ELECTROMAGNETIC (V.L.F.) SURVEY

on

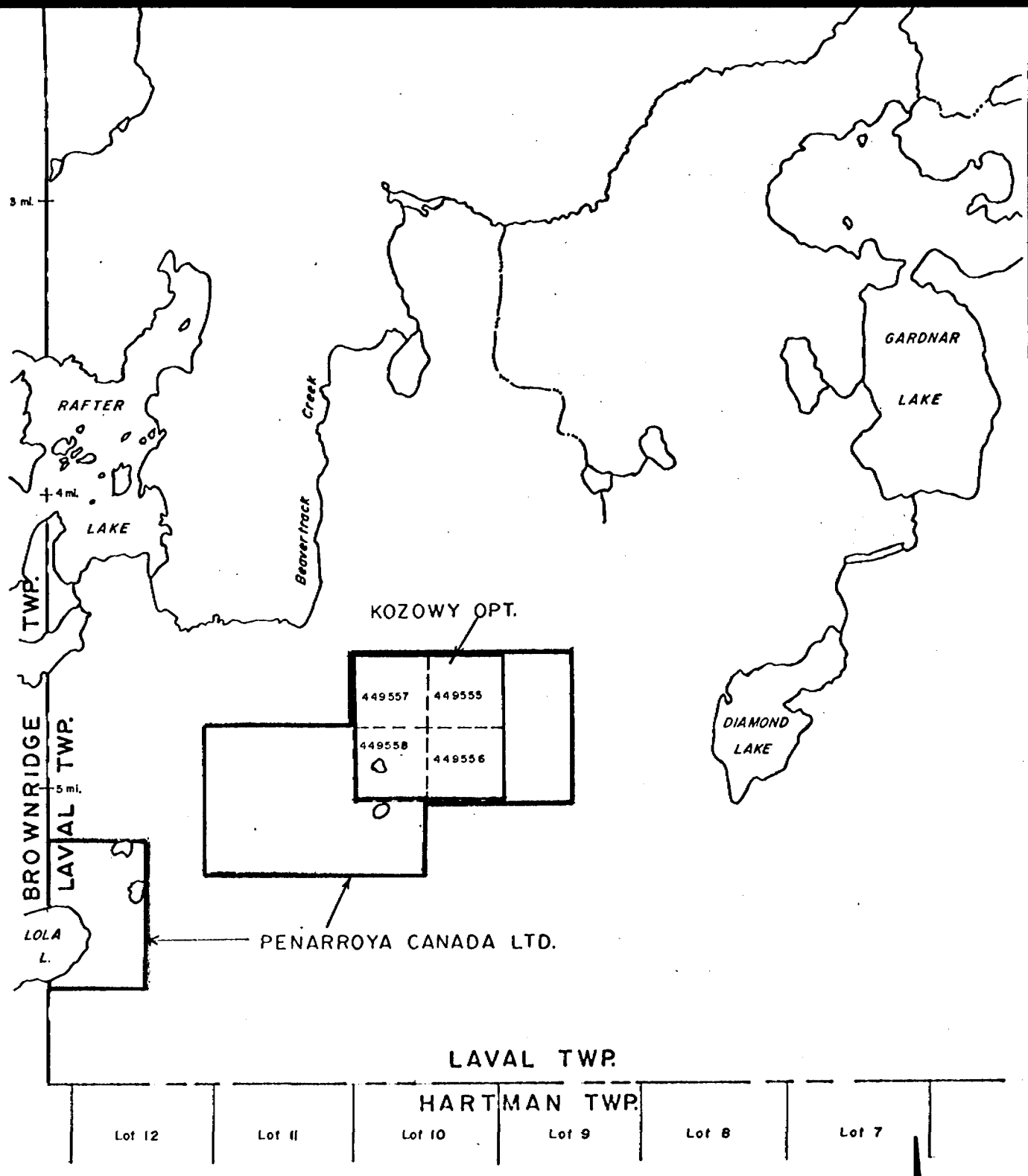
KOZOWY OPTION

Laval Township

Hollinger Mines Limited

Timmins, Ontario
July 15, 1977

D. R. Alexander



CLAIM MAP of S.W. LAVAL TWP. outling the KOZOWY CLAIMS and properties discussed under 'previous work.'

SCALE : 1" = 2640'

AST.

INTRODUCTION:

During the period April 1 to May 28, 1977, line cutting and subsequent geophysical surveys were performed over the Kozowy Option in Laval and Brownridge Townships.

A four claim portion of the much larger group, however, was the only area surveyed for assessment. These four contiguous, unpatented mining claims are located approximately fourteen miles east-northeast of Dryden in southwestern Laval Township. The claims covered during the course of the survey include numbers:

K-449555 to K-449558 inclusive

Access to the property is fairly convenient by most conventional types of ground transportation. From Dryden, Highways 17, 72 and a gravelled access road extend into southwestern Laval Township, some 2000 feet southeast of the property. (see Geology-Location Map, following).

TOPOGRAPHY:

The four claims surveyed lie within a topographic low rimmed by outcrop to the north and east, and spruce swamp to the south and west. Having been logged years previous, this portion of the group is now a wet to flooded swamp with a mix of alders, cedar, spruce and slash.

GENERAL GEOLOGY:

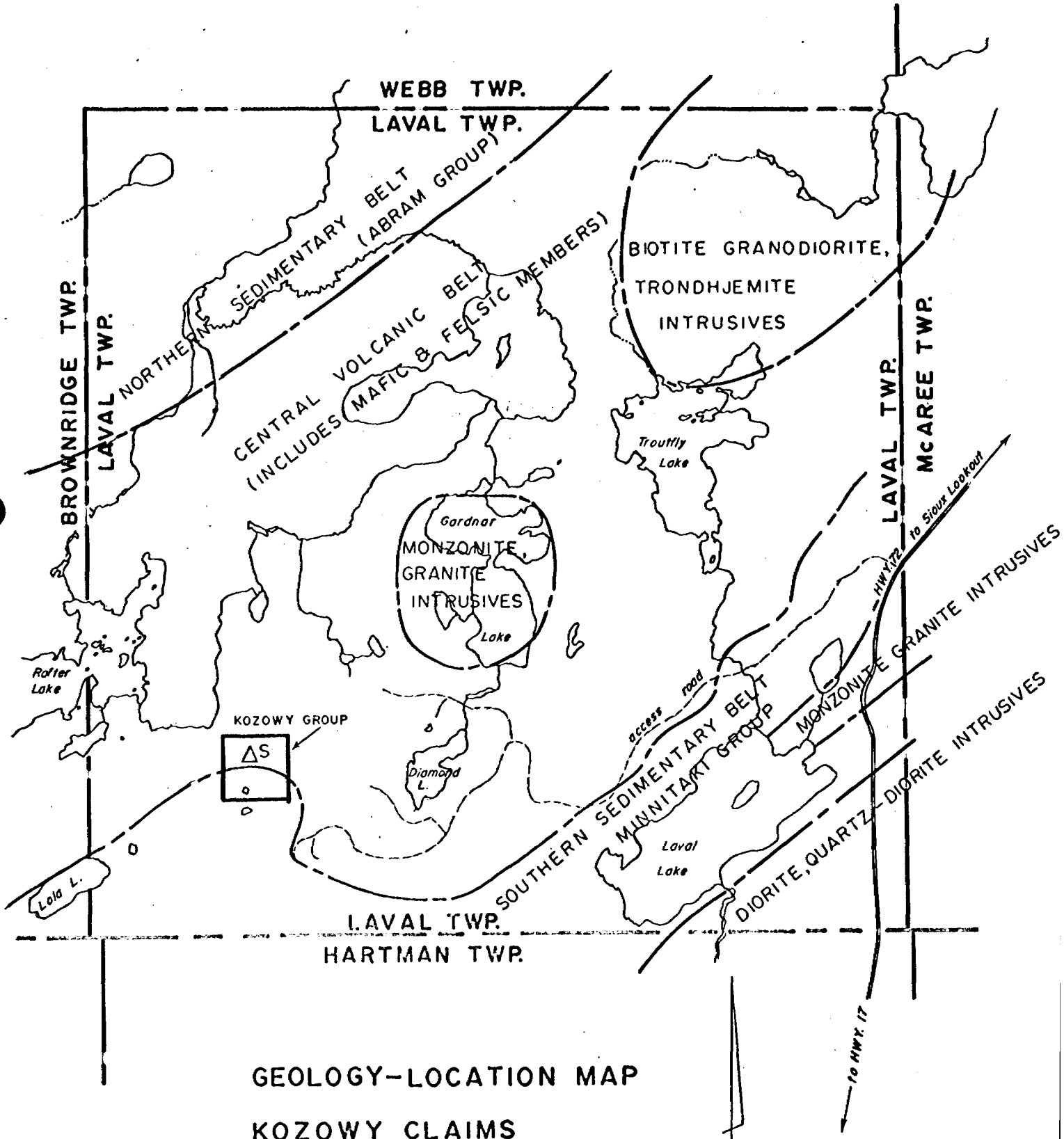
A recent series of maps released by the Ministry of Natural Resources are the most comprehensive, up-to-date publications on the area. Marginal notes, accompanying these maps state:

> "The Sandybeach Lake map-area is underlain by a mafic metavolcanic sequence and a thick sequence of metamorphosed greywacke with minor congomerate units all of Early Precambrian age. Granitic stocks penetrate the isoclinally folded metavolcanic and metasedimentary sequence.
>
> Regionally, the Wabigoon metavolcanic-metasedimentary belt, which passes through the Sandybeach Lake area, has been subdivided into five units by Turner and Walker (1973). Outer boundaries of the belt are in contact with intrusive granitic masses. The five units are from north to south:
>
> 1. Northern Volcanic Belt
> 2. Northern Sedimentary Belt (Abram Group)
> 3. Central Volcanic Belt
> 4. Southern Sedimentary Belt (Minnitaki Group)
> 5. Southern Volcanic Group "

The four claims being considered in this report straddle the boundary between the Central Volcanic Belt and the Southern Sedimentary Belt.

The resulting exposures on the property are suggested to include mafic to intermediate volcanic flows and derived amphibolites of the Central Volcanic Belt, in contact with a greywacke sequence of the Southern Sedimentary Belt.

Felsic members of the Central Volcanic Belt are interpreted to occur just north and west of the property.



GEOLOGY–LOCATION MAP

KOZOWY CLAIMS

LAVAL TWP.

After MNR Map P. 1204

Scale : 1 inch = 1 mile

PREVIOUS WORK:

The Archean volcanic-sedimentary system, traversing the Kenora-Dryden-Sioux Lookout area, has been erratically explored over a number of years in the search for economic mineralization. Recently, renewed interest on the Goldlund prospect in Echo Township, has generated the staking of several claims in the district. The southwestern part of Laval Township, however, has been somewhat removed from this activity, and very little work has been recorded.

A portion of the Kozowy group of claims were previously investigated by Penarroya Canada Limited. In 1965, Penarroya performed airborne magnetic and electromagnetic surveys in southwestern Laval and southeastern Brownridge Townships. The survey outlined a zone of electromagnetic anomalies coincident with the Keewatin volcanic-sedimentary contact as well as two anomalies within the volcanic member. The two anomalies isolated within the volcanic member show some corresponding high magnetics.

Any further work completed by Penarroya was not filed for assessment.

INSTRUMENTS USED:

The survey was performed using two, Geonics EM-16 units, serial numbers 28 and 48.

This type of instrument is easy to operate and ideal for reconnaissance electromagnetic work in an area of shallow and/or nonconductive overburden.

SURVEY METHOD:

All of the instrument readings were obtained along north-south picket lines, spaced 400 feet apart. Due to the amount of flooding in the area, adjacent lines were surveyed to provide the required number of readings per claim, for assessment.

Individual stations were taken at an interval of 100 feet, and subsequently plotted on the accompanying plan. No adjustments on the readings were calculated before plotting, such that the plan accurately presents the field observations.

RESULTS:

The survey outlines three anomalous zones of electromagnetic response. These three zones closely duplicate the regional strike for the area, subsequently all anomalies are interpreted to be of bedrock origin.

By far the strongest response is associated with anomaly 'A' (see accompanying plan). There, with some preliminary, supportive, geological information, the conductor appears to be related to a sulphide occurrence in well banded sedimentary tuffs and/or interflow sediment.

Consequently, the proposed contact between the Central Volcanic Belt and the Southern Sedimentary Belt should plot south of anomaly 'A', and may be represented by either zones 'B' or 'C'. These two zones, however, yield a much weaker electromagnetic response and certainly deserve a lesser priority.

CONCLUSIONS:

With only a limited amount of information gleaned from the EM-16 survey, further geophysical and geological surveys should be carried out to allow a more comprehensive overview of the area. Additional surveys are currently under way, but all of the data have not been compiled. Final proposals must await those results.

Dale R. Alexander

HOLLINGER EXPLORATION

Dale R. Alexander

July 15, 1977

SELECTED BIBLIOGRAPHY

Breaks, F.W., Bond, W.D., Harris, N., Westerman, C.J. and Desnoyers, D.W. (1976) - Operation Kenora-Ear Falls, Sandybeach - Route Lakes Sheet, District of Kenora; Ont. Division of Mines, Preliminary Map, P.1204, Geol. Ser., Scale: 1" = 1 mile.

Palonen, P.A. and Speed, A.A. (1976) - Marginal Notes, No. 6, Sandybeach Lake Area, District of Kenora; Ont. Division of Mines, No. 6, pp. 48-51.

Resident Geologist's Office - Kenora, Assessment files.

Ontario

Ministry of Nat

GEOPHYSICAL – GEOLO(
TECHNICAL DA1

52F15SE8292 2.2458 LAVAL

900

JUL 27 1977

MINING LANDS SECTION

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS E

Type of Survey(s) Linecutting-Electromagnetic (VLF)

Township or Area Laval Township

Claim Holder(s) Hollinger Mines Limited
P.O. Box 320, Timmins, Ontario

Survey Company Hollinger Mines Limited

Author of Report D. R. Alexander

Address of Author 106 Golden Ave., Apt.3, South Porcupine, Ont.

Covering Dates of Survey April 1, 1977 to May 28, 1977
(linecutting to office)

Total Miles of Line Cut 3.83

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
- Electromagnetic	40
- Magnetometer	
- Radiometric	
- Other	
Geological	
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: July 15/77 SIGNATURE: Dave R. Alexander
Author of Report or Agent

L.D.

Res. Geol. _____ Qualifications 8.192

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

K - 449555
K - 449556
K - 449557
K - 449558

If space insufficient, attach list

TOTAL CLAIMS _____

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations 215 Number of Readings 211

Station interval 100 feet Line spacing 400 feet

Profile scale 1" = 40%

Contour interval N/A

MAGNETIC

Instrument

Accuracy -- Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument Geonics EM-16 Serial Nos. 28 and 48

Coil configuration Horizontal receiver

Coil separation Infinity

Accuracy ± 1%

Method: ☒ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency 17.8 KHz (Station NAA, Cutler Maine, USA)
(specify V.L.F. station)

Parameters measured In-phase and quadrature

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters -- On time Frequency

-- Off time Range

-- Delay time

-- Integration time

Power

Electrode array

Electrode spacing

Type of electrode

2.2458

ASSESSMENT WORK DETAILS

Type of Survey: Electromagnetic (VLF)
A separate form is required for each type of survey

Township or Area: Laval Township

Chief Line Cutter or Contractor: A. Kozowy
Name
59 Davis St., Dryden, ON
Address

Party Chief: Dale R. Alexander
Name
c/o Hollinger Mines Ltd Box 320 Timmins, ON
Address

Consultant: n/a
Name
Address

Geological field mapping by:
Name
Address

COVERING DATES

Line Cutting: April 1 - May 23, 1977

Field: May 24 - 28, 1977
Instrument work, geological mapping, sampling etc.

Office:

INSTRUMENT DATA

Make, Model and Type: Geonic EM 16 Ser. #'s 28 & 48

Scale Constant or Sensitivity: ± 1%
Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count: n/a

Number of Stations Within Claim Group: 215

Number of Readings Within Claim Group: 211

Number of Miles of Line cut Within Claim Group: 3.88

Number of Samples Collected Within Claim Group: n/a

CREDITS REQUESTED

	20 DAYS per claim	40 DAYS per claim	----- Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☐	☒	Show Check ✓
Geochemical Survey	☐	☐	

DATE: May 30/77 SIGNED:

SPECIAL PROVISION CREDITS for PERFORMANCE & COVERAGE

MINING CLAIMS TRAVERSED
List numerically

K449555
K449556
K449557
K449558

TOTAL CLAIMS 4

If space insufficient, attach list

Send in Duplicate to:

FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES &
NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AS ASSESSMENT WORK

In order to simplify the filing of geological, geochemical and ground geophysical surveys for assessment work, the Minister has approved the following procedure under Section 84 (8a) of the Ontario Mining Act. This special provision does not apply to airborne geophysical surveys.

If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.), It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.

ASSESSMENT WORK DETAILS

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Township or Area: Laval Township

Chief Line Cutter or Contractor: A. Kozowy
Name
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Radiometric Background Count: n/a

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Geological Survey	☐	☐	
Geophysical Survey	☐	☒	Show Check ✓
Geochemical Survey	☐	☐	

DATE: May 30/77 SIGNED:

Performance and coverage credits do not apply to airborne surveys

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List numerically

K449555
K449556
K449557
K449558

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TOTAL CLAIMS: 4

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NOTES

400' surface rights reservation along the shores of all lakes and rivers.

SAND and GRAVEL

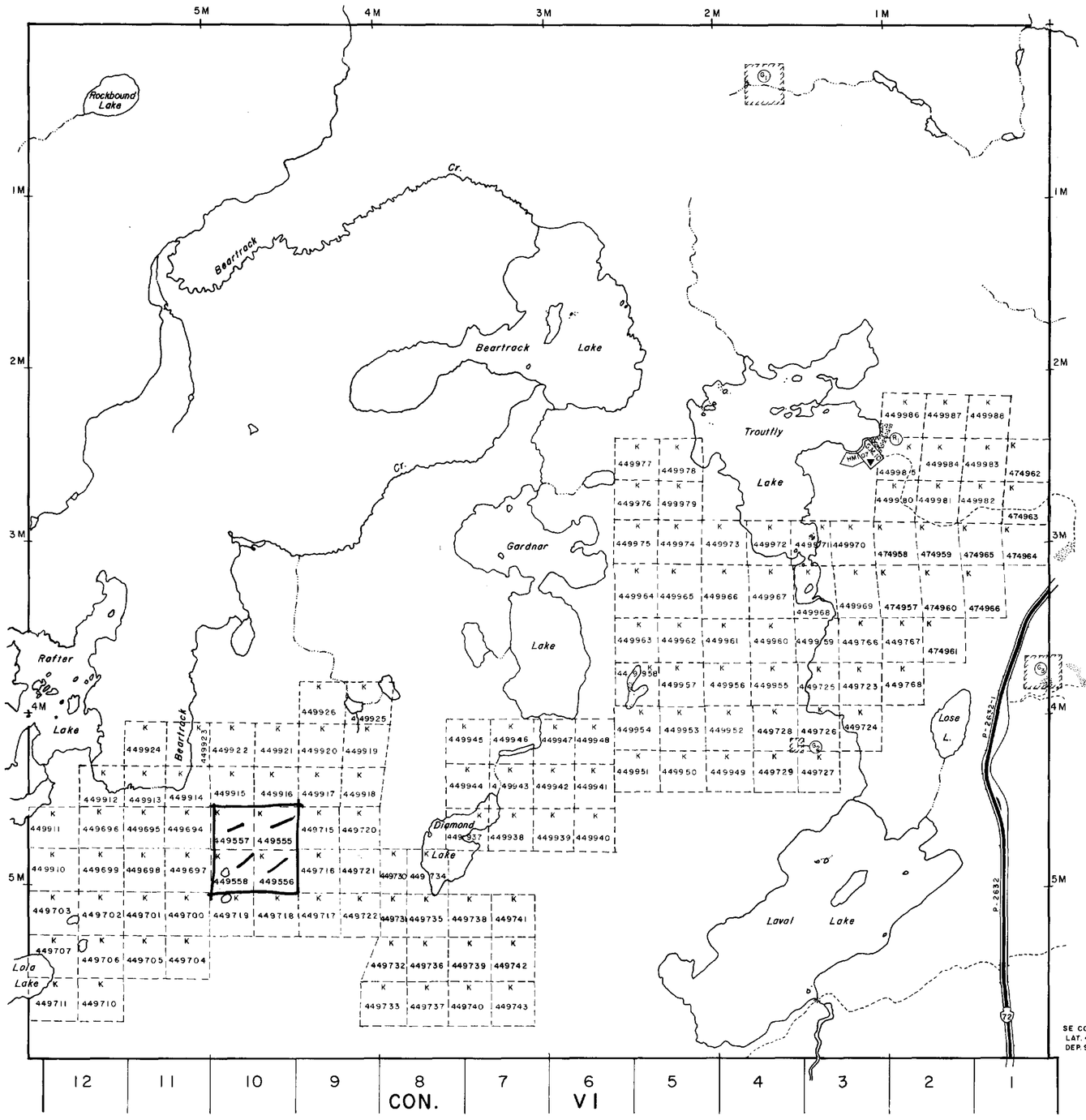
(Q1) GRAVEL File 156744
(Q2) GRAVEL File 144049
(Q3) M.T.C. PIT Nº 1112

AREAS WITHDRAWN FROM STAKING

S.R. – SURFACE RIGHTS M.R.–MINING RIGHTS

	Section	Date	Disposition	File
(R1)	Res. for Public use			163473

WEBB TP. M.1874



BROWNRIDGE TP. M.1954

McAREE TP. M.2254

HARTMAN TP. M.1986

LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES:
  - TOWNSHIPS, BASE LINES, ETC.
  - LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES:
  - LOT LINES
  - PARCEL BOUNDARY
  - MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERENNIAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION
- ORIGINAL SHORELINE
- MARSH OR MUSKEG
- MINES

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" SURFACE RIGHTS ONLY	◑
" MINING RIGHTS ONLY	◒
LEASE, SURFACE & MINING RIGHTS	■
" SURFACE RIGHTS ONLY	◨
" MINING RIGHTS ONLY	◧
LICENCE OF OCCUPATION	▼
CROWN LAND SALE	C.S.
ORDER-IN-COUNCIL	OC
RESERVATION	(R)
CANCELLED	(X)
SAND & GRAVEL	(S)

SCALE : 1 INCH = 40 CHAINS

FEET 0 500 1000 2000 4000 6000 8000
METRES 0 200 400 600 800 1 KM 2 KM

ACRES	HECTARES
40	16

TOWNSHIP

2.2458

LAVAL

DISTRICT

KENORA

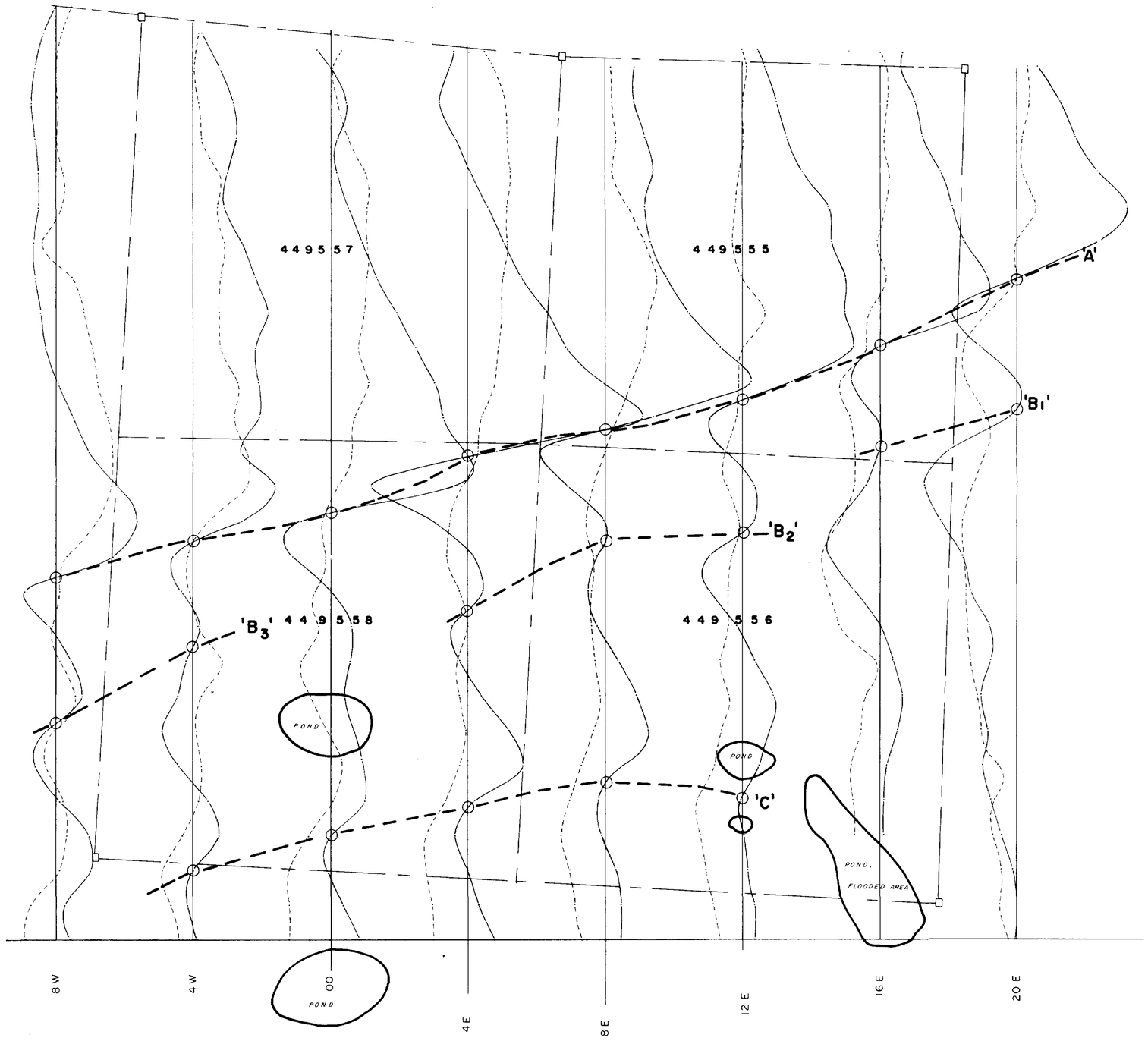
MINING DIVISION

KENORA

Ministry of Natural Resources
Ontario Surveys and Mapping Branch

Date Nov. '74
Whitney Block
Queen's Park, Toronto

Plan No.
M. 3370



AST.

HOLLINGER MINES LTD.

KOZOWY OPT.

V. L. F. SURVEY

(20 KHz.)

Laval Twp.

Scale : 1" = 200'

Profile Scale: 1" = 40%

\+ | −

Station used : N.A.A.

2.2458

Dave R. Alexander

HOLLINGER EXPLORATION