2707

GEOPHYSICAL NOTE

on the

ELECTROMAGNETIC AND MAGNETIC SURVEYS

of the

GRAND FORKS PROJECT

on behalf of

BAYLAND MINES LTD.

D. R. Cochrane, P.Eng.
Delta, B.C.,
January 4, 1970.

FIGURES:

INTRODUCTION:

I was engaged by Dr. J. H. Montgomery on January 3, 1970, to make a study of the EM and Mag data from the Pack Rat Group. This brief note describes the data processing procedure and discusses the results of the field work.

MAGNETIC DATA:

Vertical component fluxgate magnetometer readings ranged in value from a low of 0 to a high of 4500 gammas. A frequency histogram of 390 observations was compiled and accompanies this note. The population was selected from the northern property sector, and from stations north of line 20N. The histogram features a prominent mode in the range 1000 to 1049 gammas and the modal range contains 16% of the total population. The distribution is very slightly positively skewed. The standard deviation is approximately 150 gammas. There is some slight departure from normality in the 1400 to 1550 gamma range and values in this group may reflect the presence of a distinct, more magnetically subsceptible rock unit, however much of the area is underlain by a fairly homogeneous rock type with a small magnetic range.

The Magnetic trends are dominantly north directed but some east-west, and north-south line biasing is observable.

One of the most outstanding magnetic features is a linear magnetic low trending through the property in a northerly direction. It is designated A-A'. It strikes NNE in the southern section, subparallel with the base line and some 2400 to 1600 feet west of it. At a point near 14W, 24N some disruption occurs near a small magnetic high. The linear then continues north to the north property boundary and is parallel to the base line. There are a number of less conspicuous magnetic low axis parallel to this major feature. They are occasionally disturbed and possibly offset by east-west features. This north trending set of magnetic linears must reflect some major geological structural feature, possibly the bedding strike. The cross linears may indicate faulting.

A rather large and unusual magnetic plain occurs in the south central region, immediately east of A-A'. The magnetic relief in this vicinity is extremely small and limited in most instances to 100 gammas or so. It suggests that a homogeneous monolithic bedrock unit underlies this area.

Stations characterized by readings in excess of 1500 gammas (just over the mode plus three standard deviations, approximately) have been designated as magnetic highs. The largest of these occurs in the southeast grid corner on the Tokyo No. 2 claim. The anomalously high area is characterized by a maximum amplitude of 2550 gammas. The magnetic relief is not remarkably extreme, suggesting a large homogeneous body of moderately high susceptibility rather than a number of small and strong dipole situations.

Magnetic high No. 2 occurs along the magnetic linear A-A' just south of the aforementioned disruption. It actually consists of two fairly large +1500 gamma areas and a series of smaller (one station) highs. Maximum amplitude in this zone is just over 1000 gammas above background. Again, the magnetic relief is reasonably small.

Magnetic high No. 3 is centred about 26W, 48N. The peak value is 2200 gammas and the main high area is flanked to the west by a single station high.

There are several unnamed magnetic highs and many of these are distinctly spacially related to the aforementioned linears. For contouring purposes, a log scale might be most expedient, with important intervals separating the possible family groups. (i.e. 900, 1100, 1400, 2000 etc.)

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ELECTROMAGNETIC DATA:

A Sharpe SE-200 electromagnetic unit was deployed on the Grand Forks Project. This system operates at a frequency of 1250 c.p.s. and the field procedure was that generally known as the "A" field method. The transmitter was stationed along the same line as the receiver, and 400 feet east, and the receiver faced the transmitter while nulling the instrument. North angles are those recorded with the axis of the coil (perpendicular to the coil of the plane) pointing north (personal communication, Mr. Gord Irving). Interpretation of the data collected in an "in line field procedure" although eliminating, for the most part, serious topographic influences, is necessarily ambiguous. Therefore, before detailed physical work is contemplated, I would suggest detailing of the more prominent and interesting EM features, to more accurately determine their attitude and extent.

Dip angle crossovers have been categorized as follows, and are based on changes within 300 feet (3 successive readings)

1 to 4 degrees: weak
5 to 8 degrees: ~~strong~~ moderate.
greater than 8 degrees: strong

Changes in the resultant field from north to south (going east) have been indicated on the accompanying map by 3 sizes of squares, corresponding to the above categories. Similarly, changes from south to north angles have been indicated by 3 sizes of circles. Steep rate changes (first derivative anomalies) have in many cases been indicated by arrows of lengths corresponding to the amount of changes. Broad areas characterized by large north or south angles in excess of 5 degrees are indicated by hatching. One of the most outstanding electromagnetic features is designated Conductor A, and lies immediately east of the base line between 12 and 24 north. Changes in the tilt angle reach amplitudes of 8 degrees in 100 feet. This EM feature is coincident with a prominent magnetic low linear. It is probable that the linear and crossover are responses to a strong, and conductive fault or shearzone. Conductor B is situated between lines 52 and 60 north. The crossover is a southh to north change and is flanked to the east on line 56N and, both east and west on line 60N, by large areas of high resultant angles. (greater than 5 degrees) Magnetic response in this vicinity is quite low and uneventful. The crossover position on line 56N is coincident with the magnetic linear A-A', and one line 60N by a low amplitude dipole pair. The cause of the large tilt angles is unknown, and may be reflecting a conductive overburden situation, and/or a conductor between(and nearly parallel) to the lines. Conductor C is situated in the central, most southerly sector. Once again, it lies within a simple magnetic province, but there is a small magnetic bump at the north end, on line 20S. Just to the east of this position is an area of high angle response. These large angles may indicate horizontal conductivity (wet conductive overburden, swamp, weathered bedrock, etc.)..

Several additional conductors and isolated crossovers are left unnamed. These are not to be considered unimportant, but are just not as strong and throughgoing as the above described.

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Some of the EM changes occur across the magnetic linears and others in the flanks of the magnetic highs.

Of special note is the EM changes over magnetic anomalies No. 1, 2 and 3 shown in the accompanying map. They are categorized as weak conductors, but must serve as obvious targets for future investigation.

Respectfully submitted,

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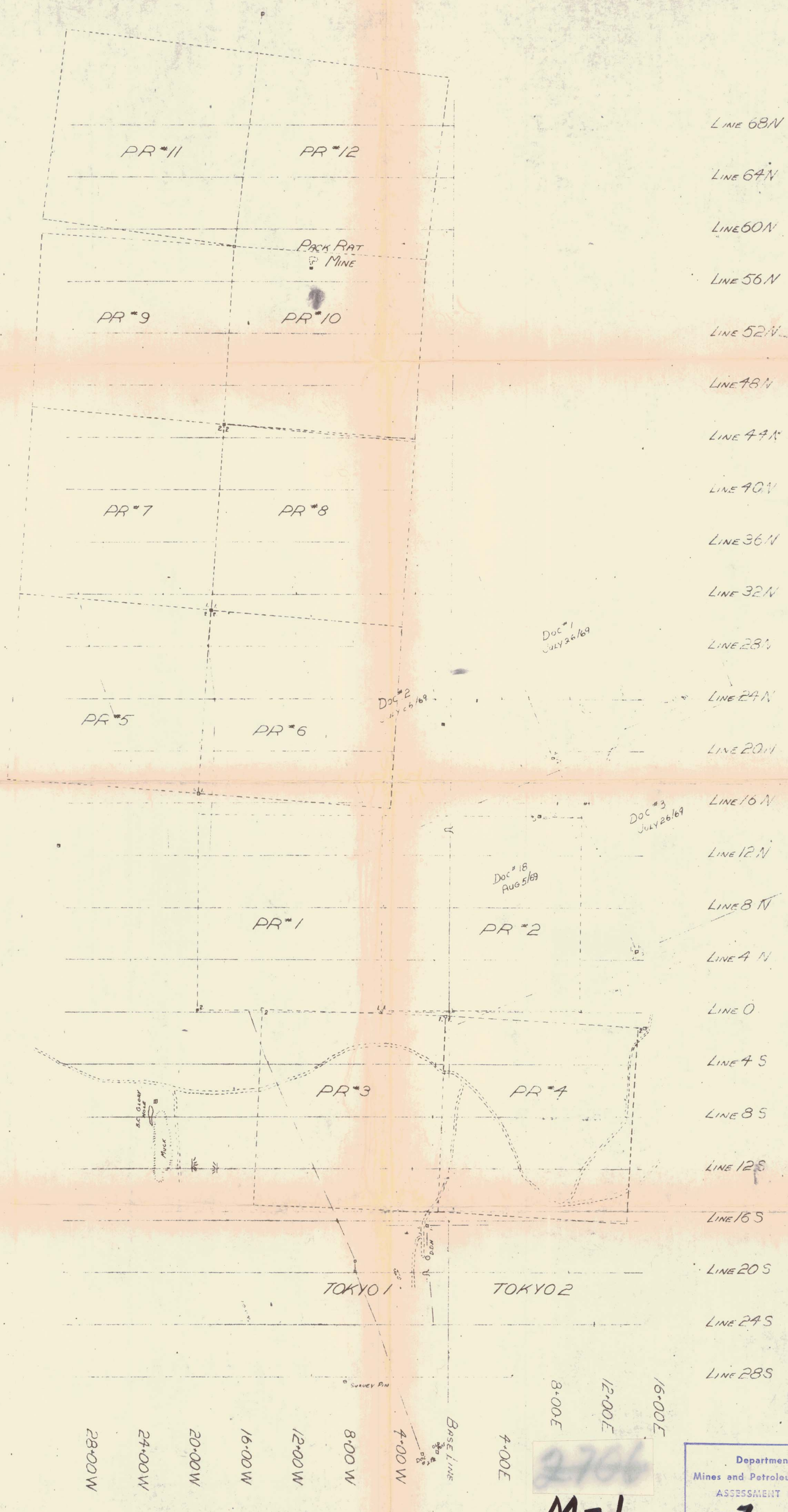

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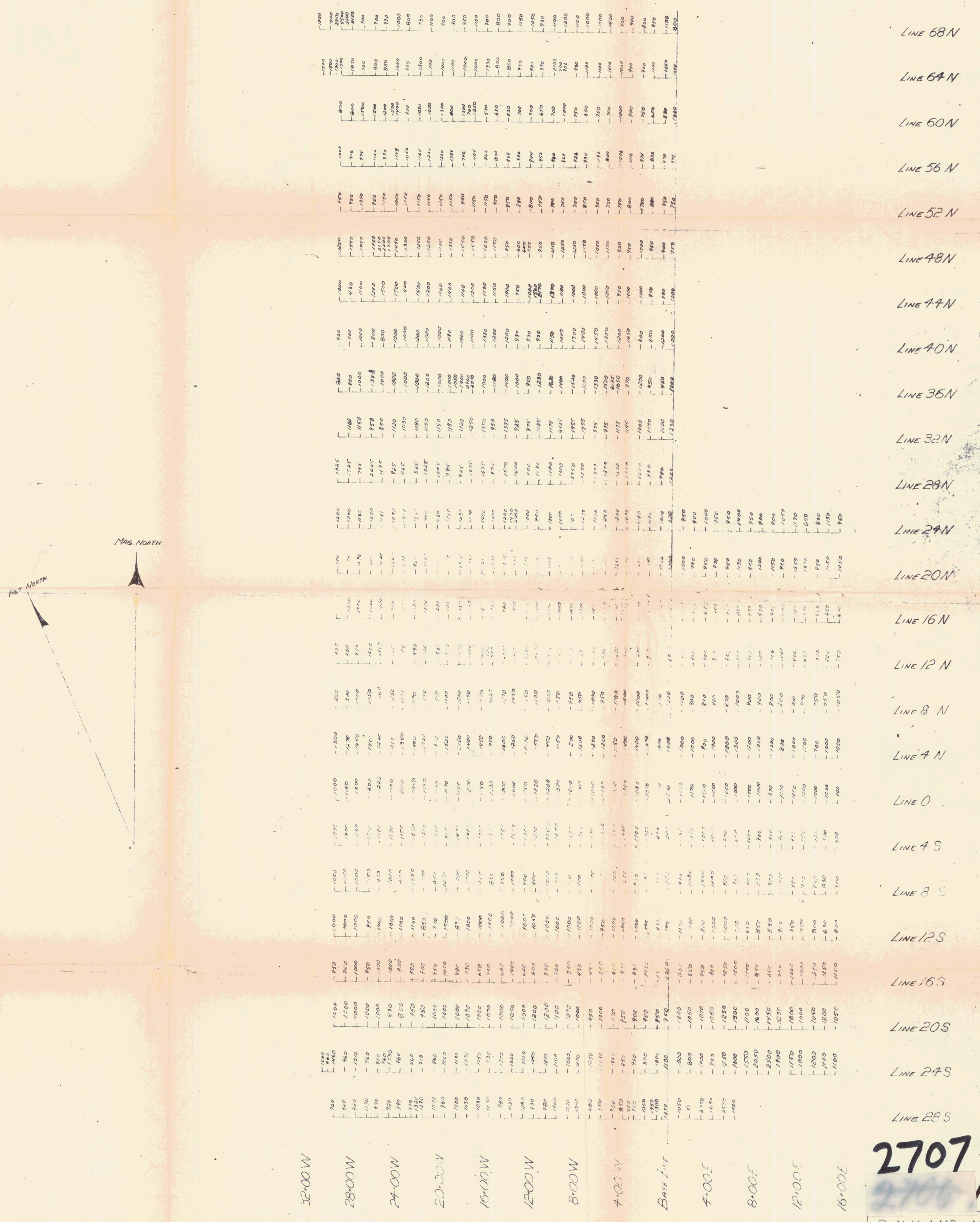
2707 — LINE GRID PACK RAT GP
Fig. 1



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M-2

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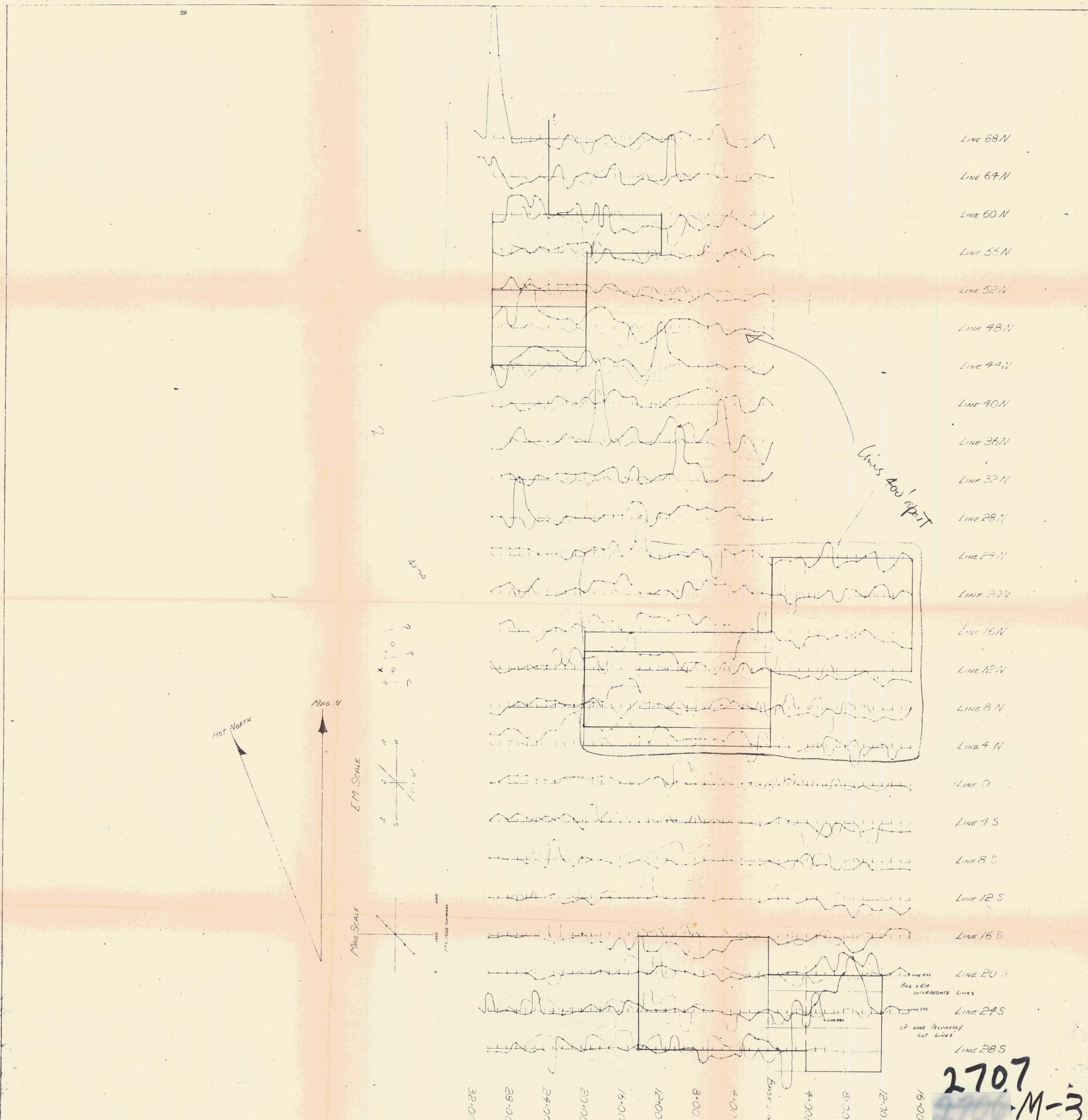
GRAND FORKS PROJECT
PACK RAT GROUP
MAGNETOMETER SURVEY

DATE DEC. 1969
SCALE 1" = 400'
DRAWN BY

Fig. 2



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PACK RAT GROUP
MAG + E.M SURVEY

DATE
SCALE
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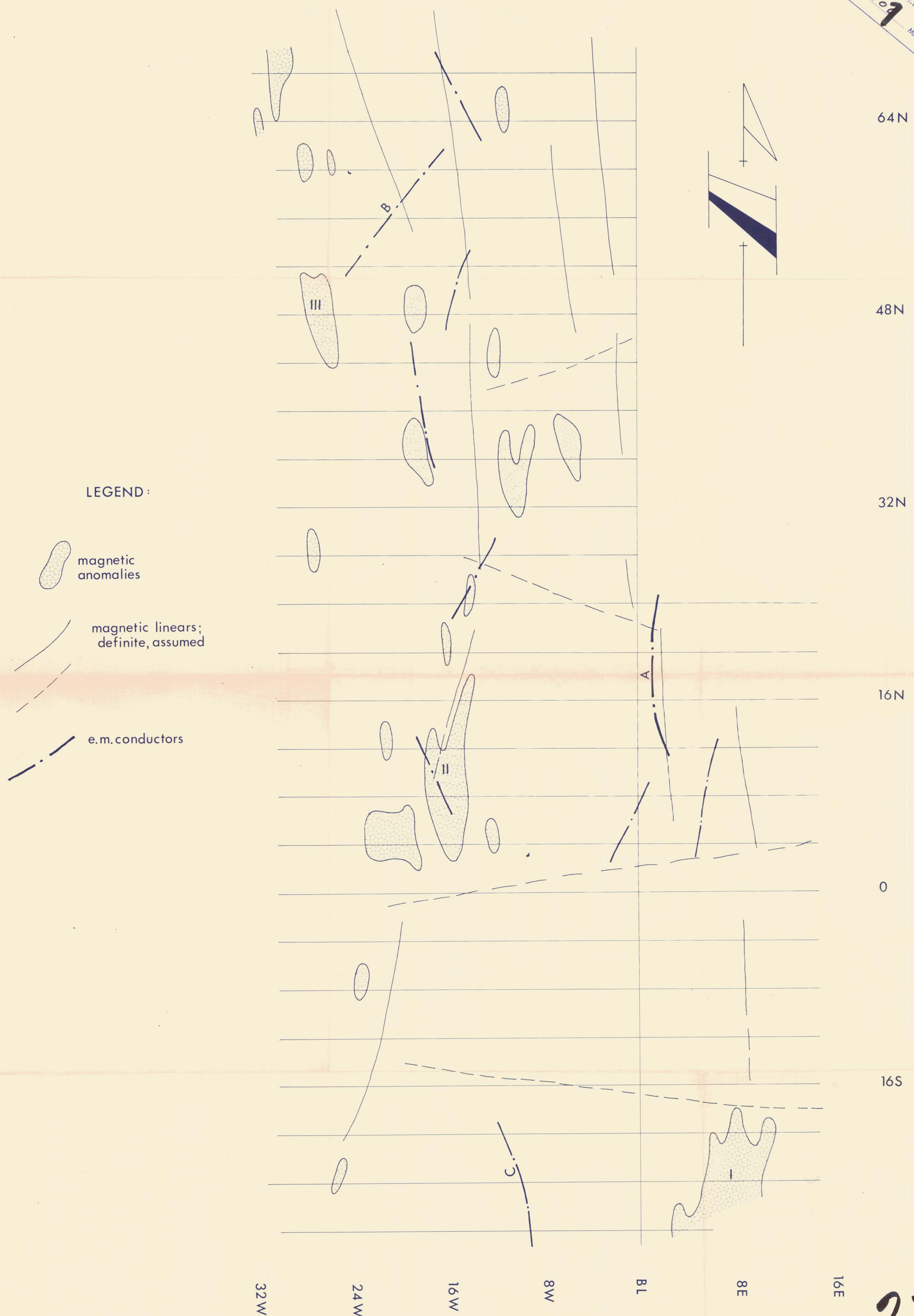
Fig. 3



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General Interpretation

GRAND FORKS PROJECT Pack Rat group

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J. H. MONTGOMERY | JAN. 14, 1970 | FIG 4