

SEIGEL ASSOCIATES LIMITED
GEOPHYSICAL CONTRACTORS AND CONSULTANTS

79 MARTIN ROSS AVE.
DOWNSVIEW, ONTARIO
CANADA



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S U M M A R Y

During the period September 26th to September 30th 1967, Seigel Associates Limited flew 176 line miles of air-borne radioactivity survey in the Ena Lake area of northwestern Ontario. The threshold radioactive spectrometer employed recorded only the higher energy gamma rays originating from the uranium/thorium series.

In the Ena Lake area several zones, with approximately north-south trend are found to have higher than $1\frac{1}{2}$ times background uranium/thorium counts. Particularly the zone immediately east of the southern Vermillion Lake arm and the northern Ena Lake arm is of interest.

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GEOPHYSICAL CONTRACTORS AND CONSULTANTS

79 MARTIN ROSS AVE.
DOWNSVIEW, ONTARIO
CANADA

TELEPHONE 633-2450
636-0801
TELEX 02-29891

REPORT ON AN AIRBORNE RADIOACTIVITY SURVEY
IN THE
ENA LAKE AREA, ONTARIO
ON BEHALF OF
MR. E.P. MCDONOUGH

INTRODUCTION

During the period September 25th to September 30th 1967, an airborne radioactivity survey was undertaken in the Ena Lake area of northwestern Ontario by Seigel Associates Limited on behalf of Mr. E.P. McDonough (Plate 1). The 176 miles of survey line were flown on September 29th and 30th, 1967.

AREA OF SURVEY

The area over which the survey was executed is part of Archean aged strongly foliated gneiss, migmatite, including areas containing abundant inclusions of metavolcanics or meta-sediments.

A broad zone of metavolcanics and metasediments is situated in the centre of the area surveyed (see Preliminary Geological Map No. P281, Lake of the Woods Sheet, Geological Compilation Series, Ontario Department of Mines 1965, and Preliminary Report on Radioactive Occurrences in the Kenora Area, by E.O. Chisholm, Ontario Department of Mines, 1950).

Submicroscopic grains of radioactive material are found as a constituent part of narrow pegmatitic stringers and dikes in the gneissic belts. A large amount of black biotite is associated with them. The radioactive materials are fine particles of uraninite and monazite. Molybdenite is present, especially in the metavolcanics and metasediments zone.

The area surveyed lies between the following longitude and latitude co-ordinates - $49^{\circ} 58' N$ - $50^{\circ} 06' N$ and $94^{\circ} 25' W$ - $94^{\circ} 35' W$.

SURVEY EQUIPMENT

The airborne radioactivity recording geophysical equipment consisted of a 5" x 4" sodium iodide crystal coupled to a photomultiplier tube whose output was fed into a Sharpe SC-1 ratemeter. The threshold in this ratemeter was set at 1.65 MeV so that only gamma radiation arising from the uranium/thorium series was recorded on an Esterline Angus Recorder.

The geophysical apparatus was installed in a Cessna 185 aircraft. This aircraft is well suited to low altitude surveying and is able to fly safely at a speed between 90 and 100 M.P.H.

SURVEY PROCEDURES AND STATISTICS

Maps derived from aerial photographs on the scale of 1" = $\frac{1}{4}$ mile were obtained from the Ontario Department of Lands and Forest. A grid of WSW-ENE lines were drawn at one-quarter mile intervals for navigation purposes. In addition, several lines were

Flown perpendicular to this grid over the most interesting zones. The area and line directions were selected by Mr. E.P. McDonough and Seigel Associates Limited. The survey was flown at an altitude of better than 200' and at an average airspeed of 90 miles per hour.

SURVEY RESULTS

The survey results have been plotted on a map at the scale 1" = $\frac{1}{4}$ mile (Plate 2.). The anomalies are designated in a numerical ratio. This ratio is the actual value of the peak of the anomaly in number of counts per second over the average background in its immediate vicinity in counts per second.

Parts of the survey lines with higher than 50 counts per second are specially marked. The supposed anomalous trend and anomalous zones are also marked.

The fiducial marks on the maps correspond with those on the original field recording tape.

CONCLUSIONS AND RECOMMENDATIONS

The amplitude of the individual peak response of a given occurrence is related to its percent uranium and/or thorium, its surface area of exposure to the airborne detector system, the elevation of the aircraft above the ground and its airspeed. Thus, any one of the recorded anomalies in this present survey could be caused by a high grade concentration over a limited area or, alternatively, lower grade concentrations over a larger area.

The difference in exposure area and elevation of aircraft were remarkable between the area directly east of the

southern arm of Vermillion Lake, the northern arm of Ena Lake and the rest of the survey area. The first area is a so-called "burned" area, it is more or less a great outcrop, exposing the barren rock. Low flying (100' or better) was possible. The rest of the area is mostly covered and the clearance was primarily between 100' and 200'.

An anomaly in the first area with the ratio $100/50$ is then of the same priority as an anomaly with the ratio $50/30$ in other parts of the area. Only ground investigations can resolve the actual significance of each individual anomaly. A ground follow-up program should be considered with priority given to those anomalies with the highest ratio-values, both those on the anomalies trend lines and the single ones. The latter, on ground investigation, have been found to have been caused by interesting concentrations of uranium or thorium, as it is not possible to give 100% coverage over the entire area surveyed. Certainly, between individual flight traverses there is a sizeable area which, as yet, has not been effectively surveyed and which should be investigated in the vicinity of each radioactive occurrence found to be of interest on the ground.

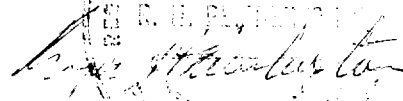
Anomalies or zones with first priority in a ground follow-up program are in the Ena Lake area:

- a) The anomalous zone immediately east of the southern Vermillion Lake arm and northern Ena Lake arm.
- b) The anomalous zone between fiducial mark 122 on line 27W and fiducial mark

266 on line 6W.

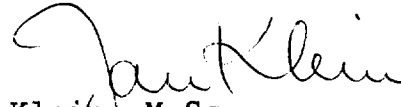
- c) The anomalous zone at the east
end of lines 6W, 7W, 8W, 9W and 10W.

Respectfully submitted,



R. H. Pemberton

Roger H. Pemberton, M.Sc.
Geophysicist.



Jan Klein

Jan Klein, M.Sc.
Geophysicist.

Toronto, Ontario
October 12, 1967.



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SUMMARY

The stronger magnetic features are caused mainly by volcanic inclusions and occasional basic dyke-like structures. Pegmatite dykes are frequent in these sections. The broader and less intense anomalies in the south detail area and elsewhere generally represent increases in the magnetite content of underlying pegmatitic granite.

A scintillometer survey is required to map surface radioactivity whereupon further trenching should be laid out to investigate radioactive zones and certain magnetic areas. The scintillometer work should cover the south detailed area primarily as well as much of the remaining grid, probably excluding most of the northeast section between #2 and #3 Base Lines.

INTRODUCTION

The magnetometer survey was carried out on behalf of Headvue Mines Limited to explore the central part of a group of 66 mining claims adjacent to Ena Lake, about 16 miles north of Kenora, Ontario. The survey covers major parts or completely the 19 mining claims numbered as follows:

K 41219	K 41232 to K 41235
K 41225 to K 41226	K 41481 to K 41485
K 41228 to K 41230	K 41487 to K 41490

The property is accessible by road from Kenora and thence by a short boat trip from the south side of Ena Lake. Cabins are available on the south side of the lake near Ena Station.

The area surveyed is underlain largely by a reddish granite that has a coarse textured pegmatitic appearance. In the central to northeast section it is more medium grained. The south to southwest part of the grid contains many large and small inclusions of volcanic rocks as well as some dyke-like bodies of basic rock generally striking west to northwest. Irregular patches of grey granite are present as well in the south and northwest extremities of this area. A dyke or remnant of a gabbroic rock is noted on Line 14 West at 800' North, crossing through the adjacent lines east and west. Pegmatite dykes are quite frequent in this section of the grid as opposed to the massive pegmatitic granite seen in most of the remainder of the area surveyed.

Extensive parts of the surveyed area are largely exposed with slight overburden in places.

As magnetite has been noted in the pegmatitic granite and a correlation is thought to exist in pegmatitic rocks between the presence of magnetite and uranium values, the magnetometer survey was undertaken to outline the magnetic areas and so help to direct the search for zones of higher uranium content.

Some initial trenching and sampling has been done in the south detailed area.

SURVEY EQUIPMENT AND PROCEDURES

The instrument employed was a Sharpe MF - 1 fluxgate magnetometer.

From three base lines 2,400 feet apart run North 45 degrees East, the traverse lines were spaced 200 feet apart except in the south detail area where the line spacing is 100 feet. Due to the shortage of material for making pickets in large parts of the survey area, pickets were only used to run Line - 0 and the three base lines. The other lines were run by compass, and orange flagging was used on all the lines to mark the 100 - foot stations. The lines are well cut out in the bushy sections.

Instrument readings were taken regularly at 50 - foot intervals with intermediate readings provided wherever magnetic variations were found that were judged to have possible significance. Readings were adjusted in the normal way to compensate for diurnal variation.

SURVEY RESULTS

A plan of the magnetic results accompanies this report, showing the results in profile form throughout the grid and in contour form in the south detail area.

The contouring probably outlines the more magnetic parts of the pegmatitic granite fairly well, but that of the smaller

more strongly magnetic zones is less reliable due to the irregular strikes and unknown continuity of the volcanic inclusions thought largely responsible.

The more magnetic pegmatitic granite is indicated to occupy a good part of the south detailed area, extending broadly a little south of true west from Line 10 West at #1 Base Line. It is about 1,100 feet long and several hundred feet wide with volcanic remnants appearing at its edges, but probably extends well to the south and southwest, intermixed with pegmatite dykes and the older volcanic and granitic inclusions. The prominent magnetic anomaly crossing #1 Base Line at 16 West is notable because only pegmatitic granite is visible there. The adjacent anomalous area to the south is of interest because of the presence of pegmatitic rocks in contact with the volcanic remnants.

The magnetic features outside the detail area in the southern and west - central parts of the grid are of similar interest, and the locally higher magnetic levels in the eastern and northwestern parts may also be significant.

RECOMMENDATIONS

A scintillometer survey is recommended, to provide Uranium Plus Thorium counts at 25 - foot stations. The instrument should be read at hip level with the instrument response observed continuously along the traverses and significant changes between the stations recorded. In the more radioactive locations,

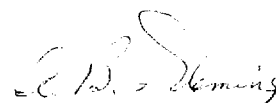
Thorium counts should be obtained as well and additional closely spaced traverses made. Ground level radiometric determinations of Uranium and Thorium content should be made every one or two feet along prospective trenching sections.

All the lines within the south detail area should be surveyed in the above manner. Similar coverage should be made of the lines in the northwest and east sections of the grid where magnetic levels are relatively high, and in the south and west areas where specific magnetic features are present.

Trenching locations should then be chosen largely on the basis of scintillometer results, but with due consideration of magnetic zones appearing to be related to concentrations of magnetite in pegmatitic granite.

Toronto, Ontario.
February 20th, 1968.

Respectfully Submitted,



A. B. Fleming, B. Eng.

Revised Work Report

Superceding Report of AUG 20/68

W6901-41047



ONTA

THE MINING ACT R



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900

To the Recorder of KENORA Mining Division

I, HEADVUE MINES LIMITED T - 168

name of Recorded Holder

Miner's Licence

Suite 902 55 Yonge St. TORONTO, 1, ONT.

Post Office Address

do hereby report the performance of 400 days of Ground Magnetometer Survey

type of work

not before reported to be applied on the following contiguous claims

Claim No.	Days per claim	Claim No.	Days	Claim No.	Days
K-41047-41050	11.76	Applied to 34 claims			
K-41212-41241	11.76 per claim				

This is not revised!

All the work was performed on Mining Claim (s) K41219, K41225, 6K41228-30, K41232-35 (Incl)
(In the case of geological and/or geophysical survey (s) where more than 18 claims are involved attach a schedule)

READ CAREFULLY: THE FOLLOWING INFORMATION IS REQUIRED BY THE MINING RECORDER.

For Manual Work, Stripping or Opening up of Mines, Sinking Shafts or Other Actual Mining Operations - Names and addresses of the men who performed the work and the dates and hours of their employment.

For Diamond and other Core Drilling - Footage, No. and angle of holes and diameter of core. Name and address of owner or operator of drill. Dates when drilling was done. Signed core log and sketch in duplicate.

For Compressed Air or Other Power Driven or Mechanical Equipment

Type of drill or equipment. Names and addresses of men engaged in operating equipment and the dates and hours of their employment.

For Power Stripping - Type of equipment. Name and address of owner or operator. Amount expended. Dates on which work was done. Proof of actual cost must be submitted within 30 days of recording.

With each of the above types of work sketches are required to show the location and extent of the work in relation to the nearest claim post. In the case of diamond or other core drilling the sketch must be submitted in duplicate.

For Geological and Geophysical Survey - The names and addresses of men employed as well as dates. Type of instrument used in the case of geophysical survey. Reports and maps in duplicate must be filed with the Minister within 60 days of recording.

For Land Survey - the name and address of Ontario Land surveyor.

The Required Information is as Follows: (Attach a list if this space is insufficient)

Line Cutters: W. Fleming, 75 Betty Ann Dr., Willowdale, Ont. Oct. 13-26/67
D. Goodchild, Heppn Bay, Ont.
A. B. Fleming, 75 Betty Ann Dr., Willowdale, Ont.

Instrument Operation: A. B. Fleming, as above- Oct. 14-26/67

Draughting, Compiling Report: A. B. Fleming- as above- Nov./67-Feb/68

Instrument Used: Sharpe MF-1 Magnetometer, Ser.# 40589

Date January 6, 1969

E.P. McDonough
Signature of Recorded Holder or Agent

The Mining Act
Certificate Verifying Report of Work

I, E. P. McDonough

Suite 902, 55 Yonge St. Toronto, Ont.

(Post Office Address)

hereby certify:

1. That I have a personal and intimate knowledge of the facts set forth in the report of work annexed here-to, having performed the work or witnessed same during and/or after its completion.
2. That the annexed report is true.

Dated Jsnuary 13, 19 69

E.P. McDonough
Signature

THE PENALTY FOR MAKING A FALSE STATEMENT IN THIS REPORT AND/OR CERTIFICATE IS \$500. OR SIX MONTHS IMPRISONMENT OR BOTH



ONTARIO

THE MINING ACT REPORT OF WORK

A separate form is required for each type of work to be recorded.

To the Recorder of KENORA Mining Division

I, HEADVUE MINES LIMITED T - 168

name of Recorded Holder Miner's Licence

Suite 902 55 Yonge St. TORONTO, 1, ONT.

Post Office Address

do hereby report the performance of 400 days of Ground Magnetometer Survey type of work

not before reported to be applied on the following contiguous claims

Table with 6 columns: Claim No., Days per claim, Claim No., Days, Claim No., Days. Includes entries for K-41047-41050 and 11212-41241.

All the work was performed on Mining Claim (s) K41219, K41225, K41228, 30, K41232, 35 (Incl) (In the case of geological and/or geophysical survey (s) where more than 18 claims are involved attach a schedule)

READ CAREFULLY: THE FOLLOWING INFORMATION IS REQUIRED BY THE MINING RECORDER.

For Manual Work, Stripping or Opening up of Mines, Sinking Shafts or Other Actual Mining Operations - Names and addresses of the men who performed the work and the dates and hours of their employment.

For Diamond and other Core Drilling - Footage, No. and angle of holes and diameter of core. Name and address of owner or operator of drill. Dates when drilling was done. Signed core log and sketch in duplicate.

For Compressed Air or Other Power Driven or Mechanical Equipment

Type of drill or equipment. Names and addresses of men engaged in operating equipment and the dates and hours of their employment.

For Power Stripping - Type of equipment. Name and address of owner or operator. Amount expended. Dates on which work was done. Proof of actual cost must be submitted within 30 days of recording.

With each of the above types of work sketches are required to show the location and extent of the work in relation to the nearest claim post. In the case of diamond or other core drilling the sketch must be submitted in duplicate.

For Geological and Geophysical Survey - The names and addresses of men employed as well as dates. Type of instrument used in the case of geophysical survey. Reports and maps in duplicate must be filed with the Minister within 60 days of recording.

For Land Survey - the name and address of Ontario Land surveyor.

The Required Information is as Follows: (Attach a list if this space is insufficient)

Line Cutters: W. Fleming, 75 Betty Ann Dr., Willowdale, Ont. Oct. 13-26/67; D. Goodchild, Heppn Bay, Ont.; A. B. Fleming, 75 Betty Ann Dr., Willowdale, Ont.

Instrument Operation: A. B. Fleming, as above - Oct. 14-26/67

Draughting, Compiling Report: A. B. Fleming - as above - Nov./67-Feb/68

Instrument Used: Sharpe MF-1 Magnetometer, Ser.# 40589

Date January 6, 1969

Signature of Recorded Holder or Agent (EP McDonough)

The Mining Act Certificate Verifying Report of Work

I, E. P. McDonough

Suite 902, 55 Yonge St. Toronto, Ont.

(Post Office Address)

hereby certify:

- 1. That I have a personal and intimate knowledge of the facts set forth in the report of work annexed here-to, having performed the work or witnessed same during and/or after its completion.
2. That the annexed report is true.

Dated January 13, 1969

Signature (EP McDonough)

THE PENALTY FOR MAKING A FALSE STATEMENT IN THIS REPORT AND/OR CERTIFICATE IS \$500. OR SIX MONTHS IMPRISONMENT OR BOTH



ONTARIO DEPARTMENT of MINES

RETURN AT POINT OF MAILING

Ontario Dept. of Mines,
Parliament Buildings,
Toronto, Ontario.

50M-63 296



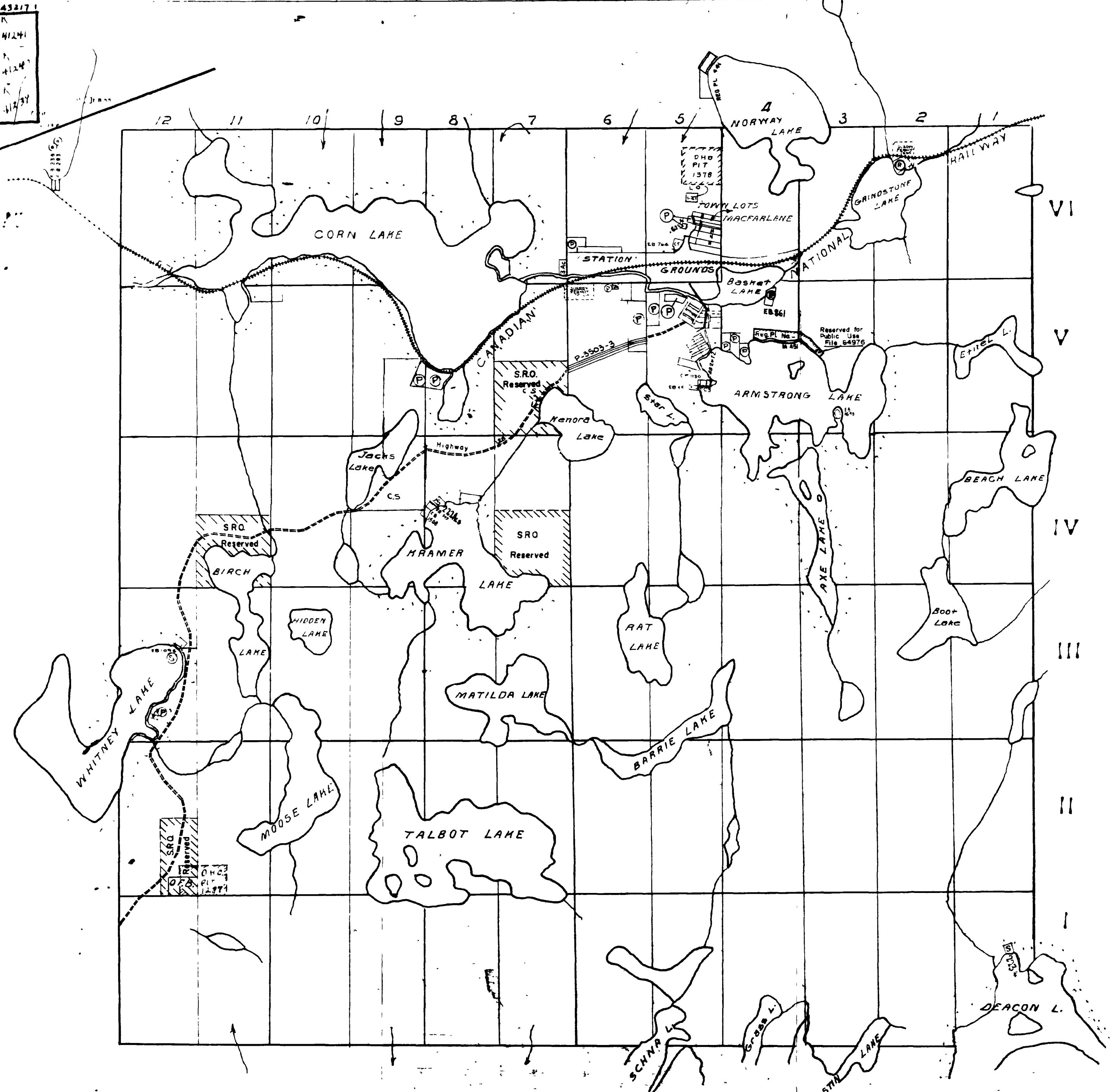
**1ST CLASS
RE
CLASSE**
33-86-169(12-60)

KENORA MINING DIVISION

Scale 40 chains to an inch

Forgotten Lake Area - M 3005 (approx boundary)

45217
IK
41241
IK
41248
IK
41234



400 Reserve to the Dept of Lands & Forests
thus.

MILICH



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SAND LAKE AREA (M.2644)

AREA OF

MINAKI

DISTRICT OF KENORA

KENORA MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

- PATENTED LAND (P)
- CROWN LAND SALE (C.S.)
- LEASES (L)
- LOCATED LAND (Loc.)
- LICENSE OF OCCUPATION (L.O.)
- MINING RIGHTS ONLY (M.R.O.)
- SURFACE RIGHTS ONLY (S.R.O.)
- ROADS (—)
- IMPROVED ROADS (—)
- KING'S HIGHWAYS (—)
- RAILWAYS (—)
- POWER LINES (—)
- MARSH OR MUSKEG (—)
- MINES (—)
- CANCELLED (C)

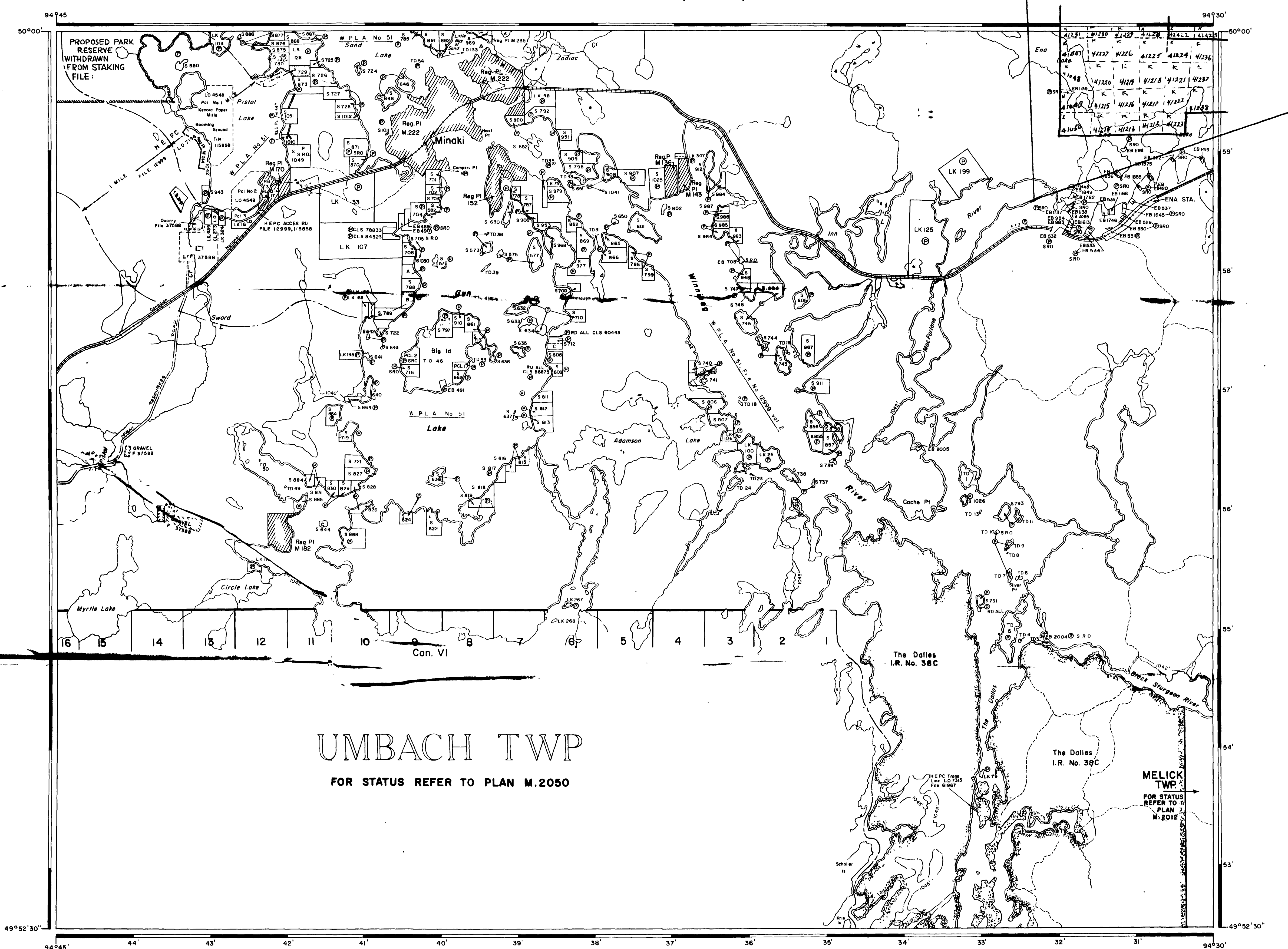
NOTES

- 400' reserve around all lakes and rivers to Dept of Lands & Forests.
- Islands and lands abutting in Gun Lake, Pistol Lake, and Winnipeg River are withdrawn from staking under Sect. 39, sub 'C' of the Mining Act. File: 67051.
- The bed of the Winnipeg River including tributaries, are reserved to H.E.P.C. for W.P.L.A. File: 12999.
- In the disposition of crown lands, reserve flooding rights without compensation up to easement contours 1042' and 1045' geodetic survey of Canada datum, 1923 adjustment.
- Contour 1042' is from head of Whitedog Falls to foot of Dalles Rapids.
- Contour 1045' is from head of Dalles Rapids to controls at old Fort Island.
- File: 4922.

INT. DEPT. OF MINING LAND
 IS MAP FOR CH. KN
 PROPOSES ONLY - AUS
 T. BE SOLD.

PLAN NO. M.1916

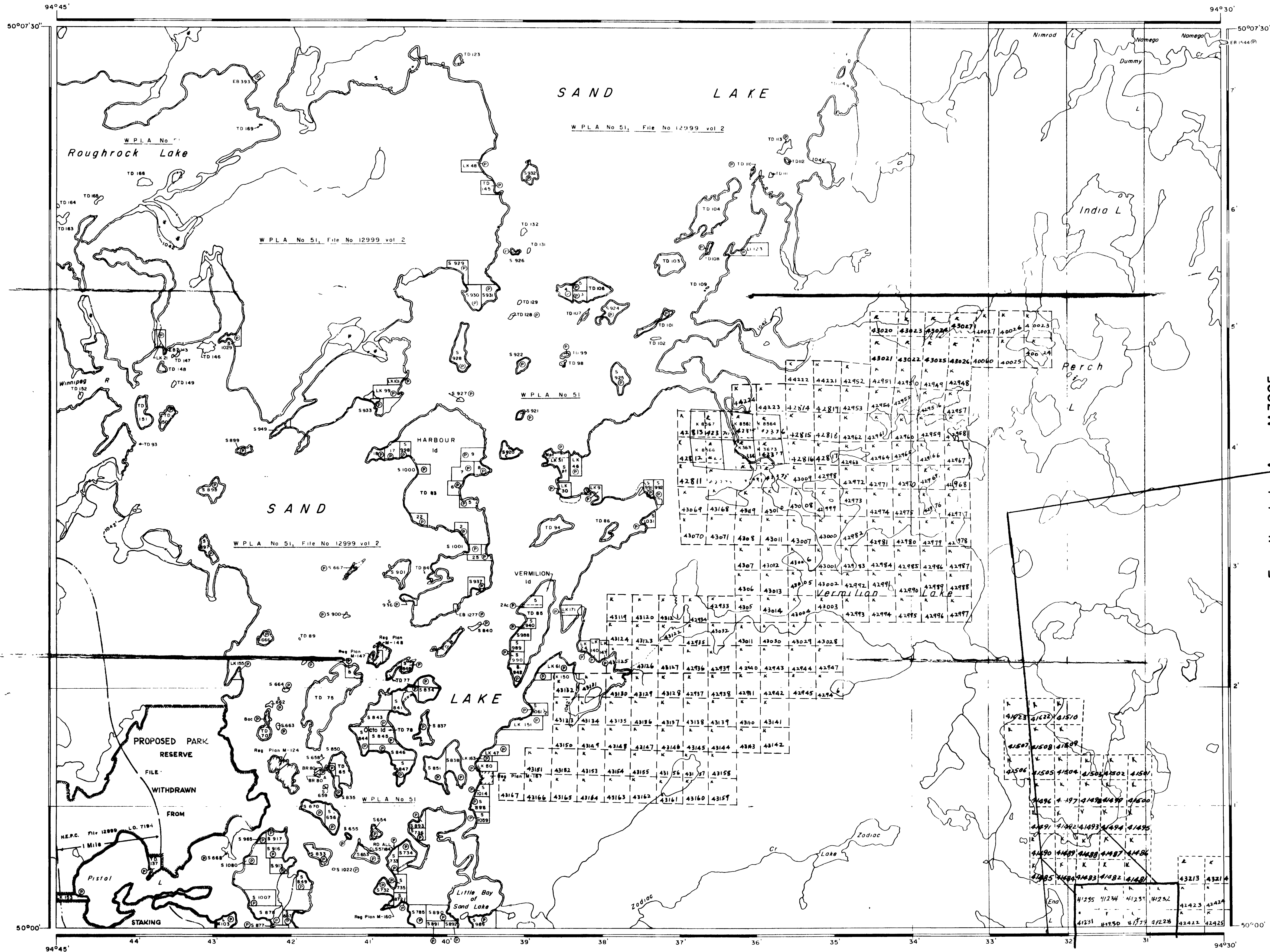
DEPARTMENT OF MINES
 — ONTARIO —



UMBACH TWP
 FOR STATUS REFER TO PLAN M.2050

MELICK TWP
 FOR STATUS REFER TO PLAN M.2012





AREA OF

SAND LAKE

DISTRICT OF
KENORA

KENORA
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 MUSKEG	—
MINES	⊙
CANCELLED	⊙

NOTES

400' Reserve around all Lakes & Rivers to Dept of Lands & Forests

In the disposition of crown lands, reserve flooding rights without compensation up to easement contours 1042 & 1045 geodetic survey of Canada datum, 1923 adjustment

Contour 1042 is from head of Whitdog Falls to foot of Dalles Rapids

Contour 1045 is from head of Dalles Rapids to controls at old Fort Island File 4922

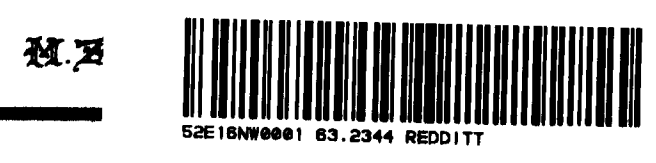
Islands & Lands abutting on Can Lake, Pistol Lake & Winnipeg River are withdrawn from staking under Sec 39 Sub (c) Mining Act

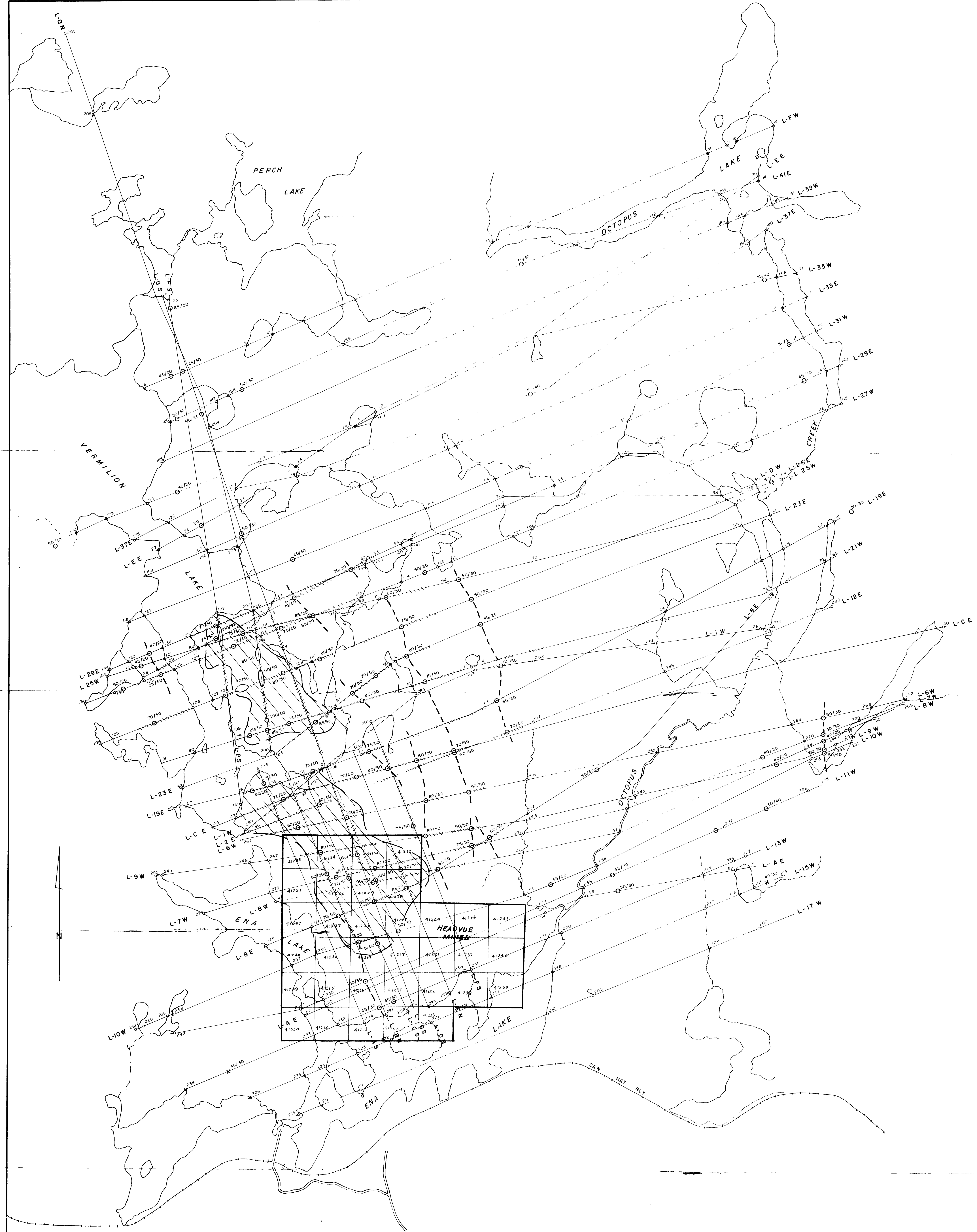
Forgotten Lake Area - M.3005

ONT. DEPT. OF MINES
 MINING LANDS BR.
 THIS MAP FOR CHECKING
 PURPOSES ONLY - MUST
 NOT BE SOLD.

PLAN NO. M. 2644

DEPARTMENT OF MINES
— ONTARIO —





LEGEND:

MEAN FLIGHT LINE SPACING = 1/4 MILE
 GROUND SPEED = 95 MPH (APPROX)
 MEAN TERRAIN CLEARANCE BETTER THAN 200'

FLIGHT LINES SHOWING NUMBER, FLIGHT DIRECTION AND NUMBERED FIDUCIAL MARKS

U + Th ANOMALY SHOWING AMPLITUDE/BACKGROUND RATIO
 U + Th BACKGROUND OVER 50 CPS

ANOMALOUS TREND
 ANOMALOUS AREA

CREEKS
 LAKES

NOTES

TOTAL MILEAGE 176 MILES
 SURVEY EQUIPMENT - SHARPE SC 1
 VARIABLE THRESHOLD GAMMA RAY SPECTROMETER
 THRESHOLD SETTING 1.05 MV
 TIME CONSTANT 1 SECOND

L-10 W

80/50

U + Th

ANOMALOUS TREND

ANOMALOUS AREA

CREEKS

LAKES

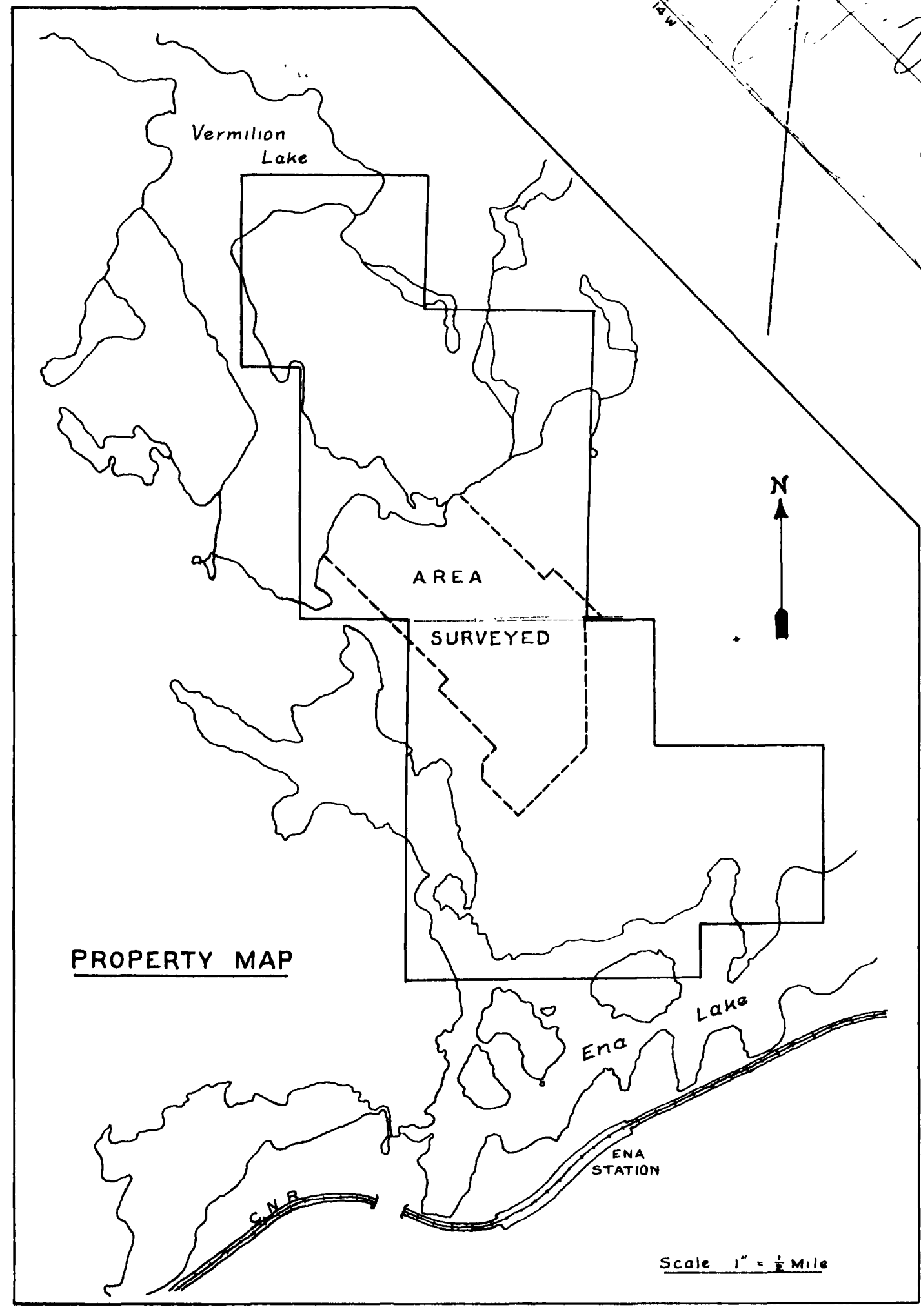
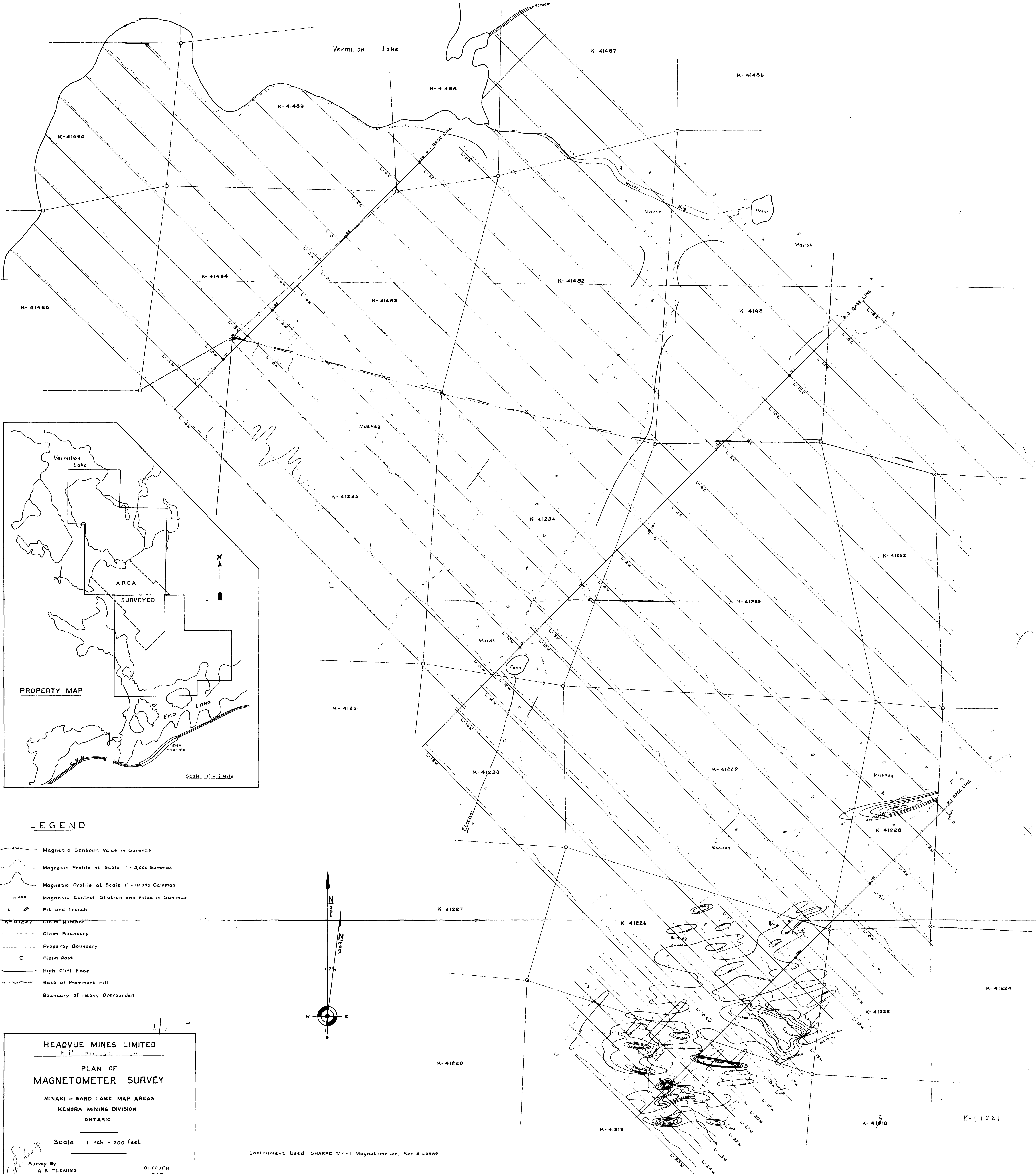
PLATE 2

SEIGEL ASSOCIATES LIMITED
 ENA LAKE AREA, ONTARIO
 AIRBORNE RADIOACTIVITY SURVEY

SCALE: 1" = 1/4 MILE

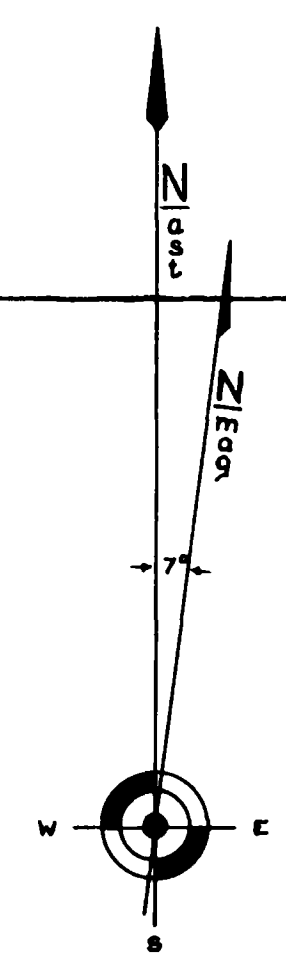
SURVEY BY SEIGEL ASSOCIATES LIMITED
 SEPTEMBER, 1967





LEGEND

- Magnetic Contour, Value in Gammas
- Magnetic Profile at Scale 1" = 2,000 Gammas
- Magnetic Profile at Scale 1" = 10,000 Gammas
- Magnetic Control Station and Value in Gammas
- Pit and Trench
- Claim Number
- Claim Boundary
- Property Boundary
- Claim Post
- High Cliff Face
- Base of Prominent Hill
- Boundary of Heavy Overburden



HEADVUE MINES LIMITED
 F. P. No. 221-1-1

**PLAN OF
 MAGNETOMETER SURVEY**

MINAKI - SAND LAKE MAP AREAS
 KENDRA MINING DIVISION
 ONTARIO

Scale 1 inch = 200 feet

Survey By
 A. B. FLEMING
 Mining Engineer

OCTOBER
 1967

Instrument Used SHARPE MF-1 Magnetometer, Ser # 40569

