

**LAForest-HLAVA EXPLORATION
SERVICES LTD.**

(705) 268-2511

24 Pine Street South, P.O. Box 1163, TIMMINS, ONTARIO P4N 7H9



42A06NW0257 2.10636 OGDEN

010

MAGNETOMETER
AND
VLF - EM 16 SURVEYS
FOR
BLACK CLIFF MINES LIMITED

OGDEN TOWNSHIP
PORCUPINE MINING DIVISION

RECEIVED
DEC 11 1987
MINING LANDS SECTION

Timmins, Ontario
November, 1987

Milan Hlava B.Sc., F.G.A.S.

Mil
2.357



42A06NW0257 2.10636 OGDEN

010C

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
PROPERTY LOCATION AND ACCESS	1
PROPERTY DESCRIPTION	1
FIGURE 1 - <i>Property Location</i>	2
FIGURE 2 - <i>Portion of Claim Map No. G-3979</i>	3
PREVIOUS WORK	4
REGIONAL GEOLOGY	4
FIGURE 3 - <i>Regional Geology</i>	5
PROPERTY GEOLOGY	6
WORK COMPLETED	6
GROUND MAGNETOMETER SURVEY	6
VLF - EM 16 ELECTROMAGNETIC SURVEY	6
SURVEY RESULTS - MAGNETOMETER	7
SURVEY RESULTS - VLF - EM	7
FIGURE 4 - <i>Magnetometer Survey</i>	8
FIGURE 5 - <i>VLF - EM16 Survey Fraser Filter</i>	9
FIGURE 6 - <i>VLF - EM16 Survey NAA Cutler Maine</i>	10
VLF-EM ANOMALY SUMMARY	11
CONCLUSIONS AND RECOMMENDATIONS	12
APPENDIX 1 - <i>Certificate</i>	13
APPENDIX 2 - <i>Assessment Work Form</i>	

INTRODUCTION

The following report describes the results of a ground magnetometer survey and VLF-EM survey for Black Cliff Mines Limited on a claim group located in Ogden Township, Porcupine Mining Division. The field work was completed on November 15, 1987. The report was completed on November 30, 1987.

PROPERTY LOCATION AND ACCESS (FIGURE 1)

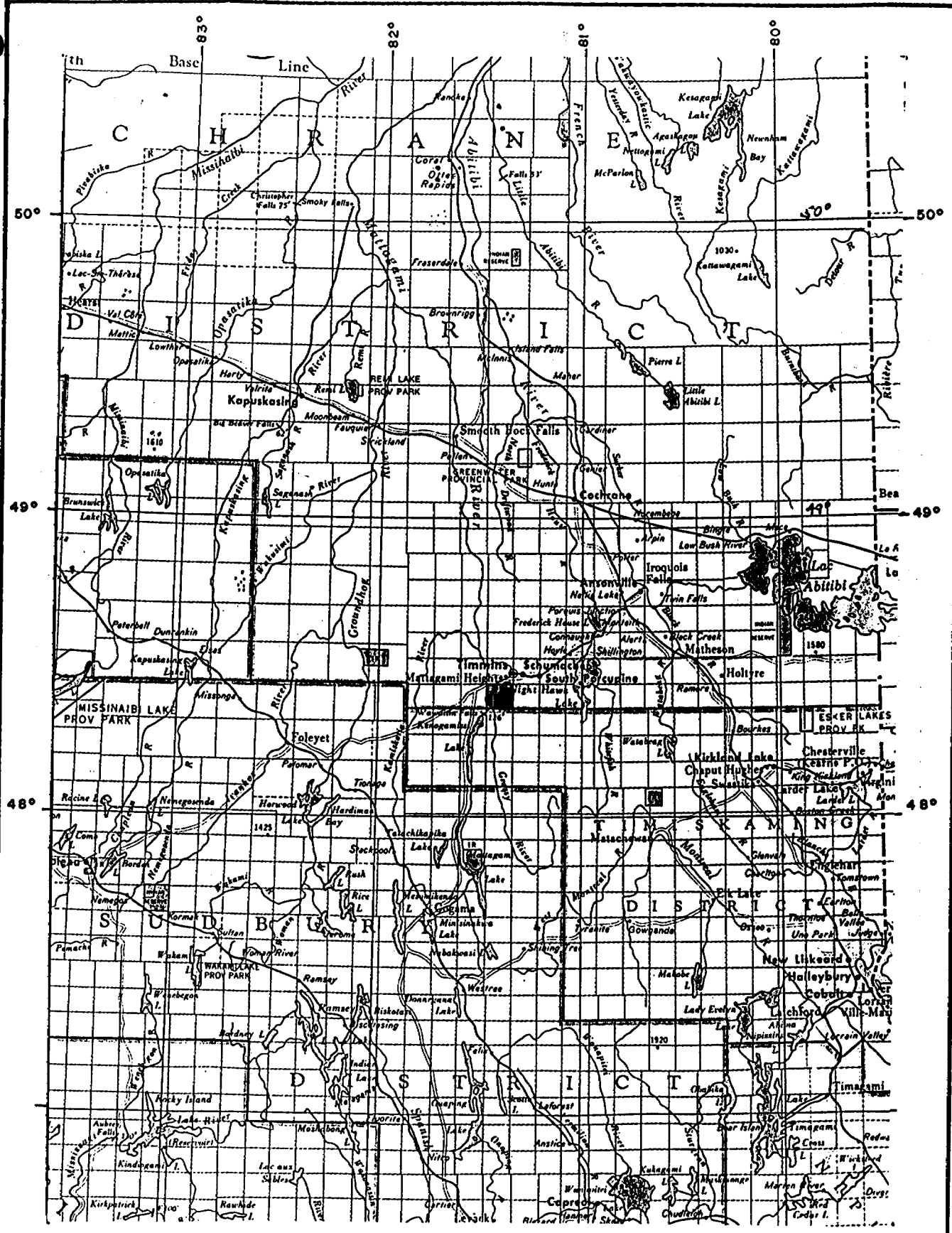
The Black Cliff Mines Limited property is located in Ogden Township, Porcupine Mining Division, Ontario at latitude $48^{\circ}24'15''$ and longitude $81^{\circ}20'30''$ or approximately six kilometers (3.73 miles) south of Timmins.

The property is accessible by a road from Timmins, approximately six kilometers, (3.73 miles) south. The road follows the entire length of the eastern boundary of the property.

PROPERTY DESCRIPTION (FIGURE 2)

The property consists of six contiguous, unpatented mining claims numbered as follows:

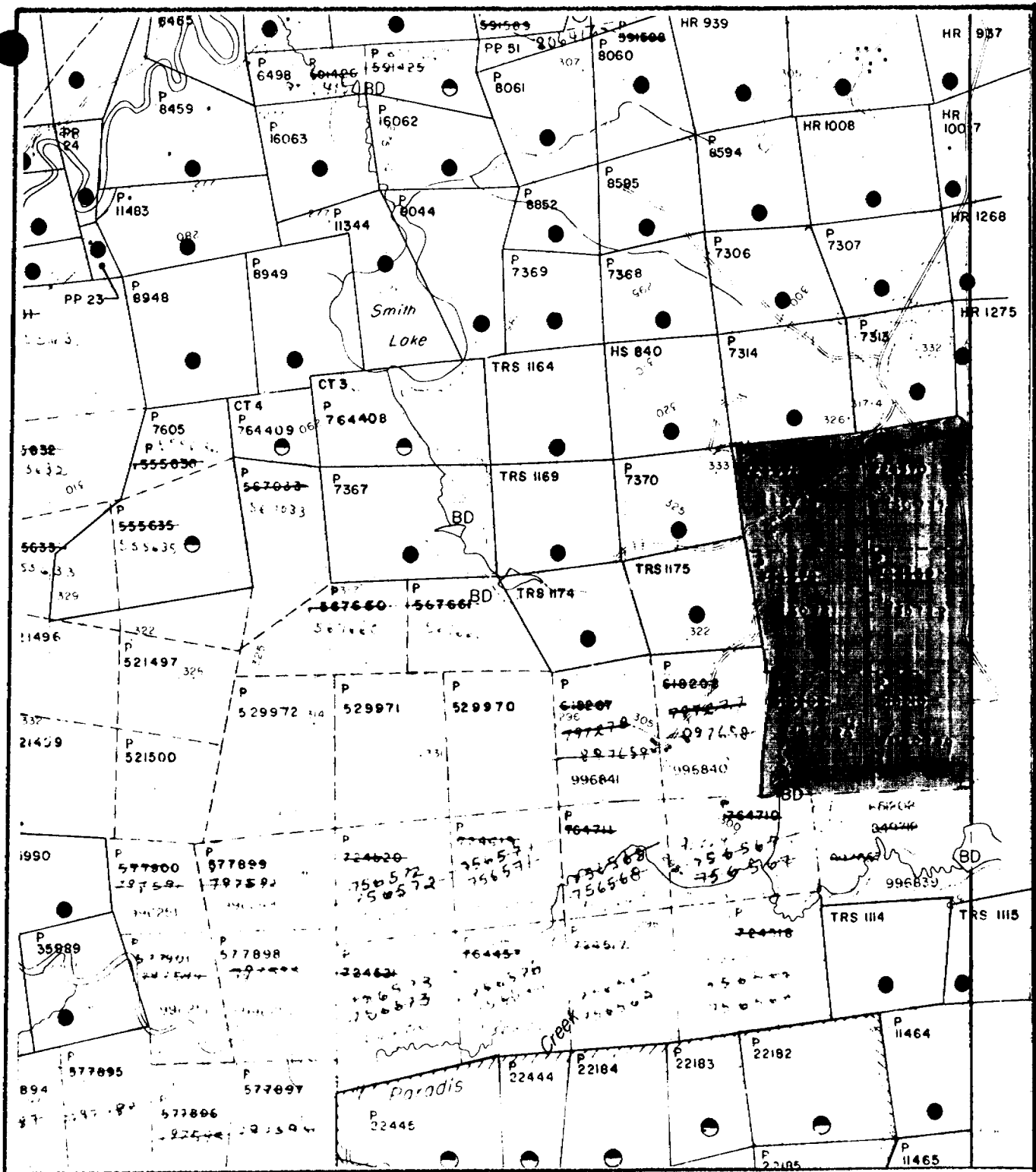
P 930776	P 930778	P 930780
P 930777	P 930779	P 930781



PROPERTY LOCATION

Scale 1"=32 miles

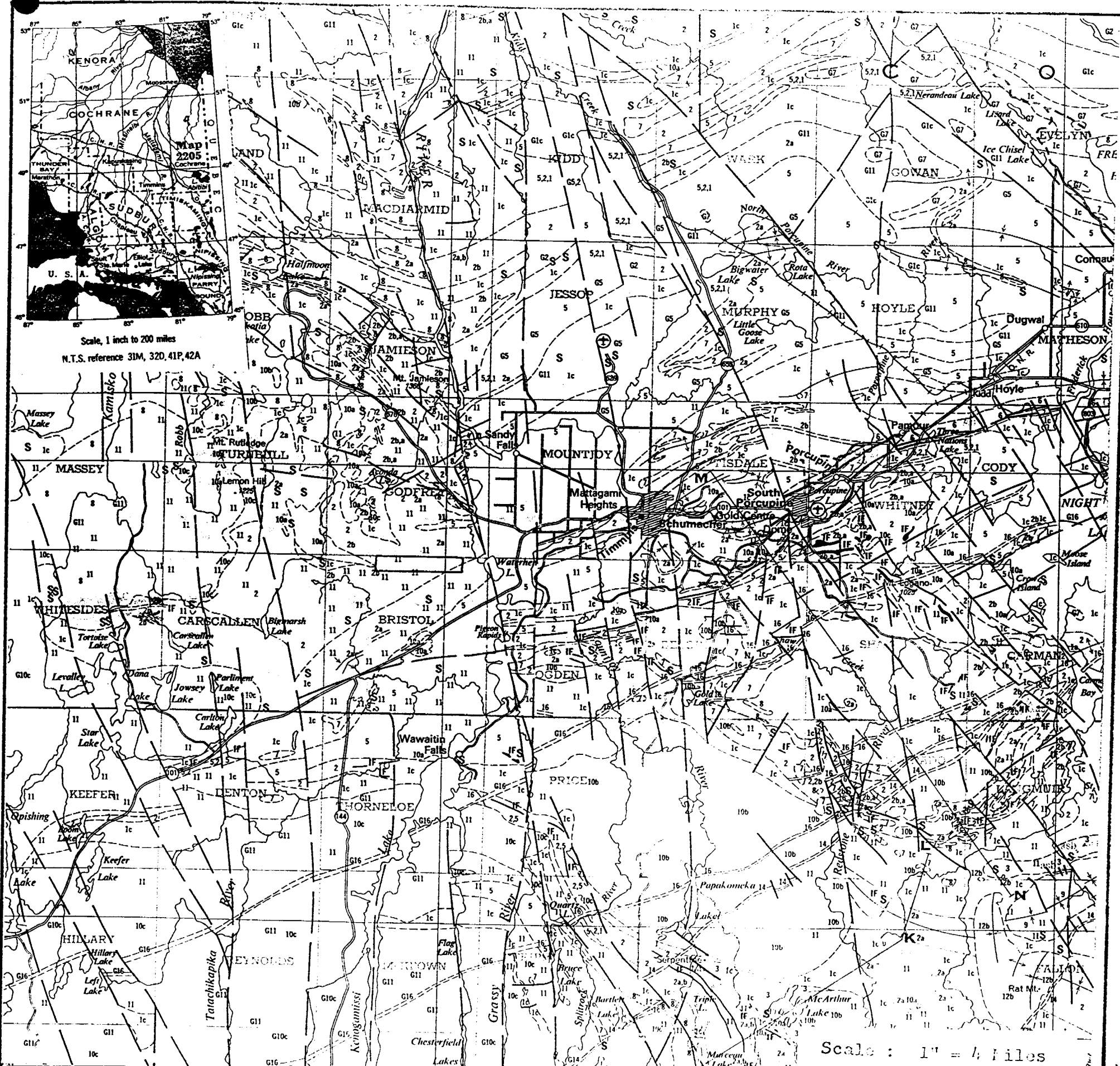
FIGURE 1



OGDEN TOWNSHIP
 PORTION OF CLAIM MAP NO. G-3979

SCALE 1:20000

FIGURE 2



Scale, 1 inch to 200 miles
N.T.S. reference 31M, 32D, 41P, 42A

Scale: 1" = 4 Miles

LEGEND

- CENOZOIC**
- PLEISTOCENE AND RECENT**
Till, varved clay, sand, gravel, peat.
- MESOZOIC**
- 19 Kimberlite: dikes.
- INTRUSIVE CONTACT**
- PALEOZOIC**
- LOWER AND MIDDLE SILURIAN**
- 18 Thornloe Formation: limestone, dolomite, sandstone.
Wabi Formation: limestone, shale.
- MIDDLE AND UPPER ORDOVICIAN**
- 17 Dawson Point Formation: shale.
Farr Formation: limestone.
Bucke Formation: limestone, shale.
Gulguis Formation: sandstone.
- UNCONFORMITY**
- PRECAMBRIAN**
- LATE PRECAMBRIAN**
- MAFIC INTRUSIVE ROCKS**
- 16 Diabase: dikes.
- INTRUSIVE CONTACT**
- MIDDLE PRECAMBRIAN**
- ALKALIC INTRUSIVE ROCKS**
- 15 Syenite, nepheline syenite.
- MAFIC INTRUSIVE ROCKS^g**
- 14 Diabase, granophyre: sheets and dikes.
- INTRUSIVE CONTACT**
- HURONIAN SUPERGROUP**
- COBALT GROUP**
Lorrain Formation
- 13 Quartzite, arkose.
- Gowganda Formation
- 12 Unsubdivided.
12a Firstbrook Member: argillite, greywacke, siltstone, arkose.
12b Coleman Member: conglomerate, arkose, greywacke, quartzite, argillite.
- UNCONFORMITY**
- EARLY PRECAMBRIAN**
- MAFIC INTRUSIVE ROCKS^g**
- 11 Diabase: dikes.
- INTRUSIVE CONTACT**
- FELSIC INTRUSIVE ROCKS^g**
- 10 10a Quartz porphyry, quartz-feldspar porphyry, feldspar porphyry, granophyre, felsite
10b Trondhjemite, granodiorite, quartz monzonite: simple batholiths and stocks
10c Trondhjemite, granodiorite, quartz monzonite, quartz diorite, aplite, pegmatite, migmatite: complex batholiths.
- 9 Syenite, monzonite, feldspar porphyry
- METAMORPHOSED MAFIC AND ULTRAMAFIC ROCKS^g**
- 8 Gabbro, diorite, lamprophyre.
- 7 Peridotite, dunite, pyroxenite, serpentinite
- INTRUSIVE CONTACT**
- METASEDIMENTS^g**
- 6 Conglomerate, greywacke, siltstone, slate, argillite
- 5 Greywacke, siltstone, slate, argillite and minor pebble conglomerate
- METAVOLCANICS^g**
- ALKALIC METAVOLCANICS^h**
- 4 Trachyte, leucitic trachyte; flows, tuff, breccia.
- ULTRAMAFIC METAVOLCANICS^k**
- 3 Serpentinized dunitic and peridotitic flows.
- FELSIC METAVOLCANICS^l**
- 2 Unsubdivided.
2a Pyroclastic rocks.
2b Flows.
- INTERMEDIATE AND MAFIC METAVOLCANICS^l**
- 1 Unsubdivided.
1a Intermediate flows.
1b Intermediate pyroclastic rocks.
1c Mafic flows and pyroclastic rocks.
- IF Iron formation and ferruginous chert (occurs as a member of stratigraphic units 1, 2, 4, and 5).
- S Sulphide mineralization.
- SYMBOLS**
- Geological boundary.
- Synclinal axis.
- Anticlinal axis.
- Fault.
- Lineament.
- 1550' Altitude in feet above mean sea level.
- Railway with station or flagstop.
- Provincial highway.
- Motor road.
- Other road.
- Producing mine.
- Past producing mine.
- Mineral occurrence. Figure 3

PROPERTY GEOLOGY

The details regarding the property geology were not available to the author at the time of writing this report.

WORK COMPLETED

LINE CUTTING: The grid was chained utilizing the Imperial system. Grid lines were established in a true north-south direction at 400 feet (121.92m) intervals with pickets at 100 feet (30.48m) intervals. A total of 8.96 km (5.57 miles) of lines were cut on the property.

GROUND MAGNETOMETER SURVEY

The ground magnetometer survey was completed utilizing a proton magnetometer (Geometrix Model G-816) capable of reading total field values to an accuracy of ± 1 gamma. The main base station was established at BL 0 + 00 with the value of 58869 gammas. Secondary base stations were established at 100' (30.48 m) intervals along the base line to provide data for diurnal corrections. Diurnal variation was corrected by tying in to the base stations at the time intervals less than 25 minutes. Maximum misclosure was 15 gammas. A total of 294 readings were taken.

VLF- EM 16 ELECTROMAGNETIC SURVEY

The electromagnetic survey was completed over the entire grid utilizing VLF-EM 16 unit manufactured by Geonics Ltd. The station used for the survey was NAA Cutler Maine with the frequency of 24.0 kHz. The azimuth to the station (NAA) is 140° . All the readings were taken with the operator facing north. A total of 276 readings were taken.

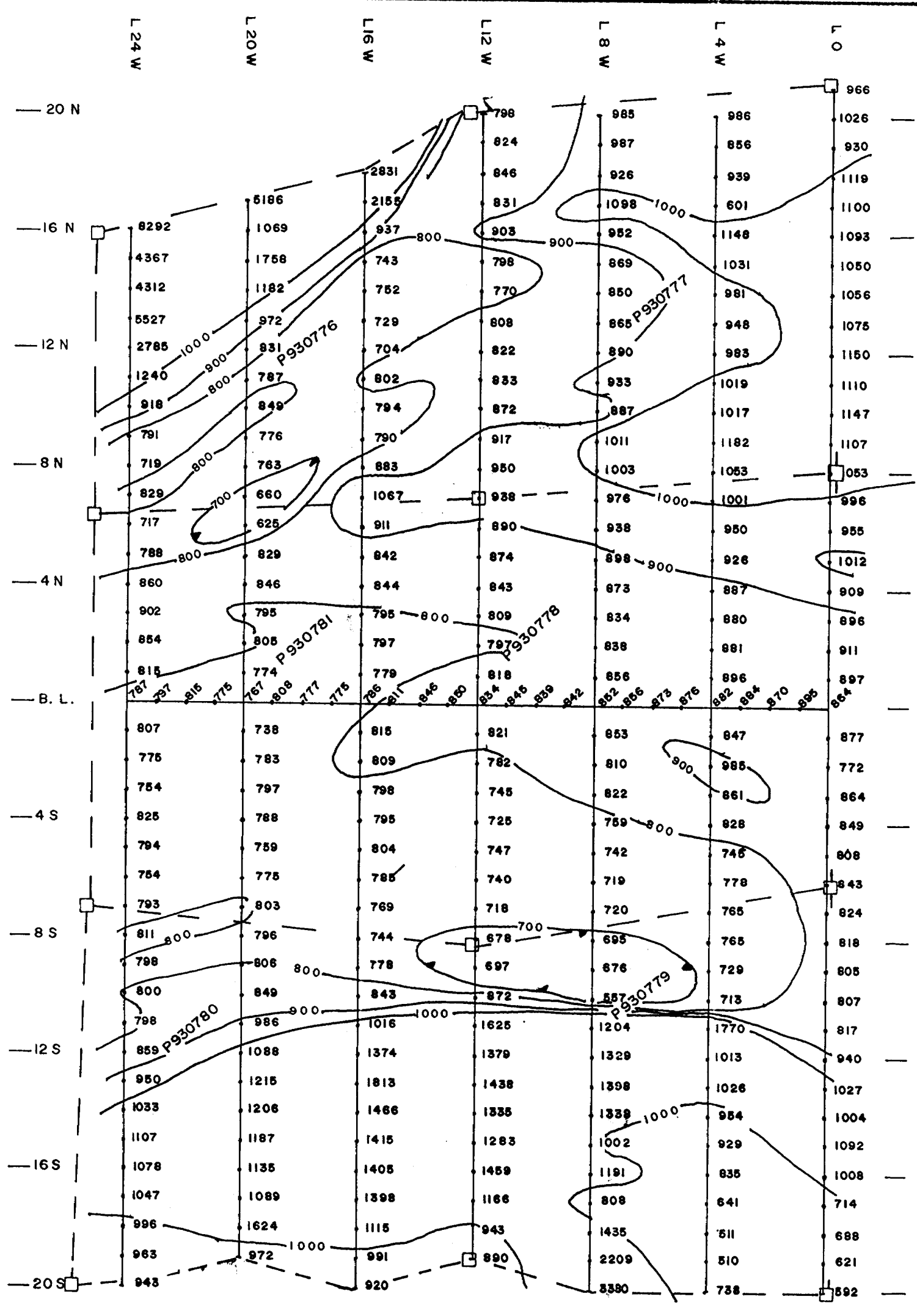
SURVEY RESULTS - MAGNETOMETER

The results of the survey are presented on Figure 4. The maximum magnetic relief within the property is 7,573 gammas in the northern portion of the property. This high relief is due to the presence of magnetite iron formation. The remaining portion of the property has low magnetic relief, (approximately 300 gammas).

SURVEY RESULTS - VLF - EM

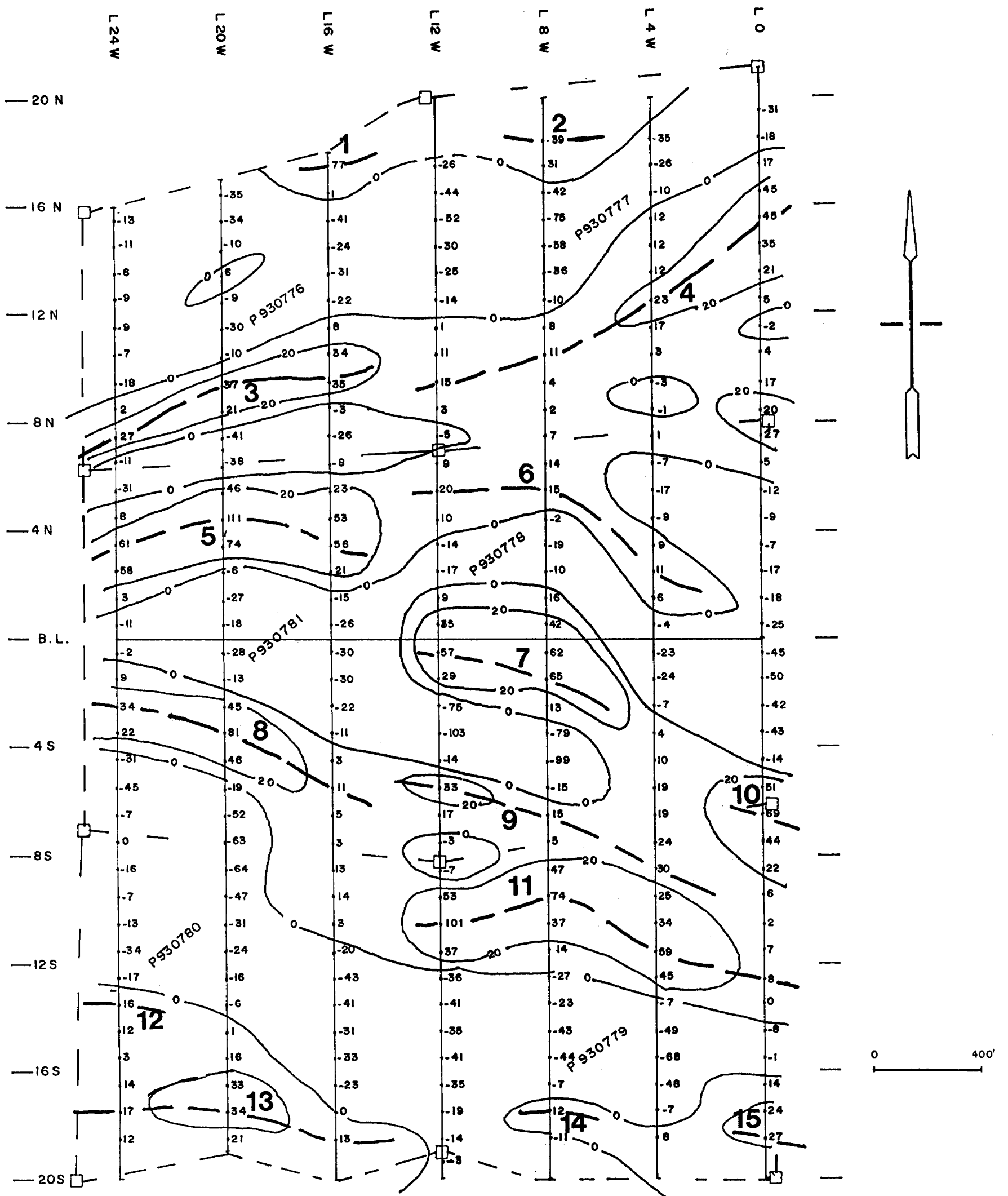
The survey results are presented on Figures 5 and 6. Figure 5 is Fraser Filter Plot and Figure 6 shows profiles of In-phase and quadrature.

A total of 15 individual anomalies were detected by the survey and are labeled numerically from one to 15 on Figure 5. The following table is a summary and brief description of the anomalies detected by the present survey.



BLACK CLIFF MINES LIMITED
 MAGNETOMETER SURVEY
 OGDEN TOWNSHIP
 FIGURE 4

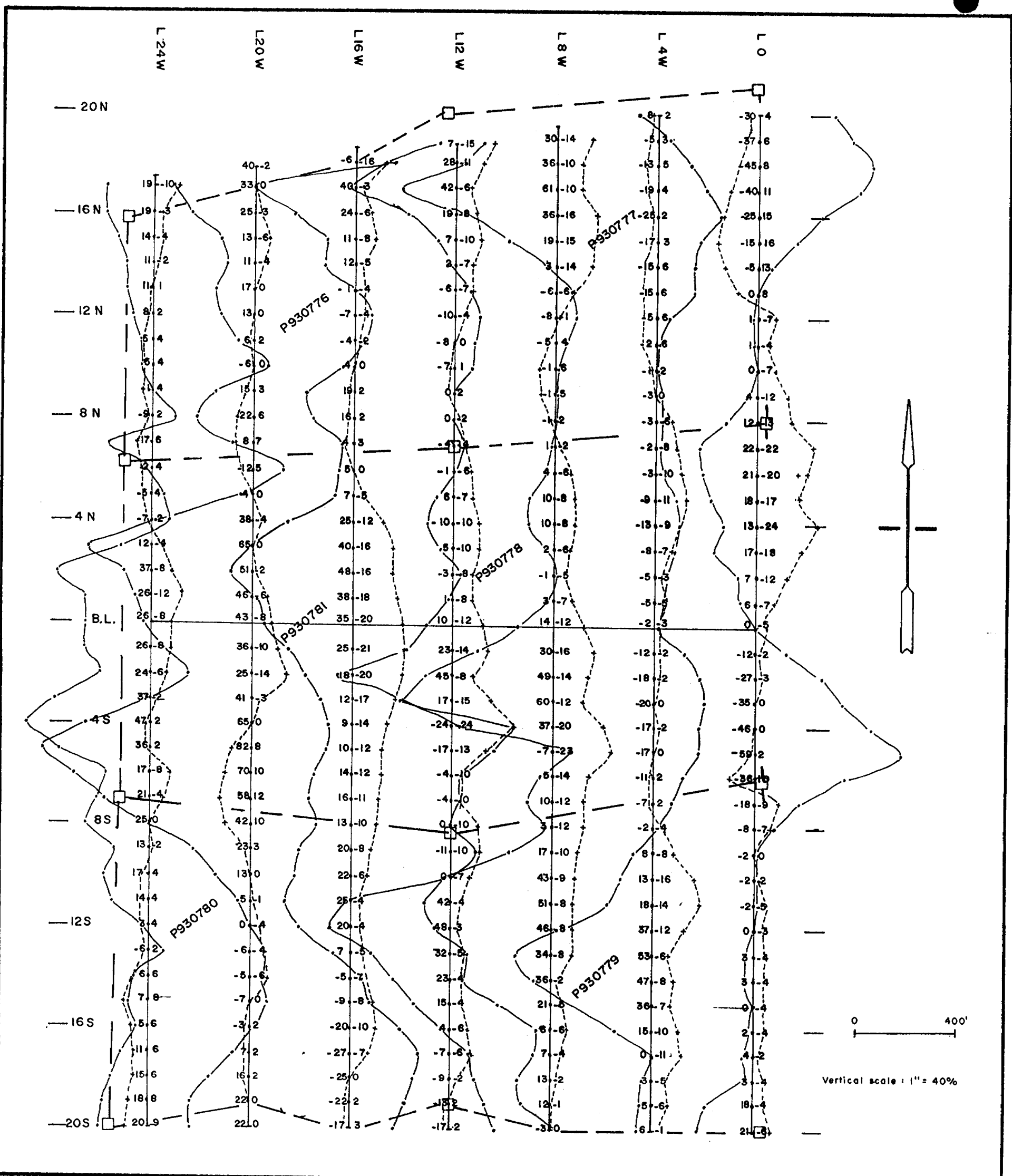
210636



BLACK CLIFF MINES LIMITED
 VLF EM 16 SURVEY
 (FRASER FILTER)
 OGDEN TOWNSHIP

FIGURE 5

210636



BLACK CLIFF MINES LIMITED
 VLF - EM 16 SURVEY
 (NAA CUTLER MAINE)

FIGURE 6

106356

VLF - EM ANOMALY SUMMARY

<u>ANOMALY NO</u>	<u>LENGTH MINIMUM</u>	<u>MAX. VALUE FRASER FILTER</u>	<u>MAGNETIC CORRELATION</u>	<u>COMMENTS</u>
1	200'	77	+ 1218	
2	200'	39	- 172	
3	1,000'	37	+ 73	
4	1,500'	45	--	
5	1,000'	111	+ 51	
6	1,100'	21	+ 20	faulted extension of #3
7	600'	65	+ 75	faulted extension of #5
8	1,100'	81	--	
9	1,100'	33	--	
10	200'	69	+ 35	
11	1,800'	101	+ 700?	faulted extension of #8
12	200'	16	- 150	
13	1,100'	34	+ 652	
14	200'	12	- 627	
15	200'	27	--	extension of #14

CONCLUSIONS AND RECOMMENDATIONS

The survey outlined 15 anomalous areas which should be further investigated. Interpretation of the conductive zones on Figure 5 strongly indicates the presence of N-S fault between line 12 + 00 E and 16 + 00 E.

Prior to evaluating the anomalies as potential drill targets, Black Cliff Mines Limited should complete detailed geological mapping and geophysical surveys. Grid lines at 100' spacing should be established over the target areas and magnetometer and VLF-EM surveys should be conducted at 25' intervals.

Once this data is available, a meaningful decision can be made regarding the anomalies that may require further evaluation by trenching or drilling.

Respectfully submitted

Milan Hlava

Milan Hlava B.Sc., F.G.A.S.

APPENDIX 1

CERTIFICATE

CERTIFICATE

I, Milan Hlava of the City of Timmins, Province of Ontario, Canada and the Town of Surrey, Province of British Columbia, Canada do state:

1. that I am a practising consulting geologist with offices at 24 Pine Street South, P.O. Box 1163, Timmins, Ontario P4N 7H9 and 14746 90A Avenue, Surrey, B.C. V3R 1B2.
2. That I am a graduate of Komensky University, Bratislava, Czechoslovakia (1968) with a degree of Bachelor of Science in Exploration Geology.
3. That I have practised my profession as a Geologist continuously since 1968 and as a Consulting Geologist continuously since 1984.
4. That I am a fellow of the Geological Association of Canada since 1972.
5. That I have no interest directly, indirectly nor anticipated in Black Cliff Mines Limited or the property reported in this report.
6. That I am familiar with the material contained in this report, having examined all the material myself.
7. That the conclusions reached in this report are my own.

Respectfully submitted,

Milan Hlava

Milan Hlava, B.Sc., F.G.A.S.

APPENDIX 2

ONTARIO DEPARTMENT OF NATURAL RESOURCES

ASSESSMENT WORK FORM

#300/87

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 entered umns.



Type of Survey(s) **MAGNETOMETER, VLF EM**

Claim Holder(s) **BLACK CLIFF MINES LIMITED**

Address **67 Yonge St., Suite 1202, Toronto, Ontario M5E 1J8**

Survey Company **Laforest-Hlava Exploration Services Ltd** Date of Survey (from & to) **Day 9, Mo 1, 87** to **Day 15, Mo 1, 87** Total Miles of line Cut **5.57**

Name and Address of Author (of Geo-Technical report) **Milan Hlava, 24 Pine St S., Timmins, Ontario P4N 7H9**

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

Mining Claims Traversed (List in numerical sequence)			Mining Claims Traversed (List in numerical sequence)		
Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
P	930776	60			
	930777	60			
	930778	60			
	930779	60			
	930780	60			
	930781	60			

RECEIVED
8.9.1987
Geochemicals

MINING LANDS SECTION

RECORDED
NOV 30 1987

Expenditures (including stripping)

Performed on Claim(s)

NOV 30 1987

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.

For Office Use Only

Total Days Cr. Recorded **Nov. 30/87** Mining Recorder **[Signature]**

Date Approved as Recorded **360-24 Dec 87** Branch Director **[Signature]**

Date **November 30/87** Recorded Holder or Agent (Signature) **Milan Hlava**

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.

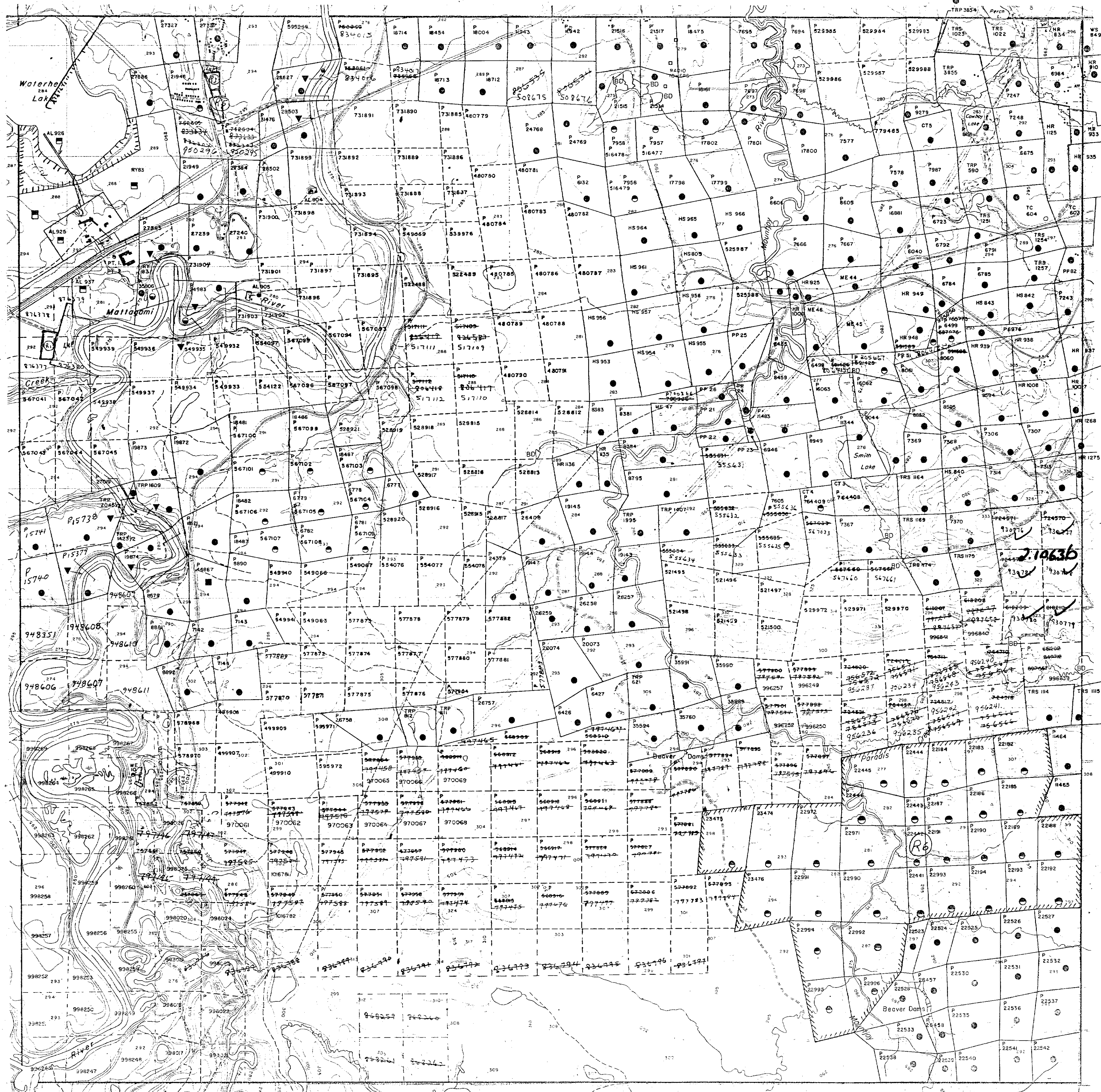
Name and Postal Address of Person Certifying **Milan Hlava, 24 Pine St S Timmins, Ontario P4N 7H9**

Date Certified **November 30/87** Certified by (Signature) **Milan Hlava**

MAP SYMBOLOLOGY

Aerial Cableway	Pipeline (above ground)
Boundary	Railroad
International	Single Track
Distinction	Double Track
Approximate	Abandoned
Lot, Concession	Terrace
Approximate	Road
Part Boundary	Roadway, County
Bridge	Tennessee
Road, Railroad	Access (road of doubtful maintenance or irregular driveway)
Building	Trail, Back Road (Garden alley)
Chimney	Rapids
Cliff, Pit, Pile	Double line river with multiple rapids
Contours	Double line river with multiple rapids
Interpretation	Reservoir
Approximate	River, Stream, Canal
Depression	Approach
Control Points	Access
Horizontal	Direction of flow
Vertical	Rock
Culvert	Impervious
Falls	Shoal
Double line river	Spot Elevation (line elevations)
Fence, Hedge, Wall	Tower
Feature Outline (Construction features, etc.)	Transmission Line
Flooded Land	Pylon
Lock	Pyrene
Marsh or Swamp	Utility Poles
Moat	Wharf, Dock, Pier
Mine Head Frame	Wooded Area
Outcrop	

MOUNTJOY TWP G-3974



BRISTOL TWP G-3998

DELORO TWP G-3993

REFERENCES

L.Q. 6613 "BOOMING GROUNDS" COVERS THE WESTERLY HALF OF THE BED OF THE MATTIGAMI RIVER FLOWING THROUGH THE TOWNSHIP FILE: 73543

- (R1) BONA FIDE APPLICATION UNDER P.L.A. for Surface Rights
- (R3) BONA FIDE APPLICATION UNDER P.L.A. - MAY 9, 1985

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
R2	NRW 5179	21/1/79	S.R.O.	
(R5)	Bona Fide Application	under P.L.A.		Placed June 4, 1985
(R6)		8/08/29	MR	3.13.7

ORDER OF THE MINISTER WITHDRAWS THE MINING RIGHTS PURSUANT TO SECTION 214(2) OF THE MINING ACT R.S.O. 1980

PRICE TWP G-

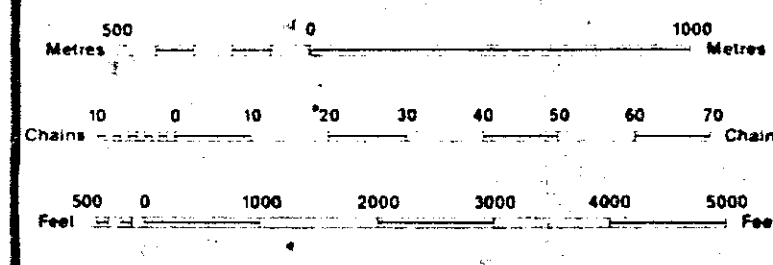
LEGEND

HIGHWAY AND ROUTE No.	
OTHER ROADS	
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

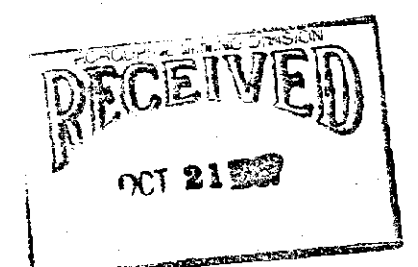
TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" SURFACE RIGHTS ONLY	○
" MINING RIGHTS ONLY	◐
LEASE, SURFACE & MINING RIGHTS	■
" SURFACE RIGHTS ONLY	◼
" MINING RIGHTS ONLY	◑
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	⊙
CANCELLED	⊖
SAND & GRAVEL	⊙

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. 1.



SCALE 1:20 000

NOTES



TOWNSHIP **2.10630**
OGDEN
 M.N.R. ADMINISTRATIVE DISTRICT
TIMMINS
 MINING DIVISION
PORCUPINE
 LAND TITLES / REGISTRY DIVISION
COCHRANE

Ministry of Natural Resources
 Land Management Branch
 Ontario

Date: FEBRUARY, 1984
 Number: **G-3979**

