Report of Work on Building Stone Prospects Huntsville-Trout Creek Area 1995

Z. L. Mandziuk

CONTENTS

APPENDICES

SUMMARY

A prospecting project for building stone was carried out by the author of this report from July to October, 1995 over building stone prospects in the Huntsville-Trout Creek project area (Figure 1). Work in 1995 (Figure 2) and previous work during 1993-94 was supported by the Ontario Prospectors Assistance Program (OPAP) of the Ministry of Northern Development and Mines. Prospecting activities were conducted as a follow-up to previous building stone prospecting which identified several potential stone resources in the area (Mandziuk 1994, 1993).

Backhoe stripping over the Cripple Creek flagstone prospect in McCraney Township has indicated the presence of quarriable reserves of orange-pink and grey flagstones which are readily split into various thicknesses. Backhoe and manual stripping, and diamond drilling of 3 holes (total length 52.21m) in the western part of the Sausage Lake prospect in Laurier Township have indicated possible reserves of up to several thousand dimension stone quarry blocks. Other prospects, including the Distress River dimension stone prospect in Chapman and Lount Townships, were assessed to be of low relative economic potential and no further prospecting work was undertaken on them in 1995. Reconnaissance prospecting traverses were conducted over selected sites in the project area, but no prospective exposures of building stones were encountered in 1995.

Unpatented mining claims were staked and recorded in 1994 to cover the Cripple Creek and Sausage Lake prospects. In the future, limited test quarrying of flagstone at the Cripple Creek prospect, and dimension stone at the Sausage Lake prospect, will be undertaken through private support to further assess the marketability of the stone resources. This report describes the work conducted to date on these two prospects.

Project Locations and Access

The area of work described in this report covered a 2 claim block in Laurier Township and 1 claim unit in McCraney Township (*see* Figures 3 ,5).

National topographic system map sheets for the entire Huntsville-Trout Creek project area at a scale of 1:50,000 are 31E/11, 31E/13, 31E/14. The area lies in the Southern Ontario Mining Division and administrative responsibilities and relevant files and information pertaining to stone resources reside at the Sudbury Resident Geologist's Office and the Mines and Minerals Information Centre in Toronto. The area is located between latitudes $45^{0}36'$N and $46^{0}00'$N and longitudes $79^{0}00'$W and 79^{0} 34'W. Cultural features include logging, farming, recreational areas; and small settlements with a well-developed infrastructure of roads, railways, power and gas lines, and service industries.

The project areas are readily accessed (*see* Figure 2) along provincial Highways 11 and 124, and via paved and unpaved secondary roads, cottage roads, forest access roads and bush tracks.

Geology of Building Stone Prospecting Targets

The prospecting targets consist of industrial minerals comprising quarriable stone resources for small, medium, and large (<10, 10-15, 15-20+ tonne) block dimensional stone; and quarriable deposits of flagstone. A variety of end-product commodities can be derived from these resources in the building and landscaping industries. Target lithologies are commercial stone granite varieties and include orthogneiss, paragneiss, mixed gneiss, migmatite and metaplutonic rocks; with emphasis on attractive, high value deposits of uniquely coloured and patterned stone amenable to a variety of applications in the currently developing market.

Building stone including landscaping material, is found in a variety of complex geologic settings typical of the central Ontario part of the Central Gneiss Belt of the Grenville Province. The project area is part of a regional high grade metamorphic assemblage of rocks of Middle Proterozoic age which have undergone predominantly northwesterly-directed ductile thrusting resulting in the development of several uniquely discernable lithotectonic terranes of dominantly northeasterly structural trends, bounded by extensive shear zones which are delineated by well-foliated high strain tectonites (Easton 1992). The lithotectonic terranes are thrusted and imbricated crustal segments which in some cases can be further subdivided into subordinate domains based on differences in rock types, internal structure, metamorphism, geologic history, and geophysical characteristics. Prospective foliated and unfoliated building stone lithologies underlie large untested areas within the tectonic terranes and domains; and flaggy gneisses occur along their margins (Marmont 1991).

More than a decade of work by the Ontario Geological Survey in the region has indicated that a variety of prospective foliated and unfoliated building stone lithologies of the *granite* commercial category occur in several potential quarriable sites; and are believed to also occur in areas which have not been thoroughly prospected. The project area includes parts of the Novar, Kiosk, Powassan, and McCraney lithotectonic domains (Mandziuk 1995) which occur in the central part of the Algonquin terrane (Easton 1992). Large folded sheets of gneissic granitic rocks occur in all of the domains and these have been extensively injected by granitic magmas. The physiography is hilly and rocky with intervening low flat plains, and a mixed forest cover ranging from hardwood temperate stands to coniferous boreal type growth. Outcrop areas usually form a series of low moss-covered ridges with good flank exposures, but relief of up to 30 metres or more of outcrop occurs along steep scarps and slopes throughout the region. Thickness of overburden is highly variable, with a predominance of bouldery till near elevated outcrop areas. Abundant swamps, pools, ponds, and lakes interconnected by dendritic drainage networks are encountered throughout the area.

Within the lithotectonic domains, structures are typically complex, discontinuous, stretched, and heterogeneous. Intercalated shallow dipping, thin sheet-like bodies outcrop in complicated patterns. However, more uniform areas of gneisses and metaplutonic rocks with favourable relief for extraction of stone also occur, such as at the Sausage Lake prospect. As quarriable sites may be a few hectares or less in size, the structural constraints of jointing, fracturing, sheeting, and other partings are critical in determining the dimension stone potential and requirements for further testing. Along domain boundaries, flaggy tectonite units, such as at the Cripple Creek

prospect, make up lesser value; but also important, targets for building stone and landscaping stone for which different structural constraints apply (Fouts and Marmont 1989). A good parting cleavage and good dressing qualities are favoured for a flagstone deposit, and the site must have favourable topography and location.

North of Burk's Falls the Powassan Batholithic Complex of amphibolite to granulite grade dioritic, anorthositic, quartz monzonitic, and granitic compositions contains attractive contorted and augen gneisses, and other orthogneissic rocks as potential dimension stone targets in a mostly unsurveyed region which includes the project area and the Sausage Lake prospect. The degree of homogeneity of pattern, colour, and fabrics are important criteria; and increasingly, popularity of unconventional patterned and coloured stone has expanded in some markets. New types of building stone materials could be developed in the project area based on current market trends towards new varieties. However, the quarriability, structural soundness, compositional integrity, and physical properties and workability of stone prospects are major considerations in their economic evaluation.

Previous government and private sector reconnaissance surveys along and near roadsides have identified some promising sites for both dimensional stone and flagstone resources containing a variety of gneissic rocks throughout the region. Recent commercial interest and initiatives by Ontario stone producers towards expansion and integration of the stone industry is gaining momentum and provides opportunities for new qarry developments. Under favourable economic conditions and with future expansion of the central Ontario stone industry, it will be possible to establish a number of specialized quarries exploited by mobile equipment and centrally located processing plants.

Both conventional and unconventional gneissic granites have been observed in the project area (Mandziuk 1994); but in many cases a lack of lithological uniformity or high joint and fracture densities obviates further consideration of areas of significant outcrop (several tens of acres). Conventional granites are less frequently encountered and include medium to coarse grained equigranular, inequigranular, and porphyroblastic and porphyroclastic rocks which are variably recrystallized. Rock types include monzonite, gabbro, diorite, granite, and hybridized intermediate varieties. Gneissic granites and paragneisses are widespread and display a great variation of types; particularly in colouration, texture, and patterning. The rocks are generally medium grained, seriate, migmatitic, and banded in various styles which range from straight-planar to highly contorted. The gneissic granites are typically wholly recrystallized, porphyroblastic, and contain varying amounts of feldspars, quartz, pyroxenes, hornblende, garnet, micas, and opaque minerals. Deleterious minerals are not abundant and most occurrences display good durability and limited depth of weathering.

DESCRIPTION OF WORK AND RESULTS

Cripple Creek Flagstone Prospect

This site was discovered in 1993 during prospecting for stone performed by the author (Figure 3). After completion of a geological survey over a flagged grid; backhoe and manual stripping over part of the Cripple Creek flagstone prospect in McCraney Township was performed during August 16 to October 24, 1995 (*see* Figure 4, Photos 1 and 2). Eighteen hours of backhoe work was carried out during August 27-29 and was performed by Chartrand Bulldozing of Emsdale. Other work during August 27, 1994 to October 4, 1995 consisted of prospecting, geological surveying, and sampling, including preparation of a thin section for petrographic analysis (Mandziuk 1994). Easy access for future bulk sampling and extraction of granitic gneiss flagstone from a potential quarry face was readily established during stripping in 1995, and a small pile of loosened material weighing approximately one tonne was pulled off the face by a steel cable attached to the backhoe. The loose material broke up during descent to reveal the presence of good quality flagstones in both orange-pink and schistose sparkling grey colours, with good splitting properties in a variety of thicknesses (~1cm to >20cm). Selected samples of these flagstones were stockpiled at the stripped site. Other loose material exposed during the stripping had slab surface dimensions of up to 1.5m across. Greater than 60% of the stone exposed at the site is estimated to be amenable to a variety of possible landscaping and decorative building stone applications, and this percentage should increase with selective light blasting of the face to penetrate less weathered material.

The stripping site is part of a 300-metre ridge of steep to overhanging northeast dipping (35-45^0) rock scarps trending along, and situated approximately 50 to 60 metres east of, the road (formerly a railway) leading to Rain Lake in Algonquin Park (Figure 4). From Highway 11, the site is accessible via Highway 518 past Kearney, east for approximately 20 kilometres to 0.5 kilometres past Round Lake. The rock scarp at the stripped site is approximately 15m high and stepped with moderate overhangings. Orange-pink granitic gneiss comprises most of the rock which is strongly foliated and banded with a finely sparkling sugary lustre and grey biotitic ribbons set in a granoblastic quartzofeldspathic matrix (0.5mm), with evenly dispersed porphyroblasts of lensoid to streaky quartz+feldspar. The stone is variably flaggy to fissile, well-layered, hard, tough, and attractive; with a characteristic streaky felsic ribbon lineation typical of Grenville paragneisses occurring within ductile shear zones. Sparkling, greyish granitic gneiss with more than 20% mafic biotitic layers comprises less than 1/3 of the stripped area and is gradationally interlayered with the orange-pink granitic gneiss. The colour and fabric variations among these two types of gneisses is complementary with regard to combined flagstone applications. On average, the mineral components and their volumetric ranges consist of perthitic potassium feldspars (40-45%), quartz (30-35%), plagioclase (10-15%), biotite (5-20%), and magnetite (1-2%). The rocks are considered to be metamorphically derived from interbedded arkoses and arkosic wackes.

THIN SECTION PETROGRAPHIC ANALYSIS: Z94-9/24 Cripple Creek (unit 1)

MINERALOGY:	%
K-feldspar (perthite)	40-45
Quartz	30-35
Plagioclase feldspar (albite)	10-15
Biotite	5
Opaques	1-2
Alteration of feldspars (sausserite)	1-2
Garnet (almandine)	Trace
Zircon	Trace

The perthitic intergrowth consists of parallel to subparallel exsolved plagioclase blebs hosted by alkalai feldspar. Average grain size is 0.5mm. Opaque phase is magnetic (magnetite). Varying proportions of the mafic and felsic minerals give the rock a banded appearance and the alignment of the biotite grains imparts a strong and pervasive mineral foliation to the rock. Approximate plagioclase composition was obtained via the Michel-Lévy method.

The structural geology of the Cripple Creek prospect is the result of strong shearing along a zone of ductile thrust faulting on the northern boundary of the Novar lithotectonic domain (Mandziuk 1994). The low to moderate density of jointing on the prospect has a range of spacing from 0.5m to >2.0m. Most of the rocky ridge consists of flaggy exposures which can be manually split; and multiple-face side-hill extraction by light blasting and mechanized quarrying is proposed for this deposit. The marketable flagstone resources in this deposit are estimated to be approximately 100,000 tonnes, with a 30-40% volume of waste or secondary lesser value material.

Sausage Lake Dimension Stone Prospect

The Sausage Lake prospect in Laurier Township is located 6.5 kilometres southeast of Highway 11 at Trout Creek, along the recently upgraded South River road (Figure 5). This prospect was discovered in 1993 during regional prospecting for dimension stone. The work carried out by the author on this two-claim block unit has included prospecting, geological mapping over a flagged grid (*see* Map), petrographic analysis, preparation of sample polished tiles, extraction of a test block for ASTM testing, diamond drilling, and backhoe and manual stripping. Altered coarse grained massive anorthosite and gabbroic (mafic) anorthosite (unit 1) comprise the most abundant and best quality rock type for dimensional stone on the property. The rock is attractive and unique from the perspective of a potential 'granite' stone commodity. The colouration is greyish to brownish purple with a faint plagioclase schiller and a well-developed porphyroblastic fabric. Mineralogy consists of plagioclase (30-40%), potassium feldspar (20-25%), quartz (10-15%), amphibole+biotite (10-20%), garnet (<5%), and magnetite (~1%). Medium to fine grained phases of the anorthosite (unit 2) are related hypabyssal rocks of similar colour and composition which occur as minor dykes generally a few metres in width or less. Hybridized mottled rocks enriched in potassium feldspar (unit 3) and associated diabase (unit 4) were also observed during the previous work on the property. Thin (1-5mm), planar quartz-feldspar veining is found in all rock types, but does not appreciably diminish the appearance of the potential stone resources.

THIN SECTION PETROGRAPHIC ANALYSIS: Z94-11/8 Sausage Lake (unit 1)

MINERALOGY:	%
Plagioclase feldspar (oligoclase-andesine)	30-35
K-feldspar (orthoclase)	20-25
Quartz	10-15
Amphibole (hornblende)	5-10
Biotite	5-10
Garnet (almandine)	5
Quartz + K-spar granophyric intergrowth	3
Opaques (magnetite)	1
Zircon	Trace
Apatite	Trace
Alteration of feldspars (sausserite + sericite)	to 1%

The plagioclase grains show bent polysynthetic twinning and a undulose extinction. The large size of the plagioclase grains (to 5mm) compared to the rest of the mineralogy (average 0.5mm) imparts a porphyroblastic fabrid to the rock. The garnets are pink in colour (almandine-rich) and the opaque phase is strongly magnetite (magnetite). Strong undulose extinction and bent albite twins make the determination of plagioclase feldspar composition difficult.

THIN SECTION PETROGRAPHIC ANALYSIS: Z94-11/8 Sausage Lake (unit 3)

MINERALOGY:	%
K-feldspar (orthoclase?)	35-40
Plagioclase feldspar (An_{27} - ologoclase)	15-20
Quartz	15-20
Biotite	3-5
Opaques (magnetite)	2-3
Amphibole (hornblende)	2
Garnet (almandine)	1-2
Zircon	Trace
Apatite	Trace
Fe-oxide staining	5-10
Alteration of feldspars (sausserite + sericite)	5-10

The large size of the K-feldspar grains (to 1cm) compared to the rest of the mineralogy (average 0.5mm) imparts a porphyroblastic fabric to the rock. Plagioclase is highly sausseritized; with a few grains to 90%. Approximate plagiclase composition was obtained via the Michel-Lévy method. Opaque phase is magnetic (magnetite). The garnets are pink in colour (almandine-rich), highly fractured and are altered to iron-oxides.

Three diamond drill holes (total length 52.21m) of vertical dip were put down over the Sausage Lake prospect in July and August 1995. The drill was a portable gasoline-powered Winkie model which was transported by all-terrain-vehicle and fastened by bolt to the outcrop surfaces during drilling. Locations are shown on the accompanying map and additional details are provided on drill logs and sections. Drilling was performed over Area 1 (*see* Map), which was identified during prospecting work in 1994 as a primary favourable area for initial test quarrying (Mandziuk 1994). The purpose of the drilling component of this project was to assess lithological uniformity, building stone quality, fracturing, and potential quarry block reserves in the western part of the Sausage Lake prospect. The drill holes were situated to form a roughly triangular pattern

designed to provide as much significant information on Area 1 as possible. The constraints on hole locations were: physiography, ATV access, depth of overburden, and water supply for drilling. The drill core is stored in Toronto.

The best results from drilling were obtained in drill holes SLZ95-1 and SLZ95-2, and in the upper 10 metres of hole SLZ95-3. Competent unfractured sections of uniform fabric and composition which are greater than 1 metre in length along the core axis comprise the favourable horizons. Most of the fracturing encountered was generally minor and localized or related to horizontal sheeting; and would contribute an average waste factor of about 10-20%. The depth of pale grey coloured weathering in drill core is generally less than 25cm. A more significant waste factor of >20% is related to the combination of: (1) small but prominent faults at 10-20^0 T.C.A. which are generally spaced a few metres apart, have limonitic or hematitic coatings and selvages, and altered margins mottled by red K-feldspars; (2) cataclastic zones of a few centimetres in width which contain granulated and rounded plagioclase porphyroblasts in a mafic-enriched and microfractured matrix; (3) narrow cross-cutting dykes of diabase and inhomogeneous intermediate anorthosite dykes and hybridized rocks such as occur in the lower half of hole SLZ95-2. In the east part of Area 1 the number of dykes and hybridized rocks appears to increase on surface and at depth, and thus limits the extent of quarriable stone in that direction. The potential extent of good stone in the flat area of shallow overburden to the north is more favourable.

Drill logs for holes SLZ95-1, SLZ95-2, and SLZ95-3 are presented on the following pages and drill sections are included in the appendices in Figures 6-8.

After completion of diamond drilling, twenty-two hours of backhoe stripping on the Sausage Lake prospect were performed during September 15-17, 1995 by G. McGuire of Trout Creek over a steep side-hill outcrop on which hole SLZ95-1 was put down. The location of the stripping is shown on the accompanying map and the surface features are recorded in Photos 3 and 4. Several large (up to tens of tonnes), loose blocks of potential commercial stone material consisting of coarse grained mafic anorthosite were exposed during the stripping. The top of the outcrop was further stripped manually, and access was also established to the top of the outcrop during backhoe stripping. This will facilitate initial test extraction of stone quarry blocks. Some of the major fractures are discernable on the photos; and outcrop examination indicates that, with adequate equipment, at least several small to medium size blocks could be extracted from this site with negligible complication. The top surface of the outcrop is roughly horizontal and is about 250 square metres in area. The top and sides are suitable for in-line drilling off of squared quarry blocks. Many of the small joints seen on the surface are discontinuous, probably not extending to depths beyond one or two metres. A general indication of more continuous fractures is the presence of hematitic or limonitic slevages, and altered margins along narrow minor faults which tend to weather out into rounded grooves on outcrop surfaces. The density of the fault fractures is generally moderate with spacings of a metre or more; and their dips are mostly near vertical. Sample polished tiles of coarse mafic anorthosite were prepared in 1994 and presented at a dimensional stone show in Sudbury. The response to the stone from industry representatives has been favourable.

By approximate extrapolation and estimated continuity of lithologic properties from the available information (Figure 9), a possible potential reserve of over 20,000 quarry blocks of minimum size of about $3m^3$ could occur in Area 1 of the prospect. Extraction of a quarry block from the stripped site around hole SLZ95-1 is now possible, and would provide further information on the nature of minor fractures at depth. The less accessible Area 2 in the central part of the grid is estimated to contain similar reserves of coarse mafic anorthosite.

CONCLUSIONS AND RECOMMENDATIONS

The results of work on the Cripple Creek flagstone prospect and on the Sausage Lake dimension stone prospect are favourable for further comittments of resources and pre-development activities towards establishment of quarrying operations. Planned future work includes some further stripping and removal of small quantities of stone for test processing and marketing. Support for additional work is being sought from stone producing companies and from developers with interests in the Ontario stone industry.

The technical assistance and advice of staff of the Ontario Geological Survey and the Mining and Land Management Branch of the Ministry of Northern Development and Mines during the course of prospecting projects for building stone carried out by the author is gratefully acknowledged.

REFERENCES

Easton, R.M. 1992: The Grenville Province and the Proterozoic history of central and southern Ontario *in* Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 2, p.714-904.

Fouts, C.R., Freeman, E.B., Kemp, K.M., Marmont, C., and Minnes, D.G. 1991: Building stone and historical structures in downtown Toronto, Geological Association of Canada - Mineralogical Association of Canada, Society of Economic Geologists, Joint Annual Meeting, Toronto '91, Field Trip A11/B11: Guidebook, 63p.

Fouts, C.R. and Marmont, C. 1989: Gneisses of the Parry Sound-Muskoka area: flagstone resources; Ontario Geological Survey, Open File Report 5725, 72p.

Hewitt, D.F. 1964: Building stones of Ontario, Part V, Granite and Gneiss; Ontario Department of Mines, Industrial Mineral Report 19, 51p.

Mandziuk, Z.L. 1995: Assessment of building stone prospects, Huntsville-Trout Creek area; Ontario Prospectors Assistance Program OP95-340, 15p., appendices.

Mandziuk, Z.L. 1994: Assessment of building stone prospects, Huntsville-Trout Creek area; Ontario Prospectors Assistance Program OP94-364, 52p.

Mandziuk, Z.L. 1993: Building stone assessment, Huntsville-Trout Creek area; Ontario Prospectors Assistance Program OP93-617, 51p.

Marmont, C. 1993: Exploration guidelines and opportunities for dimensional stone in central Ontario; Ontario Geological Survey, Open File Report 5853, 83p.

Papertzian, C. and Farrow, D. 1995: Dimension stone: A guide to prospecting and developing; Ontario Geological Survey, Open File Report 5920, 82p.

Verschuren, C.P., Papertzian, V.C., Kingston, P.W., and Villard, D.J. 1986: Reconnaissance survey of building stones of eastern and central Ontario; Ontario Geological Survey, Open File Report 5585, 302p.

Statement of Qualifications

I, Zenon L. Mandziuk, of 31 Nassau Street, in the City of Toronto, Province of Ontario, do certify that:

1. I am a graduate of the University of Toronto, Department of Geology, and was awarded the degree of Master of Science in 1975.

2. I am a Consulting Geologist and have been practising the profession of geology for a period of over 20 years in Canada.

3. I personally performed and supervised the work described in this report; and am the sole owner of interest in those claims.

Date: APR 12/96

Signature: Z. Mandziuk

Zenon Mandziuk
Consulting Geologist

APPENDICES

FIGURES

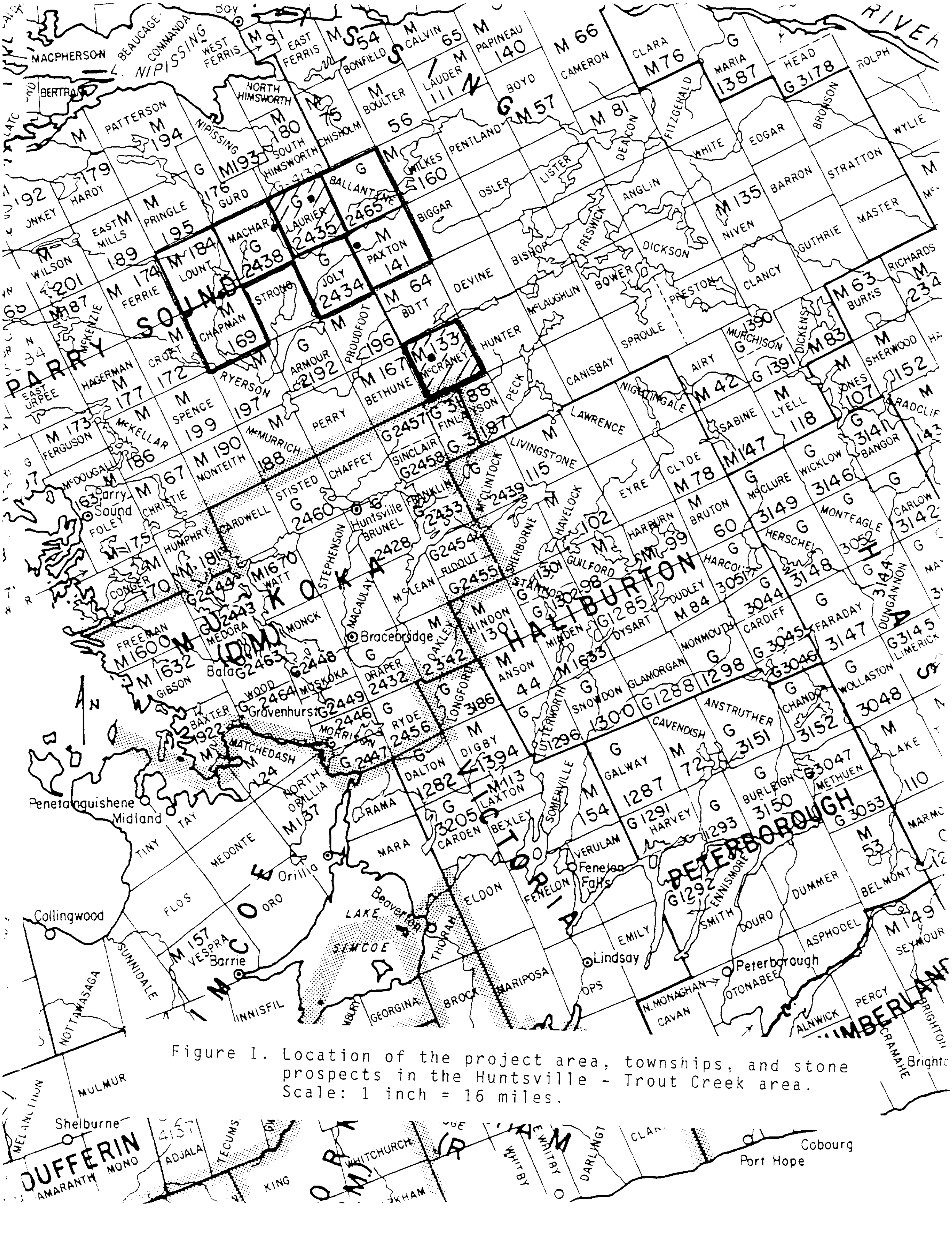


Figure 1. Location of the project area, townships, and stone prospects in the Huntsville - Trout Creek area.
Scale: 1 inch = 16 miles.

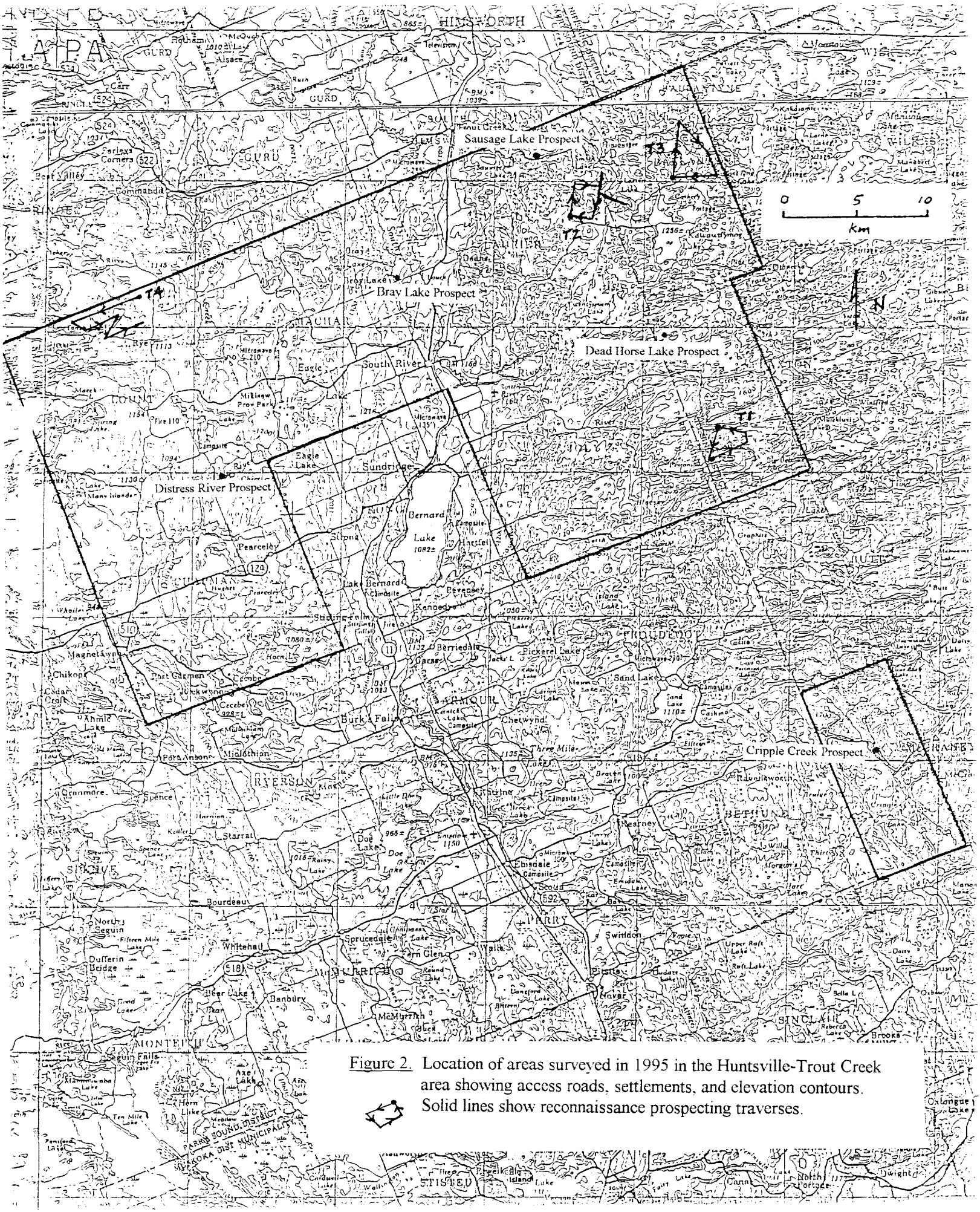


Figure 2. Location of areas surveyed in 1995 in the Huntsville-Trout Creek area showing access roads, settlements, and elevation contours. Solid lines show reconnaissance prospecting traverses.

Legend and symbols for accompanying maps

Generalized outcrop area examined

Overall Building Stone Potential

1 Good

2 Moderate

3 Poor

* (For Regional Prospecting Only)

Significant Positive (underlined), or Negative Features

a Access (e.g. a = good access)

d Dimensional stone prospect

f Flagstone prospect

e Exposure

j Jointing, fracturing density

m Deleterious minerals

r Relief

u Lithological uniformity

x Attractiveness

* (For Regional Prospecting Only)

Regional prospecting traverse in 1994

Large boulder, block

Foliation/gneissosity - inclined, vertical

Prominent jointing - inclined, vertical; spacing

LJT, MJT, DJT Low, medium, dense jointing

Peg Pegmatitic

Slope, incline; scarp

SMT Average local relief, metres

Crest of hill, ridge

Fault, lineament

Grid line, station

Poic, Noic Poor outcrop, No outcrop

SML Small, medium, large block reserves (<10, 10-15, 15-20+ tonne)

Q Proposed test quarry site

Swamp, marsh

Z94-714-1 Sample, rock

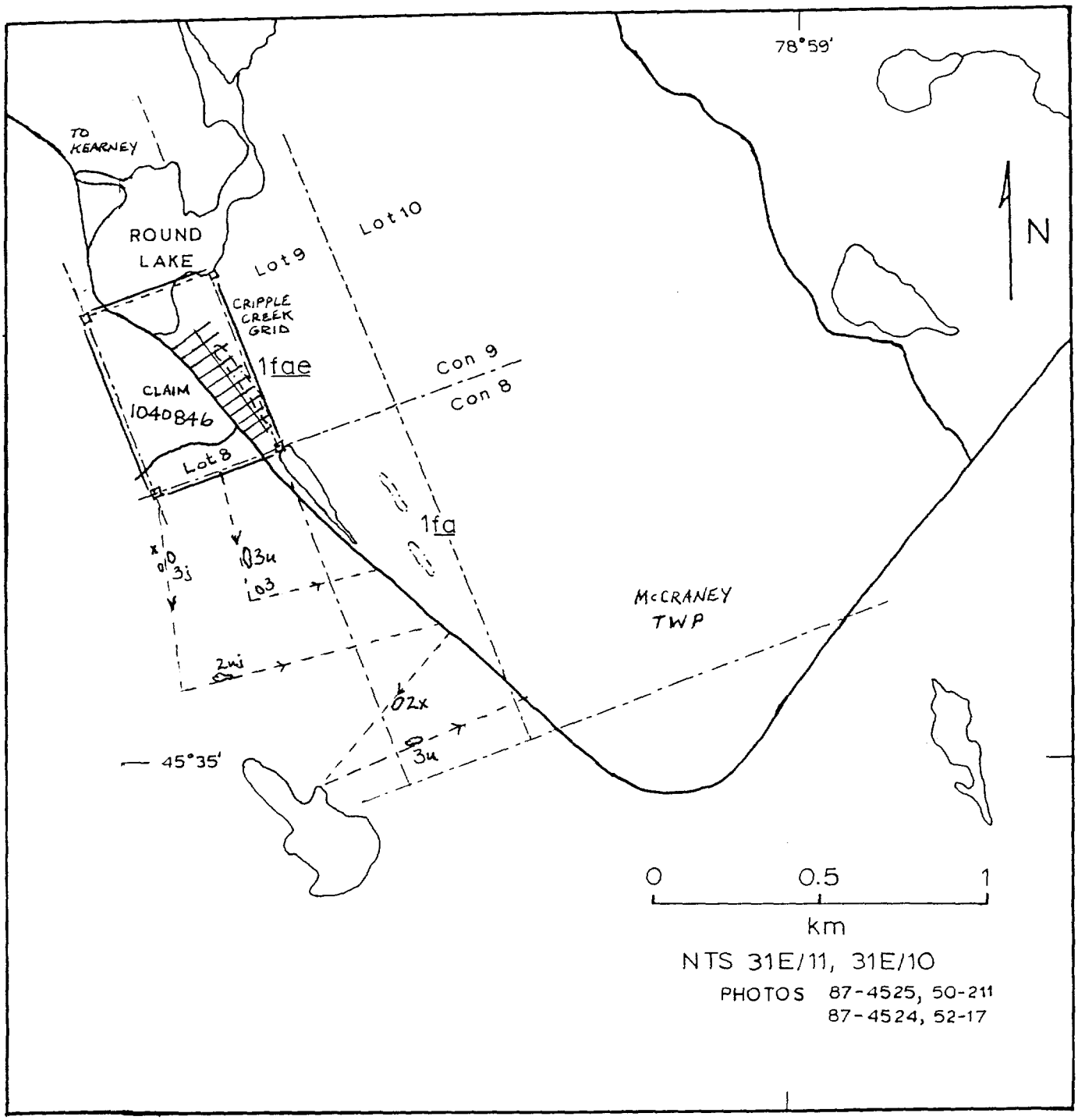


Figure 3. Location of the Cripple Creek prospect and regional prospecting traverses.

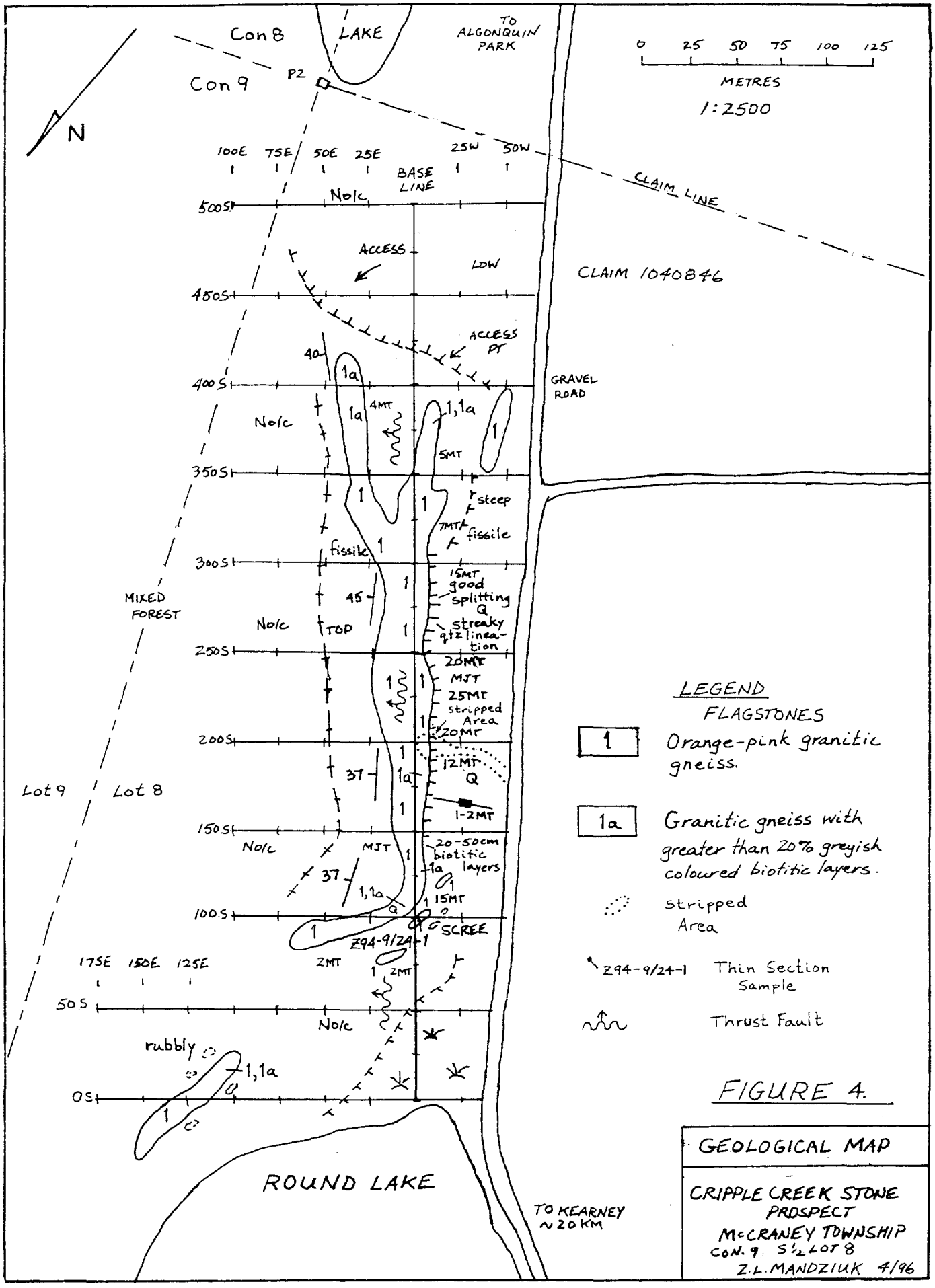


FIGURE 4.

GEOLOGICAL MAP

CRIPPLE CREEK STONE PROSPECT
McCRANEY TOWNSHIP
CON. 9 S½ LOT 8
Z.L. MANDZIUK 4/96

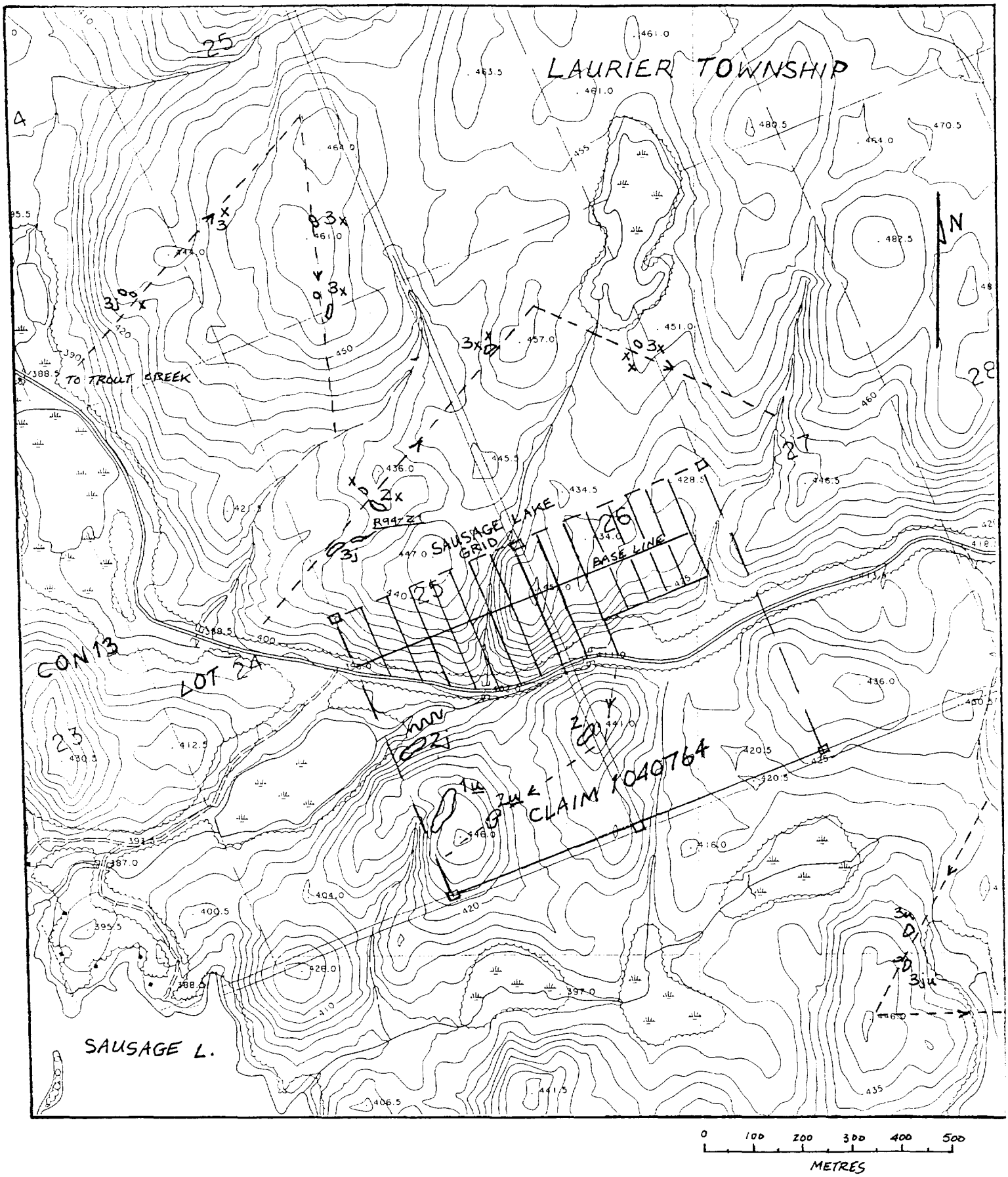


Figure 5. Location of the Sausage Lake prospect and regional prospecting traverses.

MAP (back pocket) Geological map of the Sausage Lake prospect.

TABLES

APPENDIX

ASTM TEST REPORT ON

SAMPLES SUBMITTED BY

Z. MANDZIUK
31 Nassau St., Toronto, M5T 1M3
(416) 593-9808

SAUSAGE LAKE DIMENSION STONE PROSPECT

Sample Block Z94-ASTM-1

Prepared by

Raymond Chevrier
CANMET/MSL
405 Rochester Street
Ottawa, Ontario, K1A 0G1
Tel.: (613) 996-4933 Fax: (613) 992-9389

SUMMARY OF TEST RESULTS

	ASTM	Average Results
Absorption	C 97	0.23 %
Specific Gravity	C 97	2.72
Modulus of Rupture	C 99	13.5 MPa
Compressive Strength	C 170	228.5 MPa
Abrasion Resistance	C 241	70.54 (Ha)

Note: Specimens tested for mechanical properties were tested in a dry condition according to their respective ASTM specification. The load-bearing surfaces of the compressive strength specimens were grounded to obtain parallel planes, all other specimens were tested as received.

ABSORPTION AND BULK SPECIFIC GRAVITY ASTM C97

Specimen No.	Weight A g	Weight B g	Weight C g	Absorption %	Specific Gravity
1	725.1	726.7	460.1	0.22	2.72
2	715.1	716.6	453.9	0.21	2.72
3	723.1	724.8	458.7	0.23	2.72
4	726.0	727.7	460.2	0.23	2.71
5	720.2	722.0	456.7	0.25	2.71
Average				0.23	2.72

A = Weight of dried specimen (24h @ 105 'C)

B = Weight of specimen after immersion (48h @ 20'C)

C = Weight of soaked specimen in water

Absorption, weight % = ((B-A)/A) x 100

Bulk specific gravity = A/(B-C)

MODULUS OF RUPTURE ASTM C99

Specimen No.	d1 mm	d2 mm	b1 mm	Load (W) N	Modulus of Rupture (R) MPa
1	56.9	57.2	101.1	16 500	13.4
2	56.1	56.7	100.9	15 400	12.8
3	57.2	56.9	101.5	17 800	14.4
Average					13.5

$R = 3Wl/2bd^2$ (Modulus of Rupture)
b = Width of specimen
d = Thickness of specimen
l = Span (178mm)
W = Load, kN

COMPRESSIVE STRENGTH ASTM C170

Specimen No.	h mm	d1 mm	d2 mm	A mm^2	Load (W) kN	Strength (C) MPa
1	64.1	63.5	63.6	4039	977	241.9
2	63.1	65.2	63.5	4140	883	213.3
3	65.0	64.0	64.3	4115	951	231.1
4	65.3	64.3	64.1	4122	980	237.7
5	65.0	63.6	64.3	4089	894	218.6
Average						228.5

C = W*1000/A
W = Load, kN
A = Area mm^2
d = Lateral dimension

ABRASION RESISTANCE ASTM C241

Specimen No.	Initial Weight, g	Final Weight, g	Weight Loss, g	S.G. G	Abrasion Resistance Ha
1	170.71	170.26	0.45	2.72	65.60
2	174.06	173.66	0.40	2.72	73.91
3	174.28	173.87	0.41	2.72	72.12
Average					70.54

Ha = 10G(2000+Ws)/2000Wa
G = Bulk specific gravity
Ws = Average weight
Wa = Loss of weight

PHOTOS

Photo 1

Cripple Creek Flagstone Prospect: Bedding, jointing and parting features near the base of the stripped area. Granitic gneiss layers of variable thickness dip at 37^0 with near vertical joints spaced about 1 metre apart penetrating orthogonally into the face. The surfaces weather into roughly rectilinear plates and slabs of various sizes and thickness. Iron oxide leaching along planes of parting penetrates up to a metre or more.

Photo 2

Cripple Creek Flagstone Prospect: Assorted size and thickness of flagstone pulled off from halfway up the rock face which rises to about 15 metres above the base of the area of stripping. The large slabs near the lower central part of the photo are about 1.5 to 2.0 metres across and 10 to 20 centimetres thick.

Photo 3

Sausage Lake Prospect: Distibution of fractures along the 3.5 metre high vertical side of the stripped outcrop into which drill hole SLZ95-1 was put down. Near-vertical fractures penetrating at right angles into the hill and spaced about 2 metres apart occur near the center of the photo, and a prominent horizontal sheeting fracture plane is visible near the base of the outcrop.

Photo 4

Sausage Lake Prospect: Stripped area around flagged drill hole SLZ95-1. The hole was drilled vertically to a depth of 14.76 metres, which corresponds to the elevation of the South River Road on which the truck is located 50 metres to the south. Prominent orthogonal jointing approximately parallel and perpendicular to the road is discernable on the outcrop surface.

MAP

Sausage Lake Stone Prospect
Geology, Location of Drill Holes, Sampling, Stripping
Scale 1:1000

Ministry of Northern Development and Mines
Ontario

Report of Work Conducted After Recording Claim

Mining Act

Rec. Rec. Sudbury
Transaction Number
W9690.00026

2.16551

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

Instructions: - Please ty
- Refer to t
Recorder.
- A separat
- Technical

31E14NW0002 2.16551 LAURIER

900

ınt work or consult the Mining

- A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s)		Client No.
ZENON MANDZIUK		295730
Address		Telephone No.
31 NASSAU ST. TORONTO M5T 1M3		416 593-9808
Mining Division	Township/Area	M or G Plan No.
S. ONT	LAURIER	G 2435
Dates Work Performed From: SEPT. 3/94	To: OCT. 7/95	

Work Performed (Check One Work Group Only)

	Work Group	Type
✓	Geotechnical Survey	GEOLOGICAL WORK AND PROSPECTING
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
	Assays	
	Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs $ 1792.~~00~~

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
ZENON MANDZIUK	31 NASSAU ST. TORONTO M5T 1M3

(attach a schedule if necessary)

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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

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.	Date	Recorded Holder or Agent (Signature)
	APR 15/96	Z. Mandziuk

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 after its completion and annexed report is true.

Name and Address of Person Certifying
ZENON MANDZIUK 31 NASSAU ST. TORONTO M5T 1M3

Telephone No.	Date	Certified By (Signature)
416 593-9808	APR 4/96	Z. Mandziuk

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Received Stamp
	April 15/96		SOUTHERN ONTARIO MINING DIVISION RECEIVED APR 15 1996 AM 7,8,9,10,11,12,1,2,3,4,5,6 PM
	Deemed Approval Date: July 15/96	Date Approved	
	Date Notice for Amendments Sent		

0241 (03/91)

Total Number of Claims	Claim Number (see Note 2)	Number of Claim Units	Work Report Number for Applying Reserve
1	1040764	2	

Total Value Work Done	Total Value Work Applied	Value of Assessment Work Done on this Claim	Value Applied to this Claim
1792.00	0	1792.00	0

Total Assigned From	Total Reserve	Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
—	1792.00	—	1792.00

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 respect 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	Date

Ontario and Mines

Ministère du Développement du Nord et des mines

for Assessment Credit

État des coûts aux fins du crédit d'évaluation

W9690.00026

Mining Act/Loi sur les mines

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 sont recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour GEOL, PROSP. Main-d'oeuvre	1500.00	
	Field Supervision Supervision sur le terrain		1500.00
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type		
Supplies Used Fournitures utilisées	Type FLAGGING, TOPO FIL, OFFICE	13.80	
			13.80
Equipment Rental Location de matériel	Type		
	Total Direct Costs Total des coûts directs		1513.80 ✓

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 global
Transportation Transport	Type ROAD	87.23	
			87.23
Food and Lodging Nourriture et hébergement	MEALS CABIN RENTAL	191.05	191.05
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		278.28
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		300.76
	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**		1792.08 ✓

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 dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

RECEIVED
APR 29 1996
MINING LANDS BRANCH

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 sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

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

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 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 (Recorded Holder, Agent, Position in Company) I am authorized

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 ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

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

à faire cette attestation.

Signature	Date
Z. Mankosh	APR. 4/96

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Ministry of Northern Development and Mines
Ontario

Report of Work Conducted After Recording Claim

Mining Act

Rec Dec Sudbury
Transaction Number
W9690.00027

2.16551

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7254.

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 Mining 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): ZENON MANDZIUK		Client No. 295730
Address: 31 NASSAU ST TORONTO M5T 1M3		Telephone No. 416 593-9808
Mining Division: S. ONTARIO	Township/Area: LAURIER	M or G Plan No.: G2435
Dates Work Performed: From SEP 2/94	To: NOV 9/94	

Work Performed (Check One Work Group Only)

	Work Group	Type
	Geotechnical Survey	
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
✓	Assays	ASTM TESTING, MICROSCOPIC STUDIES
	Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs $ 1890.09 ✓

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
ZENON MANDZIUK	31 NASSAU ST TORONTO M5T 1M3

(attach a schedule if necessary)

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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

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.	Date: APR 15/96	Recorded Holder or Agent (Signature): Z Mandziuk

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 after its completion and annexed report is true.

Name and Address of Person Certifying: ZENON MANDZIUK 31 NASSAU ST TORONTO M5T 1M3

Telephone No.	Date	Certified By (Signature)
416 593-9808	APR 4/96	Z. Mandziuk

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Received Stamp
	April 15/96		SOUTHERN ONTARIO MINING DIVISION RECEIVED APR 15 1996 AM 7 8 9 10 11 12 1 2 3 4 5 6 PM
	Deemed Approval Date: July 15/96	Date Approved	
	Date Notice of Amendments Sent		

0241 (93/01)

(0391)

Number of Claim Units	Claim Number (see Note 2)	Work Report Number for Applying Reserve
2	1040764	

Total Number of Claims: 1

Value of Assessment Work Done on this Claim	Value Applied to this Claim	Total Value Work Done	Total Value Work Applied
18990.09	0	18990.09	0

Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date	Total Assigned From	Total Reserve
—	18990.09	—	18990.09

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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 respect 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	Date

Ontario and Mines

Ministère du Développement du Nord et des mines

for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

W9690.00027

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 sont recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour ROCK SAMPLING TEST BLOCK Main-d'oeuvre	400.00	
	Field Supervision Supervision sur le terrain		400.00
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type SAMPLESPREP	250.18	
	PETROGRAPHY	112.00	
	CANMET ASTM TESTING	599.20	961.38
Supplies Used Fournitures utilisées	Type DRILL FUELS	19.21	
			19.21
Equipment Rental Location de matériel	Type PIONJAR DRILL	338.10	
			338.10
	Total Direct Costs Total des coûts directs		1318.69 ✓

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 global
Transportation Transport	Type ROAD	43.80	
			43.80
Food and Lodging Nourriture et hébergement	MEALS CABIN RENTAL	127.60	127.60
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		171.40
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		263.74
	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)**		1890.09 ✓

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 dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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 sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

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

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 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 ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

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

à faire cette attestation.

Signature	Date
	APR 4/96

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Ministry of Northern Development and Mines
Ontario

Report of Work Conducted After Recording Claim

Mining Act

Res. Geo. Sudbury

Transaction Number
W9690.00028

2.16551

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

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 Mining 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): ZENON MANDZIUK		Client No. 295730
Address: 31 NASSAU ST TORONTO M5T1M3		Telephone No. 416 593-9808
Mining Division: S. ONT	Township/Area: McCRANEY	M or G Plan No.: M133
Dates Work Performed: From: SEPT 24/94	To: NOV 9/94	

Work Performed (Check One Work Group Only)

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

Total Assessment Work Claimed on the Attached Statement of Costs $ 150.44

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
ZENON MANDZIUK	31 NASSAU ST TORONTO M5T 1M3

RECEIVED
APR 23 1996
MINING LANDS BRANCH

(attach a schedule if necessary)

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

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.	Date: APR 15/96	Recorded Holder or Agent (Signature): Z. Mandziuk

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 after its completion and annexed report is true.

Name and Address of Person Certifying: ZENON MANDZIUK 31 NASSAU ST TORONTO M5T 1M3		
Telephone No.: 416 593-9808	Date: APR 4/96	Certified By (Signature): Z. Mandziuk

For Office Use Only

Total Value Cr. Recorded	Date Recorded: April 15/96	Mining Recorder:	Received Stamp: SUDBURY ONTARIO MINING DIVISION RECEIVED APR 15 1996 AM PM 7,8,9,10,11,12,1,2,3,4,5,6
	Deemed Approval Date: July 15/96	Date Approved:	
	Date Notice to Amendments Sent:		

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
	1040846	1	150.41	~~150.41~~ 0	–	150.41
	Total Number of Claims: 1		Total Value Work Done: 150.41	Total Value Work Applied: ~~150.41~~ 0	Total Assigned From: –	Total Reserve: 150.41

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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. [X] 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 respect 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	Date

Ontario and Mines

Ministère du Développement du Nord et des mines

for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

W9690.00028

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 sont recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour SAMPLING Main-d'oeuvre	50.00	
	Field Supervision Supervision sur le terrain		50.00
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type SAMPLE PREP	11.34	
	PETROGRAPHY	64.00	
			75.34
Supplies Used Fournitures utilisées	Type		
Equipment Rental Location de matériel	Type		
	Total Direct Costs Total des coûts directs		125.34 ✓

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 global
Transportation Transport	Type ROAD	11.00	
			11.00
Food and Lodging Nourriture et hébergement	MEALS CABIN RENTAL	31.30	31.30
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		42.30
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		25.07 ✓
	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)**		150.41 ✓

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 dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout 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 sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

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

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 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 (Recorded Holder, Agent, Position in Company) I am authorized

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 ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

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

à faire cette attestation.

Signature	Date
Z. Mountjoy	APR 16/96

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Ministry of Northern Development and Mines
Ontario

Report of Work Conducted After Recording Claim

Mining Act

Rec. Reg. Sudbury
Transaction Number
W9690.00029

2.16551

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

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 Mining 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): ZENON MANDZIUK		Client No. 295730
Address: 31 NASSAU ST TORONTO M5T 1M3		Telephone No. 416 593-9808
Mining Division: S. ONT	Township/Area: MCCRANEY	M or G Plan No.: M133
Dates Work Performed: From: SEP 10/94	To: OCT 4/95	

Work Performed (Check One Work Group Only)

	Work Group	Type
✓	Geotechnical Survey	GEOLOGICAL AND PROSPECTING WORK 4DAYS
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
	Assays	
	Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs $ ~~734.76~~ 735 / ~~694.76~~ ✓

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
ZENON MANDZIUK	31 NASSAU ST. TORONTO M5T1M3

(attach a schedule if necessary)

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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.	APR 15/96	Z. Mandziuk

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 after its completion and annexed report is true.

Name and Address of Person Certifying: ZENON MANDZIUK 31 NASSAU ST TORONTO M5T 1M3

Telephone No.	Date	Certified By (Signature)
416 593-9808	APR 4/96	Z. Mandziuk

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	SOUTHERN ONTARIO MINING DIVISION Received Stamp
	April 15/96		RECEIVED
	Deemed Approval Date: July 15/96	Date Approved	APR 15 1996
	Date Notice for Amendments Sent		AM PM 7,8,9,10,11,12,1,2,3,4,5,6

0241 (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
	1040846	1	734.76 ~~644.76~~	734.76 ~~644.76~~	—	—
	Total Number of Claims: 1		Total Value Work Done: 735 ~~734.76~~ ~~644.76~~	Total Value Work Applied: 735 ~~734.76~~ ~~644.76~~	Total Assigned From: —	Total Reserve: —

PROSP.

RECEIVED
APR 23 1996
MINING LANDS BRANCH

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 respect 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	Date

Ontario and Mines

Ministère du Développement du Nord et des mines

for Assessment Credit

État des coûts aux fins du crédit d'évaluation

W9690.00029

Mining Act/Loi sur les mines

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 sont recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour 4 Main-d'oeuvre	600.00	
	Field Supervision Supervision sur le terrain		600.00
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type		
Supplies Used Fournitures utilisées	Type FLAGGING, TOPO-FIL, OFFICE	12.30	
			12.30
Equipment Rental Location de matériel	Type		
	Total Direct Costs Total des coûts directs		612.30 ✓

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 global
Transportation Transport	Type ROAD	34.44	
			34.44
Food and Lodging Nourriture et hébergement	MEALS CABIN RENTAL	125.20	125.20
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		159.64
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		122.46 ✓ ~~82.46~~
	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)**		734.76 ✓ ~~694.76~~

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 dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout 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 sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.
2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

RECEIVED
APR 23 1996
MINING LANDS BRANCH

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 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 (Recorded Holder, Agent, Position in Company) I am authorized

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 ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

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

à faire cette attestation.

Signature	Date
Z. Mondgut.	APR 16/96

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Ontario

Ministry of Northern Development and Mines
Ministère du Développement du Nord et des Mines

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

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

July 10, 1996

Our File: 2.16551
Transaction #: W9690.00026
.00027
.00028
.00029

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

Dear Mr. Denomme:

SUBJECT: APPROVAL OF ASSESSMENT WORK CREDIT ON MINING LAND, CLAIMS SO.1040764 & 1040846 IN LAURIER & MCCRANEY TOWNSHIPS

Assessment work credit has been approved as outlined on the Declaration of Assessment Work Form accompanying this submission. The credit has been approved under Section 12, Geology and Section 17, Assays, of the Assessment Work Regulation.

The approval date is July 08, 1996.

If you have any questions regarding this correspondence, please contact Lucille Jerome at (705) 670-5858.

Yours sincerely,
ORIGINAL SIGNED BY:

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

LBJ/cc

cc: Resident Geologist
Sudbury, Ontario

Assessment Files Library
Sudbury, Ontario

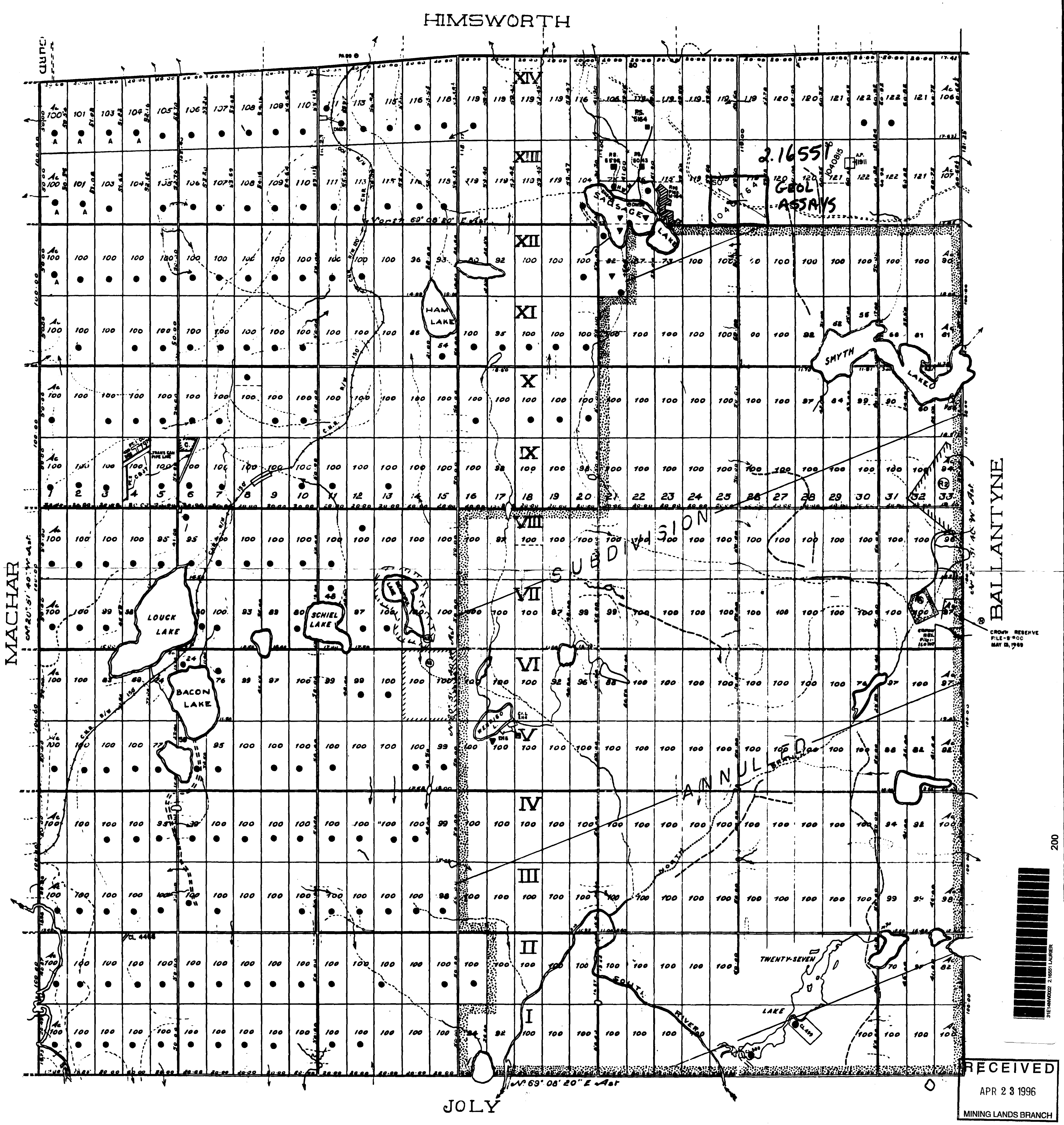
REFERENCES

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
R1	W.S./81	16/11/81	S.R.O.	160707
43		27/10/72	S.R.O.	118336
R2	W8/88	29/01/88	S.R.O.	188549

RES. GEO. SUDBURY
M.N.R. DIST.
BRACEBRIDGE



LEGEND

HIGHWAY AND ROUTE No.	
TRAILS	
SURVEYED LINES:	
TOWNSHIPS, BASE LINES, ETC.	
LOTS, MINING CLAIMS, PARCELS, ETC.	
UNSURVEYED LINES:	
LOT LINES	
PARCEL BOUNDARY	
MINING CLAIMS ETC.	
RAILWAY AND RIGHT OF WAY	
UTILITY LINES	
NON-PERENNIAL STREAM	
FLOODING OR FLOODING RIGHTS	
SUBDIVISION OR COMPOSITE PLAN	▨
RESERVATIONS	
ORIGINAL SHORELINE	
MARSH OR MUSKEG	
MINES	⚒
TRAVERSE MONUMENT	◆

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	◓
" , MINING RIGHTS ONLY	◒
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	⬒
" , MINING RIGHTS ONLY	⬓
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	®
CANCELLED	⊗
SAND & GRAVEL	Ⓢ

NOTE MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC. I

DATE OF ISSUE
APR 1 5 1996
SOUTHERN ONTARIO
MINING DIVISION

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.

NOTE · TOWNSHIP SUBDIVISION PARTIALLY ANNULLED APRIL 11/1963

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 4000 6000 8000
METRES 0 200 1000 1 KM 2000 (2 KM)

200

31E14NW0002 2.16551 LAURIER

RECEIVED
APR 2 3 1996
MINING LANDS BRANCH

TOWNSHIP
LAURIER
M.N.R. ADMINISTRATIVE DISTRICT
BRACEBRIDGE
MINING DIVISION
SOUTHERN ONTARIO
LAND TITLES / REGISTRY DIVISION
PARRY SOUND

Ministry of Natural Resources
Ministry of Northern Development and Mines
Ontario

Date FEBRUARY 1987
NUMBER G-2435

McCRANEY

M.133

ONTARIO
MINISTRY OF NATURAL RESOURCES

District of Nipissing

Scale:- 40 chains to an inch

SOUTHERN ONTARIO MINING DIVISION

LEGEND

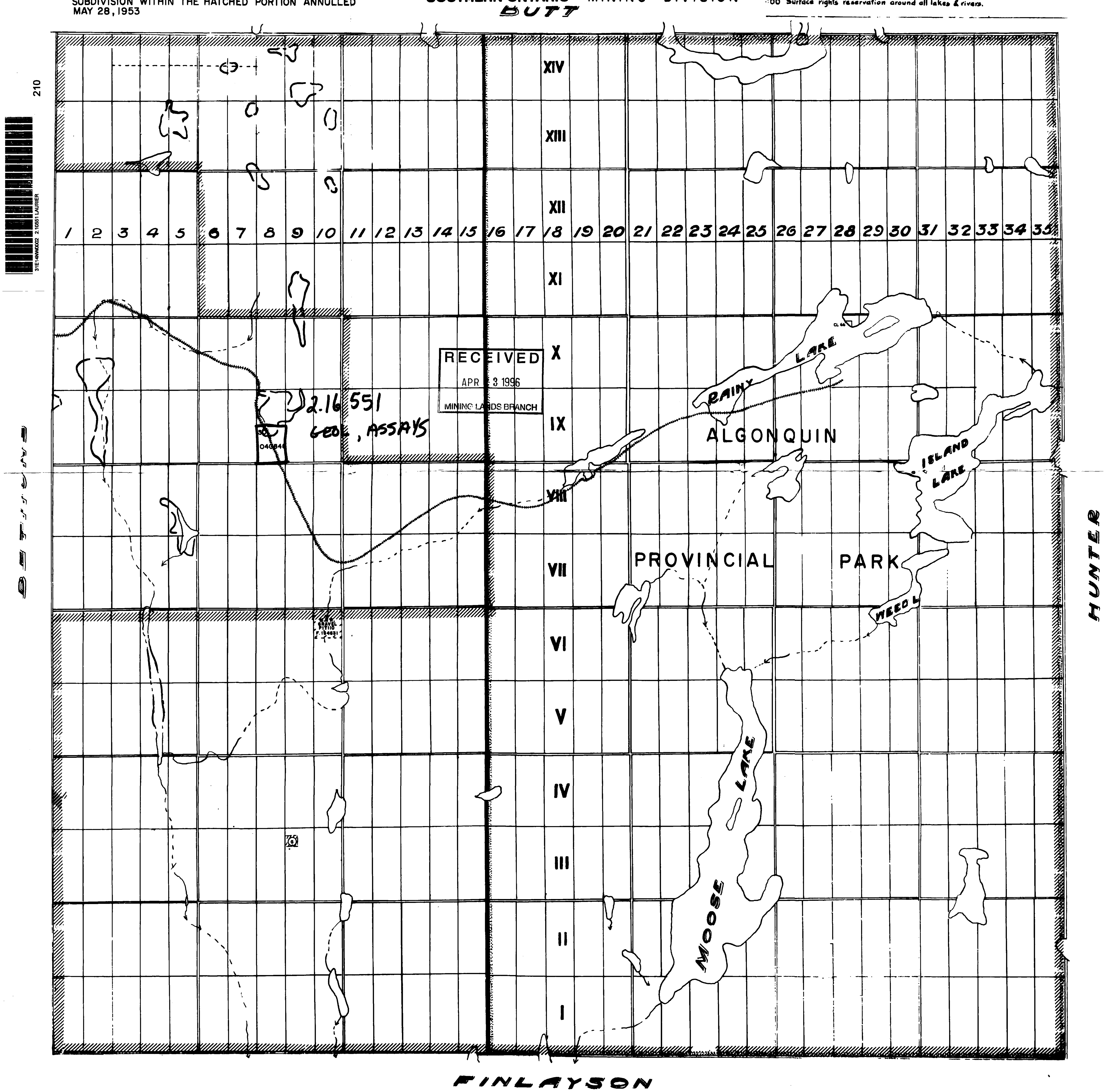
CANCELLED	C.
PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	LOC.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
QUARRY PERMIT — ⦿	

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.

SUBDIVISION WITHIN THE HATCHED PORTION ANNULLED MAY 28, 1953

AREA WITHIN THE ALGONQUIN PROVINCIAL PARK SHOWN THUS WITHDRAWN FROM STAKING.

400' Surface rights reservation around all lakes & rivers.



M-133

PLAN NO. M.133


LOT 25
LOT 26
CONCESSION 13
30E
90E
150E
210E
270E
330E
390E
450E
510E
570E
630E
690E
90N
60N
30N
30S
90S
120S
150S
180S
210S
BASE LINE
CLAIM LINE
TO TROUT CREEK ~8km
TO SAUSAGE LAKE
TO SOUTH RIVER
GRAVEL ROAD
AREA 1
AREA 2
SLZ95-3
SLZ95-2
SLZ95-1
Mixed Forest
ACCESS PT
ATV TRAIL
SWAMP
N
215°
LEGEND
1 Anorthosite: coarse grained, porphyroblastic, purple-grey
2 Anorthosite: mediium to fine grained, dyke rock
3 Hybridized rocks: mottled reddish-purple
4 Diabase
Z94-7/8-1 Outcrop: showing small dyke, sample number
Boulder, block
Lithologic contact
Fault
Jointing: vertical, inclined
Crest of ridge
Rock scarp, slope, relief in metres
LJT, MJT, DJT Low, medium, dense jointing
Gridline, station
Po/c, No/c Poor outcrop, no outcrop
Swamp, marsh
S,M,L Small, medium, large block reserves (<10, 10-15, 15-20+ tonnes)
SLZ95-2 Diamond drill hole 1995
Area of backhoe stripping 1995
Q Proposed test quarry site
Z94-11/8-3 Thin Section
2.16551
Scale
1 cm = 10 metres
0 10 20 30 40 50 60
metres
1:1000
SAUSAGE LAKE STONE PROSPECT
GEOLOGY
Location of Drill Holes, Stripping
NTS 31E/14 Scale 1:1000 By: Z. Mandziuk Date: Dec. 1995