GEOPHYSICAL VLF-EM SURVEY REPORT

ON THE

PERRON PROPERTY

CATHARINE TEN GROUP

CATHARINE TOWNSHIP

LARDER LAKE MINING DIVISION

DISTRICT OF TIMISKAMING, ONTARIO

FOR

ALEXANDER H. PERRON

MAY 20, 1986

MARY GREER
GEOPHYSICAL TECHNICIAN

ILLUSTRATIONS

Scale: 1 inch to 200 feet

Date: May 1986

Catharine Ten Group

Ground VLF-EM Survey

Map No. 86-10E-4

Map No. 86-10E-5

Map No. 86-10W-4

Map No. 86-10W-5

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GEOPHYSICAL VLF-EM SURVEY REPORT
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INTRODUCTION

The Catharine Ten Group was recorded on April 22, 1983.

A grid at a 400 foot line spacing was subsequently established by A.H. Perron in January 1984. During the period of March 1984, a magnetic survey was completed and a geological survey was completed in August 1984.

In April of 1986, two geophysical EM surveys were completed using two stations, Annapolis, Maryland and Cutler, Maine. This survey was performed to try and delineate any north-south, east-west EM conductors.

This work was conducted by Tom Obradovich of Kirkland Lake, Ontario.

All drafting was completed by Kate Calberry, and the interpretation was completed by Mary Greer.

The purpose of this report is to briefly describe the results attained in said surveys.

The results detected therefrom are shown on the accompanying plan maps

at a scale of one inch to 200 feet, that form an integral part of this report.

PROPERTY DESCRIPTION

The Catharine Ten Group consists of a contiguous block of ten (10), 40 acre, unpatented mining claims located in Catharine Township, Larder Lake Mining Division, District of Timiskaming, Ontario, and are further described as follows:

Claim No.	No. of Claims
L-760384 - L-760393 (inclusive)	10

Ownership of the aforementioned claims have been attested to by Alexander H. Perron of 103 Government Road east, Kirkland Lake, Ontario, and was not independently ascertained by the writer. (See Figure 1a).

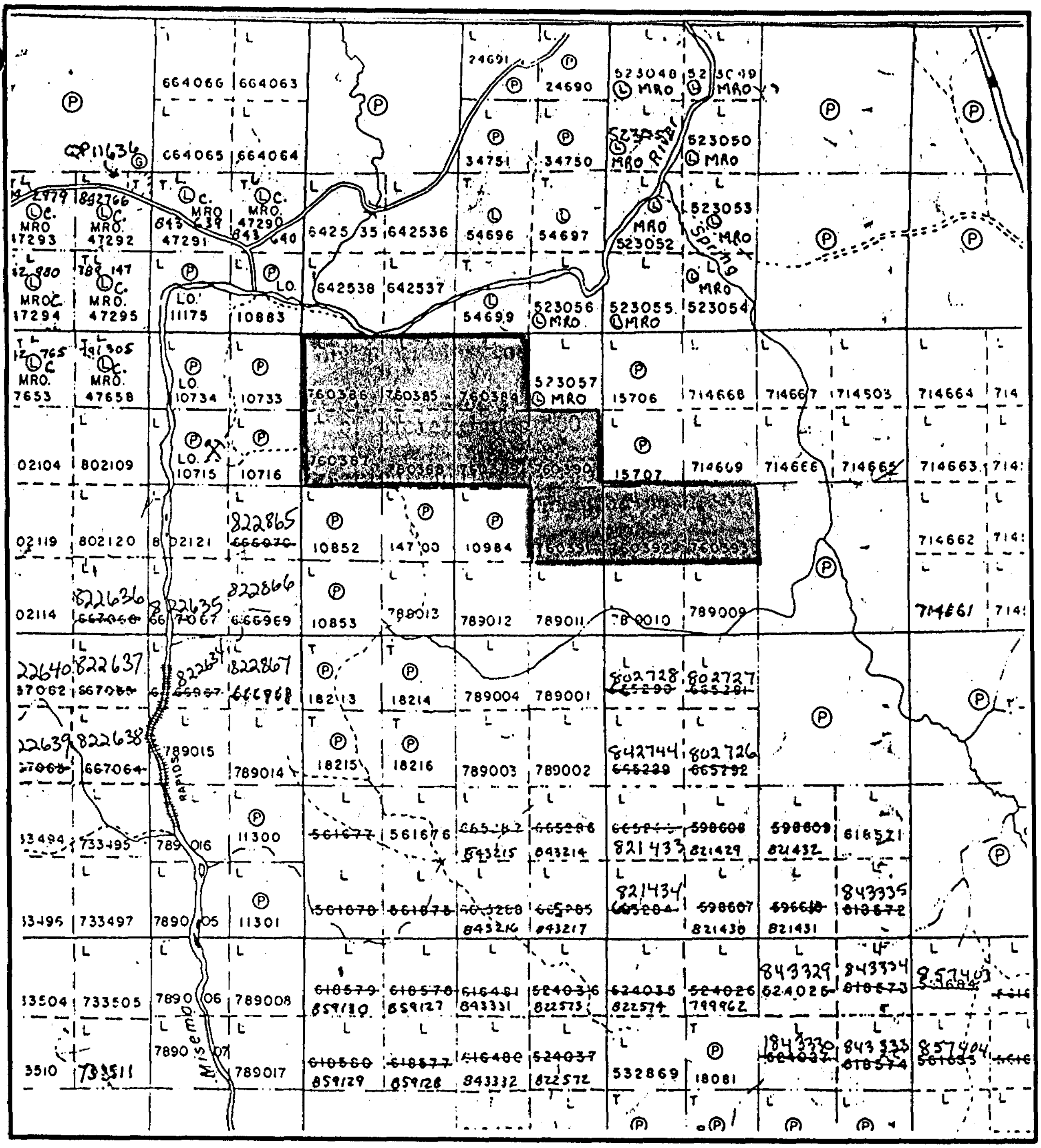
LOCATION AND ACCESS

The Catharine Ten Group encompasses Conc. V, Lots 6, 7 and 8, Catharine Township, approximately 12 miles southeast of the town of Kirkland Lake, Ontario.

This property is readily accessible via a secondary road that extends eastward approximately three miles from the village of Boston Creek to the Misema River which can be crossed by canoe. Boston Creek is located approximately 15 miles southeast of Kirkland Lake and may be reached via highway 112 and 564.

PREVIOUS WORK

In November 1980, a magnetic survey was carried out for Dome Exploration (Canada) Limited. The magnetic relief and trend was described. Some



Claim Location Map

Scale: 1 inch to 1/2 mile

Taken from a March 1986

Figure 1a

diamond drilling was also carried out on the property as well as a number of other geophysical surveys. (See Regional Assessment Files).

SURVEY PROCEDURE

A northwest baseline was established from the common post of claims L-760389 and L-760390.

A grid system of picket lines 400 feet apart with stations each 100 feet, was established at right angles to the baseline.

Readings were taken at every 100 foot station along the lines, the stations were read by two independent operators.

TOPOGRAPHY

The general terrain of this property varies from jack pine covered sand ridges to the southeast section of the property, to gently sloping poplar, birch and spruce spotted with small outcrops to the northwest section. The difference in elevation averages 75 feet. The Misema River flows west along the northern boundary.

GENERAL GEOLOGY

O.D.M. Geological Map, 2043, covering Catharine and Marter townships, at a scale of one inch to one-half mile, indicates that the bedrock is underlain

by Keewatin volcanics. This includes intermediate to acidic volcanics that are mainly pyroclastic. The local exposed outcrops are classified as a carbonatized fragmented andesite.

ECONOMIC GEOLOGY

Situated to the immediate northwest of the claim group, along the McElroy-Catharine township line, lies the Cathroy-Larder Mine property.

Cathroy-Larder Mines was incorporated in 1943 to succeed Yama Gold Mines. Yama Gold Mines produced 22,250 tons grading 0.14 oz. Au/ton between 1938 to 1942. A new gold zone was discovered by Cathroy-Larder about 1,000 feet south of the shaft. After considerable underground development, including surface and underground diamond drilling, ore reserves were calculated at 280,000 tons grading 0.20 oz. Au/ton.

Mirado Nickel optioned the property in 1960 conducting additional surface and underground drilling. In 1980 the property was optioned by Canamax (Amax) and further surface diamond drilling was performed as well as surface stripping over the south ore body.

The rocks within the mine area belong to the Skead-Group which are mainly dacites, andesites, rhyolite flows and pyroclastics. These rocks are cut by small dikes of syenite, lamprophyre and diorite.

The ore is stratabound within pyroclastic units. The shaft ore body is at or near the upper contact of the Skead pyroclastics. The south ore bodies are approximately 1,500 feet from the top of the Skead group.

The upper contact of the Skead group within the mine area strike about S 70° E and dip steeply north to vertical. The ore zones consist of many narrow quartz-calcite-sulphide and massive sulphide seams. The sulphides are pyrite, chalcopyrite and sphalerite, gold is found in fractures in the pyrite.

Presently the property has been optioned by Golden Shield Resources, who are presently involved with an underground exploration after dewatering the underground workings.

INSTRUMENTATION

1) Electromagnetic Survey:

The VLF-EM method uses as a source, one of the main submarine communications transmitters in the 15 to 25 kHz band found throughout the world. These submarine communication radio waves travel in a single mode parallel to the surface of the earth along the earth-air interface.

Without vertical conductors and travelling over flat ground, the magnetic field component of this radio or surface wave is horizontal and perpendicular to it's direction of travel.

VLF instruments are capable of picking up these structures that change the direction of the waves by measuring the tilt angle of the major axis of the polarization ellipse. This is illustrated by the tilt angle being zero on flat ground, but when a conductor is present the tilt angle will acquire a finite value. The direction of tilt indicates the direction of the conductor. Calculations of such parameters as depth, depth extent, dip and width of the conductor is very minimal.

The VLF easily illustrates the location of the upper limit of dipping structures which can be seen or plotted as VLF profiles as areas of greatest change in tilt angle per unit of distance.

The instrument used was a Geonics VLF-EM16 Unit. The sensitivity of this unit is $\pm$ 1% for the inphase and $\pm$ 1% for the quadrature. The operation frequency for the EM16 is from 15-25 kHz and the station selection is made by plug-in units.

For the purpose of this survey two stations were used, Cutler, Maine, which has a frequency of 24.0 kHz and Annapolis Maryland, frequency 21.4 kHz.

Only the dip or inphase was read and all readings were taken perpendicular to the station and the topography was noted for further use in the interpretation of the EM results.

PRESENTATION AND DISCUSSION OF RESULTS

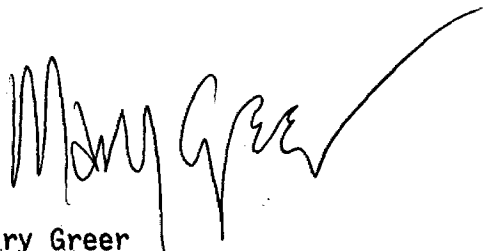
The field data is presented on four map sheets, at a horizontal scale of one inch to 200 feet, Map No. 86-10E-5 and 86-10W-5 (Annapolis), 86-10E-4 and 86-10W-4 (Cutler), found in the back pockets of this report.

Some EM responses were noted, scattered throughout the property. Some responses appear to be station noise and overburden interference.

CONCLUSIONS AND RECOMMENDATIONS

All surveys performed should be properly examined with other work performed by Perrons on other claims in the area. From this assessment, a work program should be outlined.

Respectfully submitted,



May 20, 1986

Mary Greer
Geophysical Technician

BIBLIOGRAPHY

James A. Grant

1963: Geological Report No. 18, Catharine and Marter Townships: Ontario Department of Mines

C E R T I F I C A T E

I, Mary Greer, of Kirkland Lake, Ontario, do hereby certify:

1) That I am a Geophysical Technician and reside at:
49 McKelvie Avenue, Kirkland Lake, Ontario, P2N 2K6

2) That I graduated from Sir Sandford Fleming College at Lindsay, Ontario, in 1978, with a diploma as a Geological Technician.

3) That I have been continuously engaged in my profession for the past six (6) years and I am qualified to write this report.

4) That I did not participate in this survey.

May 20 1986
Date

Mary Greer
Mary Greer
Geophysical Technician

Ontario

32D04SW0400 2.9136 CATHARINE

900

File

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.

Type of Survey(s) GEOPHYSICAL EM SURVEY - NAA NSS

Township or Area CATHARINE

Claim Holder(s) PERRONS
103 GOV'T RD. E., KIRKLAND LAKE, ONT P2N 1A9

Survey Company PERRONS

Author of Report MARY GREER

Address of Author SAME AS ABOVE

Covering Dates of Survey APRIL 6/86 - APRIL 19/86
(linecutting to office)

Total Miles of Line Cut APPROXIMATELY 11 MILES

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: May 20/86 SIGNATURE: Mary Greer
Author of Report or Agent

Res. Geol. _____ Qualifications 2.4529

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L-	760384
L-	760385
L-	760386
L-	760387
L-	760388
L-	760389
L-	760390
L-	760391
L-	760392
L-	760393

If space insufficient, attach list

TOTAL CLAIMS 10

OFFICE USE ONLY

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 437 Number of Readings 437 NAA / 437 NSS

Station interval 100 FEET Line spacing 400 FEET

Profile scale 1 INCH = ± 20°

Contour interval

MAGNETIC

Instrument

Accuracy – Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument GEONICS VLF-EM16

Coil configuration VERTICAL AND HORIZONTAL

Coil separation INFINITY

Accuracy ± 1%

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

Frequency ANNAPOLIS, MARYLAND 21.4 KHz AND CUTLER, MAINE 24.0 KHz
(specify V.L.F. station)

Parameters measured INPHASE OR DIP

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

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____

(specify for each type of survey)

Accuracy _____

(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken _____

Total Number of Samples _____

Type of Sample _____
(Nature of Material)

Average Sample Weight _____

Method of Collection _____

Soil Horizon Sampled _____

Horizon Development _____

Sample Depth _____

Terrain _____

Drainage Development _____

Estimated Range of Overburden Thickness _____

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis _____

General _____

ANALYTICAL METHODS

Values expressed in: per cent ☐
p. p. m. ☐
p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others _____

Field Analysis (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Field Laboratory Analysis

No. (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Commercial Laboratory (_____ tests)

Name of Laboratory _____

Extraction Method _____

Analytical Method _____

Reagents Used _____

General _____

Ontario Ministry of Natural Resources

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

159/86

Mining Act 2.9136

Note: – If number of mining claims traversed exceeds space on this form attach list.
– Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s): GEOPHYSICAL SURVEY - ELECTROMAGNETIC

Township or Area: CATHARINE

Claim Holder(s): ALEX H. PERRON,

Prospector's Licence No.: K-19026

Address: 103 GOVERNMENT ROAD EAST, KIRKLAND LAKE, ONTARIO P2N IA9

Survey Company: PERRONS

Date of Survey (from & to): 06 04 86 (Day Mo. Yr.) 19 04 86 (Day Mo. Yr.)

Total Miles of line Cut: APPROX. 11 MILES

Name and Address of Author (of Geo-Technical report): MARY GREER, 103 GOVERNMENT ROAD EAST, KIRKLAND LAKE, ONTARIO P2N IA9

Credits Requested per Each Claim in Columns at right

		Days per Claim
Special Provisions: For first survey: Enter 40 days. (This includes line cutting) For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Electromagnetic	40
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Man Days: Complete reverse side and enter total(s) here	Geophysical	Days per Claim
	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Airborne Credits: Note: Special provisions credits do not apply to Airborne Surveys.		Days per Claim
	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	760384	
	760385	
	760386	
	760387	
	760388	
	760389	
	760390	
	760391	
	760392	
	760393	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

LARDER LAKE MINING DIVISION
RECEIVED
APR 21 1986

RECEIVED
APR 28 1986
MINING LANDS SECTION

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits
Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Total number of mining claims covered by this report of work: 10

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
400	APR 21 1986	
	Date Approved as Recorded 86.5.28	Recorder/Director

Date: APRIL 21, 1986

Recorded Holder or Agent (Signature): Mary Greer

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: MARY GREER, 49 MCKELVIE AVENUE, KIRKLAND LAKE, ONTARIO P2N 2K6

Date Certified: APRIL 21, 1986

Certified by (Signature): Mary Greer

1362 (81/9)

PERRONS

103 GOVERNMENT ROAD EAST - KIRKLAND LAKE, ONTARIO - P2N 1A9 - (705) 567-7057

May 20, 1986

Mr. Arthur Barr,
Lands Administration Branch,
Mining Lands Section,
Ministry of Natural Resources,
Room 6450, Whitney Block,
Queen's Park,
Toronto, Ontario
M7A IW3

Dear Mr. Barr:

RE: Geophysical VLF-EM Survey Report
Catharine Township
Larder Lake Mining Division

Enclosed herewith please find a duplicate copy of the following:

- Report dated May 20, 1986, by Mary Greer entitled:

  Geophysical VLF-EM Survey Report on the
  Perron Property
  Catharine 10 Group
  Catharine Township
  Larder Lake Mining Division
  District of Timiskaming, Ontario

I trust this is the information required to correspond with the Report of Work filed concerning the above noted township.

Yours truly,

PERRONS

Mary Greer

Mary Greer
Geophysical Technician
MG/p
Encls.

Mining Lands Section

File No 2.9136

Control Sheet

TYPE OF SURVEY ✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

A. Hurst

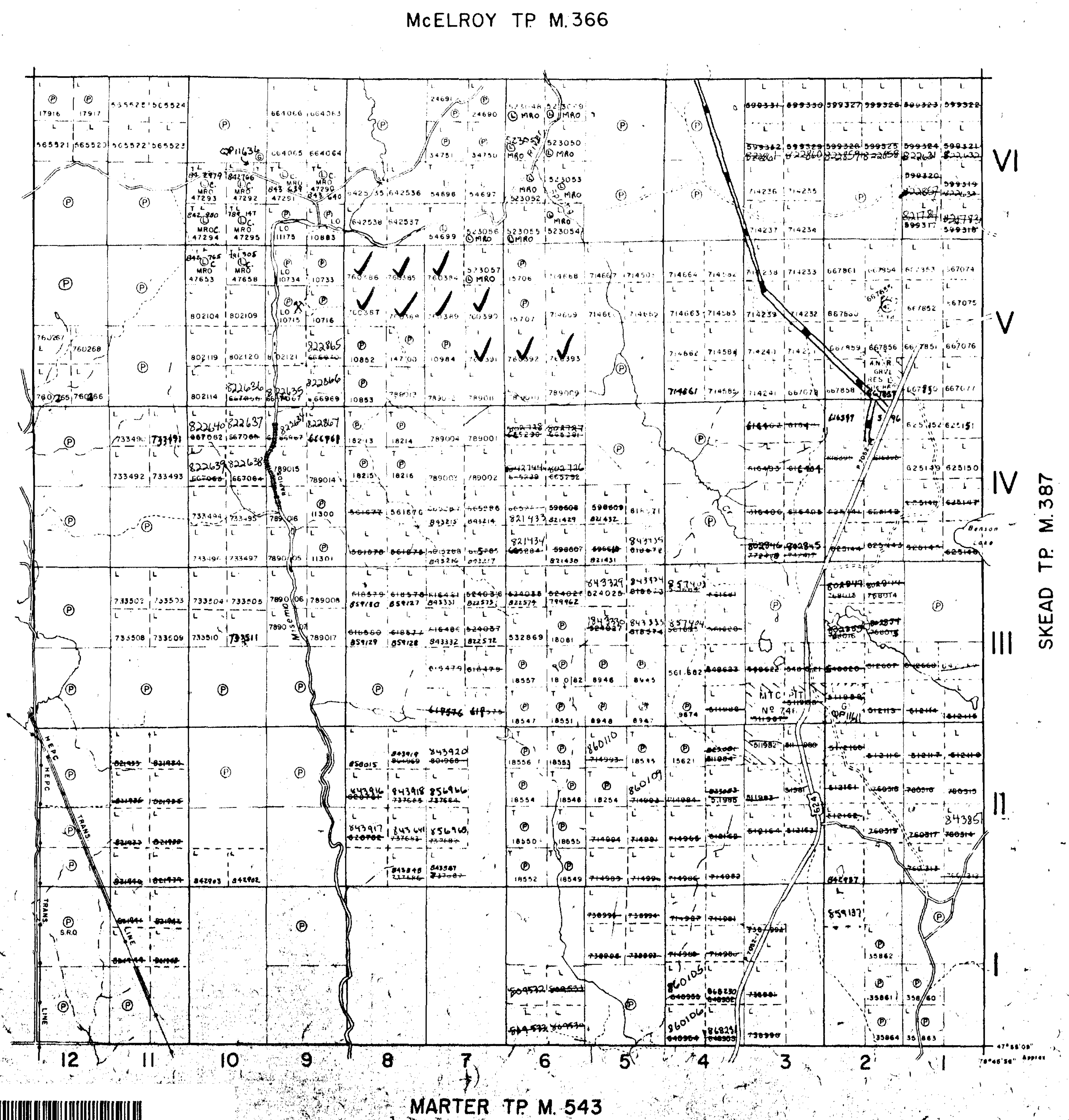
Signature of Assessor

May 27/86

Date

2.9136

760384	✓											
85	✓											
86	✓											
87	✓											
88	✓											
89	✓											
90	✓											
91	✓											
92	✓											
93	✓											



32D04SW0400 2.9136 CATHARINE

200

NOTES

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

		File	Date	Disposition
(43)	W 54/74	26940	10/10/74	S.R.O.

LEGEND

PATENTED LAND	Ⓟ or ●*
PATENTED FOR SURFACE RIGHTS ONLY	◓*
LEASE	Ⓛ
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	(17)
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒
QUARRY PERMIT	Ⓠ

*used only with summer resort locations or when space is limited

TOWNSHIP OF

CATHARINE

DISTRICT OF

TIMISKAMING MAY 23 1986

LARDER LAKE

MINING DIVISION

SCALE : 1 INCH - 40 CHAINS (1/2 MILE)

DR. K.K.I.	PLAN NO.	M. 336#7
DATE JUNE '72		

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

CATHARINE

CON. VI

Misema River

L 760386

L 760385

L 760384

L 760387

L 760388

L 760389

L 40+00 W

L 32+00 W

L 24+00 W

L 16+00 W

L 8+00 W

CON. V

LOT 9

LOT 8

LOT 7

210

Mag. 10° W

N

SYMBOLS

In-Phase

Claim Post

Claim Line

INSTRUMENTATION

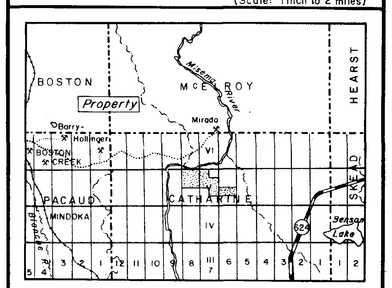
Geonics EM-16

NSS Annapolis, Maryland 21.4 kHz

Vertical Scale: 1 inch to = 20°

KEY MAP

(Scale: 1 inch to 2 miles)



CATHARINE TEN GROUP

GROUND VLF-EM SURVEY - WEST HALF

CATHARINE TOWNSHIP
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING, ONTARIO

200 0 200 400 600

Scale: 1 inch to 200 feet

PERRONS' 83 LTD.
KIRKLAND LAKE CANADA

Drawn by: K. Calberry	Map No. 86-10 W-2	Date: May 1986

2.9136

CATHARINE

CON. VI

Misema River

L 760386

L 760385

L 760384

L 760387

L 760388

L 760389

L 40+00 W

L 32+00 W

L 24+00 W

L 16+00 W

L 8+00 W

CON. V

LOT 9

LOT 8

LOT 7

Mag. 10° W

N

SYMBOLS

In-Phase

Claim Post

Claim Line

INSTRUMENTATION

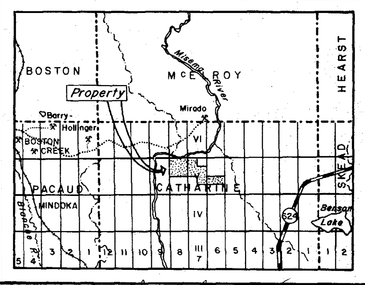
Geonics EM-16

NAA Cutler, Maine 24.0 kHz

Vertical Scale: 1 inch to ± 20°

KEY MAP

(Scale: 1 inch to 2 miles)



CATHARINE TEN GROUP

GROUND VLF-EM SURVEY - WEST HALF

CATHARINE TOWNSHIP
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING, ONTARIO

200 0 200 400 600

Scale: 1 inch to 200 feet

PERRONS' 83 LTD.
KIRKLAND LAKE CANADA

Drawn by: K. Colberry | Map No. 86-10 W-4 | Date: May 1986

2.9136

220

CATHARINE

CON. VI

CON. V

LOT 7

LOT 6

LOT 5

L 0+00

TL 8+00 E

TL 16+00 E

TL 24+00 E

TL 32+00 E

TL 6+00 N

TL 14+00 N

L 760390

L 760391

L 760392

L 760393

Mag. 10° W

N

SYMBOLS

In-Phase

Claim Post

Claim Line

INSTRUMENTATION

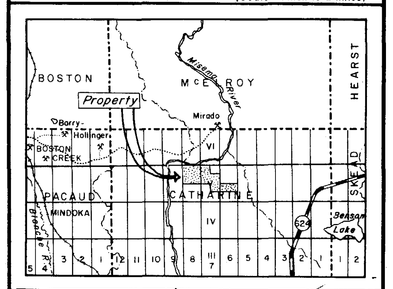
Geonics EM-16

NAA Cutler, Maine 24.0 kHz

Vertical Scale: 1 inch to ± 20°

KEY MAP

(Scale: 1 inch to 2 miles)



CATHARINE TEN GROUP

GROUND VLF-EM SURVEY- EAST HALF

CATHARINE TOWNSHIP
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING, ONTARIO

200 0 200 400 600

Scale: 1 inch to 200 feet

PERRONS' 83 LTD.
KIRKLAND LAKE CANADA

Drawn by: K. Calberry	Map No.: 86-10 E-4	Date: May 1986

2.9136

CATHARINE

CON. VI

CON. V

L 0+00

L 760390

L 760391

L 760392

L 760393

TL 8+00 E

TL 16+00E

TL 24+00 E

TL 32+00E

TL 6+00 N

TL 14+00 N

LOT 7

LOT 6

LOT 5

Mag. 10° W

N

SYMBOLS

In-Phase

Claim Post ■

Claim Line — — —

INSTRUMENTATION

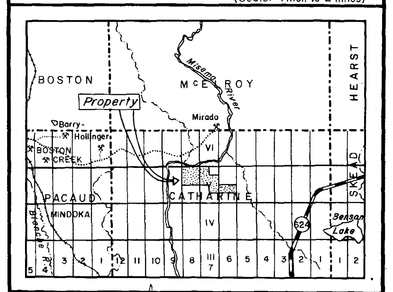
Geonics EM-16

NSS Annapolis, Maryland 21.4 kHz

Vertical Scale: 1 inch to ± 20°

KEY MAP

(Scale: 1 inch to 2 miles)



CATHARINE TEN GROUP

GROUND VLF-EM SURVEY- EAST HALF

CATHARINE TOWNSHIP
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING, ONTARIO

200 0 200 400 600

Scale: 1 inch to 200 feet

PERRONS' 83 LTD.
KIRKLAND LAKE CANADA

Drawn by: K. Calberry	Map No.: 86-10 E-5	Date: May 1986

2.9136

240