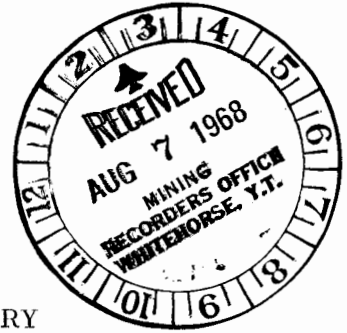


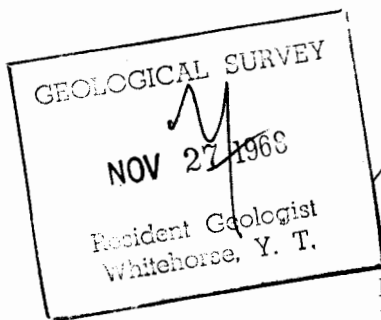
REPORT ON
A COMBINED GEOPHYSICAL SURVEY
ON THE RUST-HILL PROPERTY
WHITEHORSE MINING DISTRICT, YUKON TERRITORY



FOR

ARCHER, CATHRO AND ASSOCIATES LIMITED

BY



15,083.47

HUNTEC LIMITED
VANCOUVER B.C.
DECEMBER 1967

This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:

D.C. Fiddley
RESIDENT GEOLOGIST

Approved as to cost in the amount
of \$ 15,083.47

A.P. Beedon
RESIDENT MINING ENGINEER

Approved as representation work
under Section 30(4) Yukon Quartz
Mining Act.

[Signature]
COMMISSIONER OF YUKON

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INTRODUCTION

General

This report contains the results of a combined geophysical survey carried out by Hunttec Limited for Archer, Cathro and Associates Limited on the Rust-Hill Claim Group in the Whitehorse Mining District, Yukon Territory.

The purpose of the survey was to provide a ground follow-up investigation of two co-incident airborne electromagnetic and magnetic anomalies which were discovered in an airborne survey carried out by Lockwood Survey Corporation Limited in 1966.

The present survey consisted of an Induced Polarization, an electromagnetic and a magnetic survey. The Induced Polarization survey party was lead by Mr. M. Samilski and the work was done from September 22 to September 29, 1967 inclusive. The electromagnetic surveys were carried out by a party lead by Mr. L. Giovanetti in two periods, September 27 to October 7, and October 14 to October 18, 1967 inclusive. Interpretation and drafting were done in the Vancouver office of Hunttec Limited in November and December 1967.

The Property

A comprehensive description of the property location, access and geology is given in a report prepared by Archer, Cathro and Associates dated July 21, 1967. The property is located as shown in Fig.1 and lies at the contact between the anvil batholith and a quartz sericite-schist known as Unit No.7 on the G.S.C. map 13-1961. Specifically, the survey grids lie just south of the contact and are underlain in places by a phyllite and by an olivine gabbro. One of the airborne anomalies (grid A) was located directly

on an outcrop in the form of a small hill of the olivine gabbro and which was observed to contain considerable magnetite. The other anomaly (grid B) was located in an area of no outcrops.

SURVEY SPECIFICATIONS

1. I.P. Survey

The Equipment

The Induced Polarization equipment used was a 2.5 kw pulse-type instrument manufactured in Toronto by Hunttec Limited. The following specifications apply:

Type of current	Direct Current broken at periodic intervals
Frequency	1.5 seconds "current on" and 0.5 seconds "current off." Alternate pulses have reverse polarity.
Integrating time	400 milliseconds
Maximum power available	2.5 kw
Maximum current available	3.0 amps

Measurements taken in the field were:

1. The current flowing through the current electrodes C_1 and C_2 .
2. Primary voltage V_p between measuring electrodes during "current on" time.
3. Secondary voltage V_s between measuring electrodes during "current off" time.

The apparent chargeability (M_a) in milliseconds is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400 which is the sampling time in milliseconds of the receiver unit. The apparent resistivity is calculated by dividing V_p by the current and multiplying by the geometrical factor appropriate to the electrode array being used.

Electrode Configuration

The entire survey was carried out using the poledipole electrode configuration or array. In this array the current electrode C_1 and the two potential electrodes P_1 and P_2 are moved in unison along the line to be surveyed. The quantity "a" or "electrode separation" is the distance between C_1 and P_1 . The distance between P_1 and P_2 is kept at some convenient distance equal to "a" or a simple fraction of "a". For the reconnaissance phase of this survey the value of "a" was kept at 200 feet.

Since the value of "a" is a rough approximation to the depth penetration, detailing of anomalies discovered in the reconnaissance phase was done by profiling the anomalies at different electrode separations. This additional data provides information from which depth, dip and location may more easily be calculated than from a single profile.

2. Electromagnetic Survey

Instrument

The Crone JEM vertical loop EM instrument was used for the entire survey using the "shootback" method. This instrument uses a transmitting and receiving coil separated by 200 feet which move along the survey line together. The coils are parallel but are tilted from a coaxial alignment by 15 degrees. The manufacturer claims this tilt angle achieves optimum coupling with most kinds of massive sulphide deposits. The instrument operates at 1800 c.p.s. in the reconnaissance phase and anomalies may be detailed at the second frequency of 480 c.p.s. The receiver measured the dip angle of the resultant total EM field.

The "shootback" method is an arrangement whereby the two coils act as transmitter and receiver alternately. The dip angles measured by both coils are added algebraically which has the effect, in theory, of removing coil misalignment errors caused by uneven topography.

The data are plotted in profile form on Plate 2. The characteristic anomaly over a vertical dyke shaped conductor is strong positive readings over the centre flanked by negative readings on both sides. A dipping conductor will increase the negative anomaly on the down-dip side. A broad flat conductor will produce a broad negative anomaly.

3. Magnetometer Survey

The Jalander magnetometer, model 46-65, manufactured in Finland was used on this survey. This instrument measures the vertical magnetic intensity at an accuracy of ± 10 gammas.

Readings were taken at 50 ft. intervals over the entire area with some fill in stations at 25 ft. intervals.

The results are presented in contour form on Plate 1.

RESULTS AND INTERPRETATIONS

Magnetic Survey

Blocks 1 and 2 have a relatively smooth magnetic field with virtually no anomalous area present. Block 3 is centered about the very strong airborne magnetic anomaly which has been definitely confirmed by the ground survey. On the ground, the airborne anomaly is resolved into three strong magnetic anomalies of more than 6000 gammas above background plus three or four smaller anomalies. Considerable magnetite was observed on the hill which underlies the largest anomaly on lines 28N and 32N and there can be no doubt from this evidence, and from the strength of the anomalies, that deposits of magnetite are the cause of the anomalies. In this survey they have been contoured so as to indicate a strike direction approximately perpendicular to the survey line. However, it should be noted that a strike direction of lineation in the olivine gabbro was observed at an approximate strike of north 30° west. This lines up roughly parallel to a line drawn through the south western anomalies on lines 16, 20, 24, and 28 north and in fact this may be the correct trend of these anomalies. It would be necessary to survey intermediate lines at 200 ft. intervals to prove or disprove this theory.

Electromagnetic Survey

The E.M. profiles display a rather erratic response with many weak highs and lows on each profile. It is unlikely that these represent conductive zones in the subsurface but rather measuring errors inherent in the E.M. system. The only readings which appear significantly high above the background "noise" appear to be two anomalies on adjacent profiles, line 32N and 28N.

This is considered a relatively weak conductive trend and appears to be confirmed by its coincidence with the airborne electromagnetic anomaly at that location. However, as will be discussed below, it is not supported in any way by the resistivity readings taken in conjunction with the I.P. survey. Resistivity readings can be considered more accurate and more representative of the conductive properties of the ground and therefore this anomalous indication is not believed to represent a valid subsurface conductor. It coincides with the eastern edge of the strongest magnetic anomaly and may actually be caused by the strong magnetic susceptible at this location. It is reported that the topographic relief is extreme at this point and this may also be a cause of the anomaly in spite of the fact that the E.M. system is theoretically designed to overcome measurement errors caused by extreme topography.

Induced Polarization Survey

While it is not a normal practice to contour I.P. and resistivity results across 800 ft. line intervals, it was done in this case so as to more readily compare the results from line to line. The highest chargeability response in the area was obtained on line 32N directly coinciding with an area of strong negative magnetic response. The readings were less than twice average background and the instrument operator did not consider it necessary to make any detailed measurements or additional measurements on adjacent lines. The chargeability response is most likely caused by magnetite which is also causing the high magnetic relief and which can be seen on nearby outcrops. It is believed unlikely that any other sulphide minerals are present in any quantity because the anomaly is small and could easily be caused by the amount of magnetite present.

This interpretation could be more easily confirmed by a field examination since the bedrock outcrops at this location. The resistivity readings as mentioned before, do not indicate anomalous conductivity. There is a very slight resistivity low in that area but it is not as low as readings on the adjacent line or any others spread throughout the area.

It is concluded that no further development work should be done in this area based on these geophysical surveys unless examination of the bedrock surface should disclose economically important sulphide minerals associated with the magnetite.

A small chargeability high, roughly twice background, was discovered on line 40N at 64W. It does not have a corresponding magnetic response or resistivity anomaly and may be caused by scattered conductor particles, either sulphides or graphite which do not contain magnetite. However, it is more likely due to the natural fluctuation of the chargeability background in the phyllitic quartzite which is shown to underlie this part of the property. Experience in other parts of this formation in the Ross River area show that the chargeability background may fluctuate through five or more milliseconds without showing a noticeable increase or decrease in disseminated sulphide content.

There is a broad resistivity low in the centre of Block 1 which has approximately corresponding chargeability low. The most reasonable explanation for this would be an increase in overburden thickness which is somewhat more conductive than the underlying bedrock. Its resistivity values are not low enough to represent conductive metallic sulphides or graphite, which in any case should produce a high chargeability response. It is concluded that like Block 3, Blocks 1 and 2 should not undergo further development based on the results of this geophysical survey.

SUMMARY

1. A geophysical survey comprising electromagnetic, magnetic and induced polarization surveys was carried out over three adjacent line grids on the Rust-Hill property.
2. The airborne magnetic anomaly on Block 3 was confirmed by the ground survey and is considered caused by the magnetite in nearby outcrops.
3. Neither of the two airborne electromagnetic anomalies were confirmed on the ground by the combined E.M. and Induced Polarization surveys. A weak conductive trend was observed on the conductor in Block 1 but this was not supported by the Induced Polarization results which are considered the more diagnostic and accurate. It is suggested that the airborne anomaly was caused by the strong magnetic susceptibility in the area and by the sudden proximity of the magnetic surface to the aircraft when the aircraft was unable to maintain a constant terrain clearance over the sharp topographic relief in that area.
4. No anomalous conditions were seen on any part of the other two blocks on either of the three types of geophysical survey.
5. No further work is recommended for this area which would be based on the results of this geophysical survey.



HUNTEC LIMITED

A handwritten signature in cursive script, appearing to read "R. K. Watson".

R. K. Watson, B.A.Sc., P.Eng.
Geophysicist

APPENDIX A

Assessment Credit Data

1. Survey Coverage

Magnetometer Survey	12.43 line miles
Electromagnetic Survey	11.96 line miles
Induced Polarization Survey	5.71 line miles

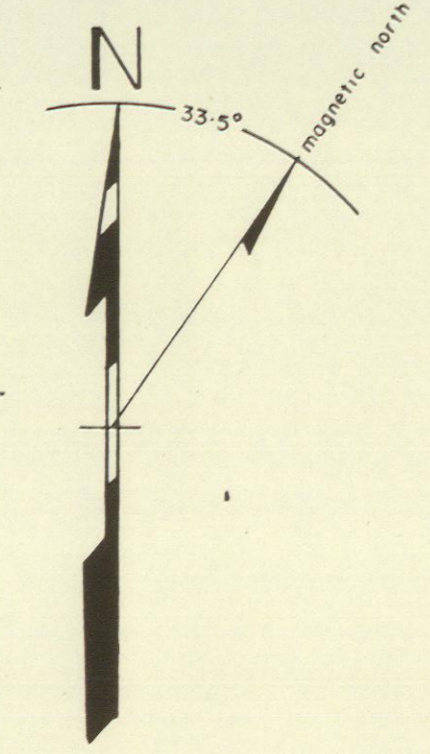
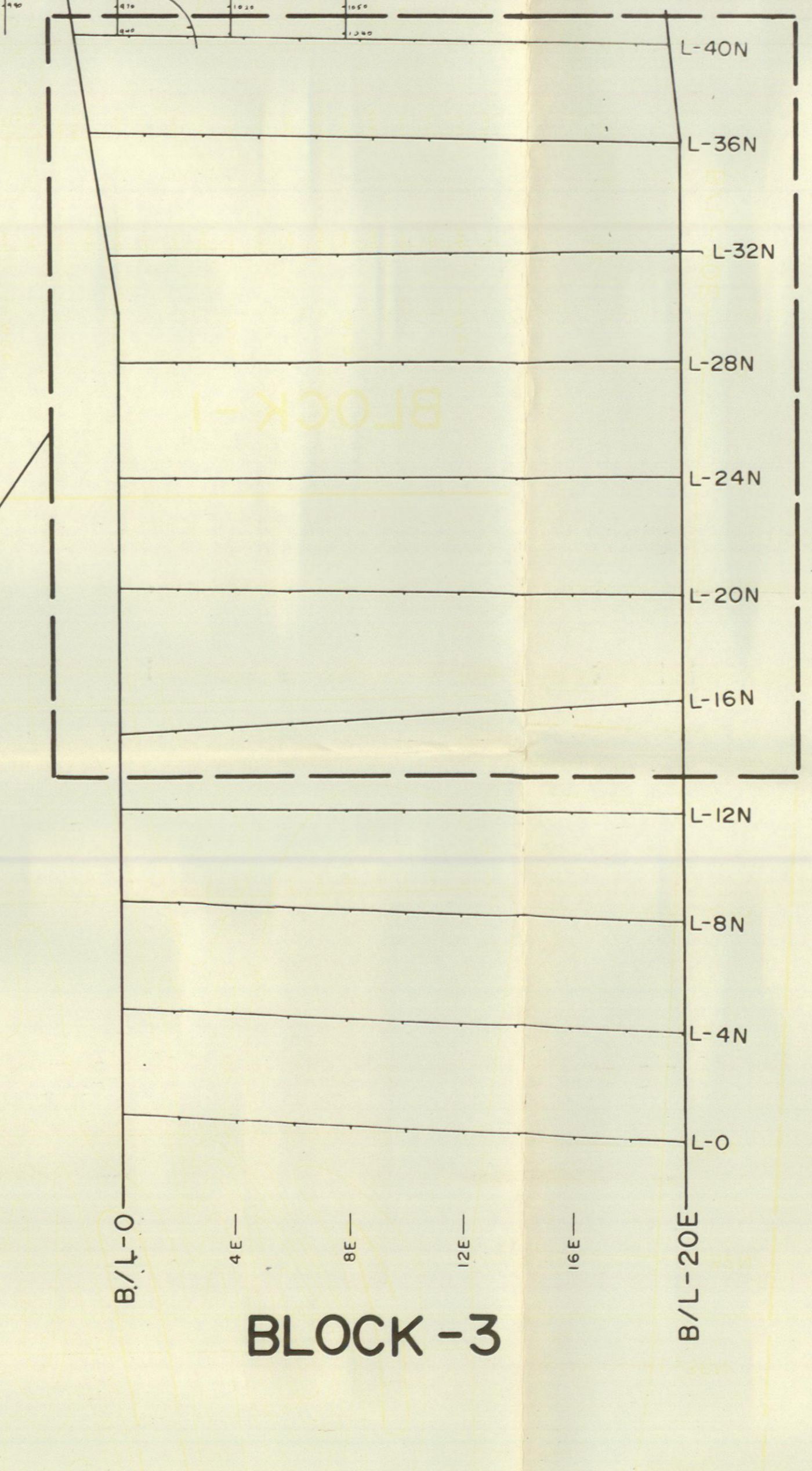
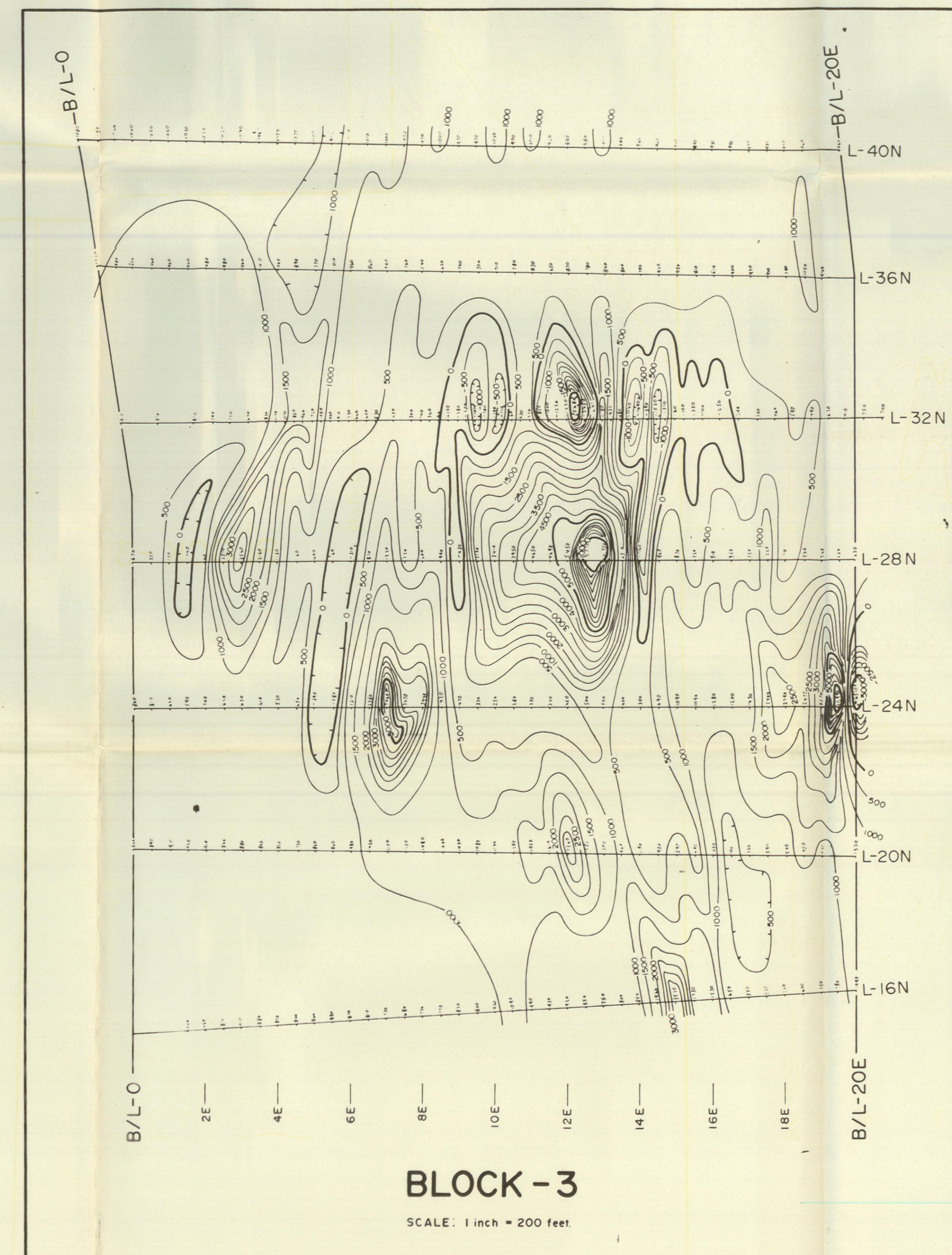
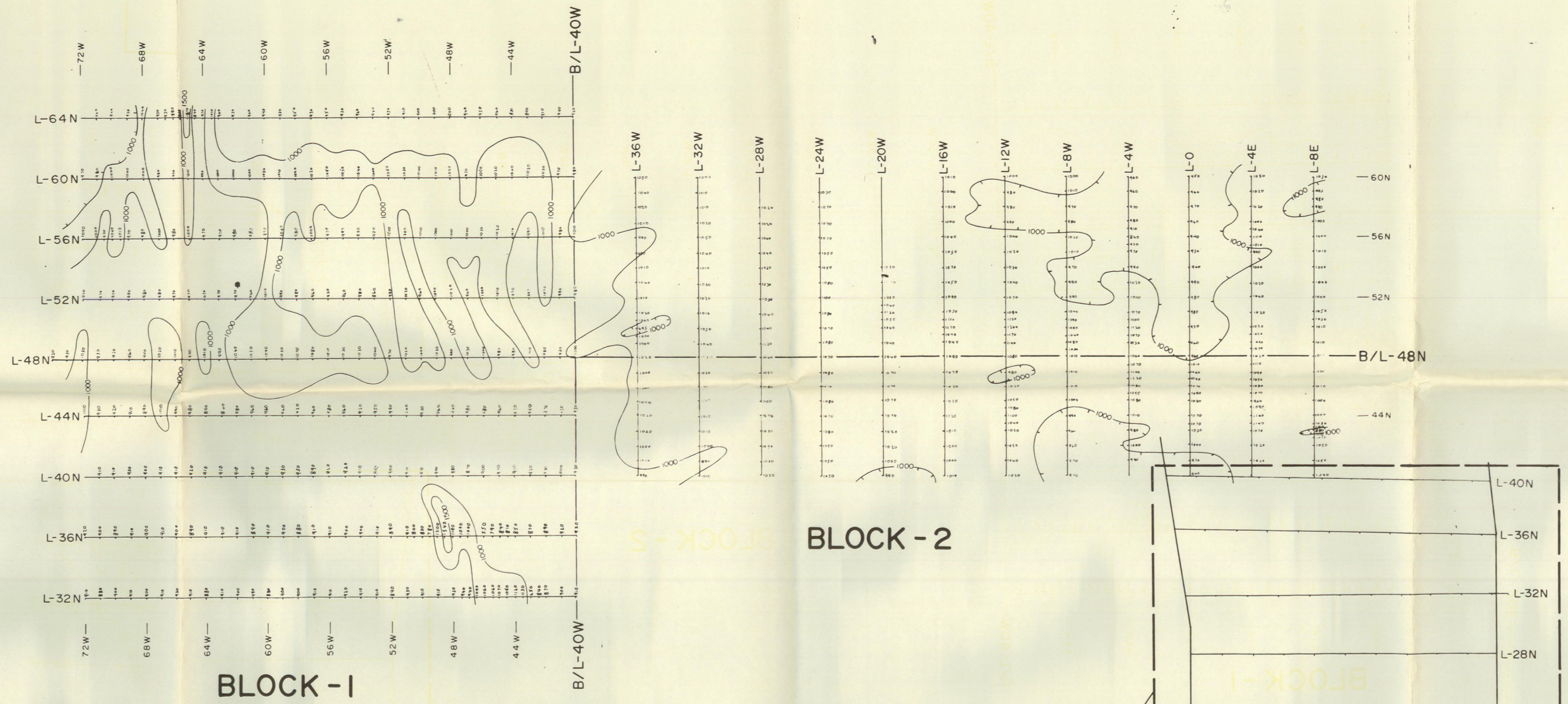
2. Personnel

<u>Name</u>	<u>Position</u>	<u>Dates</u>
M. Samilski	Party Leader/ Operator	Sept.22 - 29, 1967
A. Hovi	Operator	Sept.22 - 29, 1967
R. Rich	Helper	Sept.22 - 29, 1967
P. O'Connor	Helper	Sept.22 - 29, 1967
J. O'Connor	Helper	Sept.22 - 29, 1967
L. Giovanetti	Party Leader/ Operator	Sept.27 - Oct. 7, 1967 Oct. 14 - Oct.18, 1967
I. Van Assum	Helper	Sept.27 - Oct. 6, 1967
D. Kuhnert	Helper	Oct. 14 - Oct.18, 1967
E. Helkio	Drafting	Dec. 4 - Dec. 8, 1967 Dec. 18 - Dec.20, 1967
R. Watson	Geophysicist	Nov.6,7, 1967 Dec.19,20, 1967
R. Harrington	Typing	Dec.20, 1967



NOTE:
 MAP DRAWN FROM NATIONAL TOPOGRAPHIC SERIES.
 FIRST EDITION, SHEET 105K.

ARCHER, CATHRO & ASSOCIATES LTD. RUST HILL PROPERTY PELLY RIVER AREA, YUKON TERRITORY.	
SURVEY LOCATION MAP.	
To accompany report by: <i>R. K. Watson</i> R. K. Watson, B.A.Sc., P.Eng., Geophysicist.	
HUNTEC LIMITED. VANCOUVER-CANADA.	
SCALE: 1 inch = 4 miles.	
DRAWN: E. H.	
DATE: DEC. 1967.	
JOB N ^o : PH. - 686	FIG. - 1



BLOCK - 3
SCALE: 1 inch = 200 feet.

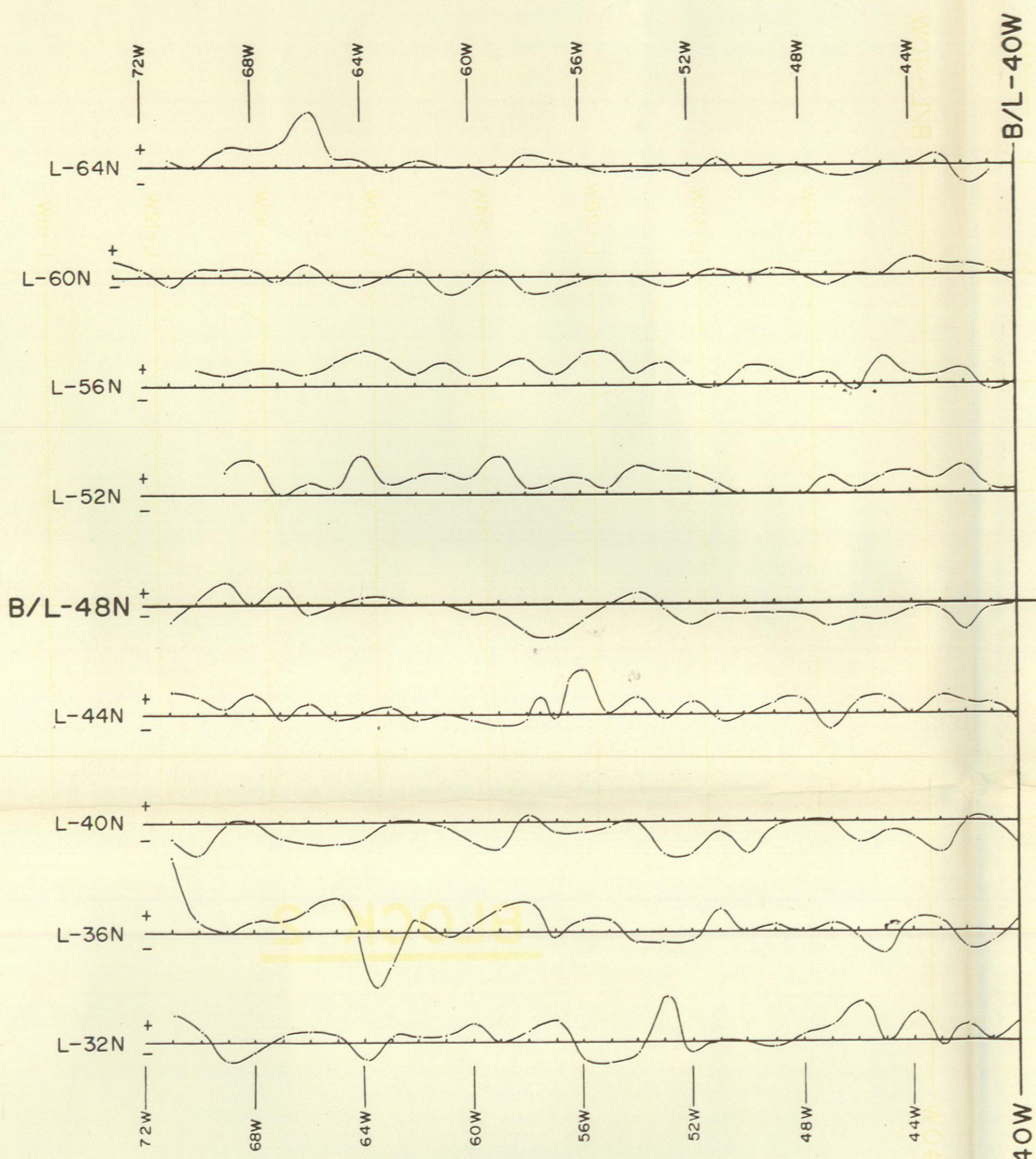
NOTE
-10,000, -5000, 0, 5000, 10,000 etc GAMMA INTERVAL
ALL OTHER GAMMA INTERVAL

ARCHER, CATHRO & ASSOCIATES LTD.
RUST HILL PROPERTY
PELLY RIVER AREA, YUKON TERRITORY

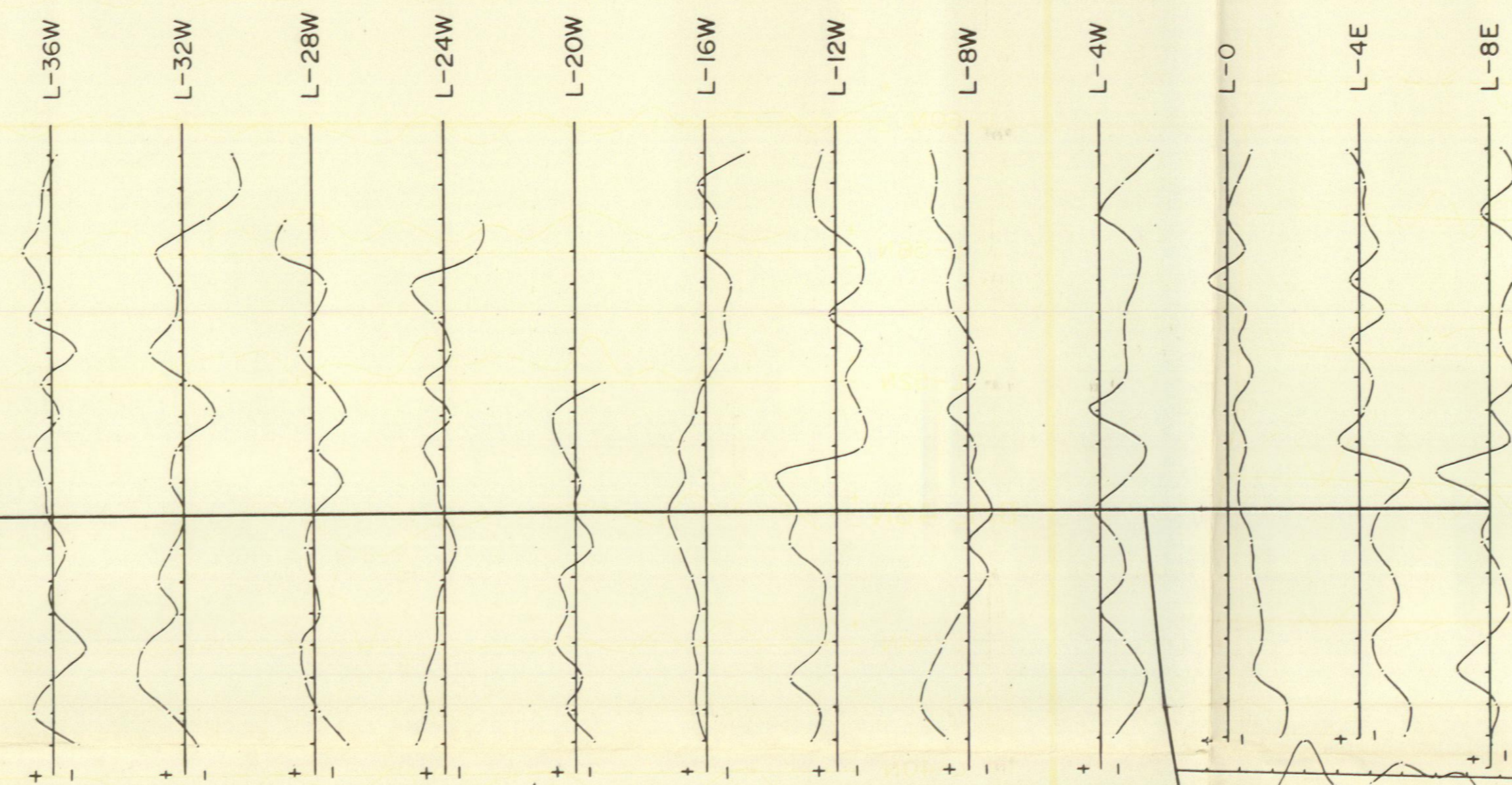
GROUND MAGNETOMETER SURVEY.
CONTOURS OF VERTICAL MAGNETIC INTENSITY

To accompany report by: *R.K. Watson*
R.K. Watson, B.A.Sc., P.Eng., Geophysicist

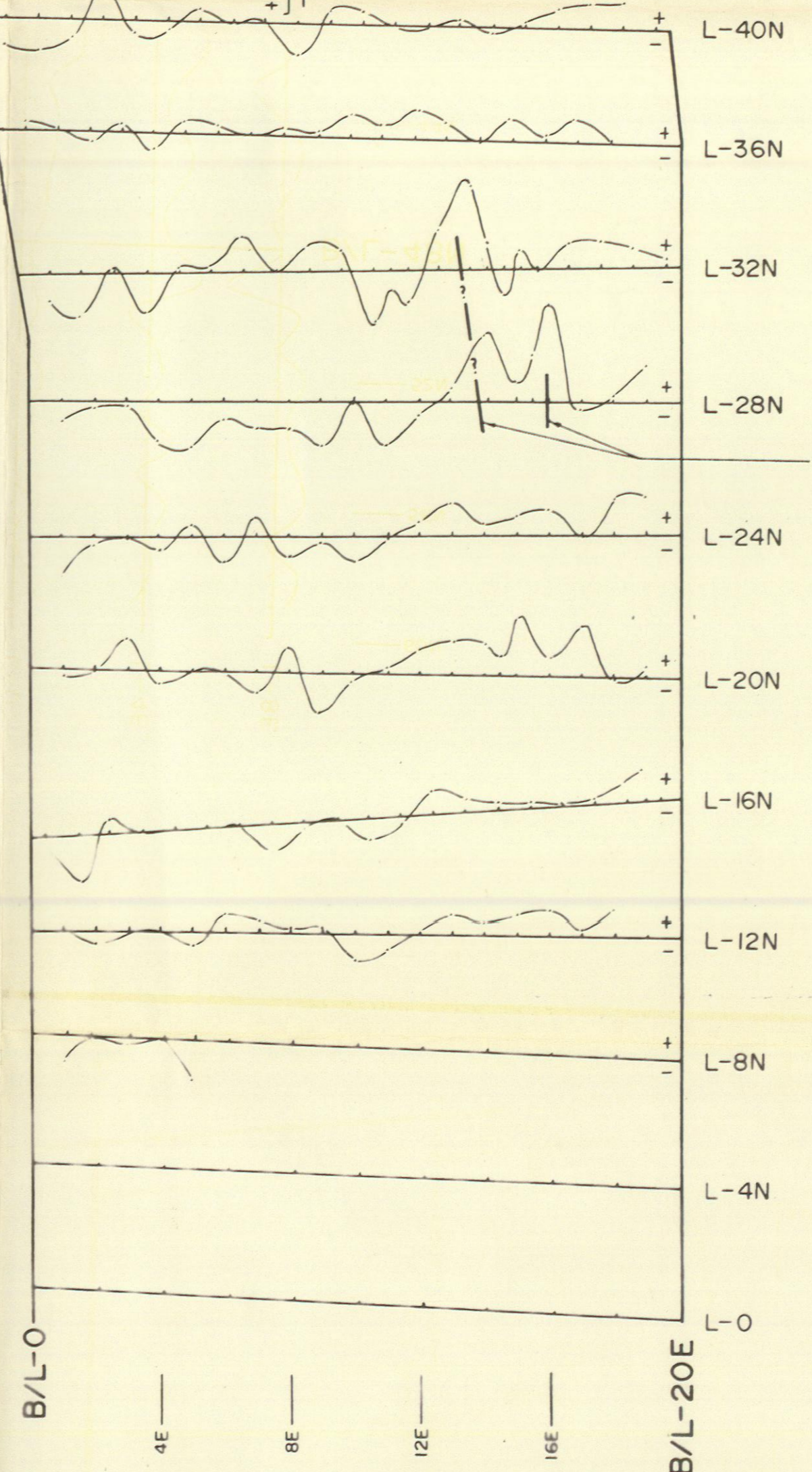
HUNTEC LIMITED	VANCOUVER-CANADA
SCALE 1 inch = 400 feet	LEGEND
DRAWN E.M.	CONTOUR INTERVAL: 500 GAMMAS
DATE: Dec., 1967	MAGNETIC LOW
JOB N° PH686/67	PLATE - 1



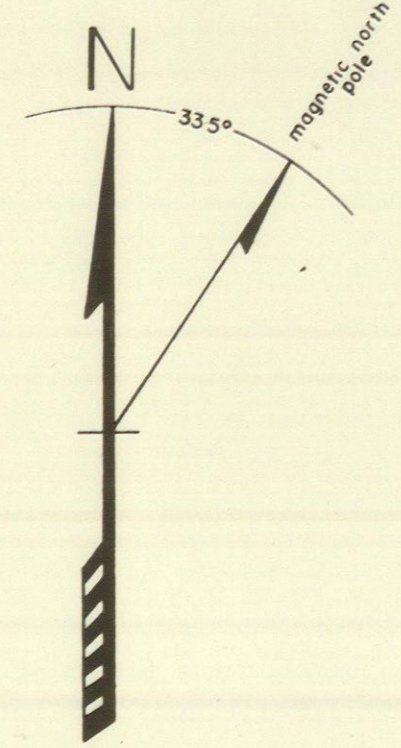
BLOCK 1



BLOCK 2



BLOCK 3



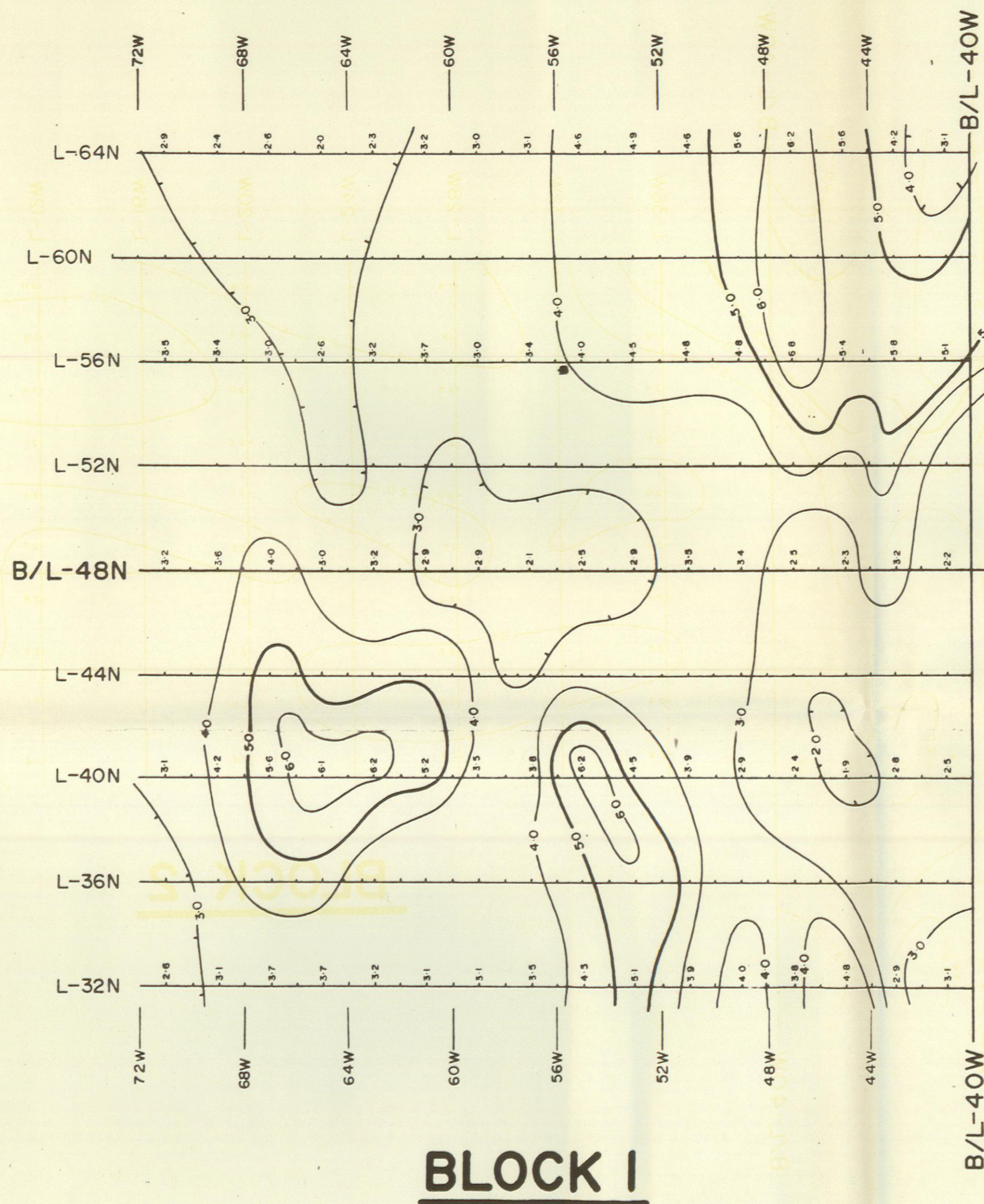
ARCHER, CATHRO & ASSOCIATES LTD.
 RUST HILL PROPERTY
 PELLY RIVER AREA, YUKON TERRITORY.

CRONE E.M. SURVEY
 DIP ANGLE PROFILES (High Frequency - 1800 C.P.S.)

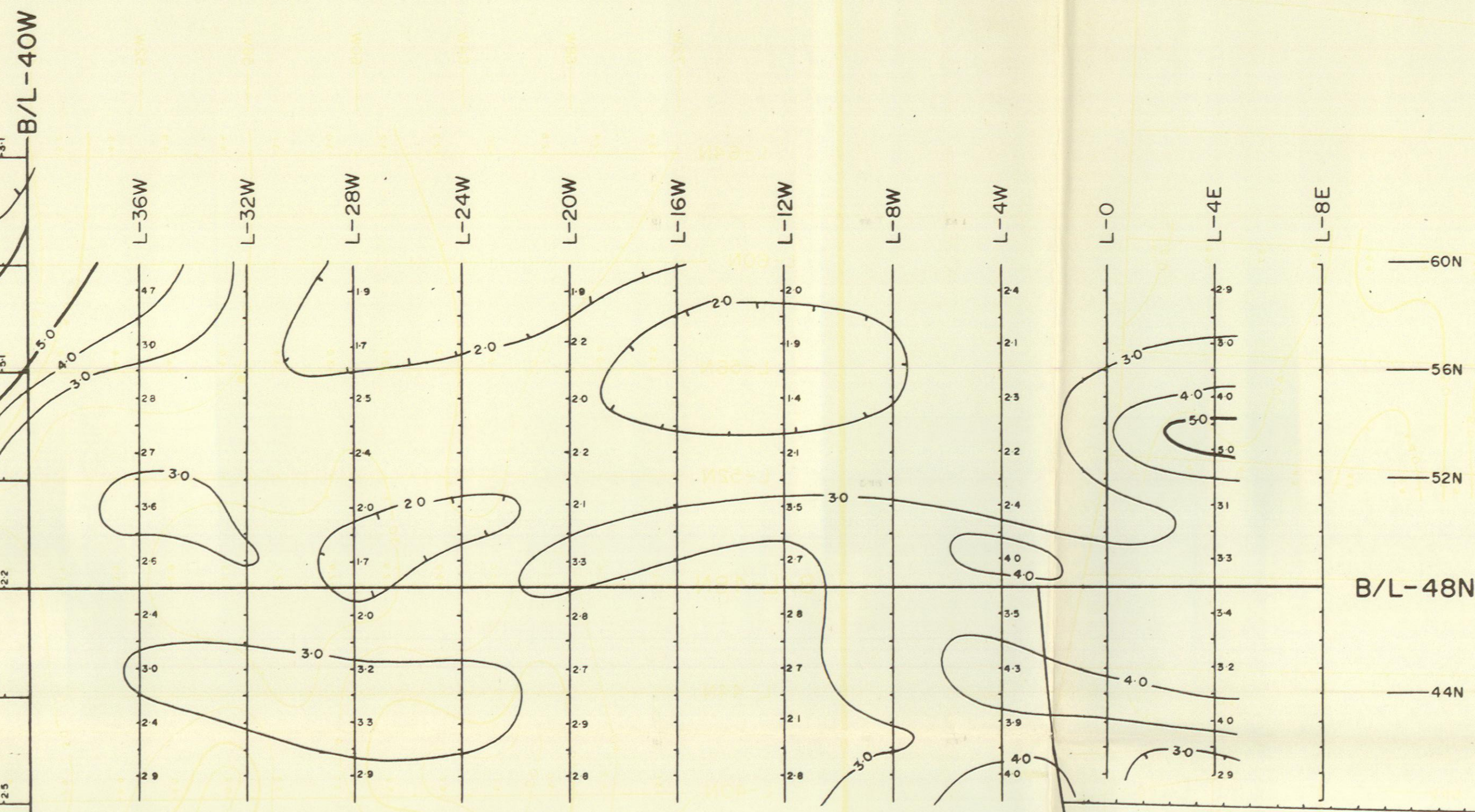
To accompany report by: *R.K. Watson*
 R.K. Watson, B.A.Sc., P.Eng., Geophysicist.

HUNTEC LIMITED VANCOUVER-CANADA
 SCALE 1 inch = 400 feet
 DRAWN: E.H.
 DATE December, 1967
 JOB # PH 686/67

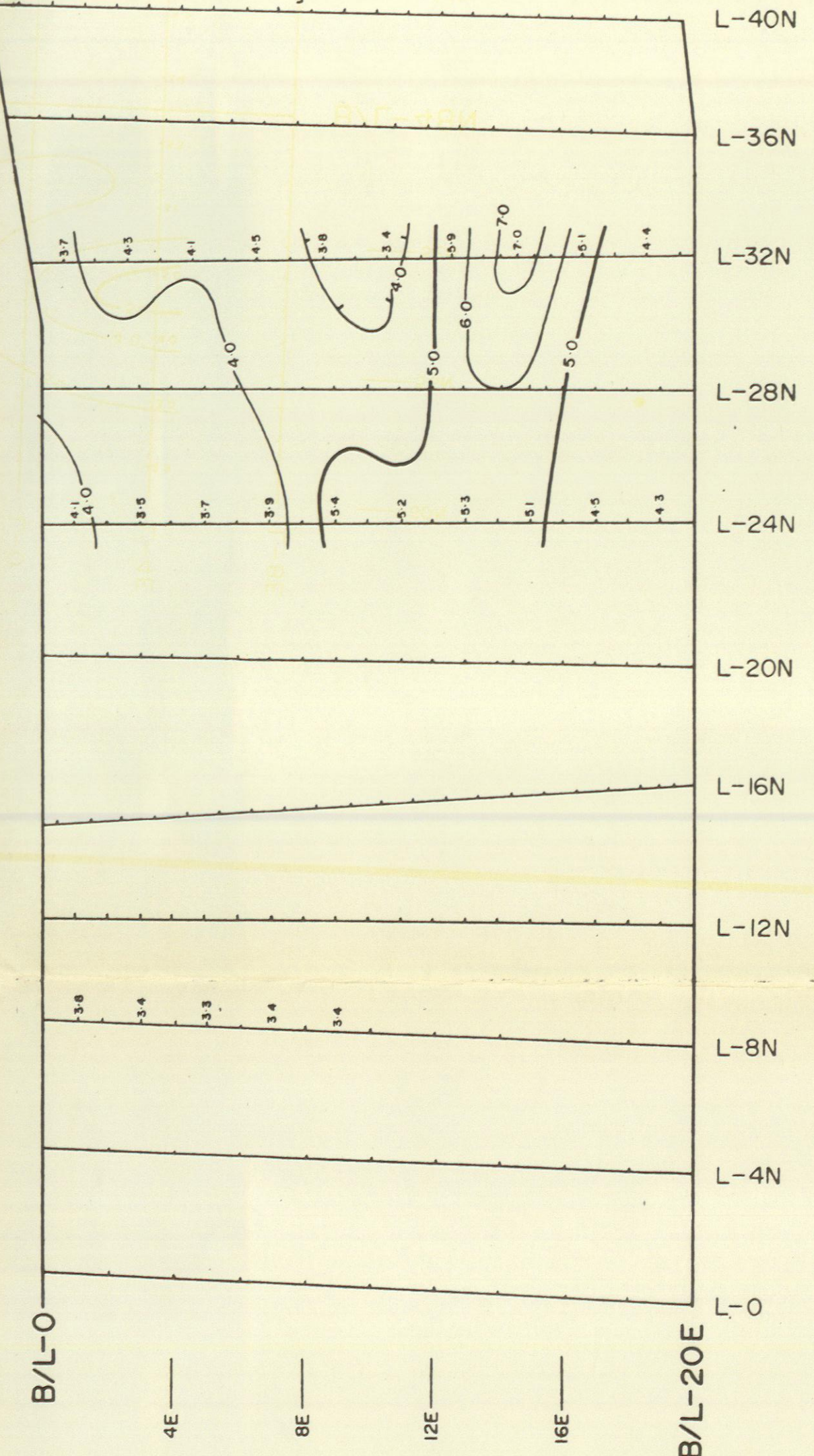
LEGEND
 Vertical Scale 1 inch = 20°



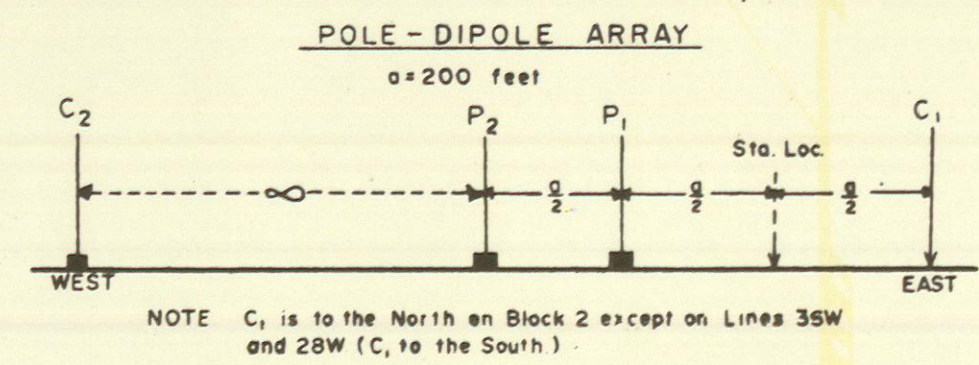
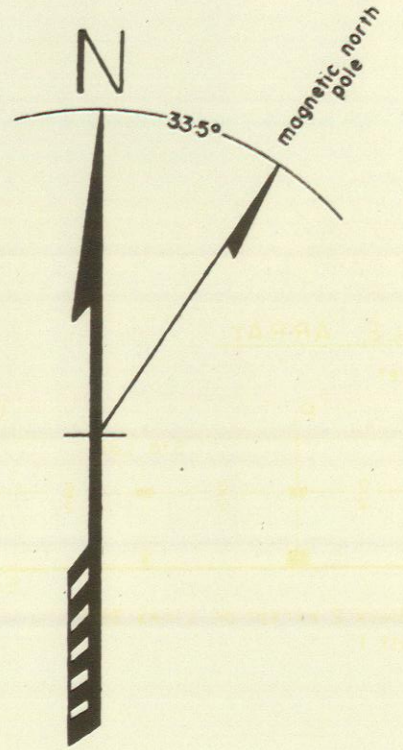
BLOCK 1



BLOCK 2



BLOCK 3

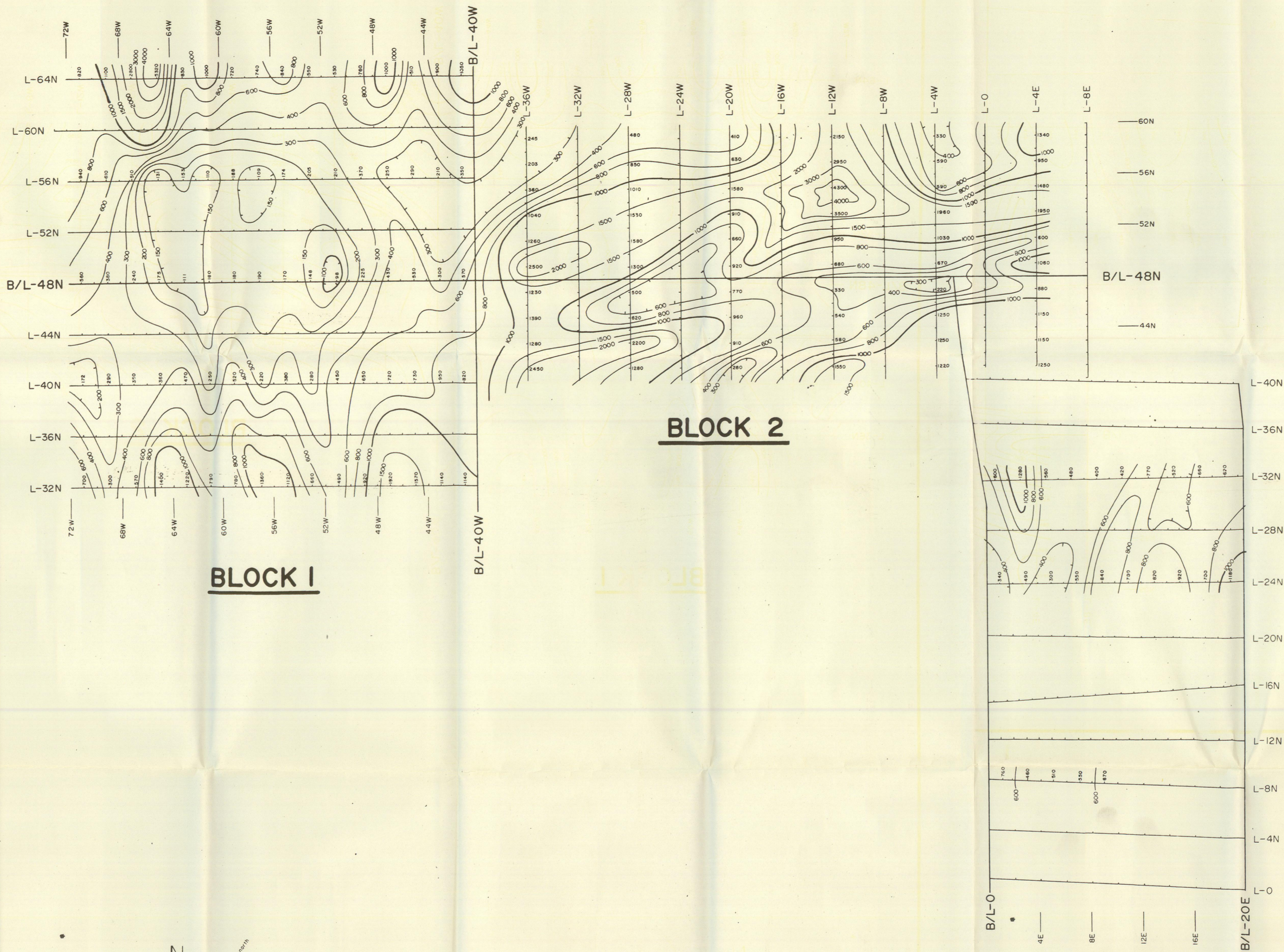


ARCHER, CATHRO & ASSOCIATES LTD.
RUST HILL PROPERTY
PELLY RIVER AREA, YUKON TERRITORY.

INDUCED POLARIZATION SURVEY
APPARENT CHARGEABILITY CONTOURS

To accompany report by: *R. K. Watson*
R. K. Watson, B.A.Sc., P.Eng., Geophysicist.

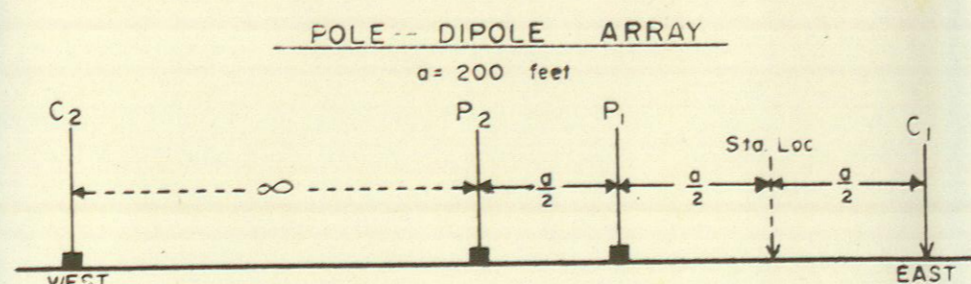
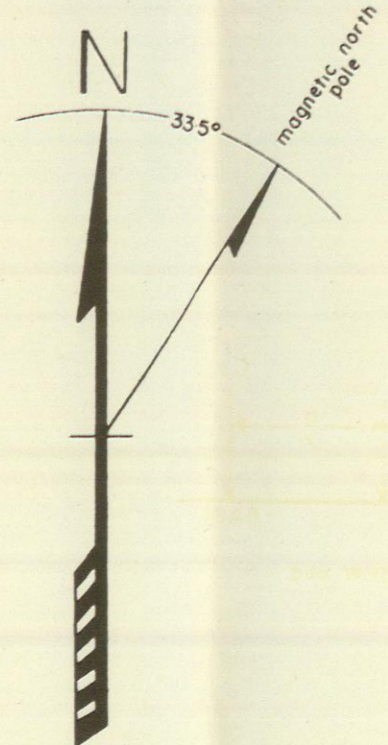
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DRAWN: E.H. Contour interval: 1.0 milliseconds
DATE: December, 1967.
JOB NO: PH 686/67. **PLATE-3**



BLOCK 1

BLOCK 2

BLOCK 3



Note: C₁ is to the North on Block 2 except on Lines 36W and 28W. (C₁ to the South)

ARCHER, CATHRO & ASSOCIATES LTD.
RUST HILL PROPERTY
PELLY RIVER AREA, YUKON TERRITORY.
INDUCED POLARIZATION SURVEY
APPARENT RESISTIVITY CONTOURS

To accompany report by: *R.K. Watson*
R.K. Watson, B.A.Sc., P.Eng., Geophysicist.

HUNTEC LIMITED VANCOUVER-CANADA
SCALE: 1 inch = 400 feet LEGEND
DRAWN: E.H. Contours at (log intervals) 100, 150,
200, 300, 400, 600, 800, 1000 etc.,
DATE: December, 1967. ohm-meters.
JOB N^o PH 686/67