# GEOPHYSICAL REPORT
on the
Magnetic and Electromagnetic Surveys
on the Aitken/Wilhelmina Property
of
GOLDEN DRAGON RESOURCES LTD.
and
CROSS LAKE MINERALS LTD.
Joint Venture
Aitken, Wilhelmina Townships
District of Cochrane
Porcupine Mining Division, Ontario
by
Richard Lachapelle, B.Sc.Ing.Jr.
June, 1989

Qual 2.11658

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ABSTRACT

From April 2 to April 8, 1989, a program of linecutting and geophysical surveying was performed on the Aitken/Wilhelmina Property of Golden Dragon Resources Ltd. and Cross Lake Minerals Ltd. of Toronto, Ontario.

The geophysical surveys delineated several interesting conductors associated with magnetic signatures interpreted to possibly represent stratabound sulphide horizons within ultramafic volcanic rocks. Possibility exists for a massive sulphide deposit. Therefore, a thorough diamond drilling program is proposed and is intended to verify the nature, extent and alteration of the conductors.

## INTRODUCTION

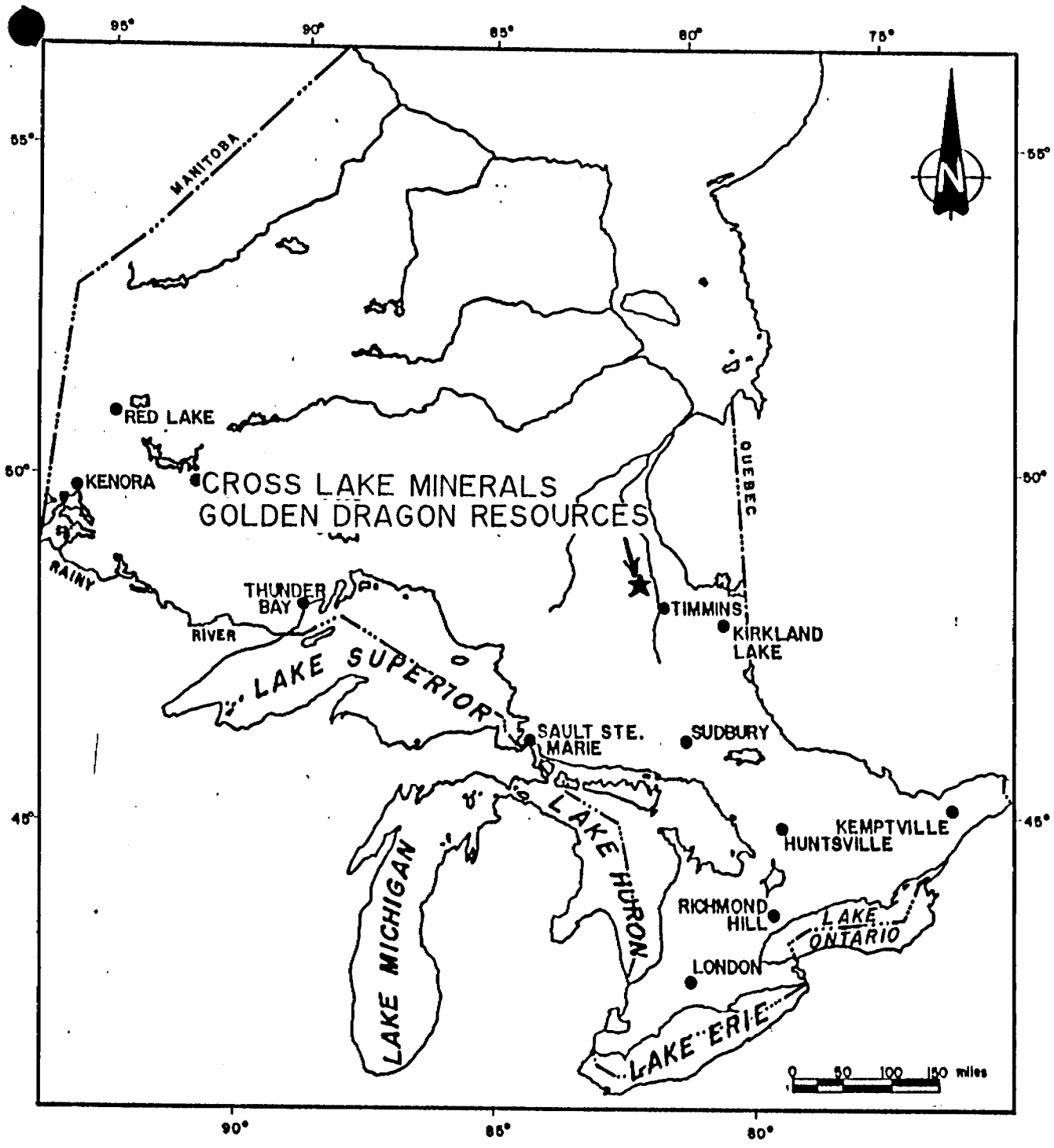
From April 2 to April 8, 1989, a program of linecutting and geophysical surveying was performed on the Aitken/Wilhelmina Property of Golden Dragon Resources Ltd. and Cross Lake Minerals Ltd. of Toronto, Ontario.

The geophysical surveying and linecutting was conducted by Robert S. Middleton Exploration Services Inc. of Timmins, Ontario. The geophysical surveying consisted of total field magnetic and horizontal loop electromagnetic surveys. The surveys were conducted as a follow-up and complimentary to airborne geophysical surveys performed by the Ontario Government (1988), which delineated structures and conductors that warranted further work.

## LOCATION AND ACCESS

The Aitken/Wilhelmina property is located on the border of Aitken and Wilhelmina Townships (Figures 1 and 2), approximately 30 km northwest of Timmins, Ontario.

The property is accessed by Highway 576 north and the Kamiskotia-Smoothrock Falls road north to northeast Wilhelmina Township then taking a logging access road approximately 9 km southwest into the property.




PROVINCE OF ONTARIO

| REVISIONS | ROBERT S. MIDDLETON EXPLORATION SERVICES INC. | | |
|---|---|---|---|
| | for CROSS LAKE MIN. / GOLDEN DRAGON | | |
| | Title PROPERTY LOCATION- REGIONAL | | |
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| | Date: June 89 | Scale: 1"=160 mi. | N.T.S.: |
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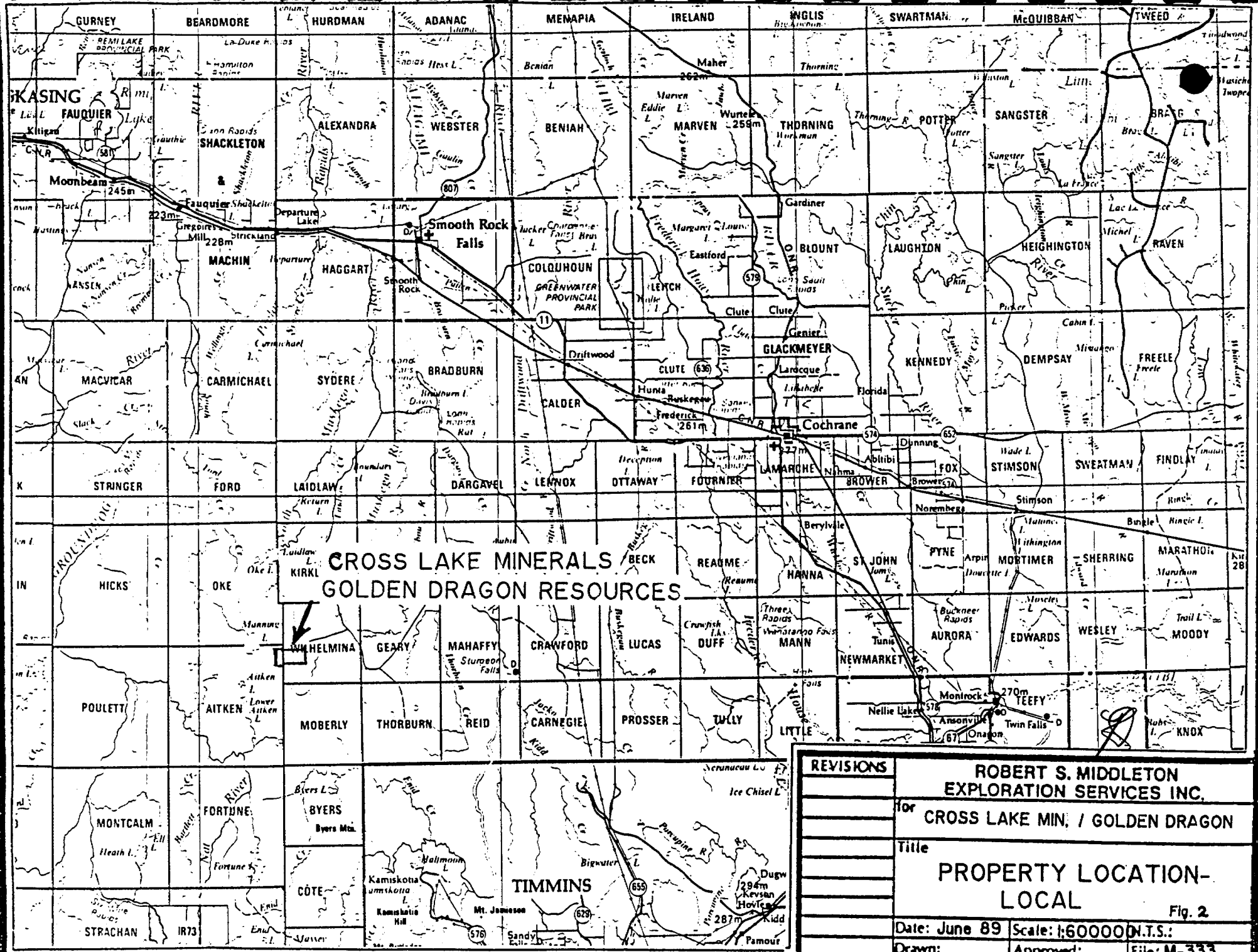


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|---|---|---|---|
| | for CROSS LAKE MIN. / GOLDEN DRAGON | | |
| | Title: PROPERTY LOCATION- LOCAL Fig. 2 | | |
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CLAIM GROUP

The property consists of 35 un-patented contiguous mining claims in Aitken and Wilhelmina Townships, Porcupine Mining Division, Ontario. The recorded holder of these claims is Golden Dragon Resources Ltd. The claims on which work was conducted are listed as follows:

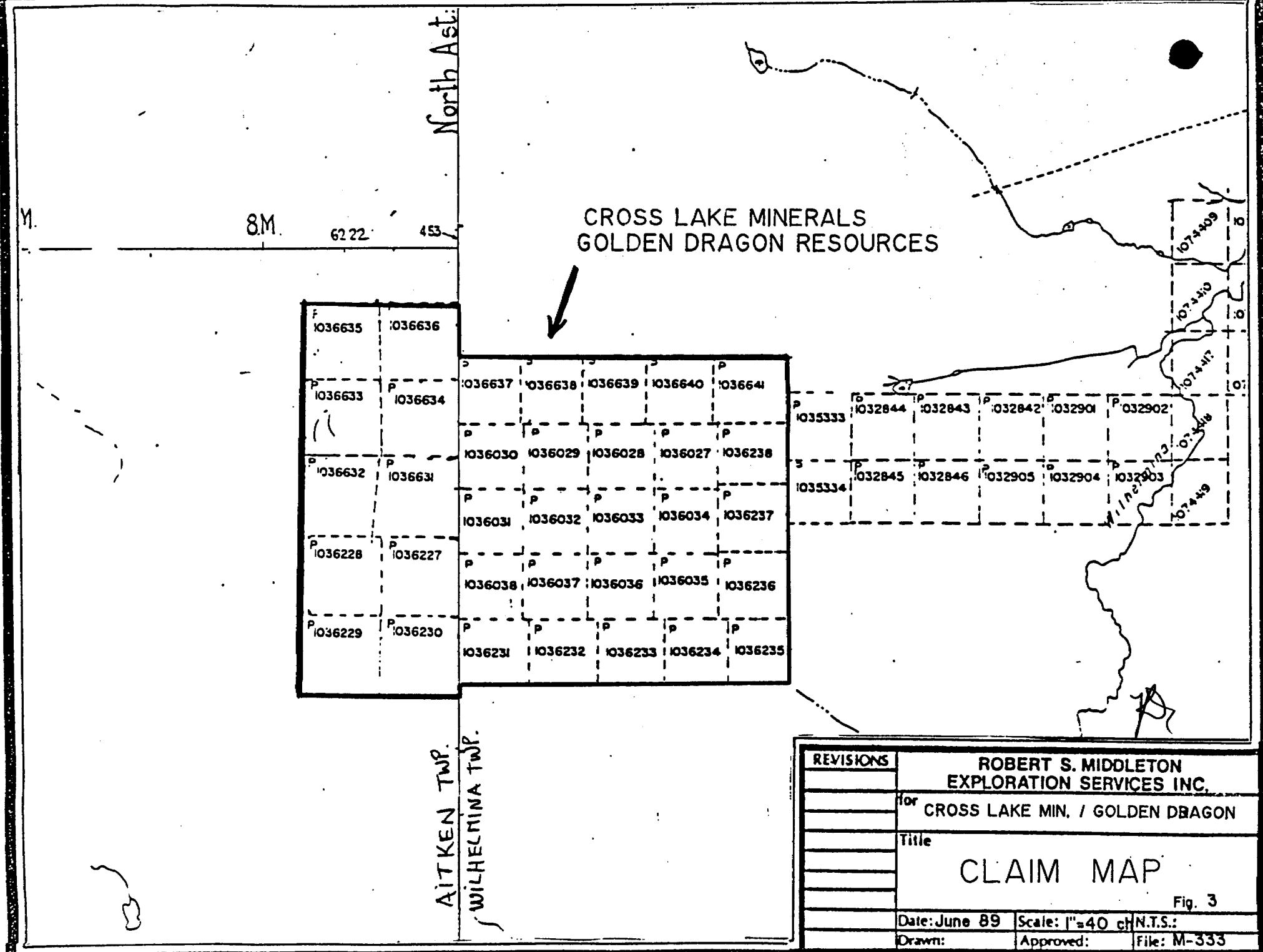
| Claim | No. | Township | Recording Date |
|---|---|---|---|
| 1036027-38 incl. | 12 | Wilhelmina | April 20, 1988 |
| 1036231-38 incl. | 8 | Wilhelmina | May 30, 1988 |
| Total | 20 claims | | |

See Figure 3 for an illustration of the claims.

REGIONAL GEOLOGY

The following is quoted from the Engineer's Report on the property by R.P. Bowen (1988):

> "The geology of the surrounding region of the Golden Dragon claims is a series of ultramafic and mafic metavolcanics and lesser interflow metasedimentary rocks of Archean age. These rocks have been intruded by mafic and possibly ultramafic sills, dikes and plugs. These supracrustal rocks have been enveloped by later felsic magma of the Kapuskasing Batholith. All rock units have in turn been intruded by north trending diabase dikes. Numerous massive sulfide base metal showings have been discovered over the years and some have become mines.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AITKEN TWP.
WILHELMINA TWP.
REVISIONS
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.
for CROSS LAKE MIN. / GOLDEN DRAGON
Title
CLAIM MAP
Fig. 3
Date: June 89
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The most notable being the Kidd Creek Mine of Falconbridge Limited. Others of a lesser stature are the Kam-Kotia, Canadian Jamieson, Jameland, United Obalski and Alexo.

The region under study lies west of the Mattagami River Fault. Due to the fact that the number of diabase dikes increases markedly west of the Mattagami River Fault and the fact that the supracrustals feather out and terminate west of study area indicates in the opinion of the author that this area has been uplifted in respect to the area east of the Mattagami River Fault. This would also lead one to believe that the study area would have a higher potential for base metal discovery. The possibility of tracing the Loveland Ni-Cu float, Middleton (1974) to a bedrock source should be considered. This Ni-Cu float is 13 miles south-southeast from the Golden Dragon property. The source of this float has been a mystery for many years and the source of it should be considered as a possibility in any exploration program where base metal possibilities exist.

The aeromagnetic map (ODM/GSC 1964) shows the general magnetic trends and configuration for the Golden Dragon area. The recently released electromagnetic and total field magnetic map, OGS (1988) shows the trends of conductors as well as the magnetic pattern. These maps

have been used in conjunction with diamond drill data and other government maps to interpret the property geology."

PROPERTY GEOLOGY

The following is quoted from the Engineer's Report on the property by R.P. Bowen (1988):

"The geology underlying the Golden Dragon property is a series of ultramafic to mafic metavolcanics and associated synvolcanic sills and dikes. Some interflow sedimentary units have been indicated in diamond drilling. Later gabbroic and possibly ultramafic units have intruded the volcanic and sedimentary units and all have been enveloped by felsic batholithic material of the Kapuskasing Batholith. All rock units have been intruded by Middle to Late Archean diabase dikes. The conductors shown the airborne survey are interpreted to be massive sulfide horizons as they are 11 to 12 channel responses and they are associated with magnetic highs which are most likely to indicate massive sulfide targets.

Being that the conductors have been found to be associated with ultramafic rocks from diamond drilling and that one assay of 0.34% copper was returned it would be reasonable to search for a copper-nickel deposit. That is the reason for keying in on the Loveland Cu-Ni float as possibly coming from this area.

Several north trending faults pass through or near to the property. Regional foliation is subparallel to the geological strike. Movement along the north trending faults may have caused shearing between the more competent (iron formations) and less competent (ultramafics) rocks thereby providing zones of permeability through which hydrothermal solutions may have percolated. Under the right conditions sulfide mineralization accompanied by precious metals could have been precipitated."

PREVIOUS WORK

The following is quoted from the Engineer's Report on the property by R.P. Bowen (1988):

"Government surveys have not covered Aitken or Wilhelmina Townships in detail. The OGS/GSC airborne magnetic surveys conducted over most of Canada in the 1960's and published at a scale of 1 inch to 1 mile, OGS/GSC (1964), formed the basis of the large scale geological compilation series that included those townships and published as Map 2205, Pyke et al (1964). Wilhelmina Townships was included in the Airborne Electromagnetic and Total Intensity Survey released this year by the Ontario Government, OGS (1988).

Leitch Gold Mines Ltd.

The only work done over any of the present claim group was done by Leitch Gold Mines Ltd. in 1965. This work was done over part of a 20 claim group in Wilhelmina Township and consisted of one diamond drill hole.

The hole intersected talc chlorite schists, (ultramafics) and tuffaceous metasedimentary rocks. There was a 6 inch intersection of massive sulfides that assayed 0.34% copper in the talc-chlorite schists where considerable calcite veining was present.

The tuffaceous metasedimentary units were reported to contain 3% and up to 15 to 20% pyrite and pyrrhotite with trace of gold and silver. A green tuff and strong sericite alteration were also reported.

Other work in the immediate area, but, not on the Golden Dragon property has been done by several different companies. Area Mines Ltd. in 1965 about 1 mile west of the Golden Dragon property southwest of Manning Lake drilled two holes and intersected gabbro and ultramafic units in the form of talc-chlorite schists and chlorite-biotite schists with pyrite and pyrrhotite and some lean iron formation. Chiblow Mines conducted geophysical surveys over a property around Manning Lake. Most of the north trending magnetic highs were interpreted to be diabase dikes while th east-west magnetic highs were

interpreted to be ultramafic units. Several minor conductors were delineated and 5 short diamond drill holes were drilled. The overburden was deep, 182 to 286 feet and the bedrock was intermediate to mafic volcanics and gabbro. Jayco Mines conducted magnetic and EM surveys southwest of the Golden Dragon property in 1965 and did not detect any conductors and the north trending magnetic highs were interpreted to be diabase dikes. In 1965 March Minerals Limited conducted geophysical surveys over ground northwest of the Golden Dragon property and detected several weak conductors, however, no follow up work was done. Marvel Minerals Ltd. continued work began by March Minerals and detected one strong conductor southwest of Manning Lake. This conductor was drilled and intersected diorite, medium grained porphyry and andesite. McIntyre Porcupine Mines Ltd. initiated a program in 1968, 2 miles northeast of the Golden Dragon property that culminated in the drilling of two diamond drill holes. These holes intersected quartz diorite, quartz feldspar porphyry, quartz biotite gneiss, granodiorite and diabase."

## SURVEY PROCEDURE

### MAGNETICS

#### Theory

The magnetic method is based on measuring alteration in the shape and magnitude of the earth's naturally occurring magnetic field caused by changes in the magnetization of the rocks in the earth.

These changes in magnetization are due mainly to the presence of the magnetic minerals, of which the most common is magnetite, and to a lesser extent ilmenite, pyrrhotite, and some less common minerals.

Magnetic anomalies in the earth's field are caused by changes in two types of magnetization: induced and remanent (permanent). Induced magnetization is caused by the magnetic field being altered and enhanced by increases in the magnetic susceptibility of the rocks, which is a function of the concentration of the magnetic minerals.

Remanent magnetism is independent of the earth's magnetic field, and is the permanent magnetization of the magnetic particles (magnetite, etc.) in the rocks. This is created when these particles orient themselves parallel to the ambient field when cooling. This magnetization may not be in the same direction as the present earth's field, due to changes in the orientation of the rock or the field.

The most common method of measuring the total magnetic field in ground exploration is with a proton precession magnetometer. This device measures the effect of the magnetic field on the magnetic dipole of hydrogen protons. This dipole is caused by the "spin" of the proton, and in a magnetometer these dipoles in a sample of hydrogen-rich fluid are oriented parallel to a magnetic field applied by an electric coil surrounding the sample. After this magnetic field is removed, the dipoles begin to precess (wobble) around their orientation under the influence of the ambient earth's magnetic field. The frequency of this precession is proportional to the earth's magnetic field intensity.

Field Method

The magnetics data was collected with an EDA PPM 350 proton procession magnetometer, which measures the absolute value of the earth's magnetic field to an accuracy of $\pm$ 1 gammas. The magnetometer was carried down the survey line by a single operator, with the sensor mounted on an aluminum pole to remove it from any surface geologic noise. Readings were normally taken at 25m intervals, and at 12.5m intervals where a high gradient or anomaly was observed by the operator.

The readings were corrected for changes in the earth's total field (diurnal drift) with an EDA PPM 400 base station magnetometer, which recorded readings every 20 seconds as the survey was being conducted. The data from both magnetometers was then dumped with a computer and base corrected values were computed.

Interpretation

Examination of the contoured survey data (Figure 5) reveals that there is moderate magnetic relief on the property, with values ranging from a background of 58900 gammas to anomalous readings in the order of 61160 gammas. Several features have been interpreted from the survey results, namely magnetic domains, anomalies and faults.

The peripheral area of the property are generally dominated by a quiet magnetic response, with observed values between 58800 and 59100 gammas. This response is believed to reflect the magnetic signature of lithologies of low magnetic susceptibility most likely the sedimentary and/or the felsic batholithic units spoken of by R.P. Bowen in the Property Geology section. The north-south trending diabase dykes are also evident, and are characterized by a response which varies from 59150 to 59600 gammas. Diabase dykes are located on line 5+00W between baseline and 6+00N, at the north and south end of line 2+00W, and on line 0, between 2+00S and 4+50S.

The discontinuous nature of the diabase intrusions indicates that the property has been subjected to faulting. Fault f1, trends northeast from line 4+00W at 6+00S to 1+75S on line 2+00E. Offsets in magnetic contours suggest that fault f2 can be traced from 3+00S on L13+00W to 1+25N on 3+00W. Other structures which have been delineated and plotted on the map include minor faults and splays.

The most dominate feature which can be identified from the survey results is the elevated magnetic response which has been

denoted as anomaly M1. It is characterized by values which range from 59900 to 61150 gammas, and the axis of M1 trends west northwest from 3+25S on line 4+00W to 0+50N on L13+00W. Anomaly M1 is believed to reflect the response of gabbroic and/or ultramafic units, which may host massive sulphide mineralization based upon the associated high electromagnetic response to be discussed shortly.

Anomaly M2 is located between L14+00W and 15+00W, at 4+00S. Its magnetic signature is similar to that of M1, therefore anomaly M2 should also be investigated for potential massive sulphide mineralization, especially where it is open to the west.

## SURVEY PROCEDURE

### MAX-MIN II

#### Theory

The Max-Min II is a frequency domain, horizontal loop electromagnetic (HLEM) system, based on measuring the response of conductors to a transmitted, time varying electromagnetic field.

The transmitted, or primary EM field is a sinusoidally varying field at any of five different frequencies. This field induces an electromotive force, (emf), or voltage, in any conductor through which the field passes. This is defined by:

$$\oint E.dl = \frac{-\partial \phi}{\partial t} \quad \text{(the Faraday Induction Principle)}$$

where E is the electric field strength in volts/metre (and so $\oint E.dl$ is the emf around a closed loop) and $\phi$ is the magnetic flux through

the conductor loop. This emf causes a "secondary" current to flow in the conductor in turn generating a secondary electromagnetic field.

This changing secondary field induces an emf in the receiver coil (by the Faraday law) at the same frequency, but which differs from the primary field in magnitude and phase. The difference in phase (the phase angle) is a function of the conductance of the conductor(s), both the target and the overburden and host rock. The magnitude of the secondary is also dependant on the conductance, and also on the dimensions, depth, and geometry of the target, as well as on the interference from overburden and the host rock.

These two parameters (phase angle and magnitude) are measured by measuring the strength of the secondary field in two components: the real field or that part "in-phase" with the primary field; and the imaginary field, or that part in "quadrature" or 90 degrees out of phase from the primary field.

The magnitude and phase angle of the response is also a function of the frequency of the primary field. A higher frequency field generates a stronger response to weaker conductors, but a lower frequency tends to pass through weak conductors and penetrate to a greater depth. The lower frequency also tends to energise the full thickness of a conductor, and gives a better measure of its true conductivity-thickness product (conductance).

For these reasons two or more frequencies are usually used; the lower for penetration and accurate measure of good conductors, and the higher frequency for strong response to weak conductors.

Distinction between conductive targets, overburden, and host rock responses are made by studying the shape of the secondary field, and the difference in the frequency responses.

The transmitted primary field also creates an emf in the receiver coil, which is much stronger than the secondary, and which must be corrected for by the receiver. This is done by electronically creating an emf in the receiver, whose magnitude is determined by the distance from receiver to transmitter as set on the receiver, and whose phase is derived from the receiver via an interconnecting wire.

Field Method

The Max-Min II survey was carried out in the "maximum coupled" mode (horizontal co-planar). The transmitter and receiver are carried in-line down the survey line separated by a constant distance (in this case 150m) with the receiver leading. Three transmitter frequencies were used: 444 Hz, 1777 Hz and 3555 Hz and readings were taken every 25m. The transmitter and receiver are connected by a cable, for phase reference and operator communication.

Interpretation

The electromagnetic survey (Figures 6, 7 and 8) delineated two sub-parallel conductors of northwest trend, denoted respectively C1 and C2. These conductors are interpreted to possibly represent stratabound sulphide horizons within ultramafic volcanic rocks. Table 1 gives the physical parameters of the conductors.

TABLE 1
PHYSICAL PARAMETERS OF THE CONDUCTORS
AT GIVEN LOCATIONS

| LINE | CONDUCTANCE (mhos) | FREQUENCY (Hz) | DEPTH (m) (approx) | DIP |
|---|---|---|---|---|
| Conductor C1 | | | | |
| 1+00W | 10 | 444 | 52 | 90 |
| 2+00W | 14 | 444 | 80 | 90 |
| 3+00W | 13 | 444 | 100 | 90 |
| 4+00W | 11 | 444 | 40 | 90 |
| 5+00W | 14 | 444 | 25 | 90 |
| 6+00W | 16 | 444 | 37 | 90 |
| 7+00W | 16 | 444 | 38 | 90 |
| 8+00W | 11 | 444 | 50 | 90 |
| 9+00W | 11 | 444 | 58 | 90 |
| 10+00W | 11 | 444 | 57 | 90 |
| Conductor C2 | | | | |
| 10+00W | 7 | 444 | 112 | 90 |
| 11+00W | 9 | 444 | 58 | 90 |

Regional airborne geophysical surveys (OGS, 1988) show a general northerly dip for all EM conductors.

## PERSONNEL AND EQUIPMENT

The survey was conducted by a three-man crew supplied by Robert S. Middleton Exploration Services Inc. of Timmins, Ontario.

The equipment used consisted of an EDA Instruments PPM 350 total field magnetometer, an EDA Instruments PPM 400 base station magnetometer and an APEX Parametrics Max-Min II horizontal loop electromagnetic system.

Specifications for these instruments are included in Appendix A.

## SURVEY STATISTICS

The survey comprised a total of 34.26 km of linecutting and total field magnetics and 28.56 line km of three frequency horizontal loop electromagnetics. The survey required 7 days to complete of which 2 days were used for camp mobilization/demobilization.

## CONCLUSIONS AND RECOMMENDATIONS

The geophysical surveys delineated several interesting conductors associated with magnetic signatures interpreted to possibly represent stratabound sulphide horizons within ultramafic volcanic rocks. Possibility exists for a massive sulphide deposit. Therefore, a thorough diamond drilling program is proposed and is intended to verify the nature, extent and alteration of the conductors.

The azimuth of the drill holes should be in a southerly direction.

Respectfully submitted

Richard Lachapelle, B.Sc.Ing.Jr.

## REFERENCES

BOWEN, R.P.
1988 A Report on the Property of CROSS LAKE MINERALS LTD., Wilhelmina Township, Porcupine Mining Division, Ontario.

ONTARIO GEOLOGICAL SURVEY
1988 Airborne Electromagnetic and Total Intensity Survey, Timmins Area, Wilhelmina Township, Districts of Cochrane and Timiskaming Ontario; by Geoterrex Limited for Ontario Geological Survey. Geophysical/Geochemical Series Map 81043. Scale 1:20,000. Survey and compilation from March 1987 to October 1987.

ODM/GSC
1963 Map 2301G, Thorburn Lake, Cochrane District, Ontario Sheet 42A/13, Scale 1"=1 mile.

PYKE, D.R. et al
1972 Timmins-Kirkland Sheet, District of Cochrane, Geological Compilation Series, Map 2205, Scale 1"=4 miles, Ontario Geological Survey.

# CERTIFICATION

I, Richard Lachapelle, of 136 Cedar Street South, in the City of Timmins, Province of Ontario, certify as follows concerning my report on the Golden Dragon Resources Ltd. and Cross Lake Minerals Ltd. joint venture property in Aitken and Wilhelmina Townships, Province of Ontario and dated June 15, 1989

1. I am a junior member in good standing of l'Ordre des Ingenieurs du Quebec.

2. I am a graduate of l'Universite de Sherbrooke, Sherbrooke, Quebec with a B.Sc. degree in Physics, obtained in 1984.

3. I am a graduate of l'Ecole Polytechnique de Montreal, Montreal, Quebec with a B.Ing degree in Geological Engineering obtained in 1987.

4. I have been practising in Canada since 1987.

5. I have no direct interest in the properties, leases, or securities of Golden Dragon Resources Ltd. or Cross Lake Minerals Ltd. nor do I expect to receive any.

6. The attached report is a product of:
   a) Examination of data included in the report which was collected on the property concerned.

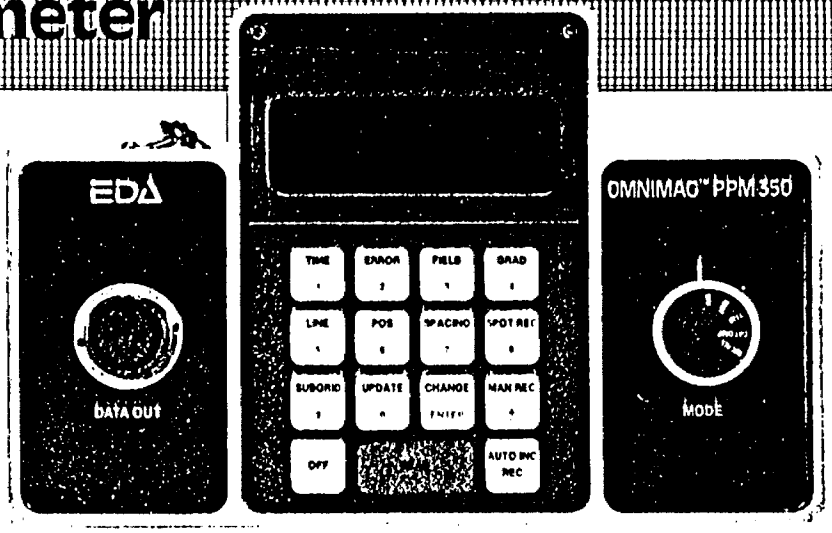
Dated this 15th day of June, 1989
TIMMINS, Ontario

Richard Lachapelle, B.Sc.Ing.Jr.
Geophysicist

# A P P E N D I X A

# OMNIMAG PPM-350
# Total Field Magnetometer

EDA




The PPM-350 is the latest addition to EDA's OMNIMAG*™ series of magnetometers and gradiometers. It is engineered to provide users with the latest state-of-the-art advances in microprocessor technology, including many features that are unique in the field.

## Major benefits and features include:

- Significant increase in productivity
- Lowered survey costs
- Automatic diurnal correction
- Programmable grid coordinates
- Highly reproduceable data
- Ergonomic design
- Simplified fieldwork
- Computer-compatible

EDA

## Specifications

| | |
|---|---|
| Dynamic Range | 18,000 to 93,000 gammas |
| Sensitivity | ±0.02 gamma |
| Statistical Error Resolution | 0.01 gamma |
| Standard Memory Capacity | 1383 data blocks or readings |
| Absolute Accuracy | ±15 ppm at 23°C, 50 ppm over the operating temperature range |
| Display Resolution | 0.1 gamma |
| Capture Range | ±25% relative to ambient field strength of last stored value |
| Display | Custom-designed, ruggedized liquid crystal display with an operating temperature range from −35°C to +55°C |
| Gradient Tolerance | 5,000 gammas per meter |
| Sensor | Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy |
| Sensor Cable | Remains flexible in temperature range; includes low strain connector |
| Operating Environmental Range | −35°C to +55°C; 0–100% relative humidity; weather-proof |
| Power Supply | Non-magnetic rechargeable sealed lead acid battery cartridge or belt; or, Disposable "C" cell battery cartridge or belt |
| Battery Cartridge Life | 2,000 to 5,000 readings, depending upon ambient temperature and rate of readings |
| Weight and Dimensions | |
| Instrument Console only | 3.4 kg, 238 x 150 x 250 mm |
| Lead Acid Battery Cartridge | 1.9 kg |
| Sensor | 1.2 kg, 56 mm diameter x 200 mm |
| System Complement | Electronics console; sensor with 3-meter cable; sensor staff; power supply; harness assembly; operation manual. |

EDA is a pioneer in the development of advanced geophysical systems and has created many innovations that increase field productivity and lower survey costs.

EDA's OMNIMAG series consists of the PPM-350 Total Field Magnetometer, PPM-400 Base Station Magnetometer, and the PPM-500 Vertical Gradiometer. Contact us *now* for details.

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E D A Instruments Inc.
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Wheat Ridge, Colorado
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Telex: 00 450681 DVR
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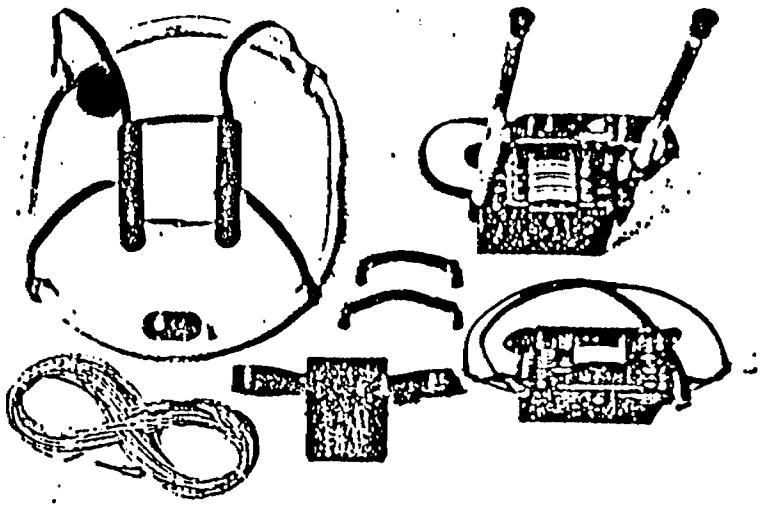
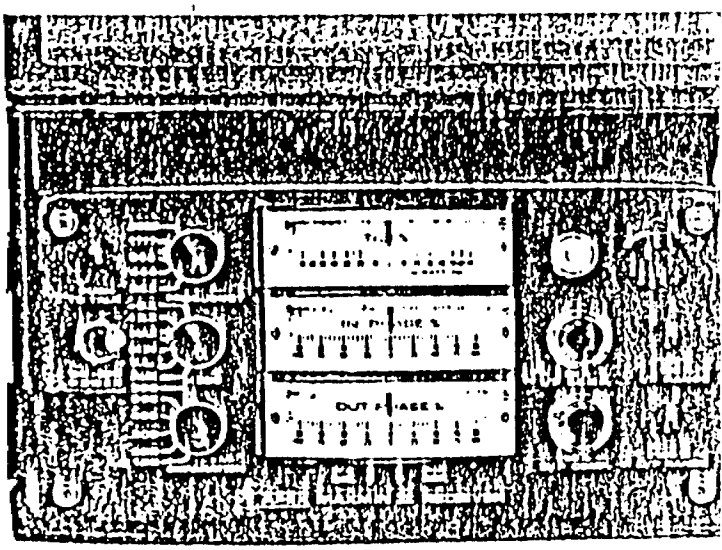
# APEX MAXMIN II PORTABLE EM

- Five frequencies: 222, 444, 888, 1777 and 3555 Hz.
- Maximum coupled (horizontal-loop) operation with reference cable.
- Minimum coupled operation with reference cable.
- Vertical-loop operation without reference cable.
- Coil separations: 25, 50, 100, 150, 200 and 250 m (with cable) or 100, 200, 300, 400, 600 and 800 ft.
- Reliable data from depths of up to 180 m (600 ft).
- Built-in voice communication circuitry with cable.
- Tilt meters to control coil orientation.

NOW ALSO ±4% QUADRATURE FULL SCALE.





## SPECIFICATIONS:

**Frequencies:** 222, 444, 888, 1777 and 3555 Hz.

**Modes of Operation:**
- MAX: Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.
- MIN: Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.
- V.L.: Transmitter coil plane vertical and receiver coil plane horizontal (Vertical-loop mode). Used without reference cable, in parallel lines.

**Coil Separations:** 25, 50, 100, 150, 200 & 250m (MMII) or 100, 200, 300, 400, 600 and 800 ft. (MMIIF).
Coil separations in V.L. mode not restricted to fixed values.

**Parameters Read:**
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Tilt-angle of the total field in V.L. mode.

**Readouts:**
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Tilt angle and null in 90mm edgewise meters in V.L. mode.

**Scale Ranges:**
In-Phase: ±20%, ±100% by push-button switch.
Quadrature: ±20%, ±100% by push-button switch.
Tilt: ±75% slope.
Null (V.L.): Sensitivity adjustable by separation switch.

NOW ALSO ±4% QUADRATURE FULL SCALE.

**Readability:** In-Phase and Quadrature: 0.25 % to 0.5 % ; Tilt: 1 %.

**Repeatability:** ±0.25% to ±1% normally, depen on conditions, frequencies and separation used.

**Transmitter Output:**
- 222Hz : 220 $Atm^2$
- 444Hz : 200 $Atm^2$
- 888Hz : 120 $Atm^2$
- 1777Hz : 60 $Atm^2$
- 3555Hz : 30 $Atm^2$

**Receiver Batteries:** 9V trans. radio type batteries Life: approx. 35 hrs. continuou ty (alkaline, 0.5 Ah), less in weather.

**Transmitter Batteries:** 12V 6 Ah Gel-type rechargeable battery. (Charger supp

**Reference Cable:** Light weight 2-conductor t cable for minimum friction. Uns ed. All reference cables opt at extra cost. Please spe

**Voice Link:** Built-in intercom system voice communication betwee ceiver and transmitter oper In MAX and MIN modes, vi ference cable.

**Indicator Lights:** Built-in signal and reference ing lights to indicate error readings.

**Temperature Range:** -40°C to +60°C (-40°F to +1

**Receiver Weight:** 6kg (13 lbs.)

**Transmitter Weight:** 13kg (29 lbs.)

**Shipping Weight:** Typically 60kg (135 lbs.), d ing on quantities of refe cable and batteries inc Shipped in two field/shipping

Specifications subject to change without notif

APEX PARAMETRICS LIMITED
200 STEELCASE RD. E., MARKHAM, ONT., CANADA, L3R 1G2

Ministry of Northern Development and Mines
Ontario

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

D

42A13SW0006 2.12579 WILHELMINA

900

1 W8906-257

Type of Survey(s): ELECTROMAGNETIC & MAGNETOMETER

Township or Area: WILHELMINA

Claim Holder(s): GOLDEN DRAGON RESOURCES LTD.

Prospector's Licence No.: T-5159

Address: c/o P.O. Box 1637 TIMMINS, ON. P4N 7W8

Survey Company: R.S. MIDDLETON EXPLORATION SERVICES INC.

Date of Survey (from & to): 02 04 89 (Day Mo. Yr.) — 08 04 89 (Day Mo. Yr.)

Total Miles of line Cut: 34.26 km

Name and Address of Author (of Geo-Technical report): R. Lachapelle c/o Box 1637 Timmins on. P4N 7W8

## Credits Requested per Each Claim in Columns at right

| Special Provisions | | Days per Claim |
|---|---|---|
| For first survey: Enter 40 days. (This includes line cutting) | Geophysical - Electromagnetic | 20 |
| | Geophysical - Magnetometer | 40 |
| For each additional survey: using the same grid: Enter 20 days (for each) | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |

| Man Days | | Days per Claim |
|---|---|---|
| Complete reverse side and enter total(s) here | Geophysical - Electromagnetic | |
| | Geophysical - Magnetometer | |
| | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |

| Airborne Credits | | Days per Claim |
|---|---|---|
| Note: Special provisions credits do not apply to Airborne Surveys. | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT OFFICE
APR 11 1989
RECEIVED

## Mining Claims Traversed (List in numerical sequence)

| Mining Claim Prefix | Mining Claim Number | Expend. Days Cr. |
|---|---|---|
| P | 1036027 | |
| | 1036028 | |
| | 1036029 | |
| | 1036030 | |
| | 1036031 | |
| | 1036032 | |
| | 1036033 | |
| | 1036034 | |
| | 1036035 | |
| | 1036036 | |
| | 1036037 | |
| | 1036038 | |
| | 1036231 | |
| | 1036232 | |
| | 1036233 | |
| | 1036234 | |
| | 1036235 | |
| | 1036236 | |
| | 1036237 | |
| | 1036238 | |

RECEIVED
APR 19 1989
10:20 a.m.

RECORDED
APR 19 1989

RECEIVED
MAY 15 1989
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: 20

For Office Use Only

| Total Days Cr. Recorded | Date Recorded | Mining Recorder |
|---|---|---|
| 1200 | April 19/89 | Mining Recorder |
| | Date Approved as Recorded: 10 July 89 | Branch Director |

Date: April 19/89

Recorded Holder or Agent (Signature):

## 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: Dan Farrow c/o Box 1637 Timmins, On. P4N 7W8

Date Certified: April 19/89

Certified by (Signature):

1362 (85/12)

Ministry of Northern Development and Mines

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

W8906.257

Mining Act 333

Note: – If number of mining claims traversed exceeds space on this form, attach a 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): ELECTROMAGNETIC & MAGNETOMETER

Township or Area: WILHELMINA

Claim Holder(s): GOLDEN DRAGON RESOURCES LTD.

Prospector's Licence No.: T-5159

Address: c/o P.O. Box 1637 TIMMINS, ON. P4N 7W8

Survey Company: R.S. MIDDLETON EXPLORATION SERVICES INC.

Date of Survey (from & to): 02 04 89 (Day Mo. Yr.) to 08 04 89 (Day Mo. Yr.)

Total ~~Miles~~ km of line Cut: 34.26

Name and Address of Author (of Geo-Technical report): R. Lachapelle c/o Box 1637 Timmins On. P4N 7W8

## Credits Requested per Each Claim in Columns at right

| Special Provisions | | Days per Claim |
|---|---|---|
| For first survey: Enter 40 days. (This includes line cutting) | Geophysical - Electromagnetic | 20 |
| | Geophysical - Magnetometer | 40 |
| For each additional survey: using the same grid: Enter 20 days (for each) | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |

| Man Days | | Days per Claim |
|---|---|---|
| Complete reverse side and enter total(s) here | Geophysical - Electromagnetic | |
| | Geophysical - Magnetometer | |
| | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |

| Airborne Credits | | Days per Claim |
|---|---|---|
| Note: Special provisions credits do not apply to Airborne Surveys. | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

RECEIVED JUN 26 1989 MINING LANDS SECTION

## Mining Claims Traversed (List in numerical sequence)

| Mining Claim Prefix | Mining Claim Number | Expend. Days Cr. |
|---|---|---|
| P | 1036027 | |
| | 1036028 | |
| | 1036029 | |
| | 1036030 | |
| | 1036031 | |
| | 1036032 | |
| | 1036033 | |
| | 1036034 | |
| | 1036035 | |
| | 1036036 | |
| | 1036037 | |
| | 1036038 | |
| | 1036231 | |
| | 1036232 | |
| | 1036233 | |
| | 1036234 | |
| | 1036235 | |
| | 1036236 | |
| | 1036237 | |
| | 1036238 | |

RECEIVED APR 19 1989 10:20 AM DC

RECORDED APR 19 1989

Total number of mining claims covered by this report of work: 20

## 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.

Date: April 19 DC/89

Recorded Holder or Agent (Signature):

For Office Use Only

Total Days Cr. Recorded: 1200

Date Recorded: April 19/89

Date Approved as Recorded:

Mining Recorder

Branch Director

## 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: D. Fagnan c/o Box 1637

# REFERENCES

## AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY

S.R.O. – SURFACE RIGHTS ONLY

M.+ S. – MINING AND SURFACE RIGHTS

| Description | Order No. | Date | Disposition | File |
|---|---|---|---|---|

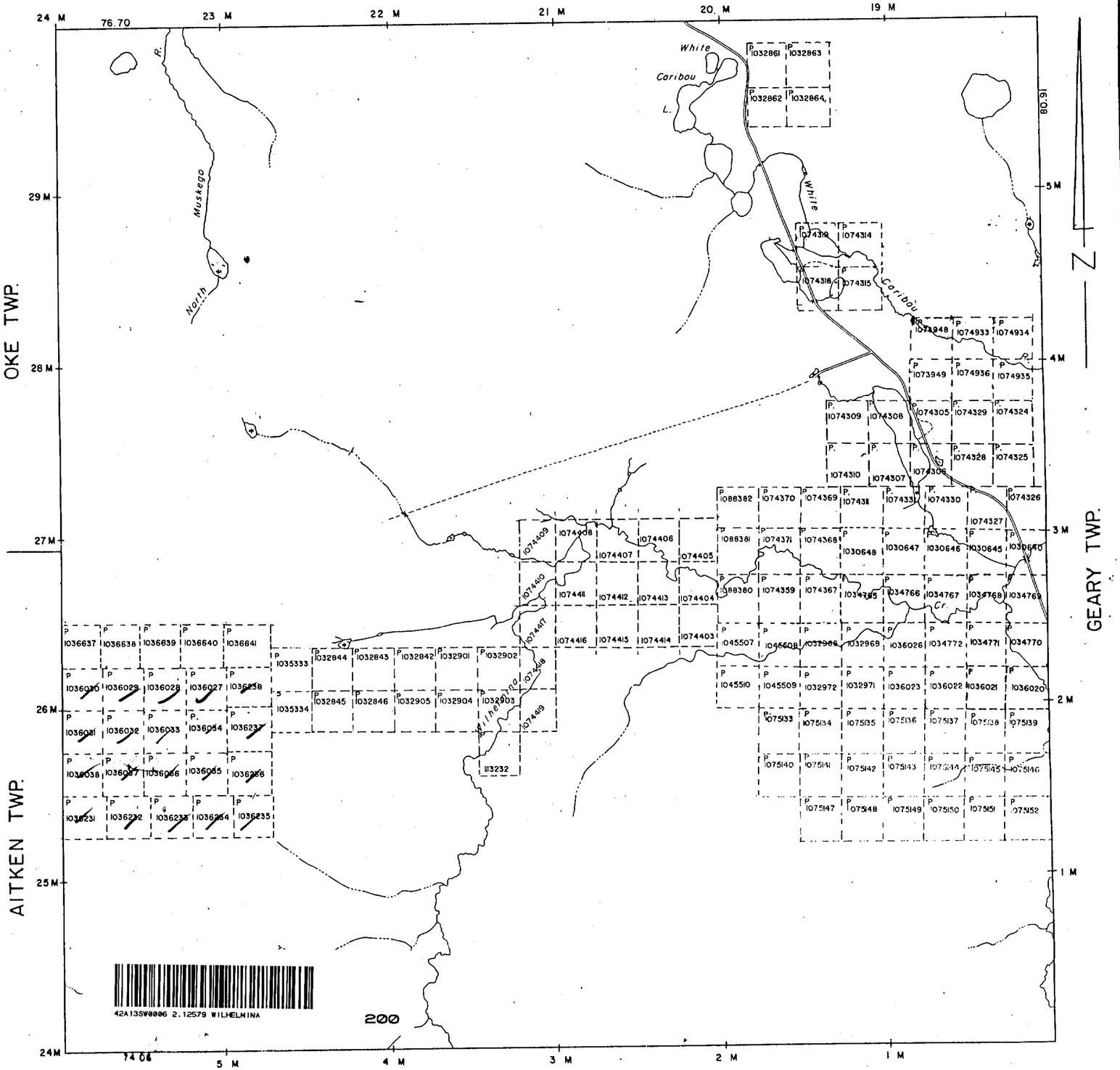
KIRKLAND TWP.

OKE TWP.

AITKEN TWP.

GEARY TWP.

MOBERLY TWP.




# 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 OR COMPOSITE PLAN
- RESERVATIONS
- ORIGINAL SHORELINE
- MARSH OR MUSKEG
- MINES
- TRAVERSE MONUMENT

# 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 | |
| ORDER-IN-COUNCIL | OC |
| RESERVATION | ® |
| CANCELLED | ⊗ |
| SAND & GRAVEL | Ⓢ |

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC 1.

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000

METRES 0 200 1000 (1 KM) 2000 (2 KM)

TOWNSHIP

# WILHELMINA

M.N.R. ADMINISTRATIVE DISTRICT

COCHRANE

MINING DIVISION

PORCUPINE

LAND TITLES / REGISTRY DIVISION

COCHRANE

Ontario

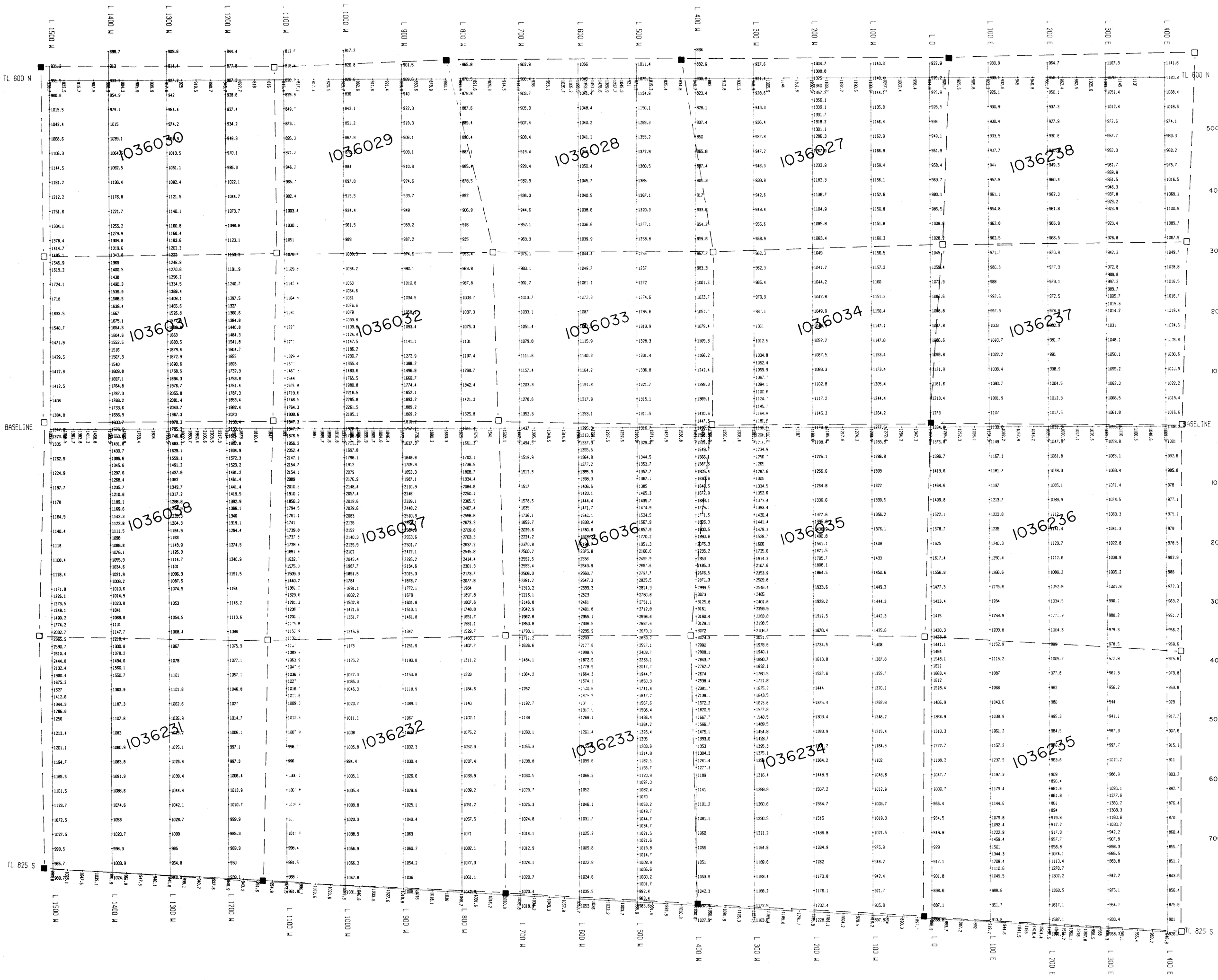
Ministry of Natural Resources

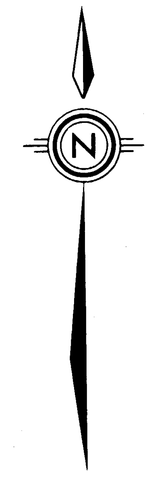
Ministry of Northern Development and Mines

NOVEMBER 1986

Checked LP. Feb 9/82 LP.

G-3580




BAR LEVEL REMOVED THROUGH
FIELD INSTRUMENT ERROR

**TOPOGRAPHY**

CLAIM POST
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 2 500

50 0 50 (metres) 100 150 200

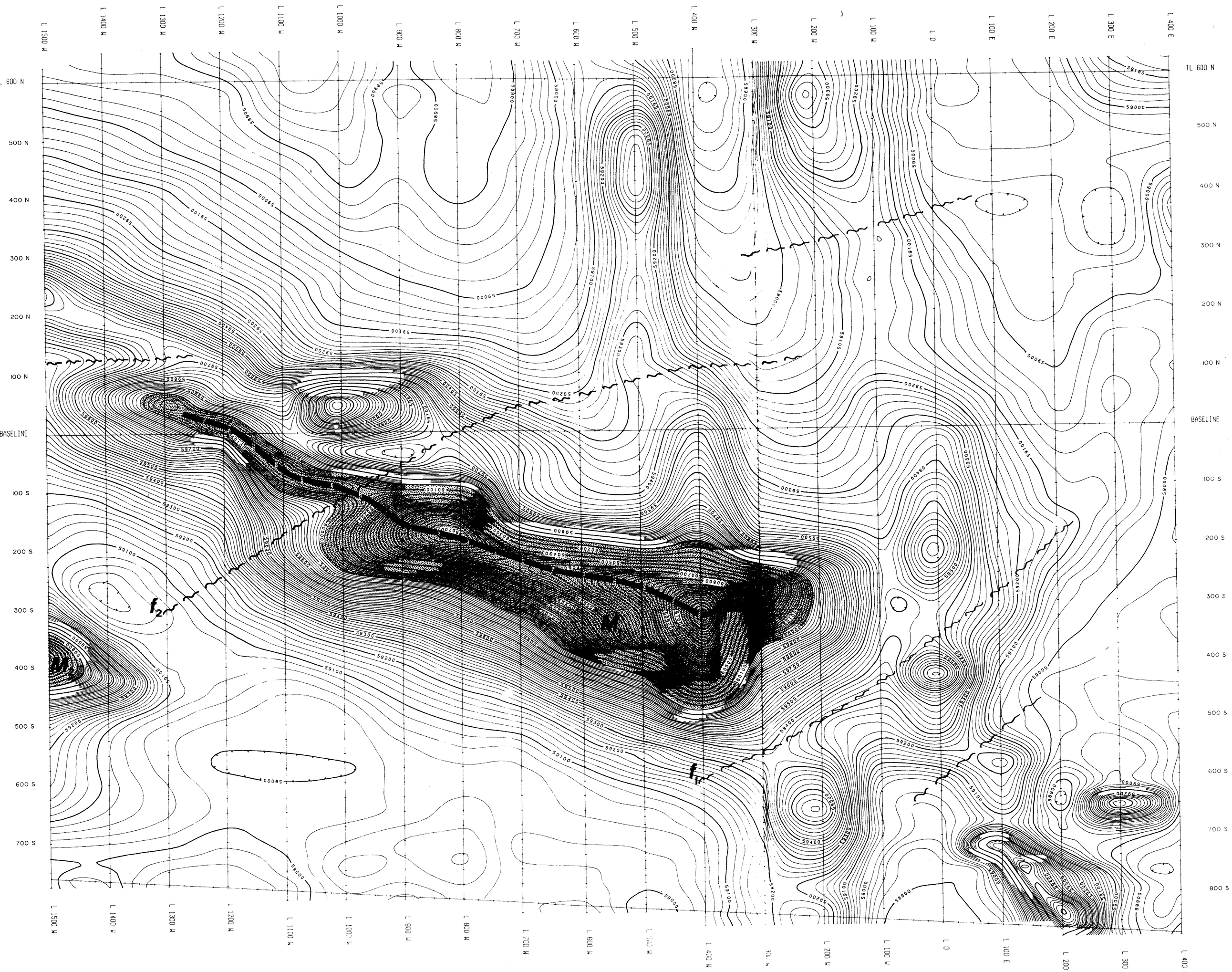
**2.12579**

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CROSS LAKE - GOLDEN DRAGON

Title
WILHELMINA TOWNSHIP
MAGNETIC SURVEY
Fig. 4

| | |
|---|---|
| Date: MAY 89 | N.T.S. |
| Operator: T.Lahey | Job # M-333 |




CONTOUR INTERVALS

20

100

1000

BASE STATION : EDA PPM 400

FIELD INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS

WIDE MAGNETIC MODELS

INTERPRETED CONTACT

INTERPRETED FAULT $f_x$

$M_x$

**2.12579**

SCALE 1 : 2 500

50 0 50 [metres] 100 150 200

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

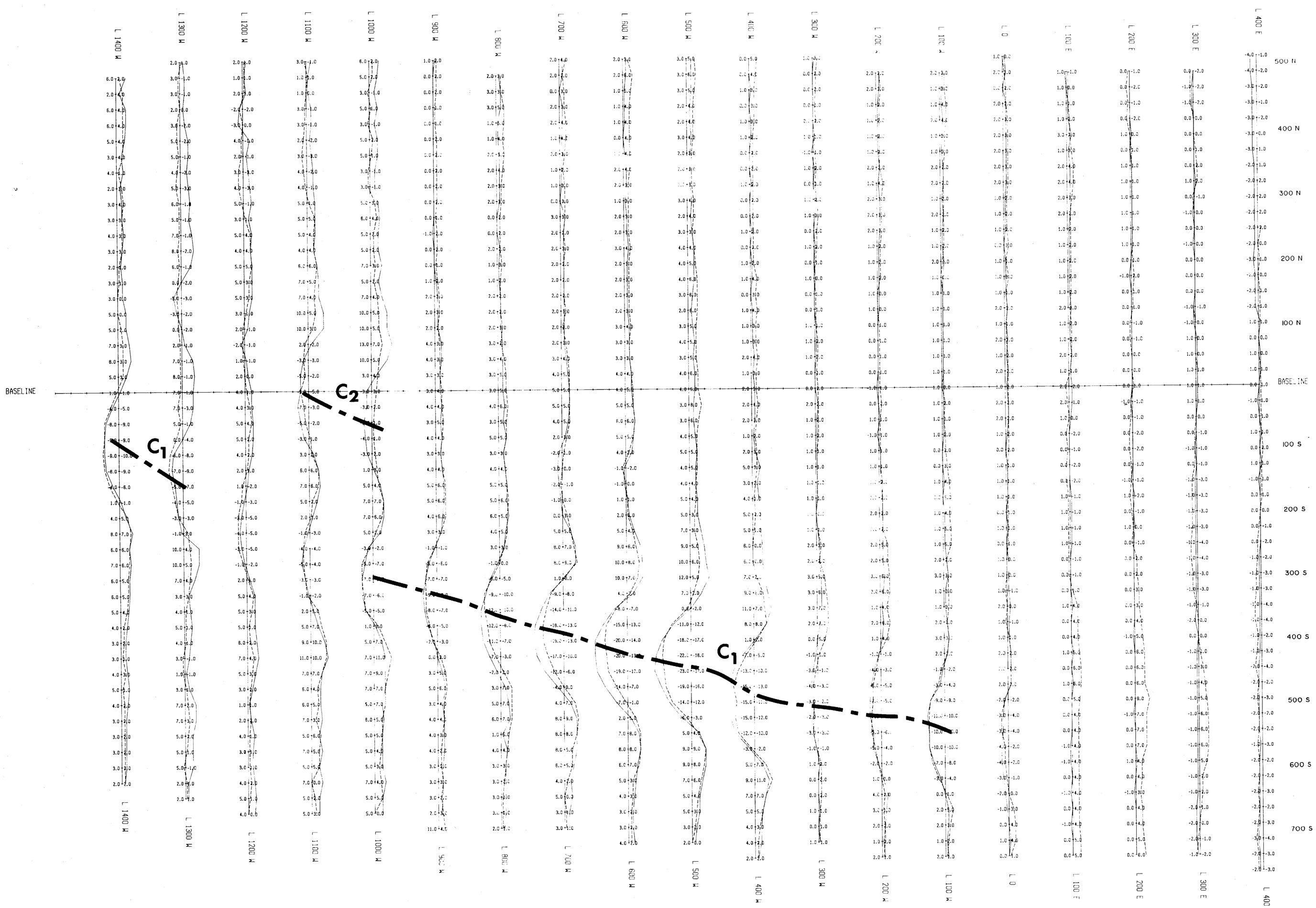
For CROSS LAKE - GOLDEN DRAGON

Title WILHELMINA TOWNSHIP
MAGNETIC SURVEY
Fig. 5

| | |
|---|---|
| Date: MAY 89 | N.T.S. |
| Operator: T.Lahey | Job # M-333 |

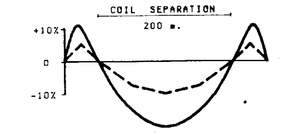
42A13NW0006 2.12579 WILHELMINA

220




**MAX-MIN II HLEM LEGEND**

Profile Scale: 1 cm. = 10 %
FREQUENCY : 444Hz
IN PHASE ——————
QUADRATURE - - - - - - -




CONDUCTOR AXIS - — — —

**2.12579**

**SCALE 1 : 2 500**

50 (metres) 100 150 200

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CROSS LAKE - GOLDEN DRAGON

Title
WILHELMINA TWP PROPERTY
Horizontal Loop EM SURVEY
Fig. 6

| | |
|---|---|
| Date: MAY 89 | N.T.S.: |
| Operator: Burton/Wilson | Job #: M-333 |

L 1400 M
L 1300 M
L 1200 M
L 1100 M
L 1000 M
L 900 M
L 800 M
L 700 M
L 600 M
L 500 M
L 400 M
L 300 M
L 200 M
L 100 M
L 0
L 100 E
L 200 E
L 300 E
L 400 E

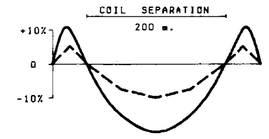
500 N
400 N
300 N
200 N
100 N
BASELINE
100 S
200 S
300 S
400 S
500 S
600 S
700 S

C1
C2

N

**MAX-MIN II HLEM LEGEND**

Profile Scale: 1 cm. = 10 %
FREQUENCY : 1777Hz
IN PHASE
QUADRATURE




CONDUCTOR AXIS

**2.12579**

SCALE 1 : 2 500

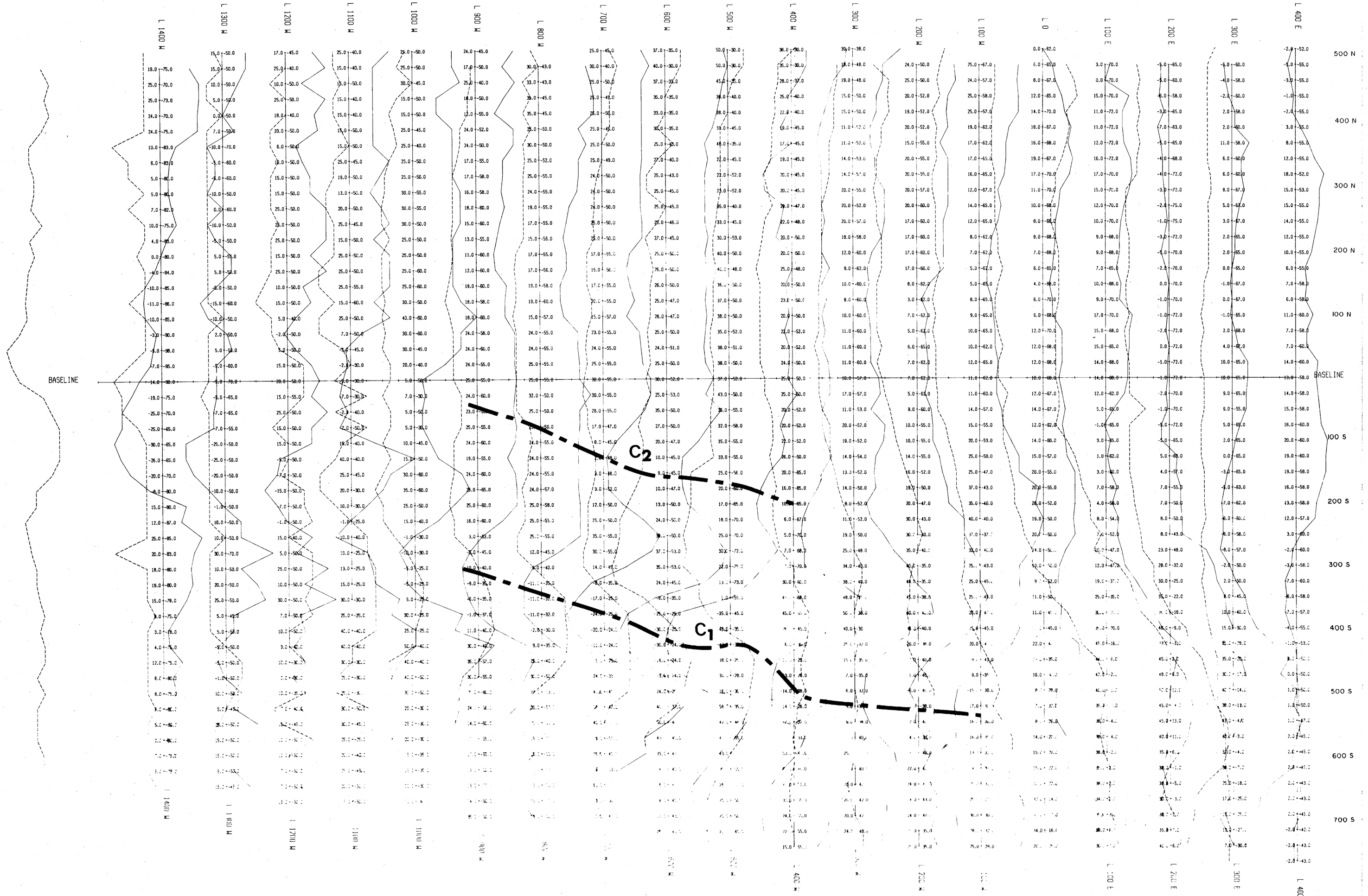
50 0 50 (metres) 100 150 200

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CROSS LAKE - GOLDEN DRAGON

Title
WILHELMINA TWP PROPERTY
Horizontal Loop EM SURVEY
Fig. 7

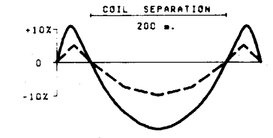
| | |
|---|---|
| Date: MAY 89 | N.T.S.: |
| Operator: Burton/Wilson | Job #: M-333 |





**MAX-MIN II HLEM LEGEND**

Profile Scale: 1 cm. = 10 %
FREQUENCY : 3555Hz
IN PHASE
QUADRATURE




CONDUCTOR AXIS

**2.12579**

**SCALE 1 : 2 500**

50 0 50 (metres) 100 150 200

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CROSS LAKE - GOLDEN DRAGON

Title
WILHELMINA TWP PROPERTY
Horizontal Loop EM SURVEY
Fig. 8

| | |
|---|---|
| Date: MAY 89 | N.T.S.: |
| Operator: Burton/Wilson | Job #: M-333 |

42A13SW0006 2.12579 WILHELMINA

250