

THE HANNA MINING COMPANY  
LARCHE PROPERTY - MIDLOTHIAN TOWNSHIP  
LARDER LAKE MINING DIVISION

2,1380

MAGNETOMETER SURVEY

NEL:



41P14NE0026 2.1380 MIDLOTHIAN

010

INTRODUCTION

The Larche property adjoins a large block of 113 claims in Midlothian Township held by The Hanna Mining Company since December of 1972. It was optioned in August, 1973, because favourable geological units on the Hanna claims extend onto the Larche ground.

Existing base lines were extended onto the Larche property, and picket lines were cut at intervals of 400 feet. A program of geological mapping, a magnetometer survey, and an electromagnetic survey were carried out during September and October, 1973.

PROPERTY:

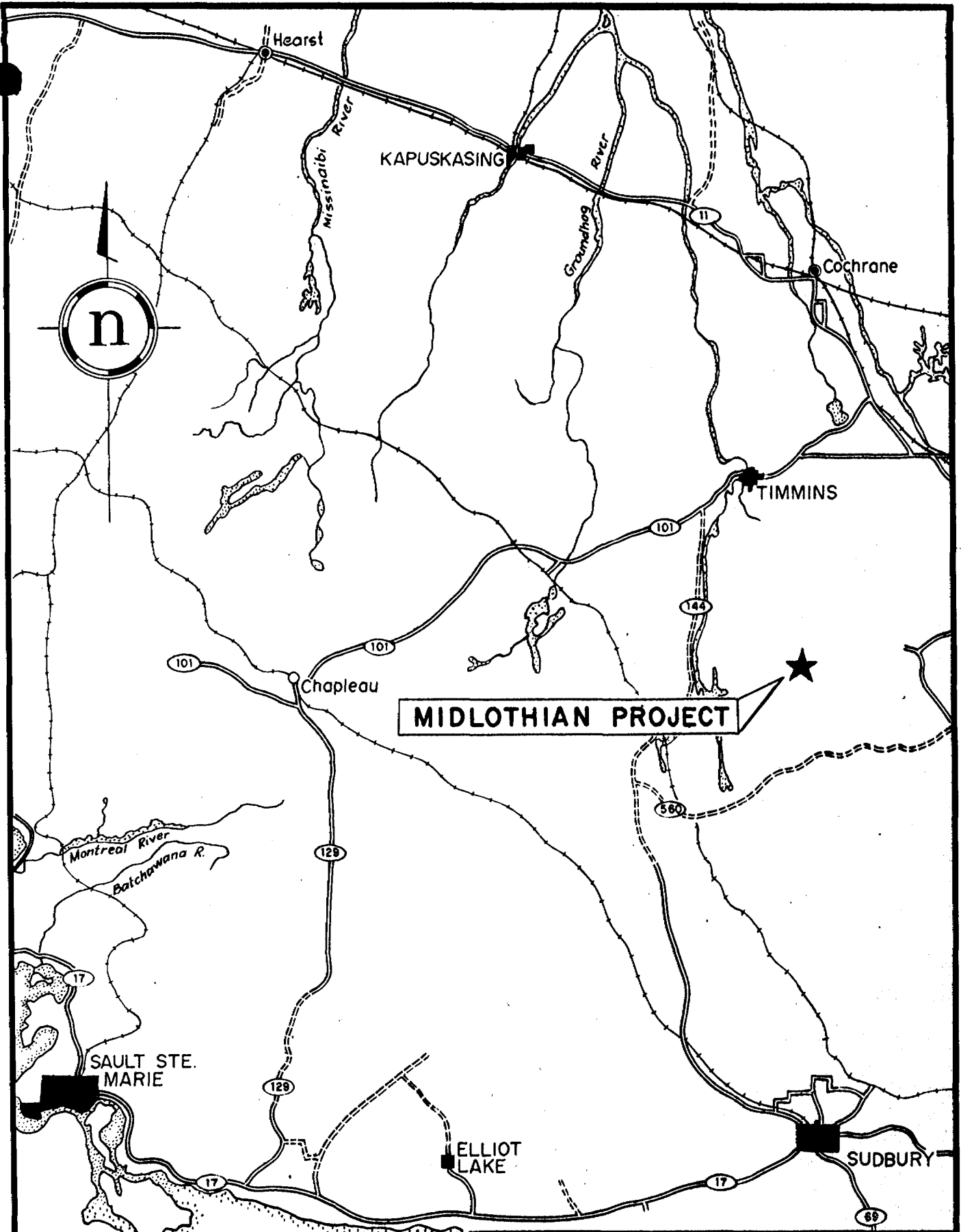
The property, optioned from John Larche of Timmins, comprises 11 claims in Midlothian Township, Larder Lake Mining Division. The claims are numbered L333617 - L333624 inclusive, L333750, L353155 and L353156. They are held in the name of:

The Hanna Mining Company,  
Room 805, 69 Yonge Street,  
Toronto, Ontario M5E 1K3.

LOCATION AND ACCESS:

The property is in central Midlothian Township. It includes Bess Lake and parts of Weary Lake, Mavis Lake and Lloyd Lake. The road from Sirola Lake to Lloyd Lake passes through the south part of the property and provides easy access for motor vehicles.

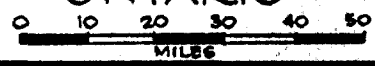
This part of Midlothian Township can be reached from Matachewan or from Timmins. The total distance from Timmins is 60½ miles and part of this distance is on rather rough road. The route starts at the south end of Pine Street and follows a Forest Access Road to the turn off into the Texmont nickel property, a distance of 27 miles. From that point the road is not maintained for 10 miles until it meets a logging road to Matachewan. At 14½ miles on the logging road toward Matachewan is the road to the old Stairs Mine which provides access to the



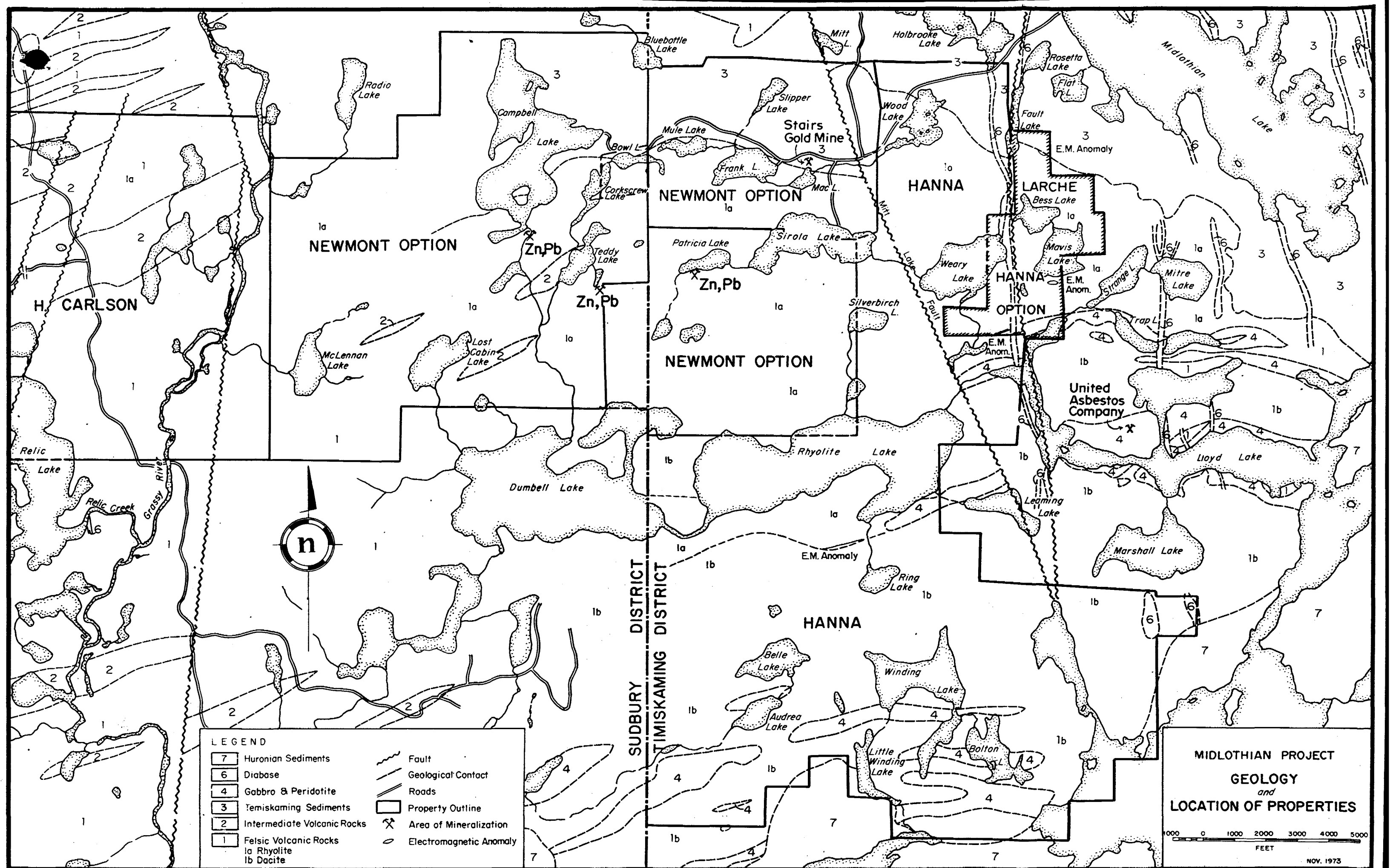
**MIDLOTHIAN PROJECT**

**LOCATION MAP**  
*showing*  
**MIDLOTHIAN PROJECT**

**ONTARIO**



OCT. 72



Stairs property in Midlothian Township and to Sirola Lake, a distance of 9 miles from the Matachewan turn-off. Recently a poor motor road has been extended from Sirola Lake to the United Asbestos property on Lloyd Lake, a distance of 5 miles. This road crosses the Larcha property.

The property can be reached from Matachewan by two different routes, via the Stairs Mine Road and the Wilson Logging Camp road. The Stairs Mine Road is 32 miles west of Matachewan and an additional 9 miles to Sirola Lake. The Wilson Lumber Camp road branches south for 10 miles from the Matachewan road at a point 17 miles west of Matachewan, at the end of highway 566. A new road has been constructed from Wilson's Camp for  $4\frac{1}{2}$  miles to the United Asbestos property, the total distance from Matachewan to Lloyd Lake being 36 miles.

PERSONNEL:

The magnetometer survey was carried out by Nelson Hogg, The Hanna Mining Company, Room 805, 69 Yonge St., Toronto, Ontario, M5E 1K3, during the period September 29 - October 2, 1973.

PREVIOUS WORK:

Stairs Exploration and Mining Company Ltd. covered what is now the Larche property with an airborne magnetometer survey in 1963. This is the only record of previous magnetometer work in the files at the Ministry of Natural Resources. However, it seems probable that ground magnetometer surveys have been made in this area where the ground has been held almost continuously since 1946. No evidence of previous diamond drilling was seen.

A more complete history of work in the area is provided in the geological report covering the Larche property.

METHOD AND EQUIPMENT:

Base lines were cut in an east-west direction at 2000-foot intervals, and picket lines were cut in a north-south direction at 400-foot intervals.

Magnetic readings were taken every 100 feet along the base lines, and every 50 feet on the picket lines.

Line-cutting on land totalled 1.16 miles of base line and 6.35 miles of picket line. About 1/3 of the property is covered by lakes.

The magnetometer used in the survey is a Scintrex MF2, which measures to plus or minus 300,000 gammas. On the most sensitive scale, a scale division represents 10 gammas, and it is possible to read to the nearest 5 gammas.

In carrying out the survey, a closed circuit was established by taking duplicate readings along the base lines in increments of 1000 feet, with similar readings on picket lines at the ends of the base lines. This established a reliable set of base stations, from which closed traverses were run on the picket lines.

GEOLOGY:

The general geology of the Midlothian area, and the detailed geology of the Larche property are described in a separate geological report.

Briefly, the area is underlain by felsic volcanic and sedimentary rocks of Archean age, isoclinally folded and intruded by 2 ages of mafic to ultramafic sills and dikes.

Younger, nearly flat-lying sediments of the Proterozoic Cobalt Group occur in eastern Midlothian Township, but not on the Larche property.

The magnetometer survey was found to be very useful in defining the limits of mafic and ultramafic intrusive bodies, which often occupy low, drift-covered ground.

RESULTS:

The Archean metasedimentary rocks and the felsic volcanics have low magnetic susceptibility, and they cannot be distinguished in the magnetometer readings. Sills of mafic and ultramafic rocks, and dikes of younger diabase have high magnetic relief, up to 1500 gammas above background. The magnetometer survey was directly useful in outlining these rock units, and indirectly in locating faults which displace them. A fault with 1000 feet of horizontal displacement strikes in a north-south direction through Fault Lake, and is occupied by a diabase dike. This dike is one of a pair of parallel dike 300' apart which can be traced from north to south across the entire property and are exposed along the road, between Bess Lake and Weary Lake.

A prominent ultramafic sill is located north of base line 90 south, along the north edge of Lloyd Lake.

There is no magnetic correlation with electromagnetic conductors on the Larche property.

*Nelson Hogg*

.....  
Nelson Hogg

*Dec. 21, 1973*

.....  
date

THE HANNA MINING COMPANY  
LARCHE PROPERTY - MIDLOTHIAN TOWNSHIP  
LARDER LAKE MINING DIVISION

ELECTROMAGNETIC SURVEY

by

NELSON HC



41P14NE0026 2.1380 MIDLOTHIAN

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INTRODUCTION

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Existing base lines were extended onto the Larche property, and picket lines were cut at intervals of 400 feet. A program of geological mapping, a magnetometer survey, and an electromagnetic survey were carried out during September and October, 1973.

PROPERTY

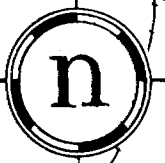
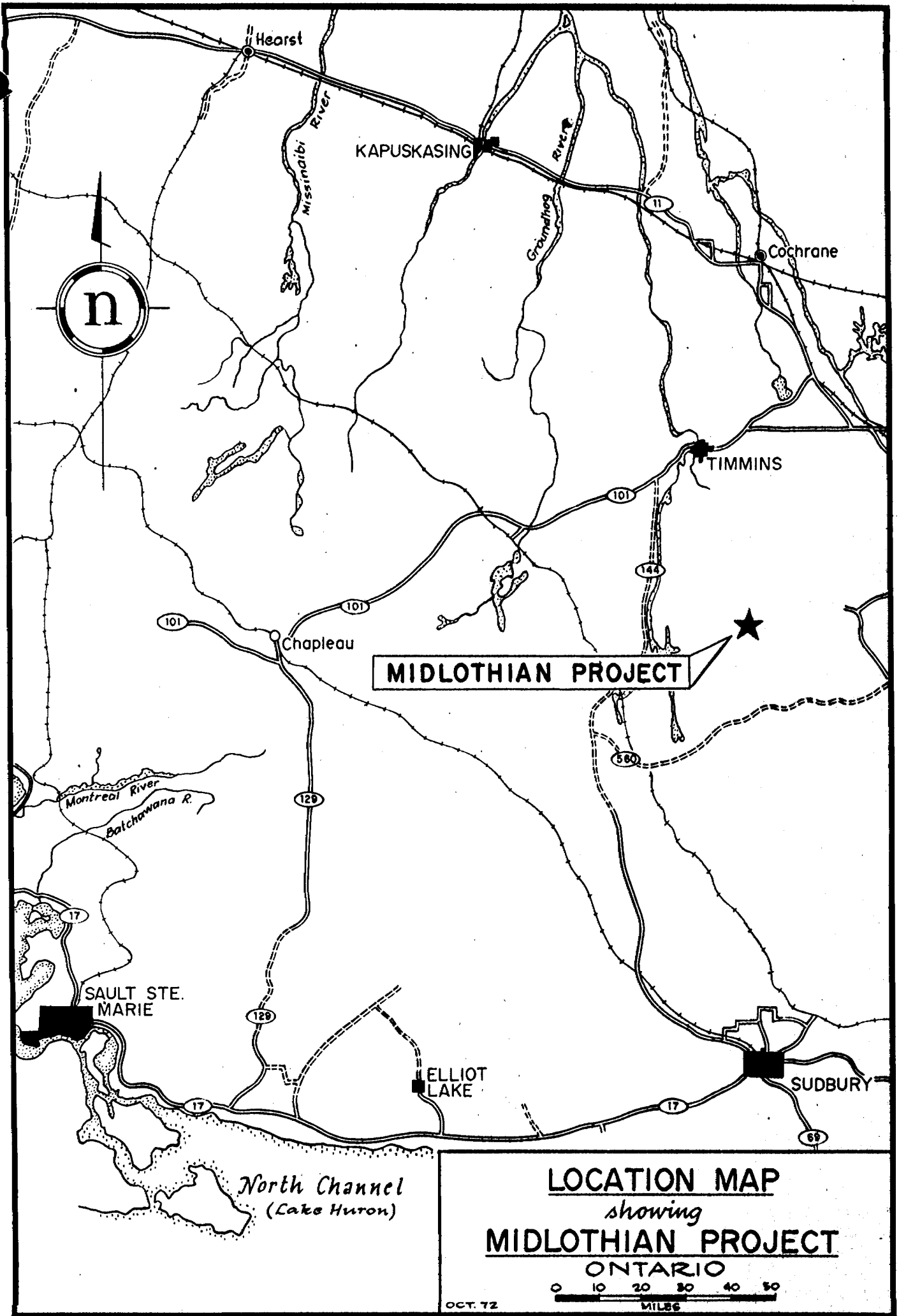
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LOCATION AND ACCESS

The property is in central Midlothian Township. It includes Bess Lake and parts of Weary Lake, Mavis Lake and Lloyd Lake. The road from Sirola Lake to Lloyd Lake passes through the south part of the property and provides easy access for motor vehicles.

This part of Midlothian Township can be reached from Matachewan or from Timmins. The total distance from Timmins is 60½ miles and part of this distance is on rather rough road. The route starts at the south end of Pine Street and follows a Forest Access Road to the turn off into the Texmont nickel property, a distance of 27 miles. From that point the road is not maintained for 10 miles until it meets a logging road to Matachewan. At 14½ miles on the logging road toward Matachewan



KAPUSKASING

Hearst  
Missinibi River

Gravelhog River

Cochrane

TIMMINS

101

101

Chapleau

MIDLOTHIAN PROJECT

101

144

560

Montreal River  
Batchawana R.

129

SAULT STE. MARIE

17

129

ELLIOT LAKE

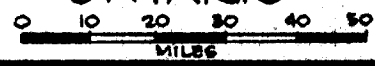
SUDBURY

17

69

North Channel  
(Lake Huron)

LOCATION MAP  
showing  
MIDLOTHIAN PROJECT  
ONTARIO



OCT. 72





is the road to the old Stairs Mine which provides access to the Stairs property in Midlothian Township and to Sirola Lake, a distance of 9 miles from the Matachewan turn-off. Recently a poor motor road has been extended from Sirola Lake to the United Asbestos property on Lloyd Lake, a distance of 5 miles. This road crosses the Larche property.

The property can be reached from Matachewan by two different routes, via the Stairs Mine Road and the Wilson Logging Camp road. The Stairs Mine Road is 32 miles west of Matachewan and an additional 9 miles to Sirola Lake. The Wilson Lumber Camp road branches south for 10 miles from the Matachewan road at a point 17 miles west of Matachewan, at the end of highway 566. A new road has been constructed from Wilson's Camp for 4½ miles to the United Asbestos property, the total distance from Matachewan to Lloyd Lake being 36 miles.

PERSONNEL:

The electromagnetic survey was carried out by Nelson Hogg, assisted by Alex Batise, during the period Oct.1 to Oct.3, 1973. Their addresses are given below:

Mr. Nelson Hogg,  
The Hanna Mining Company,  
Room 805,  
69 Yonge Street,  
Toronto, Ontario M5E 1K3

Mr. Alex Batise,  
Matachewan,  
Ontario.

PREVIOUS WORK:

Stairs Exploration and Mining Company Ltd. covered what is now the Larche property with a combined airborne electro-magnetic and magnetic survey in 1963. This survey was carried out by Canadian Aero Mineral Surveys, using an Otter aircraft.

In 1968 the area was covered for Timiskaming Nickel Limited by Lockwood Survey Corporation, using a helicopter-borne system measuring in-phase and quadrature components.

No other work is on file in the assessment records of the Ministry of Natural Resources. A few old picket lines were observed on the ground, but no evidence was seen of previous diamond drilling.

GEOLOGY:

The general geology of the Midlothian area, and the detailed geology of the Larche property are described in a separate geological report.

Briefly, the area is underlain by felsic volcanic and sedimentary rocks of Archean age, isoclinally folded and intruded by 2 ages of mafic to ultramafic sills and dikes.

Younger, nearly flat-lying sediments of the Proterozoic Cobalt Group occur in eastern Midlothian Township, but not on the Larche property.

The magnetometer survey was found to be very useful in defining the limits of mafic and ultramafic intrusive bodies, which often occupy low, drift-covered ground.

#### METHOD AND EQUIPMENT

Base lines were extended from Hanna's Midlothian Township property onto the Larche claims, at 2000-foot intervals, and picket lines were run between base lines at 400-foot intervals. A total of 1.16 miles of base line and 6.35 miles of picket line were cut on the land portion of the property. About 1/3 of the area is covered by lakes.

The electromagnetic survey was carried out using an ABEM Gun. This is a horizontal-loop method, measuring two frequencies at 880 Hz and 3520 Hz. In this case readings were taken at 100-foot intervals with a 200-foot coil spacing, on high frequency. Where anomalous values were obtained, readings were taken every 50 feet on both high and low frequency. A total of 391 stations were read.

The terrain is generally flat, but there are hills which rise to more than 100 feet above the lake levels. Where the topography varies by more than 10' in 200 feet, it is necessary to apply a correction factor to the in-phase readings. The procedure used by The Hanna Mining Company is to take all readings with the receiving coil and transmitting coil cylinders in a vertical position, estimate the difference in elevation, and apply a correction according to graphs provided by the manufacturer.

#### RESULTS

Three zones of conductivity were located by the electromagnetic survey. Two of these were found on one line only, and one was located on 2 lines. They are located as follows:

- (a) Line 48+00 East 3200 South
- (b) Line 48+00 East 7300 South
- (c) Line 28+00 East 9100 South  
Line 32+00 East 89+50 South

The conductor on line 48+00 east at 3200 south is on the contact between rhyolitic rocks and conglomerate, but there

is no rock exposure in the area of the conductor.

The conductor on line 48+00 east at 7100 south is on a prominent hill, and may be partly caused by topography. However, it has strong out-of-phase readings which should not be affected by the topography, but may reflect overburden conditions.

The conductor on lines 28+00 East and 32+00 East in the vicinity of base line 90 South has good electromagnetic characteristics on both in-phase and out-of-phase values. It is in flat ground, and may continue into a flooded area to the west. This area will be covered when the ground is frozen.

*Nelson Hogg*

.....

Nelson Hogg

*Dec. 21, 1973*

.....

date

THE HANNA MINING COMPANY

LARCHE PROPERTY - MIDLOTHIAN TOWNSHIP

LARDER LAKE MINING DIVISION

GEOLOGICAL REPORT

by

NELSON HOG



41P14NE0026 2.1380 MIDLOTHIAN

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INTRODUCTION

During December, 1972 and January, 1973, The Hanna Mining Company acquired by staking 105 claims in Midlothian Township, for the purpose of prospecting for base metals. Application was made to the Ministry of Natural Resources of Ontario for assistance under the Mineral Exploration Assistance Program and subsequently the application was approved in a formal agreement in which the Government agreed to pay 1/3 of specified exploration costs, up to a maximum of \$20,753.33.

Later, 8 additional claims were added by staking, bringing the total to 113, and the Assistance Agreement was modified to allow for the additional expense, up to \$22,828.67.

Finally, on August 27, 1973, 11 claims adjoining Hanna's property were optioned from John Larche of Timmins, and these were included in the agreement with the government, but the maximum amount of assistance remained at \$22,828.67.

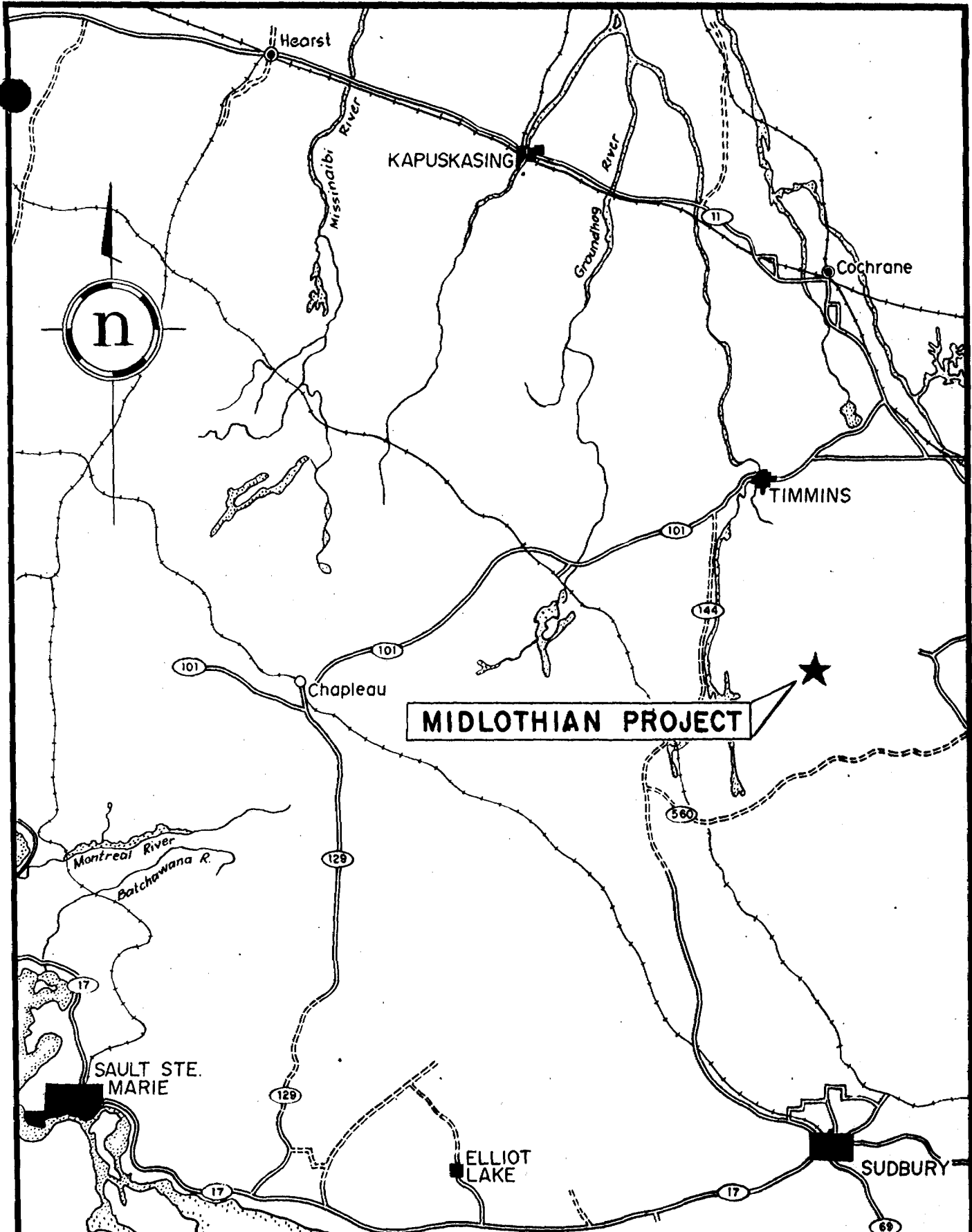
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PROPERTY

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LOCATION & ACCESS

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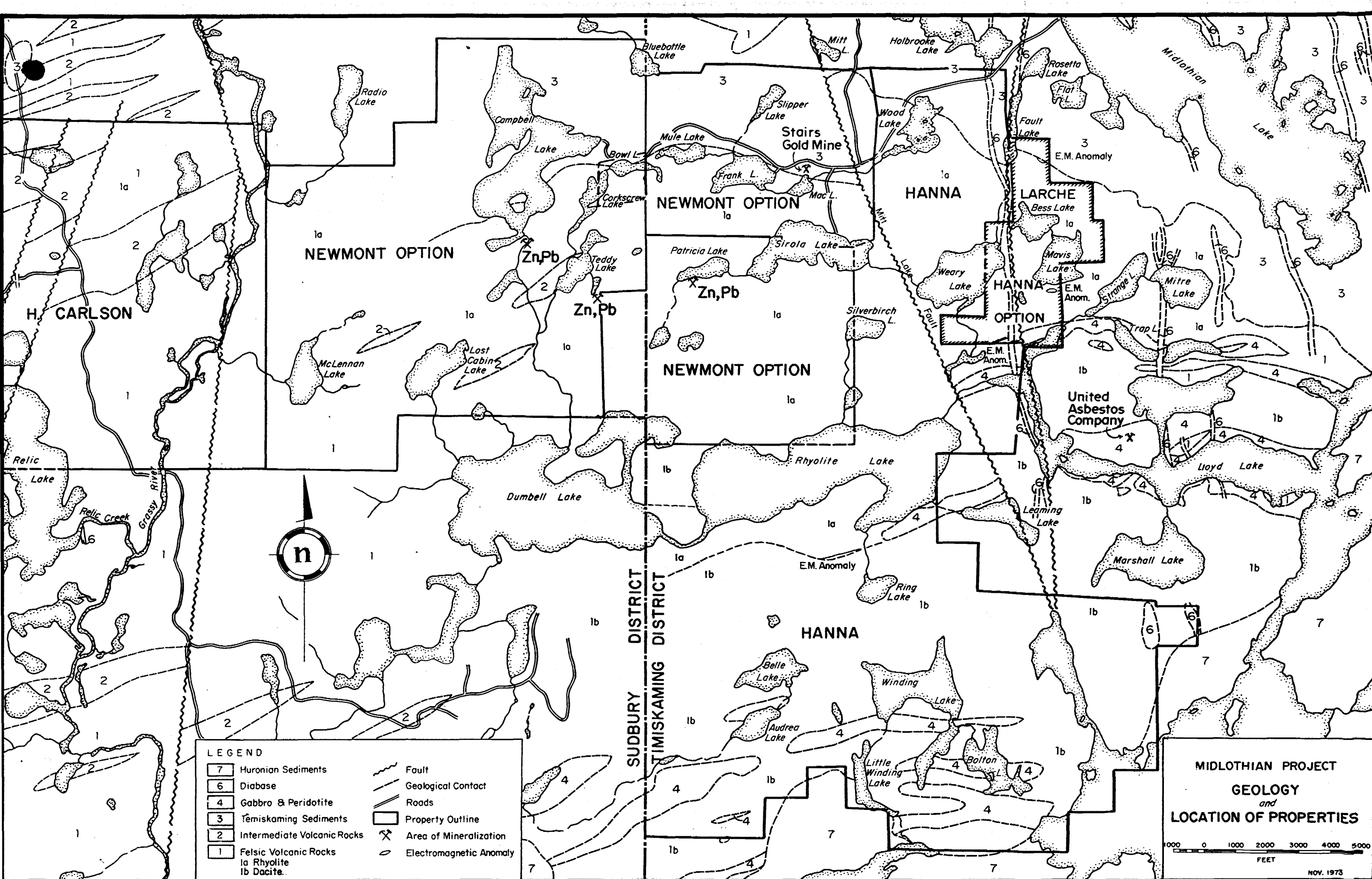
**MIDLOTHIAN PROJECT**

**LOCATION MAP**  
*showing*  
**MIDLOTHIAN PROJECT**

ONTARIO



OCT. 72



H. CARLSON

NEWMONT OPTION

NEWMONT OPTION

NEWMONT OPTION

HANNA

LARCHE

HANNA

OPTION

United Asbestos Company

Sudbury District  
Timiskaming District

HANNA

**LEGEND**

7 Huronian Sediments	Fault
6 Diabase	Geological Contact
4 Gabbro & Peridotite	Roads
3 Temiskaming Sediments	Property Outline
2 Intermediate Volcanic Rocks	Area of Mineralization
1 Felsic Volcanic Rocks 1a Rhyolite 1b Dacite	Electromagnetic Anomaly

MIDLOTHIAN PROJECT  
GEOLOGY  
and  
LOCATION OF PROPERTIES



NOV. 1973

This part of Midlothian Township can be reached from Matachewan or from Timmins. The total distance from Timmins is 60½ miles and part of this distance is on rather rough road. The route starts at the south end of Pine Street and follows a Forest Access Road to the turn off into the Texmont nickel property, a distance of 27 miles. From that point the road is not maintained for 10 miles until it meets a logging road to Matachewan. At 14½ miles on the logging road toward Matachewan is the road to the old Stairs Mine which provides access to the Stairs property in Midlothian Township and to Sirola Lake, a distance of 9 miles from the Matachewan turn-off. Recently a poor motor road has been extended from Sirola Lake to the United Asbestos property on Lloyd Lake, a distance of 5 miles. This road crosses the Larche property.

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#### LINE-CUTTING

Line-cutting was done on contract by Thorex Limited of Thunder Bay. Base lines cut previously on Hanna's claims were extended to the east, and picket lines were turned-off at 400' intervals from these base lines, which are 2000 feet apart. It will be necessary to complete the grid during winter months, when the lakes are frozen.

Lines cut on land by Thorex are summarized below:

Base Lines = 1.16 miles  
Picket Lines = 6.35 miles

All lines were chained, and pickets spaced at 100 foot intervals.

#### PERSONNEL

Line-cutting was done on Contract by Thorex Limited of Thunder Bay, Ontario during the period August 20 to Sept.1, 1973.

Geological mapping was done by Nelson Hogg of The Hanna Mining Company during the period September 20 to September 28.

### PREVIOUS WORK

Midlothian Township was thoroughly prospected for gold during the mid 1940's and most of the Larche property was then part of the Laroma Midlothian Mines Ltd. property. Interest in gold was revived in 1962 when Stairs Exploration & Mining Company acquired the former Sherwood Gold Mines property and developed it underground. Stairs covered a large area, including the Larche property, with an airborne geophysical survey, but there is no record of ground work following this survey.

The discovery of massive sulphides in Kidd Township by Texas Gulf in 1964 created interest in the rhyolitic rocks of the area, and since that time Midlothian Township has been covered several times by airborne geophysical surveys. Despite this intense interest in the area in recent years, only one set of old pickets was observed on the Larche claims in the southwest part of the property, and nothing was found in the assessment files of the Ministry of Natural Resources.

### GENERAL GEOLOGY

Midlothian Township has been mapped by Marshall<sup>1</sup> and by Bright<sup>2</sup> for the Ontario Department of Mines. The general geology of the area is best shown on map 2046<sup>3</sup> of the Ontario Department of Mines.

Consolidated rocks of the area are of Precambrian age. Archean volcanic and sedimentary rocks occur in easterly trending, isoclinally folded belts which form a westerly extension of the Kirkland Lake geosyncline. However, these highly folded rocks are unconformably overlain by Proterozoic rocks of the Huronian Cobalt Group, including the Gowganda conglomerate formation. These younger formations conceal the geologically favourable Archean rocks in the east part of Midlothian Township, and cause uncertainty in the correlation and projection of favourable units. It is notable that there are no significant exposures of felsic intrusive rocks in the Archean of Midlothian Township.



TABLE OF FORMATIONS

Genozoic

Sand, gravel, swamp deposits.

Precambrian

Proterozoic

Huronian

Cobalt Group - Gowganda Formation, Conglomerate, graywacke, Argillite, Intrusive Contact

Archean

Matachewan - Diabase.  
Intrusive Contact

Ultramafic & Mafic Intrusive Rocks

Lamprophyre -

Serpentinite derived from lunite and peridotite.  
Gabbro, diorite.

Intrusive Contact

Metasediments:-

Graywacke, arkose, argillite

Felsic Metavolcanics:-

Rhyolite flows, flow breccia, tuff breccia,  
agglomerate, chert.

Trachyte.

Undifferentiated Felsic Volcanic rocks.

Intermediate & Mafic Metavolcanics:-

Dacitic and Andesitic flows, pillow lava, tuffs and  
pyroclastics.

There is a transitional change in composition of the volcanic rocks from north to south. Intermediate volcanics including dacite and andesite increase toward the south in Midlothian Township, with minor amounts of interbedded felsic tuff, breccia and massive lava. Pillowed lavas and water-lain tuffs provide good evidence for the attitude of the intermediate volcanic units.

Overlying these is a thick mass of felsic volcanic rocks, some  $2\frac{1}{2}$  miles thick. These rocks are mainly rhyolitic in composition, but some units are trachytic. They include flow breccia, tuff breccia, agglomerate, massive rhyolite, and quartz porphyry. No good waterlain tuffs were observed - crude banding seen in some of the fine grained massive units and in some breccias is probably flow banding. A small exposure of black, finely laminated chert, occurs at the south end of Fault Lake. Graphitic bands are reported in these felsic rocks in Halliday Township and in the west part of Midlothian, but in the area covered by Hanna's claims there is no evidence that the felsic volcanic rocks are water-lain.

The felsic volcanic rocks are overlain by metasediments similar to the Temiskaming sediments of the Kirkland Lake area. On a regional scale there is an erosional unconformity between the metavolcanic and metasedimentary units, and in some places there is an angular unconformity. In Midlothian Township, however, the only good evidence of an unconformable relationship is the character of pebbles and cobbles in the conglomerate. These include most of the underlying varieties of volcanic rock, and some that resemble the ultramafic intrusive rocks. On the other hand, the upper member of the felsic volcanic rocks, a rhyolite with prominent quartz-eyes and fragments of fuchsite, has a conformable relationship with the sediments.

Close to the lower contact of the sediments, the conglomerate is generally an unsorted, closely packed assemblage of angular volcanic pebbles and cobbles up to 18 inches in diameter. Farther from the contact, there is more evidence of sorting, with occasional beds of arkosic graywacke. The pebbles of ultramafic rock are an interesting feature of the conglomerate. Both Marshall<sup>1</sup> and Bright<sup>2</sup> consider the ultramafics to be younger than the sedimentary rocks, and they are shown thus in the table of formations in this report. However, it seems probable that some ultramafics may be flows or sills contemporaneous with the volcanic rocks of the area.

The mafic to ultramafic intrusives include rocks ranging from dunite to diorite in composition. Olivine is almost completely altered to varieties of serpentine. The largest body of ultramafic rock is at the north end of Lloyd Lake, where United Asbestos, Inc. is developing an asbestos mine. The edges of the serpentinite mass are gabbroic, but there is no evidence of differentiation such as would be expected in a thick ultramafic sill.

The ultramafic rocks generally occur in bands of 100 to 500 feet thick, striking in a direction slightly north of east or east-west. This is the direction of strike in the pillowed dacites and tuffs in the south part of the township. Some gabbroic bodies have greater widths than the serpentinites.

Narrow dikes of Lamprophyre, seldom more than 20 feet thick, are common in the felsic volcanic rocks and sediments. Most common is a fine grained pink variety consisting of albite and small blades of biotite altered to chlorite. These dikes strike in an east-west direction, and do not follow either the direction of shearing or bedding.

Dikes of diabase post-date folding and faulting of the Archean rocks and often occupy major north-south faults in the area. They have great continuity along strike, but are generally less than 200 feet thick.

Rocks of the Huronian Cobalt Group overly the Archean formations in the east part of Midlothian Township, which is close to the northern limit of the Cobalt Group in this area. The Gowganda conglomerate forms impressive hills of nearby flat-lying massive beds, covering the steeply dipping Archean rocks. The Huronian cover is probably quite thin on average, but some hills are 600 - 800 feet above the general terrain. In the search for stratiform massive sulphide deposits in the Archean volcanics, the Gowganda formation presents an obstacle to the effective use of geophysical equipment.

Extensive sand deposits occur in eastern Midlothian Township, in Doon Township to the east, and in Halliday Township to the west. However there is little overburden in most of Midlothian Township, and exposures of bedrock are abundant.

#### STRUCTURE

The volcanic and sedimentary rocks are isoclinally folded and steeply dipping. The main body of sedimentary rocks in Midlothian Township trends south of east and is probably a major syncline comparable to the Kirkland Lake synclinal structure.

Structure in the felsic volcanic rocks is difficult to determine because breccias and unsorted pyroclastics predominate. However, a fragmental quartz porphyry and a massive, fine-textured rhyolitic unit near the top of the felsic volcanic mass, are conformable with the sedimentary contact.

The intermediate volcanic rocks further from the sedimentary contact show better evidence of attitude, and they have a trend which is slightly north of east. Therefore, on a regional scale it seems that there is an angular uniformity between sediments and older volcanic rocks.

Several zones of strong shearing and carbonate alteration are a prominent feature of the area. These zones are in places a mile wide, trending in a N 50°E direction across sediments and volcanic units. Locally the shearing and alteration are strong enough to obliterate the original character of the rock, and are accompanied by veins of massive carbonate that weather to a smooth, deep brown surface.

Several prominent faults striking in a northerly direction displace the Archean rocks and are sometimes filled with diabase. The Mitt Lake fault has a left-hand horizontal displacement of more than 1/2 mile, and the Fault Lake fault has a left hand horizontal displacement of nearly 1000 feet.

#### DETAILED GEOLOGY:

The Larche group of claims covers the contact between sedimentary and felsic volcanic rocks, but most of the property is underlain by felsic volcanics. The contact trends in a S 50°E direction from the northwest corner of the property, east of Fault Lake. It is not exposed in this area but is marked by a topographic depression.

The upper unit of the felsic volcanic rocks is a quartz porphyry characterized by abundant quartz "eyes" up to  $\frac{1}{4}$  inch in diameter. One thin section of this rock was described by Peach <sup>4</sup> as having the characteristics of a welded tuff.

Below the quartz porphyry is a massive, fine grained rhyolite having a porcelainic appearance on weathered outcrops. It has a width of about  $\frac{1}{4}$  mile and strikes conformably with the quartz porphyry. In thin section this rock is porphyritic, but the tabular feldspar phenocrysts are obscured by sericitization. Although it appears massive in outcrop, in thin section the rock is generally finely brecciated.

Below the fine grained massive rhyolite is a great thickness of rhyolite breccias, including flow breccias, explosive tuff breccias and agglomerates. No water-lain tuffs occur within these rocks to provide an indication of their attitude. Crude banding in the breccias is invariably discontinuous, and generally has the appearance of flow banding. Some of the best exposures of this type of banding are on the south shore of Weary Lake, where the general trend varies from north-easterly to easterly.

Rocks mapped as tuff breccias have angular to rounded fragments of a variety of rock-types, including rhyolitic and andesitic volcanics and occasionally chert. The rhyolitic fragments are largest, and often exhibit flow banding within the fragments. Fragments generally constitute more than 50% of the rock.

Rocks mapped as flow breccia have fragments of only one variety and a matrix of dark siliceous and chloritic material which

is itself a fine breccia. The amount of matrix material varies but generally the breccia has the appearance of a rhyolite that has been shattered, with the spaces being filled by finely comminuted volcanic material.

The distribution of these rocks suggests a volcanic centre where lava was cooling and fracturing with intermittent periods of explosive activity.

Near the south end of the property, on the north shore of Lloyd Lake, is an exposure of serpentinite and gabbro which forms part of a narrow sill-like body trending easterly. The north half of the outcrop is a dark green fine textured serpentinite while the south half is gabbroic.

Several dikes of diabase were mapped on the Larche property. One prominent dike occupies the Fault Lake fault zone. Others are parallel, trending in a north-south direction.

ECONOMIC GEOLOGY:

Most massive sulphide deposits discovered in recent years in the Precambrian of Northern Ontario are associated with felsic volcanic rocks, and few are exposed in outcrop. The Larche property is underlain by favourable rocks, and even though it may have been prospected in the past, it is an attractive environment for massive sulphide deposits. A Turam electromagnetic survey is planned to penetrate to a depth greater than 200 feet to investigate for buried sulphide mineralization.

REFERENCES:

1. Marshall, H.I.  
1947, Geology of Midlothian Township  
Ontario Dept. of Mines Vol. 56, pg.5
2. Bright, E.G.  
1970, Geology of Halliday & Midlothian Townships  
Ontario Dept. of Mines Geological Report 79
3. Map 2046, Ontario Department of Mines -  
Timmins-Kirkland Lake Sheet. Geological Compilation  
Series - 1 in. = 4 mi.
4. Peach, P. - Midlothian Project - Study of Thin Sections - Aug. 1973 -  
Private Report to The Hanna Mining Company

*Nelson Hogg*

.....  
Nelson Hogg  
*Dec 21, 1973*  
.....  
date



41P14NE0026 2.1380 MIDLOTHIAN

900

File 2,1380

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

RECEIVED

DEC 27 1973

PROJECTS SECTION

Type of Survey Geological & Geophysical

Township or Area Midlothian

Claim holder(s) The Hanna Mining Company

Author of Report Nelson Hogg

Address Room 805, 69 Yonge St., Toronto, Ont. M5E 1K3

Covering Dates of Survey August 20, 1973 - Oct. 30, 1973

(linecutting to office)

Total Miles of Line cut 7.5 miles

MINING CLAIMS TRAVERSED  
List numerically

L	353155
(prefix)	(number)
L	353156
L	<del>353150</del>
L	333617
L	333618
L	333619
L	333620
L	333621
L	333622
L	333623
L	333624

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	20
-Magnetometer	20
-Radiometric	
-Other	
Geological	40
Geochemical	

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

Magnetometer \_\_\_\_\_ Electromagnetic \_\_\_\_\_ Radiometric \_\_\_\_\_  
(enter days per claim)

DATE: Oct. 30, 1973 SIGNATURE: Nelson Hogg  
Author of Report or Agent

PROJECTS SECTION

Res. Geol. LD Qualifications 63-1991

Previous Surveys 63-1224

Checked by \_\_\_\_\_ date \_\_\_\_\_

GEOLOGICAL BRANCH \_\_\_\_\_

Approved by \_\_\_\_\_ date \_\_\_\_\_

GEOLOGICAL BRANCH \_\_\_\_\_

Approved by \_\_\_\_\_ date \_\_\_\_\_

TOTAL CLAIMS 11

If space insufficient, attach list

OFFICE USE ONLY

Show instrument technical data in each space for type of survey submitted or indicate "not applicable"

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Mag. Survey - 809
Number of Stations Mag. 742 EM.340 Number of Readings EM Survey - 391
Station interval 50' for Magnetometer - 100' for EM, but 50' in anomalous areas.
Line spacing 400 feet
Profile scale or Contour intervals 1008 for Magnetometer
(specify for each type of survey)

MAGNETIC

Instrument Scintrex MF2 Fluxgate Magnetometer
Accuracy - Scale constant 10 Gammas per Scale Division on 1000 scale.
Diurnal correction method Established closed circuit of base lines by triple readings.
Base station location Gauthier Camp

ELECTROMAGNETIC

Instrument ABEM Gun
Coil configuration Horizontal
Coil separation 200'
Accuracy
Method: [ ] Fixed transmitter [ ] Shoot back [x] In line [ ] Parallel line
Frequency 3520 Hz & 880 Hz on anomalous areas
(specify V.L.F. station)
Parameters measured In-phase & quadrature

GRAVITY

Instrument
Scale constant
Corrections made
Base station value and location

Elevation accuracy

INDUCED POLARIZATION - RESISTIVITY

Instrument
Time domain Frequency domain
Frequency Range
Power
Electrode array
Electrode spacing
Type of electrode





THE HANNA MINING COMPANY  
**MIDLOTHIAN PROJECT**  
 LARCHES LAKES  
 ONTARIO  
**GEOLOGIC MAP**

Scale: 1" = 200'  
 0 200 400 600 Feet

Work by: *Hanna Mining*  
 Date: *Mar. 1973*

Interpretation by: \_\_\_\_\_  
 Date: \_\_\_\_\_

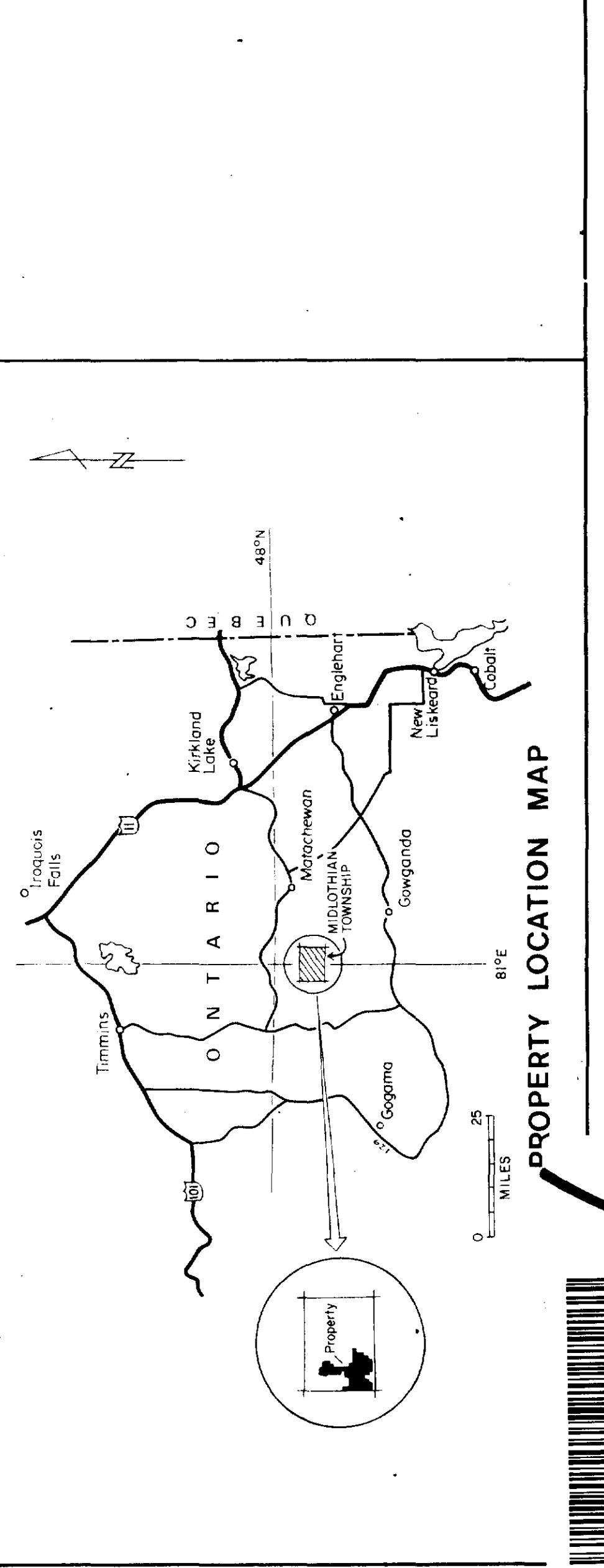
Revised: \_\_\_\_\_  
 N.T.S. No. 41-P-15

- SYMBOLS**
- Swamp
  - Small outcrop
  - Outcrop
  - Interpreted bedrock
  - Top of bed
  - Bedding, too uniform (inclined, vertical)
  - Strike and dip of schistosity (inclined, vertical)
  - Strike and dip of gneissosity (inclined, vertical)
  - Fault, assumed
  - Synclinal axis
  - Anticlinal axis
  - Mineral occurrence
  - Tractor road
  - Diamond drill hole

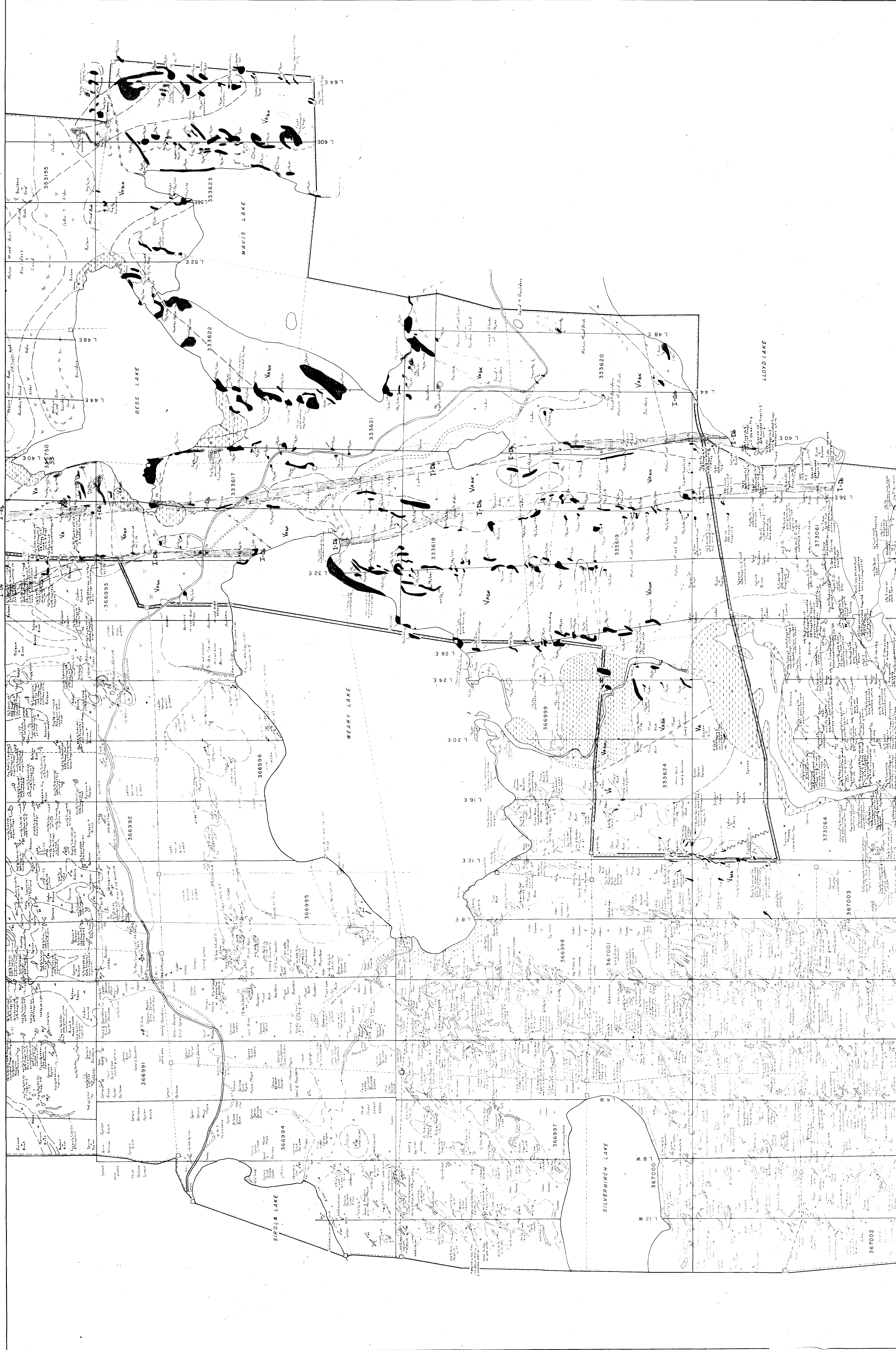
- LEGEND**
- Quartz Veins (qv), Carbonate Veins (cbv)
  - Diabase Dykes (I-Db)
  - Lamprophyre (L-Lmp)
  - Sediments: Conglomerate (S-Co), Graywacke (S-Gw)
  - Basic and acid igneous rocks: Gabbro (I-Ob), Basalt (I-Ob), Diorite (I-Di), Granite (I-Gr)
  - Ultramafic Rocks (I-Um), Serpentine (I-Ser)
  - Pyrophyllite (VRpy), Amphibole (VRam), Serpentine (I-Ser)
  - Rhyolite (VRr), Basalt (VRb), Andesite (VRa)
  - Rhyolite Flow Breccia (VRfbx)
  - Rhyolite Tuff Breccia (VRtubx)
  - Acid Volcanic (uff Breccia (VAubx)
  - Andesite (VAad), Dacite (VAd), Flow Breccia, Tuff Breccia, Flow, Pillowed Flow, etc.

**SHEET INDEX**

1	2	3	4	5	6	7
8	9					







**SYMBOLS**

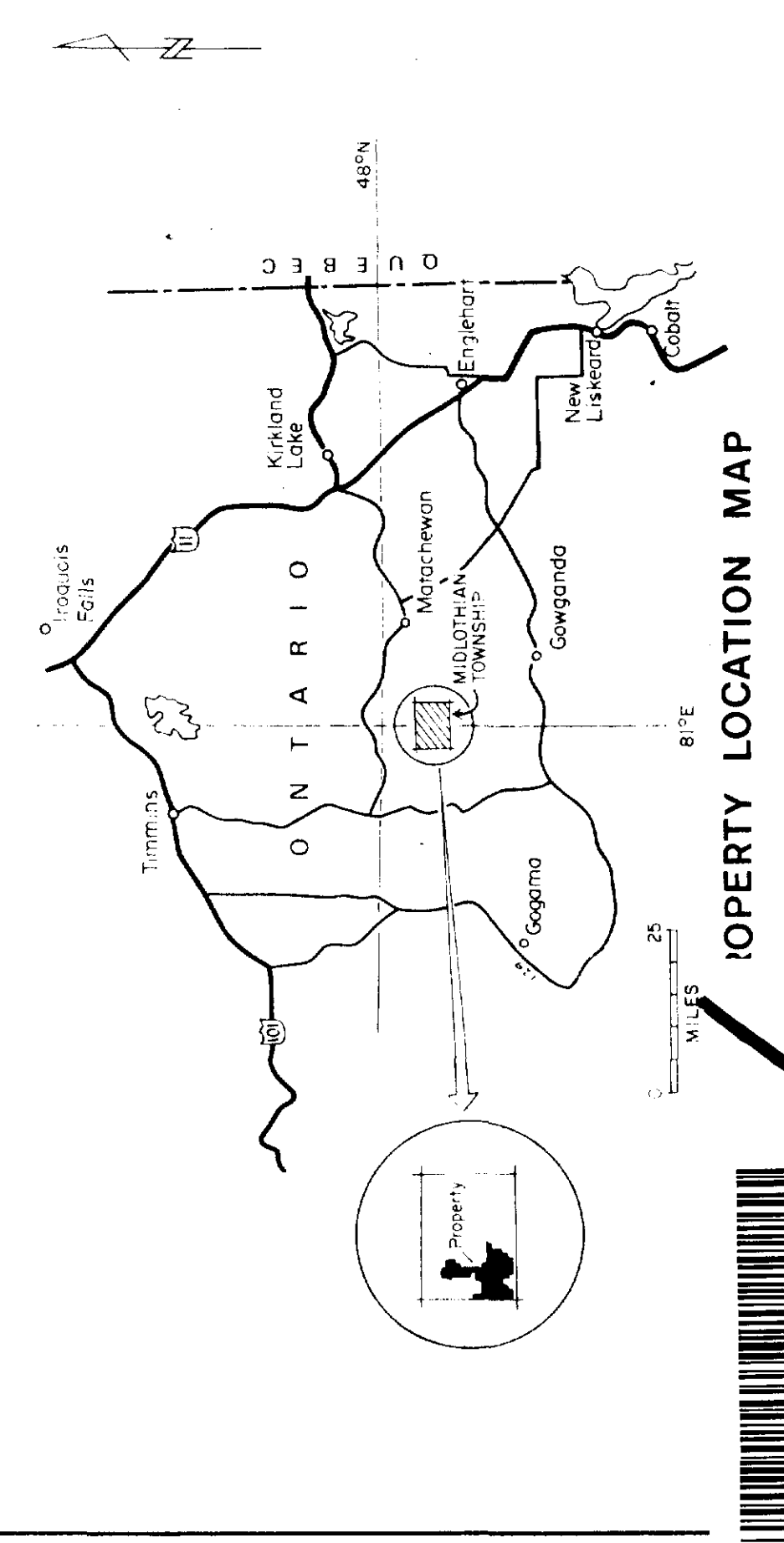
- Swamp
- Small outcrop
- Outcrop
- Interpreted bedrock
- Top of bed
- Bedding, top unmet (inclined, vertical)
- Strike and dip of schistosity (inclined, vertical)
- Fault, assumed
- Anticlinal axis
- Synclinal axis
- Mineral occurrence
- Tractor road
- Diamond drill hole

**LEGEND**

SEE SHEET 1

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8	9					

SHEET INDEX



THE HANNA MINING COMPANY  
**MIDLOTHIAN PROJECT**  
 LARDER LAKE DIVISION  
 ONTARIO

**GEOLOGIC MAP**

SCALE 1" = 200'  
 0 200 400 600 Feet

Work by: *Robert G. Goff*  
 Date: *Apr-1973*

Interpretation by: \_\_\_\_\_  
 Date: \_\_\_\_\_

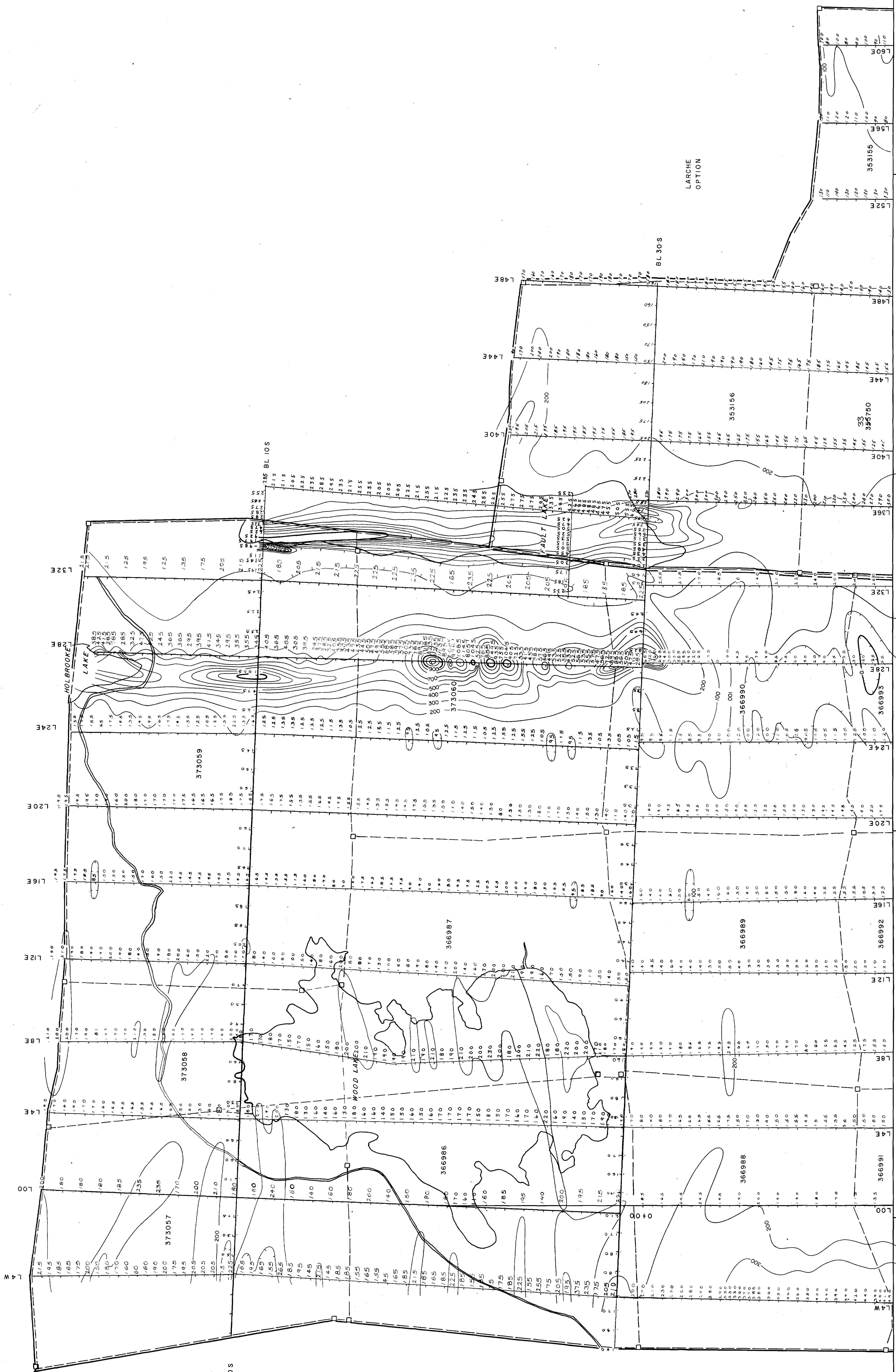
Revised \_\_\_\_\_  
 Revised \_\_\_\_\_  
 (M.S. No. 41-p-15)











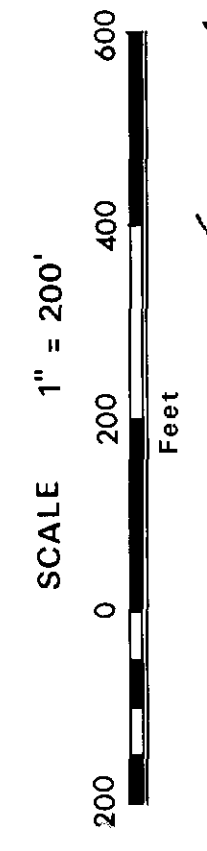
**SYMBOLS**

- HUNDRED GAMMA CONTOUR
- THOUSAND GAMMA CONTOUR
- CLOSED MAGNETIC LOW

**LEGEND**

INSTRUMENT -  
Scintrex MF 2 Fluxgate Magnetometer

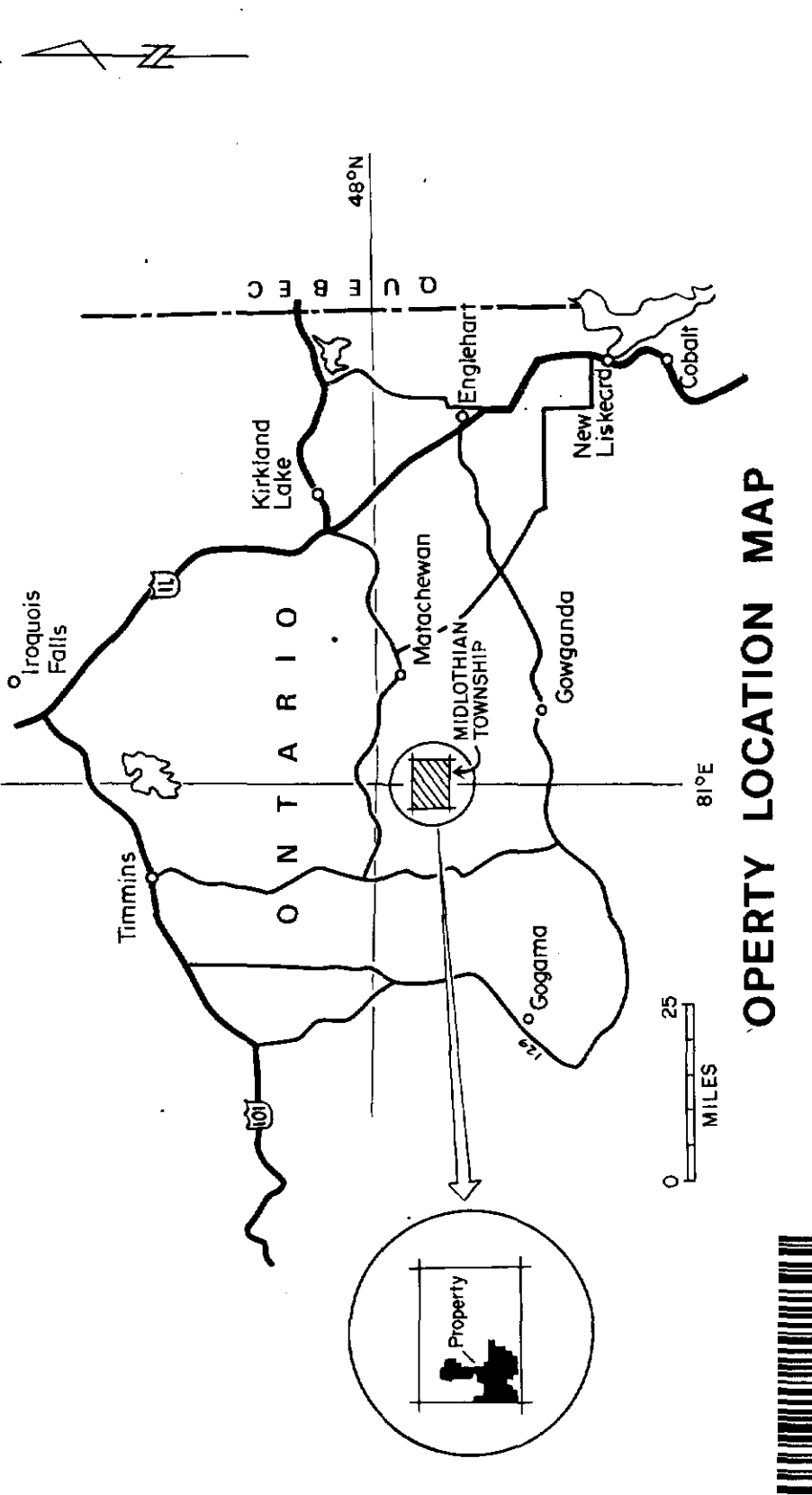
THE HANNA MINING COMPANY  
MIDLOTHIAN PROJECT  
LARCHES OPTION  
ONTARIO  
**MAGNETOMETER MAP**



Work by \_\_\_\_\_  
Date \_\_\_\_\_  
Interpretation by \_\_\_\_\_  
Date \_\_\_\_\_  
Revised \_\_\_\_\_  
R.I.S. No. 41-P-15

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4	5	6
7	8	9

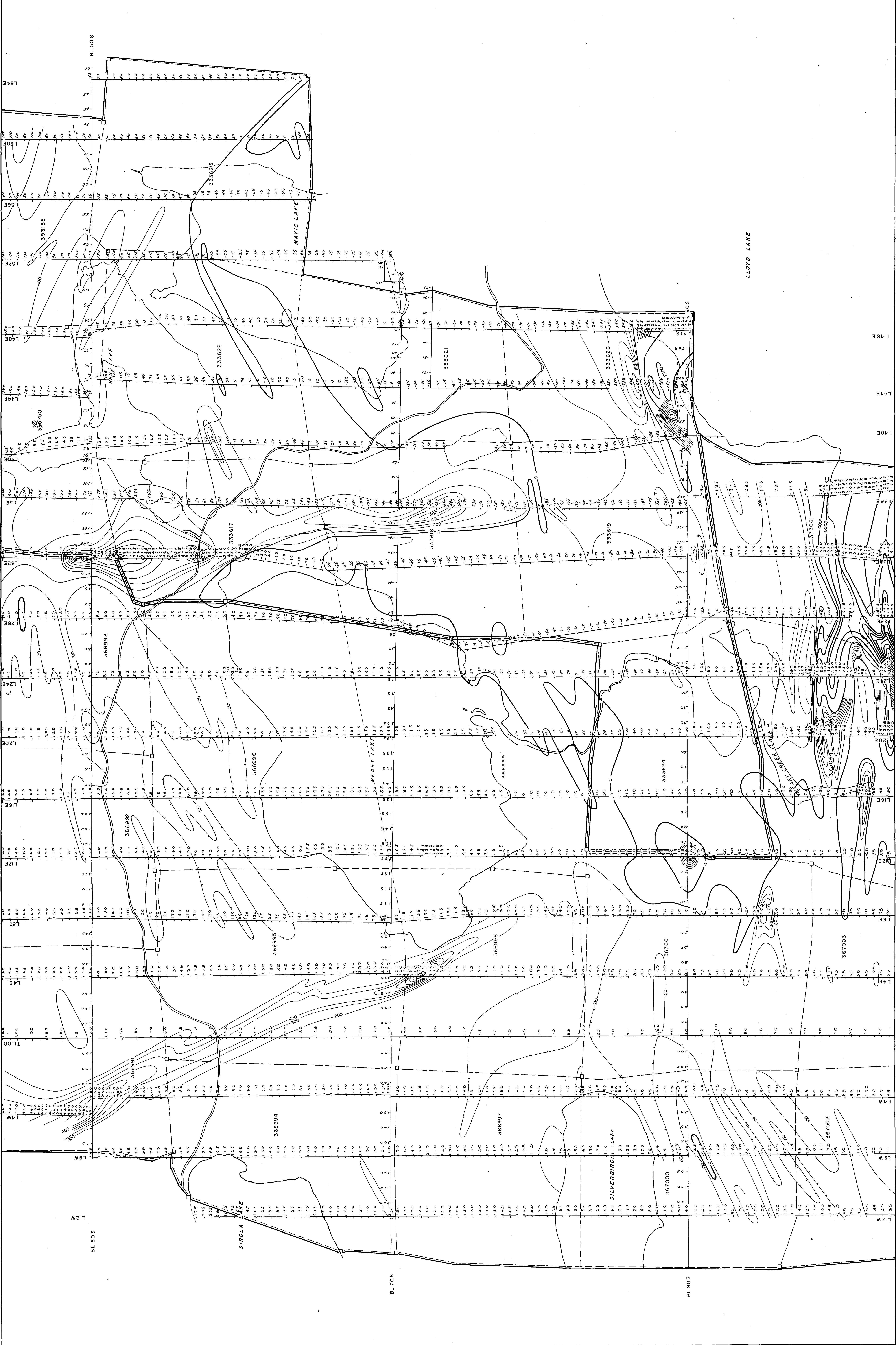
**SHEET INDEX**



**PROPERTY LOCATION MAP**







THE HANNA MINING COMPANY  
**MIDLOTHIAN PROJECT**  
 LARDER LAKE DIVISION  
 ONTARIO

**MAGNETOMETER MAP**

Scale: 1" = 200'  
 0 200 400  
 FEET

Work by: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Interpretation by: \_\_\_\_\_  
 Revised: \_\_\_\_\_  
 N.T.S. No. H-1-P-15

**SYMBOLS**

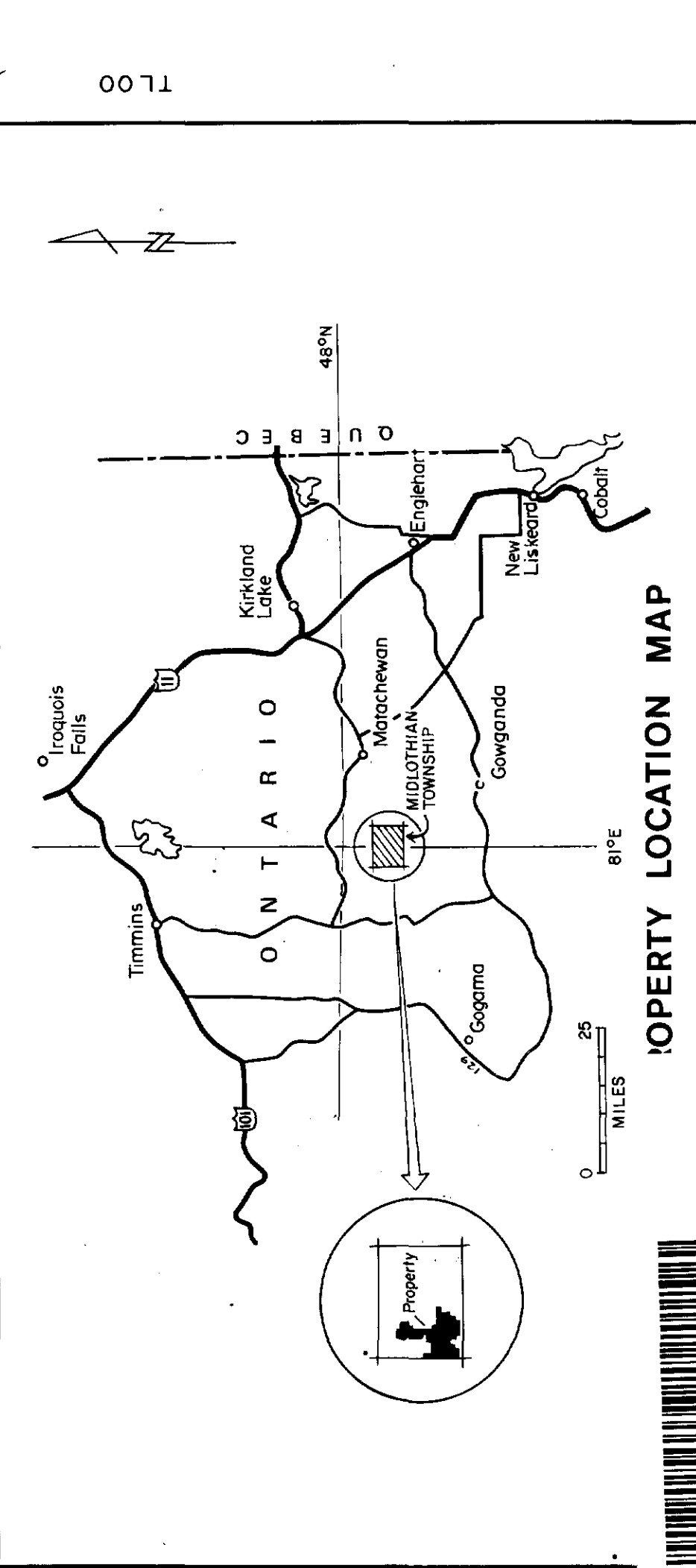
- HUNDRED GAMMA CONTOUR
- THOUSAND GAMMA CONTOUR
- CLOSED MAGNETIC LOW

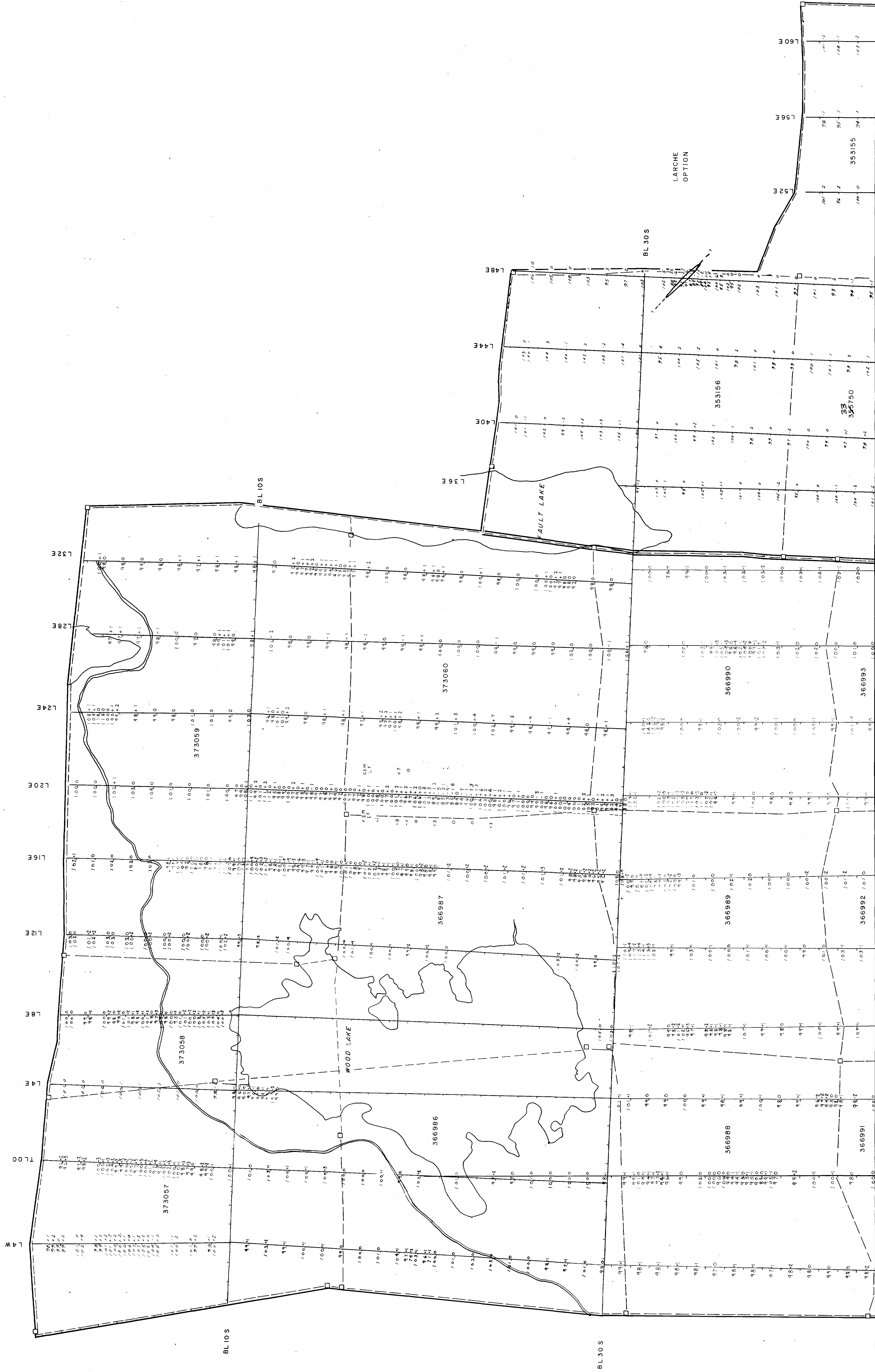
**LEGEND**

INSTRUMENT -  
 Scintrex MF 2 Fluxgate Magnetometer

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THE HANNA MINING COMPANY  
**MIDLOTHIAN PROJECT**  
 LARCHE LAKE MINING DIVISION  
 ONTARIO

**ELECTROMAGNETIC MAP**

SCALE 1" = 200'

Work by *John S. Steg* Interpretation by *John S. Steg*  
 Date *16-09-2013* Date

Revised  
 Revised  
 N.T.S. No. 81-1-15

**SYMBOLS**

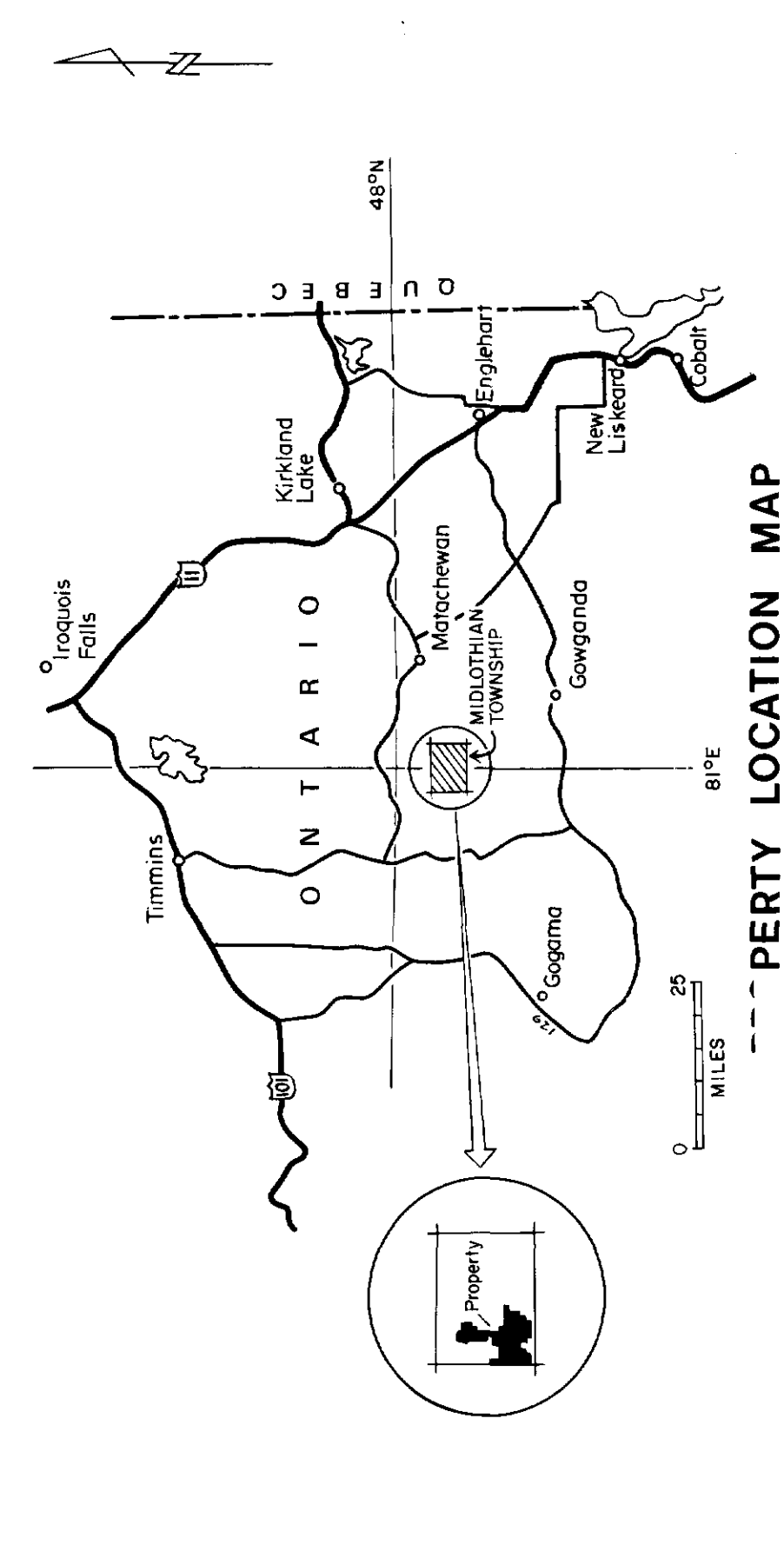
IN PHASE    OUT OF PHASE

High Frequency    100 0  
 Low Frequency    100 0  
 Only High Frequency taken    100 0

INSTRUMENT - ABEM GUN  
 High Frequency - 5550 cycles/second  
 Low Frequency - 880 cycles/second

**LEGEND**

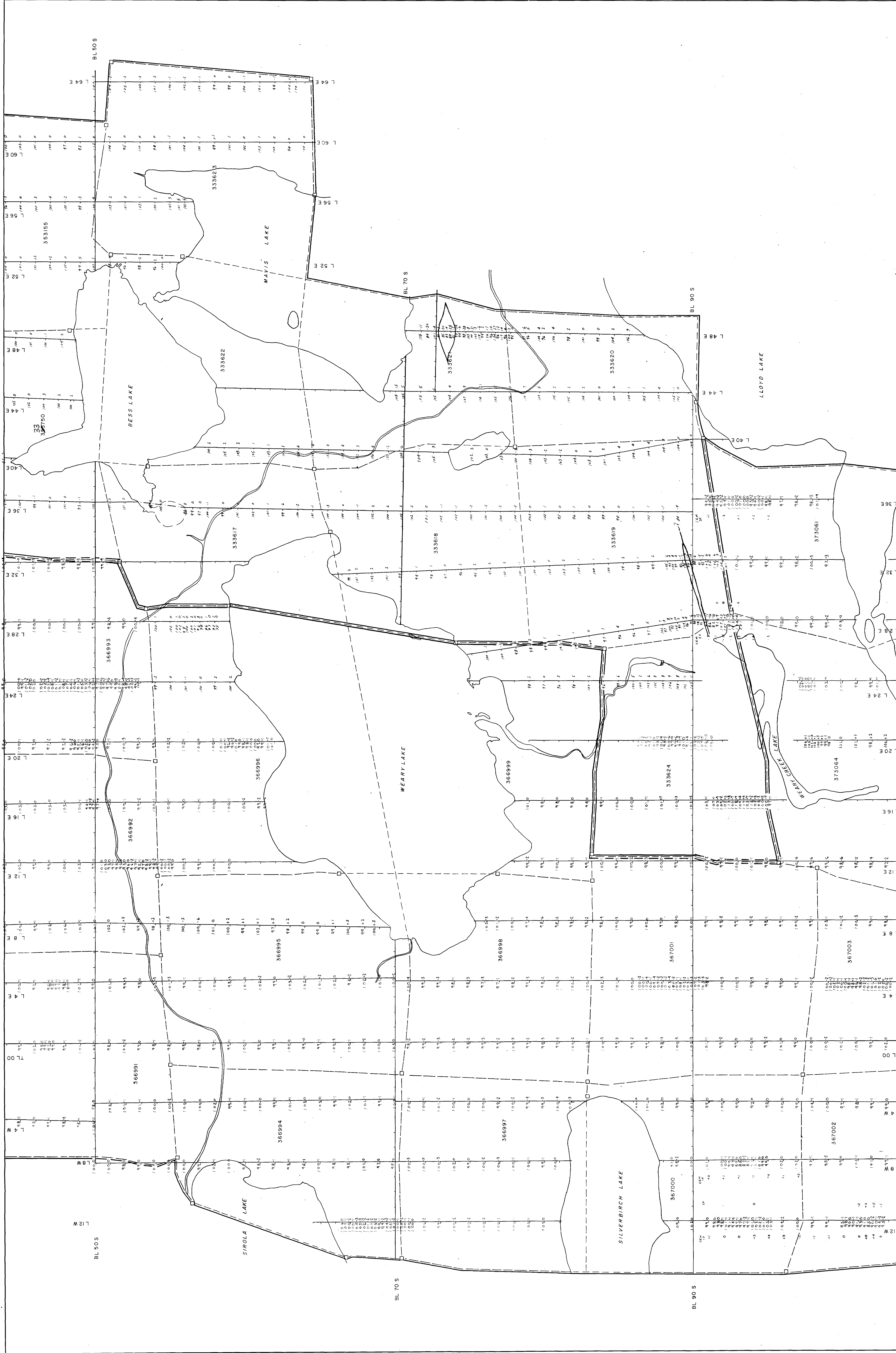
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	4
	6
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	8
	9



**SHEET INDEX**

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	9





**SYMBOLS**

IN PHASE    OUT OF PHASE

High Frequency    000    0

Low Frequency    100    0

Only High Frequency taken    100    0

**LEGEND**

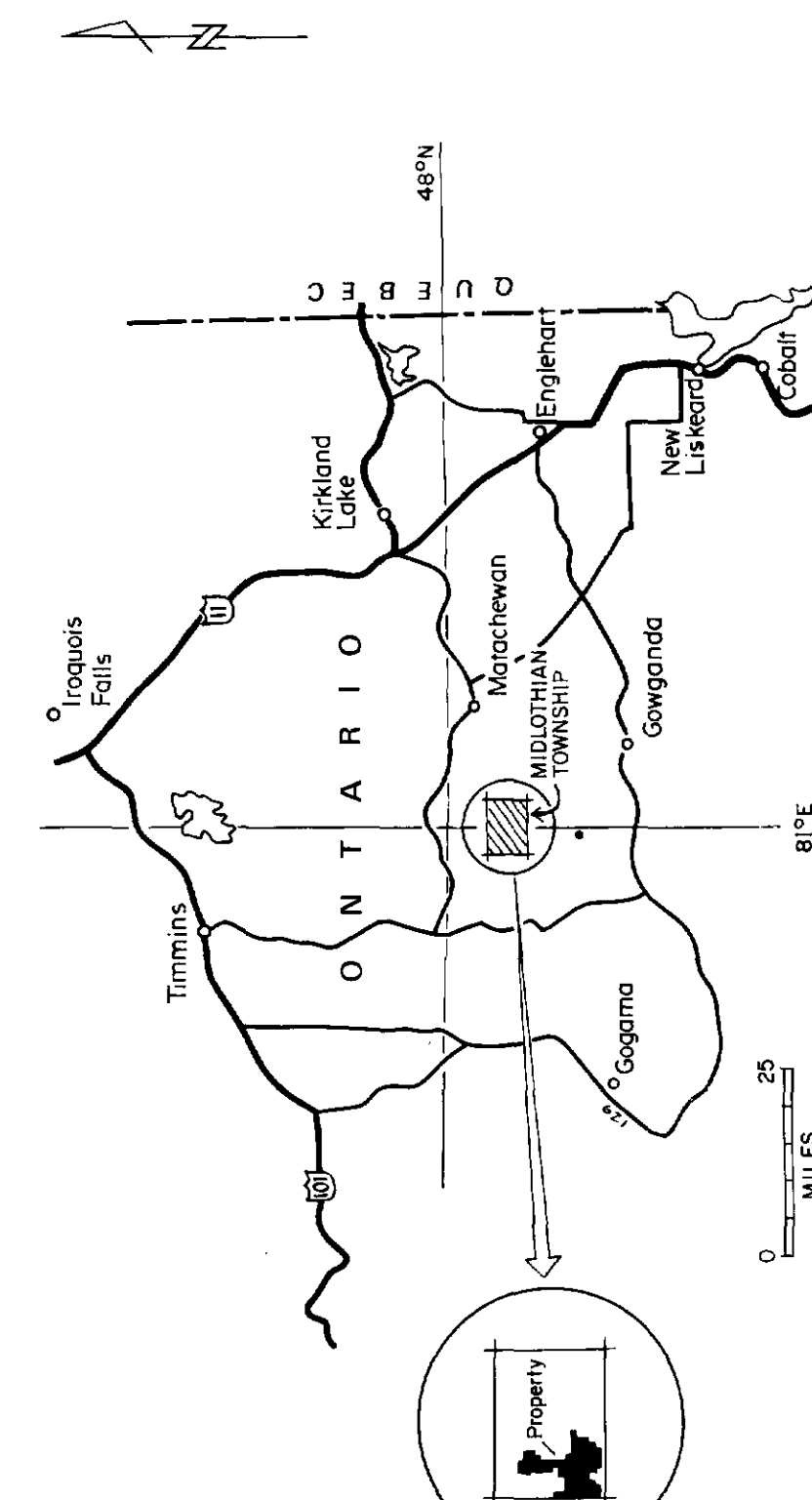
INSTRUMENT - ABEEM GUN

High Frequency - 3520 cycles/second

Low Frequency - 880 cycles/second

**SHEET INDEX**

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THE HANNA MINING COMPANY

**MIDLOTHIAN PROJECT**  
LARDER LAKE MINING DIVISION  
ONTARIO

**ELECTROMAGNETIC MAP**

SCALE 1" = 200'  
0 200 400 600  
Feet

Work by *John G. Smith*  
Date *Mar. 1973*

Interpretation by \_\_\_\_\_  
Date \_\_\_\_\_

Revised \_\_\_\_\_  
Revised \_\_\_\_\_  
N.E.S. No. 41-P-15

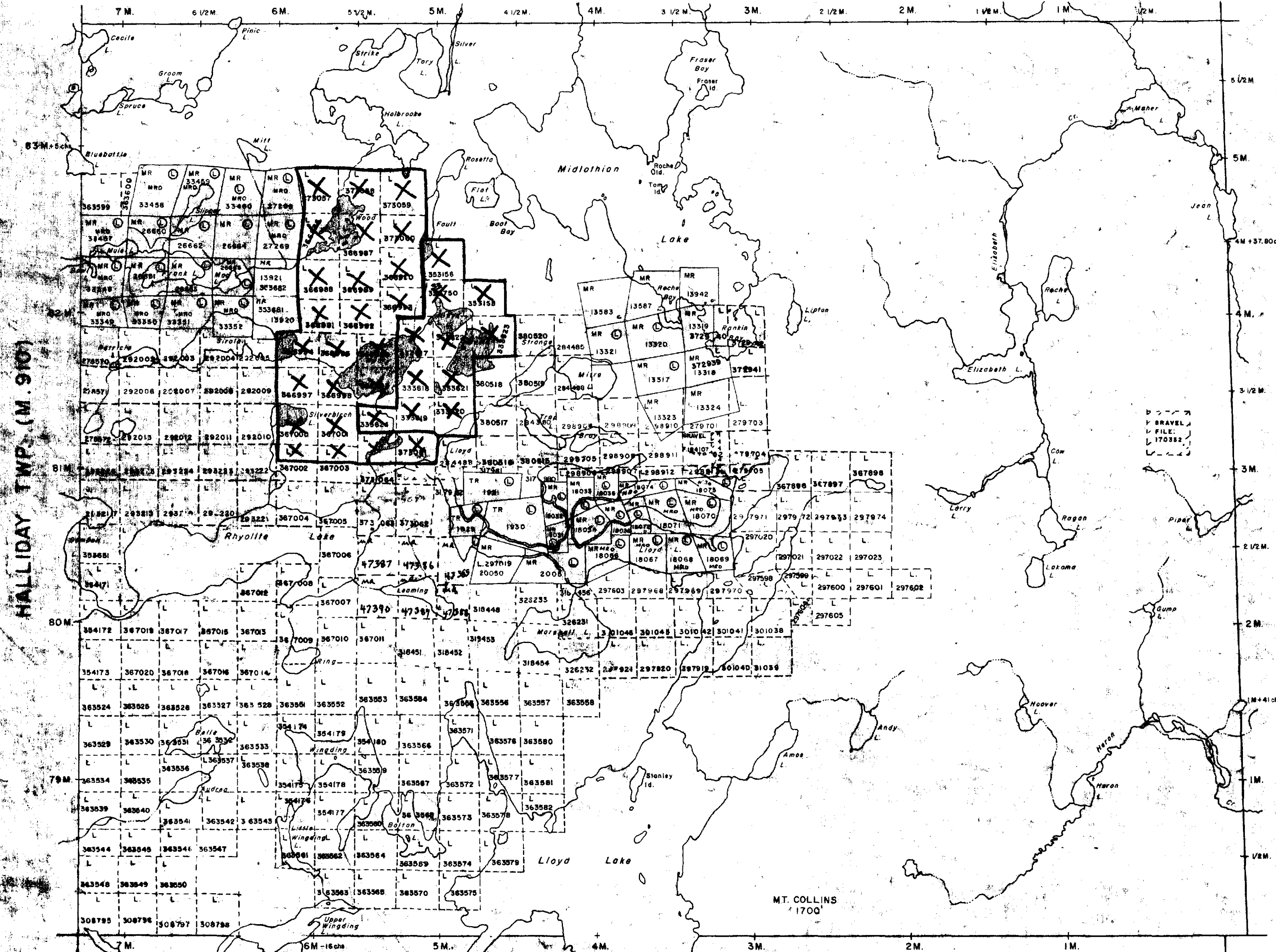








MONTROSE TWP. (M.237)



THE TOWNSHIP OF  
MIDLOTHIAN

DISTRICT OF  
TIMISKAMING

LARDER LAKE  
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 MUSKES
- MINES CANCELLED

NOTES

400' surface rights reservation around all lakes and rivers.

MINING LANDS  
DATE OF ISSUE  
DEC 27 1973  
MINISTRY  
OF NATURAL RESOURCES

PLAN NO. M.235

STABLO  
MINISTRY OF NATURAL RESOURCES  
SURVEYS AND MAPPING BRANCH

RAYMOND TWP. (M.244)



41P14NE026 2.1380 MIDLOTHIAN