2.17819

GEOPHYSICAL REPORT
FOR
FALCONBRIDGE LIMITED
ON
GRID 96-15
MANN BELT PROJECT
8278
MANN TOWNSHIP
PORCUPINE MINING DIVISION
NORTHEASTERN ONTARIO

Prepared by: A. Lambert

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INTRODUCTION

The services of Northwest Geophysics Limited were retained by Falconbridge Limited to complete a geophysical program on Grid 96-15, located in Mann Township within the Porcupine Mining Division, District of Cochrane, Northeastern, Ontario (Fig. 1).

The purpose of this program was to test the property for geological structures which would be favourable areas for base metal deposition.

The geophysical program was completed on October 26, 1996.

This report will deal with the results of the program as well as conclusions and follow up recommendations.

LOCATION AND ACCESS

Grid #96-15 is located in the central part of Mann Township, Porcupine Mining Division, District of Cochrane, Northeastern Ontario (Fig. 2). This grid is the northern extension of Grid Mann 96-11 covered under separate report by J. Grant of Exsics Exploration.

Access to the property was ideal during the survey period. A network of logging roads extends west from Highway 11 through Newmarket Township and throughout Mann Township. As these are not allweather roads, a snowmobile is required during the winter months.

CLAIM GROUP

The claim which contains Grid 96-15 is as follows:

P-1200908 (15 units) Refer to Figure 2.

PERSONNEL

The field crew directly involved with collecting the survey data were as follows:

Mike Milani	- Thunder Bay, Ontario
Sinclair James	- Thunder Bay, Ontario

The geophysical program was carried out under the direct supervision of Alfred Lambert. The plotting and computer compilation was completed by Paul Nielsen and Alfred Lambert of Northwest Geophysics Limited.

GEOPHYSICAL PROGRAM

The program consisted of a Total Field Magnetic survey being done in conjunction with a Horizontal Loop Electromagnetic (HLEM), survey.

MAGNETIC SURVEY

This survey was completed using the EDA OMNI IV System. Specifications for this instrument can be found as Appendix A of this report. The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Station Record Interval	-12.5 meters
Diurnal Correction Method	-base station recorder
Base Station Record Interval	-30 sec reading interval
Unit Accuracy	- +/- 0.5 gammas
Reference Field	- 58,560 gammas
Datum Subtraction	- 59,000 gammas

The data was then corrected for diurnal variations, a base level of 59,000 gammas was removed from each reading, and the resultant data was plotted directly onto a vellum base map at a scale of 1:5,000. The data was then contoured at 50 gamma intervals wherever possible.

Copies of the contoured map and numbers are included in the back pocket of this report.

HLEM SURVEY

This survey was completed using the Apex Parametrics MaxMin I System. Specifications for this instrument can be found as Appendix B of this report.

The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Reading Interval	-25 meters
Coil Separation	-150 meters
Theoretical Search Depth	-0.5 coil separation
Frequencies Recorded	-440 Hz, 1760Hz
Parameters Measured	-inphase and quadrature components of the secondary field
Unit Accuracy	- +/- 0.5%

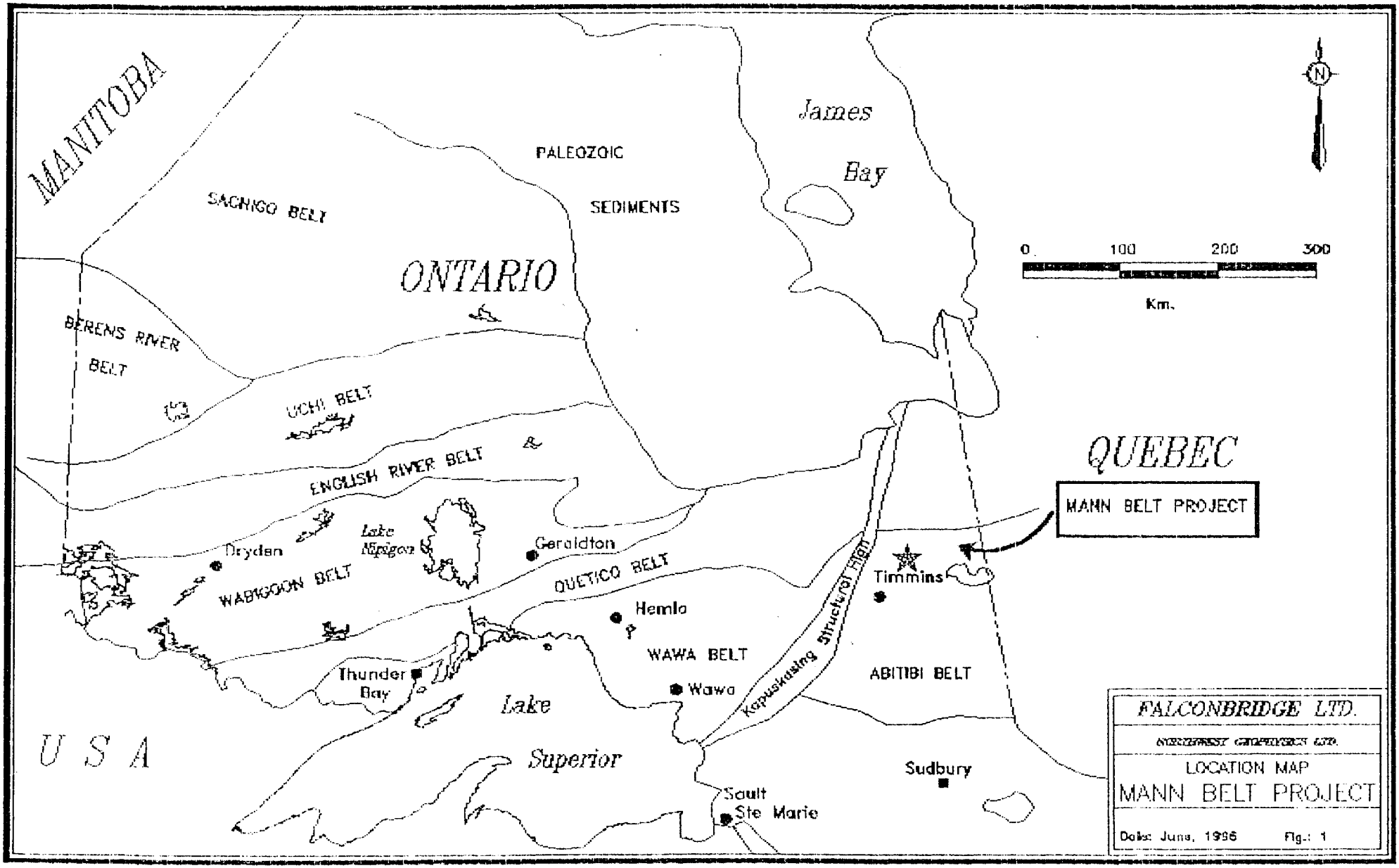
The collected data was then plotted onto a vellum base map, one map for each frequency, at a scale of 1:5000. The data was then profiled at 1cm to 20%. A copy of these base maps are included in the back pocket of this report.

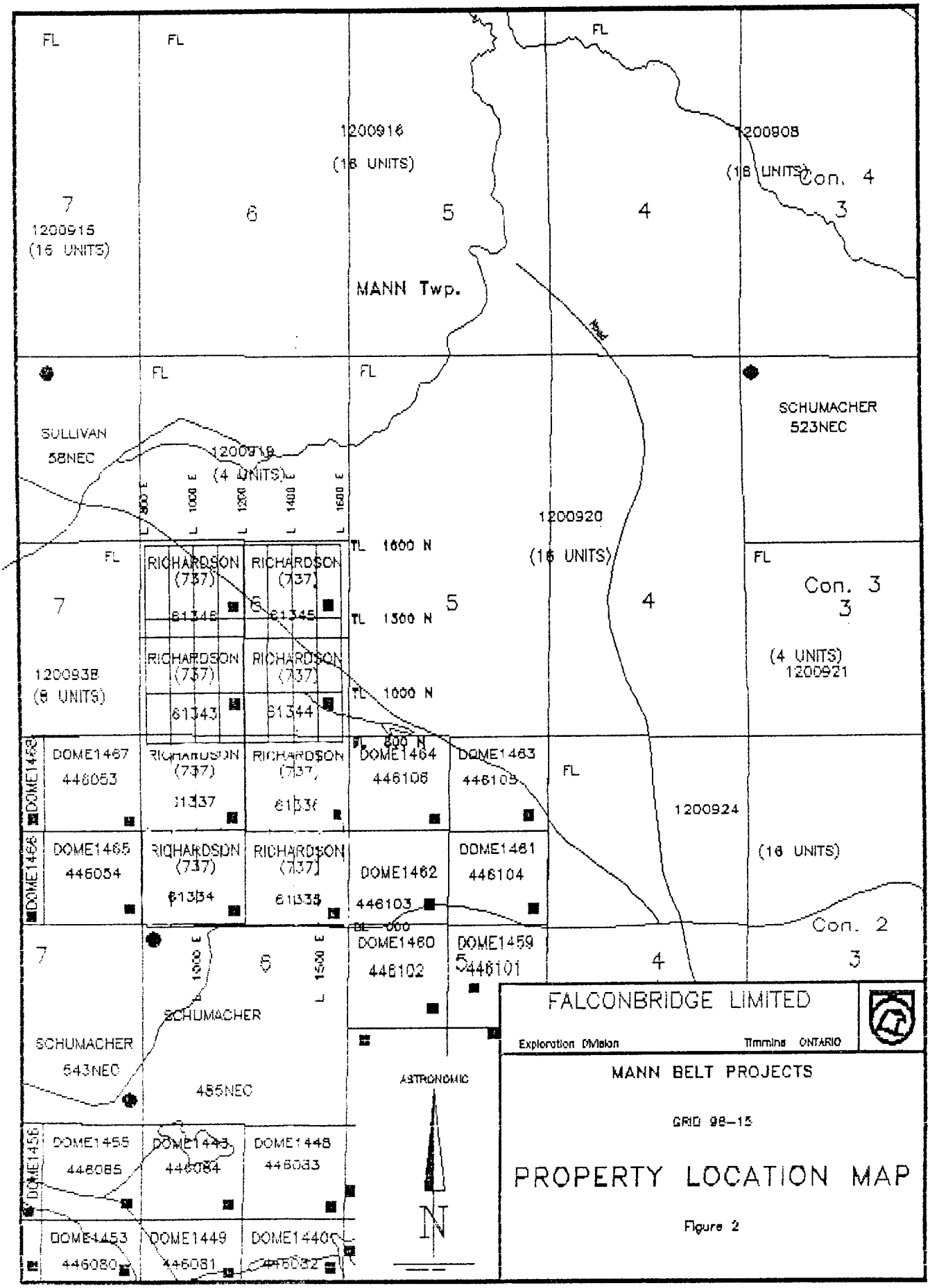
SURVEY RESULTS

The Maxmin HLEM survey detected three weak responses on the high frequency. These are located at 1600N,1060E 1300N 1275E and and 1000n,1075E. Coincident magnetic lows indicate that these responses may caused by a fault zone. The three conductors are non-responsive on the low frequency and would therefore be characterized as low priority anomalies.

CONCLUSIONS AND RECOMMENDATIONS

The surveys were successful in locating three poorly conductive zones. The results of this survey should be integrated with other work carried out on this property and then future exploration plans can be made.


MANITOBA
James Bay
PALEOZOIC SEDIMENTS
SACHIGO BELT
ONTARIO
BERENS RIVER BELT
UCHI BELT
ENGLISH RIVER BELT
QUEBEC
MANN BELT PROJECT
Lake Nipigon
Dryden
Geraldton
WABIGOON BELT
QUETICO BELT
Timmins
Hemlo
WAWA BELT
ABITIBI BELT
Kapuskasing structural zone
Thunder Bay
Wawa
Lake Superior
U S A
Sudbury
Sault Ste Marie
0 100 200 300
Km.
FALCONBRIDGE LTD.
NORTHWEST GEOPHYSICS LTD.
LOCATION MAP
MANN BELT PROJECT
Date: June, 1996 Fig.: 1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1200916
(16 UNITS)
1200908
(16 UNITS)
Con. 4
7
1200915
(16 UNITS)
6
5
4
3
MANN Twp.
SULLIVAN
58NEC
1200919
(4 UNITS)
SCHUMACHER
523NEC
1200920
(16 UNITS)
Con. 3
(4 UNITS)
1200921
1200938
(8 UNITS)
TL 1600 N
TL 1300 N
TL 1000 N
TL 800 N
RICHARDSON (737)
61345
61343
61344
DOME1467
446053
DOME1464
446106
DOME1463
446105
1200924
(16 UNITS)
DOME1465
446054
DOME1462
446103
DOME1461
446104
Con. 2
DOME1460
446102
DOME1459
446101
SCHUMACHER
543NEC
455NEC
DOME1455
446085
DOME1448
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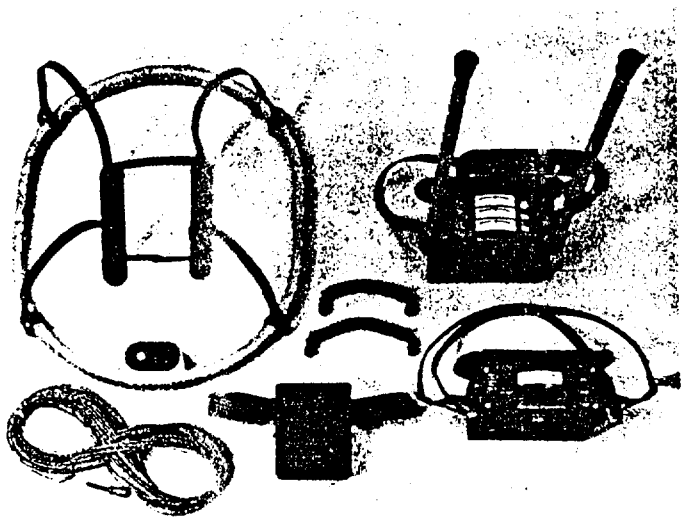
DOME1453
446080
DOME1449
446081
ASTRONOMIC
N
FALCONBRIDGE LIMITED
Exploration Division
Timmins ONTARIO
MANN BELT PROJECTS
GRID 98-15
PROPERTY LOCATION MAP
Figure 2



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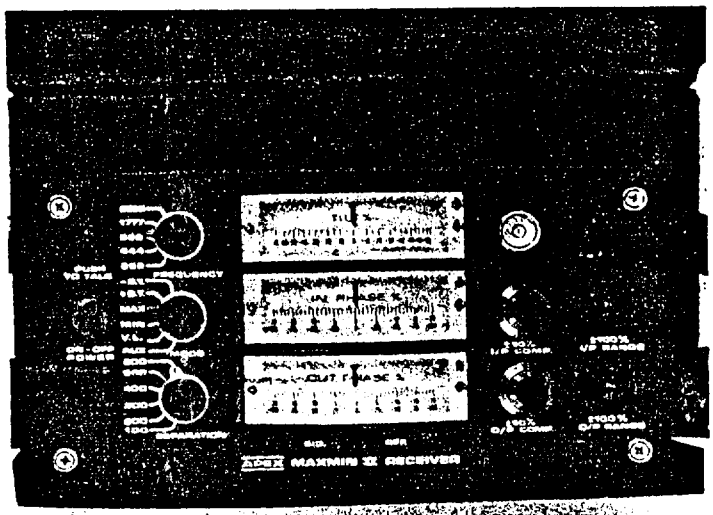

not exactly as illustrated

SPECIFICATIONS: with new 50/60Hz powerline filter and with improved spherics filter.

Frequencies: 110, 220, 440, 880, 1760, 3520, 7040, 14080Hz + 50/60Hz powerline freq.

Modes of Operation:

MAX1 Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.

MAX2=VERT. COPLANAR LOOP MODE.

MIN1 Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.

MAX3=VERT. COAXIAL LOOP MODE.

MIN2: Tx coil plane vertical, Rx coil plane horizontal. Use of Min1+Min2 allows cancellation of topography.

Coil Separations: 25,50,75,100,125,150,200,250,300, 400&500M, or 100,200,300,400,500,600,800,1000, 1200,1600 & 2000ft, or 20,40,60,80,100,120, 160,200,240,320 & 400M, switch selectable.

Parameters Read:
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Total field and/or dip-angles in % with 50/60Hz powerline mode.

Readouts:
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Field strength on IP meter and dips in % on tilt meter when using 50/60 Hz powerlines.

Scale Ranges:

In-Phase: ±20%, ±100% &±4% F.S.

Quadrature: ±20%, ±100% &±4% F.S.

Tilt: ±75% slope.

Null (V.L): Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.1 % to 0.5% ; Tilt: 1%.

Repeatability: ±0.1 % to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:

110Hz:	250Atm^2,	3520Hz:	90
220Hz:	245	7040Hz:	45
440Hz:	240	14080Hz:	23
880Hz:	230	50/60Hz:	N/A
1760Hz:	180		

Receiver Batteries: 9V trans. radio type batteries (4). Life: approx. 35hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 13 Ah Gel-type rechargeable battery. (Chargers supplied).

Reference Cable: Light weight 2-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warming lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (14 lbs.)

Transmitter Weight: 15kg (32 lbs.)

Shipping Weight: Typically 80 kg (176 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

Equipped with interface and controls for direct plug-in of KTP-84 data acquisition unit.

APEX PARAMETRICS LIMITED
P.O. BOX 818, RR#1, UXBRIDGE, ONTARIO, CANADA L0C 1K0

Phone: (416) 852-5875 Cables: APEXPARA TORONTO Telex: 06-966625 APEXPARA UXB

Specifications

Dynamic Range	18,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	± 0.02 gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6 000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.8 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation - standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation - optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

E D A Instruments Inc.
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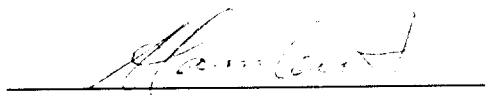
Telex: 06 23222 EDA TOR
Cable: Instruments Toron
(416) 425 7800

In U.S.A.
E D A Instruments Inc.
5151 Ward Road
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422 9112

Printed in Canada

CERTIFICATE

I, Alfred J. Lambert of Thunder Bay, Ontario, hereby certify that I am a 1968 graduate geological technician from Cambrian College, Sault Ste. Marie, Ontario. I have been employed in the Canadian mining exploration industry since that time. I have no interest, direct or indirect, nor do I expect to receive any in this property or any of Falconbridge Limited's other holdings.



A. J. Lambert

GEOPHYSICAL REPORT
FOR
FALCONBRIDGE LIMITED
ON
GRID 96-16
MANN BELT PROJECT
8269
MANN TOWNSHIP
PORCUPINE MINING DIVISION
NORTHEASTERN ONTARIO

Prepared by: A. Lambert

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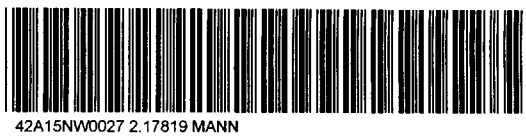


INTRODUCTION

The services of Northwest Geophysics Limited were retained by Falconbridge Limited to complete a geophysical program on Grid 96-16, located in Mann Township within the Porcupine Mining Division, District of Cochrane, Northeastern, Ontario (Fig. 1).

The purpose of this program was to test the property for geological structures which would be favourable areas for base metal deposition.

The geophysical program was completed on October 22, 1996.

This report will deal with the results of the program as well as conclusions and follow up recommendations.

LOCATION AND ACCESS

Grid #96-16 is located in the northeastern part of Mann Township, Porcupine Mining Division, District of Cochrane, Northeastern Ontario (Fig. 2).

Access to the property was ideal during the survey period. A network of logging roads extends west from Highway 11 through Newmarket Township and throughout Mann Township. As these are not allweather roads, a snowmobile is required during the winter months.

CLAIM GROUP

The claim which contains Grid 96-16 is as follows:

P-1200908 Refer to Figure 2.

PERSONNEL

The field crew directly involved with collecting the survey data were as follows:

Mike Milani - Thunder Bay, Ontario
Sinclair James - Thunder Bay, Ontario

The geophysical program was carried out under the direct supervision of Alfred Lambert. The plotting and computer compilation was completed by Paul Nielsen and Alfred Lambert of Northwest Geophysics Limited.

GEOPHYSICAL PROGRAM

The program consisted of a Total Field Magnetic survey being done in conjunction with a Horizontal Loop Electromagnetic (HLEM), survey. These surveys were followed up with a Time Domain EM Survey.

MAGNETIC SURVEY

This survey was completed using the EDA OMNI IV System. Specifications for this instrument can be found as Appendix A of this report. The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Station Record Interval	-12.5 meters
Diurnal Correction Method	-base station recorder
Base Station Record Interval	-30 sec reading interval
Unit Accuracy	- +/- 0.5 gammas
Reference Field	- 58,560 gammas
Datum Subtraction	- 59,000 gammas

The data was then corrected for diurnal variations, a base level of 59,000 gammas was removed from each reading, and the resultant data was plotted directly onto a vellum base map at a scale of 1:5,000. The data was then contoured at 100gamma intervals wherever possible.

Copies of the contoured map and numbers are included in the back pocket of this report.

HLEM SURVEY

This survey was completed using the Apex Parametrics MaxMin I System. Specifications for this instrument can be found as Appendix B of this report.

The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Reading Interval	-25 meters
Coil Separation	-150 meters
Theoretical Search Depth	-0.5 coil separation
Frequencies Recorded	-440 Hz, 1760Hz
Parameters Measured	-inphase and quadrature components of the secondary field
Unit Accuracy	- +/- 0.5%

The collected data was then plotted onto a vellum base map, one map for each frequency, at a scale of 1:5000. The data was then profiled at 1cm to 20%. A copy of these base maps are included in the back pocket of this report.

TDEM SURVEY

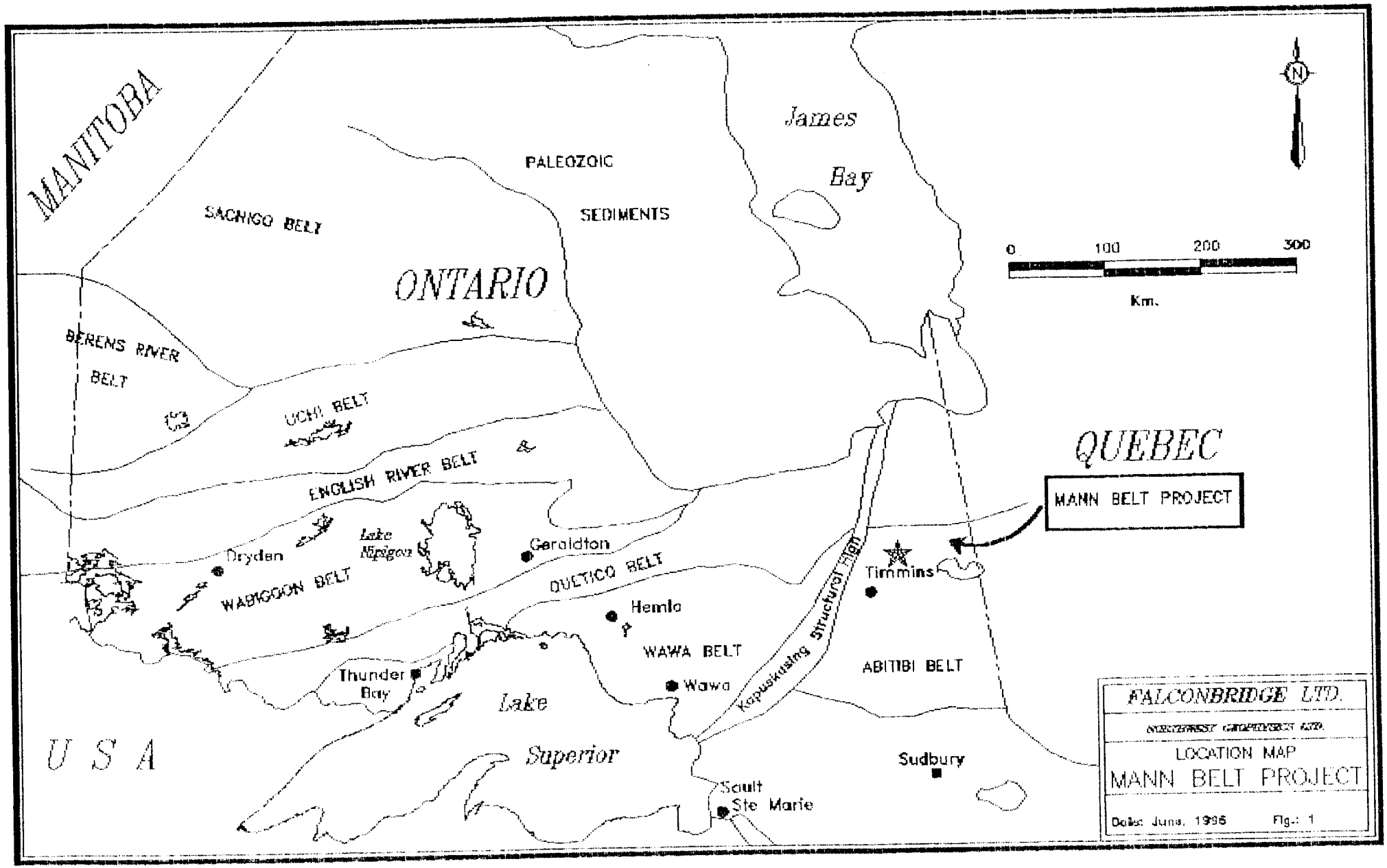
The Time Domain survey was done with a Geonics EM 37 transmitter in conjuntion with a Geonics EM 57 Reciever. System specifications for this equipment are given in Appendix 3. The results of this survey have been plotted both as contours and profiles and are included in the back of this report.

SURVEY RESULTS

The HLEM and TDEM surveys were not successful in locating any electomagnetic anomalies.

CONCLUSIONS AND RECOMMENDATIONS

The results of this program should be integrated with previous work in this area to determine if further exploration is warranted.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PALEOZOIC
SEDIMENTS
SACHIGO BELT
James
Bay
ONTARIO
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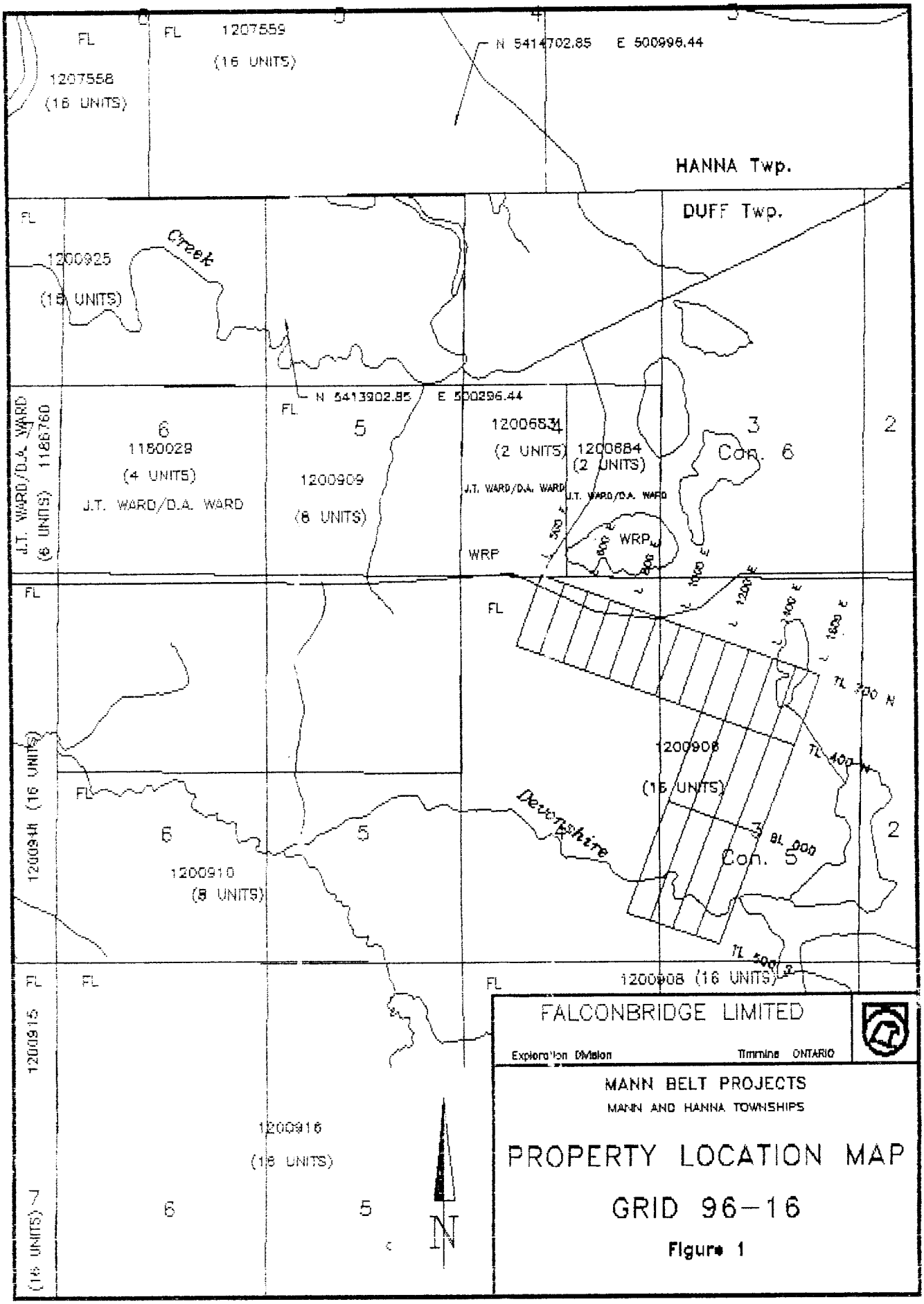
BERENS RIVER
BELT
UCHI BELT
ENGLISH RIVER BELT
QUEBEC
MANN BELT PROJECT
Lake
Nipigon
Geraldton
Dryden
WABIGOON BELT
QUETICO BELT
Timmins
Hemlo
WAWA BELT
Kapuskasing structural zone
ABITIBI BELT
Thunder
Bay
Lake
Wawa
Superior
U S A
Sudbury
Sault
Ste Marie
FALCONBRIDGE LTD.
LOCATION MAP
MANN BELT PROJECT
Date: June, 1996
Fig.: 1



FALCONBRIDGE LIMITED

Exploration Division — Timmins ONTARIO

MANN BELT PROJECTS

MANN AND HANNA TOWNSHIPS

PROPERTY LOCATION MAP

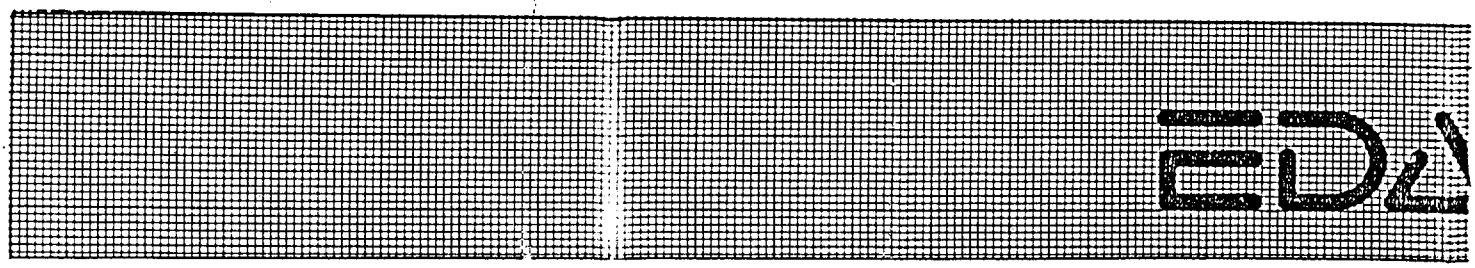
GRID 96–16

Figure 1

CERTIFICATE

I, Alfred J. Lambert of Thunder Bay, Ontario, hereby certify that I am a 1968 graduate geological technician from Cambrian College, Sault Ste. Marie, Ontario. I have been employed in the Canadian mining exploration industry since that time. I have no interest, direct or indirect, nor do I expect to receive any in this property or any of Falconbridge Limited's other holdings.

A. J. Lambert



Specifications

Dynamic Range	8,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit when exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	± 0.02 gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6 000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.8 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation - standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation - optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

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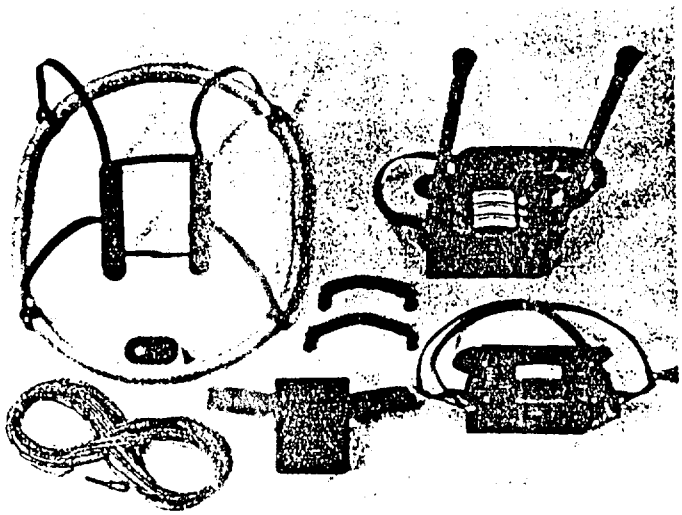
Printed in Canada



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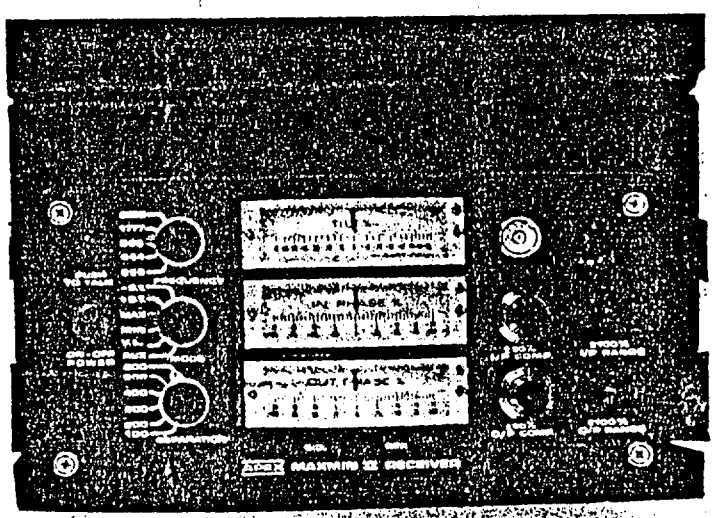


not exactly as illustrated

SPECIFICATIONS: with new 50/60Hz powerline filter and with improved spherics filter.

Frequencies: 110,220,440,880,1760,3520,7040, 14080Hz + 50/60Hz powerline freq.

Modes of Operation: MAX1 Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.

MAX2=VERT. COPLANAR LOOP MODE.

MAX3=VERT. COAXIAL LOOP MODE.

MIN1 Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.

MIN2: Tx coil plane vertical, Rx coil plane horizontal. Use of Min1+Min2 allows cancellation of topography

Coil Separations: 25,50,75,100,125,150,200,250,300, 400&500M, or 100,200,300,400,500,600,800,1000, 1200,1600 & 2000M, or 20,40,60,80,100,120, 160,200,240,320 & 400M, switch selectable.

Parameters Read: In-Phase and Quadrature components of the secondary field in MAX and MIN modes. Total field and/or dip-angles in % with 50/60Hz powerline mode.

Readouts: Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary. Field strength on IP meter and dips in % on tilt meter when using 50/60 Hz powerlines.

Scale Ranges: In-Phase: ±20%, ±100% &±4% F.S.

Quadrature: ±20%, ±100% &±4% F.S.

Tilt: ±75% slope.

Null (V.L): Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.1 % to 0.5% ; Tilt: 1%.

Repeatability: ±0.1 % to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:

110Hz:	250Atm^2	3520Hz:	90
220Hz:	245	7040Hz:	45
440Hz:	240	14080Hz:	23
880Hz:	230	50/60Hz:	N/A
1760Hz:	180		

Receiver Batteries: 9V trans. radio type batteries (4). Life: approx. 35hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 13 Ah Gel-type rechargeable battery. (Chargers supplied).

Reference Cable: Light weight 2-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warning lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (14 lbs.)

Transmitter Weight: 15kg (32 lbs.)

Shipping Weight: Typically 80 kg (176 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

Shipped with interface and controls for direct plug-in of KTP-84 data acquisition unit.

APEX PARAMETRICS LIMITED
P.O. BOX 818, RR#1, UXBRIDGE, ONTARIO, CANADA L0C 1K0

Phone: (416) 852-5875 Cables: APEXPARA TORONTO Telex: 06-966625 APEXPARA UXB

K) TECHNICAL SPECIFICATIONS

PROTEM DIGITAL RECEIVER

TECHNICAL SPECIFICATIONS

Measured Quantity		:	Time rate of decay of magnetic flux along 3 axes.
Sensors	1. (L.F.)	:	Air-cored coil of bandwidth 60 kHz; 100 cm diameter.
	2. (H.F.)	:	Air-cored coil of bandwidth 1200 kHz; 100 cm diameter.
	3. (3D-3)	:	Three orthogonal component sensor; simultaneous operation.
	4. (3D-1)	:	Three orthogonal component sensor; sequential operation.
Time Channels		:	20 geometrically spaced time gates for each base frequency gives range from 6 μs to 800 ms.
Repetition Rate (Base Frequency)		:	0.3 Hz, 0.75 Hz, 3 Hz, 7.5 Hz, 30 Hz, 75 Hz or 285 Hz for countries using 60 Hz power line frequency. 0.25 Hz, 0.625 Hz, 2.5 Hz, 6.25 Hz, 25 Hz, 62.5 Hz or 237.5 Hz for countries using 50 Hz power line frequency.
Synchronization		:	(1) Reference cable. (2) High stability quartz crystal (optional).
Integration Time		:	2, 4, 8, 15, 30, 60, 120, 240 sec.
Calibration		:	Internal self calibration External Q coil calibration (optional).
Keyboards		:	Two 3 x 4 matrix sealed key pads with positive tactile feedback.
Gain		:	Automatic or manual control.
Dynamic Range		:	23 bits (132 dB).
Display Quantity		:	(1) Table of time rate of decay of magnetic flux (dB/dt) (2) Curve of rate of decay of magnetic flux (dB/dt) (3) Table of apparent resistivity (ρ_a) (4) Curve of apparent resistivity (ρ_a) (5) Profile of dB/dt (6) Real time noise monitor (7) Calibration curve (8) Data acquisition statistics (real time)

Storage	:	Solid state memory with capacity for 3300 data sets.
Display	:	8 lines x 40 characters (240 x 64 dot) graphic LCD.
Data Transfer	:	Standard RS-232 communication port.
Processor	:	CMOS 68HC000 8 MHz CPU
Receiver Battery	:	12 volts rechargeable battery for 8 hours continuous operation. 6 hours in XTAL mode.
Receiver Size	:	34 x 38 x 27 cm.
Receiver Weight	:	15 kg.
Operating Temperature	:	-40°C to +50°C.

Note: The PROTEM Digital Receiver can be used with all three Geonics transmitters - TEM47, TEM57 and TEM37.

GEONICS PROTEM EM SYSTEM

TEM37 TRANSMITTER

TECHNICAL SPECIFICATIONS

Current Waveform	:	Bipolar rectangular current with 50% duty cycle.
Repetition Rate	:	? Hz, 7.5 Hz or 30 Hz - in countries using 60 Hz power line frequency;
	:	2.5 Hz, 6.25 Hz or 25 Hz - in countries using 50 Hz power power line frequency.
Turn-Off Time	:	300 µs at 20 amps into 300 x 600 loop. Decreases proportionally with current and transmitter loop length to minimum of 20 µsec.
Transmitter Loop	:	Any dimension from 20 x 20 m to 2000 x 2000 m single turn loop. Minimum transmitter loop resistance is 0.6 ohms.
Output Current	:	30 amps maximum.
Output Voltages	:	20 to 160 volts in seven steps.
Synchronization Mode	:	(1) Reference cable
	:	(2) High stability quartz crystal
Motor Generator	:	2800 W/120 V/400 Hz/3 phases. Approximately 8 hours continuous operation from full fuel tank.
Transmitter Protection	:	Electronic and electromechanical protection against short circuit.
Transmitter Wire Supplied	:	#10 copper wire PVC insulated.
Transmitter Size	:	43 x 27 x 40 cm.
Transmitter Weight	:	20 kg.
Motor Generator Size	:	74 x 44 x 51 cm.
Motor Generator Weight	:	66 kg.

2.17819

GEOPHYSICAL REPORT
FOR
FALCONBRIDGE LIMITED
ON
GRID 96-17
MANN BELT PROJECT
8269
MANN TOWNSHIP
PORCUPINE MINING DIVISION
NORTHEASTERN ONTARIO

Prepared by: A. Lambert

TABLE OF CONTENTS

INTRODUCTION

The services of Northwest Geophysics Limited were retained by Falconbridge Limited to complete a geophysical program on Grid 96-17, located in Mann Township within the Porcupine Mining Division, District of Cochrane, Northeastern, Ontario (Fig. 1).

The purpose of this program was to test the property for geological structures which would be favourable areas for base metal deposition.

The geophysical program was completed on October 28, 1996.

This report will deal with the results of the program as well as conclusions and follow up recommendations.

LOCATION AND ACCESS

Grid #96-17 is located in the central part of Mann Township, Porcupine Mining Division, District of Cochrane, Northeastern Ontario (Fig. 2).

Access to the property was ideal during the survey period. A network of logging roads extends west from Highway 11 through Newmarket Township and throughout Mann Township. As these are not allweather roads, a snowmobile is required during the winter months.

CLAIM GROUP

The claims which contain Grid 96-17 are as follows:

P-1200915 & 916 Refer to Figure 2.

PERSONNEL

The field crew directly involved with collecting the survey data were as follows:

Mike Milani - Thunder Bay, Ontario
Sinclair James - Thunder Bay, Ontario

The geophysical program was carried out under the direct supervision of Alfred Lambert. The plotting and computer compilation was completed by Paul Nielsen and Alfred Lambert of Northwest Geophysics Limited.

GEOPHYSICAL PROGRAM

The program consisted of a Total Field Magnetic survey being done in conjunction with a Horizontal Loop Electromagnetic (HLEM), survey.

MAGNETIC SURVEY

This survey was completed using the EDA OMNI IV System. Specifications for this instrument can be found as Appendix A of this report. The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Station Record Interval	-12.5 meters
Diurnal Correction Method	-base station recorder
Base Station Record Interval	-30 sec reading interval
Unit Accuracy	- +/- 0.5 gammas
Reference Field	- 58,560 gammas
Datum Subtraction	- 59,000 gammas

The data was then corrected for diurnal variations, a base level of 59,000 gammas was removed from each reading, and the resultant data was plotted directly onto a vellum base map at a scale of 1:5,000. The data was then contoured at 100 gamma intervals wherever possible.

Copies of the contoured map and numbers are included in the back pocket of this report.

HLEM SURVEY

This survey was completed using the Apex Parametrics MaxMin I System. Specifications for this instrument can be found as Appendix B of this report.

The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Reading Interval	-25 meters
Coil Separation	-200 meters
Theoretical Search Depth	-0.5 coil separation
Frequencies Recorded	-440 Hz, 1760Hz
Parameters Measured	-inphase and quadrature components of the secondary field
Unit Accuracy	- +/- 0.5%

The collected data was then plotted onto a vellum base map, one map for each frequency, at a scale of 1:5000. The data was then profiled at 1cm to 20%. A copy of these base maps are included in the back pocket of this report.

SURVEY RESULTS

The Maxmin HLEM survey detected a moderate high frequency response (1760hz) centered on Tieline 900N,1000E. The conductor is non-responsive on the low frequency and would therefore be characterized as a low priority anomaly.

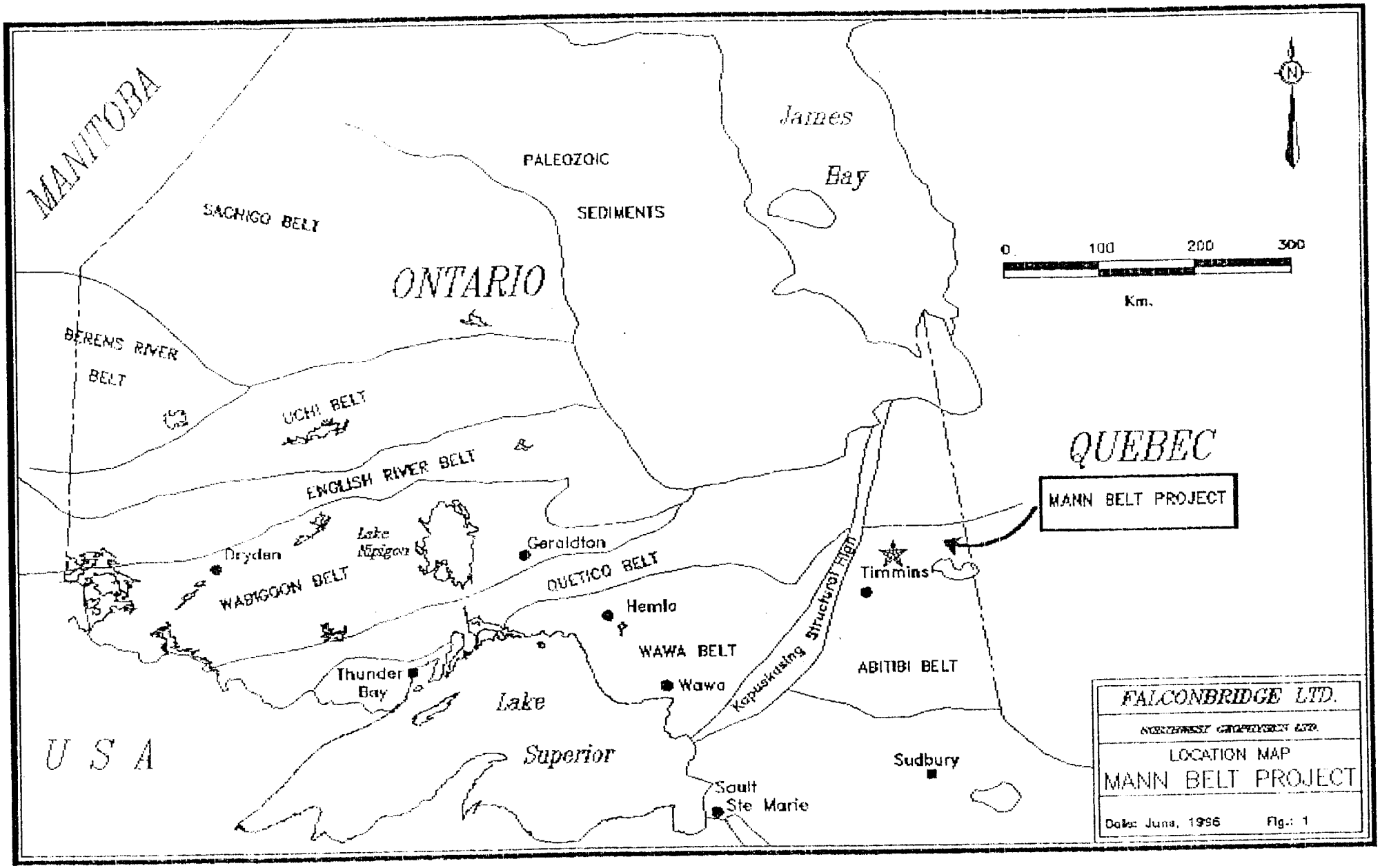
CONCLUSIONS AND RECOMMENDATIONS

The HLEM survey was successful in locating a moderate high frequency anomaly. The results of this survey should be integrated with other work carried out on this property and then future exploration plans can be made.

CERTIFICATE

I, Alfred J. Lambert of Thunder Bay, Ontario, hereby certify that I am a 1968 graduate geological technician from Cambrian College, Sault Ste. Marie, Ontario. I have been employed in the Canadian mining exploration industry since that time. I have no interest, direct or indirect, nor do I expect to receive any in this property or any of Falconbridge Limited's other holdings.

A. J. Lambert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UCHI BELT
ENGLISH RIVER BELT
QUEBEC
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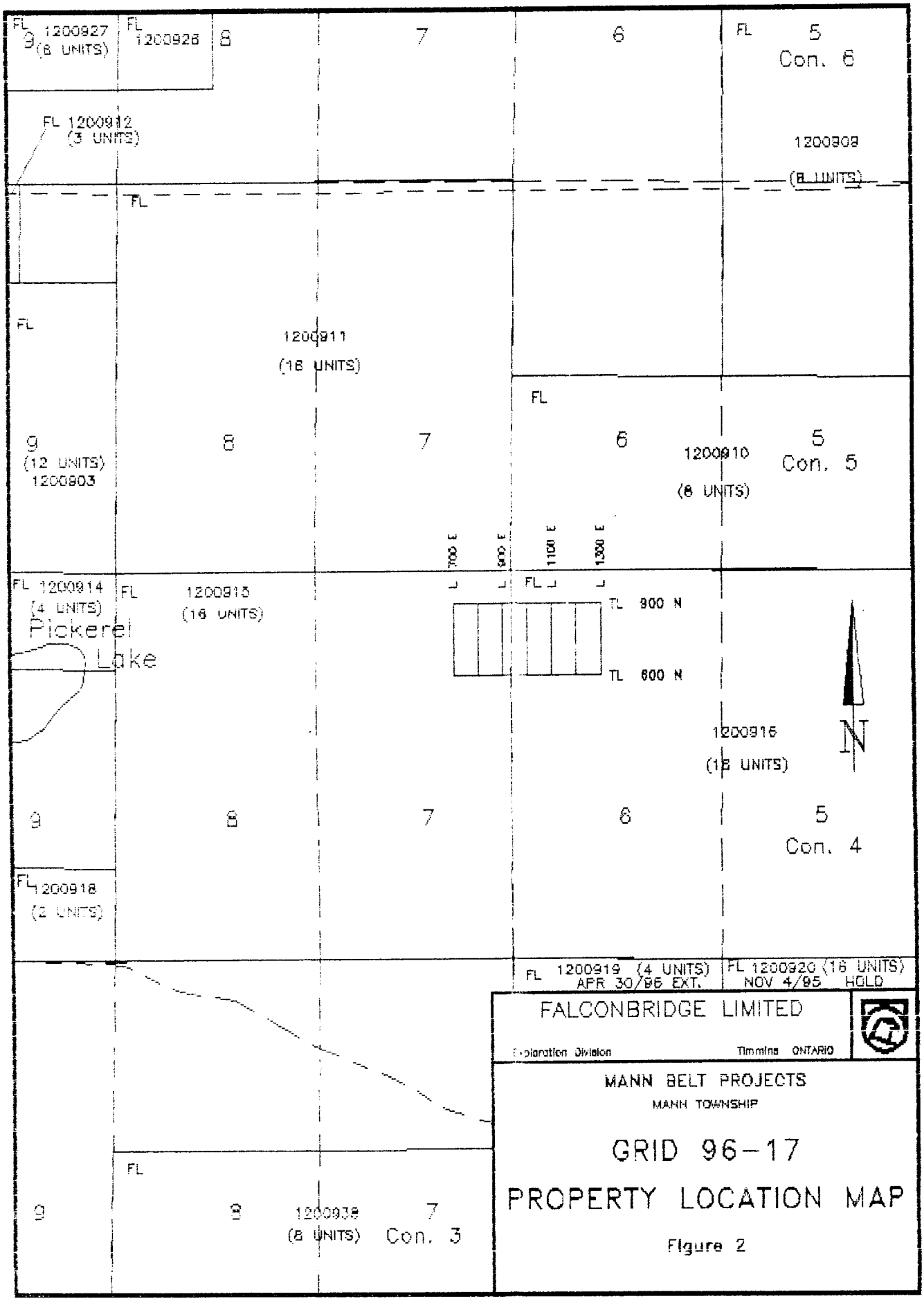
Nipigon
Dryden
Geraldton
WABIGOON BELT
OUETICO BELT
Timmins
Hemlo
WAWA BELT
ABITIBI BELT
Kapuskasing structural belt
Thunder
Bay
Wawa
Lake
Superior
U S A
Sudbury
Sault
Ste Marie
FALCONBRIDGE LTD.
LOCATION MAP
MANN BELT PROJECT
Date: June, 1996
Fig.: 1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TL 600 N
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1200939 (8 UNITS)
7 Con. 3
FALCONBRIDGE LIMITED
Exploration Division
Timmins ONTARIO
MANN BELT PROJECTS
MANN TOWNSHIP
GRID 96-17
PROPERTY LOCATION MAP
Figure 2

EDA

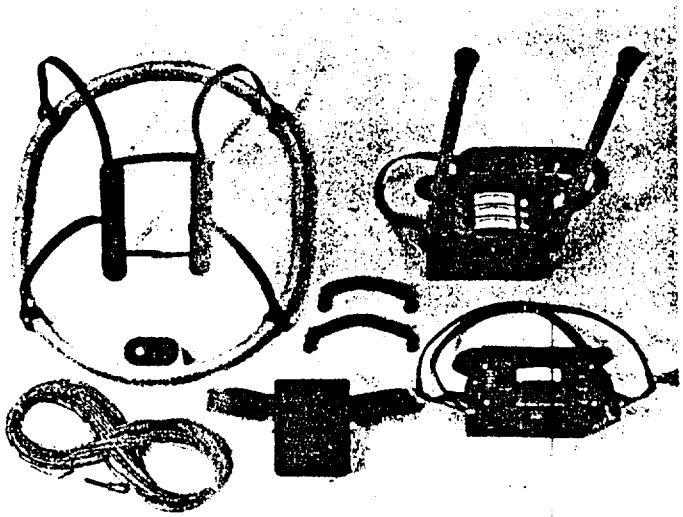
Specifications

Dynamic Range	8,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	± 0.02 gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6,000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.3 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation-standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation-optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

E D A Instruments Inc.
4 Thorncliffe Park Drive
Toronto, Ontario
Canada M4H 1H1
Telex: 06 23222 EDA TOR
Cable: Instruments Toror
(416) 425 7800

In U.S.A.
E D A Instruments Inc.
5151 Ward Road
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422 9112

Printed in Canada



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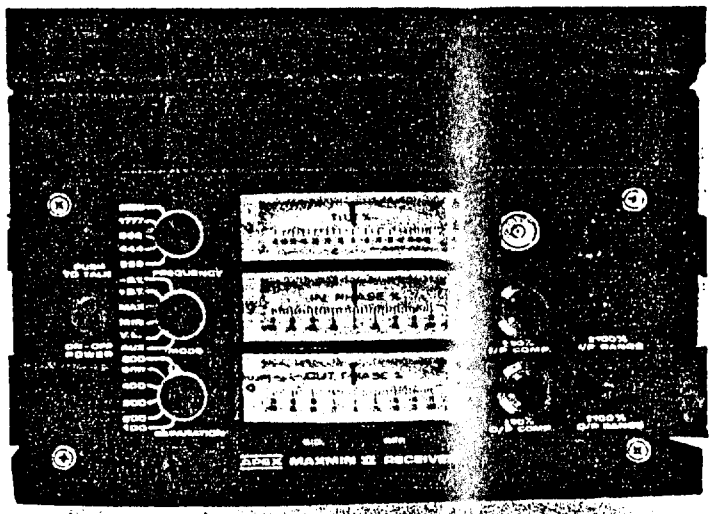


not exactly as illustrated

SPECIFICATIONS: with new 50/60Hz powerline filter and with improved spherics filter.

Frequencies: 110, 220, 440, 880, 1760, 3520, 7040, 14080Hz + 50/60Hz powerline freq.

Modes of Operation:

MAX1 Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.

MAX2=VERT. COPLANAR LOOP MODE.

MIN1 Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.

MAX3=VERT. COAXIAL LOOP MODE.

MIN2: Tx coil plane vertical, Rx coil plane horizontal. Use of Min1+Min2 allows cancellation of topography.

Coil Separations: 25,50,75,100,125,150,200,250,300, 400&500M, or 100,200,300,400,500,600,800,1000, 1200,1600 & 2000ft, or 20,40,60,80,100,120, 160,200,240,320 & 400M, switch selectable.

Parameters Read:
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Total field and/or dip-angles in % with 50/60Hz powerline mode.

Readouts:
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Field strength on IP meter and dips in % on tilt meter when using 50/60 Hz powerlines.

Scale Ranges:

In-Phase: ±20%, ±100% &±4% F.S.

Quadrature: ±20%, ±100% &±4% F.S.

Tilt: ±75% slope.

Null (V.L.): Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.1 % to 0.5 % ; Tilt: 1%.

Repeatability: ±0.1 % to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:

110Hz:	250A-m²	3520Hz:	90
220Hz:	245	7040Hz:	45
440Hz:	240	14080Hz:	23
880Hz:	230	50/60Hz:	N/A
1760Hz:	180		

Receiver Batteries: 9V trans. radio type batteries (4). Life: approx. 30 hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 13 Ah Gel-type rechargeable battery. (Chargers supplied).

Reference Cable: Light weight 2-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warming lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (14 lbs.)

Transmitter Weight: 15kg (32 lbs.)

Shipping Weight: Typically 80 kg (176 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

Equipped with interface and controls for direct plug-in of KTP-84 data acquisition unit.

APEX PARAMETRICS LIMITED
P.O. BOX 818, RR#1, UXBRIDGE, ONTARIO, CANADA L9C 1K0

Phone: (416) 852-5875 Cables: APEXPARA TORONTO Telex: 06-960625 APEXPARA UXB

GEOPHYSICAL REPORT
FOR
FALCONBRIDGE LIMITED
ON
GRID 96-18
MANN BELT PROJECT
8269
NEWMARKET TOWNSHIP
PORCUPINE MINING DIVISION
NORTHEASTERN ONTARIO

Prepared by: A. Lambert

TABLE OF CONTENTS

INTRODUCTION

The services of Northwest Geophysics Limited were retained by Falconbridge Limited to complete a geophysical program on Grid 96-18, located in Mann Township within the Porcupine Mining Division, District of Cochrane, Northeastern, Ontario (Fig. 1).

The purpose of this program was to test the property for geological structures which would be favourable areas for base metal deposition.

The geophysical program was completed on October 25, 1996.

This report will deal with the results of the program as well as conclusions and follow up recommendations.

LOCATION AND ACCESS

Grid #96-18 is located in the central part of Mann Township, Porcupine Mining Division, District of Cochrane, Northeastern Ontario (Fig. 2).

Access to the property was ideal during the survey period. A network of logging roads extends west from Highway 11 through Newmarket Township. As these are not allweather roads, a snowmobile is required during the winter months.

CLAIM GROUP

The claims which contain Grid 96-18 are as follows:

P-1200908,916,920 Refer to Figure 2.

PERSONNEL

The field crew directly involved with collecting the survey data were as follows:

Mike Milani	- Thunder Bay, Ontario
Sinclair James	- Thunder Bay, Ontario

The geophysical program was carried out under the direct supervision of Alfred Lambert. The plotting and computer compilation was completed by Paul Nielsen and Alfred Lambert of Northwest Geophysics Limited.

GEOPHYSICAL PROGRAM

The program consisted of a Total Field Magnetic survey being done in conjunction with a Horizontal Loop Electromagnetic (HLEM), survey.

MAGNETIC SURVEY

This survey was completed using the EDA OMNI IV System. Specifications for this instrument can be found as Appendix A of this report. The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Station Record Interval	-12.5 meters
Diurnal Correction Method	-base station recorder
Base Station Record Interval	-30 sec reading interval
Unit Accuracy	- +/- 0.5 gammas
Reference Field	- 58,560 gammas
Datum Subtraction	- 59,000 gammas

The data was then corrected for diurnal variations, a base level of 59,000 gammas was removed from each reading, and the resultant data was plotted directly onto a vellum base map at a scale of 1:5,000. The data was then contoured at 50 gamma intervals wherever possible.

Copies of the contoured map and numbers are included in the back pocket of this report.

HLEM SURVEY

This survey was completed using the Apex Parametrics MaxMin I System. Specifications for this instrument can be found as Appendix B of this report.

The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Reading Interval	-25 meters
Coil Separation	-150 meters
Theoretical Search Depth	-0.5 coil separation
Frequencies Recorded	-440 Hz, 1760Hz
Parameters Measured	-inphase and quadrature components of the secondary field
Unit Accuracy	- +/- 0.5%

The collected data was then plotted onto a vellum base map, one map for each frequency, at a scale of 1:5000. The data was then profiled at 1cm to 20%. A copy of these base maps are included in the back pocket of this report.

SURVEY RESULTS

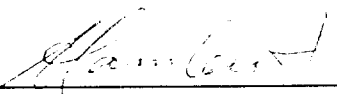
No significant electromagnetic responses were detected by the Maxmin 1 survey.

CONCLUSIONS AND RECOMMENDATIONS

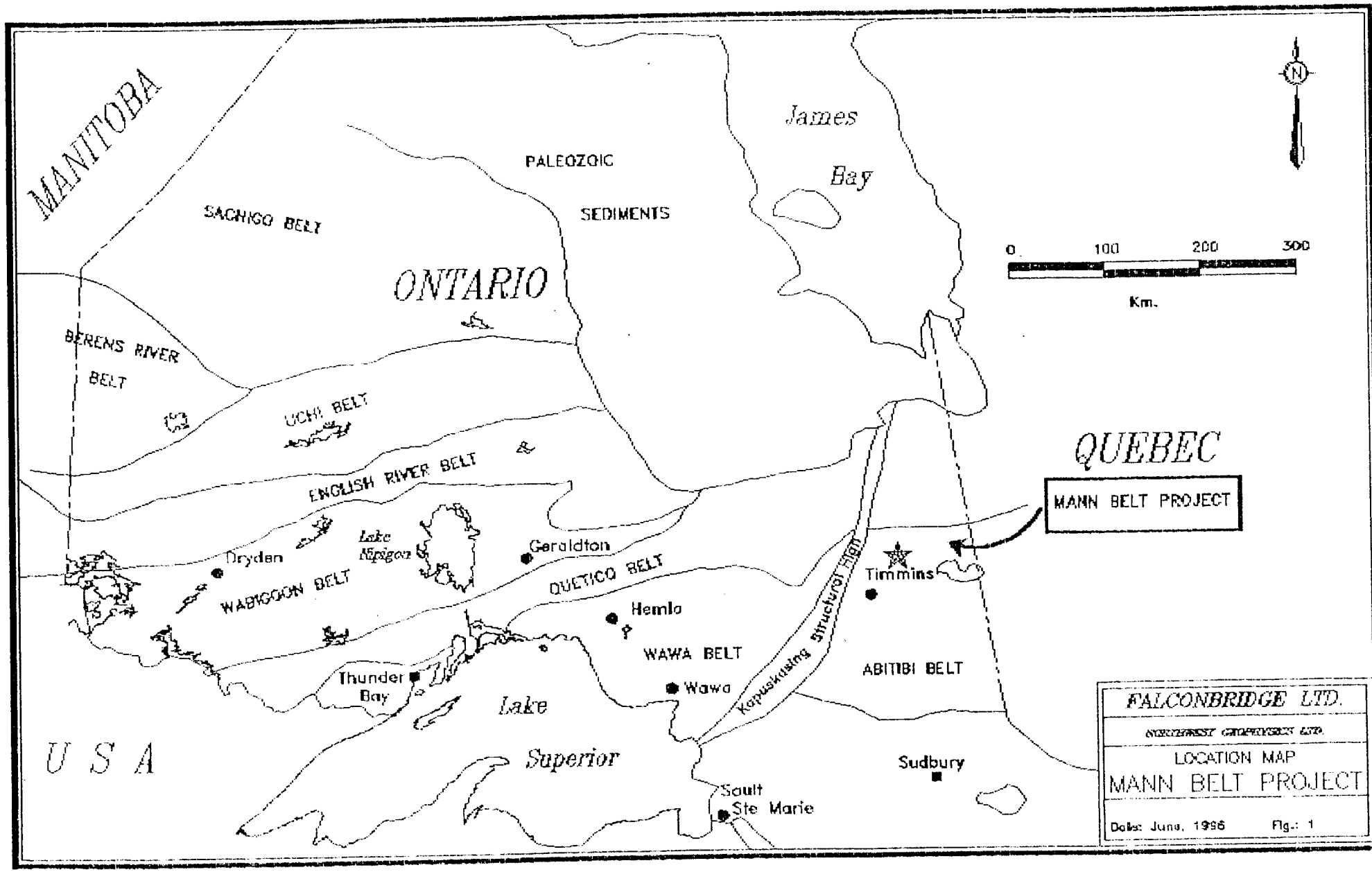
The surveys were unsuccessful in locating any anomalies on this grid. Consideration might be given to resurveying it with a deper penetrating system such as Time Domain EM.

CERTIFICATE

I, Alfred J. Lambert of Thunder Bay, Ontario, hereby certify that I am a 1968 graduate geological technician from Cambrian College, Sault Ste. Marie, Ontario. I have been employed in the Canadian mining exploration industry since that time. I have no interest, direct or indirect, nor do I expect to receive any in this property or any of Falconbridge Limited's other holdings.



A. J. Lambert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Nipigon
Dryden
Geraldton
WABIGOON BELT
OUETICO BELT
Timmins
Hemlo
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ABITIBI BELT
Kapuskasing structural high
Thunder
Bay
Wawa
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Superior
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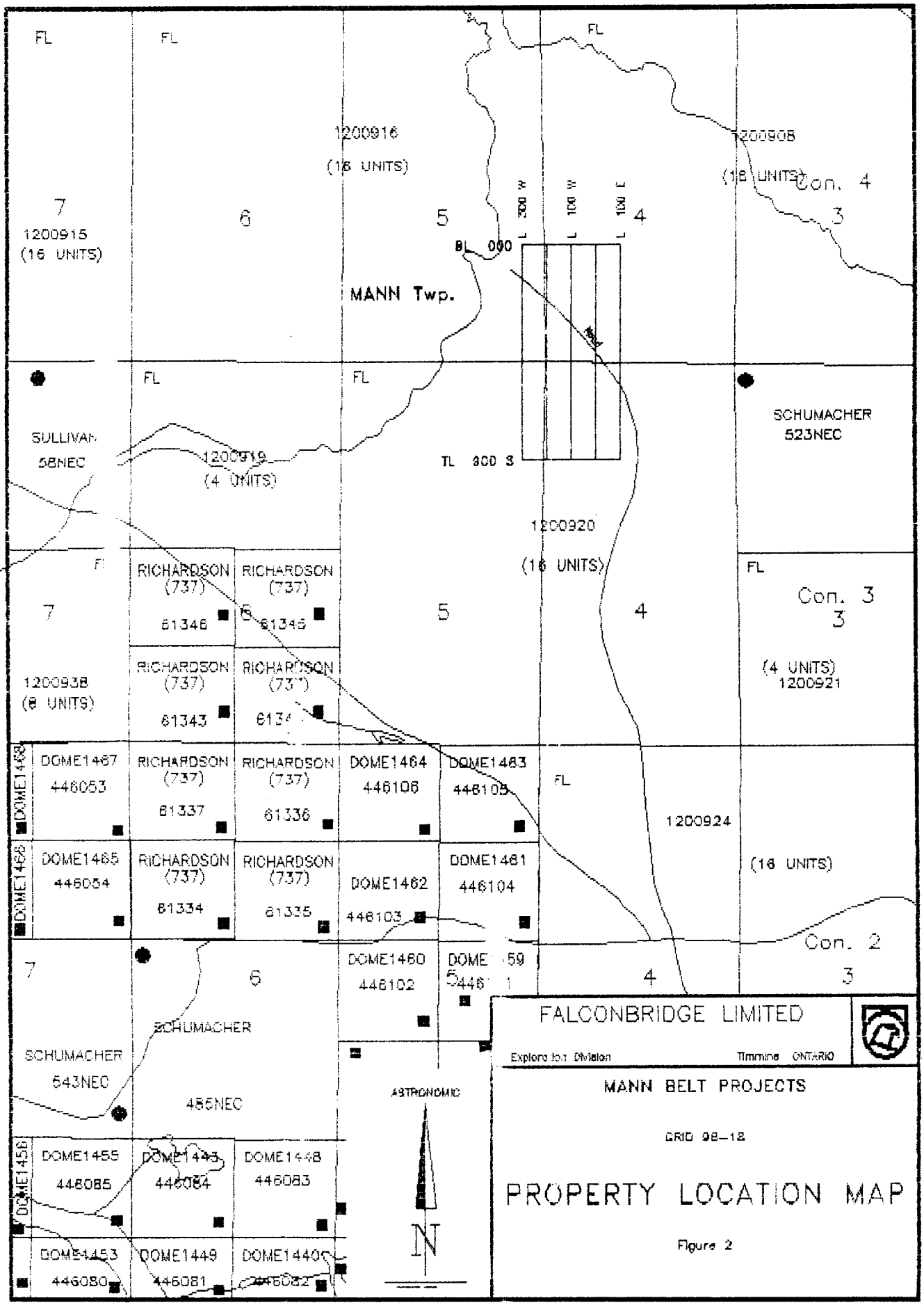
Sudbury
Sault
Ste Marie
FALCONBRIDGE LTD.
LOCATION MAP
MANN BELT PROJECT
Date: June, 1996
Fig.: 1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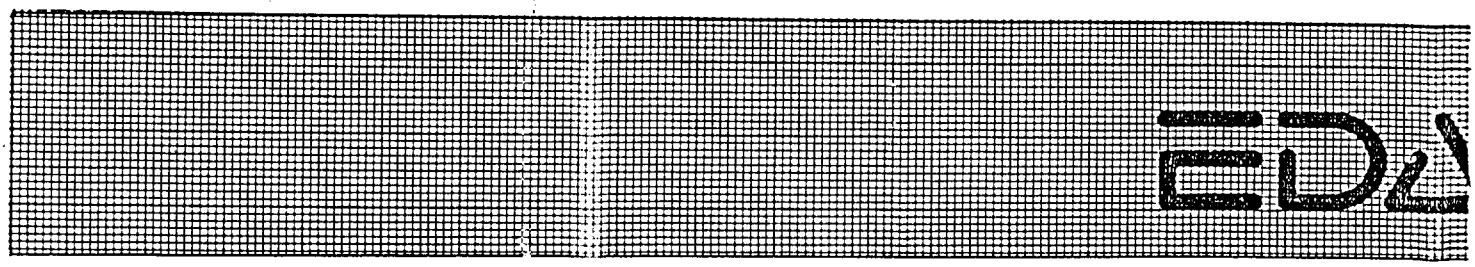
FALCONBRIDGE LIMITED
Explora tion Division
Timmins ONTARIO
MANN BELT PROJECTS
GRID 98-12
PROPERTY LOCATION MAP
Figure 2



Specifications

Dynamic Range	8,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	± 0.02 gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6,000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.3 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.3 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation - standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation - optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

E D A Instruments Inc.
4 Thorncliffe Park Drive
Toronto, Ontario
Canada M4H 1H1
Telex: 06 23222 EDA TOR
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E D A Instruments Inc.
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Wheat Ridge, Colorado
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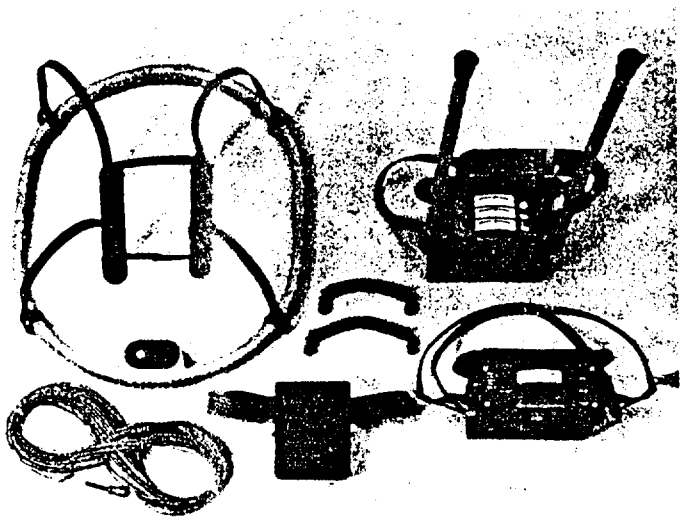
(303) 422 9112

Printed in Canada



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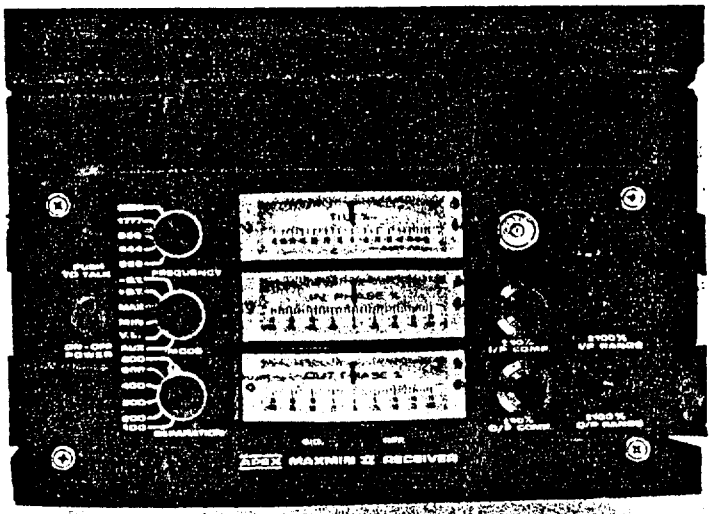


not exactly as illustrated

SPECIFICATIONS: with new 50/60Hz powerline filter and with improved spherics filter.

Frequencies: 110,220,440,880,1760,3520,7040, 14080Hz + 50/60Hz powerline freq.

Modes of Operation: MAX1 Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.

MAX2=VERT. COPLANAR LOOP MODE.

MIN1 Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.

MAX3=VERT. COAXIAL LOOP MODE.

MIN2: Tx coil plane vertical, Rx coil plane horizontal. Use of Min1+Min2 allows cancellation of topography

Coil Separations: 25,50,75,100,125,150,200,250,300, 400&500M, or 100,200,300,400,500,600,800,1000, 1200,1600 & 2000ft, or 20,40,60,80,100,120, 160,200,240,320 & 400M, switch selectable.

Parameters Read:
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Total field and/or dip-angles in % with 50/60Hz powerline mode.

Readouts:
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Field strength on IP meter and dips in % on tilt meter when using 50/60 Hz powerlines.

Scale Ranges:
In-Phase: ±20%, ±100% &±4% F.S.
Quadrature: ±20%, ±100% &±4% F.S.
Tilt: ±75% slope.
Null (V.L.): Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.1 % to 0.5% ; Tilt: 1%.

Repeatability: ±0.1 % to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:

110Hz:	250Atm^2	3520Hz:	90
220Hz:	245	7040Hz:	45
440Hz:	240	14080Hz:	23
880Hz:	230	50/60Hz:	N/A
1760Hz:	180		

Receiver Batteries: 9V trans. radio type batteries (4). Life: approx. 35hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 13 Ah Gel-type rechargeable battery. (Chargers supplied).

Reference Cable: Light weight 2-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warning lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (14 lbs.)

Transmitter Weight: 15kg (32 lbs.)

Shipping Weight: Typically 80 kg (176 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

Equipped with interface and controls for direct plug-in of KTP-84 data acquisition unit.

APEX PARAMETRICS LIMITED
P.O. BOX 818, RR#1, UXBRIDGE, ONTARIO, CANADA L0C 1K0

Phone: (416) 852-5875 Cables: APEXPARA TORONTO Telex: 06-966625 APEXPARA UXB

GEOPHYSICAL REPORT
FOR
FALCONBRIDGE LIMITED
ON
GRID 96-19
MANN BELT PROJECT
8269
MANN TOWNSHIP
PORCUPINE MINING DIVISION
NORTHEASTERN ONTARIO

2.17819

Prepared by: A. Lambert

TABLE OF CONTENTS

INTRODUCTION

The services of Northwest Geophysics Limited were retained by Falconbridge Limited to complete a geophysical program on Grid 96-19, located in Mann Township within the Porcupine Mining Division, District of Cochrane, Northeastern, Ontario (Fig. 1).

The purpose of this program was to test the property for geological structures which would be favourable areas for base metal deposition.

The geophysical program was completed on October 22, 1996.

This report will deal with the results of the program as well as conclusions and follow up recommendations.

LOCATION AND ACCESS

Grid #96-19 is located in the northern part of Mann Township, Porcupine Mining Division, District of Cochrane, Northeastern Ontario (Fig. 2).

Access to the property was ideal during the survey period. A network of logging roads extends west from Highway 11 through Newmarket Township and throughout Mann Township. As these are not allweather roads, a snowmobile is required during the winter months.

CLAIM GROUP

The claims which contain Grid 96-19 are as follows:

P-1200927 & 928 Refer to Figure 2.

PERSONNEL

The field crew directly involved with collecting the survey data were as follows:

Mike Milani - Thunder Bay, Ontario
Sinclair James - Thunder Bay, Ontario

The geophysical program was carried out under the direct supervision of Alfred Lambert. The plotting and computer compilation was completed by Paul Nielsen and Alfred Lambert of Northwest Geophysics Limited.

GEOPHYSICAL PROGRAM

The program consisted of a Total Field Magnetic survey being done in conjunction with a Horizontal Loop Electromagnetic (HLEM), survey.

MAGNETIC SURVEY

This survey was completed using the EDA OMNI IV System. Specifications for this instrument can be found as Appendix A of this report. The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Station Record Interval	-12.5 meters
Diurnal Correction Method	-base station recorder
Base Station Record Interval	-30 sec reading interval
Unit Accuracy	- +/- 0.5 gammas
Reference Field	- 58,560 gammas
Datum Subtraction	- 59,000 gammas

The data was then corrected for diurnal variations, a base level of 59,000 gammas was removed from each reading, and the resultant data was plotted directly onto a vellum base map at a scale of 1:5,000. The data was then contoured at 50 gamma intervals wherever possible.

Copies of the contoured map and numbers are included in the back pocket of this report.

HLEM SURVEY

This survey was completed using the Apex Parametrics MaxMin I System. Specifications for this instrument can be found as Appendix B of this report.

The following parameters were kept constant throughout the survey period.

Linespacing	-100 meters
Reading Interval	-25 meters
Coil Separation	-150 meters
Theoretical Search Depth	-0.5 coil separation
Frequencies Recorded	-440 Hz, 1760Hz
Parameters Measured	-inphase and quadrature components of the secondary field
Unit Accuracy	- +/- 0.5%

The collected data was then plotted onto a vellum base map, one map for each frequency, at a scale of 1:5000. The data was then profiled at 1cm to 20%. A copy of these base maps are included in the back pocket of this report.

SURVEY RESULTS

The Maxmin HLEM survey detected a moderate high frequency response (1760hz) centered on Line 700W,125S.This feature strikes NW/SE and has a coincident flanking magnetic anomaly. The conductor is non-responsive on the low frequency and would therefore be characterized as a low priority anomaly.

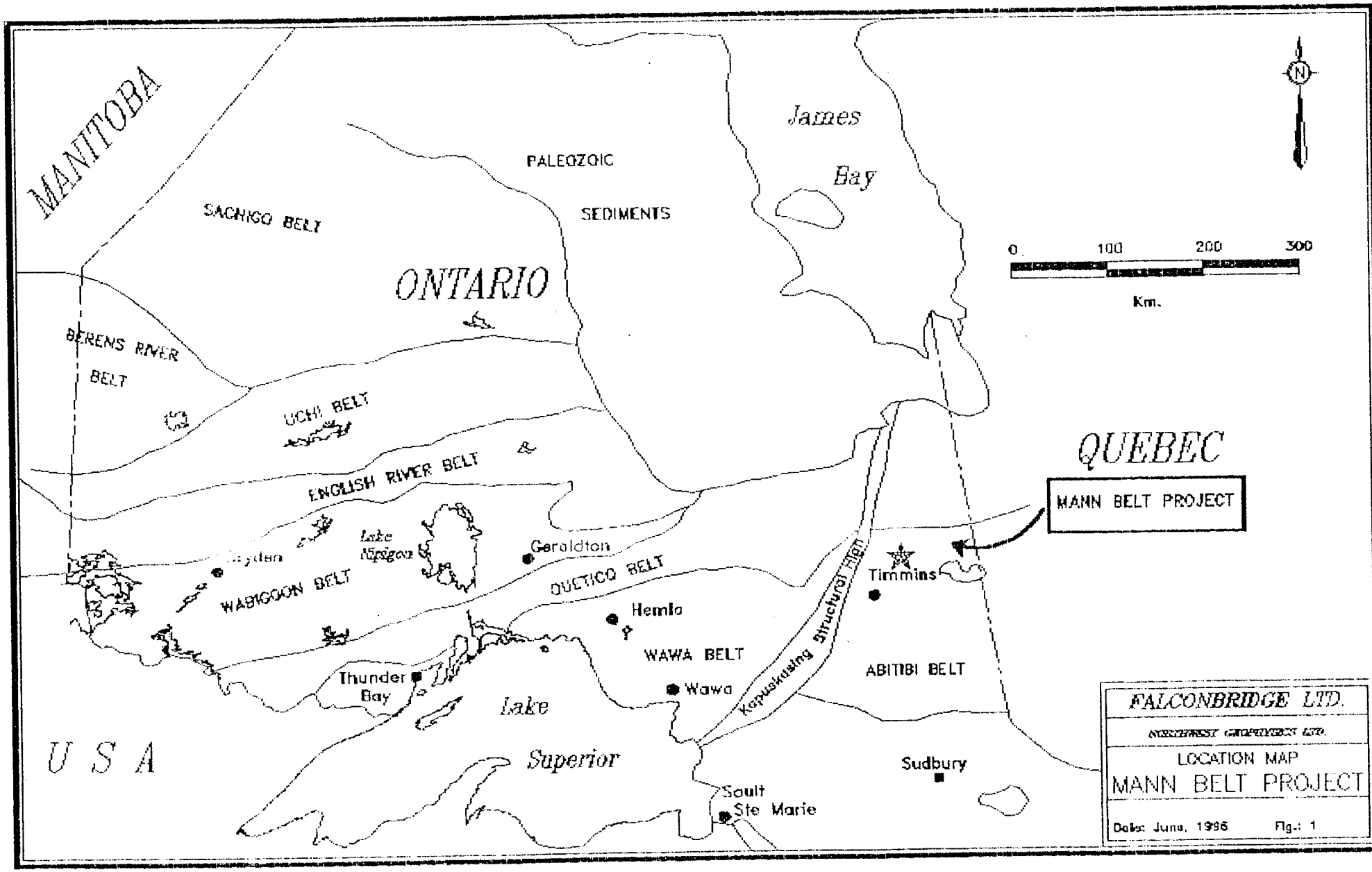
CONCLUSIONS AND RECOMMENDATIONS

The HLEM survey was successful in locating a moderate high frequency anomaly. The results of this survey should be integrated with other work carried out on this property and then future exploration plans can be made.

CERTIFICATE

I, Alfred J. Lambert of Thunder Bay, Ontario, hereby certify that I am a 1968 graduate geological technician from Cambrian College, Sault Ste. Marie, Ontario. I have been employed in the Canadian mining exploration industry since that time. I have no interest, direct or indirect, nor do I expect to receive any in this property or any of Falconbridge Limited's other holdings.

A. J. Lambert


MANITOBA
PALEOZOIC
SEDIMENTS
SACHIGO BELT
James
Bay
ONTARIO
BERENS RIVER
BELT
UCHI BELT
ENGLISH RIVER BELT
QUEBEC
MANN BELT PROJECT
Lake
Nipigon
Geraldton
WABIGOON BELT
OUETICO BELT
Timmins
Hemlo
WAWA BELT
ABITIBI BELT
Kapuskasing Structural Zone
Thunder
Bay
Wawa
Lake
Superior
U S A
Sudbury
Sault
Ste Marie
0
100
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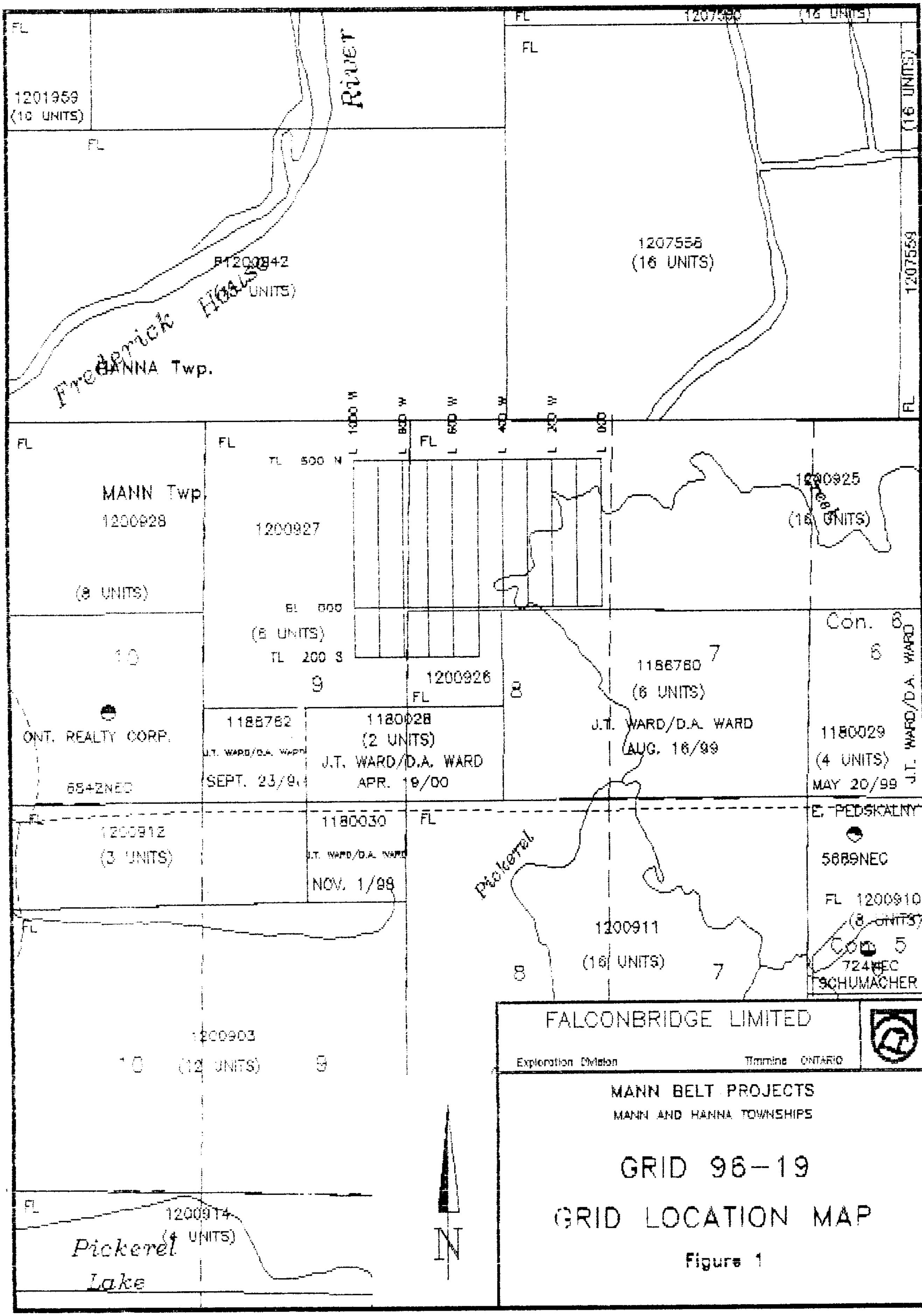
Km.
N
FALCONBRIDGE LTD.
LOCATION MAP
MANN BELT PROJECT
Date: June, 1996
Fig.: 1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Frederick House
1200942
HANNA Twp.
1207556
(16 UNITS)
1207559
MANN Twp.
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(8 UNITS)
1200927
TL 500 N
BL 000
TL 200 S
(8 UNITS)
1200925
(16 UNITS)
1200926
1186760
(6 UNITS)
J.T. WARD/D.A. WARD
AUG. 16/99
Con. 6
ONT. REALTY CORP.
6542NEC
1188762
SEPT. 23/9
1180028
(2 UNITS)
J.T. WARD/D.A. WARD
APR. 19/00
1180029
(4 UNITS)
MAY 20/99
J.T. WARD/D.A. WARD
1200912
(3 UNITS)
1180030
NOV. 1/98
Pickerel
E. PEDSKALNY
5689NEC
1200910
1200911
(16 UNITS)
Con. 5
SCHUMACHER
1200903
(12 UNITS)
1200914
Pickerel Lake
N

FALCONBRIDGE LIMITED

Exploration Division Timmins ONTARIO

MANN BELT PROJECTS

MANN AND HANNA TOWNSHIPS

GRID 96-19

GRID LOCATION MAP

Figure 1

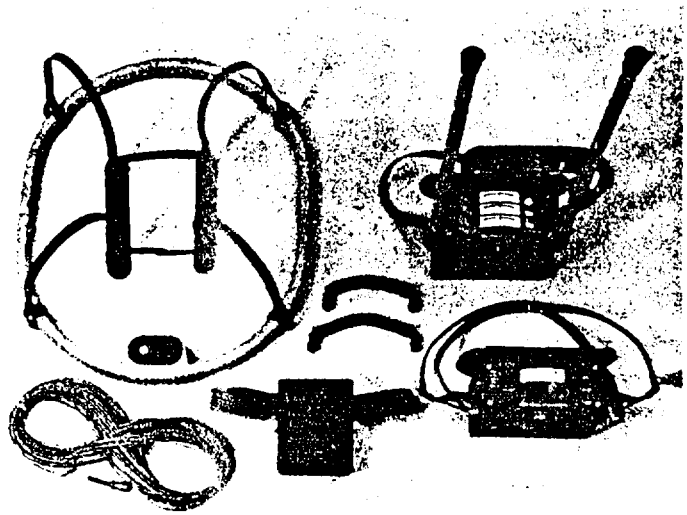
Specifications

Dynamic Range	8,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	± 0.02 gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6,000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.3 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation - standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation - optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

E D A Instruments Inc.
4 Thorncliffe Park Drive
Toronto, Ontario
Canada M4H 1H1
Telex: 06 23222 EDA TOR
Cable: Instruments Toron
(416) 425 7800

In U.S.A.
E D A Instruments Inc.
5151 Ward Road
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422 9112

Printed in Canada



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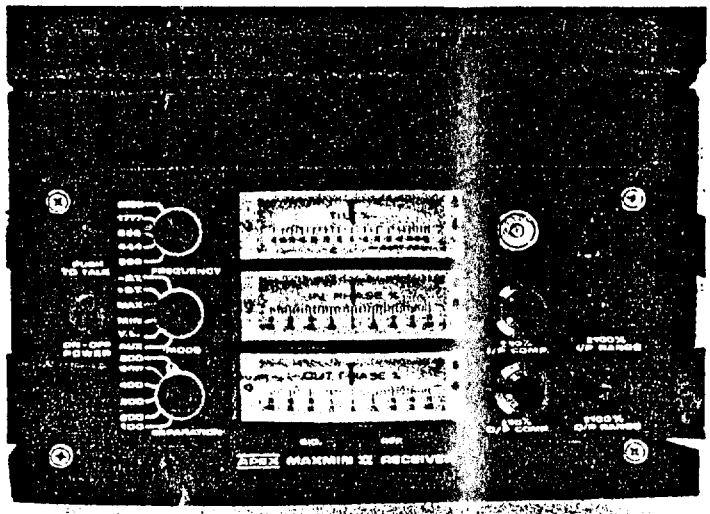


not exactly as illustrated

SPECIFICATIONS: with new 50/60Hz powerline filter and with improved spherics filter.

Frequencies: 110,220,440,880,1760,3520,7040, 14080Hz + 50/60Hz powerline freq.

Modes of Operation: MAX1 Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.

MAX2=VERT. COPLANAR LOOP MODE.

MAX3=VERT. COAXIAL LOOP MODE.

MIN1 Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.

MIN2: Tx coil plane vertical, Rx coil plane horizontal. Use of Min1+Min2 allows cancellation of topography.

Coil Separations: 25,50,75,100,125,150,200,250,300, 400&500M, or 100,200,300,400,500,600,800,1000, 1200,1600 & 2000ft, or 20,40,60,80,100,120, 160,200,240,320 & 400M, switch selectable.

Parameters Read:
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Total field and/or dip-angles in % with 50/60Hz powerline mode.

Readouts:
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Field strength on IP meter and dips in % on tilt meter when using 50/60 Hz powerlines.

Scale Ranges:

In-Phase: ±20%, ±100% &±4% F.S.

Quadrature: ±20%, ±100% &±4% F.S.

Tilt: ±75% slope.

Null (V.L): Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.1 % to 0.5 % ; Tilt: 1%.

Repeatability: ±0.1 % to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:

110Hz:	250A	3520Hz:	90
220Hz:	245	7040Hz:	45
440Hz:	240	14080Hz:	23
880Hz:	230	50/60Hz:	N/A
1760Hz:	180		

Receiver Batteries: 9V transistor radio type batteries (4). Life: approx. 30 hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 13 Ah Gel type rechargeable battery. (Chargers supplied).

Reference Cable: Light weight 8-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warning lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (14 lbs.)

Transmitter Weight: 15kg (32 lbs.)

Shipping Weight: Typically 80 kg (176 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

Equipped with interface and controls for direct plug-in of MTP-84 data acquisition unit.

APEX PARAMETRICS LIMITED
P.O. BOX 818, RR#1, UXBRIDGE, ONTARIO, CANADA L0C 1K0

Phone: (416) 852-5875 Cables: APEXPARA TORONTO Telex: 06-966625 APEXPARA UXB

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
1.4760.00555
Assessment Files Research Imaging

Personal information collected ... Mining Act, the information is a ... Questions about this collectio ... 933 Ramsey Lake Road, Sudb ...

42A15NW0027 2.17819 MANN

900

...e Mining Act. Under section 8 of the ...orrespond with the mining land holder. ... Development and Mines, 6th Floor, ...

Instructions: - For work performed on Crown Lands before **recording** a claim, use form 0240.
- Please type or print in ink.

2.17819

1. Recorded holder(s) (Attach a list if necessary)

Name	Client Number
FALCONBRIDGE LTD.	130679
Address	**Telephone Number**
P.O. BOX 1140, 571 MONETA AVE.	(705) 267-1188
TIMMINS, ONT. P4N 7H9	**Fax Number** (705) 264-6080
Name	**Client Number**
Address	**Telephone Number**
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☑ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling, stripping, trenching and associated assays ☐ Rehabilitation

Work Type	Office Use
LINECUTTING & GEOPHYSICAL SURVEYS	Commodity
	Total $ Value of Work Claimed 31,561.00
Dates Work Performed From 17 (Day) 10 (Month) 96 (Year) To 30 (Day) 10 (Month) 96 (Year)	NTS Reference
Global Positioning System Data (if available) Township/Area: MANN TOWNSHIP	Mining Division Porcupine
M or G-Plan Number	Resident Geologist District Timmins

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name	Telephone Number
ALF LAMBERT - NORTHWEST GEOPHYSICS LTD.	(807) 345-9405
Address	**Fax Number**
P.O. BOX 3263, THUNDER BAY, ONT. P7B 5E8	(807) 345-0523
Name	**Telephone Number**
Address	**Fax Number**
Name	**Telephone Number**
Address	**Fax Number**

RECEIVED
APR 25 1997
11:25

4. Certification by Recorded Holder or Agent

I, C. PETCH (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent	Date
Christine Petch Christine Petch	APRIL 24, 1997
Agent's Address	**Telephone Number** / **Fax Number**
P.O. Box 1140, 571 Moneta Ave, Timmins ON P4N 7H9	(705) 267-1188 / (705) 264-6080

Deemed Apr 24/97

11 (02/96)

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date.
eg	TB 7827	16 ha	$26, 825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8, 892	$ 4,000	0	$4,892
6-16 1	• 1200906 ✓	16	9518 ✓	0	9518	
2	• 1200915	16	1419 ✓	0	1419	
6-17 3	• 1200916 ✓	16	2129 ✓	0	2129	
4	• 1200916 ✓	16	453 ✓	0	453	
6-18 5	• 1200908 ✓	16	1812 ✓	0	1812	
6	• 1200920 ✓	16	2266 ✓	0	2266	
7	• 1200927 ✓	6	1390 ✓	1390 ✓	0	
6-19 8	• 1200926 ✓	1	695 ✓	400	295	
9	• 1200925 ✓	16	4865	4865 ✓	0	
1200086 10	61343 ✓	1	1754	0	1754	
6-15 11	61344 ✓	1	1753	0	1753	
12	61345 ✓	1	1754	0	1754	
13	61346 ✓	1	1753	0	1753	
14	see appended sheet for distributed work					
15						
		Column Totals	31,561	6655	24,906	0

I, CHRISTINE PETCH (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
Christine Petch	APRIL 24, 1997

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☒ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

from P1201901 = 2.17810

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp: RECEIVED APR 25 1997

Deemed Approved Date	Date Notification Sent
JULY 24/97	
Date Approved	Total Value of Credit Approved
Approved for Recording by Mining Recorder (Signature)	

0241 (02/96)

W9760.00555

Work to be recorded and distributed (cont'd)

Mining Claim Number	No. of Claim Units	Value of work performed	Value of work applied to this claim	Value of work assigned to other	Bank
1200912	3	0	$1,200	✓	
1200913	4	0	$1,600	✓	
1200914	4	0	$1,600	✓	
1200921	4	0	$1,600	✓	
1200922	16	0	$5,700	✓	
1200923	16	0	$6,136	✓	
~~1200925~~	16	0	6400 $1,535		
~~1200927~~ ✓	6	0	2400 $1,010		
1200928 ✓	8	0	$2,726		
1201901 ✓	16	0	$1,799		
	Column Totals	0	$24,906	0	0

Christine Petch
April 24, 1997

2.17819

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use): W9760.00555

Personal information collected on this form is obtained under the authority of subsection 6(1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Work Type	Units of Work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
LINECUTTING	40.8-41.85 km	$250/km	$10,221
GEOPHYSICAL SURVEY	12 days	$1500/day	$18,000
GEOPHYSICAL MAPS/REPORTS	5 SETS MAPS+REPORT	$255.40/set	$1,277
Associated Costs (e.g. supplies, mobilization and demobilization).			
		2.17819	
Transportation Costs			
Food and Lodging Costs			
GST (tax)		7%	$2,064
		Total Value of Assessment Work	$31,562

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK × 0.50 = Total $ value of worked claimed.

Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, CHRISTINE PETCH (please print full name), do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as agent (recorded holder, agent, or state company position with signing authority) I am authorized to make this certification.

Signature	Date
C. Petch	APRIL 24, 1997

0212 (02/96)

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (705) 670-5863

November 18, 1997

Christine Petch
FALCONBRIDGE LIMITED
PO BOX 1140
571 MONETA AVENUE
TIMMINS, ONTARIO
P4N 7H9

Dear Sir or Madam:

Submission Number: 2.17819

Subject: Transaction Number(s):	**Status**
W9760.00555	Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Lucille Jerome by e-mail at jerome_l@torv05.ndm.gov.on.ca or by telephone at (705) 670-5858.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 11570

Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17819

Date Correspondence Sent: November 18, 1997 **Assessor:** Lucille Jerome

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9760.00555	1200906	MANN	Deemed Approval	July 24, 1997

Section:
14 Geophysical EM
14 Geophysical MAG

Correspondence to:
Resident Geologist
South Porcupine, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):
Christine Petch
FALCONBRIDGE LIMITED
TIMMINS, ONTARIO

Correspondence ID: 11570

2.17819
MAG, EM
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
W.P.R. WATER POWER RESERVE
W.O. 87 / 87
SURFACE AND MINING RIGHTS RE-OPENED TO PROSPECTING, STAKING OUT, SALE OR LEASE UNDER SECTION 36 OF THE MINING ACT R.S.O. 1980 EFFECTIVE 90-SEP-05 AT 7AM E.S.T ORDER NO. O-P 4/90 NR DATED 90-AUG-22.
NOTE: P1125837 PLOTTED IN ERROR. S/B P1114737.
MANN TOWNSHIP
DUFF TOWNSHIP
NEWMARKET TOWNSHIP
LITTLE TOWNSHIP
Pickerel Lake
Frederick House River
W.P.R.
1201909
1200928
1200927
1200925
1200902
1200901
1204690
1186760
1180029
1200909
1180028
1200912
1200913
1200903
1200910
1200906
1200905
1200904
1200914
1200915
1200916
1200908
1190952
1201907
1200907
1200947
1200918
1200948
1200919
1200920
1200922
1200921
1200938
1200924
1200923
1204445
1190189
1201901
1201903
1201373
1200984
1201902
VI
V
IV
III
II
I
12
11
10
9
8
7
6
5
4
3
2
1
THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.
LEGEND
DISPOSITION OF CROWN LANDS
TYPE OF DOCUMENT
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
RESERVATION
CANCELLED
SAND & GRAVEL
SCALE 1:20 000
SNOWMOBILE TRAIL (LAND USE PERMIT) NOTICE RECEIVED 92-DEC-09
Received Sept 22/86
TOWNSHIP
MANN
M.N.R. ADMINISTRATIVE DISTRICT
COCHRANE
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
COCHRANE
Ministry of Natural Resources
Ministry of Northern Development and Mines
Ontario
SEPTEMBER 1986
G-3537

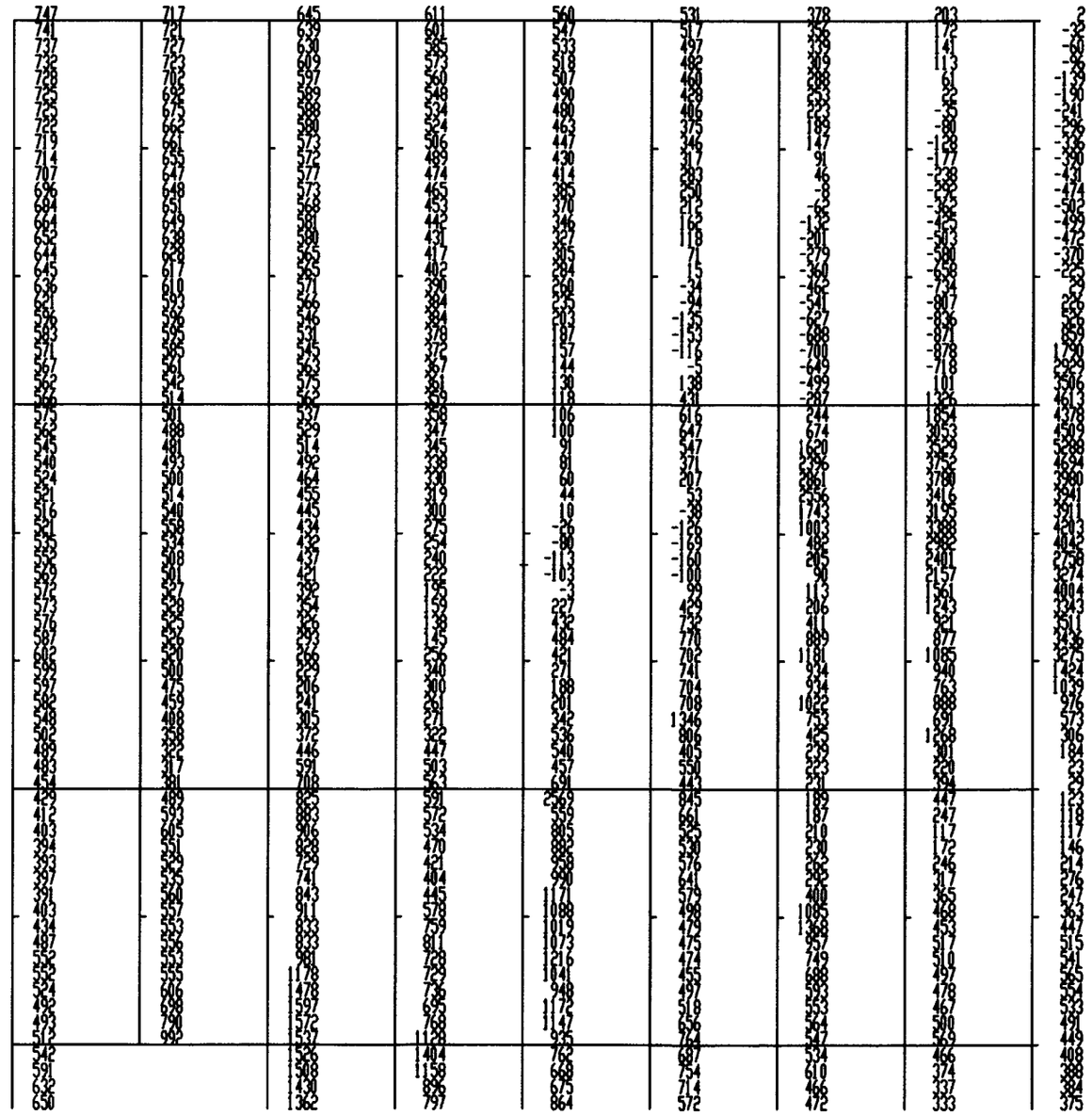
800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E

TIELINE 1600N

TIELINE 1300N

TIELINE 1000N

BASELINE 800N



N

2.17819

100m 50m 0m 100m 200m

Instrument : OMNI
Field : TOTAL
Datum : 59000.0 nT

Contour Interval :

Conductor Axis :

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-15

BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 **DATE : 10/15/96**
SURVEY BY : NWG **NTS : 42 A/15**

NORTHWEST GEOPHYSICS LTD.

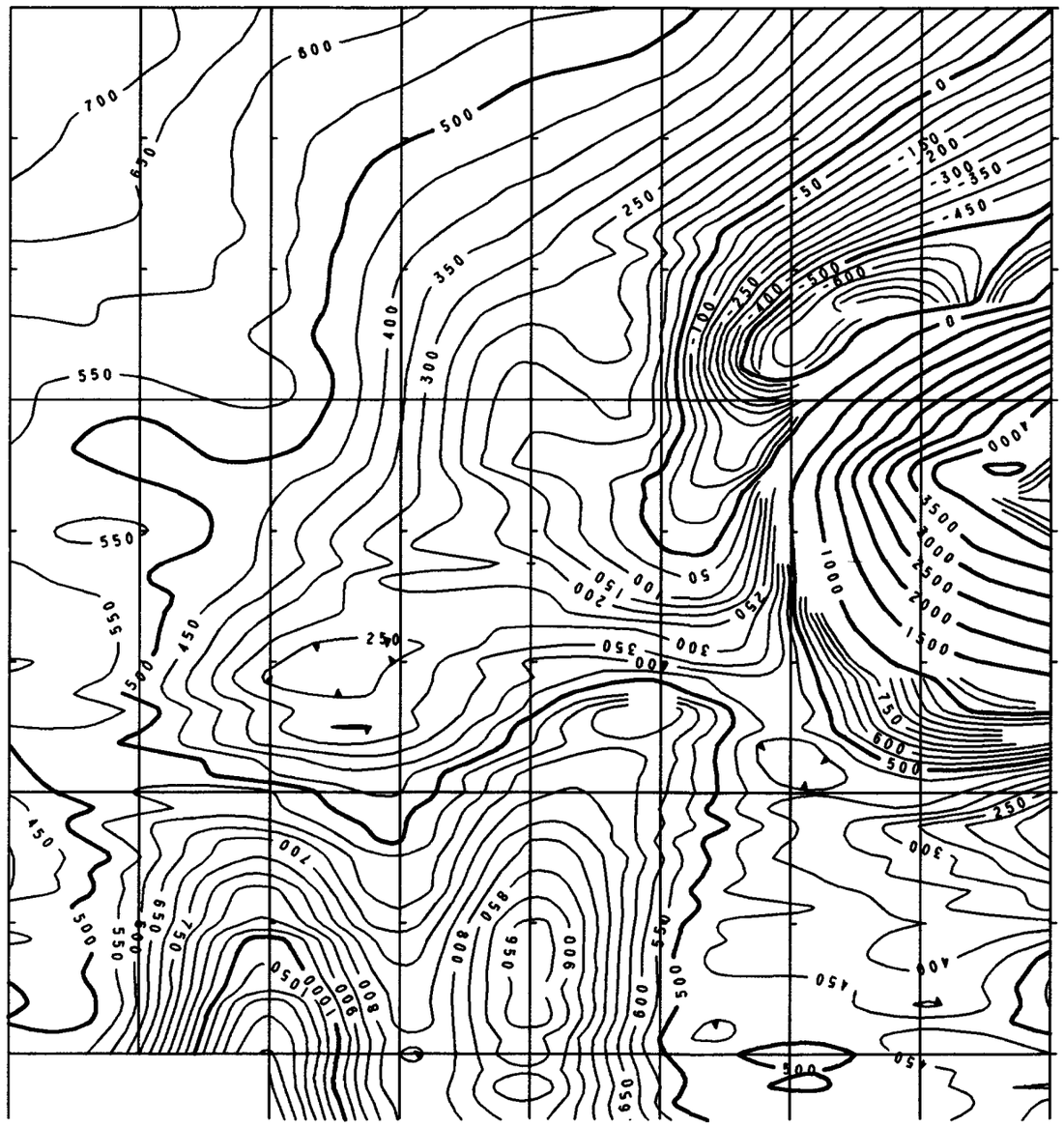
800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E

TIELINE 1600N

TIELINE 1300N

TIELINE 1000N

BASELINE 800N



N

2.17819

220

100m 50m 0m 100m 200m

Instrument : DNI
Field : TOTAL
Datum : 59000.0 nT
Contour Interval :
Conductor Axis :

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-15

BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 DATE : 10/15/96

SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

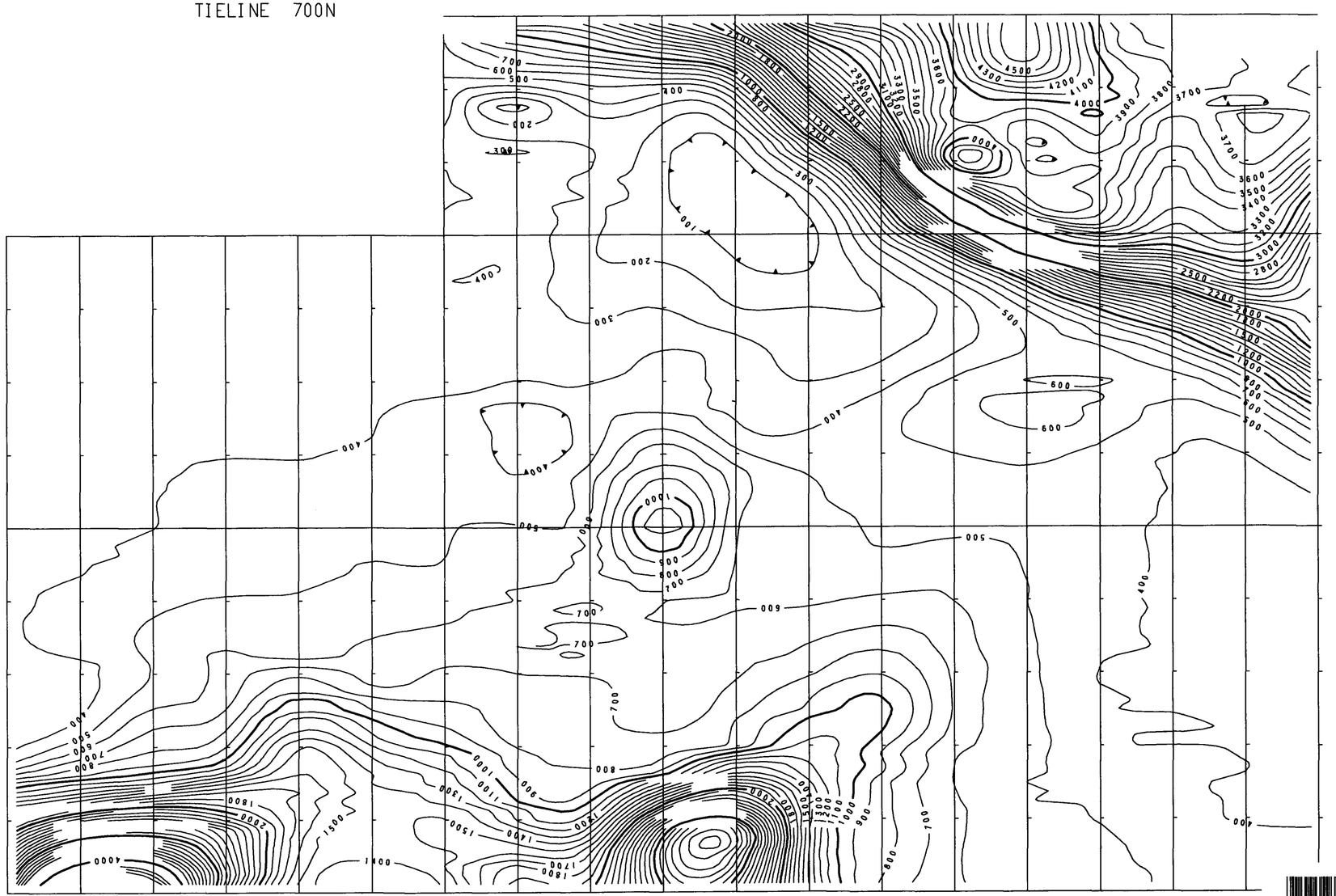
200W 100W 0+00 100E 200E 300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E

TIELINE 700N

TIELINE 400N

BASELINE 0+00

TIELINE 500S



2 17819

230

100m 50m 0m 100m 200m

Instrument : OMNI
Field : TOTAL
Datum : 59000.0 nT
Contour Interval :
Conductor Axis :

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-12/16

BASELINE AZIMUTH : 110 Deg.

SCALE = 1 : 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/16

NORTHWEST GEOPHYSICS LTD.

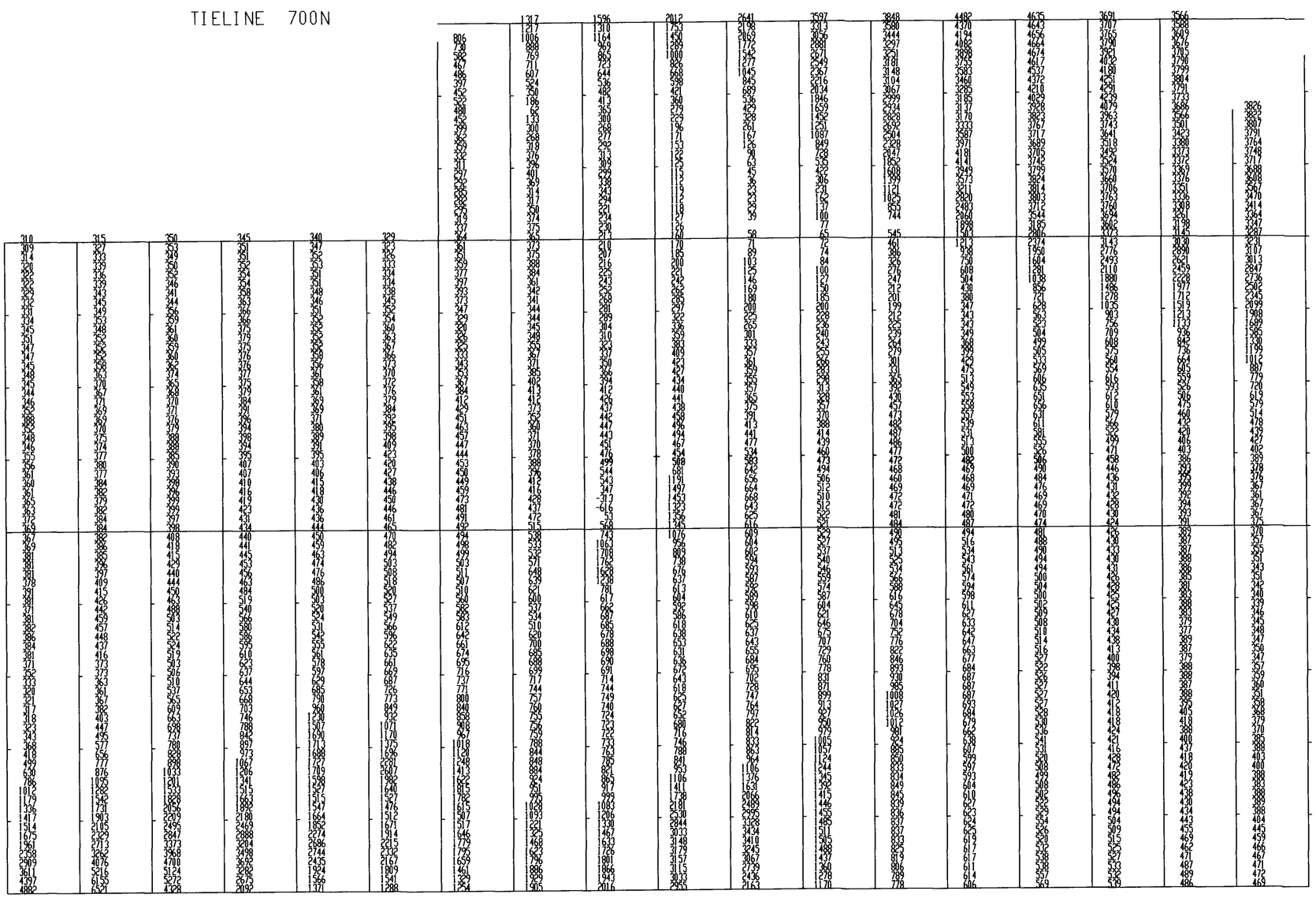
200W | 100W | 0+00 | 100E | 200E | 300E | 400E | 500E | 600E | 700E | 800E | 900E | 1000E | 1100E | 1200E | 1300E | 1400E | 1500E | 1600E

TIELINE 700N

TIELINE 400N

BASELINE 0+00

TIELINE 500S



2.1781

100m 50m 0m 100m 200m

Instrument	: OMNI
Field	: TOTAL
Datum	: 59000.0 nT
Contour Interval	:
Conductor Axis	:

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-12/16

BASELINE AZIMUTH : 110 Deg.

SCALE = 1 : 5000 DATE : 10/15/96

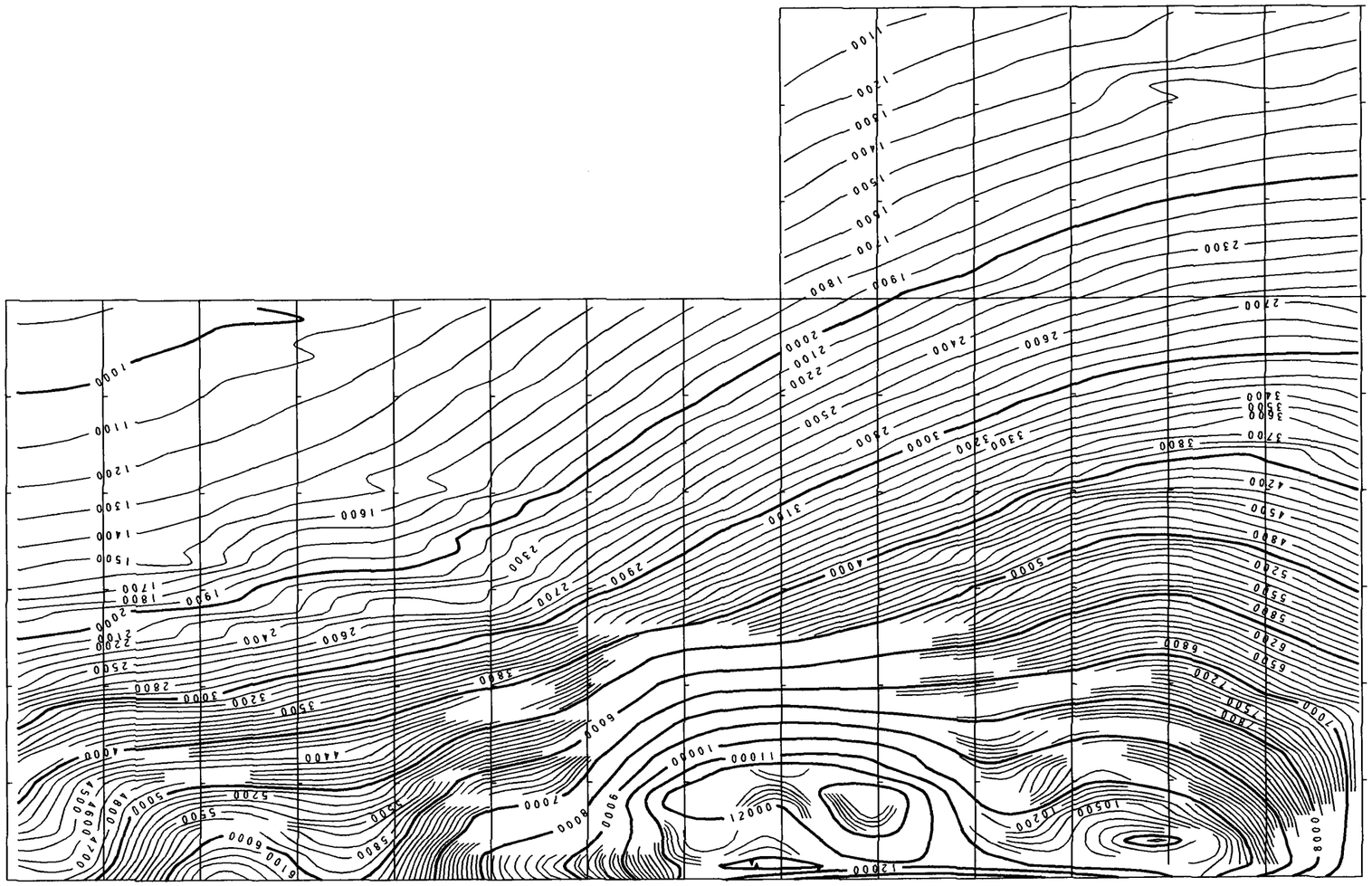
SURVEY BY : NWG NTS : 42 A/16

NORTHWEST GEOPHYSICS LTD.

100W 0+00 100E 200E 300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E

N

TIELINE 900N



TIELINE 600N

BASELINE 0+00

42A15NW0027 2.17819 MANN

250

100m 50m 0m 100m 200m

Instrument	: OMNI
Field	: TOTAL
Datum	: 59000.0 nT
Contour Interval	:
Conductor Axis	:

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-10/17

BASELINE AZIMUTH : 90 Deg.

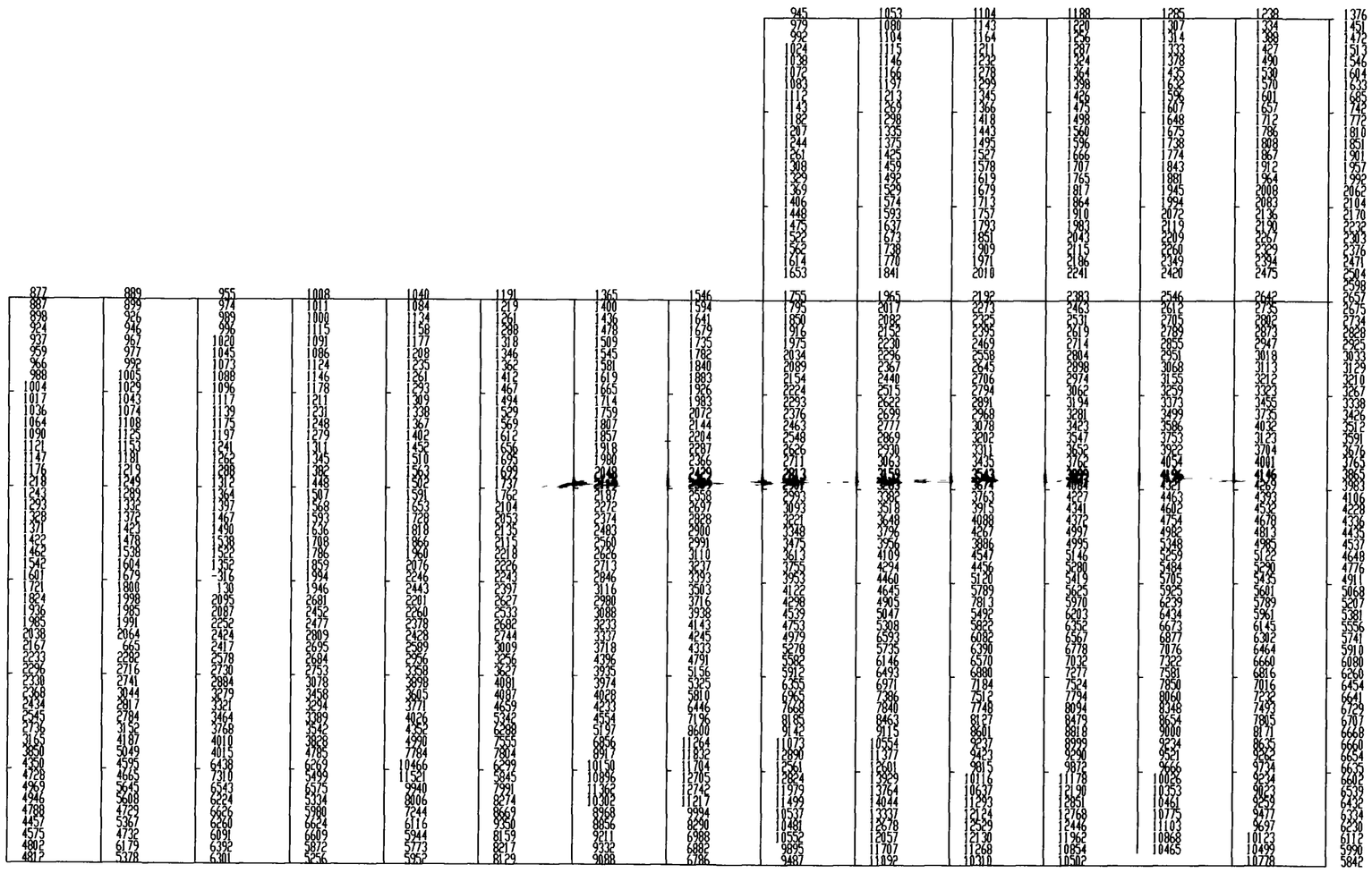
SCALE = 1 : 5000 DATE : 10/19/ 6

SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

100W | 0+00 | 100E | 200E | 300E | 400E | 500E | 600E | 700E | 800E | 900E | 1000E | 1100E | 1200E | 1300E

N



TIELINE 900N

TIELINE 600N

BASELINE 0+00

100m 50m 0m 100m 200m

Instrument	: OMNI
Field	: TOTAL
Datum	: 59000.0 nT
Contour Interval	:
Conductor Axis	:

42A15NW0027 2.17819 MANN

260

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-10/17

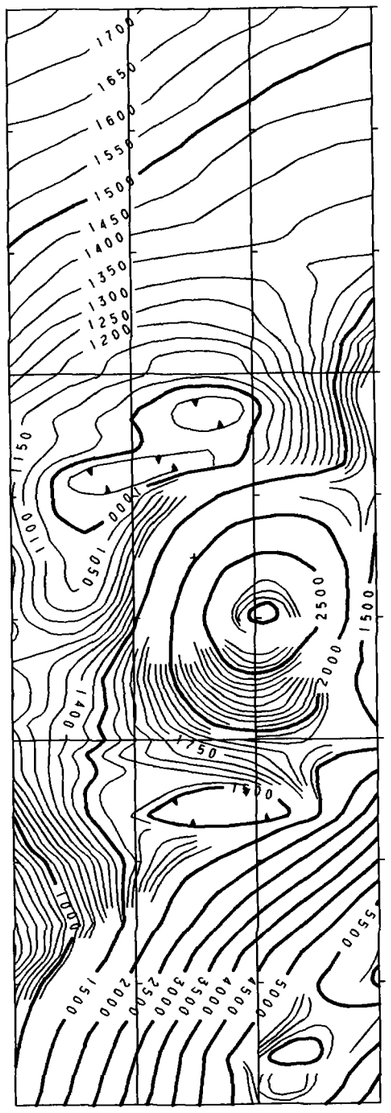
BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 DATE : 10/19/ 6

SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

300W 200W 100W 0+00



BASELINE 0+00

TIELINE 300S

TIELINE 600S

TIELINE 900S

300W 200W 100W 0+00

1775	1709	1621	1534
1767	1700	1610	1525
1748	1682	1581	1510
1731	1670	1557	1487
1712	1649	1539	1475
1700	1631	1518	1460
1680	1619	1502	1451
1668	1594	1478	1434
1637	1566	1454	1414
1624	1548	1439	1393
1607	1522	1421	1391
1595	1506	1413	1374
1569	1486	1395	1356
1562	1455	1384	1339
1555	1439	1372	1322
1527	1437	1363	1306
1515	1392	1342	1294
1487	1374	1330	1280
1475	1339	1293	1276
1451	1321	1293	1288
1431	1279	1271	1288
1408	1252	1247	1350
1380	1196	1235	1463
1348	1164	1199	1701
1329	1138	1178	1900
1323	1118	1148	1918
1295	1125	1114	1888
1275	1110	1037	1880
1245	1079	859	1913
1192	999	893	1990
1177	921	1016	1902
1166	787	1004	1878
1099	686	706	1716
1055	529	460	1624
982	413	301	1538
901	212	404	1368
782	73	1075	1221
700	205	1743	1127
624	519	2859	1184
663	1353	2807	1366
975	2117	2868	1547
1276	2527	3587	1614
1717	2748	3744	1603
2070	3073	3582	1501
2334	3131	3316	1384
2272	3186	2902	1188
1914	3278	1814	1046
1520	2996	1015	900
1206	1028	734	828
1014	605	971	796
818	784	1774	868
695	1775	1733	1401
488	2453	1718	1901
462	2428	1579	4147
1182	1537	1350	4684
2034	859	1153	4094
2331	532	973	4021
2081	551	1115	5317
1416	224	2308	5347
979	473	2668	4685
809	995	2407	5278
744	1041	2804	5588
722	814	4618	5750
695	2024	4427	6977
642	2574	4032	6149
606	2606	4056	5997
575	2238	5798	6121
560	2593	6038	6216
531	2424	6319	5733
495	2481	5650	4737
477	2706	6388	3977
461	2239	5156	3375
439	3791	5449	3222
536	3613	5068	3376
576	4322	4621	3443
1587			
1947			
2055			

100m 50m 0m 100m 200m

Instrument	: OMNI
Field	: TOTAL
Datum	: 59000.0 nT
Contour Interval	:
Conductor Axis	:

42A15NW0027 2.17819 MANN

270

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID 96-18

BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 **DATE : 10/15/96**

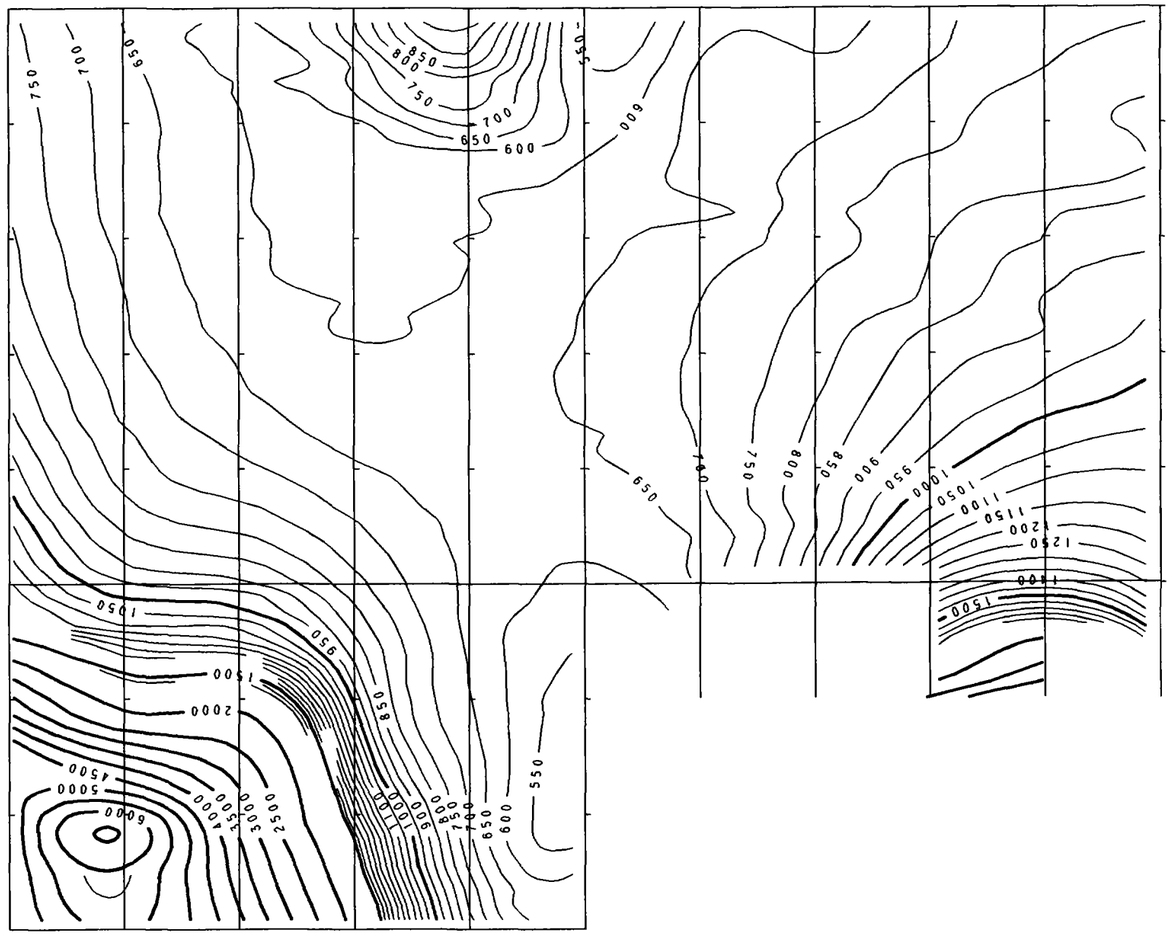
SURVEY BY : NWG **NTS : 42 A/15**

NORTHWEST GEOPHYSICS LTD.

1000W 900W 800W 700W 600W 500W 400W 300W 200W 100W 0+00

N

TIELINE 600N



BASELINE 100N

TIELINE 200S

100m 50m 0m 100m 200m

Instrument : OMNI
Field : TOTAL
Datum : 59000.0 nT
Contour Interval :
Conductor Axis :

FALCONBRIDGE LIMITED

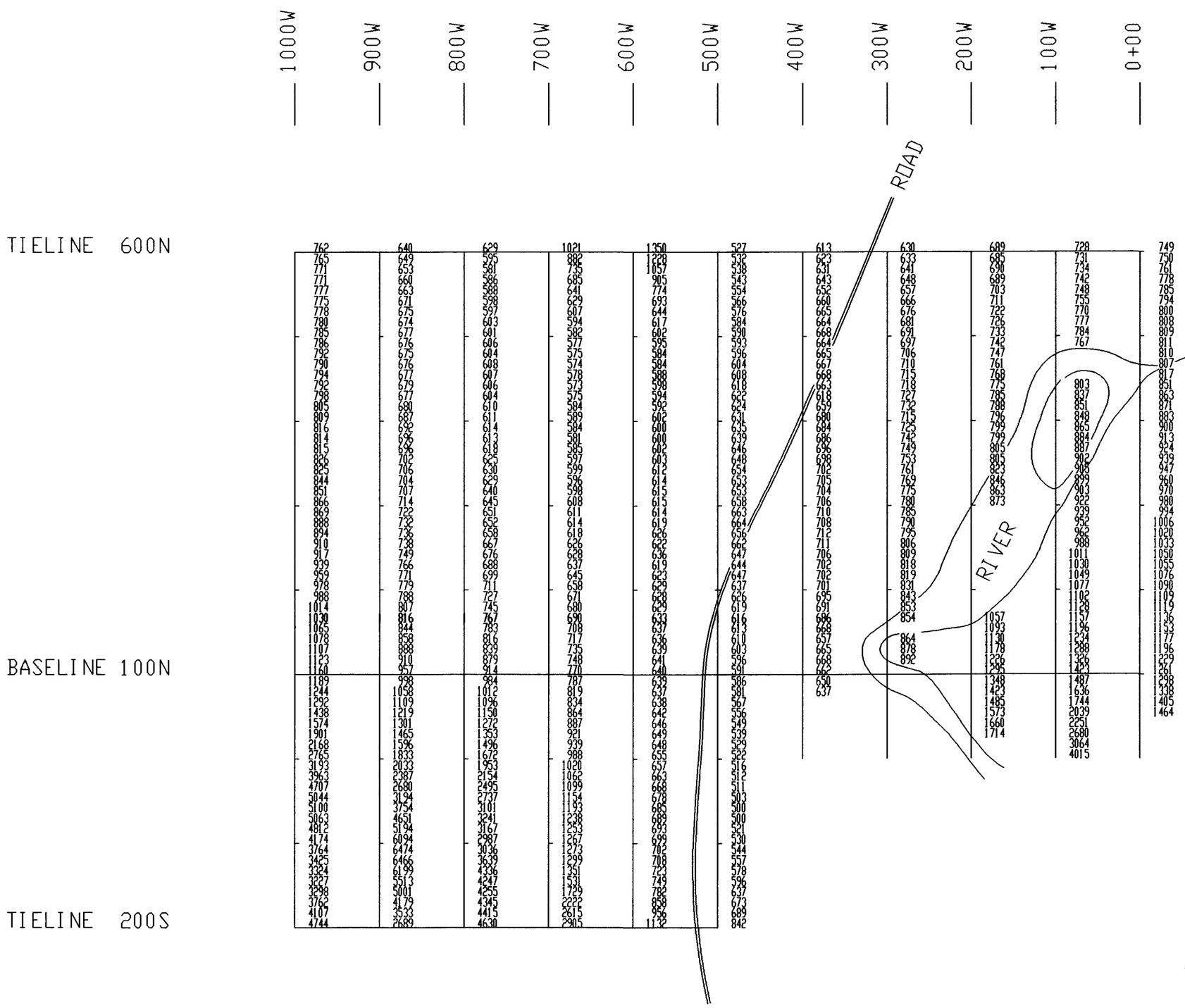
MAGNETOMETER SURVEY

MANN BELT PROJECT GRID MAN 96-19

BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.



TIELINE 600N

BASELINE 100N

TIELINE 200S

2.17819

42A15NW0027 2.17819 MANN

290

100m 50m 0m 100m 200m

Instrument : OMNI
Field : TOTAL
Datum : 59000.0 nT
Contour Interval :
Conductor Axis :

FALCONBRIDGE LIMITED

MAGNETOMETER SURVEY

MANN BELT PROJECT GRID MAN 96-19

BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 5000 DATE : 10/15/96

SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

LINE 800E

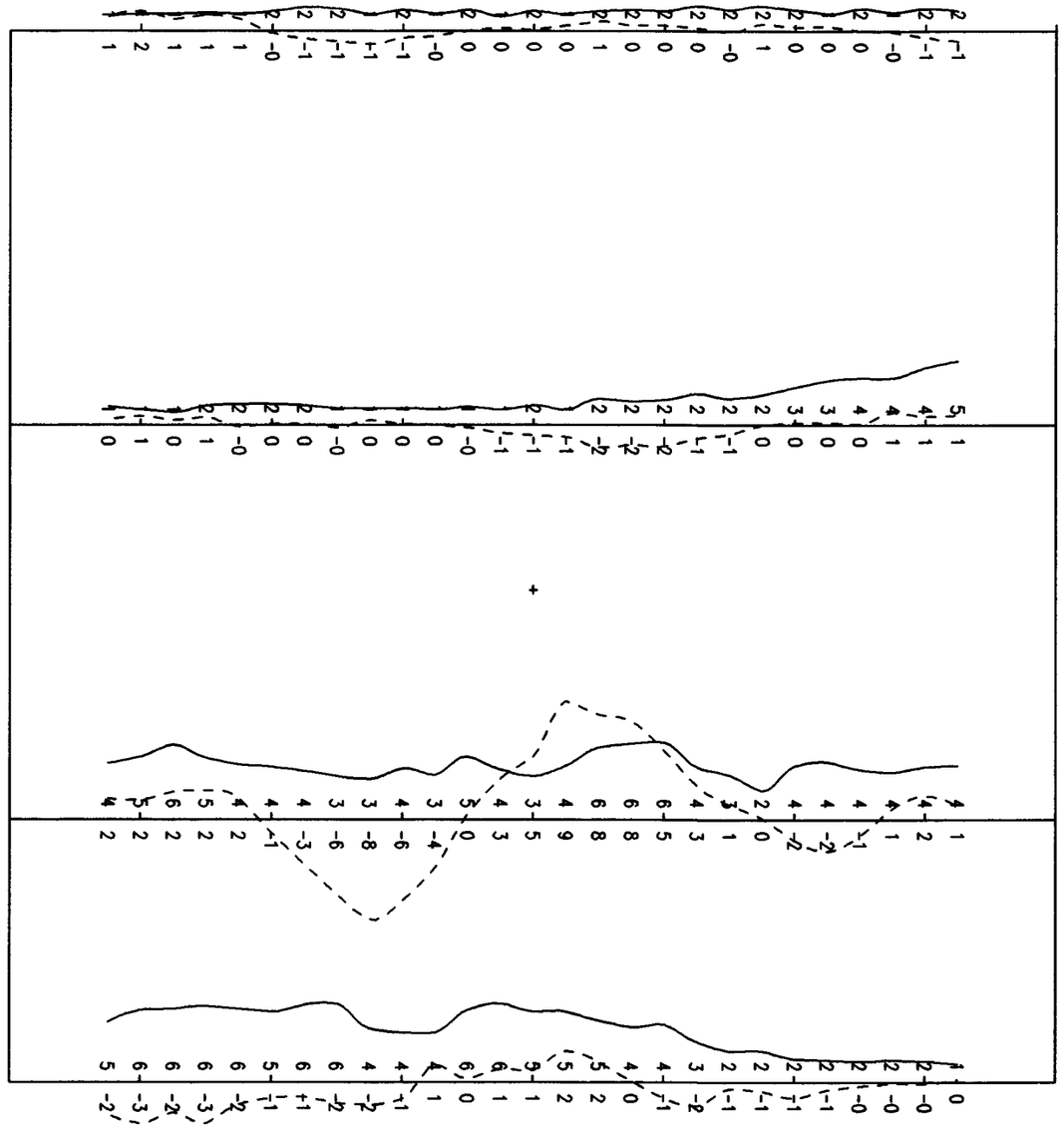
LINE 1600E

1600N TL

1300N TL

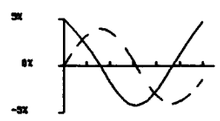
1000N TL

800N BL



300

100m 50m 0m 100m 200m



Instrument : MAXMIN 1
Coil Spacing : 150m
Vertical Scale: 1 cm = 5%
Frequency : 440 Hz
In Phase : _____
Quadrature : _ _ _

FALCONBRIDGE LIMITED

HLEM SURVEY

FREQ. 440 HERTZ

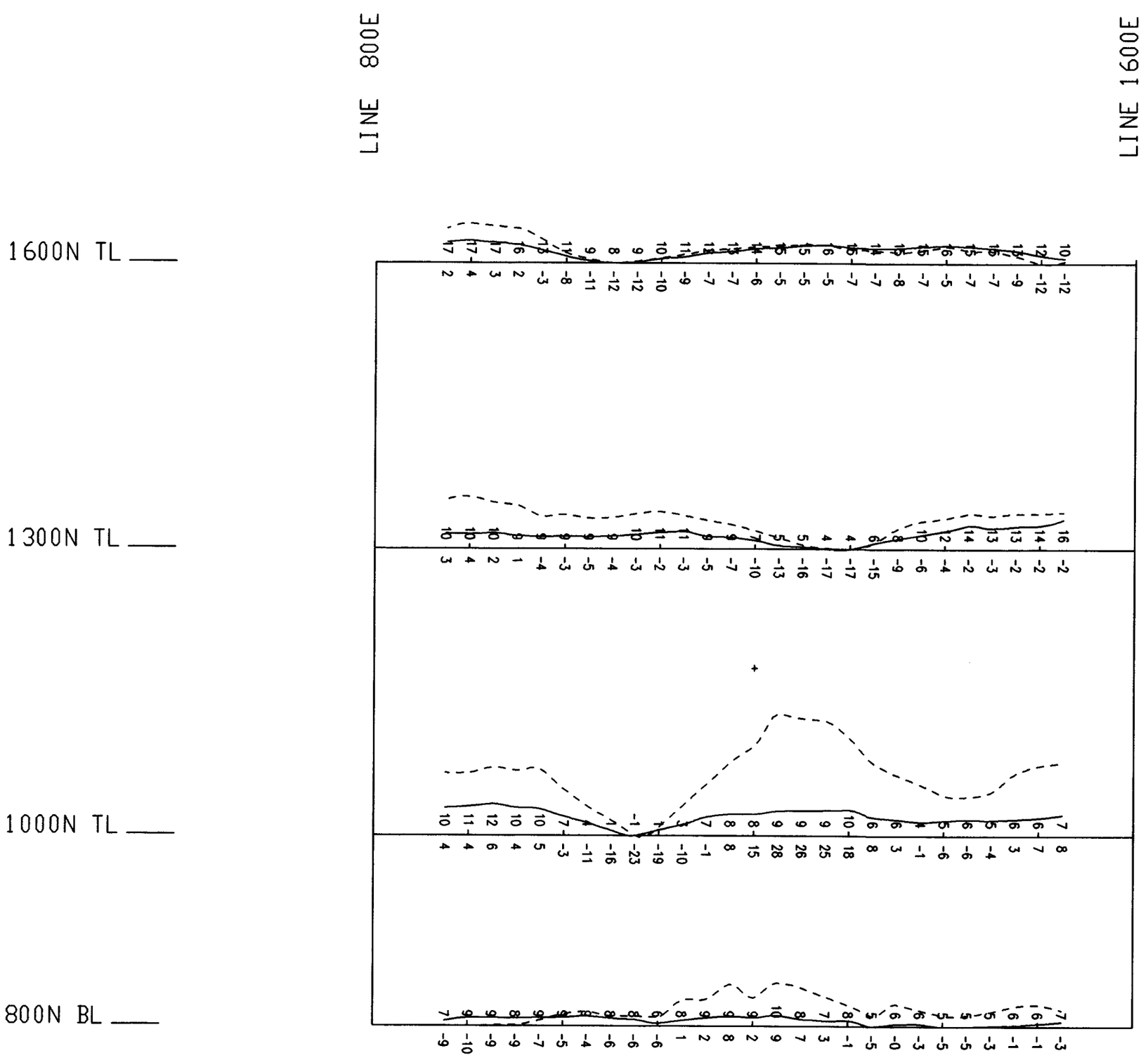
MANN BELT PROJECT GRID 96-15

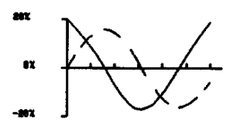
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 5000 **DATE : 10/15/96**

SURVEY BY : NWG **NTS : 42 A/16**

NORTHWEST GEOPHYSICS LTD.





Instrument : MAXMIN I
Coil Spacing : 150m
Vertical Scale : 1 cm = 20%
Frequency : 1760
In Phase : ———
Quadrature : — — —

42A15NW0027 2.17819 MANN

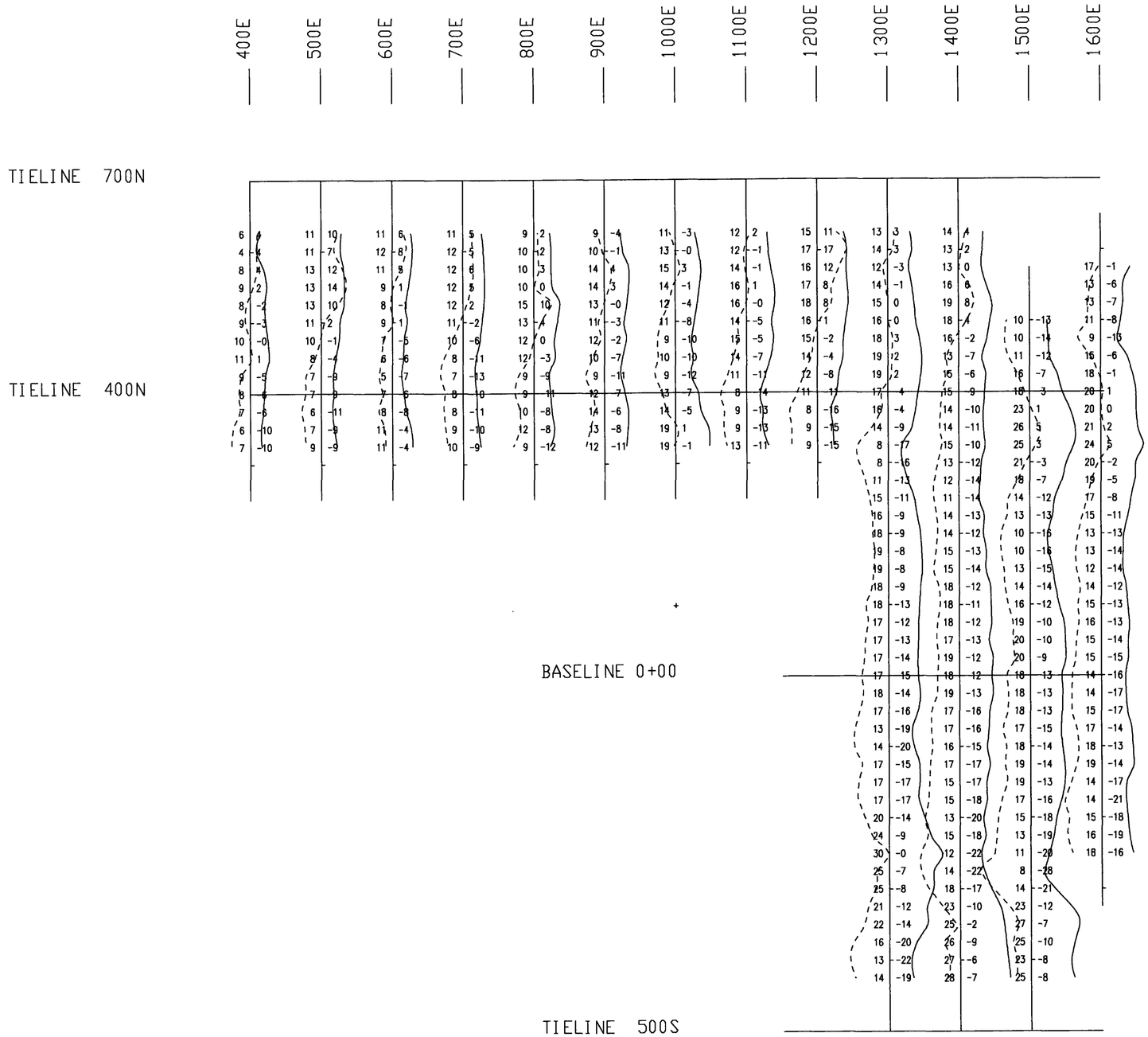
310

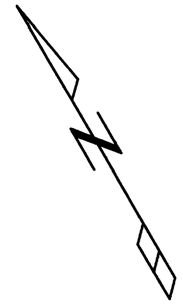
FALCONBRIDGE LIMITED

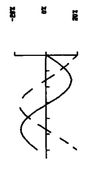
HLEM SURVEY
FREQ. 1760 HERTZ
MANN BELT PROJECT GRID 96-15
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/16

NORTHWEST GEOPHYSICS LTD.







Instrument : MAXMIN I
Coil Spacing : 150m
Vertical Scale : 1 cm = 20%
Frequency : 1760 Hz.
In Phase : ———
Quadrature : - - - -

FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 1760 HERTZ
MANN BELT PROJECT GIRD 96-16
BASELINE AZIMUTH : 120 Deg.

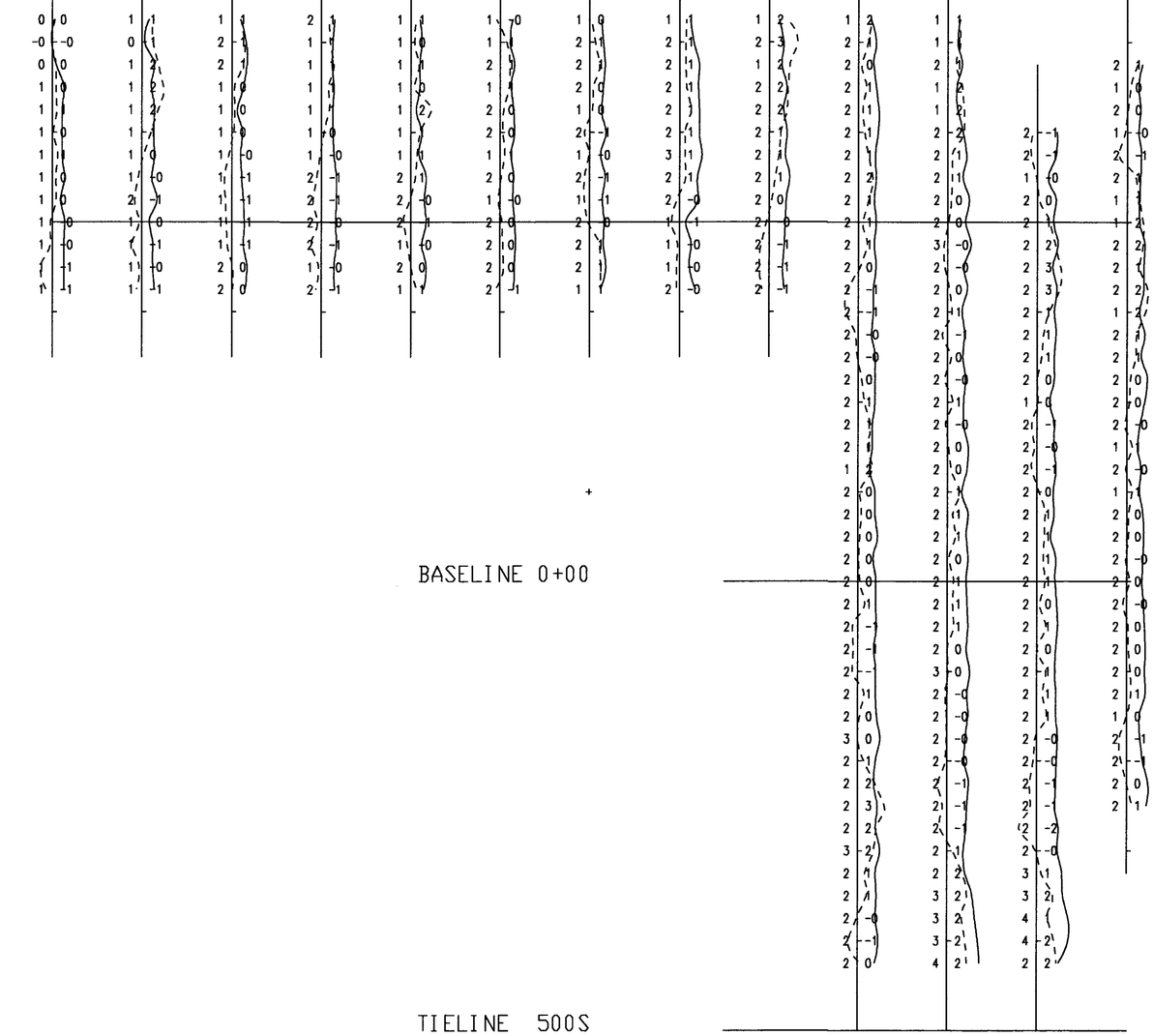
SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E

TIELINE 700N

TIELINE 400N



BASELINE 0+00

TIELINE 500S

100m 50m 0m 100m 200m

Instrument : MAXMIN 1
Coil Spacing : 150m
Vertical Scale: 1 cm = 5%
Frequency : 440 Hz
In Phase :
Quadrature :

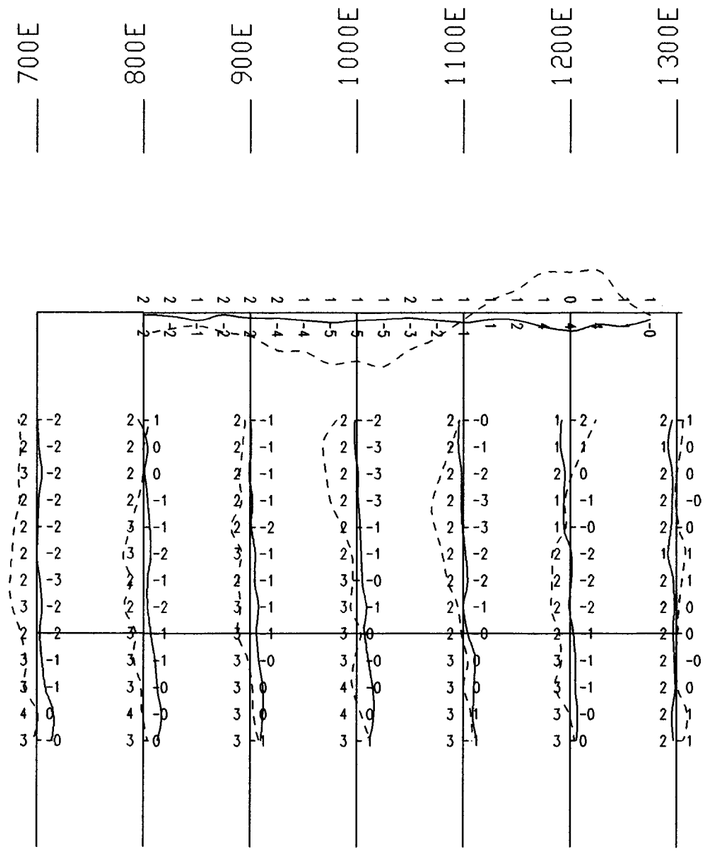
2.17819

FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 440 HERTZ
MANN BELT PROJECT GIRD 96-16
BASELINE AZIMUTH : 120 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

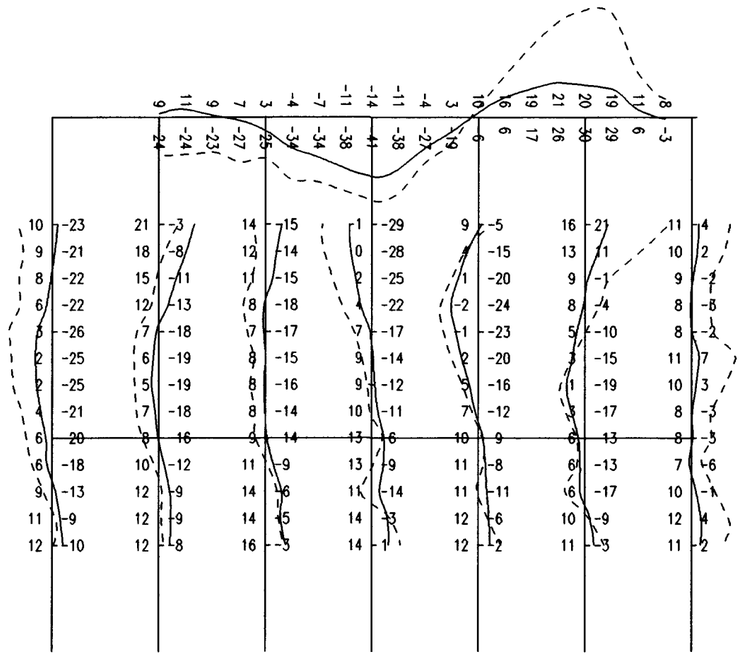
NORTHWEST GEOPHYSICS LTD.



FREQ. 440 Hz. 1 cm = 5%

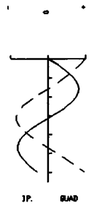
TIELINE 900N

BASELINE 600N



FREQ. 1760 Hz. 1 cm = 20%

2.17819



Instrument : MAXMIN 1
Coil Spacing : 200m
In Phase : ———
Quadrature : - - - -

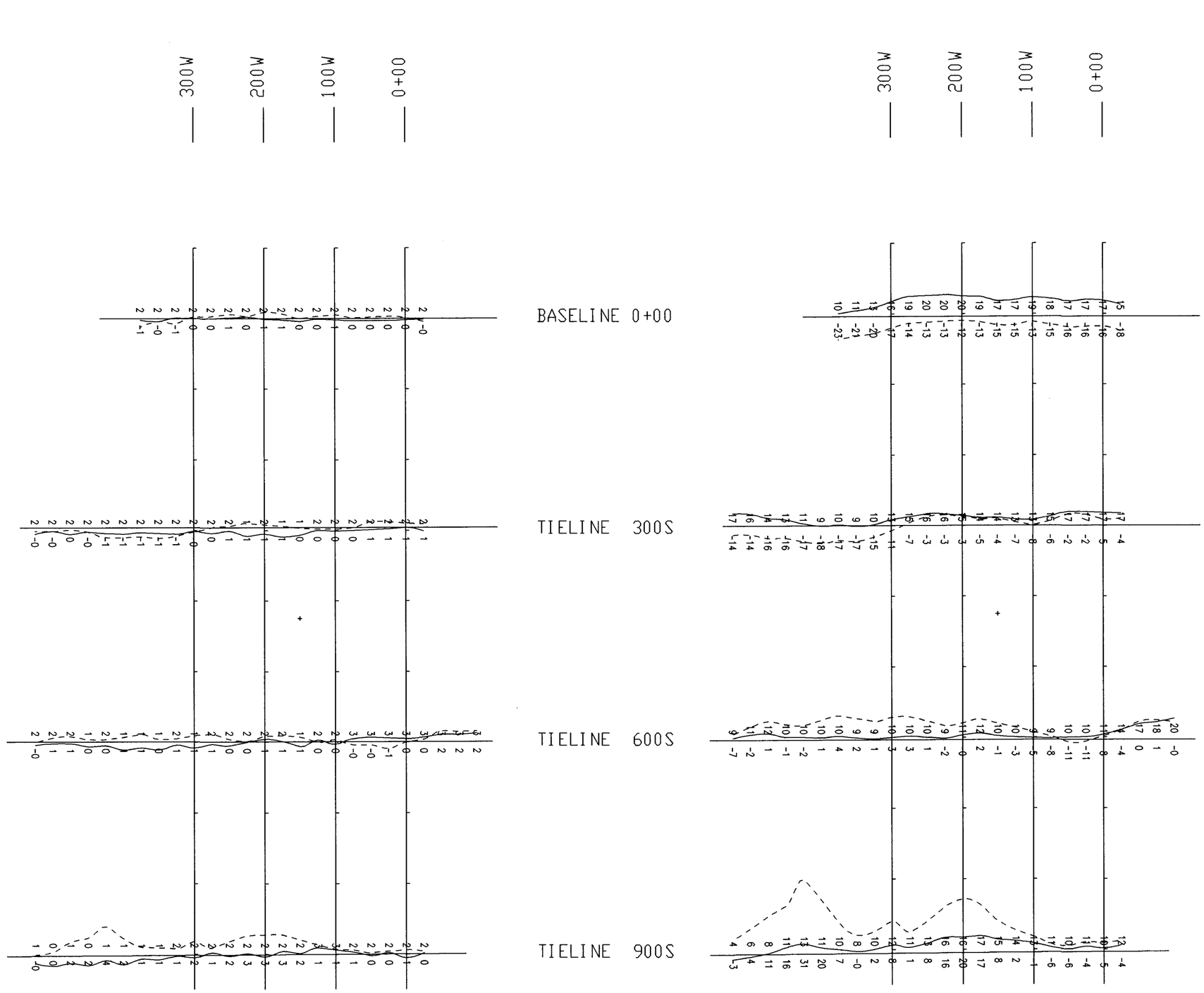
340

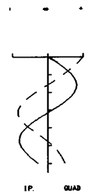
FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 440/1760 Hz
MANN BELT PROJECT GRID 96-17
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.





Instrument : MAXMIN I
Coil Spacing : 150m
In Phase : ———
Quadrature : - - - -

42A15NW0027 2.17819 MANN

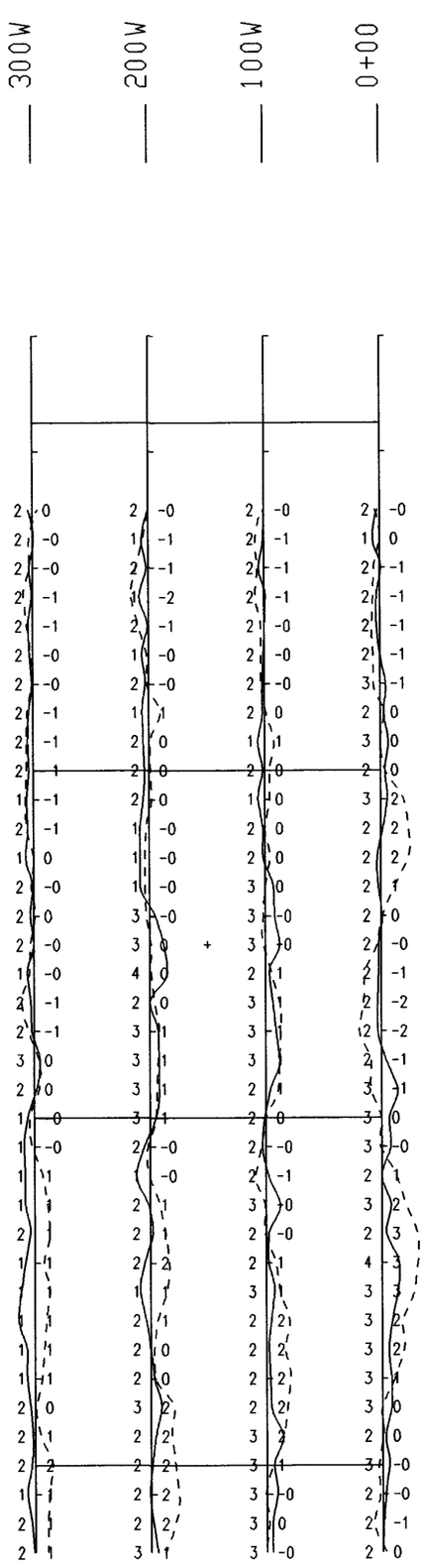
350

FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 440/1760 Hz.
MANN BELT PROJECT GRID 96-18
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.



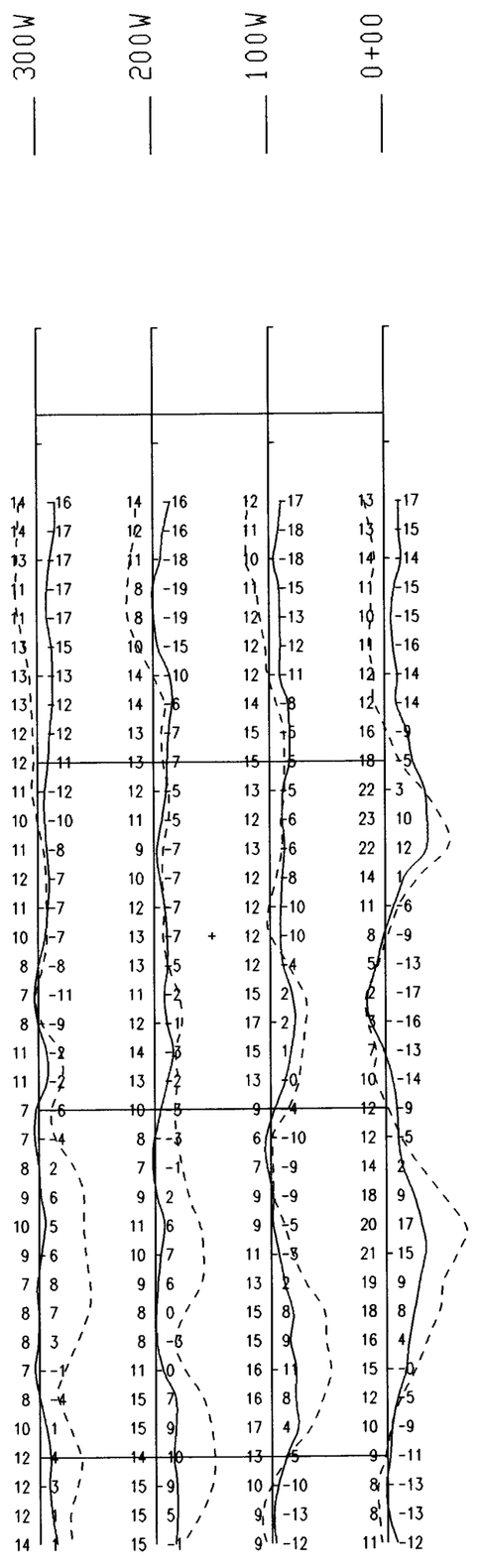
BASELINE 0+00

TIELINE 300S

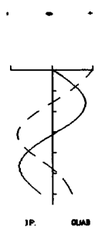
TIELINE 600S

TIELINE 900S

FREQ. 440 Hz. 1 cm = 5%



FREQ. 1760 Hz. 1 cm = 20%



Instrument : MAXMIN I
Coil Spacing : 150m
In Phase : ———
Quadrature : - - - -

42A15NW0027 2.17819 MANN

360

FALCONBRIDGE LIMITED

HLEM SURVEY

FREQ. 440/1760 Hz.

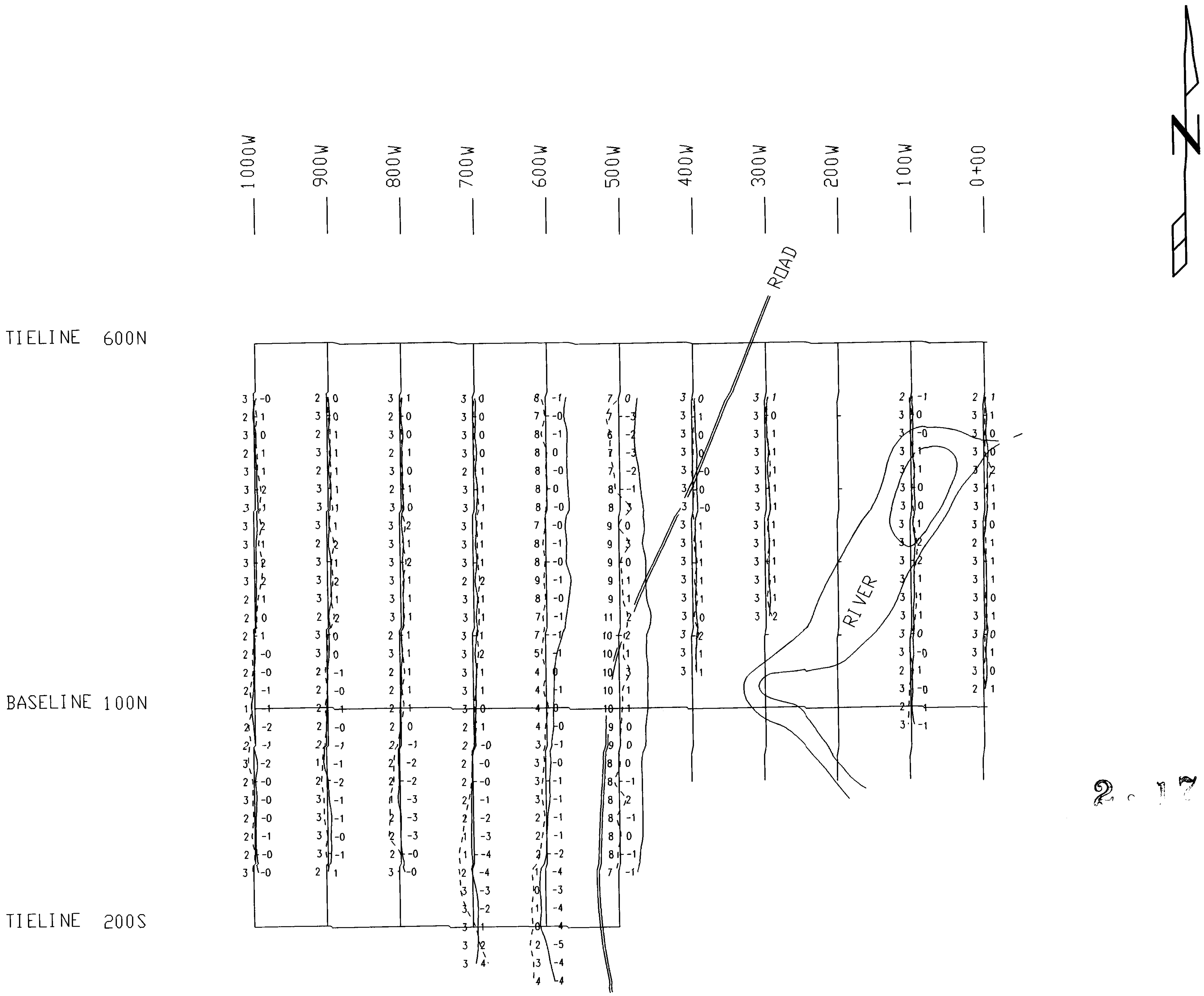
MANN BELT PROJECT GRID 96-18

BASELINE AZIMUTH : 90 Deg.

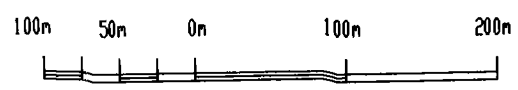
SCALE = 1: 5000 DATE : 10/15/96

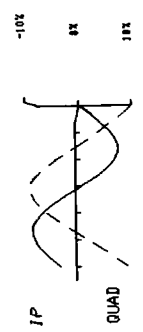
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.



2.17819





Instrument	:	MAXMIN 1
Coil Spacing	:	150m
Vertical Scale	:	1 cm = 10%
Frequency	:	440 Hz
In Phase	:	———
Quadrature	:	- - - - -

42A15NW0027 2.17819 MANN

370

FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 440 HERTZ
MANN BELT PROJECT GRID 96-19
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

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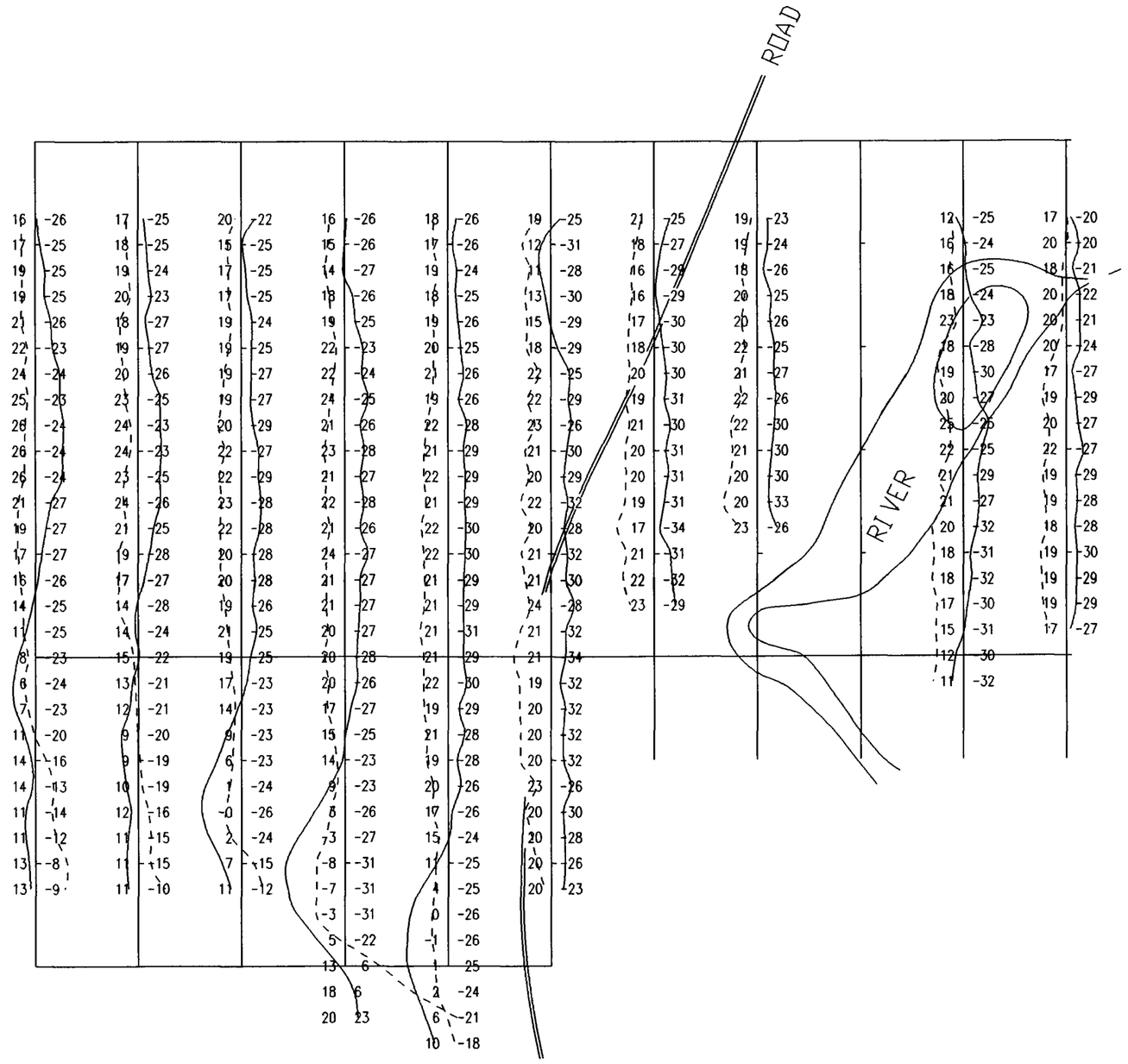
1000W 900W 800W 700W 600W 500W 400W 300W 200W 100W 0+00

TIELINE 600N

BASELINE 100N

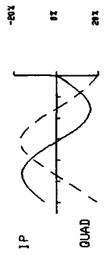
TIELINE 200S



2.17819

380

100m 50m 0m 100m 200m



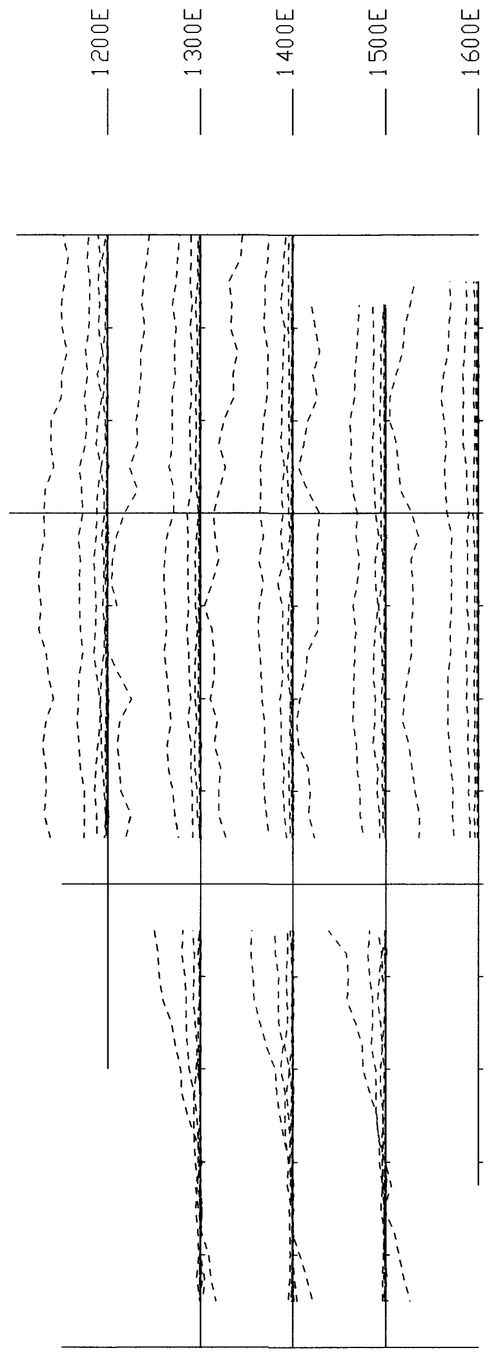
Instrument : MAXMIN I
Coil Spacing : 150m
Vertical Scale: 1 cm = 20%
Frequency : 1760 Hz
In Phase : ———
Quadrature : - - - - - -

FALCONBRIDGE LIMITED

HLEM SURVEY
FREQ. 1760 HERTZ
MANN BELT PROJECT GRID 96-19
BASELINE AZIMUTH : 90 Deg.

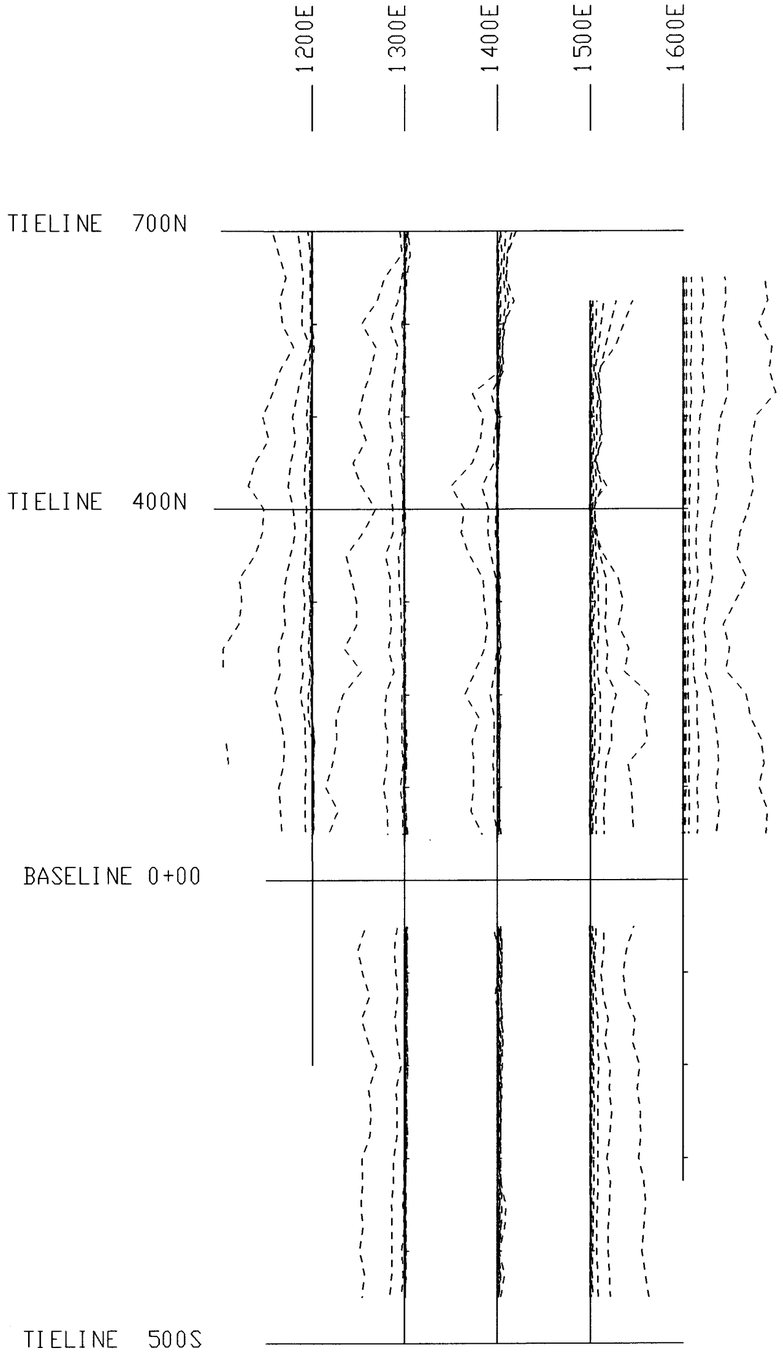
SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.



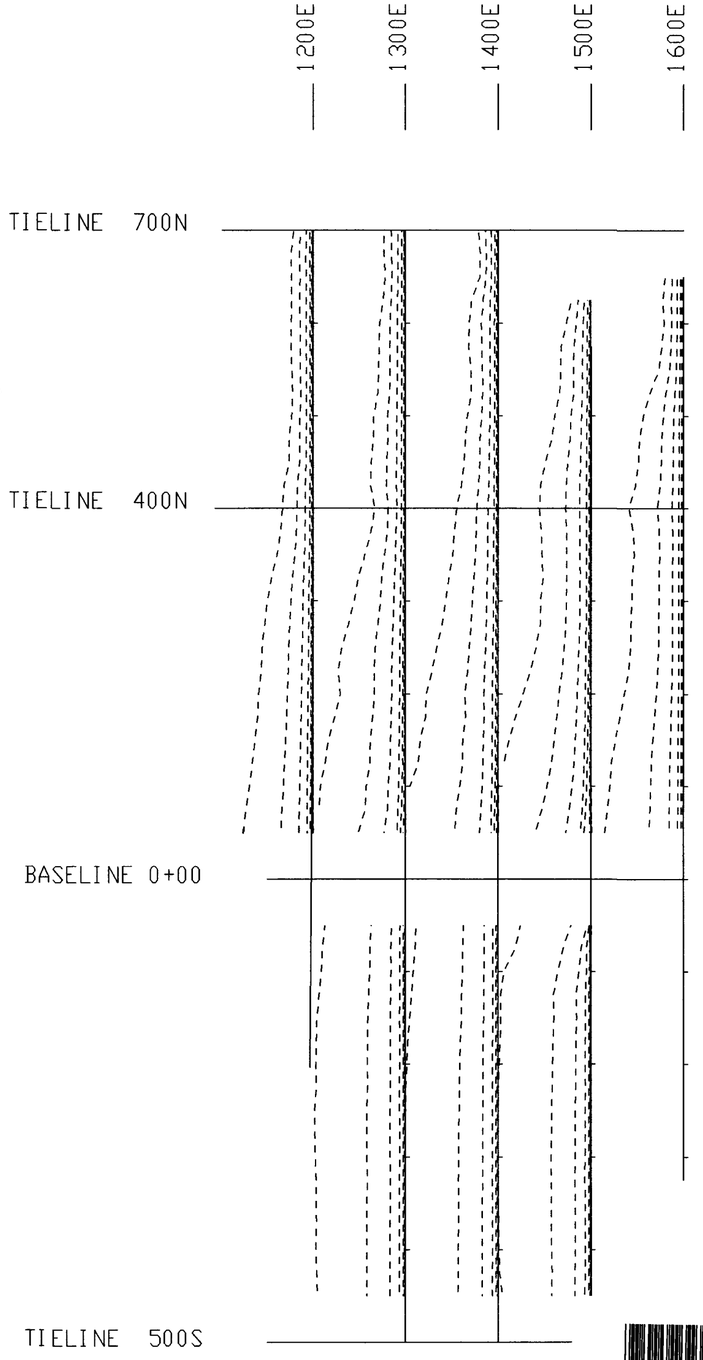
X Component

Profile Scale: 1 cm = 30 nV



Y Component

Profile Scale: 1 cm = 10 nV.



Z Component

Profile Scale: 1 cm = 50 nV.

Instrument : GEONICS EM 37/57
Frequency : 30 Hertz

2.17819

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390

FALCONBRIDGE LIMITED

TDEM SURVEY
CHANNELS 11-20
MANN BELT PROJECT GIRD 96-16
BASELINE AZIMUTH : 120 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

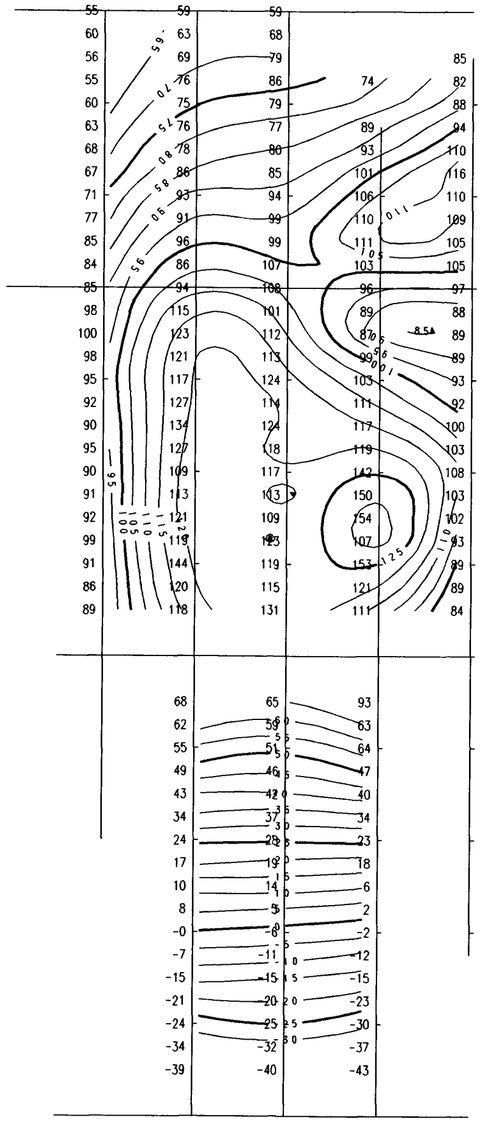
1200E 1300E 1400E 1500E 1600E

TIELINE 700N

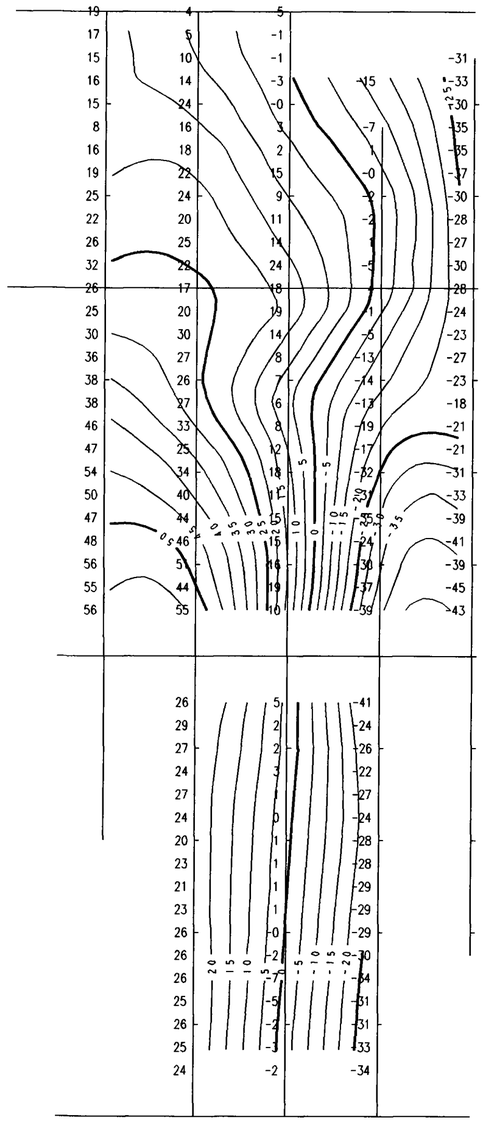
TIELINE 400N

BASELINE 0+00

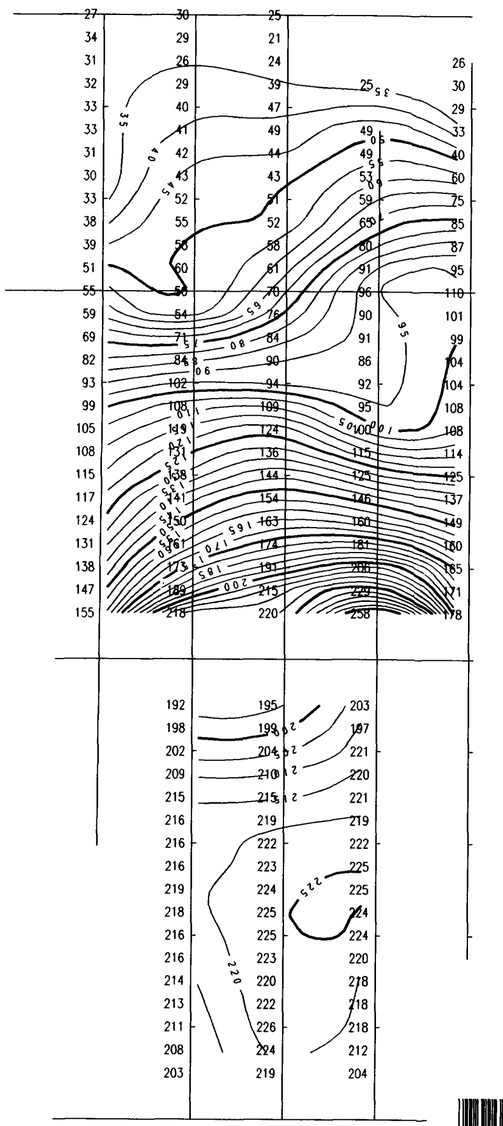
TIELINE 500S



X Component



Y Component



Z Component

2.17819

42A15NW0027 2.17819 MANN

400

100m 50m 0m 100m 200m

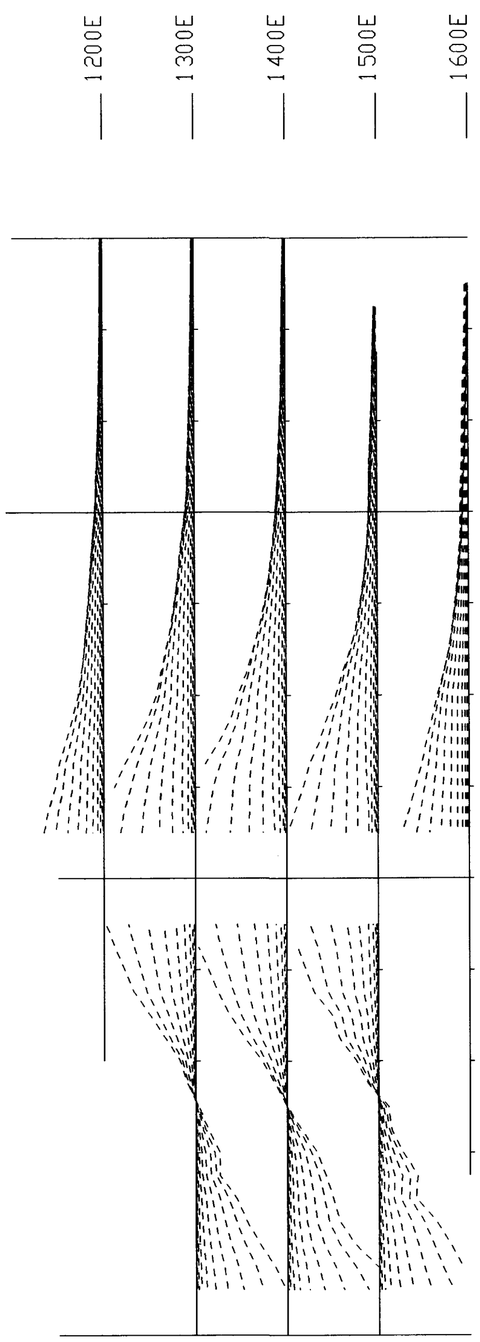
Instrument : GEONICS EM 37/57
Contour Intv. : 5 Mv.
Frequency : 30 Hertz

FALCONBRIDGE LIMITED

TDEM SURVEY
CHANNEL 10
MANN BELT PROJECT GIRD 96-16
BASELINE AZIMUTH : 120 Deg.

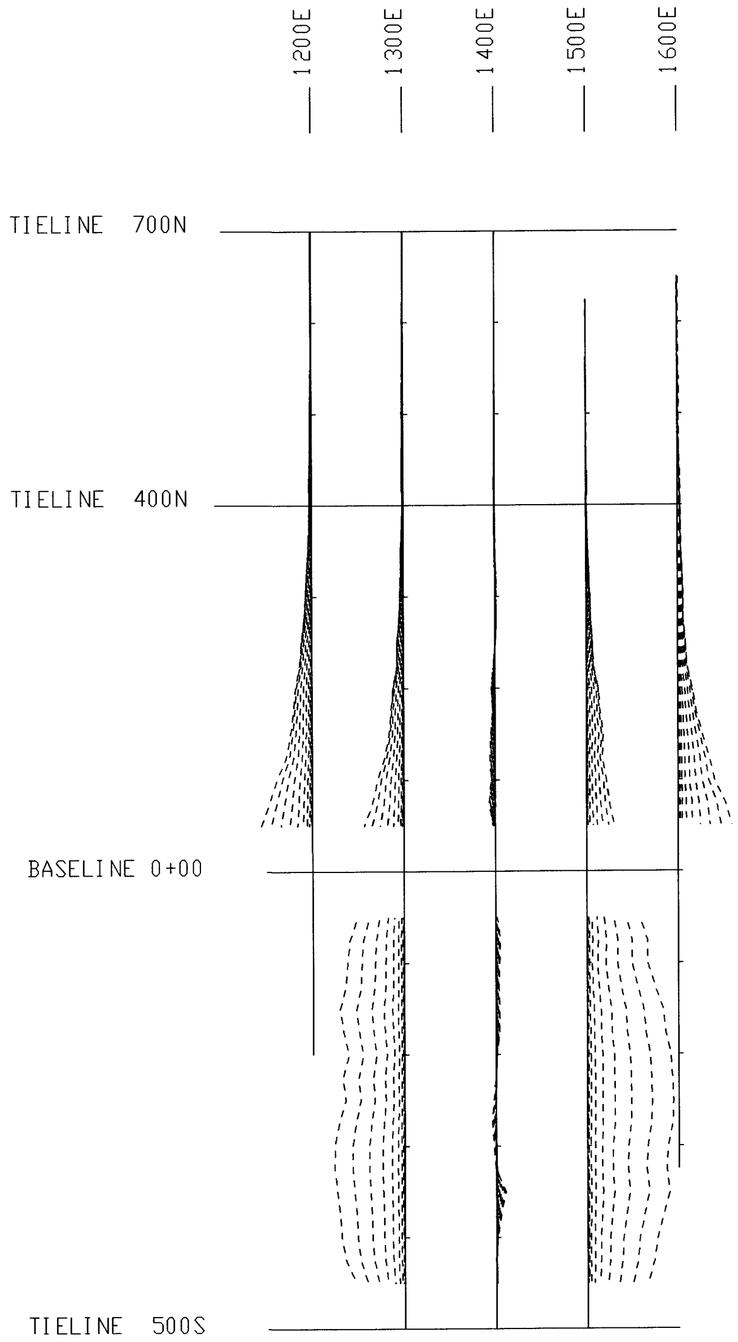
SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.



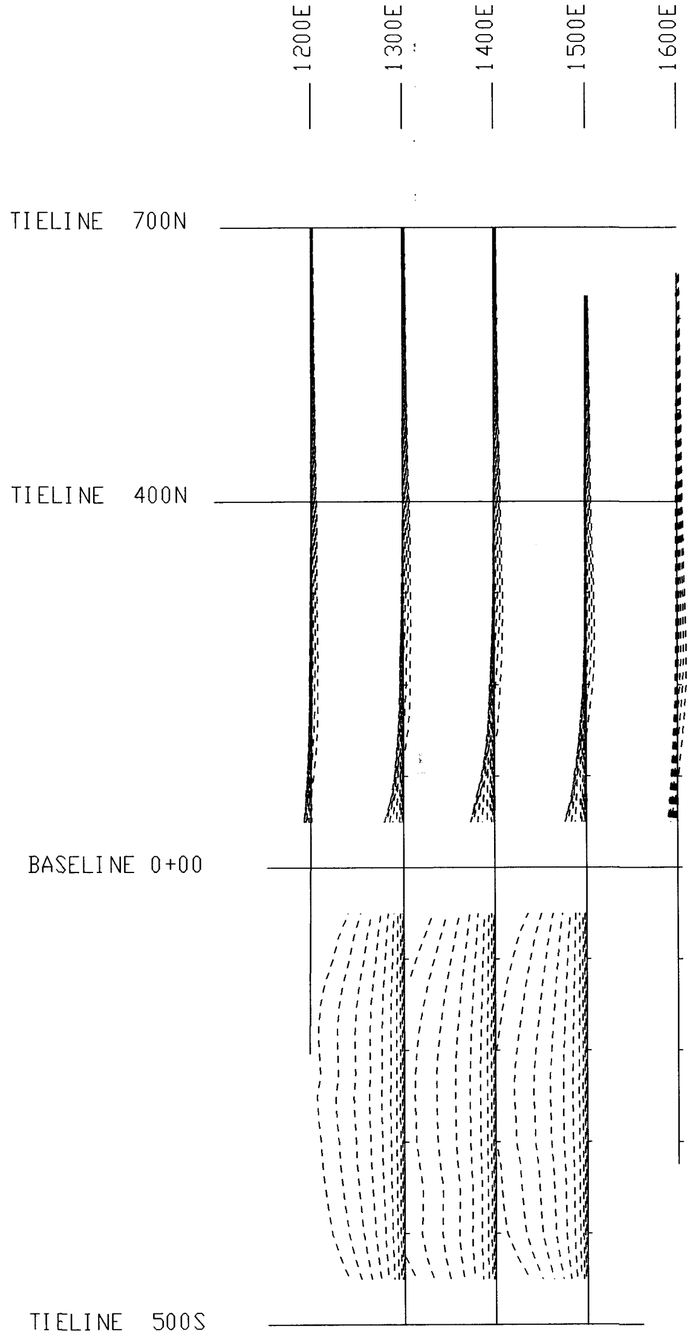
X Component

Profile Scale: 1 cm = 5000 nV.



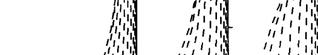
Y Component

Profile Scale: 1 cm = 5000 nV.



Z Component

Profile Scale: 1 cm = 10000 nV.



Instrument : GEONICS EM 37/57
Frequency : 30 Hertz

FALCONBRIDGE LIMITED

TDEM SURVEY
CHANNELS 1-10
MANN BELT PROJECT GIRD 96-16
BASELINE AZIMUTH : 120 Deg.

SCALE = 1: 5000 DATE : 10/15/96
SURVEY BY : NWG NTS : 42 A/15

NORTHWEST GEOPHYSICS LTD.

2.17819

410