2.468

Report on an Electromagnetic and Magnetic Geophysical Survey on the Bell Island, Mistinikon Lake Section of the British Matachewan Gold Mines Limited Property Powell Township, Ontario

010

PROPERTY

This survey covers seven unpatended mining claims of the British Matachewan Gold Mines Limited property, Powell Township, Ontario, MR 50440, MR 50439, MR 40068, MR 40071, MR 40067, MR 269340, and MR 267339.

LOCATION AND ACCESSIBILITY

This group of claims lies at the northern end of Bell Island in Mistinikon Lake of the West Branch of the Montreal River, Powell Township, Ontario. The property is accessible by gravel highway 2 1/2 miles north of the Town of Matachewan, thence 2 miles by summer road to Mistinikon Lake at a point approximately 1/2 mile south of the south boundary of the group.

TOPOGRAPHY

Sixty-five percent of the group is water covered by the west branch of the Montreal River. The shorelines and the northern end of Bell Island comprising the other thirty-five percent of the group have relief of 100 to 200 feet predominated by north-south tending outcropping scarps. The forest cover is predominantly spruce and balsam with the exception of a 20-acre stand of birch near the grid baseline between 4+00E and 14+00E.

GEOLOGY

The property is in general underlain by 200' to 1000' thickness of cobalt sediments which dip shallowly to the west and are cut by a major

north-south fault underlying the lake on the west side of Bell Island. Temiskaming volcanics underlie the cobalt sediments and are exposed at the north extreme of the group.

HISTORY

This group has had limited prospecting only. A minor magnetic reconnaissance survey was also carried out by J. Sherriff in the summer of 1970. The area is included in airborne magnetic map 287G (Matachewan Sheet) 41 - P/15.

PRESENT WORK

From December 20 to 23 inclusive, 1970, a reconnaissance geophysical orientation survey was carried out with Scintrex SE 71 (Turam type) electromagnetic and MFI fluxgate magnetic instruments to determine a suitable direction to cut the geophysical survey grid, and to determine the dip direction of conductors, if encountered. From December 28 to January 10, approximately 2 1/2 miles of line were cut on Bell Island by Jim Johnson and Mervin King hampered by rough topography on the island and adverse slush conditions on the lake. Grid chaining on the island and onto the lake was completed by Jacques Robert and Oliver Simard, January 16 to 23, again hampered by adverse slush conditions. Ten miles of geophysical surveying with Scintrex SE71 and MF[illegible] were then completed, January 24 to February 10 inclusive, by J. Ward and Jacques Robert. Some operating difficulties were encountered with the SE71 motor generator when temperatures were sub -20° below zero, but these were avoidable by keeping the motor generator in a heated enclosure at the survey site.

TECHNICAL DESCRIPTION SURVEY METHODS

(a) Scintrex SE71 Electromagnetic Method - (Serial # 009114

The Scintrex SE71 electromagnetic survey method is essentially similar to the Swedish Turam method. A large single turn loop of #18 HF insulated copper wire of dimensions in the order of 1/2 mile square is energized by a motor generator unit producing approximately 1.5 amperes signals of either 200 H_z, 400 H_z, or 800 H_z. Two receivers joined by a 100-foot reference cable traverse outside of the transmitter loop up to distances of approximately 1/2 mile from the near side of the transmitter loop. The ratio of the signal strengths and phase difference in degrees between the two receivers is measured at each station. The ratios of signal strength between the two receivers are then compared with the ratios expected by theoretical calculation from the transmitters loop size and geometry (i.e. the signals in the receiver nearer the transmitter loop will be stronger by a predictable amount). The deviation of the ratio of the signal strengths read compared to the ratios of the signal strengths expected is then expressed in % ratio and recorded on the survey map midway between the receiver locations. The phase difference is recorded in degrees phase. The % ratios were read to the nearest 1/2% ratio and the phase difference to the nearest 0.1 degree phase.

The SE71 and Turam methods are superior in their depth of survey abilities due to their large transmitter receiver separation, low frequency signals used, smallness of errors in signal strength ratios in rugged terrain, and very high accuracy in out-of-phase measurements.

(b) Sharpe MF1 Fluxgate Magnetometer - (Serial # 906472

The MF1 fluxgate magnetometer measures the vertical magnetic field

variations directly in gammas. Reading divisions are at 20 gamma intervals on the sensitive range (0 - 1000 gammas) used and were read to the nearest 10 gammas. Readings were reduced to a standard datum by correcting for instrument drift at base and tie in stations.

GEOPHYSICAL INTERPRETATION

(a) A weakly mineralized shear zone striking N60°W through claims 267340 and 267339 is interpreted as topping 300 feet subsurface and therefore probably lying in the volcanics capped by the cobalt sediments. The strongest conductivity (10 mhos conductivity width) lies between L11E and L17E with an indicated thickness of 100' and a steeply north dip (65° ± 20°). Vertical coil EM checkwork gave less than 2 degrees peak to peak crossover response consistent with the 300-foot depth below surface to the top of the conductor. Probable mineralization associated with conductivities of the order indicated for this conductive zone is roughly 5% sulphides by volume or minor graphitic shearing.

(b) A second conductive zone striking N20°W through claims 40067 and 40068 is enhanced by good coupling with the east side of the transmitter loop in claims 40066 and 39022. This is a probable shear zone in the cobalt sediments and may be expected to be an extension of the metallic lustre graphite zone encountered in previous drilling by J. Sherriff on the west flank of a mineralized carbonate shear zone immediately to the south of the group.

(c) The Mistinikon Lake fault under the river on the west side of Bell Island also has an enhanced anomaly due to good coupling with a side

of transmitter loop, this time in claim 298185. East-west detailed SE71 electromagnetic traverses (see fig.10) show that virtually all electromagnetic response on line OE is due to traversing the fault anomaly at sub-parallel angles. East-west reconnaissance traverses were read across the fault anomaly at several locations as far as a mile to the south of the group. Depth to top of conductive zone in Mistinikon Fault is indicated at less than 50 feet. The conductivity of the fault mineralization is traceable over the entire length tested but is strongest in the section from the baseline 00 south for 3/4 of a mile. Magnetic detailing indicated a possible magnetic correlation of less than 20 gammas with the more conductive sections of the Mistinikon Fault.

(d) A very weak shallow dipping conductor strikes northwest-southeast through the northeast corner of claim number 50439. It is expected to outcrop in the area 275' west of the #1 post of 50439. Direct negative magnetic correlation of approximately 200 gammas suggests high temperature metamorphism accompanied the formation or emplacement of minor mineralization in an accommodating stratagraphic horizon of the cobalt sediments. Mineralization indicated by the conductivity, if caused by sulphides, is characteristic of roughly 2% sulphides by volume.

(e) A conductor of indicated 10 mhos conductivity width and probable thickness of 150 feet was detected on the west boundary of claim 50439. Depth to top of this conductor is indicated as 450 feet with dip steeply north and strike north 70° west.

(f) Anomalous conductivity at a depth of roughly 600 feet seems to be indicated in correlation with a 200 gamma magnetic anomaly between Line 8E and L20E approximately 600 feet north of the baseline in claims 50440 and 40068. Anomalous responses from near surface conductors especially shoreline effects and the near surface shear zone at line 20E 4450N, limited traverses with lower frequencies with the transmitter at large distances and the reverse coupling with the transmitter too near the deep conductor make analysis of this possible conductor with present data virtually impossible excepting that it has better conductivity than the near surface conductors.

RECOMMENDATIONS AND CONCLUSIONS

The proposed drill hole spotted for conductor "A" was field located before all data were plotted and was chosen in part for convenient drill platform terrain. It is now recommended that a sub baseline 200' or 300' long be cut from the proposed collar at right angles to the proposed azimuth of drilling and that the collar of the proposed drill hole be re-spotted about 300 feet west of its present location. The respotted hole should be at such a dip so as to intersect the conductive zone at -350'. The new location will then permit more economical testing of a broadening of the zone on Line 8E - 20+00N to 23+00N should a second hole be warranted.

Conductors "B" and "C" require lake traverses with induction loops energizing them in an east-west direction to assess their unenhanced apparent conductivity since limited vertical coil EM testing at 10+00S Line 0 indicated scattered sulphides at best.

Conductor "D" in claim #50439 near #1 post should receive limited prospecting to determine the character of the indicated minor amounts of conductive mineralization.

Conductor "E" investigation should be considered only in the light of the findings of conductor "A".

Conductor "F" requires further 200H_z detailing to reduce the response from near surface conductors. The near side of the transmitter loop should be ideally at approximately 10+00S in order to avoid reverse coupling by being too near the deep conductor and, of course, still within the limited range of readability of the 200 H_z signal.

Respectfully submitted,

Toronto, Ontario
April 30, 1971

J. T. Ward, P.Eng.

ASSESSMENT WORK DETAILS

41P15NE8292 2.468 POWELL

900

Type of Survey MAGNETIC GEOPHYSICAL
A separate form is required for each type of sur

Township or Area POWELL

Chief Line Cutter or Contractor
JIM JOHNSON
Name
MATACHEWAN ONT
Address

Party Chief JOHN T WARD
Name
9 WILLAMERE DRIVE SCARBOROUGH
Address

Consultant JOHN T. WARD
Name
9 WILLAMERE DRIVE SCARBOROUGH
Address

Geological field mapping by
Name
Address

COVERING DATES

Line Cutting Dec 28/70 Jan 23/71

Field Jan 24/71 Feb 6/71
Instrument work, geological mapping, sampling etc.

Office Feb 13/71 April 30/71

INSTRUMENT DATA

Make, Model and Type SHARPE MF1 FLUXGATE

Scale Constant or Sensitivity 20 GAMMAS PER DIVISION
Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count

Number of Stations Within Claim Group

Number of Readings Within Claim Group 609

Number of Miles of Line cut Within Claim Group 10

Number of Samples Collected Within Claim Group

CREDITS REQUESTED

	20 DAYS per claim	40 DAYS per claim	----- Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☐	☑	Show Check ✓
Geochemical Survey	☐	☐	

DATE June 16/71 SIGNED John T. Ward

MINING CLAIMS TRAVERSED
List numerically

40067
40068
40071
50439, 50440
ONE HALF OF 267339
267340

RECEIVED
JUN 23 1971
PROJECTS SECTION

expired L-267339 no days allow

TOTAL CLAIMS 6½

If space insufficient, attach list

Send in Duplicate to:

FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES &
NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS

AS ASSESSMENT WORK

In order to simplify the filing of geological, geochemical and ground geophysical surveys for assessment work, the Minister has approved the following procedure under Section 84 (8a) of the Ontario Mining Act. This special provision does not apply to airborne geophysical surveys.

If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.). It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

SE 71 ELECTROMAGNETIC SURVEY INTERPRETATION

SCALE: 1" = 400'

FEB.-1971

267340

Weakly Mineralized Shear Zone
10 MHOS Conductivity Width
100 ft. Width - Top - 300 ft.
Dip - Steeply to North

Proposed D. D. Hole

Disseminated Mineralization

267339

A N

MISTINIKON CONDUCTOR 'A'

Weakly Mineralized Shear Zone

Fault

50440

LAKE

Deep Magnetic Conductor
Dip - Steeply to North

Deep Magnetic Conductor

40068

CONDUCTOR 'F'

BASE LINE

10 MHOS Conductivity Width
150 ft. Width - Top - 450 ft.
Dip - Steeply to North

COND. 'E'

298187

CONDUCTOR 'D'

Outcrop Area

Weak Surface Conductor
Dip - 100 West or Shallower
Weakly Negatively Magnetic

Probable Shear Zone
Weakly Negatively Magnetic

CONDUCTOR 'B'

40067

Fault

Weakly Mineralized Very Weakly Magnetic

COND. 'C'

50439

40071

Probable Weakly Negatively Shear Zone Magnetic

L-0

298185

L-20E

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J. T. WARD
PROVINCE OF ONTARIO

FIG. #11

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

RECONNAISSANCE FLUXGATE MAGNETIC SURVEY

SCALE: 1" = 400'

DEC. - 1970

L-13E

L-17E

L-21E

L-25E

267339

40068

BELL ISLAND

MISTINIKON LAKE

A. N.

LEGEND

Contour interval in gammas

- 0 to 500 Gamma contour interval
- 600 " " "
- 700 " " "
- 800 " " "
- 1000 " " "
- Mag low

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J. T. WARD
PROVINCE OF ONTARIO

Fig. #1

FIG. 8

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

200Hz SE 71 ELECTROMAGNETIC DETAIL

SCALE: 1"= 400'

FEB. - 1971

MISTINIKON LAKE

Proposed D. D. Hole

267339

40068

Northern Loop Source on Baseline 0

Southern Loop Source 2800' S. of Baseline 0

BASE LINE

L-0

L-20 E

LEGEND

In Phase	Out of Phase
Per cent	Degrees
2·0	0·8

A. N.

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John T. Ward
PROVINCE OF ONTARIO

FIG. #8

FIG. 9

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

800 Hz SE 71 ELECTROMAGNETIC DETAIL

SCALE : 1" = 400'

FEB. - 1971

MISTINIKON LAKE

Proposed D. D. Hole

267339

40068

BASE LINE

Southern Loop Source 2800' S. of Baseline 0

L-0

L-20 E

In Phase (Per cent)	Out of Phase (Degrees)
-1·5	2·7
-0·5	2·2
2·5	-0·6
2·5	-1·3
4·0	-2·1
4·5	-3·5
13·5	-10·0
5·0	-3·3
2·5	-1·3
0	-0·3
-3·0	3·7

LEGEND

2·0 | 0·8

A. N.

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FIG #9

FIG. 10

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

400 Hz SE 71 ELECTROMAGNETIC SURVEY
EAST-WEST DETAIL TRAVERSING

SCALE: 1" = 400'

FEB. - 1971

LEGEND

Out of Phase
Degrees
-10 -24
-30 -10
In Phase
Per cent

—— Conductor Axis

MISTINIKON LAKE

50440

BASE LINE

50439

40071

298185

L-0

L-20E

A. N.

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J.T. WARD
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FIG #10

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

RECONNAISSANCE 800 Hz ELECTROMAGNETIC SURVEY

SCALE: 1" = 400'

DEC. - 1970

L-13E

L-17E

L-21E

L-25E

267339

40068

A. N.

BELL ISLAND

MISTINIKON LAKE

TRANSMITTER LOOP

LEGEND

In Phase Per Cent	Out of Phase Degrees
1" = 20%	1" = 10°

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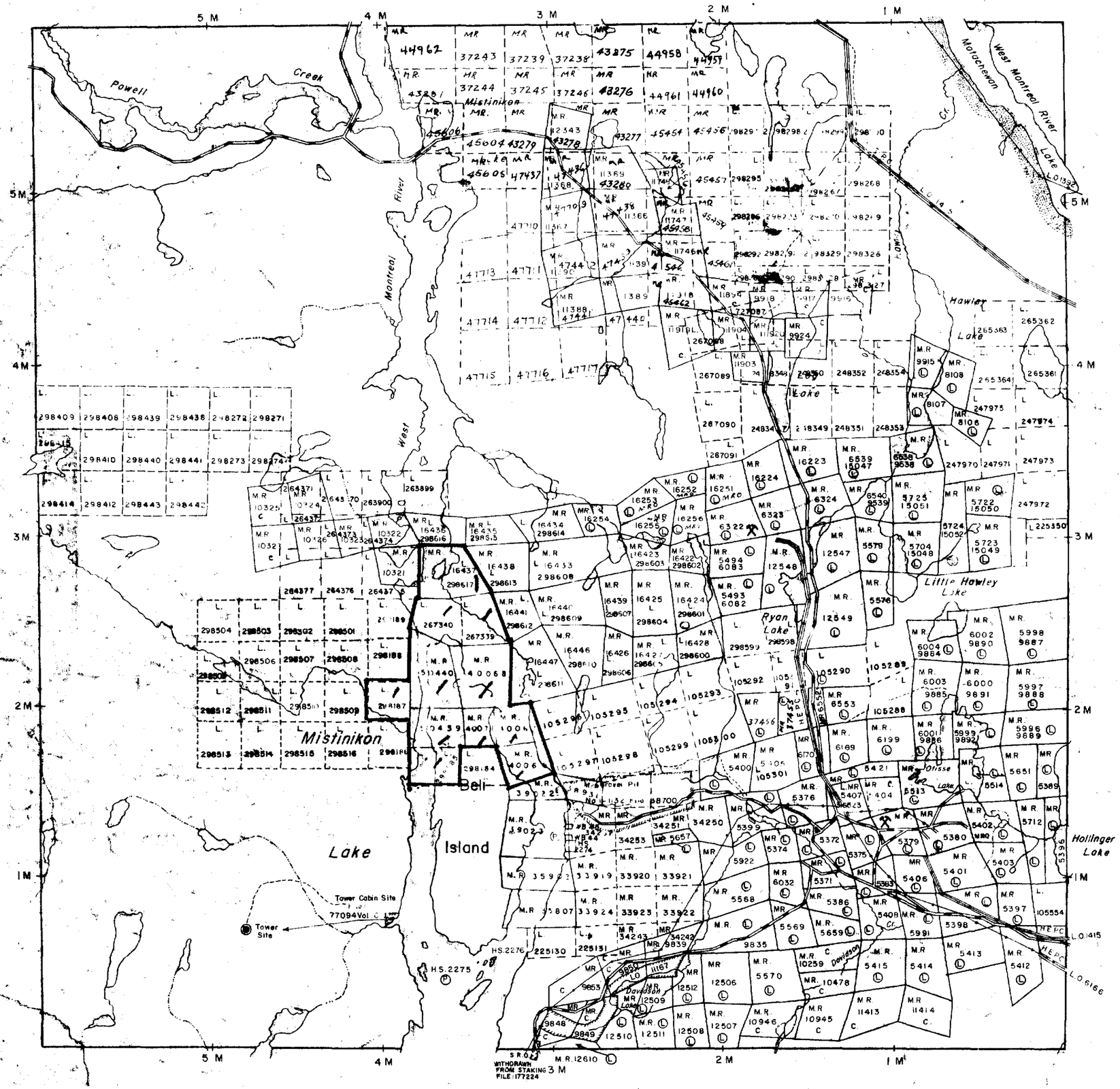
FIG #3

Baden Twp. (M.205)

Bannockburn Twp. (M.207)

Cairo Twp. (M. 210)

Yarrow Twp. (M.260)



THE TOWNSHIP OF

POWELL

Claim Map

DISTRICT OF TIMISKAMING

LAFDER 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.

NOTES

PART OF THIS TWP LYING SOUTH AND WEST OF THE MATACHEWAN LAKE WITHIN THE TIMAGAMI PROVINCIAL FOREST.

400' Surface Rights Reservation Around All Lakes & Rivers.

L.O. 7601 Covers Flooding Rights In This Twp To Below Contour 870'.00 To H E P C. File: 12290 Vol. 2.

L.O. 11167 Shown thus: —— File 90970

2.468

PLAN NO. M.241

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

41P15NE8292 2.468 POWELL

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

FLUXGATE VERTICAL FIELD MAGNETOMETER SURVEY

SCALE: 1" = 400'

FEB. -1971

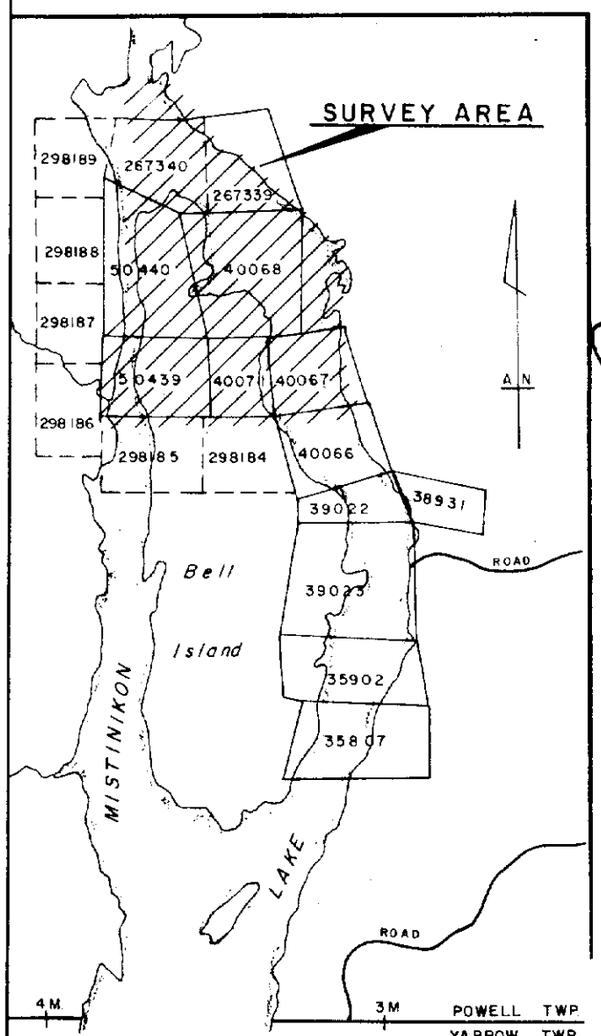
L-4W L-00 L-4E L-8E L-12E L-14E L-16E L-20E L-22E L-24E L-28E L-30+50E L-31E L-34E L-8W

TIE LINE

BASE LINE

Proposed D.D. Hole

A. N.



KEY MAP

SCALE 1" = 2640'

LEGEND

Contour interval in gammas

- 0 to 500 Gamma contour interval
- 600 " " "
- 700 " " "
- 800 " " "
- 1000 " " "
- 1500 " " "
- 2000 " " "

Mag low

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41P15NE8292 2.468 POWELL

210

FIG. #2

BRITISH MATACHEWAN GOLD MINES LTD.

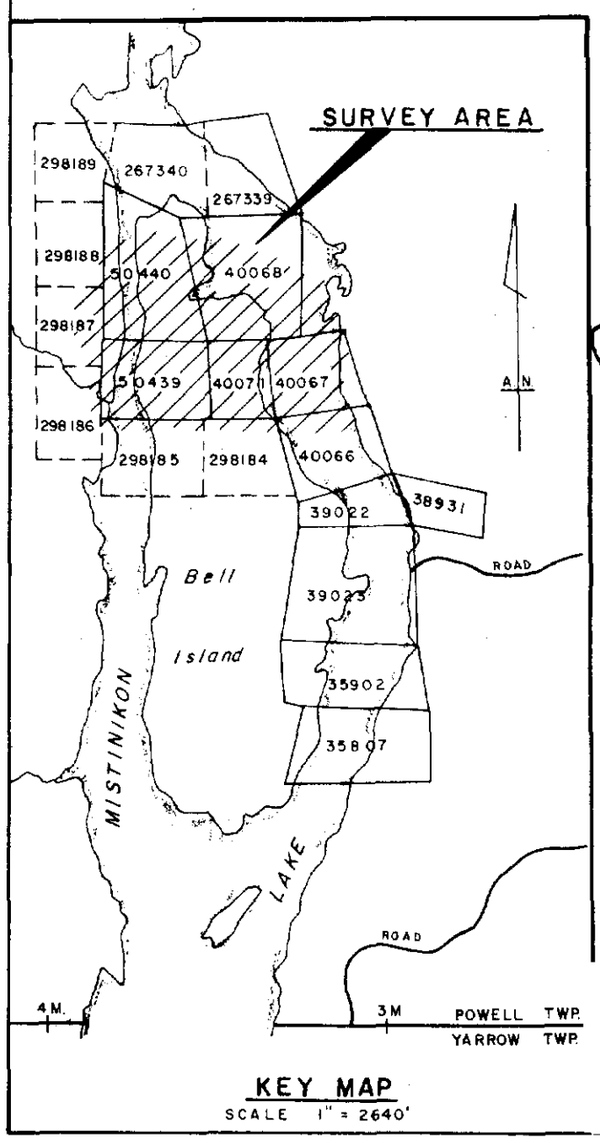
POWELL TWP., ONTARIO

400 Hz ELECTROMAGNETIC SURVEY
SOUTHERN TRANSMITTER LOOP

SCALE: 1" = 400'

FEB.-1971

L-4W
L-00
L-4E
L-8E
L-12E
L-14E
L-16E
L-20E
L-22E
L-24E
L-28E
L-30+50E
L-31E
L-34E
L-8W
TIE LINE
BASE LINE
A. N.



KEY MAP

SCALE 1" = 2640'

TRANSMITTER LOOP

LEGEND

'In Phase' Contours

1%
2%
4%
6%

In Phase Out of Phase

Per cent | Degrees

2·0 | 0·8

41P15NE8292 2.468 POWELL

220

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FIG. #4

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

400 Hz SE 71 ELECTROMAGNETIC SURVEY

SOUTHERN TRANSMITTER LOOP

SCALE: 1" = 400'

FEB. - 1971

L-4W L-00 L-4E L-8E L-12E L-14E L-16E L-20E L-22E L-24E L-28E L-30+50E L-31E L-34E

298189 267340 267339

298188 50440 40068

298187 50439 40071 40067 40066

298186 298185 298184

39022 38931 39023 35902 35807

L-8W

TIE LINE

BASE LINE

TRANSMITTER LOOP

MISTINIKON LAKE

BELL ISLAND

ROAD

A. N.

KEY MAP

SCALE 1" = 2640'

SURVEY AREA

4M. 3M POWELL TWP. YARROW TWP.

LEGEND

'Out of Phase' Contours

1 Degree

2 "

4 "

6 "

8 "

J. T. WARD

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41P15NE8292 2.468 POWELL

Fig. #5

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

400 Hz SE 71 ELECTROMAGNETIC SURVEY

NORTHERN TRANSMITTER LOOP

SCALE: 1" = 400'

FEB. - 1971

L-4W L-00 L-4E L-8E L-12E L-14E L-16E L-20E L-22E L-24E L-28E L-30+50E L-31E L-34E

298189 298188 298187 267340 267339 Proposed D.D. Hole 50440 40068 40066 50439 40071 40067 298185 298184

TIE LINE

BASE LINE

L-8 W

A. N.

MISTINIKON LAKE

BELL ISLAND

TRANSMITTER LOOP

KEY MAP

SCALE: 1" = 2640'

SURVEY AREA

298189 267340 267339 298188 50440 40068 298187 50439 40071 40067 298186 298185 298184 40066 39022 38931 39023 35902 35807

Bell Island

MISTINIKON LAKE

ROAD ROAD

4M. 3M POWELL TW YARROW TWI

A.N.

LEGEND

'In Phase' Contours

1%
2%
4%
6%

In Phase Out of Phase

Per cent | Degrees

2·0 | 0·8

REGISTERED PROFESSIONAL ENGINEER J. T. WARD PROVINCE OF ONTARIO

41P15NE8292 2.468 POWELL

FIG. #6

BRITISH MATACHEWAN GOLD MINES LTD.

POWELL TWP., ONTARIO

400 Hz SE 71 ELECTROMAGNETIC SURVEY

NORTHERN TRANSMITTER LOOP

SCALE: 1" = 400'

FEB. -1971

L-4W L-00 L-4E L-8E L-12E L-14E L-16E L-20E L-22E L-24E L-28E L-30+50E L-31E L-34E

298189 267340 267339 Proposed D.D. Hole

298188 50440 40068

298187 50439 40071 40067

298186 298185 298184 40066 39022 38931 39023 35902 35807 40066

TIE LINE

BASE LINE

L-8 W

TRANSMITTER LOOP

ROAD

Bell Island

MISTINIKON LAKE

BELL ISLAND

A N

LEGEND

'Out of Phase' Contours

- 1 Degree
- 2 "
- 4 "
- 6 "
- 8 "

KEY MAP

SCALE 1" = 2640'

SURVEY AREA

4M 3M POWELL TWP. YARROW TWP.

REGISTERED PROFESSIONAL ENGINEER J.T. WARD PROVINCE OF ONTARIO

41P15NE8292 2.468 POWELL

250

FIG #7