A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE KILLBEAR POINT PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

Dual. 2.244

2.15206

LONG.: 80°13'44"W - 80°15'30"W
LAT.: 45°21'33"N - 45°23'31"N
NTS: 41H/8

DATE: October 18, 1993

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SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been hypothesized by Davidson et al (1982).

Although Davidson's model is being modified and no reasonably detailed geological map has yet been made available for the area, it has become evident that several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains. Moreover the fact that two very similar and intrinsically unique lineated pink flagstones occurred 90 km apart (at Mill Lake and Magnetawan) along a particular ductile thrust encouraged the view that a large flagstone deposit might be located between the two sites. In addition, the high temperature environment of the metamorphism within these tectonic domains leads one to anticipate that competent, annealed gneisses and migmatites physically suitable for dimension stone can be located.

As a result of mapping dimension stone potential, nine sites exposing migmatitic orthogneisses in the Britt domain were sampled producing encouraging results on sawing and polishing. Subsequently six of the properties examined and three properties identified in government research have been staked. One of these properties is the ten claim unit, 500 acre, Killbear Point property.

The property is underlain by massive to gneissic pink granite gneiss, migmatite and a purple and pink migmatite all of which are flat lying or gently dipping to the southeast. A study of the joint spacings indicates average spacings of 2 metres for horizontal joints and over 5 metres for vertical joints. Four prospective products , two of which are unique, attractive, red, textured granites have been identified in five potential quarry locations. A high yield rate of 30 tonne blocks is inferred.

Detailed mapping, drilling, and site planning for the five sites is recommended. Material testing will be required. It is recommended that permitting be sought to licence 3,000 tonne tests on two sites.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PHOTOS

INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by government geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 is being conducted. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In October 1991, the first portion of the Killbear Point property was acquired for its dimension stone potential. Additions to the property were made in 1992. Geological mapping was carried out initially in 1992 and a Preliminary map was prepared and submitted with the final report for the OPAP grant in 1992. This work was supplemented in 1993 with additional mapping on the property resulting in a more detailed interpretation of the northeast corner of the claim group and a revision of the Legend.

The format of the report is in compliance with requirements for submission of a regional geological report for assessment purposes.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Algonquin District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°-15'-30"W on the west and 80°-13'-44"W on the east and latitudes 45°-21'-33"N on the south and 45°-23'-31" on the north. The corresponding UTM co-ordinates in metres are 558,100 on the west, 560,370 on the east, 5,022,840 on the south and 5,027,320 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The property can be accessed from Hwy 559, the Pengallie Bay Rd. and the Snug Harbour Rd by first leaving Hwy 69 some 10 km north of Parry Sound and travelling 19 km west on Hwy 559. Due to an old road and relatively flat outcrop the bulk of the property is currently accessible to 4-wheel drive vehicles.

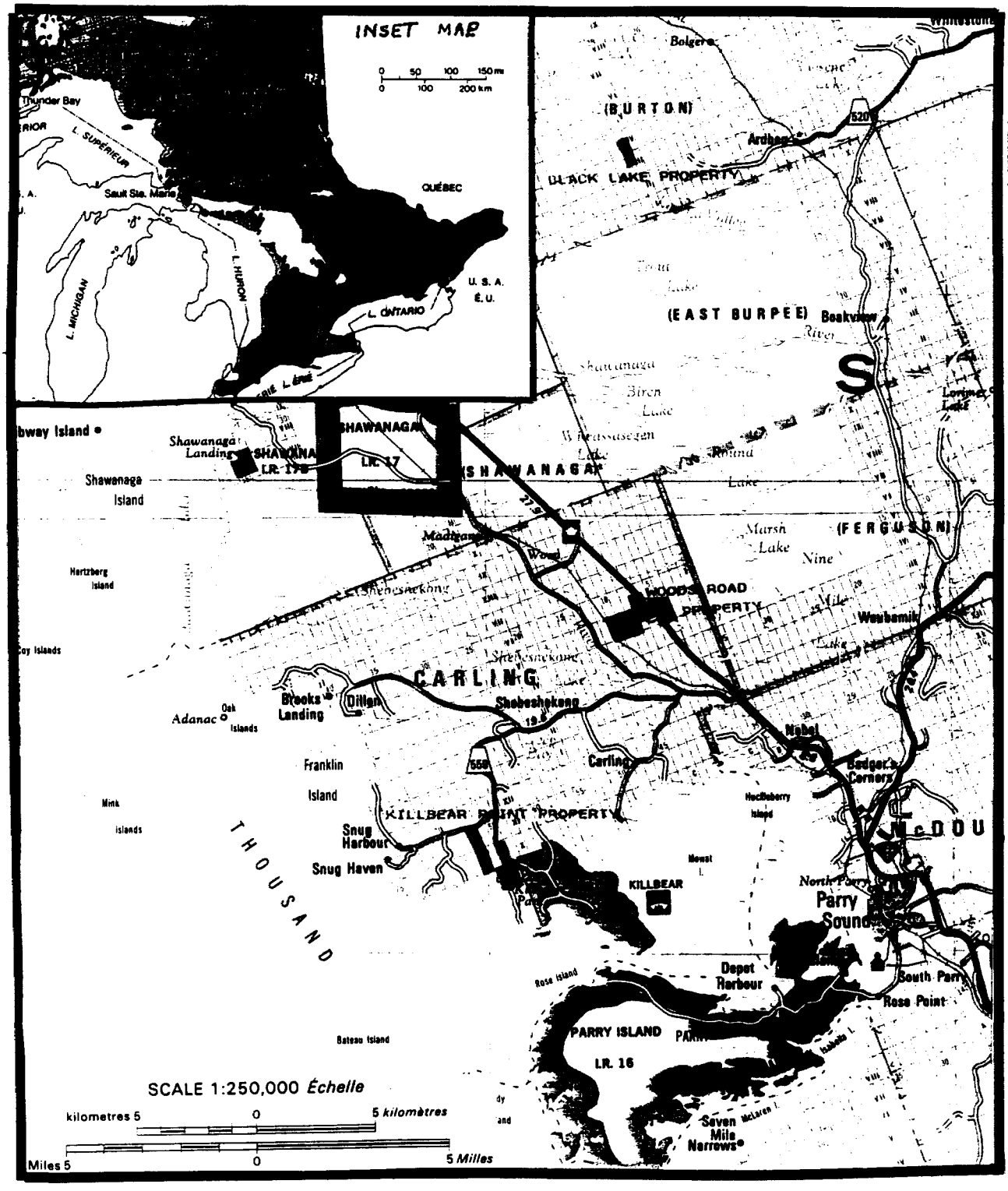

Figure 1: Location Map

PROPERTY

The Killbear Point property comprises approximately 500 acres and is more particularly described in TABLE 1 (Figure 2). Assessment was applied to the claims recorded in 1992 on July 24 of this year, and this report will be filed for assessment prior to Oct. 23. As a result sufficient credits should be available to keep the entire claim group in good standing for some five years from date of staking.

TABLE 1: KILLBEAR POINT PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1151129	Carling	66	XI		
		66	X	200 ac	Oct.23, 1991
1151135	Carling	64	X	100 ac	Nov. 5, 1992
1151136	Carling	64,65	IX	200 ac	Nov. 5, 1992

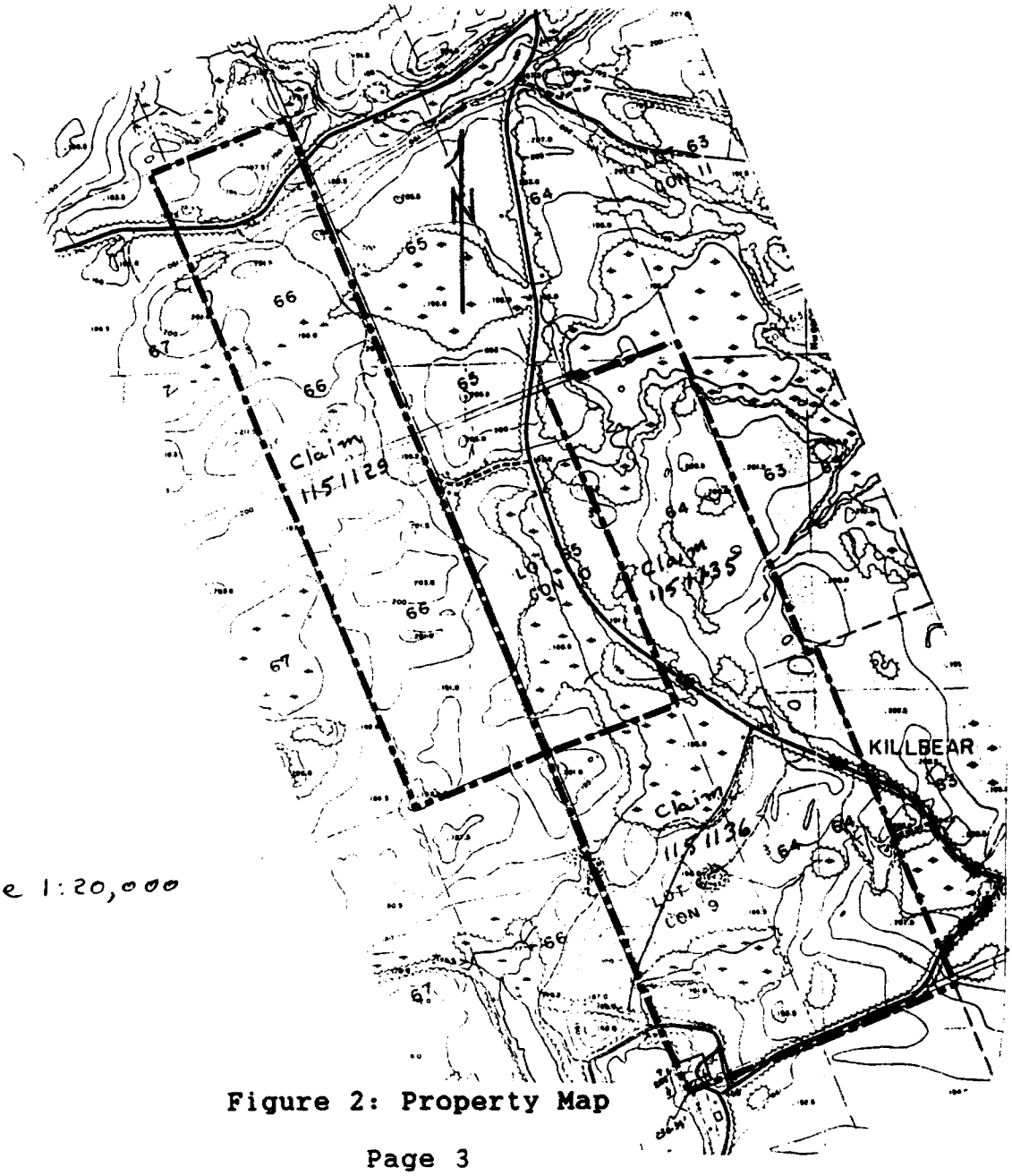

Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced on June 18, 1992, the field work commenced on Nov. 23, 1992 and the map drafting and report writing was completed on Oct 18, 1993. Actual work days for assessment purposes break down as follows:

Killbear Point Property: Claims SO1151129, 1151135, 1151136

Preparation: Nov. 7, 1992, Apr. 5&8, 1993 (2½ days)

Field:Nov. 23,24,25& 26, 1992; Apr. 29, May 10, June 4,5, July 14,15 & 16, 1993 (11 days)

Drafting: Dec.1,2,3,4,6,10& 12,1992; Oct.13,14&15,1993(9½days)

Reporting:Nov.29,30, Dec.13,14,1992; Oct. 16, 17, 18,1993 (7 days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop (approximately 70%), visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-5'W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes. Statistical analysis of joints was done to demonstrate the generally favourable joint spacing and orient future development.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terrains in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has provided a coherent review, but the tectonic terrains and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.

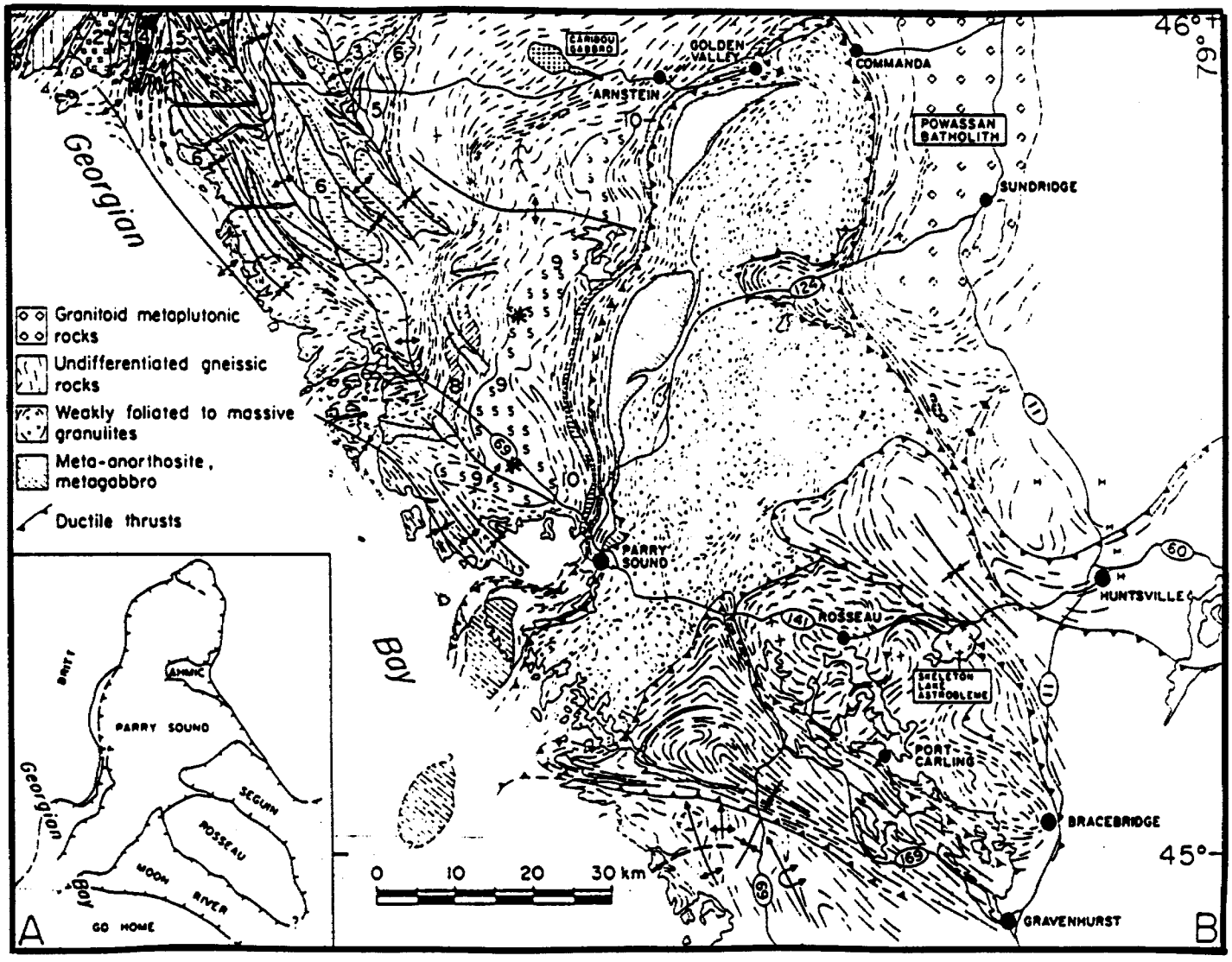

Figure 3: Tectonic map of Parry Sound - Muskoka region (Davidson et al. 1982)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) in sythesizing previous works indicates that the stacked model applies, but that the Algonquin terrain is parautochthonous and includes the Britt and Rosseau Domains which are dominantly underlain by 1450-1420 Ma and 1350-1320 Ma intrusions within a subordinate 1800-1700 Ma juvenile crust. He further states that the Parry Sound and Moon River domains are allocthonous and consist chiefly of juvenile mantle derived crust dated at 1450-1350 Ma. Metamorphism in the Britt domain is granulite facies dated at 1450 Ma. and overprinted by amphibolite facies metamorphism(s) of Grenville age (1100-1030) (Culshaw et al. (1991)). Easton (1992) suggests that this last metamorphism occurred in pulses which culminated with a final continental collision with a land mass to the southeast.

Despite the rapid evolution of diverse geological frameworks, the project area is known to be underlain by Mesoproterozoic rocks which have been metamorphosed during the Grenville orogeny. The bedrock largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting).

The Britt Domain comprises a complexly deformed and

metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

The Ahmic sub-domain is underlain by similar rocks to the Parry Sound domain but contains some of the charnokitic gneisses more typical of the Britt domain and is dominated by an east-west trending fold.

According to the Davidson model the boundary of the Parry Sound domain with both the Ahmic sub-domain to the east and the Britt domain to the northwest is a zone or zones displaying varying degrees of ductile deformation or mylonitization produced by thrusting. This model did not entirely stand up to detailed scrutiny during the investigations for flagstone carried out by Trusler (1992,1993).

Flagstone which is strongly lineated, felsic, siliceous and fine grained (mylonitite to ultramylonite) occurs at the Mill Lake Quarry in Mc Dougall Twp. and in lot 28, Conc. 5 Chapman Twp within the zone of ductile deformation. This is the type of material which was being sought as part of a study carried out by the writer in 1992. In general, however, the deformation is characterized by a tectonic breccia notably where the faulting is dominated by strike slip motion rather than thrusting postulated by Davidson.

DESCRIPTION OF ROCK UNITS

Since no detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. Since each domain postulated by Davidson has been transposed over a large distance none of the rock units are correlative across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping. However, the property is principally underlain by rocks that correlate with the Killbear Point Formation and to a lesser extent with rocks of the Bateau Island Formation. Culshaw et al. (1991) correlate these rocks with the Sand Bay Gneiss Association.

The rocks on the property have been subdivided into mappable units as follows: granite gneiss, purple and pink migmatite, migmatite and coronitic metagabbro. The granite gneiss is a pink, layered to massive rock, varying from fine grained to coarse grained from one area to another and comprising quartz, plagioclase and microcline with minor biotite and variable accessory magnetite, hematite and almandine. A significant portion of this rock unit is demonstrably composed of breccias cataclastically derived from granite pegmatites.

The purple and pink migmatite is a composite layered rock generally containing medium to coarse grained layers of the granite gneiss and a regular fine to medium grained purple or mauve layer comprising quartz, feldspar, biotite, almandine and hematite. Frequently a milky to buff rock of medium to coarse grained granulated late tectonic pegmatite forms layers within the purple and pink migmatite. Pinch and swell of the late tectonic pegmatite and brecciation or crenulation of the purple constituent are common variations of this rock unit.

The migmatite is a generally coarse grained composite layered rock comprising a generally mafic paleosome biotite or hornblende dominant material and a neosome late tectonic pegmatite.

Coronitic metagabbro has been found in two isolated segments on the property. The rock is commonly mafic to ultramafic and coarse grained. In many cases, especially towards the core of an intrusion, relict clinopyroxenes have been preserved generally rimmed by amphiboles.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
_____Unconformity (possible regolith)_____

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
_____Unconformity_____

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
_____Intrusive Contact_____
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
_____Sheared Contact_____

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
_____Intrusive Contact_____

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

_____Intrusive Contact_____

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

_____Intrusive Contact_____

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

_____Intrusive Contact_____

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite.

_____Intrusive Contact_____

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The pre-metamorphic origin of these rocks is obscure. In addition, the degree of thermal and dynamic metamorphism to which these rocks were subjected through multiple stage or polyphase deformation is difficult to determine in the field.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The granite gneiss is generally hypidiomorphic granular. Several features of this rock unit infer at least a partial metamorphic origin: cataclastic textures including tectonic grain gradation characterize the fine grained portions of the unit and frequently occur with regularly spaced biotite and amphibole rich partings; the cataclastic grain classification forms a strong gneissic foliation in portions of the unit; significant portions of the unit comprise a matrix supported, pegmatite breccia which consists of apparently unstrained microcline porphyroclasts in a gneissic, fine to coarse grained, granitic ground mass. The genesis of this material would also be obscured except for some textbook quality examples in road cuts near the property on Hwy 559 where a well constituted coarse grained granite pegmatite grades laterally into a pegmatite breccia. A portion of both the fine and coarse grained varieties have purple to dark red speckles of hematite.

Despite the apparent role of dynamic metamorphism in the genesis of this rock unit several large outcrops expose uniform occurrences of massive, equigranular granite possibly suitable for monument stone.

In the purple and pink migmatite, the granite gneiss appears to form the introduced neosome constituent which appears to have been reduced in grain size by cataclasis (many examples of syntectonic pegmatites reduced to fine grained neosome constituents are evident in the region within both the Britt domain and the Moon River domain). The paleosome layer in a few places still contains over 10% biotite and exhibits a relict foliation; however, this material appears to be a schlieren produced by the process of granitization. The hematite which macroscopically appears to follow the biotite foliation or occur in streaks parallel to the gneissic foliation, microscopically coats the grain boundaries of all the other minerals and is translucent in character. The hematite spotting which is very strong in this unit is a regional feature of the area and is frequently erroneously attributed to almandite.

In a variety of the pink and purple migmatite a pale to buff medium to coarse grained pegmatite forms lit par lit stringers parallel to the gneissic foliation. This material is of late tectonic origin and forms some very attractive textures. Frequently the late tectonic pegmatite exhibits pinch and swell textures over

very large areas. This might provide a target material for quarrying. A very attractive, voluminous, and somewhat unique variety of the pink and purple migmatite is a breccia or crenulation of the purple material in the pink granitic or the buff pegmatitic materials.

The more common migmatite contains thick paleosome sections from 2 cm thick to 2 metres thick in a lit par lit arrangement with late tectonic, quartz-rich, pink to grey granite pegmatite. The paleosome is generally over 50% mafics with biotite being more frequently the mafic mineral than amphibole. The migmatite is frequently flanked by the purple and pink migmatite giving the impression that the varieties of rock evidence gradational granitization.

Gneissic foliations were measured at each station where possible. Despite some exceptions which may be caused by outcrop scale folding, the general pattern displayed is of a relatively structurally uniform sequence which is flat lying to gently southeast dipping.

A concerted investigation of the joints was made on the property which is presented on the geological map as individual plots, a frequency analysis of the vertical joints and histograms of joint spacing for both vertical and horizontal jointing. Vertical joint data total 280 and horizontal and sub-horizontal joint data total 55. The major vertical joint is at 150° with a cluster of over 50% of the data. The two minor vertical joints each having a data cluster of approximately 11 to 18% depending on interpretation are centred at 75° and 25°. With total outcrop exposure approaching 70% over the whole property it is very encouraging to note that the average horizontal and sub-horizontal joint spacing on the property is 2 metres from observable surfaces and the vertical joint spacing averages over 5 metres. Indeed many areas were seen with joint spacings in excess of thirty metres.

POTENTIAL DIMENSION STONE SITES

At least four distinctive potential dimension stone products may be found in various locations on the property. Although there are a large number of potential quarry sites, five appear to be more outstanding due to existing vertical faces or the presence of a steep hill.

The first site is located at the west side of lot 66, Concession 11, 100 metres south of the Snug Harbour Road. A north facing hill rises 10 to 15 metres above the valley and exposes a brecciated or crenulated variety of purple and pink migmatite with a minor amount of coarse granitic gneiss and some lit par lit purple and pink migmatite. A sample of this latter material (Sample 3) is described in TABLE 3 (Page 18) and illustrated in outcrop and

polished specimen in Photos 1, 2 (Page 15)and 3 (Page 16). Photo 1 is of a road cut on Hwy 559 approximately 150 metres south of the junction with the Snug Harbour Rd. and is not on the Killbear Point property. The fracturing in the outcrop is induced by blasting and tends to understate the very large joint spacing that exists on the property.

This particular rock type occurs to the south in the same lot in both concessions 10 and 11 and should be provide large quarry blocks along most of this distance. Another very good potential quarry site for the brecciated purple and pink migmatite is in the middle of concession 10 on the west side of lot 66. Here again a north facing steep slope rises between 5 and 10 metres above the swamp and exhibits large joint spacings. Sub-horizontal joint spacings exceed 2 metres and vertical joint spacings are from 10 to 30 metres. Many 20 to 30 tonne frost heaved or glacial lag blocks are recoverable from this area.

A more regularly layered variant of the purple and pink migmatite occurs with pegmatite breccia on a steep hill which faces west and rises 10 metres above a treed area in the north-central portion of lot 64, concession 10. This site is less accessible than the others, but a trail to it could be constructed inexpensively.

The best area noted for extraction of pegmatite breccia is located in the middle of concession 9 at the junction of lots 64 and 65. A north facing cliff rises 5 metres above a winter road on the southern fringe of a swamp. All joint spacings exceed three metres. A polished sample of the pegmatite breccia is described in Sample 4 in TABLE 3 (Page 18) and is depicted in Photo 4 (Page 16).

In the northwest corner of lot 65 concession 9 a 200 metre X 300 metre outcrop rises over 10 metres above the swamp. The outcrop exposes a uniform, massive to slightly gneissic granite which is modestly speckled with hematite. Horizontal joint spacing exceeds 2 metres and vertical joint spacing exceeds 3 metres. The rock is depicted in Photos 5 and 6 (Page 17) and Sample 9 in TABLE 3 (Page 19) is a description of the polished sample.

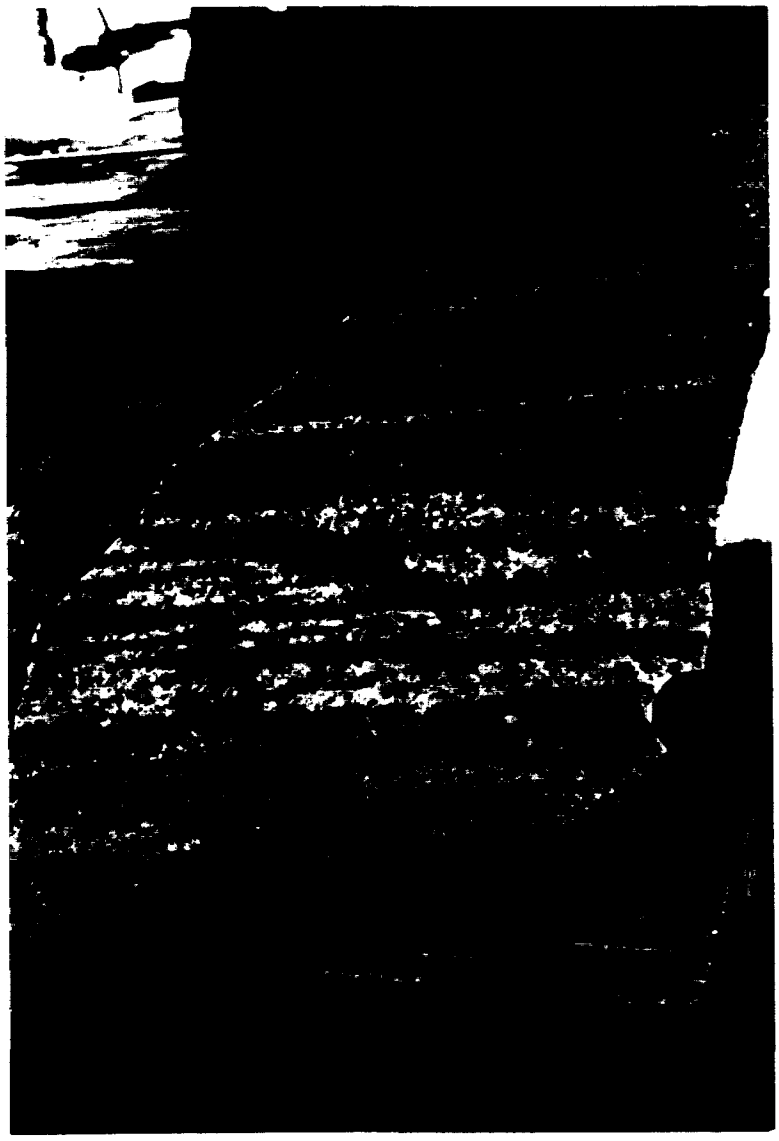

Photo 1 (above) and Photo 2 (Killbear Point Property) showing a roadcut and polished slab of mauve-pink and cream-buff variegated "veined-gneiss": the mauve-pink portion is the older portion of rock which comprises a medium to coarse grained mixture of quartz, plagioclase and microcline with minor biotite and rare magnetite; the intense red spots are actually formed by translucent hematite-stained grain boundaries- which impart the apparent mauve-pink appearance in much of the rock; the cream-buff portion is a coarse grained recrystallized pegmatite which forms parallel laminae or veins in the mauve pink material; the pegmatite contains plagioclase, quartz, microcline, biotite and magnetite; an attractive polish is achieved with minimal plucking.
A rock material not shown is a breccia of mauve-pink fragments in the cream-buff pegmatite.

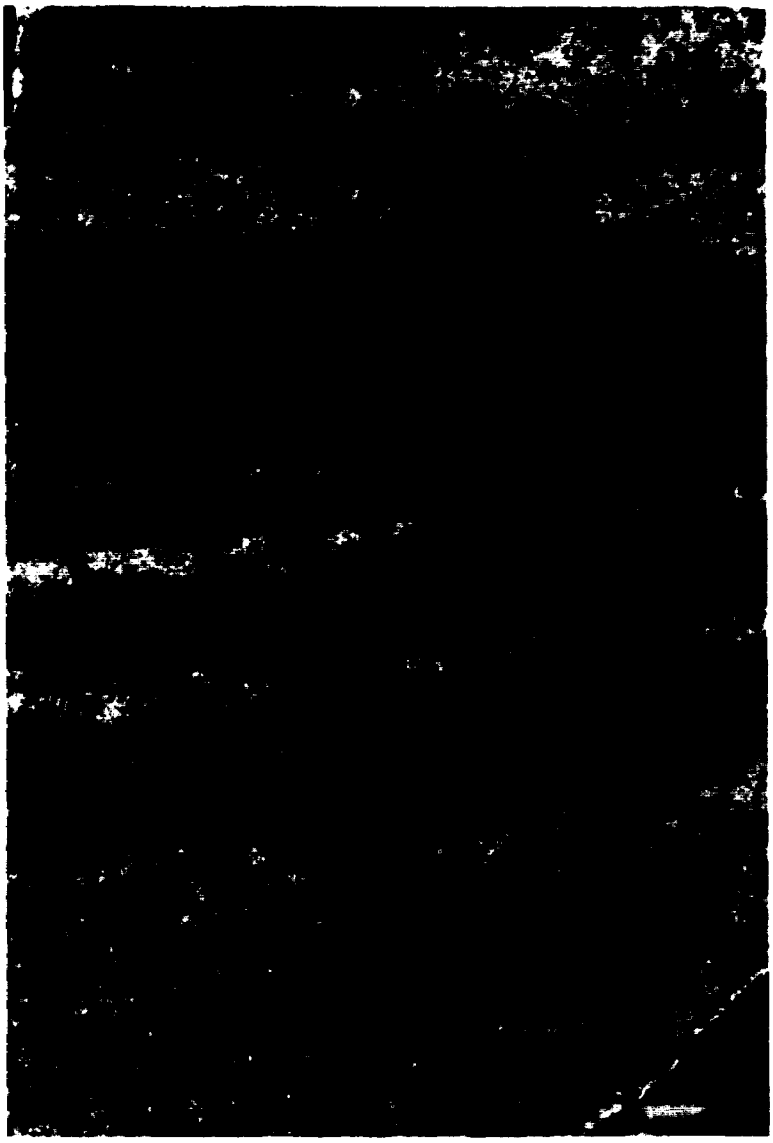

Photo 3(top) (Killbear Point Property) depicts a closeup picture of the polished surface of the purple and pink gneiss shown in Photo 2; note the intense red glassy or translucent quality of the speckles; the similarity in appearance to a red garnet has lead many to the erroneous assumption that this colour is imparted by almandite; in fact an excellent polish is obtained on the surface with no apparent pluck outs.

Photo 4(bottom) (Killbear Point Property) depicts a granite pegmatite breccia: rose-pink microcline crystals with sharp grain boundaries are semi-randomly oriented within a quartz, plagioclase (some peristerite), microcline, and biotite matrix which has graded grain sizes. This rock is very attractive and has been found in several locations. The rock is similar to that marketed under tradename agate.

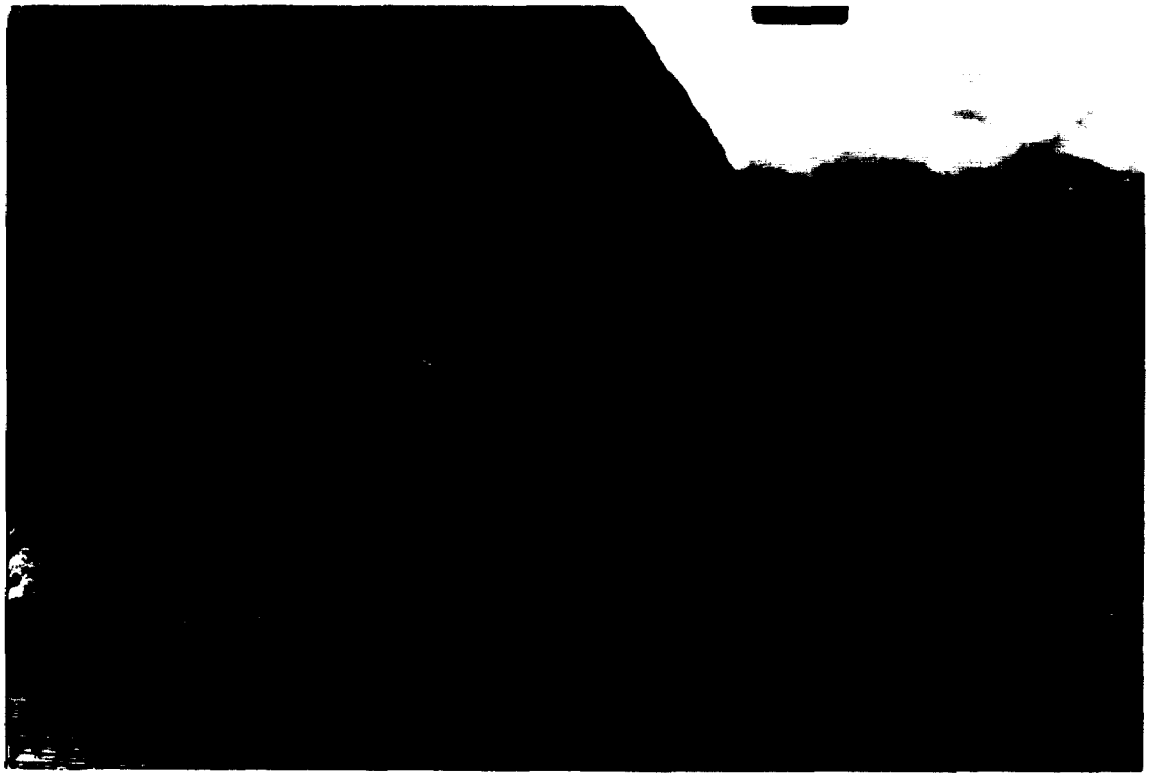

Photo 5(above) and Photo 6(below) (Killbear Point Property) depict a slightly foliated medium grained granite which is characterized by an equigranular matrix and intense red hematite spotting of grain boundaries. The rock is intensely pink when viewed from a distance. The mineral constituents are the same as in photos 1 and 2, however the hematite spotting is consistent, but less intense in this example. This rock is well exposed and could be removed from one outcrop covering an area 600 feet X 900 feet. The rock is similar to Laurentian Pink.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
Sample 3 Claim 1151129	large block weighing 55 kg.	Purple and pink medium grained variegated migmatite with hematite stain and possibly fine grained garnets	Buff to pink laminae with elongated biotite clusters; mineral foliation at acute angle to the tightly folded compositional layering; the buff to pink material is a medium to coarse grained cataclastic relict of pegmatite containing minor peristerite; red spotted material with pink buff ground mass composes ≈70% of the sample; the red spots are hematite stain on grain boundaries proximal to biotite and accessory magnetite; 50% of this layer is stained and the unit is medium grained; the rock takes an excellent polish with minor biotite plucking; the rock is unique and very attractive.
Sample 4 Claim 1151136	Large block weighing ≈60 kg.	Pink, coarse grained cataclastic, pegmatitic granitic breccia with minor hematite spotting.	Pink and grey, medium to coarse grained to megacrystic pegmatite breccia with sharply defined, cemented grain boundaries between the large clasts and the ground mass; the clasts are slightly deformed and rounded but the individual crystals in the clasts are fresh and unstrained; the rock takes an excellent polish with some plucking of biotite and quartz in the pegmatite and cracks within feldspar crystals; biotite foliation does not penetrate the pegmatitic fragments; magnetite ≈3% with slight hematite stain.

Sample 5 Claim 1151136	10 kg sample.	Coronitic metagabbro which is a dark grey, coarse grained amphibole-pyroxene-feldspar bearing rock.	The polish did not come up on this rock; an anastamosing network of profuse cracks on grain boundaries and within individual crystals appears to weather low and on close examination appears to comprise largely carbonate replacement; approximately 10% magnetite in the rock.
Sample 8 NW corner of Claim 1151135	15 kg sample	Granitic mylonite, or pink gneiss in contact with granitic pegmatite.	Rich, pink coloured, fine grained, mylonitic, quartzo-feldspathic rock with minor biotite, magnetite and hematite (the latter in laminae or streaks); a parallel stretched granitic pegmatite with well healed boundaries; excellent polish with only minor plucking of smoky quartz in pegmatite.
Sample 9 NW corner of Claim 1151136	15 kg. sample	A medium to coarse grained, equigranular rock with hematite speckles.	Under microscopic examination this rock presents as a formerly megacrystic, granitic intrusion which has been stretched into faint layers and recrystallized into an equigranular medium grained rock; cataclasis is very evident; medium grained hematite spots comprise 15% by volume over a pink to slightly grey background; minor biotite and magnetite and a small percentage of plagioclase compared to microcline; Smith's Monument Co. staff was very complimentary about this specimen which they state to be similar to a Laurentian Pink Granite which is used as a high quality monument stone.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Seven dimension stone prospects were staked in the Britt domain and have since been mapped geologically. Most of these rocks are deformed plutons or migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The Killbear Point property comprises 500 acres, and is underlain by complex migmatites of Middle to Late Precambrian age. A study of the joints and joint spacings suggest that most of the property would yield a high percentage of 30 tonne blocks of dimension stone. Four potential product lines have been identified in five potential quarry sites. Two of the potential product lines are unique and the other two are similar to other stone already being marketed. All of the stone appears to be of good quality and very attractive.

In addition to the stone in place, a large number of very large loose blocks occur on the property. Due to the extreme durability of this rock (some of the exposed rock still retains a glacial polish) it is anticipated that some of these blocks would be suitable for direct shipping dimension stone or landscaping purposes.

RECOMMENDATIONS

It is recommended that efforts be concentrated on further inventory and development of the purple and pink migmatite and the pegmatite breccia:

1. Inventory work would consist of detailed mapping of the proposed quarry sites including a few drill holes for definition of sub-horizontal joints, continuity and material tests plus preparation of site plans.
2. Initial licencing should proceed with the Minister of Northern Development and Mines to licence two sites for removal of a 3000 tonne test sample at each site; public information meetings will be required.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1992. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Dated: October 1, 1993

Signed

James R. Trusler M.S., P.Eng.

Ontario

41H08NW9800 2.15206 CARLING

900

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Geoscience Approvals Section
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (705) 670-5853
Fax: (705) 670-5863

January 18, 1994

Our File: 2.15206
Transaction #: W9390.00067

Mining Recorder
Ministry of Northern
Development and Mines
MacDonald Block, Room M2-17
900 Bay Street
Toronto, Ontario
M7A 1C3

Dear Sir/Madam:

Subject: APPROVAL OF ASSESSMENT WORK SUBMITTED FOR GEOLOGY WORK ON MINING CLAIMS SO1151129 ET AL IN THE TOWNSHIP OF CARLING

A Notice of Deficiency was not issued on this Report of Work prior to the 90 day deemed approval date and as outlined in subsection 6(5) of the Mining Act Regulations this Report of Work is **deemed approved** as of **JANUARY 17, 1994.**

If you have any questions regarding this correspondence, please contact Lucille Jerome at (705) 670-5855.

Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Section
Mining and Land Managment Branch
Mines and Minerals Division

LJ/ls

cc: Resident Geologist
Sudbury, Ontario

✓ Assessment Files Library
Toronto, Ontario

Ministry of Northern Development and Mines

Ontario

Report of Work Conducted After Recording Claim

Mining Act

Transaction Number: W9390.00067

Rec. Hes. Sudbury

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

2.15206

Instructions:
- Please type or print and submit in duplicate.
- Refer to the Mining Act and Regulations for requirements of filing assessment work or consult the Mir Recorder.
- A separate copy of this form must be completed for each Work Group.
- Technical reports and maps must accompany this form in duplicate.
- A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s)		Client No.
JAMES R. TRUSLER		203403
Address: #3 TEMPERANCE ST. AURORA, ONT. L4G 2R5		Telephone No.: 416-727-5084
Mining Division: SOUTHERN ONTARIO	Township/Area: CARLING	M or G Plan No.: M2297
Dates Work Performed — From: Nov 7, 1992	To: Oct. 18, 1993	

Work Performed (Check One Work Group Only)

	Work Group	Type
✓	Geotechnical Survey	Geological Survey
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
	Assays	
	Assignment from Reserve	

02294

RECEIVED
NOV 02 1993
MINING LANDS BRANCH

Total Assessment Work Claimed on the Attached Statement of Costs $ 10,824

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address
JAMES R TRUSLER	143 TEMPERANCE ST AURORA, ONT L4G 2R5

(attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

	Date	Recorded Holder or Agent (Signature)
I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Oct 19, 1993	James R Trusler

Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or aft its completion and annexed report is true.

Name and Address of Person Certifying		
JAMES R TRUSLER 143 Temperance St Aurora, Ont. L4G 2R5		
Telepone No.: 416 727 5084	Date: Oct 19, 1993	Certified By (Signature): James R Trusler

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Received Stamp
$10,824	Oct 19/93		SOUTHERN ONTARIO MINING DIVISION RECEIVED OCT 19 1993 AM 7,8,9,10,11,12,1,2,3,4,5,6 PM
	Deemed Approval Date: Jan 17/94	Date Approved	
	Date Notice for Amendments Sent		

0841 (03/91)

Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units	Value of Assessment Work Done on this Claim	Value Applied to this Claim	Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
	1151129	4	$5,000	$4,800		$ ~~6,024~~ 5,000
	1151135	2	$2,000		$2,000	
	1151136	4	$3,824		$ ~~3,824~~ 2,800	1,024
	Total Number of Claims: 3		Total Value Work Done: 10,824	Total Value Work Applied: 4,800	Total Assigned From: ~~$3,824~~ 4,800	Total Reserve: $6,024

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to priorize the deletion of credits. Please mark (✓) one of the following:

1. ☒ Credits are to be cut back starting with the claim listed last, working backwards.
2. ☐ Credits are to be cut back equally over all claims contained in this report of work.
3. ☐ Credits are to be cut back as priorized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respe to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented *or leased* land at the time the work was performed.	Signature: [signature]	Date: Oct 19, 1993

0241 (03/91)

Ontario

Ministry of Northern Development and Mines

Ministère du [illegible]oppement du Nord [illegible] mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de transaction: W9390.00067

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un reg des concessions minières. Adresser toute question sur la collecte de renseignements au chef provincial des terrains miniers, ministère Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sud (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type Geological Mapping & Preparation 13½ days @ $400/day	$5,400	
	Drafting 9.5 days @ $150/day	$1,425	
	Report Writing 7 days @ $400/day	$2,800	9,625
Supplies Used Fournitures utilisées	Type Film and batteries	11.49	
	Stationary & copying	74.16	
			85.65
Equipment Rental Location de matériel	Type		
	Total Direct Costs Total des coûts directs		9,710.65

2. Indirect Costs/Coûts indirects

** Note: When claiming Rehabilitation work indirect costs are not allowable as assessment work.
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total glo
Transportation Transport	Type personal vehicle		
	2102 Km @ .30	630.60	
			630.
Food and Lodging Nourriture et hébergement	camping & Hotel & Meals	12.21 & 470.47	482
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		1113.
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		1,113.
	Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs) Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)		10,82

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées d le présent état des coûts dans les 30 jours suivant une demande à effet. Si la vérification n'est pas effectuée, le ministre peut rejeter t ou une partie des travaux d'évaluation présentés.

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.

2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
× 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement so remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluati

2. Les travaux déposés trois, quatre ou cinq ans après leur achèvem sont remboursés à 50 % de la valeur totale du crédit d'évaluat susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Évaluation totale demandé
× 0,50 =	

Certification Verifying Statement of Costs

I hereby certify:
that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as Recorded Holder I am authorized
(Recorded Holder, Agent, Position in Company)

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possible et que c dépenses ont été engagées pour effectuer les travaux d'évaluati sur les terrains indiqués dans la formule de rapport de travail ci-joi

Et qu'à titre de _____ je suis autor
(titulaire enregistré, représentant, poste occupé dans la compagnie)

à faire cette attestation.

Signature: [signature] Date: Oct 19, 1

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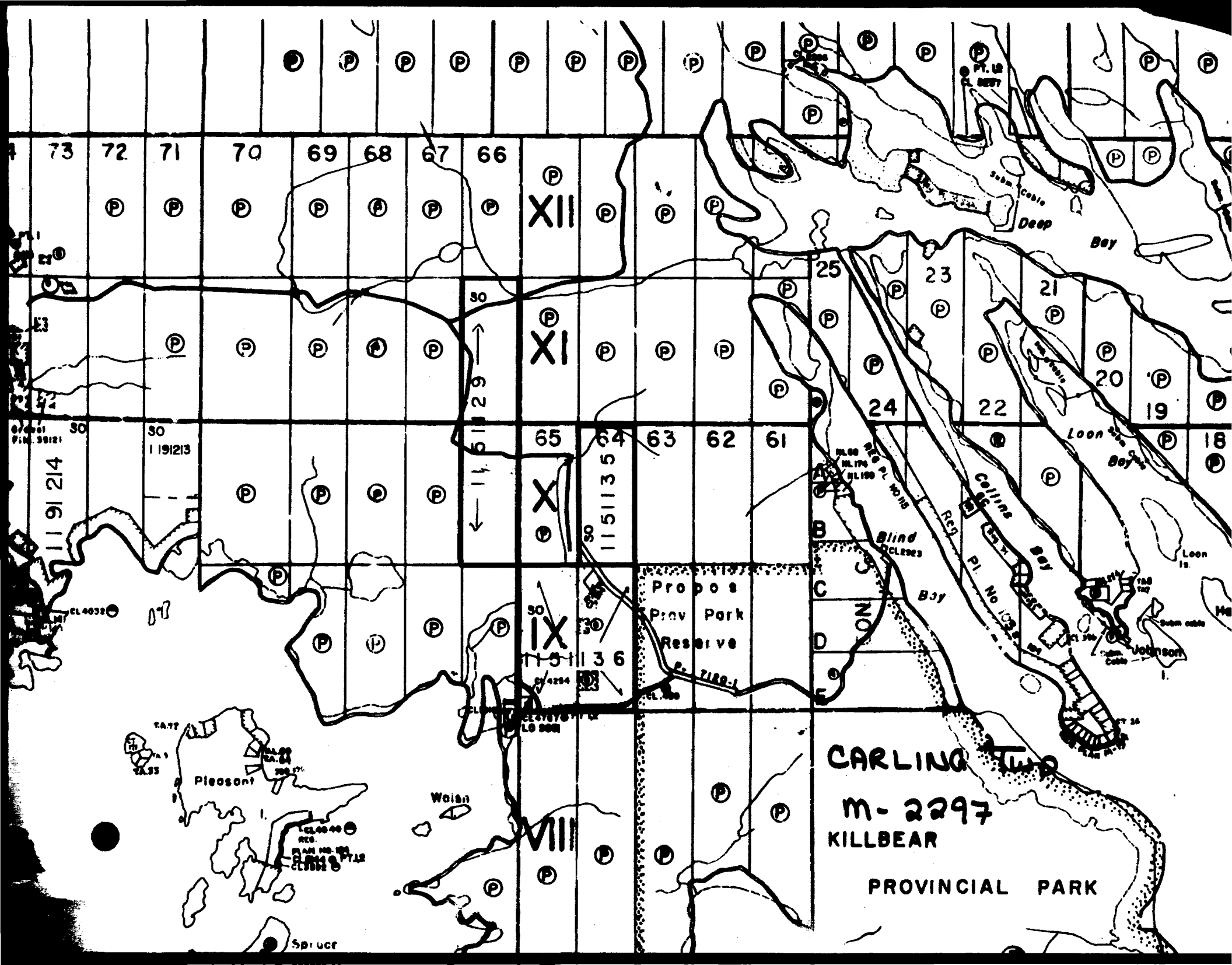
CARLING TWP
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Deep Bay
Collins Bay
Loon Bay
Blind
Johnson
Pleasant
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CON 5
A
B
C
D

THE TOWNSHIP OF

CARLING

DISTRICT OF PARRY SOUND

SOUTHERN ONTARIO
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	● or Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.
PATENTED S.R.O.	◐

NOTES

400' Reserve to the Dept of Lands & Forests shown thus:

For status of summer resort locations shown thus & islands in Georgian Bay Please contact Dept of Lands & Forests

This Map Is Not To Be Used —FOR SURVEY PURPOSES—

Land under Georgian Bay withdrawn from staking by Order in Council dated April 30, 1912

Area indicated thus withdrawn from staking and reserved for proposed Provincial Park — No permit for gravel to be issued in this area

Withdrawn from Staking under Section 43 of the Mining Act (R.S.O.-1970).

File	Date	Disposition
㊸ 27126	19-Aug-70	S.R. & M.R.
Ⓡ1 W.64/85 188533	15/9/83	S.R.&M.R.
Ⓡ2	21/3/86	S.R.O.

SAND AND GRAVEL

Ⓠ Quarry Permit

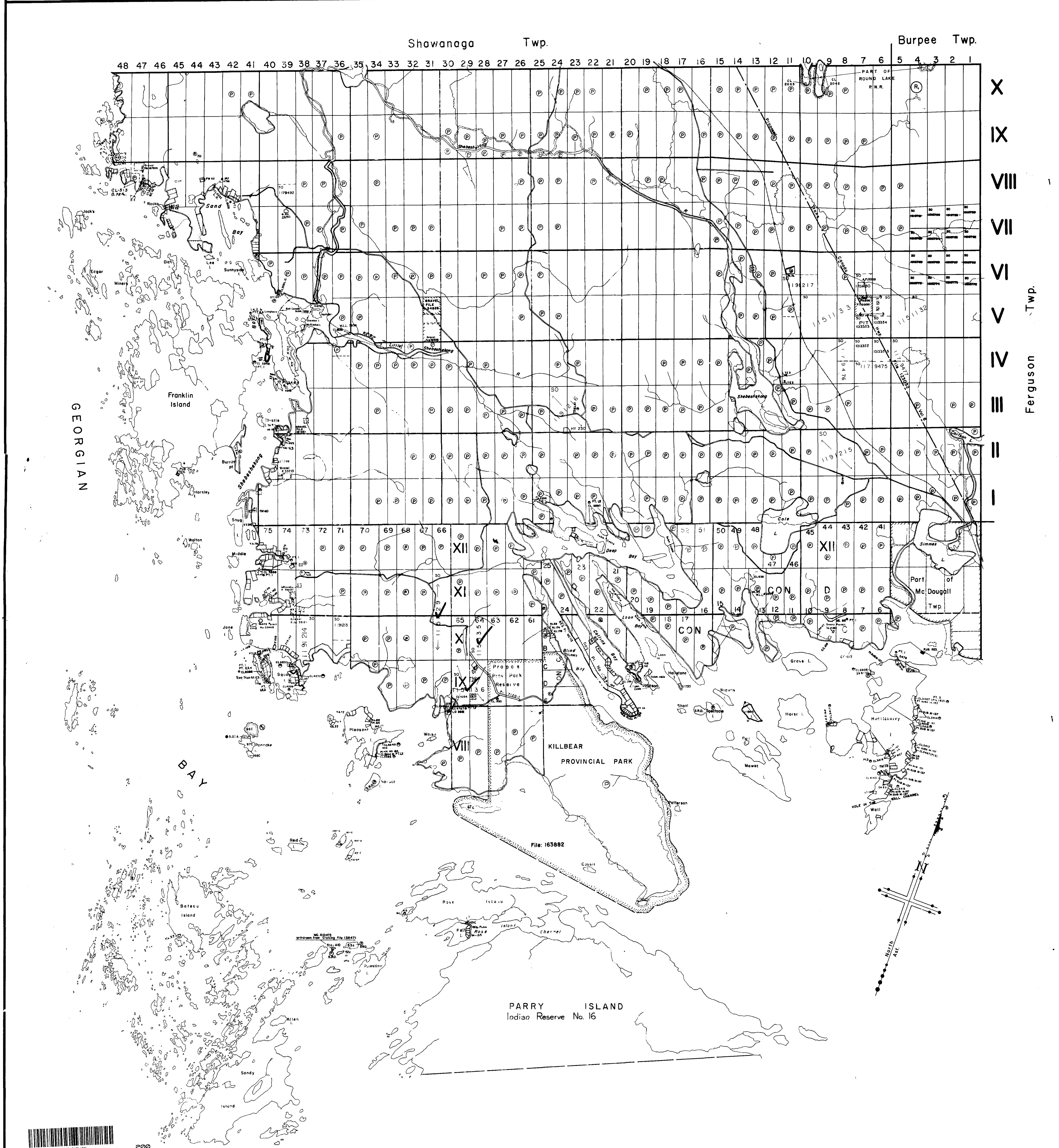
DATE OF ISSUE
OCT 2 5 1993
SOUTHERN ONTARIO MINING DIVISION

RES. GEO. SUDBURY
M.N.R. DIST. PARRY SOUND

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

PLAN NO. M-2297

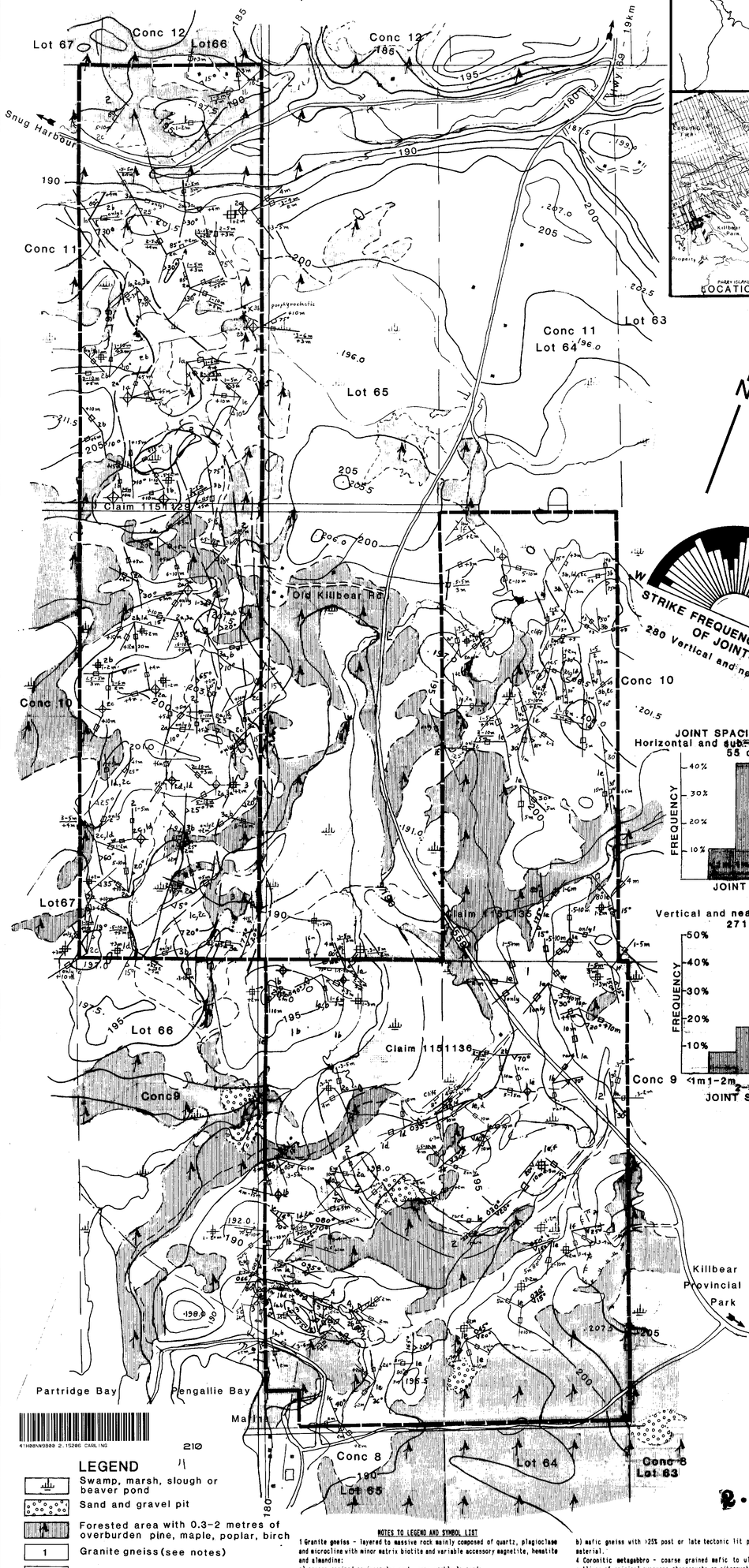
ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH



41H08NW9000 2.15286 CARLING

200

KILLBEAR POINT PROPERTY



2.15206

LEGEND

- Swamp, marsh, slough or beaver pond
- Sand and gravel pit
- Forested area with 0.3-2 metres of overburden pine, maple, poplar, birch
- 1 Granite gneiss (see notes)
- 2 Purple and pink migmatite (see notes)
- 3 Migmatite (see notes)
- 4 Coronitic metagabbro

SYMBOL LIST

- Gneissic foliation
- Joints
- Property boundary
- Highway, road
- Secondary road
- Abandoned road or trail
- Road allowance
- Concession line
- Lot line
- Electric power line
- Topographic contour (5 metre interval ASL)
- Edge of swamp
- Edge of forested area
- Beaver dam
- Edge of quarry (now municipal garbage dump)
- Buildings
- Geological contact inferred

NOTES TO LEGEND AND SYMBOL LIST

1 Granite gneiss - layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine:
a) coarse grained equigranular rock, very weakly layered;
b) unit 1a with coarse reddish-mauve speckles imparted by a combination of almandine and hematite;
c) strongly layered fine to coarse grained cataclastic rock;
d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain;
e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings;
f) unit 1a more thinly layered and containing mauve almandine-hematite laminae.

2 Purple and pink migmatite - generally a layered rock containing medium to coarse grained layers of unit 1a as a principal constituent and a regular fine to medium grained purple or mauve layer comprising quartz, feldspar, biotite, almandine and hematite; often a third regular milky to buff layer of late tectonic granulated quartzo-feldspathic pegmatitic material forms parallel conformable layers which generally exhibit pinch and swell textures:
a) thinly laminated or layered pink and mauve or pink, mauve and buff rock;
b) 2a with brecciated mauve fragments in pink layers or crenulations of mauve layers in the pink layers;
c) 2a or 2b with >5% biotite or hornblende-rich mafic layers.

3 Biotite hornblende migmatite - a rock comprising mixed components in which >25% is introduced or neosome material:
a) unit 2a with >25% post or late tectonic lit par lit granitic pegmatitic material;
b) mafic gneiss with >25% post or late tectonic lit par lit granitic pegmatitic material.

4 Coronitic metagabbro - coarse grained mafic to ultramafic rock with relict outlines of original pyroxene phenocrysts or oikocrysts.

Gneissic foliation - in order of occurrence the symbols depict an inclined surface with dip angle recorded and the azimuth indicated by the line, a vertical gneissic foliation again with the azimuth indicated by the line, and, a horizontal gneissic foliation.

Joints - in order of occurrence the joints (fractures) are horizontal, vertical, and inclined with the dip indicated. The spacing or separation between a set of regular parallel joints is recorded in metres close to the plotted location of the joint as follows: the numbers above the horizontal line represent the minimum and maximum spacing in metres between fractures and the number below the line (or where a single number is displayed) represents the average joint separation in metres.

SCALE
1:5,000
feet
metres

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KILLBEAR POINT PROPERTY

GEOLOGICAL MAP

Date: Oct.13, 1993 Drawn by: JR Trusler