REPORT ON
AIRBORNE GEOPHYSICAL SURVEYS
METEOR LAKE AREA
SAULT STE. MARIE MINING DIVISION
ONTARIO

BY

H. FERDERBER GEOPHYSICS

FOR

HARLIN RESOURCES LIMITED

JUNE 10, 1985

FENTON SCOTT, P. ENG.

INTRODUCTION

An airborne geophysical survey was carried out over a claim group in the Meteor Lake Area, Algoma District of Ontario, by H.Ferderber Geophysics.

Data was collected on VLF-EM magnetometer responses. The survey was flown from a base at Timmins, Ontario.

PURPOSE OF SURVEY

The Survey was designed to provide data which would:

1. Permit an interpretation of geological structure through recording variations in the magnetic mineral content of the formations underlying the survey area.

2. Identify potentially economic mineral concentrations which may have marked variation in accessory magnetic minerals.

3. Identify linear structures, such as major shear zones, which may result in current concentration of VLF-signals. Such structures may contain economic minerals, notably precious metals.

4. Identify shallow, potentially valuable metallic sulfide deposits whose lower electrical resistance will localize secondary VLF-EM fields.

5. Identify areas of near surface conductivity which may be indicative of clay lenses in the local glaciofluvial overburden type.

SURVEY AREA

The survey covered a 20 square mile block in Garibaldi, Moffat, and Beulah Townships, Larder Lake Mining Division, Ontario.

The 294 mining claims included in the survey are shown on the maps in an attached pocket.

EQUIPMENT

The aircraft used in this survey was a Cessna 172 owned and operated by H.Ferderber Geophysics. The sensors for geophysical data were mounted in modified wing tip installations.

Magnetometer The instrument used was a GEM GSM - 18 BA proton precession type. The sensitivity of the device was set at 2 gammas at a 1 second sampling rate. Data was recorded on paper on an on-board recorder.

VLF - EM System The instrument used was a Herz Totem 1 A. The total field and vertical resultant field was recorded on analogue tape. The transmitter station for this survey was Annapolis, Maryland, at a frequency of 21.4 kiloherz. The system was accurate to 1%.

SURVEY METHOD

The aircraft was flown at a terrain clearance of 250 feet. Navigation consisted of reference to an air photo mosaic, with manual fiducials recorded on the mosaic simultaneously with the geophysical tapes.

Line direction was East-West, and line spacing was 1/12 mile (440 feet).

DATA PRESENTATION

Flight lines, fiducial points, and geophysical responses are shown on air photo mosaics at a scale of 1/15, 840 (quarter mile). These mosaics also show the outlines of the individual claim groups, together with enough claim numbers to permit indentification.

Magnetic Contour Maps Correction of the aeromagnetic data for diurnal variation was by reference to cross-lines. The corrected profiles were then reduced to appropriate field strength intervals, and presented as contours at 20 gamma intervals.

VLF-EM Maps The axes of conductivity were selected on each analogue tape, and transferred to the mosaics with reference to fiducial points. These axis are further discriminated between those conductors showing an increass in total field strength, and those whose position only relates to "crossover" points on the vertical field components.

DISCUSSION OF RESULTS

MAGNETOMETER SURVEY

There is a series of magnetic highs trending north-northeast through the claim group. Some suggestion of folding to a south direction in the southerly 1/3 of the claims.

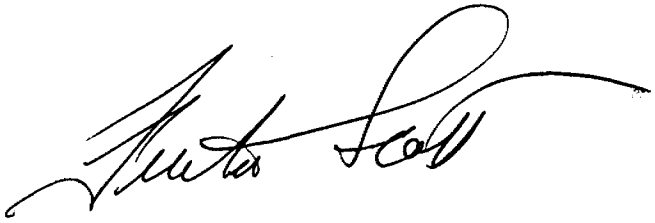
AIRBORNE VLF SURVEY

A total of 26 conductor axes were selected from the tapes for discussion. The majority of these are considered to be caused by conductive overburden, either silts or clays.

The remarks on the 26 selections are as follows:

1. Probably overburden effects from silts of Deschenes Creek in lake.
2. Interpreted as silts in bay of lake
3. Interpreted as silts
4. Interpreted as silts, coincides with magnetic high
5. Possible bedrock conductor

6. Interpreted as conductive silts
7. Silts
8. Conductive silts(?) coincides with magnetic high
9. Possible bedrock or clay lenses
10. Silts
11. Silts
12. Silts, on magnetic high
13. Possibly bedrock or clay lenses
14. Silts
15. Possible bedrock or clay lenses
16. Conductive overburden or clau edge effects
17. Silts or clay
18. Silts
19. Possible extensions of 16 - Some coincident magnetics
20. Conductive sheet edge effects, magnetic high
21. Unknown, possibly bedrock
22. Bedrock or clay lens
23. Silt
24. Silt
25. Silt
26. Silt



900

Mining Lands Section

File No 2.8211

Control Sheet

TYPE OF SURVEY

✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

Gpd

Doug

Signature of Assessor

17/6/85

Date

LD

1985 08 02

Your File: #175
Our File: 2.8211

Mining Recorder
Ministry of Natural Resources
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

RE: Notice of Intent dated July 15, 1985
Geophysical (Electromagnetic & Magnetometer)
Surveys on Mining Claims L 634802, et al,
in Beulah, Garibaldi & Moffat Townships

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

D. Isherwood:mc

cc: Harlin Resources Ltd
Suite 810
625 Howe Street
Vancouver, B.C.
V6C 2T6

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Encl.

cc: Harry Ferderber
169 Perreault Avenue
Val d'Or, Quebec
J9P 2H1

cc: B. Scott
17 Malabar Place
Don Mills, Ontario
M3B 1A4

cc: Resident Geologist
Kirkland Lake, Ontario

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.8211

Date 1985 07 15

Mining Recorder's Report of Work No. 175

Recorded Holder
HARLIN RESOURCES LIMITED

Township or Area
BEULAH, GARIBALDI, MOFFAT

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	L 634802 634817 to 826 incl 743421 to 440 incl 743566 to 590 incl 748901 to 957 incl 748959 to 962 incl 748965 748969 to 972 incl 748976 748978 to 999 incl 749001 to 024 incl 749026 to 043 incl 749051 to 065 incl 749552 to 634 incl 749637 to 656 incl
Electromagnetic 30 days	
Magnetometer 30 days	
Radiometric ____ days	
Induced polarization ____ days	
Other ____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological ____ days	
Geochemical ____ days	
Man days ☐ Airborne ☒	
Special provision ☐ Ground ☐	
☒ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19)—60:

929 (83/6)

Ministry of Natural Resources

July 30/85

1985 07 15

Your File: #175
Our File: 2.8211

Mining Recorder
Ministry of Natural Resources
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. R.J. Pichette at 416/965-4888.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3

D. Isherwood:mc

Encls.

cc: Harlin Resources Ltd
Suite 810
625 Howe Street
Vancouver, B.C.
V6C 2T6

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

cc: Harry Ferderber
169 Perreault Avenue
Val d'Or, Quebec
J9P 2H1

cc: F. Scott
17 Malabar Place
Don Mills, Ontario
M3B 1A4

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1985 07 15

2.8211/175

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

David

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

The Mining Act

28211

June 19th #175

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s): Airborne Magnetic and VLF-EM

Township or Area: Garibaldi, Moffat and Beulah Twps.

Claim Holder(s): Harlin Resources Ltd.

Prospector's Licence No.: T1707

Address: 810-625 Howe Street, Vancouver, B.C. V6C 2T6

Survey Company: H. Ferderber Geophysics Ltd.

Date of Survey (from & to): 22 04 85 (Day Mo. Yr.) 23 04 85 (Day Mo. Yr.)

Total Miles of line Cut: 260

Name and Address of Author (of Geo-Technical report): F. Scott, 17 Malabar Place, Don Mills, Ontario

Credits Requested per Each Claim in Columns at right

		Days per Claim
Special Provisions: For first survey: Enter 40 days. (This includes line cutting) For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Man Days: Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Airborne Credits: Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	34.1
	Magnetometer	34.1
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	634802	
	See attached List	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

RECEIVED
MAY 09 1985
MINING LANDS SECTION

LARDER LAKE MINING DIV.
RECEIVED
APR 30 1985
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

Total number of mining claims covered by this report of work: 305

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.

Date: April 26, 1985

Recorded Holder or Agent (Signature): Harry Ferderber

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
20,089	APR 30 1985	
	Date Approved as Recorded: see revised statement	Branch Director

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 Avenue, Val d'Or Quebec J9P 2H1

Date Certified: Apr. 26, 1985

Certified by (Signature): Harry Ferderber

305CL - GARIBALDI, MOFFAT AND BEULAH TOWNSHIPS

BEULAH TWP - 142 cl

L634802	Days	L748925	L748961	Days	L749006	L749041
	17 - 20	26	62		07	42
	18 - 20	27	65		08	43
	19 - 20	28	69		09	
	20 - 20	29	70		10	
	21 - 20	30	71		11	
	22 - 20	31	72		12	
	23 - 20	32	76	- 20	13	
	24 - 20	33	78		14	
	25 - 20	34	79		15	
	26 - 20	35	80		16	
L748901		36	81		17	
	02	37	82		18	
	03	38	83		19	
	04	39	84	- 20	20	
	05	40	85		21	
	06	41	86		22	
	07	42	87			
	08	43	88		23	
	09	44	89		24	
	10	45	90		26 - 20 days	
	11	46	91		27	
	12	47	92		28	
	13	48	93		29	
	14	49	94		30	
	15	50	95		31	
	16	51	96		32	
	17	52	97		33	
	18	53	98		34	
	19	54	99		35	
	20	55	L749001		36	
	21	56		02	37	
	22	57		03	38	
	23	59		04	39	
	24	60		05	40	

305 CL - GARIBALDI, MOFFAT & BELLAH TOWNSHIPS

MOFFAT TWP - 140 CL

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L743581
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L749051
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L749552
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L749562
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L749597
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L749600
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305 CL - GARIBALDI, MOFFAT + BELLAH TOWNSHIPS

GARIBLADI TOWNSHIP - 23 cl

L 749632
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Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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) AIRBORNE MAGNETK, VLF-EM

Township or Area GARIBALDI, MOFFATT, BEULAH.

Claim Holder(s) HARLIN RESOURCES, RAYMOND COLLINS, DAVID LARCH ET. AL.

Survey Company H. FERDERBER GEOPHYSICS.

Author of Report FENTON SCOTT

Address of Author 17 MALABAR PLACE, DON MILLS, ONT.

Covering Dates of Survey MARCH 20 - MARCH 25/85 (linecutting to office)

Total Miles of Line ~~Cut~~ FLOWN 221 OVER CLAIMS

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 30 Electromagnetic 30 Radiometric _____ (enter days per claim)

DATE: June 10/85 SIGNATURE: Fenton Scott
Author of Report or Agent

Res. Geol. _____ Qualifications 63.1263

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

L 743421 ETAL.
(prefix) (number)
LIST ATTACHED

RECEIVED
JUN 14 1985
MINING LANDS SECTION

If space insufficient, attach list

TOTAL CLAIMS 294

OFFICE USE ONLY

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations _____ Number of Readings _____

Station interval _____ Line spacing _____

Profile scale _____

Contour interval _____

MAGNETIC

Instrument _____

Accuracy – Scale constant _____

Diurnal correction method _____

Base Station check-in interval (hours) _____

Base Station location and value _____

_____

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 _____

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time _____ Frequency _____

– Off time _____ Range _____

– Delay time _____

– Integration time _____

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) VLF-EM MAGNETOMETER

Instrument(s) TOTEM 1A GEM GSM-18BA

(specify for each type of survey)

Accuracy 1% 2 GAMMAS

(specify for each type of survey)

Aircraft used CESSNA 172

Sensor altitude 250 FEET

Navigation and flight path recovery method VISUAL NAVIGATION, MANUAL FIDUCIALS SIMULTANEOUSLY ON ANALOGUE TAPES AND ON-BOARD PHOTOMOSAICS

Aircraft altitude 250 FEET Line Spacing 440 FEET.

Miles flown over total area 222 Over claims only 221

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 _____

_____

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_____

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 _____

_____

_____

_____

_____

_____

_____

_____

_____

HARLIN RESOURCES

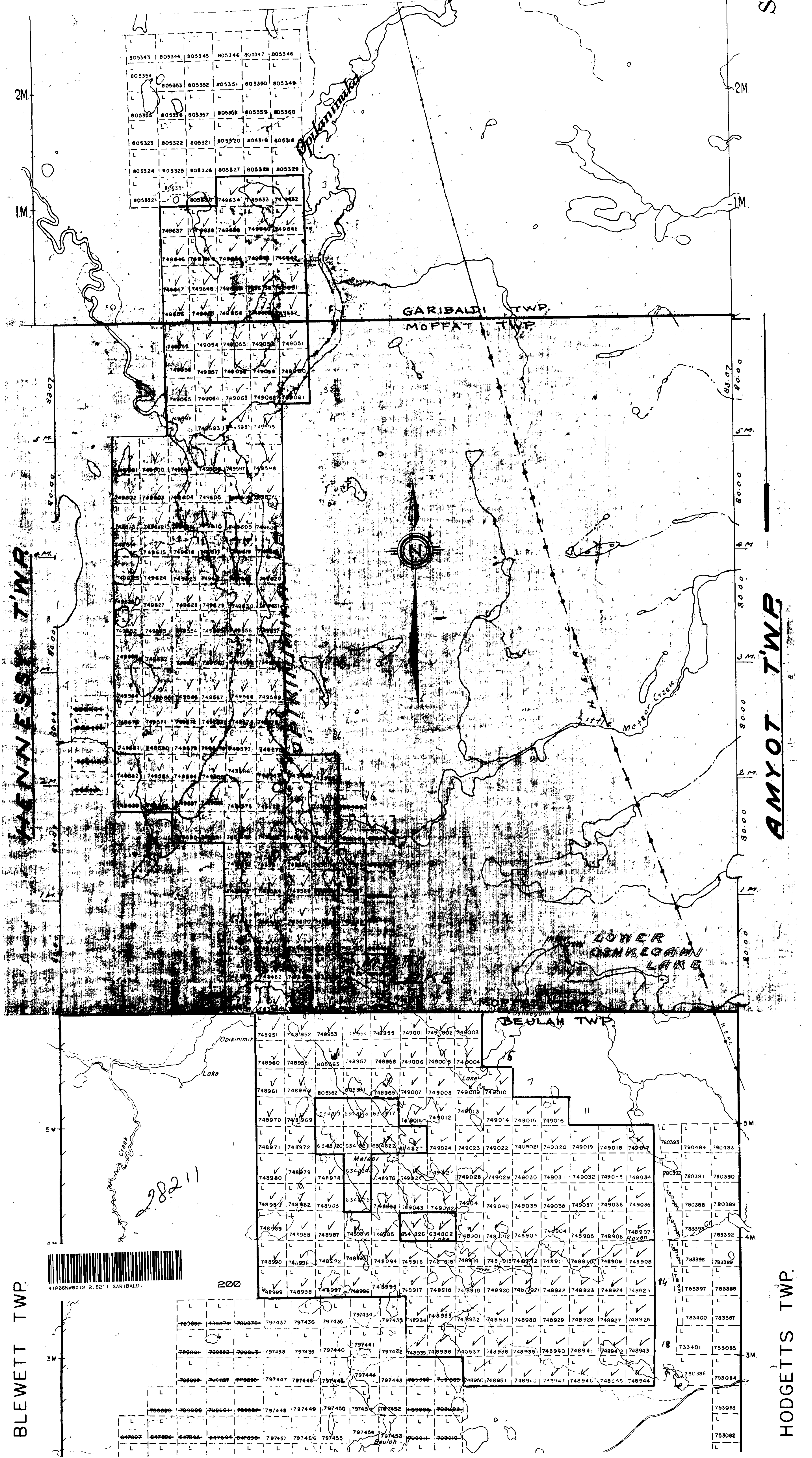
CLAIM LIST

L 743421	L 743576	L 748916	L 748946	L 748986	L 749047	749056
22	77	17	47	87	18	57
23	78	18	48	88	19	58
24	79	19	49	89	20	60
25	80	20	50	90	21	61
26	81	21	51	91	22	62
27	82	22	52	92	23	63
28	83	23	53	93	24	64
29	84	24	54	94	26	65
30	85	25	55	95	27	749552
31	86	26	56	96	28	53
32	87	27	57	97	30	54
33	88	28	59	98	31	55
34	89	29	60	99	32	56
35	90	30	61	749001	33	57
36	L 748901	31	62	02	34	58
37	02	32	65	03	35	59
38	03	33	69	04	36	60
39	04	34	70	05	37	61
40	05	35	71	06	38	62
743566	06	36	72	07	39	63
67	07	37	76	08	40	64
68	08	38	78	09	41	65
69	09	39	79	10	42	66
70	10	40	80	11	43	67
71	11	41	81	12	749051	68
72	12	42	82	13	52	69
73	13	43	83	14	53	70
74	14	44	84	15	54	71
75	15	45	85	16	55	72

HARLIN RESOURCES

L749573	L749603	L749634	
74	04	37	
75	05	38	
76	06	39	
77	07	40	
78	08	41	
79	09	42	
80	10	43	
81	11	44	
82	12	45	
83	13	46	
84	14	47	
85	15	48	
86	16	49	
87	17	50	
88	18	51	
89	19	52	
90	20	53	
91	21	54	
92	22	55	
93	23	56	
94	24		
95	25	L805361	
96	26	62	
97	27	63	
98	28		
99	29		
L749600	30		
01	31		
02	L749632		
	33		

TOTAL 294 CLAIM



GARIBALDI TWP.
MOFFAT TWP.
BEULAH TWP.
HENNESSY T'WP.
AMYOT T'WP.
BLEWETT TWP.
HODGETTS TWP.
Opikinimika
OPIKINIMIKA
Little Meteor Creek
LOWER OSHKEGAMI LAKE
Oshkegami
Opikinimika Lake
Creek
Meteor
Raven
Raven Cr.
Beulah
H.E.P.C.
Lake
2M.
1M.
5M.
4M.
3M.
80.00
83.07
28211
200
41P06NW0012 2.8211 GARIBALDI

HARLIN RESOURCES LTD.

GARIBALDI, MOFFAT, BEAULAH TWPS. SUDBURY DISTRICT - ONT.

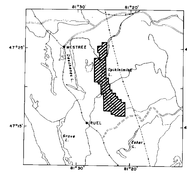
OPIKINIMIKA LAKE PROJECT

AIRBORNE MAGNETIC SURVEY

INTERPRETED BY:	N.T.S.	DATE
F. SCOTT	41 P/6	MAY - 1985
SCALE 1"=1320'		PLATE 1M

J-1488-M

28211



LEGEND

CONTOUR INTERVAL ..... 20 GAMMAS
500 GAMMA .....
100 GAMMA .....
20 GAMMA .....
MAGNETIC LOW .....
BASE VALUE ..... 58,000 GAMMAS

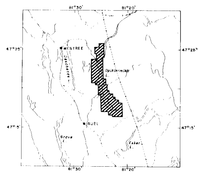
HARLIN RESOURCES LTD.

GARIBALDI, MOFFAT, BEULAH TWPS. SUDBURY DISTRICT - ONT.

OPIKINIMIKA LAKE PROJECT

AIRBORNE V.L.F.-EM SURVEY

INTERPRETED BY: F. SCOTT	N.T.S. 41 P/6	DATE: MAY - 1985
SCALE: 1" = 1320'		PLATE 1v



LEGEND

CONDUCTOR AXIS

CONDUCTOR AXIS WITH QUADRATURE FIELD

INTERPRETATION

OVERBURDEN OR BEDROCK RESPONSE