

2.1675



42A03SE0183 2.1675 ZAVITZ

R E P O R T

010

on

DEC 23 1974

ELECTROMAGNETIC AND MAGNETOMETER SURVEY

PROJECTS UNIT

and

SURFACE GEOLOGICAL WORK

on

ZAVITZ TOWNSHIP PROPERTY

for

VANTAGE MINING CO. INC.

LARDER LAKE MINING DIVISION, ONTARIO

CLAIMS

L-410081 to L-410085

L-354070 to L-354073

JOHN R. BOISSONEAULT, B.Sc., P.Eng.

Geologist, Engineer

November 29, 1974

## INTRODUCTION

During the periods of August 23 to September 25, 1974 and October 3 to October 17, 1974, a geophysical field party executed a radio frequency (VLF) electromagnetic and magnetometer survey on the Zavitz Township property of Vantage Mining Co. Inc. in northeastern Ontario. The field party, consisting of two men, was under the supervision of a professional engineer. Twelve different areas were exposed by drilling and blasting, and sampled during the program. Also, all outcrop were mapped.

The survey grid consisted of north-south picket lines, 300 feet apart, as was previously recommended, a total of 10.3 miles. The location of the grid, relative to the claim boundaries, is shown on Plate 1 on a scale of 1 in. = 400 feet.

The location and description of the property is covered in a previous report entitled "Geological Report on Zavitz Township Property for Vantage Mining Co. Inc.". Almost all the property was covered by the survey; only the creek and a swamp in the northwest corner, was left out. The claims involved are listed on the title page of this report, and all belong to Vantage Mining Co. Inc.

The overburden cover, over most of the property, is quite thin except possibly in the northwestern quarter, probably less than 50 feet, and there are several outcrop in the southern, central and eastern parts of the property.

The land surface is generally low, flat and swampy, sloping gently towards the centre of the claim block which is

crossed by Zavitz Creek, and there are several small rocky hills in the central portion of the property.

A Ronka EM-16 electromagnetic unit was used for the survey and a total of 9.6 miles was covered. The instrument is a sensitive radio receiver, tuned to the frequency of a V.L.F. radio communications station which is used as a transmitter. It measures vertical field components of secondary fields set up in conductive bodies by the primary signal.

Two coils with perpendicular axes, allow the measurement of the mechanical tilt angles of both the inphase and quadrature components of the secondary field. The measurements are expressed in degrees. A transmitting station is selected so that the primary field is approximately at right angles to the strike of the geological structures in the area to be surveyed and approximately parallel to the grid lines. The V.L.F. radio station in Annapolis Maine, was used for this survey (Frequency 17.8 kilocycles per second) with the reading taken facing north. Additional readings were taken in the anomalous areas, using the same instrument orientation.

A Scintrex MF-1, "fluxgate" type magnetometer was used for the magnetometer survey, with readings taken to an accuracy of  $\pm 10$  gamma, every 100 feet along the picket lines. The 'tie in' procedure, used to correct diurnal variation, is included in the appendix. A total of 10.3 miles were covered by the survey. Additional readings were taken at 50 foot intervals in the anomalous areas. This instrument measures the vertical component of the earth's magnetic field, at the point where

the reading is taken.

One of the purposes of the survey, was to detect subsurface concentrations of metallicly conducting mineralization, with anomalous magnetic susceptibility, which might occur beneath the grid covered, and within the range of the instruments. The majority of base metal ore deposits in the Precambrian Shield occur as tabular bodies of "massive sulfides" which are usually distinguishable from the enclosing rocks by their electrical conductivity and magnetic susceptibility. Also, some of the gold bearing ore deposits in the Precambrian Shield, occur as bodies of auriferous pyrite which are sometimes distinguishable from the enclosing rocks by their geophysical characteristics. Another purpose was to discover possible mineralized shear zones containing gold or other metals; these zones are usually conductive at the high frequency employed. The third purpose was to outline the boundaries of geological units using magnetics and surface mapping, and to sample all mineralization for gold.

Unfortunately, anomalous geophysical responses are also caused by features which have little or no commercial significance. These are often undistinguishable from features of interest by the geophysical means employed.

#### DISCUSSION OF MAGNETIC RESULTS:

The magnetic intensity readings and contours are presented on Plate 2. These show three distinct magnetic backgrounds which are the reflections of three different

rock types. A long plateau-like high (800-1300 gammas), consisting of two segments disconnected at line 3 West, crosses the central portion of the property in an approximately east-west direction. This area is underlain by an ultramafic sill remnant, which appears to be displaced by faulting, in the vicinity of line 21 West. This rock type is exposed in one large outcrop at 7 + 00 North between lines 6 West and 9 West.

The areas to the immediate north and south of the intrusive, and in the extreme southern section, have a somewhat lower and less variable magnetic background (down to 280 gammas). These areas are underlain by mafic volcanic rocks which are exposed in several places, notably near the base line between lines 00 and 6 West. Two areas of low flat magnetic relief (280 to 180 gammas) lie to the north and south of the mafic volcanics. These are interpreted as being the result of underlying volcanic rocks of more felsic composition. Rocks of this type (dacitic) are exposed in the northern part of the property, near lines 00 and 3 West, and on line 6 West south of the base line.

The magnetic results seem to indicate an east-west striking fold structure, probably synclinal, with steeply dipping truncated limbs. The ultramafic intrusive would lie along the fold axis in the crest of the fold.

The most interesting magnetic feature is an east-west striking, linear magnetic high, several hundred feet to the north of the base line, between lines 9 West and 6 East. This anomaly of 700-800 gammas, is caused by a body from 150-200

feet wide, and about 1,000 feet long, dipping steeply to the north. Other magnetic features on the property, are of less interest because they are weaker, and are probably caused by changes in lithology in the underlying volcanics.

DISCUSSION OF ELECTROMAGNETIC RESULTS:

The tilt angles of the inphase and outphase (quadrature) components of the vertical secondary field, measured during the survey, are presented as profiles on Plate 3. Examination of these, reveals two zones of anomalous bedrock conductivity in the southeastern quarter of the property. The more important of these anomalies, lies along the southern edge of the previously described magnetic high, striking east-west, about 300 feet north of the base line, between lines 9 West and 6 East. The inphase to outphase ratio of between 3:1 and 4:1, and the shape of the profiles, indicate a zone of moderately strong conduction with a steep northerly dip. The other conductive zone, which is somewhat shorter, lies just south of the base line, between lines 3 West and 9 East, and also has an east-west strike. Inphase to outphase relationships are not as clear, in this case, but seem to indicate a zone of moderate conduction with a steep northerly dip. In this case, however, there is no coinciding magnetic anomaly.

There are several zones of weak conductivity on the property, principally in the south-central section. The characteristics of these, indicate that they are probably caused by overburden conditions, and these are therefore of less interest.

DISCUSSION OF SURFACE EXAMINATIONS:

A series of small pits has been created by drilling and blasting, along and to, the south of the base line between lines 6 West and 00. Fresh surfaces in the mafic volcanics, have been exposed for examination. Here, the rocks have been intensely altered and bleached by the introduction of silica, chlorite and brown iron and possibly magnesium carbonate, into zones of fracturing and shearing. Within this broad alteration zone, distinct quartz-carbonate veining has formed along with disseminations and small streaks of pyrite. Twelve separate areas have been sampled and assayed, yielding traces of gold, copper and nickel. Only one gold assay in excess of 0.05 ounces per ton, was obtained; this was from a small vein, 200 feet south of the base line between lines 3 West and 6 West, near the contact between the mafic volcanic rock and a large felsic dike, which appears to strike north-70°-west.

North of Zavitz creek, at 7+00 North, between lines 9 West and 3 West, are two large outcrop of mafic volcanic rock, showing strong brecciation and alteration. The most westerly outcrop lies on the volcanic-ultramafic contact. The ultramafic rock also shows strong shearing and alteration, and contains background nickel.

CONCLUSIONS AND RECOMMENDATIONS

These surveys conducted on the property, have detected two zones of anomalous electromagnetic conduction, one of them coinciding closely with a magnetic high, north of the base line

between lines 9 West and 6 East. These coinciding anomalies lie within a zone of strong hydrothermal alteration, in a series of mafic volcanic rock. This fact along with the proximity of these anomalies, with the ultramafic contact to the north and interpreted mafic-intermediate volcanic to the south, indicate a prime target for diamond drilling.

It was not possible to trace the zone of low grade gold mineralization, south of the base line. The writer concludes that this was an isolated occurrence, and exploration should not be pursued in this direction, but should instead, be directed toward the geophysical targets.

It is recommended that detail geophysical work, employing the horizontal loop electromagnetic method, should be carried out in the area of interest, in order to better outline the geophysical anomalies and to determine more closely, their characteristics and attitudes. Following this, a diamond drilling program should be planned to test these anomalies for the presence of sulfides, containing nickel and copper, or gold. A total of 1,000 feet of drilling would be required to complete this program, and would cost about ten thousand dollars (\$10,000). Further drilling, of course, would depend upon the results of this preliminary program.

Respectfully submitted,

JRB/lb

November 29, 1974

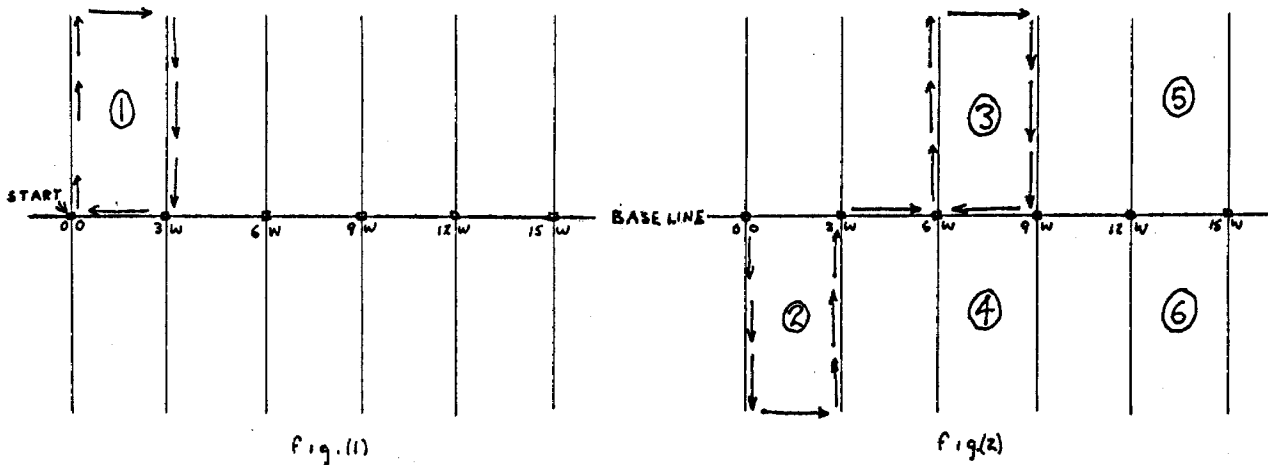
John R. BOISSONNEAU B.Sc., P.Eng.

Geologist & Engineer





## Tie In Procedure to Correct Diurnal Variation



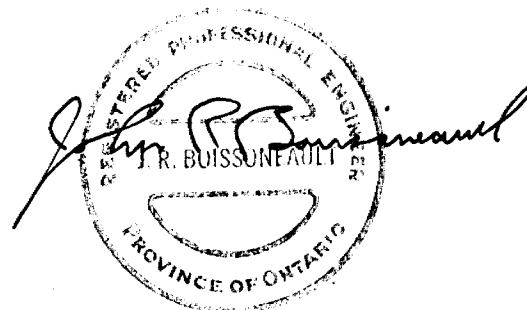
The method used to correct Diurnal Variation is one suggested by D. S. Parasnis (1966) as being "sufficiently accurate for most surveys". It consists of repeating the reading taken at a base station after an interval of less than two hours during which traverses are carried out. Any increase in the repeated reading "d" is divided by the number of readings 'n' and each reading corrected by subtracting  $d/n \cdot x$  (where  $x$  = the ordinal number of the reading). For example, if the diurnal variation was +120 gamma and 60 readings were taken, the correction for the 25th reading =  $-d/n \cdot x$  or  $-120/60 \cdot 25 = -50$  gamma.

In order to extend this over the entire grid, the survey is done in loops (see map), beginning and ending at a base station on the base line and then tying in to the next base station, also on the base line. For example, when loop 1 is completed, base stations 00 and 3W are tied in. When loop 2 is completed, station 6W is tied in and loop 3 is started.

As a further check, when the last loop is completed at 15W, all the base stations are read on the way back. This is done as quickly as possible to minimize the effects of drift.

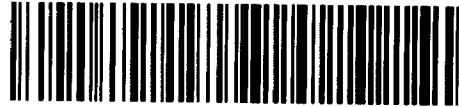
One makes the assumption that the change 'd' occurred at a fairly constant rate, and that the time interval between the readings is relatively constant.

The method allows reasonably accurate corrections, for drift in the instrument due to such factors as temperature changes, as well as, for diurnal variation.





GEOPHYSICAL - GEOLOGIC TECHNICAL DATA



42A03SE0183 2.1675 ZAVITZ

900

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.

PROJECTS UNIT

Type of Survey(s) ELECTROMAGNETIC (RADIOFREQUENCY)

Township or Area ZAVITZ

Claim Holder(s) VANTAGE MINING CO. INC.

67 YONGE ST. SUITE 226, TORONTO, ONT.

Survey Company JOHN R. BOISSONEAULT P. ENG.

Author of Report JOHN R. BOISSONEAULT

Address of Author 670 SPRUCE ST. NORTH, TIMMINS, ONT.

Covering Dates of Survey AUGUST 23 TO OCTOBER 17, 1974  
(linecutting to office)

Total Miles of Line Cut 10.3 MILES

MINING CLAIMS TRAVERSED  
List numerically

- L - 4100.81 (prefix) (number)
- L - 4100.82
- L - 4100.83 <sup>1/3</sup> covered
- L - 4100.84
- L - 4100.85 <sup>1/4</sup>
- L - 354070
- L - 354071
- L - 354072
- L - 354073

If space insufficient, attach list

SPECIAL PROVISIONS  
CREDITS REQUESTED

DAYS  
per claim

- Geophysical
- Electromagnetic 20
- Magnetometer
- Radiometric
- Other
- Geological
- Geochemical

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

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

Magnetometer \_\_\_\_\_ Electromagnetic \_\_\_\_\_ Radiometric \_\_\_\_\_  
(enter days per claim)

DATE: DEC. 11, 1974 SIGNATURE: John R. Boissoneault  
Author of Report or Agent

Res. Geol. \_\_\_\_\_ Qualifications 2.740

Previous Surveys

File No.	Type	Date	Claim Holder
<u>No previous work filed.</u>			
<u>LD</u>			

TOTAL CLAIMS 9

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 506 Number of Readings 506
Station interval 100' Line spacing 300'
Profile scale 1" = 40'
Contour interval

MAGNETIC

Instrument
Accuracy - Scale constant
Diurnal correction method
Base Station check-in interval (hours)
Base Station location and value

ELECTROMAGNETIC

Instrument RONKA E-M 16
Coil configuration ONE HORIZONTAL ONE VERTICAL
Coil separation INFINITY
Accuracy +/- 2%
Method: [X] Fixed transmitter [ ] Shoot back [ ] In line [ ] Parallel line
Frequency 17.8 KILOCYCLES PER SECOND (ANNAPOLIS, MAINE, USA)
Parameters measured VERTICAL COMPONENT OF SECONDARY FIELD - INCLINATION AND QUADRATURE COMPONENT

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



Ministry of Natural Resources

File 2.1675

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.

RECEIVED  
DEC 27 1974  
PROJECTS UNIT

Type of Survey(s) MAGNETOMETER

Township or Area ZAVITZ

Claim Holder(s) VANTAGE MINING CO. INC.

67 YONGE ST., SUITE 226, TORONTO, ONT.

Survey Company JOHN R. BOISSONEAULT P. ENG.

Author of Report JOHN R. BOISSONEAULT

Address of Author 670 SPRUCE ST. NORTH, TIMMINI, ONT.

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List numerically

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- L - 410083 <sup>1/3</sup> not covered
- L - 410084
- L - 410085 <sup>1/4</sup>
- L - 354070
- L - 354071
- L - 354072
- L - 354073

If space insufficient, attach list

*J.R. Boissoneault*

SPECIAL PROVISIONS  
CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

Geophysical

-Electromagnetic

-Magnetometer

-Radiometric

-Other

Geological

Geochemical

DAYS per claim

40

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

Magnetometer \_\_\_\_\_ Electromagnetic \_\_\_\_\_ Radiometric \_\_\_\_\_  
(enter days per claim)

DATE: DECEMBER 11/1974 SIGNATURE: John R. Boissoneault  
Author of Report or Agent

Res. Geol. \_\_\_\_\_ Qualifications 2.740

Previous Surveys

File No.	Type	Date	Claim Holder

TOTAL CLAIMS 9

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 506 Number of Readings 506
Station interval 100' Line spacing 300'
Profile scale -
Contour interval 100 gamma

MAGNETIC

Instrument SHARPE MF-1
Accuracy - Scale constant +/- 10 gamma
Diurnal correction method RETURN TO BASE LINE STATION WITHIN 2 HOURS (SEE REPORT APPENDIX)
Base Station check-in interval (hours) < 2 HOURS
Base Station location and value BASE LINE PICKETS, MAIN BASE STATION AT BASE LINE AT 00 - VALUE: 220 gamma

ELECTROMAGNETIC

Instrument
Coil configuration
Coil separation
Accuracy
Method: [ ] Fixed transmitter [ ] Shoot back [ ] In line [ ] Parallel line
Frequency 17.8 KILOCYCLES PER SECOND (ANNAPOLIS, MARYLAND, USA)
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

Geikie Twp.(M.320)

THE TOWNSHIP OF

2.1675

ZAVITZ

DISTRICT OF SUDBURY

LARDER LAKE MINING DIVISION

SCALE: 1 INCH 40 CHAINS

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKOGEE
- MINES
- CANCELLED

NOTES

400' SURFACE RIGHTS RESERVATION AROUND ALL LAKES AND RIVERS.

MINING LANDS -  
 DATE OF ISSUE  
 DEC 27 1974  
 MINISTRY OF NATURAL RESOURCES

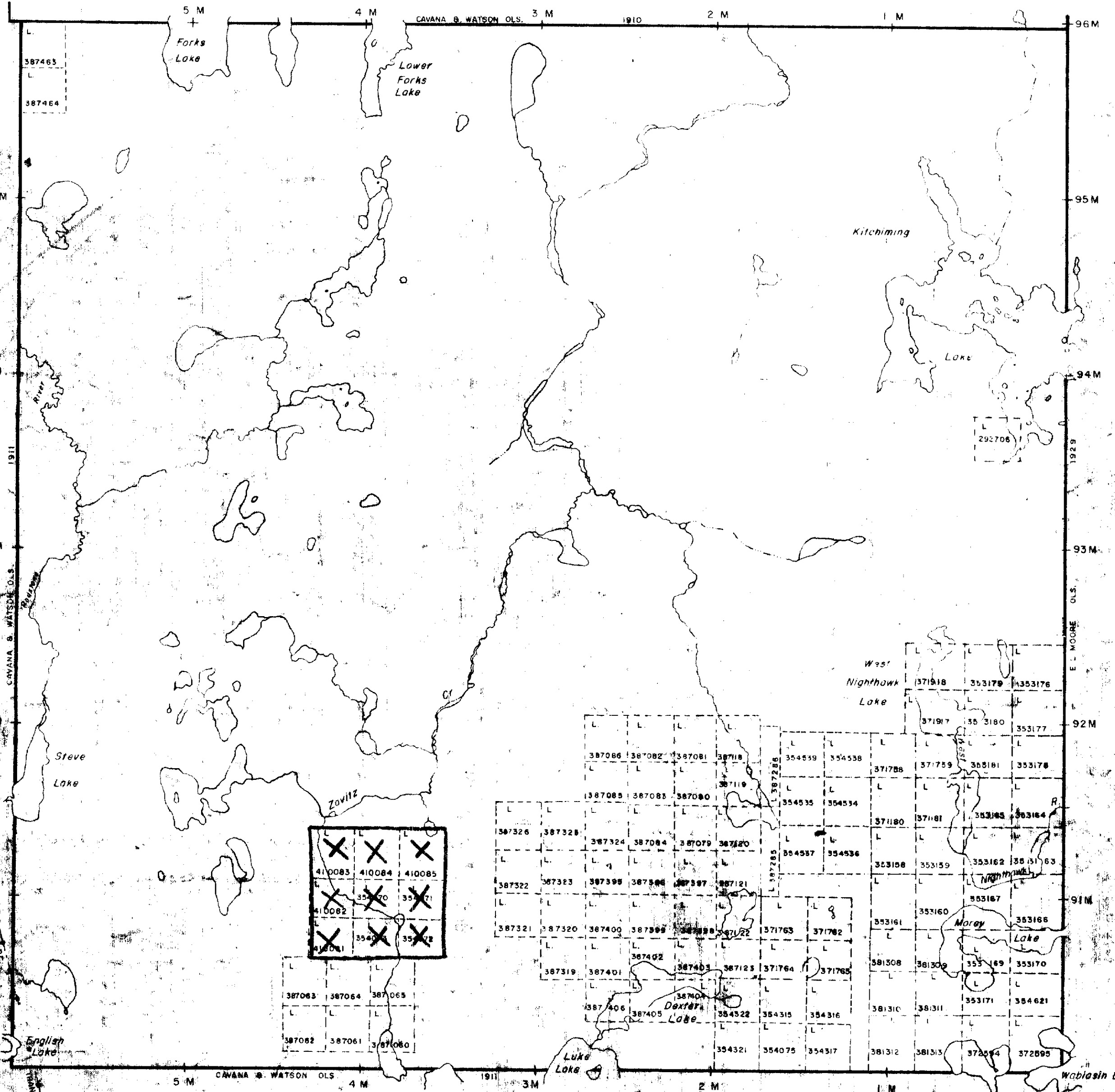
PLAN NO. M. 1189

ONTARIO  
MINISTRY OF NATURAL RESOURCES  
SURVEYS AND MAPPING BRANCH

English Twp.(M.787)

Hincks Twp.(M.223)

Hutt Twp.(M.943)



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# PLATE 1

VANTAGE MINING CO. INC.

ZAVITZ TWP., ONTARIO

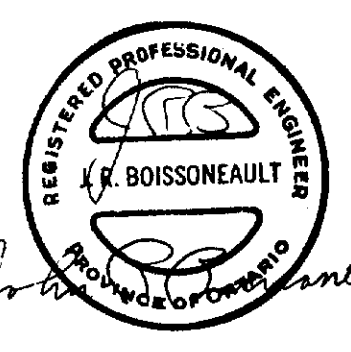
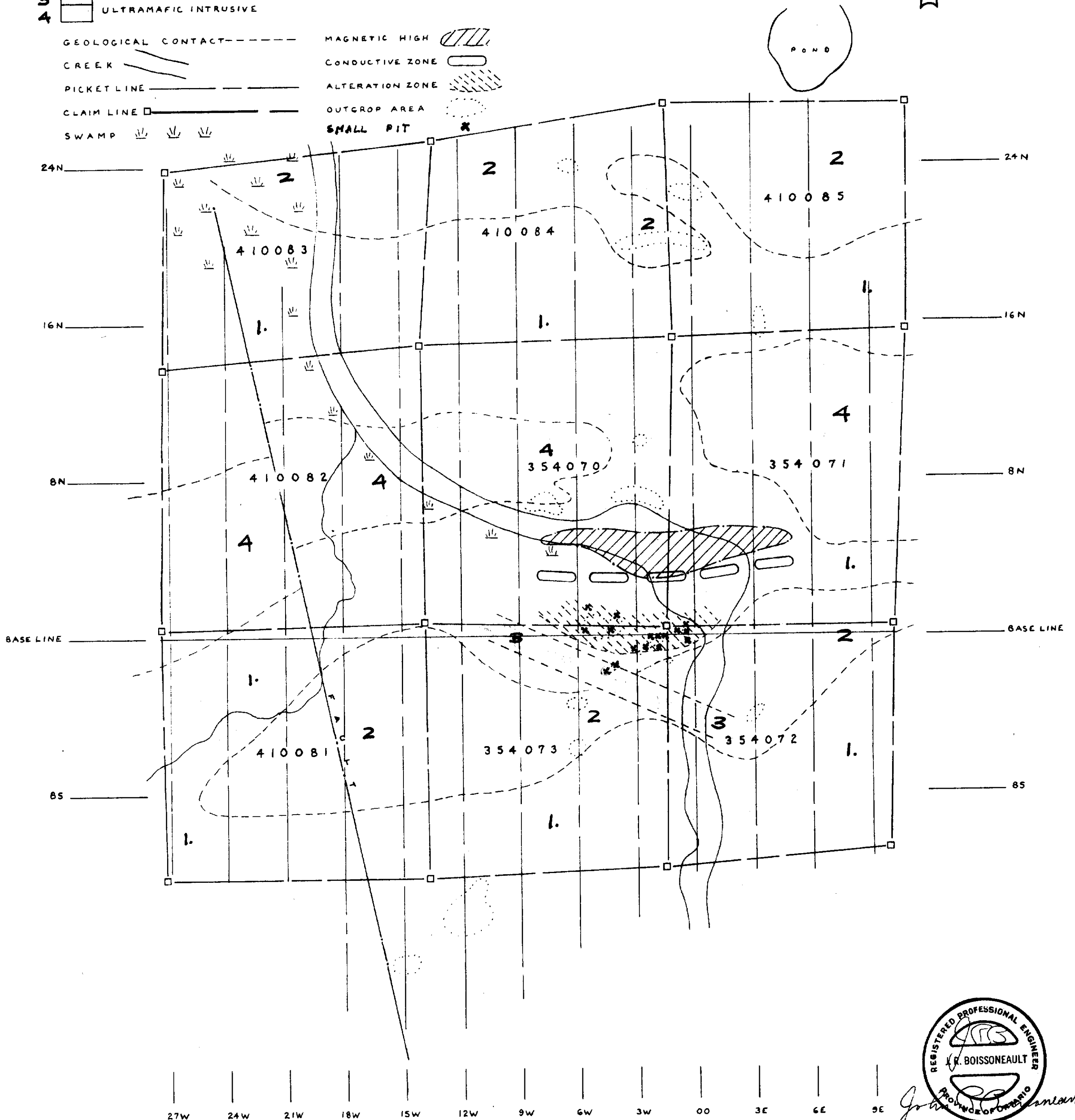
## GEOLOGY AND GENERAL PLAN

SCALE: 1 IN. = 400 FT.



- LEGEND**
- 1 MAFIC VOLCANIC
  - 2 INT. VOLCANIC
  - 3 FELSIC INTRUSIVE DIKE
  - 4 ULTRAMAFIC INTRUSIVE

- GEOLOGICAL CONTACT - - - - -
- CREEK
- PICKET LINE
- CLAIM LINE
- SWAMP
- MAGNETIC HIGH
- CONDUCTIVE ZONE
- ALTERATION ZONE
- OUTCROP AREA
- SMALL PIT



210

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# PLATE 2

## VANTAGE MINING CO. INC.

### ZAVITZ TWP., ONTARIO

### MAGNETIC CONTOURS

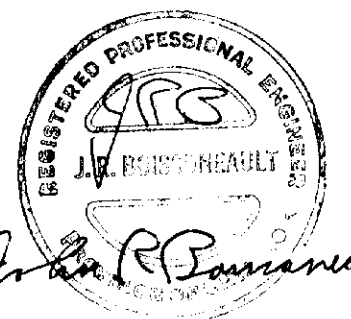
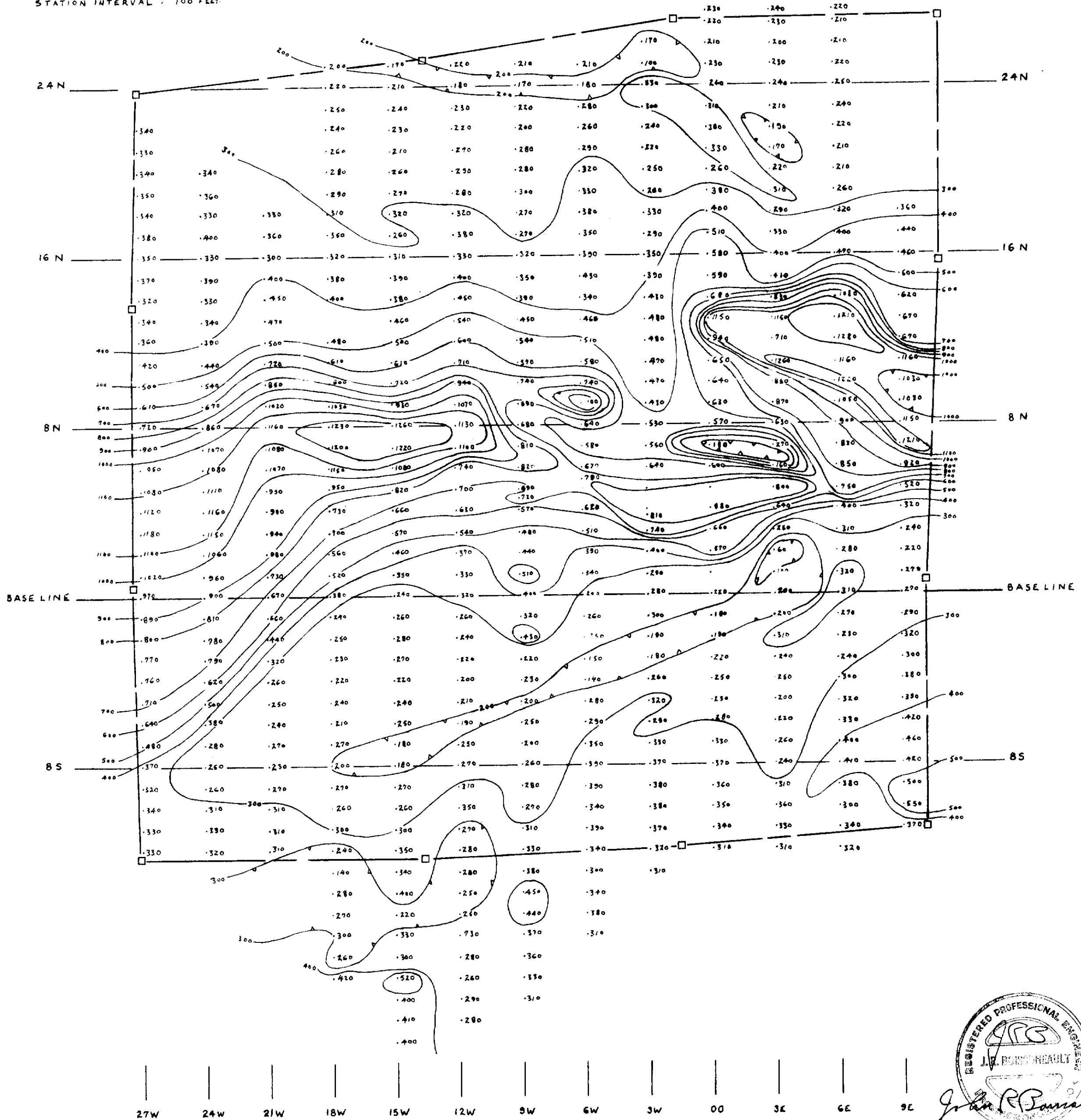
SCALE : 1 IN. = 400 FT.



**LEGEND**

MAGNETIC INTENSITY READING  $\gamma$  340  
 CONTOUR LINE   
 PROPERTY BOUNDARY

INSTRUMENT : SHARPE, MF-1  
 ACCURACY :  $\pm 10$  gamma  
 CONTOUR INTERVAL : 100 gamma  
 STATION INTERVAL : 100 FEET





# PLATE 3

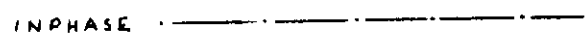



VANTAGE MINING CO. INC.

ZAVITZ TWP, ONTARIO

## E-M PROFILES

SCALE: 1 in. = 400 ft.

### LEGEND

INPHASE   
OUTPHASE   
CONDUCTOR AXIS   
PROPERTY BOUNDARY 

INSTRUMENT: RONKA E.M.-16  
TRANSMITTER LOCATION: ANAPOLIS, MAINE  
ORIENTATION: FACING NORTH  
FREQUENCY: 17.8 KILOCYCLES PER SECOND  
SCALE: 1 in. = 40' (PROFILE)

