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BHP MINERALS LIMITED

ANNUAL REPORT FOR THE YEAR ENDED 3rd MARCH, 1983

AND FINAL REPORT

EXPLORATION LICENCES 2566, 2674, 2675, 2676, 2677, 2678 and 2838

BATTEN BLOCK, BAUHINIA DOWNS, N.T.

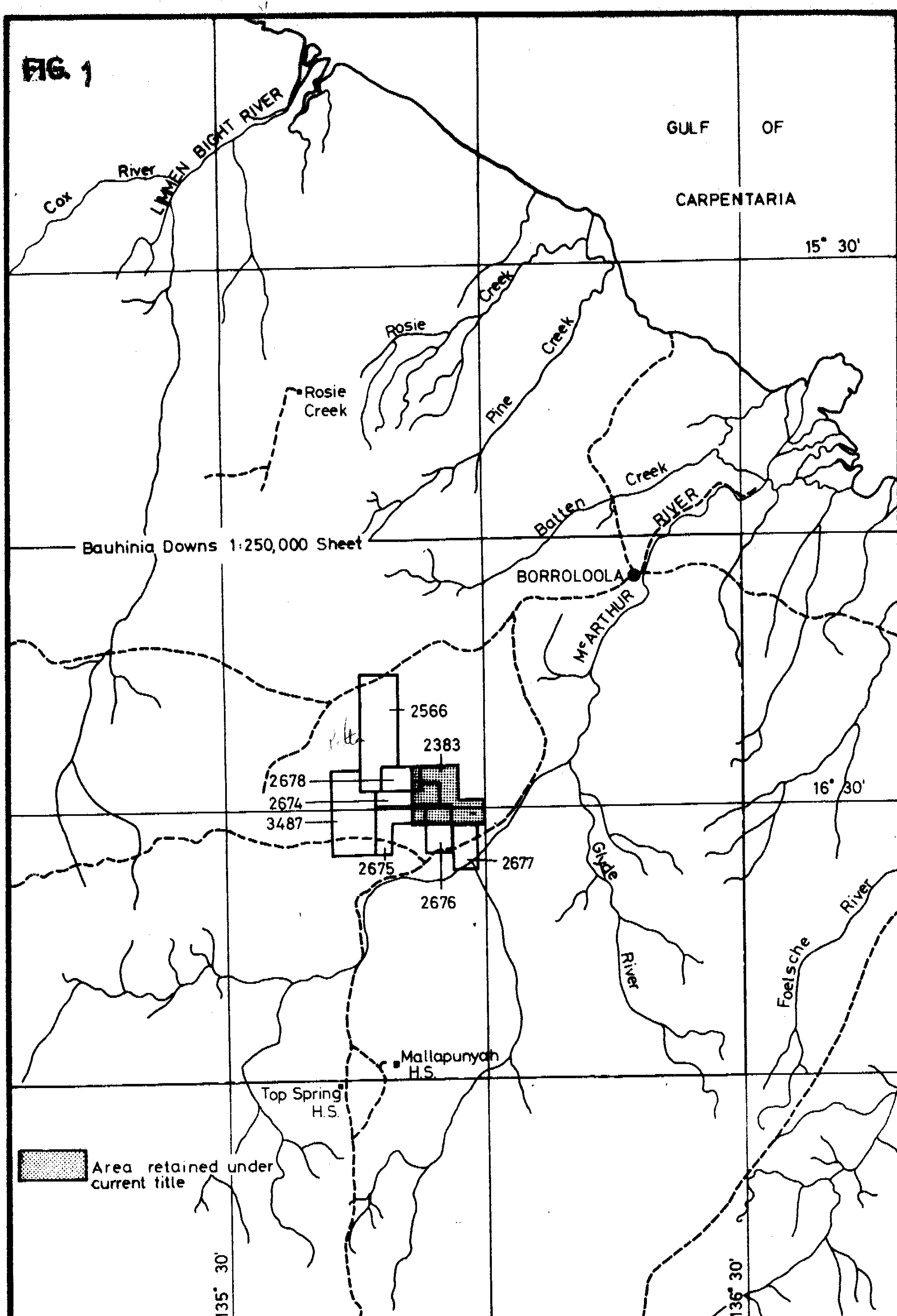
CONTENTS

		Page
1.	INTRODUCTION	1
2.	FIELD INVESTIGATIONS AND RESULTS	1
2.1	Geology	2
2.1.1	Tawallah Group	2
2.1.2	McArthur Group	3
2.1.3	Nathan Group	6
2.1.4	Roper Group	6
2.2	Geochemical Sampling	7
2.3	Geophysical Surveys	7
2.3.1	INPUT	7
2.3.2	Seismic Survey	8
2.3.3	EM37 Survey	9
3.	CONCLUSIONS	10
4.	EXPENDITURE	11

APPENDIX 1 Geochemical Samples, Base of Slope Assay Results
APPENDIX 2 EM Survey in EL 2838, 1982
Part A EM37 Sounding Survey
Part B EM37 Traverses

Figure 1 Location
Figure 2 Geology
Figure 3 Geochemical Sample Locations
Figure 4 Electro-Magnetic Map, Mallapunyah 'A' and 'B' Areas
Figure 5 McArthur River Seismic Line A
Figure 6 McArthur River Seismic Line B
Figure 7 McArthur River Seismic Line 6
Figure 8 EL 2838 Batten Block N.T. 4E Line A
Figure 9 EL 2838 Batten Block N.T. 5E Seismic Line B
Figure 10 EL 2838 Batten Block N.T. 6E EM Line 6
Figure 11 EL 2838 Batten Block N.T. 7E EM Line 7

FIG. 1



Centre Darwin	THE BROKEN HILL PROPRIETARY CO. LTD. BATTEN BLOCK EL's 2383, 2566, 2674, 2675, 2676, 2677, 2678, 3487. — LOCATION MAP	Project No.
Date 18-3-83		Drawing No. A4-22

BATTEN BLOCK, BAUHINIA DOWNS, N.T.

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1. INTRODUCTION

Exploration Licences 2566, 2674, 2675, 2676, 2677 and 2678 were granted to BHP Minerals Limited on the 4th March, 1981, and EL 2838 was granted on the 27th January, 1981, and together with EL 3487, they form the Batten Block of exploration licences.

The centre of the Batten Block of EL's is located at about latitude 16° 29'S longitude 135° 50'E on the Bauhinia Downs 1:250,000 sheet (Figure 1). The block is about 70 kilometres southwest of Borroloola, and is accessible via tracks leading to the north and west of the Carpentaria Highway about 310 kilometres from its junction with the Stuart Highway.

The exploration target in the block is a lead/zinc massive sulphide deposit hosted by dolomitic and carbonaceous sediments similar to the HYC deposit at McArthur River. The most prospective unit is the Barney Creek Formation of the McArthur River Group which hosts the HYC deposit.

The Batten Block of EL's is subject to a proposal to consolidate areas of interest into one exploration licence. As part of this procedure, part of the block is subject to Reservation from Occupation 1046 and Exploration Licence Application 4363. This report covers work over all the exploration licences (except EL 3487) during the period of tenure, including details of work for the twelve months ended 3rd March, 1983. A second report will be submitted covering work carried out over parts of the block which will not be retained under the new exploration licence.

2. FIELD INVESTIGATIONS AND RESULTS

The following field investigations have been carried out in the Batten Block area:

(1) Photo-interpretation of 1:25,000 scale colour air photographs.

(2) Detailed geological mapping of prospective units.

(3) Stream sediment and soil geochemical sampling of areas considered to be underlain by Barney Creek Formation.

(4) Several test lines using the airborne INPUT electromagnetic system.

(5) Four traverses and seven soundings using the Geonics EM37 transient electromagnetic system.

(6) Three lines of Minisosie seismic survey.

2.1 Geology

Photo-interpretation of 1:25,000 scale colour air photographs was carried out in 1981 to provide a base for subsequent geological mapping of prospective areas. Mapping was focussed on the Barney Creek Formation which hosts the HYC, W-fold and Teena mineralisation in MR 581 to the east. Figure 2 is a compilation of this work reduced to 1:50,000 scale.

2.1.1 Tawallah Group

Outcrop of Tawallah Group is restricted to the western side of the Tawallah Fault in EL 2566.

The lowest unit exposed is white quartzite of the Yiyintyi Sandstone which is overlain by Peters Creek Volcanics. These rocks are reported as basalts in Bureau of Mineral Resources mapping, but outcrops have not been inspected.

The Sly Creek Sandstone overlies the Peters Creek Volcanics and forms major ranges of white quartzite with minor pebbles. The Rosie Creek Sandstone overlies the Sly Creek Sandstone with apparent conformity, and is more friable, resulting in subdued outcrop.

The Rosie Creek Sandstone is not readily distinguished on air photographs from the Wollogorang Formation, which is also a subdued, mixed unit containing red micaceous shales and quartz sandstone with local mudcracks and small-scale cross-bedding.

The Masterton Formation disconformably overlies the Wollogorang Formation in this area. Several boulder conglomerate beds 30 to 50 metres thick with rounded boulders in a reddish sandstone matrix have been mapped near the base of the Masterton Formation. The unit may be sub-divided into several distinct ridges of quartzite usually consisting of white to pink, medium- to coarse-grained quartzite. The texture is typically bimodal with the coarser grains well-rounded. Low amplitude ripples commonly cover bedding planes.

The Mulholland Formation overlies the Masterton Formation with apparent conformity in this area. Near the base the sandstone is vuggy, silicified and brecciated suggesting that the original evaporite content was high. The upper part consists of poorly outcropping friable brown sandstone grading upwards into sandstone with abundant cauliflower chert textures which mark the base of the overlying Mallapunyah Formation.

2.1.2 McArthur Group

The Mallapunyah Formation is normally regarded as the lowest unit of the McArthur Group. It represents the transition from essentially arenites of the Tawallah Group to predominantly argillites and carbonates of the McArthur Group. It has only been briefly traversed in the north-western part of EL 2566, where the unit consists of poorly outcropping shale, dolomite and sandstone.

The Amelia Dolomite conformably overlies the Mallapunyah Formation. It is mainly exposed in the core of the Hot Springs Anticline, where it consists of interbedded red, cream and yellow carbonates with stromatolitic, oolitic and cauliflower chert.

Gradationally above the Amelia Dolomite is the Tatoola Sandstone which may be considered in two parts. The lower part consists of flaggy, well-bedded, medium-grained white quartz sandstone about 50m thick, separated by a 100 metre break in outcrop from the upper sandstones which are about 70m thick, coarser-grained, and contain abundant gypsum pseudomorphs.

The Tooganinie Formation is a shallow-water carbonate facies about 500m thick transitionally overlying the Tatoola Sandstone. It is widespread within the Hot Springs Anticline. The basal beds are of algal dolomite and quartz-rich arenites, with the remainder essentially a cyclic algal dolomite and dololutite sequence with minor sandstone beds. The algal dolomites typically consist of cycles about 10 metres thick commencing with 5 metres of shaley buff-coloured dololutite grading upwards into low-relief, algal-mat dolomite which in turn grades into algal mounds up to one metre across. The top of the cycle contains some sand and intraclastic flat-pebble carbonate conglomerate, suggesting that the cycles are upward shallowing with maximum growth of algal mounds in the shallowest water.

The uppermost 50 to 100 metres of the Tooganinie Formation are characteristically red and greenish shales with red sandstones of the Myrtle Shale Member.

Overlying the Myrtle Shale is the Emmerugga Dolomite which is about 200 to 500 metres thick. The basal 50 metres is typically boulder- to pebble-sized carbonate breccia which is transitional from the Myrtle Shale with dolomite and shale clasts peppered with gypsum pseudomorphs. The middle to upper Emmerugga Dolomite is best exposed in the south to south-east section of the Batten Block, and consists of cyclic dololutite and algal dolomite with several conophyton stromatolite horizons. Dolarenite and intraformational dolomite and chert breccia indicate shallow-water deposition. The chert flake breccia often gives a "barnacled" appearance to karstic grey dolomite outcrops. The Mitchell Yard Dolomite Member of the Emmerugga

Dolomite forms characteristic bold outcrops of massive blue/grey karstic dolomite. It overlies, as well as being a facies equivalent of, the Emmerugga Dolomite.

The Teena Dolomite is recognised as a buff-coloured dololutite interbedded with numerous pink (locally green) tuffaceous beds from one centimetre to several metres thick. It is the only chronostratigraphic formation in the McArthur Group. The Coxco Dolomite Member is a massive, bleached buff-coloured dolomite similar to the Mitchell Yard Member which it usually overlies. Clusters of pseudomorphs after acicular gypsum crystals (Coxco pseudomorphs) are a distinguishing but not diagnostic feature of this unit.

The Barney Creek Formation is a dolomitic shale and dololutite facies developed in depressions between palaeo-highs of Mitchell Yard Member and Emmerugga Dolomite. Within the Batten Block, the unit is well developed at only two localities. A typical section is marked at the base by Coxco Dolomite and tuffaceous Teena Dolomite separated by a ten metre break in outcrop from 22 metres of mainly black and red dolomitic siltstone. Ten metres of interbedded shale and dololutite are overlain by 25 metres of hard, thin-bedded dololutite with minor dolarenite. Three metres of red and black pyritic bituminous shale are overlain by 18 metres of scree-covered siltstone. The section is capped by boulders of chert breccia (probably silicified dolomite breccia), which is considered to be a regolith at the base of the Lynott Formation.

Outcrop of the Reward Dolomite is restricted to EL 2838 and consists of grey- and buff-coloured dolomite with bituminous dolomite breccia and chert spheres, lenses and sinuous masses.

The Lynott Formation conformably overlies the Reward Dolomite in depressions but overlies with erosional disconformity a number of older units on palaeo-tectonic ridges. Along the eastern margin of the Tawallah Depression, the base of the Lynott Formation is marked with a regolith of boulder conglomerate up to 40 metres thick, derived from the erosion of Mitchell Yard Member and Emmerugga Dolomite on nearby rises. The boulders are characteristically silicified with silica-filled vugs. The boulders are up to 20 metres in diameter with a siltstone matrix.

Over the Tawallah Depression the Lower Lynott Formation contains a pyritic shaley siltstone with minor sandstone and chert breccia beds. Adjacent to palaeo-highs, the overall sequence is thinner and contains medium- to coarse-grained quartz sandstone beds. The Donnegan Member of the Lynott Formation consists of reddish, silty, fine-grained sandstone with mud balls and abundant dessication cracks.

The Yalco Formation overlies the Donnegan Member, and consists of cherty siltstone with thin and disrupted beds with a characteristic "bubbly" appearance. The Yalco Formation is about 150 to 200 metres thick, and is succeeded by similar thicknesses of Stretton Sandstone, which consists of medium-grained, thin-bedded, grey sandstone, and the Looking Glass Formation consisting of cherty siltstone with minor stromatolites.

2.1.3 Nathan Group

The McArthur Group is unconformably overlain by the Nathan Group with dirty brown sandstone and conglomerate of the Smythe Sandstone forming the base. Other units of the group outcrop poorly, and were not mapped in detail.

2.1.4 Roper Group

Outcrop interpreted as being part of the Roper Group is located east of the Tawallah Fault in EL 2566. The unit consists of sandstone and siltstone with ripple marks, shale clasts and pseudomorphs of halite are common. The sequence unconformably overlies the Nathan Group and is unconformably overlain by Cretaceous sediments.

2.2 Geochemical Sampling

Geochemical sampling was mainly carried out during the 1981 field season, and analyses were listed in the annual report for that year. 600 stream sediment samples and 500 soil samples were collected in areas where Barney Creek Formation had been defined during geological mapping (Figure 3). Extensive stream sediment sampling had previously been carried out in the area by Carpentaria Exploration Company, and data were incorporated with BHP sampling. Sample locations for the previous work are included in Figure 3, but analyses are not documented in reports by BHP Minerals Limited.

Eighteen base-of-slope soil samples were collected during the 1982 field season in two areas adjacent to outcrops of Barney Creek Formation or Teena Dolomite. Sample locations are shown in Figure 3 and analyses listed in Appendix 1.

Stream sediment and soil samples taken in 1982 were sieved on site to minus 80 mesh, and analysed for copper, lead and zinc using AAS after perchloric acid digestion by Analabs in its Darwin laboratory. Analyses reported previously had been carried out by Genalysis Laboratory Services of Perth.

2.3 Geophysical Surveys

2.3.1 INPUT

A trial INPUT electromagentic survey was flown within the Batten Block by Geoterrex Pty. Ltd. in 1981. Survey details and the interpretation report were included in the annual report for that period. Five lines were flown in two areas (Figure 4). Six Priority 3 anomalies (zones almost certainly of surficial origin) and one Priority 2 anomaly (zones satisfying most criteria associated with bedrock features), were defined. The trial indicated that INPUT may be a suitable method to detect shallow (less than 100 metres) massive sulphide deposits.

2.3.2 Seismic Survey

A Minisosie seismic survey was carried out in the Barney Creek Depression area of EL 2338 in August 1982 to obtain structural and stratigraphic information in areas of poor outcrop and blacksoil cover. Three traverses (Figure 2) were spaced to give the best possible coverage of the depression area.

The data were processed by Seismograph Services Limited of Perth. Seismic sections (Figures 5, 6 and 7) show detailed recording parameters and geometry, as well as the computer processing techniques used.

Data processing difficulties were mainly caused by poor quality raw data. The signal to noise ratio was low because of strong source-generated noise and weak reflections. A very strong event was evident near the top of all initial stacked profiles, and this dominated data processing. The event is considered to be part of the first arrival signal rather than a reflection, because although weak deep reflections were visible on the raw records, they were not enhanced on the final stacks, which did enhance the strong shallow event.

Data reprocessing enhanced weak deep events which are considered to be reflections because of their continuity across the sections.

The vertical scale on the seismic sections is in seconds, but this cannot be directly related to depth as yet, because of the lack of appropriate down-hole geophysical data in the area. Assuming a velocity of 5000 metres per second, 0.1 seconds two-way time would represent 200-300 metres. This does not allow for the low velocity material near the surface which could lead to a delay of 20 to 40 milliseconds before the higher velocity Proterozoic rocks are detected. It is estimated that 0.1 seconds represents 100 ± 50 metres below the surface.

The sections indicate that there are seismic reflectors in nearly flat-lying units underneath black soil cover, and that high-angle faults are probably present.

2.3.3 EM37 Survey

A transient electromagnetic survey (Geonics EM37) was carried out in the Barney Creek Depression by Geoterrex Pty. Ltd. in July, 1982.

The survey consisted of four EM37 traverses (EM lines 6 and 7, and seismic lines A and B, shown on Figure 2), and seven depth soundings.

Details of the survey appear in Appendix 2 in two parts. The results of the soundings, as well as a comprehensive description of the equipment and technique, appears first (Appendix 2, Part A), followed by the results of the EM37 traverses (Appendix 2, Part B). Geoterrex analysed the results of the soundings, and BHP Minerals Limited assessed the results of the EM 37 traverses.

In summary, a 600m x 300m transmitter loop was laid out, and a traverse was read along a line perpendicular to the long side, except for lines A and B, where the loop was orientated with the long side parallel to the traverse direction, which was centred in the middle of the loop. Three components of the magnetic flux (referred to as X, Y, Z components) were read every 50 metres. Each component at every station was recorded at 20 successively late delay times ranging from 0.8 milliseconds to 6.4 milliseconds.

The profiles for the X, Y, Z components are attached in Part B of Appendix 2. Preliminary interpretation indicates a fair to moderate anomaly on line 6. The conductor is possibly related to a fault rather than a large flat-lying body, but more lines detailing the anomaly would be required before this could be established with certainty. Line B results indicate that a reasonable conductor exists under much of the black soil plains, and initial interpretation is that it may be due to pyritic shales of the Barney Creek Formation. No similar conductor was apparent on Line A where similar geology is expected away from the small central outcrop.

For the soundings, two measurements were carried out on each loop position by connecting a wire across the middle of the large loop, creating two 300m x 300m loops. Only one sounding was done on Line B. The soundings were interpreted by Geoterrex. Soundings on Line A indicate 250m of fairly conductive ground over very resistive ground. The Line B sounding indicates 80m of conductive ground over very resistive units. Line 6 results are not easily interpretable, but suggest at least several hundred metres of moderately resistive rocks above more resistive rocks. Line 7 soundings show about 100m of moderately conductive units overlying very resistive ground.

3. CONCLUSIONS

Work in the Batten Block of exploration licences over the two years of tenure indicates that the Barney Creek Depression is the only area still considered to be prospective for HYC type base metal deposits. This area is being retained under a new exploration licence as a result of consolidation of parts of several of the Batten EL's.

The work programme for the new exploration licence consists of:

(1) EM37 traverses on lines adjacent to the anomaly defined on EM line 6.

(2) Drilling of at least three diamond drill holes in the Barney Creek Depression to test potential areas of sub-basin development.

(3) Down-hole geophysical logging using self potential/resistivity logs, density logs and down-hole Sirotem.

(4) Assessment of results and further drilling as required.

4. EXPENDITURE

Expenditure for E.L.s 2566, 2674, 2675, 2676, 2677, 2678 and 2838 for the year was:-

Wages & Salaries	9,814.00
Field Support	3,297.00
Drilling	6,544.00
Transport	2,385.00
Equipment	3,774.00
Geochemistry	817.00
Geophysics	30,294.00
Surveying	890.00
Tenement fees	300.00
Overheads	2,629.00
Capital	313.00
Sundries	1,163.00
Services	1,754.00
	$63,974.00

Total expenditure on the Licences was $110,551.00

APPENDIX 1

GEOCHEMICAL SAMPLES, BASE OF SLOPE ASSAY RESULTS.

B.H.P. MINERALS LTD - GEOCHEMICAL SAMPLES.

EL 2838 DATE. 4/11/82 LAB. REPORT 14.8.14.275 METHOD. 101.. Analabs, Darwin

Sample No.	Location	TYPE Soil	Auger	Stream (width)	RESULTS P.P.M. Copper	Lead	Zinc			Comments
BJ 9800	Barney Creek	✓			5	20	20			Photo No Ratter 13/9559
9495	" "	✓			5	15	30			
9496	" "	✓			10	5	15			
9497	" "	✓			5	15	20			
9498	" "	✓			5	20	25			
9499	" "	✓			5	15	65			
9500	" "	✓			25	15	65			
9501	" "	✓			5	15	20			
9502	" "	✓			5	20	20			
9503	" "	✓			5	25	15			
9504	" "	✓			5	15	15			
9505	" "	✓			5	20	15			
9506	" "	✓			5	10	40			
9507	" "	✓			-	15	45			

B.H.P. MINERALS LTD - GEOCHEMICAL SAMPLES.

EL. 2888.. DATE. 4/11/82 LAB. REPORT. 14:8:14.275 METHOD. 101.. Analabs, Darwin

Sample No.	Location	TYPE Soil	Auger	Stream (width)	RESULTS P.P.M. Copper	Lead	Zinc			Comments
BJ 9508	Barney Creek	✓			5	15	15			Photo N° Battler 13/9559
9509	" "	✓			–	5	15			
9510	" "	✓			–	5	15			
9511	" "	✓			–	5	5			

APPENDIX 2.

EM37 Survey in EL 2838, 1982.

Part A - EM37 Sounding Survey.

The following is taken from a report by Geoterrex Pty. Limited who undertook both the survey and the analysis of the data.

As their report also covered EM37 surveys in other tenements, both in the Northern Territory and Queensland, only the results applicable to EL 2838 are presented in the appendix.

AN INTERPRETATION REPORT

ON THE

McARTHUR RIVER EM37 SOUNDING SURVEY

CONDUCTED BY

GEOTERREX PTY. LIMITED

ON BEHALF OF

BHP EXPLORATION

Geoterrex Pty. Limited
Sydney

Job No. 85-1419
July - August, 1982

John Peacock
Geophysicist

I N D E X

1. INTRODUCTION

1.1 General

1.2 Terrain - Geophysical Conditions

1.3 Personnel

1.4 Equipment

2. SURVEY DETAILS

2.1 Field Operations

2.2 Data Presentation

3. TRANSIENT ELECTROMAGNETICS AS A SOUNDING TOOL

3.1 Discussion of the Model

3.2 Field Procedure

3.3 Techniques Involved in Curve Matching

3.4 Discussion of Survey Results

3.5 Comments on Indivudial Soundings

CONCLUSIONS

Appendix 1 EM37 Specifications

1. INTRODUCTION

1.1 General

From the 19th July, 1982 to 1st August, 1982, Geoterrex Pty. Limited carried out an EM37 survey in the McArthur River area of the Northern Territory on behalf of BHP Exploration. A total of 11 traverses and 21 soundings were completed. Four main areas were surveyed -

a) The HYC grid
b) The MARINER grid
c) BARNEY CREEK
d) Brittania (Charters Towers, Queensland).

1.2 Terrain - Geophysical Conditions

Generally the terrain over the grids was flat with vegetation being only an occasional hindrance. Surficial conductivities were quite low in most areas.

1.3 Personnel

Geoterrex supplied two men for the survey:
John Peacock (Senior Geophysicist/Crew Chief) and Nick Alford (Geophysical Operator).

1.4 Equipment

Geoterrex supplied the Geonics EM37 unit with logger, HP-85 with cassette reader, and all peripherals and supplies necessary for the completion of the survey.

2. SURVEY DETAILS.

2.1. Field Operations.

*The details for the grids in EL2838 are as follows:

Seismic line A	600S to 2600S Soundings 13 and 14.
Seismic line B	600S to 2600S Sounding 15.
Line 6	3000E to 5300E Soundings 16 and 17.
Line 7	4000E to 5400E Soundings 18 and 19.

For lines A and B a 600m x 300m loop was orientated long side parallel to the line with the line passing through the middle of the loop. For lines 6 and 7 the loop was orientated long side perpendicular to the line with the traverse line passing through the middle. For the depth soundings, a wire was joined across the loop along the traverse line, dividing the large loop into two 300m x 300m loops. The soundings were taken by placing the receiver in the middle of each of these loops.*

2.2 Data Presentation.

Fixed loop profile data was recorded on cassette and computer - plotted upon returning to Sydney. The sounding data was reduced and plotted daily in an attempt to monitor the results of this method.

*Information between asterixs is revised from the data provided by Geoterrex - BHP Minerals Limited.

3. TRANSIENT ELECTROMAGNETICS AS A SOUNDING TOOL

By comparing the magnitude of the response and the shape of the transient decay curve over an assumed laterally homogeneous earth with those of models, an applicable layered situation can be interpreted. As this was the first large scale attempt at a production sounding job employing time domain electromagnetics, it was felt that careful analyses of the technique and results were in order. The remainder of this report is devoted to that purpose.

3.1 Discussion of the Method

The Geonics EM37 employs a waveform with an exponential rise time and a rapid linear ramp for the turnoff.

The rapid turnoff induced currents in the ground at the transmitter. The currents, with passing time, diffuse outwards and downwards roughly following a cone of an angle 30° from the surface. If we assume a layered medium, it is obvious that at very early times the currents will be situated virtually at the transmitter and readings taken at this time will reflect the characteristics of the upper layer in which they are concentrated. At progressively later times, measurements will reflect the characteristics of deeper layers.

The homogeneous halfspace apparent resistivity as a function of time in the late stage is given by

$$\rho_a(t) = \frac{\mu}{4\pi t}\left(\frac{2\mu M}{5t(k\dot{B}_z)}\right)^{2/3}$$

where μ = $4\pi \times 10^{-7}$ h/m

t = time (seconds)

M = Moment (loop area x current)

$\dot{B}z$ = time derivative of flux density for the vertical component $\left(\frac{\text{volts}}{M^2}\right)$

The equation assumes excitation by a step function. Since the EM37 has a finite ramp time, gate responses must be multiplied by a factor k given by

$$k = \frac{1}{\frac{2t}{3t_0}\left[1 - \left(1 + \frac{t_0}{t}\right)^{-3/2}\right]}$$

(for a step function, k = 1)

This correction is of a substantial size only for gate times less than two turn off times after shut off.

After turnoff, the currents diffuse outwards at a rate which is inversely proportional to the conductivity. The initial magnitude of the induced current is not a function of conductivity. However the position of the surface current maximum is proportional to $\mathcal{T}$, the time domain equivalent of skin depth where

$$\mathcal{T} = \sqrt{2\pi\rho t/10^7}$$

The parallel between a direct current sounding method and transient sounding is obvious. With electrical soundings, measurements are taken at progressively greater intervals in space. With transient EM, readings are taken with an ever expanding time scale. In both cases, apparent resistivities are plotted against what amounts to a distance. In transient EM, apparent resistivities are plotted against $t^{\frac{1}{2}}$ as the surface current maximum is proportional to this.

3.2 Field Procedure

To maximise the signal to noise, a large square loop is laid out with the receiver positioned in the centre.

In this configuration, many readings of the $\dot{B}_z$ component are taken at several different gains to maximize all of the information along the entire decay curve. Typically, the $\dot{B}_x$ and $\dot{B}_y$ components are also read to yield a qualitative judgement as to how laterally homogeneous the situation really is. (In a truly homogeneous case the $\dot{B}_x$ and $\dot{B}_y$ would be zero).

The loop dimensions, current and turnoff time are recorded to complete the sounding.

3.3 Techniques Involved in Curve Matching

The axes of theoretical transient sounding curves are normalized to the first layer resistivity and thickness in exactly the same manner as those used in direct current methods. By matching the appropriate theoretical curve to the plotted field data the first layer resistivity can be read directly off the field data sheet. Once ρ_1 is known, it is a simple matter to calculate τ_1, at any point (preferably the axes 'origin'). Since the ratio of τ_1/h_1, is derived from the curve matching, h_1 can be deduced (see following example).

One will note the similarities between many drastically different models. For instance, there is very little difference between substantial sections of the theoretical curves for a conductive layer over a resistive half space and a three layer case with a moderately resistive layer overlaying conductive layer and finally a resistive half space as illustrated below

To determine which case applies to the field data, one must determine the thin sheet conductivity-thickness from the ascending branch of the curves. This ascending branch forms an angle of $63^\circ 26'$ with the horizontal axis. A complete derivation is not included but this is the behaviour exhibited by a thin sheet when plotted on such curves. The conductivity thickness (S) is given by

$$S = \sqrt{\frac{225.1\, t}{\rho_\infty}}$$

along this ascending branch. Therefore S may be read directly off $t^{\frac{1}{2}}$ axis. The sum of the overlying conductivity thicknesses is given as

$$S = \frac{h_1}{\rho_1} + \frac{h_2}{\rho_2} + \ldots$$

Mission *SAMPLE Work Sheet*

Date

E.S.

Drill Hole

Interp:

58 Ωm	*111 metres*
3.6 Ωm	*24 metres*
∞	*∞*

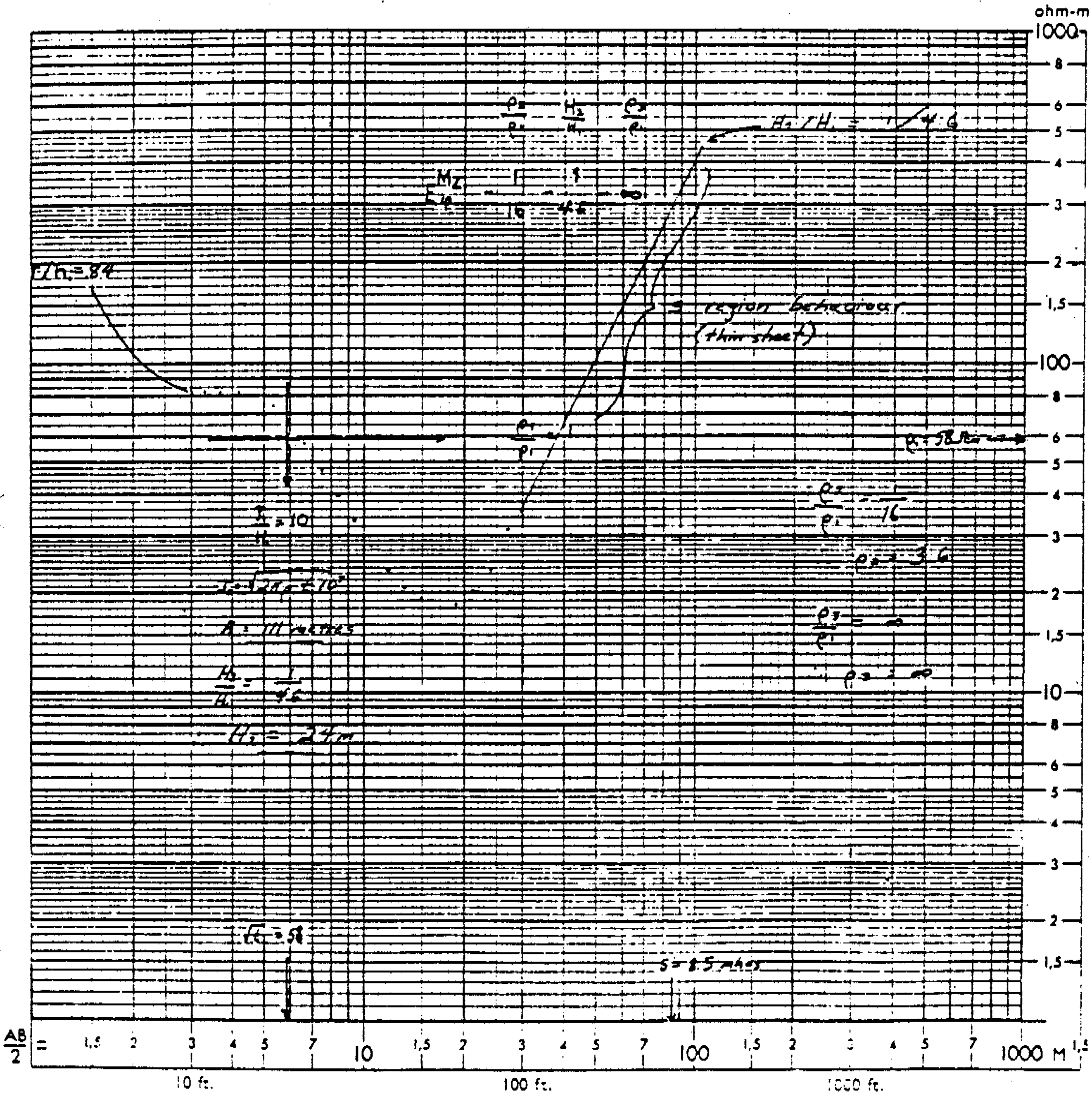
S = 8.6 mhos

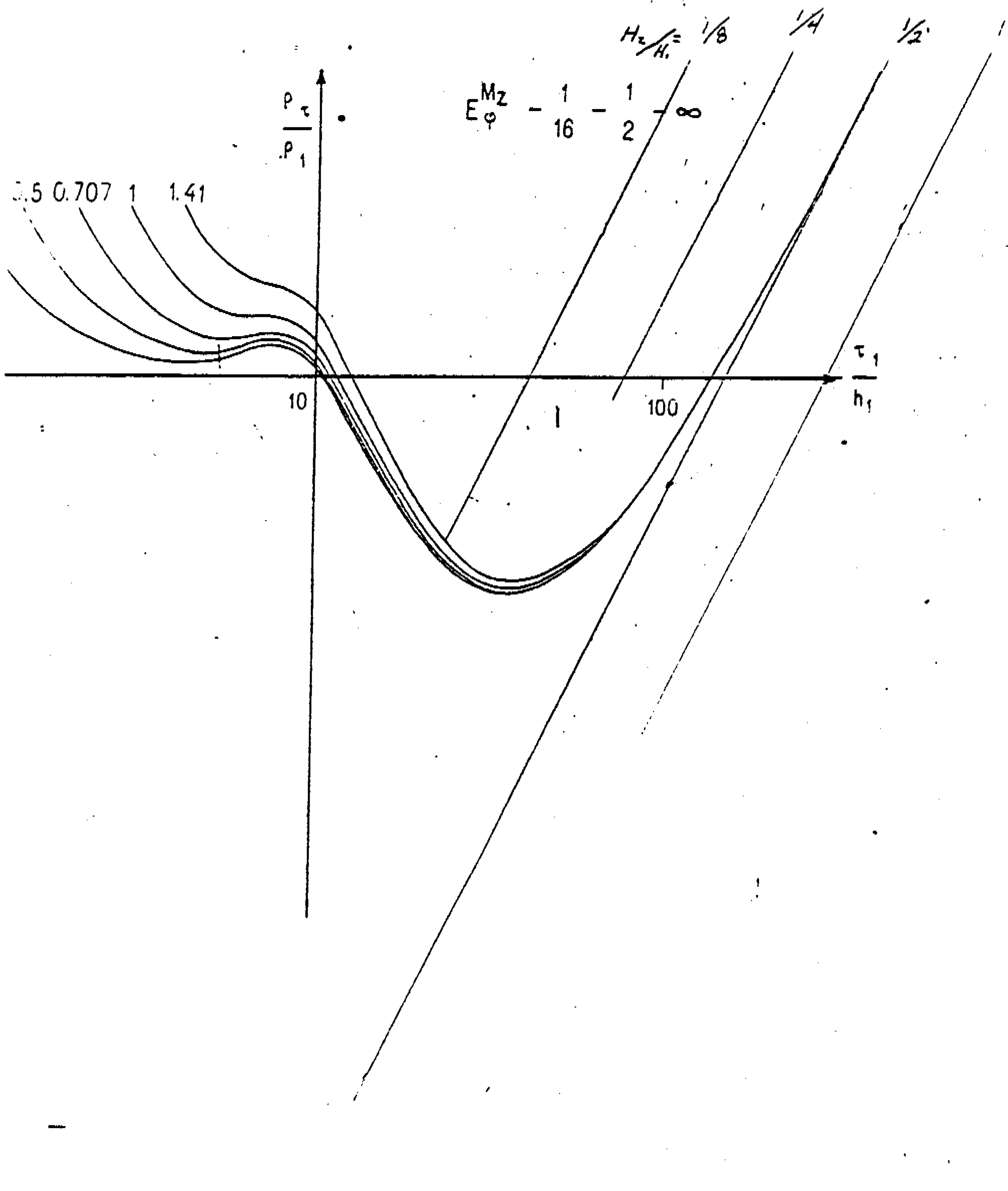
Bearing of A B

Elevation

Co-ordinates of centre

X = Y =





H_2/H_1 = 1/8
1/4
1/2
1
E_φ^{Mz} - 1/16 - 1/2 - ∞
ρ_τ / ρ_1
0.5 0.707 1 1.41
10
1
100
τ_1 / h_1

Mission SAMPLE WORK SHEET

Date ____________

E.S.

Drill Hole

interp.

33.2m 177 m

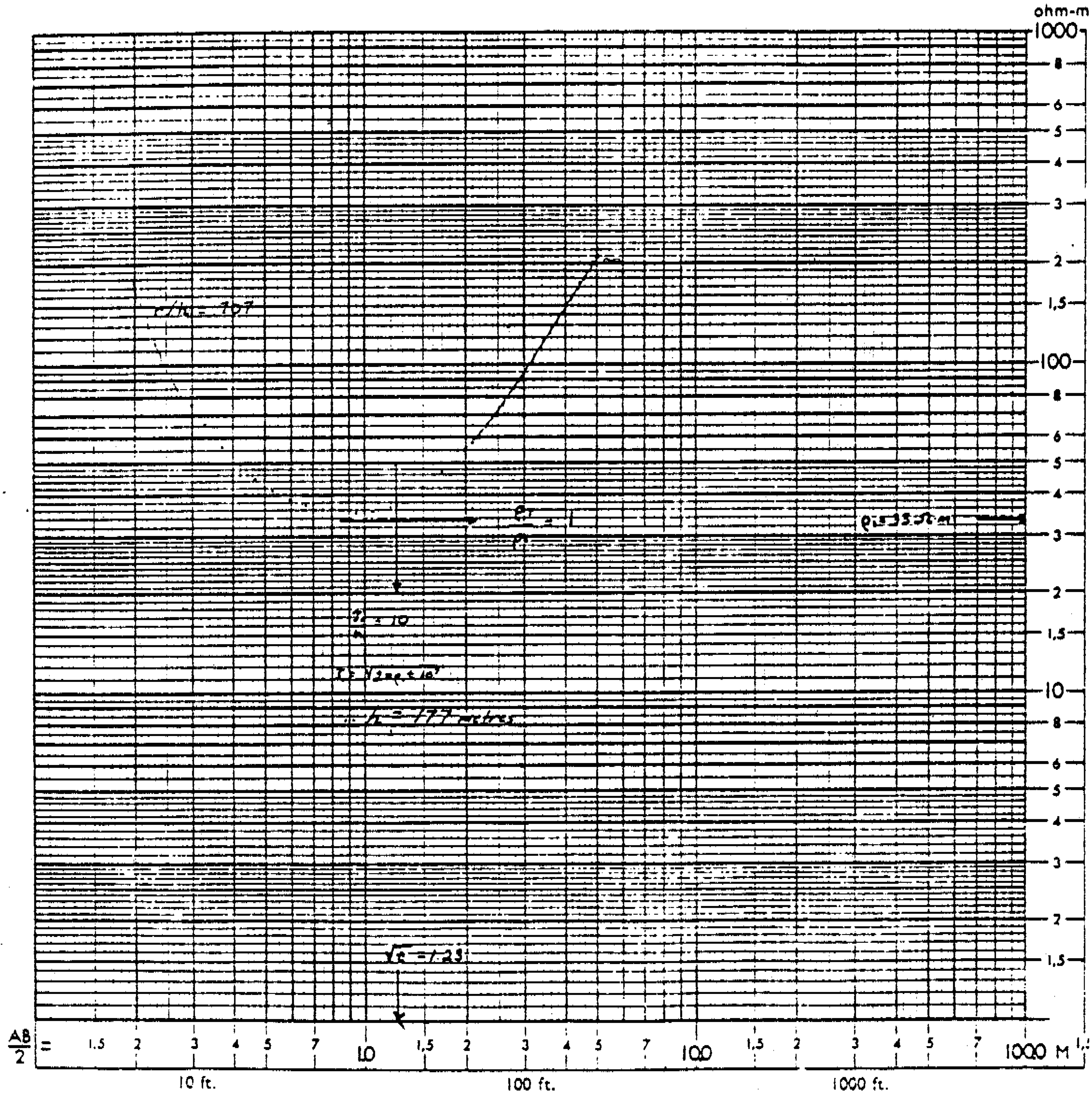
∞ ∞

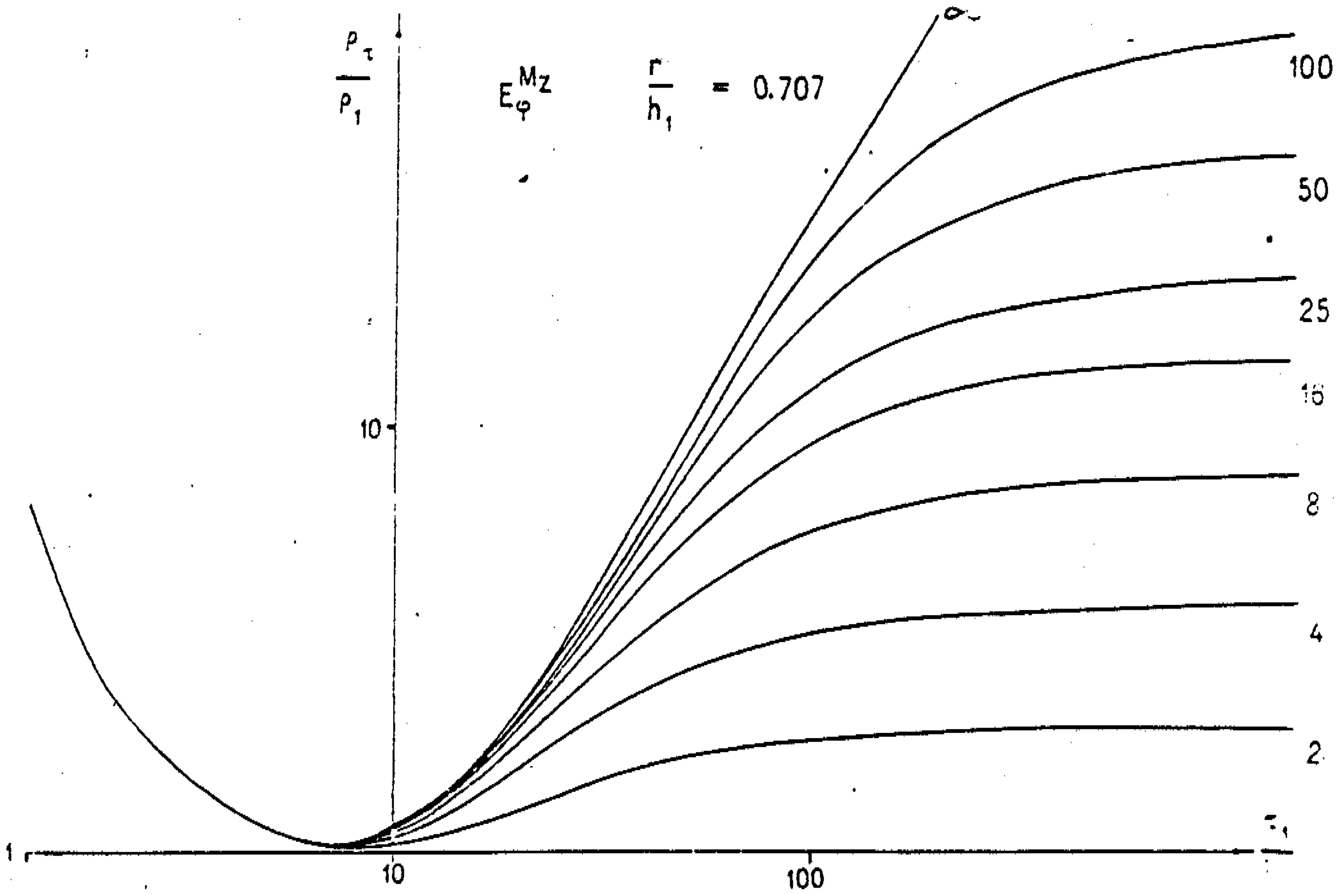
Bearing of A B ____________

Elevation ____________

Co-ordinates of centre ____________

X = ____________ Y = ____________





p_τ / p_1
E_φ^{Mz}
$r / h_1 = 0.707$
∞
100
50
25
16
8
4
2
10
1
10
100
τ_1

and should be fairly close to what was deduced from the graphical method. Any drastic departure indicates that an inappropriate model has been chosen.

N.B. Two examples of graphical sounding interpretation have been included as an aid.

3.4 Discussion of Survey Results

The great majority of the soundings involved very straight forward interpretation. Most involved two layer cases. Only those done around HYC required three and four layer interpretations. A more detailed discussion of the individual soundings accompanies the results.

As with direct current sounding methods, there is a theoretical maximum angle between the horizontal and ascending branches. This angle (63^{o} 26') is often exceeded and the question must be asked as to what is the cause. It is noted that the most serious departures occur in resistive terrains, especially in areas with very thin moderately conductive cover. It is my belief that this is largely an instrumental effect. Slowly decaying currents in the receiver would suppress the half space response and therefore increase the resistivities faster than that theoretically allowed. This would be especially serious where a thin moderately conductive cover was present. The currents would diffuse extremely rapidly due to the thin sheet geometry. Quite possibly much of the field left would be due to the instrument. This assessment does not lower the quality of the soundings. It merely explains an effect seen over usually a very limited and late time range.

Further interpretational complications arise if there are lateral conductivity changes.

Fictitious layers can easily be interpreted. Probably the best way to detect this is to examine the profiles.

Conductors that appear on the profiles, would also effect the sounding interpretation creating non-existent layers. (The best example of this is sounding No. 1.)

Sounding Nos. 13 and 14 - Seismic Line A.

These are probably two layer cases with severe departures in the ascending branch. Taken at face value, they do not fit any model well.

Sounding No. 15 - Seismic Line B.

This is interpreted as a two layer case with a departure in the ascending branch.

Sounding Nos. 16 and 17 - Test Line 6 - Barney Creek.

Both these were interpreted as two layer cases although neither fit any model very well. This can probably be attributed to the high resistivities and low signal levels involved.

Sounding Nos. 18 and 19 - Test Line 7 - Barney Creek.

These were interpreted as two layer cases although No. 18 does not fit well. It is difficult to determine why the departure on the ascending branch is so severe although it is suspected that the rapid decay of the thin sheet geometry accentuates any instrumental effect.

Conclusions.

The majority of the soundings done in the area were readily interpretable. Soundings that did not fit a model often had lateral changes or extremely high resistivities.

The method certainly appears to be a viable tool to search for such flat-lying bodies.

Respectfully submitted,
GEOTERREX PTY. LIMITED.

John Peacock
GEOPHYSICIST.

Sounding No. 13

Date: July 25, 1982

Component: Z

Location: North half of loop - Seismic line 'A'

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 264 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	6	5299.3	.30	254
2	.109	6	4474.8	.33	226
3	.140	6	3629.8	.37	194
4	.177	6	2911.0	.42	171
5	.220	6/7	2331.3/4633.8	.47	152/152
6	.280	7	3486.8	.53	136
7	.355	7	2575.8	.60	122
8	.443	7	1858.3	.67	112
9	.563	7	1260.8	.75	104
10	.712	7	793.3	.84	102
11	.876	7	520.6	.94	99
12	1.087	7	302.3	1.04	103
13	1.400	7	148.6	1.18	113
14	1.772	7/9	68.2/274.9	1.33	132/131
15	2.210	9	125.2	1.49	157
16	2.820	9	50.8	1.68	194
17	3.570	9	19.0	1.89	256
18	4.460	9	7.8	2.11	324
19	5.667	9	3.8	2.38	354
20	7.160	9	1.9	2.68	384

Interpreted Model:

Sounding No. 13

Date: July 25, 1982

Component: X

Location: North half of loop - Seismic line 'A'

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 264 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	7	2864	.30	
2	.109	7	2287	.33	
3	.140	7	1730	.37	
4	.177	7	1281	.42	
5	.220	7	942	.47	
6	.280	7	635	.53	
7	.355	7	407	.60	
8	.443	7	248	.67	
9	.563	7	127	.75	
10	.712	7	53	.84	
11	.876	7	31.5	.94	
12	1.087	7	14.2	1.04	
13	1.400	7	7.1	1.18	
14	1.772	7	2.7	1.33	
15	2.210	7	6.1	1.49	
16	2.820	7	10.3	1.68	
17	3.570	7	11.3	1.89	
18	4.460	7	10.7	2.11	
19	5.667	7	15.3	2.38	
20	7.160	7	16.4	2.68	

Interpreted Model:

Sounding No. 13

Date: July 25, 1982

Component: Y

Location: North half of loop - Seismic line 'A'

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 264 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	7	1993	.30	
2	.109	7	1645	.33	
3	.140	7	1264	.37	
4	.177	7	953	.42	
5	.220	7	904	.47	
6	.280	7	476	.53	
7	.355	7	304	.60	
8	.443	7	181	.67	
9	.563	7	89	.75	
10	.712	7	35	.84	
11	.876	7	24.1	.94	
12	1.087	7	13.8	1.04	
13	1.400	7	9.0	1.18	
14	1.772	7	5.0	1.33	
15	2.210	7	8.0	1.49	
16	2.820	7	11.2	1.68	
17	3.570	7	12.3	1.89	
18	4.460	7	11.2	2.11	
19	5.667	7	15.9	2.38	
20	7.160	7	16.9	2.68	

Interpreted Model:

Mission 85 - 1419

Date JULY 25, 1982

E.S.

Drill Hole

SOUNDING No. 13

A = 300 m
B = 300 m
I = 17.0 A
T/o = 264 μsec
Freq.= 25 Hz

Bearing of A B

Elevation

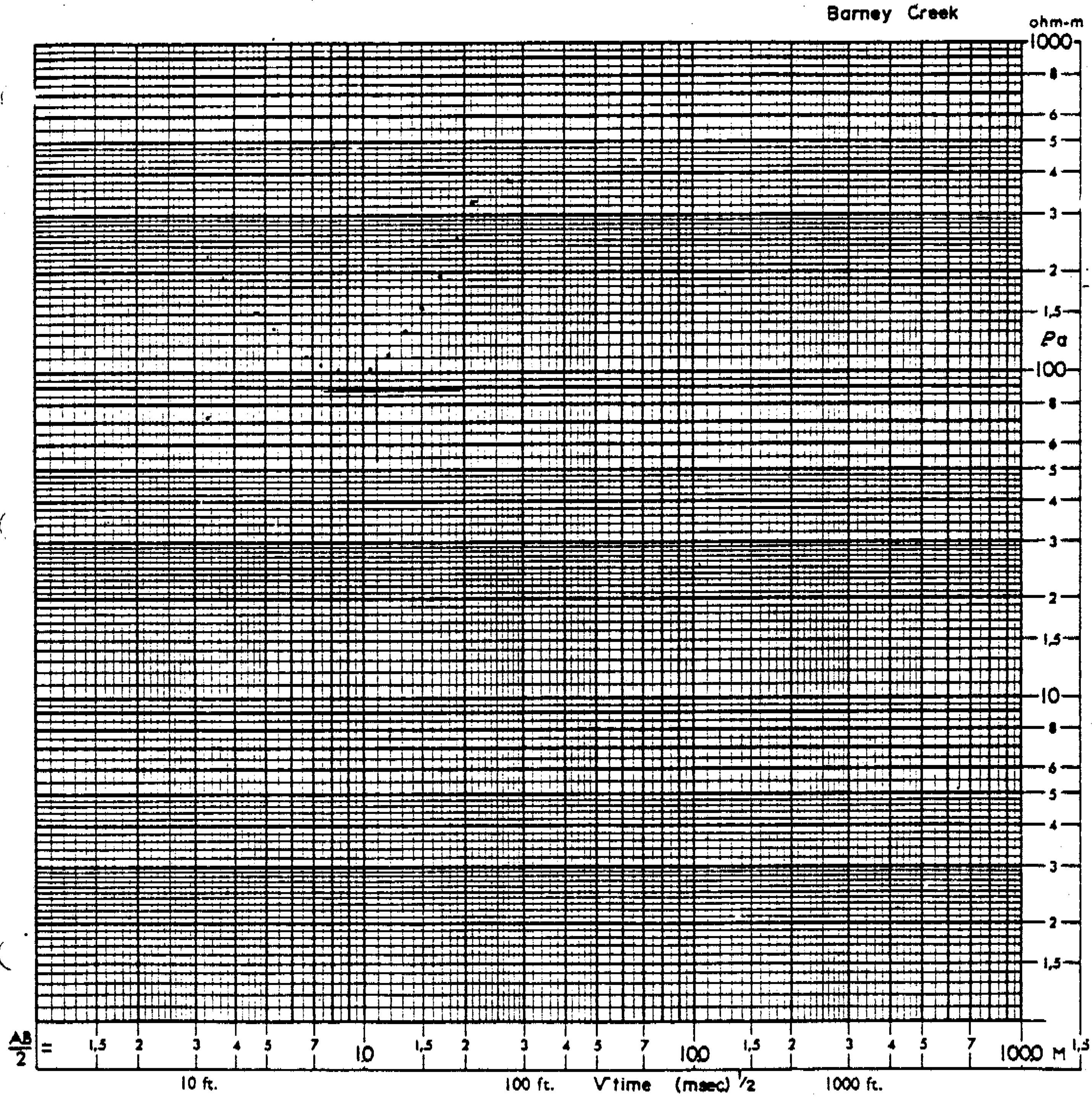
Co-ordinates of centre

X = Y =

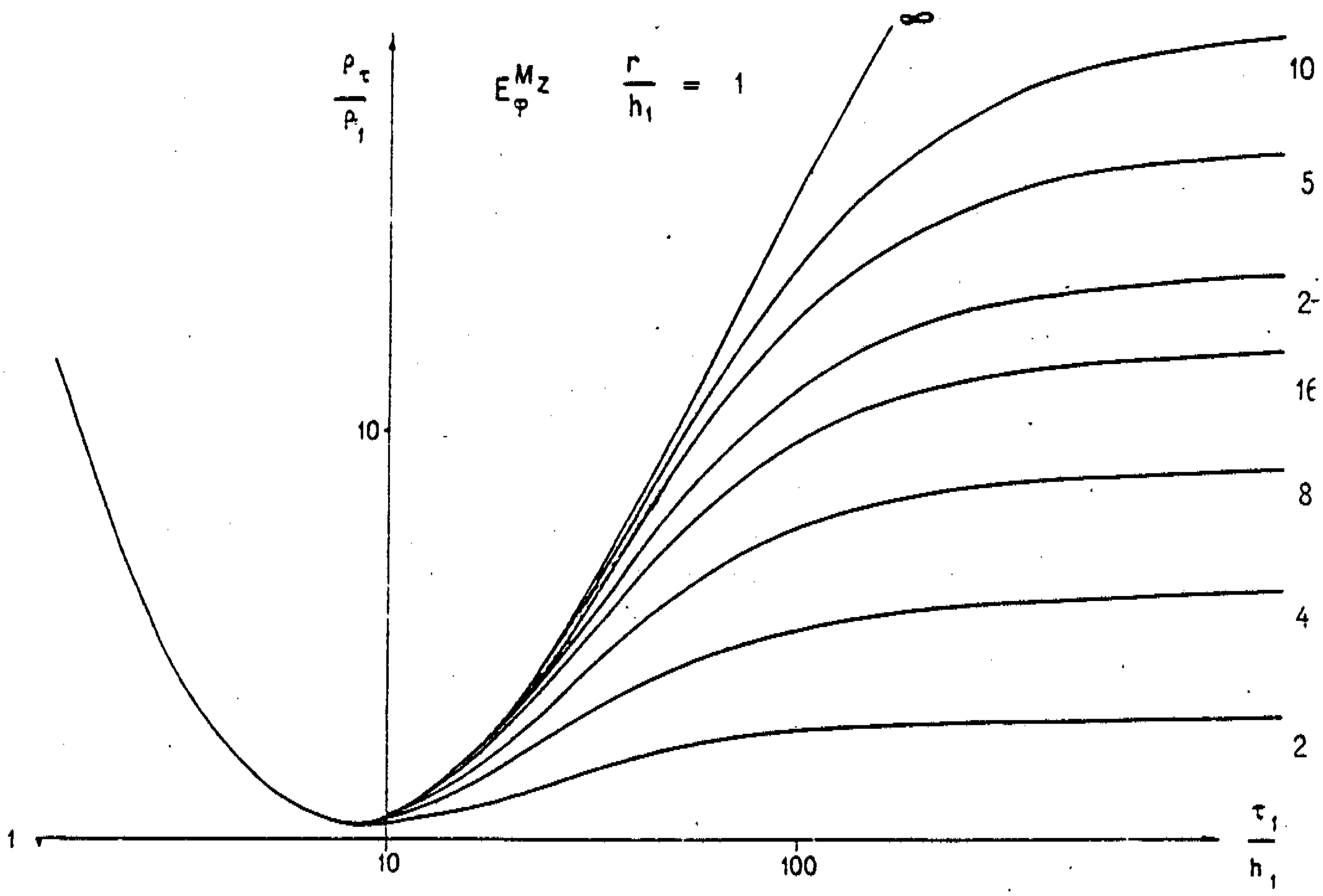
Z COMPONENT

(north half loop - Seismic line A)

Barney Creek



Fits Sounding 13



Sounding # . 14

Date: July 25, 1982

Component: Z

Location: South half of loop - Seismic Line 'A'

A = 300 metres

B = 300 metres

I = 16.0 Amps

T/o = 250 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	ρa
1	.0885	5	5073.3	.30	163
2	.109	5	4033.0	.33	151
3	.140	5	3019.5	.37	137
4	.177	5	2219.5	.42	127
5	.220	5	1624	.47	119
6	.280	7	4466.8	.53	113
7	.355	7	2980	.60	108
8	.443	7	1969.8	.67	106
9	.563	7	1235.3	.75	103
10	.712	7	732.3	.84	104
11	.876	7	467.2	.94	104
12	1.087	7	267.1	1.04	109
13	1.400	7/9	131.5/531.2	1.18	119/118
14	1.772	9	245.4	1.33	137
15	2.210	9	112.4	1.49	163
16	2.820	9	45.3	1.68	202
17	3.570	9	16.1	1.89	276
18	4.460	9	5.92	2.11	375
19	5.667	9	1.78	2.38	565
20	7.160	9	.28	2.68	1356

Interpreted Model:

95 ohm meters   251 m

infinite   half space

$\frac{RHO2}{RHO1}$ = infinite

$\frac{H2}{H1}$ = infinite

Sounding No. 14

Date: July 25, 1982

Component: X

Location: South half of loop - Seismic loop 'A'

A = 300 metres

B = 300 metres

I = 16.0 Amps

T/o = 250 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	7	-5959	.30	
2	.109	7	-4623	.33	
3	.140	7	-2983	.37	
4	.177	7	-1828	.42	
5	.220	7	-1072	.47	
6	.280	7	- 501	.53	
7	.355	7	- 169	.60	
8	.443	7	- 1.0	.67	
9	.563	7	66	.75	
10	.712	7	78	.84	
11	.876	7	81.1	.94	
12	1.087	7	61.7	1.04	
13	1.400	7	39.9	1.18	
14	1.772	7	22.3	1.33	
15	2.210	7	17.2	1.49	
16	2.820	7	17.2	1.68	
17	3.570	7	16.3	1.89	
18	4.460	7	14.7	2.11	
19	5.667	7	20.0	2.38	
20	7.160	7	21.0	2.68	

Interpreted Model:

Sounding No.	14	A	=	300 metres
Date:	July 25, 1982	B	=	300 metres
Component:	Y	I	=	16.0 Amps
Location:	South half of loop - Seismic line 'A'	T/o	=	250 u sec
		Base Frequency	=	25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{\text{TIME}}$	pa
1	.0885	7	6115	.30	
2	.109	7	4509	.33	
3	.140	7	3037	.37	
4	.177	7	1957	.42	
5	.220	7	1214	.47	
6	.280	7	653	.53	
7	.355	7	296	.60	
8	.443	7	107	.67	
9	.563	7	2	.75	
10	.712	7	- 30	.84	
11	.876	7	- 19.5	.94	
12	1.087	7	- 10.3	1.04	
13	1.400	7	- 1.0	1.18	
14	1.772	7	- 1.2	1.33	
15	2.210	7	7.7	1.49	
16	2.820	7	13.0	1.68	
17	3.570	7	14.5	1.89	
18	4.460	7	13.5	2.11	
19	5.667	7	19.2	2.38	
20	7.160	7	20.2	2.68	

Interpreted Model:

Mission 85 - 1419

Date JULY 25, 1982

E.S.

Drill Hole

SOUNDING No. 14

A = 300 m
B = 300 m
I = 16.0 A
T/b = 250 µsec
Freq.= 25 Hz

Bearing of A B ____________

Elevation ____________

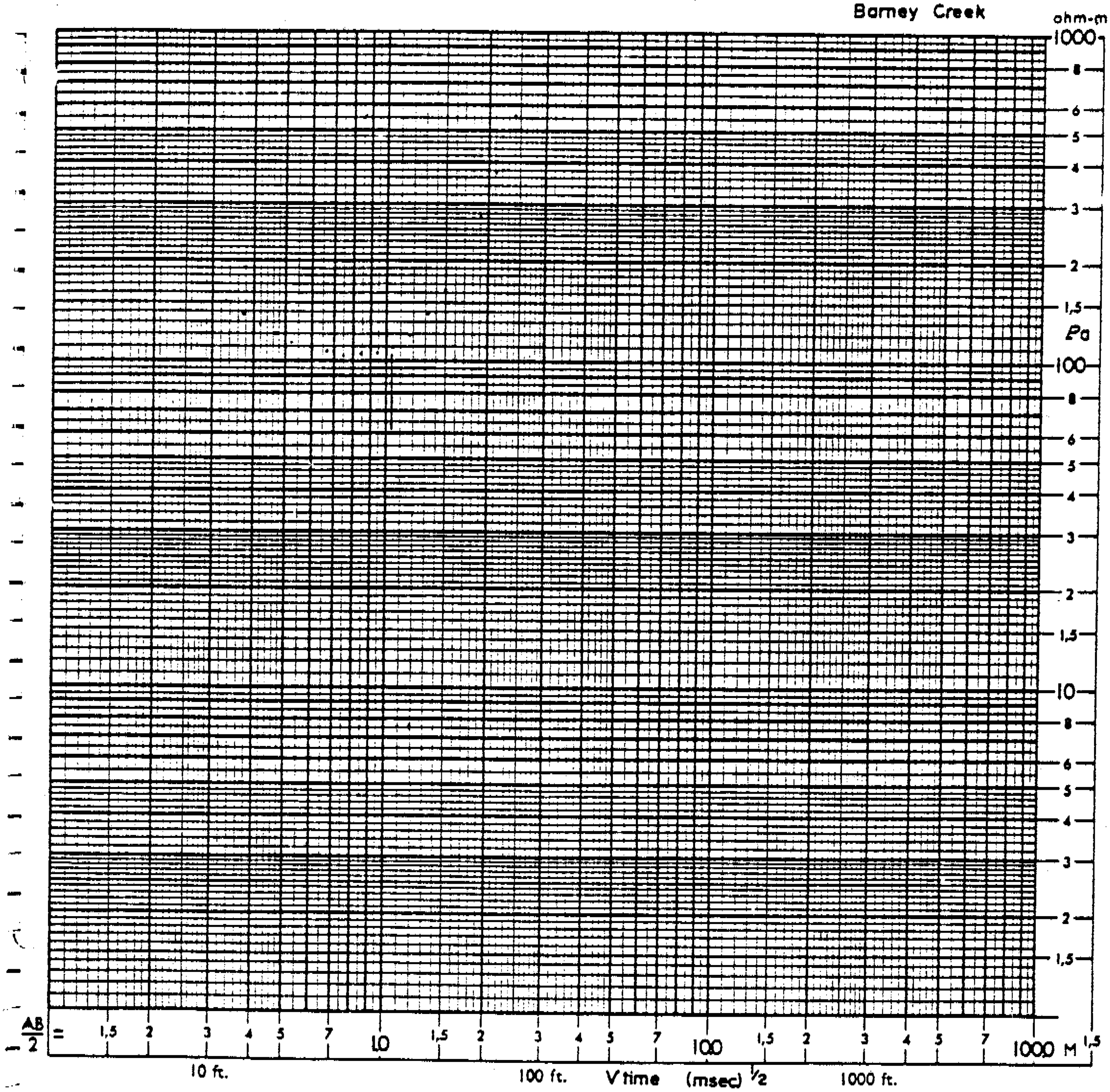
Co-ordinates of centre ____________

X = ____________ Y = ____________

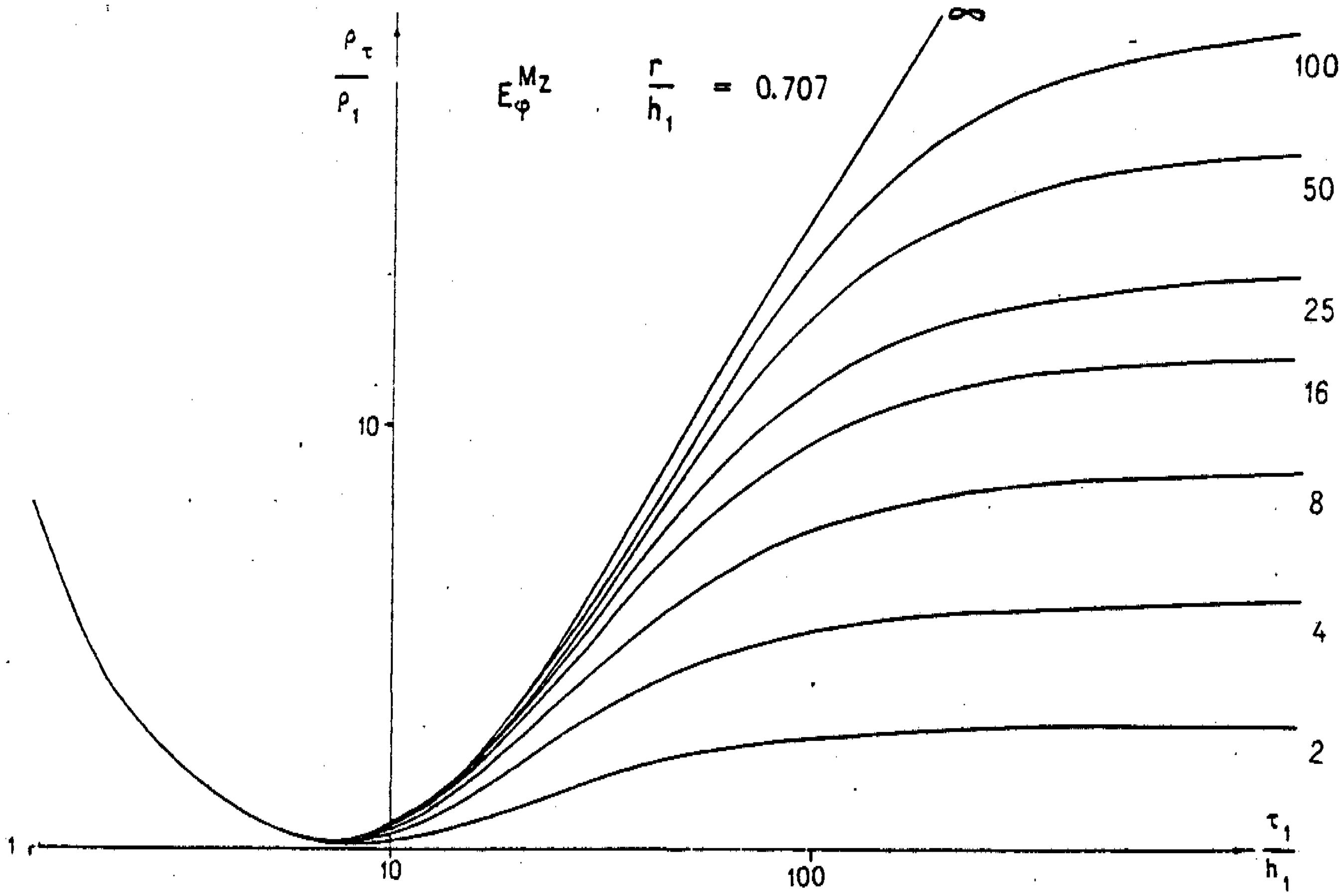
Z COMPONENT

(south half loop - Seismic line A)

Barney Creek



Fits Sounding 14



Sounding # 15

Date: July 27, 1982

Component: Z

Location: Centred on 1325 S Seismic Line 'B'

A = 300 metres

B = 300 metres

I = 17.5 Amps

T/o = 266 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	3	5051	.30	67
2	.109	3	4197.5	.33	60
3	.140	3	3205	.37	54
4	.177	3	2317.5	.42	49
5	.220	3	1610.8	.47	49
6	.280	3	1001.3	.53	50
7	.355	6	4922.3	.60	50.7
8	.443	6	2817	.67	54.6
9	.563	6	1484.8	.75	60
10	.712	6	733.3	.84	69
11	.876	6	405.7	.94	75
12	1.087	6	202.83	1.04	87
13	1.400	6	89.45	1.18	102
14	1.772	6/9	38.18/314.8	1.33	125/122
15	2.210	9	144.4	1.49	145
16	2.820	9	61.0	1.68	175
17	3.570	9	22.2	1.89	235
18	4.460	9	8.3	2.11	317
19	5.667	9	2.5	2.38	478
20	7.160	9	.5	2.68	953

Interpreted Model:

$\frac{RHO2}{RHO1}$ = infinite

$\frac{H2}{H1}$ = infinite

40 ohm meters — 84 m

infinite — half space

Mission 85 - 1419

Date JULY 27, 1982

E.S.

Drill Hole

SOUNDING No. 15

A = 300 m
B = 300 m
I = 17.5 A
T/o = 266 µsec
Freq = 25 Hz

Bearing of A B

Elevation

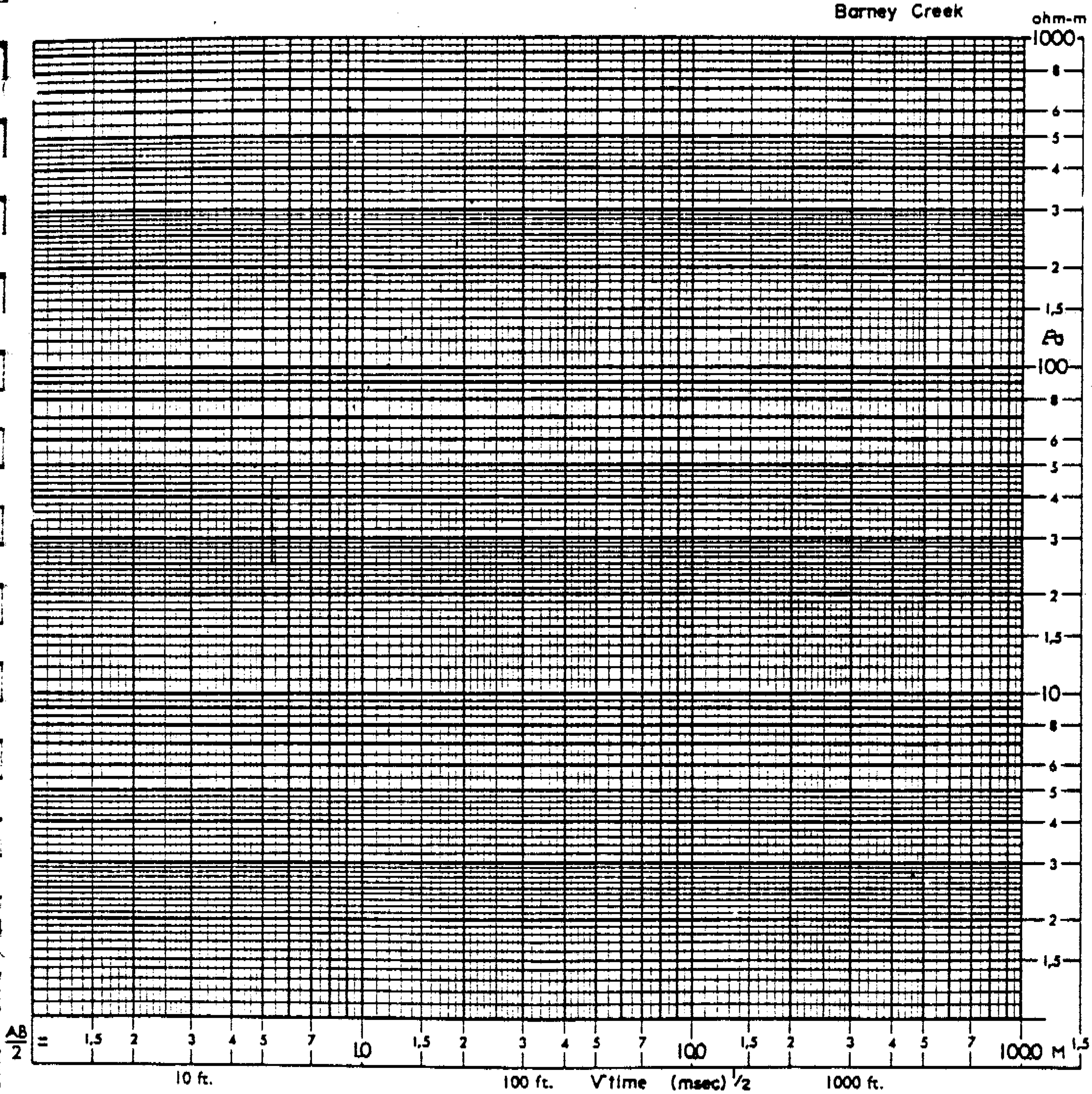
Co-ordinates of centre

X = Y =

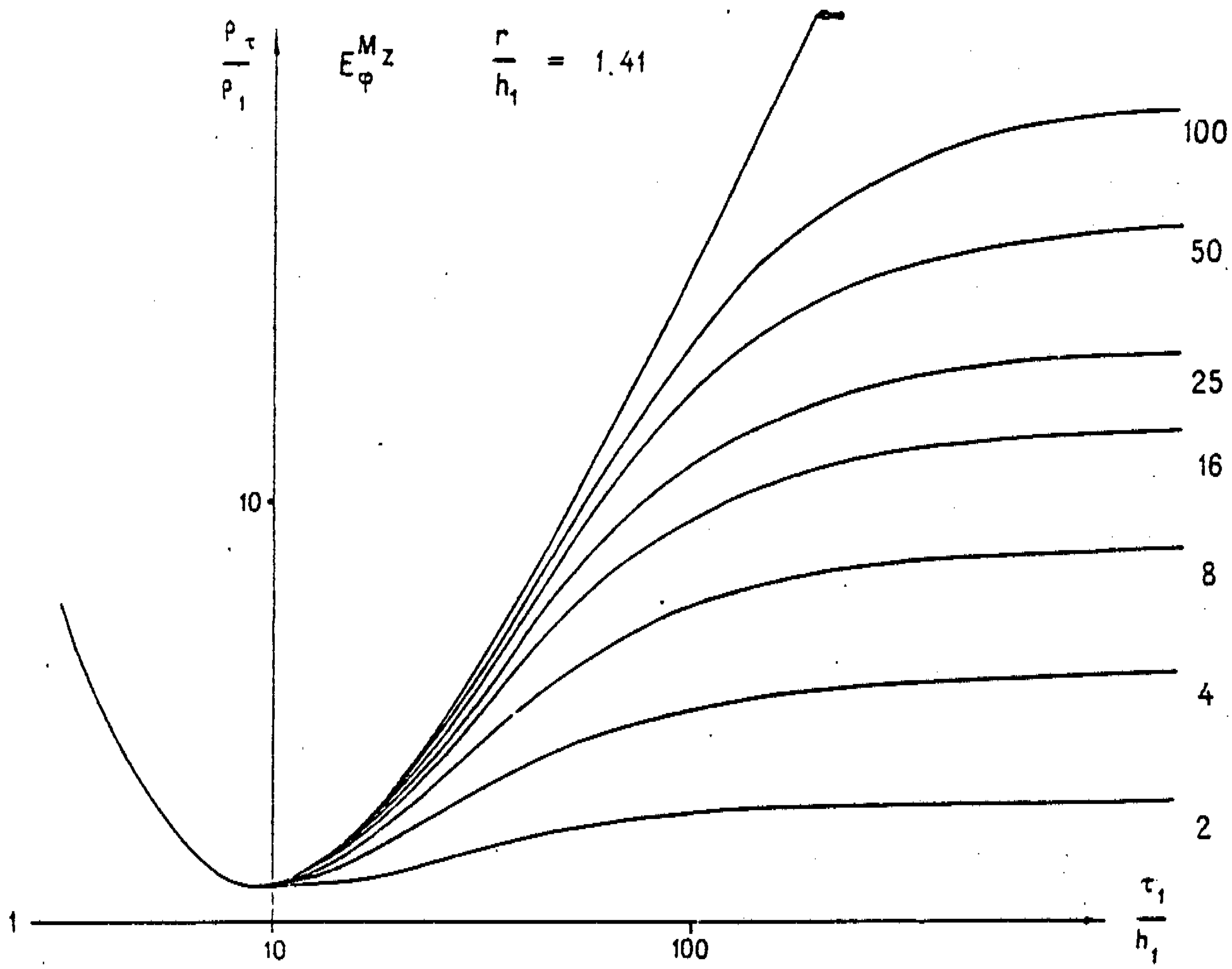
Z COMPONENT

(centred on 1325 S - Seismic line B)

Barney Creek



Fits Sounding 15



Sounding No. 16

Date: July 28, 1982

Component: Z

Location: Northern half line 6 loop

A = 300 metres

B = 300 metres

I = 18.2 Amps

T/o = 270 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	6	4362	.30	299
2	.109	6	3061	.33	300
3	.140	6	1956	.37	304
4	.177	6	1226	.42	314
5	.220	6	784	.47	325
6	.280	6/9	471/3780	.53	337/336
7	.355	6/9	286/2300	.60	345/344
8	.443	6/9	177/1421	.67	353/352
9	.563	9	834	.75	360
10	.712	9	464	.84	381
11	.876	9	287.2	.94	388
12	1.087	9	159.3	1.04	417
13	1.400	9	80.1	1.18	449
14	1.772	9	40.9	1.33	488
15	2.210	9	22.4	1.49	515
16	2.820	9	11.6	1.68	543
17	3.570	9	5.8	1.89	591
18	4.460	9	2.5	2.11	723
19	5.667	9	.6	2.38	1269
20	7.160	9		2.68	

Interpreted Model:

$\frac{RHO2}{RHO1}$ = 2 (?)

$\frac{H2}{H1}$ = infinite

(poor fit - see comments)

290 ohm meters	166 m
580 ohm meters	half space

Sounding No. 16

Date: July 28, 1982

Component: X

Location: Northern half line 6 loop

A = 300 metres

B = 300 metres

I = 18.2 Amps

T/o = 270 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	6	1446	.30	
2	.109	6	834	.33	
3	.140	6	366	.37	
4	.177	6	109	.42	
5	.220	6	- 3	.47	
6	.280	6	- 43	.53	
7	.355	6	- 49	.60	
8	.443	6	- 37	.67	
9	.563	6	- 26	.75	
10	.712	6	- 13	.84	
11	.876	6	- 7.4	.94	
12	1.087	6	- 2.1	1.04	
13	1.400	6	0	1.18	
14	1.772	6	- .2	1.33	
15	2.210	6	.4	1.49	
16	2.820	6	1.1	1.68	
17	3.570	6	1.3	1.89	
18	4.460	6	1.4	2.11	
19	5.667	6	2.1	2.38	
20	7.160	6	2.6	2.68	

Interpreted Model:

Sounding No. 16

Date: July 28, 1982

Component: Y

Location: Northern half line loop 6

A = 300 metres

B = 300 metres

I = 18.2 Amps

T/o = 270 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{\text{TIME}}$	pa
1	.0885	6	- 537	.30	
2	.109	6	- 275	.33	
3	.140	6	- 80	.37	
4	.177	6	20	.42	
5	.220	6	59	.47	
6	.280	6	65	.53	
7	.355	6	54	.60	
8	.443	6	40	.67	
9	.563	6	24	.75	
10	.712	6	15	.84	
11	.876	6	11.9	.94	
12	1.087	6	8.2	1.04	
13	1.400	6	5.2	1.18	
14	1.772	6	2.2	1.33	
15	2.210	6	1.8	1.49	
16	2.820	6	1.8	1.68	
17	3.570	6	1.7	1.89	
18	4.460	6	1.5	2.11	
19	5.667	6	2.2	2.38	
20	7.160	6	2.6	2.68	

Interpreted Model:

Mission 85 - 1419

Date JULY 28, 1982

E.S.

Drill Hole

SOUNDING No. 16

A = 300 m
B = 300 m
I = 18.2 A
T/o = 270 µsec
Freq = 25 Hz

Bearing of A B

Elevation

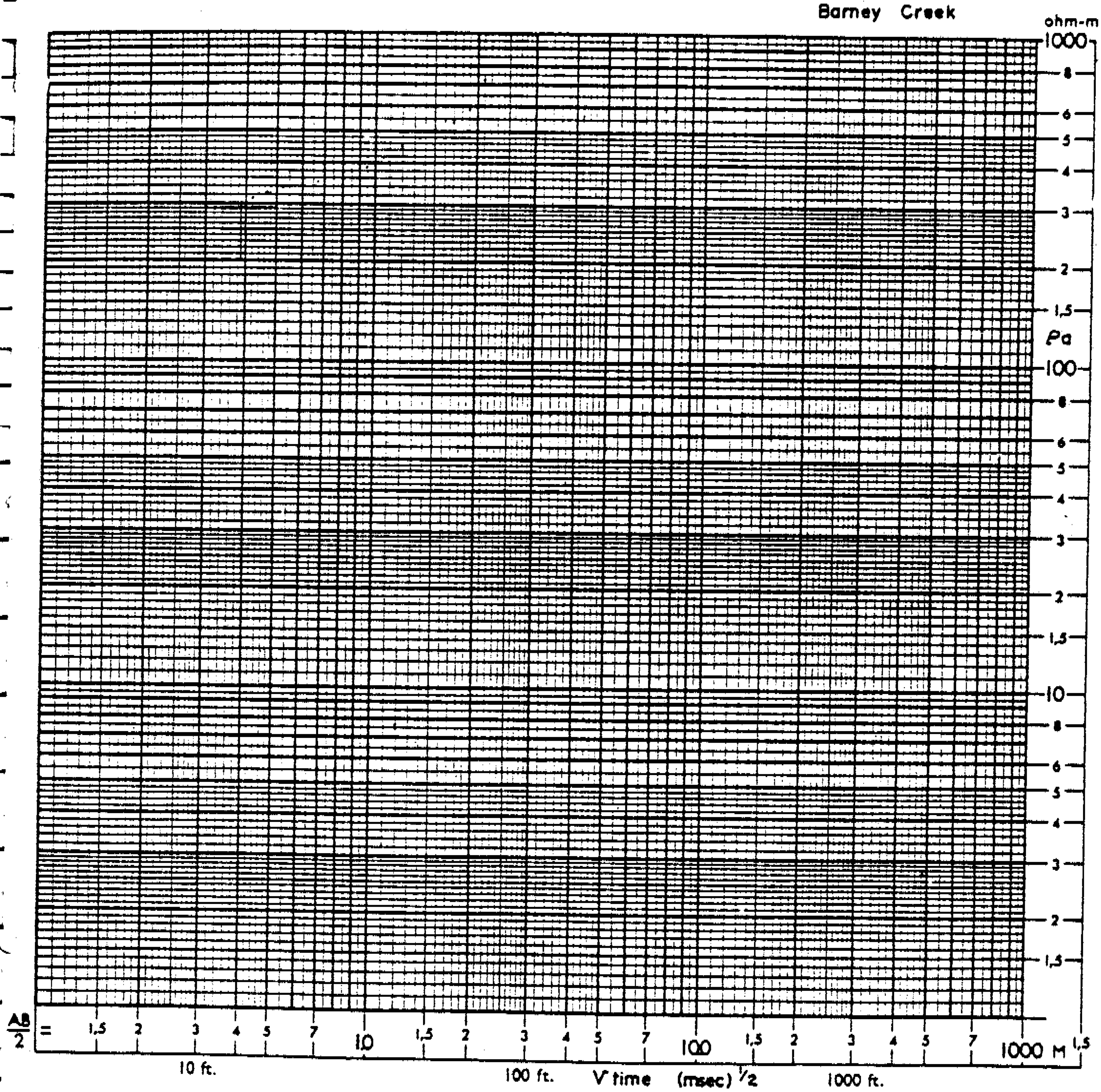
Co-ordinates of centre

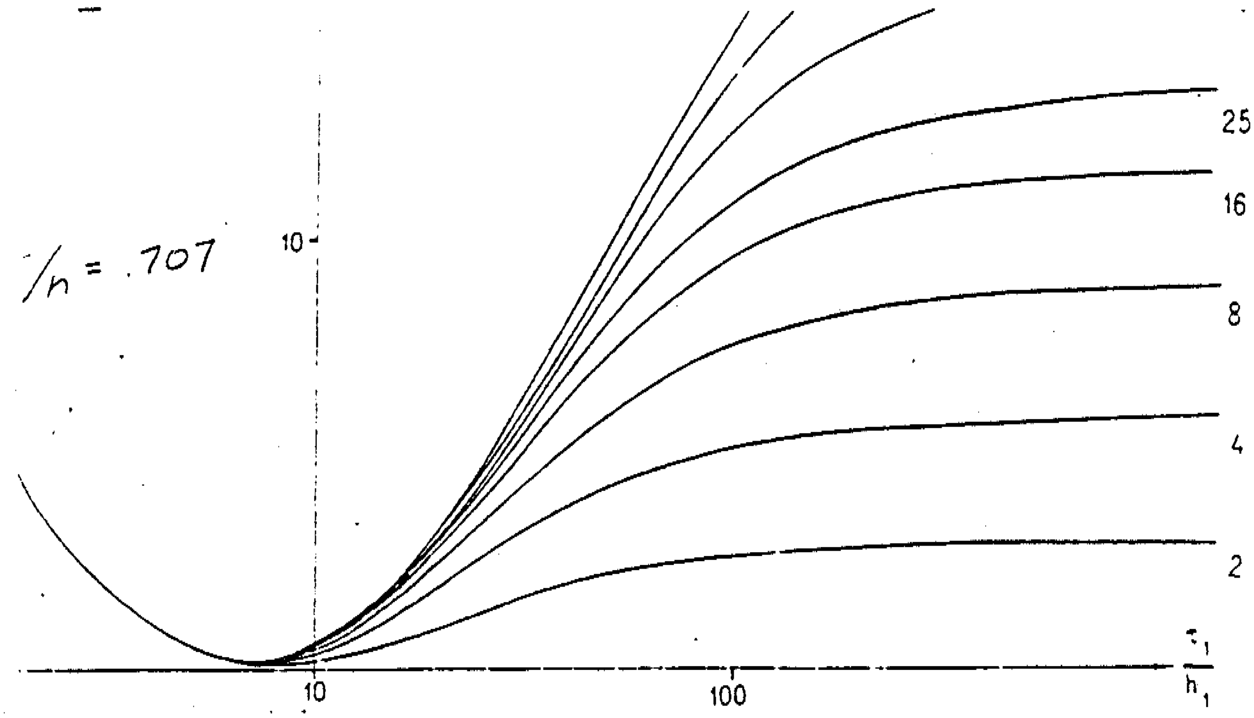
X = Y =

Z COMPONENT

(northern half line 6 loop)

Barney Creek





Fits Sounding 16

Sounding No. 17

Date: July 28, 1982

Component: Z

Location: South half line 6 loop

A = 300 metres

B = 300 metres

I = 18.0 Amps

T/o = 278 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	8	4973	.30	675
2	.109	8	3810	.33	639
3	.140	8/9	2789/5335	.37	609
4	.177	8/9	2039/4098	.42	551
5	.220	8/9	1517/3119	.47	508
6	.280	8/9	1062/2176	.53	477
7	.355	9	1501	.60	449
8	.443	9	1017	.67	433
9	.563	9	649	.75	420
10	.712	9	390	.84	422
11	.876	9	256.8	.94	413
12	1.087	9	154	1.04	421
13	1.400	9	82.9	1.18	434
14	1.772	9	45.6	1.33	449
15	2.210	9	26.8	1.49	453
16	2.820	9	15.1	1.68	451
17	3.570	9	8.3	1.89	461
18	4.460	9	4.6	2.11	477
19	5.667	9	2.2	2.38	529
20	7.160	9	1.3	2.68	513

400 ohm meters 551 m

800 ohm meters half space

Interpreted Model:

$\frac{RHO2}{RHO1}$ = 2 (?)

$\frac{H2}{H1}$ = infinite

[illegible]

Sounding No. 17

Date: July 28, 1982

Component: X

Location: South half line 6 loop

A = 300 metres

B = 300 metres

I = 18.0 Amps

T/o = 278 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	8	888	.30	
2	.109	8	603	.33	
3	.140	8	376	.37	
4	.177	8	232	.42	
5	.220	8	149	.47	
6	.280	8	91	.53	
7	.355	8	58	.60	
8	.443	8	32	.67	
9	.563	8	19	.75	
10	.712	8	16	.84	
11	.876	8	32.6	.94	
12	1.087	8	37.5	1.04	
13	1.400	8	32.3	1.18	
14	1.772	8	33.1	1.33	
15	2.210	8	33.0	1.49	
16	2.820	8	48.7	1.68	
17	3.570	8	48.9	1.89	
18	4.460	8	44.1	2.11	
19	5.667	8	44.6	2.38	
20	7.160	8	41.6	2.68	

Interpreted Model:

Sounding No. 17

Date: July 28, 1982

Component: Y

Location: South half line 6 loop

A = 300 metres

B = 300 metres

I = 18.0 Amps

T/o = 278 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	8	-259	.30	
2	.109	8	-173	.33	
3	.140	8	- 94	.37	
4	.177	8	- 44	.42	
5	.220	8	- 13	.47	
6	.280	8	17	.53	
7	.355	8	34	.60	
8	.443	8	42	.67	
9	.563	8	38	.75	
10	.712	8	35	.84	
11	.876	8	51.5	.94	
12	1.087	8	50.3	1.04	
13	1.400	8	44.6	1.18	
14	1.772	8	40.6	1.33	
15	2.210	8	39.1	1.49	
16	2.820	8	53.5	1.68	
17	3.570	8	53.3	1.89	
18	4.460	8	46.9	2.11	
19	5.667	8	45.7	2.38	
20	7.160	8	41.9	2.68	

Interpreted Model:

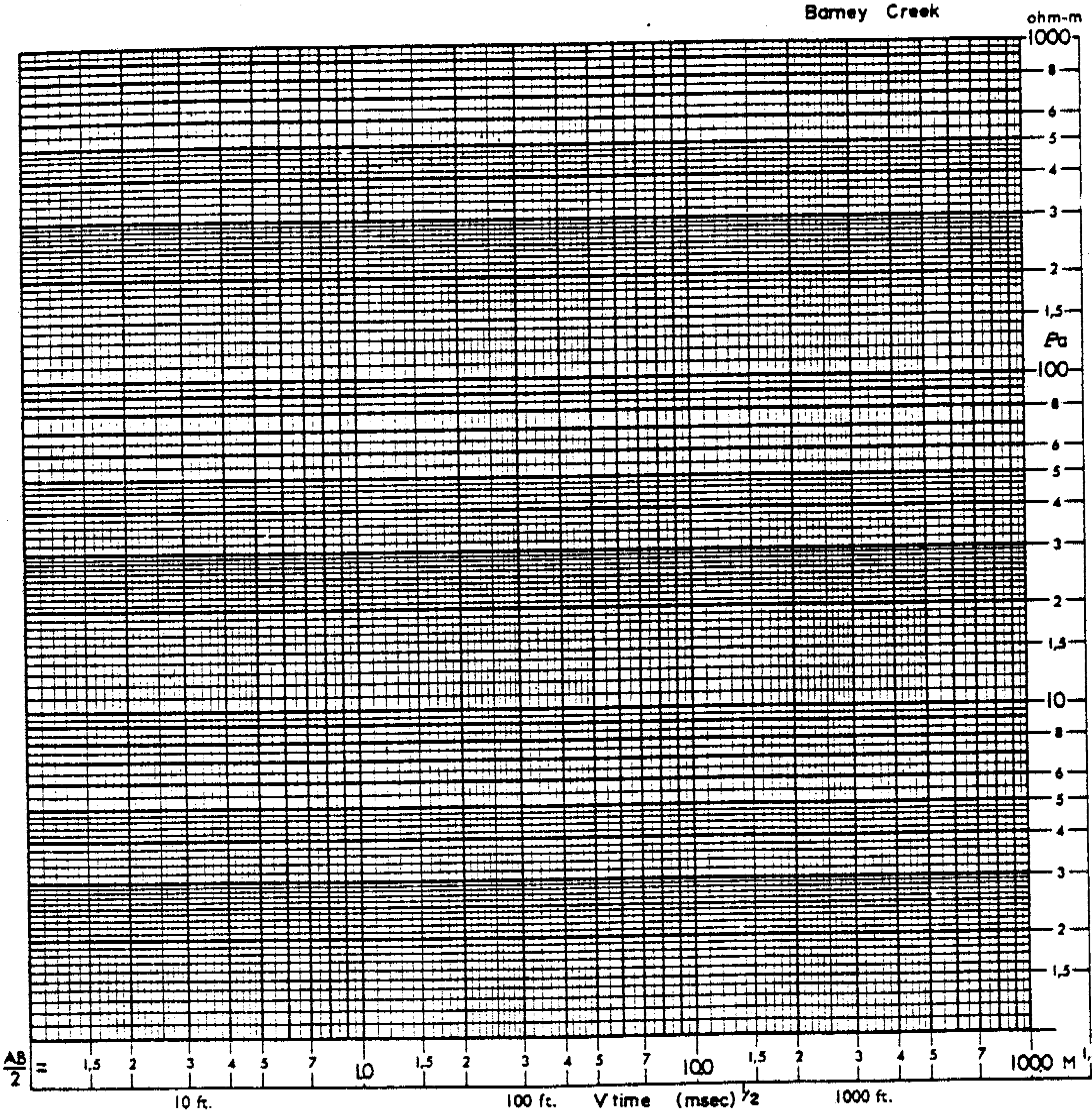
Mission 85 - 1419
Date JULY 28, 1982

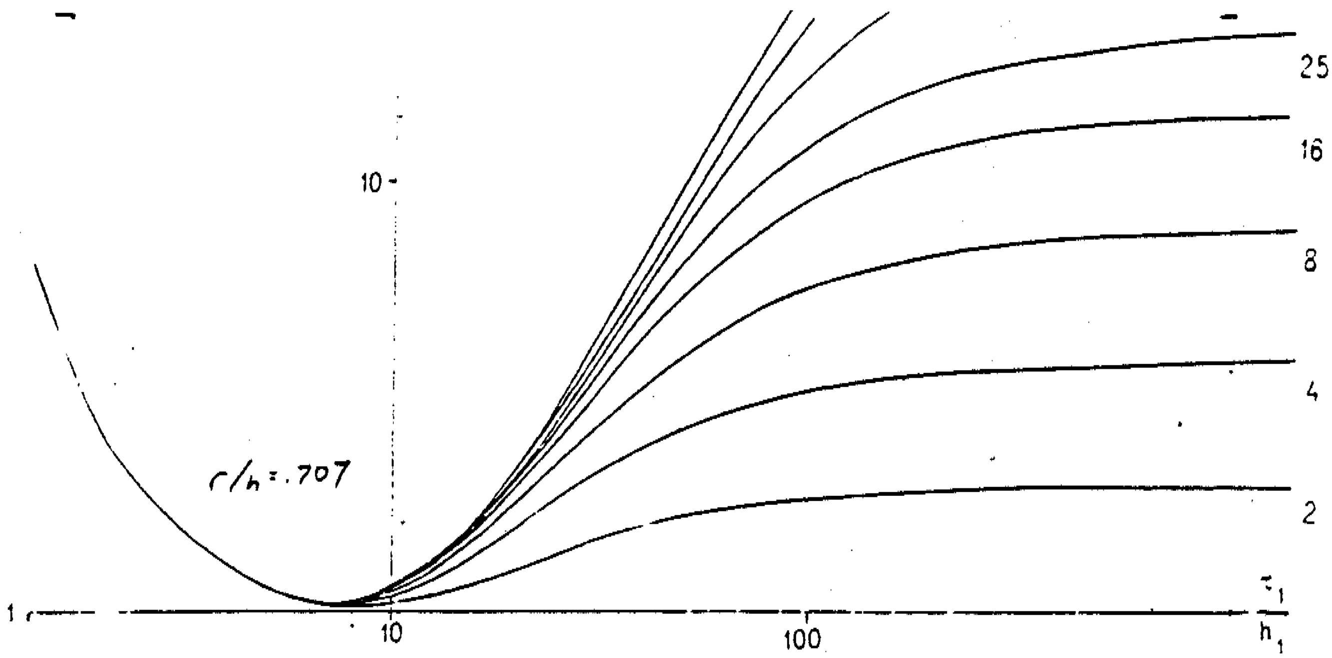
E.S.
Drill Hole

SOUNDING No. 17

A = 300 m
B = 300 m
I = 18.0 A
T/o = 278 µ sec
Freq= 25 Hz

Bearing of A B
Elevation
Co-ordinates of centre
X = Y =
Z COMPONENT
(south half line 6 loop)
Barney Creek





Fits Sounding 17

Sounding No. 18

Date: July 30, 1982

Component: Z

Location: South side of loop - line 7 - Barney Creek

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 270 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	ρa
1	.0885	4	5655	.30	95.5
2	.109	4	4343	.33	90.2
3	.140	4	3036	.37	85.9
4	.177	4	2028	.42	85.2
5	.220	4	1320	.47	87.1
6	.280	4	763	.53	92.6
7	.355	4	415	.60	102.1
8	.443	4/8	218/3534	.67	116.5/115.2
9	.563	8	1635	.75	138.5
10	.712	8	679	.84	178.0
11	.876	8	320.9	.94	216.8
12	1.087	8	129.5	1.04	287.9
13	1.400	8	44.0	1.18	402.6
14	1.772	8	14.1	1.33	597.2
15	2.210	8	4.2	1.49	947.0
16	2.820		-	1.68	
17	3.570		-	1.89	
18	4.460		-	2.11	
19	5.667		-	2.38	
20	7.160		-	2.68	

67 ohm meters	94 m
infinite	half space

Interpreted Model:

$\frac{RHO2}{RHO1}$ = infinite

$\frac{H2}{H1}$ = infinite

(see comments)

Sounding No. 18
Date: July 30, 1982
Component: X
Location: South side of loop - line 7 - Barney Creek

A = 300 metres
B = 300 metres
I = 17.0 Amps
T/o = 270 u sec
Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	√TIME	pa
1	.0885	8	-5833	.30	
2	.109	8	-5559	.33	
3	.140	8	-4593	.37	
4	.177	8	-3544.8	.42	
5	.220	8	-2620.8	.47	
6	.280	8	-1675	.53	
7	.355	8	- 955.9	.60	
8	.443	8	- 485.5	.67	
9	.563	8	- 196.6	.75	
10	.712	8	- 52.1	.84	
11	.876	8	8.4	.94	
12	1.087	8	30.9	1.04	
13	1.400	8	33.6	1.18	
14	1.772	8	33.1	1.33	
15	2.210	8	32.8	1.49	
16	2.820	8	44.9	1.68	
17	3.570	8	44.5	1.89	
18	4.460	8	40.2	2.11	
19	5.667	8	40.7	2.38	
20	7.160	8	37.6	2.68	

Interpreted Model:

Sounding No. 18

Date: July 30, 1982

Component: Y

Location: South side of loop - line 7 - Barney Creek

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 270 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{\text{TIME}}$	pa
1	.0885	8	310.8	.30	
2	.109	8	514.1	.33	
3	.140	8	574.6	.37	
4	.177	8	512.4	.42	
5	.220	8	403.2	.47	
6	.280	8	273.8	.53	
7	.355	8	173.0	.60	
8	.443	8	100.8	.67	
9	.563	8	53.8	.75	
10	.712	8	35.3	.84	
11	.876	8	39.6	.94	
12	1.087	8	38.6	1.04	
13	1.400	8	31.9	1.18	
14	1.772	8	30.9	1.33	
15	2.210	8	29.7	1.49	
16	2.820	8	41.5	1.68	
17	3.570	8	43.5	1.89	
18	4.460	8	40.8	2.11	
19	5.667	8	39.0	2.38	
20	7.160	8	36.6	2.68	

Interpreted Model:

Mission 85 - 1419

Date JULY 30, 1982

E.S.

Drill Hole

SOUNDING No. 18

A = 300 m
B = 300 m
I = 17.0 A
T/o = 270 µsec
Freq = 25 Hz

Bearing of A B

Elevation

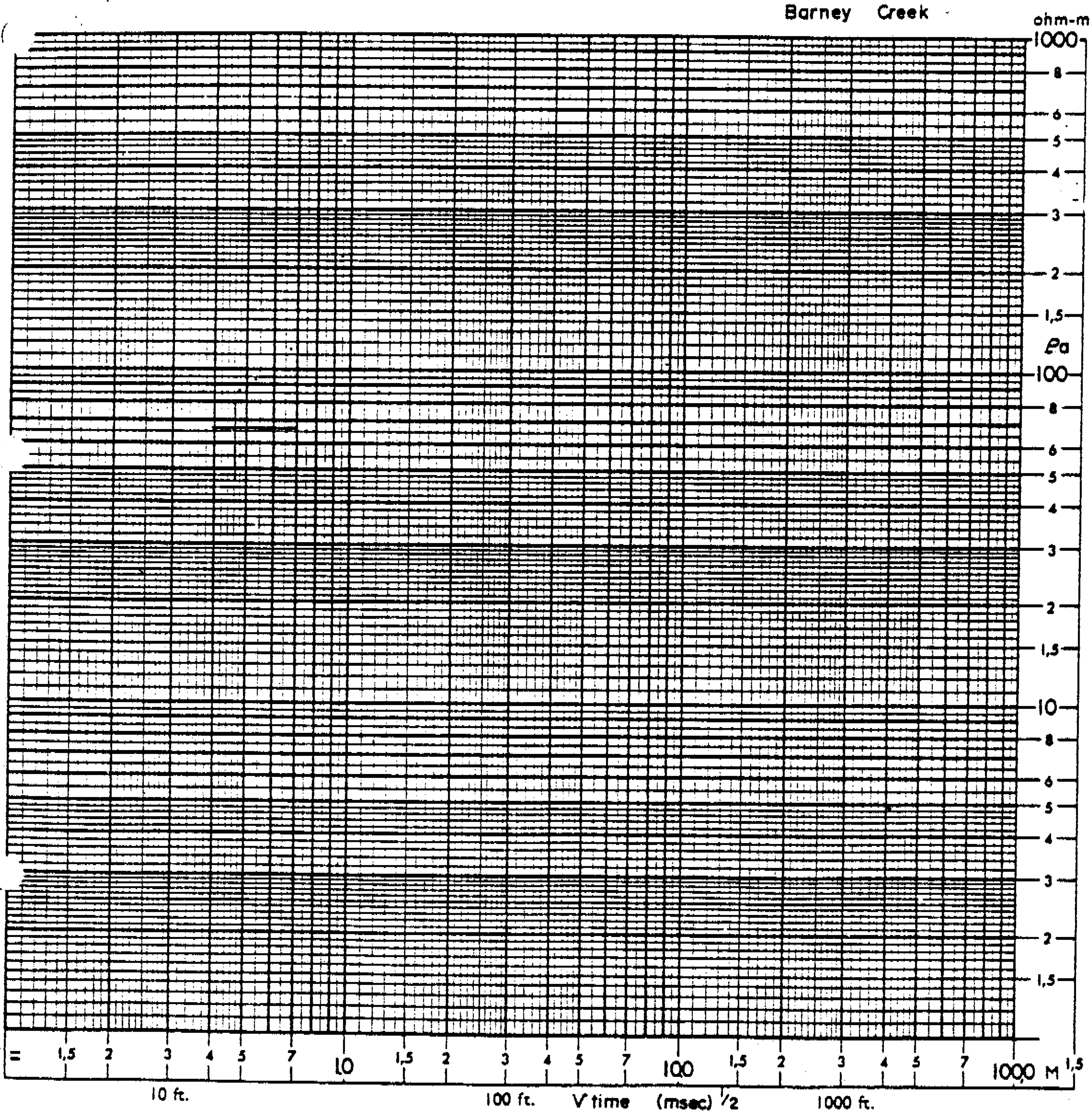
Co-ordinates of centre

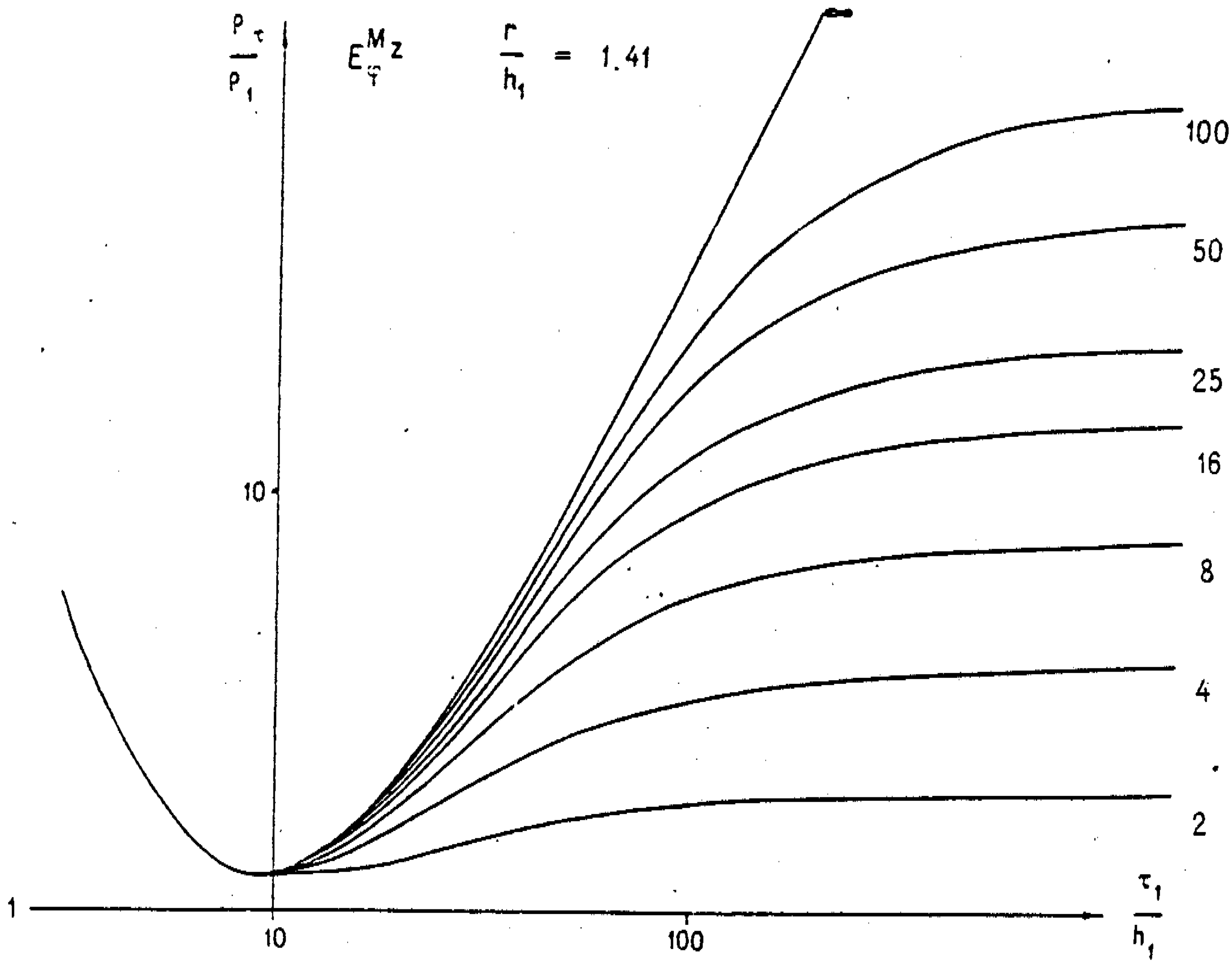
X = Y =

Z COMPONENT

(south side of loop line 7)

Barney Creek





Fits Sounding 18

Sounding No. 19

Date: July 30, 1982

Component: Z

Location: North side of loop - line 7 - Barney Creek

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 268 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	ρa
1	.0885	5	5737	.30	150.7
2	.109	5	4494	.33	141
3	.140	5	3241	.37	131
4	.177	5	2243	.42	127
5	.220	5	1511	.47	127
6	.280	5	908	.53	131
7	.355	5/8	517/4183	.60	140.3/139.3
8	.443	8	2324	.67	153.0
9	.563	8	1180	.75	172.4
10	.712	8	562	.84	202.3
11	.876	8	305.7	.94	224.3
12	1.087	8	145.3	1.04	267.0
13	1.400	8	59.8	1.18	328.4
14	1.772	8	24.2	1.33	417
15	2.210	8	10.1	1.49	528
16	2.820	8	3.4	1.68	741
17	3.570		.7	1.89	1457
18	4.460		-	2.11	
19	5.667		-	2.38	
20	7.160		-	2.68	

105 ohm meters	118 m
infinite	half space

Interpreted Model:

$\frac{RHO2}{RHO1}$ = infinite

$\frac{H2}{H1}$ = infinite

Sounding No. 19

Date: July 30, 1982

Component: X

Location: North side of loop - line 7 - Barney Creek

A = 300 metres

B = 300 metres

I = 17.0 Amps

T/o = 268 u sec

Base Frequency = 25 Hz

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	8	-5974.1	.30	
2	.109	8	-5950.6	.33	
3	.140	8	-5819.5	.37	
4	.177	8	-2481.4	.42	
5	.220	8	- 722.4	.47	
6	.280	8	129.4	.53	
7	.355	8	359.5	.60	
8	.443	8	322.6	.67	
9	.563	8	218.4	.75	
10	.712	8	134.4	.84	
11	.876	8	104.8	.94	
12	1.087	8	79.0	1.04	
13	1.400	8	53.4	1.18	
14	1.772	8	43.5	1.33	
15	2.210	8	39.1	1.49	
16	2.820	8	51.4	1.68	
17	3.570	8	50.7	1.89	
18	4.460	8	45.4	2.11	
19	5.667	8	45.4	2.38	
20	7.160	8	41.8	2.68	

Interpreted Model:

Sounding No.	19	A	=	300	metres
Date:	July 30, 1982	B	=	300	metres
Component:	Y	I	=	17.0	Amps
Location:	North side of loop - line 7 - Barney Creek	T/o	=	268	u sec
		Base Frequency	=	25 Hz	

CHANNEL	TIME (ms)	GAIN	VALUE	$\sqrt{TIME}$	pa
1	.0885	8	2511.6	.30	
2	.109	8	2011	.33	
3	.140	8	1527.1	.37	
4	.177	8	1076.9	.42	
5	.220	8	737.5	.47	
6	.280	8	433.4	.53	
7	.355	8	230.2	.60	
8	.443	8	127.7	.67	
9	.563	8	58.8	.75	
10	.712	8	25.2	.84	
11	.876	8	11.9	.94	
12	1.087	8	6.4	1.04	
13	1.400	8	1.3	1.18	
14	1.772	8	- .7	1.33	
15	2.210	8	- .3	1.49	
16	2.820	8	- 1.0	1.68	
17	3.570	8	- 1.0	1.89	
18	4.460	8	- 1.3	2.11	
19	5.667	8	- .8	2.38	
20	7.160	8	- .8	2.68	

Interpreted Model:

Mission 85 - 1419

Date JULY 30, 1982

E.S.

Drill Hole

SOUNDING No. 19

A = 300 m
B = 300 m
I = 17.0 A
T/o = 268 μsec
Freq = 25 Hz

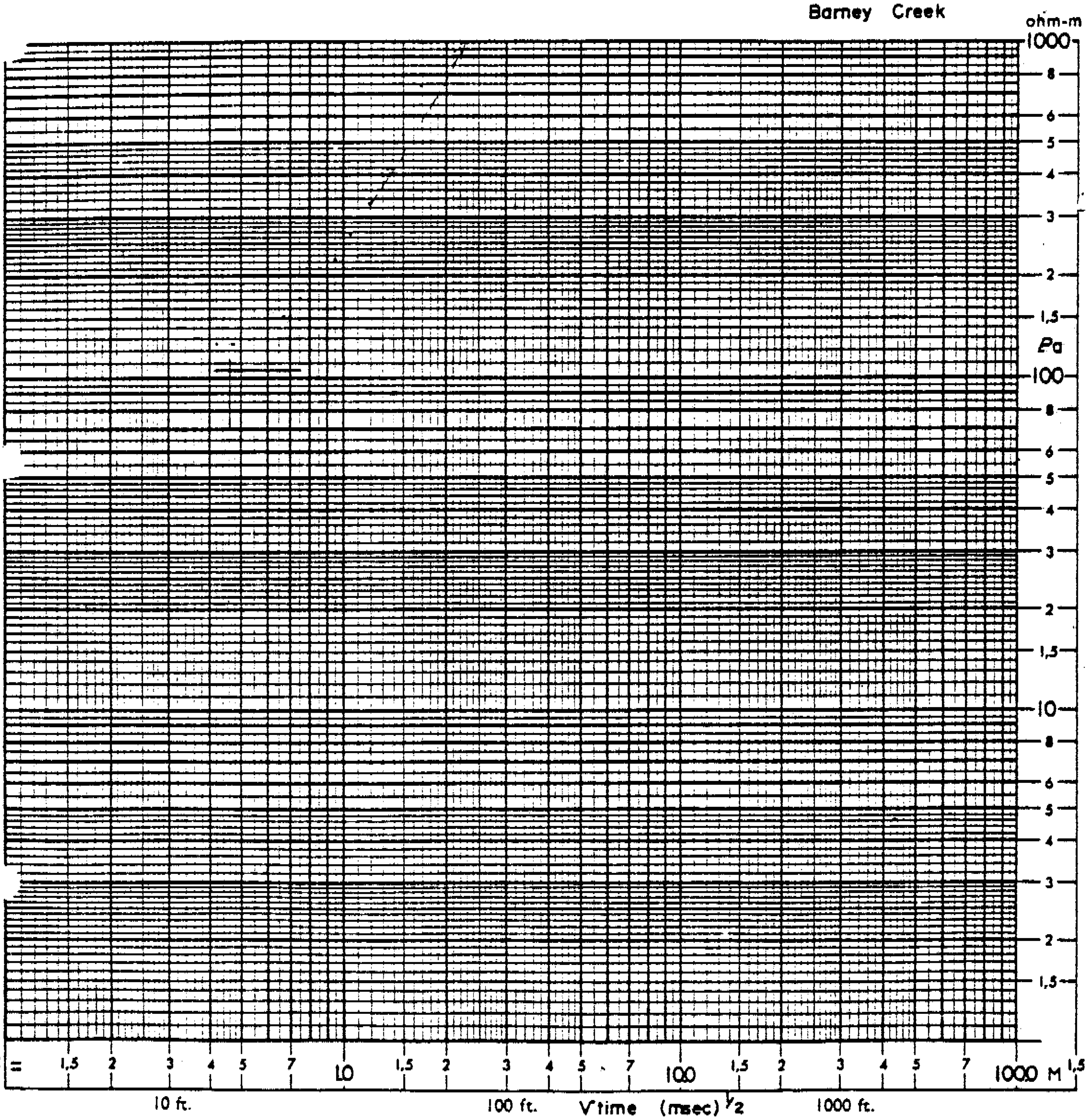
Bearing of A B

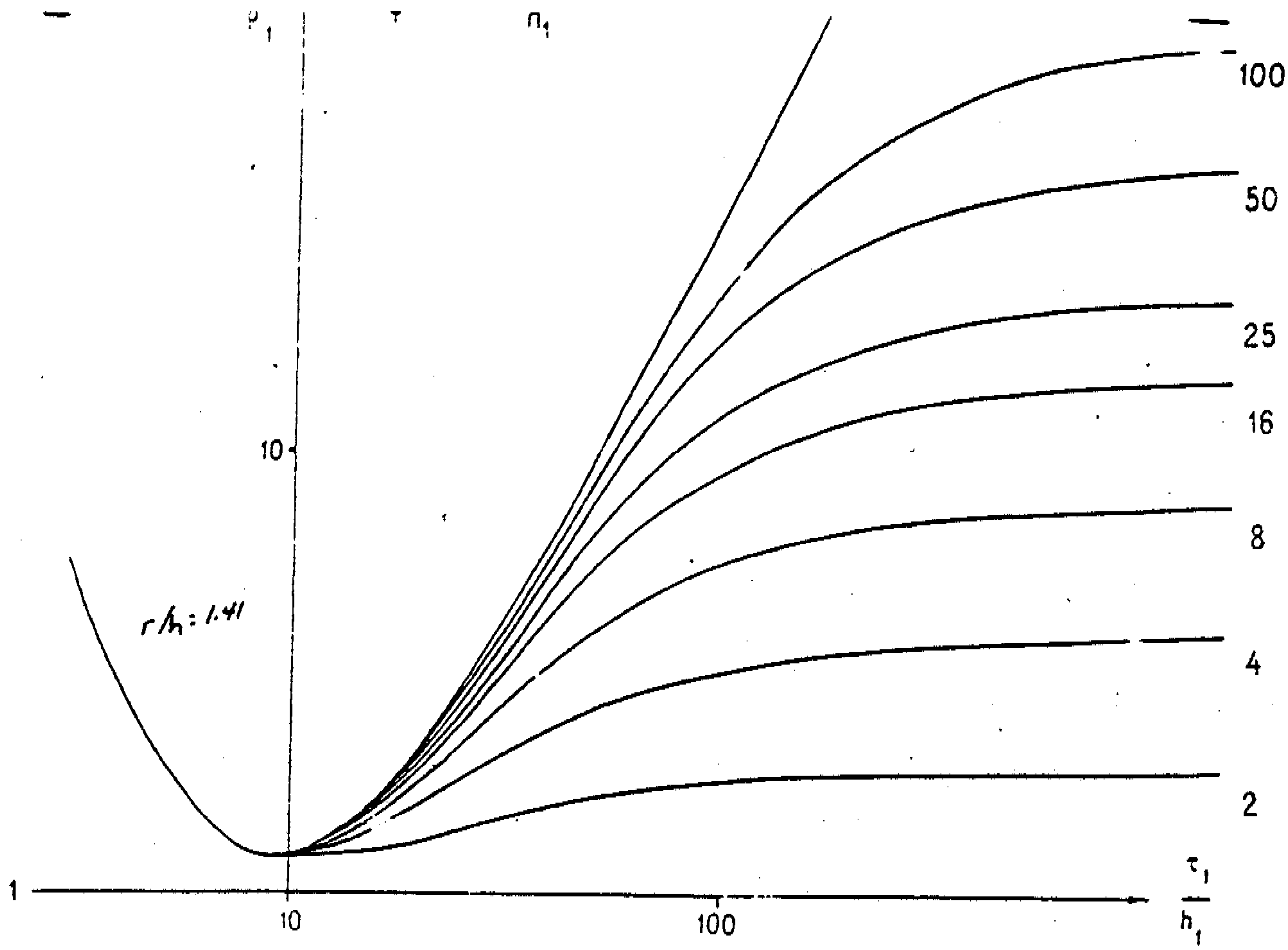
Elevation

Co-ordinates of centre

X = Y =

Z COMPONENT
(north side of loop line 7)
Barney Creek





Fits Sounding 19

APPENDIX 1

EM37 Ground Transient Electromagnetic System Technical Specifications

Transmitter

Current Waveform	- See Fig. 1
Repetition rate	- 3Hz or 30Hz in countries using 60Hz power line frequency; 2.5Hz or 25Hz in countries using 50Hz power line frequency; all four base frequencies are switch selectable.
Turn-off time (Δt)	- fast linear turn-off of maximum 300 μsec. at 20 amps into 300x600m loop. Decreases proportionally with current and (loop area)$^{1/2}$ to minimum of 20 μsec. Actual value of Δt read on front panel meter.
Transmitter loop	- any dimensions from 40x40m to 300x600m maximum at 20 amps. Larger dimensions at reduced current. Transmitter output voltage switch adjustable for smaller loops. Value of loop resistance read from front panel meter; resistance must be greater than 1 ohm on lowest voltage setting to prevent overload.
Transmitter protection	- circuit breaker protection against input overvoltage; instantaneous solid state protection against output short circuit; automatically resets on removal of short circuit. Input voltage, output voltage and current indicated on front panel meter.
Transmitter output voltage	- 150 volts (zero to peak) maximum; 20 volts (zero to peak) minimum
Transmitter output power	- 2.8 kw maximum
Transmitter wire supplied	- 1800m. #10 copper wire PVC insulated with nylon jacket; transmitter wire contained on 6 reels (supplied); 2 reel winders supplied.
Transmitter motor generator	- 5 HP Honda gasoline engine coupled to 120 volt, 3 phase, 400Hz alternator. Approximately 8 hours continuous operation from full (built-in) fuel tank.

Receiver

Measured quantity	-	time rate of decay of magnetic flux along 3 axes.
Sensor	-	air-cored coil of bandwidth 40 kHz; 100cm dia. by 7x5cm cross-section. Coil holder supplied to facilitate measurement along 3 axes.
Time channels	-	20 time channels with locations and widths as shown in Fig. 2. Successive operation at 30Hz, then 3Hz, effectively gives 30 channels covering range from 80 μsec. to 80 msec.
Output display	-	4 digit plus sign LED display; display also shows channel number and gain.
Integration time	-	2^n cycles at 30Hz; n=4,6,8,10,12,14 (switch selectable); similar integration times at other base frequencies.
Receiver output noise referred to input	-	typically 1.5×10^{-10} volt/m^2 at last gate at 30Hz with integration time of 34 seconds. Noise will be higher during intense local spherics activity.
Output connector	-	all 20 channels in analogue format and house-keeping functions in digital format available from output connector.
Synchronization to Tx	-	any of the following (switch selectable) (1) reference cable (2) primary pulse (3) 27 MHz radio link (40 channels) (4) high stability (oven controlled) quartz crystals.
Noise rejection circuitry	-	Selective clipping of atmospheric noise pulses at all times. Audio output of Rx coil (transmitter pulse blanked out) is available on built-in loud speaker for ready identification of interference.
Receiver batteries	-	12 volt rechargeable Gel-cell; 9 hours continuous operating time at 17°C. Two batteries and a battery charger supplied to permit charging of second battery from transmitter motor-generator during survey.

Component Dimensions

Transmitter console	25x42x36 cm
GPU	35x74x48 cm
Wirewinder	42x38x35 cm each (2 off)
Wire reels (20 amp)	33x31(dia.)cm each (6 off)
Receiver console	38x37x27 cm
Receiver coil	100 cm dia. 7x5 cm cross-section

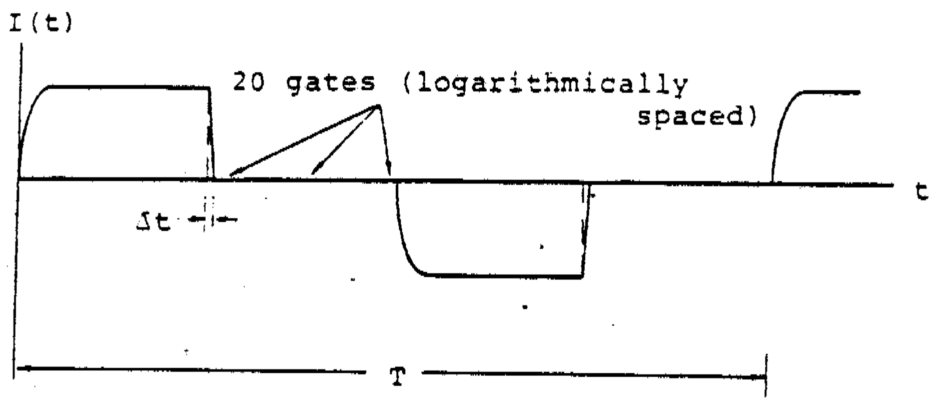
Component Weights

Transmitter console	20 kg
GPU	60 kg
Wirewinders and loaded reels (20 amp)	120 kg (total)
Receiver console (incl.20 amp-hour battery)	21.8 kg
Receiver coil	8.0 kg

Shipping Information

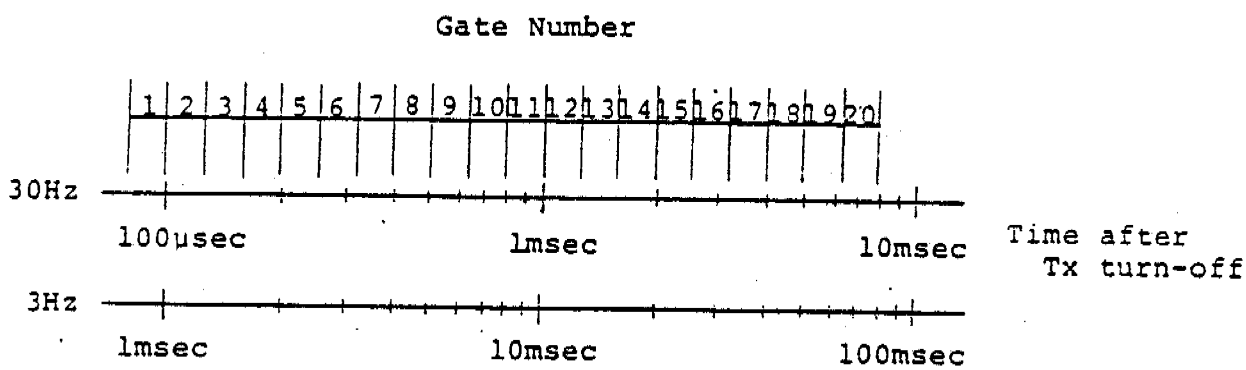
Shipment consists of 5 boxes

Two wire boxes	116x62x48 cm @ 186 kg (total)
GPU box	96x61x73 cm @ 90 kg
Receiver/transmitter box	96x75x73 cm @ 86 kg
Receiver coil/coil-holder box	110x110x20 cm @ 34 kg
Total shipping volume	1.90 cubic metres
Total shipping weight	390 kg



Transmitter Current Waveform

FIG. 1



Gate Location and Widths (30 and 3Hz)

FIG. 2

BANDWIDTH OF EM-37 SYSTEM

4 MAY 1982

~~30~~ 25 Hz Repetition Rate

CHANNEL	BEGINNING	END	GATE WIDTH	MID-GATE
1	.080	.097	.017	.0885
2	.097	.121	.024	.109
3	.121	.158	.037	.140
4	.158	.195	.037	.177
5	.195	.244	.049	.220
6	.244	.316	.072	.280
7	.316	.393	.077	.355
8	.393	.492	.099	.443
9	.492	.634	.142	.563
10	.634	.790	.156	.712
11	.790	.962	.172	.876
12	.962	1.212	.250	1.087
13	1.212	1.587	.378	1.400
14	1.587	1.957	.367	1.772
15	1.957	2.457	.400	2.21
16	2.457	3.177	.720	2.82
17	3.177	3.957	.780	3.57
18	3.957	4.957	1.000	4.46
19	4.957	6.377	1.420	5.667
20	6.377	7.937	1.560	7.16

ALL TIMES ARE IN MILLISECONDS FROM END OF RAMP.

Part B EM37 Traverses.

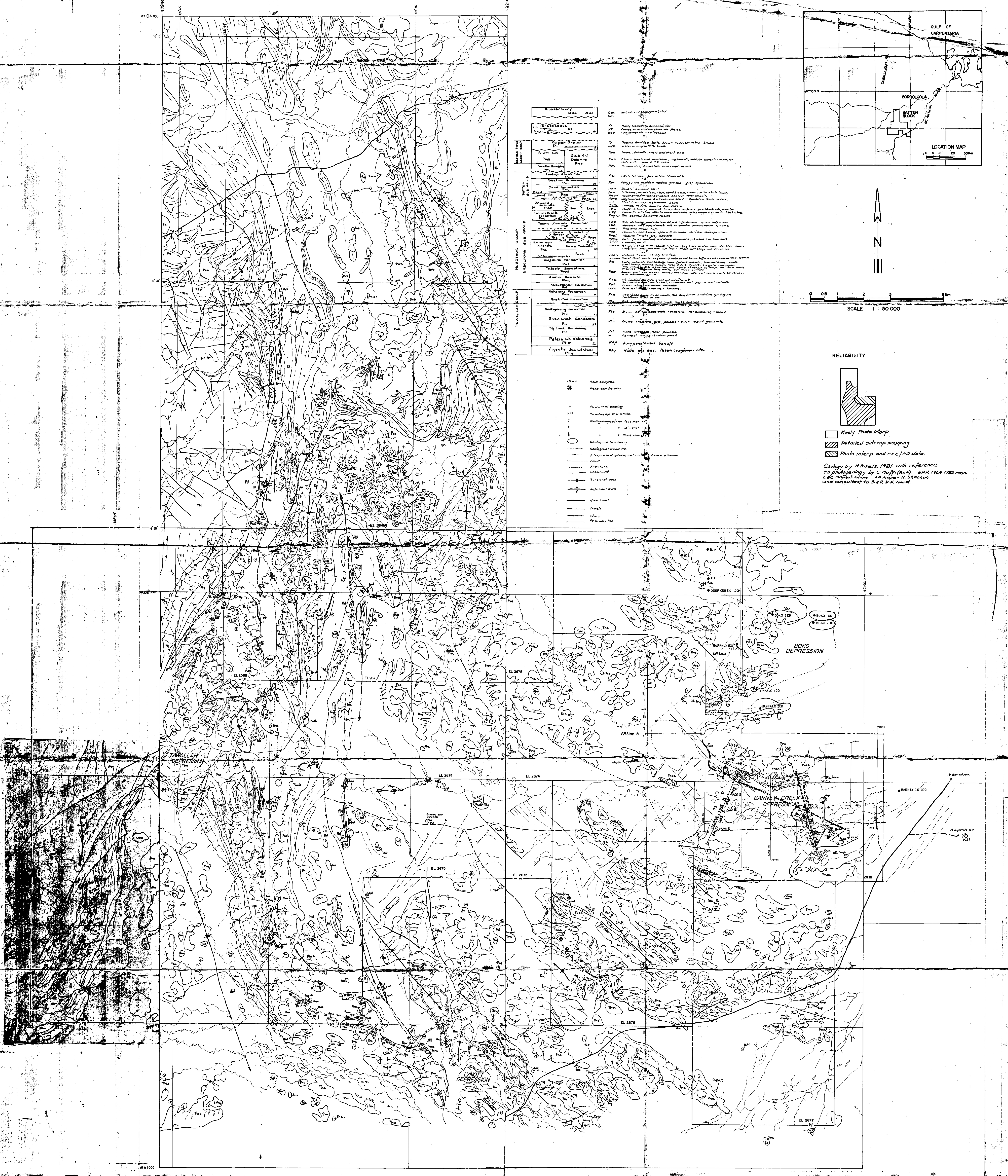


FIG. 2 J

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR83/256

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

BATTEN BLOCK EL'S 2674-2678, 2838, 3478, 2566 NT

DETAILED AND INTERPRETIVE GEOLOGY

Drawn: M. RAETZ	Date: 27.1.1982	Centre: DARWIN
Traced: M.R.		Project No: #330
Checked:		Drawing No: A6-1
O.I.C.:		

Revisions:

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR83/256

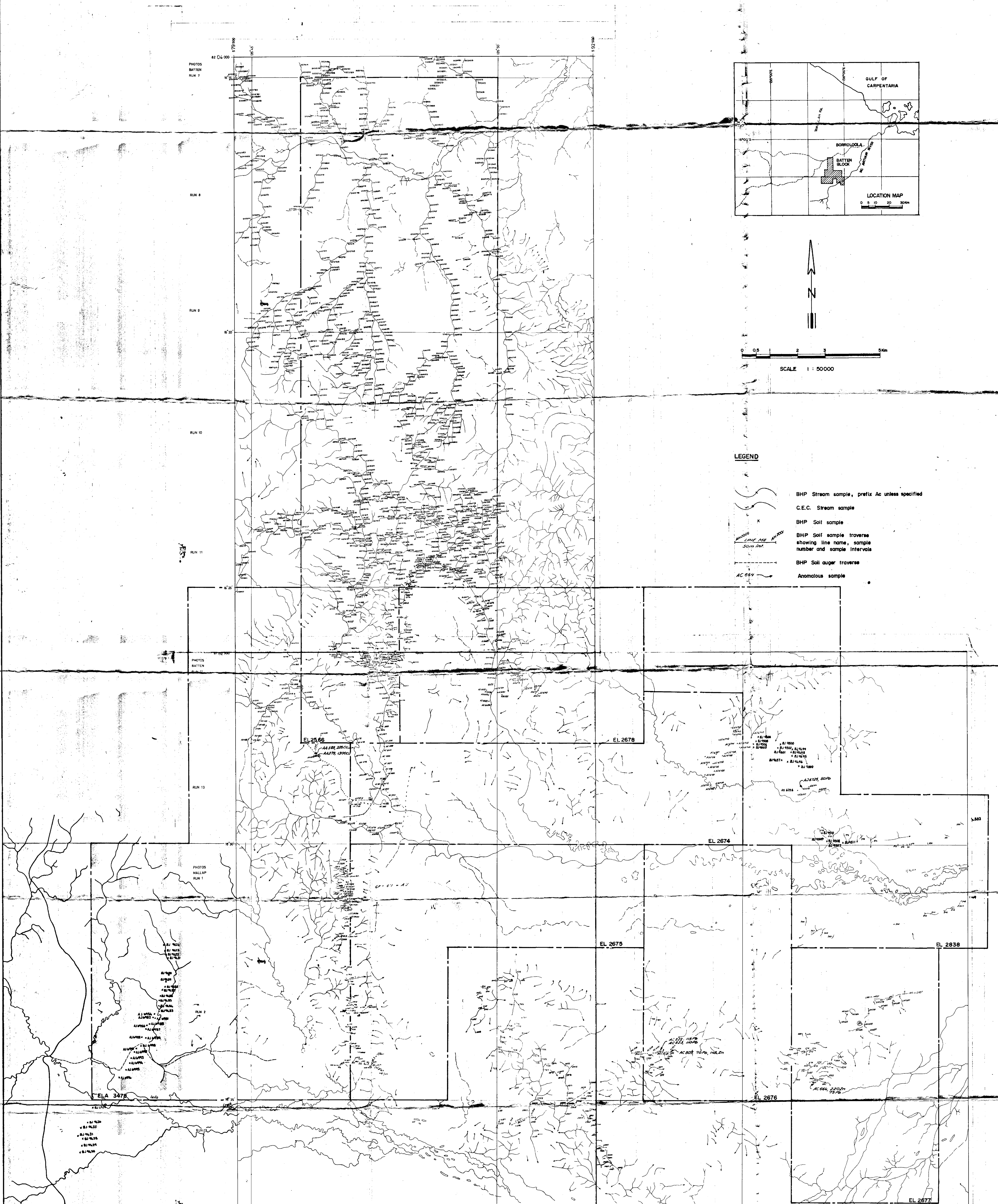
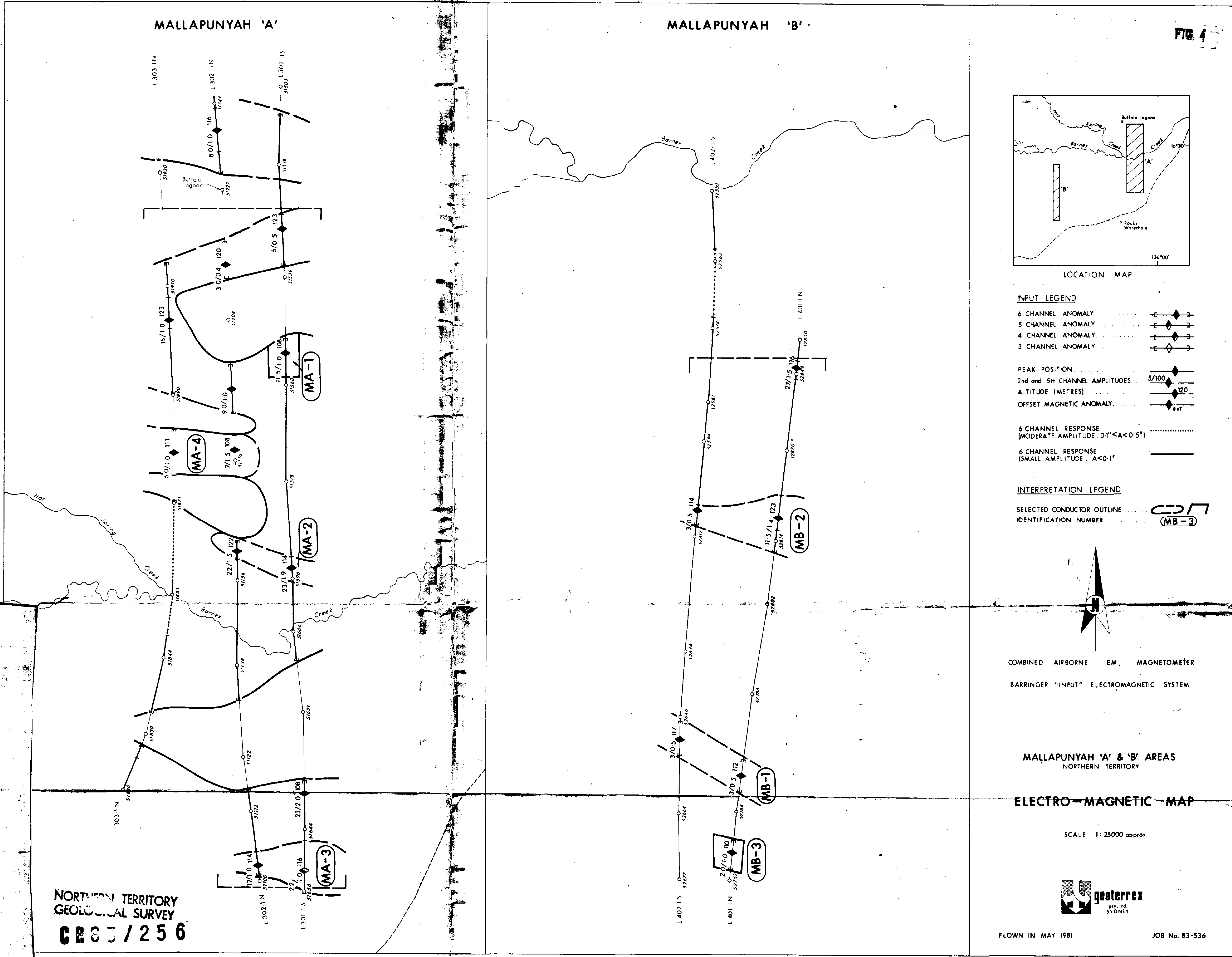


FIG 3.7

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
BATTEN BLOCK EL'S 2566, 2674-2678 2838, 3478 NT		
GEOCHEMICAL SAMPLE LOCATIONS		
Drawn:	Date: 29.1.1982	Centre: DARWIN
Traced:	Project No.: B 310	Drawing No.: A0-2
Checked:		
O.I.C.:		

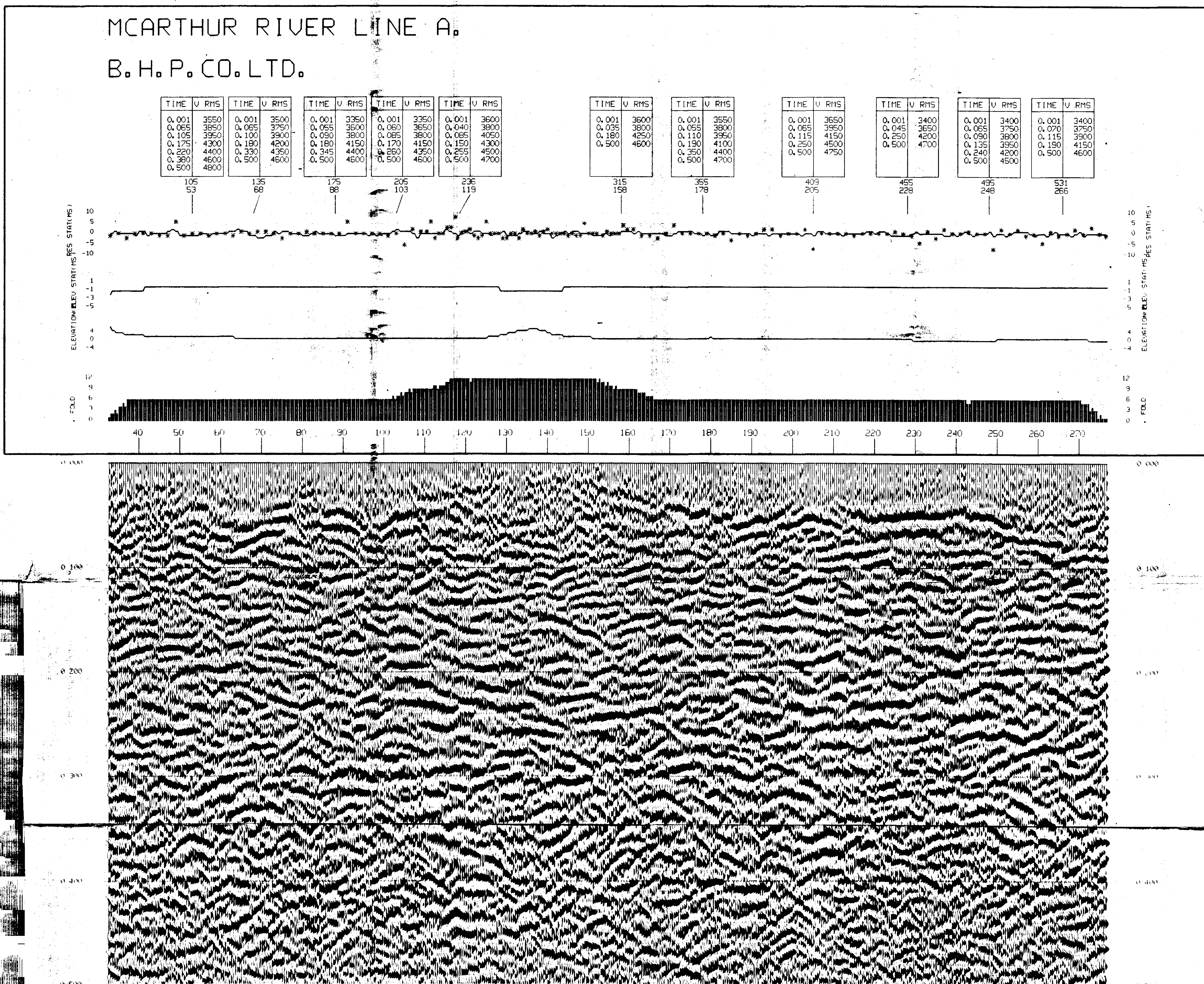
Revisions:



MALLAPUNYAH 'A'
MALLAPUNYAH 'B'
L 303 1 N
L 302 1 N
L 301 1 S
L 402 1 S
L 401 1 N
Buffalo Lagoon
Hot Spring Creek
Barney Creek
MA-1
MA-2
MA-3
MA-4
MB-1
MB-2
MB-3
LOCATION MAP
Buffalo Lagoon
Hot Spring Creek
Barney Creek
'A'
'B'
Rocky Waterhole
16°30'
136°00'
INPUT LEGEND
6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
PEAK POSITION
2nd and 5th CHANNEL AMPLITUDES
5/100
ALTITUDE (METRES)
120
OFFSET MAGNETIC ANOMALY
8nT
6 CHANNEL RESPONSE (MODERATE AMPLITUDE ; 0·1"<A<0·5")
6 CHANNEL RESPONSE (SMALL AMPLITUDE , A<0·1"
INTERPRETATION LEGEND
SELECTED CONDUCTOR OUTLINE
IDENTIFICATION NUMBER
MB-3
N
COMBINED AIRBORNE EM, MAGNETOMETER
BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM
MALLAPUNYAH 'A' & 'B' AREAS
NORTHERN TERRITORY
ELECTRO-MAGNETIC MAP
SCALE 1: 25000 approx.
geoterrex pty. ltd. SYDNEY
FLOWN IN MAY 1981
JOB No. 83-536

FIG. 4

FIG 5.1



MCARTHUR RIVER LINE A.

B.H.P.CO.LTD.

RECORDED BY :VELOCITY DATA PTY LTD.
PROCESSED BY :SEISMOGRAPH SERVICE LTD.
PROSPECT :MCARTHUR RIVER.
:MINIMUM PHASE DATA.

FINAL TIME SECTION. LOCATIONS REAL.
VELOCITY FILTER APPLIED.
RESIDUAL STATICS APPLIED.
COHERENCY FILTER APPLIED.

DATUM : 0 METRES.

ELEV. CORRECTION VELOCITY : 4500 METRES/SEC.

PROCESSED THROUGH PHOENIX"I"

RECORDING PARAMETERS

DATE SHOT :7-9 AUG 1982.
SAMPLE RATE:1 MILLISECOND.
RECORD LGTH:500 MILLISECONDS.
SOURCE :MINISOSIE RAMMERS.
STACK :600 RAMS.
GEOPHONES :SM 7.28 HZ.
12 PHONES BUNCHED.
FILTERS :LOCUT 40 HZ.
HICUT OUT.
RECORD MODE:TRUE AMPLITUDE.

RECORDING GEOMETRY

PEG INTERVAL : 10 METRES.
MINIMUM OFFSET: 40 METRES.
MAXIMUM OFFSET: 150 METRES.
SPREAD LAYOUT : 110-40-20-40-110(M)
RAM SEGMENT : TWO RAMMERS MIGRATED OVER A 20M SEGMENT.

SEQUENCE.	PROCESSING PARAMETERS.
CONVERT.	FROM MINISOSIE DMX TAPES TO PHOENIX "I" FORMAT.
RDCB & GAIN.	REMOVAL OF D.C. BIAS. APPLICATION OF T GAIN FUNCTION.
EDIT.	EDIT INTO 24 TRACE RECORDS.
VELOCITY FILTER.	FK PLANE DESIGNED FILTER TO OPERATE ON FIRST BREAKS.
SORT.	C.D.P. SORT AND APPLICATION OF ELEVATION STATICS.
DECON.	DECONVOLUTION BEFORE STACK,SPIKE DECON. 75MS OPERATOR.1% WHITE NOISE.
FILTER.	BANDPASS FILTER.30-45-115-130HZ.(0-135MS) 30-35-115-130HZ.(135-500MS)
A.G.C. & N.M.O.	SLIDING WINDOW TRIM.(50MS WINDOW) N.M.O. CORR.FROM MULTI VEL.STACKS.
AUTOSTATICS.	1 PASS (2 RECURSIONS) SURFACE CONSISTENT RESIDUAL STATICS. 100MS WINDOW(DIPPING)
RESIDUAL STATICS.	ONE PASS OF C.D.P. ALIGNED RESIDUAL STATICS. 5 TRACE PILOT.100MS WINDOW(DIPPING) 8MS.MAX SHIFT
STACK.	SIX FOLD C.D.P. STACK.
COHERENCY FILTER.	COHERENCY FILTER. (MILD) 11 TRACE PILOT. -3MS LEFT DIP, 3MS RIGHT DIP.
FILTER.	BANDPASS FILTER 35-45-150-170 HZ.
FINAL TRIM.	TIME VARIANT EQUALISATION. 100MS WINDOWS 50MS OVERLAPS.

DISPLAY DETAILS.

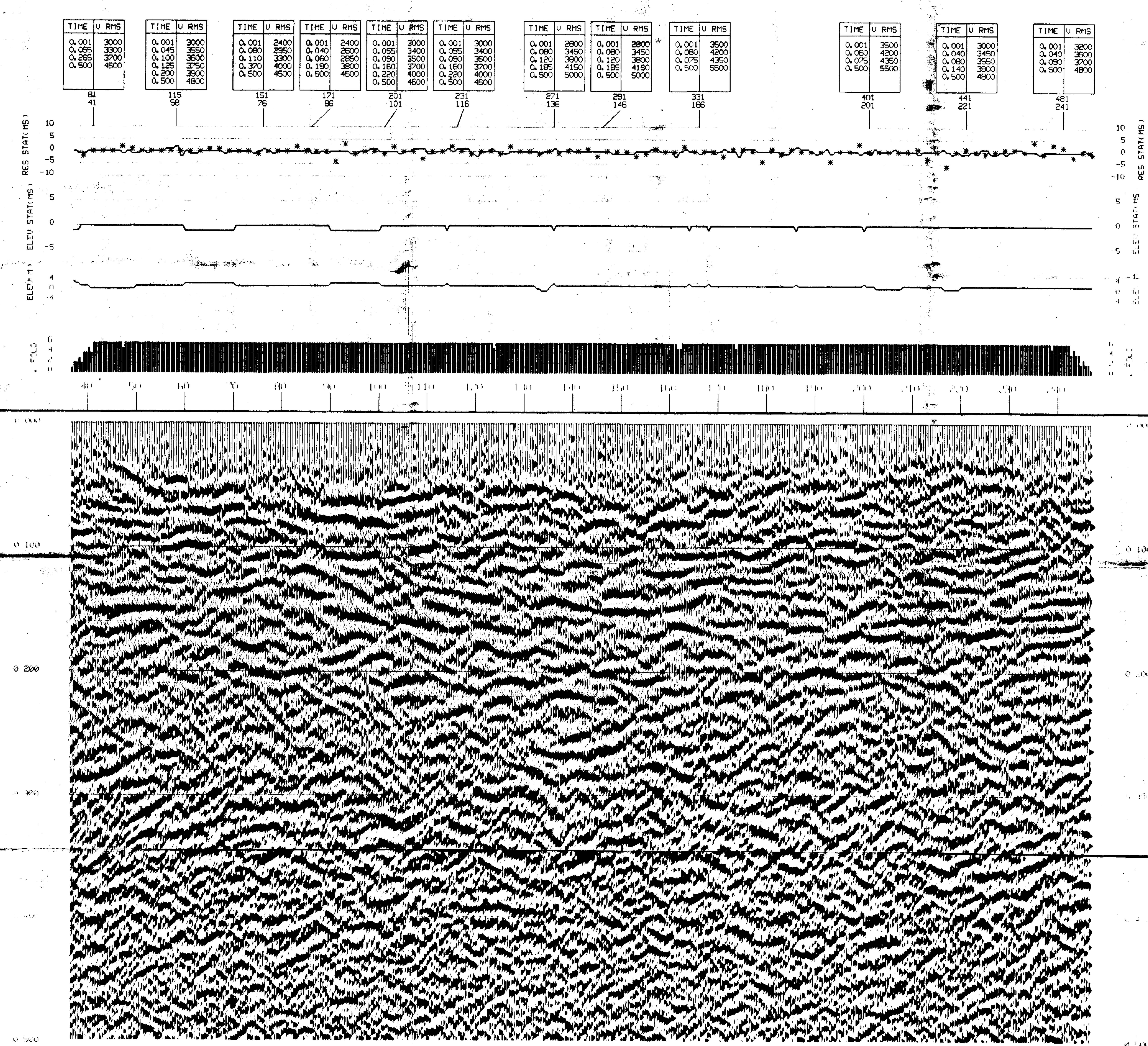
VERTICAL SCALE : 50 CM/SEC. POLARITY "SEG"
HORIZONTAL SCALE: 10 TRACES/CM. BLACK VAR +VE VALUES.
1:5000

SEISMOGRAPH SERVICE LTD. ADELAIDE DECEMBER 1982.
INC. IN ENGLAND. REGISTERED IN U.A. PROCESSING N.FITZGERALD.

FIG. 6

MCARTHUR RIVER LINE B.

B.H.P.CO.LTD.



MCARTHUR RIVER LINE B.

B.H.P.CO.LTD.

RECORDED BY :VELOCITY DATA PTY LTD.
PROCESSED BY :SEISMOGRAPH SERVICE LTD.
PROSPECT :MCARTHUR RIVER.
MINIMUM PHASE DATA.

FINAL TIME SECTION.
VELOCITY FILTER APPLIED.
RESIDUAL STATICS APPLIED.
COHERENCY FILTER APPLIED.

LOCATIONS REAL.

DATUM : 0 METRES.

ELEV. CORRECTION VELOCITY : 4500 METRES/SEC.

PROCESSED THROUGH PHOENIX "I"

RECORDING PARAMETERS

DATE SHOT :12-13 AUG 1982.
SAMPLE RATE:1 MILLISECOND.
RECORD LGTH:500 MILLISECONDS.
SOURCE :MINISOSIE RAMMERS.
STACK :600 RAMS.
GEOPHONES :SM 7.28 HZ.
12 PHONES BUNCHED.
FILTERS :LOCUT 40 HZ.
HICUT OUT.
RECORD MODE:TRUE AMPLITUDE.

RECORDING GEOMETRY

PEG INTERVAL : 10 METRES.
MINIMUM OFFSET: 40 METRES.
MAXIMUM OFFSET: 150 METRES.
SPREAD LAYOUT : 110-40-20-40-110(M)
RAM SEGMENT : TWO RAMMERS MIGRATED OVER A 20M SEGMENT.

SEQUENCE.	PROCESSING PARAMETERS.
CONVERT.	FROM MINISOSIE DMX TAPES TO PHOENIX "I" FORMAT.
RDCB & GAIN.	REMOVAL OF D.C. BIAS. APPLICATION OF T GAIN FUNCTION.
EDIT.	EDIT INTO 24 TRACE RECORDS.
VELOCITY FILTER.	FK PLANE DESIGNED FILTER TO OPERATE ON FIRST BREAKS.
SORT.	C.D.P. SORT AND APPLICATION OF ELEVATION STATICS.
DECON.	DECONVOLUTION BEFORE STACK, SPIKE DECON. 75MS OPERATOR. 1% WHITE NOISE.
FILTER.	BANDPASS FILTER. 30-45-115-130HZ. (0-135MS) 30-35-115-130HZ. (135-500MS)
A.G.C. & N.M.O.	SLIDING WINDOW TRIM. (50MS WINDOW) N.M.O. CORR. FROM MULTI VEL. STACKS.
AUTOSTATICS.	1 PASS (2 RECURSIONS) SURFACE CONSISTENT RESIDUAL STATICS. 100MS WINDOW (DIPPING)
RESIDUAL STATICS.	ONE PASS OF C.D.P. ALIGNED RESIDUAL STATICS. 9 TRACE PILOT. 100MS WINDOW (DIPPING) 8MS. MAX SHIFT
STACK.	SIX FOLD C.D.P. STACK.
COHERENCY FILTER.	COHERENCY FILTER. (MILD) 11 TRACE PILOT. -3MS LEFT DIP. 3MS RIGHT DIP.
FILTER.	BANDPASS FILTER 35-45-150-170 HZ.
FINAL TRIM.	TIME VARIANT EQUALISATION. 100MS WINDOWS 50MS OVERLAPS.

DISPLAY DETAILS.

VERTICAL SCALE : 50 CM/SEC.
HORIZONTAL SCALE: 10 TRACES/CM.
1:5000

POLARITY "SEG"
BLACK VAR +VE VALUES.

SEISMOGRAPH SERVICE LTD. ADELAIDE DECEMBER 1982.

FIG. 7 J

MCARTHUR RIVER LINE 6.

B.H.P. CO. LTD.

TIME	V RMS
0.001	3550
0.040	3750
0.500	4500

701
351

TIME	V RMS
0.001	3550
0.045	3700
0.110	3850
0.185	4000
0.500	4500

741
371

TIME	V RMS
0.001	3500
0.040	3600
0.112	3675
0.290	4000
0.380	4100
0.500	4300

775
388

TIME	V RMS
0.001	3400
0.040	3600
0.065	3700
0.130	3850
0.500	4400

821
411

TIME	V RMS
0.001	3450
0.075	3680
0.125	3800
0.230	3925
0.500	4300

855
428

TIME	V RMS
0.001	3400
0.085	3650
0.155	3850
0.330	4000
0.500	4300

901
451

TIME	V RMS
0.001	3400
0.040	3500
0.090	3600
0.170	3800
0.350	4000
0.500	4300

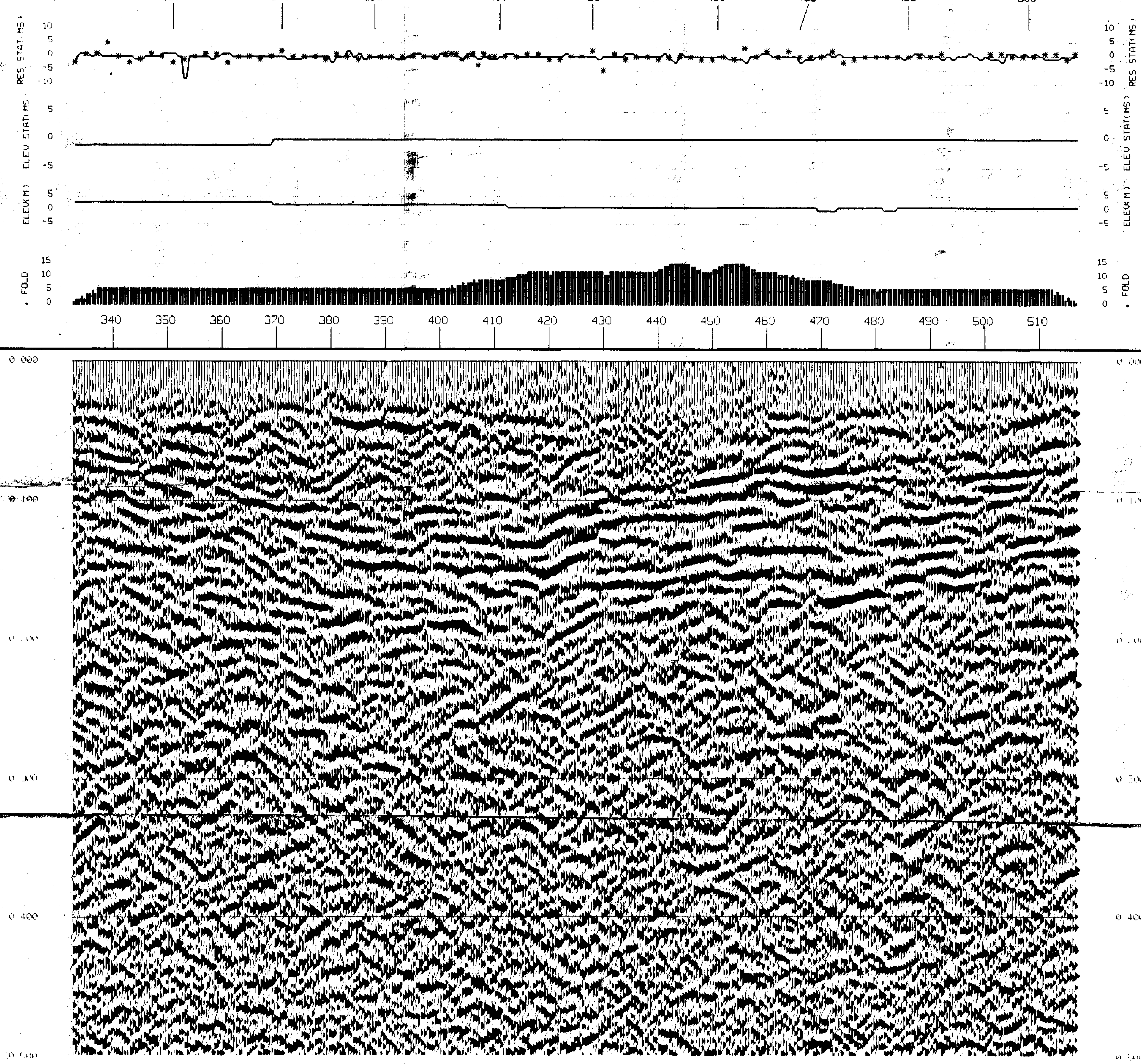
931
466

TIME	V RMS
0.001	3400
0.035	3500
0.090	3600
0.120	3750
0.205	3925
0.300	4100
0.500	4400

971
486

TIME	V RMS
0.001	3550
0.040	3750
0.135	3850
0.210	4000
0.360	4250
0.500	4400

1015
508



MCARTHUR RIVER LINE 6.

B.H.P. CO. LTD.

RECORDED BY :VELOCITY DATA PTY LTD.
PROCESSED BY :SEISMOGRAPH SERVICE LTD.
PROSPECT :MCARTHUR RIVER.
MINIMUM PHASE DATA.

FINAL TIME SECTION.
VELOCITY FILTER APPLIED.
RESIDUAL STATICS APPLIED.
COHERENCY FILTER APPLIED.

LOCATIONS REAL.

DATUM : 0 METRES.
ELEV. CORRECTION VELOCITY : 4500 METRES/SEC.

PROCESSED THROUGH PHOENIX"I"

RECORDING PARAMETERS

DATE SHOT :10-11 AUG 1982.
SAMPLE RATE:1 MILLISECOND.
RECORD LGTH:500 MILLISECONDS.
SOURCE :MINISOSIE RAMMERS.
STACK :600 RAMS.
GEOPHONES :SM 7.28 HZ.
12 PHONES BUNCHED.
FILTERS :LOCUT 40 HZ.
HICUT OUT.
RECORD MODE:TRUE AMPLITUDE.

RECORDING GEOMETRY

PEG INTERVAL : 10 METRES.
MINIMUM OFFSET: 40 METRES.
MAXIMUM OFFSET: 150 METRES.
SPREAD LAYOUT : 110-40-20-40-110(M)
RAM SEGMENT : TWO RAMMERS MIGRATED OVER A 20M SEGMENT.

SEQUENCE.	PROCESSING PARAMETERS.
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RDCB & GAIN.	REMOVAL OF D.C. BIAS. APPLICATION OF T GAIN FUNCTION.
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SORT.	C.D.P. SORT AND APPLICATION OF ELEVATION STATICS.
DECON.	DECONVOLUTION BEFORE STACK, SPIKE DECON. 75MS OPERATOR. 1X WHITE NOISE.
FILTER.	BANDPASS FILTER. 30-35-115-120HZ.(0-130MS) 30-35-115-130HZ.(130-600MS)
A.G.C. & N.M.O.	SLIDING WINDOW TRIM.(50MS WINDOW) N.M.O. CORR. FROM MULTI VEL. STACKS.
AUTOSTATICS.	1 PASS (2 RECURSIONS) SURFACE CONSISTENT RESIDUAL STATICS. 100MS WINDOW.(DIPPING)
RESIDUAL STATICS.	ONE PASS OF C.D.P. ALIGNED RESIDUAL STATICS. 5 TRACE PILOT. 100MS WINDOW(DIPPING) 8MS. MAX SHIFT
STACK.	SIX FOLD C.D.P. STACK.
COHERENCY FILTER.	COHERENCY FILTER. (MILD) 11 TRACE PILOT. -3MS LEFT DIP. 3MS RIGHT DIP.
FILTER.	BANDPASS FILTER 35-45-150-170 HZ.
FINAL TRIM.	TIME VARIANT EQUALISATION. 100MS WINDOWS 50MS OVERLAPS.

DISPLAY DETAILS.

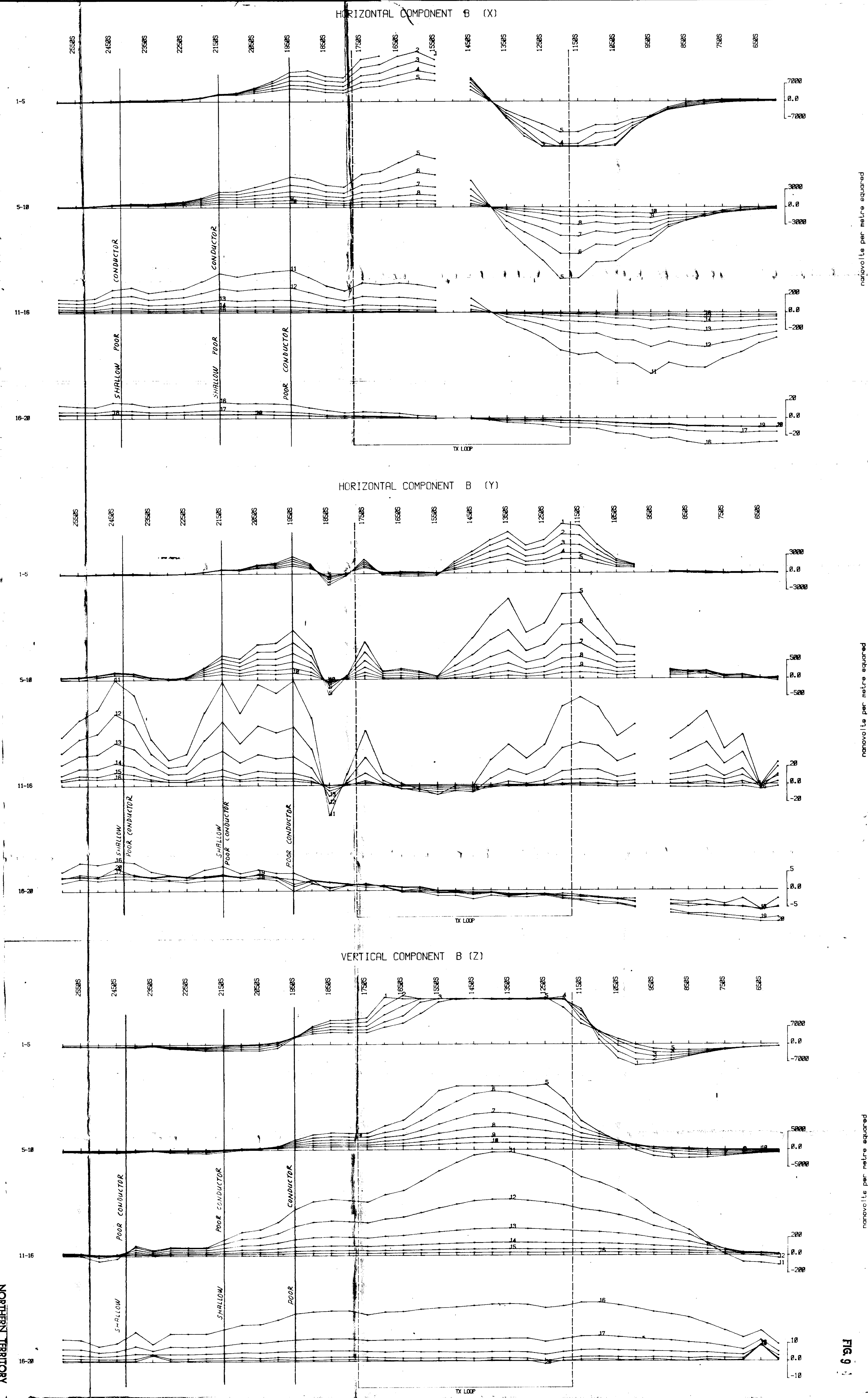
VERTICAL SCALE : 50 CM/SEC.
HORIZONTAL SCALE: 10 TRACES/CM.
1:5000

POLARITY "SEG"
BLACK VAR +VE VALUES.

SEISMOGRAPH SERVICE LTD.
INC. IN ENGLAND. REGISTERED IN U.A.

ADELAIDE DECEMBER 1982.
PROCESSING N.FITZGERALD.

HORIZONTAL COMPONENT B (X)
2550S
2450S
2350S
2250S
2150S
2050S
1950S
1850S
1750S
1650S
1550S
1450S
1350S
1250S
1150S
1050S
950S
850S
750S
650S
1-5
5-10
11-16
16-20
7000
0.0
-7000
2000
0.0
-2000
300
0.0
-300
20
0.0
-20
POOR CONDUCTOR
CONDUCTOR
MODERATE
CONDUCTOR
POSSIBLE BROAD CONDUCTIVE ZONE
TX LOOP
nanovolts per metre squared
HORIZONTAL COMPONENT B (Y)
2000
0.0
-2000
700
0.0
-700
100
0.0
-100
10
0.0
-10
POOR CONDUCTOR
CONDUCTOR
MODERATE
GOOD CONDUCTOR
POSSIBLE BROAD CONDUCTIVE ZONE
TX LOOP
nanovolts per metre squared
TX LOOP SIDES : 1175 S 150 E
: 1775 S 150 W
TX LOOP SIZE : 300m x 600m
TX TURN OFF TIME : 348
CURRENT : 14.8A
FREQUENCY : 25 Hz
INTEGRATION TIME : 10
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : J.P
DATE : 26/7/82
VERTICAL COMPONENT B (Z)
7000
0.0
-7000
2000
0.0
-2000
300
0.0
-300
10
0.0
-10
POOR CONDUCTOR
CONDUCTOR
MODERATE
CONDUCTOR
GOOD
POSSIBLE BROAD CONDUCTIVE ZONE
TX LOOP
nanovolts per metre squared
FIG. 8.1
NORTHERN TERRITORY GEOLOGICAL SURVEY
CR83/256
Surveyed and compiled by Geoterrex Pty Ltd
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
E.L. 2838 BATTEN BLOCK N.T.
4E LINE A
Revisions:
Drawn:
Traced:
Checked:
Date:
Project No:
Centre:
Drawing No:
A1-



TX LOOP SIDES	: 1775 S 0 E : 1175 S 300 E
TX LOOP SIZE	: 300m x 600m
TX TURN OFF TIME	: 348
CURRENT	: 15 A
FREQUENCY	: 25 Hz
INTEGRATION	: 10
SYNC MODE	: CRYSTAL
HORIZONTAL SCALE	: 1:5000
SURVEYED BY	: B.M.
DATE	: 27/7/82

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR83/256

Surveyed and compiled by Geoterrex Pty. Ltd

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 2038 BATTEN BLOCK N.T.

5E SEISMIC LINE B

Revisions:		
Drawn:	Date:	Centre:
Traced:	Project No:	Drawing No:
Checked:		A1-

FIG. 9

TX LOOP SIDES	: 0 N 3975 E
	: 600 N 4275 E
TX LOOP SIZE	: 300m x 600m
TX TURN OFF TIME	: 350
CURRENT	: 15 A
FREQUENCY	: 25 Hz
INTEGRATION TIME	: 10
SYNC MODE	: CRYSTAL
HORZIONTAL SCALE	: 1:5000
SURVEYED BY	: J.P
DATE	: 29/7/82

NORTHERN TERRITORY GEOLOGICAL SURVEY

Surveyed and compiled by Geoterrex. Pty. Ltd.

CR 83/256

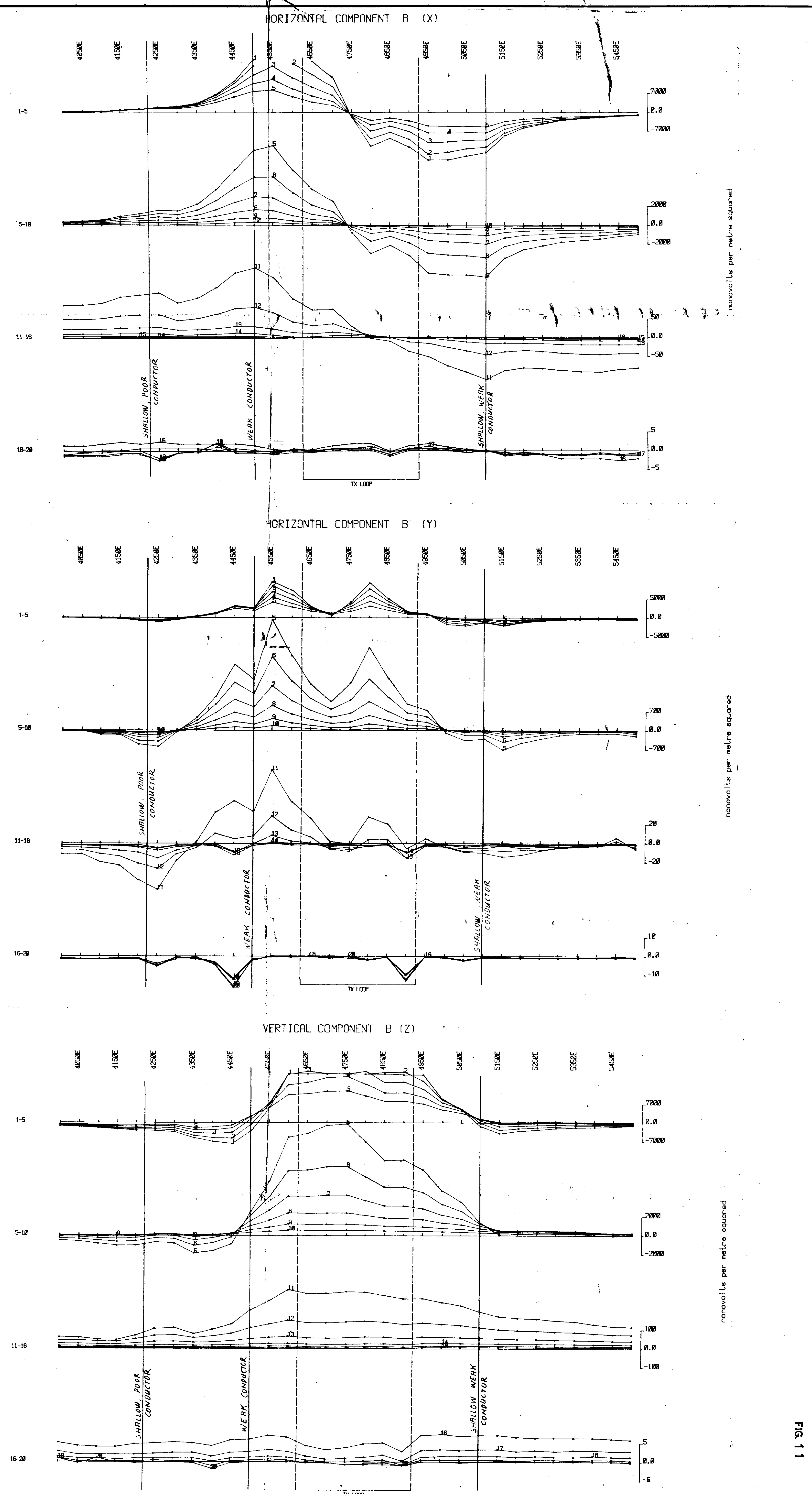
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 2838 BATTEN BLOCK N.T.

6E EM LINE 6

Revisions:

Drawn: | Date: | Centre:
Traced: | Project No: | Drawing No:
Checked: | | A1-



TX LOOP SIDES	:	0 N 4625 E 600 N 4925 E
TX LOOP SIZE	:	300m x 600m
TX TURN OFF TIME	:	355
CURRENT	:	15.5A
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	10
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	J.P
DATE	:	30/7/83

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR83/256

Surveyed and compiled by Geoterrex Pty Ltd

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 2838 BATTEN BLOCK N.T.

TE EM LINE 7

Revisions:
Drawn:
Traced:
Checked:
Date:
Project No:
Centre:
Drawing No:
A1-

FIG. 11