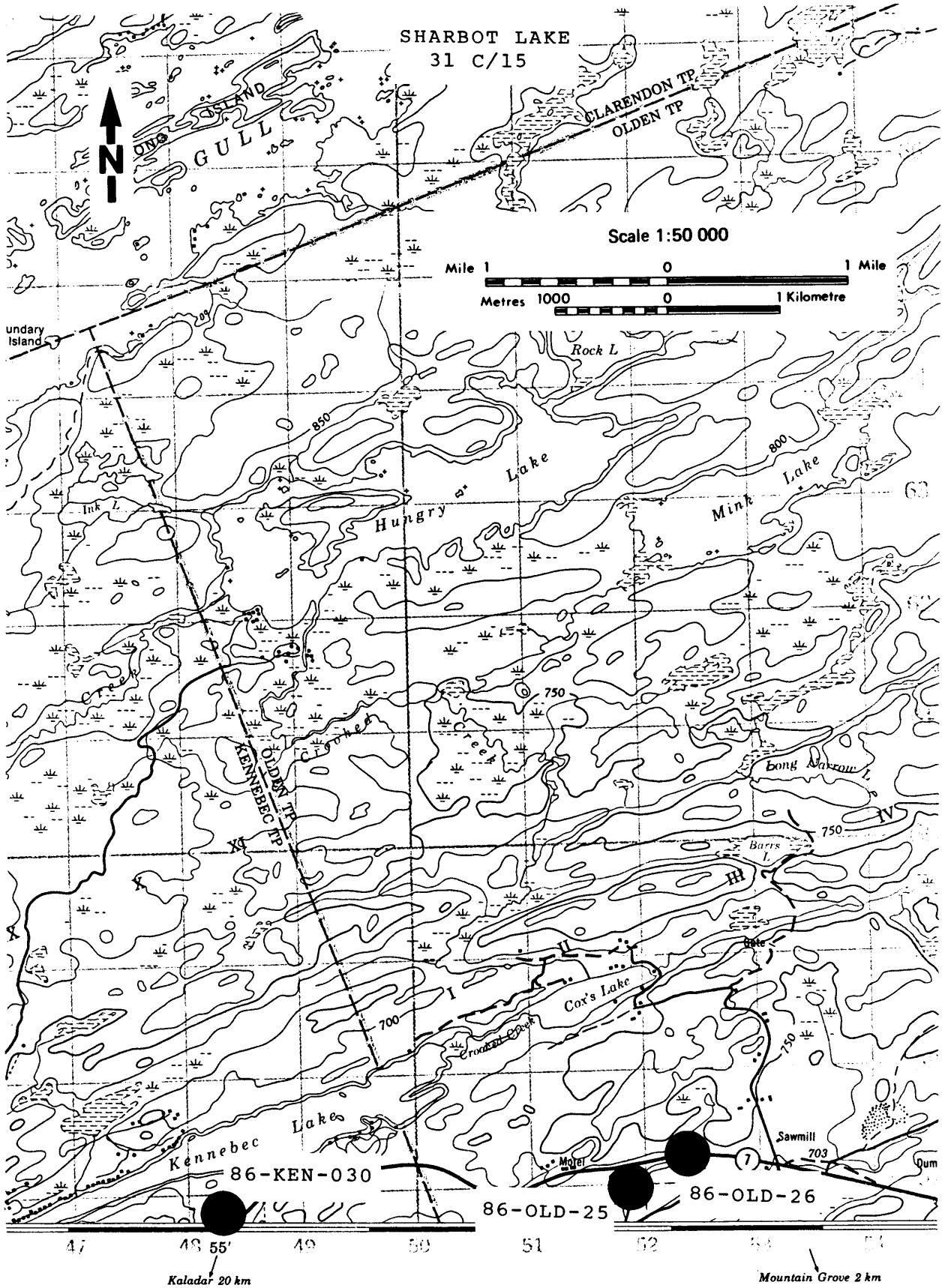


Figure B61. Sample location, 86-KEN-030.

86-MAD-030

PROPERTY NO. 86-MAD-030 PLUTON NAME
 PROPERTY NAME Arena Road COMMERCIAL STONE NAME Marble
 GEOLOGICAL ROCK NAME Marble Breccia
 TOWNSHIP Madoc LOT 3 CONC. 6
 NTS 31 C/11 UTM CO-ORDINATES Easting 303600 Northing 4931700
 PROPERTY STATUS Inactive AIR PHOTO NO. 78-4436-127-160
 PRODUCTION HISTORY None-roadcut
 USE OF EXPLOSIVES Yes X No Type
 COLOUR Fresh Surface Pink-brown-grey-white
 Weathered Surface Brown-dull
 Uniform Variable X
 WEATHERING DEPTH up to 0.5 cm
 GRAIN SIZE Coarse grains in a fine-grained matrix Uniform Variable X
 TEXTURE Brecciated Uniform X Variable
 FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Brecciation
 BEDDING Yes X No Strike 135 degrees Dip Avg. Thickness 2 to 3 m
 JOINTING Regular Pattern Irregular Pattern
 Limited Jointing Moderate Jointing Intensive Jointing
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
 POTENTIAL FOR QUARRY BLOCKS Fair
 MINERALOGY Calcite, quartz
 DELETERIOUS MINERALS Yes No X Type Percent
 OTHER FEATURES Limited outcrop exposure.
 POSSIBLE USES Architectural stone, ornamental stone
 OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This site displays a very unique marble breccia. It appears that very coarse (2 to 3 cm) dolomitic fragments are set in a fine-grained calcitic matrix. The fragments are commonly banded and exhibit a variety of colours, including pink, brown, grey, white, yellow, red and orange, all of which combine to give this stone a striking colour mosaic appearance. The outcrop can be seen on both the north and south sides of Highway 7. On the north side the stone is light, on the south side it appears darker. The breccia zone strikes at about 135 degrees and is 2 to 3 m thick.

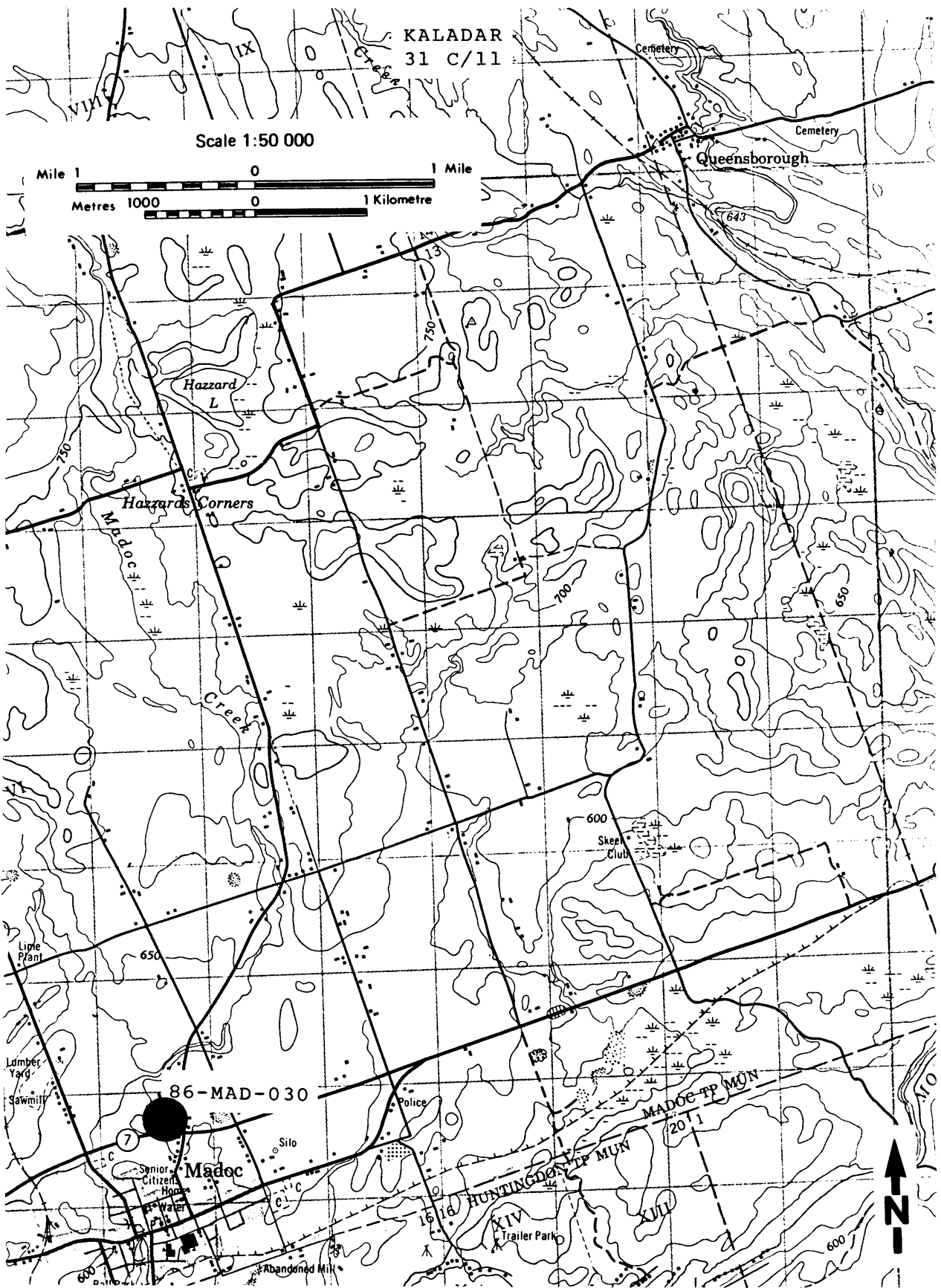


Figure B62. Sample location, 86-MAD-030.

86-MAR-020

PROPERTY NO. 86-MAR-020 PLUTON NAME

PROPERTY NAME Malone-South East COMMERCIAL STONE NAME Marble
 (Bonter quarry) GEOLOGICAL ROCK NAME Calcitic Marble

TOWNSHIP Marmora LOT 17 CONC. 11

NTS 31 C/12 UTM CO-ORDINATES Easting 293500 Northing 4937100

PROPERTY STATUS Inactive AIR PHOTO NO. 78-4439-132-72

PRODUCTION HISTORY Former marble quarry (terrazzo, crushed stone)

USE OF EXPLOSIVES Yes X No Type

COLOUR Fresh Surface White-greenish tinge
 Weathered Surface Dull white
 Uniform Variable X

WEATHERING DEPTH 1 mm

GRAIN SIZE Fine Uniform X Variable

TEXTURE Massive to slightly foliated Uniform Variable X

FABRIC Yes X No. Weak Mod. X Strong Strike Dip
 Formed By Foliation

BEDDING Yes No X Strike Dip Avg. Thickness

JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor

MINERALOGY Calcite (serpentine, diopside)

DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace

OTHER FEATURES Severe blast fractures distort true interpretation of jointing.

POSSIBLE USES Crushed stone, ornamental stone

OUTCROP EXPOSURE Good X Fair Poor

COMMENTS This property appears to have very little potential for building stone except as small items such as bookends or other ornaments. The colour is dominantly white with a greenish tinge in some areas. Jointing is very intensive and irregular, probably due to blasting. Away from the quarry, it may improve but overburden prevents confirmation of this. The rock is predominantly massive but some foliation can be seen in the form of greenish bands and swirls which are likely diopside or serpentine. Minor pyrite was also noted.

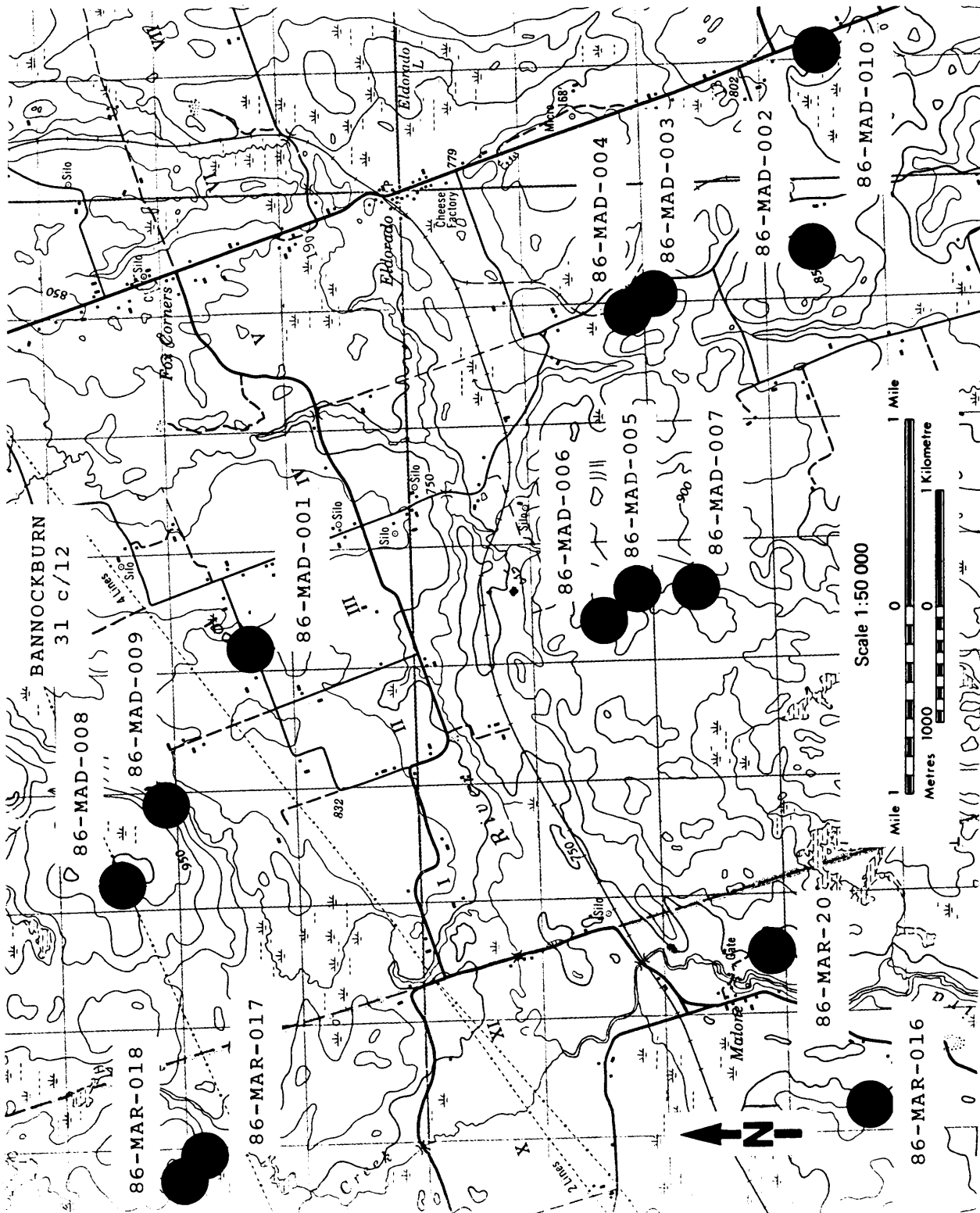


Figure B63. Sample location, 86-MAR-020.

86-OLD-026

PROPERTY NO. 86-OLD-026 PLUTON NAME
PROPERTY NAME Howard Gibbs COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Dolomitic Marble
TOWNSHIP Olden LOT 17 CONC. 2
NTS 31 C/15 UTM CO-ORDINATES Easting 3523501 Northing 4957200
PROPERTY STATUS Roadcut AIR PHOTO NO. 78-4453-162-129,130,131
PRODUCTION HISTORY None
USE OF EXPLOSIVES Yes X No Type High velocity
COLOUR Fresh Surface White
 Weathered Surface Grey-black
 Uniform X Variable
WEATHERING DEPTH Nil
GRAIN SIZE Medium Uniform X Variable
TEXTURE Foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Foliation
BEDDING Yes X No Strike Dip Avg. Thickness 2 to 3 m
JOINTING Regular Pattern Irregular Pattern X
 Limited Jointing Moderate Jointing Intensive Jointing X
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Dolomite, tremolite
DELETERIOUS MINERALS Yes X No Type Pyrite-phlogopite Percent Trace
OTHER FEATURES
POSSIBLE USES Landscaping stone, ornamental stone, ashlar
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This site is a roadcut on Highway 7 near Mountain Grove. It is a foliated dolomitic marble with medium grain size. The marble appears to be bedded with an average thickness of 2 to 3 m. In addition to dolomite, a major constituent is tremolite. Pyrite and phlogopite are found in trace amounts. Overburden and blast fracturing hinder an accurate evaluation of the jointing but it appears fairly irregular and intense, limiting the building stone potential.

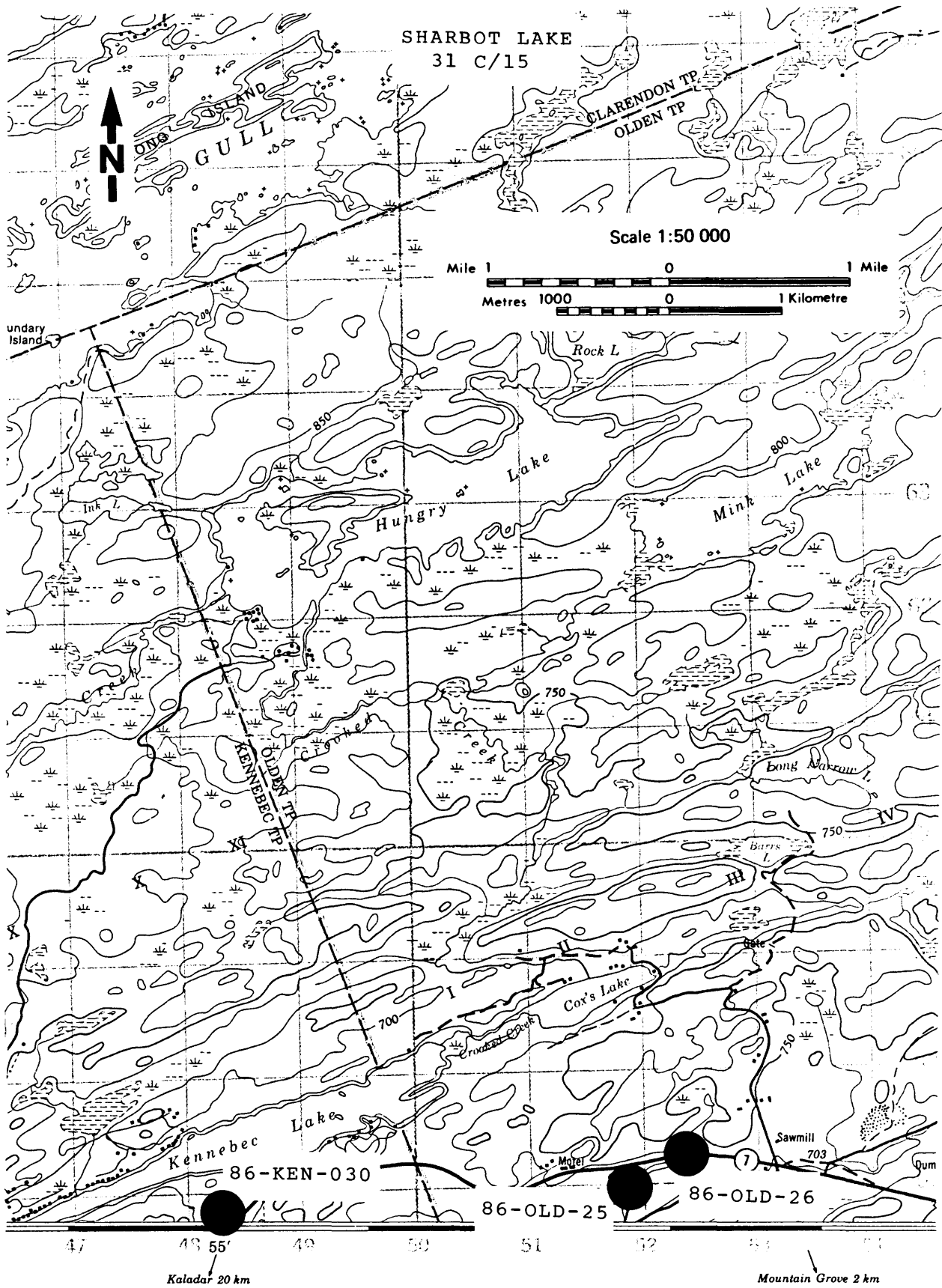


Figure B64. Sample location, 86-OLD-026.

86-OSO-010

PROPERTY NO. 86-OSO-010 PLUTON NAME
PROPERTY NAME John Donelly Gravel COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Grey banded crystalline limestone
TOWNSHIP Oso LOT 23 CONC. 5
NTS 31 C/15 UTM CO-ORDINATES Easting 371300 Northing 4967800
PROPERTY STATUS Inactive AIR PHOTO NO. 78-4459-90-128
PRODUCTION HISTORY Former Gravel Pit
USE OF EXPLOSIVES Yes No X Type
COLOUR Fresh Surface White and grey banded
 Weathered Surface White and grey banded
 Uniform X Variable
WEATHERING DEPTH Nil
GRAIN SIZE Coarse Uniform X Variable
TEXTURE Foliated-Granoblastic Uniform X Variable
FABRIC Yes X No. Weak Mod. Strong X Strike Dip
 Formed By Foliation - Relict bedding
BEDDING Yes X No Strike 65 degrees Dip 50 degrees S. Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 65 degrees Dip 50 degrees S Spacing 0.5 m
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Calcite
DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace
OTHER FEATURES Some areas of outcrop may show large dark patches of uncertain mineralogy.
POSSIBLE USES Architectural stone, structural stone, ashlar
OUTCROP EXPOSURE Good Fair Poor X

COMMENTS This crystalline limestone is quite attractive because of alternating white and grey bands of calcite. The texture of the rock is foliated with granoblastic coarse grains. A gravel pit has exposed a face of this rock which displays the foliation quite well. The jointing appears to be fairly regular and moderate, striking at about 65 degrees. The mineralogy is calcite with trace amounts of pyrite. Also present were large dark inclusions of uncertain mineralogy. This area may warrant further investigation.



Photo B66. Bedding with large mafic knots; field of view is approximately 2 m. 86-OSO-010



Photo B67. View showing foliated texture of rock. 86-OSO-010

86-OSO-011

PROPERTY NO. 86-OSO-011 PLUTON NAME Zealand Corners
PROPERTY NAME Zealand Corners COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Dolomitic Marble
TOWNSHIP Oso LOT 20 CONC. 6
NTS 31 C/15 UTM CO-ORDINATES Easting 371550 Northing 4965500
PROPERTY STATUS Roadcut AIR PHOTO NO. 78-4458-189-175,176,177
PRODUCTION HISTORY Nil
USE OF EXPLOSIVES Yes X No Type High velocity
COLOUR Fresh Surface White
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH Nil
GRAIN SIZE Medium Uniform X Variable
TEXTURE Slightly foliated Uniform X Variable
FABRIC Yes X No. Weak Mod. X Strong Strike Dip
 Formed By Foliation - Relict Bedding
BEDDING Yes No Strike Dip Avg. Thickness
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike Dip Spacing
 B) Strike Dip Spacing
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Fair
MINERALOGY Dolomite
DELETERIOUS MINERALS Yes X No Type Phlogopite-garnet Percent Trace
OTHER FEATURES Limited outcrop area.
POSSIBLE USES Landscaping stone, ornamental stone, monument stone
OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This site consists of a white dolomitic marble that displays slight foliation, perhaps due to relict bedding. The jointing pattern appears to be fairly regular and moderate, but not optimal for building stone extraction, except on a fairly small scale. The fresh surface of the rock displays an attractive white, medium-grained, slightly foliated texture. Outcrop area is fair to poor in extent. Phlogopite and garnet are found in the stone in trace amounts.



Photo B68. View showing limited outcrop exposure, uniform massive texture and white colour. 86-OSO-011

86-OSO-012

PROPERTY NO. 86-OSO-012 PLUTON NAME

PROPERTY NAME Ralph MacPherson COMMERCIAL STONE NAME Limestone

GEOLOGICAL ROCK NAME Grey banded limestone

TOWNSHIP Oso LOT 21 CONC. 4

NTS 31 C/15 UTM CO-ORDINATES Easting 369100 Northing 4965300

PROPERTY STATUS Inactive AIR PHOTO NO. 78-4458-189-173,174,175

PRODUCTION HISTORY Former marble quarry

USE OF EXPLOSIVES Yes X No Type

COLOUR Fresh Surface Light whitish grey
Weathered Surface Dark grey
Uniform X Variable

WEATHERING DEPTH Negligible

GRAIN SIZE Fine to coarse Uniform Variable X

TEXTURE Foliated Uniform X Variable

FABRIC Yes X No. Weak Mod. Strong X Strike Dip
Formed By Foliation

BEDDING Yes X No Strike Dip Avg. Thickness

JOINTING Regular Pattern X Irregular Pattern
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 65 degrees Dip 70 degrees S. Spacing 0.5 m
B) Strike 130 degrees Dip Spacing
C) Strike Dip Spacing
D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Fair

MINERALOGY Calcite, some tremolite

DELETERIOUS MINERALS Yes X No Type Biotite Percent 5%

OTHER FEATURES Some biotite or hornblende pods.

POSSIBLE USES Architectural stone, ornamental stone, ashlar

OUTCROP EXPOSURE Good Fair X Poor

COMMENTS This rock is quite attractive and displays alternating bands of coarse, white calcite and fine- to medium-grained, greyish calcite. The bands vary in width but appear to be less than 2 cm on average. Establishing a definite joint pattern is difficult but blocks of 1 by 1 by 1 m have been removed and some are still at the site. Minor siliceous veining, biotite and hornblende pods (15 by 30 cm), and accessory tremolite are present in the marble. This quarry would only be suited for very small scale uses.

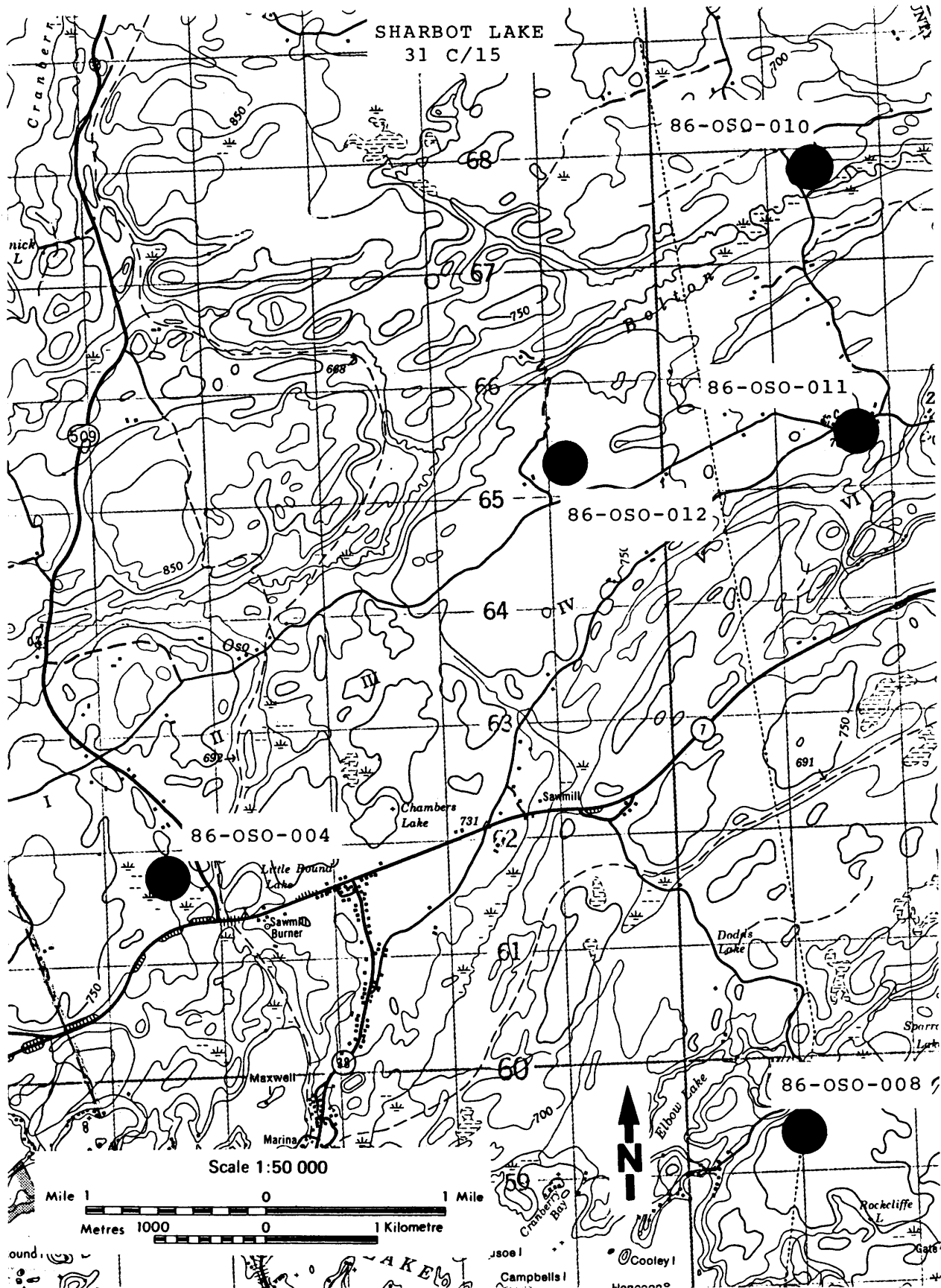


Figure B65. Sample locations, 86-OSO-010, 86-OSO-011, 86-OSO-012.

86-ROSS-001

PROPERTY NO. 86-ROSS-001 PLUTON NAME

PROPERTY NAME COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Calcitic Marble

TOWNSHIP Ross LOT 24 CONC. 2

NTS 31 F/10 UTM CO-ORDINATES Easting 361250 Northing 504650

PROPERTY STATUS Prospect AIR PHOTO NO.

PRODUCTION HISTORY Nil

USE OF EXPLOSIVES Yes X No Type High velocity - roadcut

COLOUR Fresh Surface Banded pale and dark grey to blue-grey
Weathered Surface Black
Uniform X Variable

WEATHERING DEPTH <1 cm

GRAIN SIZE Coarse Uniform X Variable

TEXTURE Banded Uniform X Variable

FABRIC Yes X No. Weak Mod. Strong X Strike 10 degrees Dip 80 degrees E
(variable)
Formed By Colour banding

BEDDING Yes No Strike Dip Avg. Thickness

JOINTING Regular Pattern Irregular Pattern X
Limited Jointing Moderate Jointing X Intensive Jointing
A) Strike 340 degrees Dip 90 degrees Spacing 0.3 to 1 m
B) Strike 100 degrees Dip 80 degrees S. Spacing 0.3 to 3 m
C) Strike Dip horizontal Spacing 0.3 to 1.5 m
D) Strike Dip Spacing

POTENTIAL FOR QUARRY BLOCKS Poor to moderate

MINERALOGY Calcite; dark grey bands contain 1% graphite

DELETERIOUS MINERALS Yes X No Type Pyrite Percent Trace

OTHER FEATURES Orange iron stain in pale grey bands, probably caused by oxidation of fine pyrite.

POSSIBLE USES Ashlar, ornamental stone, landscaping stone

OUTCROP EXPOSURE Good Fair X Poor

COMMENTS Some large quarry blocks could be extracted, but the irregular joint pattern limits the potential as a quarry site.

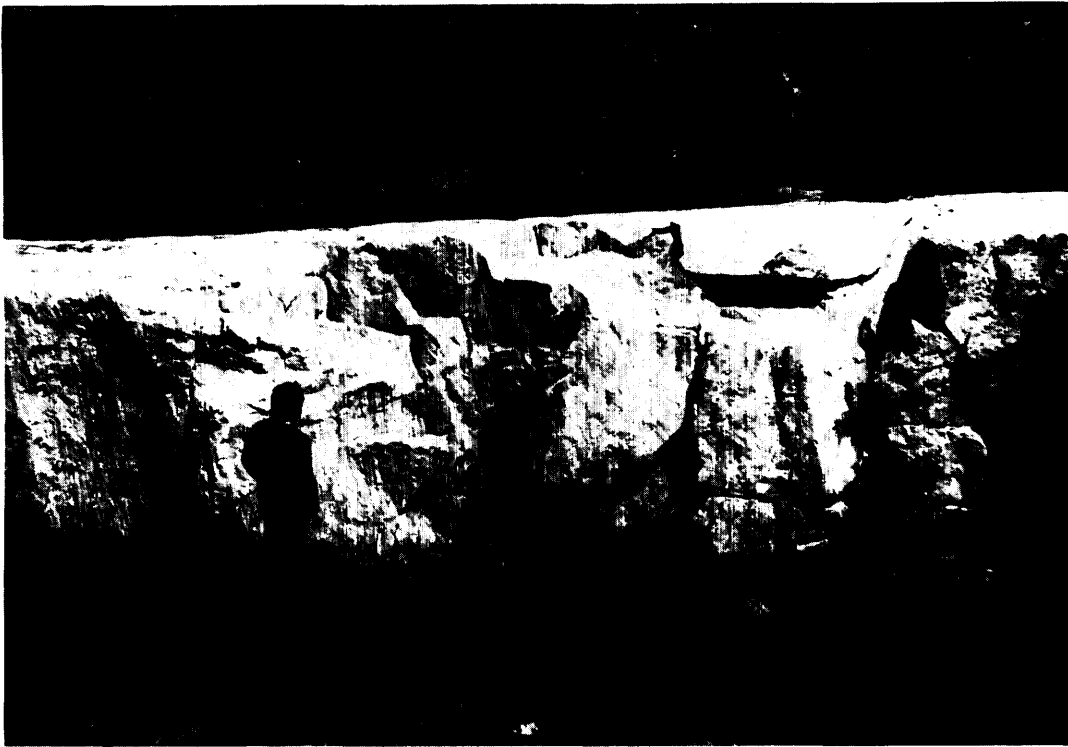


Photo B69. Moderate jointing in banded marble. 86-ROSS-001

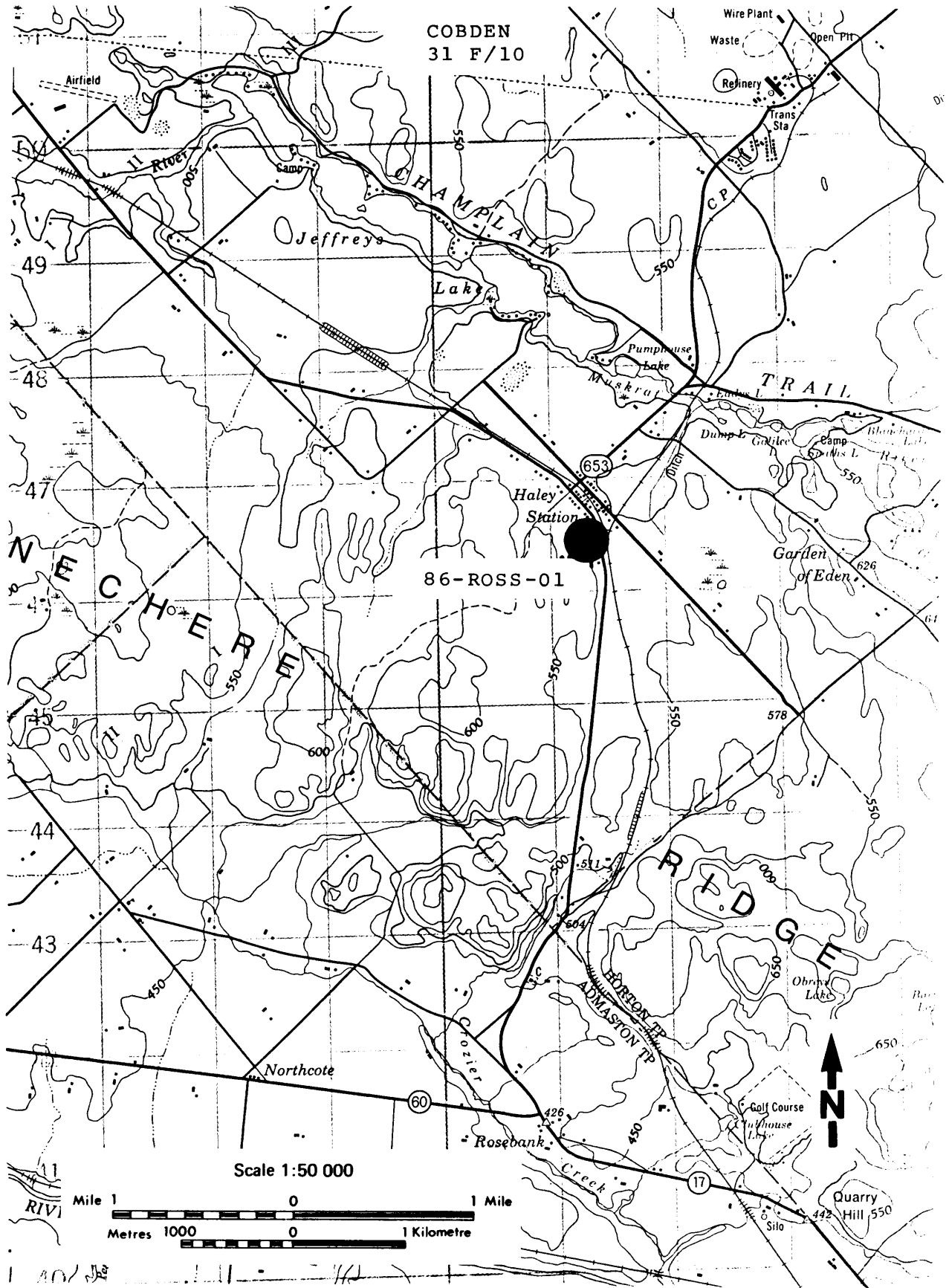


Figure B66. Sample location, 86-ROSS-001.

Appendix B. 1986 Property Examination Reports—Limestone Properties

86-THUR-001

PROPERTY NO. 86-THUR-001 PLUTON NAME
PROPERTY NAME Point Anne Quarry COMMERCIAL STONE NAME Marble
GEOLOGICAL ROCK NAME Limestone
TOWNSHIP Thurlow LOT 23, 24 CONC. B.F.
NTS 31 C/3 UTM CO-ORDINATES Easting 317650 Northing 4992800
PROPERTY STATUS Active AIR PHOTO NO.
PRODUCTION HISTORY McFarlane Construction Company, Canada Cement LaFarge
USE OF EXPLOSIVES Yes X No Type High velocity
COLOUR Fresh Surface Grey
 Weathered Surface Grey
 Uniform X Variable
WEATHERING DEPTH Negligible
GRAIN SIZE Lithographic to coarsely crystalline Uniform Variable X
TEXTURE Massive Uniform X Variable
FABRIC Yes No. X Weak Mod. Strong Strike Dip
 Formed By
BEDDING Yes X No Strike Sub Horizontal Dip Avg. Thickness 1 m
JOINTING Regular Pattern X Irregular Pattern
 Limited Jointing Moderate Jointing X Intensive Jointing
 A) Strike 100 degrees Dip Vertical Spacing 1 m
 B) Strike Horizontal Dip Spacing 1 m
 C) Strike Dip Spacing
 D) Strike Dip Spacing
POTENTIAL FOR QUARRY BLOCKS Poor
MINERALOGY Calcite
DELETERIOUS MINERALS Yes No X Type Percent
OTHER FEATURES Thin interbeds of shale.
POSSIBLE USES Crushed aggregate
OUTCROP EXPOSURE Good X Fair Poor

COMMENTS The Point Anne quarry displays limestone bedded to a maximum thickness of 1 m. The grain size varies from lithographic to coarsely crystalline with a massive texture. At present it appears that McFarlane Construction Company is quarrying Bobcageon Formation limestone for crushed aggregate. The main part of the quarry is under approximately 50 feet of water and is inactive. The northeast section of the property is presently being worked by McFarlane and is the only active part of the quarry. The jointing is fairly regular and moderate and blocks of 1 m cubed could be removed. Also present are minor interbeds of shale.

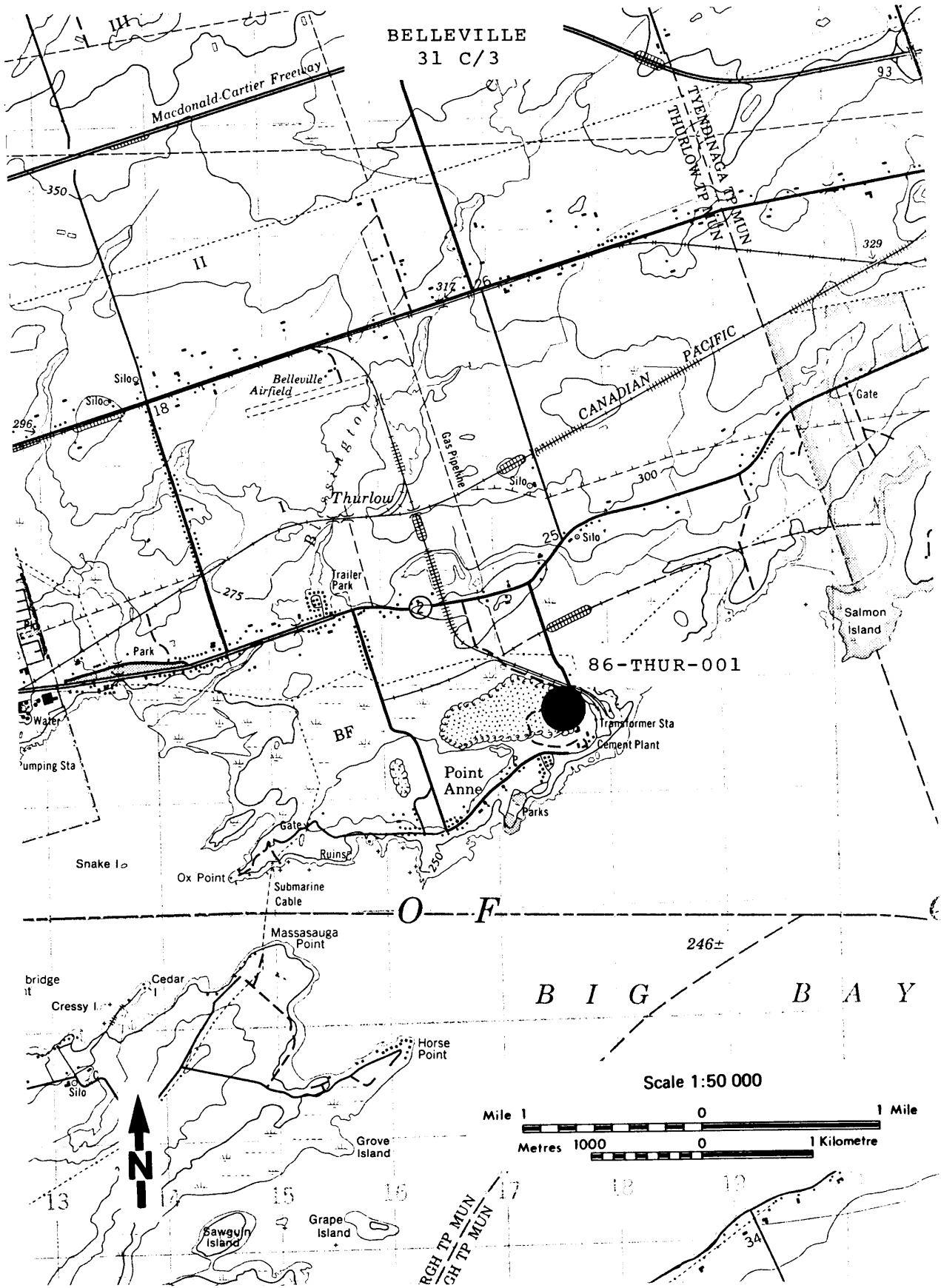


Figure B67. Sample location, 86-THUR-001.

Appendix C. List of Granite Properties Examined 1985–86, Grouped by Pluton

1986 PROPERTY EXAMINATIONS—GRANITE

Pluton Name	Property Report	Potential		
		Poor (P)	Moderate (M)	Good (G)
Abbotts Hill	86-OLD-007			P
	86-OLD-008			P
	86-OLD-009			P
	86-KEN-007			P
	86-KEN-008			P
	86-KEN-009			P
	86-KEN-010			P
Addington	86-OLD-003			P
	86-OLD-004			P
Beaver Creek	86-TUD-003			P
	86-TUD-004			P
	86-TUD-005			P
	86-TUD-006			P
	86-TUD-007			P
	86-TUD-008			P
Bishop Corners Formation	86-KAL-009			M
Coe Hill	86-WOL-006			P
	86-WOL-007			M
	86-WOL-008			M
	86-WOL-009			P
	86-WOL-010			M
Cordova	86-MAR-001			P
	86-MAR-002			P
	86-MAR-003			P
	86-MAR-004			P
	86-MAR-014			P
	86-MAR-015			P
Crow Lake	86-SCRO-001			P
Deloro	86-MAR-005			P
	86-MAR-006			P
	86-MAR-007			M-G
	86-MAR-008			G
	86-MAR-009			M
	86-MAR-010			M-G
	86-MAR-011			M
	86-MAR-012			P
	86-MAR-013			M
	86-MAD-002			P
	86-MAD-003			P
	86-MAD-004			P
	86-MAD-005			P
	86-MAD-006			P
86-MAD-007			P	
86-MAD-010			M	
Elzevir	86-KAL-001			P-M
	86-KAL-002			P-M
	86-KAL-004			P
	86-KAL-005			P-M
	86-ELZ-001			P
	86-ELZ-002			P
	86-ELZ-003			P-M
	86-ELZ-004			M
	86-ELZ-005			P
	86-ELZ-006			P-M
	86-ELZ-007			P-M
	86-ELZ-008			P-M
	86-ELZ-009			P-M
Empey	86-MAD-001			P
Gawley Creek	86-MAR-017			P
	86-MAR-018			P
	86-MAD-008			P
	86-MAD-009			P

1986 PROPERTY EXAMINATIONS—GRANITE

Pluton Name	Property Report	Potential		
		Poor (P)	Moderate (M)	Good (G)
Glanmire	86-TUD-009			P
	86-TUD-010			P
	86-TUD-011			P
	86-TUD-012			P
Lanark-Oso	86-OSO-001			P
	86-OSO-002			P
	86-OSO-003			P
	86-OSO-008			P
	86-SSHER-001			P
Lavant	86-OSO-005			P
	86-OSO-006			P
	86-OSO-007			P
	86-LAV-001			P
Leggat Lake	86-OLD-005			P-M
	86-OLD-006			P
	86-OLD-010			P
	86-OLD-011			P
	86-OLD-012			P
	86-OLD-013			P
	86-OLD-014			P
Malone	86-MAR-016			P
McLean	86-OLD-015			P
	86-OLD-016			P
	86-OLD-017			P
	86-OLD-018			P
	86-OLD-019			P
	86-OLD-020			M
	86-OLD-021			P
	86-OLD-022			M
	86-HIN-002			P
	86-KEN-011			P
	86-KEN-012			P
	Methuen and Belmont	86-BEL-001		
86-MET-001				P
Mount Moriah	86-ELZ-010			P
	86-ELZ-011			P-M
	86-ELZ-012			P
	86-GRI-001			P-M
	86-GRI-002			P-M
	86-GRI-003			P-M
	86-GRI-004			P-M
86-GRI-005			G	
Mountain Grove	86-OLD-027			P
Newboro	86-NCROS-005			P
Northbrook	86-KAL-006			P
	86-KEN-001			M
	86-KEN-002			P-M
	86-KEN-003			P-M
	86-KEN-004			P-M
	86-KEN-005			P
	86-KEN-006			P
Rideau Lake	86-NBURG-001			P
	86-NBURG-002			P
	86-NBURG-003			P
	86-NBURG-004			P
	86-NBURG-005			P
Skootamatta Lake	86-ANG-001			P
	86-ANG-002			P
	86-ANG-003			P
	86-GRI-006			P
	86-GRI-007			P
Tamworth, Bellrock Wilkinson, First Depot	86-CAM-001			P
	86-POR-001			P
	86-POR-002			P
	86-POR-003			P
	86-POR-004			P
	86-HIN-001			P-M

1986 PROPERTY EXAMINATIONS—GRANITE

Pluton Name	Property Report	Potential		
		Poor (P)	Moderate (M)	Good (G)
The Ridge	86-WOL-012			P
Umfraville	86-WOL-004			P
	86-WOL-005			P
Wadsworth	86-TUD-001			P
	86-TUD-002			P
Weslemkoon	86-DEN-001			P
Westport	86-NCROS-001			P
	86-NCROS-002			P
White Lake	86-OSO-004			P
	86-OLD-001			P
	86-OLD-002			P
Wolfe Lake	86-NCROS-003			P
	86-NCROS-004			P
Wollaston Granite	86-WOL-002			P
	86-WOL-003			P
	86-WOL-011			P
Wollaston Lake Gabbro	86-WOL-013			P
Township				
Chandos	86-CHA-001			P
Hungerford	86-HUN-001			P
Limerick	86-LIM-001			P
Madoc	86-MAD-031			P-M
Olden	86-OLD-025			G
Wollaston	86-WOL-001			M

1985 PROPERTY EXAMINATIONS

Pluton Name	Property Report	Potential		
		Poor (P)	Moderate (M)	Good (G)
Battersea	85-STO-01			G (active quarry)
	85-STO-02			M-G
Coe Hill	85-WOL-01			M
	85-WOL-02			P-M
Gananoque Syenite	85-FLL-04			M
Glamorgan Gabbro	85-CAV-02			P
	85-GLA-01			P-M
	85-GLA-02			P
Gooderham Syenite	85-MON-01			G
LaRose Bay Diorite	85-RLL-04			M-G
Lyndhurst	85-RLL-01			M (active quarry)
	85-RLL-02			P
	85-RLL-06			G
	85-RLL-07			G
	85-RLL-08			G
Mallard Lake	85-DUN-06b			M
Sheffield	85-HUG-01			P
Taylor	85-FLL-01			G (active quarry)
	85-FLL-02			G (active quarry)
	85-FLL-03			P
	85-FLL-05			P
	85-PIT-01			P-M
Pittsburgh	85-PIT-01			P-M
Township				
Burleigh	85-BUR-01			G
Carlow	85-CARL-01			M-G
Cavendish	85-CAV-01			P
Elizabethtown	85-ELI-01			P
Elizabethtown	85-ELI-02			P
Front of Escott	85-FOE-01			P
Front of Escott	85-FOE-02			P
Front of Yonge	85-KAL-01			M-G
Kaladar	85-KAL-01			M-G
Pittsburgh	85-PIT-02			P
Raglan	85-RAG-01			G
Rear of Leeds and Lansdowne	85-RLL-05			P
Rear of Yonge	85-ROY-01			P
Wollaston	85-WOL-03			P

Appendix D. ASTM Tests on Granite and Marble Samples from the Ontario Ministry of Northern Development and Mines (Job No. 025506)

R.L. Chevrier

Construction Materials Section, MSL

August 1987

CANMET Mineral Sciences Laboratories Internal Report (Energy, Mines and Resources Canada)

INTRODUCTION

This report presents results of ASTM testing on prepared building stone samples supplied by the Ontario Department of Northern Development and Mines, Tweed, Eastern Region. The work was requested by Ron Collings, Head, Non-Metallic Minerals Section and was carried out in the Construction Materials Laboratory of MSL.

Apart from freeze-thaw durability, all other requested ASTM tests were performed in accordance with standards for natural building stones. Freeze-thaw durability tests were carried out using ASTM C666 (Procedure A) normally specified for testing concrete specimens.

SAMPLE PREPARATION

The load bearing faces of each specimen tested in compression (ASTM C170) were ground and polished to obtain parallel and planar surfaces. Specimens were later checked for planarity using a machined-steel surface in accordance with note 4 of ASTM C170.

For ASTM C97, C241, C99, C880 and C666, specimens were tested as received.

PRECONDITIONING

Specimens for compression (ASTM C170), flexural (ASTM C880) and modulus of rupture (ASTM C99) were tested wet after being immersed for 48 hours in water at a temperature of approximately 20°C.

Specimens for freeze-thaw durability were tested after being immersed 48 hours in water at 20°C and 1 hour at 5°C.

TEST RESULTS

A total of 6 granite (no. 1, 10, 12, 13, 52, 82) and 3 marble (no. 29, 31, 71) samples were received and each was tested as indicated in Table D1.

A summary of test results is presented in Tables D2 and D3. Detailed test results are given in Tables D4, D5 and D6 and ASTM test specifications are reproduced in American Society for Testing and Materials (1985).

TABLE D1. TEST RESULTS.

Test	ASTM	No. of Specimens	Specimen size inches
Absorption	C97	3	2 x 2 x 3
Bulk Specific Gravity	C97	3	2 x 2 x 1
Abrasion Resistance	C241	3	2 x 2 x 1
Modulus of Rupture	C99	3	4 x 8 x 2.25
Compressive Strength	C170	3	2 x 2 x 3
Flexural Strength	C880	3	1 x 1.5 x 12
Freeze-Thaw Durability	C666*	2	4 x 8 x 2.25

*Procedure "A"

TABLE D2. SUMMARY OF TEST RESULTS.

Type of Stone	Sample No.	ASTM C97		ASTM C241 Abrasion Resistance, Ha	ASTM C99 Modulus of Rupture, MPa	ASTM C170		ASTM C880 Flexural Strength, MPa
		Absorption (by weight) %	Bulk Specific Gravity			51x51x76 mm specimens	Compressive Strength, MPa corresponding cube strength*	
Granite	1	0.11	2.68	62.9	11.8	176.8	190.0	13.1
	10	0.17	2.66	68.6	11.6	211.0	226.9	15.0
	12	0.04	2.76	67.7	15.2	169.6	183.2	15.8
	13	0.07	2.72	71.0	13.2	191.2	205.0	13.3
	52	0.10	2.72	64.0	11.5	141.9	153.0	-**
	82	0.15	2.61	51.2	11.6	144.2	154.8	10.0
Marble	29	0.03	2.78	23.1	10.2	153.0	164.8	5.3
	31	0.04	2.87	9.6	9.3	169.0	181.7	5.7
	71	0.08	2.73	10.7	6.3	79.4	85.0	5.9

*Calculated as per section 9.2 of ASTM C170

**Specimens not available

Note: Each value is average of three test specimens.

TABLE D3. SUMMARY OF FREEZING AND THAWING TEST RESULTS.

Type of Stone	Sample No.	ASTM C666 (Procedure A)			
		Weight change, %	Pulse velocity change, %	Frequency change, %	Modulus of rupture after 300 cycles, MPa
Granite	1	0.0	4.8	5.1	11.1
	10	0.0	1.4	3.1	17.2
	12	0.0	1.0	-1.0	17.3
	13	0.0	2.4	-9.6	17.7
	52	0.0	0.8	5.6	14.0
	82	0.0	1.1	1.1	11.8
Marble	29	0.0	1.7	1.1	11.3
	31	0.0	1.3	1.8	8.6
	71	0.0	8.7	7.1	6.0

Note: Each value is average of two test specimens.

TABLE D4. ABSORPTION, BULK SPECIFIC GRAVITY AND ABRASION RESISTANCE.

Type of Stone	Sample No.	Absorption, %			Specific Gravity			Abrasion, Ha		
		max.	min.	aver.	max.	min.	aver.	max.	min.	aver.
Granite	1	0.112	0.103	0.11	2.690	2.676	2.68	69.94	55.07	62.9
	10	0.201	0.143	0.17	2.667	2.660	2.66	76.69	61.66	68.6
	12	0.050	0.037	0.04	2.759	2.755	2.76	75.05	61.33	67.7
	13	0.073	0.067	0.07	2.732	2.695	2.72	72.99	68.00	71.0
	52	0.116	0.081	0.10	2.716	2.714	2.72	66.33	59.84	64.0
	82	0.162	0.138	0.15	2.610	2.608	2.61	52.81	48.09	51.2
Marble	29	0.054	0.019	0.03	2.808	2.749	2.78	25.03	20.70	23.1
	31	0.045	0.041	0.04	2.867	2.865	2.87	10.57	8.64	9.6
	71	0.087	0.075	0.08	2.732	2.731	2.73	11.08	10.38	10.7

TABLE D5. COMPRESSIVE STRENGTH, FLEXURAL STRENGTH AND MODULUS OF RUPTURE TEST RESULTS ON INDIVIDUAL SPECIMENS.

Type of Stone	Sample No.	Compressive strength, MPa			Flexural Strength, MPa			Modulus of Rupture, MPa		
		1	2	3	1	2	3	1	2	3
Granite	1	167.3	180.8	182.3	13.8	12.7	12.8	11.4	11.8	12.2
	10	207.0	223.0	202.1	13.7	15.8	15.5	11.4	11.3	12.1
	12	177.5	174.1	157.3	15.7	15.0	16.8	16.4	12.1	17.1
	13	171.9	201.1	200.8	12.9	14.3	12.7	16.2	10.4	12.9
	52	144.8	141.0	139.9	-	-	-*	11.9	10.1	12.3
	82	134.9	159.3	138.4	9.7	10.0	10.3	11.3	11.6	12.0
Marble	29	158.6	160.4	140.0	5.6	5.0	-**	9.9	9.6	11.1
	31	169.0	167.2	170.7	6.3	4.5	6.3	9.2	9.4	-***
	71	79.7	80.5	78.0	5.7	6.2	5.7	5.0	6.7	7.2

* Specimens not available
 ** Specimen broken in transport
 *** Faulty specimen

TABLE D6. FREEZING AND THAWING TEST RESULTS ON INDIVIDUAL SPECIMENS.

Type of Stone	Sample and Spec. No.	Weight, g		Velocity, m/s		Frequency, Hz		Modulus of rupture after 300 cycles, MPa	
		Initial	Final	Initial	Final	Initial	Final		
Granite	1	1	3340	3340	5190	5423	9100	9900	11.2
		2	3204	3205	5216	5481	9400	9500	10.9
	10	1	3376	3377	5486	5577	10400	11800	18.1
		2	3213	3214	5541	5601	9100	10700	16.3
	12	1	3309	3308	5949	6000	12700	12300	16.7
		2	3470	3470	5824	5891	12500	12600	17.8
	13	1	3367	3369	5994	6175	13000	12000	18.3
		2	3250	3250	5965	6070	11900	10500	17.1
	52	1	3283	3282	5476	5535	9000	10200	12.1
		2	3044	3044	5526	5556	8900	8700	15.9
82	1	3205	3205	5413	5470	9300	10000	12.2	
	2	3213	3213	5714	5475	8800	8200	11.4	
Marble	29	1	3312	3312	6078	6152	12900	13200	10.7
		2	3488	3487	6119	6250	13200	13200	11.8
	31	1	3445	3444	6551	6592	9200	9900	8.1
		2	3365	3365	6404	6527	9800	9400	9.0
	71	1	3228	3228	5674	6030	9000	9300	6.8
		2	3248	3250	5000	5577	9400	10400	5.2

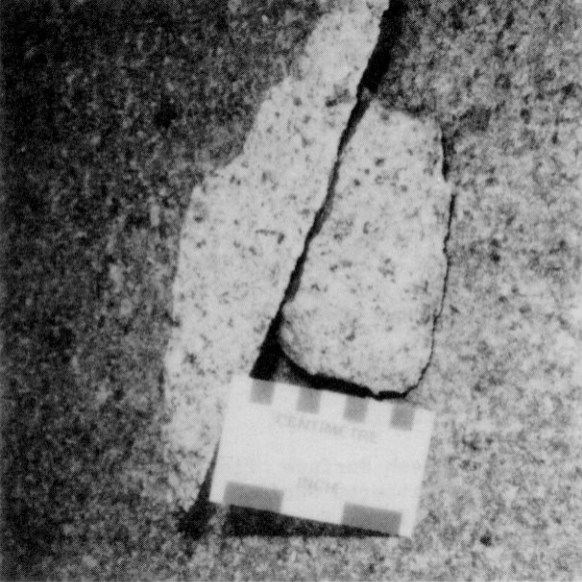
Appendix E. List of Properties with Polished Samples on Display at the MNDM Core Library, Tweed, Ontario

List of Polished Samples, Eastern Ontario Building Stone Survey

Property No.	Sample No.	Township	Rock Type
86-BEL-001	14	Belmont	granite
85-BUR-001	74	Burleigh	porphyritic granite
86-CHA-001	64	Chandos	granite
86-CLA-001	83	Clarendon	marble
85-DAR-001	18	Darling	serpentinized marble
86-DEN-001	62	Denbigh	granite
85-DUN-001	21	Dungannon	dolomitic marble
86-DUN-001	29	Dungannon	stromatolitic marble
86-ELZ-004	52	Elzevir	granite
86-FAR-020	22	Faraday	marble breccia
86-FAR-021	27	Faraday	calcitic marble
86-FLL-005	13	Front of Leeds & Lansdowne	syenite
86-GRI-005	81	Grimsthorpe	syenite
86-HIN-001	54	Hinchinbrooke	anorthosite
85-HUG-002	20, 31	Hungerford	dolomitic marble
85-HUN-001	17	Huntingdon	limestone
85-HUN-004	61	Huntingdon	serpentinized marble
85-KAL-001	15	Kaladar	anthophyllite-bearing ultramafic
86-KAL-009	57	Kaladar	quartz pebble conglomerate
86-KEN-030	58	Kennebec	dolomitic marble
86-MAD-010	60	Madoc	granite
86-MAD-030	3	Madoc	marble breccia
85-MAR-002	8	Marmora	calcitic marble
85-MAR-003	73	Marmora	wollastonite-bearing marble
86-MAR-009	51	Marmora	granite
86-MET-001	68	Methuen	granite
85-MON-001	82	Monmouth	granite
85-MUS-004	24	Muskoka Lake	gabbro
86-OLD-011	55	Olden	granite
86-OLD-020	50	Olden	granite
86-OLD-025	63	Olden	pegmatite
86-OLD-026	65	Olden	dolomitic marble
86-OLD-027	67	Olden	gabbro
86-OSO-010	69	Oso	banded calcitic marble
86-OSO-011	70	Oso	dolomitic marble
86-OSO-012	71	Oso	banded calcitic marble
85-PAK-001	19	Pakenham	limestone
85-RLL-001	2,9,10,16	Rear of Leeds & Lansdowne	granite (Rideau Red)
85-RLL-004	12	Rear of Leeds & Lansdowne	quartz diorite
85-RLL-008	11	Rear of Leeds & Lansdowne	granite
86-ROSS-001	59	Ross	calcitic marble
85-SHIM-001	26	South Himsworth	porphyritic syenite
85-STO-001	7	Storrington	granite (Battersea)
85-STO-002	1	Storrington	granite (Battersea)
85-STR-001	25	Strong	porphyritic gneiss
86-THUR-001	30	Thurlow	stylolitic limestone
85-WOL-001	5	Wollaston	quartz syenite
85-WOL-002	6	Wollaston	diabase
85-WOL-003	4	Wollaston	gabbro
86-WOL-002	56	Wollaston	granite
86-WOL-010	53	Wollaston	granite

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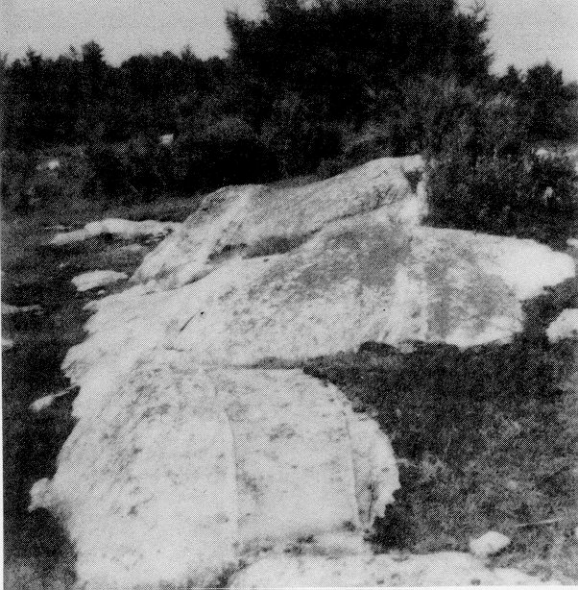
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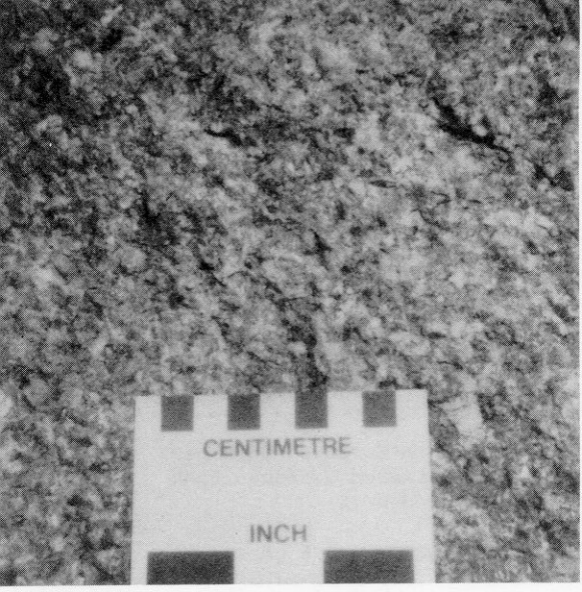












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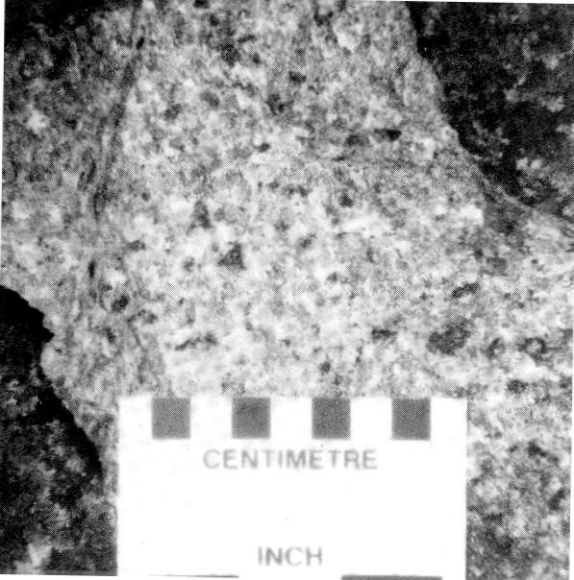








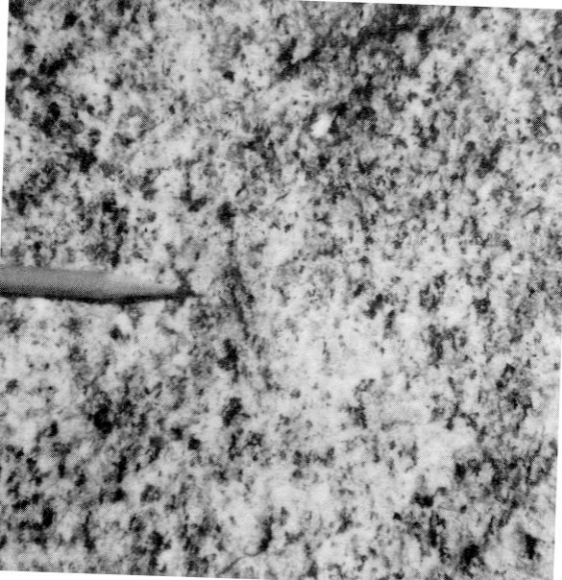




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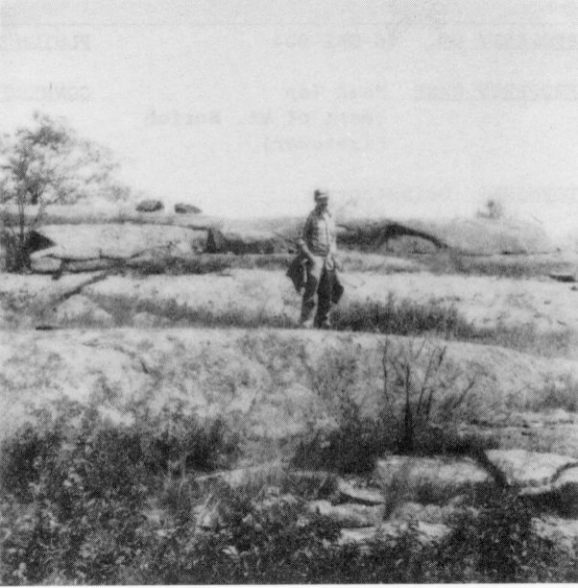


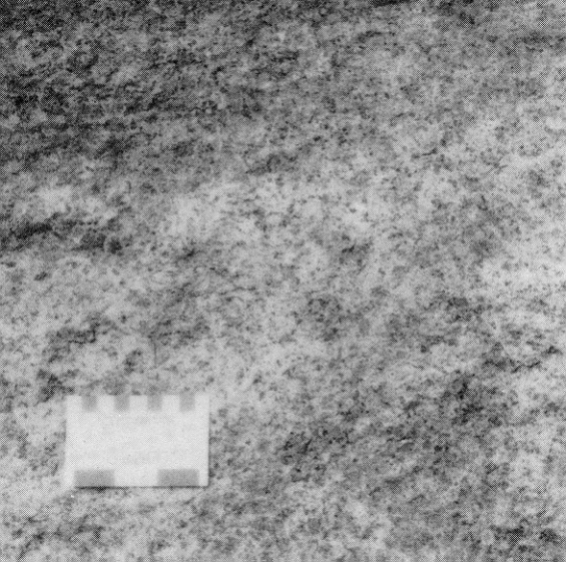










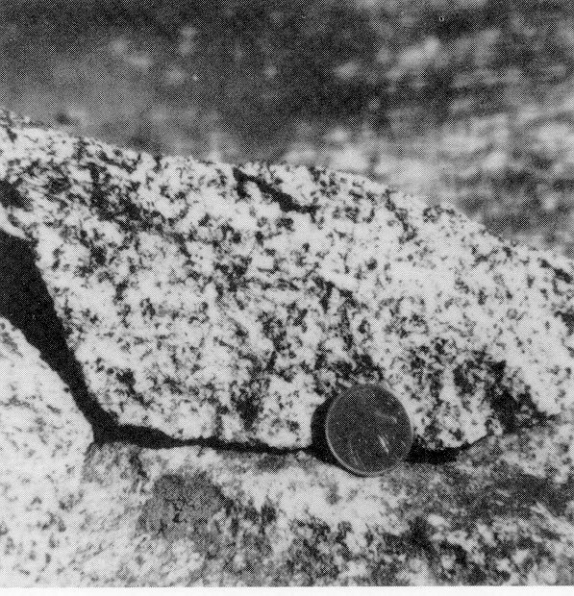










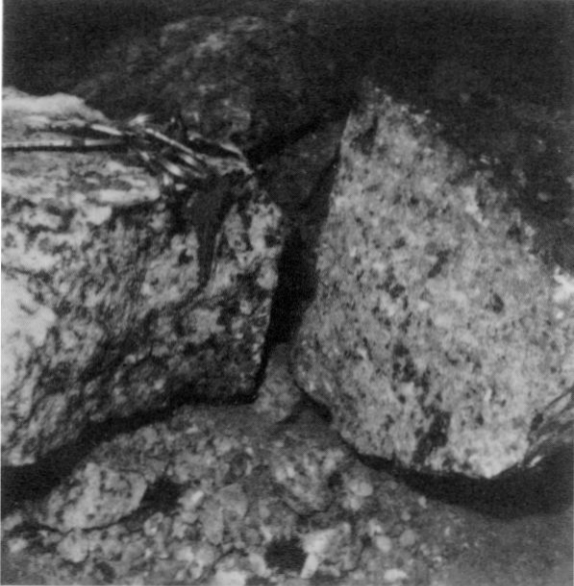










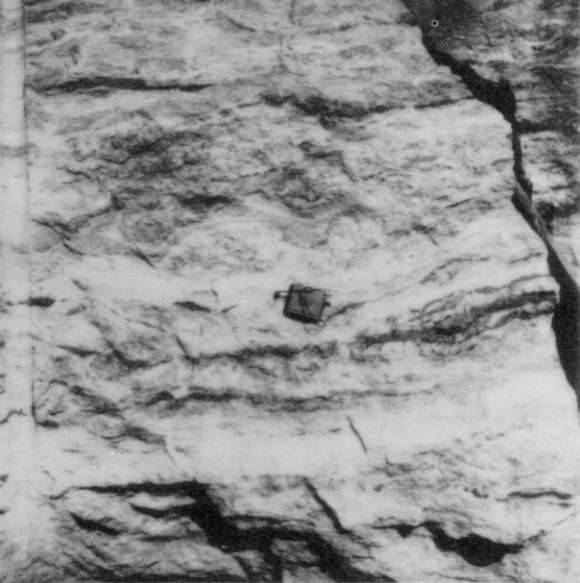














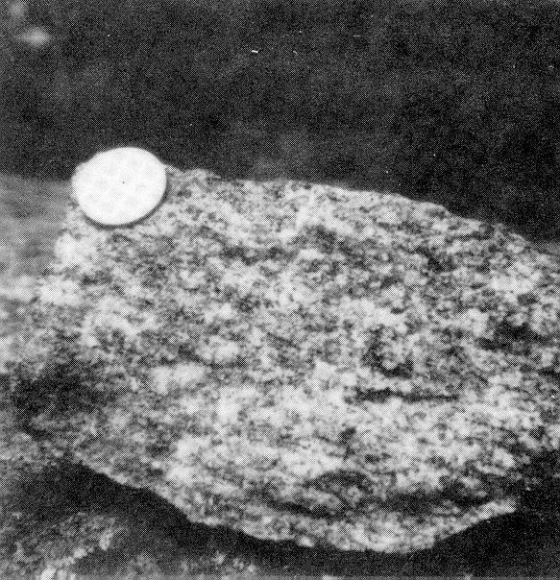






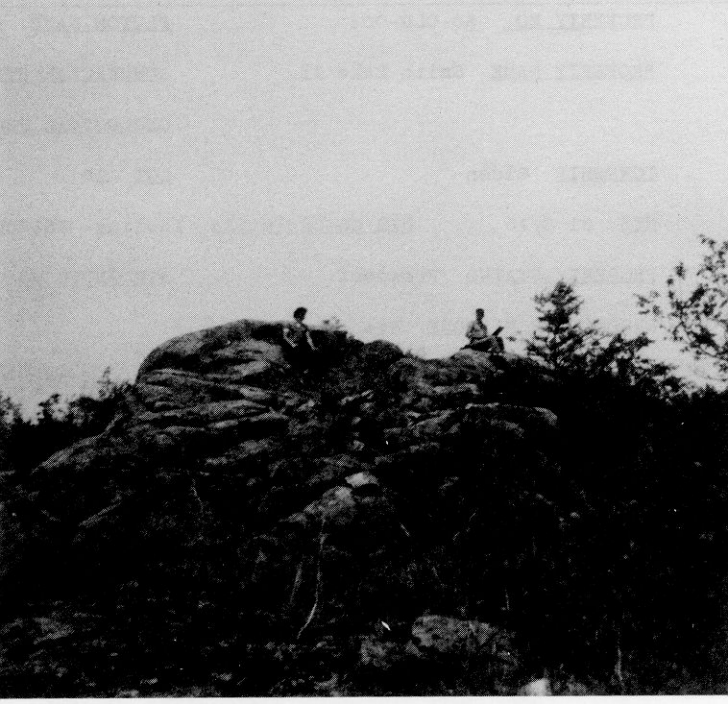


























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