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C O N T E N T S

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Appendix.

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PLAN NO. 1..... Iso-Dynamic Contours of Magnetic Intensities,  
 In Part  
 Electrical Resistivity Check Survey Data and  
 Geological Interpretation.  
 (Drawing Ref. No. 5-1-57)

Brunhurst Mines Limited,  
100 Adelaide Street West, Suite 1600,  
TORONTO 1, Ontario.

Gentlemen:

This report describes the results of a magnetometer survey and an electrical resistivity check survey conducted by Geo-Technical Development Company Limited on your 42-claim group property located along the Wesley River, Otatakan Lake Area, Kenora District, Ontario.

The surveys were carried out during November and December, 1956, and the results are depicted on Plan No. 1 accompanying this report.

#### CONCLUSIONS AND RECOMMENDATIONS

The ground geophysical surveys outlined two anomalous areas on the property which warrant further surface exploration.

These areas are located at the east and west ends of the main air-borne electro-magnetic anomaly previously outlined on the property, which has an air-borne magnetic anomaly near it. Ground geophysical survey data in or near areas of other air-borne electro-magnetic anomalies do not have characteristics which indicate mineralization.

The geophysical characteristics of the two anomalous areas and their geological environment are similar to those located at the west central part of the neighbouring property of



the Geophysical Operators, and given on Plan No. 1 accompanying this report. Higher grounds and swampy areas are also given on the same plan.

### GENERAL GEOLOGY

Geology of the Otatakan Lake Area is given on Map 347A, G.S.C., 1935, on a scale of 1 inch to 2 miles. According to this map, and with topography as an indication for location, the property is underlain by two of the four rock formations which occur in the general area. The four formations are:

- (4) Granite, grano-diorite, etc., undifferentiated, small bodies of greenstone.
- (3) Slate, greywacke, conglomerate.
- (2) Keewatin: andesite lava and tuff, with minor amounts of basalt, iron formation and slaty sediments.
- (1) Quartz-biotite schist.

All these rock formations are Archean in Age.

The meta-sediments (3) and (1) are not indicated on the property.

The Keewatin formation is part of a large belt of greenstone which runs east-west from near Lake St. Joseph to the Slate Lake Area - a belt of about 50 miles long, and up to 4 miles in width. The property is located at the part of this belt where the Keewatin formation is comparatively wide. The descriptive notes on Map 347A state that the several larger areas

of Keewatin volcanic rocks are largely occupied by rather massive greenstone cut by dykes of granite and feldspar porphyry. The occurrence of sediments in the Keewatin greenstones are usually minor. However, G. C. McCartney reports the occurrence of re-crystallized sediments and considerable development of graphitic material at the east end of the main air-borne electro-magnetic anomaly outlined over the property.

Weak sulphide mineralization has been noted by the writer, on the property of Capital Lithium Mines Limited. J. D. Bateman (Vol. XLVII, Pt. VII, 1939, Ont. Dept. of Mines) described the occurrence of gold deposits of the Uchi-Slate Lake Area, located to the northwest. He noted that chalcopyrite, although widely distributed, is quantitatively insignificant and almost invariably associated with pyrrhotite. The source of the mineralizing solutions, as well as the gold, appears to have come from a late differentiate of the consolidating granite. G. C. McCartney observed pyrrhotite-pyrite mineralization at the east end of the air-borne anomaly previously outlined on the property, with a trace of copper, upon assay. (Property Report, dated September 26, 1956.)

Iron formation of different grades has been noted in the Keewatin formation in the general area. However, McCartney did not mention the occurrence of such formation at the air-borne anomalous area of the property.

#### MAGNETOMETER SURVEY DATA

The magnetometer survey outlined several magnetic anomalies on the property. These are moderate-to-weak anomalies; most of them have dipoles. They are short anomalies (with indicated lengths of less than 500 feet), but they are crowded into two elongated, east-west areas, which are marked Anomalous Area "A" and Anomalous Area "B" on Plan No. 1 accompanying this report.

Anomalous Area "A" is located at the central eastern part of the property, for a length of approximately 3,200 feet, and is apparently open to the east. "Highs" are in the order of 800 to 2,900 gammas, and a strong negative reading of -3,765 gammas. A small air-borne magnetic anomaly is outlined approximately here.

Anomalous Area "B" is located at the central western part of the property, for approximately 2,800 feet, and is possibly open to the west. "Highs" are in the order of 800 to 1,800 gammas, except a strong negative anomaly which has a maximum negative reading of 6,975 gammas.

## RESISTIVITY CHECK SURVEY RESULTS

The electrical resistivity check survey outlined several strong resistivity anomalies in the anomalous areas outlined by the ground magnetometer survey.

In Area "A", the "lows" ranged from 12 to 64 ohm-cms.  $\times 10^3$ , against border readings in the order of 100 to 1,360 ohm-cms.  $\times 10^3$ . These are all narrow anomalies with different lengths. The longest is over 1,200 feet. A zone of high resistivity is located to the immediate north of this anomalous zone. This high resistivity zone has extreme readings which are in the order of 5,000 ohm-cms.  $\times 10^3$ . Low resistivity anomalies immediately south of this zone are associated closely with magnetic "highs".

In Area "B", the check survey covered only part of the area, and outlined one strong anomaly which has a low of 9 ohm-cms.  $\times 10^3$ . The resistivity anomaly is narrow, and open to the west. It is bordering a magnetic anomaly outlined here, and is apparently located within the west end of the main air-borne electro-magnetic anomaly previously outlined on the property.

No appreciable resistivity anomaly is outlined at the approximate location of the second large air-borne electro-magnetic anomaly previously outlined north of the main anomaly.

In Claim 39857, the resistivity check survey outlined a weak anomaly apparently running along the Wesley River. A small air-borne electro-magnetic anomaly is located here.

#### GEOLOGICAL INTERPRETATION AND RECOMMENDATIONS

The geological interpretations given on Plan No. 1 accompanying this report are based on G.S.C. Map 347A, and the consideration of geophysical indications.

It is apparent that the north part of the property is underlain by Keewatin rocks. However, the occurrence of sediments and iron formation may greatly affect the interpretation. Definite information of such is not available. It follows that interpretation of anomalies in this area cannot be anything but tentative suggestions. Anomalous Areas "A" and "B" are located within these Keewatin greenstone, with minor amounts of iron formation and slaty sediments.

The area north of these anomalies has one resistivity anomaly which runs along the Wesley River, and is apparently affected considerably by topography. The resistivity characteristic of this area as a whole indicates greenstone rather than meta-sediments.

An inferred geological contact between this Keewatin formation and the granitic intrusives is given on Plan No. 1.



There are apparently no appreciable anomalies located within these intrusives.

The interpretations of Anomalous Area "A" and Anomalous Area "B" are described as follows:

In Anomalous Area "A", the resistivity "lows" correspond closely, but are not super-imposed, with magnetic "highs". Because of the fact that sulphides have been observed here by McCartney, the above-mentioned phenomenon is interpreted as weak-to-moderate ferro-magnetic mineralization, possibly pyrrhotite. Two of the extreme low resistivity readings ( $12 \text{ ohm-cms.} \times 10^3$ ) are in the order generally accounted for by graphite. McCartney observed graphitic material somewhere here; it follows that the above-indicated possible sulphide occurrence is probably associated with graphite. The zone of extremely high resistivity is interpreted as an indication of quartzite or extensive silicification, probably associated with the mineralization in origin.

In Anomalous Area "B", the resistivity "lows" are bordering moderate magnetic "highs" which, in places, are associated with resistivity "highs".

It follows that the ferro-magnetic mineralization in this area is probably weak-to-moderate, and the extreme low

resistivity reading ( $9 \text{ ohm-cms.} \times 10^3$ ) is probably indicative of graphite. The weak resistivity anomaly, which associated closely with the strong negative magnetic reading, however, indicated a local concentration of considerable degree of ferromagnetic mineralization.

One can conclude that the geophysical characteristics of anomalies outlined on the property and their geological environment, are similar to those located at the west central part of the neighbouring property of Cheskirk Mines Limited.

Following the interpretations, and, because sulphide samples collected by McCartney assayed an insignificant amount of valuable elements, it is doubtful if a deposit of such sulphide mineralization is economical.

The fact that choice anomalies are located on higher ground justifies a suggestion of surface exploration. A program of close surface examination by means of prospecting in the anomalous area, to be followed by trenching or pack-sack drilling, is recommended. Choice places for such an operation are given on Plan No. 1, accompanying this report. A successful surface examination, or successful news from the neighbouring property of Cheskirk Mines Limited, may warrant test diamond drilling.

### MAGNETOMETER SURVEY METHOD AND INSTRUMENT DATA

The magnetometer survey was conducted by the base check method. The instruments used were: a Wolfson Magnetometer with a sensitivity of 21.3 gammas per scale division, and a Sharpe Magnetometer, Model D1-M, with a sensitivity of 25 gammas per scale division.

### RESISTIVITY SURVEY METHOD AND INSTRUMENT DATA

The method used by Geo-Technical Development Company Limited is a form of the early resistivity survey or "mapping" methods, modified by some eleven years' experience in the field.

In short, a known current is introduced into the ground, by means of two screen contacts which are separated by a distance approximately equal to three times the width of the property, with a spread line drawn through the centre of the property at right angles to the base line. The contacts are spaced equi-distant from the central base line. Readings are then taken at 50-foot intervals along the picket lines, by means of a sensitive vacuum tube voltmeter which measures the potential drop across the interval. The apparent resistivity is then calculated from the potential readings and

current, in terms of ohm-centimeters.

Shear and fracture zones are relatively better conductors, due to their higher water content. This is true also of porous, unconsolidated, sediments. Extreme low resistivity readings may be due to graphite, or to sulphide mineralization, and there is no way to distinguish between sulphide and graphite, from the results obtained. Graphite is suspected as the cause of an anomaly, when there are occurrences of this mineral within schists or shear zones in the immediate vicinity. Sulphide mineral deposits have also been discovered in areas of high resistivity contrasts which did not register extremely low readings.

For the electrical resistivity survey, a Canadian Research Institute Vacuum Tube Voltmeter, Model No. E-9008A, with 100-microvolt full-scale deflection, was used, together with a Canadian Fairbanks-Morse Onan Motor Generator Plant, 115V., 400W..

#### SURVEY DATA

A ground magnetometer survey and an electrical resistivity survey were conducted by Geo-Technical Development

Company on your 42-claim group property located along the Wesley River, Otatakan Lake Area, Kenora District, Ontario.

The surveys were carried out during November and December, 1956, and the results and interpretations are depicted on Plan No. 1 accompanying this report.

An east-west base line was cut across the central part of the property, with picket lines turned off at right angles to the base line, at 400-foot intervals.

A total of 40 miles of line was cut and chained for the survey operation.

A total of 38.1 miles of line was covered by the magnetometer survey, with readings obtained at 100-foot intervals along the picket lines. The base control station for this survey was established at Line 0+00, 50 feet north, 70 feet east. There were 2,012 observations made.

A total of 18.7 miles of picket lines was covered by the electrical resistivity survey, to check the anomalous areas. Readings were obtained at 50-foot intervals, and 1,975 observations were made.

The total number of 8-hour man days required  
to complete the surveys is as follows:

	<u>(8-Hour) Man Days</u>	<u>Attributable to Assessment Work</u>
Line Cutting and Chaining	232 x 4	928
Operating Magnetometer and Electrical Resistivity Surveys	175 x 4	690
Drafting	12 x 4	48
Preparation of Report and Office Typing	<u>10 x 4</u>	<u>40</u>
Total	429	1,706

Respectfully submitted,

GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

*S. S. Szetu*  
S. S. Szetu, Ph. D.,  
Geologist.

Toronto, Ontario,

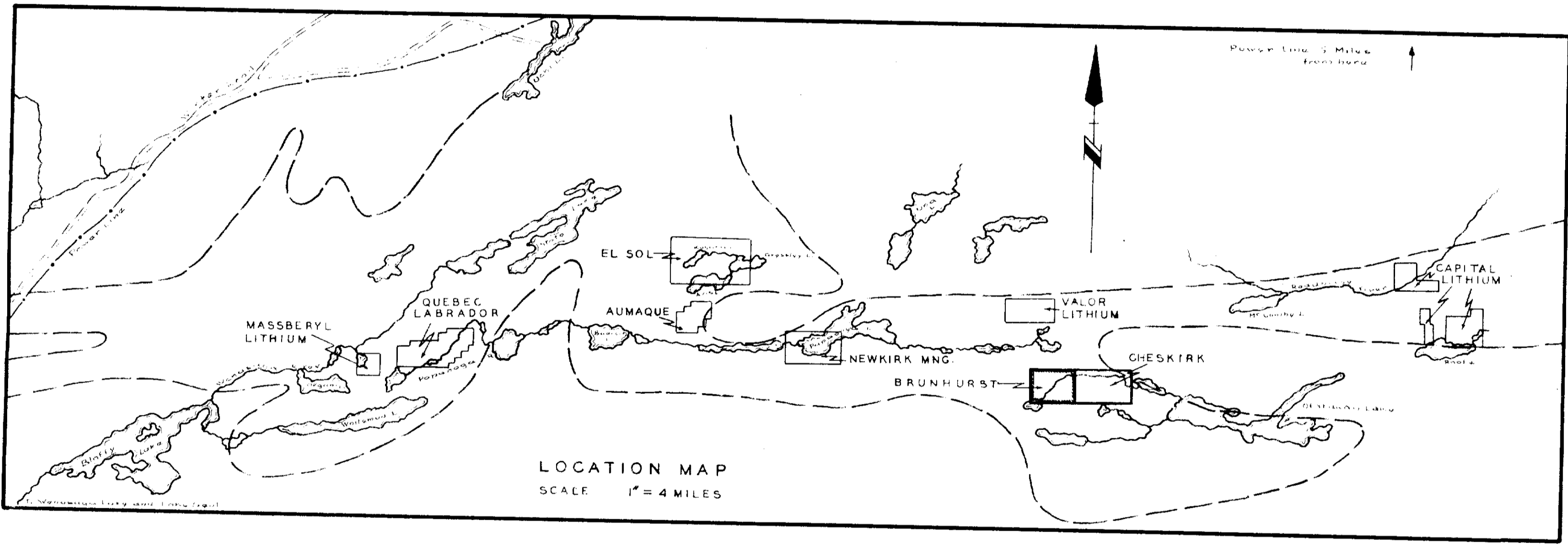
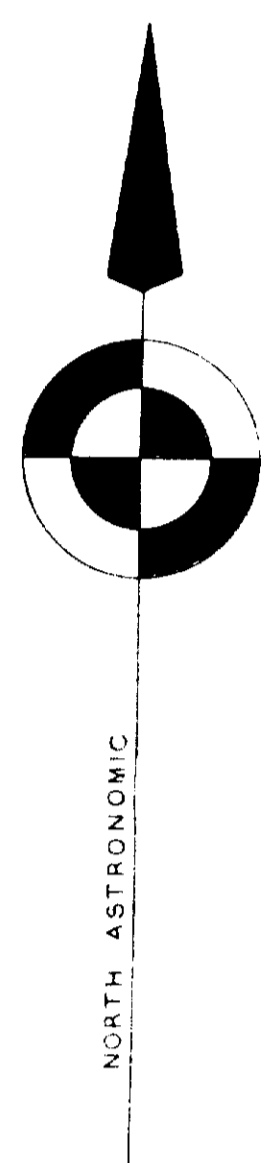
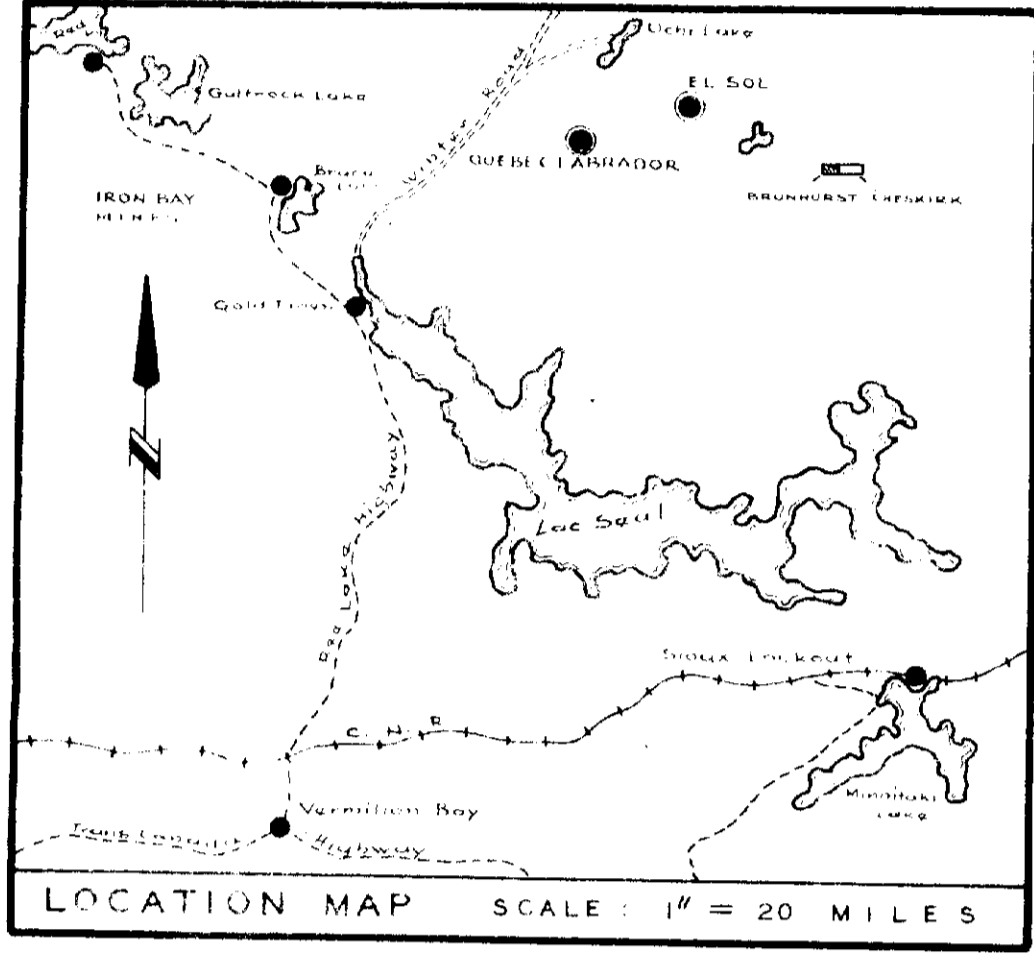
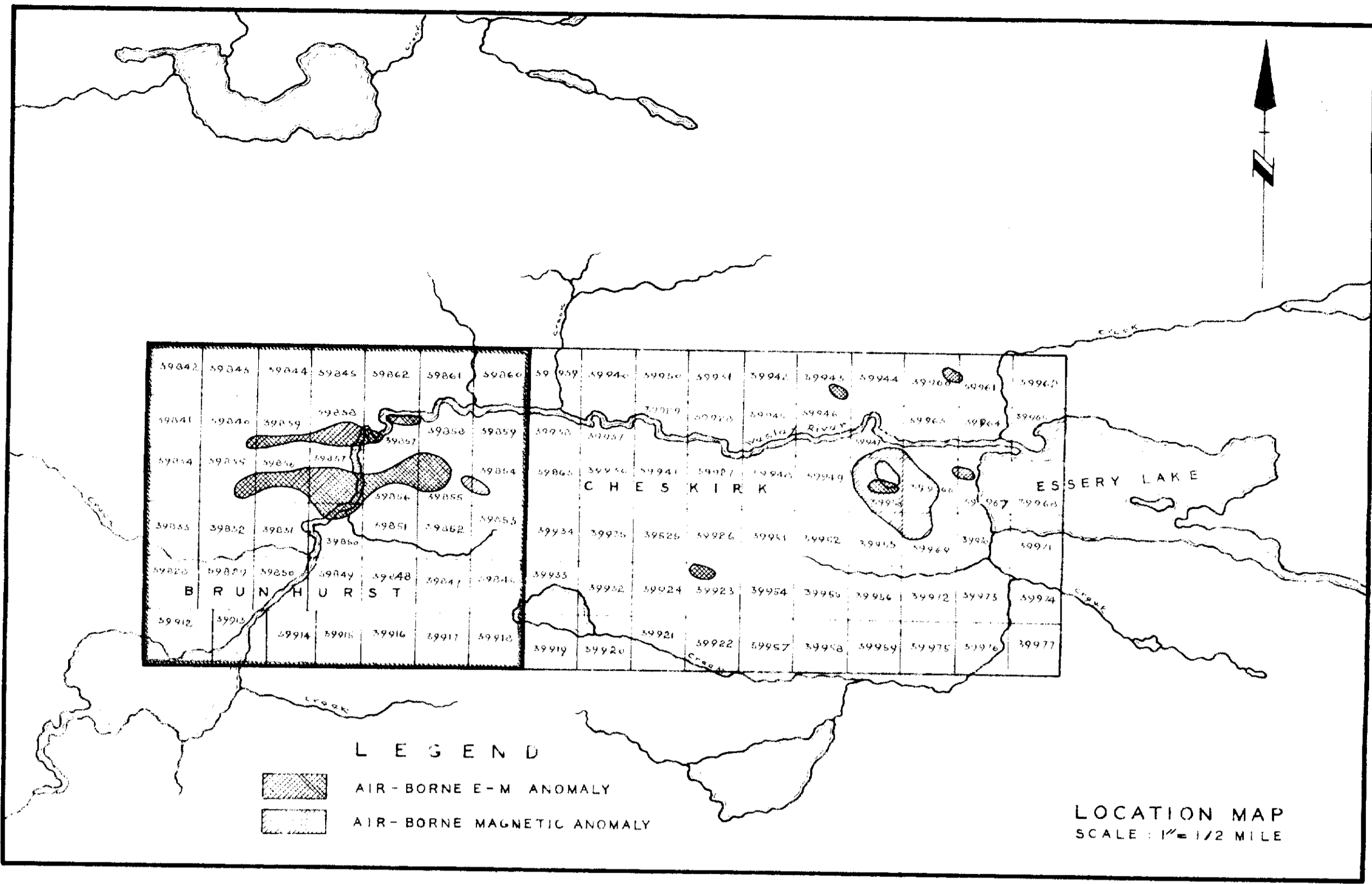
February 6, 1957.

SSS/rap

*Tech - 197*  
*Time - 19.7 (reduced from 232)*

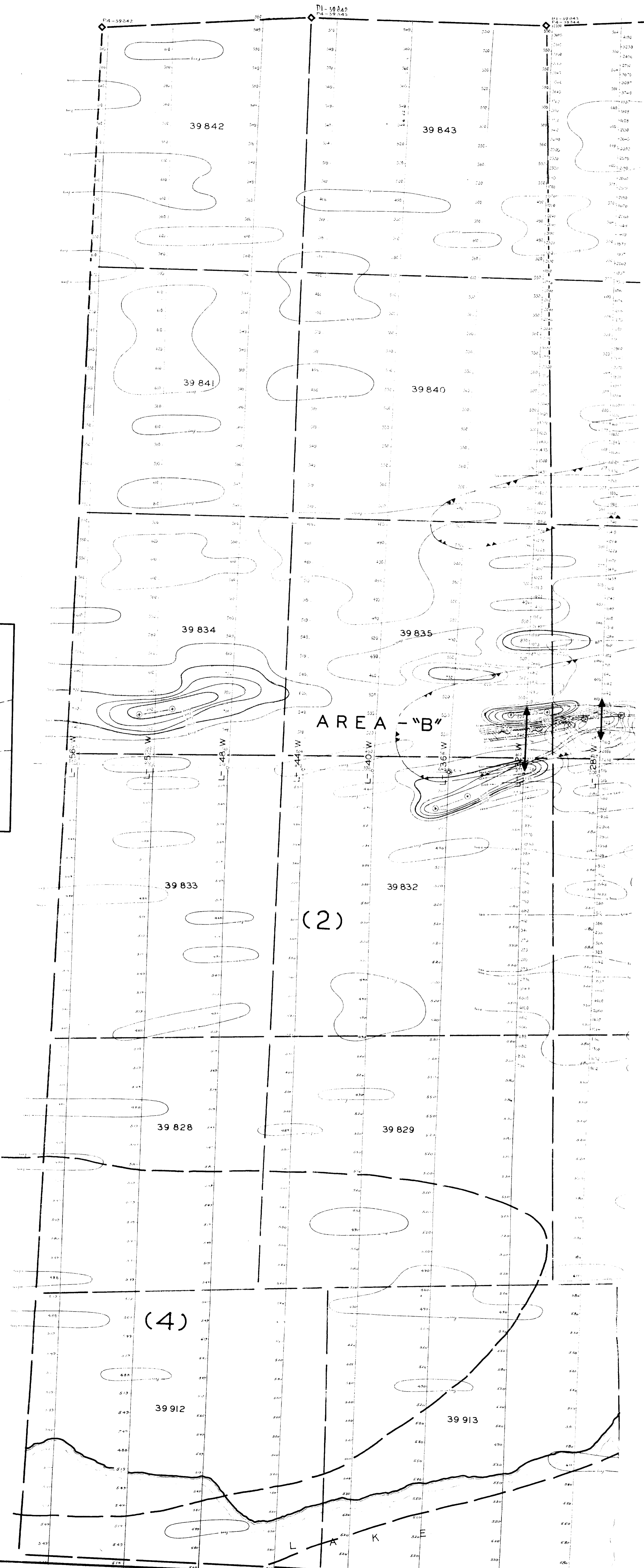
$$39.4 \times 4 \div 42$$

$$= 37.5 \text{ days per cl.}$$



LEGEND

- LINES PUT AND CHAINED MAGNETIC READINGS OBSERVED AND PLOTTED ON WEST SIDE OF LINE GRID
  - MAGNETIC CONTOUR
  - ELECTRICAL RESISTIVITY READINGS OBSERVED AND PLOTTED ON EAST SIDE OF LINE GRID
  - ELECTRICAL RESISTIVITY CONTOUR
  - MAGNETIC BASE CONTROL STATION
  - MAGNETIC CONTROL STATION
  - SWAMP AND AREA OF LOW GROUND
  - OUTLINE OF HIGHER GROUND
  - OUTCROP AREA
  - CLAIM POST LOCATION AND CLAIM BOUNDARY
  - APPROXIMATE LOCATION OF AERO E-M ANOMALY
  - APPROXIMATE LOCATION OF AERO MAGNETIC ANOMALY
  - GEOLOGICAL CONTACT INFERRED FROM GLOPHYSICAL SURVEY DATA
  - INFERRED CROSS FAULT
  - PROPOSED PROSPECTING AND/OR TRENCHING, AND PACKSACK DRILLING
  - AXIS OF POSITIVE MAGNETIC ANOMALY
  - AXIS OF NEGATIVE MAGNETIC ANOMALY
  - AXIS OF RESISTIVITY ANOMALY
- |        |      |       |
|--------|------|-------|
| 500 -  | UP   | GAMMA |
| 0 -    | 500  |       |
| 0 -    | 500  |       |
| 500 -  | 600  |       |
| 600 -  | 700  |       |
| 700 -  | 800  |       |
| 800 -  | 900  |       |
| 900 -  | 1000 |       |
| 1000 - | UP   |       |
- |        |      |                          |
|--------|------|--------------------------|
| 0 -    | 50   | OHM-CM x 10 <sup>3</sup> |
| 50 -   | 100  |                          |
| 100 -  | 200  |                          |
| 200 -  | 500  |                          |
| 500 -  | 1000 |                          |
| 1000 - | UP   |                          |
- (1) GRANITE, GRANODIORITE, ETC. UNDIFFERENTIATED, SMALL BODIES OF GREENSTONE
  - (2) SLATE, GREYWACK, AND CONGLOMERATE, OCCUR IN THE GENERAL AREA
  - (3) KEEWATIN: ANDESITE LAVA AND TUFF WITH MINOR AMOUNTS OF BASALT, IRON FORMATION AND SLATY SEDIMENTS
  - (4) QUARTZ-BIOTITE SCHIST, OCCUR IN THE GENERAL AREA



GEOPHYSICAL SURVEY DATA ON PROPERTY OF  
**BRUNHURST MINES LIMITED**  
 ISO-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES  
 IN PART  
 ELECTRICAL RESISTIVITY CHECK SURVEY DATA  
 AND  
 GEOLOGICAL INTERPRETATION

RED LAKE MINING DIVISION  
 DISTRICT OF KENORA  
 ONTARIO

GEOPHYSICAL SURVEY BY:  
**GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED**

PLAN NO-1  
 SCALE: 1" = 200'  
 DECEMBER 1956

