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**STEALTH MINERALS LTD.**

**A GEOPHYSICAL REPORT ON A GROUND MAGNETOMETER,  
INDUCED POLARIZATION AND RESISTIVITY TEST SURVEY OVER  
THE MEX PROSPECT, TOODOGGONE AREA, OMINECA MINING  
DIVISION, NORTH CENTRAL BRITISH COLUMBIA**

**LATITUDE 57° 12' NORTH  
LONGITUDE 126° 40' WEST  
NTS: 94E02W**

**By**

**John Lloyd, M.Sc., P.Eng.**

**LLOYD GEOPHYSICS INC.  
VANCOUVER, BRITISH COLUMBIA  
NOVEMBER 2002**

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27160 3 of 5

## **SUMMARY**

During the period September 6 to 8, 2002, Lloyd Geophysics Inc. carried out a ground magnetometer and an induced polarization (IP) and resistivity test survey on 3 lines over the Mex copper-gold porphyry prospect, in the Toodoggone area of north central British Columbia, for Stealth Minerals Ltd.

A very strong magnetic anomaly, open along strike in both directions, was established along with a moderately high chargeability anomaly over the large gossanous cap which overlies the prospect.

It is recommended that the IP and magnetic surveys be extended to close off both anomalies and 3 vertical holes be drilled, along the ridge, to test the chargeability anomaly which is believed to be caused by a sulphide system below the gossanous cap.

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COST OF SURVEY	Appendix A
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## MAP POCKET

PSEUDO-SECTIONS WITH MAGNETIC PROFILES
PLAN MAP WITH MAGNETIC PROFILES

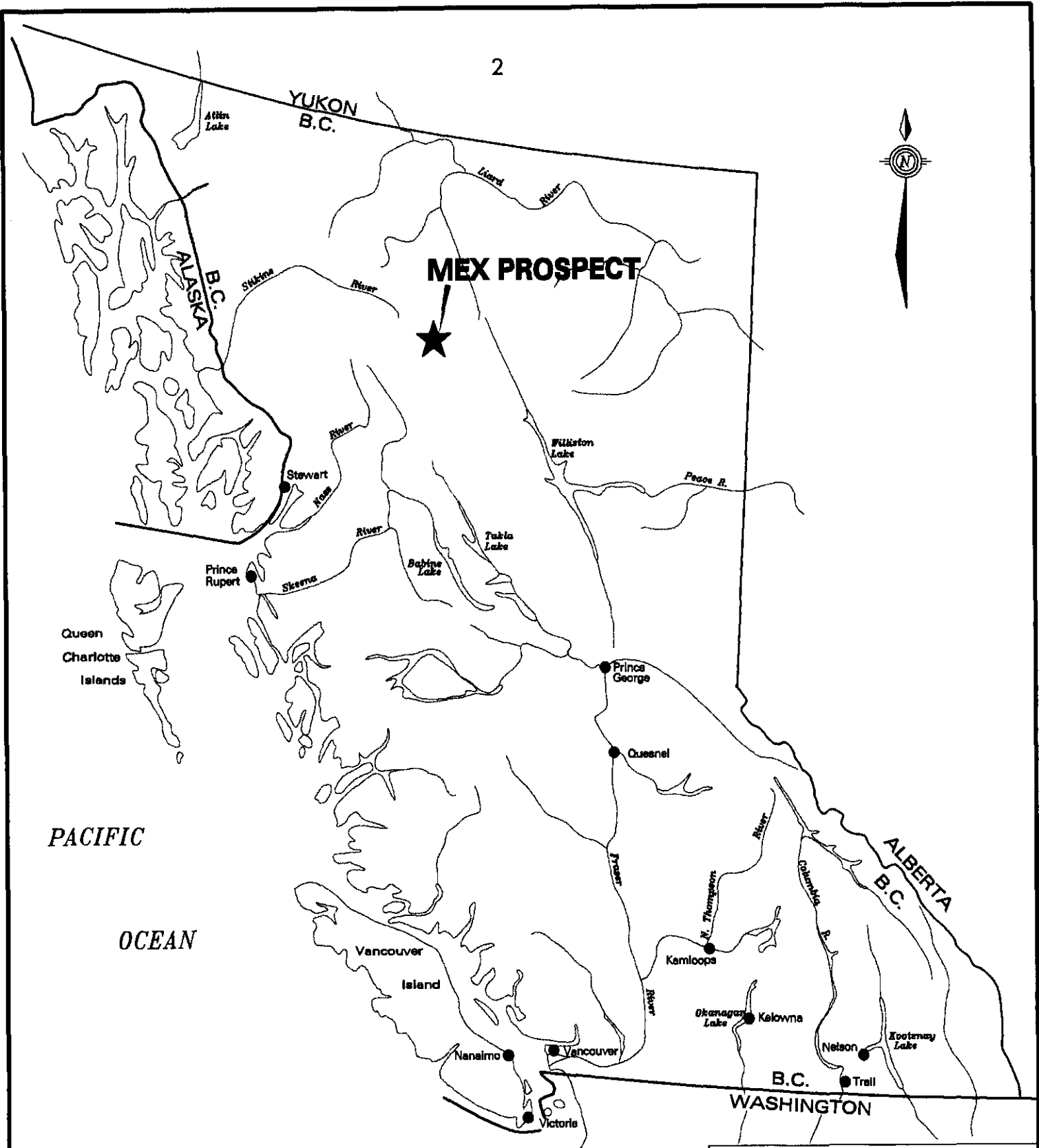
## **1.0 INTRODUCTION**

During the period September 6 to September 8, 2002, Lloyd Geophysics Inc. carried out a ground magnetometer and an induced polarization (IP) and resistivity test survey on three NW-SE lines over the Mex copper-gold porphyry prospect, in the Toadoggone area of north central British Columbia, for Stealth Minerals Ltd.

The purpose of the magnetometer survey was to trace on the ground a strong magnetic high, known from previous aeromagnetic surveys, which lies on the edge of a large gossan zone and close to the contact between quartz monzonite and granodiorite rocks. The purpose of the IP survey was to outline the limits of the sulphide zone beneath the gossanous cap.

## **2.0 PROPERTY LOCATION AND ACCESS**

The Mex prospect lies within a broad region of prospects and mines known as the Toadoggone mining camp in north central British Columbia. The prospect is located about 20 kilometers northwest of the Kemess South Mine, which in turn is about 500 kilometers north-northwest of Prince George, British Columbia (Figure 1). The prospect is located in the Omineca Mining Division, on NTS sheet 94E02W at latitude 57° 12' north and longitude 126° 40' west. The Stealth camp is approximately 20 kilometers north-northwest of the Kemess South Mine. Access to the property for this work was by helicopter operating out of the Kemess South mine site.



<b>STEALTH MINERALS LTD.</b>	
<b>MEX PROSPECT</b>	
<b>GENERAL LOCATION MAP</b>	
Date: Nov. 2002	Figure: 1
<b>LLOYD GEOPHYSICS INC.</b>	



### **3.0 CLAIM HOLDINGS**

The following claim information was provided by Stealth Minerals Ltd. at the time of writing this report:

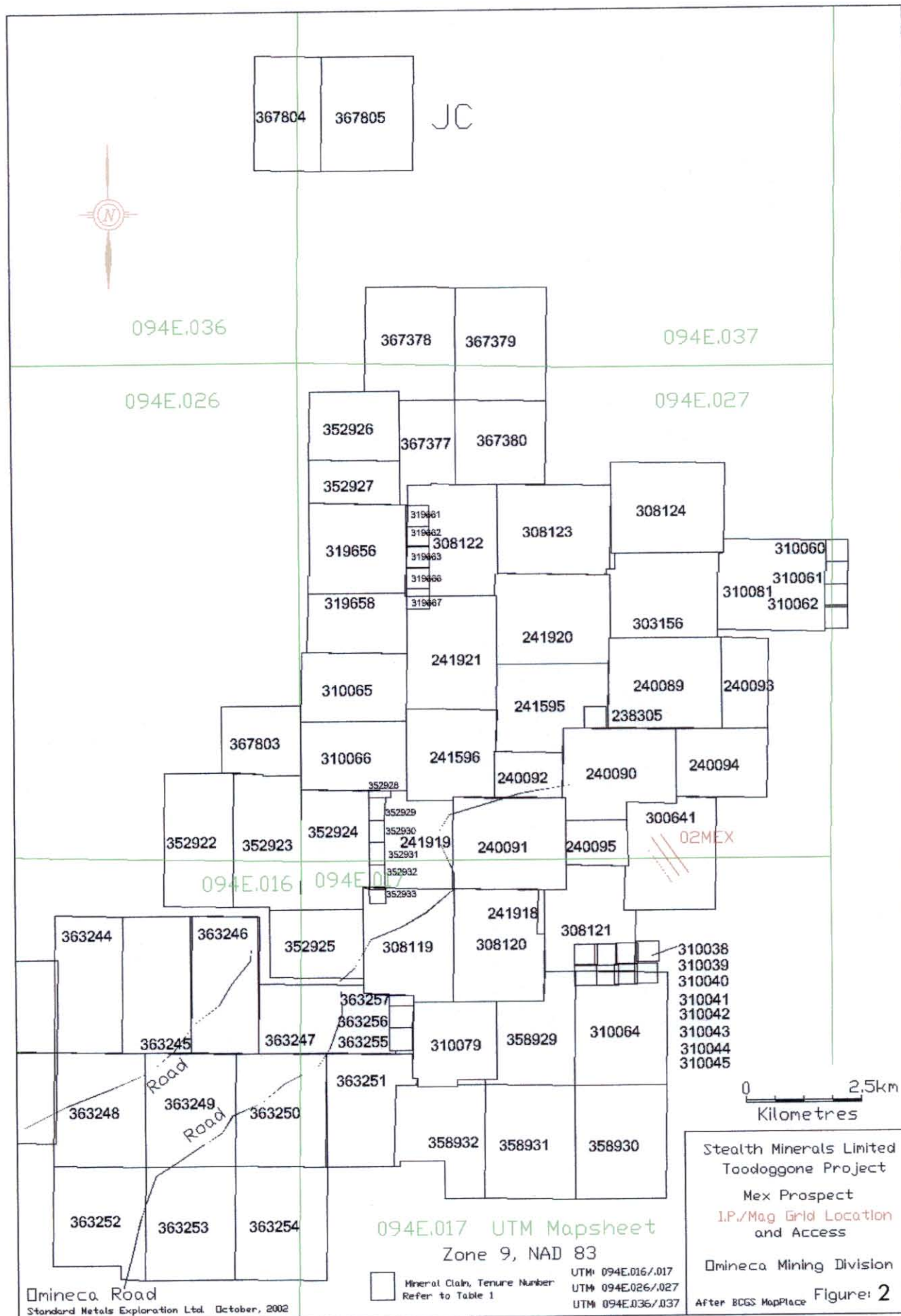
<b>Name</b>	<b>Tenure #</b>	<b>Units</b>	<b>Anniversary Date</b>	<b>Expiry Date</b>	<b>Registered</b>
Paula	300641	20	91/06/08	2004MAR31	107591

The location of the three NW-SE test lines, with respect to the above mentioned claims, is shown in Figure 2.

### **4.0 GEOLOGY**

The area is underlain by Asitka Group volcanic, siliciclastic and carbonate rocks, Permian in age, Stuhini/Takla Group basalt-andesite, Upper Triassic-Lower Jurassic in age, and Hazelton Group-Toodoggone Formation dacite-andesite volcanoclastic rocks, Lower to Middle Jurassic in age. Granodiorite, monzodiorite to quartz monzonite and locally pyroxene gabbro intrusive rocks of the Omineca/Black Lake plutonic suite, Lower to Middle Jurassic in age, cut previous lithology. Sub-parallel intrusive and volcanic arcs trend northwest and are associated with major deep-seated regional faults; conjugate, dilation faults cross-cut and in part offset these structures, and may impart a secondary control on intrusive, volcanic and hydrothermal activity.

The Toodoggone Formation is comprised of subaerial, calc-alkaline quartz-hornblendefeldspar crystal dacite-andesite pyroclastic rocks deposited within an island arc environment, and appear in part, coeval with the Black Lake quartz monzonite intrusive rocks. These Omineca intrusions host porphyry deposits such as Mt Milligan, Kemess, Pine, Brenda and Pil deposits, and may in part be a source for most of the regions prolific porphyry, skarn, and epithermal gold mineralization.



The Mex prospect is a calc-alkaline copper-gold porphyry prospect located approximately 1 kilometre south of the Pine-Tree copper-gold porphyry prospect, in proximity to a north-northeast trending contact between the Geigerich pluton of predominately granodiorite composition, and the Toodoggone Formation. Several dykes of quartz monzonite composition cut Toodoggone Formation rocks approximately 100 to 500 metres from the contact near station 0 and may be sub-parallel to it. A pronounced gossan over 1000 metres long occurs on top of a ridge (Line M1) and more than 200 metres down slope to the northeast (Line M2). Talus and vegetation cover limit geological observations to the southwest (Line M3). Both intrusive and volcanic rocks are mineralized and are comprised of quartz veinlets containing pyrite, magnetite and chalcopyrite, with associated copper, gold and silver values, although intense leaching may have removed much of the copper from the surface exposures.

## **5.0 INSTRUMENT SPECIFICATIONS**

### **5.1 Ground Magnetometer System**

The system consists of 2 Omni total field proton precession magnetometers manufactured by EDA Instruments Inc., Toronto, Canada. The system is completely software controlled. The field magnetometer measures and stores in memory, via the keypad, the time, the location and the value of the earth's total magnetic field at each station. The base station magnetometer measures and stores in memory, automatically, the daily fluctuations of the earth's total magnetic field throughout each day.

At the end of each survey day, the 2 sets of data are merged and downloaded to a field computer. The field data is automatically corrected, via software, for diurnal variations recorded by the base station magnetometer.



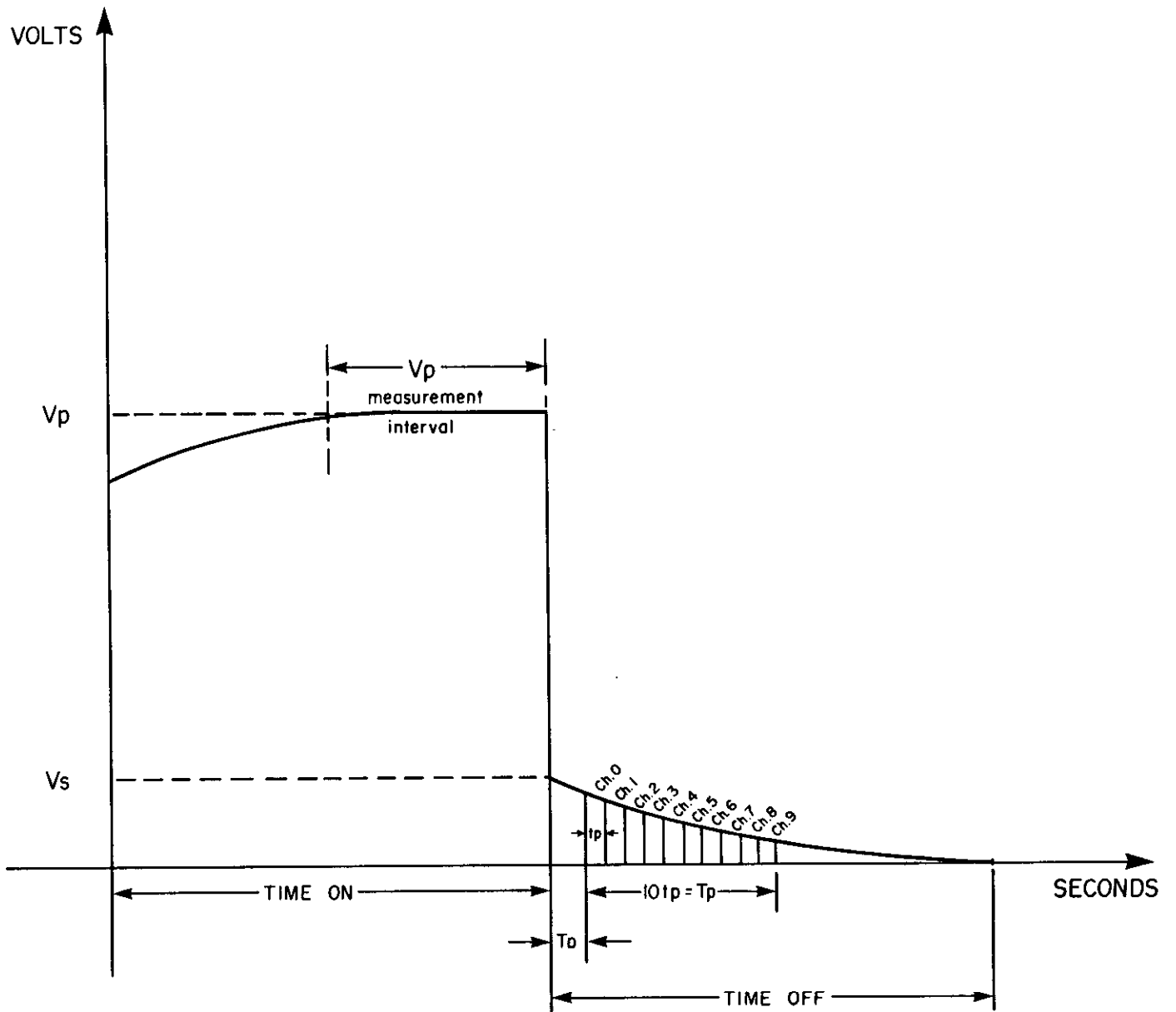
## **5.2 Induced Polarization System**

The system used to carry out this survey was a 7.5 kw time domain unit consisting of a 400 hertz Onan/Wagner Leland motor generator set and a Mark II transmitter manufactured by Hunttec Limited, Toronto, Canada and a 6 channel IP-6 receiver manufactured by Iris Instruments, Orleans, France.

The transmitter was operated with a cycle time of 8 seconds and the duty cycle ratio: [(time on)/(time on + time off)] was 0.5 seconds. This means the cycling sequence of the transmitter was 2 seconds current "on" and 2 seconds current "off" with consecutive pulses reversed in polarity.

The IP-6 receiver can measure up to 6 dipoles simultaneously. It is microprocessor controlled, featuring automatic calibration, gain setting, SP cancellation and fault diagnosis. **To accommodate a wide range of geological conditions, the delay time, the window widths and hence the total integration time is programmable via the keypad.** Measurements are calculated automatically every 2 to 4 seconds from the averaged waveform which is accumulated in memory.

The window widths of the IP-6 receiver can be programmed arithmetically or logarithmically. For this survey the instrument was programmed arithmetically into 10 equal window widths or channels. Ch<sub>0</sub>, Ch<sub>1</sub>, Ch<sub>2</sub>, Ch<sub>3</sub>, Ch<sub>4</sub>, Ch<sub>5</sub>, Ch<sub>6</sub>, Ch<sub>7</sub>, Ch<sub>8</sub>, Ch<sub>9</sub>, (Figure 3). These are recorded individually and summed up automatically to obtain the total chargeability. Similarly, the resistivity (R) in ohm-metres is also calculated automatically.



IP-6 RECEIVER PARAMETERS

Figure 3

The instrument parameters chosen for this survey were as follows:

Cycle Time ( $T_c$ )	= 8 secs.	Delay Time ( $T_D$ )	= 120 msec
Ratio (Time On) (Time Off)	= 1:1	Window Width ( $t_w$ )	= 90 msec
Duty Cycle Ratio (Time On) (Time On) + (Time Off)	= 0.5	Total Integration Time ( $T_p$ )	= 900 msec

## **6.0 SURVEY SPECIFICATIONS**

### **6.1 Ground Magnetometer Survey**

The magnetometer survey measurements were recorded at 12.5 metre station intervals. Due to the rugged nature of the terrain, it was not possible to maintain an equal distance between each of the lines. The distance between lines M1 and M3 is approximately 200 metres and the distance between lines M1 and M2 is approximately 350 metres.

### **6.2 Induced Polarization Survey**

The pole-dipole array was used for this survey, with the dipole length ( $x$ ) equal to 50 metres and measurements were recorded for  $n=1$  through 5. The current electrode ( $C_1$ ) was always located to the **south** of the potential measuring dipole ( $P_1P_2$ ) as depicted on each pseudo-section drawing.

## **7.0 DATA PROCESSING AND PRESENTATION**

The magnetic data collected in the field is merged with the base station data, downloaded to a field computer, automatically corrected and plotted in profile form on the pseudo-sections.

The IP data was processed at the end of each survey day using a Pentium laptop computer and a Fujitsu printer. In the Vancouver office, the data was transferred to a high-speed desktop computer coupled to an HP DesignJet colour plotter to make the final pseudo-sections. The numerical value obtained from a 15 point triangular filter applied consecutively at every station on each line is also plotted on the pseudo-sections.

The magnetic data are presented in profile form on a plan map. The IP data are presented on 3 pseudo-section drawings which, for easy reference, also includes the individual magnetic profiles. Both the plan map and the pseudo-sections, at a scale of 1:2500, and are located in the map pocket at the end of this report.

<b>Plan Map</b>	<b>Drawing No.</b>
Total Field Magnetic Profiles	02454 – M Mag

<b>Pseudo-Sections with Magnetic Profiles</b>	
Line M1	02454 – M1
Line M2	02454 – M2
Line M3	02454 - M3

## **8.0 DISCUSSION OF RESULTS**

The identification of a magnetic signature is often quite adequate in distinguishing between different rock types based largely on their magnetite content. In conjunction with geological mapping, this kind of interpretation can also be extended to identify geological structures such as folds and faults.

The writer has reviewed the aeromagnetic, ground magnetic and IP data from approximately 30 copper-gold and copper-gold-molybdenum porphyry deposits in British Columbia and the Yukon.

At the reconnaissance stage, the aeromagnetic data was often extremely useful in locating intrusive stocks and associated structural features for ground follow up. In the case of one porphyry deposit, a strong aeromagnetic high is superimposed almost exactly over a zone of strong potassic alteration, which contains abundant magnetite.

At the drilling stage of the individual deposits, the ground magnetic data was only as useful as the IP data in about 15% of the cases, whereas the IP data was much more useful than the ground magnetic data in the remaining 85% of the cases.

The Mex prospect has a strong magnetic component and it is more than likely that this magnetic component is spatially related to the distribution of sulphides in the porphyry system. Only drilling will prove or disprove this theory.

An IP response depends largely on the following factors:

- The volume content of sulphide minerals.
- The number of pore paths that are blocked by sulphide grains.
- The number of sulphide faces that are available for polarization.

- The absolute size and shape of the sulphide grains and the relationship of their size and shape to the size and shape of the available pore paths.
- The electrode array employed.
- The width, depth, thickness and strike length of the sulphide body and its location relative to the array.
- The resistivity contrast between the sulphide body and the barren host rock.

There are several critical factors that we would like to determine from IP field measurements made over a sulphide body. These are the sulphide content, the width, length, depth of burial and thickness of the body. Experience has shown that this is both difficult and unreliable because of the large number of variables, described above, which contribute to an IP response. The problem is further complicated by the fact that rocks containing magnetite, graphite, clay minerals and variably altered rocks produce IP responses of varying amplitudes.

It is difficult to resolve the actual position of multiple sulphide sources from a pseudo-section alone. Nevertheless, it is doubtful if any significant deposits have gone undiscovered, where drilling has been based largely on a complex pseudo-section.

During the 1990's, various research workers have developed special inversion software capable of generating realistic chargeability and resistivity models. While such models are often a good representation of the geological cross-section of a sulphide body, **they do not provide a unique solution, but rather a probable solution.** These models appear to be most useful for bodies of large lateral extent, for example porphyry deposits and less useful over smaller more confined bodies, for example massive sulphide deposits.

**Line M1**

This line was run along the ridge.

The magnetic data revealed a strong magnetic high, 1500 nT above background, 150 metres wide, lying between stations 125N and 275N. This magnetic high has been interpreted to represent a body dipping steeply to the northwest and containing +/- 15% magnetite. There are a number of smaller magnetic highs along this line generally reaching about 500 nT above background. The main magnetic high, centered at about 200N, is associated with a fairly isolated chargeability and resistivity high which peaks at about 225N.

There is a broad moderately high chargeability response, 450 metres wide, extending from station 600N to station 1050N. This anomaly is worthy of further exploration by drilling.

**Line M2**

This line was run along the valley bottom about 350 metres northeast of line M1.

The main magnetic anomaly is again centered at about 200N, but is only 400 to 500 nT above background. Over the remainder of this line the magnetic response is much more subdued than on line M1. This may be caused by more overburden cover than occurs along the ridge on line M1. Similarly, this overburden cover may account for the diminished response over the main magnetic anomaly centered at 200N.

There is a broad moderately high chargeability response, 800 metres wide, extending from about station 175N to station 975N. The resistivity response suggests that the overburden cover is not too thick.

### **Line M3**

This line was run along the side hill about 200 metres southwest of line M1.

The magnetic data again revealed a strong magnetic high, 1500nT above background, 100 metres wide, extending from station 175N to station 275N. On this line the moderate chargeability high is only about 200 metres wide, extending from station 150N to station 350N, and correlating with the main magnetic high. This data is, therefore, less interesting than the data obtained on lines M1 and M2.

## **9.0 CONCLUSIONS AND RECOMMENDATIONS**

From a study of the geophysical data described in this report, it has been concluded that:

- The magnetic survey outlined a magnetite bearing body 100 to 150 metres wide, striking roughly northeast-southwest, dipping steeply northwest and open along strike in both directions.
- The IP survey **partially** delineated a moderately high chargeability anomaly, which may indicate the presence of a copper-gold sulphide system beneath the gossanous cap.

It is recommended that additional IP and magnetometer survey lines be established in an effort to close off the IP and magnetic anomalies. However, in view of the very rugged terrain in the immediate vicinity of the prospect, it may not be possible to establish an all-encompassing grid for this purpose.



Finally it is recommended that 3 holes be drilled to test the IP anomaly overlying the gossanous cap on line M1.

Line No.	Station No.	Dip of Hole	Depth of Hole (m)
M1	200N	Vertical	150
M2	650N	Vertical	150
M3	850N	Vertical	150

Respectfully submitted,

**LLOYD GEOPHYSICS INC.**



**John Lloyd, M.Sc., P.Eng.**

Senior Geophysicist

**APPENDICES**

## **APPENDIX A**

### **COST OF THE SURVEYS**

Lloyd Geophysics contracted the acquisition of the magnetic data on a per kilometre basis and the IP data on a per diem basis. Data processing, computer plotting, consumables, reprographics, interpretation and report writing were additional costs:

• Magnetic and IP Data Acquisition	\$4,775.00
• Data Processing and Computer Plotting	488.75
• Consumables and Reprographics	325.47
• Interpretation and Report Writing	1,500.00
Sub Total	7,089.22
GST 7%	496.25
<b>TOTAL COST</b>	<b>\$7,585.47</b>

**APPENDIX B**

**CERTIFICATION OF THE AUTHOR**

I, John Lloyd of 805 – 4438 West 10<sup>th</sup> Avenue, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

I graduated from the University of Liverpool, England in 1960 with a B.Sc. in Physics and Geology, Geophysics Option.

I obtained the diploma of the Imperial College of Science, Technology and Medicine (D.I.C.) in Applied Geophysics from the Royal School of Mines, London University in 1961.

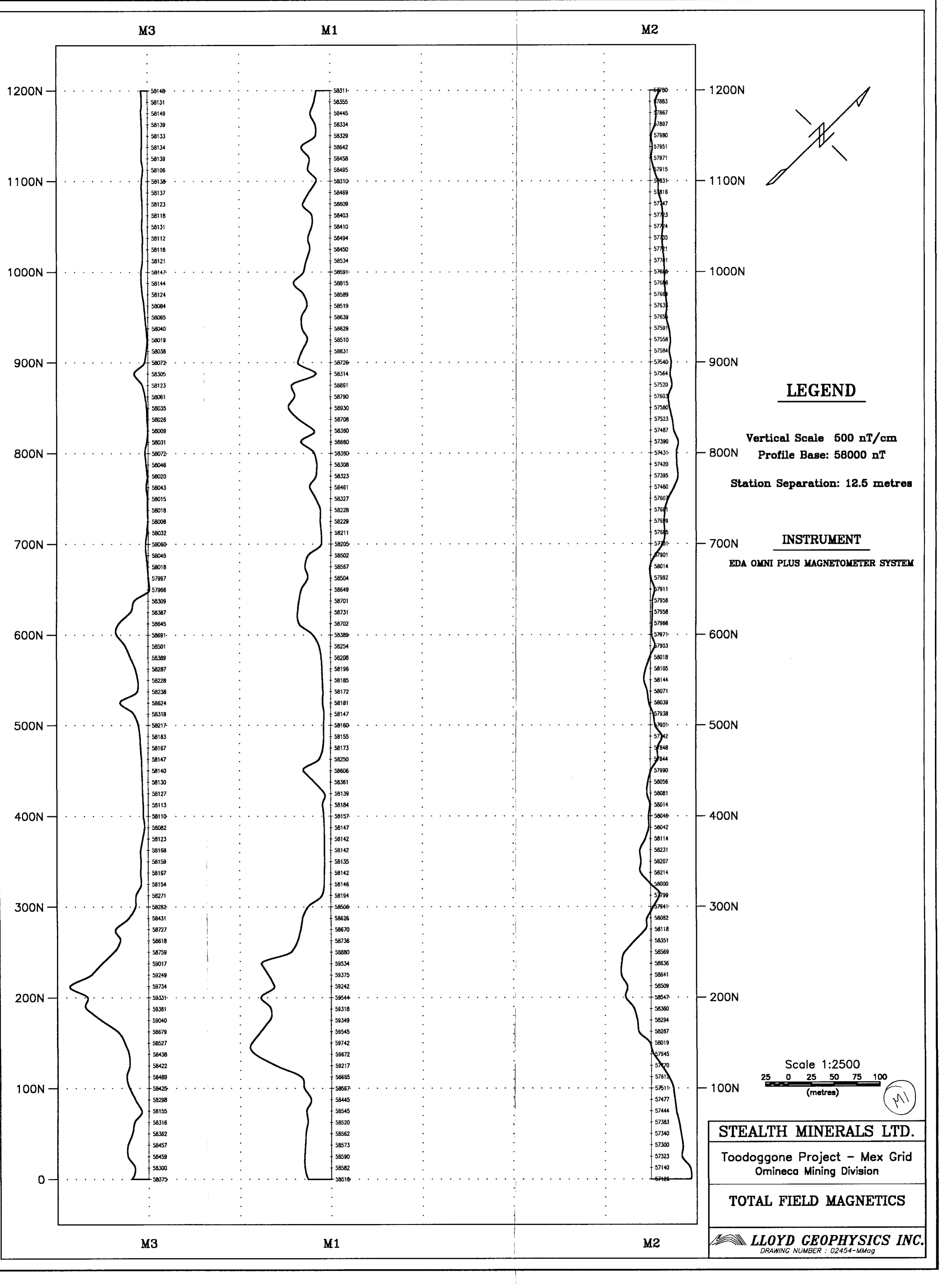
I obtained the degree of M.Sc. in Geophysics from the Royal School of Mines, London University in 1962.

I am a member in good standing of the Association of Professional Engineers in the Province of British Columbia, the Society of Exploration Geophysicists of America, the European Association of Exploration Geophysicists and the Canadian Institute of Mining and Metallurgy.

I have been practicing my profession for over thirty-five years.

Vancouver, B.C.

November 2002



1200N  
1100N  
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300N  
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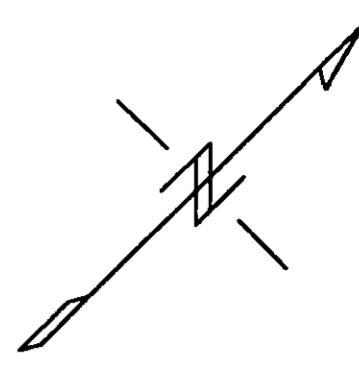
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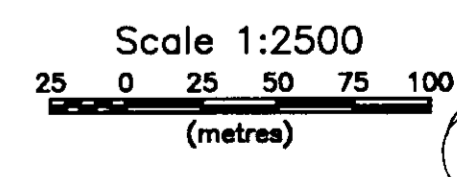
**LEGEND**

Vertical Scale 500 nT/cm  
Profile Base: 58000 nT

Station Separation: 12.5 metres

**INSTRUMENT**

EDA OMNI PLUS MAGNETOMETER SYSTEM



**STEALTH MINERALS LTD.**  
Toodoggone Project - Mex Grid  
Omineca Mining Division

**TOTAL FIELD MAGNETICS**

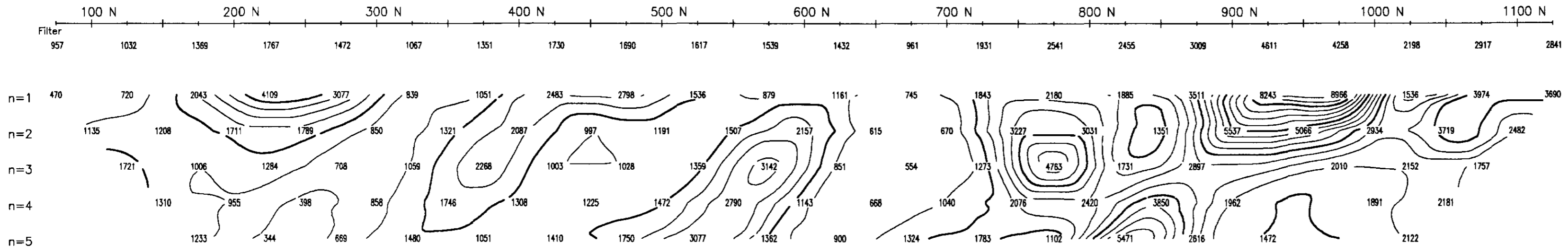
**LLOYD GEOPHYSICS INC.**  
DRAWING NUMBER : 02454-MMag

M3

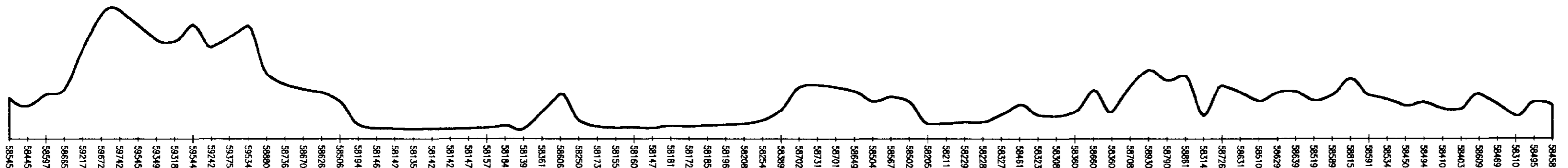
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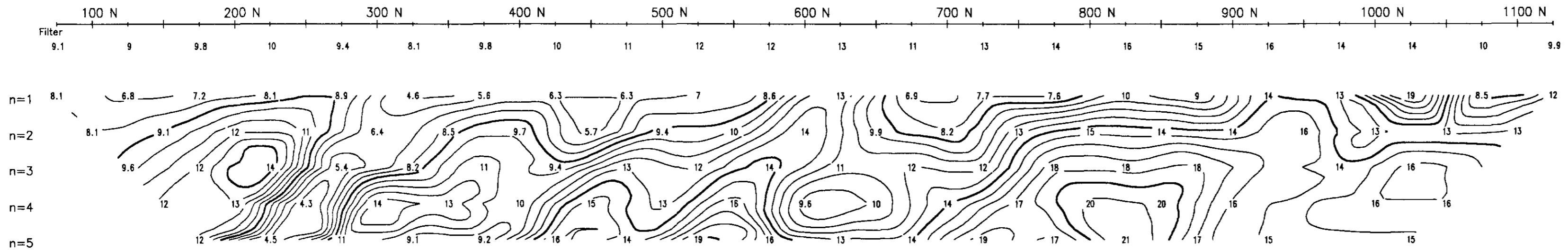
RESISTIVITY (ohm-m)



TOTAL FIELD MAGNETICS (nT)

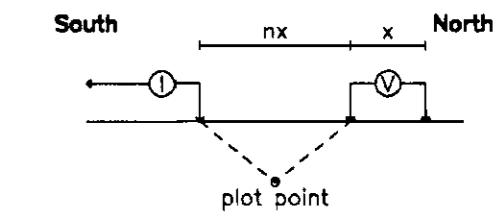


CHARGEABILITY (msec)

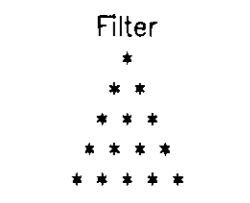


RESISTIVITY (ohm-m)

**LINE: M1**  
**Pole-Dipole Array**



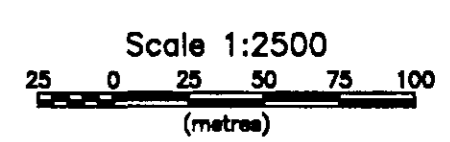
x = 50 M n = 1 - 5  
 Current electrode south of potential dipole



TOTAL FIELD MAGNETICS (nT)

CHARGEABILITY (msec)

**CONTOUR INTERVALS**  
 RESISTIVITY: 500 (ohm-m)  
 CHARGEABILITY: 1.0 (msec)  
 Surveyed: September, 2002  
 TX: Huntec Mk II Model 7500  
 RX: Iris Instruments ELREC-6

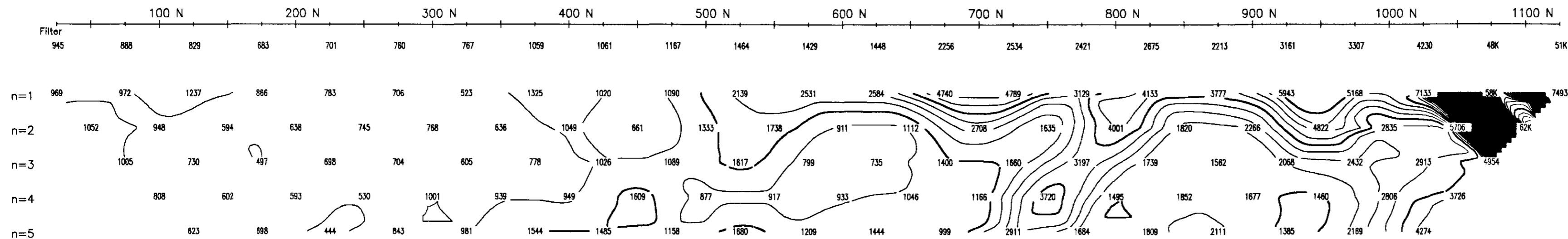


**STEALTH MINERALS LTD.**  
 Toodoggone Project - Mex Grid  
 Omineca Mining Division

**INDUCED POLARIZATION PSEUDOSECTION WITH MAGNETIC PROFILE**

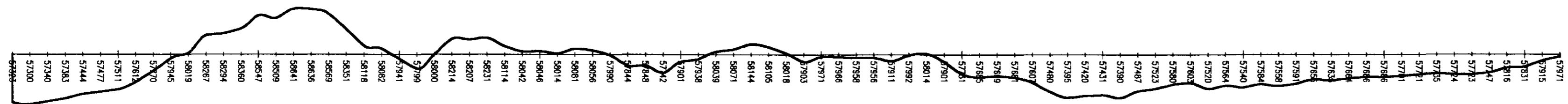
**LLOYD GEOPHYSICS INC.**  
 DRAWING NUMBER : 02454-M1

RESISTIVITY  
(ohm-m)



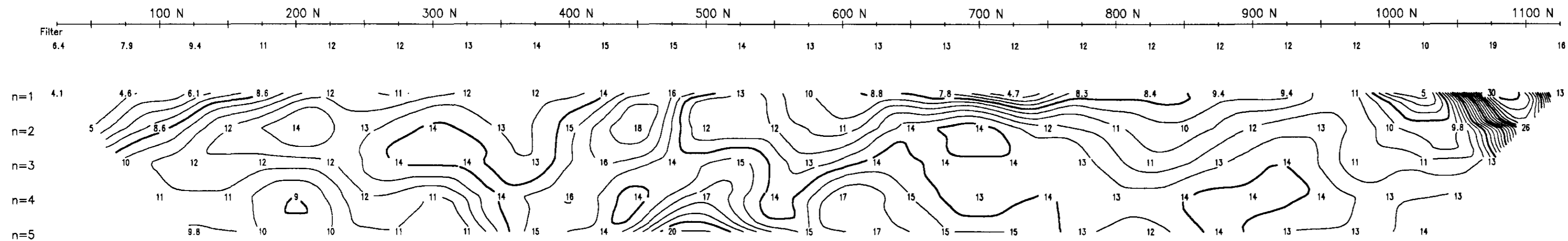
RESISTIVITY  
(ohm-m)

TOTAL FIELD  
MAGNETICS (nT)



TOTAL FIELD  
MAGNETICS (nT)

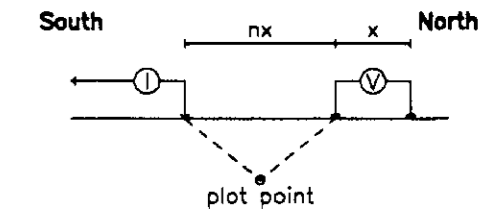
CHARGEABILITY  
(msec)



CHARGEABILITY  
(msec)

# LINE: M2

## Pole-Dipole Array



x = 50 M n = 1 - 5

Current electrode south  
of potential dipole

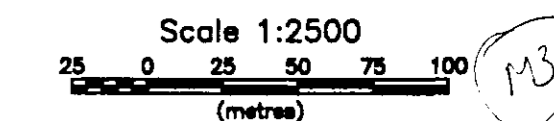
Filter  
\*  
\*\*  
\*\*\*  
\*\*\*\*  
\*\*\*\*\*

### CONTOUR INTERVALS

RESISTIVITY: 500 (ohm-m)  
CHARGEABILITY: 1.0 (msec)

Surveyed : September, 2002

TX : Huntec Mk II Model 7500  
RX : Iris Instruments ELREC-6



## STEALTH MINERALS LTD.

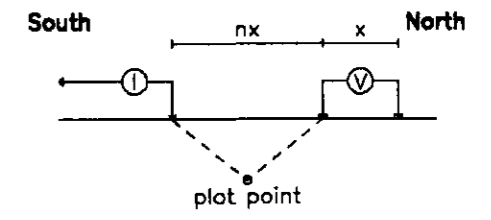
Toodoggone Project - Mex Grid  
Omineca Mining Division

### INDUCED POLARIZATION PSEDOSECTION WITH MAGNETIC PROFILE

**LLOYD GEOPHYSICS INC.**  
DRAWING NUMBER : 02454-M2

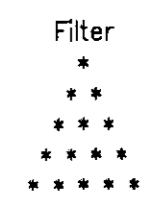
# LINE: M3

## Pole-Dipole Array



x = 50 M    n = 1 - 5

Current electrode south of potential dipole

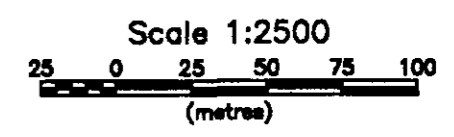


### CONTOUR INTERVALS

RESISTIVITY: 500 (ohm-m)  
CHARGEABILITY: 1.0 (msec)

Surveyed : September, 2002

TX : Huntec Mk II Model 7500  
RX : Iris Instruments ELREC-6



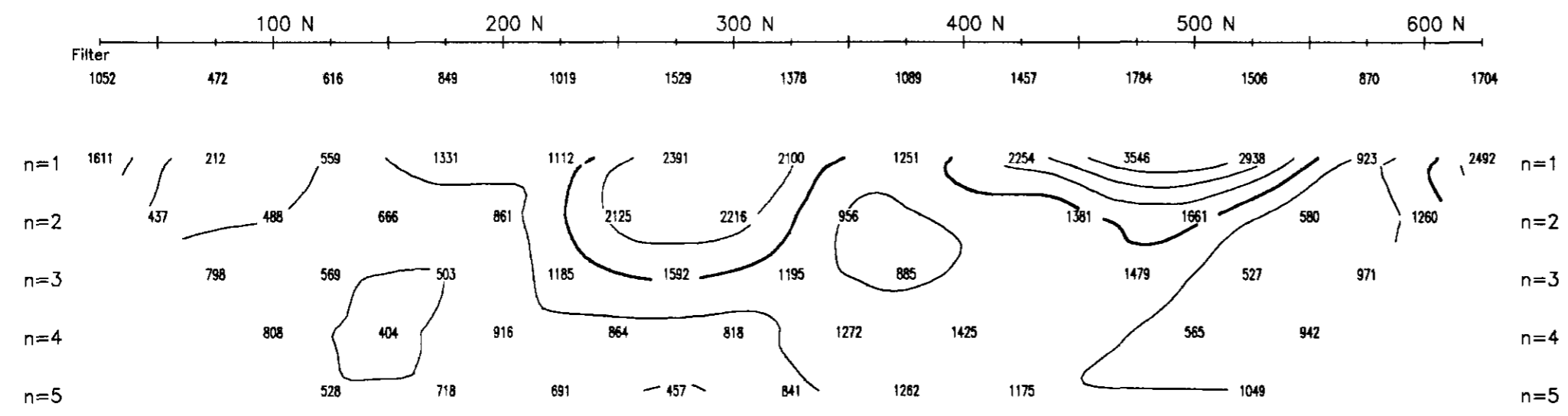
## STEALTH MINERALS LTD.

Toodoggone Project - Mex Grid  
Omineca Mining Division

### INDUCED POLARIZATION PSEDOSECTION WITH MAGNETIC PROFILE

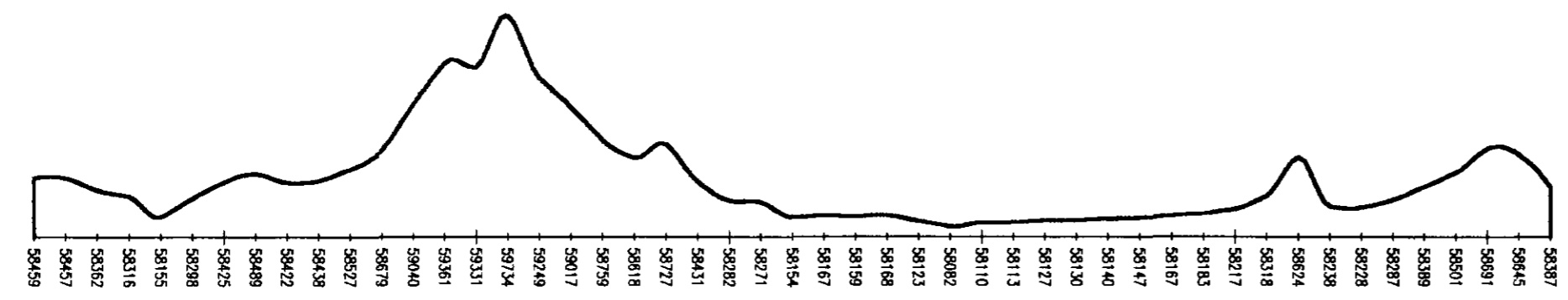
**LLOYD GEOPHYSICS INC.**  
DRAWING NUMBER : 02454-M3

RESISTIVITY (ohm-m)



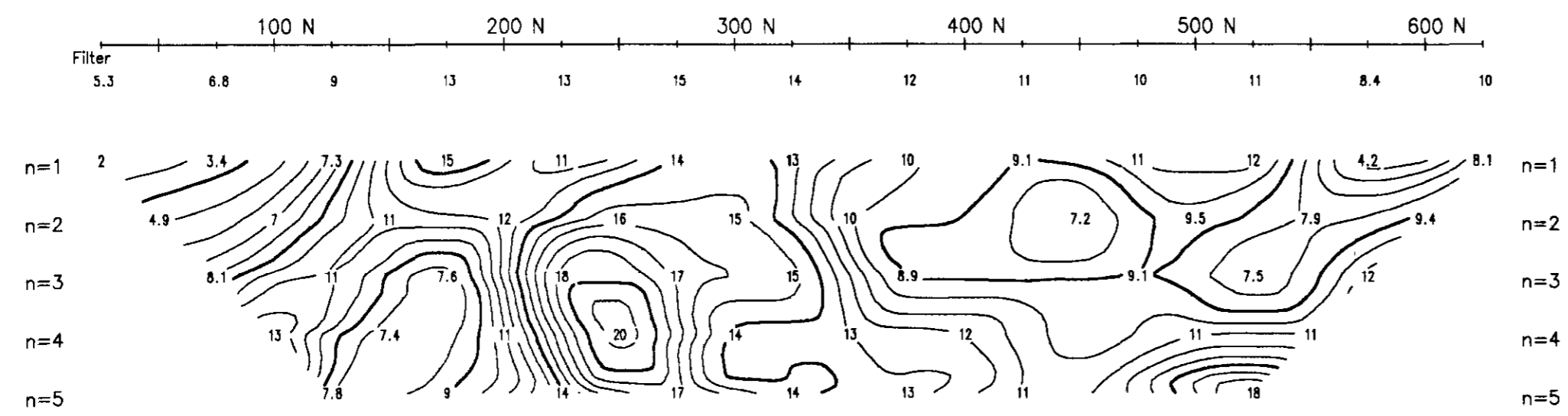
RESISTIVITY (ohm-m)

TOTAL FIELD MAGNETICS (nT)



TOTAL FIELD MAGNETICS (nT)

CHARGEABILITY (msec)



CHARGEABILITY (msec)