HARAMA MARBLE DEPOSIT

John Brady
Sudbury, Ontario, Canada

Norwin Geological Ltd.
September, 1991

INTRODUCTION

The following appraisal of the dimension stone potential of the Harama marble deposit is based on a brief one-day property visit by the undersigned.

The property which consists of seven mining claims comprising 113.4 hectares is located in Concession IV, Lots 10 and 11 in Parkin Township, approximately 40 kilometres north of Sudbury. Access is by a public gravel road leading from Hwy. 545, north of the town of Capreol (Figure 1).

GEOLOGY

The property is underlain by a portion of the Huronian Supergroup of the Southern Province, a Middle Precambrian (Aphebian-age) assemblage of sedimentary and volcanic rocks. The rocks of interest are limestones (marble) of the Espanola Formation[1]. The Espanola Formation in Parkin Township consists of two members (Meyn,1970). The lower member is a limestone interbedded with siltstone and the upper member is a fine-grained siltstone to sandstone. " The total thickness of the Espanola Formation is difficult to determine.....Total thickness is probably between 100 (30.5 m) to 200 (61.0 m) feet for the limestone..." Meyn, (1970).

To date stripping and trenching carried out on the property has revealed two areas (hereafter, referred to as Zones A and B) underlain by limestone deposits (Figure 2). Zone A encompasses an exposed area 50 meters by 150 meters and Zone B encompasses an exposed area 40 meters by 60 meters. Zone A trends north-south and Zone B trends east-west. This data suggests that limestone beds underlying Zone B may have been folded into a northerly orientation in the area underlain by Zone A. If this interpretation is correct it would significantly increase the

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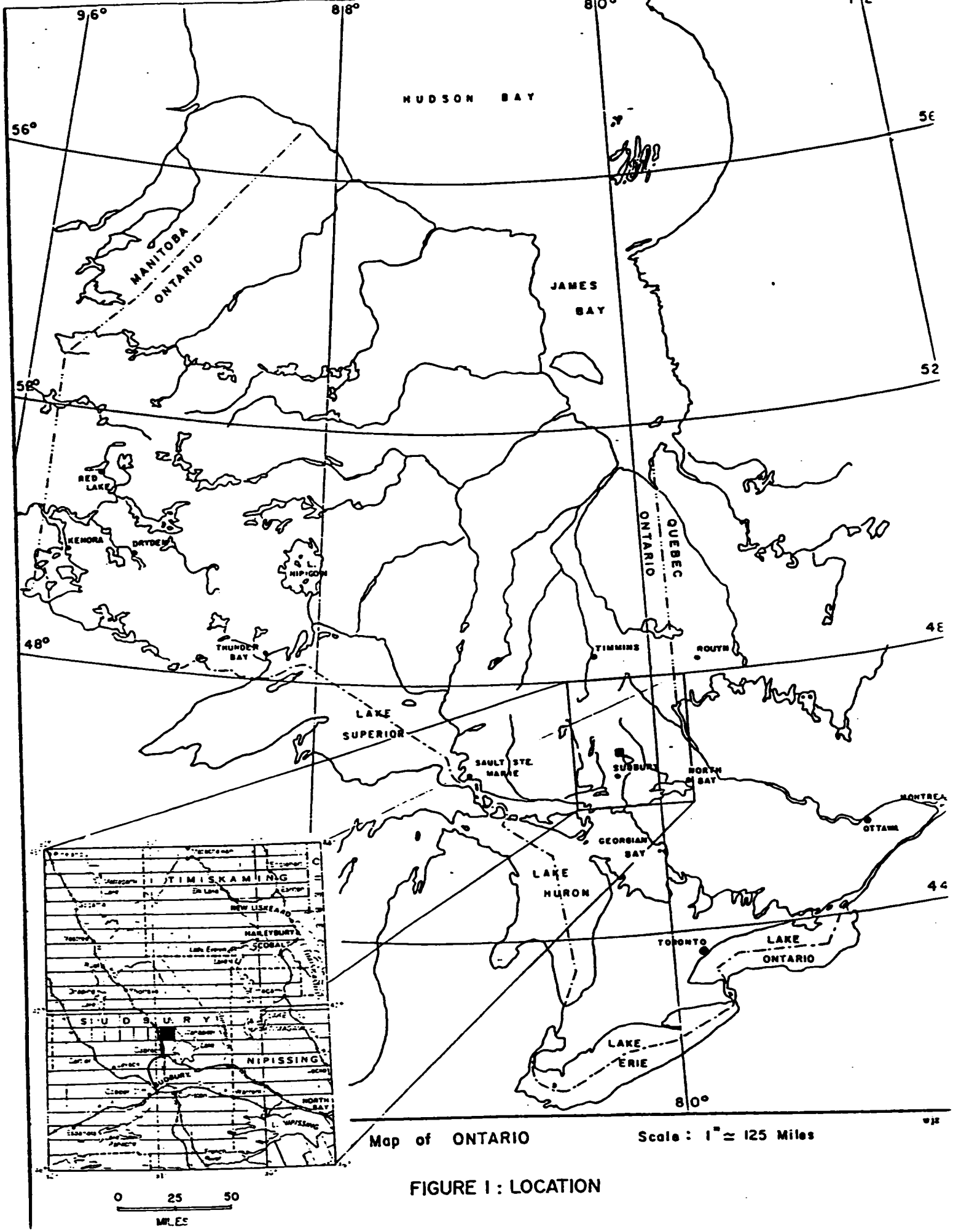
[1] Espanola Formation is a subunit of the Bruce Group.



Map of ONTARIO Scale : 1" ≃ 125 Miles

FIGURE 1 : LOCATION

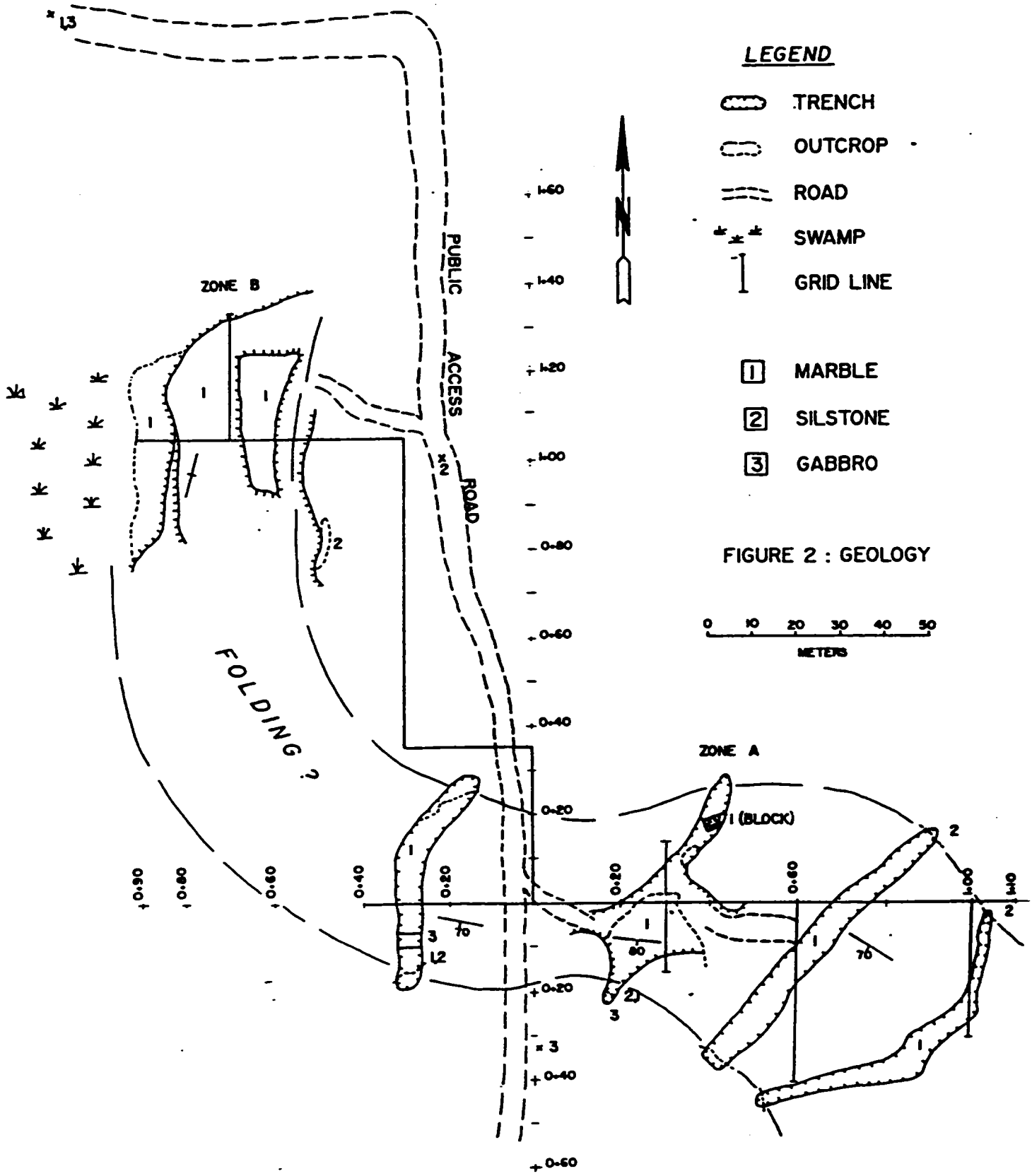


FIGURE 2 : GEOLOGY

potential reserves on the property.

The potential tonnes[2] of limestone available from the property is as follows:

Zone A....	641,250 tonnes	(assuming a depth of 30 metres)
	1,282,500	(assuming a depth of 60 metres)
Zone B...	205,200 tonnes	(assuming a depth of 30 metres)
	410,400	(assuming a depth of 60 metres)
Subtotal	846,450 tonnes	(30 metres)
	1,692,900	(60 metres)
Zone A-B fold structure....	1,120,000 tonnes	(30 metres)
	2,140,000 tonnes	(60 metres)

Northwest of Zone B, stripping and trenching revealed an outcrop of limestone (Figure 2). If the intervening area between this latter exposure and Zone B is underlain by limestone this would again increase the number of tonnes of limestone available from the property by a significant factor.

In Zone A limestone predominates and is intercalated with minor thin beds of siltstone. This zone is characterized by uniform, thin to thickly bedded limestone of alternating grey-green, grey-buff and pink colours. The very attractive and decorative colour banding of this marble is shown in Photograph 1. The buff to pink tones are consistently developed in varying proportions in all trenches exposed. Convoluted bedding and brecciated textures which characterize Zone B are minor components of this area.

In Zone B limestone predominates with rare siltstone intercalations. This area is characterized by a buff, buff-green and pink coloured limestone displaying a brecciated texture and

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[2] Assumptions: Specific gravity of marble = 2.85, "Height" = 30 metres and 60 metres; these depths have been intersected by Jarvis Res., 1 km to the southeast of the Harama site.

convoluted bedding.

Zone B consists of a series of ridges readily amenable to the extraction of large blocks of dimension stone. Two large blocks measuring 3.0 metres by 2.0 metres by 1.5 metres were removed from Zone B for cutting and polishing in Sudbury. The polished material produced an aesthetically beautiful marble with a dazzling array of pink-green colours and intriguing bedding plane patterns.

Initial ASTM testing on a single specimen was carried out by Trow Engineering of Sudbury with test results presented in Appendix A. Results of various strength tests have been very positive.

The Harama marble project is 1 kilometre northwest of the Jarvis Resources' quarry operation which is currently producing marble dimension stone from a 6 million-ton marble deposit (Northern Miner, May 6, 1991; Sept. 2, 1991).

SUMMARY

An attractive multicoloured marble with predominate pink-green hues suitable for the extraction of large blocks of dimension stone has been discovered in Parkin Township, north of Sudbury, Ontario. The marble deposit with potential tonnage estimates of at least 1.2 million tonnes is readily accessible by road. It is on strike with a currently operating marble quarry with proven and probable reserves of 6 million tons.

APPENDIX

ASTM RESULTS

Trow Rock Mechanics

Trow Consulting Engineers Ltd.
1074 Webbwood Drive, Sudbury
Ontario, Canada, P3C 3B7
Telephone: (705) 674-9681
Facsimile: (705) 674-8271

SO0381R

September 18, 1991

Mr. John Brady
1227 Holland Road
Sudbury, Ontario
P3A 3R1

Dear Sirs:

MARBLE DIMENSION STONE TESTING
PRELIMINARY TEST REPORT

Further to your authorization, Trow Consulting Engineers Ltd. performed the required preliminary tests in connection with the above noted project.

The stone sample delivered to our laboratory was collected at the surface. It has been tentatively identified as marble. The sample as delivered was determined by macroscopic means to be a calcitic dolomite variety of marble. The marble is buff-pink in colour with green to pink, 4-mm wide parallel bands. It is fine grained, with a granoblastic saccharoidal texture. Local fractures (2-mm wide), which are filled with a possible chloritic material, cross-cut the above mentioned banding at an angle of approximately 45°. The marble has a quasi conchoidal fracture. During testing procedures minor subhedral pyrite (< 1mm) was noted closely associated with the banding.

All the tests were performed according to relevant ASTM standards, however, because of the preliminary nature of this project, only one specimen was used in each of the tests. Modulus of rupture, uniaxial compressive strength and flexural strength were determined for dry condition. Test results are provided in Table 1. The reported values are compared with the requirements for Marble Dimension Stone (Exterior), as specified in ASTM C 503 - 89. Generally, the strength requirements were met. Absorption test results were slightly high in case of one specimen; the other specimen met the criterion.

The test results provided in Table 1 are based on single specimens only. The ASTM standards cited in Table 1 require a series of tests performed on certain number of

specimens tested in directions parallel and perpendicular to the bedding (rifts) in dry and wet conditions in order to obtain enough data for statistical evaluation of stone properties. In this regard the reported test results cannot be considered as meeting relevant ASTM standards and further testing is recommended in order to comply with the standards.

We trust that the above is satisfactory to you at this time. Should you have any questions, please do not hesitate to contact our office.

Yours very truly,
TROW CONSULTING ENGINEERS LTD.

Jacek Niodzynski

TABLE 1

TEST		TEST RESULTS	ASTM REQUIREMENTS (C 503-89)
C97	Absorption	0.18%, 0.22%	max. 0.20%
C97	Density (kg/m^3)	2730, 2708	- [1]
C99	Modulus of Rupture (MPa)	7.26	min. 7.00
C170	Uniaxial Compressive Strength[2] (MPa)	96	min. 52
C880	Flexural Strength (MPa)	7.10	min. 7.00

[1] Based on visual examination only, the rock can be classified as calcitic dolomite marble, therefore the density requirement is 2595 - 2800 kg/m^3.

[2] Core specimen was tested and the strength result was converted to that of corresponding cube (according to the standard requirements).

Description of Trenching, Stone Removed and Method

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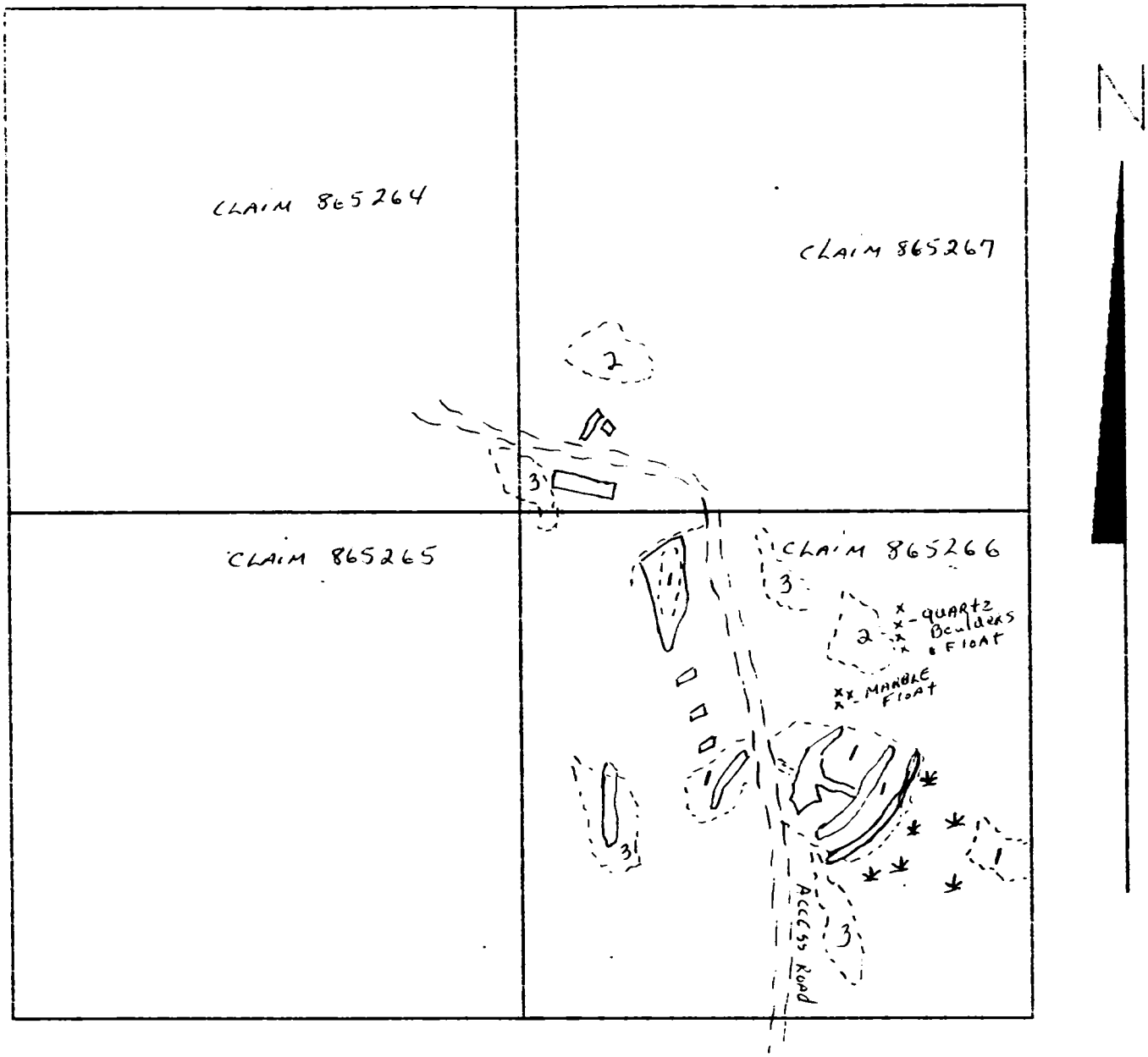
Trench No	Dimensions	Marble Color	Marble Type	Excavated Block Sizes	Equipment used
(1)	75M X 5M X 1.8M	pink/green	layered, wavy lines 1-3cm banding	7 Block 1M X 1M X 1.5M. 1 Block .7M X .6M X .5M	gas drill - portable gas excavator gas water pump
(2)	75M X 5M X 2M	pink/green blue grey/buff	" " "	2 Blocks .6M X .5M X .8M	hydraulic drill hydraulic excavator
(3)	60M X 15M X 1.7M	pink/green	" " "	1 Block 2M X 1.5M X 1.5M	+ manual tools - chisels
+	40M X 20M X 1.7M			2 Blocks .6M X .6M X .5M	shovels, scrapers
(4)	55M X 6M X 1.8M	grey/green pink/green	" " "	1 Block .7M X .5M X .4M	brooms, pulleys, chains, axes etc.
(6)(7)(8)	Total 16M X 5M X 2.7M	No Bedrock —	muskeg & gravel		4 vehicles Boom Truck HX Hs.
(9) East	40M X 15M X 1.5M	pink/green	layered, wavy lines 1-3cm banding		+ cutting and
(9) centre	45M X 20M X 1.5M	pink/green rust/green/grey	Breccia marble	1 Block .7M X .6M X 1.5M. 1 Block .7M X .5M X 1M	polishing equipment at Khouri Granite
(9) West	30M X 6M X 1M	" "	" "	4 Blocks 2.5M X 2M X 1.5M 1 Block 600CM X 500CM X 300CM	and Ellero Marble and Hercules Stone
(10)	40M X 5M X 1.6M	pink/green	layered, wavy lines 1-3cm banding		
(11)	Total 25M X 5M X 1.5M	Siltstone			

LOCATION MAP NO. II-B PARKIN Twp TOWNSHIP



Scale - 1:5000 1cm = 50m

(1) Base Map Reference G2915 (2) Refer to Detail Map No. II-B-HARAMA

(3) Legends: ▽ - TRENCH AREA ✱ - SWAMP [1] MARBLE

[2] Siltstone [3] GABBRO

Work Location	Type of Work	Dimensions	Assays & Ref. No's	Other
REFER TO DETAIL MAP II-B AND "DESCRIPTION OF TRENCHING" SHEET.				

NOTES:

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HARAMA PROJECT

PARKIN TUP - DETAIL MAP II-B

REFER TO LOCATION MAP II-B

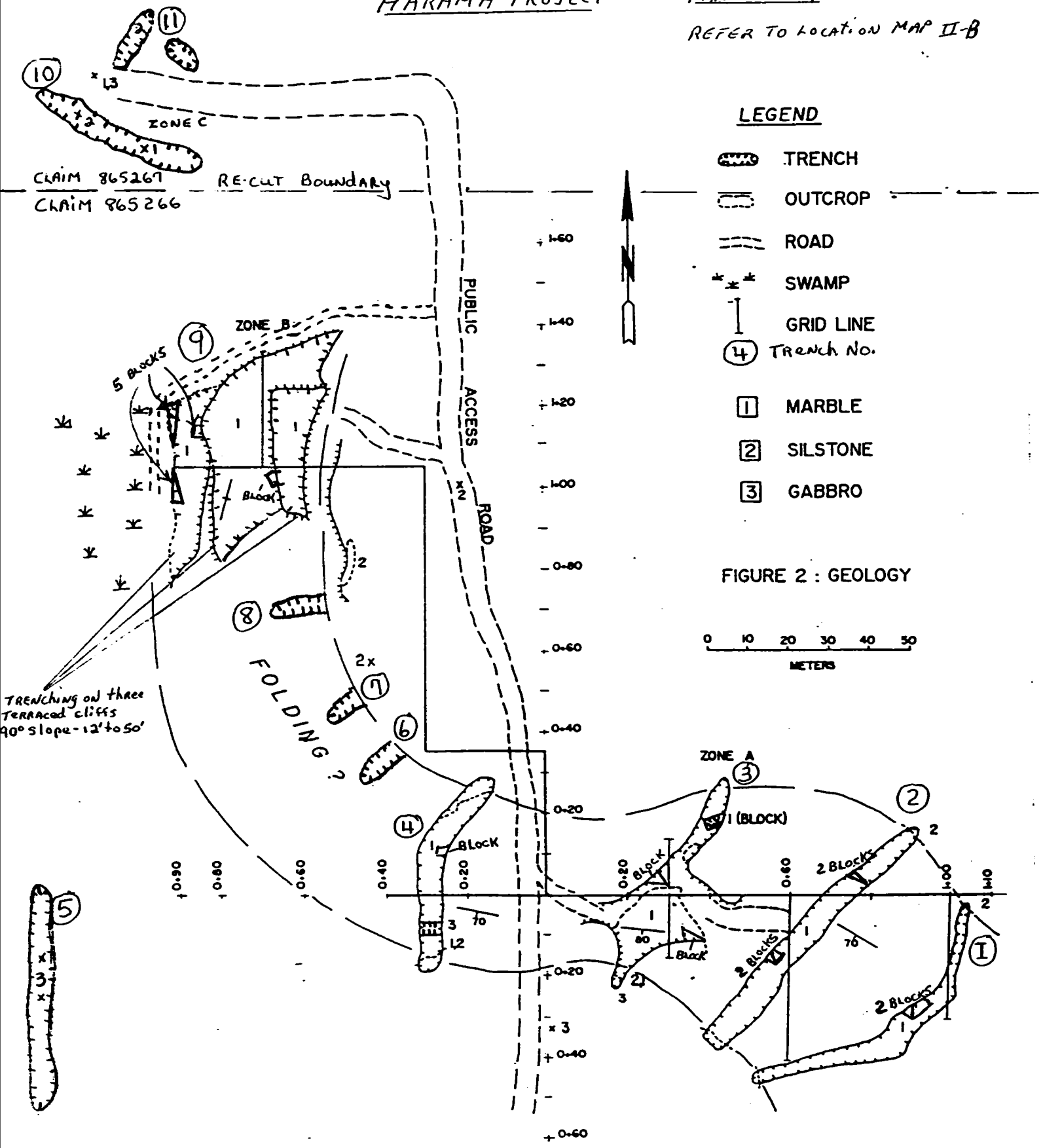

FIGURE 2 : GEOLOGY

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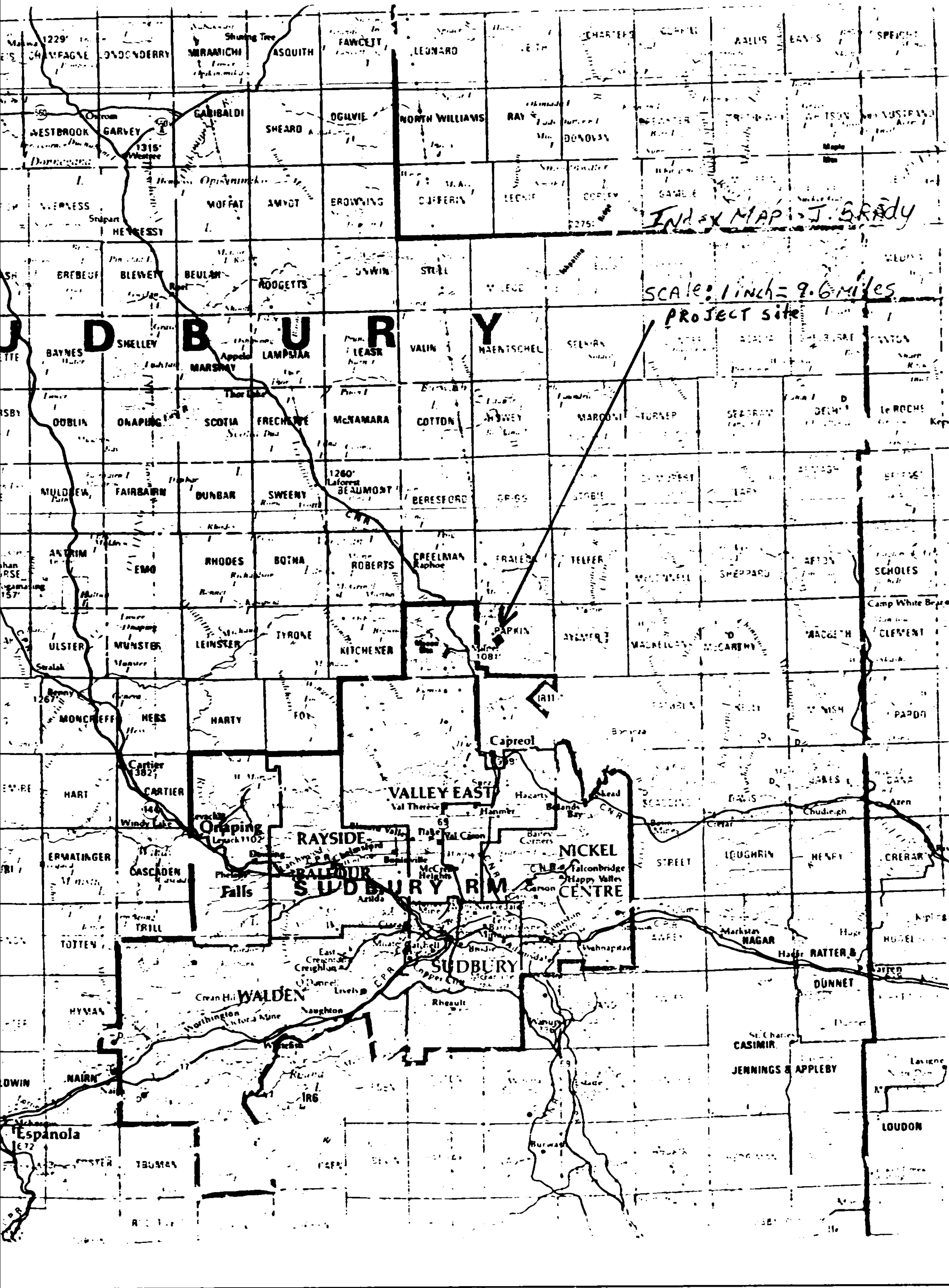
Index Map - J. Grady
Scale: 1 inch = 9.6 miles
Project site
SUDBURY
CHAMPAGNE
LONDONDERRY
MIRAMICHI
ASQUITH
FAWCETT
LEONARD
WESTBROOK
GARVEY
GARIBALDI
SHEARD
OGILVIE
NORTH WILLIAMS
RAY
DONOVAN
MOFFAT
AMYOT
BROWNING
DUFFERIN
HENNESSY
BREBEUF
BLEWETT
BEULAH
ROGGETTS
UNWIN
STULL
BAYNES
SHELLEY
MARSHAY
LAMPMAN
LEASK
VALIN
HAENTSCHEL
DUBLIN
ONAPING
SCOTIA
FRECHETTE
McNAMARA
COTTON
LeROCHE
MULDREW
FAIRBAIRN
DUNBAR
SWEENY
BEAUMONT
BERESFORD
CNR
ANTRIM
EMO
RHODES
BOTHA
ROBERTS
CREELMAN
TELFER
SHEPPARD
SCHOLES
Camp White Bear
ULSTER
MUNSTER
LEINSTER
TYRONE
KITCHENER
PAPKIN
McCARTHY
CLEMENT
MONCRIEFF
HESS
HARTY
FOY
Capreol
VALLEY EAST
Val Therese
Hanmer
Cartier
CARTIER
HART
Windy Lake
Onaping
Levack
RAYSIDE
BALFOUR
Val Caron
Chelmsford
NICKEL CENTRE
Falconbridge
Garson
ERMATINGER
CASCADEN
Falls
SUDBURY RM
STREET
LOUGHRIN
CRERAR
TRILL
TOTTEN
Copper Cliff
SUDBURY
NAGAR
RATTER & DUNNET
DUNNET
WALDEN
Creighton
Lively
Naughton
HYMAN
Rheault
CASIMIR
JENNINGS & APPLEBY
NAIRN
Espanola
TRUMAN
LOUDON

J. Brady
1227 Holland Rd.
Sudbury, ONT
P3A3R1
JAN 24/92

C.M.I.P Administrator

Please find enclosed: application for grant
: detailed list of expenditures
: 13 Receipts for expenditures
: description of trenching
: daily Reports - log of work x 2
: DETAIL MAP II-B
: Location MAP II-B
: CLAIM MAP
: Index MAP
: Geological Report entitled "HARAMA MARBLE Deposit" which includes ASTM Tests by TRCW

Due to the elevated interest in building stone this past field season, I had decided to focus on exploration for same. I had asked for permission to modify my initial proposal in order to focus on this deposit. (letter on file) The objective of the project after initial discovery was to determine the commercial viability of the deposit within budget and time restraints. To this end the CMIP project was very successful - as follows:

1) Surface evaluation indicated a commercial deposit (geological report)
2) Consistency in colour and style or pattern was confirmed (geol report)
3) ASTM Testing confirmed suitability as a building stone (geol report
4) We demonstrated that large, competent blocks could be extracted
5) Preliminary marketing tests were very positive both at the Carrara MARBLE show, and with Toronto, Ottawa and Sudbury suppliers

I am currently negotiating with various parties who have expressed interest in developing the site to supply marble products. I appreciate the assistance of the CMIP staff and many other MNDM staff who have been both encouraging and helpful in this endeavour.

Yours Truly

John Brady