

85-983-14187
10/86

Report on Linecutting and HLEM Survey

Bar and Chu Chua Properties

Kamloops Mining Division

NTS 82M/5W, 92P/8E

51° 15' ; 120° 00'

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,187

Owner & Operator

Corporation Falconbridge Copper

6415 - 64th Street

Delta, B. C. V4K 4E2

Ian D. Pirie

December, 1985

PART 1 OF 2

Table of Contents

| | Page |
|---|------|
| INTRODUCTION | 1 |
| General | 1 |
| Location & Access | 1 |
| Physiography | 1 |
| Property and Ownership | 3 |
| History | 5 |
| Work Done | 5 |
| LOGISTICS | 5 |
| Survey Specifications and Instrumentation | 5 |
| Survey Personnel and Data Acquisition | 6 |
| Survey Coverage | 6 |
| Data Processing | 7 |
| Data Presentation | |
| INTERPRETATION | 8 |
| Anna Grid | 8 |
| SC Grid | 8 |
| Chu Chua Grid | 9 |
| CONCLUSIONS AND RECOMMENDATIONS | 10 |
| ITEMIZED COST STATEMENT | 11 |
| STATEMENT OF QUALIFICATIONS | 13 |

LIST OF MAPS (in pocket)

- 1a Anna Grid 1777 Hz
- 1b Anna Grid 444 Hz
- 2a SC Grid 1777 Hz
- 2b SC Grid 444 Hz
- 3a Chu Chua Grid 1777 Hz
- 3b Chu Chua Grid 444 Hz
- 4 Grid Locations

INTRODUCTION

General

The Bar and Chu Chua properties contain 690 claim units covering some 17,000 hectares of the Barriere area, Kamloops Mining Division. Corporation Falconbridge Copper is owner and operator. For the purpose of administration this large area is divided into 10 claim groups. This report covers a linecutting/HLEM survey carried out over parts of 5 of these groups (Dunn Gp, North Gp and South Gp on the Chu Chua property, SC Gp and Anna Gp on the Bar property) during August 1985.

Location and Access (Figure 1)

The claims are located on the Adams Plateau between Adams Lake and the North Thompson River and are bounded by latitude $51^{\circ}00'N$ and $51^{\circ}25'N$ and longitude $119^{\circ}45'W$ and $120^{\circ}10'W$.

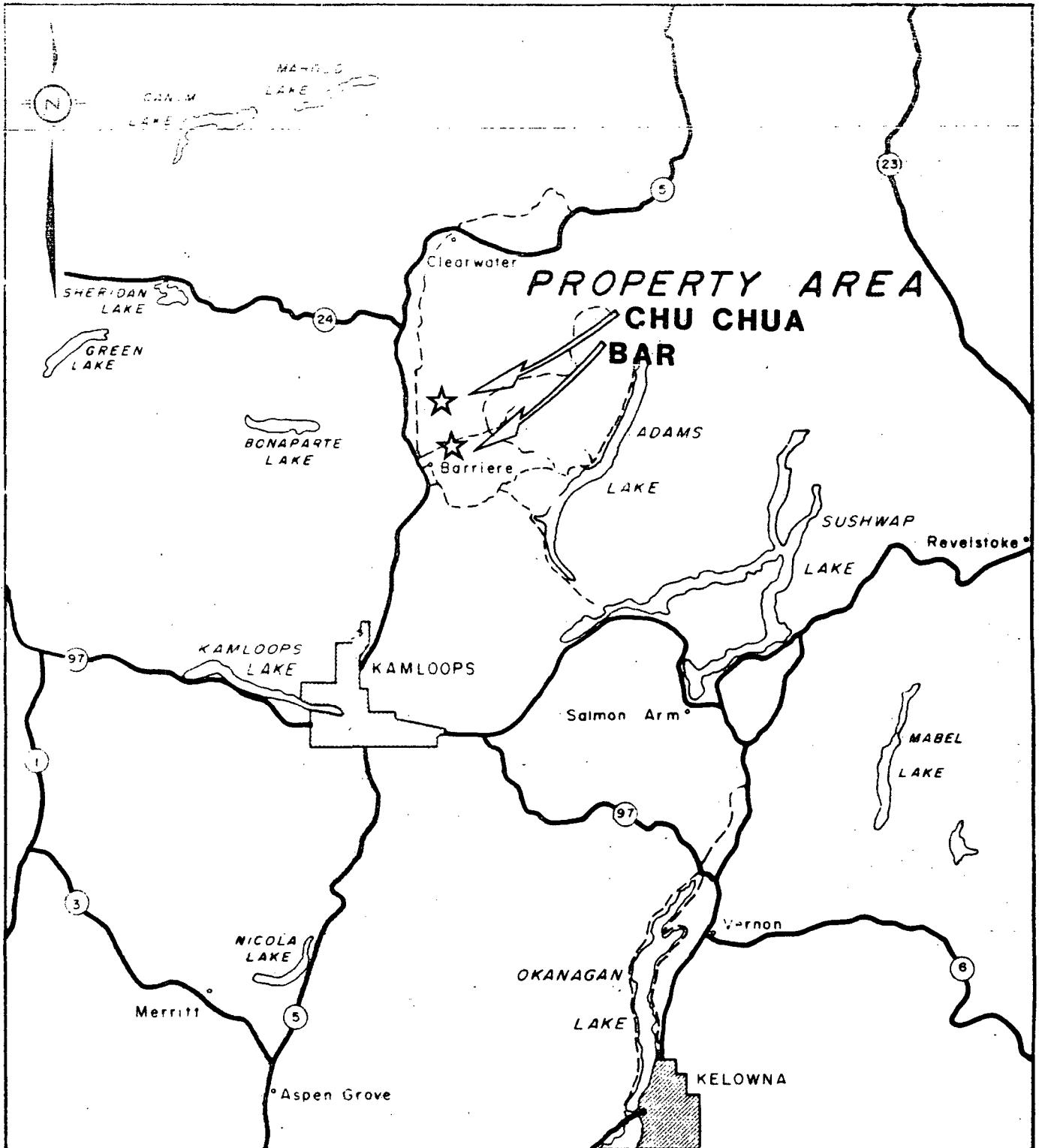
Access is readily available from Highway 5 in the Barriere area by the Barriere Lakes road and thence by various logging roads.

Physiography

The western edge of the Adams Plateau consists of high rolling plateau country incised by locally steep, drift filled valleys. Elevations range from less than 500m in the Simax Valley, at the south end of the area to over 2000m on the Chu Chua property at the north end.

Fairly dense forest cover occurs across most of the area giving way to sub-alpine vegetation above 1900m. Active logging operations are present.

The climate is moderate with temperatures ranging from $-35^{\circ}C$ in the winter to $30^{\circ}+$ in the summer. Precipitation is extremely variable ranging from semi-arid in the south to moderately wet in the north. The snow free period runs from May to November in the south, but lasts only from July to October in the north.



LOCATION MAP
- BAR PROJECT AND CHU CHUA OPTION -

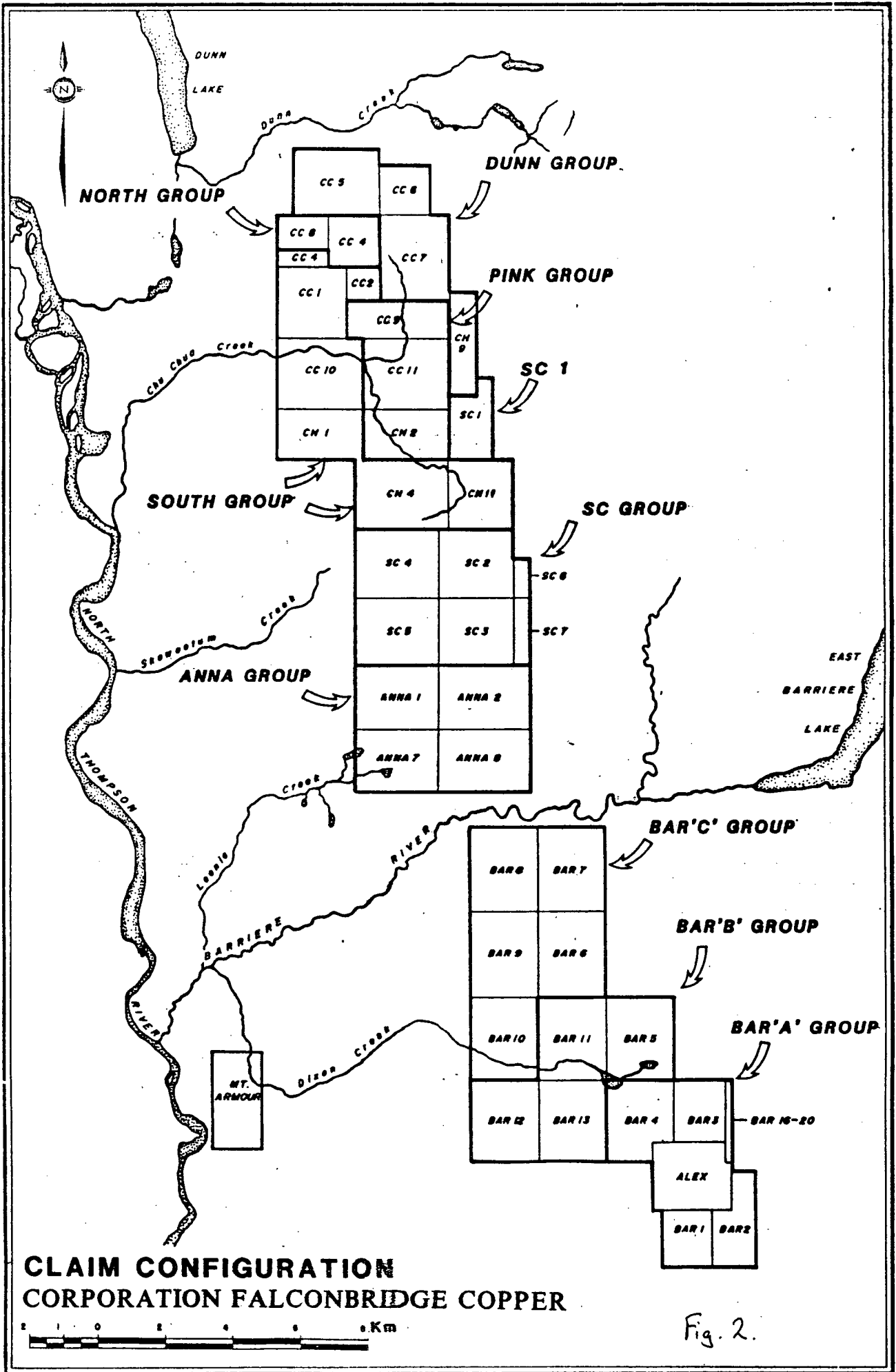
Fig. 1.

Property and Ownership

Figure 2 shows the configuration of the claim groups on the two properties. Table 1 summarizes the pertinent data on claims reported upon herein. All are registered to CFC.

Table 1

| <u>Name</u> | <u>Record No.</u> | <u>Units</u> | <u>Month</u> | <u>Group</u> |
|-------------|-------------------|--------------|--------------|--------------|
| Anna 1 | 5332 | 20 | December | Anna |
| Anna 2 | 5333 | 20 | December | Anna |
| Anna 7 | 5339 | 20 | December | Anna |
| Anna 8 | 5340 | 20 | December | Anna |
| SC 2 | 5561 | 20 | March | SC |
| SC 3 | 5562 | 20 | March | SC |
| SC 4 | 5640 | 20 | May | SC |
| SC 5 | 5641 | 20 | May | SC |
| SC 6 | 5906 | 3 | October | SC |
| SC 7 | 5907 | 6 | October | SC |
| CC 1 | 1154 | 16 | March | South |
| CC 2 | 1373 | 4 | August | South |
| CC 3 | 1374 | 3 | August | South |
| CC 4 | 1423 | 9 | October | North |
| CC 5 | 1455 | 20 | October | Dunn |
| CC 6 | 1456 | 9 | October | Dunn |
| CC 7 | 1457 | 20 | October | Dunn |
| CC 8 | 1424 | 6 | October | North |
| CC 10 | 1459 | 20 | October | South |
| CH 1 | 1461 | 20 | October | South |
| CH 4 | 1464 | 20 | October | South |
| CH 9 | 1469 | 12 | October | Dunn |
| CH 11 | 1471 | 16 | October | Dunn |



CLAIM CONFIGURATION CORPORATION FALCONBRIDGE COPPER

Fig. 2.

History

The claims in question cover some 30km of stratigraphy considered favourable for volcanogenic massive sulphides. The Bar Claims were staked following the discovery of the Rea Gold massive sulphide showings in late 1983, which are located 5km to the southeast. The Chu Chua claims were optioned in 1985. They include a massive sulphide body estimated to contain 2M tonnes grading 2% copper.

Apart from around the known sulphides on the Chu Chua claims, almost no work has been carried out on the entire property. In 1984, CFC initiated a program of reconnaissance scale mapping and lithogeochemical sampling designed to isolate specific areas favourable for volcanogenic massive sulphides. This work, combined with an AEM (Dighem) survey carried out by Craigmont in 1979, led to the choice of areas for the linecutting and HLEM described herein.

Work Done

During the period August 10th to August 31st, 1985 a total of 77.65km of linecutting and 63km of HLEM was carried out on 3 grids as follows:

| <u>Grid</u> | <u>Line (km)</u> | <u>HLEM (km)</u> | <u>Claim Groups (% apportioned)</u> |
|-------------|------------------|------------------|--|
| Chu Chua | 41.35 | 29.7 (5 days) | Dunn (41%) North (39%) South (20%) |
| SC | 20.2 | 18.6 (4 days) | SC (100%) |
| Anna | 16.1 | 14.7 (3 days) | Anna (100%) |

LOGISTICS

Survey Specifications and Instrumentation

The surveys were conducted using an Apex MaxMin I electromagnetic system in the max-coupled (horizontal loop) mode. Survey parameters were selected based on an analysis of airborne electromagnetic anomalies.

The following survey parameters were employed:

Coil spacing : 150 m
 Station spacing: 25m
 Frequencies: 444 Hz and 1777 Hz

The line spacing on all 3 grids was 100 meters; however, 2 lines (L106+00N and L107+00N) on the Chu Chua property were not surveyed.

Survey Personnel and Data Acquisition

To perform the survey work, MPH Consulting Ltd. provided a 2 man crew consisting of:

R. Nickson, B. Sc. - geophysicist
 R. Garcia - technician

At each station, secant measurements were taken to correct for nominal coil spacing irregularities induced by the rough terrain encountered. The in-phase and quadrature values, read as percentage of primary field strength, were manually recorded for each of the two frequencies used.

Where bush conditions permitted the acquisition of reliable data, survey coverage was extended to include anomalies not defined by the existing grids.

Survey Coverage

The following lines were surveyed on each grid:

(a) Chu Chua grid

| <u>Lines</u> | <u>Easting</u> |
|--------------------|--------------------|
| 95+00N to 98+00N | 98+00E to 120+00E |
| 100+00N to 105+00N | 101+00E to 120+00E |
| 108+00N to 111+00N | 101+00E to 120+00E |

(b) SC grid

| <u>Lines</u> | <u>Easting</u> |
|--------------|--------------------|
| 90+00N | 100+00E to 106+00E |
| 91+00N | 100+00E to 105+00E |
| 92+00N | 100+00E to 105+75E |
| 93+00N | 99+75E to 105+00E |

| | |
|--------------------|--------------------|
| 94+00N | 100+00E to 105+00E |
| 95+00N | 99+75E to 107+50E |
| 96+00N | 100+00E to 109+50E |
| 97+00N | 100+00E to 107+50E |
| 98+00N | 100+00E to 108+50E |
| 99+00N | 95+00N to 108+50E |
| 100+00N | 95+00E to 109+00E |
| 101+00N | 95+00E to 107+50E |
| 102+00N | 95+00E to 108+25E |
| 103+00N | 95+00E to 109+00E |
| 104+00N | 95+00E to 108+50E |
| 105+00N to 110+00N | 95+00E to 100+00E |
| 111+00N | 95+00E to 101+50E |
| 112+00N | 95+00E to 100+00E |

(c) Anna grid

| <u>Lines</u> | <u>Easting</u> |
|------------------|------------------|
| 56+00N to 61+00N | 83+00E to 90+00E |
| 62+00N to 63+00N | 77+50E to 92+50E |
| 64+00N | 77+50E to 93+25E |
| 65+00N to 67+00N | 77+50E to 90+00E |
| 68+00N to 70+00N | 77+50E to 85+00E |

Data Processing

Data was manually recorded in the field and keyed into a HP-85 computer on a daily basis. Data is then automatically corrected for the coil spacing variations which occur in rough terrain, stored on magnetic tape and plotted in profile format using software developed by MPH Consulting Ltd. The computer profiles were then individually pasted onto plan maps to create a series of stacked profiles for each frequency at a scale of 1:2,500.

Following completion of the project the data was transferred to a mainframe computer for the final data presentation.

Final data is presented in the form of computer plotted stacked profiles. Scales used were:

Horizontal: 1:2,500

Vertical: 1 cm = 10%

the in-phase and quadrature values for each frequency are plotted on separate plan maps (in pocket).

INTERPRETATION

Anna Grid (Maps 1a,b)

Three anomalies have been picked from MaxMin data for the Anna grid. These are labelled A, B and C on Map 1a (1777 Hz).

Anomaly A runs from L67N, 88+05E to L62N, 86+55E. It is open to the north and is only very weakly present on lines 63 and 64.

Anomaly B runs from L65N, 89+30E to L61N, 88+45E. It is also open to the north.

Anomaly C runs from L64N, 91+25E to L62N, 90+90E. It is open at both ends.

All three are moderate to strong conductors with at least some response on the lower frequency (444 Hz). C is strongest. The fact that A and B appear to die out southwards possibly indicates the conductors plunge in that direction. Alternatively they may pinch out or be cut off by a fault.

Although formational conductors such as graphitic sediments are the most likely cause of these anomalies, the results do not preclude the possibility that one or all of them may represent sulphides.

SC Grid (Maps 2a, b)

Two discrete conductors (A and B) and two groups of conductors (C and D) have been picked from the data for the SC grid and are shown on Map 2a (1777 Hz).

Anomaly A runs from L108N, 97+75E to L99N, 99+30E. It is open to the south. It is a weak conductor which is only apparent on the higher frequency (1777 Hz).

Anomaly B runs from L104N, 101+00E to 97N, 101+50E. It is open to the north and may be the same conductor picked up on L110N at 99+75E. At its south end of anomaly becomes lost in noisy data caused by extreme topography. It is very weak, occurring only on the higher frequency (1777 Hz).

Both anomalies A and B are most likely caused by weak formational conductors such as argillites.

Conductor C yields a multiple anomaly running from L96N to L104N at the eastern margin of the grid. It is open in both directions. Its complexity may be due to folding or to a flat lying conductor with edge effects. It is a very strong conductor with a good response at 444 Hz as well.

Conductor D is very complex, in part due to topography but also probably due to folding and/or faulting. It has similar ratios to C and may be its folded or faulted equivalent.

Although most likely caused by graphitic sediments, both C and D warrant further examination in the field.

Chu Chua Grid (Maps 3a, b)

Four conductors, labelled A, B, C and D have been interpreted from data for the Chu Chua grid.

Anomaly A runs from L105N, 107+50E to L100N, 108+10E. It terminates at the survey gap (L106, 107) although may possibly be very weakly present on L108. To the south it becomes weaker and weaker until it can no longer be seen. It has no response on the 444 Hz data.

This is a short strike length conductor which may be indicative of a massive sulphide body at depth.

Anomaly B runs from L105N, 112+75E to L95N, 112+50E. It is open to the south. It may be represented by a weak response on L108, 109 at 114+50E. It is a moderate conductor with a definite response on the 444 Hz data. A fault is suspected between lines 96 and 95.

Outcrop noted during the survey in this area contained chert fragments in an argillitic matrix. Although this may be sufficient to account for the conductor a further ground check is warranted.

Anomaly C runs from L111N, 116+75E to L108N, 117E. It is open both ways. It might well be a multiple conductor and has a vague expression on the 444 Hz data.

Because of its short strike length this anomaly may well be indicative of massive sulphides.

D is a single line anomaly on L110N at 108+75E. The appearance, an in phase anomaly only on both 1777 Hz and 444 Hz, is typical of a topographic

anomaly. Likewise, noisy data at the east end of the grid is put down to chainage errors caused by steep topography.

CONCLUSIONS AND RECOMMENDATIONS

The MaxMin I survey has identified conductors on each of the three grids which warrant further attention. Due to early snowfall this year, mapping was unable to proceed as planned but should be undertaken as soon as possible in 1986. This, combined with rock and soil geochemistry, will determine whether any of the conductors warrant drill testing.

ITEMIZED COST STATEMENT

| | | |
|---|-------|---------------|
| Linecutting (contractor: Spirex Geoservices Ltd.) | | |
| 41.35km @ \$215/km (Chu Chua) | | 8,890.25 |
| 36.3km @ \$300/km (Anna/SC) | | 10,890.00 |
| MaxMin I Survey (contractor: MPH Consulting Ltd.) | | |
| mob/demob, standby 3 days @ \$350/day | | |
| operating 11 days @ \$580/day | | |
| expenses (+15% admin) \$1226.61 | | |
| | | 8,656.61 |
| Map production (63km X2 frequencies X12.42/km) | | 1,564.92 |
| modem time (3hrs @ \$30/hr) | | 90.00 |
| Orientation and Supervision | | |
| L. D. Pirie 3 days @ \$300/day | | 900.00 |
| Report Preparation, Interpretation | | |
| L. D. Pirie 5 days @ \$300/day | | 1,500.00 |
| Miscellaneous | | |
| (drafting, typing, field and office supplies) | | <u>300.00</u> |
| | TOTAL | \$32,791.78 |

Apportionment

| | | |
|---------------|---------------|-----------------|
| Chu Chua Grid | Linecutting | 8,890.25 |
| | MaxMin (5/12) | 3,606.92 |
| | Other (5/12) | <u>1,814.55</u> |
| | Total | \$14,311.72 |

i.e. Dunn Group (41%) = \$5867.80; South Group (39%) = \$5581.57
North Group (20%) = \$2862.35

| | | |
|-----------|---------------|-----------------|
| Anna Grid | Linecutting | 4,830.00 |
| | MaxMin (3/12) | 2,164.15 |
| | Other (3/12) | <u>1,088.73</u> |
| | Total | \$8,082.88 |

| | | |
|---------|---------------|-----------------|
| SC Grid | Linecutting | 6,060.00 |
| | MaxMin (4/12) | 2,885.53 |
| | Other (4/12) | <u>1,451.64</u> |
| | Total | \$10,397.17 |

Note: costs for Max Min survey and related expenses have been apportioned according to the number of days spent on each grid.

| | | |
|----------|-------------|--------|
| Anna | (Aug 20-23) | 3 days |
| SC | (Aug 23-26) | 4 days |
| Chu Chua | (Aug 27-31) | 5 days |

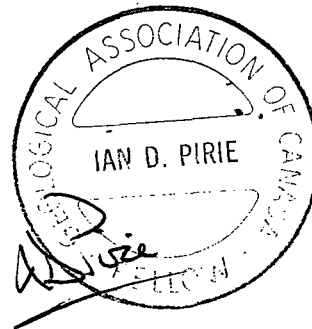
CERTIFICATE OF QUALIFICATIONS

I, Ian D. Pirie certify that:

1. I am an Exploration Geologist residing at 307 - 2145 York Avenue, Vancouver, B. C.
2. I have a BSc (Hons) in Applied Geology from the University of Strathclyde, Glasgow, Scotland (1977) and a MSc (Geology/Geochemistry) from Queen's University at Kingston, Ontario (1980).
3. I have practised my profession since 1977.
4. I personally carried out or supervised the work reported herein.

Date

Ian D. Pirie



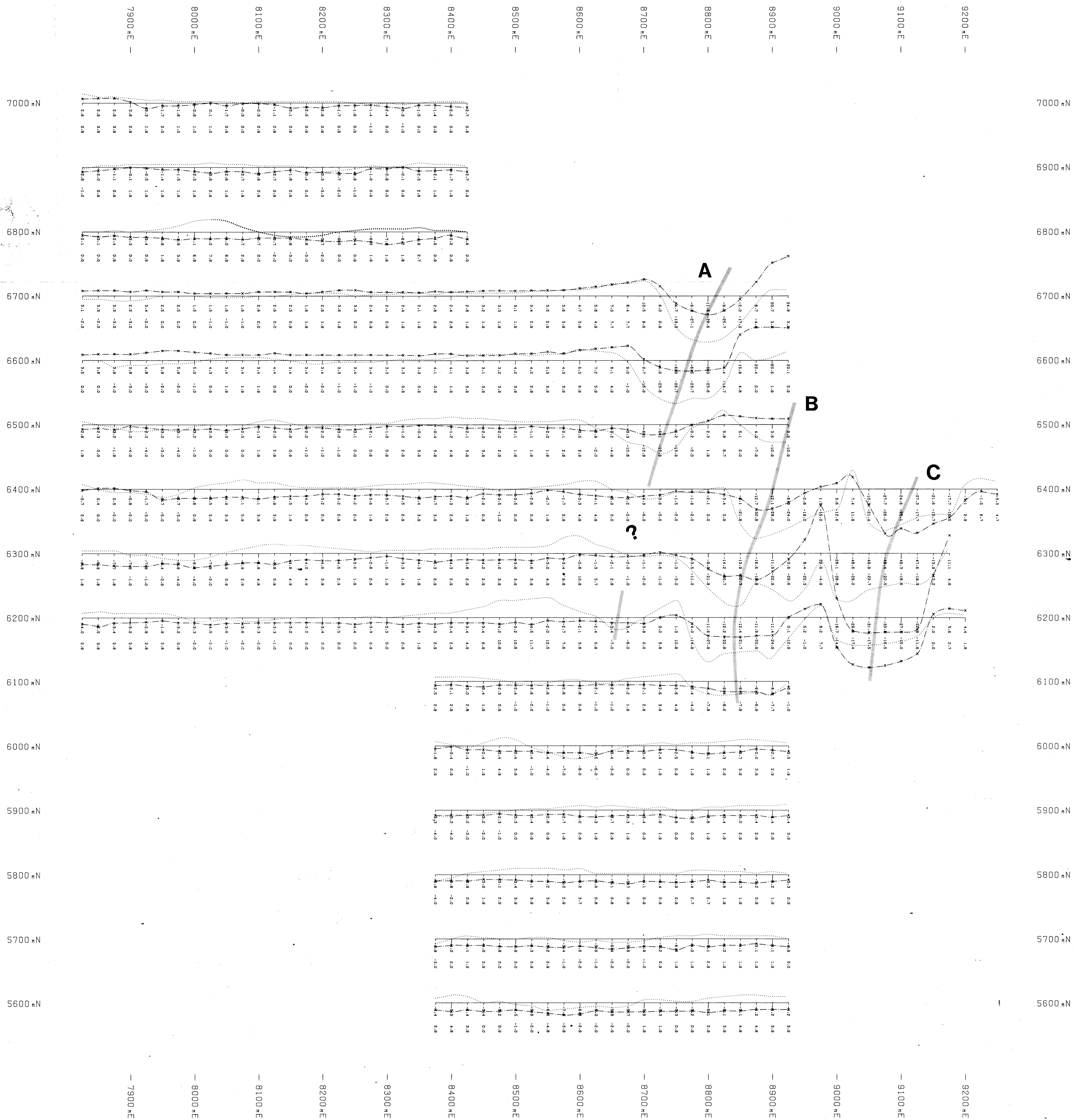
CERTIFICATE

I, Randy Nickson of Toronto, Ontario hereby certify that:

- 1) I hold a Bachelor of Science degree in Mining Geophysics from Queen's University, Kingston, Ontario.
- 2) I have practised my profession in exploration continuously since graduation.
- 3) I have based conclusions and recommendations contained in this report on knowledge of this area, my previous experience and on the results of the field work conducted on the property, under the supervision of David Jones during 1985.
- 4) I hold no interest, directly or indirectly in this property other than professional fees, nor do I expect to receive any interest in the property or in Falconbridge Limited or in any of its subsidiary companies.

Toronto, Ontario, Canada
December, 1985

Randy Nickson, B.Sc.
MPH CONSULTING LIMITED



GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,187
PART 1 OF 2
SCALE
0 50 100 200
METRES

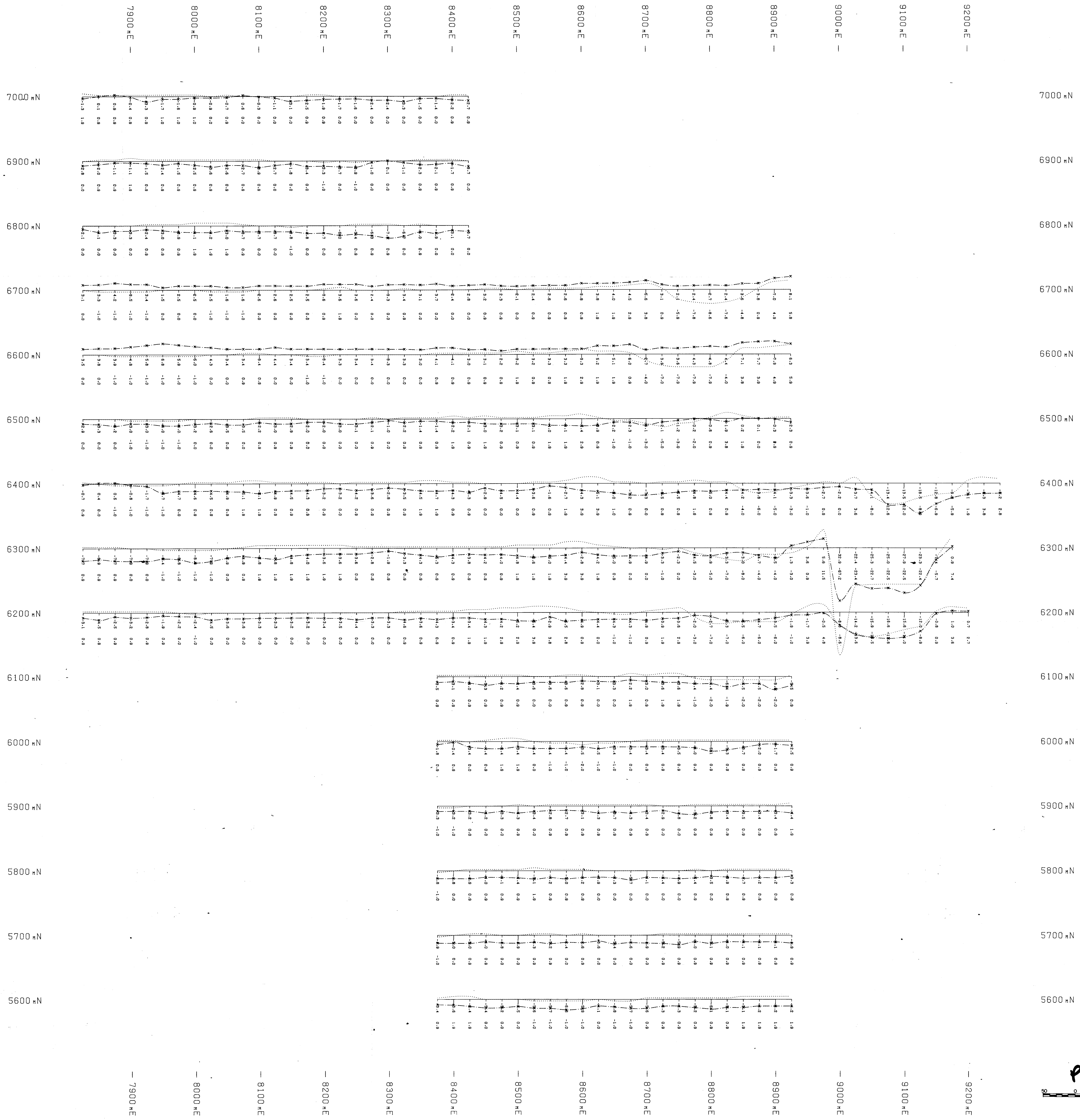
CORPORATION FALCONBRIDGE COPPER

ANNA GRID
MAX MIN I SURVEY 1777 Hz

| | |
|-------------------|---------------------------|
| Project No: V-213 | By: R.Nickson, D.Jones |
| Scale: 1:2,500 | Drawn: Dataplotting / MPH |
| Drawing No: | Date: October, 1985 |



MPH Consulting Limited



7000 nT
6900 nT
6800 nT
6700 nT
6600 nT
6500 nT
6400 nT
6300 nT
6200 nT
6100 nT
6000 nT
5900 nT
5800 nT
5700 nT
5600 nT

7900 mE
8000 mE
8100 mE
8200 mE
8300 mE
8400 mE
8500 mE
8600 mE
8700 mE
8800 mE
8900 mE
9000 mE
9100 mE
9200 mE

LEGEND

INSTRUMENT: Apex Parametrics Max Min I
 CABLE LENGTH: 450m
 FREQUENCY: 444 Hz
 PROFILE SCALE: 1 cm = 40%

Plotting Designation
 Inphase Profile
 Quadrature Profile
 Station Location

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,187
PART 1 OF 2

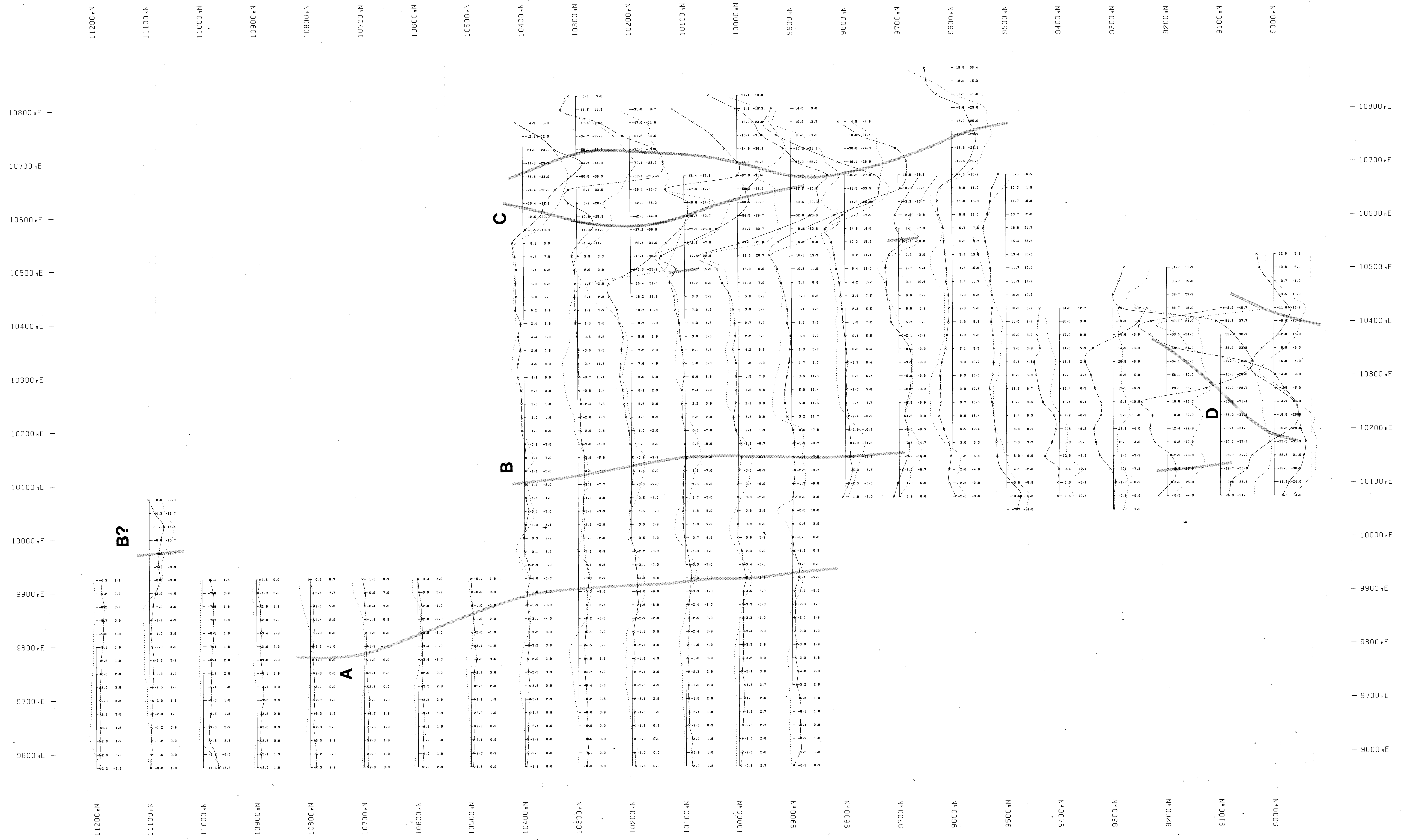
SCALE 1:2,500
METRES

CORPORATION FALCONBRIDGE COPPER

ANNA GRID
MAX MIN I SURVEY - 444 Hz

| | |
|-------------------|-------------------------|
| Project No: V-213 | By: R Nickson, D Jones |
| Scale: 1:2,500 | Drawn: Dataplotting/MPH |
| Drawing No: | Date: October, 1985 |

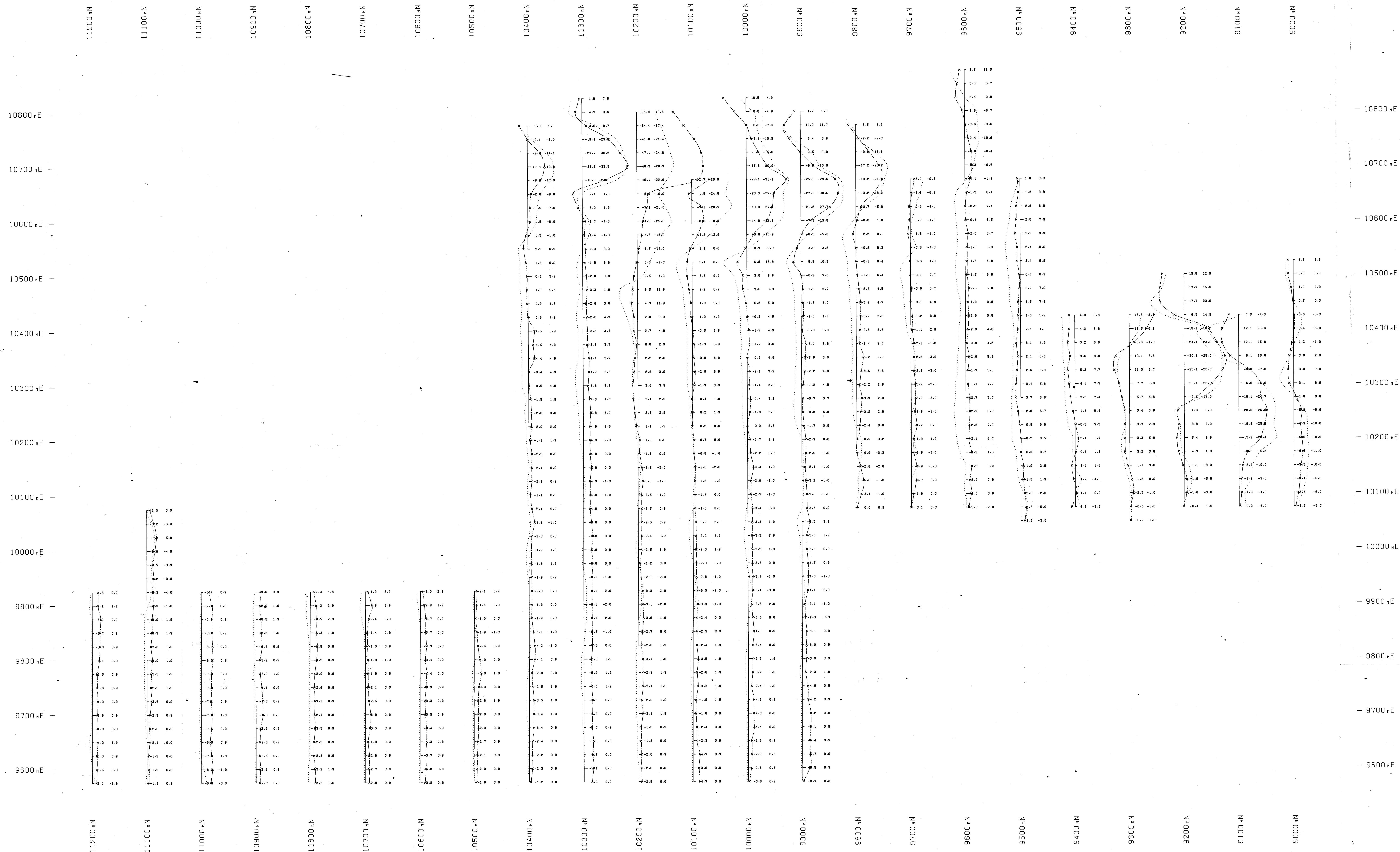
MPH Consulting Limited **1b**



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,187
PART 1 OF 2

| | |
|-----------------------------------|-------------------------|
| CORPORATION FALCONBRIDGE COPPER | |
| SC GRID | |
| MAX MIN I SURVEY - 1777 Hz | |
| Project No: V-213 | By: R.Nickson, D.Jones |
| Scale: 1:2,500 | Drawn: Dataplotting/MPH |
| Drawing No: | Date: October, 1985 |
| | |



LEGEND

INSTRUMENT: Apex Parametrics Max Min I

CABLE LENGTH: 450m

FREQUENCY: 444 Hz

PROFILE SCALE: 1 cm = 90%

Plotting Designation

Inphase Profile

Quadrature Profile

Station Location

GEOLOGICAL BRANCH ASSESSMENT REPORT

14,187

SCALE 1:2,500

PART 1 OF 2

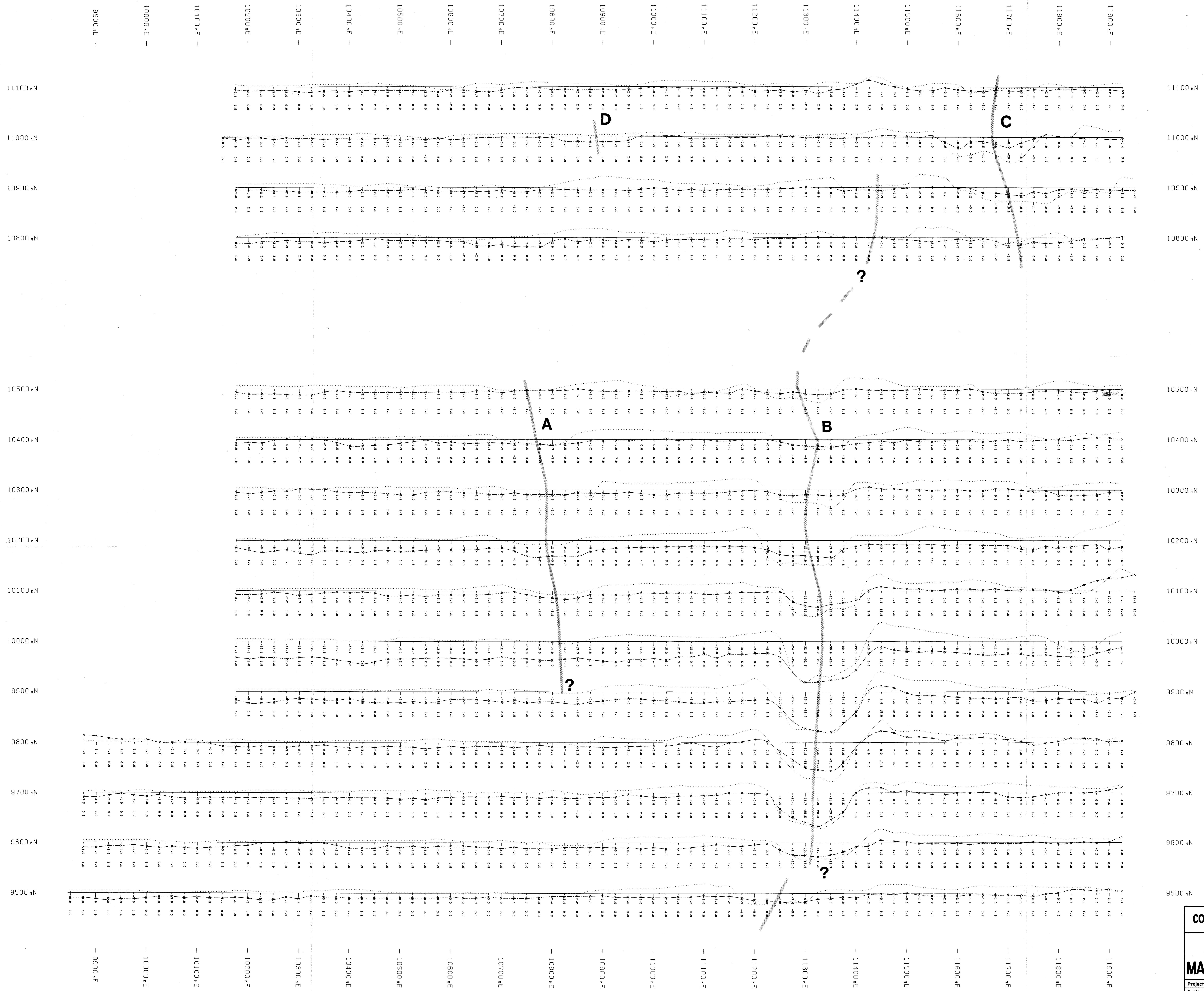
CORPORATION FALCONBRIDGE COPPER

SC GRID

MAX MIN I SURVEY - 444 Hz

| | |
|-------------------|-------------------------|
| Project No: V-213 | By: R.Nickson, D.Jones |
| Scale: 1:2,500 | Drawn: Dataplotting/MPH |
| Drawing No: | Date: October, 1995 |

MPH Consulting Limited



LEGEND
 INSTRUMENT: Apex Parametrics Max Min I
 CABLE LENGTH: 450m
 FREQUENCY: 1777 Hz
 PROFILE SCALE: 1 cm = 10%
 Plotting Designation
 Elevation Profile
 Quadrature Profile
 Station Location

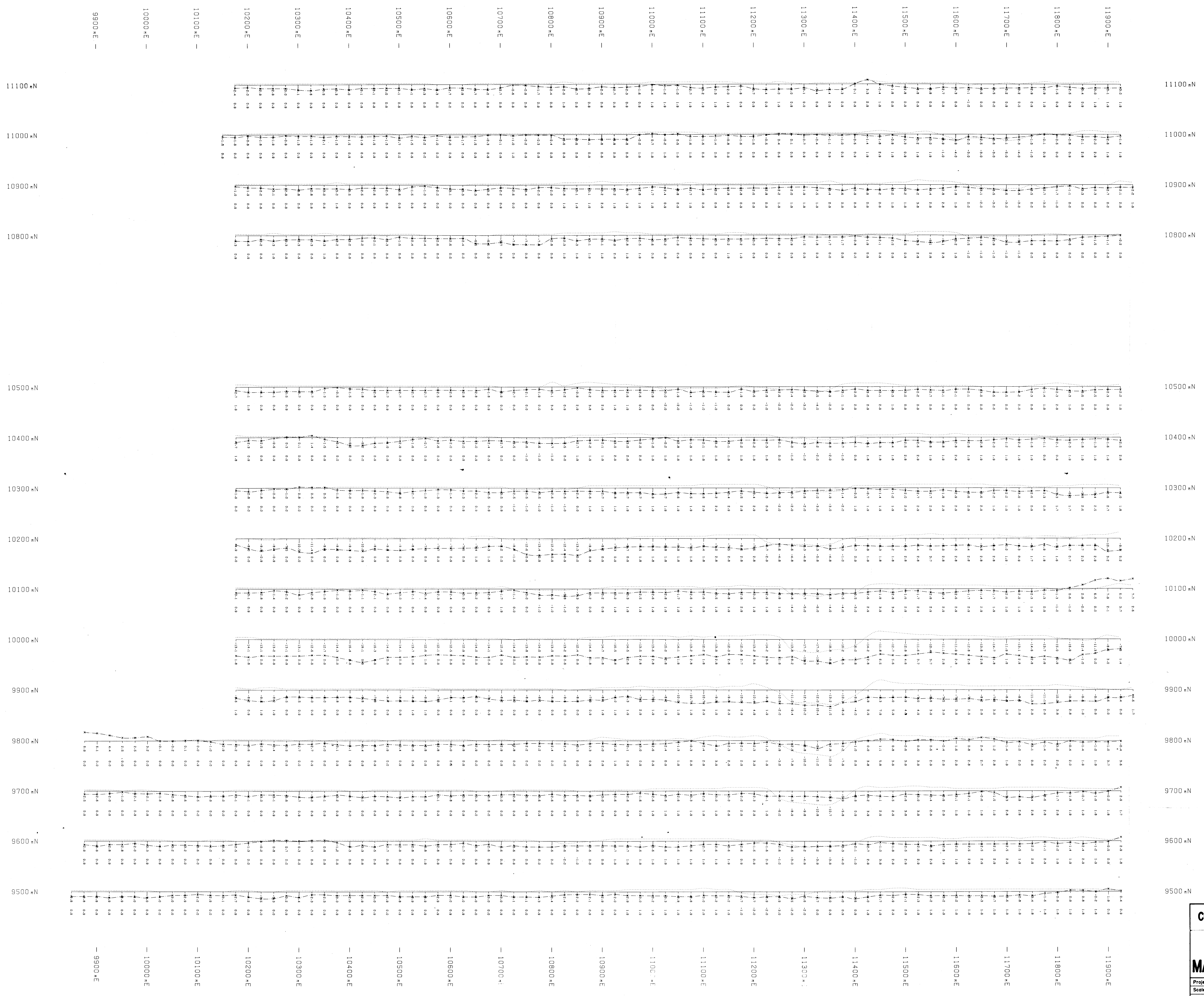
**GEOLOGICAL BRANCH
 ASSESSMENT REPORT**
14,187
 SCALE
 METRES
PART 1 OF 2

CORPORATION FALCONBRIDGE COPPER

CHUCHUA GRID
MAX MIN I SURVEY-1777 Hz

| | |
|-------------------|-------------------------|
| Project No: V-215 | By: R Nickson, D Jones |
| Scale: 1:2,500 | Drawn: Dataplotting/MPH |
| Drawing No: | Date: October, 1985 |

MPH MPH Consulting Limited **3a**



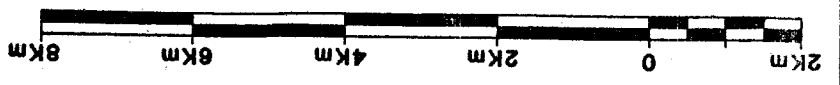
11100 mN
11000 mN
10900 mN
10800 mN
10500 mN
10400 mN
10300 mN
10200 mN
10100 mN
10000 mN
9900 mN
9800 mN
9700 mN
9600 mN
9500 mN

11100 mE
11000 mE
10900 mE
10800 mE
10700 mE
10600 mE
10500 mE
10400 mE
10300 mE
10200 mE
10100 mE
10000 mE
9900 mE

LEGEND
 INSTRUMENT: Apex Parametrics Max Min I
 CABLE LENGTH: 450m
 FREQUENCY: 444 Hz
 PROFILE SCALE: 1cm = 10%
 Plotting Designation
 Inphase Profile
 Quadrature Profile
 Station Location

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**
14,187
 PART 1 OF 2

CORPORATION FALCONBRIDGE COPPER
 CHUCHUA GRID
MAX MIN I SURVEY - 444 Hz
 Project No: V-215 By: R Nickson, D Jones
 Scale: 1:2,500 Drawn: Dataplotting/MPH
 Drawing No: Date: October, 1985
MPH Consulting Limited
 3b



Map 4
GRID LOCATIONS

CORPORATION FALCONBRIDGE COPPER

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14187
PART 2 OF 2
FC
MT. ARMOUR
Dixon Creek

