REPORT ON THE MAGNETIC AND HORIZONTAL LOOP-ELECTROMAGNETIC SURVEYS ON THE PROPERTY OF 775741 ONTARIO LTD. COOK TOWNSHIP, ONTARIO

BY

H. FERDERBER GEOPHYSICS LTD.

August, 1988
Val d'Or, Quebec

D.M. Thai, B.Sc.
Geophysicist

R.A. Campbell, B.Sc.
Geologist

REPORT ON THE MAGNETIC AND HORIZONTAL LOOP-ELECTROMAGNETIC SURVEYS ON THE PROPERTY OF 775741 ONTARIO LTD. COOK TOWNSHIP, ONTARIO

INTRODUCTION

In July and August, 1988 a grid was cut and magnetic and horizontal loop-electromagnetic surveys were carried out on the property of 775741 Ontario Ltd., in Cook Township, Ontario. The magnetic survey was conducted to define the limits of airborne magnetic anomalies to obtain information which helps outline underlying geological structures and contacts and to identify any potential economic concentrations which may contain variations in accessory magnetic minerals. The purpose of the electromagnetic survey was to outline and classify the location of airborne electromagnetic anomalies representing conductive zones on the property which may be related to gold or base metal mineralization.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The property is comprised of 15 claims, covering 240 hectares in the central part of Cook Township, Larder Lake Mining Division, Ontario. The claims are registered with the office of the Mining Recorder in Kirkland Lake and are listed in the Appendix.

The property is located 32 km north-northwest of Kirkland Lake, 20 km southeast of Matheson and 7.7 km east of the village of Ramore. Provincial Highway 11, from Kirkland Lake to Matheson passes within 8 km of the eastern boundary of the property. A road east from Ramore ends 1.3 km east of the property. Air photos indicate that a bush road, from the southeast, crosses the northeastern corner of the claim block.

The property is forested and a swamp is situated in the central part of the claim group. The Pike River flows across the northern boundary of the surveyed area.

Supplies, services and qualified manpower and services are available in the Kirkland Lake-Matheson area.

GEOLOGY

The property is located in the western portion of the Abitibi Volcanic Belt of the Superior Province of the Canadian Shield. The Abitibi Volcanic Belts extends for nearly 350 miles in a west-east direction from Timmins to Chibougamau. It is host to a variety of precious and base metal deposits including the Timmins, Kirkland Lake, Noranda, Val d'Or and Chibougamau mining camps.

The Abitibi Volcanic Belt is comprised of a complex assemblage of interbeded volcanic and sedimentary rocks intruded by a variety of intrusives, from ultrabasic to granitic in composition. The rocks are Archean in age and have been metamorphosed to a greenschist facies. Numerous late Precambrian diabase dykes cut formations of the belt. The rocks generally strike east-west, have a vertical dip and are highly folded and faulted.

The Ontario Division of Mines, Map 2205 - Geological Compilation Series, Timmins-Kirkland Lake Area, outlines the geology underlying the property. The map indicates that the claims are underlain by mafic metavolcanic flows and pyroclastic rocks.

The Destor-Porcupine Fault, the most predominent structural feature in the area, strikes southeast and east through Guibord Township, approximately 5 km north of the claim group. Splays strike south-southeast into the northern part of Cook Township.

Gold exploration and production has increased in recent years in the Kirkland Lake and Harker-Holloway areas. An increase in production is planned at Lac Minerals Macassa Mine (projected production of 75,000 ounces of gold for 1988), Inco gold and Queenston Gold Mines joint ventrues (Anoki Deposit, estimated tonnage of 600,000 tons at 0.16 oz/ton) and Eastmaque Gold Mines tailings reclamation project have led other undertakings in the Kirkland Lake Area.

In the townships of Harker-Holloway, 35 km east-northeast of the property American Barrick Resources Holt-McDermott Mine is to start production soon with reserves of 610,000 ounces of gold. Just east of the Holt-McDermott Mine, Canamax Resources has driven a ramp into its east zone which has drill-indicated reserves of 576,000 tons at 0.216 oz/ton. To the west of the Holt-McDermott Mine, Lenora Exploration's - American Barrick's worvest property has indicated reserves of 1.5 million tons at0.134 oz/ton gold.

Numerous gold propects and occurrences have been found in the surrounding townships, the closest is Guibord Township, 4 km to the north.

SURVEY METHODS AND INSTRUMENT DATA

A grid was established by cutting an east-west base line and three tie lines, approximately one half a mile apart. Cross lines were cut at 400 and 200 foot intervals along the base line. All lines were chained and picketted at 100 foot stations.

The ground horizontal loop-electromagnetic survey was performed on the cross lines. An Apex Max Min II unit was used with a transmitter receiver coil separation of 500 feet was used. The frequencies of the transmitter were set at 1777 and 3555 Hz. Readings were taken at 100 foot stations with increased data density over anomalous areas.

The horizontal loop survey measures the in-phase and out-of-phase (quadrature) components of the secondary field. By comparing the ratio of the in-phase and out-of-phase the conductivity can be measured. A good conductor such as a massive sulphide or graphite horizons will produce a curve going from positive through zero to negative and back again to positive. Both the in-phase and out-of-phase will show the same shaped curve over a good conductor. A poor conductor will show greater deviation in the out-of-phase component while a body exhibiting better conductivity will have a greater deviation in the in-phase component. The results of the HLEM survey are plotted as profile on the accompanying maps, HL-1 (1777 Hz) and HL-2 (3555 Hz). The axis of the inferred conductors are labelled A,B,C etc. This label is applied for identification purposes only and no priority is implied in the use of a particular label.

The magnetic survey was conducted using a GEM GSM-8 proton precession magnetometer. The magnetometer measures the total field intensity of the earth's total field in gammas. It has a sensitivity and repeatability of one gamma or better. Magnetic readings were taken at 100 foot intervals along the tie lines except in areas of high magnetic relief where the sample density was increased to one reading per 50 feet. Base stations for determining the magnetic diurnal variations were established along the base line. The total field readings, corrected for the diurnal variations, were plotted on map, MG-1. All readings are 58,000 gammas plus plotted values. The data was contoured 100 gamma intervals.

SURVEY RESULTS AND INTERPRETATION:
Magnetic survey Map MG-1

The ground magnetic survey outlined 3 anomalous magnetic bands striking west-northwest across the claim group. There also exist several isolated zones of magnetic high above a background of 58,000 gammas.

These bands of magnetic high represent underlying mafic to ultramafic volcanic with some possisble exceptions on the most northerly and central bands where the high magnetic readings are typical of the iron formations in the area. However, the magnetic data indicates that the general geology is not a simple banding but has been affected by several definite "fingering" of non-magnetic materials. Areas of low magnetic readings are probably underlain by felsic to intermediate metavolcanic and/or metasedimentary rocks which are intercalated with the mafic volcanic rocks. Geological boundaries among these units can be readily recognized by the distinctive contrast in magnetic readings.

Isolated zones of extremely high magnetic readings may represent underlying lenses of volcanic rocks being metamorphosed to amphibolitic facies. Other magnetic depressions located near to the high magnetic zones may be caused by the dipolar effect of magnetism where components of the magnetic readings shift directions abruptly.

Horizontal loop-EM Survey Maps HL-1 and HL-2

The horizontal loop-electromagnetic survey in both frequencies (3555 Hz and 1777 Hz) outlined several promising conductive bodies on the property. Most of these conductors are coincidental ones.

The most prominent conductor (conductor A) is the one on the northern part of lines L0, L2W, L4W and L8W and in the vicinity of BL0+00. The conductor is about 300 feet wide and more than a thousand feet long and strikes approximately east-west. The conductor appears to continue further to the west and split into two long and narrow zones.

Another conductive zone (conductor B) measured about 800 feet is west of conductive zone A. The zone is much smaller and appears to be on strike with conductor A.

Both A and B overlie areas of low magnetic and between two high magnetic bands. These zones may represent underlying conductive graphitic horizons with possible sulphide concentration within the interpreted felsic to intermediate metavolcanic and/or metasedimentary rocks. These zones may represent shears or alteration zones. Readings of these electromagnetic in-phase as well as the ratios with the out-of-phase indicate that the conductive zone is close to suface and exhibits very high conductivity.

The survey also delineated several discontinuous, narrow conductive zones on the property. Some conductors are coincidental in both frequencies while others are rather closely matched. These zones overlie high magnetic as well as low magnetic areas and appear to be caused by conductive overburden or topographic variations.

Conductive zone C, located at the southern portion of the property, overlie a moderately high magnetic zone and may represent bedrock conductivity in association with magnetic materials in the area. Even though there are two axes drawn on map, zone C may be caused by a single wide zone with relatively low conductivity.

Evidents indicating major structural changes are limited from the magnetic and horizontal loop-electromagnetic survey. However, faulting or fracturing could be associated with some conductive zones striking approximately parallel to the underlying rocks.

CONCLUSION AND RECOMMENDATION

The recent ground geophysical surveys were successful in delineating and defining horizontal loop-electromagnetic conductors and linear patterns of magnetic highs and lows on the property of 775741 Ontario Ltd. in Cook Township, Ontario. Rocks of high magnetic susceptability underlying the property occur as continuous west-northwest trending bands and lenses. The bands and lenses may contain concentrations of magnetite in probable iron formations or host pyrrhotite mineralization. The rocks of low magnetic susceptability have an inhomogenous magnetite mineral distribution and probably are of felsic to intermediate metavolcanic and/or metasedimentary in composition.

Several conductors having east-west, west-northwest strike directions were outlined by the HLEM surveys. Conductive zones A, B, and C appear to be bedrock related. Zone A exhibits the strongest electromagnetic response among the conductors. It appears being close to surface and wide in area coverage. Zone B, being not as wide as A, appears to be on strike with A and also exhibits strong response. Zone C is a long, continuous zone exhibiting moderate electromagnetic response. It is considered as a weak bedrock conductor due to small in-phase out-of-phase ratios as well as the inconsistency of the profile patterns. Other conductors drawn on HL-1 and HL-2 are believed being caused by conductive overburden or variations in topography.

Further work is warranted on the property especially in the areas of the above mentioned conductors. An exploration program of geological mapping and sampling and several test lines of induced polarization over selected electromagnetic conductors should be performed. Geophysical anomalies with corresponding geology should then be tested by diamond drilling.

Respectfully submitted,

H. FERDERBER GEOPHYSICS LTD.

R.A. Campbell, B.Sc
Geologist

2.16609

D.M. Thai, B.Sc.
Geophysicist

2.11241

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Respectfully submitted,

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RA Campbell

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Geologist

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Geophysicist

COOK TOWNSHIP - CLAIM LIST

L 843114
843115
843116
843117
843118
843119
843121
843122
843123
843856
971279
971280
971281
971282
971283

Ministry of Northern Development and Mines

Ontario

Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

DOC WS

42A08NE0245 2.11634 COOK

900

W8808.384 2.11634

Type of Survey(s)
Horizontal Loop-Electromagnetic

Township or Area
Cook Township

Claim Holder(s)
Charlie Marshall

Prospector's Licence No.
K-15629

Address
25 Carlton St. Apt # 3, St Catherines, Ontario L2R 1P5

Survey Company
H. Ferderber Geophysics Ltd.

Date of Survey (from & to)
Day 01 Mo. 07 Yr. 88 — Day 01 Mo. 08 Yr. 88

Total Miles of line Cut
16.21

Name and Address of Author (of Geo-Technical report)
H. Ferderber Geophysics Ltd. 169 Perreault Ave., Val d'Or, Quebec

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical - Electromagnetic	~~40~~ 4
	Geophysical - Magnetometer	~~20~~ 4
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Radiometric	
	Geophysical - Other	
	Geophysical	
	Geochemical	

RECEIVED
SEP 6 1988
MINING LANDS SECTION

Mandays		Days per Claim
Complete reverse side	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geophysical	
	Geochemical	

RECEIVED
AUG 22 1988
8:20 am

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	843114	*
	843115	*
	843116	*
	843117	*
	843118	*
	843119	*
	843121	*
	843122	*
	843123	*
	843856	*
	971279	*
	971280	*
	971281	*
	971282	*
	971283	*

* apply 8 days per claim, maximum credits allowed

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES OFFICE
OCT 18 1988

Total number of mining claims covered by this report of work: 15

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
120	RECEIVED OCT 88	M.A. Pecunen
	Date Approved as Recorded	Branch Director
	OCT 88 BM	

Date: Aug. 19, 1988

Recorded Holder or Agent (Signature): Harry Ferderber

Certification Verifying Report of Work

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

Name and Postal Address of Person Certifying
Harry Ferderber, 169 Perreault Ave., Val d'Or, Quebec J9P 2H1

Date Certified: Aug 11, 1988

Certified by (Signature): Harry Ferderber

1362 (85/12)

Ministry of Northern Development and Mines

Ontario

Geophysical-Geological-Geochemical Technical Data Statement

File _____

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Magnetometer and Horizontal Loop-Electromgnetic

Township or Area Cook Township

Claim Holder(s) Charles Marshall

25 Carlton Ave Apt 3 St. Catharines Ont.

Survey Company H. Ferderber Geophysics Ltd.

Author of Report R. A. Campbell & D. Thai

Address of Author 169 Perreault Avenue, Val d'Or, Que.

Covering Dates of Survey ~~July 1st, 1988 to August 1st~~ /88 (linecutting to office)

Total Miles of Line Cut 16.21 miles

SPECIAL PROVISIONS CREDITS REQUESTED		DAYS per claim
ENTER 40 days (includes line cutting) for first survey.	Geophysical	
	--Electromagnetic	
	--Magnetometer	
	--Radiometric	
ENTER 20 days for each additional survey using same grid.	--Other	
	Geological	
	Geochemical	

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

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: August 12, 88 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L	843114
	843115
	843116
	843117
	843118
	843119
	843121
	843122
	843123
	843856
	971279
	971280
	971281
	971282
	971283

If space insufficient, attach list

TOTAL CLAIMS 15

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS -- If more than one survey, specify data for each type of survey

Number of Stations 856 Number of Readings 856

Station interval 100 feet Line spacing 400 feet and 200 feet

Profile scale 1" = 20%

Contour interval 100 gammas

MAGNETIC

Instrument ~~GEM GSM-8~~

Accuracy – Scale constant 1 gamma (absolute)

Diurnal correction method Base station

Base Station check-in interval (hours) 2 hours

Base Station location and value middle of grid

ELECTROMAGNETIC

Instrument Max-Min II Horizontal Loop-electromagnetic

Coil configuration ~~Horizontal~~

Coil separation 500 feet

Accuracy 1%

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

Frequency 1777 Hz and 3555 Hz
(specify V.L.F. station)

Parameters measured In-Phase and Out-of-phase

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time Frequency

– Off time Range

– Delay time

– Integration time

Power

Electrode array

Electrode spacing

Type of electrode

Guibord Twp.

Playfair Twp.

Barnet Twp.

Benoit Twp.

VI

V

IV

III

II

I

12 11 10 9 8 7 6 5 4 3 2 1

Bolton Lake

Black

River

ONTARIO NORTHLAND RAILWAY

200

THE TOWNSHIP OF

COOK

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH= 40 CHAINS

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	(S) or 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	

NOTES

Area Withdrawn From Staking Under Mg. Act, 5 April 1951 Clause (d) Section 39

Gravel Reserve Shown Thus:

400' Surface rights reservation around all lakes & rivers.

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE WATABEAG MANAGEMENT UNIT

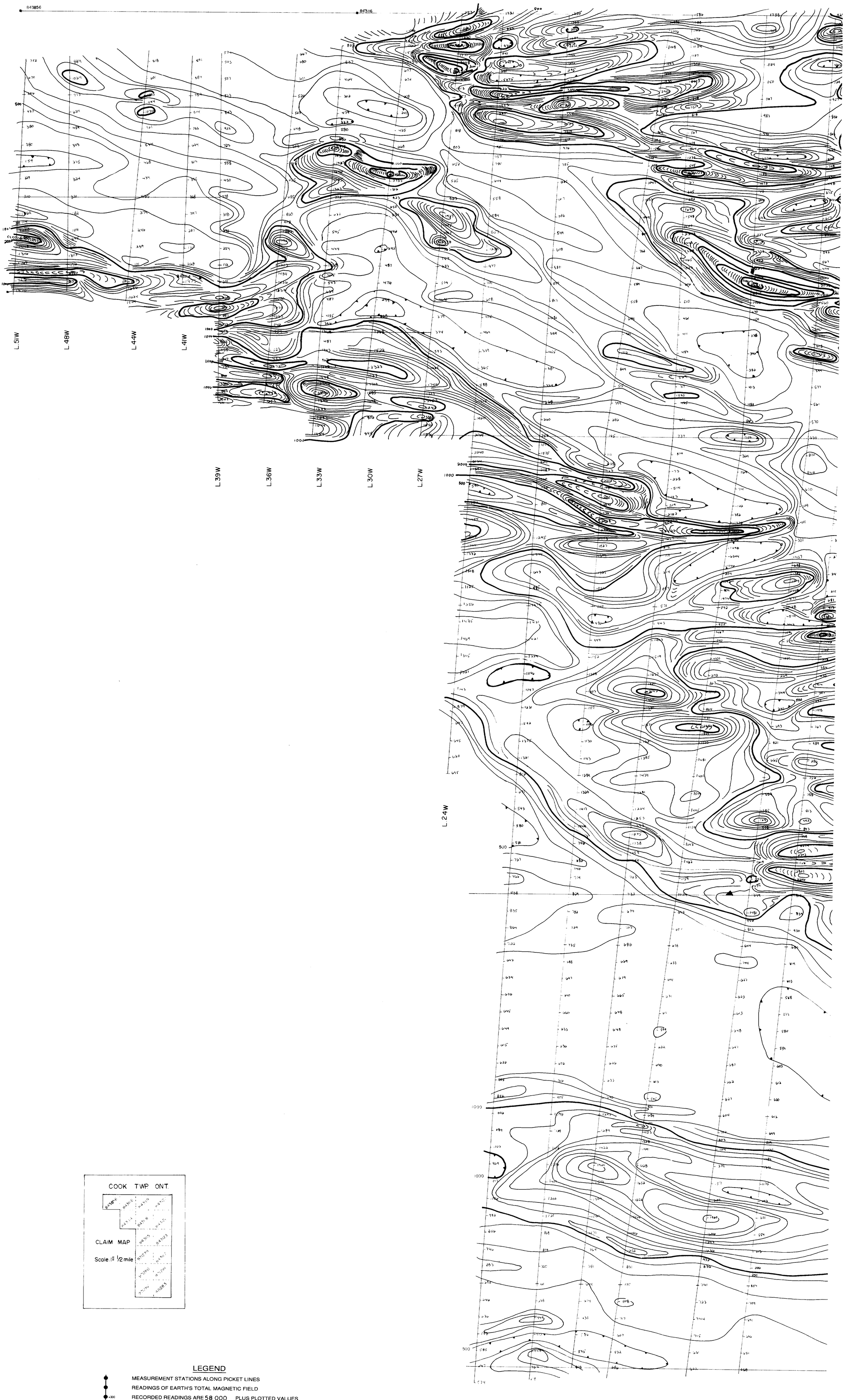
AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129
SWASTIKA, ONT.
P0K 1T0
705-642-3222

PLAN NO.- M.339

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

B.D.

COOK TWP.



COOK TWP ONT

CLAIM MAP

Scale 1/2 mile

LEGEND

MEASUREMENT STATIONS ALONG PICKET LINES

READINGS OF EARTH'S TOTAL MAGNETIC FIELD

RECORDED READINGS ARE 58 000 PLUS PLOTTED VALUES

FORCE OF THE EARTH'S MAGNETIC FIELD (IN GAMMAS)

MAGNETIC CONTOURS

BASE STATION

MAGNETIC LOW

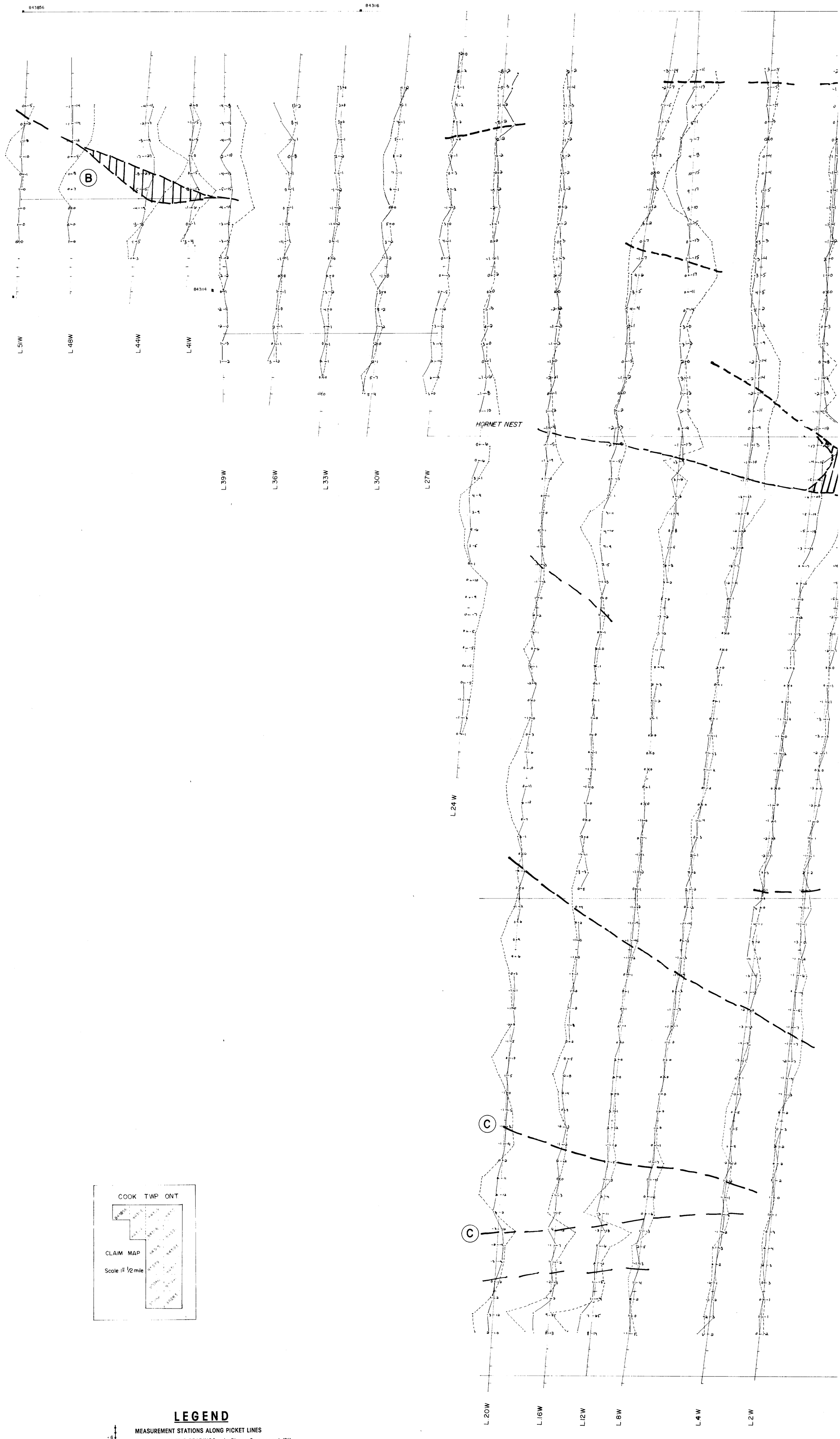
INSTRUMENT USED : PROTON MAGNETOMETER GEM, GSM-8

_____ TO _____ GAMMAS

_____ TO _____ GAMMAS

OVER _____ GAMMAS

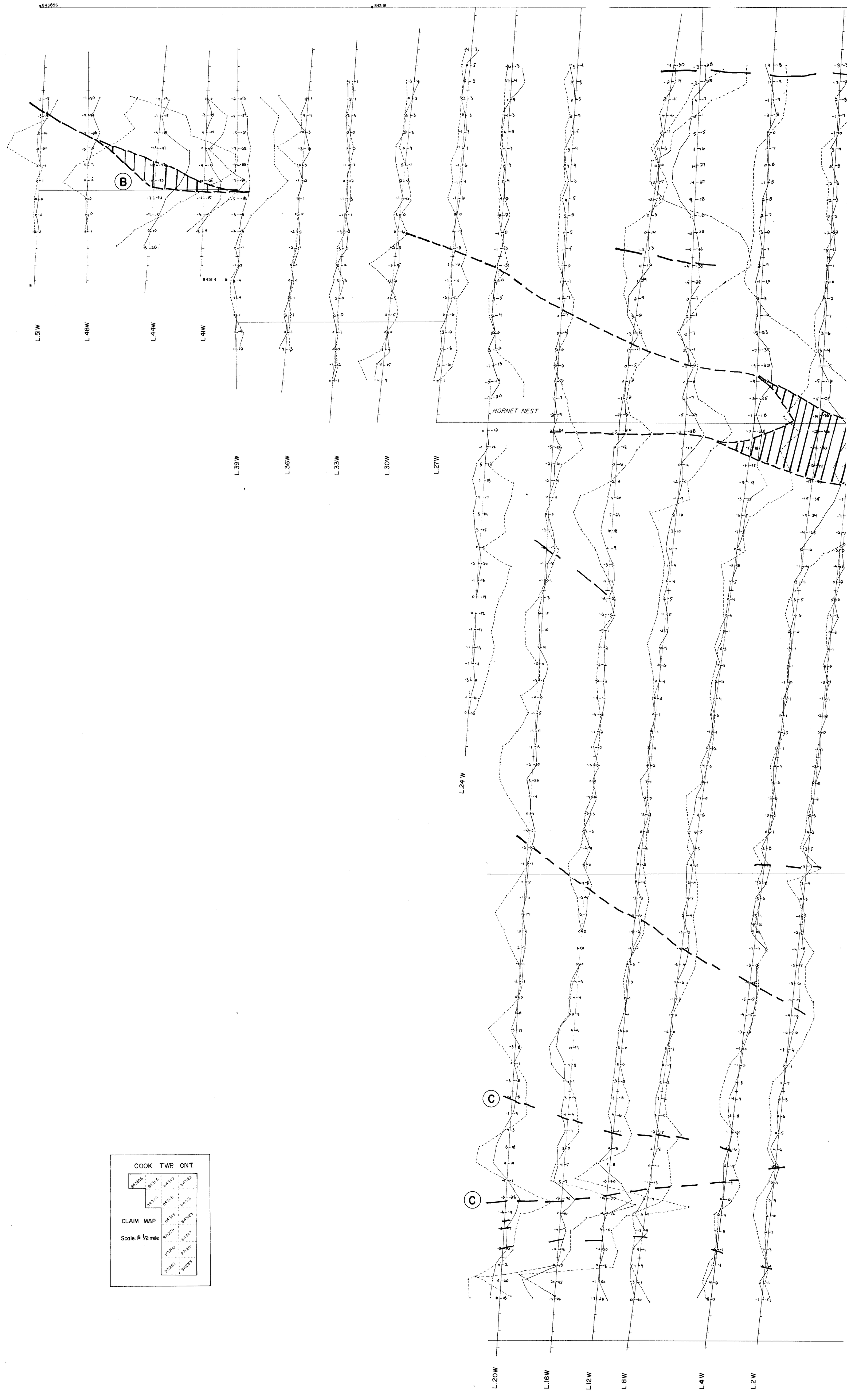
COOK TWP.



LEGEND

- MEASUREMENT STATIONS ALONG PICKET LINES
- ELECTROMAGNETIC READINGS - In Phase Component (%)
- ELECTROMAGNETIC READINGS - Out of Phase Component (%)
- PROFILE - In Phase Component (Scale 1" = 20 %)
- PROFILE - Out of Phase Component (Scale 1" = 20 %)
- COIL SEPARATION - 500 Feet
- INSTRUMENT - APEX MAX-MIN II FREQ. 1777 Hz
- ELECTRICAL CONDUCTOR

COOK TWP.



LEGEND

- MEASUREMENT STATIONS ALONG PICKET LINES
- ELECTROMAGNETIC READINGS - In Phase Component (%)
- ELECTROMAGNETIC READINGS - Out of Phase Component (%)
- PROFILE - In Phase Component (Scale 1" = 20 %)
- PROFILE - Out of Phase Component (Scale 1" = 20 %)
- COIL SEPARATION - 500 Feet
- INSTRUMENT - APEX MAX-MIN II FREQ. 3555 Hz
- ELECTRICAL CONDUCTOR

COOK TWP.

ONT.

LEGEND

MENT STATIONS ALONG PICKET LINES
; OF EARTH'S TOTAL MAGNETIC FIELD
D READINGS ARE 58 000 PLUS PLOTTED VALUES
THE EARTH'S MAGNETIC FIELD (IN GAMMAS)
: CONTOURS
TION
: LOW

NT USED : PROTON MAGNETOMETER GEM, GSM-8
O_____GAMMAS
O_____GAMMAS
R_____GAMMAS

2.11034

TYPE OF WORK	MAGNETOMETER SURVEY
CLIENT	775741 ONTARIO LTD.
PROJECT	AREA: COOK TWP. ONTARIO
H. Ferderber Geophysics Ltd.	SCALE: 1"=200' / DATE: JULY: 1988
	DRAWN BY: D.M. / MAP OR SHEET NO.: MG-1

COOK TWP.

84316

TL25+00N

20+00N

T.L.14+00N

10+00N

TL. 6+00 N

B.L.0+00

10+00S

20+00S

TL 27+00S

30+00S

40+00S

50+00S

TL.55+00S

HORNET NEST

L.36W L.33W L.30W L.27W L.24 W L.20W L.16W L.12W L.8W L.4W L.2W L.0

A

C

C

.INES
Component (%)
ase Component (%)
= 20 %)
e 1" = 20 %)

REQ. 1777 Hz

2.11034

TYPE OF WORK: HONRIZONTAL LOOP ELECTROMAGNETIC SURVEY	
CLIENT: 775741 ONTARIO LTD.	
PROJECT:	AREA: COOK TWP ONTARIO
H. Ferderber Geophysics Ltd.	SCALE: 1"=200' / DATE: JULY: 1988
	DRAWN BY: D.fn. / MAP OR SHEET NO.: HL-2

COOK TWP.

N
W E
S

843116

T.L.25+00N

20+00N

T.L.14+00N

10+00N

T.L. 6+00 N

B.L.0+00

HORNET NEST

A

10+00S

20+00S

T.L. 27+00S

30+00S

40+00S

C

50+00S

T.L. 55+00S

L.39W L.36W L.33W L.30W L.27W L.24 W L.20W L.16W L.12W L.8W L.4W L.2W L.0

2.11634

D

IG PICKET LINES

· In Phase Component (%)

· Out of Phase Component (%)

(Scale 1" = 20 %)

nent (Scale 1" = 20 %)

et

VIN II FREQ. 3555 Hz

TYPE OF WORK	HONRIZONTAL LOOP ELECTROMAGNETIC SURVEY
CLIENT	775741 ONTARIO LTD.
PROJECT	
AREA	COOK TWP. ONTARIO
H. Ferderber Geophysics Ltd.	
SCALE	1"=200'
DATE	JULY: 1988
DRAWN BY	D.fm.
MAP OR SHEET NO.	HL-1