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REPORT ON THE VLF GEOPHYSICAL SURVEY
ON A PORTION OF THE PROPERTY OF
MAYFAIR MINES LIMITED
GAUTHIER TOWNSHIP, ONTARIO

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DOUGLAS BURTON, P. ENG.

GEOPHYSICAL SURVEYS

COBALT, ONT

REPORT ON THE VLF GEOPHYSICAL SURVEY
ON A PORTION OF THE PROPERTY OF
MAYFAIR MINES LIMITED
GAUTHIER TOWNSHIP, ONTARIO

ABSTRACT

A VLF geophysical survey was carried out on over ten miles of taped lines 200 feet apart on a portion of the property of Mayfair Mines Limited in the southeast corner of Gauthier Township between Highway 66 and the Nipissing Central Railroad (ONR)..

This survey geophysically examines the main Larder Lake 'Break' across 3000 feet of the property. VLF anomalies are located near the base line for a zone length of 1400 feet.

It is recommended that these anomalies be tested by drilling in order to determine the cause of these anomalies and their economic significance. Three holes are recommended for the first phase of the exploration.



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REPORT ON THE VLF GEOPHYSICAL SURVEY
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INTRODUCTION

General

Through the dates August 30th to September 5th, 1974, a VLF Geophysical survey was carried out on a portion of this property. More than ten miles of line 200 feet apart and base lines were used for positioning the VLF determinations.

The weather during the course of the examination was excellent for field work. No days were lost because of rain. Flies and mosquitoes were not annoying.

Accessibility and Property Description

This claim group is located in the southeast quadrant of Gauthier Township mostly between Highway 66 and the NCR tracks to the north; about twelve miles east of Kirkland Lake. The property consists of fifteen contiguous claims numbered from 373800 to 373814, with an area of about 600 acres. On the claims there are many old roads and trails that may be useful after some brushing-out.



The topography of the property is normal for this area. It is fairly level with a few low rock outcrops. In general the overburden will not be deep; probably less than 50 feet. The forest growth consists of small poplar, spruce, pine and balsam, with the ever-present thick low-growing brush.

The Land Survey

A base line 3000 feet long is established in a direction approximately N112°E. This is close to and parallel to the Larder Lake "break" and the carbonate zone. Lines 200 feet apart and at right angles to the base line were out and taped with pickets at 100 foot intervals. They were extended to the railroad line about 2200 feet to the northeast, and to the southwest they cross Highway 66 at about S500 feet. The lines are located on claims 373800, 373801, 373802, 373803, 373804, 373805, 373809, 373810 and 373811. These lines were well out and should be useful through 1976.

Climate

The climate is typical for Northern Ontario, with snow through December to April. The growing season is from May to September, with temperatures to 90° F (32°C) for a few days in July and August. Frost rarely occurs during the summer season. In the winter season the temperature may get as low as minus 60°F for a few days, probably in February. The rainfall averages about 31 inches per year, evenly distributed over the months. Black flies and



mosquitoes are plentiful in the bush from June through September.

They are particularly annoying and persistent in June.



THE GEOLOGY

Governmental Maps and Reports

ODE Map 2205 "Timmins - Kirkland Lake" (1964), scale 1 inch equals
4 miles,

ODE Map 50C "Township of Gauthier" (1941), scale 1 inch equals
1000 feet,

Aeromagnetic Map 470 "Larder Lake" (1951), scale one inch to one mile,

ODE Report Volume I, part 8, 1941,

ODE Report Volume LVII, part 5, 1948,

ODE Mineral Resources Circular No. 3 (1964), "Mineral Resources and
Mining Properties in the Kirkland Lake - Larder Lake Area",

by W. S. Savage, with Chart A.

Regional Geology

The property is located on the gold-producing structure of the Kirkland Lake and Larder Lake area, which extends into Quebec through the Malartic-Cadillac gold area. The rocks are chiefly Timiskaming sediments and Algonian intrusives. Their dip is vertical and to the south, and the strike is about 110° east of north locally. The structure is a persistent wide carbonatized shear zone characterized by the presence of green mica and quartz stockworks.

Savage says that the gold ore bodies have a closer relationship to structure rather than rock types.



Local Geology

In the area geophysically examined a band several hundred feet wide of carbonate material striking about N110°E is bounded on the north by fine-grained sediments and syenite porphyry, and on the south by basic volcanics and syenite. The carbonate material is generally sheared. The formations and the structure generally dip south of vertical.

The fault zone or "break" is closely parallel to the carbonate material, and the base line established for this examination. Some trenching and prospecting has been carried out in the past. A few scattered drill holes are recorded for the area of survey.

Economic Geological Considerations

The Larder Lake "break" crossed the area surveyed. The gold ore bodies are believed to be associated with the periods of deformation that followed the carbonate alteration. The ore conditions may lie outside of the central zone of intense shearing, in adjacent hard competent rocks which failed under tension during different periods of deformation.

The gold deposits of the Larder Lake area occur in fissure or composite quartz veins, quartz stockwork deposits in the carbonate zone, quartz sulphide deposits in lavas and tuffs, sulphide deposits without much quartz, and in talc-chlorite schists and mineralized dikes.



Native gold was the last element deposited; often associated with tellurides. Other minerals are chalcopyrite, hematite, galena, sphalerite, molybdenite and graphite.

The shearing with accompanying minerals may create an electrically conductive zone in places. The 3000 foot long zone on this claim group seems to be a favorable locus for gold deposition. The geophysical examination has located a 1400-foot long conductive zone over the favorable structure. This should be explored by drilling.



THE GEOPHYSICAL SURVEY

Geophysical Correlation with the Geology

Geophysical examinations may be a guide to indicate conditions favorable for the deposition of ore minerals.

Geophysical results must be prepared and mapped in such a way that they may be translated into geological terms and possibilities, in order to be of assistance in the exploration and testing of a mining property.

Some geological information must be available in order to derive the maximum benefit from a geophysical examination.

Economic gold deposits may contain less than three parts per million (3 ppm) of gold. This is obviously not detectable by our present geophysical examinations. But the association of gold with conductive minerals in shear zones may allow the detection and tracing of the associated conditions. This may guide further exploration and drilling to zones of gold deposition in the structure.

The VLF Method and Procedure for Geophysical Exploration

Very Low Frequency (VLF) transmitters (15 to 25 kHz) are located all over the world. These transmitters originate Morse Code and pulsed continuous wave carriers. Their particular application is for world-wide communication with submarines under conductive seawater. VLF radiation has considerable penetration into the earth.



The radiation is vertically polarized and propagates radially in straight lines concentrically from the transmitter. The radiation is characterized by low path attenuation which is relatively stable with time.

Changes in the usual propagation pattern of the VLF radiation are introduced by such factors as land-sea boundaries, topographic surface elevation differences, and changes in the ground characteristics. Good conductors in the earth, such as sulphides and graphite zones, shears and faults of some considerable dimension, and flat-lying clay beds, will have a tendency to concentrate and locally distort VLF radiation. Artificial conductors such as pipe lines, fences, electric and phone lines and railroad tracks also distort these fields.

VLF transmissions are most strongly distorted by electrically conductive zones with a striking direction along the radial path of propagation from the transmitter. The important shear zones in the area of survey have a striking direction about 110° azimuth; therefore the transmitter at Cutler, Maine, was selected for examinations of its radiation. The path of radiation is almost parallel with the "break".

The Ronka EM16 receiver was used for this examination. It has two directional antenna at right angles. By means of ear-phones and null direction reception the azimuth direction to the transmitter is determined, and also, the dip of the field at right angles to this direction and the quadrature phase difference are



determined from point to point in the area to be tested with this geophysical method. These parameters may be quickly determined at each point with the Ronka receiver.

Readings were taken at 100 foot intervals along profile lines crossing the general geological strike of the area examined. Conductive zones are indicated by anomalous dips of the VLF field in the vicinity, with a vertical orientation directly over the axis of the conductive axis. When the dips are recorded on a map, the conductive zones may be traced from line to line. The approximate dip of these zones may also be indicated.



THE RESULTS OF THE PHYSICAL SURVEYS

The Map Numbered 74-99-1

One map numbered 74-99-1, scale one inch equals 200 feet, accompanies this report. This map shows the results of the VLF field work, and the dip of the VLF field is drawn as a profile on the survey lines as datum.

The lines for the positioning of the geophysical readings are superimposed on the approximate claim boundaries for assessment work records. Highway 66 and the Nipissing Central railroad are also shown.

The VLF readings of percentage dip of the VLF field from Culler, Maine, and a quadrature phase effect are noted on the survey lines at their appropriate location.

The location of the drill holes recommended for testing the significance of the VLF anomalies are shown on the map.

The Results of the VLF Geophysical Survey

Large VLF anomalies are recorded in the area surveyed. These are chiefly caused by artificial conductors; the electric lines and phone lines along Highway 66, and, the railroad tracks and phone lines on the northern side of the area examined.

There are a number of VLF anomalies due to natural conditions in the ground. A stronger zone about 1400 feet long, is located along the base line close to the location of the carbonate



zone and the Larder Lake fault system.

The location of the VLF zone is shown on the accompanying Map numbered 74-99-1 as a red line along the axis of the conductor.

The location of the drill holes recommended to test the economic significance of the VLF conductive zone are also shown on the map. These will test the conductive zone with a southerndip.

DRILL HOLES SUGGESTED AND RECOMMENDED

Survey Line	Azimuth Direction	Drill Site	Horiz. Section	Total Footage	Recommended Footage
<u>0</u>	<u>N20°E</u>	<u>S200</u>	200	280	280
W200	N20°E	S150	150	210	
<u>W400</u>	<u>N20°E</u>	<u>S100</u>	250	350	350
W600	N20°E	S100	200	280	
W800	N20°E	S100	200	280	
<u>W1000</u>	<u>N20°E</u>	<u>S050</u>	200	280	280
	along present lines		1200	1680	910

Three drill holes are recommended to be drilled to test the economic significance of the zone of VLF conductivity. These holes are shown underlined on the above tabulation. The other three holes listed may be drilled after the results of the first drilling is studied.

The cost of the preliminary drilling of 910 feet is estimated to be, at this time, (1974), \$9100. at \$10 per foot. The drilling will cost about \$8. per foot at this location, and \$2 may cover the supervision, logging and assaying.

ASSESSMENT WORK DETAILS



32D04SW0069 2.1614 GAUTHIER

900

Type of Survey VLF Cutler Maine
A separate form is required for each type
 Township or Area Gauthier Township
 Chief Line Cutter or Contractor Labbe
Name
Larder Lake, Ont.
Address
 Party Chief Douglas Burton,
Name
Box 293, Cobalt, Ont.,
Address
 Consultant L. J. Cunningham,
Name
1 McPhee, Kirkland Lake, Ont.
Address
 Geological field mapping by _____
Name

Address

MINING CLAIMS TRAVERSED		
Reading	Numerically	Credit requested
373800	100	40
373801	72	40
373802	51	40
373803	67	40
373804	26	20
373805	5	--
373809	74	40
373810	80	40
373811	16	20
<u>491</u>		<u>280 days</u>
readings		
<i>370 : 9.75 = 39 days per claim</i>		
<i>(no credit for 373805)</i>		
<i>JW</i>		
TOTAL CLAIMS		<u>9</u>

If space insufficient, attach list

COVERING DATES

Line Cutting July - August, 1974
 Field August 30th - September 5th, 1974
Instrument work, geological mapping, sampling etc.
 Office September 10th - 23rd, 1974

INSTRUMENT DATA

Make, Model and Type Ronka EM16 VLF receiver
 Scale Constant or Sensitivity percent dip & quad phase
Or provide copy of instrument data from Manufacturer's brochure.
 Radiometric Background Count _____
 Number of Stations Within Claim Group 491
 Number of Readings Within Claim Group 491
 Number of Miles of Line cut Within Claim Group 9.3 miles
 Number of Samples Collected Within Claim Group _____
 Lines 200 feet apart totalling 10.8 miles

CREDITS REQUESTED

	<u>20 DAYS</u>	<u>40 DAYS</u>	----- Includes
	per claim	per claim	(Line cutting)
Geological Survey	<input type="checkbox"/>	<input type="checkbox"/>	
Geophysical Survey	<input type="checkbox"/> pro rata	<input type="checkbox"/>	Show Check <input checked="" type="checkbox"/>
Geochemical Survey	<input type="checkbox"/>	<input type="checkbox"/>	

DATE Sept. 23, 1974 SIGNED Douglas Burton
Douglas Burton

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

Qualifications - on this file + 63-1158

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 86 (10) 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 9 and 11 of section 86 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.

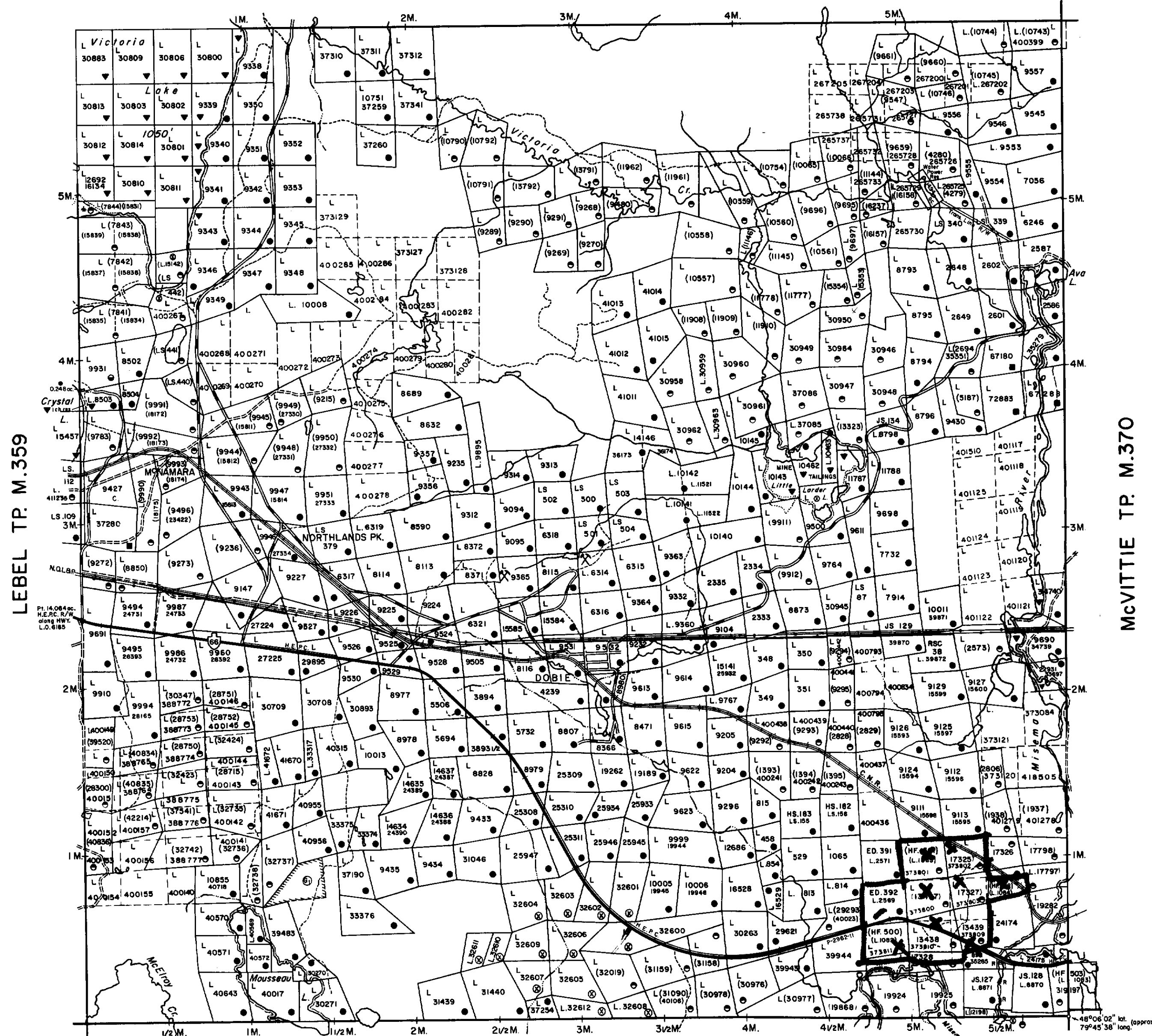
NOTES

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

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MINING LANDS
DATE OF ISSUE
NOV - 5 1974
MINISTRY OF NATURAL RESOURCES

ARNOLD TP. M.321



LEBEL TP. M.359

MCVITTIE TP. M.370

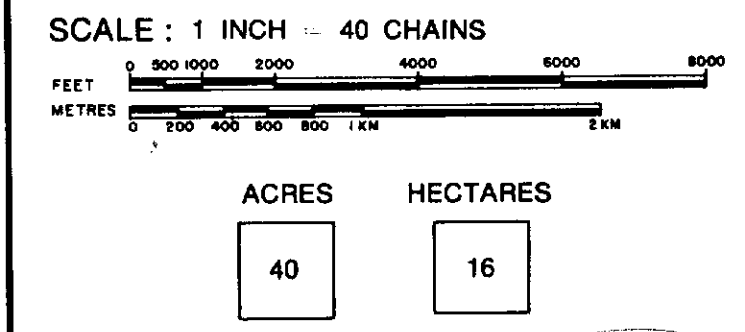
McELROY TP. M.366

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

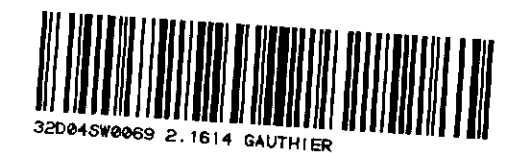
DISPOSITION OF CROWN LANDS

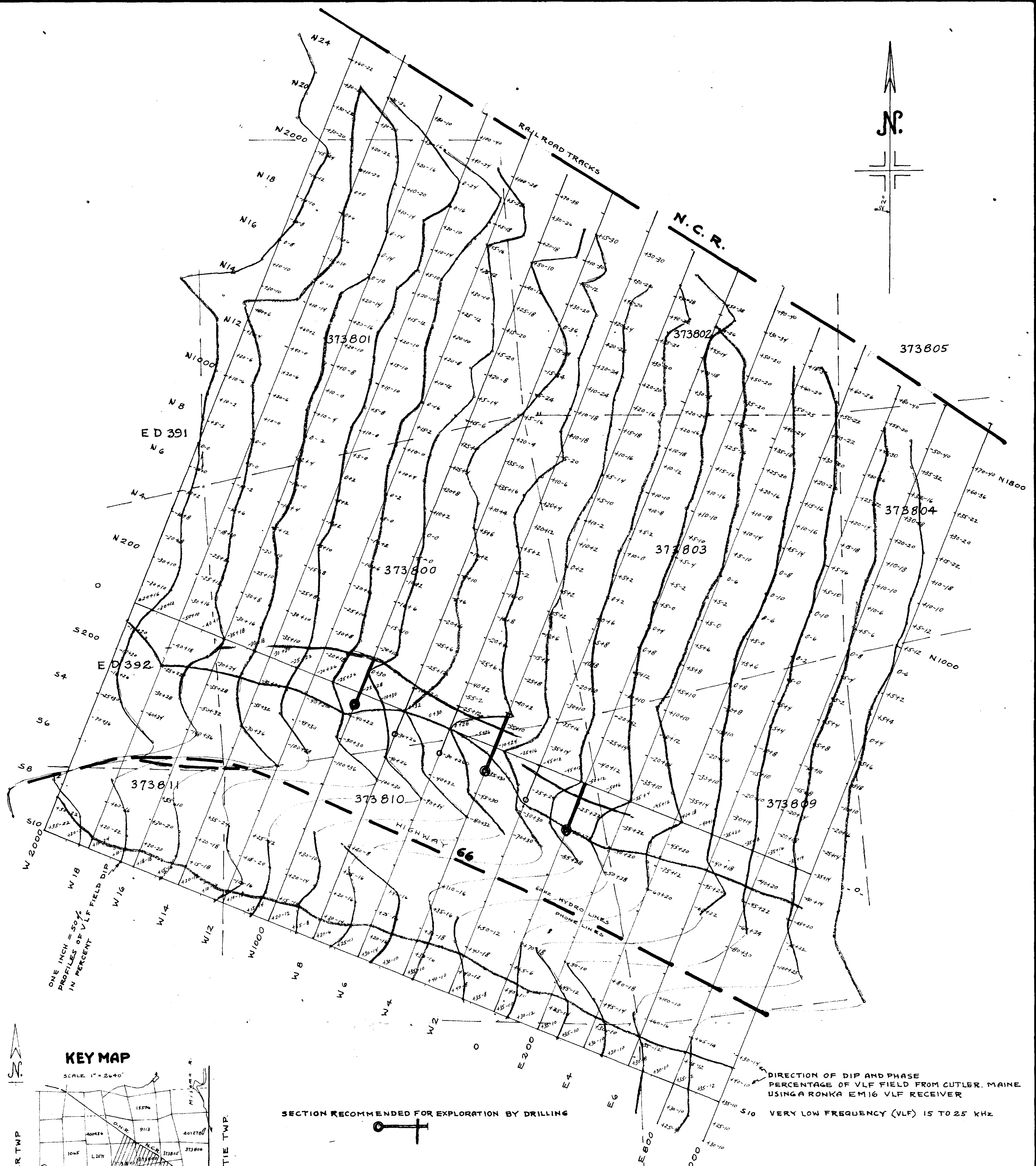
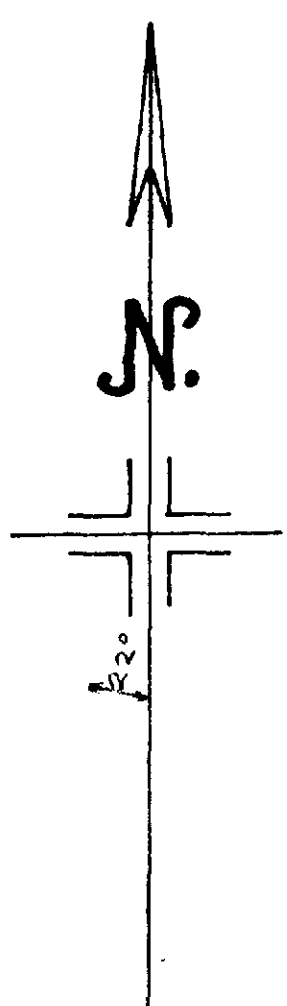
TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" SURFACE RIGHTS ONLY	○
" MINING RIGHTS ONLY	◐
LEASE, SURFACE & MINING RIGHTS	■
" SURFACE RIGHTS ONLY	◼
" MINING RIGHTS ONLY	◑
LICENCE OF OCCUPATION	▼
CROWN LAND SALE	C.S.
ORDER-IN-COUNCIL	OC
RESERVATION	⊙
CANCELLED	⊗
SAND & GRAVEL	⊕



TOWNSHIP 21614
GAUTHIER
DISTRICT
TIMISKAMING
MINING DIVISION
LARDER LAKE

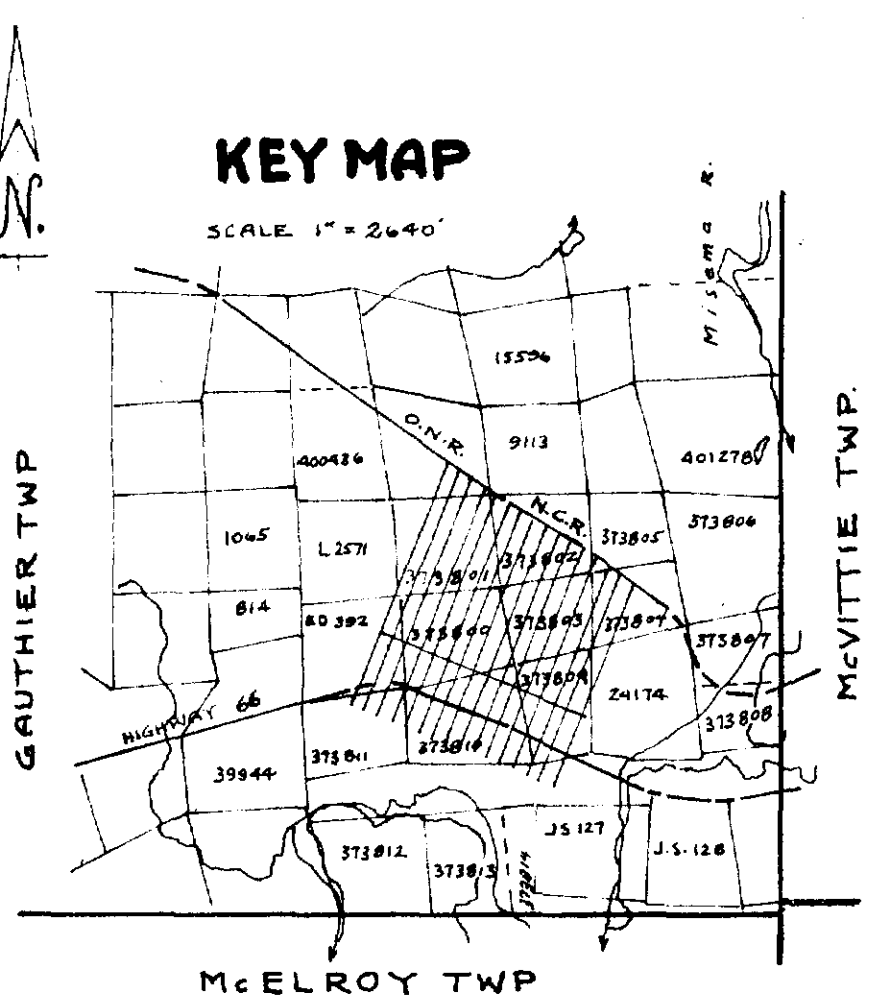
Ministry of Natural Resources
Ontario Surveys and Mapping Branch
Date JAN. 1973 Plan No. **M.350**
Whitney Block
Queen's Park, Toronto



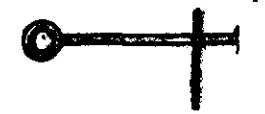


ONE INCH = 50%
PROFILES OF VLF FIELD DIP
IN PERCENT

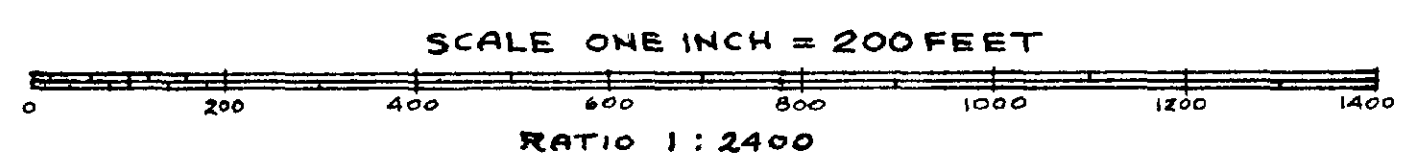
DIRECTION OF DIP AND PHASE
PERCENTAGE OF VLF FIELD FROM CUTLER, MAINE
USING A RONKA EM 16 VLF RECEIVER
VERY LOW FREQUENCY (VLF) IS TO 25 KHZ



SECTION RECOMMENDED FOR EXPLORATION BY DRILLING



**MAP SHOWING
AN INTERPRETATION OF THE VLF RESULTS
OF THE GEOPHYSICAL SURVEY
ON A PORTION OF THE PROPERTY OF
MAYFAIR MINES LIMITED
GAUTHIER TOWNSHIP, ONTARIO**



Douglas Burton

TO ACCOMPANY REPORT BY
DOUGLAS BURTON
COBALT, ONTARIO
SEPTEMBER, 1974

74-99-1

