A GEOPHYSICAL REPORT
ON
A COMBINED GROUND MAGNETIC
AND
ELECTROMAGNETIC SURVEY
FOR
MENORAH MINES LIMITED

By
Kenting Earth Sciences
Toronto, Canada
April , 1970

1. INTRODUCTION

1.1 General

This report is based upon a combined magnetic and electromagnetic survey conducted in the Nighthawk Lake area near Timmins, Ontario, by Kenting Earth Sciences for Menorah Mines Limited. The survey involved both reconnaissance and detail surveying.

The field work was performed during the period of March 30th to April 8th, 1970 by a crew comprising a geophysicist, senior operator and helper. Instruments used were a Jalander flux-gate magnetometer and a Sharpe S.E.-300 electromagnetic unit.

The purpose of the survey was to outline possible conductive zones within the bedrock.

1.2 The Property

The property is located in the southwest portion of Nighthawk Lake. Portions of the property are on well drained land but a majority of the area is water covered, necessitating a winter survey. Access to the property is best by aeroplane but there are numerous bush trails passable by snowmobiles in winter.

1.3 Geology

The geology of the area has been described in the map by the Ontario Department of Mines, Preliminary Map No. P. 356, Carman Township. The area is underlain by Keewatin volcanics and Iron formation which were intruded by a quartz-feldspar porphyry, probably Algoman in age. Up to ninety feet of overburden covers the area. Varved clays were observed on a cliff face on the shoreline in the north-west portion of the property.

Three holes have been drilled on the property and each indicate the presence of Iron formation and graphite.

2. MAGNETIC SURVEY

2.1 Survey Specifications

Measurements of vertical magnetic intensity were to be taken every 100 feet on lines spaced 400 feet apart and on a smaller grid, lines 200 feet apart, with a Jalander flux-gate magnetometer. The readings were to be corrected for diurnal variation.

2.2 Field Procedure

The survey was carried out according to specifications. A base station was established and all readings referenced to it.

A network of secondary base stations were established at various convenient locations in the survey area. The survey loop accomplished in a series of traverse loops. Each loop initiated and terminated at a base station, no loop lasting more than two hours.

2.3 Presentation of Results

The results of the magnetic survey have been presented as a contour map, Drawing 2, at a scale of 1 inch = 400 feet. The basic contour interval is 50 gammas and is expanded to 1,000 gammas over anomalous areas.

The detailed grid is given separately and the results from the large grid do not incorporate the detail grid readings.

3. ELECTROMAGNETIC SURVEY

3.1 Survey Specifications

Measurements of the dip angle were to be taken at 100-foot intervals along lines 400 feet apart. Due to the depth of overburden, a frequency of 400 c.p.s. was used throughout the survey.

3.2 Field Procedure

The electromagnetic survey was carried out according to specifications using the Broadside technique and instrumentation as outlined in Appendix I. The convention for the dip angle results was that of north dip being positive and as south dip being negative. Separation of transmitter and receiver was 400 feet.

3.3 Presentation of Results

The results are presented on Drawing 1, at a scale of 1 inch = 400 feet. A vertical scale of 1 inch = 10 degrees was used for the main grid and 1 inch = 12 degrees for the detailed grid. Transmitter positions for each line are also given.

4. INTERPRETATION

4.1 Electromagnetic Survey

There appears to be only one good indication of the presence of a buried conductor throughout the entire surveyed areas. This indication occurs immediately south-east of the detailed grid and the strike of the conductor is given on Drawing 1. The strongest cross-over is on line 0 + 00 at 3 south on the large grid. On lines 4 + 00W, 4 + 00E and 8 + 00E there are good cross-overs.

A close examination of the small grid also reveals the cross-over likely occurs to the southeast. Lines 6 + 00E and 10 + 00E have not yet reached the cross-over point.

The strike of the peak of the magnetic anomaly and strike of the cross-overs are offset because the cross-overs occur vertically above the top of a dipping conductor; but, the maximum vertical magnetic field is offset from the strike of the top of a dipping body. The shape of the cross-over curves indicates the possibility that the conductor is near vertically oriented.

The remaining cross-overs are considered to be within the range of noise and are not considered to indicate subsurface conductors.

4.2 Magnetic Survey

There are two main features revealed by magnetics. One is the anomaly associated with the detailed grid and the other is a sudden increase in the magnetic field in the extreme south of the claim block. Two other smaller features are also to be noted.

The anomaly associated with the detailed grid is the most prominent and indicates, very likely, a body dipping steeply to the southeast. The southeast flank of the anomaly was missed by the detailed grid. An anomaly of moderate relief and small areal extent at the base line on line 16 + 00E may be an offset of the above anomaly.

The small anomaly at the north end of line 24 + 00E is probably due to the appearance of basic volcanics and intrusives as outcrop to the northeast. There is not enough information to make a firm interpretation of this anomaly.

The sudden increase in the south of the area could indicate a contact with another rock type or a broad shear zone or most likely, a combination of both.

5. SUMMARY AND CONCLUSIONS

Only one good conductor was located in the survey area and its presence was indicated in both surveys. Perhaps a new grid extending farther southeast could be set up and surveyed if more detailed information is desired.

Respectfully submitted,

Kenting Earth Sciences,

J. B. Henry, B.Sc., (Eng.)
Geophysicist.

Frank L. Jagodits, P. Eng.
Senior Geophysicist.

SHARPE S.E.-300 E.M.

Introduction

The Sharpe S.E.-300 is a lightweight and highly portable electromagnetic instrument. Each unit comprises a coil, transmitter and receiver. A special feature of each unit is that it can be used in the transmitting and receiving mode. There are two transmitting modes; 400 c.p.s. and 1,600 c.p.s.

Instrumentation

Coil The coil is approximately eighteen inches in diameter and weighs eight and one-half pounds. It is connected to the receiver by means of a cable. Built into the coil is a clinometer which can measure ± 40 degrees and may be rotated, by increments of 90 degrees, to facilitate dip measurement in any configuration. When using the coil in the transmitting mode, a button on the coil is depressed and a steady beep is heard through the earphones.

Transmitter

The transmitter is carried on the back and weighs approximately twenty pounds. The transmitter is connected to the receiver by a cable and is powered by two six volt batteries in series.

Receiver

The receiver is attached to a web belt and worn around the waist. The weight of the receiver is two pounds. There are three dials on the receiver to control; mode and frequency, volume, and squelch. The mode and frequency dial are set on the frequency being used, whether the instrument is transmitting or receiving. This dial is also used to switch off the instrument. The squelch dial is adjusted while in the field such that the minimum noise is heard in order to hear a maximum signal.

Headphones are connected to the receiver and the volume dial is adjusted for optimum clarity.

Field Procedure

Introduction

All field procedures employ the "null" method whereby only the minimum signal is used to designate dip angle. The direction of dip is measured either north or south; east or west, depending upon direction of traverse.

Three configurations can be used and these are described as configuration A, B or C. See Figure I. In configuration A, the transmitting coil is held with its plane vertical and directed toward the receiving coil, whose plane is initially held horizontally. This configuration is best for reconnaissance and detail work, gives a minimum response to flat lying conductors and is not affected by elevation differences.

In configuration B, the plane of the transmitting coil is held vertically with the axis of the coil pointed toward the receiver. The receiver is rotated out of the horizontal plane. This configuration is better for flat lying conductors, but is affected by overburden and elevation differences.

The transmitting coil is held horizontally in configuration C. The plane of the receiver is held vertically and rotated about a horizontal and vertical axis. These two measurements result in a "dip" and "strike" angle. This configuration is also affected by overburden and elevation differences.

Reconnaissance Techniques

The purpose of reconnaissance is to obtain the most information in a minimum time with the least expenditure. In reconning an area, each man moves to his respective station, transmits and receives on each or one of the frequencies. In this way an entire area can be covered such that no anomalies are missed.

Broadside or Parallel Line Method

With this method, each man moves on a separate line such that they are on the same station number on his respective line. One man transmits first and after the other man records the angle, their roles are reversed. This completed, each man moves on to the next station and repeats the procedure.

Configuration A is used and either or both frequencies can be employed. The high frequency is preferable as the dip angles tend to be higher than those for low frequency.

In the final map, the position of the transmitter is usually marked for each line. Traverse lines should be aligned 90 degrees to expected strike.

In-Line Method

For general reconnaissance along roads, trails or creek-beds, the in-line method is employed. Each man advances along the line and are separated by a fixed distance; stations usually read every one hundred feet. Configuration A is used over configuration B and the direction of traverse should be approximately 30 degrees to 45 degrees to the expected strike. Again, both or one frequency can be used.

One Man Search Method

Configuration C is used in this method. The transmitting coil is laid on the ground with the transmitting button taped in the on position. At each station the dip and strike angles are noted. The high frequency is used and stations taken within range of the transmitting coil. This method is very susceptible to overburden and elevation differences.

Detail Technique

Once the anomalies have been found from the reconnaissance survey, a detail survey is performed to pinpoint the extent of the anomaly. Configuration A is used on both frequencies.

The transmitter is located on the trace of the conductor and remains at that position. The receiver is moved several hundred feet on both sides of the anomaly, reading taken every fifty or one hundred feet. The transmitter location is usually situated at either end of the conductor. Using this technique a definite outline of the anomaly is obtained.

ADDENDUM

A magnetic and electromagnetic survey was performed by Kenting Earth Sciences on claims P-101625, P-101626, P-101627, P-101628, P-101629, P-101630, P-101631, P-101632, P-101633, P-101634, P-101635, P-101636, P-101637, P-101638, P-101639, P-101640, P-101641, P-101642, P-101643, P-101644, P-101645, P-101646, P-101647, P-101648, P-101649, P-101650 which are held in trust for Menorah Mines Limited by O. E. Smith. The magnetic survey was carried out on March 28 and March 30, and April 3 to 7, 1970 inclusive and the electromagnetic survey between April 1 to April 6, 1970 inclusive.

1,067 See letter 3/2/1971

There were 1,108 magnetic stations and 1,108 electromagnetic stations within the surveyed area. A Sharpe S.E.-300 electromagnetic unit, with a sensitivity of 50 millimicrovolts, and a Jalander fluxgate magnetometer Type 46 - 65, which has an accuracy of 10 gammas on scale 1 and a scale constant of 12.27 on scale 1, were used throughout the survey.

The party chief was J. B. Henry who obtained a Bachelor of Science (Engineering) degree in 1969 and has since been on the staff at Kenting Earth Sciences.

Respectfully

Kenting Earth Sciences

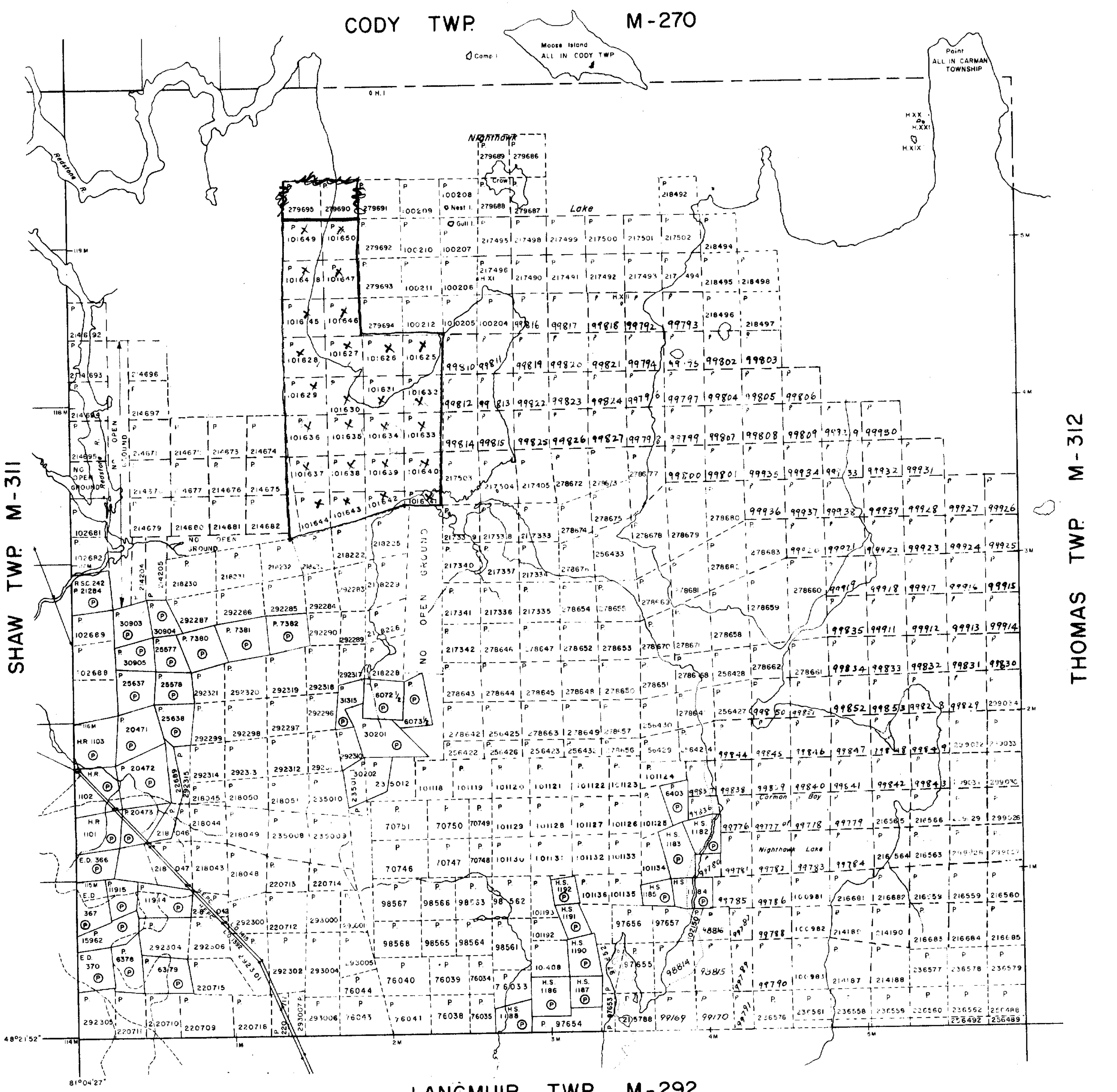
J. B. Henry, B.Sc., (Eng)
Geophysicist

THE TOWNSHIP OF CARMAN

DISTRICT OF COCHRANE

PORCUPINE 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

400' Surface Rights Reservation around all lakes and rivers.

Flooding Rights on Nighthawk Lake to the contour elevation 903.5' reserved to H.E.P.C.

DATE OF ISSUE
DEC 1 1970
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

PLAN NO. M-266

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

42A06NE0269 63.2829 CARMAN

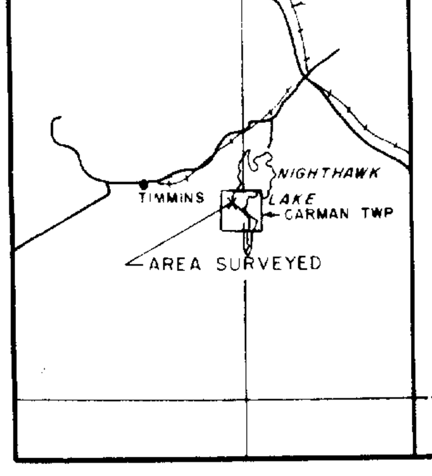
200

N dips E of line

LOCATION MAP

1" = 25 mi.

TRACED FROM ODM Map 2024



42A06NE0269 63.2829 CARMAN

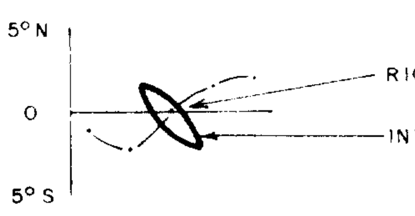
210

LEGEND

INSTRUMENT USED : SHARPE S.E.-300

FREQUENCY : 400 C.P.S

PLOTTING CONVENTION IS : NORTH TILT (POSITIVE)
SOUTH TILT (NEGATIVE)



MENORAH MINES LIMITED

NIGHTHAWK LAKE AREA – ONTARIO

CARMAN TWP., PORCUPINE M.D

VERTICAL LOOP E.M. SURVEY

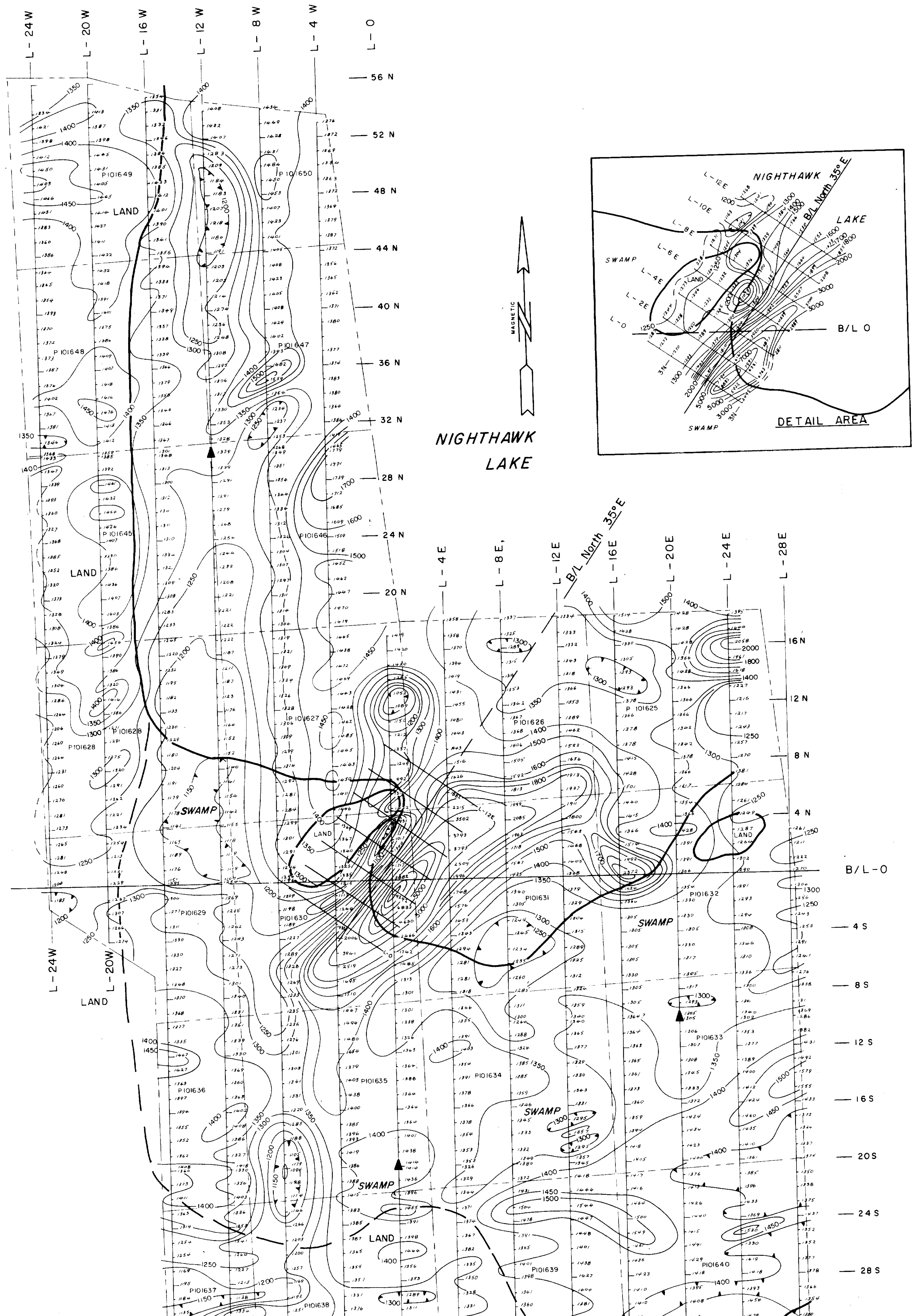
(PROFILES OF RECONNAISSANCE & DETAIL AREA)

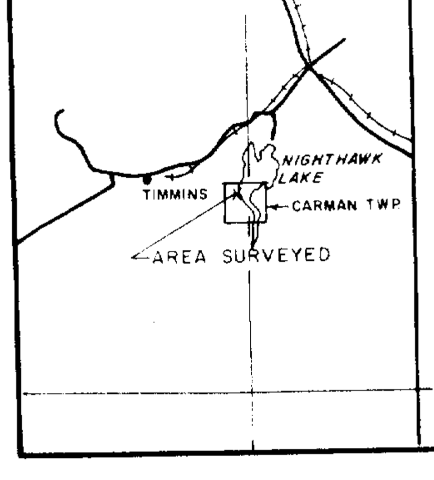
To accompany report by:
J.B. HENRY B.Sc.(Eng.) & F.L. JAGODITS, Dipl.Eng., P.Eng., Geophysicist

JBHenry

KENTING EARTH SCIENCES. TORONTO – CANADA.

SCALE 1 inch = 400 feet.	1" = 10° OF RESULTANT FIELD.
DRAWN V.L.	
DATE April 1970	
JOB Nº PT 1276.	DWG. Nº: 1





MENORAH MINES LIMITED

NIGHTHAWK LAKE AREA – ONTARIO
CARMAN TWP., PORCUPINE M.D.

GROUND MAGNETOMETER SURVEY.

(CONTOURS OF VERTICAL FIELD)
(INSTRUMENT USED: JALANDER.)

To accompany report by:
J.B. HENRY B.Sc.(Eng.) & F.L. JAGODITS, Dipl.Eng., P.Eng., Geophysicist

J.B. Henry

KENTING EARTH SCIENCES. TORONTO – CANADA.

SCALE: 1 inch = 400 feet	CONTOUR INTERVAL 50,100, 1000 GAMMA
DRAWN: E.H.	▲ BASE STATION
DATE: April 1970	
JOB Nº: PT 1276.	DWG. Nº: 2