2 975

32D05SE0017 2.975 BEN NEVIS

AEROMAGNETIC SURVEY

BEN NEVIS & PONTIAC TWPS.

ONTARIO

JEREMY ROTH

Amax Exploration, Inc.,
7 King Street East, Suite 1302,
Toronto, Ontario

August 1972

I. INTRODUCTION

During October and November, 1970, a combined aeromagnetic and AEM survey was undertaken by Seigal Associates Limited on behalf of Amax Exploration, Inc., in and near Ben Nevis Township in Northeastern Ontario. The area surveyed comprised portions of Ben Nevis, Pontiac and Katrine Townships, as shown on the enclosed location map. (Figure 1)

The purpose of the aeromagnetic survey was to map the distribution of magnetic minerals within the survey area and to provide supporting data to help in the analysis of the AEM anomalies.

The survey was conducted with a Scintrex HEM-701 in-phase out-of phase electromagnetic system operation at 1600 HZ and a Scintrex NPM-1 nuclear resonance, total intensity magnetometer. This equipment was installed in an Alouette II helicopter on charter from Haida Helicopters Limited of Vancouver, B.C. The full details of the geophysical and ancillary equipment used as well as the treatment of the data resulting from these surveys are presented in Appendix A.

The personnel involved in carrying out the survey were:

(Seigel Associates Limited, 222 Snidercroft Road, Concord, Ontario.)

Peter Godard - geophysicist

Lipton Spence - operator

Stuart Mervin - navigator

Tony Szantos - technician

Ian MacGregor - data recovery

(Haida Helicopters, Vancouver, B.C.)

John Laurie - pilot

John Oystersen - engineer

(Amax Exploration, Inc., 7 King Street East, Toronto.)

Jeremy Roth - geophysicist

In-flight navigation and flight path recovery were based upon photomosaics at a scale of 1" = 1320' respectively. Magnetic tie lines were flown over the area to facilitate the contouring of magnetic data.

The area was flown in an E-W direction with a mean spacing of 1320 feet. A total of 354.3 line miles of coverage was effected. Mean magnetometer height was 250 feet over the survey area. Full logistical details are presented in Table I. Only the aeromagnetic data is herein submitted for assessment credit. The claims and claim numbers for which 10 days assessment work credit is requested, are listed in Appendix B.

II GEOLOGY

The area covered by the airborne geophysical surveys is largely underlain by felsic to intermediate volcanics of Archaean age. Locally, some pyroclastic horizons are present and a number of base metal showings have been reported. In particular, located in Ben Nevis Township is the old (long defunct) Interprovincial Mine, which produced a rather modest tonnage of lead, zinc and silver. Recent mapping of the area by the ODM under the direction of Mr. Larry Jensen has disclosed considerable structural complexity (ODM maps P-629 and P-693). Several NE-trenching faults are indicated, as well as several late, felsic intrusives which may mark centers of volcanic activity.

III PREVIOUS WORK

Previous exploration work is relatively limited for Ben Nevis and Pontiac Townships. Six DDHs were drilled by Frobe in 1964 on a sulphide horizon in the northern part of Ben Nevis Township, with subeconomic base-metal values encountered. An additional hole was drilled here by Amax in 1971 encountering a zone of disseminated pyrite in felsic volcanics. Two other DDHs were completed by Amax in 1971 in the southern part of the Ben Nevis claim block, again intersecting disseminated pyrite in felsic volcanics. Limited development and modest production was achieved at the Interprovincial Mines property in the 1930's. In addition to the aeromagnetic survey reported herein, Amax also flew a combined aeromagnetic and AEM survey on N-S lines over the eastern half of Ben Nevis and the western half of Pontiac Townships. No anomalies that could be definitely attributed to bedrock conductors were recorded.

IV PRESENTATION OF DATA

The electro-magnetic and magnetic data, together with the altimeter trace and fiducial marks, were recorded on a six channel MFE recorder in the following order and at the following scales.

MFE Recorder (reading from top to bottom)

Channel 1	Altimeter	Logarithmic
Channel 2	Magnetometer (Fine Scale)	1 mm = 20 gammas
Channel 3	Magnetometer (step indicator)	1 step = 500 gammas
Channel 4	Electromagnetic (in-phase)	1 mm = 5 ppm
Channel 5	Electromagnetic (out-of-phase)	1 mm = 5 ppm

Fiducial markers are presented between channels 5 and 6.

In addition to the magnetic data recorded on channels 2 and 3 of the MFE recorder, a Mosley 680 chart recorder provided a more easily read trace for the fine scale magnetic features. The data here is presented on a scale of 1" = 200 gammas, with fiducial markers also being shown on this chart.

The magnetometer charts were digitized by Dataplotting Services of Toronto and were then contoured by computer, with levelling of line-to-line and removal of diurnal variations achieved through use of N-S tie lines. The contoured aeromagnetic results are presented on a 1" = 1320' photomosaic, with the flight lines, and the claim boundaries and claim numbers shown.

The electromagnetic anomalies are also shown on the photomosaic (Plates 1 and 2). Coding, with the values of the in-phase and out-of-phase amplitudes and magnetic correlation (if any) indicated for each anomaly intersection. Where anomaly indications were encountered on adjacent lines, these were tentatively linked together as one conducting system or zone and suitably numbered. The electromagnetic results were discussed in an earlier report filed for assessment with the ODM. → 2.448

V DISCUSSION OF RESULTS

The total magnetic intensity, contoured in 25 gamma intervals, displays two types of anomalies. The first type consists of very weak (25 to 50 gammas) magnetic features which do not have line-to-line correlation. These anomalies are in many cases probably spurious, and may be traced to several possible sources: (1) the effect of altitude variations over the rugged topography in the area; (2) the computer contouring program which at times interpolates anomalies between lines; (3) locally inaccurate levelling between flight lines.

Nevertheless the results provide a greater level of definition of magnetic features than the GSC aeromagnetics for the Ben Nevis and Pontiac Townships. In particular the late intrusive granitic stocks around Clarice Lake and around Verna Lake are clearly distinguished by their annular magnetic anomalies. The north-south magnetic linear in western Ben Nevis Township is interpreted as a diabase dike. In addition there are several isolated isolated circular magnetic anomalies which are speculatively ascribed to dioritic intrusives. The remainder of the area, underlain predominantly by felsic volcanics, is magnetically quite featureless, apart from the probably spurious anomalies mentioned above.

None of the weak AEM anomalies shown are clearly associated with magnetic features, nor can any be confidently interpreted as reflecting bedrock conductors.

August 1972

Jeremy Roth
JEREMY ROTH

APPENDIX A

SURVEY EQUIPMENT AND PROCEDURES

Electromagnetic System - Scintrex HEM-701

Equipment

The Scintrex HEM-701 is a solid state, fixed-configuration, electromagnetic system especially designed for helicopter transport. It consists of two coaxial coils, one serving as transmitter and the other as receiver, which are mounted, 30 ft. apart, in a rigid "bird" with their axes horizontal and in the direction of flight. The bird is towed approximately 100 ft. below the helicopter, by means of a suitable cable which also carried electrical signals and power to and from the bird.

The system operates at 1600 Hertz. Changes in the alternating magnetic field at the receiver coil are observed and these changes are converted into two components, one whose phase is the same as that of the transmitted signal (the "In-Phase" component).and the other whose phase is 90° apart (the "Out-of-Phase" component). These changes are expressed in terms of the normal undistorted primary field. They are so small as to be expressed usually in parts-per-million or p.p.m.

The In-Phase and Out-of-Phase variations are presented in graphic form on two channels or in time-shared form on a single channel of a graphic recorder. The full scale chart width employed is commonly 500 p.p.m. although in areas of low geologic noise levels 250 p.p.m. may be employed. At one or more points during each flight the scale sensitivity is checked by means of calibration signals, usually 100 p.m.m. on each trace.

The reference or "zero" level for each EM trace is an arbitrary one and is obtained empirically from the regional level of each trace. These levels may drift slowly during a flight because of temperature changes affecting the bird dimensions. These drifts are very gradual and are readily distinguishable from much quicker, local changes due to conductors of a geologic origin. Similarly, severe turbulence effects sometimes introduce low-order, primarily in-phase disturbances which are of such short period that they may also readily be distinguished from the effects of geologic conductors.

Man-made disturbances are often to be seen, including power lines, pipe lines, metal fences, railways, etc. The former are generally recognizable as such because they usually show through as cyclic noise of irregular shape and phase relationship. Non-energized, grounded power lines (e.g. 3 phase systems) may also give rise to proper conductor indications, however. Such indications, as well as those from pipe lines and metal fences, etc. are usually of short duration and can be distinguished from proper geologic sources except for very narrow, near-surface lenses. In some instances ground investigation may be necessary in order to resolve the ambiguity of possible source. Whereas the airborne geophysical crew attempts to note visible man-made conductors of the above types, the ground moves by so rapidly at the low flight elevation employed that 100% recognition of such sources cannot be expected from the air.

The normal terrain clearance of the bird is 100 ft. - 200 ft. depending on the surface topography and tree cover, etc., with the helicopter 100 ft. above. The established useful depth of detection of the system for moderate-to-large conducting bodies is about 350 ft. sub-bird under conditions of low extraneous geologic noise, i.e. where the general level of conductivity of the overburden and rock types of the area is low. The useful depth of detection of the system is therefore between 150 ft. and 250 ft. beneath the ground surface under these conditions.

Interpretation of Results

The EM records are interpreted to determine the presence of conducting bodies and to obtain some information relating to their character. The intervalometer time marks (see below) are synchronized with the positioning camera film strip (also see below) and thereby permit the relating of the conductors with appropriate ground locations. The altimeter data (see below) indicate, for each conductor, what the terrain clearance was at the time of detection.

A plan is prepared, either using a subdued photo-mosaic ("grayflex") or an overlay from a mosaic or topographic plan as base. The flight path of each survey line is obtained by means of "tie points", which are features on the mosaic or topographic plan which are also recognizable on the positioning camera film. The flight path is interpolated between these tie points.

For each conductor the following quantities are measured and recorded.

a) Half width. This is the distance between the points of half the maximum conductor disturbance. For a very thin, steeply dipping body or pipe line, etc., the half width will be about 1.6 times its depth below the bird. If the bird is at a mean conductor clearance of 150 ft. the half width would be about 250 ft. Larger half widths reflect either more deeply buried or more likely, thicker conductors.

Flat-lying conductors (e.g. overburden) characteristically give large half widths.

The conductor half width is indicated on the plan by an open bar symbol along the flight line. In the event of very narrow conductors only the peak location may be shown (see below).

b) Peak Location. The in-phase conductor peak location is shown on the plan by a circle in the appropriate location. In the case of broad conductors or closely spaced multiple conductor zones there may be more than one peak, in which event all major peaks are shown. If a conductor is of short half width there may be no room for a half width bar and only the peak circle will be shown. A conductor which is likely man-made will be indicated by an X rather than by a circle.

c) In-Phase and Out-of-Phase Amplitudes. These amplitudes are scaled from the EM traces and noted in parts per million. On the flight plan, opposite each peak location (circle) will be given the peak in-phase and out-of-phase amplitudes (see below).

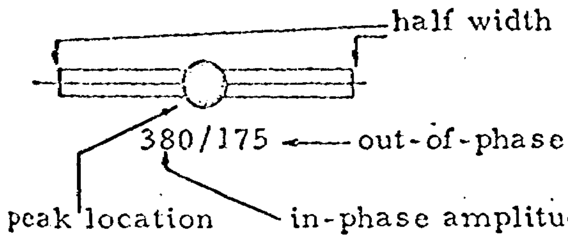
d) Conductor Coding. Conductor intersections are graded in electrical categories 1, 2, and 3, based on the in-phase amplitude but taking into account the terrain clearance. For tabular bodies such as sheet-like ore deposits, strata bound conductors and overburden, their response drops off almost in accordance with the inverse cube power of the elevation. Assuming an average 50 ft. of overburden, a category 1 conductor has a peak in-phase response equivalent to 350 p.p.m. or over at 100 ft. bird terrain clearance. A category 2 conductor has a peak in-phase response under similar conditions of between 100 p.p.m. and 350 p.p.m. A category 3 conductor has an equivalent peak in-phase response of less than 100 p.p.m.

The respective peak circles are shaded to reflect their electrical category, with category 1 fully shaded, category 2 half shaded and category 3 unshaded.

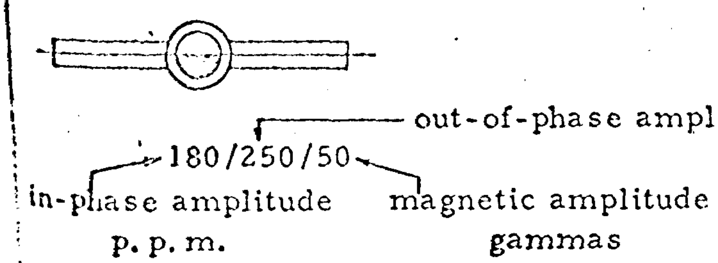
The ratio of peak in-phase over peak out-of-phase amplitudes is indicative of a conductivity-size factor for the conductor. Generally, high conducting bodies such as massive sulphides or graphite and sea-water, etc., have ratios of 3 or over. Moderate conductivity-size bodies will have ratios between 1 and 3. Poor conductivity bodies (e.g. most overburden and some sulphide and graphitic zones) will have ratios of less than 1. In areas where there is a clear differentiation in conductivity between the targets of potential economic interest and other possible conductors, the ratio is a diagnostic feature. In some areas, however, there is an overlap of conductivity ranges and then the ratio cannot be too rigidly relied upon.

Where magnetic data is available, preferably from a coincident recording magnetometer, any correlating magnetic activity will be noted for the pertinent conductor peak. A conductor peak with apparently direct magnetic correlation will be indicated by a double concentric circle. Although a conducting body which is appreciably magnetic is more likely to be a sulphide body than one which is non-magnetic, there are many very important base metal ore bodies which are quite non-magnetic.

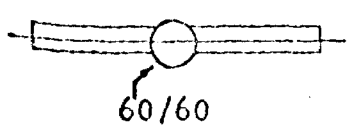
Examples of conductor coding are given below.



Category one, no magnetic correlation.



Category two, magnetic correlation.



Category three, no magnetic correlation.

X Probably man-made conductor.

Magnetometer - Scintrex NPM-1

The Scintrex NPM-1 nuclear resonance airborne magnetometer is based on a Newmont modification of a Varian Associates magnetometer and is produced under license to both companies. It is a very light weight, solid state unit, especially designed for use in a helicopter or light fixed-wing aircraft where weight is an important consideration.

Its cycle period is 1.1 seconds. Each cycle it measures the total intensity of the earth's magnetic field and this quantity, in gammas, is recorded, in analogue form, on a suitable graphic recorder. The full scale sensitivity is usually 1000 gammas and the recorder automatically steps each 500 gammas. In very active areas a full scale sensitivity of 5000 gammas with steps of 2,500 gammas may be employed. Only the magnetic variations are actually recorded although the absolute base level may be established from the NPM-1 as well.

The magnetic sensing head may be on a cable as much as 100 ft. below the aircraft or, in some installations, may be rigidly attached to the aircraft on a suitable boom.

The intrinsic noise level of each reading is about 5 gammas.

Where it is intended to contour the NPM-1 information it is customary to fly tie lines across the survey grid. A fixed magnetic field monitor is often used as well, on the ground, primarily to indicate periods of magnetic storms during which the aeromagnetic data should be considered as unreliable.

The aeromagnetic data may be contoured if desired, using a contour interval of 25 gammas or up, depending on the amount of magnetic relief. Alternatively they may be used simply for purposes of correlation with simultaneously obtained electromagnetic data to determine which conductor zones are appreciably magnetic.

Altimeter

A Bonzer, high frequency solid state radioaltimeter is employed to continuously indicate the mean terrain clearance of the helicopter or other transporting aircraft. The altimeter is installed in the aircraft (unless otherwise indicated) so that the elevation of the sensing birds (electro-magnetic or magnetic) will be less by the usual vertical displacement of these birds below the aircraft.

The output of the Bonzer may be expressed in analogue form on a suitable graphic recorder, or may be, for convenience, converted to a semi-digital form on a recorder side pen. In the latter event the altimeter record is a series of spaced pulses whose separation is proportional to the mean terrain clearance.

Positioning Camera

A Vinten Mark 3 16 mm positioning camera is employed with a wide angle lens. Photographs of the ground are taken with sufficient frequency to give a complete record of the flight path of the aircraft or helicopter. The frequency of exposure is controlled by the intervalometer referred to below.

Intervalometer

A Scintrex IA-2 intervalometer provides regularly spaced timing pulses which drive the positioning camera exposure mechanism and produces synchronous "fiducial marks" on the side pen of the geophysical graphic recorder or recorders. Because of the synchronization of the geophysical traces and the positioning camera it is then possible to relate the geophysical events of interest to their proper ground location. The timing pulse frequency may be adjusted in accordance with the ground speed of the aircraft so that an adequate flight path record is obtained.

I. INTRODUCTION

During October and November, 1970, a combined aeromagnetic and AEM survey was undertaken by Seigal Associates Limited on behalf of Amax Exploration, Inc., in and near Ben Nevis Township in Northeastern Ontario. The area surveyed comprised portions of Ben Nevis, Pontiac and Katrine Townships, as shown on the enclosed location map. (Figure 1)

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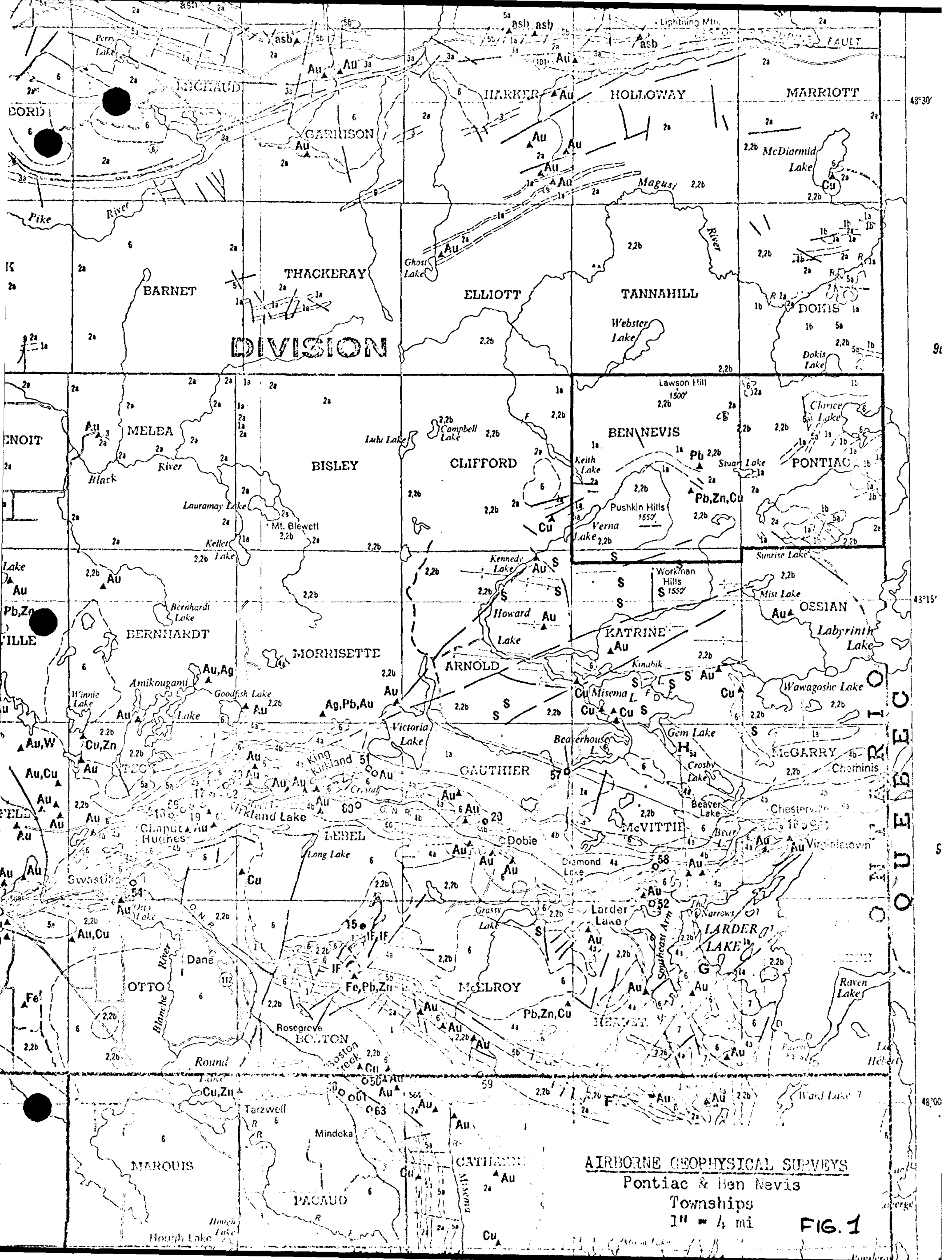

AIRBORNE GEOPHYSICAL SURVEYS
Pontiac & Ben Nevis
Townships
1" = 4 mi
FIG. 1

File 2.975

GEOPHY[illegible]
T[illegible]

32D05SE0017 2.975 BEN NEVIS

RECEIVED
AUG 4 1972
PROJECTS SECTION

TO BE ATT[illegible]
FACTS SH[illegible]
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

900

Type of Survey: Aeromagnetic

Township or Area: Ben Nevis & Pontiac Twps.

Claim holder(s): Amax Exploration, Inc.
7 King St.E., Toronto 1, Ont.

Author of Report: Jeremy Roth

Address: 940½ Queen St. W., Toronto, Ont.

Covering Dates of Survey: October - November, 1971
(linecutting to office)

Total Miles of Line cut:

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	
--Magnetometer	
--Radiometric	
--Other	
Geological	
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer 10 Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: Aug. 2, 1972 SIGNATURE: Jeremy Roth
Author of Report

MINING CLAIMS TRAVERSED
List numerically

~~See attached schedule~~

(prefix) (number)

see 266 claims listed in Appendix B

TOTAL CLAIMS ______

If space insufficient, attach list

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol. ______ Qualifications 2.279

Previous Surveys 2.449 (E.M. & Mag) received mag credits N.S. directions only

Checked by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations ______ Number of Readings ______

Station interval ______

Line spacing ______

Profile scale or Contour intervals ______
(specify for each type of survey)

MAGNETIC

Instrument ______

Accuracy - Scale constant ______

Diurnal correction method ______

Base station location ______

______

ELECTROMAGNETIC

Instrument ______

Coil configuration ______

Coil separation ______

Accuracy ______

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency ______
(specify V.L.F. station)

Parameters measured ______

GRAVITY

Instrument ______

Scale constant ______

Corrections made ______

______

Base station value and location ______

______

Elevation accuracy ______

INDUCED POLARIZATION – RESISTIVITY

Instrument ______

Time domain ______ Frequency domain ______

Frequency ______ Range ______

Power ______

Electrode array ______

Electrode spacing ______

Type of electrode ______

SELF POTENTIAL

Instrument ________ Range ________

Survey Method ________

Corrections made ________

RADIOMETRIC

Instrument ________

Values measured ________

Energy windows (levels) ________

Height of instrument ________ Background Count ________

Size of detector ________

Overburden ________
(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey ________

Instrument ________

Accuracy ________

Parameters measured ________

Additional information (for understanding results) ________

AIRBORNE SURVEYS

Type of survey(s) Aeromagnetic

Instrument(s) Scintrex NPM-1 proton precession magnetometer
(specify for each type of survey)

Accuracy ± 5 gammas
(specify for each type of survey)

Aircraft used Alouette II helicopter

Sensor altitude 200 feet

Navigation and flight path recovery method Photomosaic ; Vinten Mk 3 camera

Aircraft altitude 225 feet   Line Spacing 1320 ft.

Miles flown over total area 354.3   Over claims only 29.9 Ben Nevis
29.5 Pontiac

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken ____________________

____

____

Total Number of Samples ____________________

Type of Sample ____________________
(Nature of Material)

Average Sample Weight ____________________

Method of Collection ____________________

____

Soil Horizon Sampled ____________________

Horizon Development ____________________

Sample Depth ____________________

Terrain ____________________

____

Drainage Development ____________________

Estimated Range of Overburden Thickness ____________________

____

____

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis ____________________

____

____

____

General ____________________

____

____

____

____

____

____

____

____

____

ANALYTICAL METHODS

Values expressed in: per cent ☐ p. p. m. ☐ p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others ____________________

Field Analysis (____________________ tests)

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

Field Laboratory Analysis

No. (____________________ tests)

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

Commercial Laboratory (____________________ tests)

Name of Laboratory ____________________

Extraction Method ____________________

Analytical Method ____________________

Reagents Used ____________________

General ____________________

____

____

____

____

____

____

____

____

____

SCHEDULE OF MINING CLAIMS
BEN NEVIS TOWNSHIP, ONTARIO

APPENDIX B

CLAIM NO.	CLAIM NO.	CLAIM NO.
L-265461	L-264435	L-280496
L-265462	L-265818	L-280497
L-265463	L-265819	L-280498
L-265464	L-265933	L-280635
L-265465	L-265934	L-280636
L-265466	L-265935	L-280637
L-265467	L-265936	L-280638
L-265468	L-265939	L-280639
L-265469	L-265940	L-280640
L-265470	L-265941	L-280641
L-265471	L-265942	L-280642
L-265472	L-265943	L-280643
L-265473	L-265944	L-280644
L-265474	L-265945	L-280645
L-265475	L-265946	L-280646
L-265476	L-265949	L-280647
L-265477	L-265950	L-280648
L-265478	L-265951	L-280649
L-265479	L-265952	L-280650
L-265480	L-265953	L-280651
L-265481	L-265954	L-280652
L-265482	L-265955	L-280653
L-265483	L-265956	L-280654
L-265484	L-265964	L-280655
L-265485	L-265967	L-280656
L-265486	L-265968	L-280657
L-265487	L-265971	L-280658
L-265488	L-265972	L-280659
L-265489	L-266135	
L-265490	L-266136	
L-264299	L-280427	
L-264300	L-280428	
L-264301	L-280429	
L-264302	L-280430	
L-264303	L-280431	
L-264304	L-280432	
L-264431	L-280433	
L-264432	L-280489	
L-264433	L-280490	
L-264434	L-280495	

Schedule of Mining Claims
P[illegible]ac Township, Ontario

APPENDIX B

CLAIM NO.

L-265789
L-265790
L-265791
L-265792
L-265799
L-265800
L-265801
L-265802
L-265809
L-265810
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L-266019
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L-266037
L-266038
L-266039
L-266040
L-266041
L-266042
L-266043
L-266044
L-266045
L-266035

CLAIM NO.

L-266046
L-266047
L-266048
L-266049
L-266050
L-266051
L-266052
L-266053
L-266054
L-266055
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L-266096
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L-266098
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L-266100
L-266101
L-266102
L-266103
L-266104

CLAIM NO.

L-266105
L-266106
L-266107
L-266108
L-266109
L-266110
L-266111
L-266112
L-266113
L-266114
L-266115
L-266116
L-266117
L-266118
L-266119
L-266120
L-266121
L-266122
L-266123
L-266124
L-266125
L-266126
L-266127
L-265838

226 claims

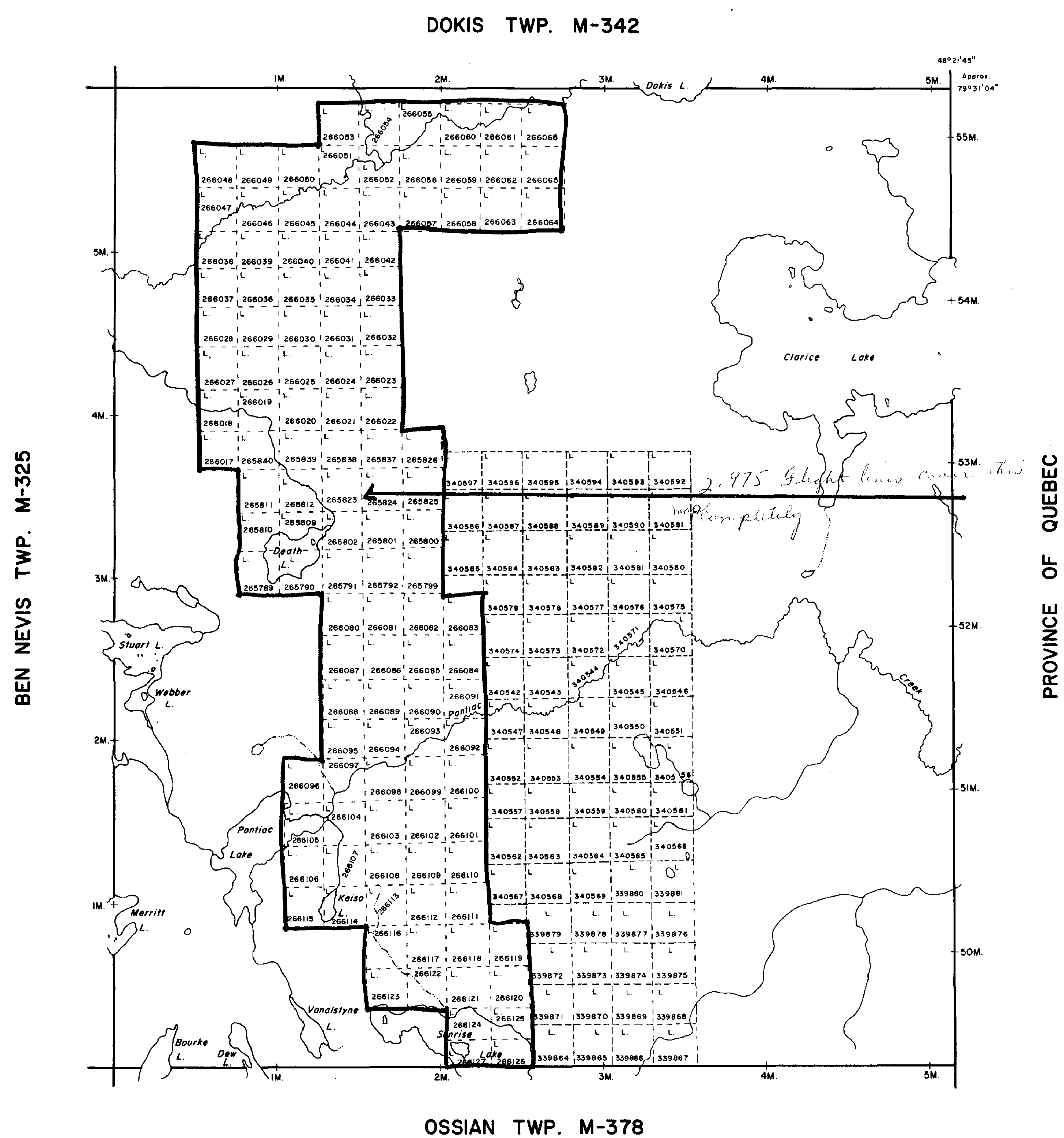
TABLE I

Townships Covered (Wholly or in part)	Plates	Area Covered	No. of Lines	Mean Line Spacing	Line Direction	Line Miles	Line Miles Within Block	Line Miles Over Claims
Block A Ben Nevis, Pontiac Katrine	May 1, 2	11.2 x 6.2 miles	27	1,320'	E-W	354.3	294.8	29.9 Ben Nevis 29.5 Pontiac 59.4

59.4 x 40 = 2376 ÷ 226 = 10.5 days per claim.

TRIM LINE

M-382



NOTES

400' surface rights reservation along the shores of all lakes and rivers.

LEGEND

PATENTED LAND	Ⓟ or ●*
PATENTED FOR SURFACE RIGHTS ONLY	◓*
LEASE	Ⓛ
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	17
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	

*used only with summer resort locations or when space is limited

TOWNSHIP OF

PONTIAC

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE : 1 INCH -- 40 CHAINS (1/2 MILE)

DR. R.W. Noble
DATE Feb. 10, 72
PLAN NO. M-382

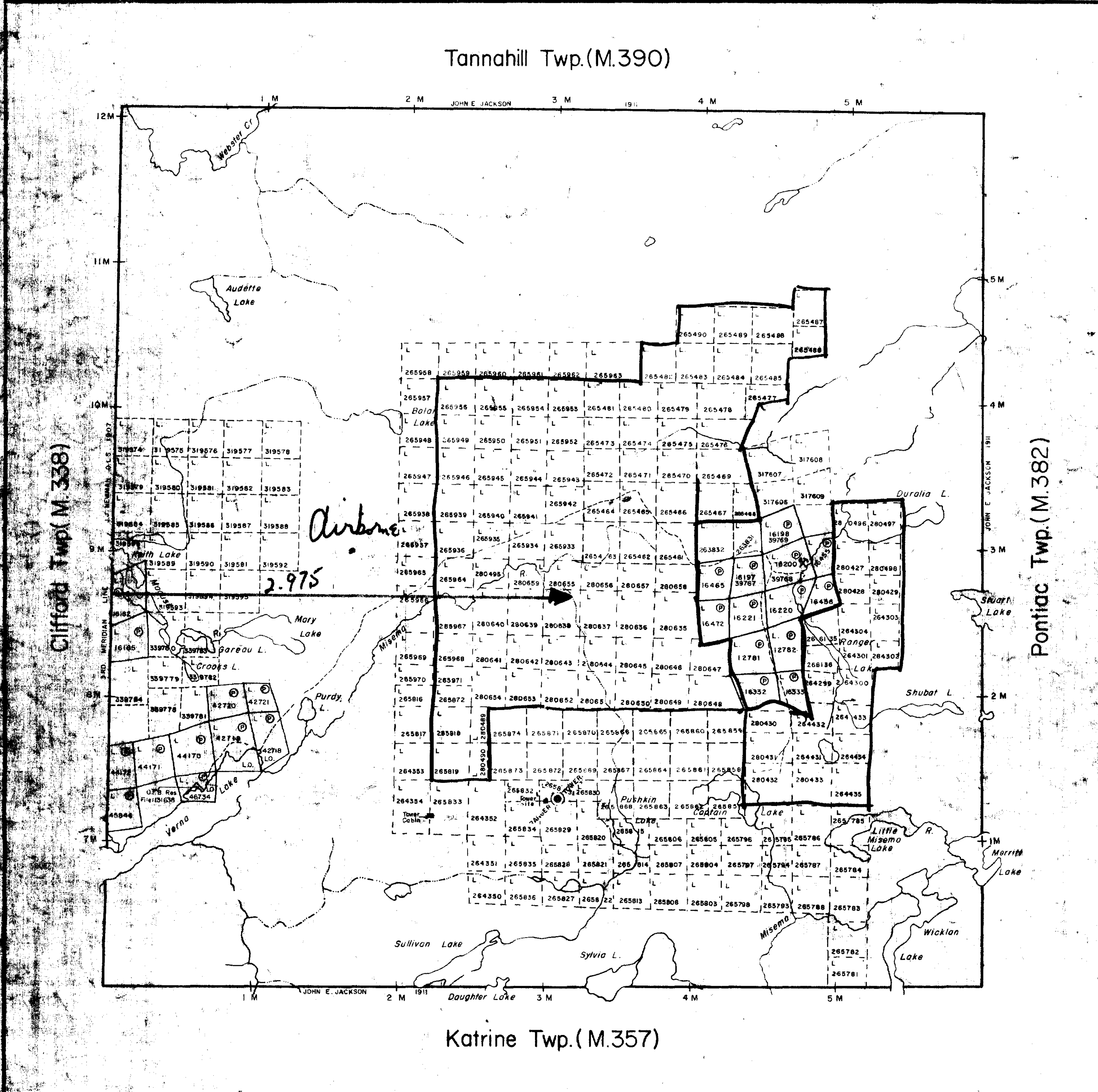
ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

2.975

PONTIAC TWP.

32D05SE0017 2.975 BEN NEVIS

200



THE TOWNSHIP OF

BEN NEVIS

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1 INCH = 40 CHAINS

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	C.S.
LEASES	(L)
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.
TRAILS	

NOTES

400' Surface rights reservation around all Lakes & Rivers.

FILE NO.- 160706 COVERS RANGER TOWER, TOWER SITE & CABIN SITE.

DATE OF ISSUE
AUG 9 1972
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

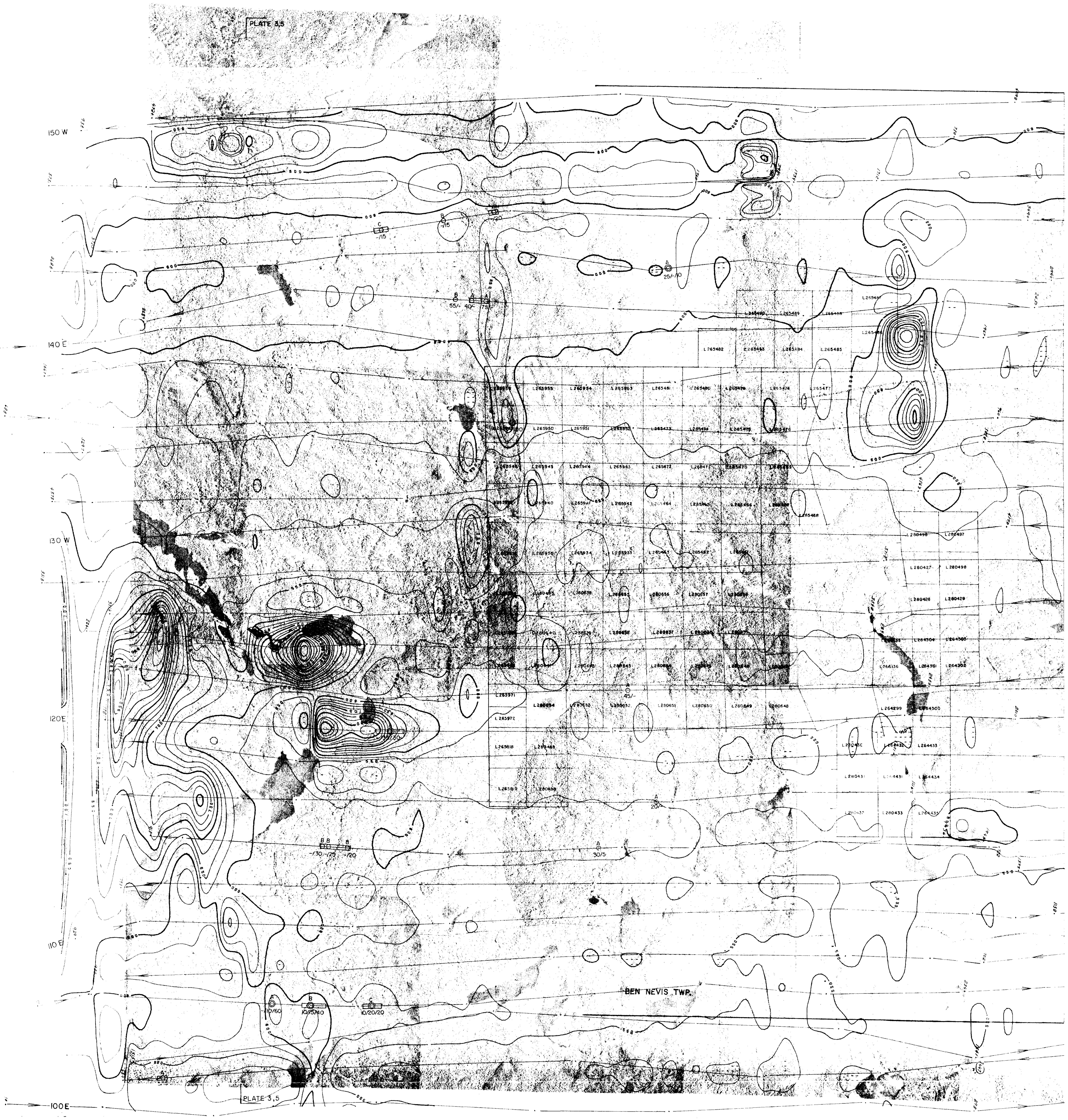
PLAN NO. M.325

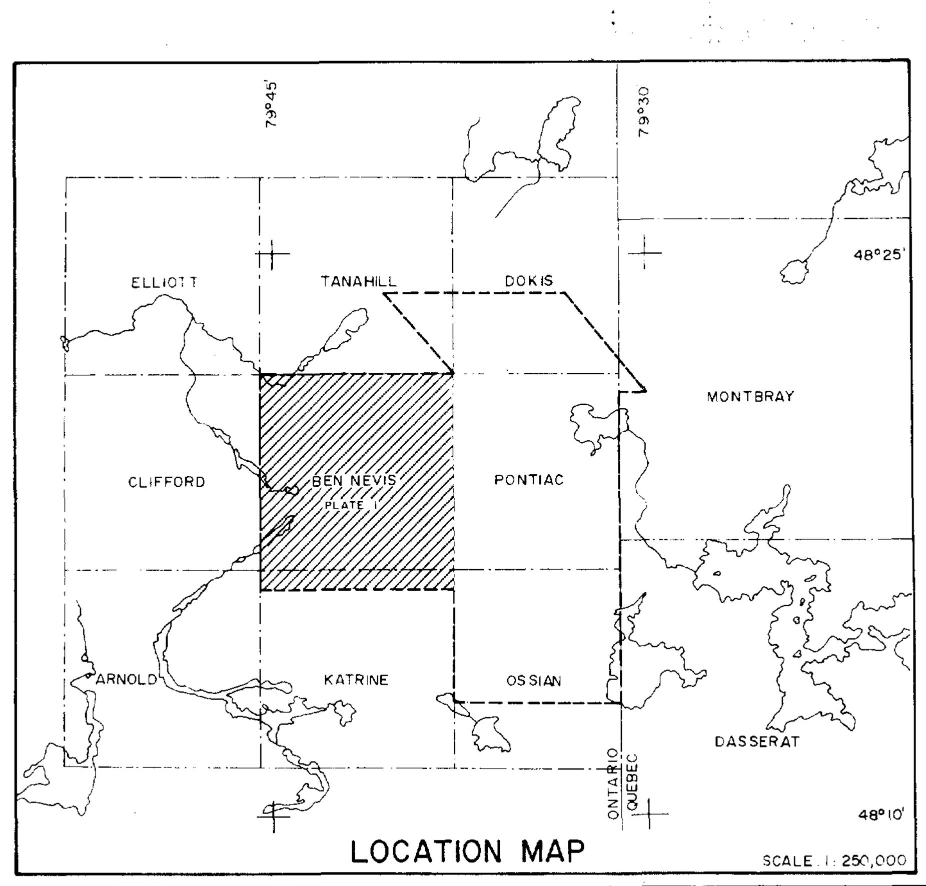
ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

2.975

32D05SE0017 2.975 BEN NEVIS

210





ELECTROMAGNETIC ANOMALY PLAN

LEGEND:

34 W < FLIGHT LINE NUMBER DIRECTION AND NUMBERED CONTROL POINT

1st CATEGORY ANOMALY

2nd CATEGORY ANOMALY

3rd CATEGORY ANOMALY

A.E.M. ANOMALY WITH MAGNETIC CORRELATION
72/12/100 — 72 PPM IN PHASE / 12 PPM OUT OF PHASE / Magnetic Correlation AMPLITUDE IN GAMMAS

ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION

32D05SE0017 2.975 BEN NEVIS

220

Jeremy Roth

PLATE I

AMAX EXPLORATION INC.

BEN NEVIS AREA, ONTARIO

AIRBORNE GEOPHYSICAL SURVEY

TOTAL MAGNETIC INTENSITY

(CONTOUR INTERVAL 25 GAMMAS)

SCALE : 1" ≃ 1320'   2.975

SURVEY BY SEIGEL ASSOCIATES LIMITED

FLOWN AND COMPILED

FLIGHT ALTITUDE ≃ 220'

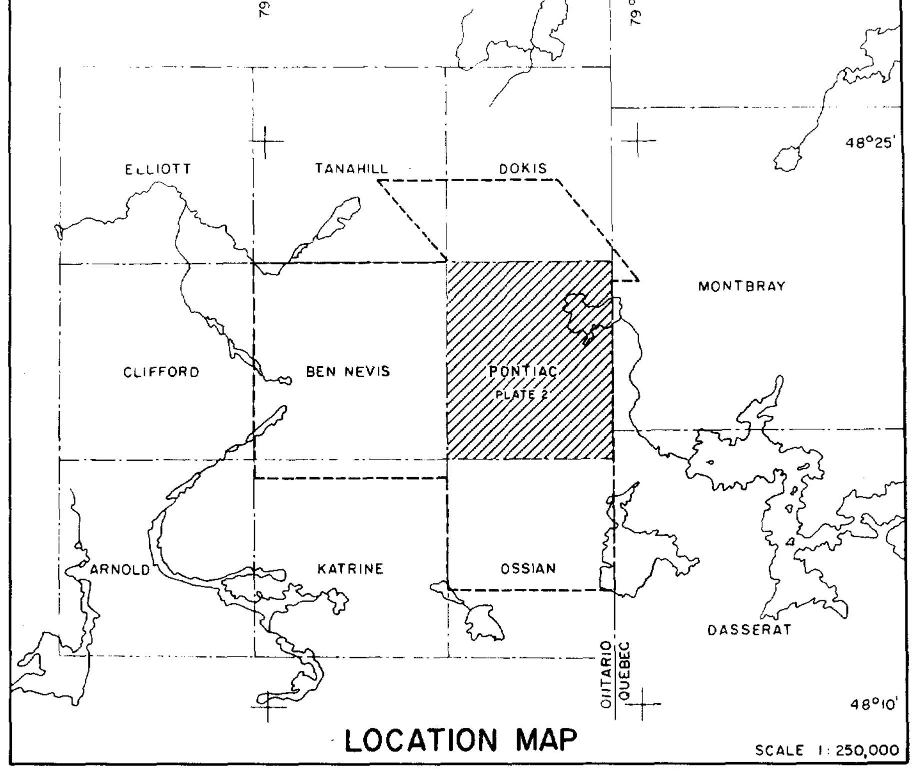
FLIGHT LINE SPACING ≃ 1320'

- TO ACCOMPANY REPORT BY: J. Roth   AUG 1972   70 - 9314 - 01

ELECTROMAGNETIC ANOMALY PLAN

LEGEND:

34 W <	FLIGHT LINE NUMBER DIRECTION AND NUMBERED CONTROL POINT
●	1st CATEGORY ANOMALY
◓	2nd CATEGORY ANOMALY
○	3rd CATEGORY ANOMALY
◎ 72/12/100	A.E.M. ANOMALY WITH MAGNETIC CORRELATION 72 PPM IN PHASE / 12 PPM OUT OF PHASE / Magnetic Correlation AMPLITUDE IN GAMMAS
▭	ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION



LOCATION MAP

SCALE 1:250,000

Jeremy Roth

PLATE 2

AMAX EXPLORATION INC.

BEN NEVIS AREA, ONTARIO

AIRBORNE GEOPHYSICAL SURVEY

TOTAL MAGNETIC INTENSITY

(CONTOUR INTERVAL 25 GAMMAS)

SCALE : 1" ≃ 1320'

2.975

SURVEY BY SEIGEL ASSOCIATES LIMITED

FLOWN AND COMPILED

FLIGHT ALTITUDE ≃ 220'

FLIGHT LINE SPACING ≃ 1320'

- TO ACCOMPANY REPORT BY: J. Roth AUG 1972 70 - 9314 - 02

32D05SE0017 2.975 BEN NEVIS

230

AMAX EXPLORATION, INC.

PONTIAC TOWNSHIP, ONTARIO

BATTERY I.P. SURVEY

DIPOLE - DIPOLE ARRAY

A = 200' N = 200'

ISOCHARGEABILITY CONTOURS AT 5 MS. INTERVALS

LINEAR SCALE: 1" = 100'

OPERATORS: L. KYDD, M. LAITINEN

DATE: AUGUST, 1971

Drill Hole

date: may 73

240

Figure 4

63-3103 10 sq ft