

File 63-1052



42801NE0125 63.1052 PENHORWOOD

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REPORT ON A GEOMAGNETIC SURVEY
OF
THE NAT RIVER GROUP OF KUKATUSH MINING CORPORATION
PENHORWOOD AND KENOGAMING TOWNSHIPS, ONTARIO



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SUMMARY

A geomagnetic survey of the Nat River Group has indicated five zones of magnetite mineralization of appreciable size and potential economic importance along with several smaller occurrences.

Although the bands are relatively narrow, it is obvious that a considerable tonnage of concentrating-grade magnetite ore is present which could prove to be a valuable future reserve.

A program of diamond drilling has been recommended to test and sample these deposits at depth and at the same time provide the required assessment credits to permit patenting selected groups of claims after surveying.

INTRODUCTION

The occurrence of magnetite in the Groundhog River area has been known for many years. Dr. Willet G. Miller first examined the deposits in 1902 for the Ontario Department of Mines and the area was mapped in 1924 by E. W. Todd and in 1937 by W. D. Harding, both of whom show the iron bands on their maps.

Not until the development of efficient methods of concentrating low-grade siliceous magnetites and the increasing popularity in the steel industry of the high-grade pellets produced from them in recent years, did the Groundhog River deposits become of economic importance. In 1957 and 1958 however, Kukatush Mining Corporation acquired claims in Penhorwood Township where, by drilling and magnetometer surveying, a large body of concentrating ore has been outlined.

By dip-needle reconnaissance the trend of the magnetite band shown roughly on map 35g of the Ontario Department of Mines was traced and staked eastward across the eastern part of Penhorwood and the western half of Kenogaming Township.

In order to assess the potential of these claims and direct future exploration and development a detailed magnetometer survey was carried out between October 1959 and March 1960.

The results of this work are shown on the accompanying maps and discussed in the following report.

PROPERTY, LOCATION, ACCESS

The Net River Group of Kukatush Mining Corporation consists of the following 66 unpatented claims located in the northeastern portion of Penhorwood Township and the northwestern portion of Kenogaming Township, District of Sudbury, Ontario:

In Penhorwood Township:

S 108417 to S 108438 inclusive

In Kenogaming Township:

S 108415, 108416

S 109701 to 109716 inclusive

S 109719 to 109730 inclusive

S 112095 to 112105 inclusive

S 111927 to 111931 inclusive

With the exception of claims S 108436 to 108438 which lie about one-half mile south of the main group, these are all contiguous extending for a distance of $7\frac{1}{2}$ miles in a northeasterly direction. Timmins, the nearest large town lies about 40 miles to the northeast along Highway 101, an excellent asphalt and gravel highway. From the highway, a system of old logging roads negotiable by four-wheel drive vehicles and tractors gives access to the claim group.

SURVEY PROCEDURE

Magnetometer field work consisted of semi-reconnaissance magnetic surveying on picket lines spaced at 400-foot intervals. As far as possible the cross-lines were laid out to cross the iron formation at right-angles to its trend. As a result lines bear $N37^{\circ}W$ in the westernmost map sheet (NR200 West) and due north at the east end of the claim group (NR200 East).

Significant anomaly zones indicated by the reconnaissance were then covered in detail on 100-foot lines with magnetic observations at 50-foot intervals.

A Sharpe Model A-5 magnetometer was employed in this work as it is particularly well adapted for use in areas of iron formation having a range of over 150,000 gammas.

Readings were converted to gammas and plotted at a scale of 200 feet to the inch for the reconnaissance work; detail work on anomaly zones was plotted at 100 feet to the inch. The only deviation from this pattern was for the separate 3-claim group (S 108436 to 108438) in Penhorwood. Due to remoteness, lines spaced at 200 feet were used on this group and the final map plotted at 100 feet to the inch.

Profiles were drawn at a scale of 10,000 gammas to the inch which was found to be most suitable for showing up the anomalies due to magnetite.

Due to the length of the property and the number of anomalies requiring detailed surveying, a total of 9 sheets were required to cover the area. From west to east these are,

- NR 100 Southwest (1 inch to 100 feet)
- NR 200 West (1 inch to 200 feet)
 - NR 100 West, Penhorwood Township (1 inch to 100 feet)
 - NR 100 East, Penhorwood Township (1 inch to 100 feet)
- NR 200 Middle (1 inch to 200 feet)
 - NR 100 Middle, West Half (1 inch to 100 feet)
 - NR 100 Middle, East Half (1 inch to 100 feet)
- NR 200 East (1 inch to 200 feet)
 - NR 100 East, Kenogaming Township (1 inch to 100 feet)

A total of 118 miles of line were out and surveyed.

GEOLOGY

The geology of Penhorwood and Kenogaming Townships is shown in a very general way on Ontario Department of Mines map 55g. Iron formation occurs within a wide belt of volcanic rocks which extends in an east-west direction across Keith, Penhorwood and the northwestern portion of Kenogaming Townships. Rock exposures are rare in this area and as the magnetometer

survey was done in winter, there was no opportunity to examine those that do occur.

Todd¹ states "The iron is in the form of magnetite interbanded with jasper and white silica which, in parts of the formation, has associated with it pyrrhotite which, in some cases, bears traces of nickel".

Such an occurrence of sulphides was visited by Mr. H. S. Gerson who reports that samples of the sulphide mineralization contained no detectable amounts of nickel. This occurrence lies in the northern part of claim S 109712 (NR 200 Middle).

Todd also shows an outcrop of serpentinite lying east of the Crawford River in Kenogaming Township and mentions that "Small masses of this rock occur in different parts of the area, mostly in the form of dikes intruding the volcanic rocks".² Considerable magnetite, pyrrhotite and chromite is present in these rocks which could therefore give rise to moderately high magnetic anomalies. Farther west in the same volcanic belt, Preat³ mentions the presence of sills of quartz-diorite, diorite and gabbro. On the accompanying maps features believed due to such sills or dikes have been labeled "Basic Dike".

RESULTS OF THE GEOMAGNETIC SURVEY

As shown on the accompanying geomagnetic profile maps, significant anomalies (that is, anomalies with significant lateral extent and magnetic intensity) are of three types.

1. Linear anomalies of moderate magnetic relief (from 1,500 to 6,000 gammas.

1. Todd, E. W., Ont. Dept. Min. Vol. 55, Part 6, 1924

2. Op. Cit., P. 6

3. Preat, V. K., Ont. Dept. Min. Vol. 59, Part 7

2. Wide areas of moderate magnetic relief (1,500 to about 6,000 gammas).

3. Narrow, linear, intense, magnetic anomalies with peak magnetic values in places of over 80,000 gammas.

Basic dikes and plugs

From experience in Keith Township where serpentinite outcrops were accurately mapped by Prest and could thus be closely correlated with the magnetic results, it is probable that anomalies of types 1 and 2 are indicative of serpentinite, gabbro or (less likely) diorite intrusives.

Two small bodies of such material are indicated on sheet NR 100 Southwest; a basic or ultrabasic dike is indicated on sheet NR 100 East (Penhorwood Township) extending east-west for some 4,000 feet between lines 7W and 45W; on sheet NR 200 Middle a dike or sill is indicated in the southeastern corner which extends eastward on to sheet NR 200 East.

The last two occurrences are directly on strike of the major magnetite band and occasionally, as on line 24W and line 31W (NR 100 East) have strong anomalies indicative of magnetite concentrations directly associated with them. It might therefore be suggested that these anomalies are indicative of lean iron formation. Todd however remarks on the occurrence of serpentinite lying between two narrow magnetite bands on the trail between Akweskwa Lake and the Crawford River. This, with the uniformity of the magnetic results from line to line and the similarity to occurrences in Keith, leads the writer to believe that these are basic or ultrabasic dikes with occasional concentrations of sulphides and magnetite in or closely associated with them.

Other smaller bodies are indicated on the map sheets and certain anomalies such as those near the south boundary of S 112103 (NR 200 East),

in 112096 and 112097 may also be due to the presence of basic rocks.

Magnetite

Of greater practical importance are the narrow intense magnetic anomalies which are due to banded siliceous magnetite.

The iron formation does not form a continuous band for the full length of the claim group but occurs as lenses from a few hundred to over 5,000 feet in length and from (probably) a few feet up to 150 feet in apparent width.

The magnetic profiles indicate that the magnetite-bearing zones are vertical or dipping very steeply to the north.

Although overburden is extensive it does not seem to be excessively deep. Five determinations of pole depth at various places across the claim group gave depths of from 25 to 80 feet approximately.

In order of apparent economic significance, the following is a list of the more important zones of magnetite occurrence:

1. Sheets NR 200 West and NR 100 West (Penhorwood)

(a) Between lines 73W and 129W an anomaly with maximum intensity in excess of 55,000 gammas indicates a magnetite band some 5,600 feet in length and up to about 120 feet in apparent width.

This zone may consist of two overlapping lenses but so closely contiguous that they may be considered as a unit.

(b) After a gap of about 400 feet between lines 68W and 73W, the magnetite band appears again on strike to the east (NR 100 West, Penhorwood) and extends for a further 1,600 feet to line 52W attaining possible widths of 150 feet on line 58 and 59W.

There is, therefore, a potential strike length of 7,200 feet of magnetite mineralization along this zone.

(c) On the same sheet, between lines 69W and 87W a parallel band occurs lying from 400 to 700 feet north of the main band. This zone is some 1,900 feet in length, from 30 to 70 feet in apparent width and shows peak readings of over 50,000 gammas.

2. Sheets NR 200 Middle and NR 100 Middle (West Half) between lines 4E and 61E. Here an anomaly zone with peak values up to 59,000 gammas indicates a horizon about 5,700 in length and from 75 to possibly 175 feet in apparent width. Detailed work on this zone suggests that it may be made up of two en echelon lenses overlapping in the vicinity of line 30E.

3. On sheets NR 200 East and NR 100 East (Kenogaming) between lines 154E and 125E a zone of anomalies indicates a magnetite-bearing horizon some 2,900 feet in length. An abrupt change in strike between lines 127E and 128E probably indicates a north-south fault with a left-hand offset of about 200 feet. Between lines 125E and 135E the zone appears to have a width of about 200 feet but a consistent relative drop in intensity in the middle of each profile across this zone suggests that there may be two bands in this section separated by, at most, 75 feet of barren material.

4. On sheet NR 100 Southwest an anomaly zone with a peak value of 33,700 gammas trends in a southwesterly direction for some 2,400 feet between lines 18E and 2W. The band appears to be only a few feet in width at the east end but widens toward the west reaching a possible 150 feet on line 2W. Obviously it continues into the adjoining claims.

The only other occurrence of possible economic interest in this area lies almost entirely within claims 897108, 97109 and 97110 which are not held by Kukatush (Sheet NR 200 East). This was indicated by readings on paced traverses at wide spacing. The band begins on line 156E about 600 feet south of the east end of the horizon described above and continues eastward

for at least 5,200 feet with apparent widths up to about 100 feet. The anomaly does not appear on line 212E so the band must pinch out probably in claim S 98168.

In addition to the important deposits described above there are indications of several minor magnetite lenses of limited extent as shown on the accompanying maps. The most important of these is the irregularly shaped anomaly in claim S 109712 (NR 200 Middle) which has a peak value of 86,000 gammas. Pyrrhotite and pyrite are reported to occur here but it is quite obvious that the anomaly is due to magnetite. A prospect shaft has been sunk on the edge of the anomaly but sulphide-bearing material carried no values in base-metals and only an insignificant amount of gold according to Mr. H. S. Gerson.

CONCLUSIONS AND RECOMMENDATIONS

Detailed magnetic surveying of the Nat River Group has defined the extent and configuration of the occurrences of magnetite. Five zones of appreciable size are indicated along with several smaller occurrences of no economic importance. Although the bands are relatively narrow, it is obvious that an appreciable tonnage of magnetite is present which could prove to be a valuable future reserve for the Radio Hill deposit.

The following groups of claims should be retained and future work concentrated on the magnetite occurrences present:

Group 1: S 108456, 108457, 108458 (Sheet NR 100 Southwest)

If reasonable option terms are available on the claim group to the west, the magnetite band should be traced for its full length and the necessary claims acquired provided magnetic results encourage.

Group 2: S 108421, 108422, 108423, 108426 to 108433 inclusive (Sheet NR 200 West) and an additional claim which should be staked to fill in the angle between S 108432 and 108430.

Group 3: S 108415, 108416, 109710, 109711, 109,712, 109713, 109714, 109725, 109726, 109727, 109728, 109730. (NR 200 Middle). Before abandoning the claims to the east on this sheet (109719, 109720, 109721, 109722, 109724, 109729) a short hole should be drilled south from 13003 line 84E to confirm that the anomaly is due to serpentinite as suspected.

Group 4: S 109704, 109707, 109708, 109709, 109715, 109716, 109723 (Sheet NR200 East). If a reasonable working option can be arranged, detailed magnetic work should be done on S 97108, 97109, 98168 to trace out the magnetite band indicated by the reconnaissance traverses.

A total of 4,120 feet of diamond drilling is proposed to give 120 days or 3 years assessment credit on each of the claims listed above plus 160 days or 4 years credit on the extra claim to be staked north of S 108432. This work should be divided between the four claim groups as follows:

Group 1, 360 feet

Group 2, 1,480 feet

Group 3, 1,440 feet

Group 4, 840 feet

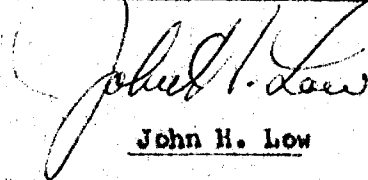
Holes should be drilled at -45° north to south or northwest to southeast depending on the local trend. Holes 200 feet long should be sufficient except where overburden is deep but occasional deep holes should be drilled in section to check the dip.

Cores should be tested and analysed in the usual way.

On completion of this work plus a claim survey, application
can be made to patent the claims.

Respectfully submitted,

Low and Morrow, Consulting Geologists,

A handwritten signature in cursive script, appearing to read "John H. Low".

John H. Low

Toronto, Ontario
May 24, 1960

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Significant anomaly zones indicated by the reconnaissance were then covered in detail on 100-foot lines with magnetic observations at 50-foot intervals.

A Sharpe Model A-3 magnetometer was employed in this work as it is particularly well adapted for use in areas of iron formation having a range of over 150,000 gammas.

Readings were converted to gammas and plotted at a scale of 200 feet to the inch for the reconnaissance work; detail work on anomaly zones was plotted at 100 feet to the inch. The only deviation from this pattern was for the separate 3-claim group (S 108436 to 108438) in Penhorwood. Due to remoteness, lines spaced at 200 feet were used on this group and the final map plotted at 100 feet to the inch.

Profiles were drawn at a scale of 10,000 gammas to the inch which was found to be most suitable for showing up the anomalies due to magnetite.

Due to the length of the property and the number of anomalies requiring detailed surveying, a total of 9 sheets were required to cover the area. From west to east these are,

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A total of 118 miles of line were out and surveyed.

GEOLOGY

The geology of Penhorwood and Kenogaming Townships is shown in a very general way on Ontario Department of Mines map 33g. Iron formation occurs within a wide belt of volcanic rocks which extends in an east-west direction across Keith, Penhorwood and the northwestern portion of Kenogaming Townships. Rock exposures are rare in this area and as the magnetometer

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Other smaller bodies are indicated on the map sheets and certain anomalies such as those near the south boundary of S 112103 (NR 200 East),

in 112096 and 112097 may also be due to the presence of basic rocks.

Magnetite

Of greater practical importance are the narrow intense magnetic anomalies which are due to banded siliceous magnetite.

The iron formation does not form a continuous band for the full length of the claim group but occurs as lenses from a few hundred to over 5,000 feet in length and from (probably) a few feet up to 150 feet in apparent width.

The magnetic profiles indicate that the magnetite-bearing zones are vertical or dipping very steeply to the north.

Although overburden is extensive it does not seem to be excessively deep. Five determinations of pole depth at various places across the claim group gave depths of from 25 to 80 feet approximately.

In order of apparent economic significance, the following is a list of the more important zones of magnetite occurrence;

1. Sheets NR 200 West and NR 100 West (Penhorwood)

(a) Between lines 73W and 129W an anomaly with maximum intensity in excess of 35,000 gammas indicates a magnetite band some 5,600 feet in length and up to about 120 feet in apparent width.

This zone may consist of two overlapping lenses but so closely contiguous that they may be considered as a unit.

(b) After a gap of about 400 feet between lines 68W and 73W, the magnetite band appears again on strike to the east (NR 100 West, Penhorwood) and extends for a further 1,600 feet to line 52W attaining possible widths of 150 feet on line 53 and 59W.

There is, therefore, a potential strike length of 7,200 feet of magnetite mineralization along this zone.

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In addition to the important deposits described above there are indications of several minor magnetite lenses of limited extent as shown on the accompanying maps. The most important of these is the irregularly shaped anomaly in claim S 109712 (NR 200 Middle) which has a peak value of 86,000 gammas. Pyrrhotite and pyrite are reported to occur here but it is quite obvious that the anomaly is due to magnetite. A prospect shaft has been sunk on the edge of the anomaly but sulphide-bearing material carried no values in base-metals and only an insignificant amount of gold according to Mr. H. S. Gerson.

CONCLUSIONS AND RECOMMENDATIONS

Detailed magnetic surveying of the Nat River Group has defined the extent and configuration of the occurrences of magnetite. Five zones of appreciable size are indicated along with several smaller occurrences of no economic importance. Although the bands are relatively narrow, it is obvious that an appreciable tonnage of magnetite is present which could prove to be a valuable future reserve for the Radio Hill deposit.

The following groups of claims should be retained and future work concentrated on the magnetite occurrences present:

Group 1: S 103436, 103437, 103438 (Sheet RR 100 Southwest)

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Group 2: S 108421, 108422, 108423, 108426 to 108433 inclusive (Sheet NR 200 West) and an additional claim which should be staked to fill in the angle between S 108432 and 108430.

Group 3: S 108415, 108416, 109710, 109711, 109,712, 109713, 109714, 109725, 109726, 109727, 109728, 109730. (NR 200 Middle). Before abandoning the claims to the east on this sheet (109719, 109720, 109721, 109722, 109724, 109729) a short hole should be drilled south from 13003 line 84E to confirm that the anomaly is due to serpentinite as suspected.

Group 4: S 109704, 109707, 109708, 109709, 109715, 109716, 109723 (Sheet NR200 East). If a reasonable working option can be arranged, detailed magnetic work should be done on S 97108, 97109, 98168 to trace out the magnetite band indicated by the reconnaissance traverses.

A total of 4,120 feet of diamond drilling is proposed to give 120 days or 3 years assessment credit on each of the claims listed above plus 160 days or 4 years credit on the extra claim to be staked north of S 108432. This work should be divided between the four claim groups as follows:

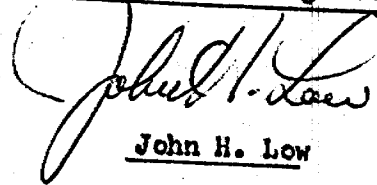
- Group 1, 360 feet
- Group 2, 1,480 feet
- Group 3, 1,440 feet
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Cores should be tested and analysed in the usual way.
On completion of this work plus a claim survey, application
can be made to patent the claims.

Respectfully submitted,

Low and Morrow, Consulting Geologists,



John H. Low

Toronto, Ontario
May 24, 1960

APPENDIX

Property: The property of Kukatush Mining Corporation Limited
1510 Drummond Street
Montreal 25, Quebec

66 unpatented claims, namely

S 108417 to 108458 inclusive

S 108415, 108416

S 109701 to 109716 inclusive

S 109719 to 109730 inclusive

S 111927 to 111931 inclusive

S 112095 to 112105 inclusive

located in Fenherwood and Kenogaming Townships,
Sudbury Mining Division

Miles of line: 118

Number of magnetometer observations: 9,852

Instrument: Sharpe Model A5 magnetometer

Man days: Line-cutting and chaining

Richard Anglehart, Timmins, Ontario

Edgar Anglehart, Timmins, Ontario

November 19, 1959 to April 6, 1960, 2 x 140 = 280

Robert Bergeron

November 19, 1959 to January 7, 1960

50 350

Magnetometer survey

R. A. Watt, Toronto, Ontario

Robert Bergeron, Timmins, Ontario

January 8, 1960 to April 14, 1960, 2 x 98

196

Calculations, Map, Report etc.

John H. Low, Toronto, Ontario

G. E. Low, Toronto, Ontario

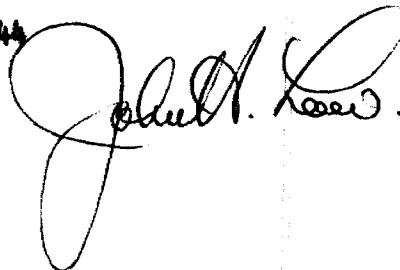
F. Love, Toronto, Ontario

April 10 to May 24, 1960, 3 x 45

132

661

661 x 4 = 2,644





ONTARIO

From the
DEPARTMENT
of
MINES
RETURN
at Point
of Mailing

Mr. R.V. Scott,
Chief, Mining Lands Branch,
Parliament Bldgs.,
TORONTO,
ONT.

50M-56-92

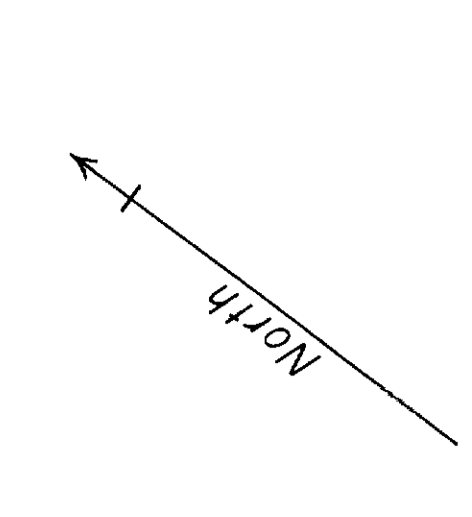
From **SUBBURY, ONT.**
 Registered
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 1957/1958
 Express charges on this shipment are
PREPAID
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4280 INE0125 63 1052 PENHORWOOD

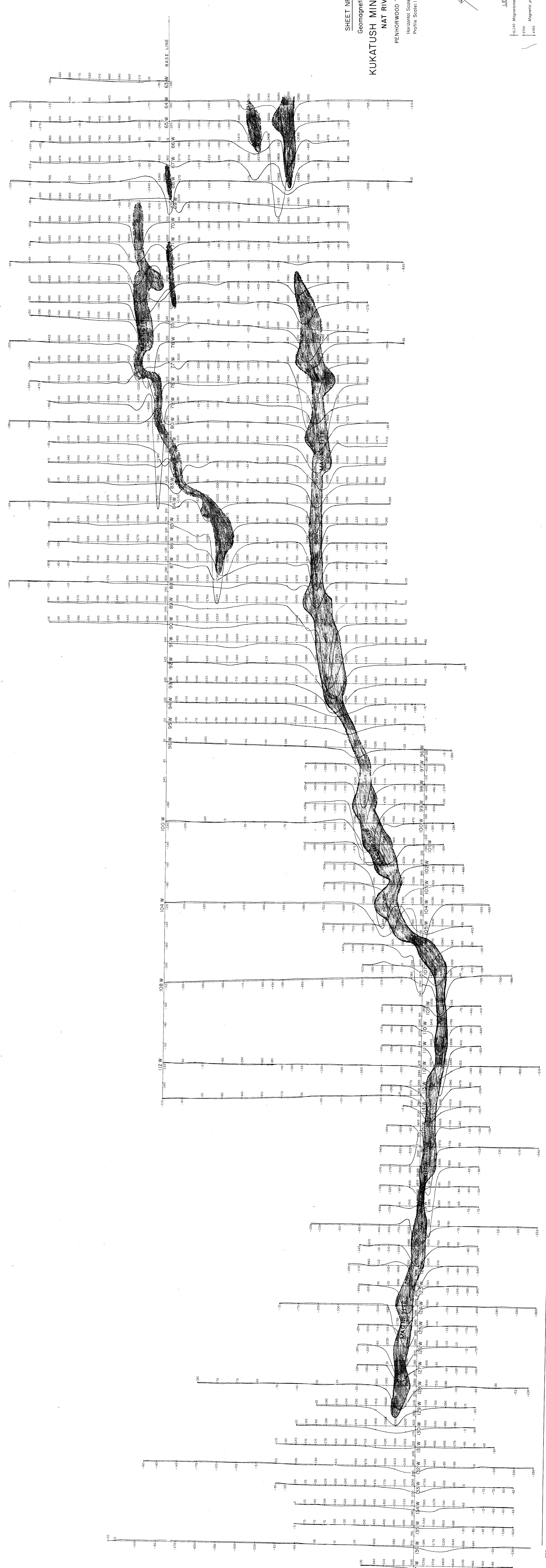
900

SHEET NR100 WEST
Geomagnetic Profile Map
NAT RIVER GROUP
KUKATUSH MINING CORPORATION
 PENHORWOOD TOWNSHIP, ONTARIO
 Horizontal Scale: 1 inch to 100 feet
 Profile Scale: 1 inch to 10,000 gammas



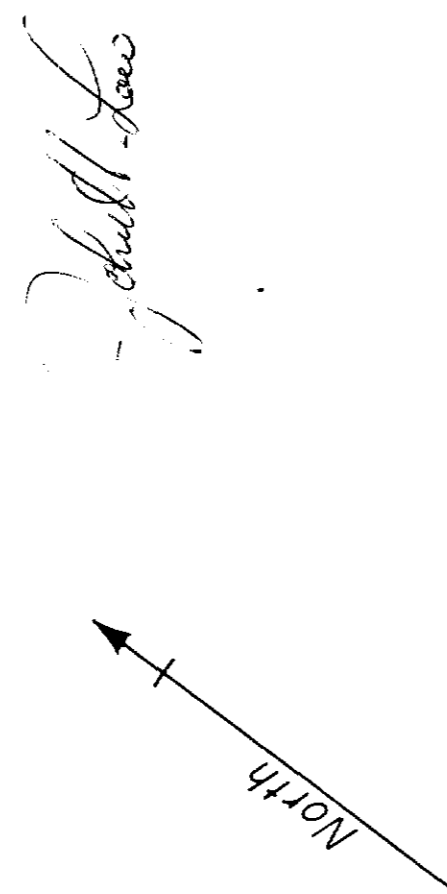
LEGEND
 10.140 Magnetometer station, reading in gammas
 Magnetic profile

John H. Lee



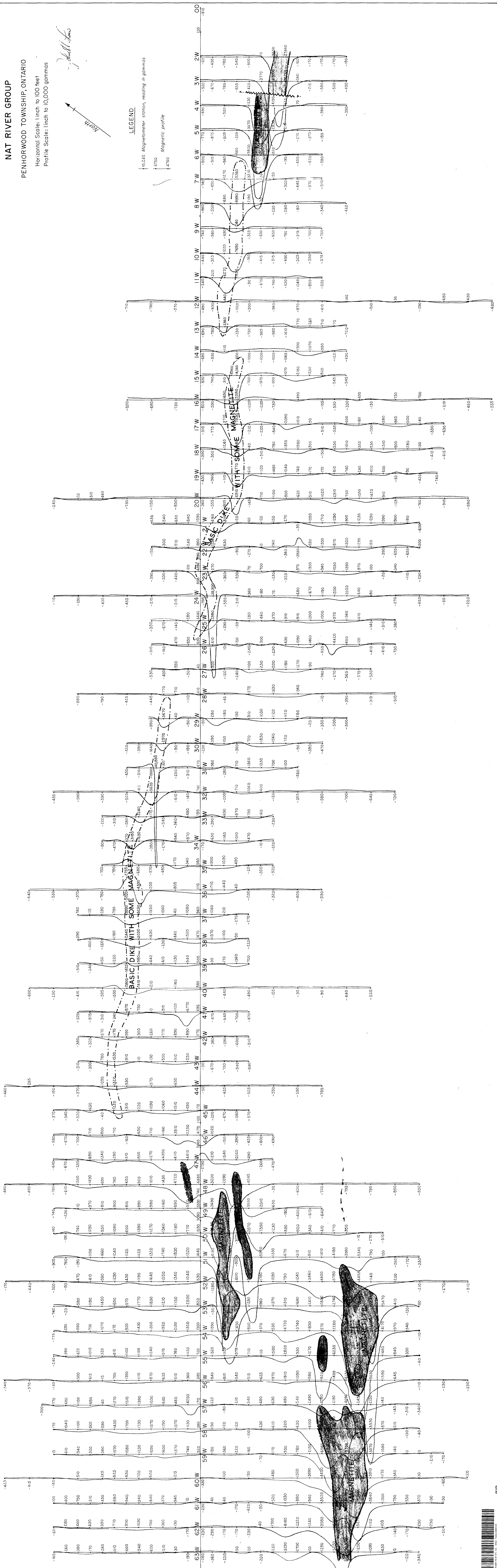
Geomagnetic Profile Map KUKATUSH MINING CORPORATION NAT RIVER GROUP

PENHORWOOD TOWNSHIP, ONTARIO
Horizontal Scale: 1 inch to 100 feet
Profile Scale: 1 inch to 10,000 gammas



10,240 Magnetometer station, reading in gammas
5750
4760

LEGEND
Magnetic profile



SHEET NR 100 MIDDLE
WEST HALF

KUKATUSH MINING CORPORATION

Geomagnetic Profile Map
NAT RIVER GROUP

KENOGAMING TOWNSHIP, ONTARIO

Horizontal Scale: 1 inch to 100 feet

Profile Scale: 1 inch to 10,000 gammas

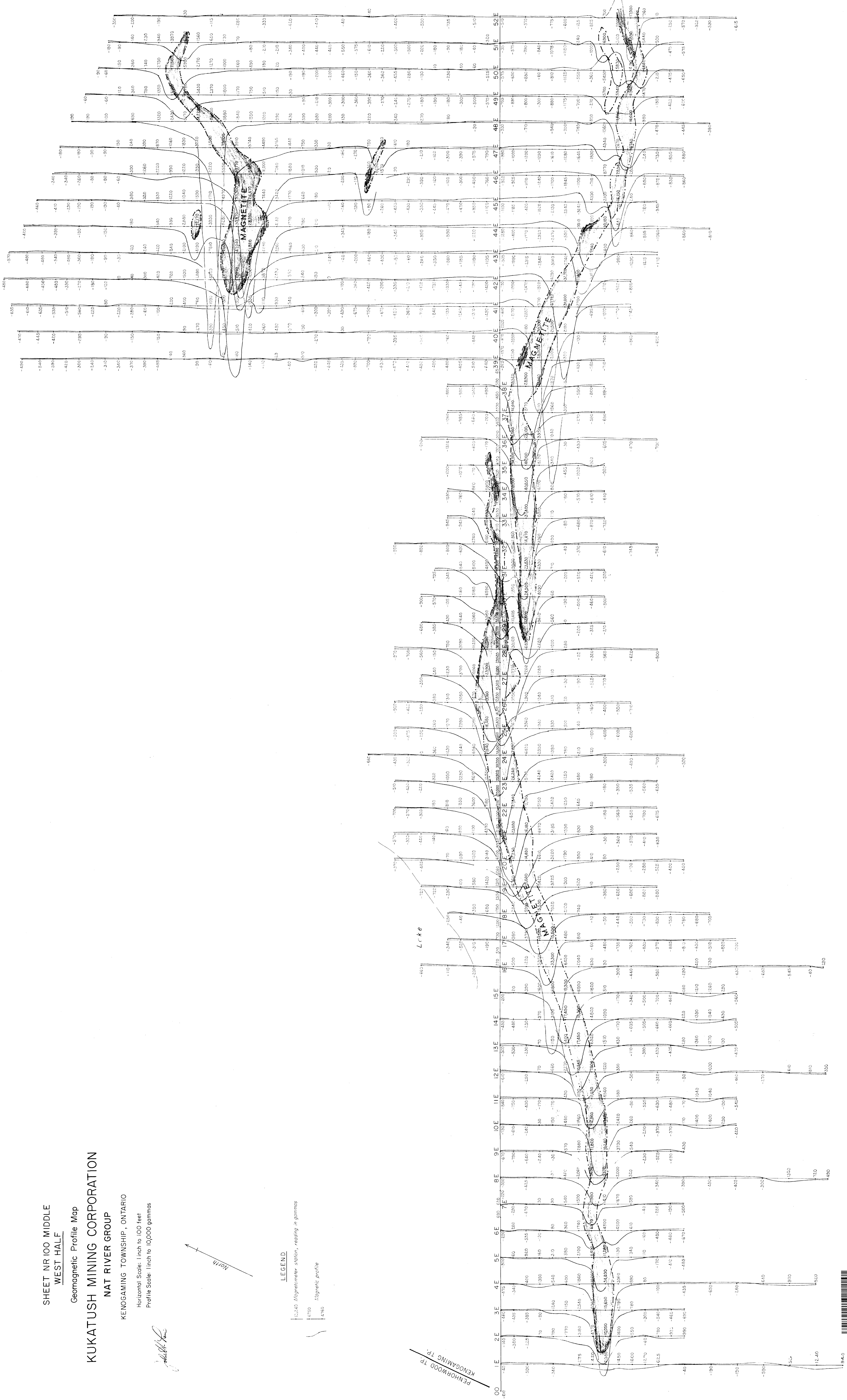
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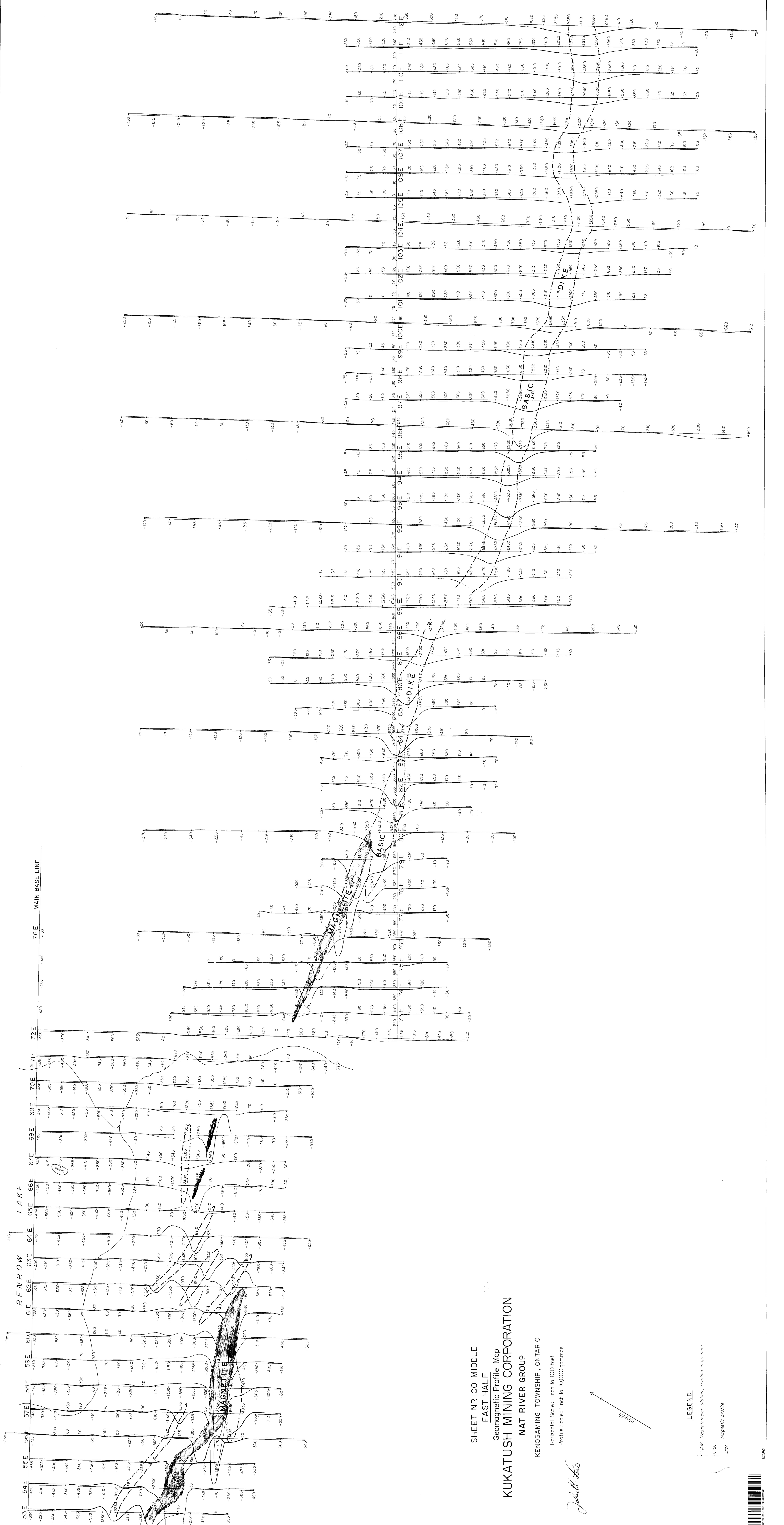
North

LEGEND

1:140 Magnetometer station, reading in gammas

1:160 Magnetic profile





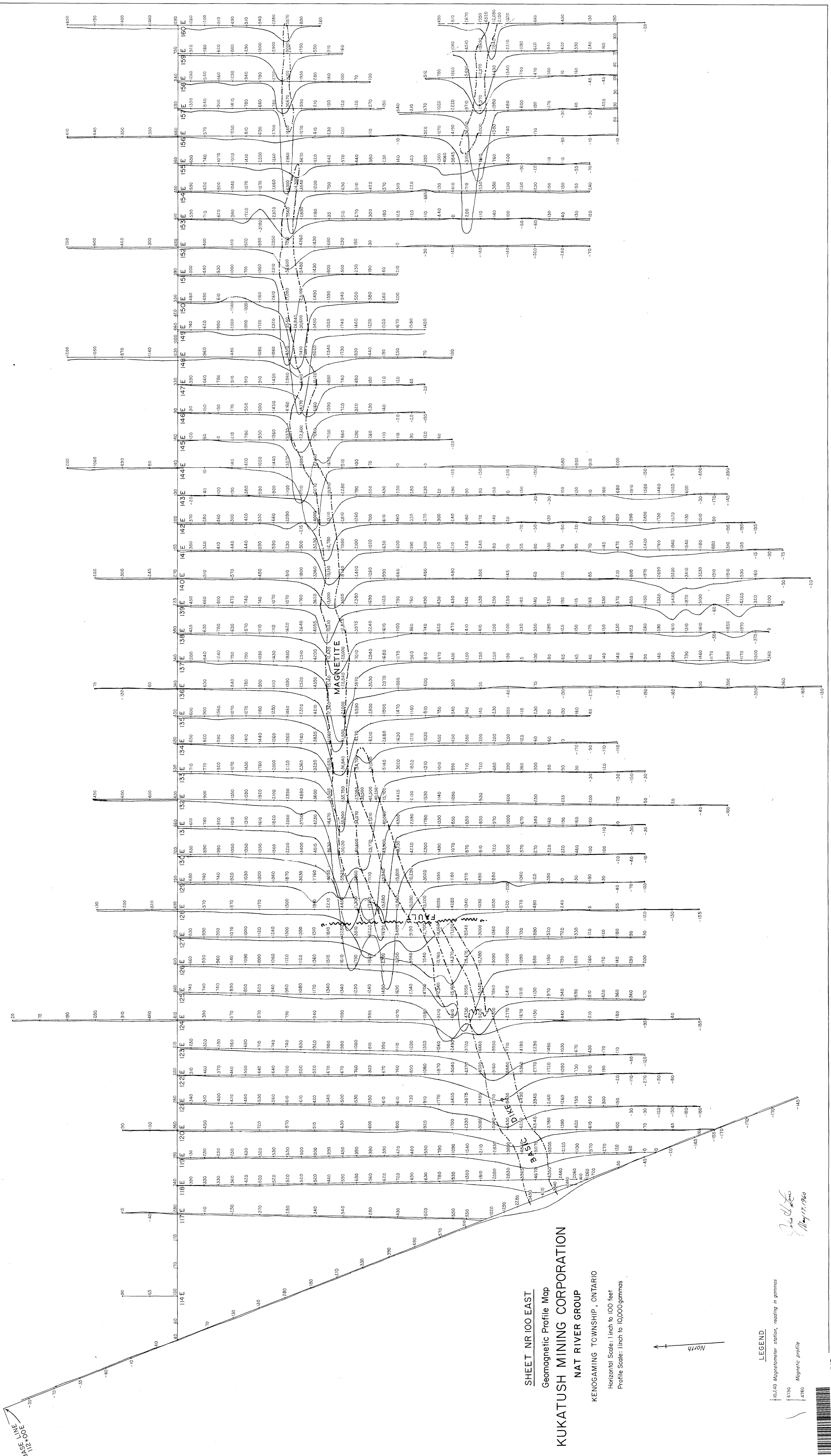
SHEET NR 100 MIDDLE
 EAST HALF
 Geomagnetic Profile Map
 KUKATASH MINING CORPORATION
 NAT RIVER GROUP
 KENOGAMING TOWNSHIP, ON TARIO

Horizontal Scale: 1 inch to 100 feet
 Profile Scale: 1 inch to 10000 gammas

John H. ...

LEGEND
 10.4c Magnetometer station, reading in gammas
 6750
 4740
 Magnetic profile





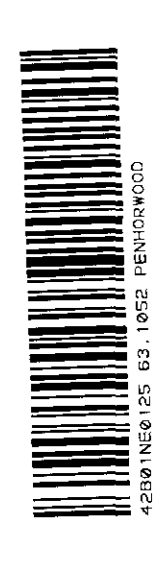
SHEET NR 100 EAST
Geomagnetic Profile Map
KUKATUSH MINING CORPORATION
NAT RIVER GROUP
KENOGAMING TOWNSHIP, ONTARIO

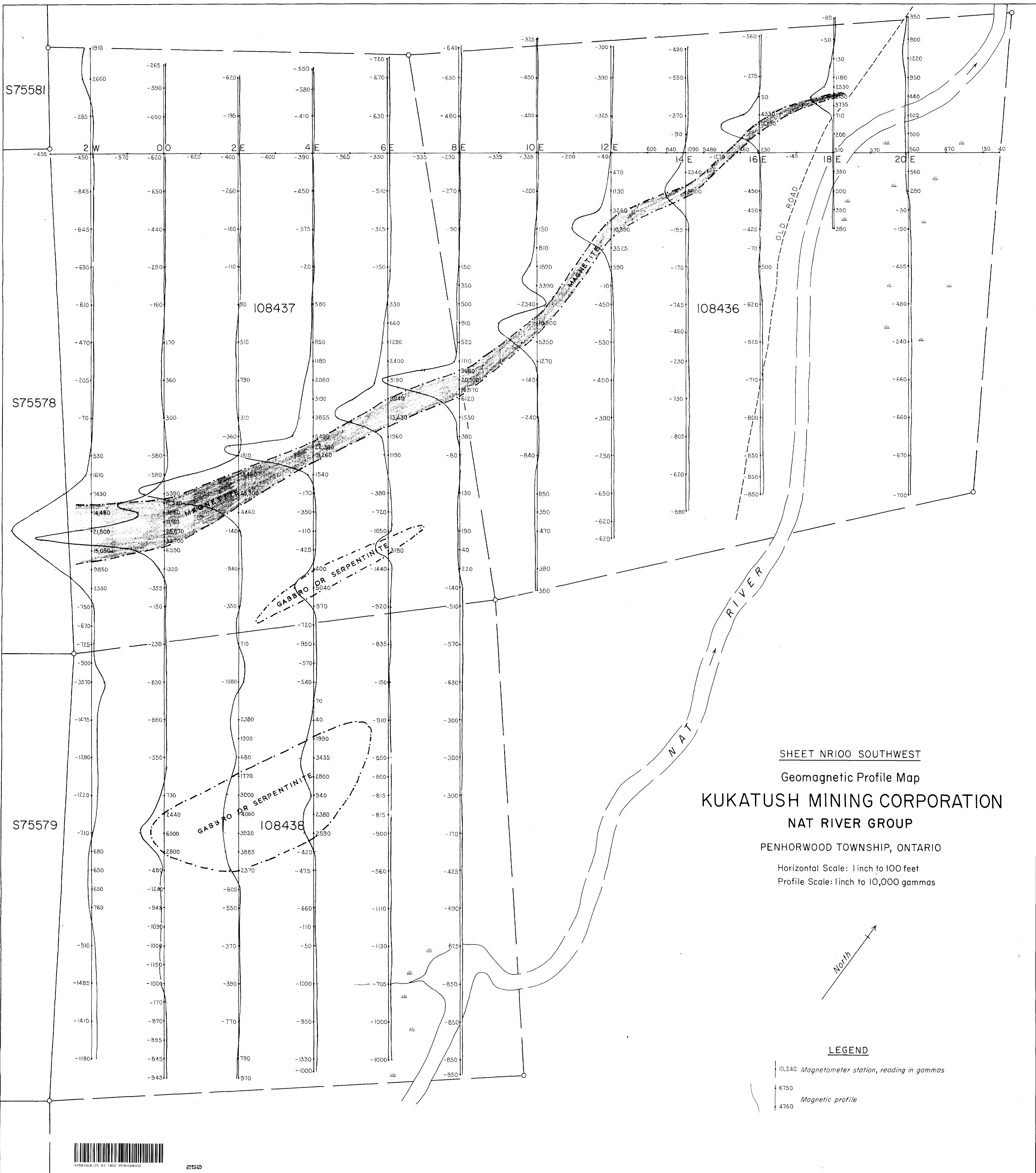
Horizontal Scale: 1 inch to 100 feet
 Profile Scale: 1 inch to 10,000 gammas

LEGEND

- 10.240 Magnetometer station, reading in gammas
- 6150
- 4760 Magnetic profile

John D. Lee
 May 17, 1960





S75581

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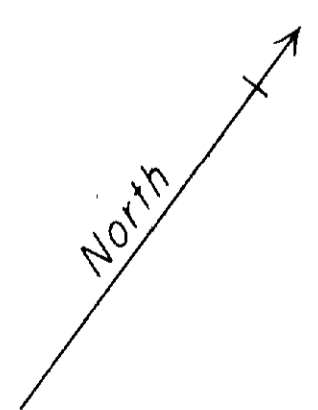
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SHEET NR100 SOUTHWEST
 Geomagnetic Profile Map
 KUKATUSH MINING CORPORATION
 NAT RIVER GROUP
 PENHORWOOD TOWNSHIP, ONTARIO

Horizontal Scale: 1 inch to 100 feet
 Profile Scale: 1 inch to 10,000 gammas



LEGEND

- 10,240 Magnetometer station, reading in gammas
- 6750 Magnetic profile
- 4760



SHEET NR200 WEST
Geomagnetic Profile Map
KUKATUSH MINING CORPORATION
NAT RIVER GROUP
PENHORWOOD TOWNSHIP, ONTARIO

Horizontal Scale: 1 inch to 200 feet
 Profile Scale: 1 inch to 10,000 gammas



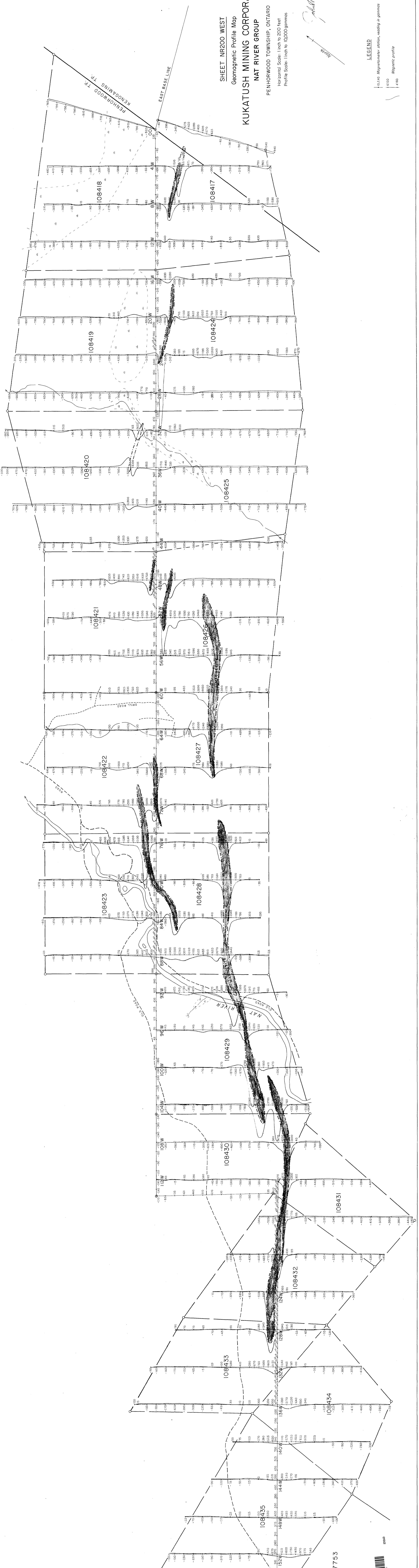
LEGEND

—+0.240 Magnetometer station, reading in gammas

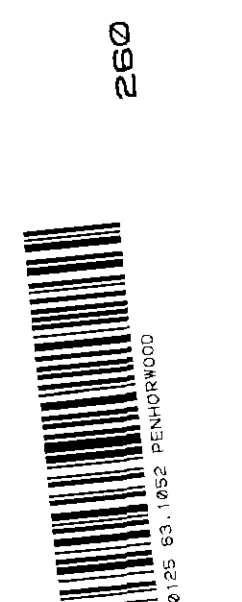
— 6150

— 6160

— Magnetic profile

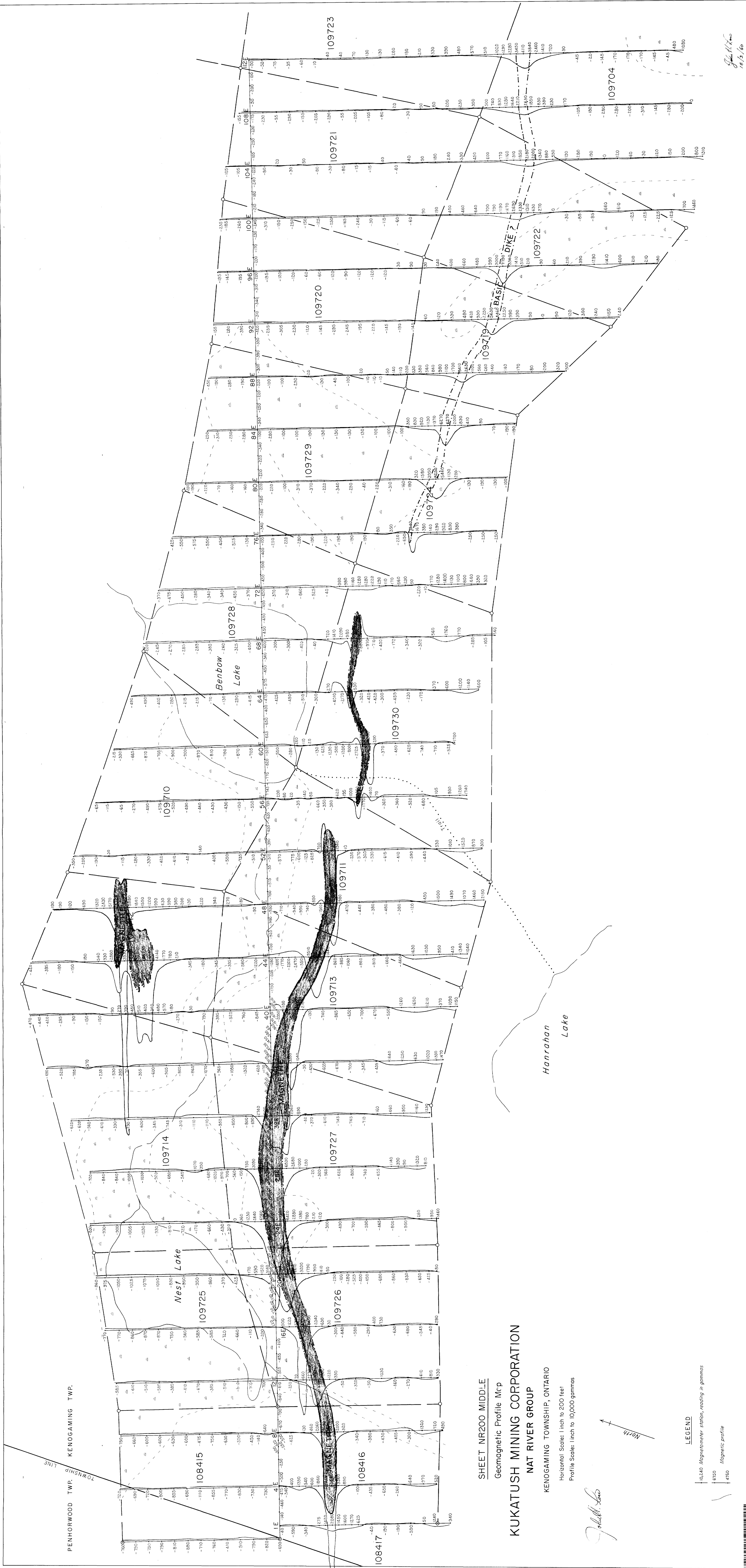


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John H. King
18/3/80



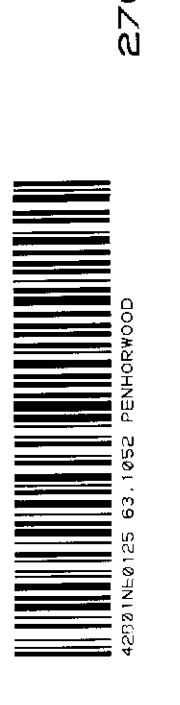
PENHORWOOD TWP. KENOGAMING TWP.

SHEET NR200 MIDDLE
 Geomagnetic Profile Mcp
KUKATUSH MINING CORPORATION
 NAT RIVER GROUP
 KENOGAMING TOWNSHIP, ONTARIO

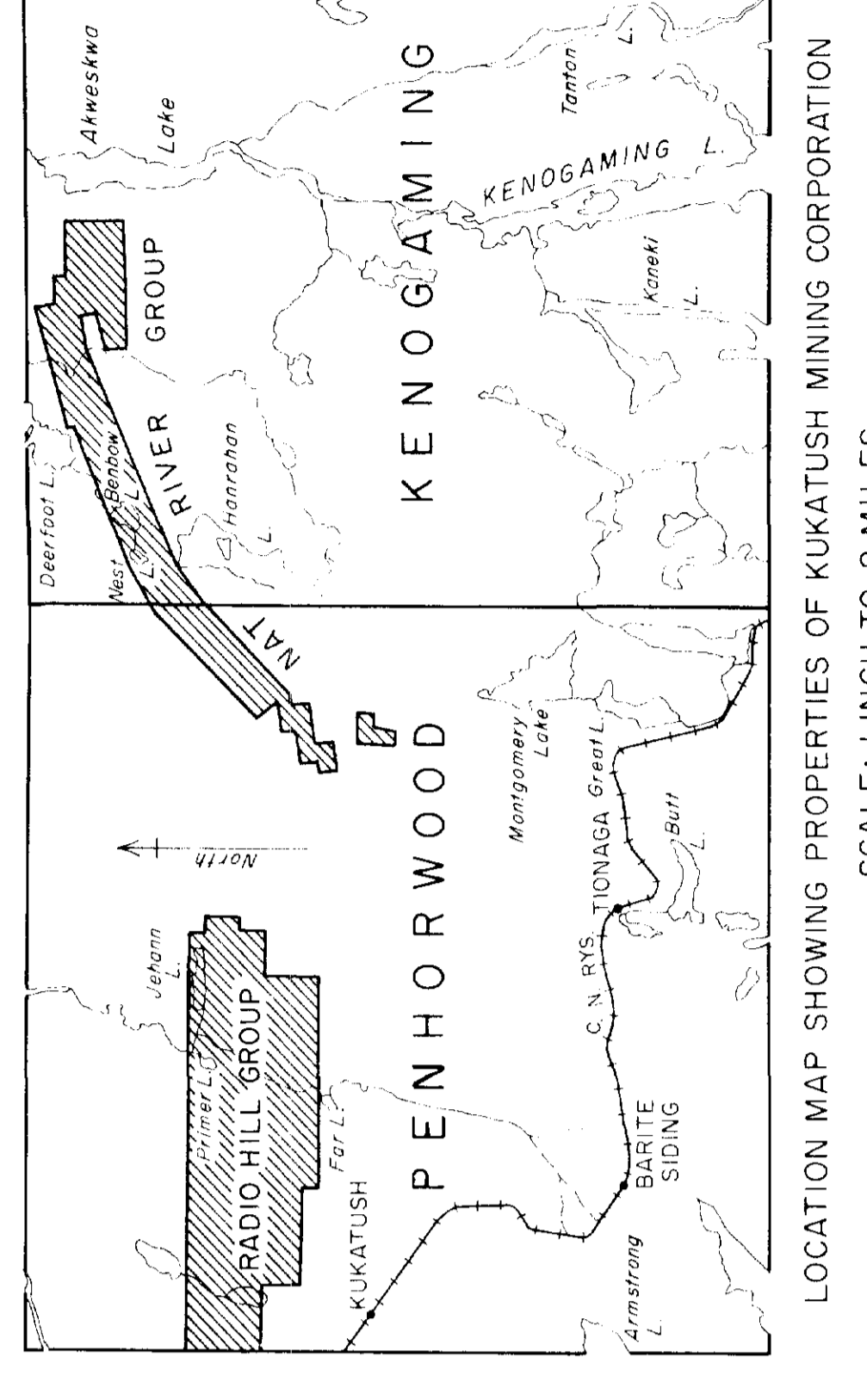
Horizontal Scale: 1 inch to 200 feet
 Profile Scale: 1 inch to 10,000 gammas

John H. King

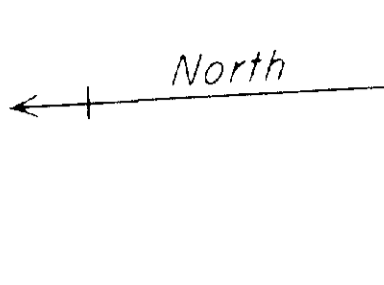
LEGEND
 10,440 Magnetometer station, reading in gammas
 8150
 4750 Magnetic profile



SHEET NR200 EAST
Geomagnetic Profile Map
KUKUTUSH MINING CORPORATION
NAT RIVER GROUP
 KENOGAMING TOWNSHIP, ONTARIO
 Horizontal Scale: 1 inch to 200 feet
 Profile Scale: 1 inch to 10,000 gammas



LEGEND
 1:20,000 Magnetometer station, reading in gammas
 Magnetic profile



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