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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

E.L. 1/76 - GUILDFORD

Progress Report on Exploration for the Period

1st January, 1980 - 31st December, 1983

OPEN FILE

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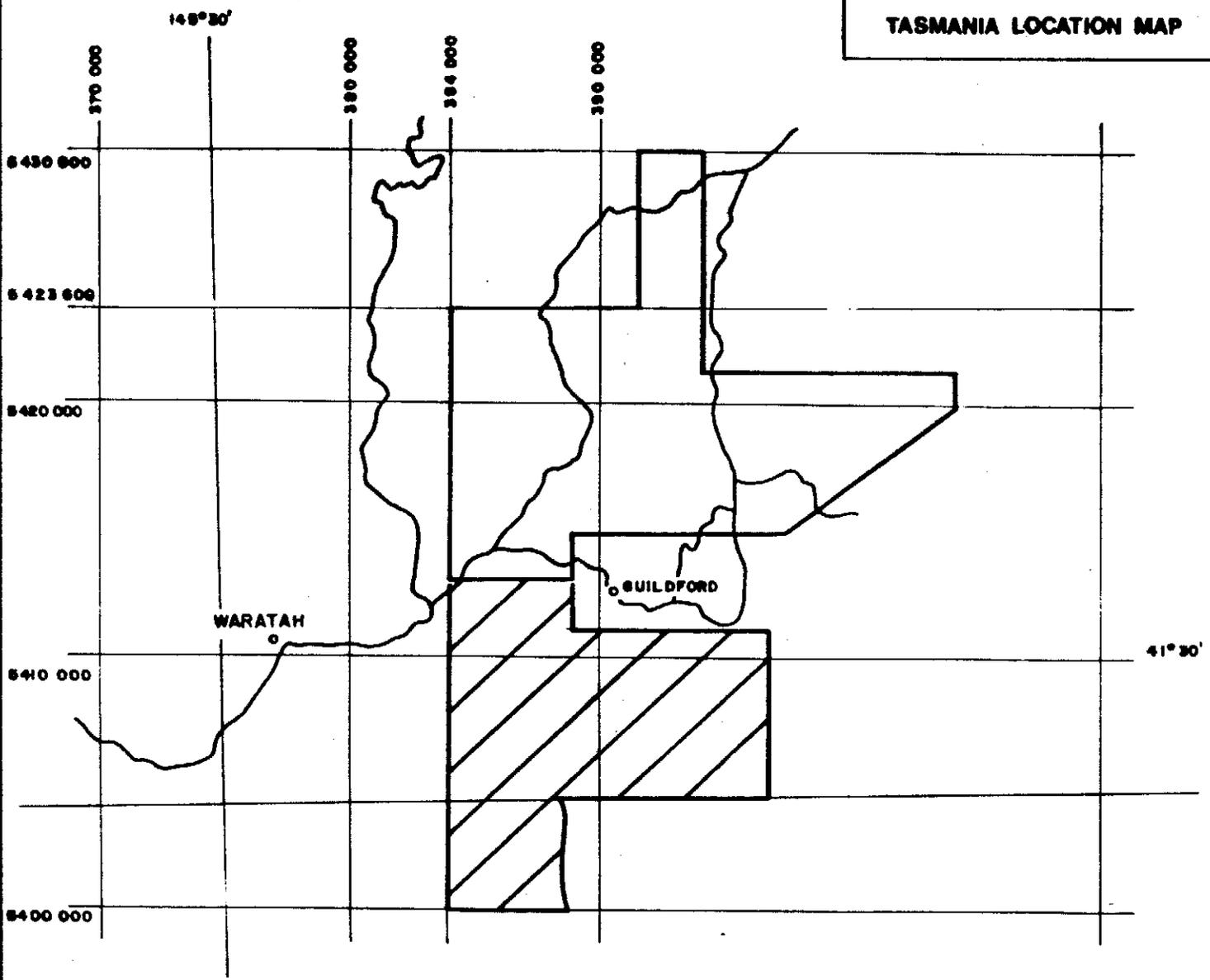
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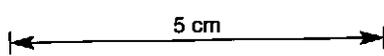
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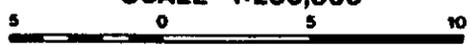
TASMANIA LOCATION MAP



 Area relinquished
29-3-83



SCALE 1:250,000



The Shell Company of Australia Limited
METALS DIVISION

LOCATION MAP
GUILDFORD
E-L/76
As of 29-9-83

SCALE 1:250,000	DATE
AUTHOR	DRAWN
OFFICE AHD.	REP.No.
DRG No	FIG No 1

SUMMARY

Guildford - E.L. 1/76, became part of the Housetop Joint Venture agreement negotiated between the Shell Company of Australia Ltd. and Comalco Ltd. in early 1980.

Over the past four years a variety of geophysical methods have been used to try to discriminate through the thick Tertiary basalt which covers most of the licence area.

These techniques have included aeromagnetics, radiometrics, gravity, AMT depth soundings, resistivity depth soundings, SIROTEM depth soundings, INPUT airborne EM and two stratigraphic drill holes. The work has indicated that the basalt over much of the area is greater than 200m thick.

In addition to the regional surveys a total of fourteen aeromagnetic anomalies and one INPUT anomaly have been investigated using various combinations of ground magnetic, Max-Min EM, gravity, IP and soil sampling surveys and percussion/diamond drilling. None of the anomalies are thought to merit further investigation as most appear to be produced by the extensive Tertiary basalt cover.

1.0 INTRODUCTION

1.1 Tenement Status

The Guildford Licence EL 1/76 of 264 sq km was included in the Housetop Joint Venture area, which was entered into with Comalco Ltd. in May 1980.

This report covers all exploration on the current licence and the area previously relinquished from May 1980. References to the "licence area" will refer to the original licence of 264 sq km.

1.2 Location and Access

The licence is located approximately 25 km south of Burnie in the northwest of Tasmania. It has common boundaries with and lies to the south and west of the Shell/Comalco licences of Highclere EL 4/77, Loongana EL 36/79 (Fig. 1).

Access is via the Guildford Road south from Burnie and numerous well kept Associated Pulp and Paper Mills Ltd. logging roads. The Murchison Highway provides access in the south of the licence area.

1.3 Previous Investigations

Northern Prospecting Pty Ltd (Gould, 1975) drilled three diamond drill holes within the area of the licence in 1975. All finished in basalt. DDH GF1 went to 152.0m, DDH GF2 to 88.5m and GF3 to 90.0m. Approximate locations of these holes are shown on Drawing No. D/MQ 02/031. Because of the depth of the basalt Northern Prospecting gave up their interest in the area.

Comalco Ltd. conducted a stream geochemical survey. Several anomalies were investigated with none being of major interest. A small helicopter borne aeromagnetic survey was done in the north of the licence (Weste, G. 1978, 1979). Grids were established at St. Valentine's Peak and Blythe Road and ground magnetic and IP investigations carried out. A diamond drill hole was completed at St. Valentine's Grid. A diamond drillhole at Blythe Road failed to penetrate the basalt cover. At Teluna Road and Basils Road ground magnetics and IP surveys were done.

A reference list of other investigations is included in References.

1.4 Exploration Targets

The only targets considered have been Bischoff style pyrrhotite (pyrite) cassiterite deposits or Moina/Kara style magnetite-cassiterite-scheelite deposits.

2.0 REGIONAL GEOLOGY

The major portion of the licence (approx. 90%) is covered by varying thickness of Tertiary basalt. The underlying stratigraphy is inferred from pre-Tertiary outcrop around the margins of the area, the restricted outcrops within the licence area, and deductions from the geophysical data.

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Precambrian rocks outcrop at Mt Bischoff and near the Arthur-Wandle Rivers confluence and to the north of Hampshire. Similar dolomitic rocks to those which host the main pyrrhotite mineralisation at Mt Bischoff are present in both the other locations, with the main part of the sequence consisting of interbedded quartites and phyllitic siltstones.

Along the Arthur River north of Mt Bischoff a Cambrian-Eocambrian sequence of interbedded (high Mg) basaltic pillow lavas, very fine-grained reddish to brown pelitic sediments and greywacke beds and minor chert beds outcrop. These are intruded by mafic and ultramafic bodies. A similar sequence is mapped near Luina which is thought to be an equivalent of the Crimson Creek Formation. A similar greywacke sequence is exposed in the Hellyer River but no basaltic lavas of Cambrian age are reported elsewhere. The Carboniferous Wynyard Tillite outcrops in both the Hellyer and Arthur Rivers unconformably overlying both Precambrian and Cambrian rocks.

Another major zone of pre-Tertiary outcrops is located in the Blyth Road-St Valentine's Peak area. This represents a folded and faulted sequence of Cambrian acid volcanics overlain by a sequence of clastic rocks dated (Pike, 1964) as Middle to Upper Cambrian. These are unconformably overlain by the conformable sequence of Ordovician Roland (Owen) Conglomerate, Moina Sandstone, Gordon Limestone and the Silurian (?) Bell shale. This sequence is intruded by the Devonian Housetop granite which has contact metasomatised various units and produced the Kara scheelite skarn.

To the south, outcrops of Ordovician Owen Conglomerate at Mt Pearse and Mooney's Mount protrude above the basalt plain and define the nose of a major syncline.

Major open NNE and North Devonian folding is thought to be the main structural influence upon the licence area although East trending cross folds are also important. A major NW trending structure terminates the St. Valentine's Peak structures to the south and may be of regional significance. Outcrop geology is indicated in Drawing No. D/MQ 02/031.

Drawing D/MQ03/067 shows the interpreted pre-basalt geology. This is inferred from the outcrop geology and regional geophysics. A major feature derived from the geophysics is the interpreted E-W fault east of Mt Bischoff. This trend is apparent from the aeromagnetics and gravity (Drawing Nos. D/MQ02/056,066). The block north of this postulated fault is both more magnetic and more dense and could therefore be due to an increased thickness of basalt or Cambrian volcanics adjacent to the Pre-Cambrian.

3.0 INVESTIGATIONS COMPLETED

3.1 Regional Investigations

3.1.1 Aeromagnetic Investigations

A regional helicopter magnetic and radiometric survey was flown by Geometrics in March 1980 across the licence area. Flight lines were run east-west at 250 m spacing and a nominal height of 80 m. A small area around St. Valentine's Peak previously covered by Comalco Ltd. with aeromagnetics only, was not reflight. This data was originally compiled on 1:20,000 Cadastral sheets and later

reduced to 1:50,000 regional sheets (Drawing D/MQ02/056). It was hoped this coverage would locate any near-surface magnetite or pyrrhotite skarns, since computer modelling had suggested that the magnetic signatures of such bodies would be considerably larger than signatures due to basalt valleys or hills, at least for basalt thickness of no more than 100 metres.

It can be seen from the aeromagnetic contour maps that the basalt is expressed by high frequency, high intensity magnetic anomalies. In order to reduce the effect of the basalt on the magnetics, upward continuation to 600 metres was carried out (Drawing No. D/MQ 00/1006). (Spectral analysis was also carried out and appropriate filters applied but this did not achieve any more useful results). The upward continuation satisfactorily removed the high frequency (near surface) effects leaving magnetic features that could then be investigated. Many of these features are obviously basalt filled valleys judging from their long linear expressions especially in the northern part of the EL. (One of these was drilled at Dudfield Road by HG-1). Certain other more isolated anomalies (13 in all) were followed up on the ground using ground magnetics to locate and define the sources. For instance Wandle River (3841/3), Peak Plain (3941/3). and Hellyer River West (3841/1). These are reported on individually in Section 3.2.

The few areas of substantial pre-basalt outcrop are usually well defined by areas of low intensity aeromagnetics. Small windows in the basalt are frequently well defined by the total count radiometric map (Drawing No. D/MQ02/057), and previously unknown outcrop has been found using the radiometrics (such as that near Shooters Hill). In general the basalt has a lower total count than any other lithologies present in the EL.

Measurements of magnetic remanence have been made on samples from three locations within the EL, and at several other locations in adjacent areas (Appendix 2). The basalt samples have very variable and frequently very high Konigsberger ratios although usually the direction of remanence is the same as that of the present earth's field. The results imply that interpretation of anomalies using normal modelling procedures is at best an approximation when remanence information is available, and at worst misleading when such information is unavailable (as is usually the case).

3.1.2 Gravity Survey

A regional gravity survey carried out along roads, with a station spacing of about 2 kms, covered the Housetop Granite with the exception of the Kara area to which access was not possible (non-Shell EL). Subsequent zones of interest were then followed-up in some more detail also along roads. Certain of the original anomalous zones were found to be false and caused by incorrect barometric readings or gravity mis-ties by the operator. Drawing No. D/MQ02/066 indicates the smoothed Bouguer gravity contour map. This was terrain-corrected by digitising the 1:100,000 topographic maps.

The purpose of the regional gravity survey was to define granite cupolas beneath the basalt cover. Having defined these any associated magnetic anomalies could then be considered as possible

*PA Pavane survey
3842/11*

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magnetite or pyrrhotite skarns. Unfortunately there are very few discrete gravity lows in the Guildford EL. The major one of interest is in the north in the area of Companion reservoir. It lies immediately west of a linear N-S magnetic trend which has been followed-up as Reservoir West anomaly (3942/6) and Bunkers Road anomaly (3942/3). The latter was drilled by SH-1 (200 m basalt) and the anomaly attributed to a basalt valley.

The regional gravity map shows the strong E-W trend east of Mt Bischoff which is also indicated on the aeromagnetics and has been commented on in Section 2.0.

Many measurements have been carried out on various rock types to assist in modelling gravity anomalies. The results are summarised below (units grams/c.c.):

Magnetite skarn	: 3.25 - 4.25
Pyrrhotite skarn	: 3.5
Gordon limestone (Ordovician)	: 2.7
Moina sandstone (Ordovician)	: 2.7
Granite	: 2.6
Cambrian volcanics	: 2.75 - 3.25
Tertiary basalt	: 2.7 - 3.0

3.1.1 Geophysical Depth Soundings

Various methods of estimating basalt thickness over the EL have been attempted. These include resistivity, TEM (Transient electromagnetic) and AMT (Audio Magneto Telluric) soundings. Shortly before the EL was relinquished, an attempt was made by a consultant to determine basalt thickness from spectral analysis of a line of aeromagnetic data. The apparent lack of success of this brief attempt can probably be attributed to the very variable magnetic properties of the basalt, which is known to have a wide range of magnetic remanent magnitudes and directions (see section on physical rock properties). By contrast the basalt is known to be consistently fairly conductive in a gross-sense (150 to 50 ohm-metres throughout) although variations are observable across individual flows, the weathered clay flow-tops being more conductive.

Since this conductive layer can be expected to lie on resistive bedrock, an electrical contrast should permit determination of the basalt thickness. A complication does arise however in that the pre-basalt terrain (Devonian to Pre-Cambrian) may be weathered and thus conductive. This weathered layer would probably be indistinguishable in resistivity from the overlying Tertiary basalt. Thus the following estimates of 'basalt thickness' are more probably estimates of depth to unweathered pre-Tertiary bedrock.

3.1.3.1 Resistivity Soundings

In late 1981, six Schlumberger soundings were carried out by Scintrex, measuring both resistivity and chargeability. Drg.D/MQ02/0 indicates the location of these soundings and the results. Plots of the soundings are attached (Appendix 3), together with the computer inversions carried out by Shell.

Most of the results indicate a thin, resistive, shallow layer (dry soil?), overlying fairly conductive layers (different basalt flows), usually out to the widest spacing used (AB/2 up to 700 metres, limited by equipment).

The net result of these soundings was that the basalt appeared to be thicker than originally anticipated ie greater than 100 metres. Also of considerable interest was the unexpected result that the basalts are only very weakly chargeable. Hence exploration for massive sulphides beneath basalt cover could be carried out using IP (although depth penetration of the technique is limited by the conductivity of the basalt layers). It should be noted however that certain pre-basalt rock-types, such as Ordovician Moina sandstone can be moderately chargeable (although also resistive) due to common disseminated pyrite, and that highly magnetic rock-types such as magnetite skarns can also be chargeable due to the high magnetite content.

3.1.3.2 Sirottem Soundings

Since it was evident from the Schlumberger soundings and subsequent drilling that the basalt thickness was likely to be in excess of 100 metres over much of the EL, it was decided to use TEM soundings to obtain more information on basalt thickness at further locations. In addition TEM has greater depth penetration and is more cost-effective than conventional resistivity soundings in this situation.

Forward modelling of the TEM response for resistive bedrock at 200 metres suggested that although a square transmitter loop of sides 400 x 400 metres would be preferable, a 200 m square loop should be sufficient to 'see' bedrock. This size loop was in any case about the maximum possible for use with Shell's low-power Sirottem Mark 1. Since a remote vector receiver (RVR) was not available, coincident loop mode was used. SPM effect did not appear to be present judging from a comparison with a displaced loop set-up at one site (sounding k). However, measurements by CSIRO on surface basalt samples at Gordon's Corner (sounding H) indicate 37% by weight of magnetite giving a channel 1 response of 18 v/amp. Since this is fairly substantial (compares with values from 298 to 56 v/amp at Elura), it suggests that an SPM effect is possibly present and future soundings should avoid the use of coincident loop mode.

Eleven soundings were carried out in August 1983 at locations indicated on Plan D/MQ02/055 (resistivity curves in Appendix 9). At 5 of the sites resistive basement could not be seen suggesting a basalt thickness of at least 300 metres. For another 4 sites, resistive basement appears to be between 200 and 300 metres deep. The only sites with resistive basement

less than 200 metres appear to be in the north of the EL, although one of these (sounding H) produced a remarkable apparent resistivity curve indicating a substantial conductor at depth (greater than 400 metres). This particular site is discussed under anomaly 3942/2 (Basils Road). A somewhat similar situation occurs at sounding G, discussed under anomaly 3841/3 (Wandle River).

Inversions of the TEM data were carried out using the GRENDL program run on Shell's IBM computer. This program was developed by CSIRO as part of an AMIRA research project of which Shell is a sponsor. GRENDL is a joint or single inversion program for TEM and/or DC resistivity data.

Unfortunately there are few locations at which the Sirotem results were verified by drilling. DDH SH1 was drilled prior to sounding D and terminated in basalt at 200 metres, so actual basalt thickness here is unknown.

3.1.3.3 AMT Soundings

The Audio Magneto Telluric system used was that developed by Professor Vozoff at Macquarie University. The development was sponsored by AMIRA of which Shell was a participant. The field work for Shell in Tasmania in early 1983 was carried out as one of the first field tests of the system. The report on the results and the inversions subsequently carried out at Macquarie are attached as Appendix 10. Seven AMT sites were surveyed in the Guildford EL. All suggest basalt thicknesses of 200 to 300 metres, except for that about 1.25 kms south of Peak Plain aeromagnetic anomaly (3941/3). This anomaly was subsequently drilled through 70 metres of basalt, whilst the AMT sounding nearby had indicated about 90 metres. In general the AMT soundings agreed satisfactorily with the Sirotem soundings, and in addition gave some indication of electrical 'grain' or anisotropy. In the basalt this seemed to indicate directions of basalt valleys often confirmed by aeromagnetic trends. Grain of the underlying bedrock may assist in defining pre basalt stratigraphic trends, but this cannot be confirmed due to the lack of drill hole information.

3.1.3.4 Summary of Results

Despite the lack of drilling confirmation, the various geophysical soundings appear to be generally consistent with one another. They strongly suggest that the Tertiary basalt exceeds 200 metres in thickness over most of the EL with exceptions being the areas north of Companion Hill and east of Peak Plain/St. Valentine's Peak. If present pre-Tertiary topography is any indication, not only is the basalt thick but also widely variable in thickness.

The aeromagnetics might be expected to confirm the increasing basalt thickness in the EL by an increase in the regional magnetic field. This does appear to occur although not with a simple pattern. In the Shooters Hill area and south of the present EL boundary there are marked decreases in the total

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magnetic field, which do suggest local thinning of the basalt. However, as remarked above magnetic remanence of the basalt could affect any simple conclusions. This is illustrated by the basalt between Mt Bischoff and the EL boundary, which coincides with relatively low intensity aeromagnetism (200-300 nT less than much of Guildford). This basalt is not, however, thought to be just a thin veneer (confirmed by Schlumberger sounding 1 on the Murchison Highway).

3.2 Anomalies Investigated

A total of 16 localities have been investigated by the Shell Co. of Australia Ltd. on the licence area. Anomaly numbers refer to the Cadastral sheet number and the sequence in which the anomalies were gridded. Location and grids are shown on Drawing D/MQ02/054.

3.2.1 Mt Pearse East 3840/1

- 3.2.1.1 Location. A 110 nT aeromagnetic anomaly adjacent to Mt Pearse, crossing the Murchison Highway.
- 3.2.1.2 Geology. Tertiary basalt covers the grid which may lie over Ordovician Gordon Limestone within the core of the Mt Pearse syncline.
- 3.2.1.3 Geophysics. Two ground magnetic traverses were run across the anomaly. The profiles have the characteristic noisy basalt signature with the airborne anomaly corresponding to a 500 nT ground anomaly. (Drawing D/MQ02/011).
- 3.2.1.4 Conclusions & Recommendations. The anomaly appears to be related to a basalt hill.

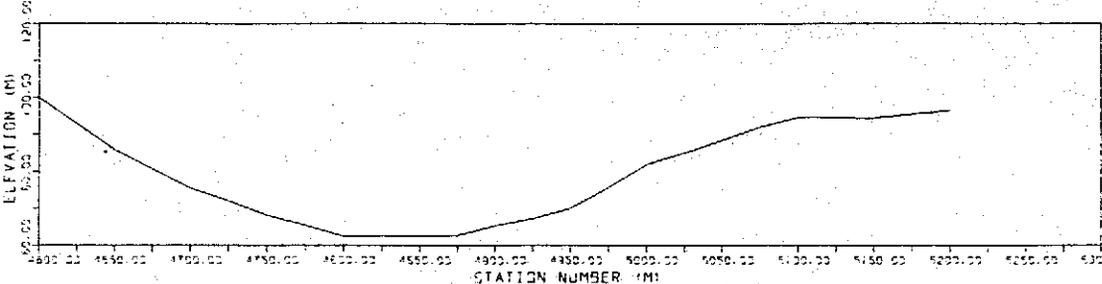
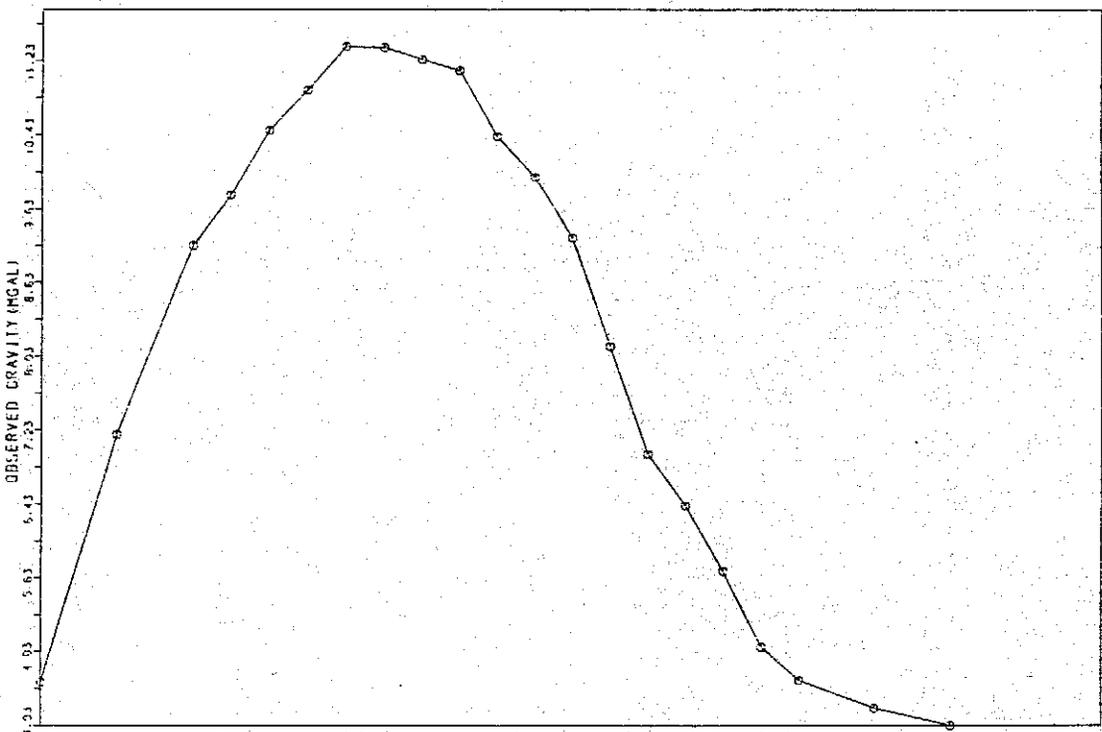
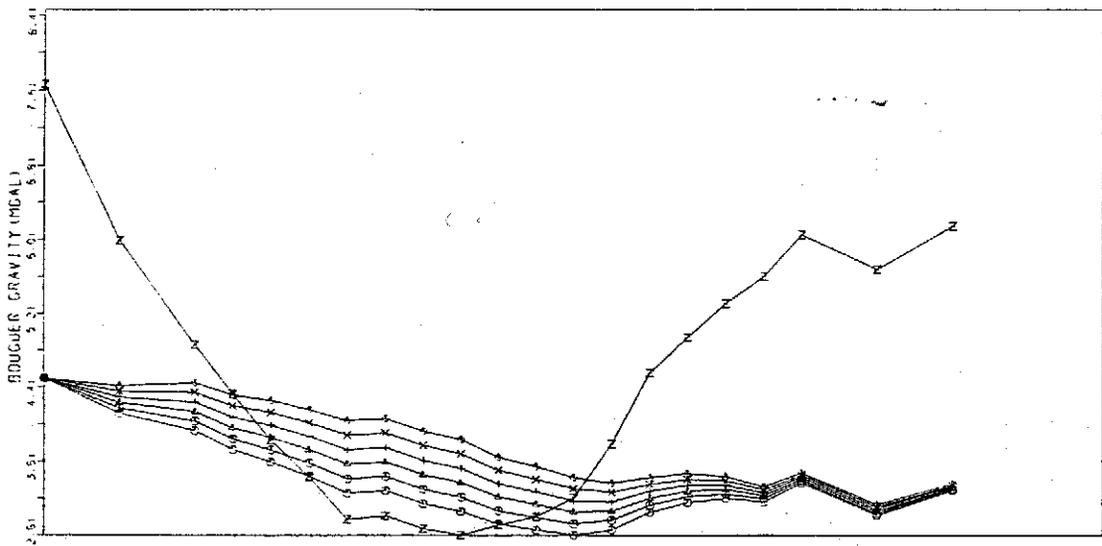
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3.2.2 Mt Pearse 3840/2

- 3.2.2.1 Location. A 280 nT aeromagnetic anomaly adjacent to Mt Pearse, west of the Murchison Highway.
- 3.2.2.2 Geology. Tertiary basalt outcrops between two high ridges of Moina Sandstone probably overlying Gordon Limestone.
- 3.2.2.3 Geophysics. A ground magnetics survey at 25 m station spacings was initially done on three lines at 200 m spacings plus a base line. An additional line surveyed at 5 m spacings was later included. A broad anomaly of approx. 300 nT is overprinted by basalt noise (Drawing D/MQ02/013, 012, 015, 028). Two basalt samples gave Koenigsberger ratios of 1.0 and 9.1 (refer Appendix 2). A line of gravity was done which failed to show any excess mass. Fig. 2.
- 3.2.2.4 Geochemistry. Soil samples taken at 50 m intervals along the additional line gave typical basalt geochemical response (elevated Cu, Zn, Ni) (refer Appendix ①).
- 3.2.2.5 Conclusions & Recommendations. The magnetic response is probably related to topography.
- Antennas*

017

449018



GRAVITY FACTOR PROGRAM

LINE 5800.00

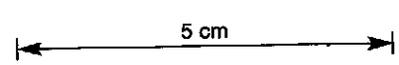
STATION SCALE = 2500.

LEGEND

DENSITY	FACTOR
2.200000	0.216530
2.300000	0.212345
2.400000	0.206160
2.500000	0.203975
2.600000	0.199790
2.700000	0.195605
Z	FREE AIR GRAVITY

FACTOR IS CORRECTED FOR FREE AIR AND BOUGUER

SHELL COMPANY OF AUSTRALIA METALS DIVISION	
TASMANIAN GRAVITY MT PEARSE 3840/2	
SCALE: 1 : 5000	
FIG. NO: 2	REPT. NO:
ENCL. NO:	SRC. NO:
DATE:	AUTHOR: G.O.
DRAWN:	OFFICE: ARO



Pk

3.2.3 Hellyer River West 3841/1

- 3.2.3.1 Location. Between and near junction of Hellyer and Fossey Rivers.
- 3.2.3.2 Geology. Tertiary basalt plain probably overlies the core of the SW-NE Mt Pearse syncline which is expected to be Ordovician Gordon Limestone.
- 3.2.3.3 Geophysics. The discrete 400 nT aeromagnetic anomaly was followed up with a ground magnetic survey at 10 metre station spacing along seven traverse lines and one base line. An irregularly shaped 1000-2000 nT anomaly over an area of 600 x 400 metres was located. (Drawing Nos. D/MQ02/019, 032, 017, 18 A & B).

Modelling of the magnetics was attempted despite the obvious complexity of the source(s) using an inverse routine (Fig. 9). The resultant modelled susceptibilities were high but assuming a high Koenigsberger ratio of about 20 (from other basalt measurements), the anomalies could be explained by basalt rather than skarn. (The only basalt sample at this location gave a K-factor of 6). Gravity was done along 3 lines 200 metres apart (10200W, 10400W, 10600W) (Figs. 3, 4, 5). Gravity anomalies of about 0.5 mgals occurred on Lines 10400W and 10600W, and were modelled using inverse routines. A body of 100 to 150 m depth extent, 100 to 150 m wide and a density contrast of 0.4 to 0.5 gm/cc gave a good fit to the field data. (Fig. 10).

A VLF-EM survey did not detect a bedrock conductor on Line 10400N. A Max-Min EM survey using a coil separation of 150 metres similarly did not detect any bedrock conductor (Fig. 6). Fig. 7 shows a Schlumberger sounding.

The integrated interpretation of the geophysical results suggested that a basalt valley or plug could account for the magnetic and gravity anomalies (Fig. 11).

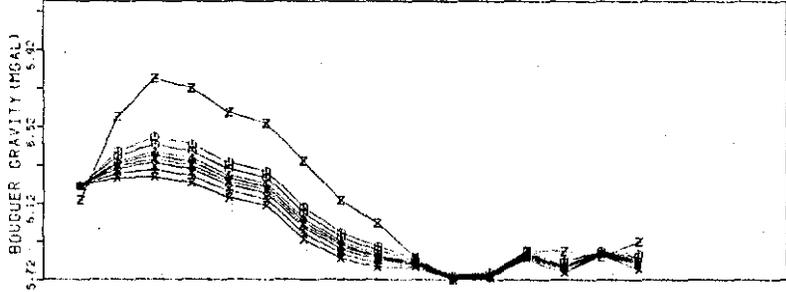
- 3.2.3.4 Geochemistry. Soil sampling gave typical basalt values.
- 3.2.3.4 Drilling. A percussion/diamond drill hole was completed to 197.6 metres in basalt (see Appendix 6). Geophysical logging indicated resistivities of about 200+ ohm-metres down to 100 metres with chargeabilities of less than 10 msec (Fig. 8).
- 3.2.3.5 Conclusions. The anomaly has been tested and confirmed as being due to a basalt valley.

*note: note recorded in
basalt*

GRAVITY FACTOR PROGRAM

LINE 10600.00

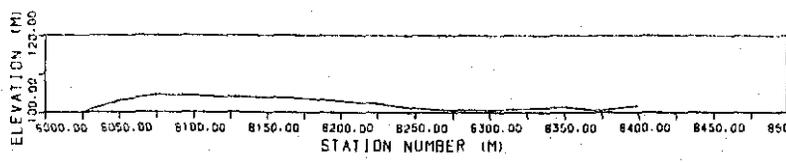
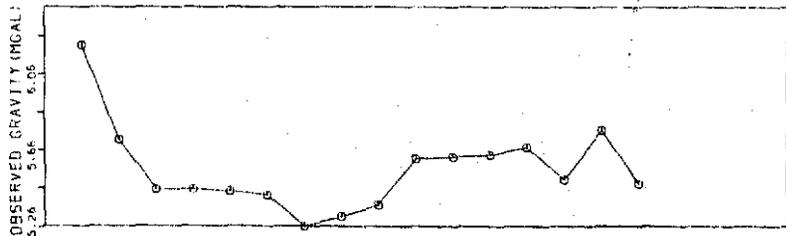
STATION SCALE : 2500.



LEGEND

DENSITY	FACTOR
⊙ 2.00000	0.224900
⊖ 2.20000	0.216530
△ 2.40000	0.208160
+ 2.50000	0.203975
x 2.60000	0.199790
⊕ 2.70000	0.195605
⊙ 2.90000	0.187235
x 3.10000	0.178865
Z	FREE AIR GRAVITY

FACTOR IS CORRECTED FOR FREE AIR AND BOUGUER



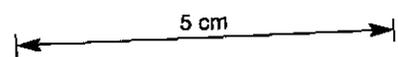
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

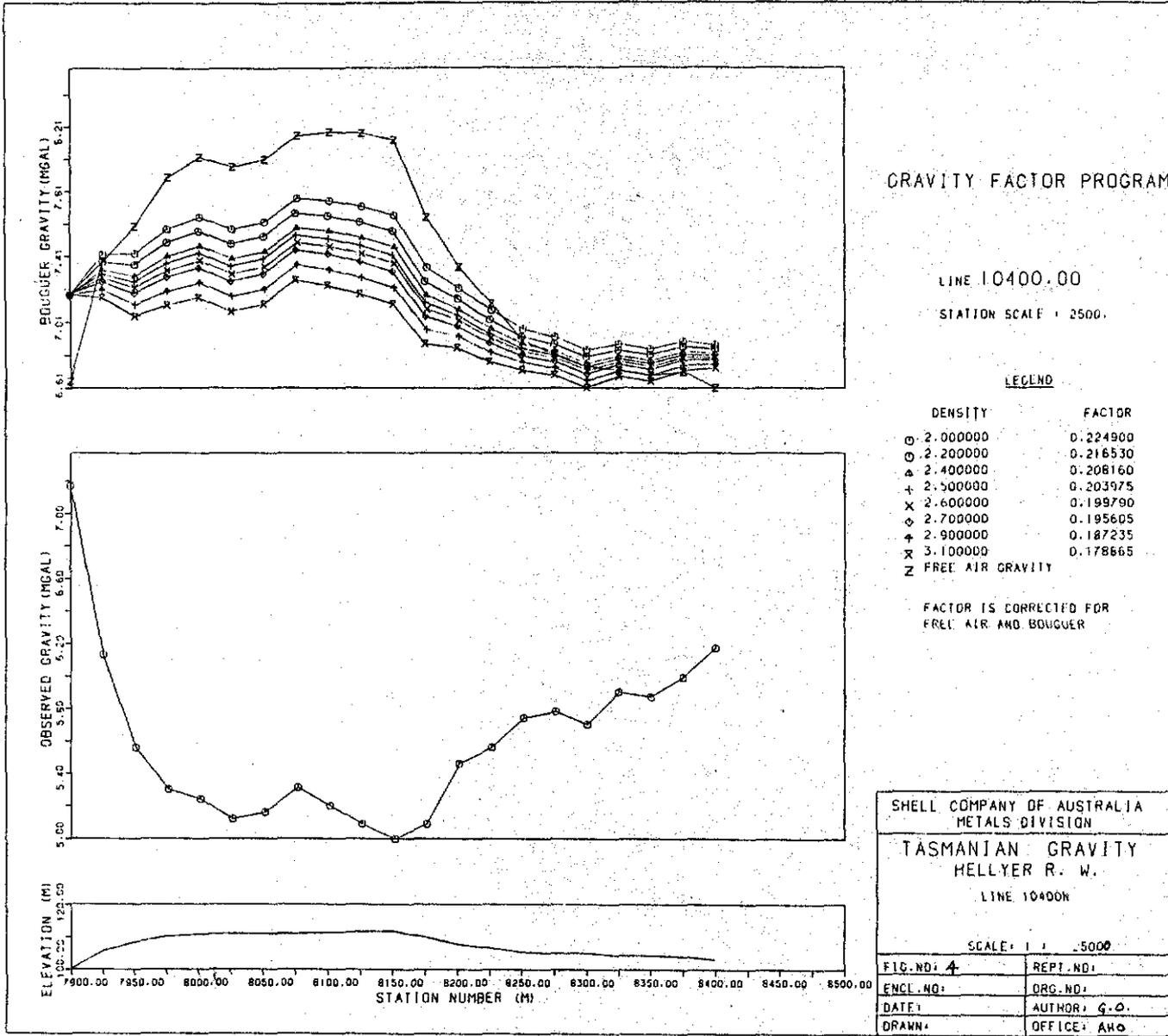
TASMANIAN GRAVITY
HELLYER R. W.

LINE 10600N

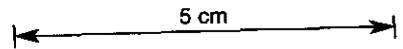
SCALE: 1 : 25000

FIG. NO: 3	REPT. NO:
ENCL. NO:	ORG. NO:
DATE:	AUTHOR: G. G.
DRAWN:	OFFICE: AHC





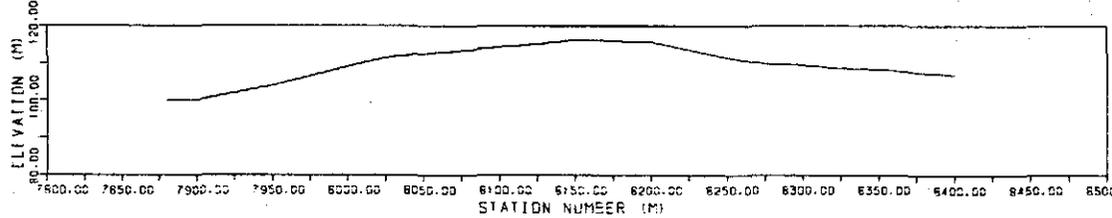
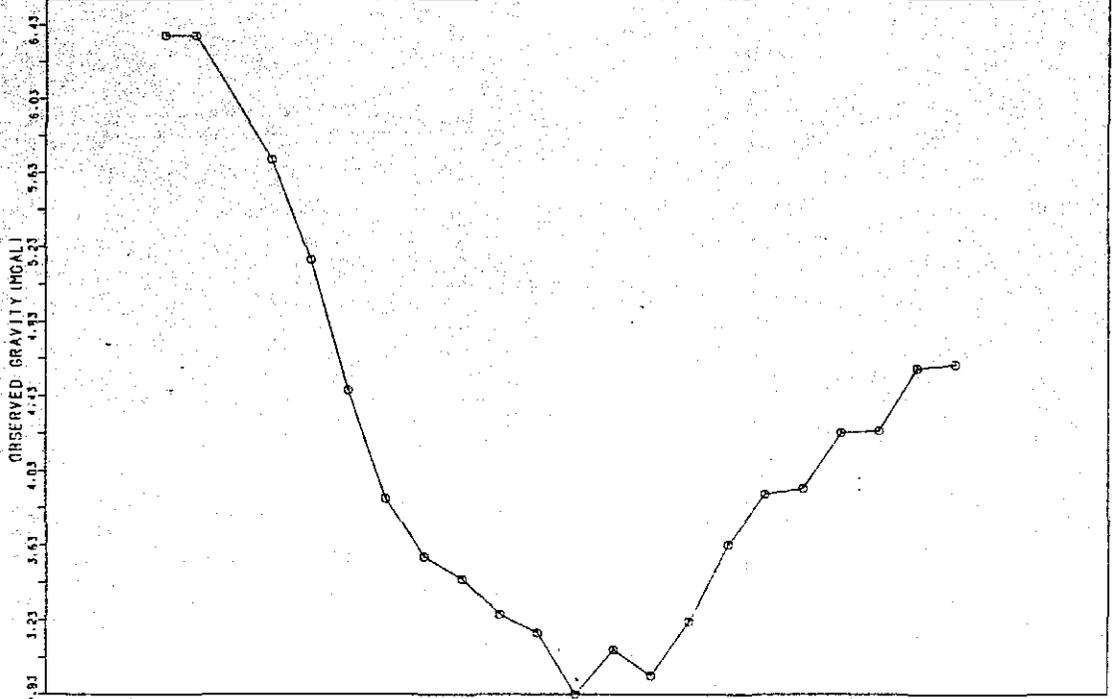
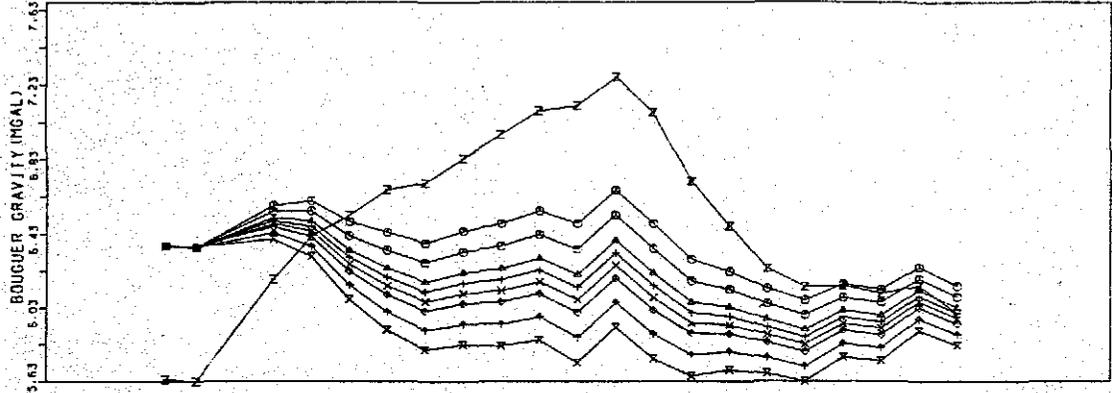
Reduce to 1:5000



021

449022

use $P=2.5$, no Terrain Corrections



GRAVITY FACTOR PROGRAM

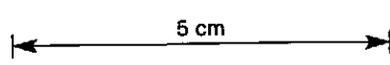
LINE 10200.00
STATION SCALE: 250g.

LEGEND

DENSITY	FACTOR
○ 2.000000	0.224900
△ 2.200000	0.216530
◇ 2.400000	0.206160
+ 2.500000	0.203975
x 2.600000	0.199790
◇ 2.700000	0.195605
+ 2.900000	0.167235
x 3.100000	0.176665
Z	FREE AIR GRAVITY

FACTOR IS CORRECTED FOR FREE AIR AND BOUGUER

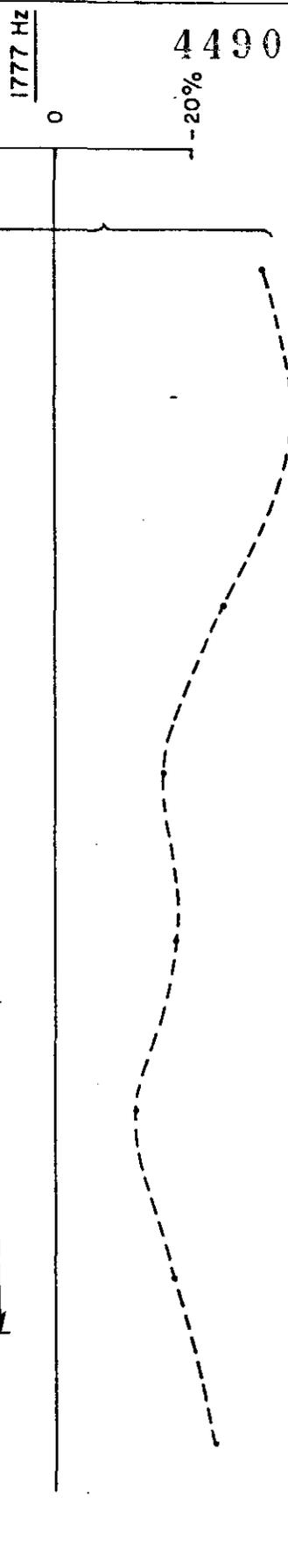
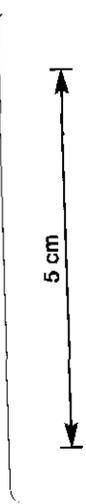
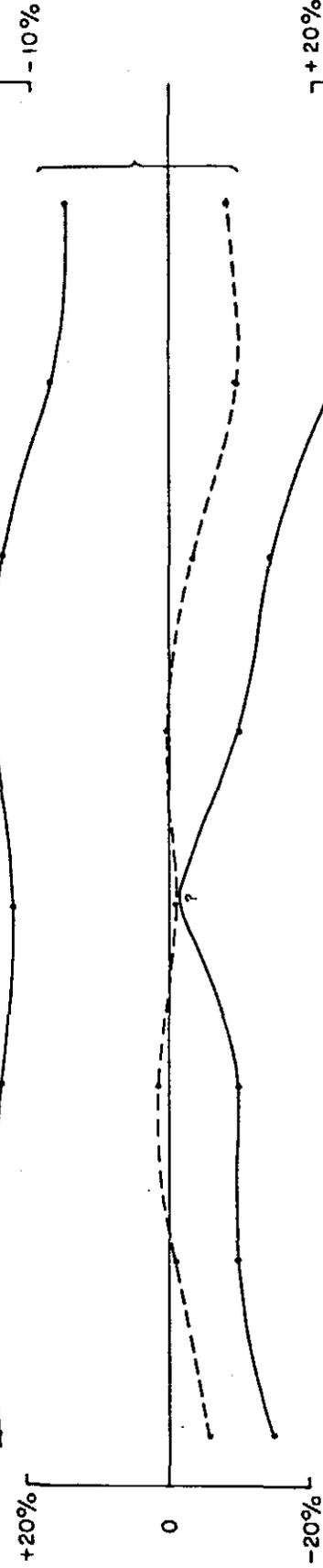
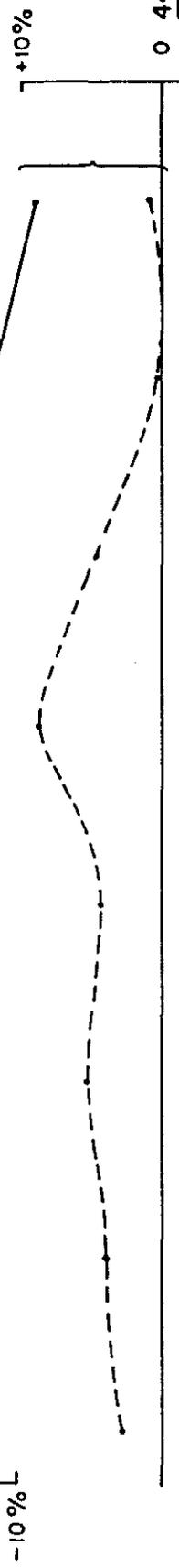
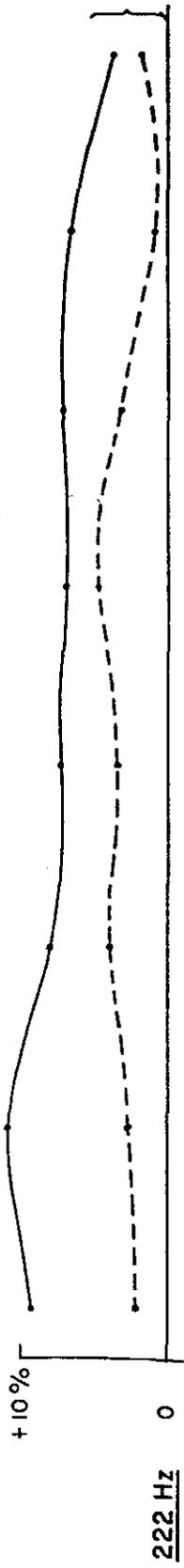
SHELL COMPANY OF AUSTRALIA METALS DIVISION	
TASMANIAN GRAVITY HELLYER R. W. LINE 10200N	
SCALE: 1 : 25000	
FIG. NO: 5	REP. NO:
ENCL. NO:	DEG. NO:
DATE:	AUTHOR: G. O.
DRAWN:	OFFICE: AND





022

449023



8000E 8200 8200E 8000E

Horizontal Scale 1:2000

— I.P.
 - - - O.P.

COIL SEP'N = 150m

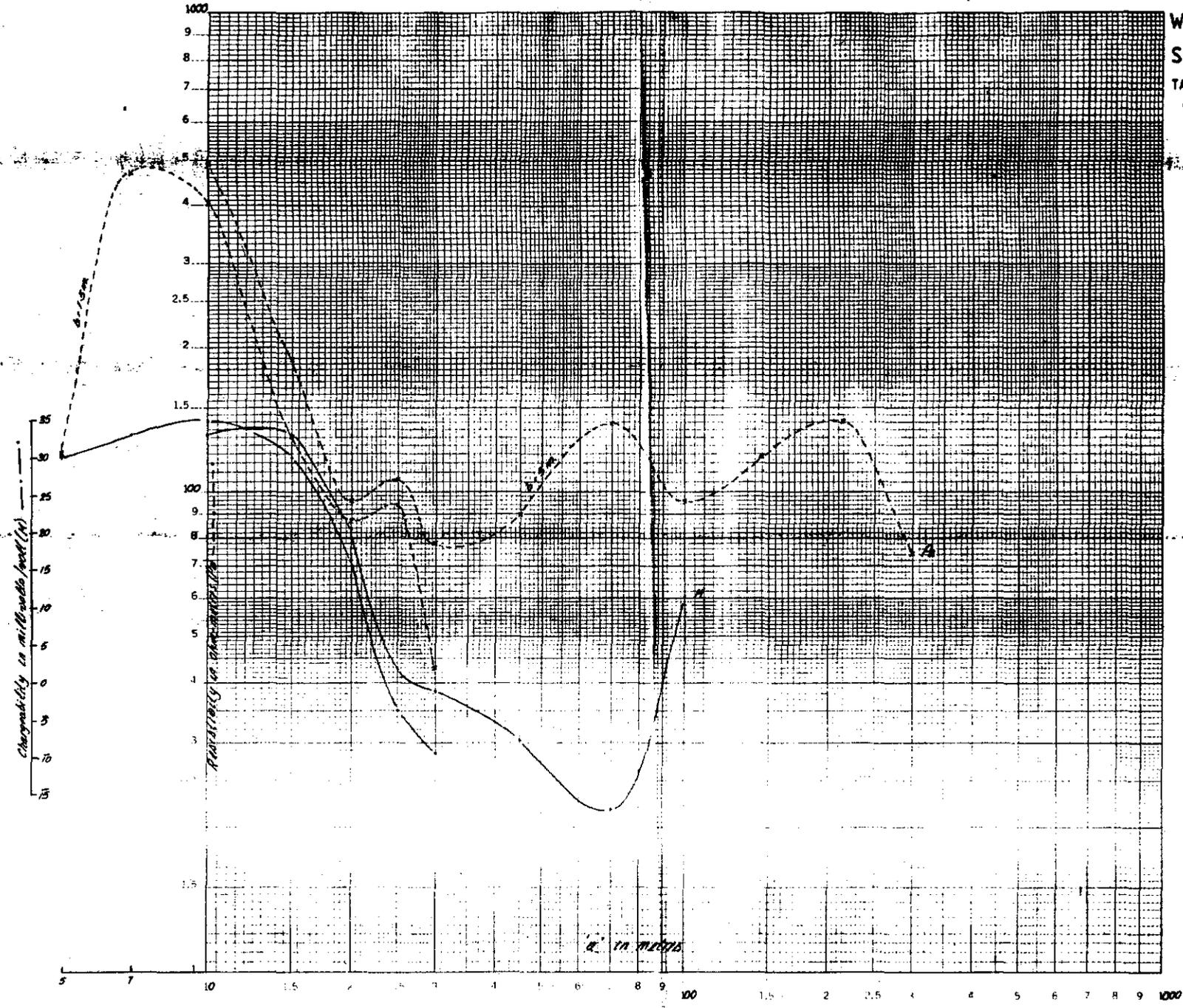
The Shell Company of Australia Limited METALS DIVISION	
HELLYER RIVER WEST - TASMANIA	
ANOMALY No 3841/1	
LINE 10400N	
MAX-MIN E.M.	
FIG No. 6	REPORT No.
ENCL No.	DWG. No.
DATE Nov 1981	AUTHOR N Hungerford

023

WEST HELLYER RIVER
Schlumberger Array
TAS-099 28-3-62
SCINTREX

47 7203

K&E LOGARITHMIC 2 AS CYCLES
KEUFFEL & ESSER CO. NEW YORK



449024

Fig. 7

HELLYER RIVER WEST - TAS. 3841/1
 PERCUSSION DRILL HOLE
 LOGGED:- P. BURNHEIM/R. DURAJ (SHELL)
 DATE :- 17-4-82
 Tx : IPE-7/25W
 Rx : IPR-7
 G_r : 200m GRID WEST

RESISTIVITY IN OHM-METRES

DOWNHOLE 3-ARRAY
 ELECTRODE CONFIGURATIONS:-
 ○ --- 3 metre SEPARATION
 □ --- 6 metre " "
 △ --- 12 metre " "

TERTIARY BASALT

EOH 197.6m

CHARGEABILITY IN MILLISECONDS

DEPTH IN METRES

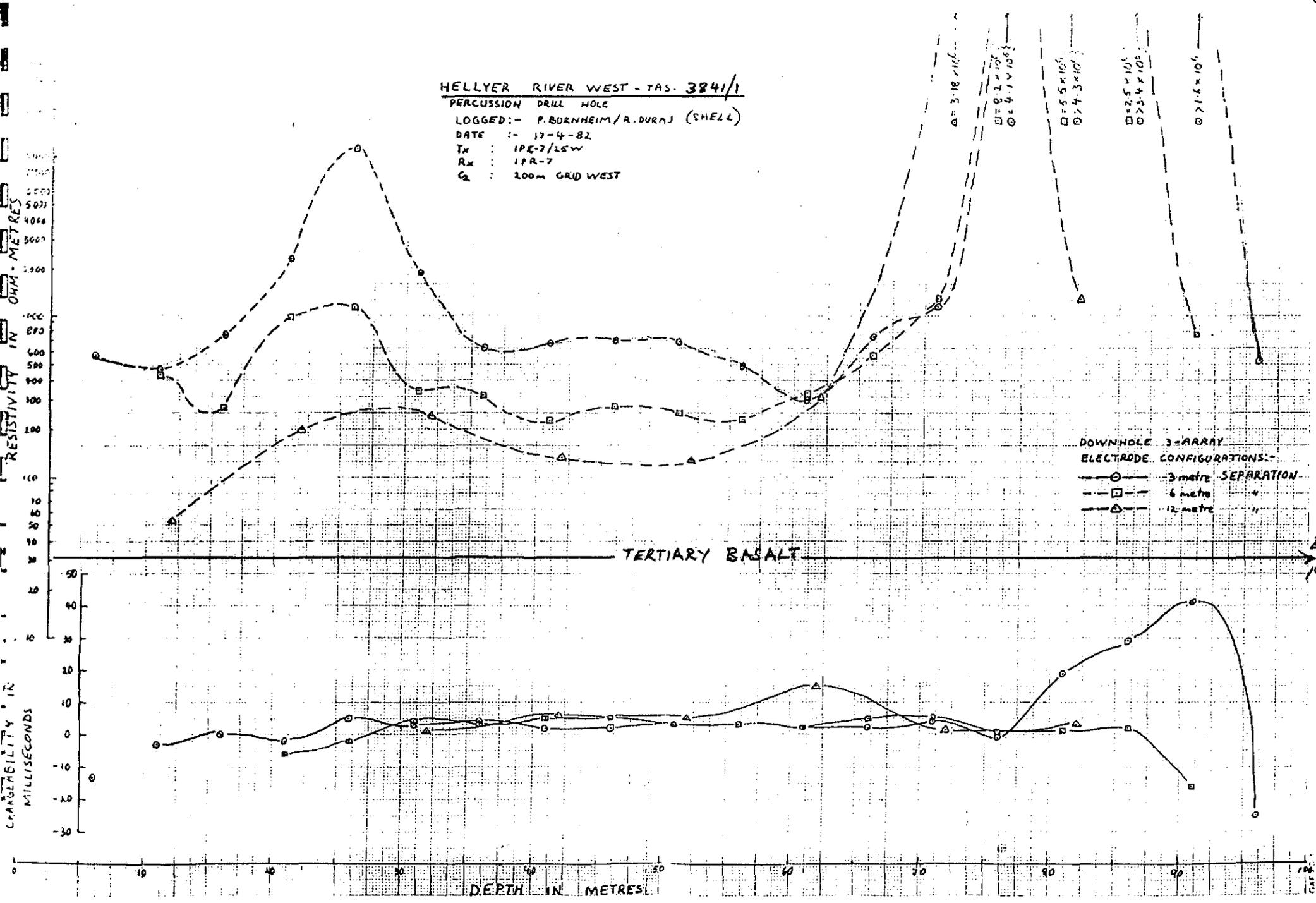
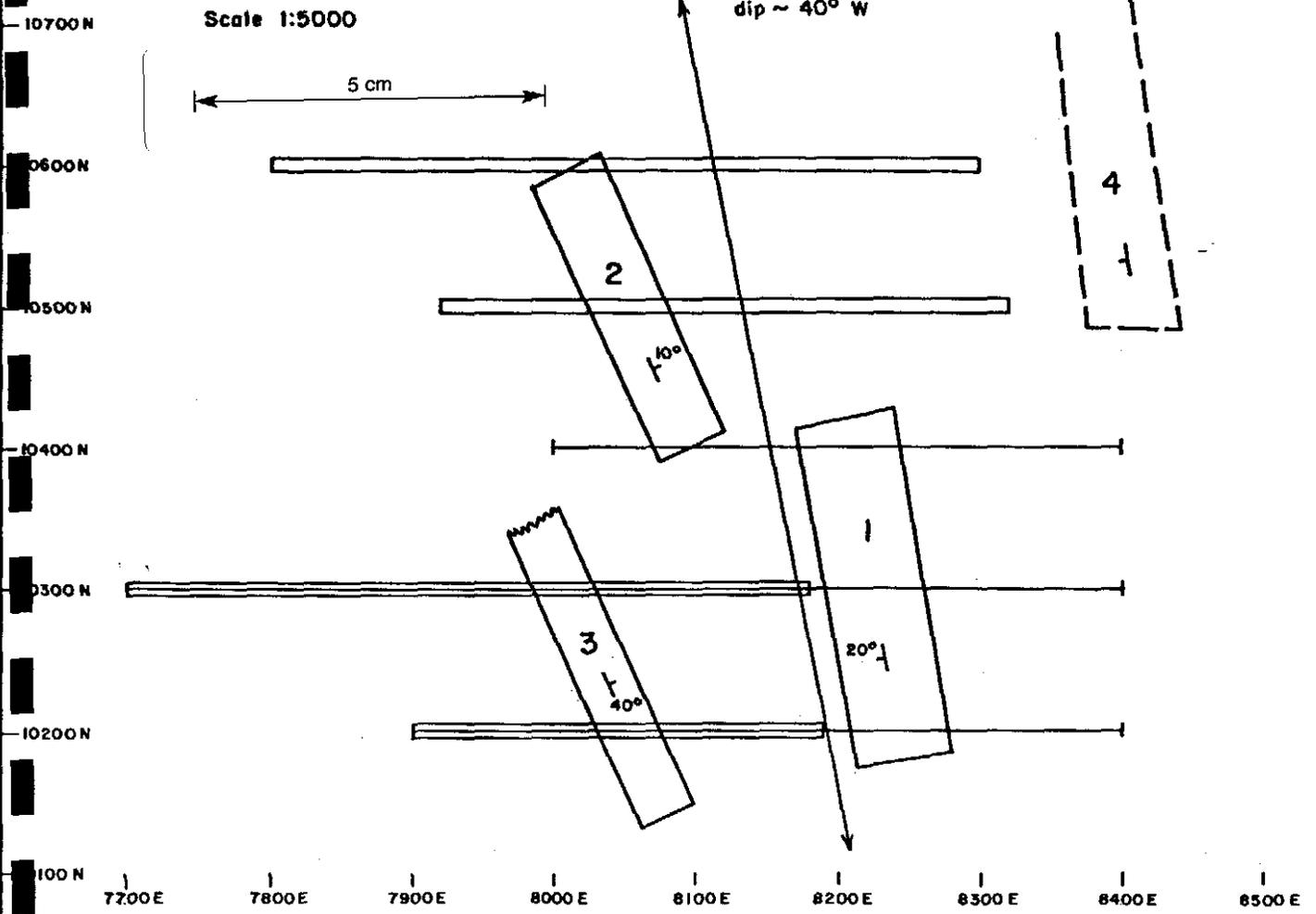


FIG 8

PLAN VIEW

Scale 1:5000

Axis of Gravity Anomaly
(100-150 m. wide)
dip ~ 40° W

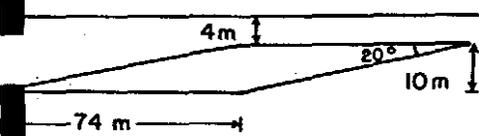


- Data for Body 1
- Data for Body 2
- Data for Body 3

SECTIONS

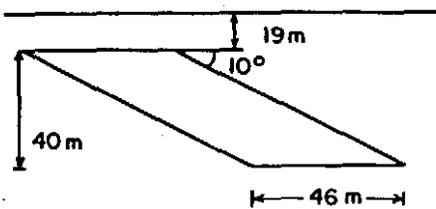
Not to Scale

BODY 1



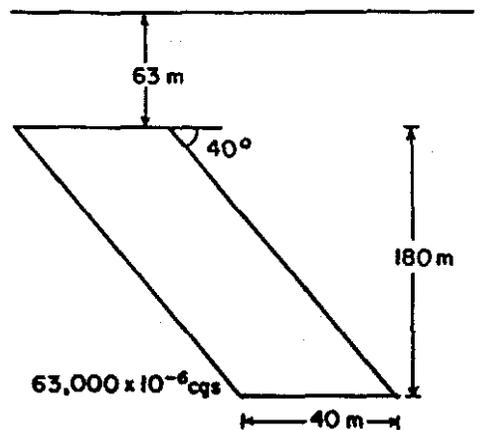
Susceptibility = $19,000 \times 10^{-6}$ cgs

BODY 2



$42,000 \times 10^{-6}$ cgs

BODY 3



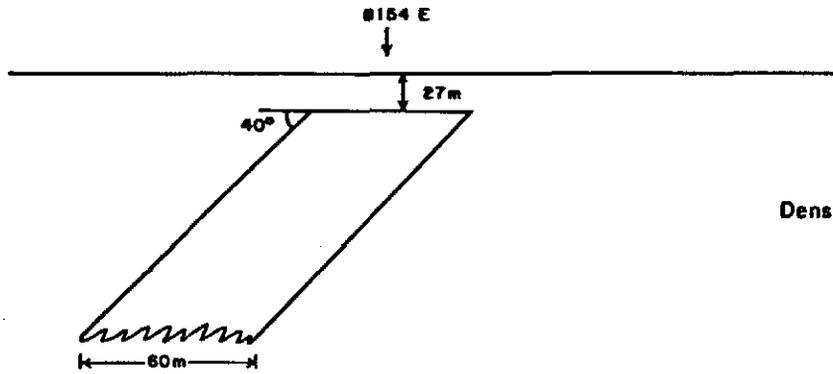
$63,000 \times 10^{-6}$ cgs

Effective susceptibility = $1000-3000 \times 10^{-6}$ cgs
(Assuming basalt of Königsberg ratio = 20)

The Shell Company of Australia Limited METALS DIVISION	
HELLYER RIVER WEST MAGMOD MODELS	
FIG 9	
SCALE 1:5000	DATE Nov. 81
AUTHOR G. Oakes	DRAWN A.S.

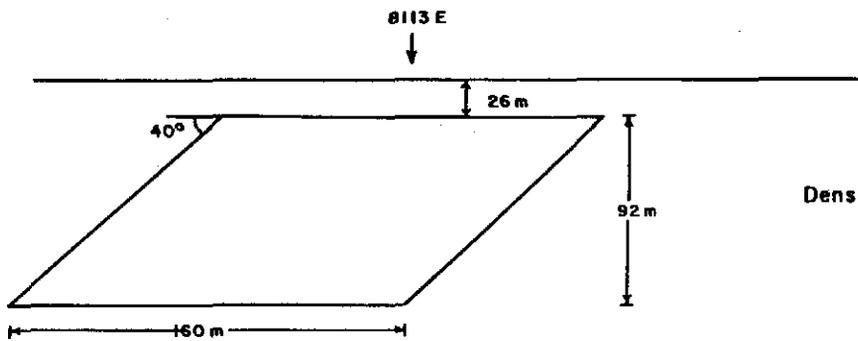
① Regional rises towards E (gives best fit to observed gravity)

10400 N



Density ~0.45

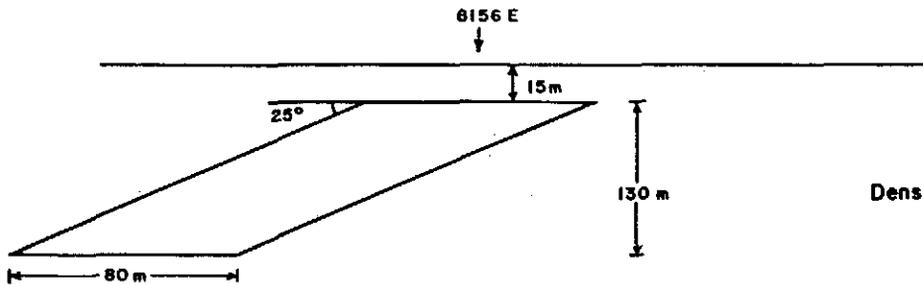
10600 N



Density = 0.46

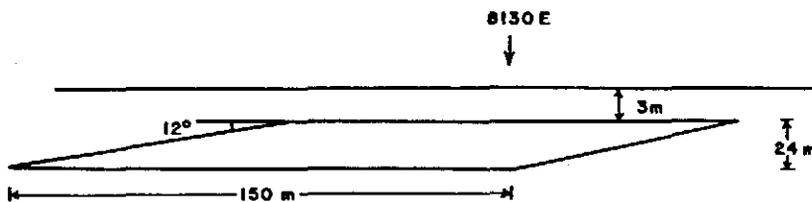
② Regional rises towards W

10400 N



Density = 0.57

10600 N



Density = 0.66

NOTE: Model ① seems to be the more reasonable of the two, but the regional is not well enough defined to be certain.

The Shell Company of Australia Limited METALS DIVISION	
HELLYER RIVER WEST	
GRAMOD MODELS	
FIG 10	
SCALE	DATE Nov. 81
AUTHOR G. Oakes	DRAWN A.S.

027

7600 E

7800 E

8000 E

8200 E

8400 E

PLAN

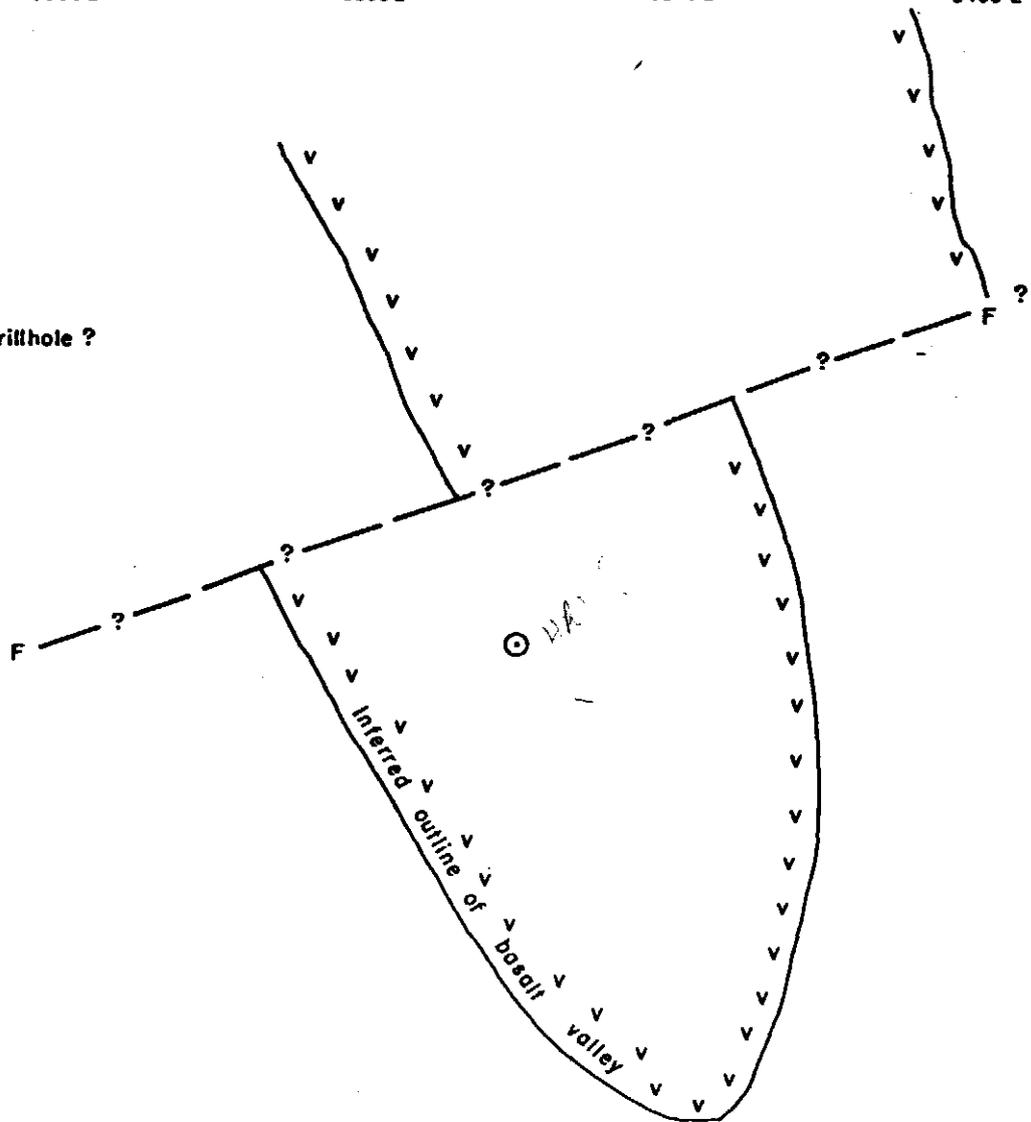
10600 N

⊙ Proposed vertical drillhole ?

10500 N

10200 N

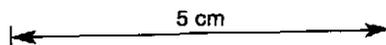
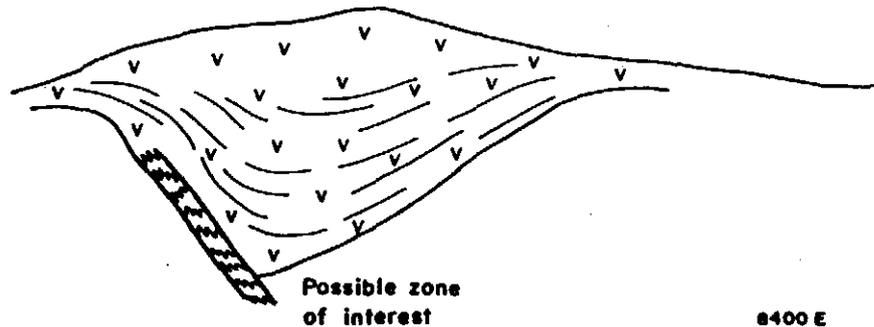
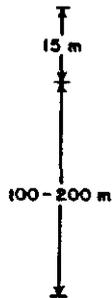
10000 N



SECTION (10300 N)

7950 E

8250 E

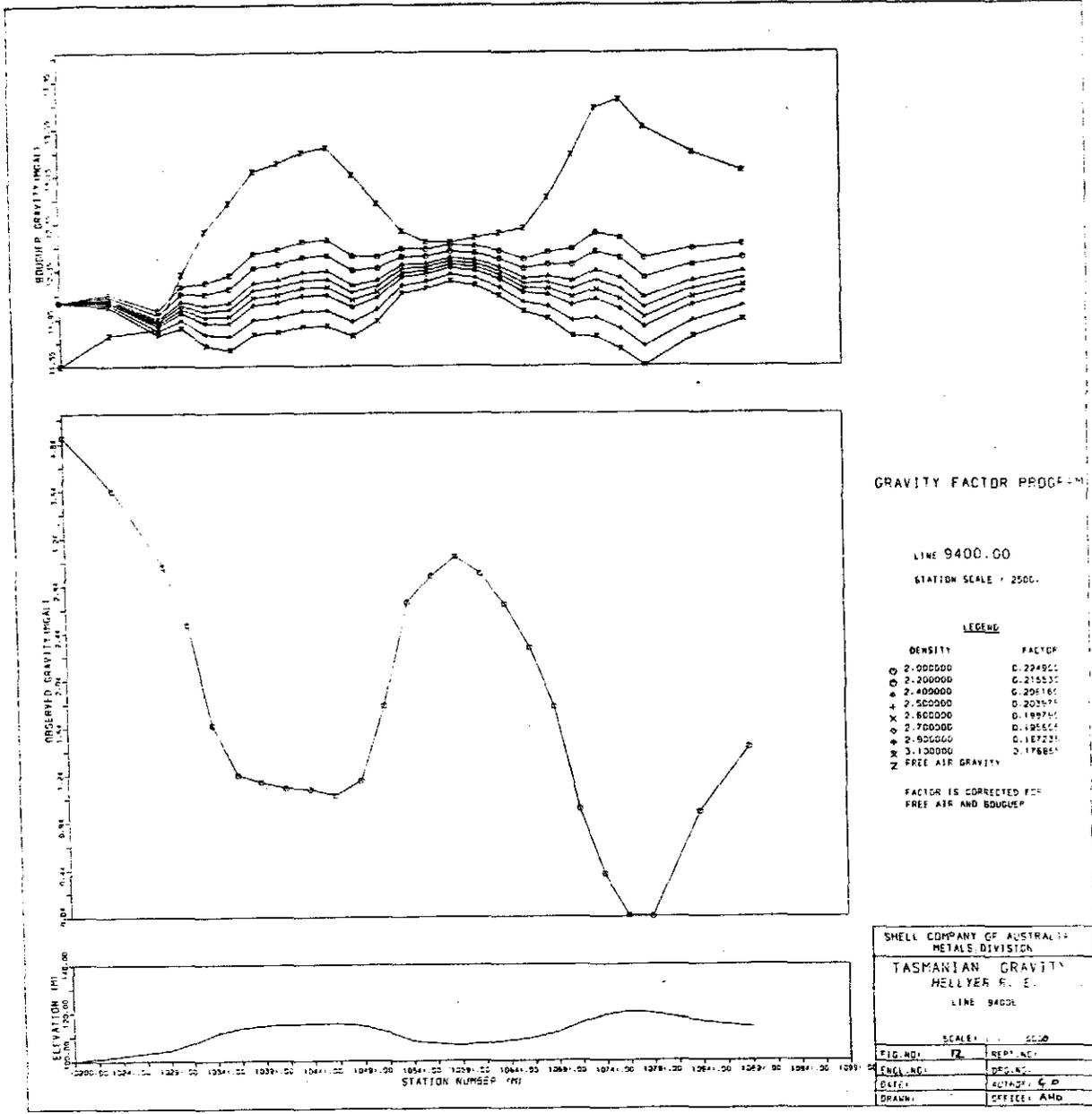


The Shell Company of Australia Limited METALS DIVISION	
HELLYER RIVER WEST	
GEOPHYSICAL INTERPRETATION	
FIG 11	
SCALE 1:5000	DATE Nov. 61
AUTHOR G. Oakes	DRAWN A.S.

028

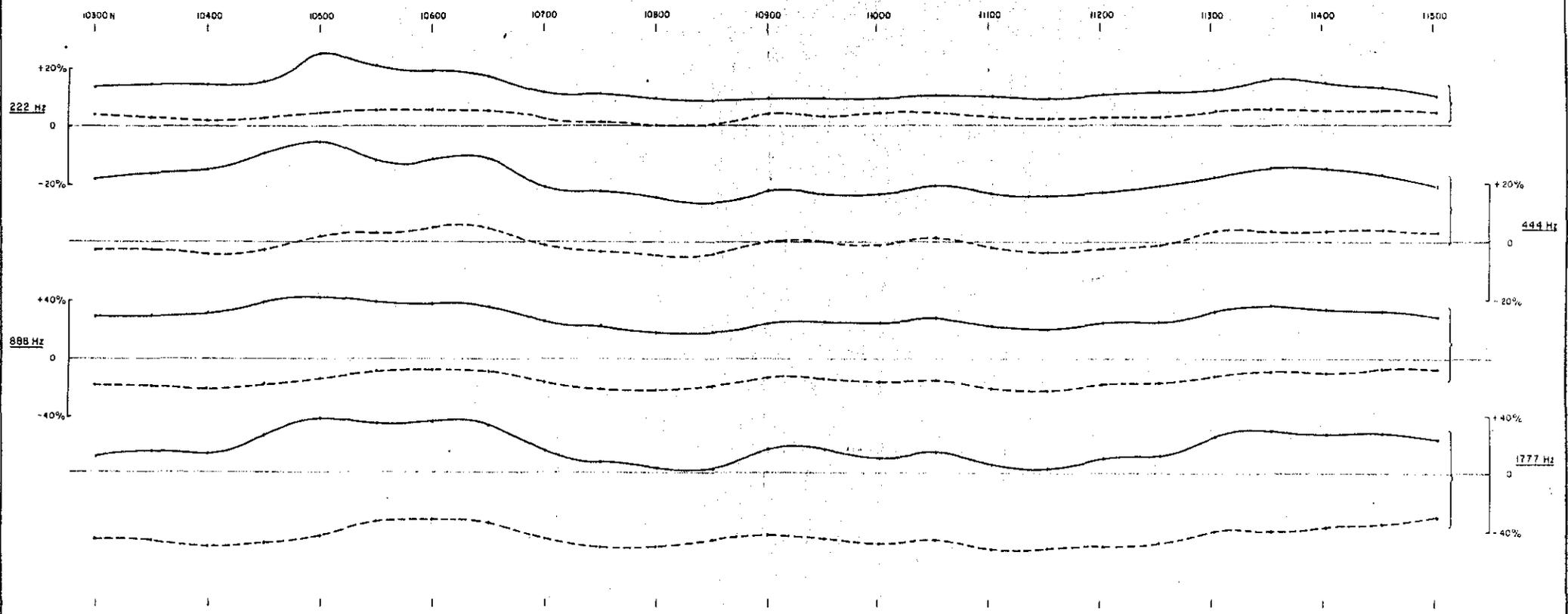
3.2.4 Hellyer River East 3841/2

- 3.2.4.1 Location. A 310 nT aeromagnetic anomaly 1 km east of the confluence of the Hellyer and Fossey Rivers.
- 3.2.4.2 Geology. A Tertiary basalt plan probably overlies the core of the Mt Pearse Syncline composed of Ordovician Gordon Limestone.
- 3.2.3.3 Geophysics. A ground magnetic survey was done initially at 25 m spacings over four lines and one baseline. An additional two lines and a short joining line were surveyed at 10 m spacings. A complex series of highs were located (Drawing Nos. D/MQ02/022, 021, 023).
- One line of gravity was surveyed. A small, 0.25 mgal, broad anomaly was associated with the major magnetic feature (Fig. 12).
- One line of Max-Min EM was surveyed. This failed to locate a bedrock conductor (Fig. 13).
- 3.2.3.4 Geochemistry. Soil sampling results were typical of basalt soil (Refer Appendix 7).
- 3.2.3.5 Conclusions & Recommendations. The anomaly is thought to be due to a basalt filled valley similar to Hellyer River West. No further work is recommended.



5 cm

030



Horizontal Scale 1:2500'

— I.P.
- - - O.P.

COIL SEP'N = 150 m

5 cm

The Steel Company of Australia Limited METALS DIVISION	
TASMANIA	
HELLYER RIVER EAST LINE 9400E MAX-MIN E.M.	
SCALE: 1:5000	DATE: 17/11/61
AUTHOR: N. Hunsford	DRAWN: A. Carter
OFFICE: A.H.O.	REF: Jan
DRG No:	FIG No: 13

449031

031

3.2.5 Wandle River 3841/3

- 3.2.5.1 Location. A 200 nT aeromagnetic anomaly, north of the Wandle River in the west of the licence.
- 3.2.5.2 Geology. A Tertiary basalt knoll on a basalt plain, possibly close to a Cambrian/Precambrian contact or major fault as indicated on regional magnetics and gravity.
- 3.2.5.3 Geophysics. Ground magnetics at 10 m spacings were done along three lines and one base line. A broad (150 m wide) 600 nT anomaly was located on one line and the baseline. Computer modelling indicated a shallow broad source (Figs. 14, 15, 16).
- A SIROTEM depth sounding on the site of the anomaly indicated a depth of greater than 200 m to pre-basalt basement (Sounding G, Appendix 9).
- 3.2.5.4 Conclusions & Recommendations. The anomaly is thought to be due to a basalt hill. No further work is recommended.

032

449033



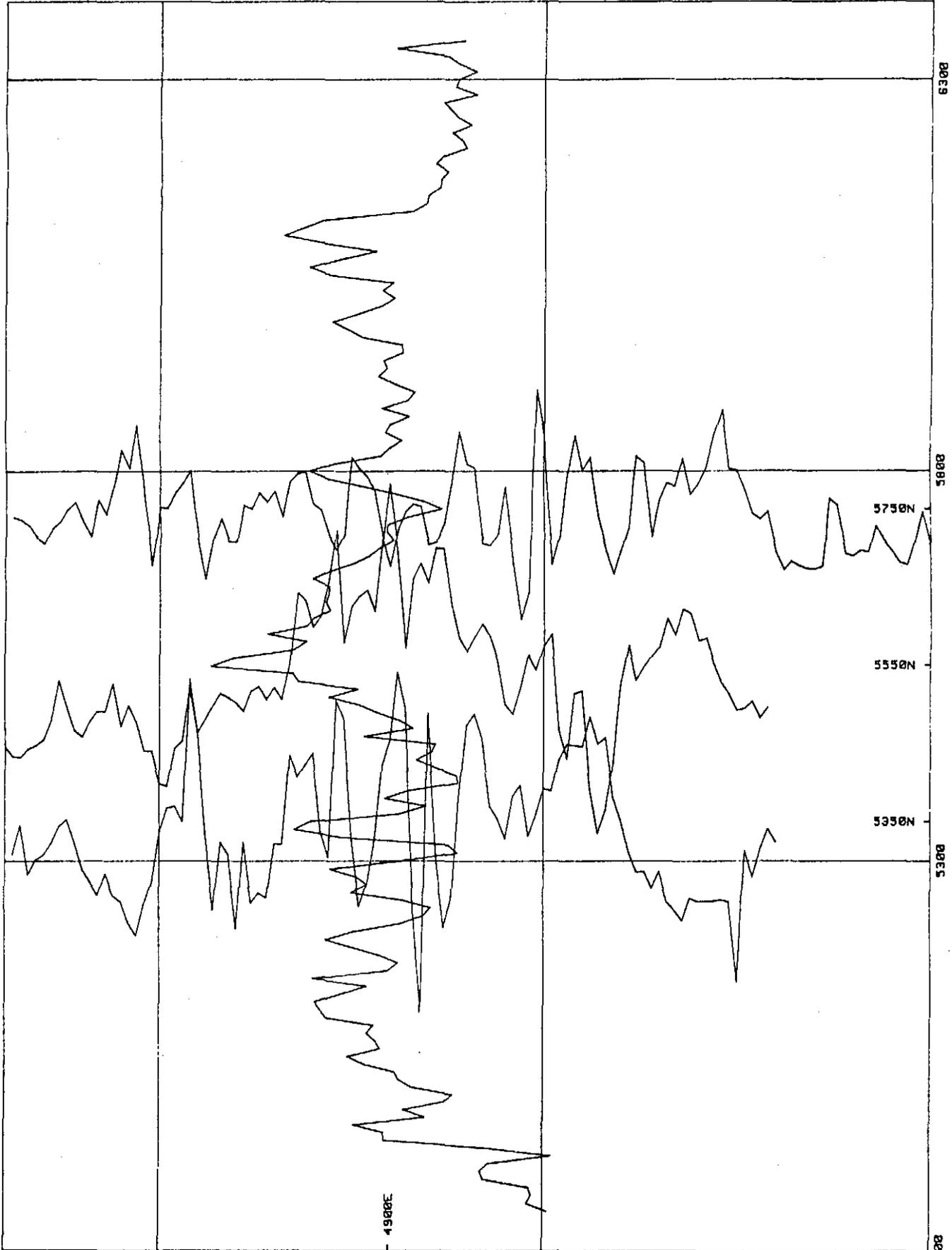
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
WANDELL Rvr, 3841/3
TOTAL MAGNETICS
UNFILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

FIG 14

5 cm



4500

4900

5100

5300
5550
5750
5900



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
WANDELL Rvr, 3841/3
TOTAL MAGNETICS
2x7pt FILTERED

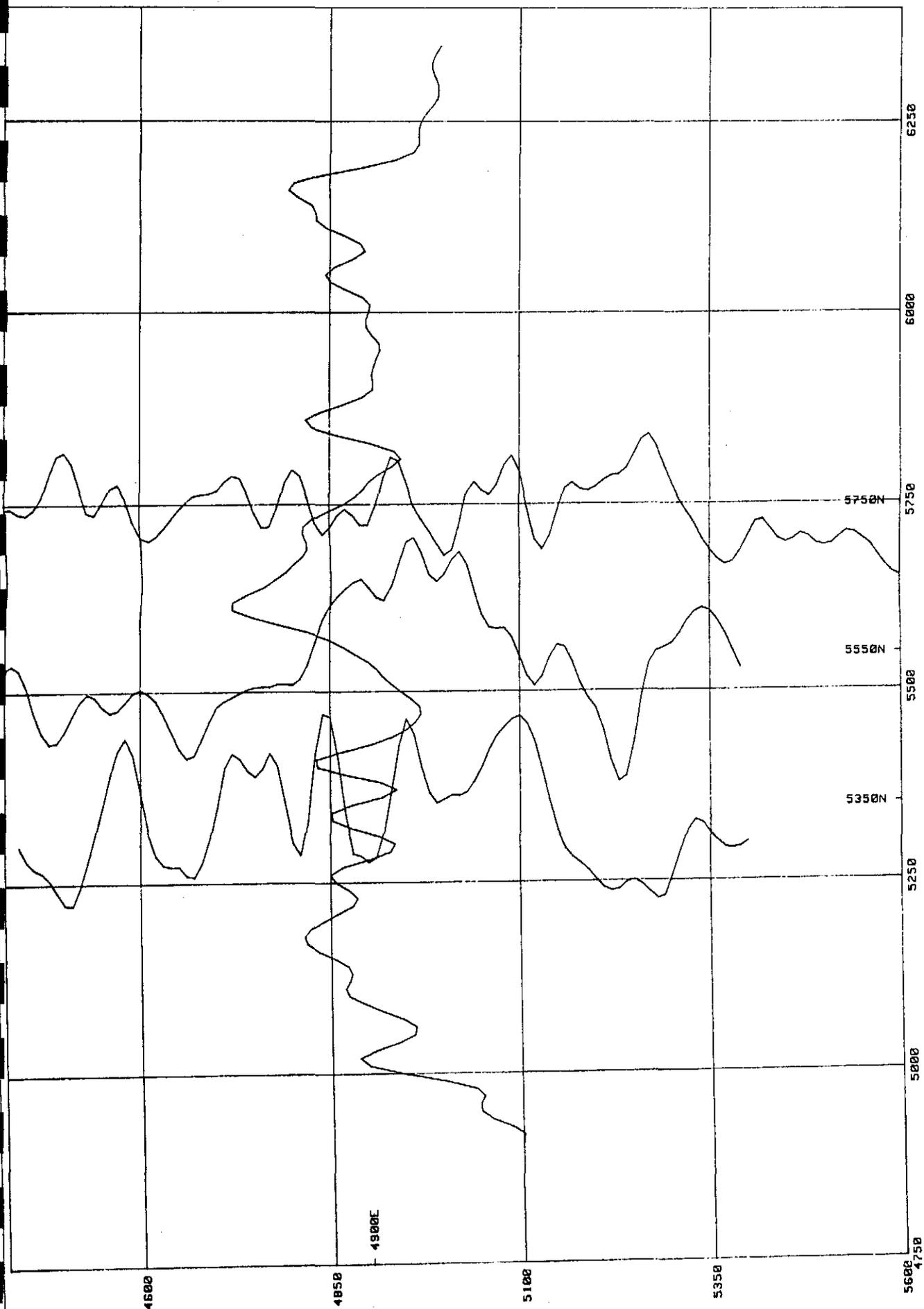
DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

Fig 15

033

449034

5 cm



4600 4850 5100 5350 5600 4750

4500E

5800 5250 5500 5750 6000 6250

035

3.2.6 Guildford Rd 3841/4

- 3.2.6.1 Location. A 150 nT aeromagnetic anomaly crossing the Guildford Road west of the Wandle River.
- 3.2.6.2 Geology. Tertiary basalt only outcrops on the gridded area, which may be near a Cambrian/Precambrian contact.
- 3.2.6.3 Geophysics. A ground magnetic survey at 10 m station spacing was done over four lines. A narrow (150 m) 500 nT anomaly was located at 4450N, 5800E amongst considerable high frequency noise. The source appears to be quite shallow (Figs. 17, 18, 19).
- 3.2.6.4 Conclusions & Recommendations. From regional considerations the basalt is thought to be quite thick (200 m) in this area. The magnetic anomaly appears to be related to a variation in basalt magnetisation (different basalt flows) and thus no further work is recommended.

036

449037



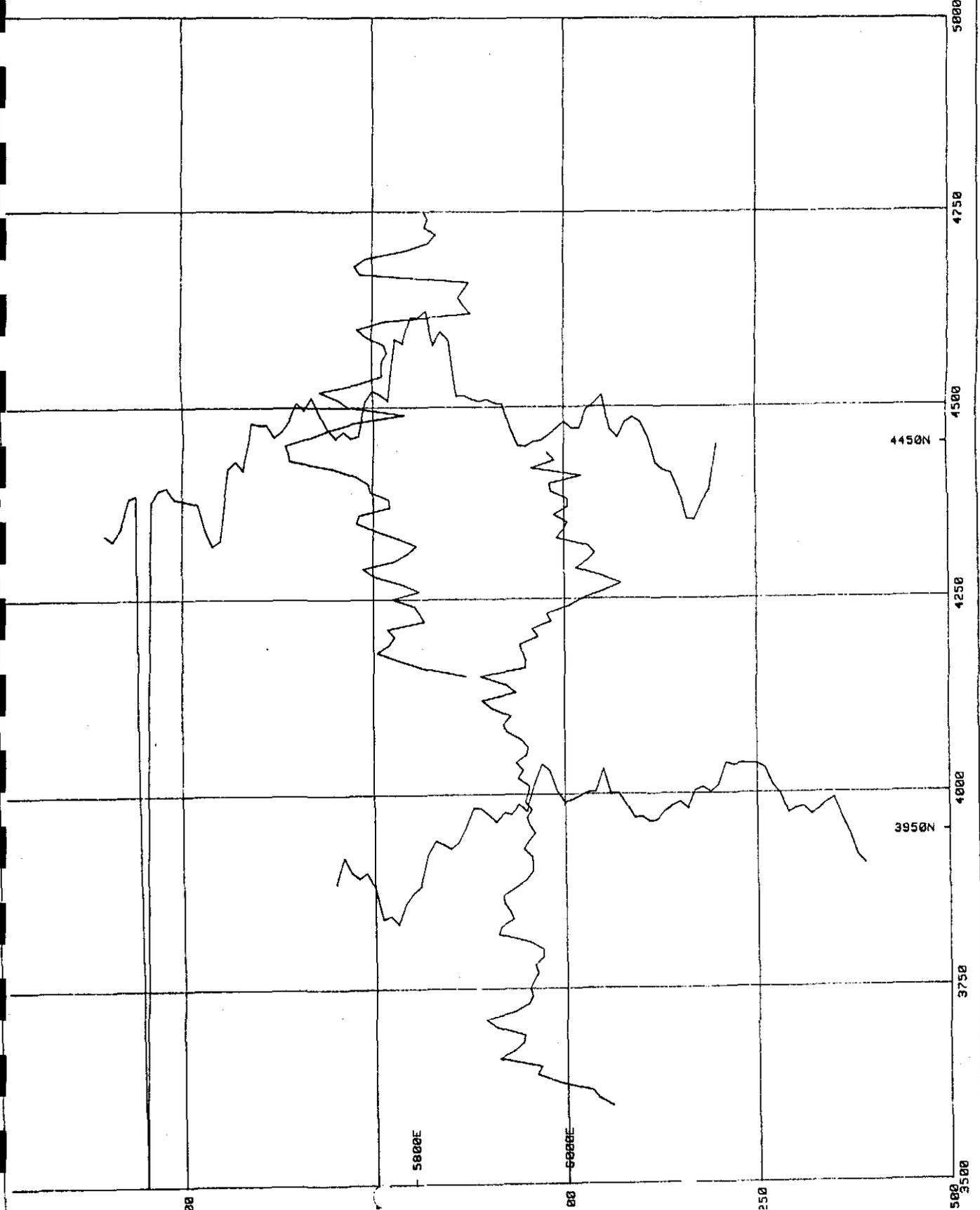
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
GUILDFD. RD. 3841/4
TOTAL MAGNETICS
UNFILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

Fig 17

5 cm





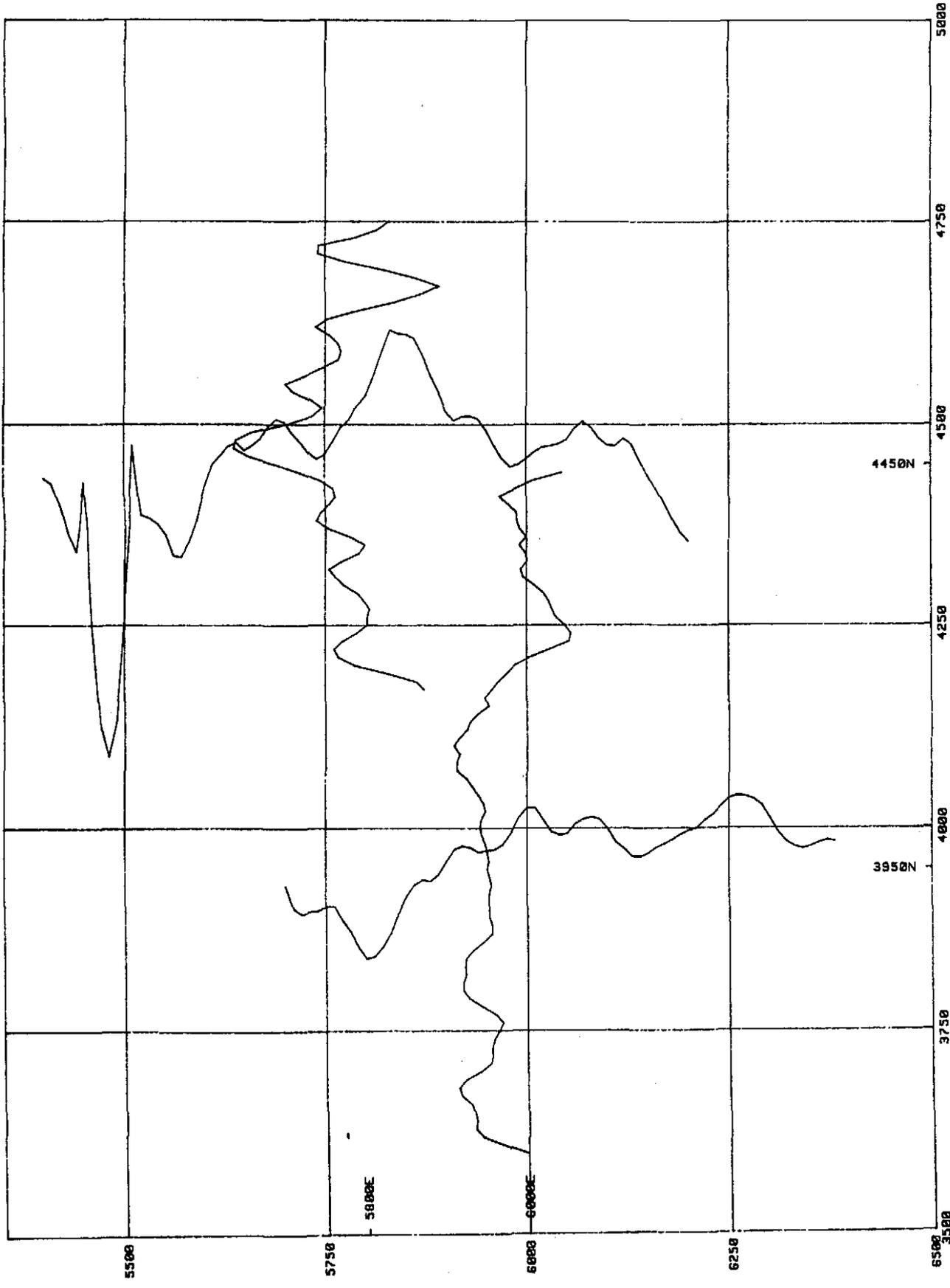
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
GUILDFD. RD. 3841/4
TOTAL MAGNETICS
7 pt FILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

FIG 18

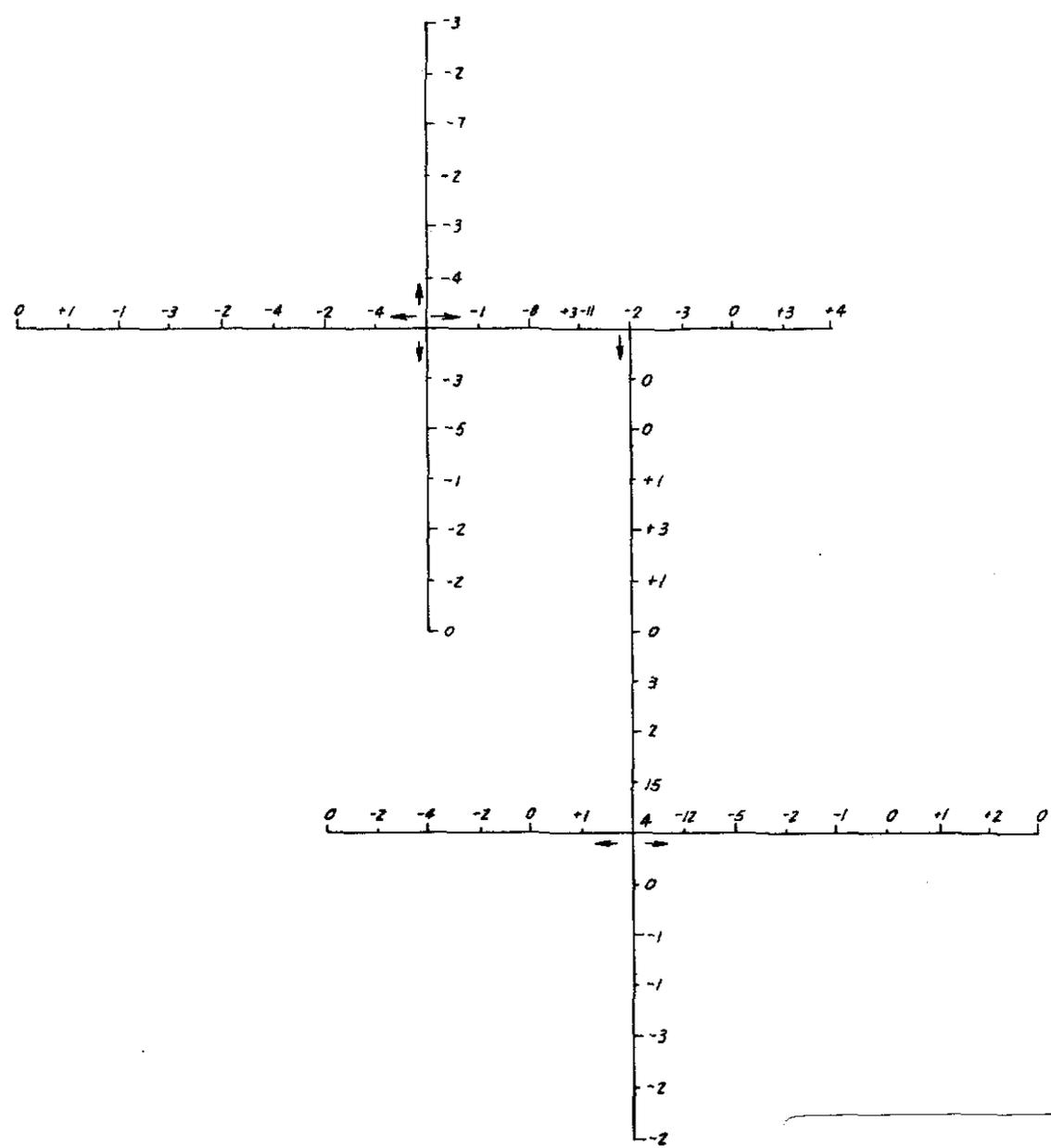
5 cm



038

4750 N
4450 N
3950 N
3650 N

5400 E
5600 E
5800 E
6000 E
6200 E
6400 E



5 cm



449039

The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD GUILDFORD ROAD GRID SLOPE CORRECTIONS (DEGREES)			
SCALE	1:5000	DATE	3-11-63
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP No.	
DRG. No.	D/MQ02/052	FIG. No.	19

039

3.2.7 Chilton Bridge 3841/5

- 3.2.7.1 Location. A 200 nT aeromagnetic anomaly approximately 1 km north of the Guildford Rd/Goderich Rd junction.
- 3.2.7.2 Geology. Only Tertiary basalt outcrops over the gridded area.
- 3.2.7.3 Geophysics. A ground magnetic survey at 10 m station spacing was carried out over one line and a broad (500 m) 300 nT anomaly located (Figs. 20, 21).
- 3.2.7.4 Conclusions & Recommendations. The anomaly coincides with a basalt hill and thus no further work is recommended.

040

449041



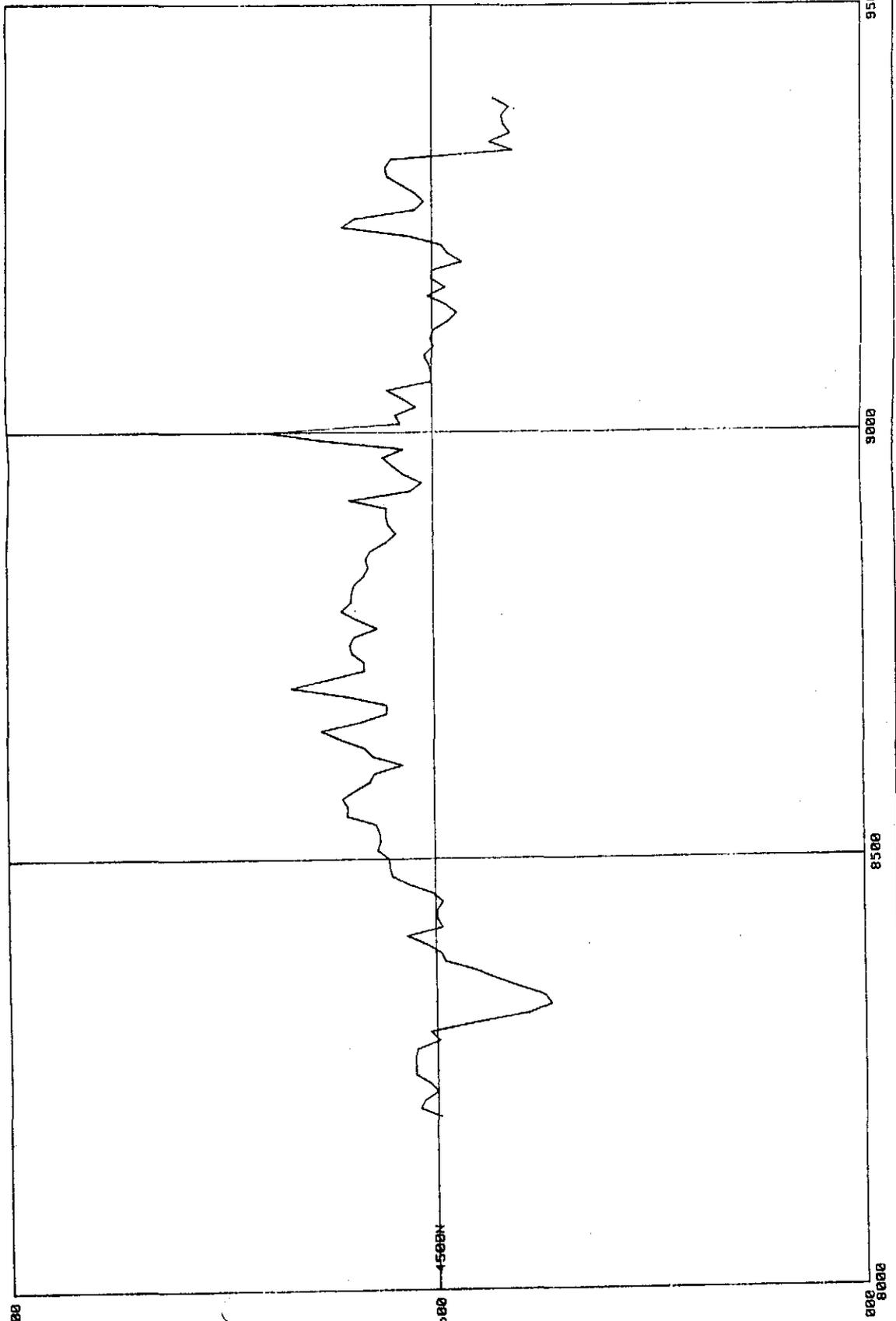
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
CHILTON BG. 3841/5
TOTAL MAGNETICS
UNFILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

FIG 20

5 cm



041

443042



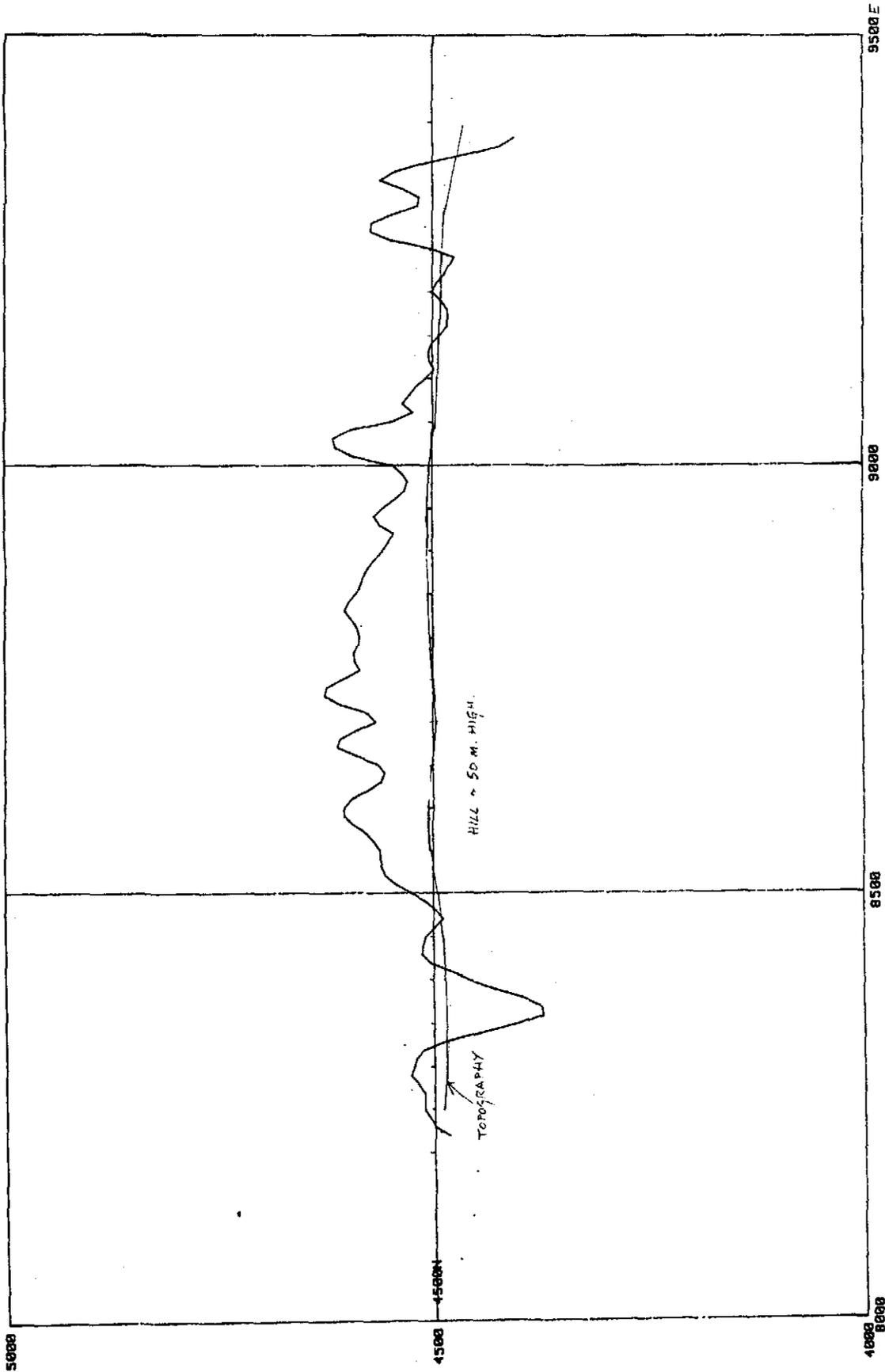
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
CHILTON BG. 3841/5
TOTAL MAGNETICS
7pt FILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 62000

Fig 21

5 cm



- 042
- 3.2.8.1⁷ ^{Page 382/11} Location. A 670 nT aeromagnetic anomaly located in the north west corner of the licence adjacent to the Hellyer River.
- 3.2.8.2 Geology. Tertiary basalt outcrops on this grid and may overlie Cambrian or Permian sediments.
- 3.2.8.3 Geophysics. Ground magnetics at 25 m station spacing over four lines and a baseline with follow up at 10 m intervals on one line located a broad (250 m) shallow (?) 1000 nT anomaly over 600 m long coincident with a hill (Drawing D/MQ02/016, 024, 020).

A broad gravity low of amplitude about 1 mgal was located on the one line surveyed (Fig. 23). This may indicate a coincident granite.

- 3.2.8.4 Geochemistry. Soil sampling gave typical basalt analyses except for two sites. Examination of the chips indicated a possible 'granitic' source, (Refer Appendix 9).

- 3.2.8.5 Conclusion & Recommendations. The coincidence of a gravity low with a magnetic high is unexplained, but is unlikely to indicate a source of economic interest. No further work is recommended.

This is the required signature for magnetic - po
 stams assoc. with granite (see section 3.1.2.
 Gravity anomaly) D.M.P.O.

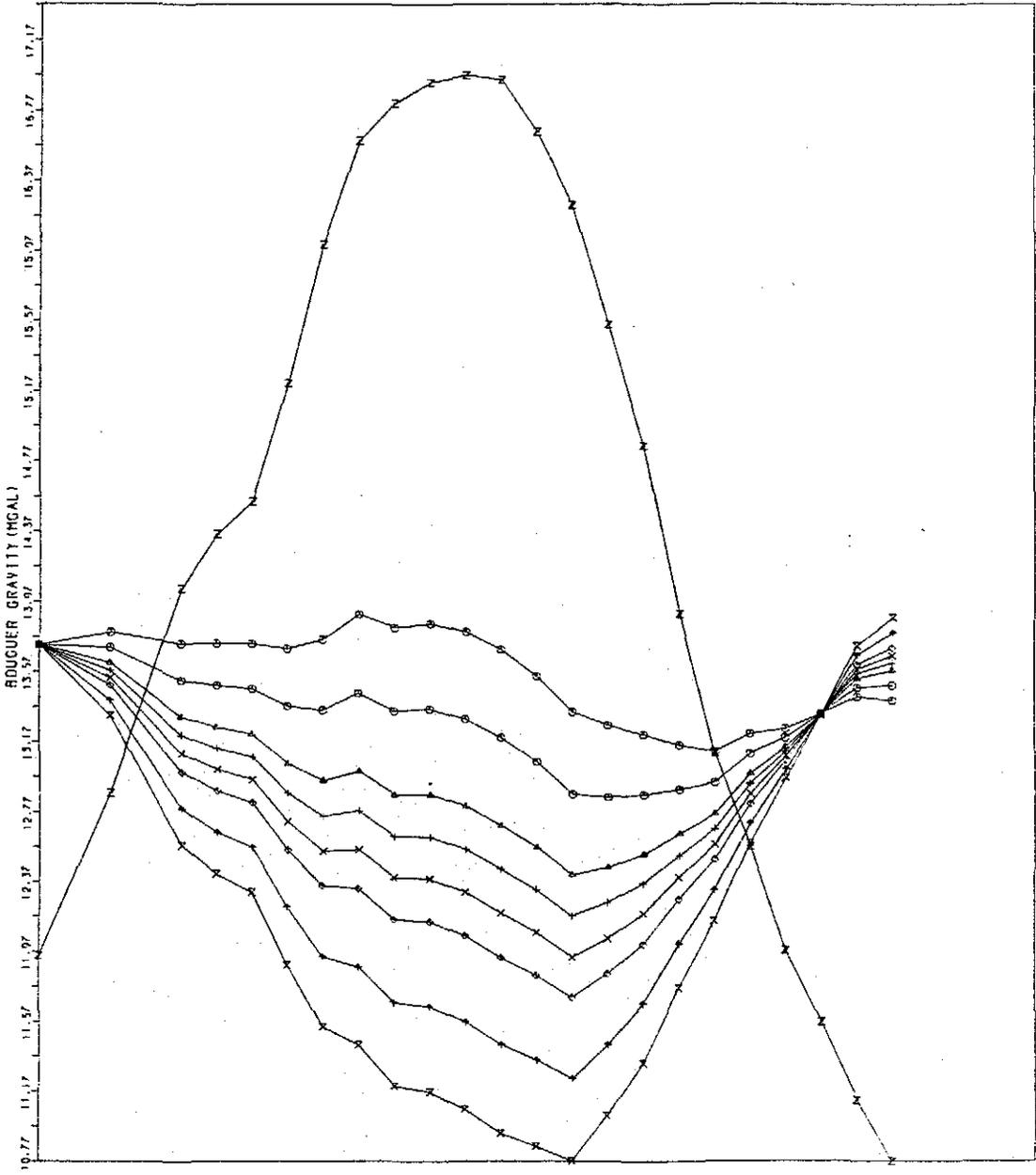
Is it worth drilling?!

Near edge of basalt overlying Permian tillite?

Magnetics - edge effect (?) of basalt

"Gravity" lowdown in tillite.

043



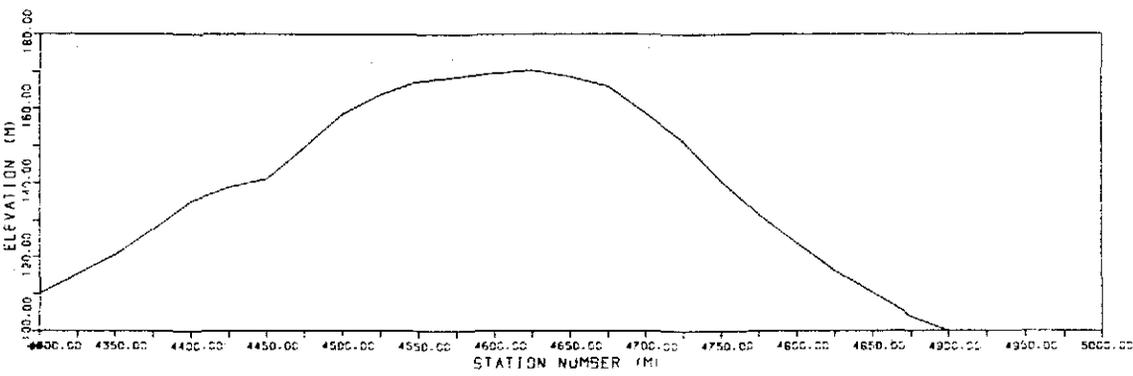
GRAVITY FACTOR PROGRAM

LINE 2700.00
STATION SCALE : 2500.

LEGEND

DENSITY	FACTOR
2.900000	0.224900
2.200000	0.216530
2.400000	0.205160
2.500000	0.203975
2.600000	0.199790
2.700000	0.195605
2.900000	0.187235
3.100000	0.178865
Z	FREE AIR GRAVITY

FACTOR IS CORRECTED FOR
FREE AIR AND BOUGUER



SHELL COMPANY OF AUSTRALIA METALS DIVISION	
TASMANIAN GRAVITY PARAWE	
LINE 2700E	
SCALE: 1 : 25000	
FIG. NO: 23	REPT. NO: .
ENCL. NO: .	DRG. NO: .
DATE: .	AUTHOR: G.O.
DRAWN: .	OFFICE: AHO

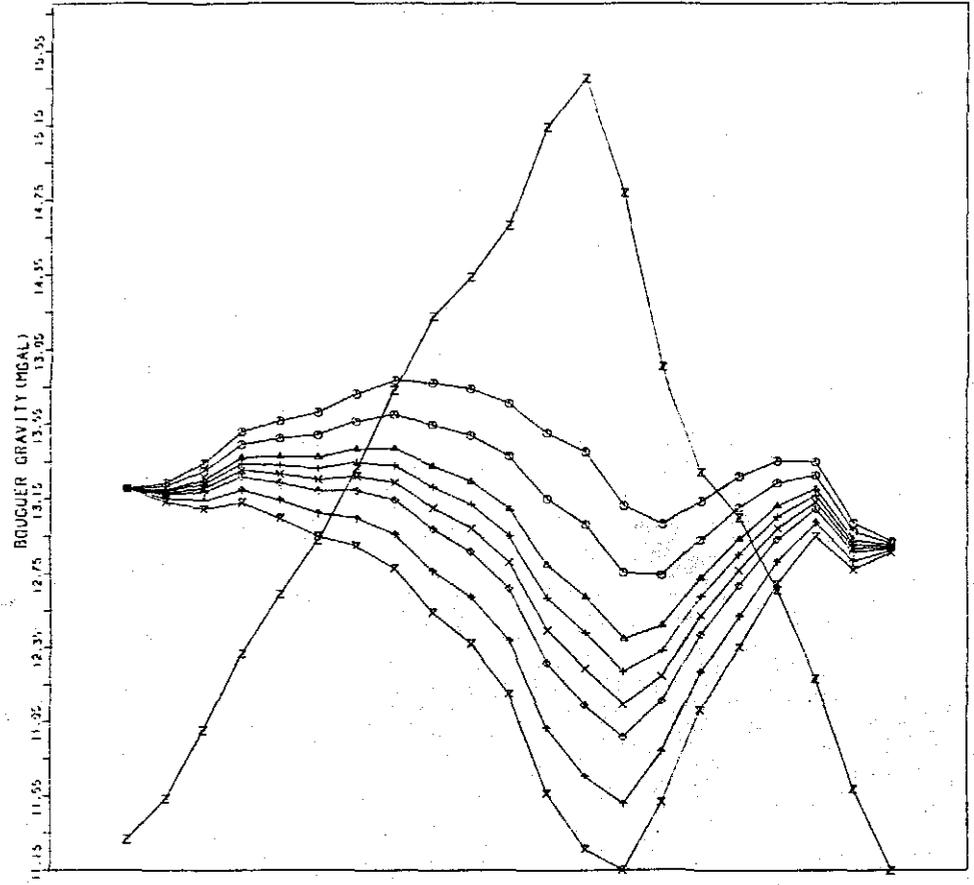
5 cm

Shooters Hill 3842/2

- 3.2.9.1 Location. A 400 nT anomaly located adjacent to and on the east bank of the Hellyer river approximately one kilometer north of the confluence with the Wey River.
- 3.2.9.2 Geology. Only Tertiary basalt outcrops on the grid. An outcrop of Moina Sandstone is located to the north east of the grid dipping south east. The anomaly is probably underlain by Moina sandstone.
- 3.2.9.3 Geophysics. Ground magnetics was done at a station spacing of 10 m over five lines plus a baseline. A narrow 1000 nT anomaly was located on one line. (Drawing Nos. D/MQ02/027, 025, 026).
- A gravity survey was done over one line. A sharp, 0.6 mgal negative anomaly was located which was not coincident with the magnetic anomaly (Fig. 24).
- 3.2.9.4 Geochemistry. Soil sampling gave typical basalt analyses. (Refer to Appendix 7).
- 3.2.9.5 Conclusions & Recommendations. The lack of positive gravity correlation downgrades the isolated magnetic feature. No further work is recommended on this anomaly.

045

449046



GRAVITY FACTOR PROGRAM

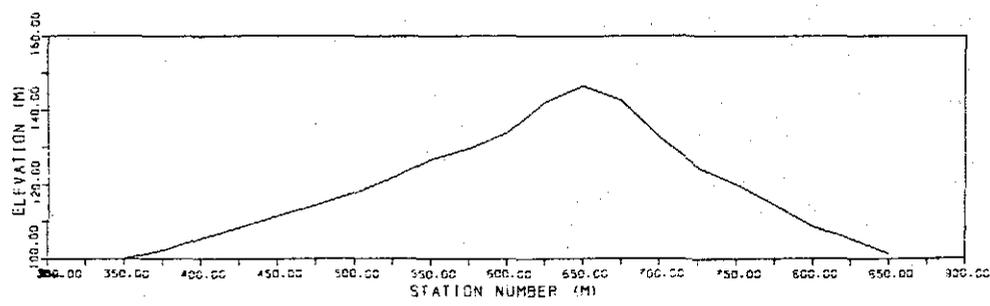
LINE 8100.00

STATION SCALE : 2500.

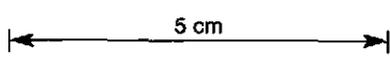
LEGEND

DENSITY	FACTOR
○ 2.000000	0.224900
○ 2.200000	0.216530
△ 2.400000	0.205160
+ 2.500000	0.203975
x 2.600000	0.199790
○ 2.700000	0.195605
+ 2.900000	0.187235
x 3.100000	0.175865
Z	FREE AIR GRAVITY

FACTOR IS CORRECTED FOR FREE AIR AND EQUIVER



SHELL COMPANY OF AUSTRALIA METALS DIVISION	
TASMANIAN GRAVITY SHOOTERS HILL	
LINE 6100E	
SCALE: 1 : 5000	
FIG. NO: 24	REPT. NO:
ENCL. NO:	CRG. NO:
DATE:	AUTHOR: G O
DRAWN:	OFFICE: AHO



Peak Spur Rd Anomaly

- 3.2.10.1 Location. This 350 nT aeromagnetic anomaly is located north of Peak Spur Rd approximately one-half kilometer from the Guildford Rd, and immediately south of the St. Valentine's Peak magnetite skarn.
- 3.2.10.2 Geology. The southern $\frac{3}{4}$ of the gridded area is overlain by basalt. Roland conglomerate boulders and rubble occur in the north of the area. A major structure trending NW-SE crosses the area. The gridded area was thought to overlie Gordon Limestone beneath the basalt.
- 3.2.10.3 Geophysics. Ground magnetics was carried out at 10 m station spacing over 4 traverse lines and one base line. This indicated the regionally prominent NW-SE fault in the north of the grid, and a major complex magnetic anomaly trending roughly SW (parallel to the expected sub-basalt regional geologic strike) (Figs. 25, 26, 27). The source of the magnetic anomaly did not appear to be deep and modelled susceptibilities were higher than expected from basalt.
- In order to assist in defining the cause of the magnetic anomaly a dipole-dipole IP survey was run on one line (a=100 m, n=1 to 4) (Fig 28). This confirmed a resistivity contact where the fault was expected and a broad ill-defined chargeability anomaly (twice background) south of the fault roughly coincident with a weak resistivity low.
- 3.2.10.4 Geochemistry. Soil samples were taken on two lines across the magnetic anomaly (Drg No. D/MQ02/047). These confirmed that the edge of the basalt was located at the possible fault on the magnetics.
- 3.2.10.5 Drilling. One Percussion/Diamond ^{PPI} drill hole was sited to test the magnetic/IP anomaly. The hole was collared at 150N 800E and drilled to a depth of 113.30 m (0-52 m percussion, 52-113.30 m diamond). (Refer Appendix 6).

SUMMARY LOG PPI

- 0- 67.60 Tertiary Basalt - some pyrite with chalcedony in vugs
- 67.60- 71.20 Tertiary sediments - greybilly conglomerate.
- 71.20- 79.50 Siltstone black, disseminated pyrite < 5%.
- 79.50-106.00 Calcareous siltstone, disseminated pyrite < 5%.
- 106.00-113.30 Limestone. Semimassive pyrite 106.1-106.3. No sign of metamorphism/metasomatism.

Selected core samples were submitted for analyses. The maximum values of 520 ppm Pb, 155 ppm Zn, 125 ppm Ni, 3 ppm Ag were returned from the zone of semi-massive sulphide.

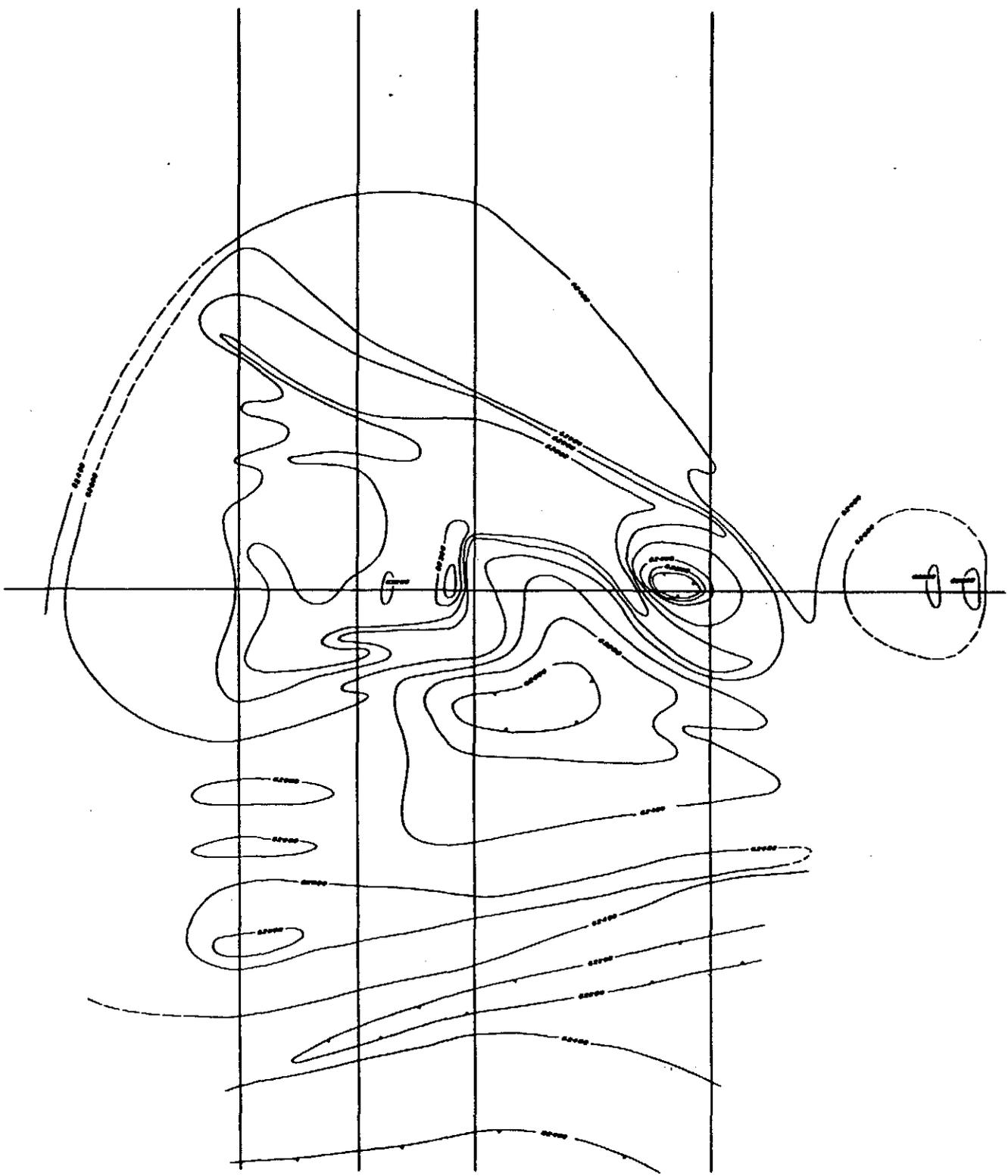
Down hole logging (to only 90 m) for chargeability and resistivity showed relatively high resistivities throughout the hole and an increase in chargeability towards the base of the

047

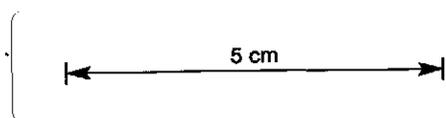
1000.10 cgs units.

3.2.10.6 Conclusions & Recommendations. It is thought the magnetic anomaly is due to high magnetic remanance in the shallow basalt. The lack of metamorphic minerals in the underlying limestone would indicate that no magnetite skarn source is likely at a reasonable depth below the end of hole. The drill hole confirmed the existence of Gordon Limestone at depth and confirms the interpreted structure. No further work is recommended for this anomaly.

1000 N



1000 S



C.I. = 200 AT

The Shell Company of Australia Limited METALS DIVISION	
GUILDFORD E.L. PEAK PLAIN ANOMALY GROUND MAGNETIC CONTOURS TOTAL FIELD	
SCALE 1:10,000	DATE June 1983
AUTHOR NH	DRAWN AS

049



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

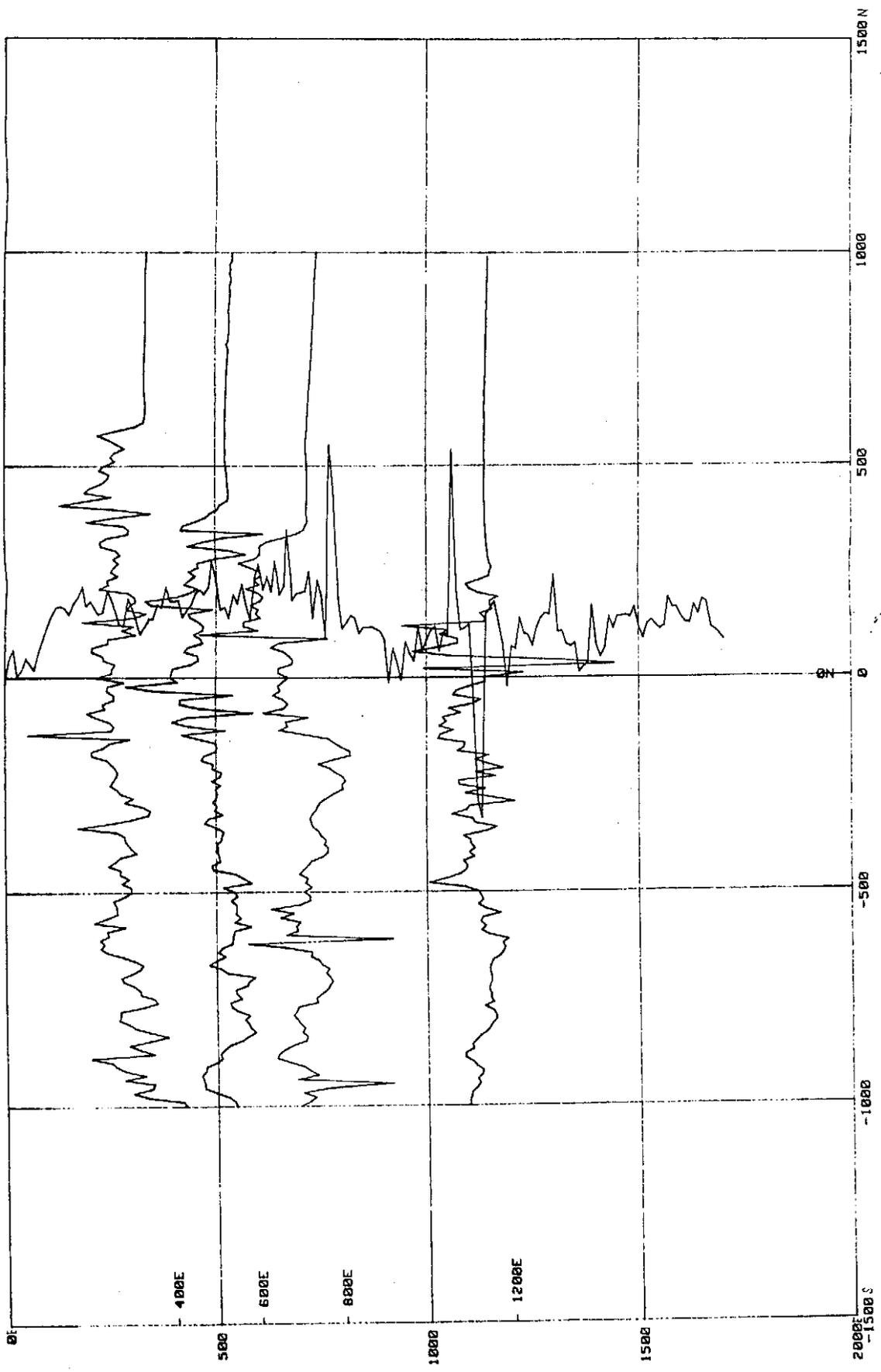
GUILDFORD E.L., TAS
PEAK PLAIN 3941/3
TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 100 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

449050

FIG 26
SERIES NO. 1008

5 cm



050



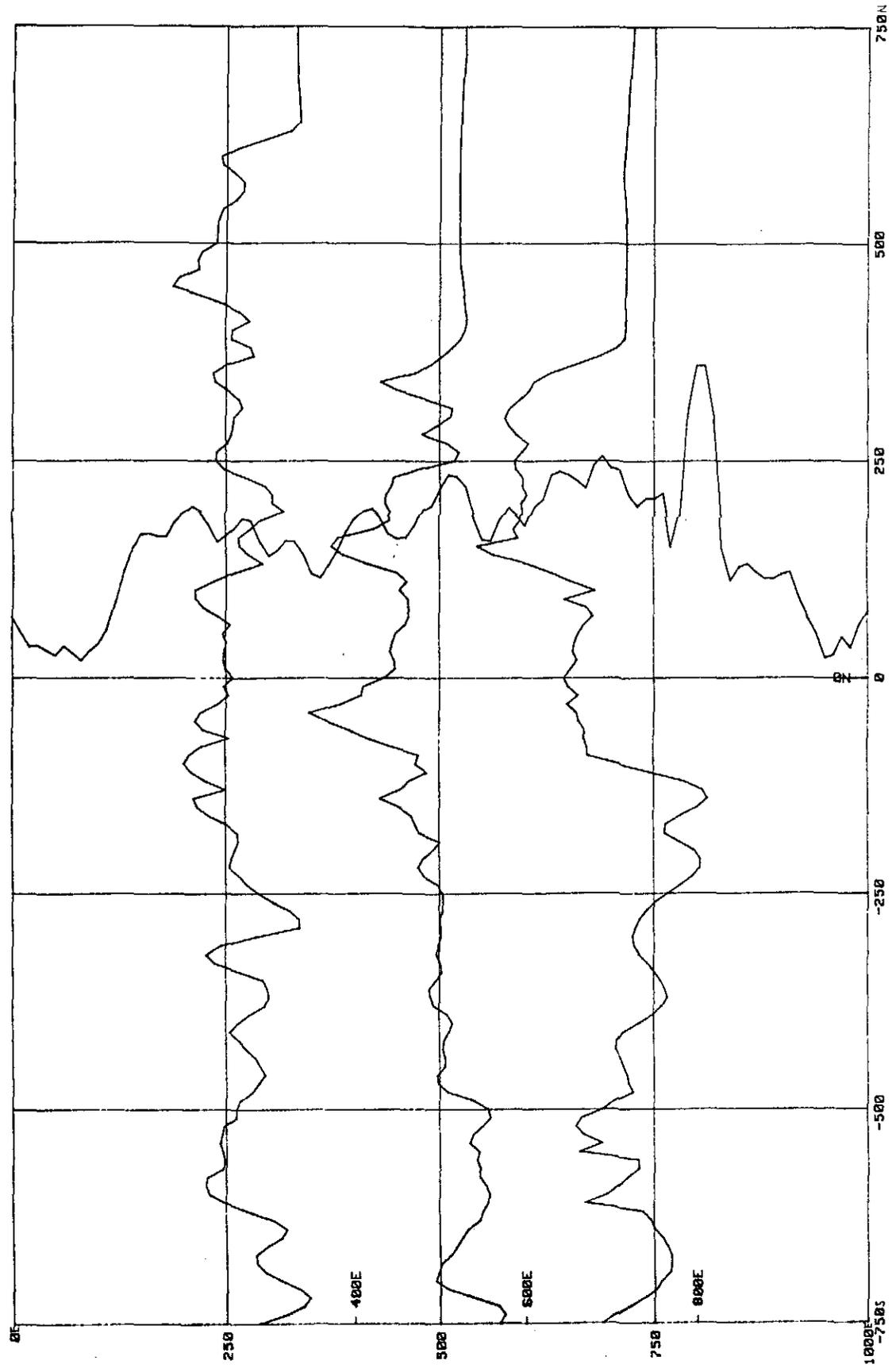
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

GUILDFORD E.L., TAS
PEAK PLAIN 3941/3
MAGNETICS
7 PT. FILTER

DISTANCE SCALE : 50 M/CM
READING SCALE : 250 /CM
BASE READING : 62000

FIG. 27
SUS 40-1016

5 cm

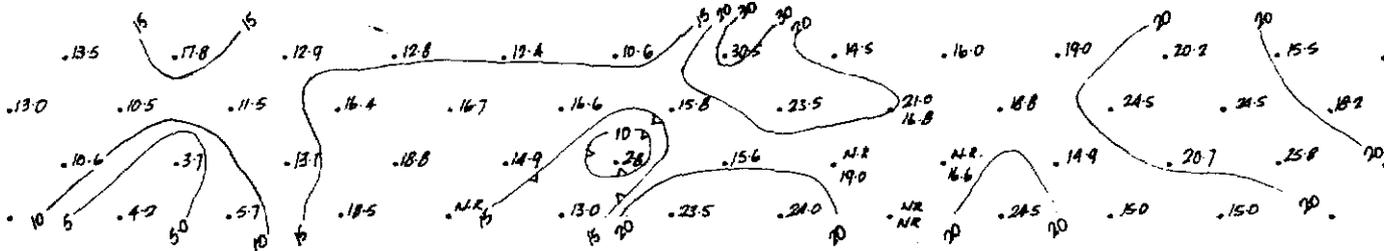


GEOLOGY
& TOPOGRAPHY

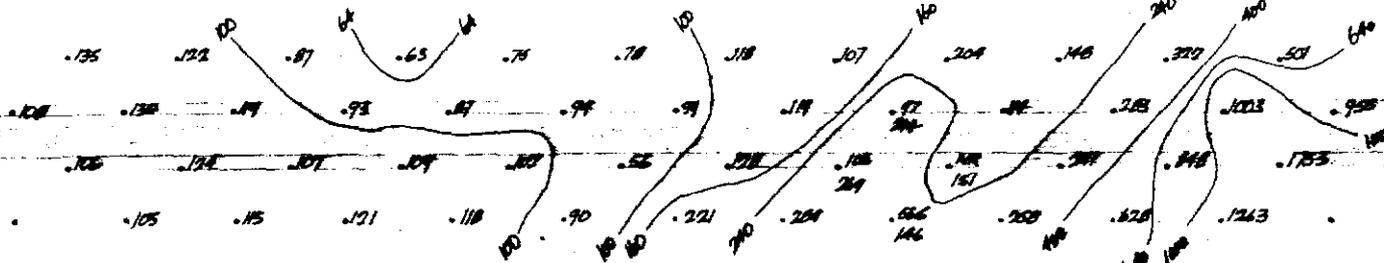
? FAULT (MAGNETICS)

400 S 300 S 200 S 100 S 00 100 N 200 N 300 N 400 N 500 N 600 N

APPARENT CHARGEABILITY.



APPARENT RESISTIVITY.



Contractor : SCINTRIX
 Date : 27-8-88
 Timing : 2 Sec.
 Transmitter : 1 P7AA 2.5kw
 Receiver : 1 PR8
 Integration time :
 Array : DIPOLE - DIPOLE
 Dipole length : 100 m

The Shell Company of Australia Limited
 METALS DIVISION
 E.L. 1/76 GURDFORD
 PEAK PLAIN, LINE 800E
 I.P. / RESISTIVITY SURVEY

DATE	11-8-88
BY	ILL
REPORT	
DPACC2050	FIG NO. 26

3.2.11 Old Park Road 3941/4

3.2.11.1 Location. Two weak aeromagnetic anomalies, the northern one having a maximum amplitude of about 90 nT, adjacent to the Old Park Rd/Peak Spur Rd junction.

3.2.11.2 Geology. Tertiary basalt outcrops in the gridded area, north of an area of Florence Sandstone outcrop. The area is probably underlain by Bell Shale and at great depth by Gordon Limestone

3.2.11.3 Geophysics. Groundmagnetics at 10 m station spacings was done along five lines (Figs. 30, 31 and Drg No. D/MQ02/048). Of the lines surveyed there was no obvious anomaly suggestive of a skarn at depth. The grid lines may, however, be poorly located with respect to the aeromagnetic anomalies.

3.2.11.4 Conclusions & Recommendations. No magnetic anomaly of interest was recovered. The anomaly does not appear to be associated with stratigraphy of interest. No further work is recommended in this area.

05A



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

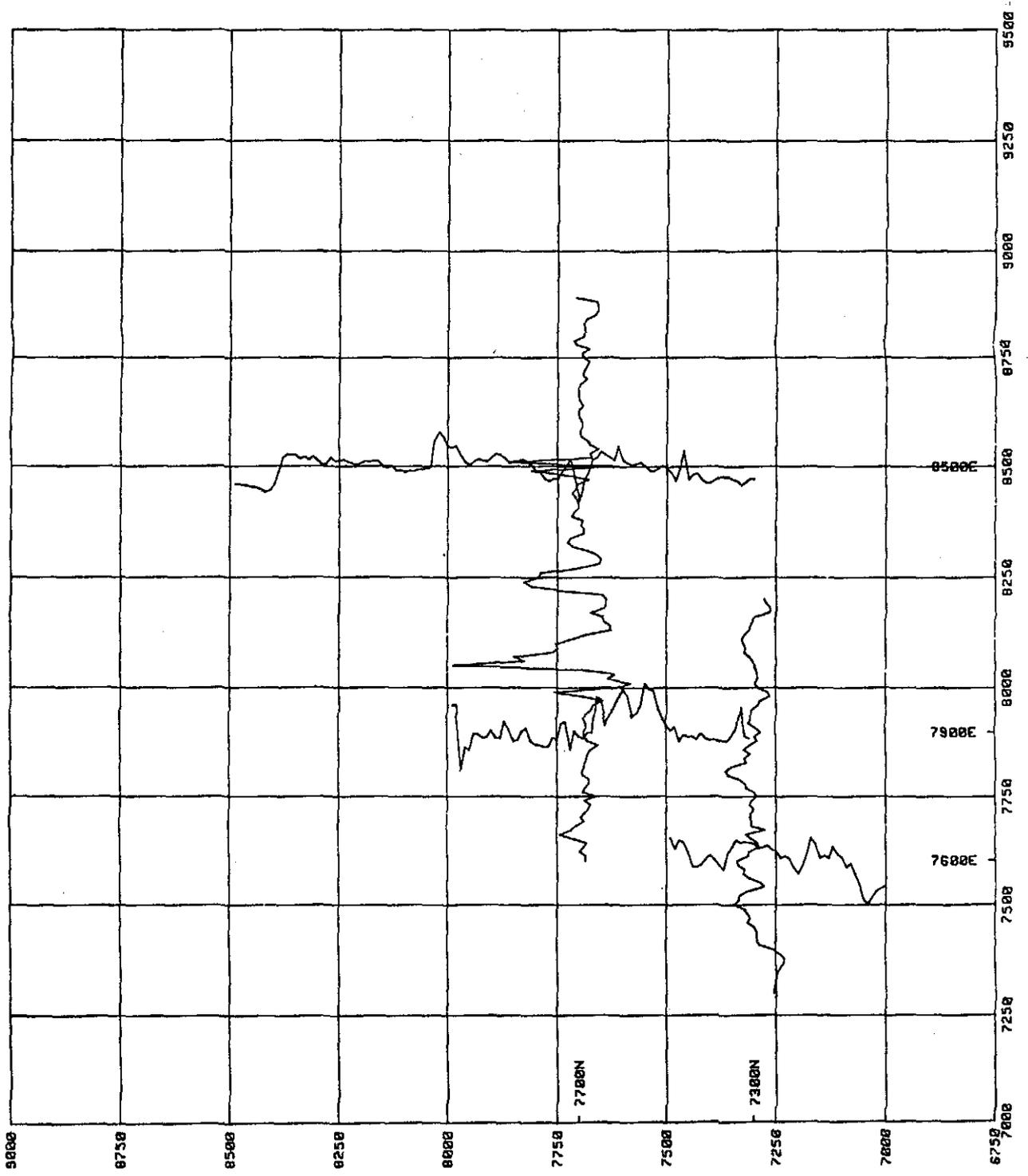
GUILDFORD E.L., TAS
OLD PARK Rd 3941/4
TOTAL FIELD
MAGNETIC PROFILES

DISTANCE SCALE : 100 M/CM
READING SCALE : 1000 /CM
BASE READING : 62000

FIG 30
DRG NO 1014/A

449055

5 cm



055



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

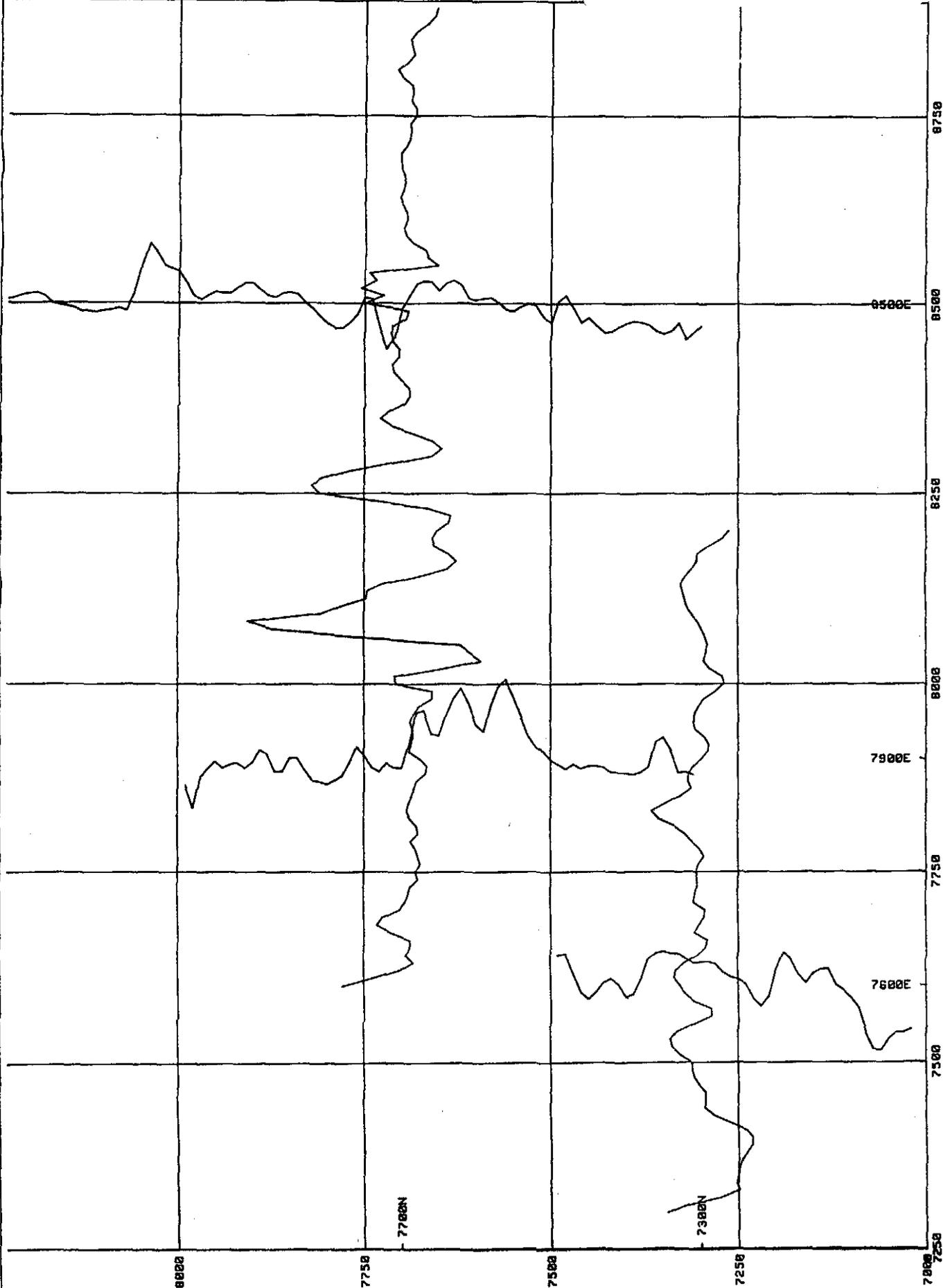
GUILDFORD E.L., TAS
OLD PARK Rd 3941/4
TOTAL FIELD
MAGNETIC PROFILES
(FILTERED)

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 γ/CM
BASE READING : 82000

FIG 31
DRG NO. 1015

449056

5 cm



3.2.12 St Valentines 3942/1

- 3.2.12.1 Location. This grid was established by Comalco Ltd on the SE flank of St Valentine's Peak over a long linear 400 nT aeromagnetic anomaly.
- 3.2.12.2 Geology. The area is underlain in the west by the NNE trending Roland Conglomerate that composes the St Valentine's Peak. This appears to be overlain, with a fault contact, by various argillaceous units grading up to a sandstone and including some limey horizons. The whole zone has been contact metamorphosed and magnetite and epidote garnet skarn developed in some of the limestone units. (Refer Weste, 1979).
- 3.2.12.3 Geophysics. The ground magnetic work done by Comalco Ltd was repeated and modelled.
- 3.2.12.4 Conclusions & Recommendations. It was concluded that the thin skarn intersected in the Diamond Drill Hole SV1 adequately explains the ground magnetic anomaly. No further work is proposed for this anomaly.

Skarn shown is a target.

3.2.13 Basils Rd 3942/2

3.2.13.1 Location. Basils Rd is located in the narrow northern sector of the licence. Various geophysical techniques were used along Basils Rd to the west of its junction with the Guildford Rd. It was used, because of favourable access, as a representative example to test a string of aeromagnetic anomalies which trend NNE to the west of Companion Hill.

3.2.13.2 Geology. One small cutting of possible Cambrian sediments capped by basalt soil was located approximately half way along the road. It consisted of very weathered argillaceous rocks and a fine grained siliceous (chert?, volcanic?) rock. This outcrops in a zone of flat magnetics. All other exposures are of basalt.

3.2.13.3 Geophysics. A ground magnetic survey at 10 m station spacing was done along Basils Rd. (Figs. 36, 37). This showed high frequency, high intensity basalt noise superimposed on a broad (1 km) 800 nT anomaly in the east. An area of flat magnetic responses was situated over a zone of possible Cambrian subcrop.

A dipole-dipole IP ($n=200$ m, $a=1$ to 8) survey was done along the eastern half of the road. (Drg. No. D/MQ02/24). This showed a zone of low chargeability and low resistivity in the east separated by a marked gradient from a zone of higher chargeabilities and resistivities in the west. The resistivity contours suggest a contact possibly marking the western side of a basalt valley. The higher chargeabilities in the west may be due to disseminated sulphides in the adjacent Cambrian sediments.

Two SIROTEM soundings were made in the western half of the line. Both indicated depth to basement in the order of 100 m. The possible effect of SPM on the soundings is discussed in para 3.1.3.2.

3.2.13.4 Geochemistry. Soil sampling was done over part of the line thought to be underlain by pre basalt rocks. A zone of 200 m was outlined as being non basalt soils. In various other cuttings of Cambrian? sediments overlain by basalt, iron staining indicating a high mobility for some elements (including Ni) was noted. Using Pb instead of Ni as an indication of Cambrian rock showed a window of approximately 340 m width.

3.2.13.5 Conclusions & Recommendations. The Basils Rd traverses showed a deep basalt valley coinciding with the zone of magnetic highs in the east. A small window of subcropping Cambrian sediments was detected giving a western edge to the Companion Hill syncline.

No further work is recommended in this area.

058



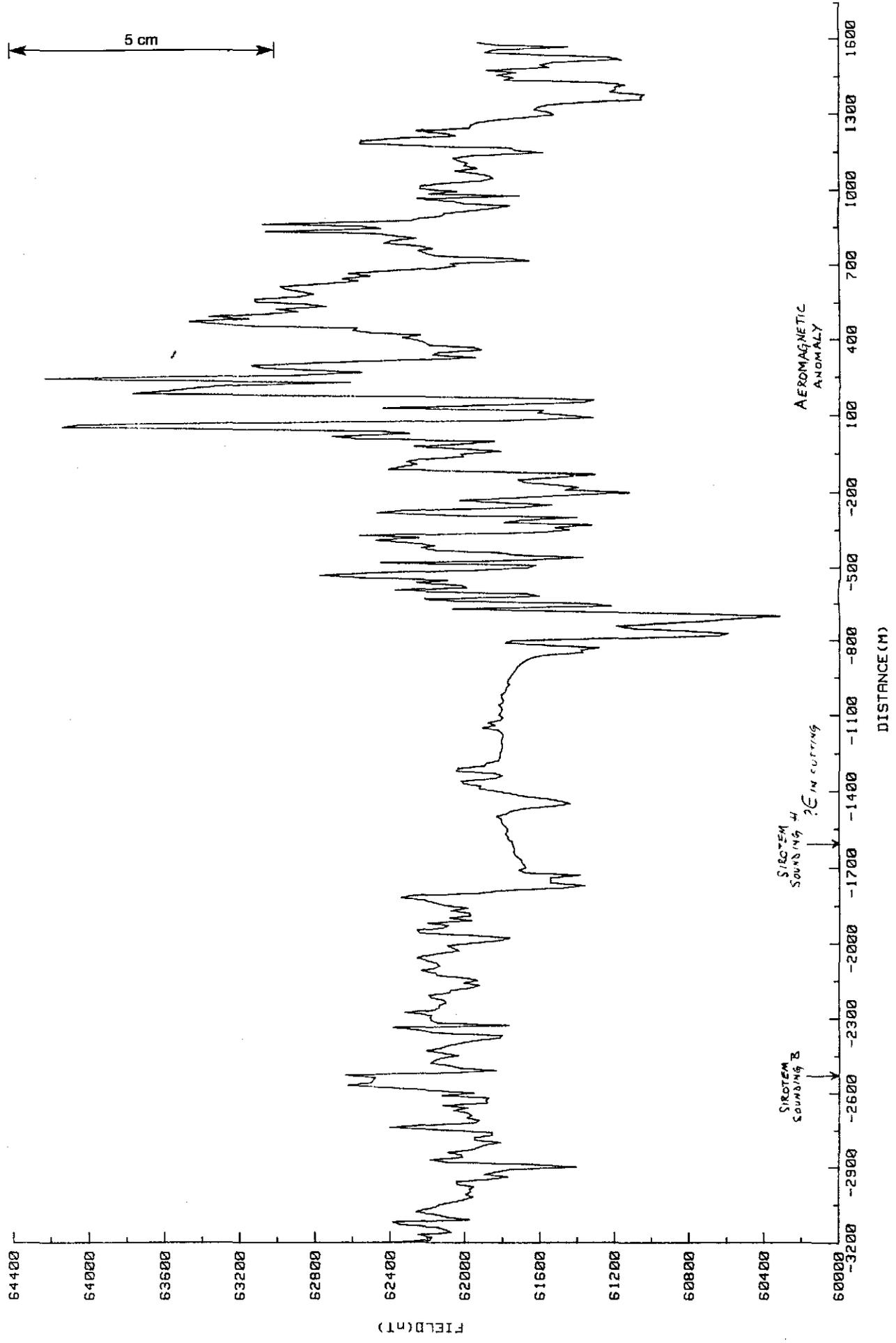
SHELL COMPANY OF AUSTRALIA
METALS DIVISION
TOTAL MAG. FIELD - PROFILE

N.W. TASMANIA
GUILDFORD E.L.
BASILS ROAD 3942/2
GRD MAG. UNFILTERED

LINE NAME : 00N
DETAIL No 1 TO 480

1:15000

Fig 36



053



SHELL COMPANY OF AUSTRALIA

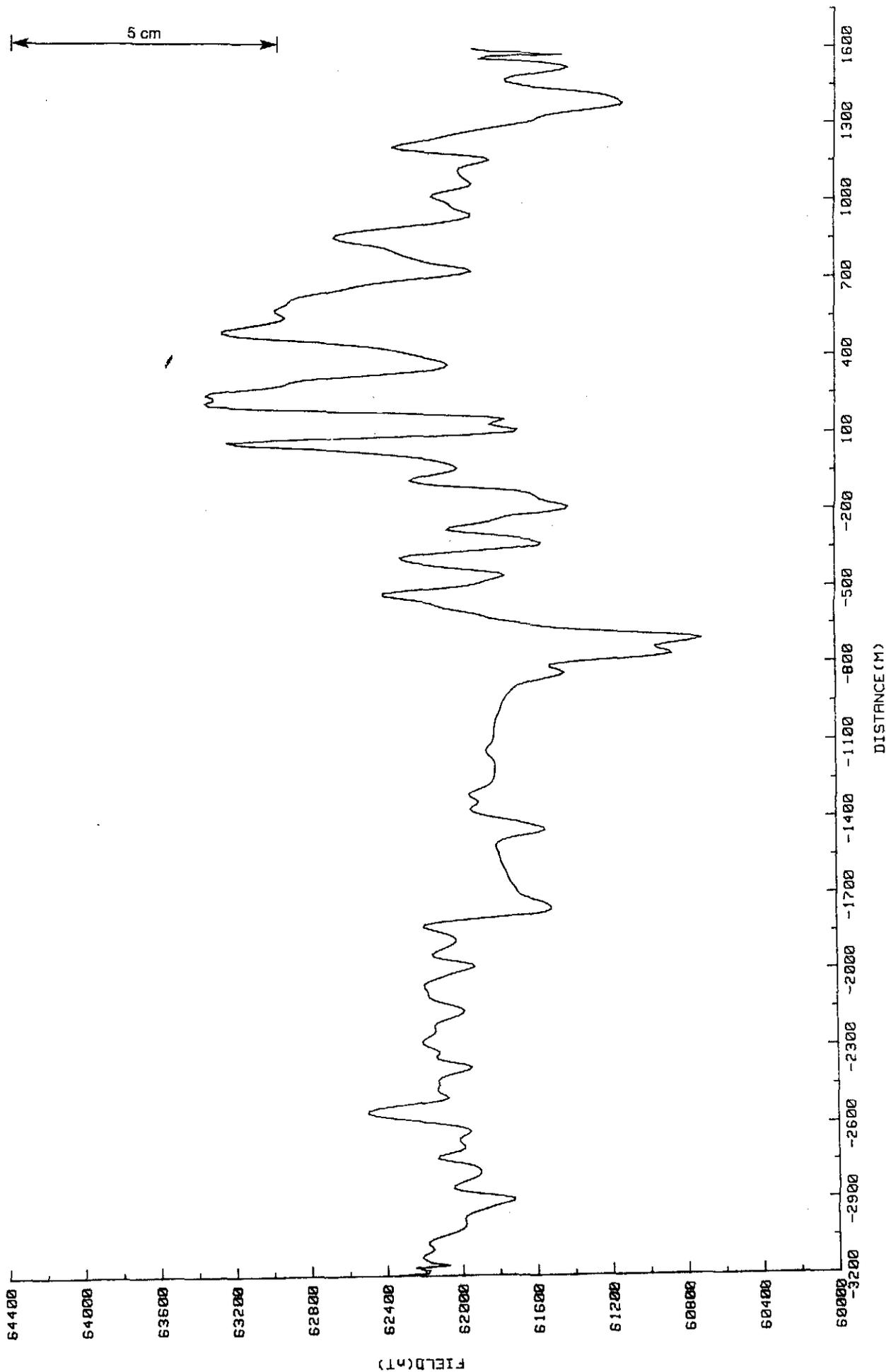
METALS DIVISION

TOTAL MAG. FIELD - PROFILE

N.W. TASMANIA
GUILDFORD E.L.
BASIL'S ROAD 3942/2
GRD MAG 11 Pt Fil1t

LINE NAME : 00N
DETAIL No 1 TO 480
1/15000

FIG 37



060

3.2.14 Bunkers Rd Stratigraphic Drill Hole 3942/3

3.2.14.1 Location. Beside Bunkers Road approximately one km from the junction with 29 Mile Rd.

3.2.14.2 Geology. A stratigraphic hole was drilled to 202.5 m but intersected only basalt. (Refer Appendix ~~5~~⁷).

3.2.14.3 Geophysics. A subsequent AMT sounding at the site gave an approximate depth to resistive basement of 260 m.

A SIROTEM sounding at the same site gave a depth to basement of 244 m. The hole was logged for IP/Resistivity from 160-202 m (Fig. 32).

3.2.14.4 Conclusions & Recommendations. The drill hole failed to penetrate to the preTertiary basement which, from the depth soundings, appears to be an additional 50 m deeper. No further work is recommended.

061

449062

SHELL COMPANY OF AUSTRALIA LTD.

Geophysical Log

PAGE 1 OF 3 PAGES

DIAMOND DRILL HOLE N° : SH-1

PROJECT : BUNKER RD HIGHCREE	STATE : TAS	IP / RESISTIVITY LOGGING —
ANOMALY N° : 3941/2	GRID COORDS (AMG) : 5421000mN 392000mE	CONTRACTOR : SCIPITREX (TAS-103) DATE LOGGED : 10 JAN 83
INCLINATION : 90°	AZIMUTH : —	ARRAY : DM. 3 ARRAY ELECTRODE SPACINGS : 10m
DATE DRILLED : 9-19/12/82	TOTAL DEPTH : 202.5m	SUSCEPTIBILITY LOGGING
CASING :		BY : DATE LOGGED :

GROUND GEOPHYSICAL ANOMALIES : MAGNETIC

M6

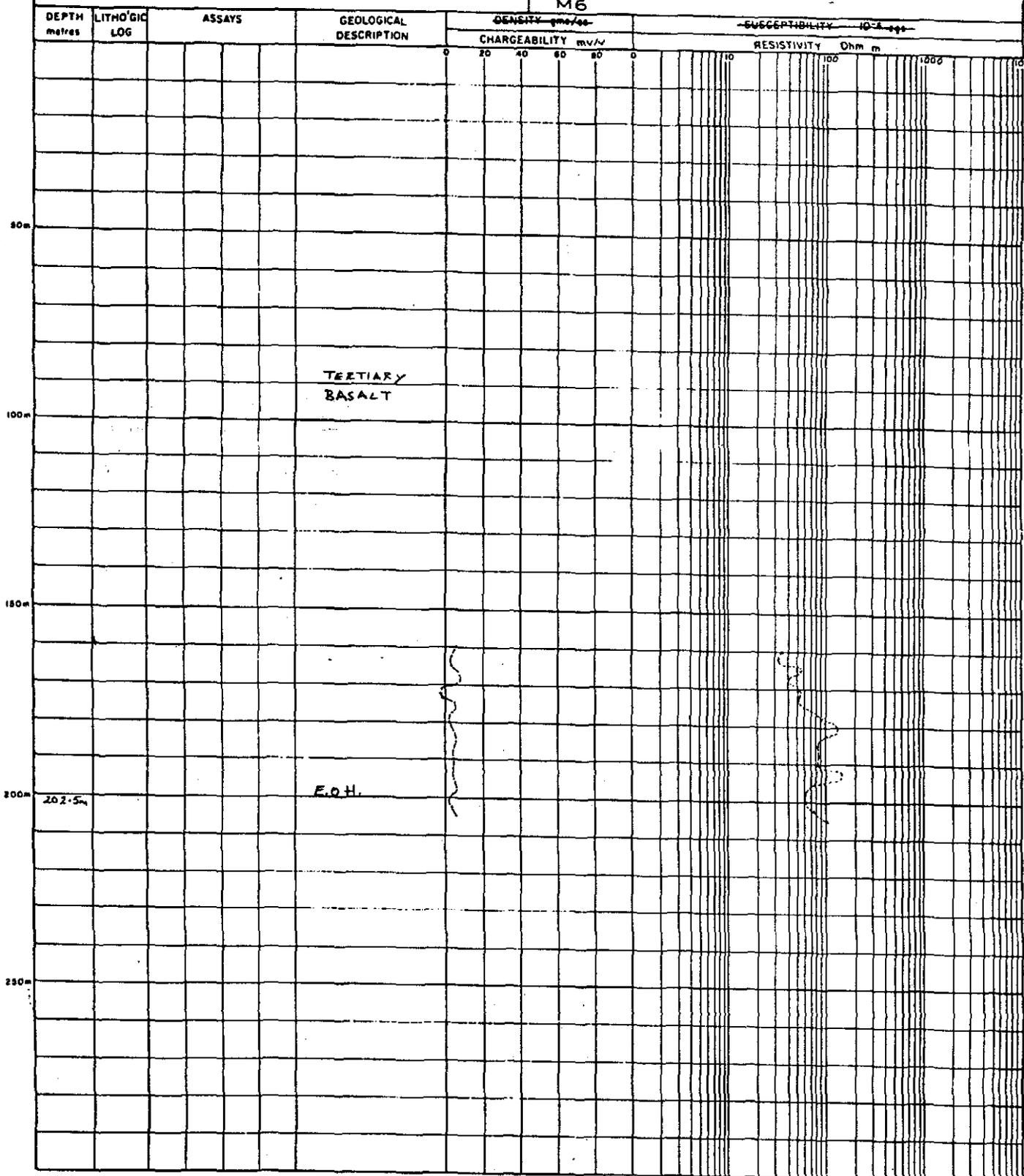


FIG 32

062
3.2.15 Reservoir West 3942/6

- 3.2.15.1 Location. A 200 nT aeromagnetic anomaly north of the Companion Reservoir.
- 3.2.15.2 Geology. Tertiary Basalt covers most of the grid except for two small weathered outcrops of Cambrian argillaceous sediment in road cuttings in the east of the grid.
- 3.2.15.3 Geophysics. Ground magnetics was done at 10 m station spacings along four lines and a base line (Figs. 33-35). A narrow N-S elongate shallow 800 nT anomaly was recovered with superimposed spiky basalt responses.
- 3.2.15.4 Conclusions & Recommendations. The anomaly appears to be related to a basalt hill. No further work is recommended.



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

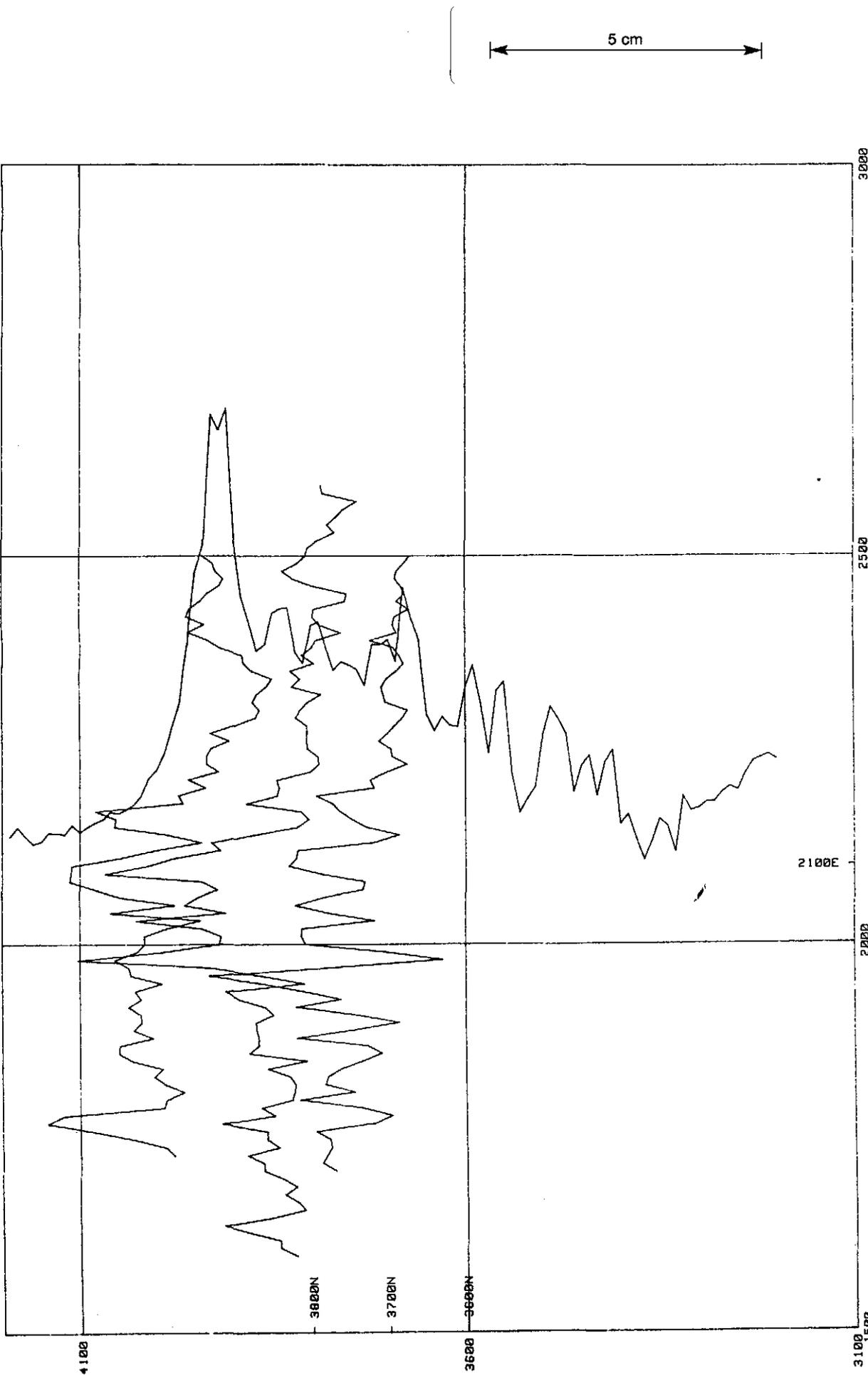
N.W. TASMANIA
GUILDFORD L.L.
RESERVOIR W. 3942/6
GRD MAG UNFILTERED

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 61700

Fig 33

063

449064





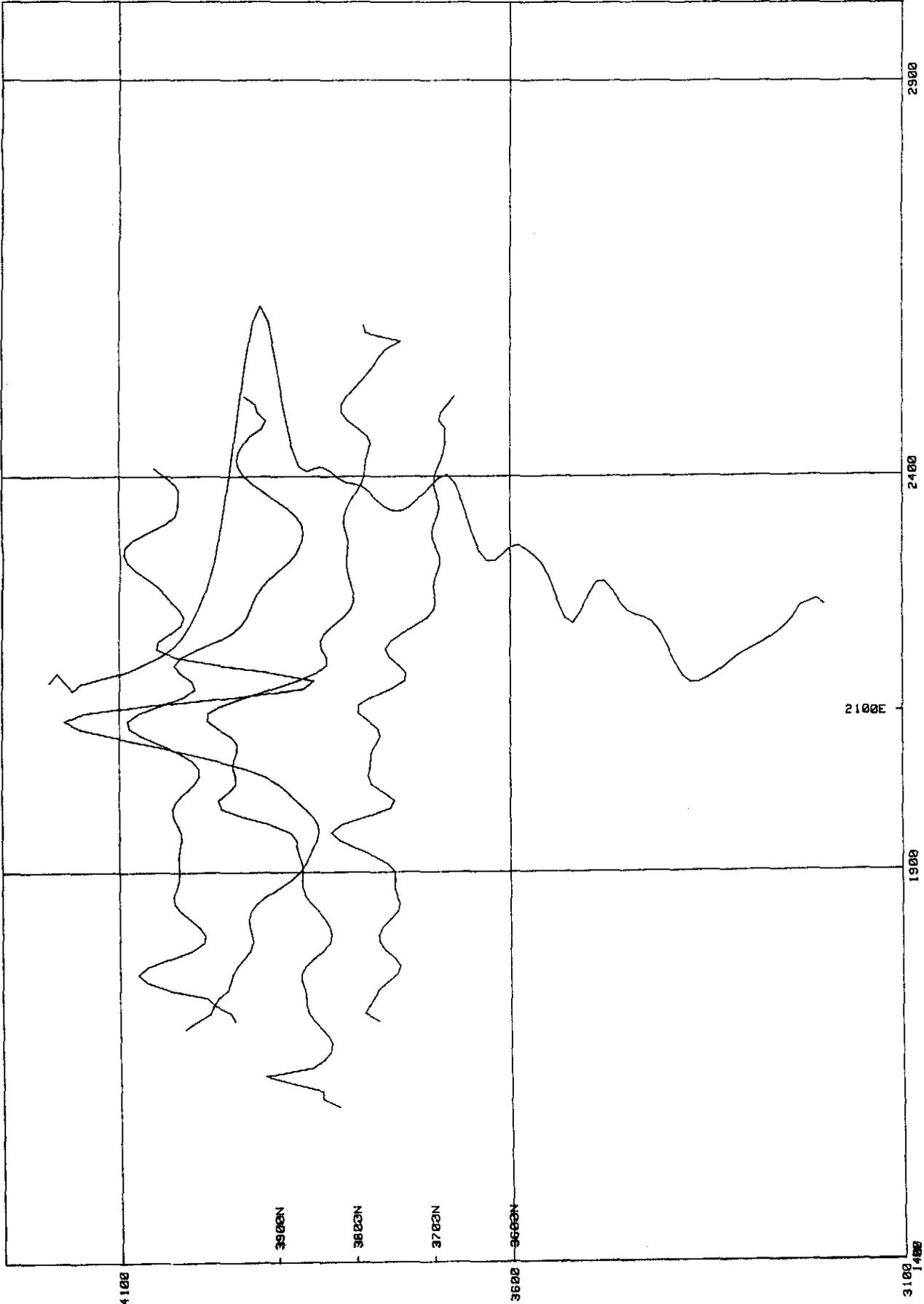
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

N.W. TASMANIA
GUILDFORD E.L.
RESERVOIR W. 3942/6
GRD MAG 11 Pt BINOM

DISTANCE SCALE : 50 M/CM
READING SCALE : 200 /CM
BASE READING : 61700

FIG 34

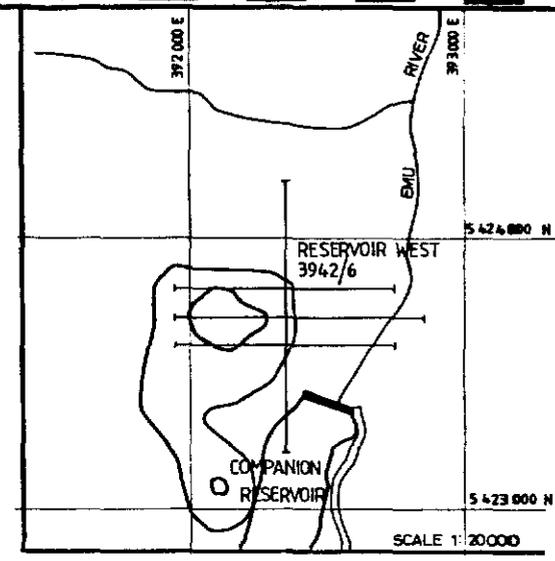
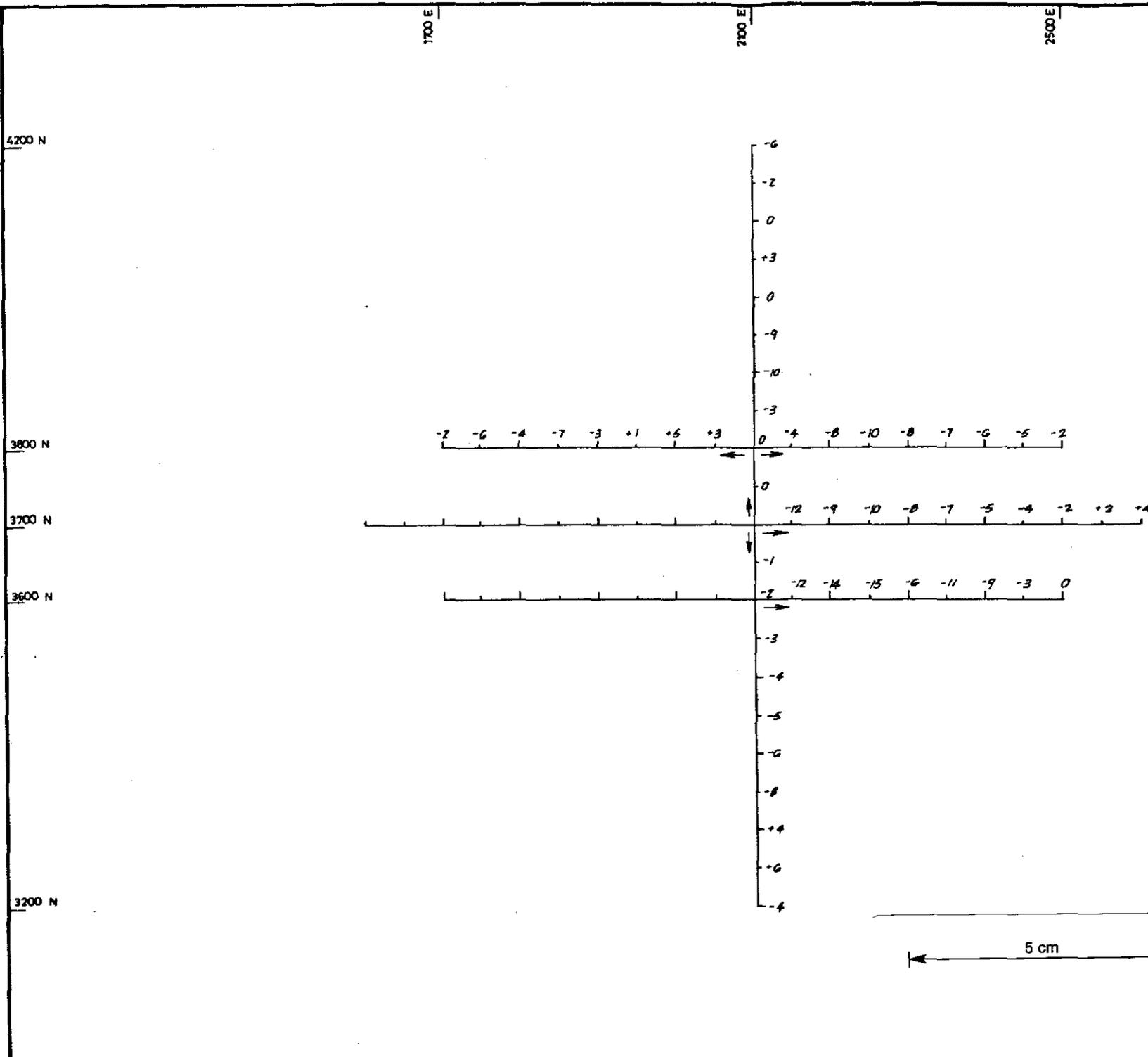
5 cm



449065

064

MSU



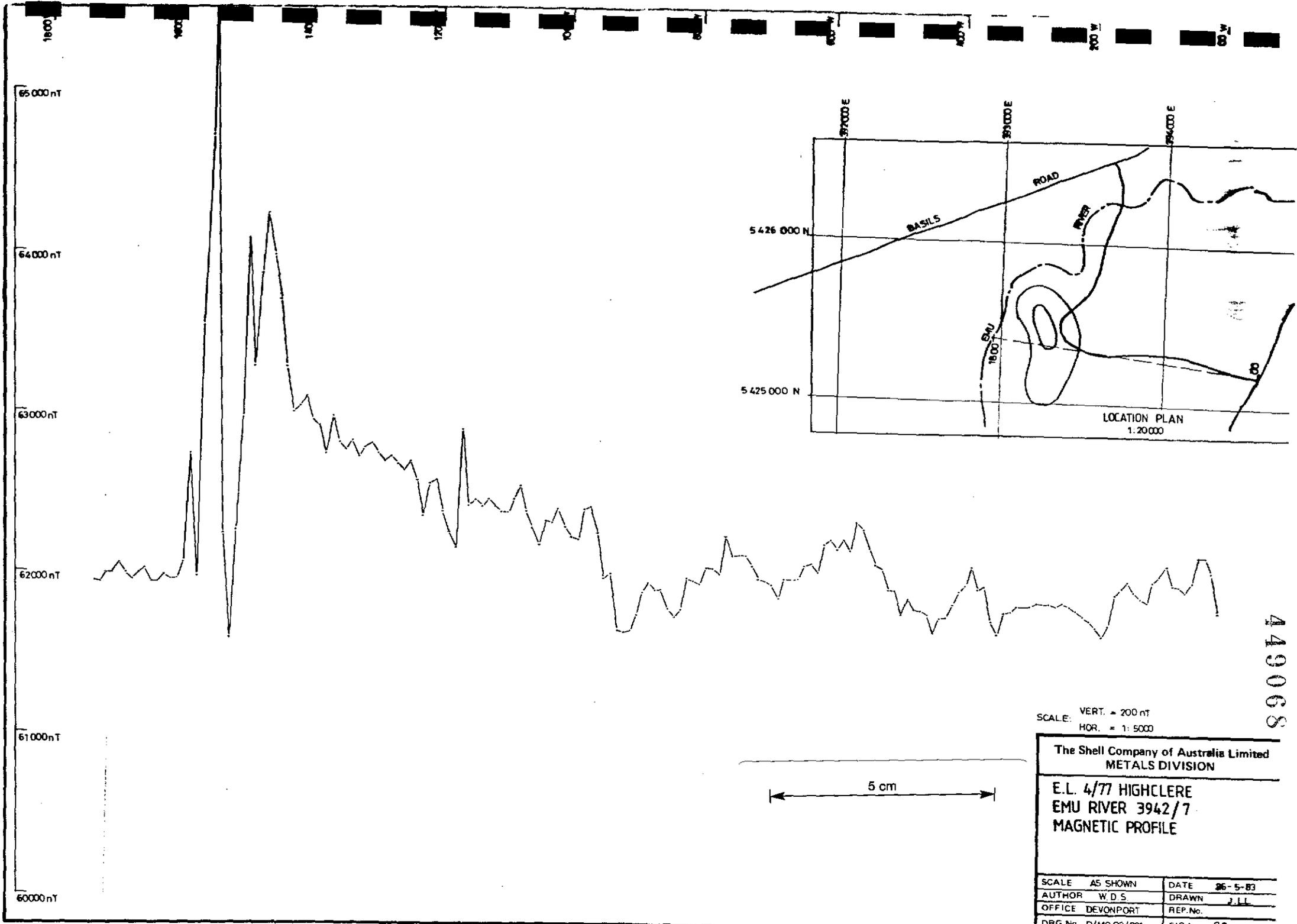
449066

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD ANOMALY 3942/6 RESERVOIR WEST SLOPE CORRECTIONS	
SCALE 1:5000	DATE 9-11-83
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REF.No.
DRG No. D/MQ.02/053	FIG.No. 35

066

3.2.16 Emu River 3942/7

- 3.2.16.1 Location. A 400 nT aeromagnetic anomaly at the end of Companion Road, in the north of the licence, on the same trend as the Basils Road and Reservoir West anomalies.
- 3.2.16.2 Geology. Tertiary basalt covers the area.
- 3.2.16.3 Geophysics. A ground magnetic survey was done at 10 m station spacings along the road and thence along a cut line to the Emu River (Fig. 38). A broad 800 nT feature with superimposed spiky basalt response was located. The magnetic anomaly indicated a dip or contact to the east.
- 3.2.16.4 Conclusion & Recommendations. The anomaly is part of a string of anomalies thought to be related to a basalt filled valley. The profile recovered is similar to that at Basils Rd. No further work is recommended.



290

449068

SCALE: VERT. = 200 nT
 HOR. = 1:5000

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 4/77 HIGHCLERE
 EMU RIVER 3942/7
 MAGNETIC PROFILE

SCALE	AS SHOWN	DATE	26-5-83
AUTHOR	W.D.S	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
DRG.No	D/MC 03/091	FIG.No	38

068

3.2.17 Wey Rd 3941/IL10

3.2.17.1 Location. A 6 channel INPUT response east of Wey Rd, approximately one kilometre south of the junction with Bunkers Rd. The INPUT response was selected by Shell staff, as being of possible interest within the strong basalt responses.

3.2.17.2 Geology. Tertiary basalt outcrops over the whole of the grid.

3.2.17.3 Geophysics. A Max-Min EM survey was done along three lines. A conductive zone was located on all lines at approximately the same position with the possibility of two conductors on two of the lines. (Drawing D/MQ02/036,037,038).

A line of IP (a=100 m) showed fairly uniform low resistivities and low chargeabilities. No chargeable bodies were located within 50-100 metres of the surface.

VLF-EM failed to locate a conductor.

3.2.17.4 Conclusions & Recommendations. The INPUT anomaly can be ascribed to basalt-related weathering effects.

069
4.0 CONCLUSIONS & RECOMMENDATIONS

The regional assessments of the licence indicate that the extensive area of basalt is quite thick (greater than 200m) throughout most of the outcropping basalt area. No drillholes have so far penetrated the main zone of basalt to confirm the depth estimates or to test the accuracy of the interpreted geology. The zones of prospective stratigraphy, whether Gordon Limestone, Oonah equivalent dolomite, or a Cambrian limestone, have not been confidently outlined.

Numerous aeromagnetic anomalies have been investigated during the tenure of the licence and all, with the exception of St. Valentines Peak anomaly, have been attributed to various basalt topographic features (hills or valleys), and to the variability of the magnetic remanance of the basalt. No significant anomalies remain to be tested.

The major exploration tool, aeromagnetics has been extensively applied with no success. The prospective stratigraphies have not been located. To do so would entail stratigraphic drilling through basalt to depths of 200-300m.

Subsequent ground surveying using high power TEM techniques would be hampered by the low resistivity (100 ohm-metres or less) and considerable thickness of the overlying basalt.

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- COMSTAFF PTY LTD (1970). EL 19/65 St Valentine's Peak area. Report on a follow up programme to investigate stream sediment anomalies. 1969-1970. Tas Dept. Mines Open File Report Q 36/15.
- GOULD, I. G. (1975). North Prospecting Pty Ltd EL 1/75. Final report and report for month ended 30 April, 1975. Tas. Dept. Mines Open File Report Q36/24.
- McBRIDE B. (1969). Comstaff Pty Ltd Review of summer exploration programme EL 19/68 St Valentine's Peak 1965-69. Tas. Dept. Mines Open File Report Q36/14.
- MILLS D. M. (1971). The St Valentine's Peak Granite - Metasediment contact zone. Unpublished B.Sc. Hons. Thesis. Uni. of Tas.
- PIKE C. P. (1964). Geology of the region around St Valentine's Peak Tasmania. Unpublished B. Sc. Hons. Thesis Uni. of Tas.
- WESTE C. (1978). EL 1/76 Guildford and southern part of EL 4/77 Highclere, Tasmania. Report on all investigations to September 1978. Comalco Ltd. Unpublished Report.
- WESTE C. (1979). EL 1/76 Guildford and southern part of EL 4/77 Highclere. Report on all exploration from October, 1978 to December, 1979. Comalco Ltd. Unpublished Report.

071

APPENDICES

MAGNETIC ROCK MEASUREMENTS

APPENDIX 1

073

449074

N.Q.O. / 744

CSIRO

Division of Mineral Physics
Deihi Road, North Ryde, NSW, Australia

A Division of the Institute of Energy and Earth Resources

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1 October 1981

Mr J J Lawton
Shell Co of Australia Ltd
PO Box 860
DAVENPORT, TASMANIA 7301

Dear Mr Lawton

Please find enclosed discussion of our measurements on your rock samples from Northern Tasmania. The results indicate that remanence will have to be taken into account in interpretation but that a simplification using a pseudo-susceptibility is possible.

I hope the results are useful, and I would welcome feedback on the applicability of these measurements to your exploration programme.

Yours sincerely

David Clark

David Clark

cc. Nigel Hungerford
Shell Co. of Aust. Ltd
PO Box 872K
Melbourne Vic 3001

5/10/81
N201-744

MAGNETIC PROPERTIES OF SAMPLES FROM NORTHERN TASMANIA

The susceptibility, NRM intensity and Koenigsberger ratios of the samples are given in Table 1, and the remanence directions in Table 2.

All the basalt samples have moderate susceptibility but overall have high remanence intensities and the corresponding Q ratios are therefore generally much greater than one. The Cambrian volcanic sample is also magnetic with a large remanence and the Moina "wrigglite" is highly magnetic, again with remanence contributing significantly to the magnetisation.

Therefore remanence will have to be taken into account for meaningful interpretation of the magnetics from this area. Because of the limited number of samples, very little can be said about the remanence of the wrigglite and the Cambrian volcanics, but the directions of magnetisation appear to be ancient in both cases and therefore may be primary stable magnetisations. This could be confirmed by further sampling of these rock types. If the remanence is indeed primary the remanence direction in these rock types could be assumed with some credibility and the presence of these rock types could possibly be recognised by a characteristic signature. For instance the magnetisation of the wrigglite appears to be directed westerly with shallow negative inclination. This should produce an anomaly with a strong high to the west or northwest, and prominent low to the east or southeast, depending on the Q value ($\gg 1$ or ~ 1 respectively). Because the NRM of the Cambrian volcanic is approximately reversed with respect to the present field, this rock unit should be associated with a negative anomaly if present in significant quantity within or beneath normally magnetised lava flows.

Because the Tertiary basalts were extruded during a mixed polarity interval of the geomagnetic field, flows of different ages acquired magnetisations of opposite polarity. Because remanence dominates induction in this rock type, knowledge of the mean NRM direction in each area is important.

As can be seen from Table 2, samples 2175, 2177, 2178, 2184, 2185, 2188 and 2190 have normal polarity and samples 2186 and 2187 are reversed. Samples collected independently near Waratah are also reversed. We can therefore draw a line between Guildford and Waratah NE of which all basalt samples are normal, and SW of which all are reversed. Although the sampling density is low, this strongly suggests that the polarity distribution could be mapped on the surface. Of course if there is a considerable thickness of flows, those lower down in the pile may be of opposite polarity to those exposed at the surface.

The NRM directions given in Table 2 show some scatter suggesting that the primary thermoremanent magnetisation of the basalts may have been perturbed in some cases, possibly by lightning. Lightning strikes could partially

remagnetise the rock and give unrepresentative J and Q values. To test this one specimen from each sample was subjected to AF demagnetisation (magnetic cleaning) in progressively higher fields. This process selectively removed unstable components such as lightning-induced magnetisations. Better grouping of remanence directions was obtained after cleaning, suggesting some noise had to be removed from the palaeomagnetic signal.

The mean NRM direction, irrespective of polarity, of the basalt samples is $(20^\circ, -71^\circ)$ ($N = 9, \alpha_{95} = 19^\circ$).

After cleaning at 600 Oersteds peak field the mean direction was $(7^\circ, -69^\circ)$ ($\alpha_{95} = 10^\circ$). These directions are both indistinguishable from the Earth's present field, within experimental error.

The high Koenigsberger ratios listed in Table 1 still stand however, because in some cases (e.g. 2175) the NRM was unaffected by secondary components, and in no case were secondary magnetisations dominant.

If we take an age of approximately 20 my for the basalts, the South pole with respect to Australia at that time was at $(75^\circ\text{S}, 100^\circ\text{E})$ which corresponds to a field direction in Northern Tasmania of $(17^\circ, -67^\circ)$ if normal or $(197^\circ, +67^\circ)$ if reversed. Because these rocks are young and unlikely to have been remagnetised, these directions should correspond to the mean NRM directions of normal and reversed flows respectively. This can lead to a considerable simplification of interpretation. The expected mean direction is sufficiently close to the present field $(13^\circ, -72^\circ)$ that induction may be assumed in modelling but with a considerably enhanced model susceptibility. For instance if a typical NRM intensity is 5,000 microgauss the corresponding susceptibility used in modelling should be $5,000 \times 10^{-6}/0.63 = 7,940 \times 10^{-6}$. If the remanence is reversed this susceptibility should be taken as negative.

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TABLE 1. MAGNETIC PARAMETERS

Sample	Rock Type	k	J	Q	
2175	Tertiary basalt	200	8,890	71	GRANDE RIVER
2177	"	840	5,850	11	LORINNA EAST
2178	"	1,460	37,030	40	REDWATER
2179	Moina wriggilite	87,750	327,400	5.9	
2181	Moina wriggilite	57,500	17,140	0.47	
2184	Tertiary basalt	210	4,820	36	CIPRON A
2185	"	500	1,880	6.0	H.R.W.
2186	"	440	285	1.0	MT PEARSE
2187	"	400	2,290	9.1	"
2188	"	390	4,150	17	CAMENA
2189	Cambrian volcanic	2,180	9,810	7.1	LOYETEA WEST
2190	Tertiary basalt	580	2,230	6.1	LOYETEA EAST

k = emu susceptibility $\times 10^6$

J = NRM intensity in microgauss

Q = Koenigsberger ratio

= J/kH where $H = 0.63$ Oersteds

TABLE 2. REMANENCE DIRECTIONS

Sample	No of specimens	Mean NRM Directions	α_{95}	Polarity
2175	1	(57 ⁰ , -74 ⁰)	-	N
2177	4	(212 ⁰ , -65 ⁰)	2 ⁰	N
2178	3	(8 ⁰ , -30 ⁰)	7 ⁰	N
2179	2	(263 ⁰ , -26 ⁰)	30 ⁰	-
2181	3	(280 ⁰ , -33 ⁰)	>90 ⁰	-
2184	4	(356 ⁰ , -70 ⁰)	2 ⁰	N
2185	2	(347 ⁰ , -48 ⁰)	4 ⁰	N
2186	3	(217 ⁰ , +84 ⁰)	9 ⁰	R
2187	3	(119 ⁰ , +68 ⁰)	2 ⁰	R
2188	3	(341 ⁰ , -56 ⁰)	4 ⁰	N
2189	3	(268 ⁰ , +74 ⁰)	7 ⁰	-
2190	4	(68 ⁰ , -52 ⁰)	6 ⁰	N

Directions are expressed in the form (declination, inclination) with declination positive clockwise from true north, inclination positive downwards.

N = normal polarity

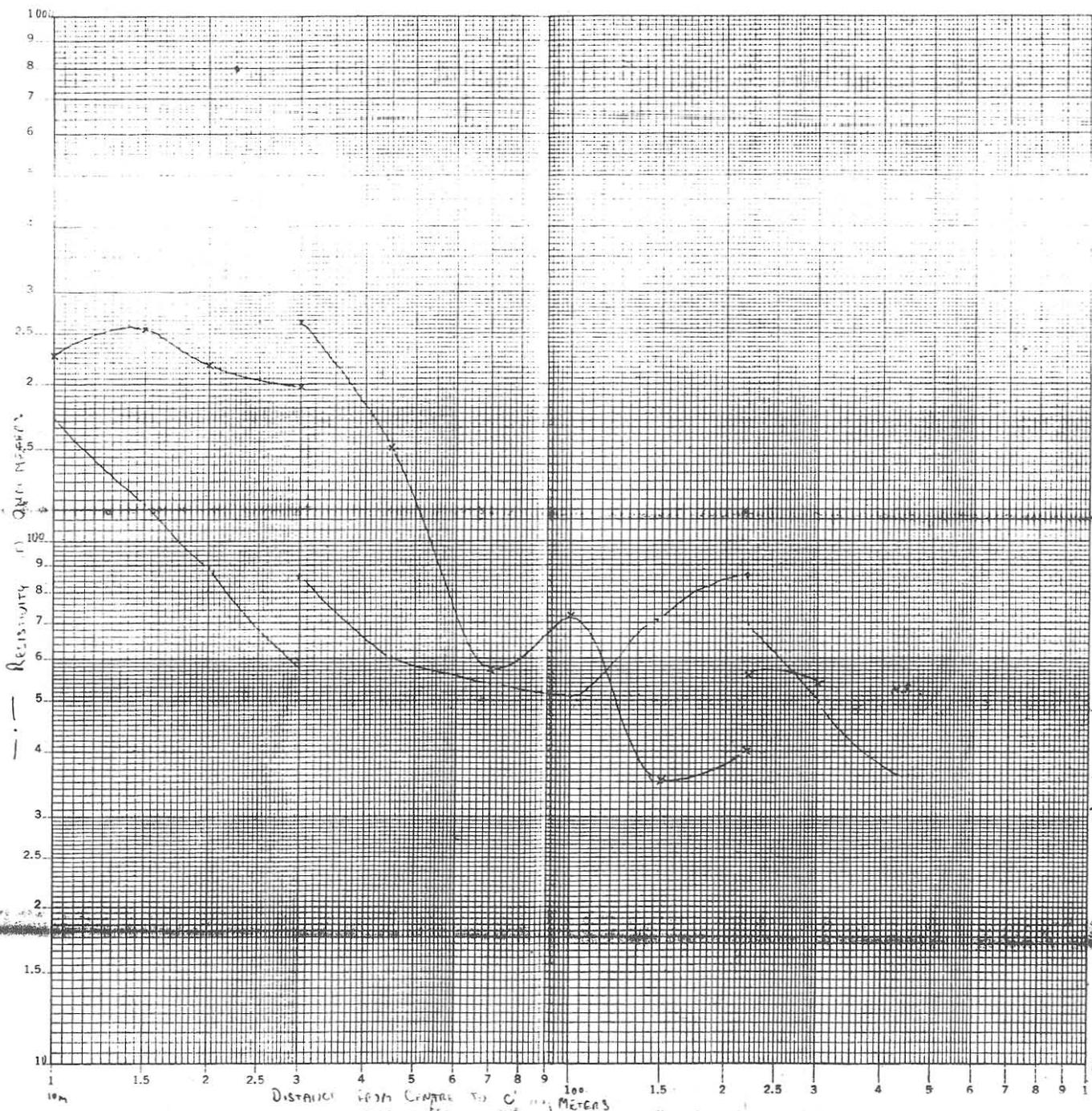
R = reversed polarity

α_{95} is the radius of the circle of 95% confidence about the mean direction.

RESISTIVITY SOUNDING CURVES

APPENDIX 2

EJLSFORD AREA
 LINE NO. 1
 (MURCHISON HIGHWAY)



177.2m 0
 12.5 11 meters
 41 (?)
 206
 9.3 (?) 87

47 720

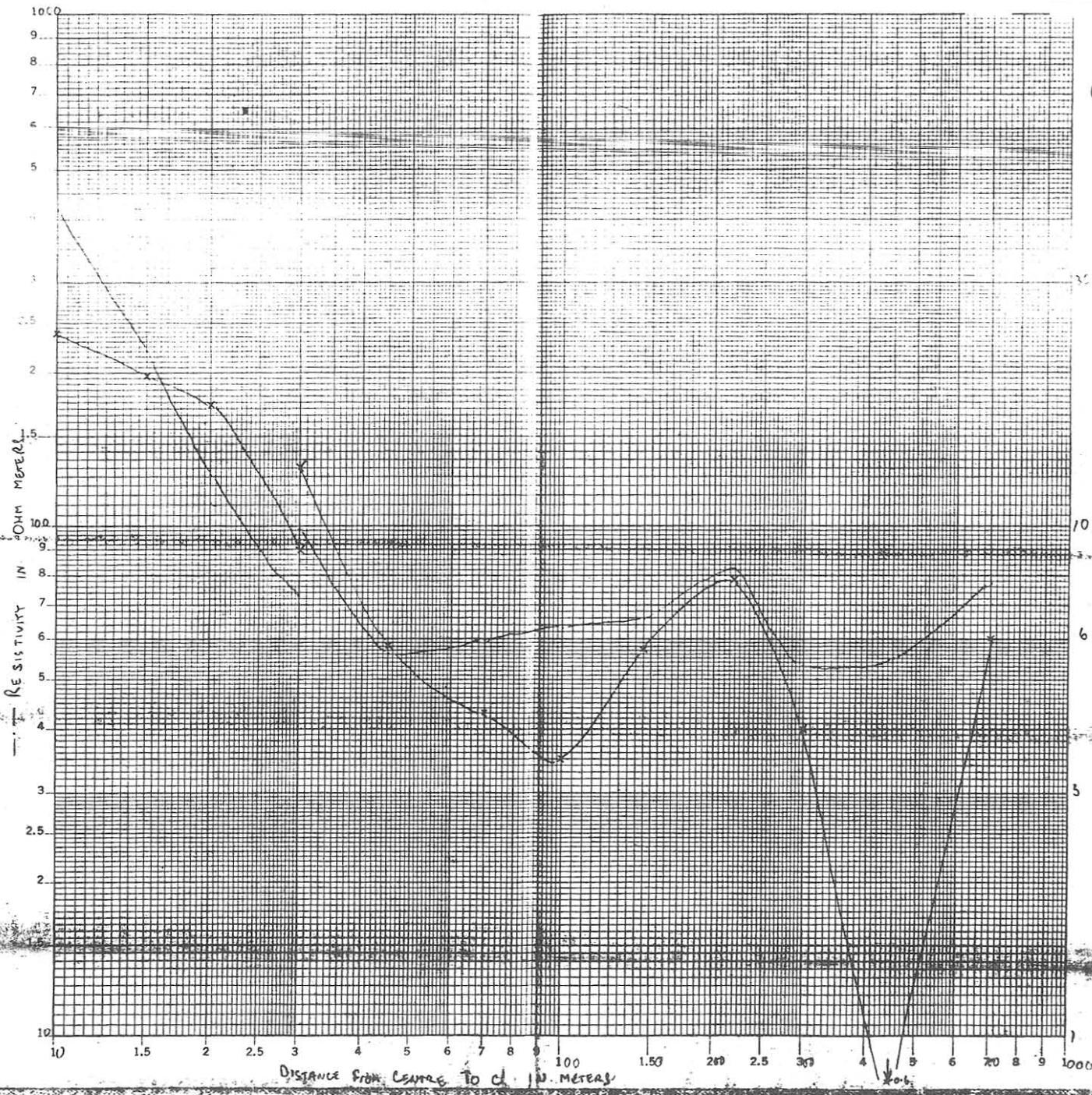
LOGARITHMIC 2x2 CYCLES
 REUPPEL & ESSEP CO. MILWAUKEE

449081

080

47 7203

K&E LOGARITHMIC 2 1/2 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.



GUILDFORD AREA
LINE NO. 5
(AMTR)
(GUILDFORD ROAD)

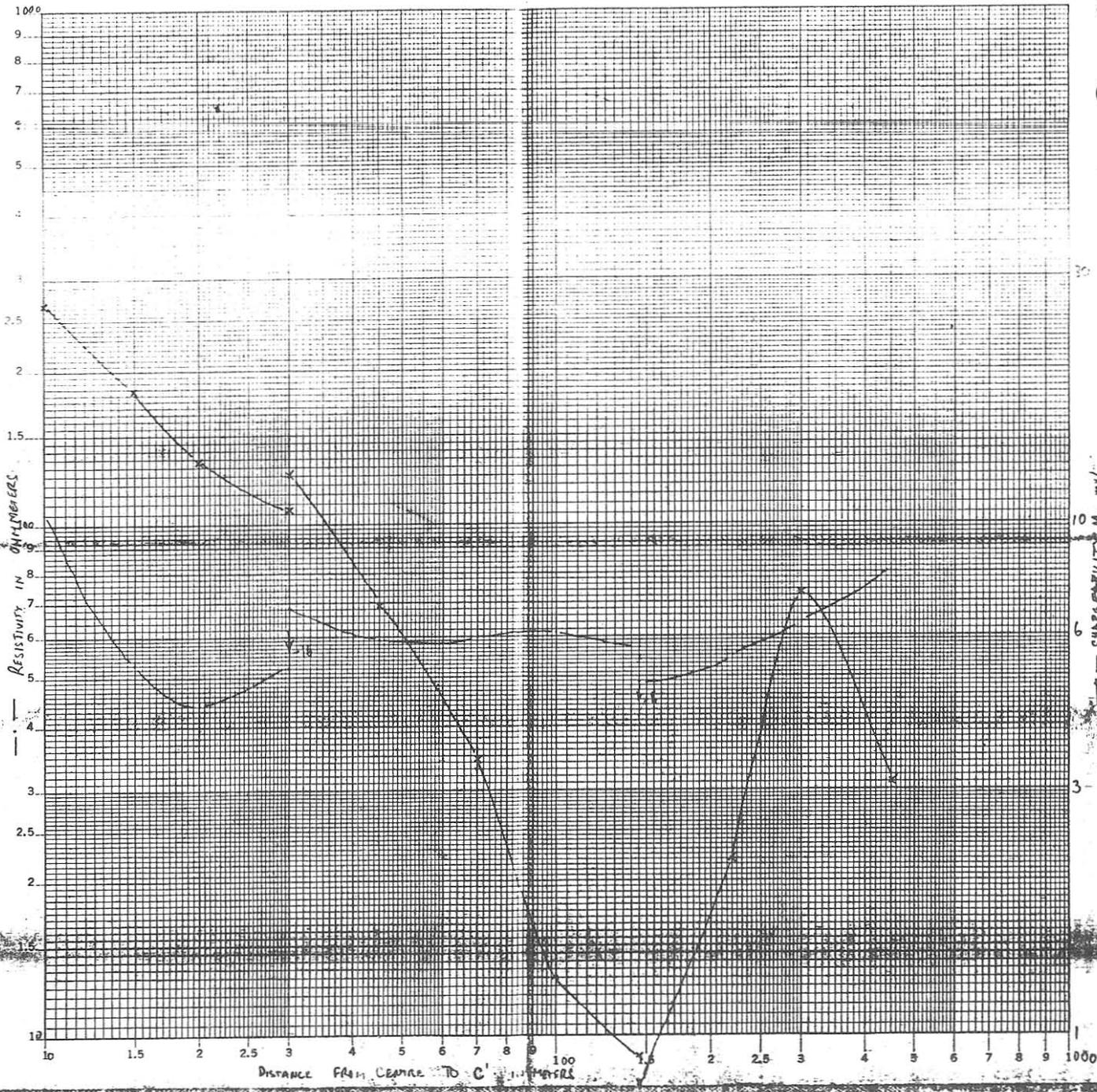
483.2m	0
23	7.7
116 (?)	39
40 (?)	53(?)
38	71(?)

4490824

081

47 7203

LOGARITHMIC 2 x 2 CYCLES
HEATH & SHERRILL CO. MA 01914



GUILDFORD AREA
 LINE NO 6
 (MTA)
 (BUNKERS ROAD)

384.2m	0
25.2	3.3
169 (?)	10.7
	14.8 (?)
36.7	metals
299 (?)	183

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082

083

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SIROTEM SOUNDING CURVES

(FOR LOCATIONS SEE DRAWING NO. D/MQ 04/005)

APPENDIX 3

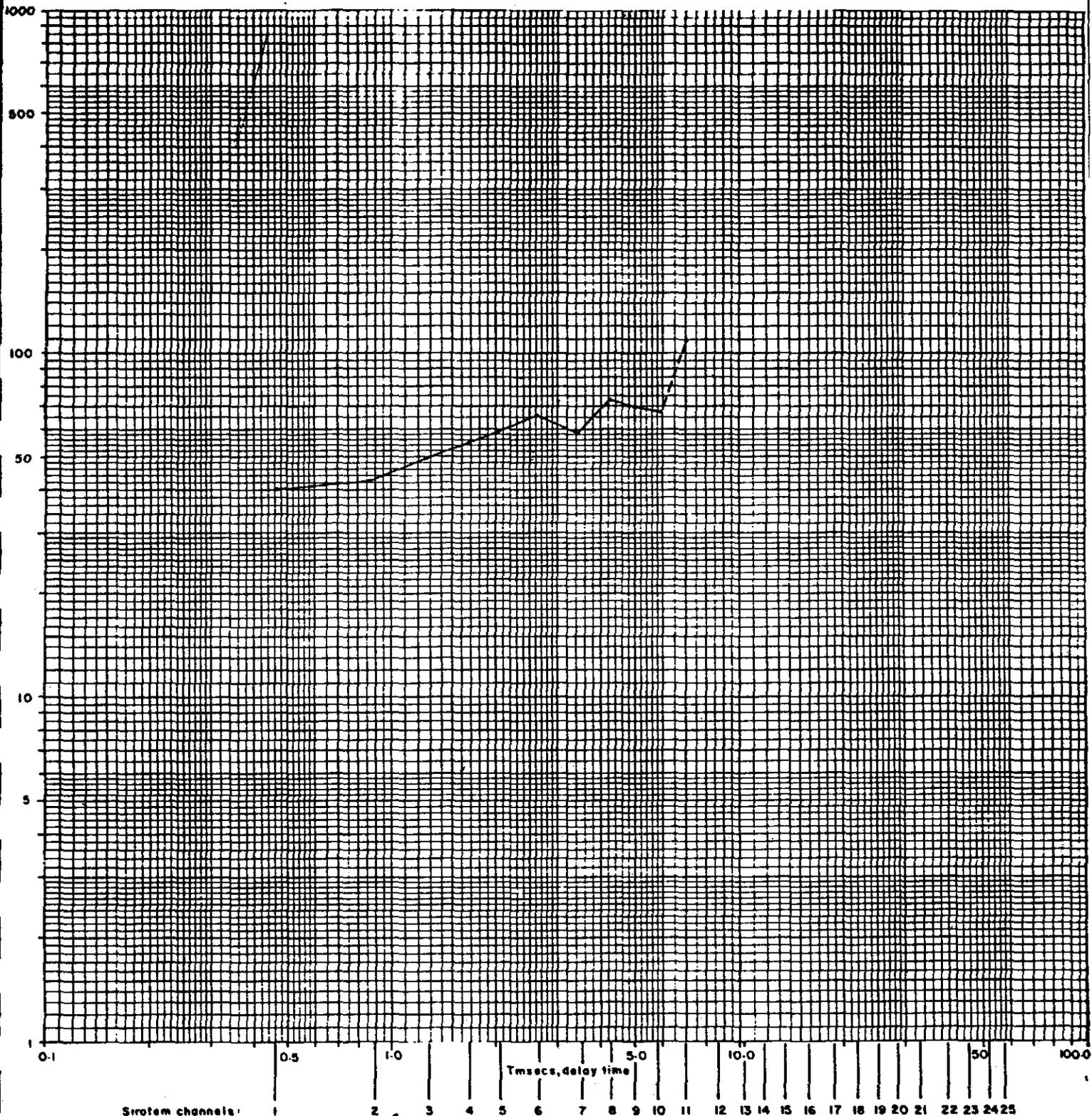
084

449085

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



INTERPRETATION :
(Method: GRENDL)

_____ 0m	_____ 0m
41 ohm.m.	39 ohm.m.
_____ 128m	_____ 102m
170	106
	(edited data)

APRE

22%

9%

The Shell Company of Australia Limited METALS DIVISION			
STATE :	TASMANIA		
LOCATION :	GUIDFORD E.L. BASILS RD SOUNDING B		
SCALE	-	DATE	OCT. 1983
AUTHOR	N.H.	DRAWN	V.C.
OFFICE	AHO	REP No	

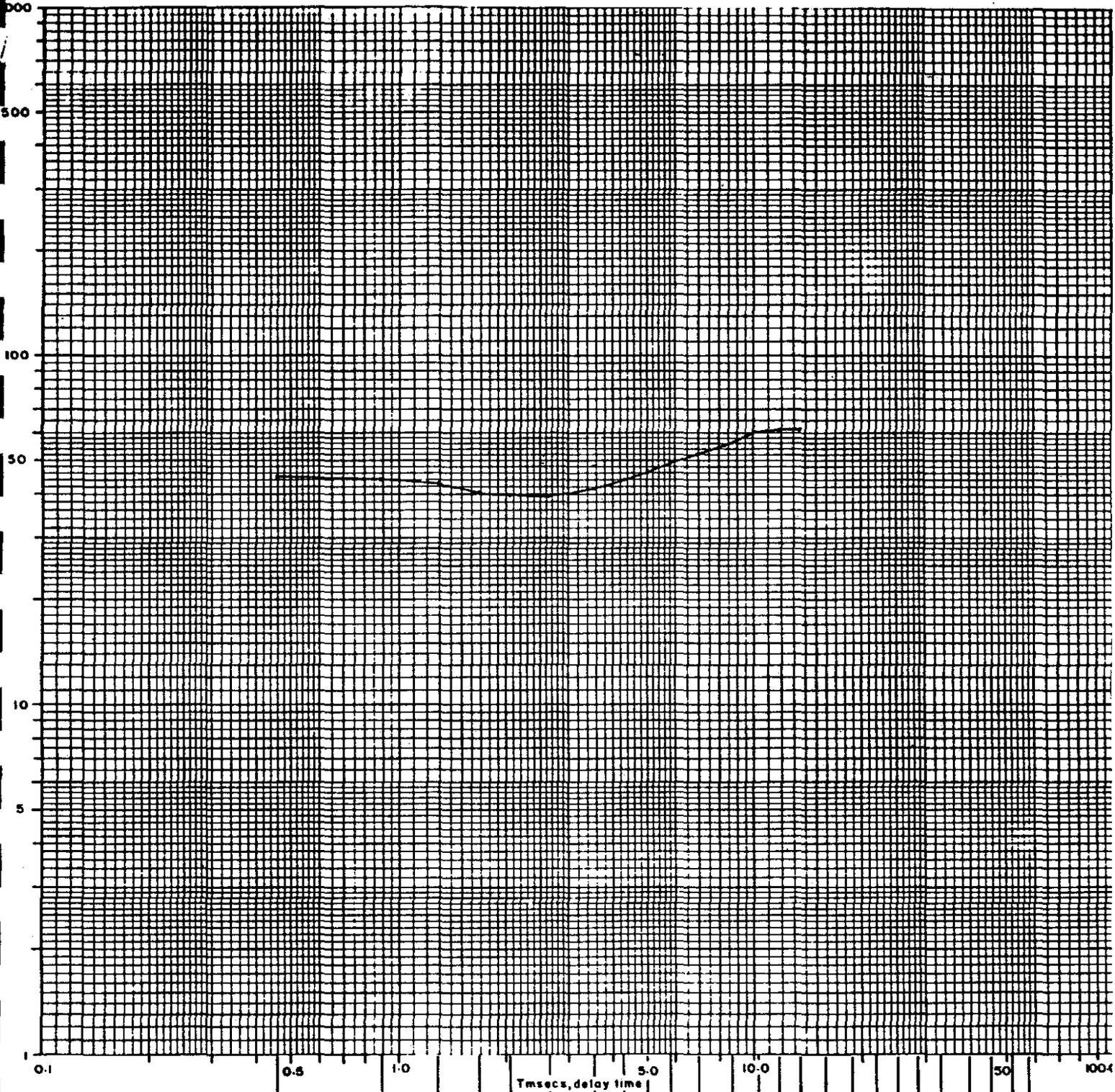
085

449086

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

Po, app. resistivity



Sirotem channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION : _____ 0m
 (Method: GRENDL) 46 ohm.m.
 _____ 132
 32
 _____ 260
 158

The Shell Company of Australia Limited
METALS DIVISION

STATE : TASMANIA
LOCATION: GUILDFORD E.L.
WEST DOWNS
SOUNDING C

SCALE - DATE OCT. 1983
AUTHOR N.H. DRAWN V.C.

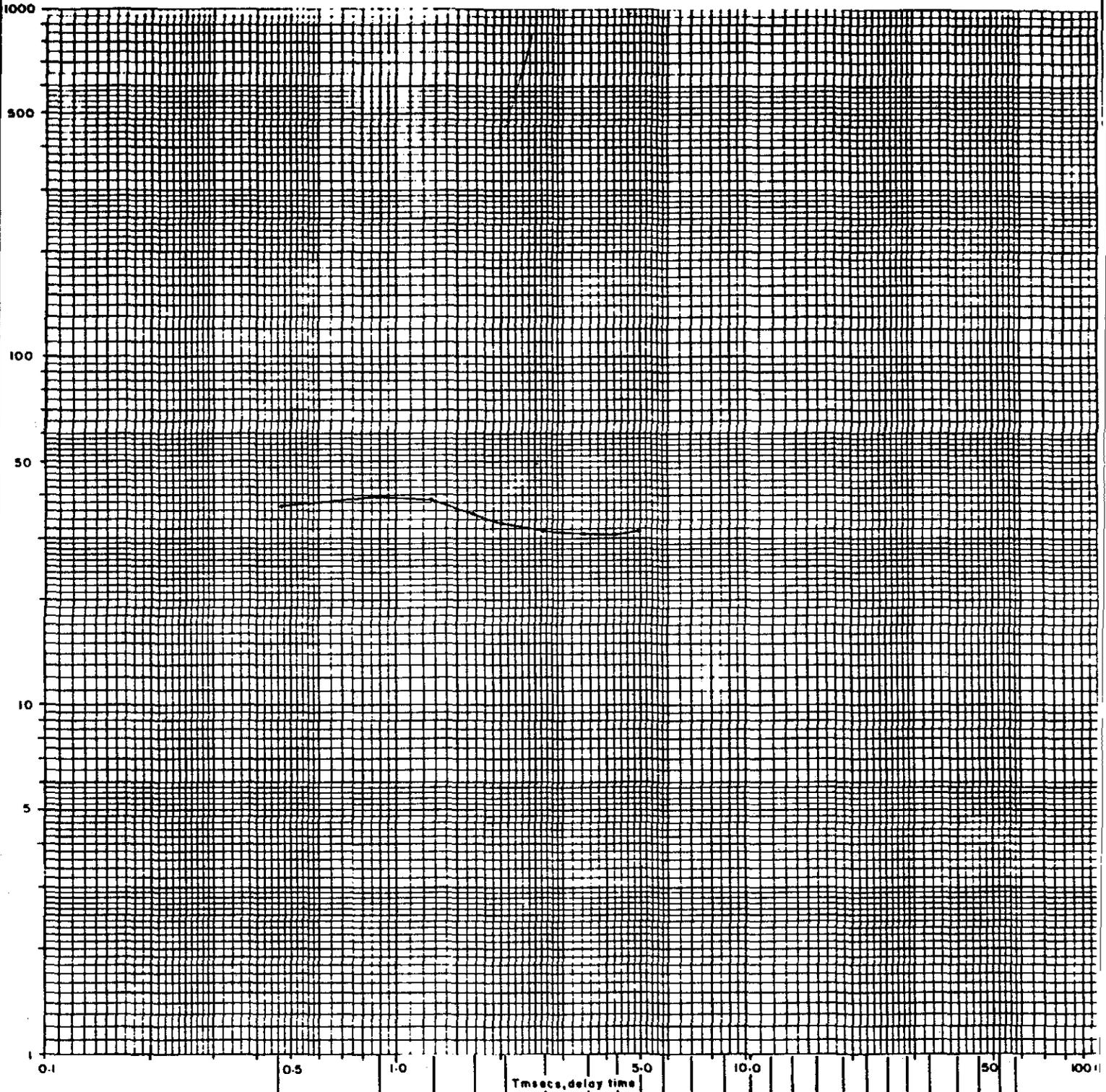
087

449088

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app resistivity



System channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION
(Method: GRENDL)

34 ohm.m.	0m	54	0m
135	501	28	102
		5124	199

ADDF

20%

32%

The Shell Company of Australia Limited METALS DIVISION	
STATE :	TASMANIA
LOCATION :	GUILDFORD E.L BUNKERS RD 2 SOUNDING E
SCALE	DATE OCT, 1983
AUTHOR	M.H DRAWN V
DATE	AND

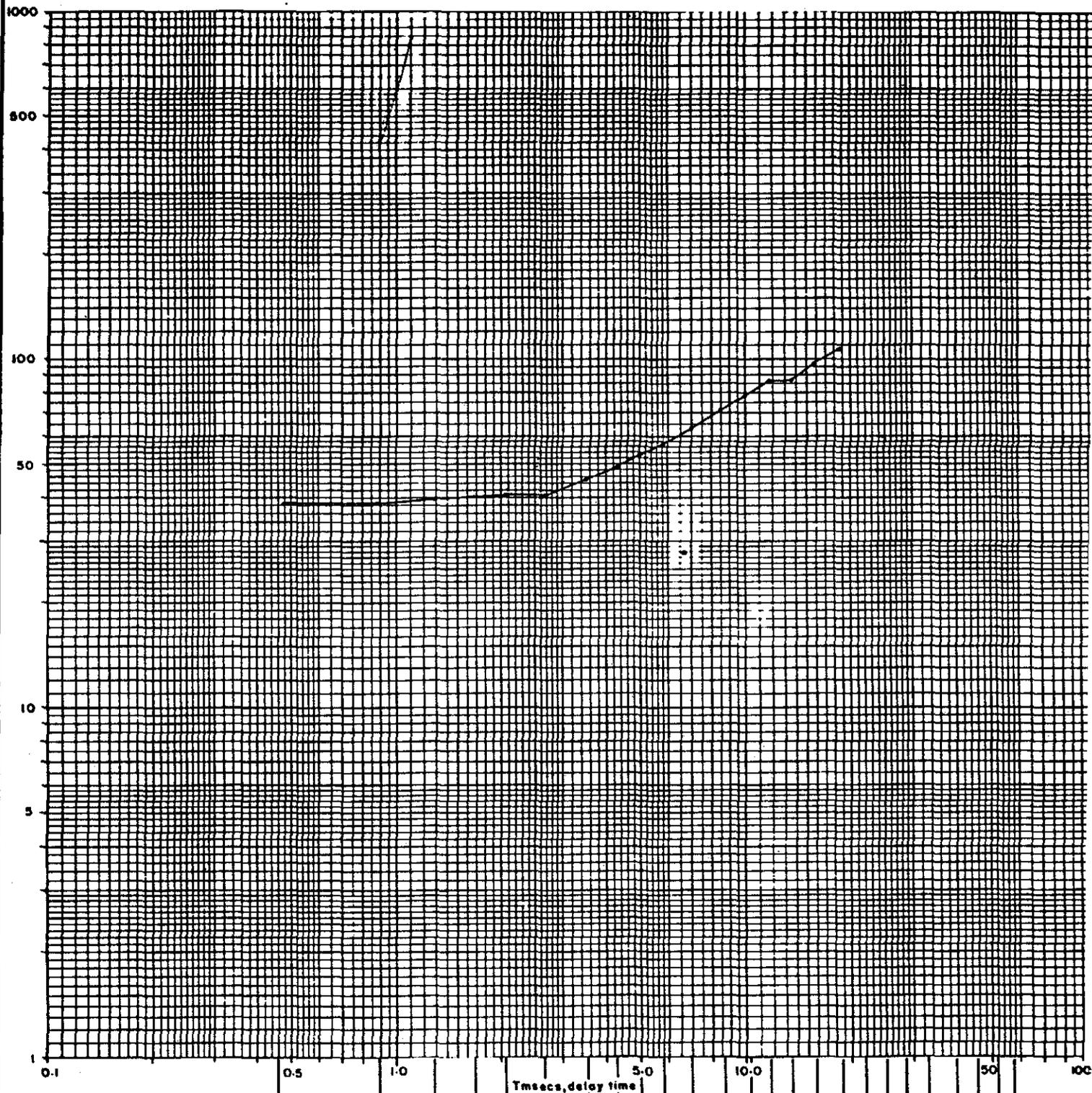
088

449089

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : BP
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



Sirotem channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION
(Method: GRENDL)

————— 0m
40 ohm.m.
————— 256 m
745

APRE: 5%

The Shell Company of Australia Limit	
METALS DIVISION	
STATE:	TASMANIA
LOCATION:	GUILDFORD E.L
	WEY RD
	SOUNDING F
SCALE	DATE OCT. 18
AUTHOR M H	DRAWN V

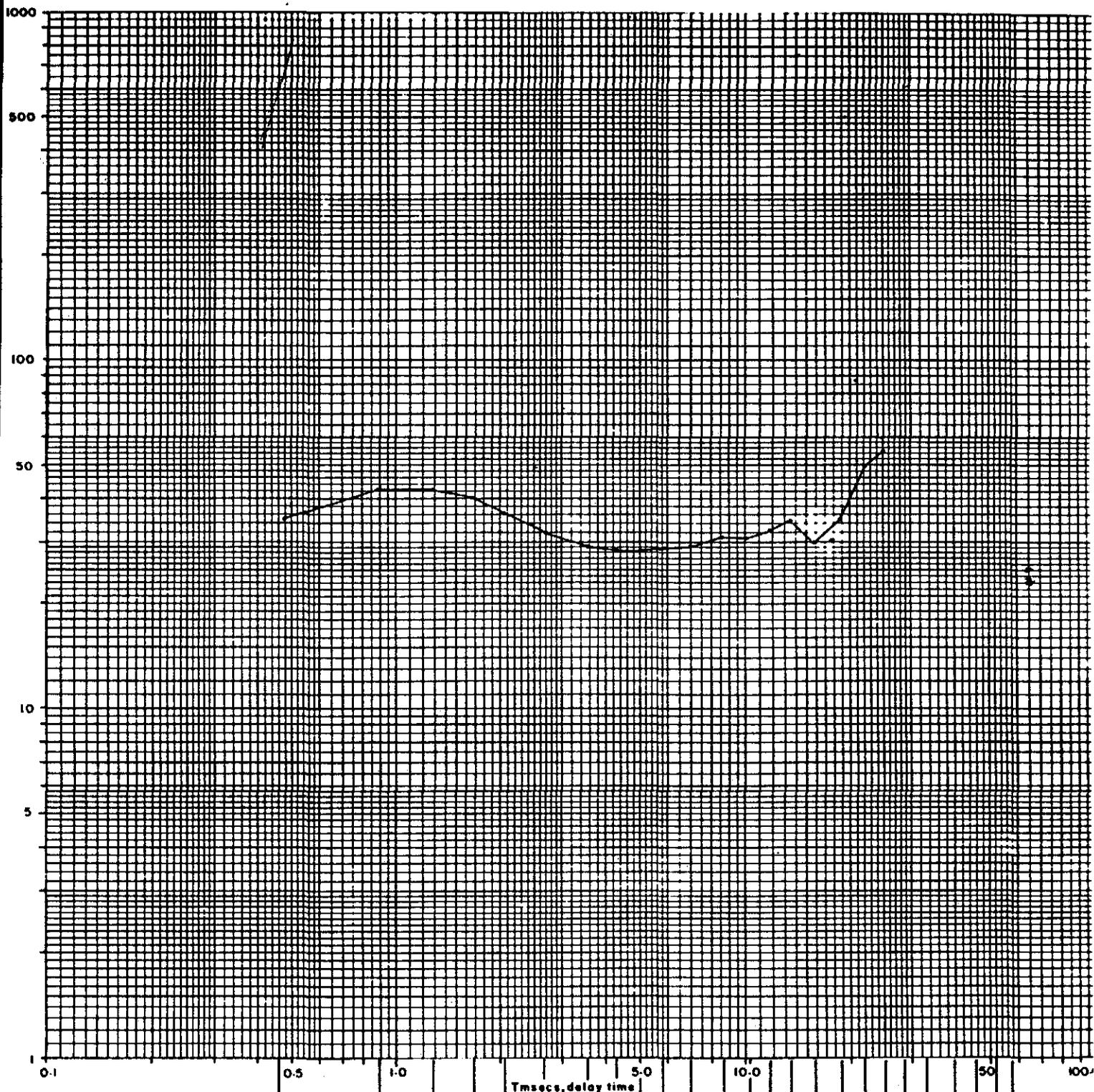
089

449090

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



Sirotem channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION :	_____ 0m	_____ 0m
(Method: GRENOL)	_____ 33 ohm.m.	_____ 33 ohm.m.
	_____ 60	_____ 91
	_____ 396	_____ 123
	_____ 4	_____ 226
	_____ 1028	_____ 262

The Shell Company of Australia Limited
METALS DIVISION

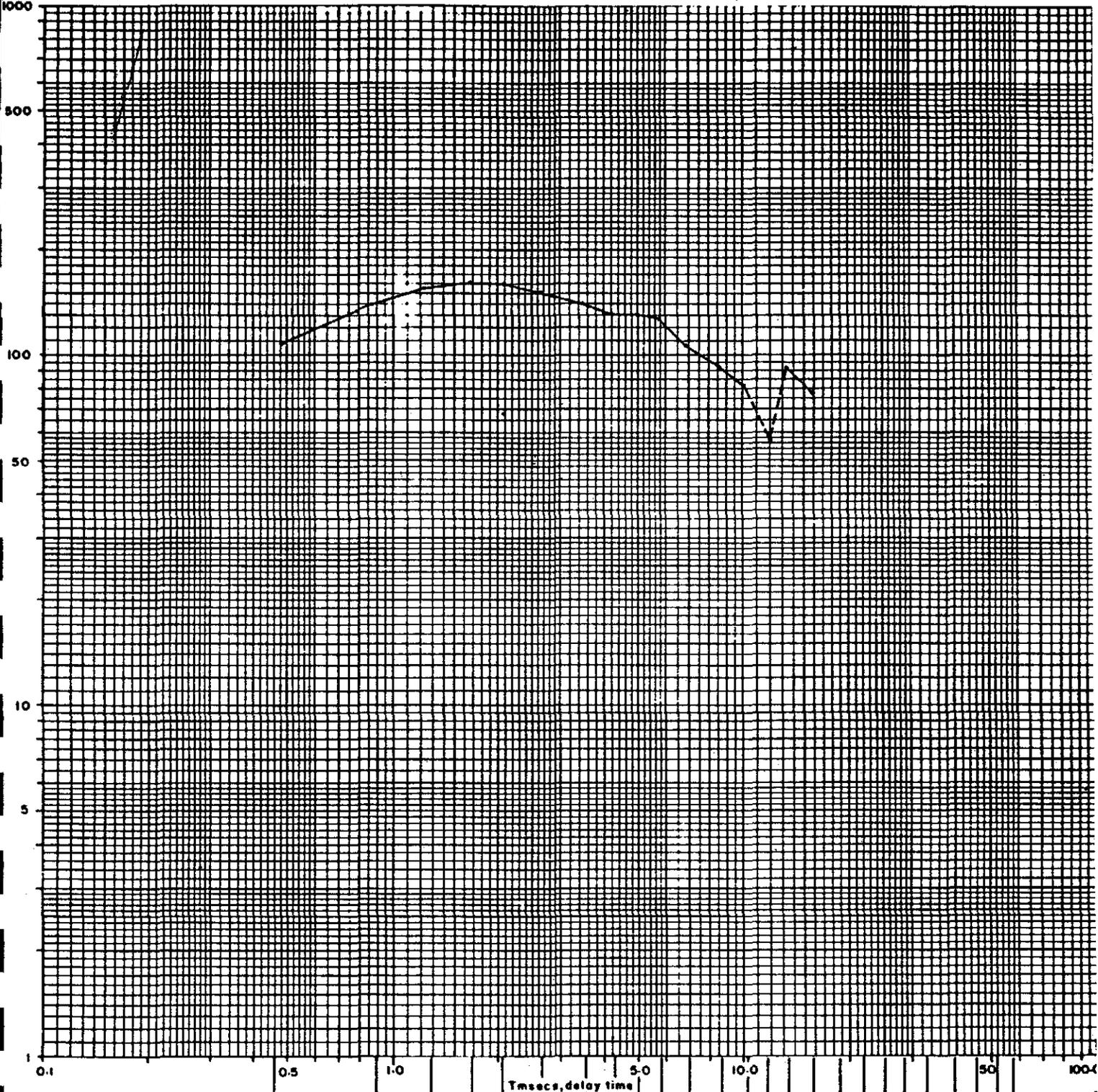
STATE: TASMANIA
LOCATION: GUILDFORD E.L.
WANDLE RIVER
SOUNDING G

SCALE - DATE OCT. 1983
AUTHOR N M DRAWN V C

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
 LOOP SIZE : 200 m COINCIDENT LOOP
 OPERATOR : PB
 DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



Sirotem channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION (Method: GRENDL)	0m	0m	0m
	147 ohm.m	110 ohm.m	90 ohm.m
	46	473	112
		167	402
		590	410
		10	66

The Shell Company of Australia Limited
 METALS DIVISION

STATE : TASMANIA
 LOCATION: GUILDFORD E.L
 GORDON'S CNR
 SOUNDING H

SCALE - DATE OCT, 1983
 AUTHOR N H DRAWN VC

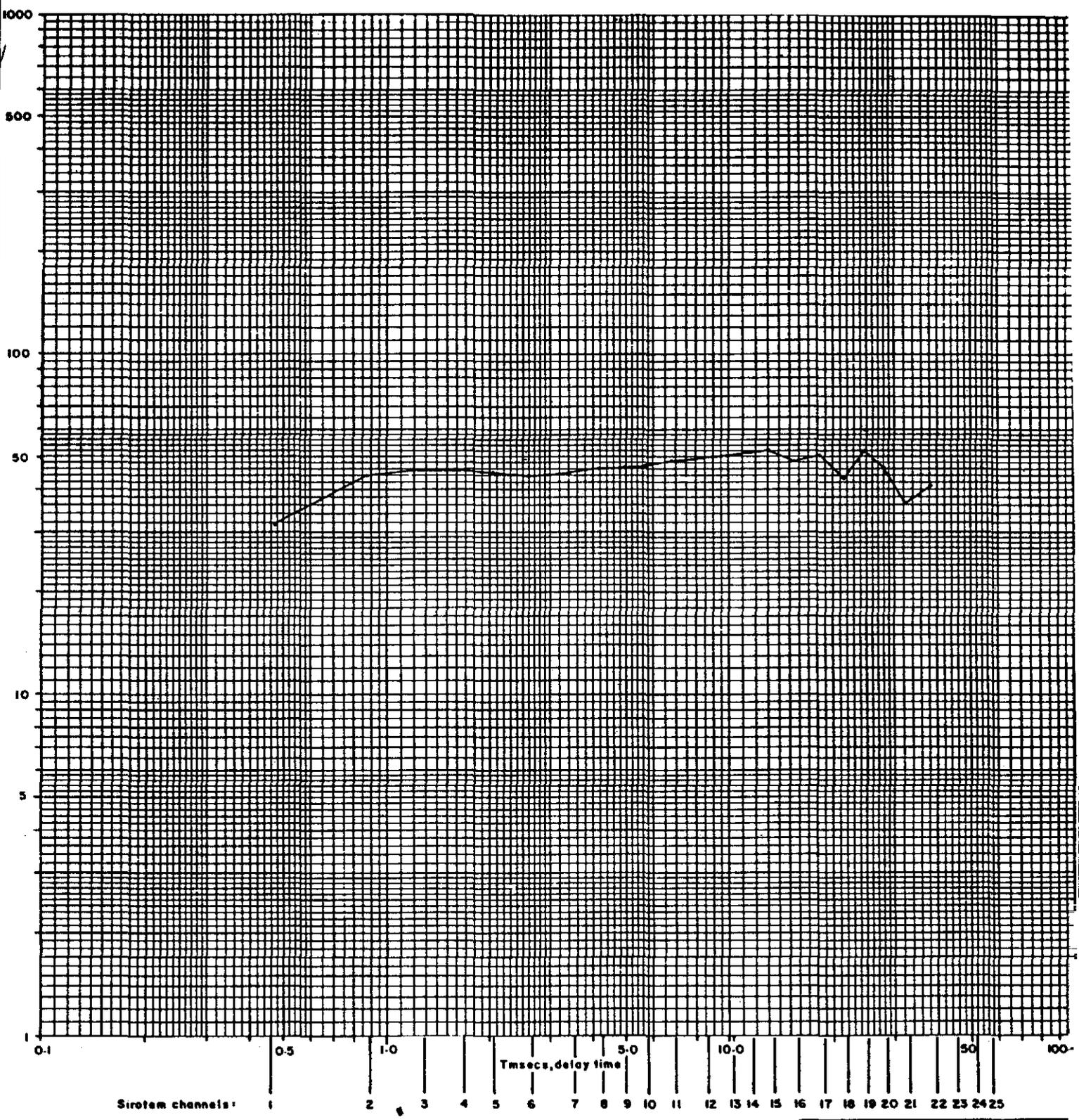
091

449092

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m CONCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



INTERPRETATION : _____ Om
(Method:) ohm.m.

Resistive basement not seen
Basalt thickness > 300m ?

The Shell Company of Australia Limited METALS DIVISION	
STATE :	TASMANIA
LOCATION :	GUILFORD E.L. CHILTON BRIDGE SOUNDING I
SCALE :	DATE OCT. 1983
AUTHOR N H	DRAWN V.

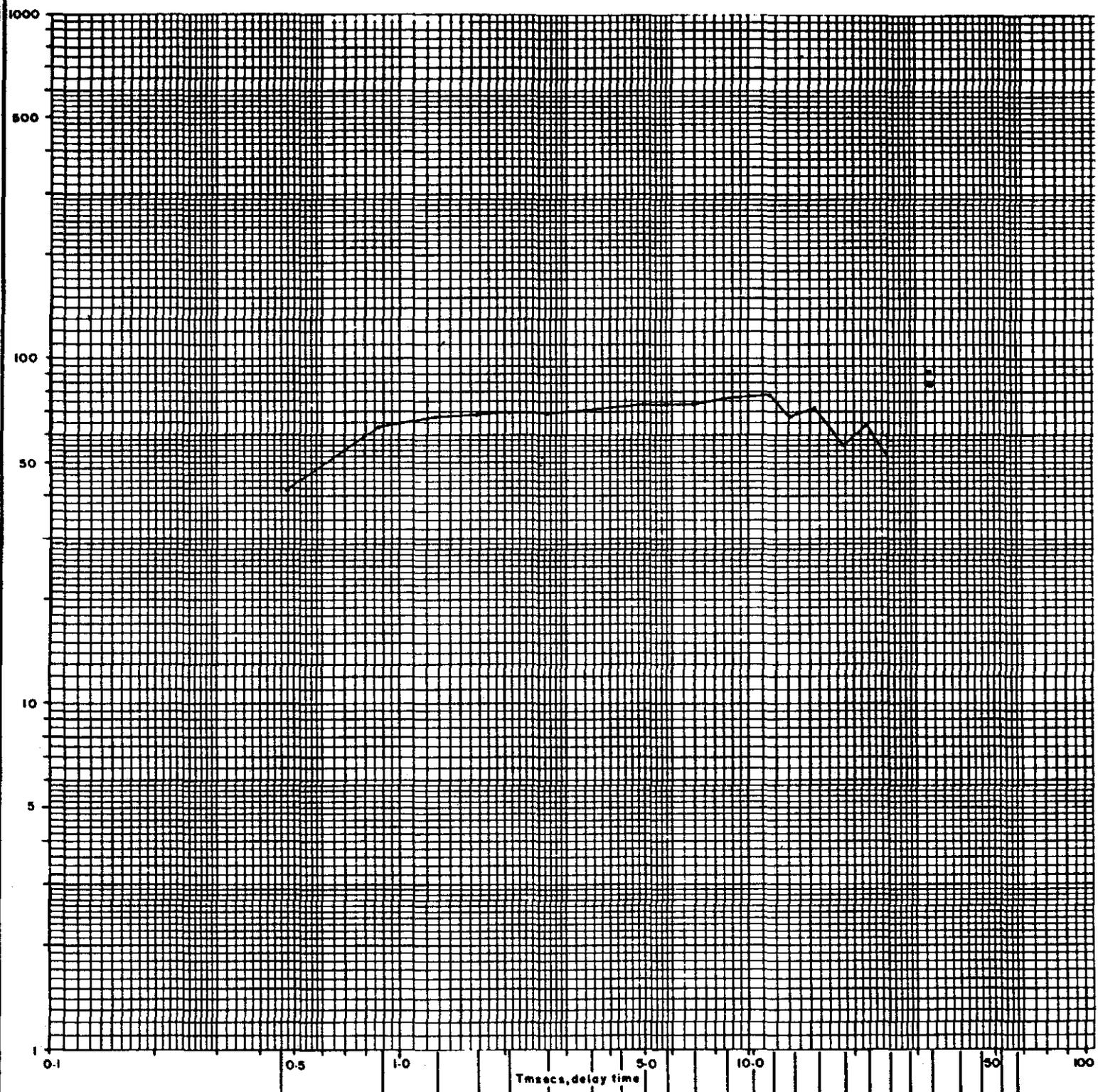
092

449093

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



Sirotem channels: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

INTERPRETATION : _____ Om
(Method:) ohm.m.

Resistive basement not seen
Basalt thickness > 300 m

The Shell Company of Australia Limited METALS DIVISION	
STATE :	TASMANIA
LOCATION :	GUILDFORD E.L. GODERICH RD. SOUNDING J
SCALE -	DATE OCT. 1983
AUTHOR N H	DRAWN V

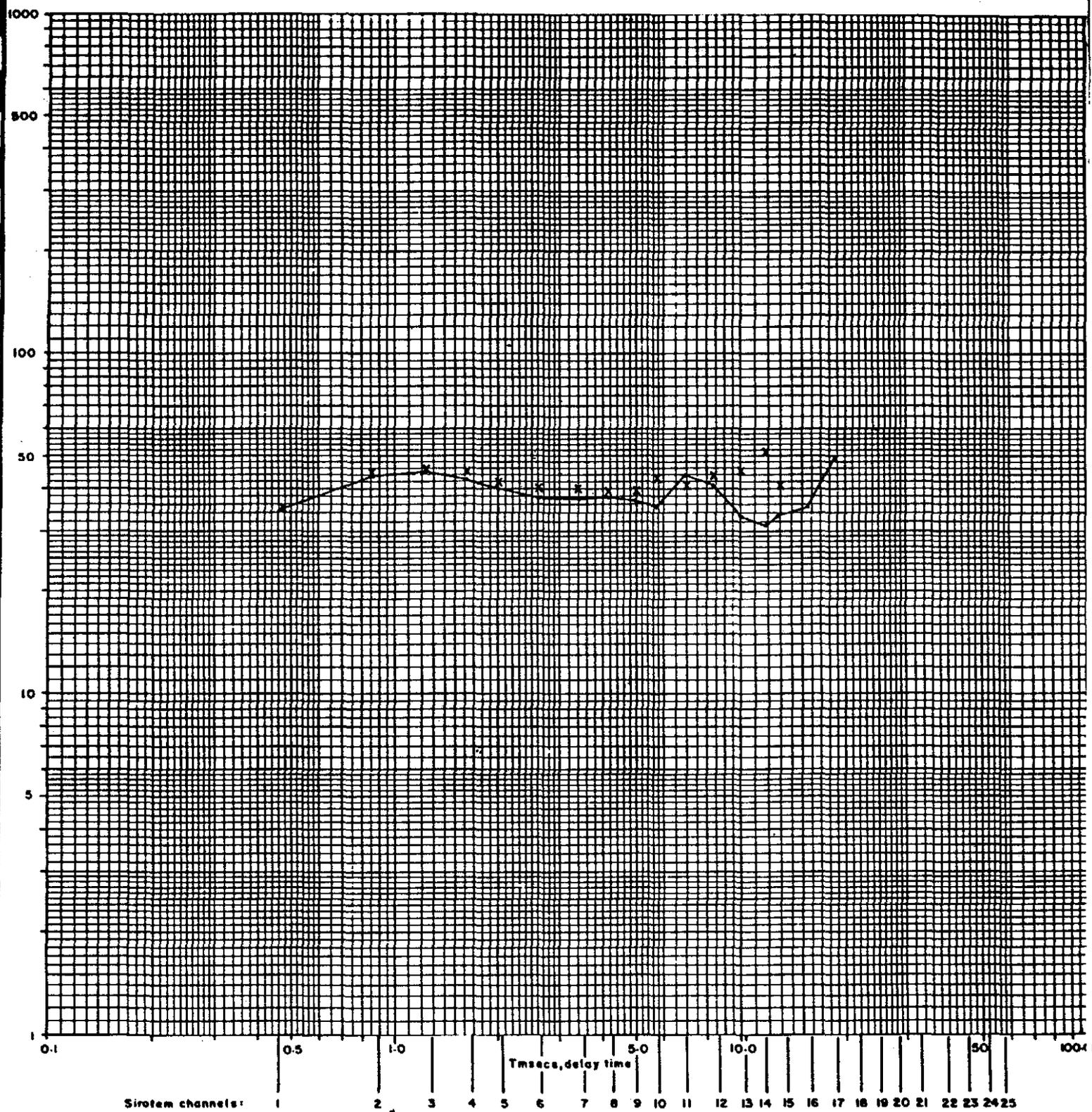
093

449094

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



INTERPRETATION : 0m
(Method:) ohm.m.

- x coincident loop
- ~~coincident~~ loop displaced.

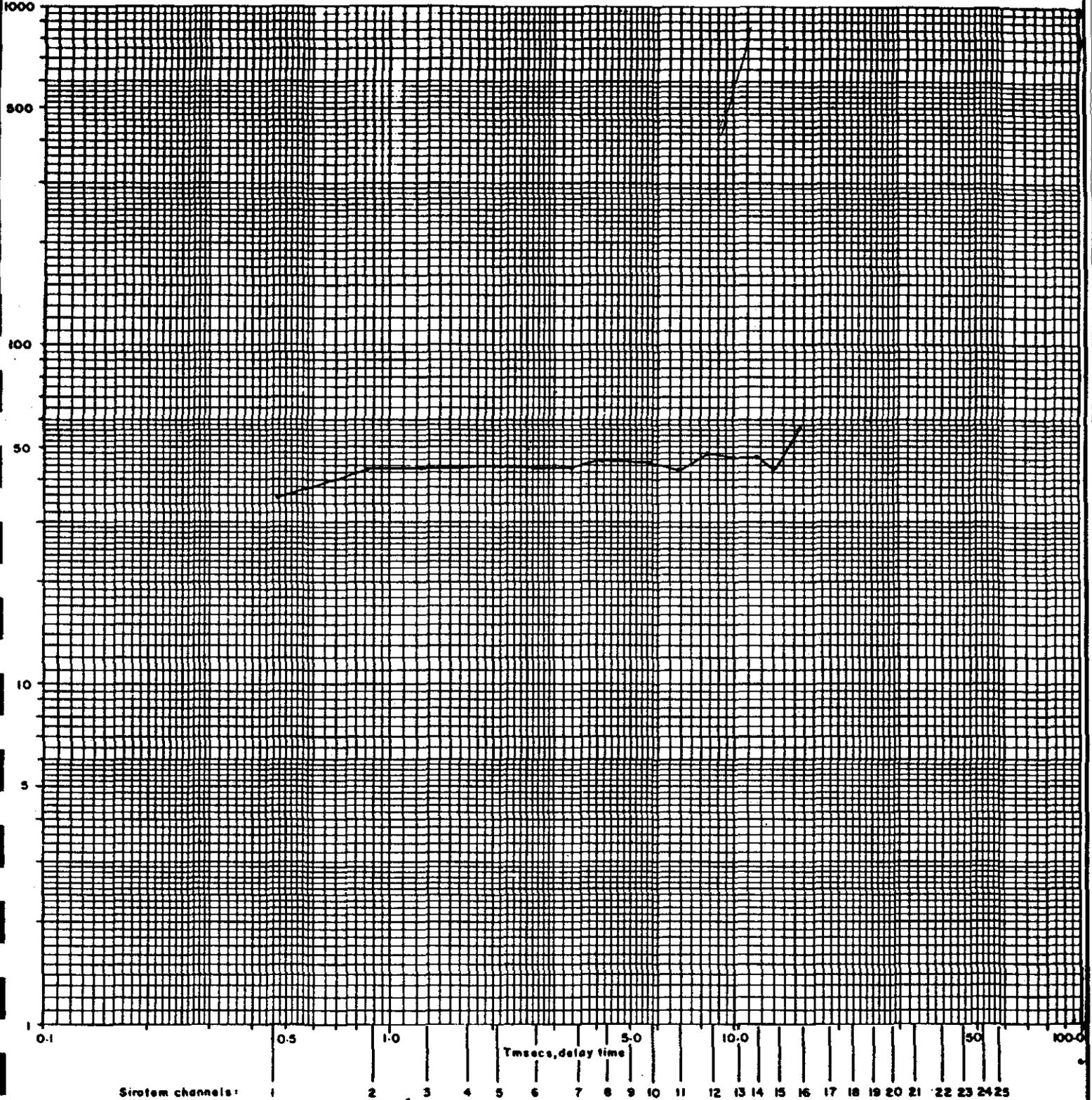
Resistive basement not seen
Basalt thickness > 300m

The Shell Company of Australia Limited METALS DIVISION	
STATE :	TASMANIA
LOCATION :	GUILDFORD E.L. GODERICH PLAIN I SOUNDING K
SCALE -	DATE OCT. 1983
AUTHOR N.H	DRAWN V.C

TEM DEPTH SOUNDING

SYSTEM : SIROTEM
LOOP SIZE : 200m COINCIDENT LOOP
OPERATOR : PB
DATE : SEPTEMBER, 1983

ρ_a , app. resistivity



INTERPRETATION :
(Method:)

_____ Om
ohm. m.

Resistive basement not seen
Basalt thickness > 300m

The Shell Company of Australia Limited METALS DIVISION	
STATE :	TASMANIA
LOCATION :	GUILDFORD E.L. GODERICH PLAIN 2 SOUNDING L
SCALE	DATE OCT. 1983
AUTHOR	NH DRAWN VC

REPORT ON AMT SOUNDINGS

(FOR LOCATIONS SEE DRAWING NO. MQ00/1004)

APPENDIX 4

096

449097



AND CLARENCE STREET

MACQUARIE UNIVERSITY

CENTRE FOR GEOPHYSICAL EXPLORATION RESEARCH

NORTHRYDE NEW SOUTH WALES 2113 AUSTRALIA

TELEPHONE: 888 8000 EXTN: 9220

TELEGRAPHS & TELEX: MACOUNI AA27377

IN REPLY PLEASE QUOTE: KV:RS

22 March 1983

CIRCULATED BY

AUSTRALIAN MINERAL INDUSTRIES RESEARCH ASSOCIATION LTD.

TO SPONSORS OF THIS PROJECT

DATE: 29 MAR 1983

Director: Professor K. Austin
Assistant Director: Dr A.P. Raiche

Final Report : Tasmania AMT Surveys - Shell EL

1. Introduction

AMT measurements were carried out at 11 locations on a Shell EL in the northwest of Tasmania. The general area is shown in Figure 1. The object of the survey was to determine whether AMT could define the thickness of the very irregular basalt cover, the depth to resistive basement, and the thickness of any material between. It is known that resistivities can vary widely amongst flows. Between flows and basement, sediments, skarn and weathered basement are found in places. Banks (1962) notes that the basalt flows covered a surface whose topographic relief in places exceeded 1000 feet. Basement rocks are not exposed in the immediate area but are thought to consist of lower paleozoic metasediments and granites.

To assist in the evaluation there were drill holes at five of the sites, electrical soundings at six sites and a dipole-dipole survey at a seventh. Several of the drill holes did not emerge from basalt, giving only minimum thicknesses. The sites were scattered over an area of 150 square kilometres. Borehole resistivity logs were available at a few places in the area, but values were much larger than observed from the surface measurements.

Dr Roger Lewis of the University of Tasmania helped with on-site inversion in the early part of the program.

2. Results

The equipment functioned without fault for the seven working days of the survey. Data quality was fair, although some power line interference was encountered at a few sites especially 5, 9 and 11. In addition the upper half frequency decade was distorted on both components at nearly all sites on account of high contact resistances. This gave a false downturn in apparent resistivity and phase. On inversion it produced a superficial layer of very low resistivity which artificially reduced the apparent depth to deeper interfaces. As a practical matter it was decided to reject the affected data points. (The problem does not arise with the new junction box).

Results and Discussion

The scalar apparent resistivities, phases and inversion models are shown in Figures 2-17. Resulting models are summarised in Table 1, alongside the drill data and DC inversions. Results are generally consistent with the external data and expectations. Most sites show a 3 layer pattern with a relatively conductive zone sandwiched between a moderately resistive surface layer and a more resistive basement. Basement resistivities are usually less than 1000 ohm-m, well resolved and direction-dependent.

Two outlying sites, 2 and 12, differ from the rest in that they do not have a conductive second layer, and their basement resistivities exceed 1000 ohm-m.

Tensor analyses yield definite strike directions and modest Tippers at all sites. These indicate distinct 'grain', and give its strike direction. This lies between WNW and NNW at sites 3, 4, 5, 10 and 11. At sites 2 and 12 it is NNE-NE. Tippers are largest at sites 1 and least at 2, 5 and 8. With more closely spaced sites it might be possible to map bedrock geology. The task would be complicated by buried topography but assisted by the frequency dependence of data rotations.

AMT results will differ from drill results for several reasons in an area of this kind. Buried topographic relief is important in some places. This is evidenced by major depth differences between the two AMT components, which are local averages in their respective directions. For example, at site 1 it appears that the base of the top (resistive) layer is roughly horizontal, but that the surface of the resistive basement has N-S oriented topographic relief, with an average (local) depth to the tops of 160 m. This accords with aeromagnetic indications.

Likewise AMT and DC results might differ for example because of their different responses to a thin resistive layer. Differences of this kind are resolved by joint inversion using anisotropic layers.

Usually the AMT and DC resistivities agree, and are much less than the borehole log values. The reason for the discrepancy is not known.

Conclusions

The AMT survey successfully achieved the objectives set out for it. The technique also indicated a potential for more detailed application to mapping bedrock beneath flows, but this would require more closely spaced sites.

While many improvements can be made, the system as it stands is practical and suited to its demonstration function.

We are indebted to Dr Roger Lewis for his help.

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NB CONVENTION X - NORTH
Y - WEST

TABLE 1 Tasmania AMT Results : Shell Area : January 1983

SITE	EXHY	EYHX	JOINT DC		DC	DRILLING	COMMENTS
			with XY	with YX			
1	$\frac{87}{26}$ 119 $\frac{570}{245}$	$\frac{85}{16}$ 114 $\frac{1800}{164}$	$\frac{83}{8}$ 160 $\frac{600}{190}$			$\frac{202}{255}$ Basalt Seds, skarn Granite	N-S aeromag trend Dipole-dipole DC
2	$\frac{50}{980}$ 420	$\frac{40}{1800}$ 360					
3	$\frac{65}{39}$ 26 $\frac{980}{260}$	$\frac{35}{26}$ 58 $\frac{390}{235}$				>250 m of basalt	
4	$\frac{20}{140}$ 34 $\frac{30}{570}$ 105 330	$\frac{20}{60}$ 50 $\frac{40}{170}$ 60 320	$\frac{(1000)}{14}$ 1.5 $\frac{40}{770}$ 6 430	$\frac{(1000)}{23}$ 1.2 $\frac{60}{290}$ 90 440	$\frac{104}{55}$ 1 $\frac{10}{(400)}$ 130 150		N-S DC sounding (#6)
5	$\frac{(4000)}{(3)}$ (230) $\frac{620}{(250)}$	$\frac{95}{26}$ 47 $\frac{970}{92}$					Noisy EXHY
6	$\frac{76}{9}$ 213 $\frac{2000}{250}$	$\frac{60}{30}$ 102 $\frac{190}{350}$		$\frac{270}{57}$ 1 $\frac{30}{200}$ 100 250	$\frac{1000}{130}$ 4 $\frac{10}{(300)}$ 180 230	Basalt >90 m	N-S DC sounding (#3)
7	NOT OCCUPIED						
8	$\frac{50}{5}$ 230 $\frac{440}{270}$	$\frac{60}{19}$ 200 $\frac{260}{330}$	$\frac{53}{3}$ 245 $\frac{430}{255}$	$\frac{53}{7}$ 245 $\frac{280}{300}$	$\frac{700}{60}$ 5 $\frac{(11)}{(300)}$ 220 250		NW-SE DC sounding (#5)
9	$\frac{54}{10}$ 240 $\frac{230}{290}$	$\frac{63}{16}$ 170 $\frac{390}{270}$				Basalt >90 m	Noisy
10	$\frac{40}{2}$ 160 $\frac{600}{180}$	$\frac{40}{34}$ 56 $\frac{530}{310}$					
11	$\frac{50}{25}$ 190 $\frac{400}{280}$	$\frac{40}{25}$ 120 $\frac{180}{200}$					Noisy
12	$\frac{25}{70}$ 13 $\frac{1000}{210}$	$\frac{16}{50}$ 9 $\frac{1100}{110}$					



MACQUARIE UNIVERSITY

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NORTH RYDE NEW SOUTH WALES 2113 AUSTRALIA

TELEPHONE: 888 8000 EXTN: 9220

TELEGRAPHS & TELEX: MACQUNT AA22377

IN REPLY PLEASE QUOTE:

1 February 1984

Director: Professor K. Vozoff
 Assistant Director: Dr A.P. Raiche

Addendum to Final Report Tasmania AMT Surveys - Shell EL

Introduction

At the request of Shell the data were reduced and plotted in ink to form an addendum to the final report. The purpose of this work was to produce ink plots for copying purposes whilst also providing a check on the original interpretations.

Results

In cases where it was decided to combine the XY and YX data sets the same data is contained in both the XY and YX files before editing.

Site 1 (Figure 12)

EXHY	EYHX
<u>87</u>	<u>85</u>
26	16
734	913
119	114
245	164

These models represent the best fit obtained. These plots were generated using the original interpreted models.

Site 1 (Figure 13)

In this plot both the XY and YX data have been combined, with the models used in Figure 1 being superimposed to show the effects of the poorly resolved phase data in the YX component.

Site 2 (Figure 14)

COMBINED EXHY AND EYHX

<u>47</u>	
63	242
435	352

In this case the resistivity data indicate an approximation to a one-dimensional situation whereas the phase data appears incompatible with the resistivity data at frequencies below 10 Hz. The XY and YX data were combined to produce an average fit as shown above.

Site 3 (Figure 14)

EXHY	EYHX
$\frac{44}{1200}$ 280	$\frac{31}{377}$ 249

In this case the interpretation is not markedly different to that obtained previously; however the first two layers previously interpreted have been combined to obtain one equivalent layer.

Site 4 (Figure 16)

EXHY	EYHX
$\frac{38}{792}$ 410	$\frac{37}{241}$ 232

In keeping with the simplicity of the models generated for this area it was decided to reduce the number of layers previously used. The phase and resistivity data for the XY and YX components suggest that this site may approximate a one-dimensional situation, and that the true model should be a compromise between the XY and YX models presented.

Site 5 (Figure 17)

EXHY	EYHX
$\frac{(30,000)}{3}$ 219	$\frac{58}{35}$ 53
$\frac{712}{(3083)}$ 231	$\frac{946}{199}$ 98

The interpretation models of this site are almost identical to those originally obtained. At the present moment I cannot explain the large differences existing between the XY and YX models.

Site 6 (Figure 18)

EXHY	EYHX
$\frac{76}{8}$ 228	$\frac{52}{20}$ 156
$\frac{(3083)}{712}$ 263	$\frac{199}{946}$ 304

These results are in good agreement with the previous interpretation.

Site 7 NOT OCCUPIEDSite 8

EXHY AND EYHX COMBINED

$\frac{53}{8}$ 215
$\frac{300}{712}$ 266

In this case the XY and YX components were combined and processed to produce the model shown. The XY plot shows the edited data and final fitted model, whilst the YX plot shows the unedited data with the initial model used.

Figure 20 uses the combined data as used to produce Figure 19, but with different models and editing used, to produce a range of fitted models. This gives some idea as to the reliability of the fitted model.

Figure 21 uses the XY and YX components in an uncombined form for the same site.

Site 9 (Figure 22)

COMBINED EXHY AND EYHX

58	
14	196
336	273

The data in this case were noisy and difficult to interpret with the two components (XY and YX) appearing very similar within the noise envelope. On this basis it was felt that by combining the data a better model could be obtained. This model is presented above.

The XY plot shows the edited data and final model whilst the YX plot shows the unedited data and initial model used.

Site 10 (Figure 23)

When processing this site it was found that no low frequency data had been collected and it was decided to restack the raw data before reprocessing. This site appears very similar in nature to site 5 with similar XY and YX curves being obtained.

EXHY		EYHX
(24,172)		38
8	140	27
763	148	431
		317

Site 11 (Figure 24)

In this case it was felt that neither the XY or YX data could be interpreted realistically and accurately by themselves and due to this they were combined with the fitted model shown below being obtained.

COMBINED EXHY AND EYHX

48	
40	310
273	349

The XY plot shows the edited data with final model whilst the YX plot presents the unedited data and initial model used.

Site 12 (Figure 25)

Inspection of the data from site 12, and the previously interpreted models suggest that the apparent differences obtained using the XY and YX components are due to differences in the data caused by noise (?power lines). On this basis it was decided to combine the XY and YX components and reduce the data. The final model and edited data are presented in the XY plot whilst the YX plot contains the unedited data and starting model.

COMBINED EXHY AND EYHX

$$\frac{53}{1080} \quad 156$$

Replacement of the initially interpreted 3-layer model with a 2-layer model has produced a model which is in reasonable agreement with the prevailing interpreted depths and resistivities for this site.

Conclusion

The re-reduction of the data has produced final models which are consistent with those obtained previously. In the case of site 10 the restacking and consequent reduction of the data has resulted in a quite different model being obtained.

The consistency of interpretation obtained between the two reductions would appear to reinforce the reliability of the interpretations.

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AMT ANALYSIS

SHELL TASMANIA SITE I

SWIFT

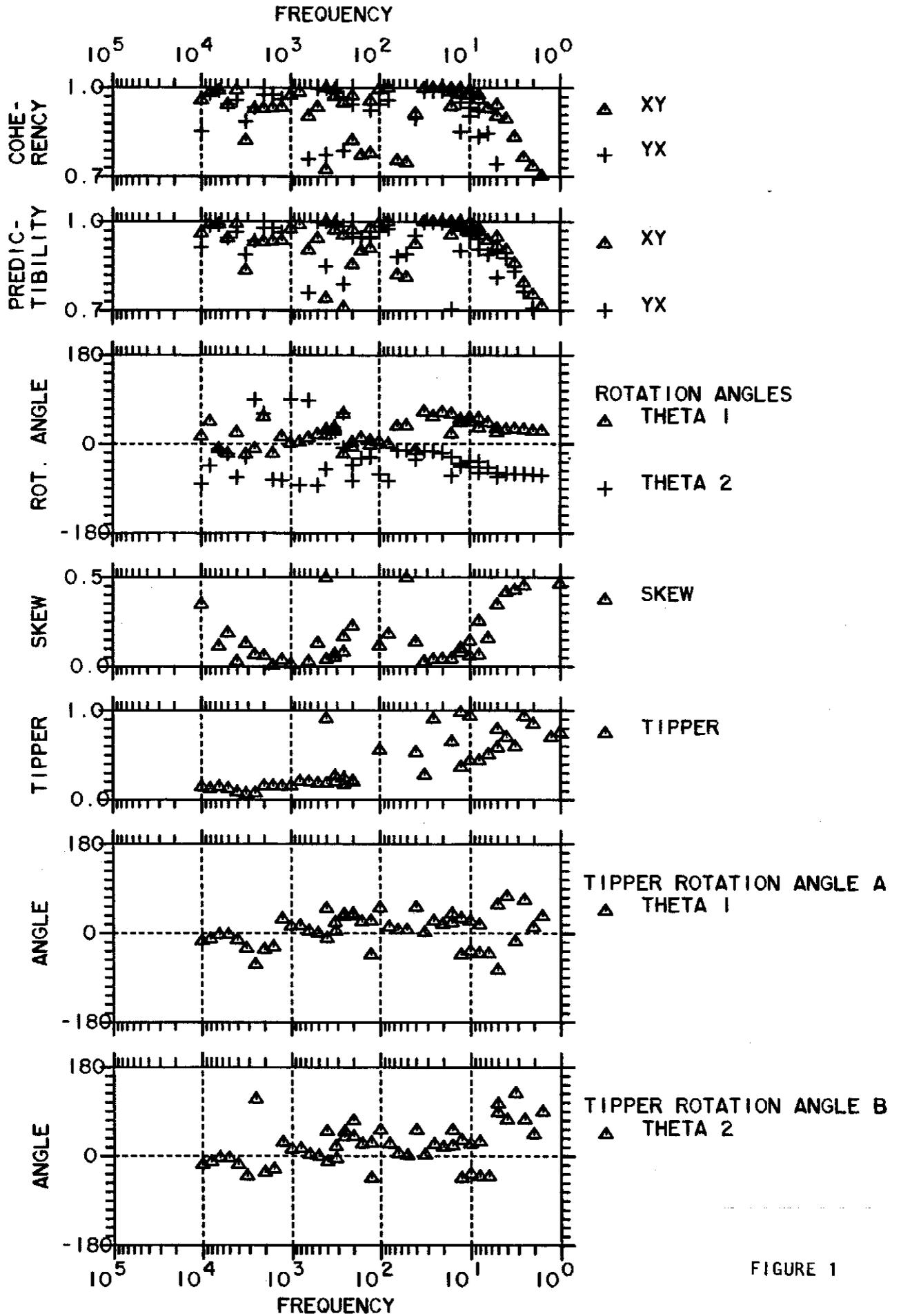


FIGURE 1

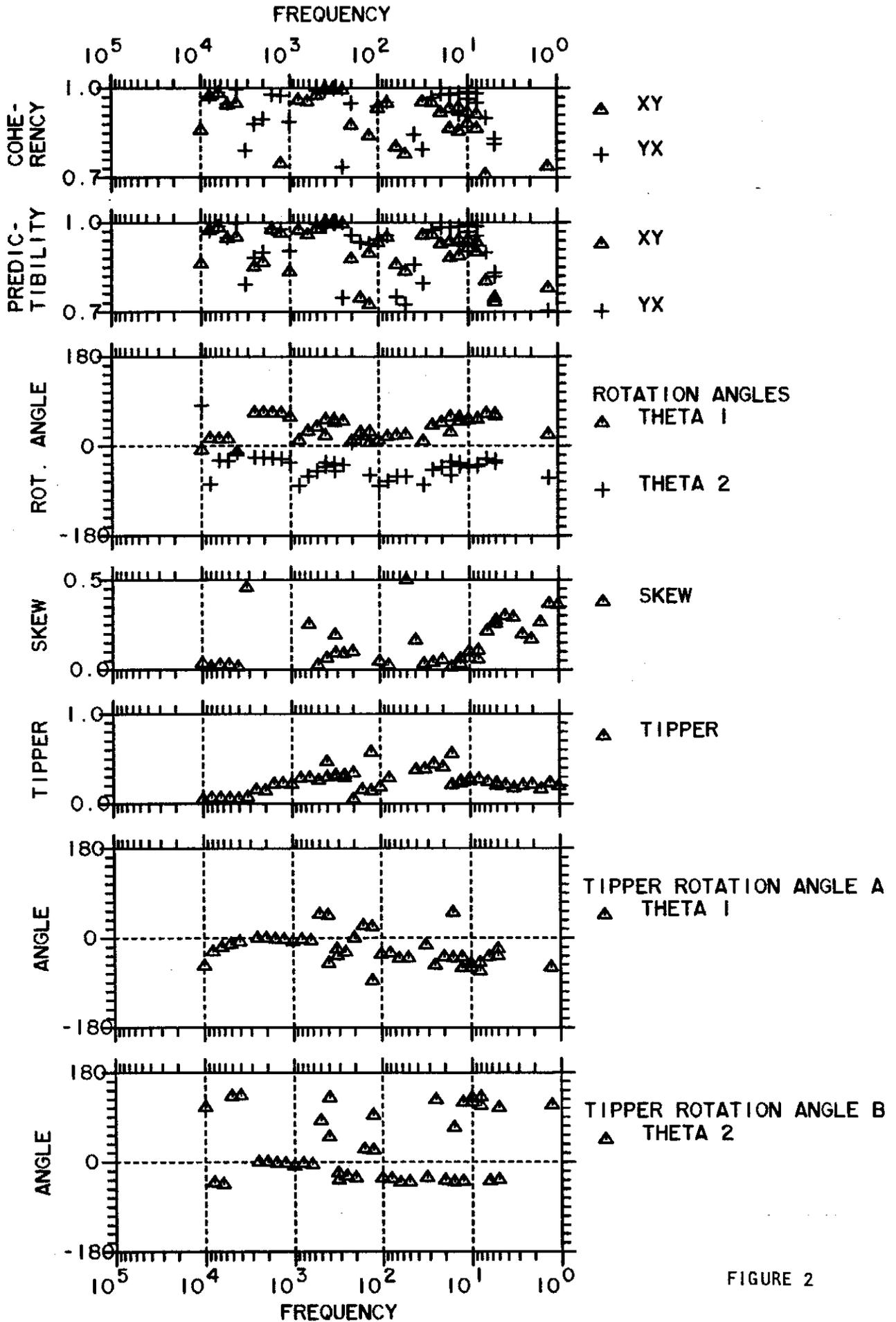


FIGURE 2

105

SHELL TASMANIA SITE 3

SWIFT

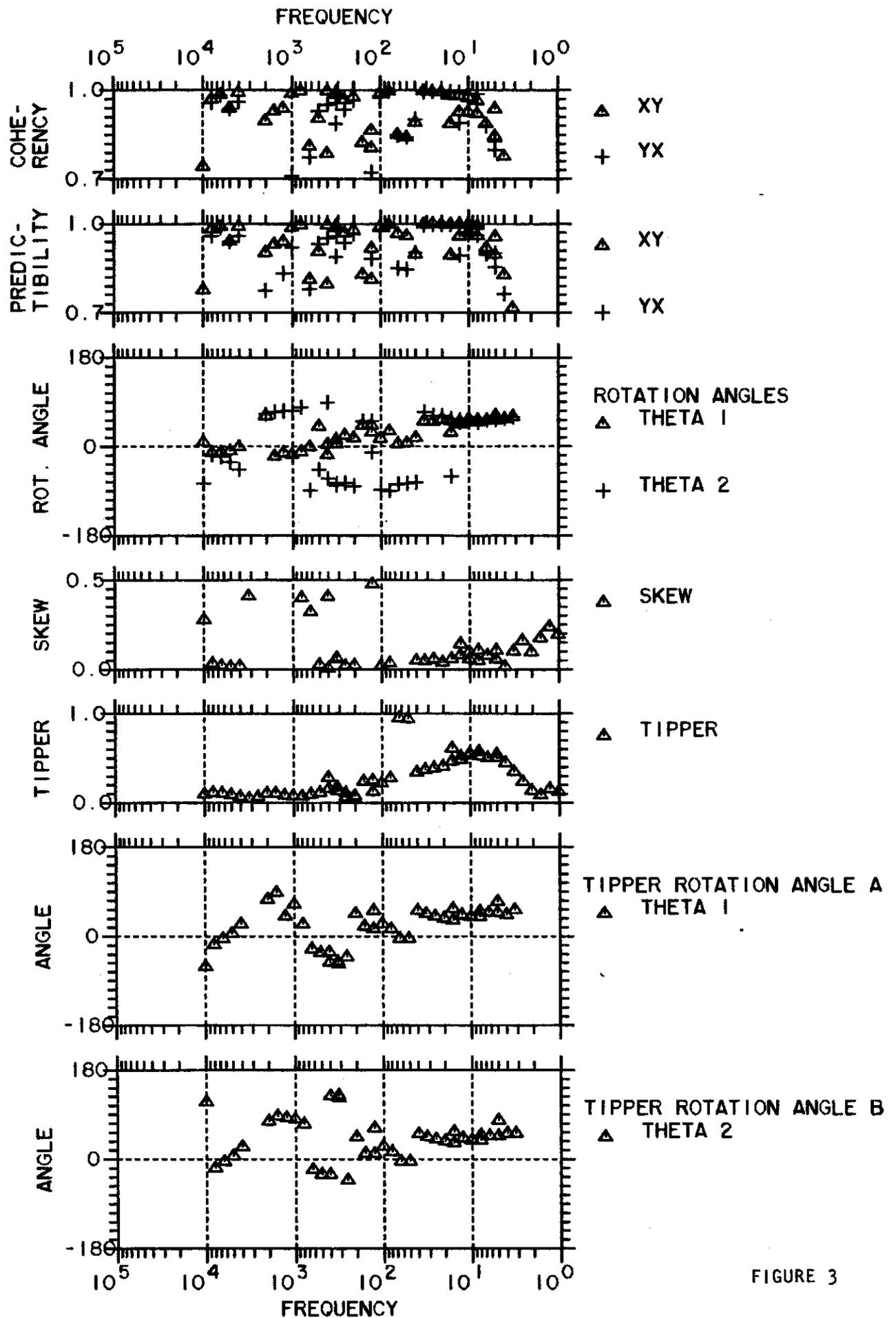


FIGURE 3

106

SHELL TASMANIA SITE 4

SWIFT

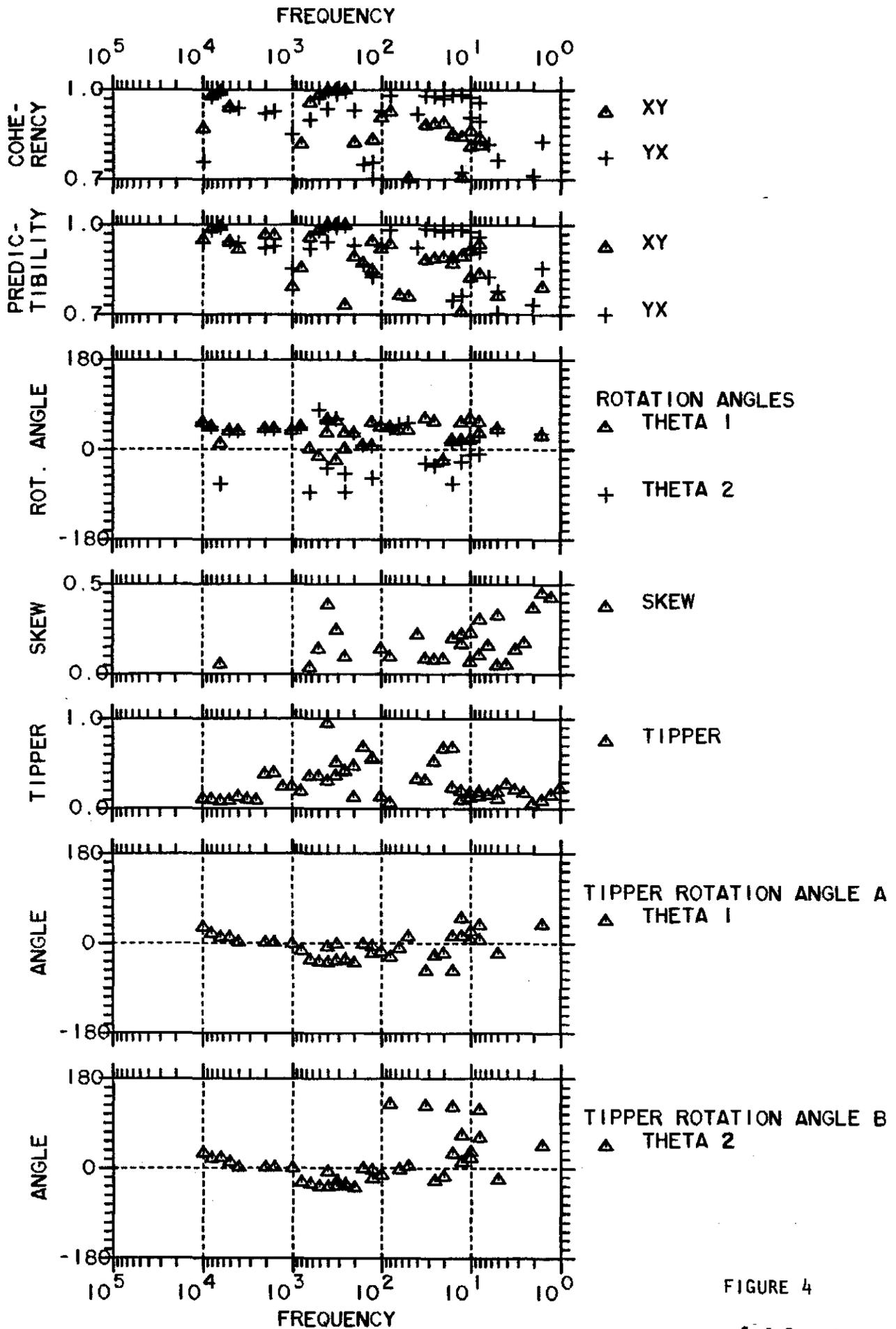


FIGURE 4

449107

107

AMT ANALYSIS

SHELL TASMANIA SITE 5

SWIFT

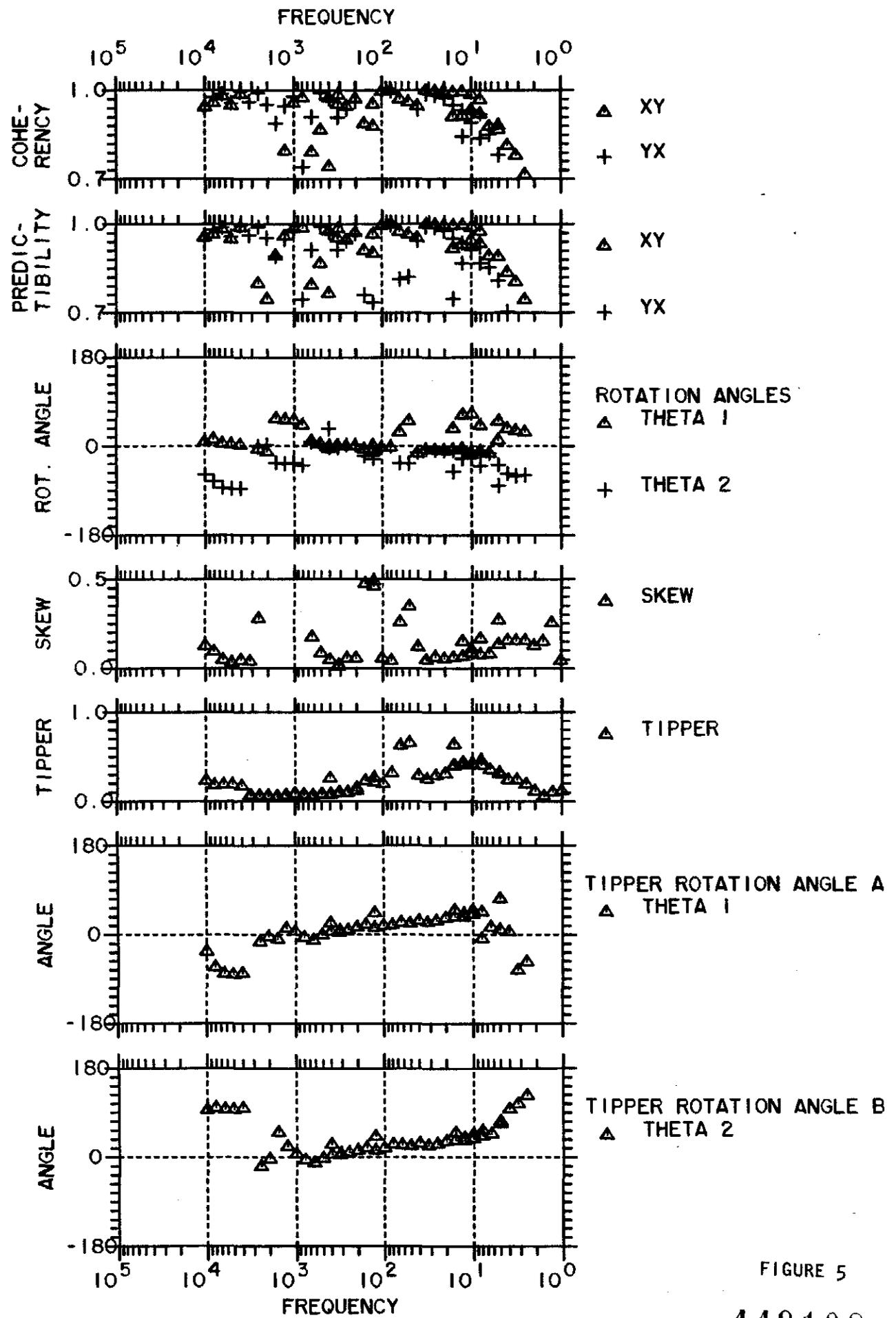


FIGURE 5

449108

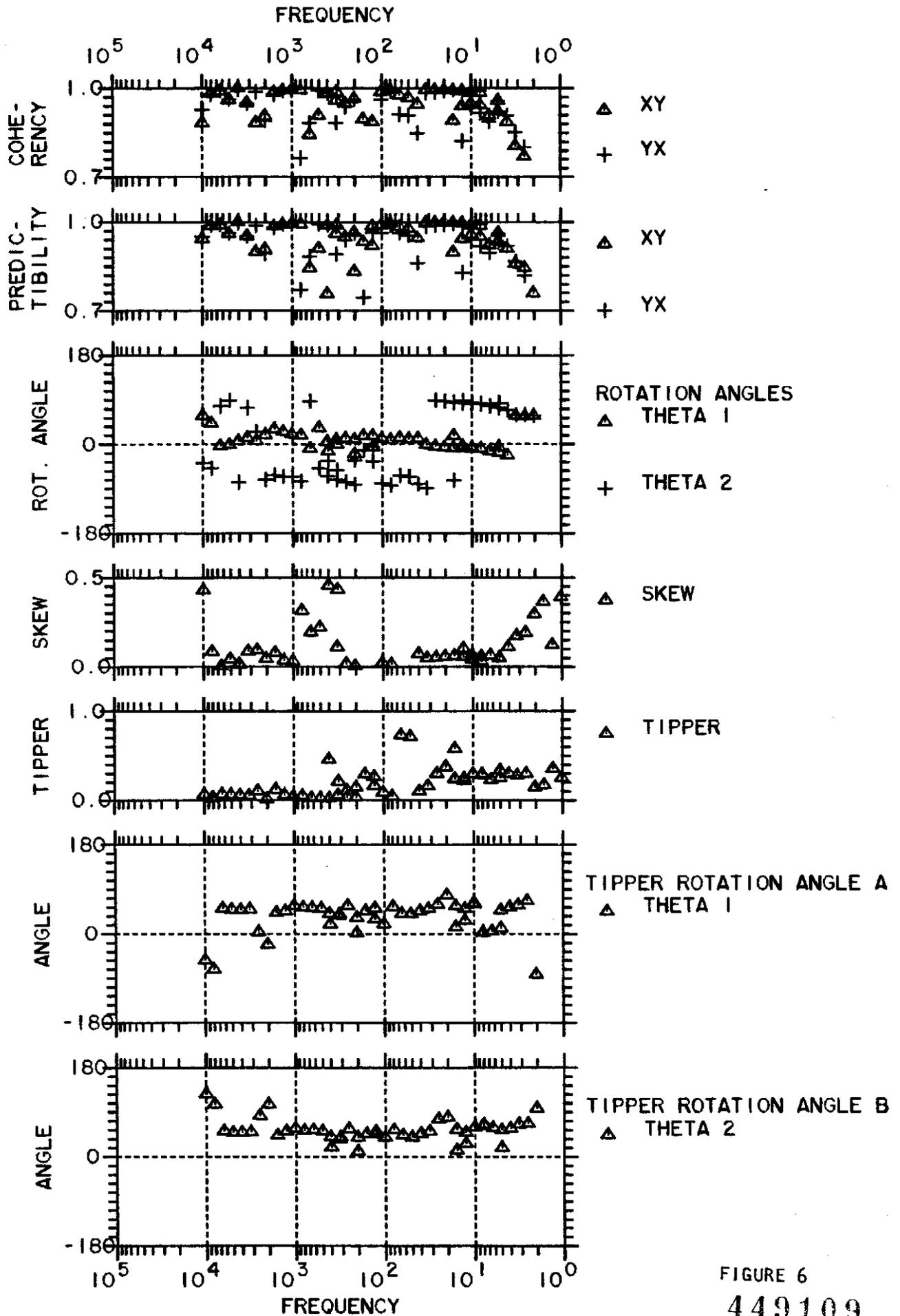


FIGURE 6

449109

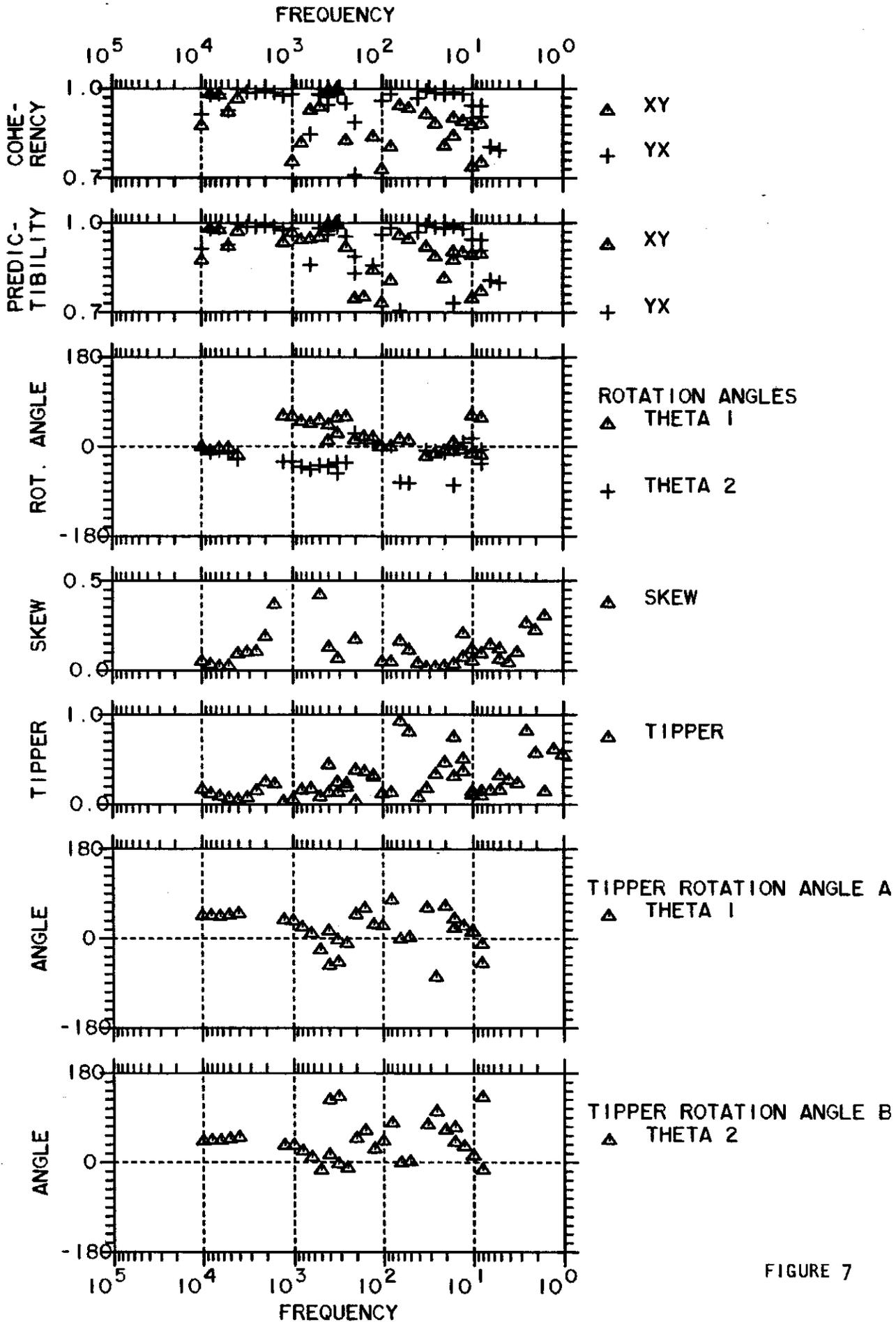
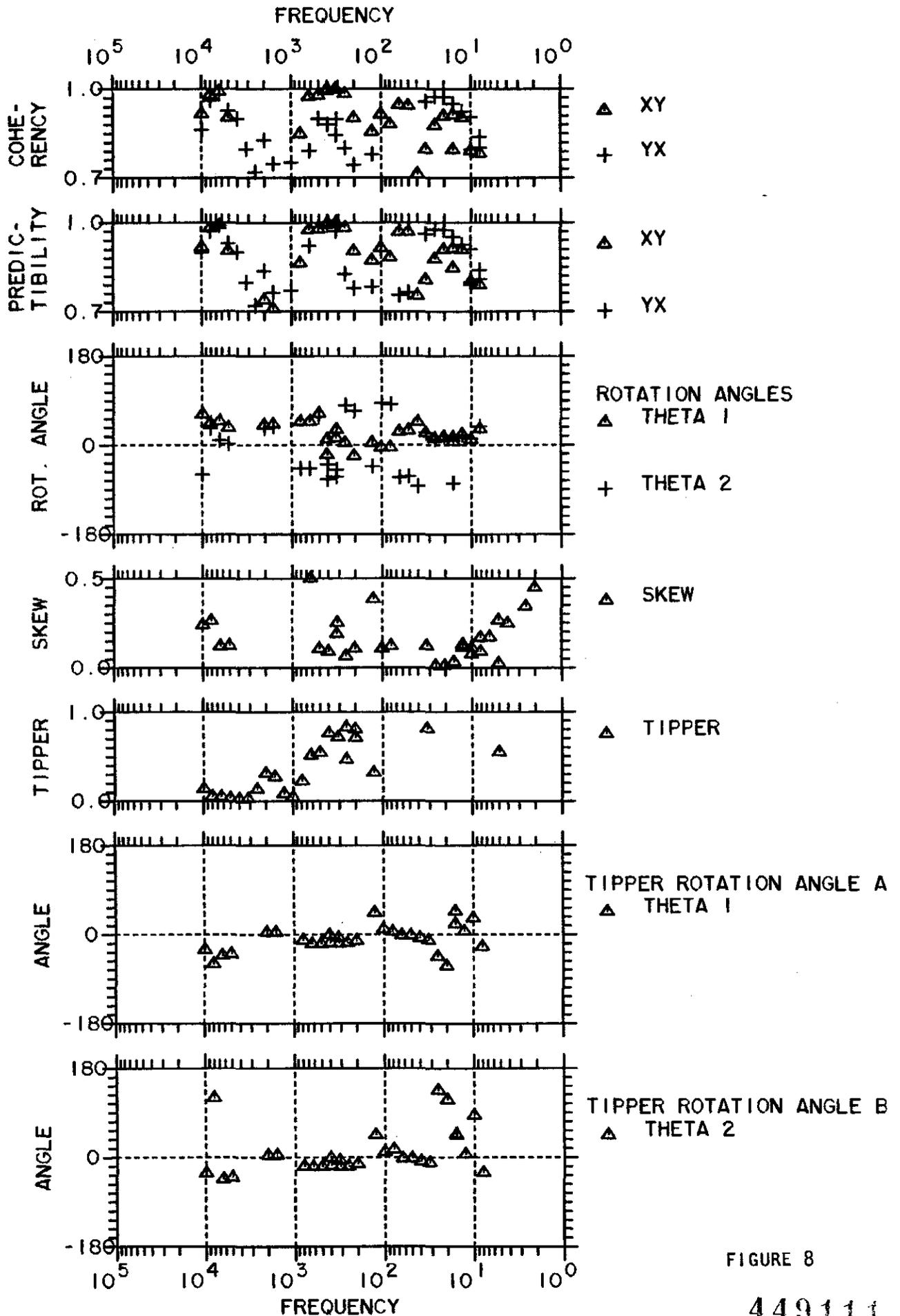


FIGURE 7



111

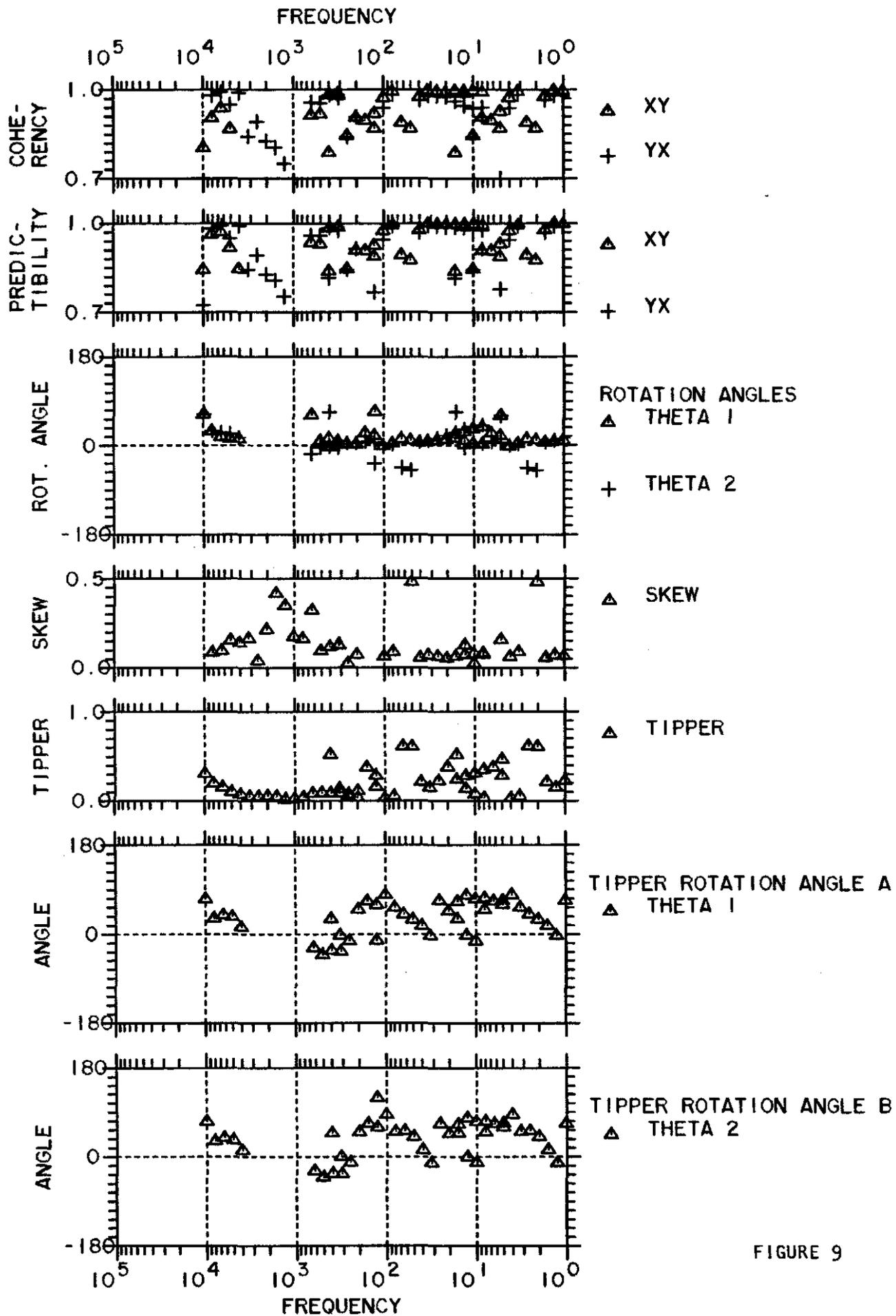


FIGURE 9

112

SHELL TASMANIA SITE II

SWIFT

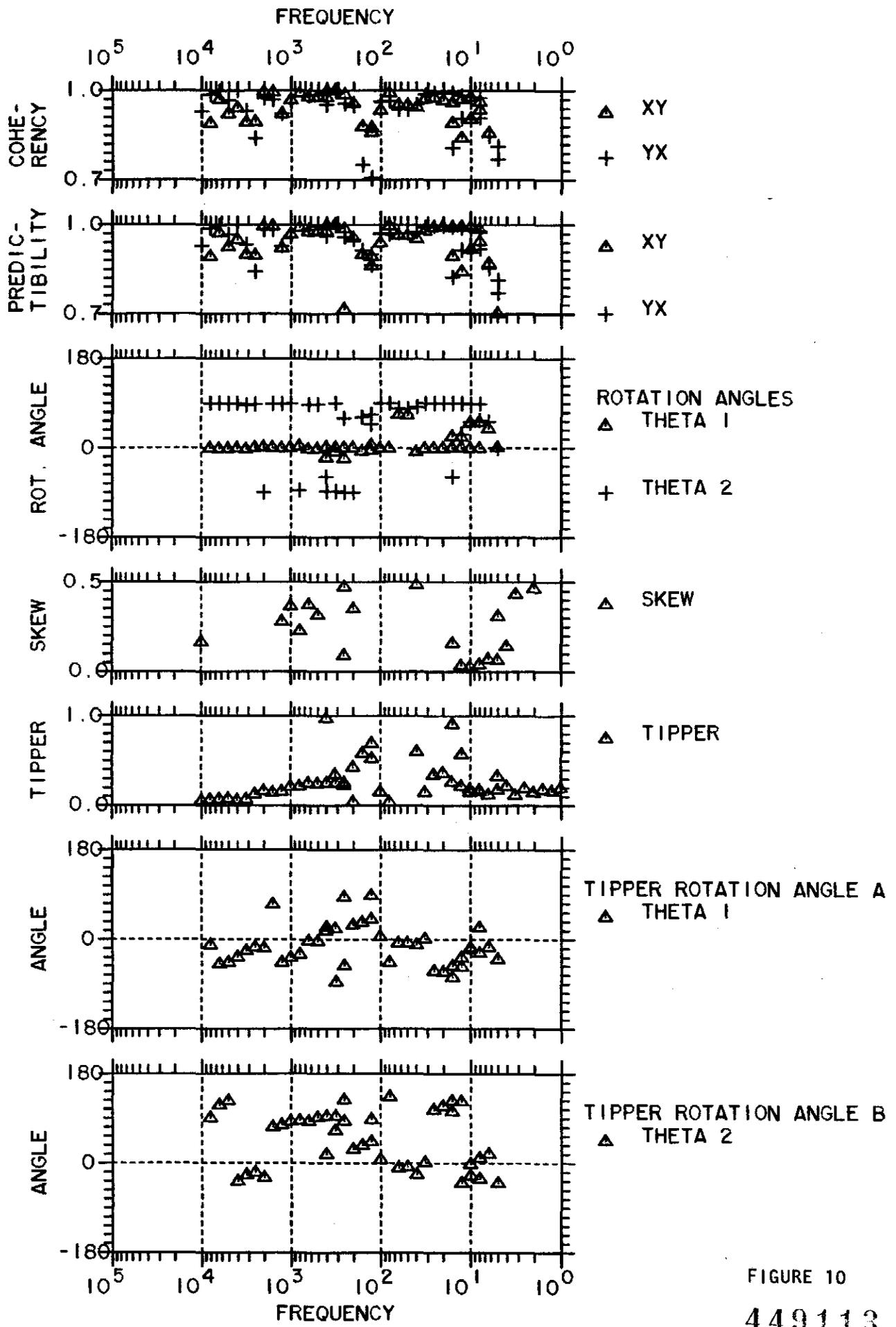


FIGURE 10

449113

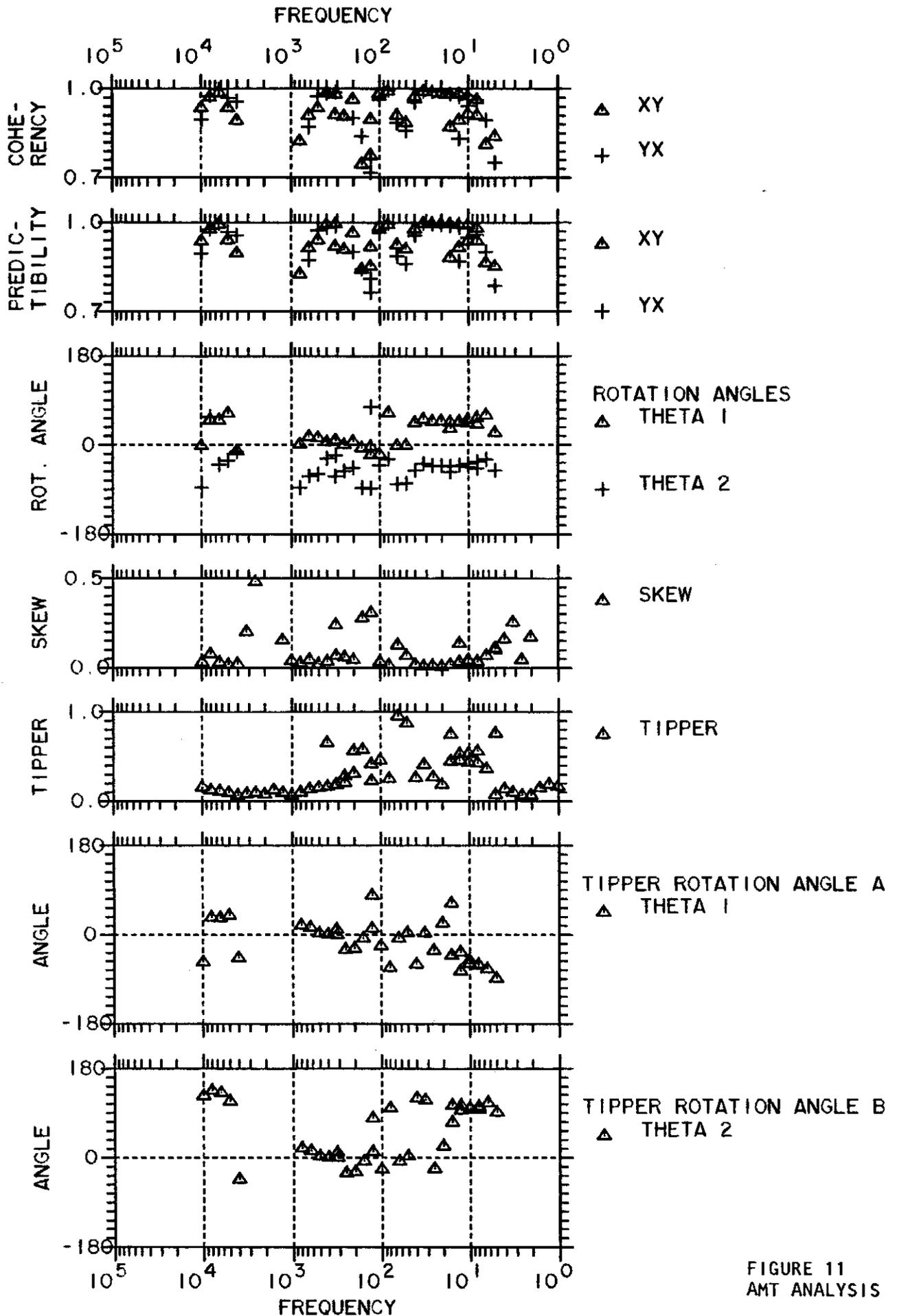


FIGURE 11
AMT ANALYSIS

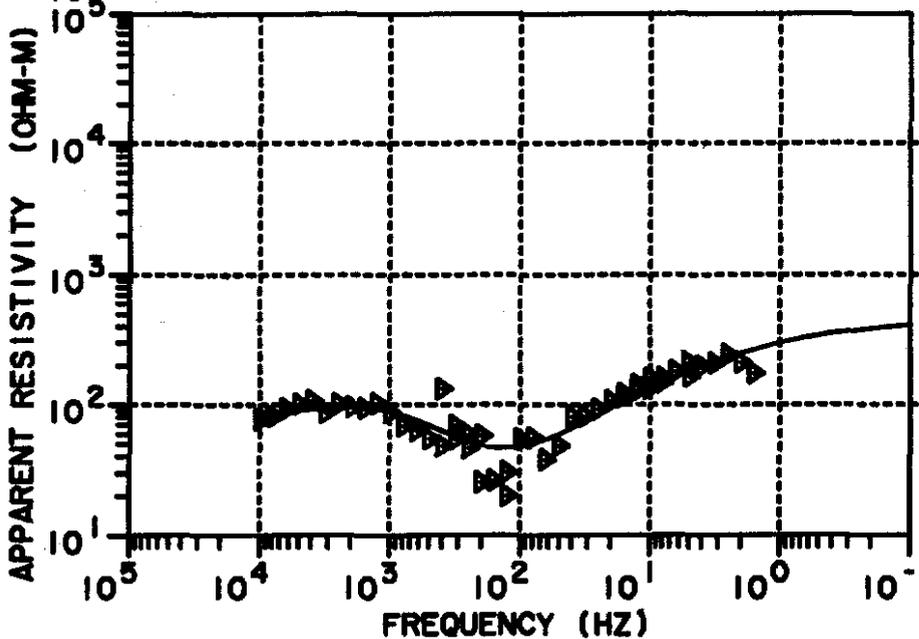
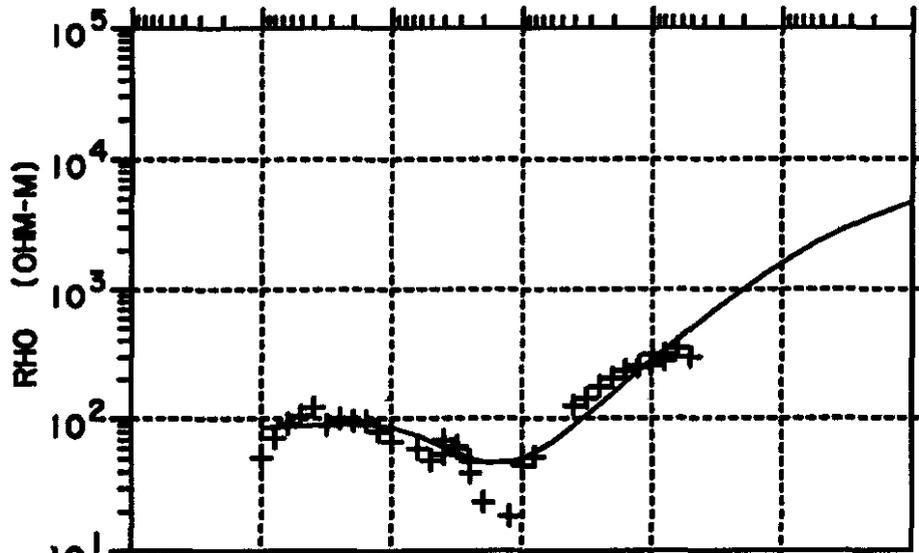
FIGURE 12

YX:

LAYERS 3

THICKNESS. 114, 150, (METERS)

RHO. 85.0, 32.5, 9050.8 (OHM-M)

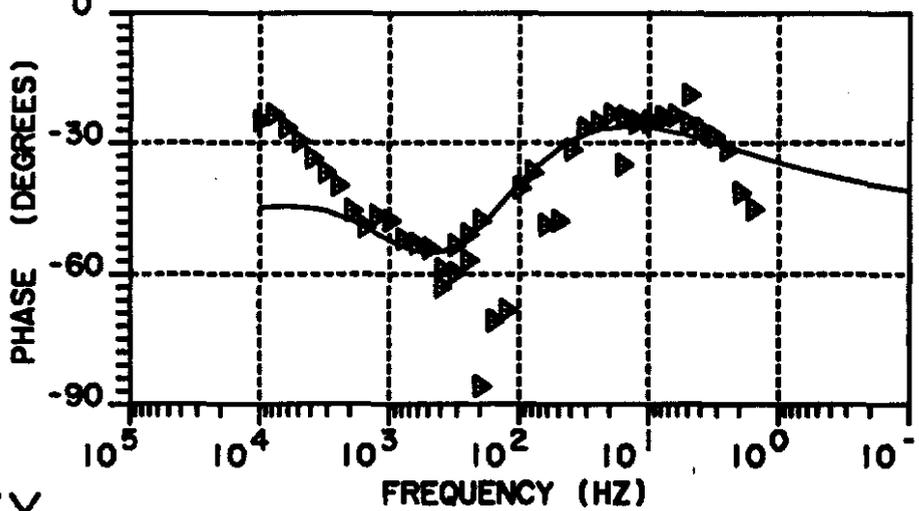
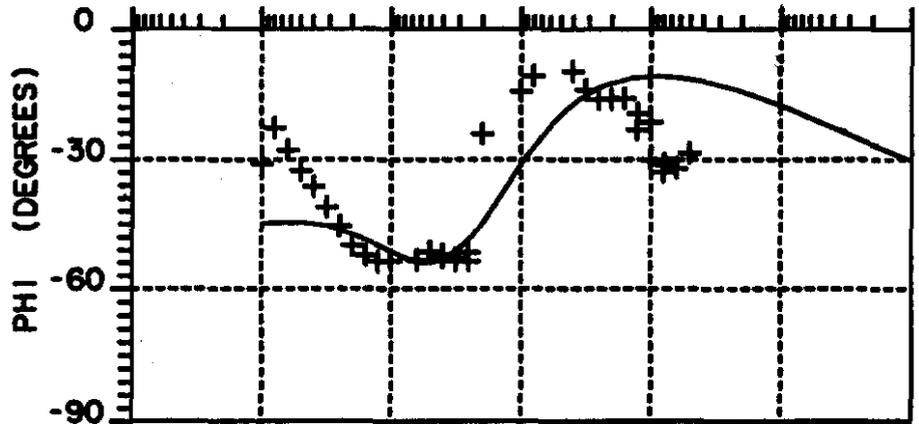


XY:

LAYERS. 3

THICKNESS. 119, 126, (METERS)

RHO. 87.0, 26.0, 477.7 (OHM-M)



114

CGER MACQUARIE UNI . 20-JAN-84

14.32.36

SITE 1 CAGNIARD

AMT MODELLING

449115

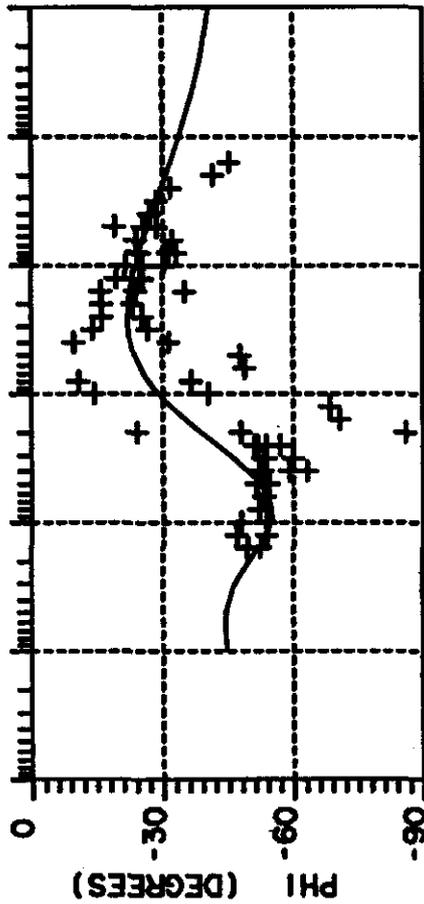
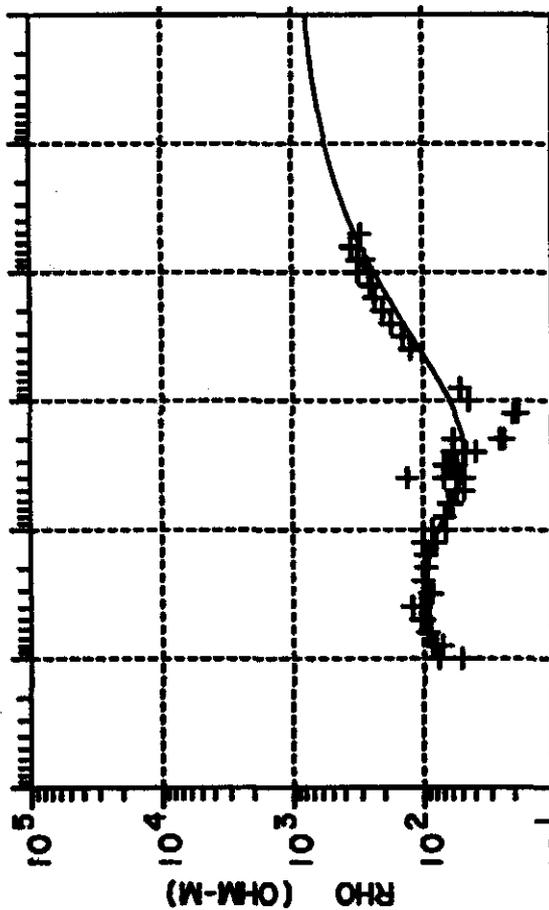
FIGURE 13

YX :

LAYERS: 3

THICKNESS: 114, 50, (METERS)

RHO: 85.0, 16.0, 912.8 (OHM-M)



XY :

LAYERS: 3

THICKNESS: 119, 126, (METERS)

RHO: 87.0, 26.0, 734.1 (OHM-M)

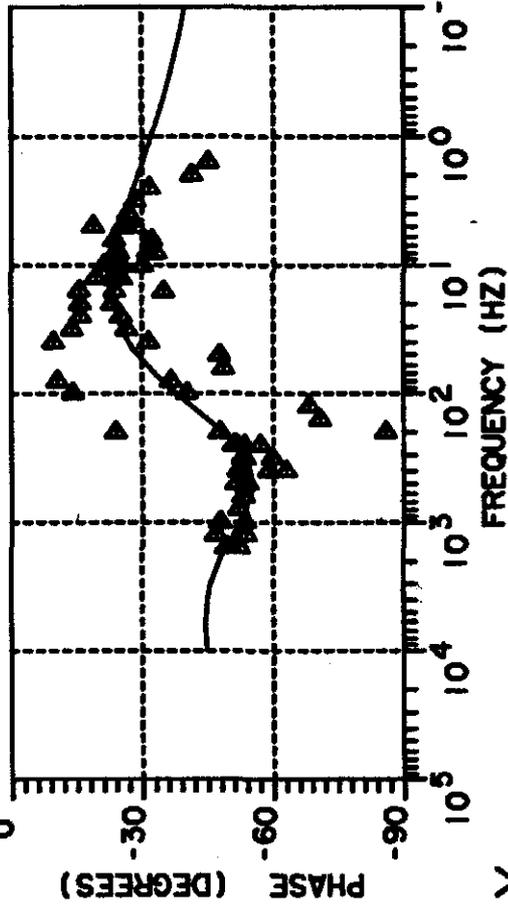
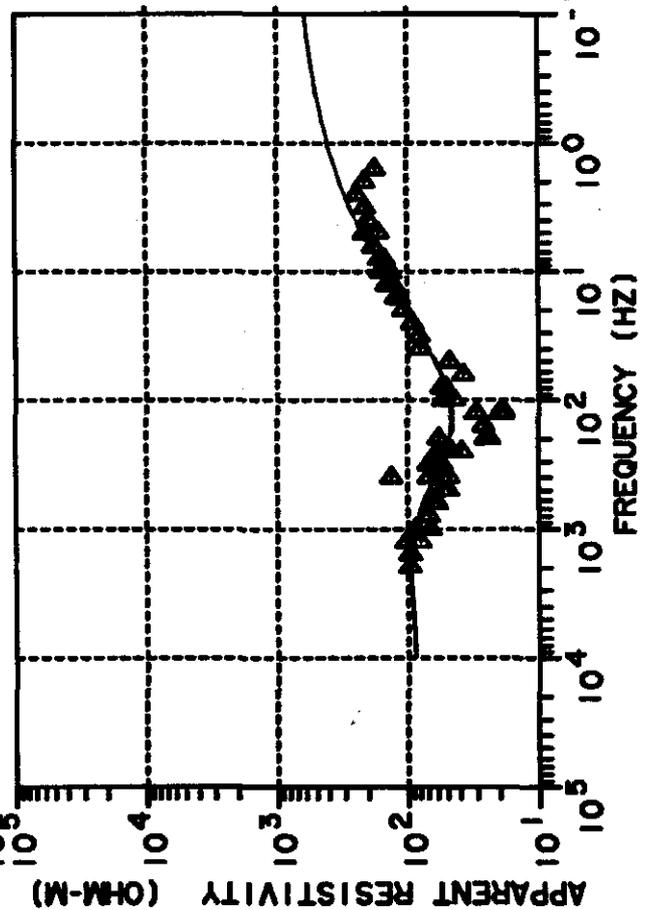
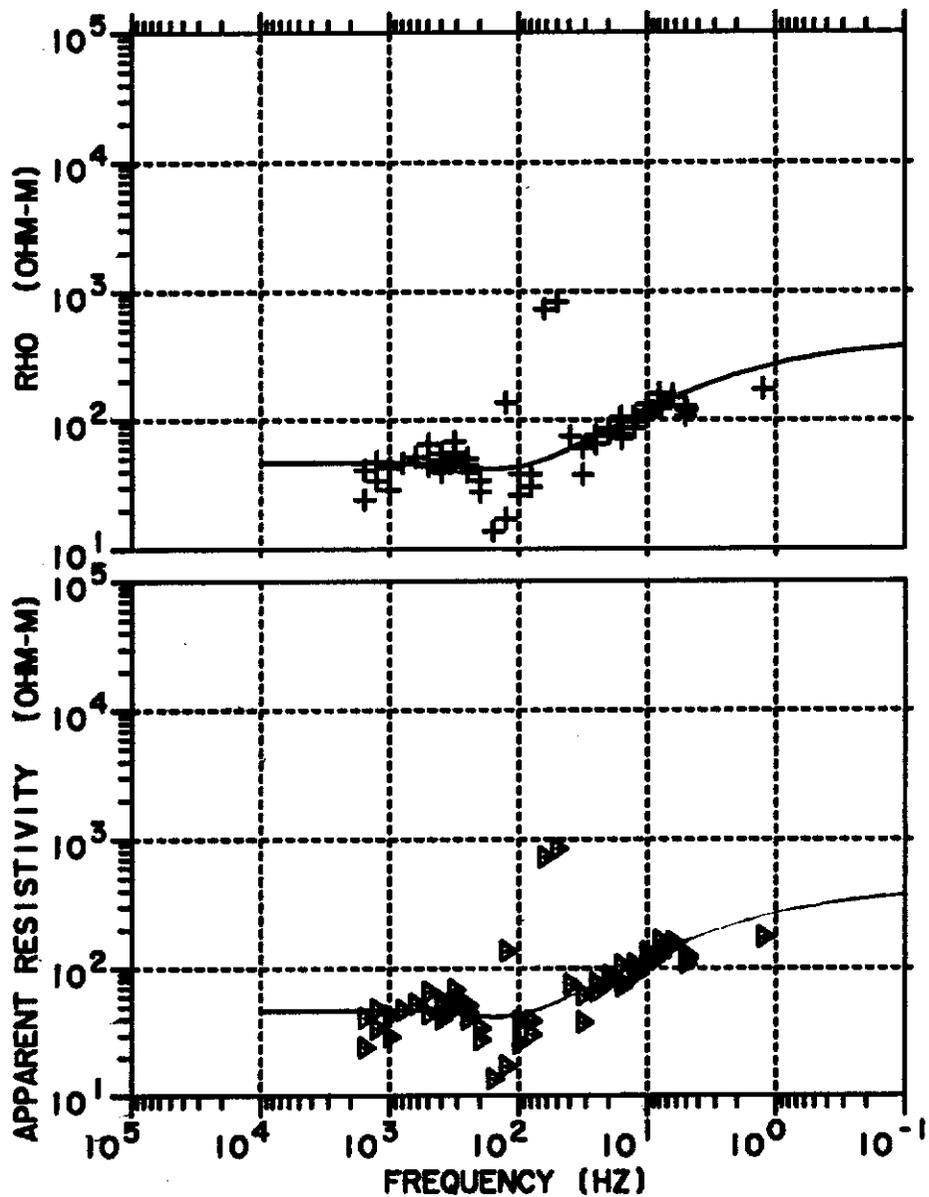


FIGURE 14

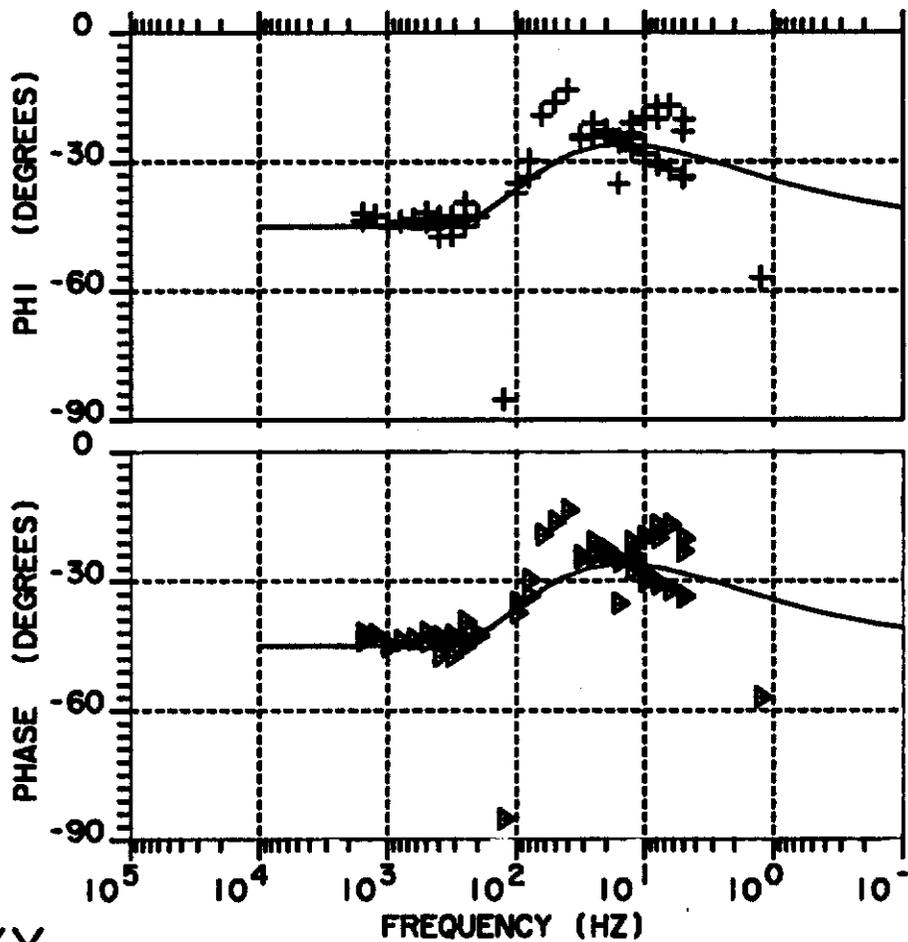


YX:

LAYERS. 3

THICKNESS. 242, 110, (METERS)

RHO. 46.9, 63.2, 435.0 (OHM-M)



XY:

LAYERS. 3

THICKNESS. 242, 110, (METERS)

RHO. 46.9, 63.2, 435.0 (OHM-M)

3

SITE 2 COMBINED XY/YX CAGNIARD

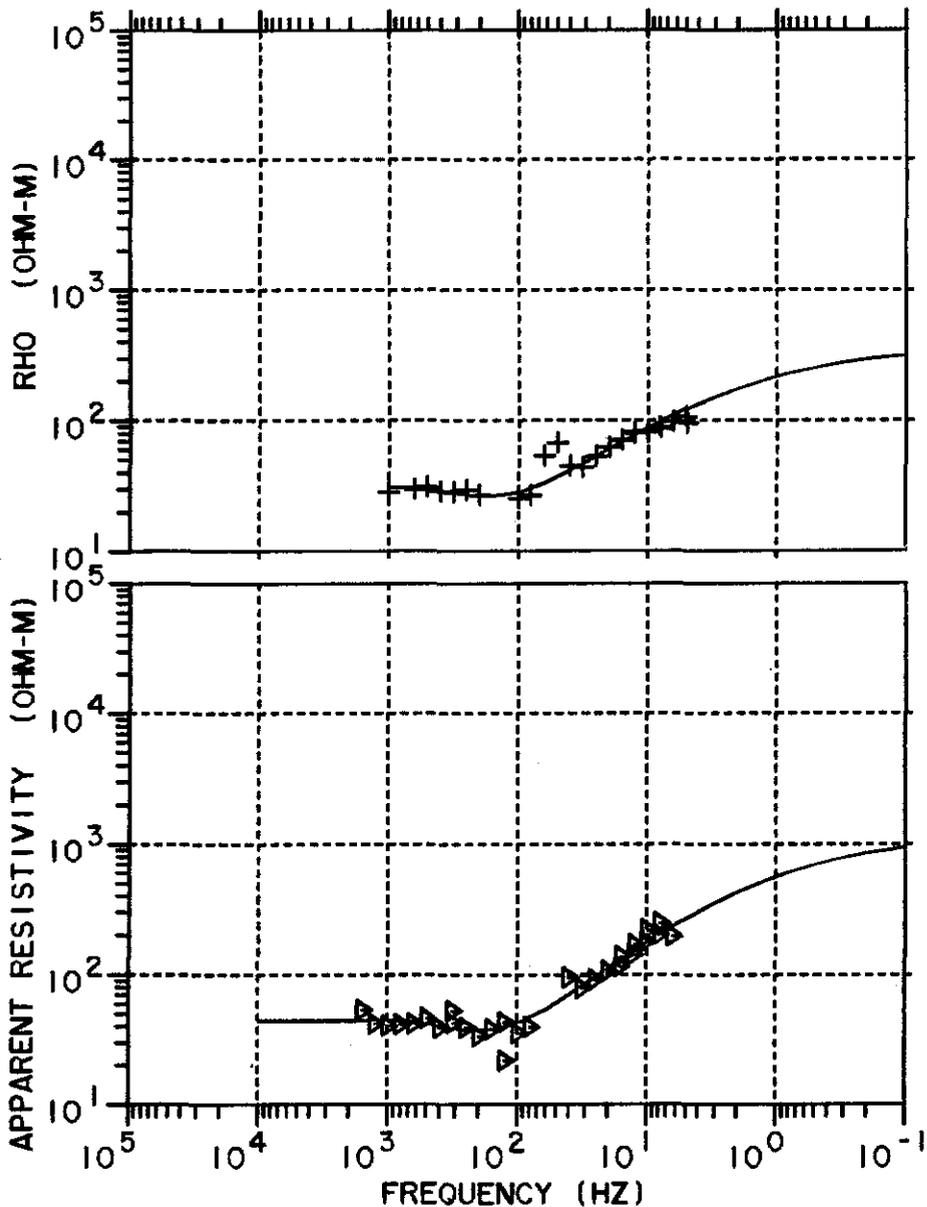
AMT MODELLING

CGER MACQUARIE UNI . 20-JAN-84 18.24.36

116

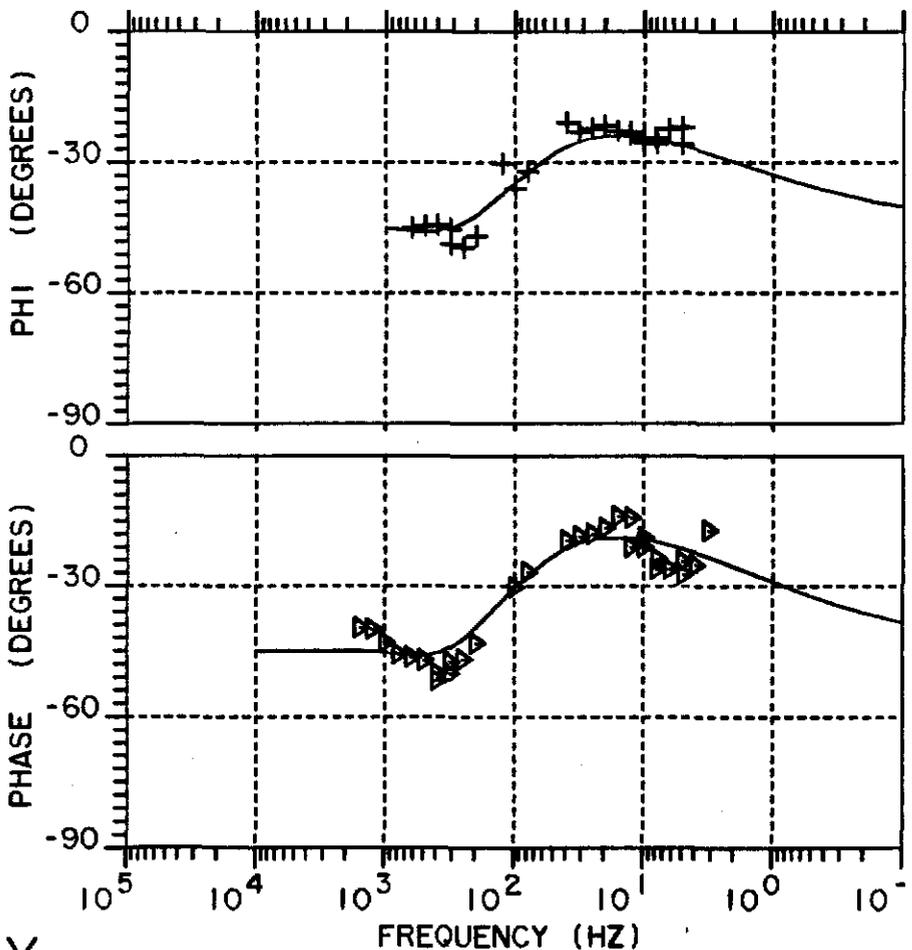
U P U V V

FIGURE 15



YX:

LAYERS. 2
 THICKNESS. 249. (METERS)
 RHO. 30.5, 377.2 (OHM-M)

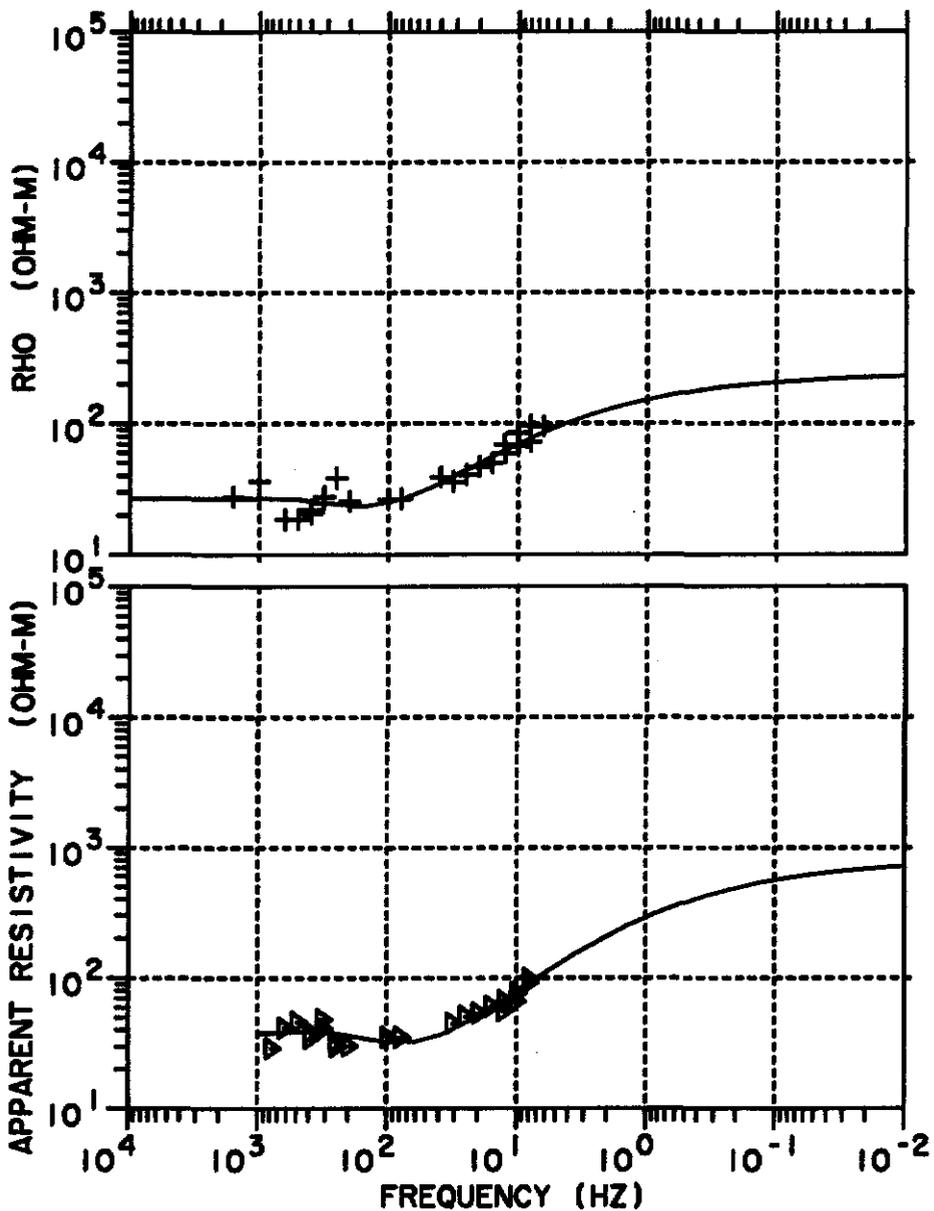


XY:

LAYERS. 2
 THICKNESS. 280. (METERS)
 RHO. 44.3, 1213.8 (OHM-M)

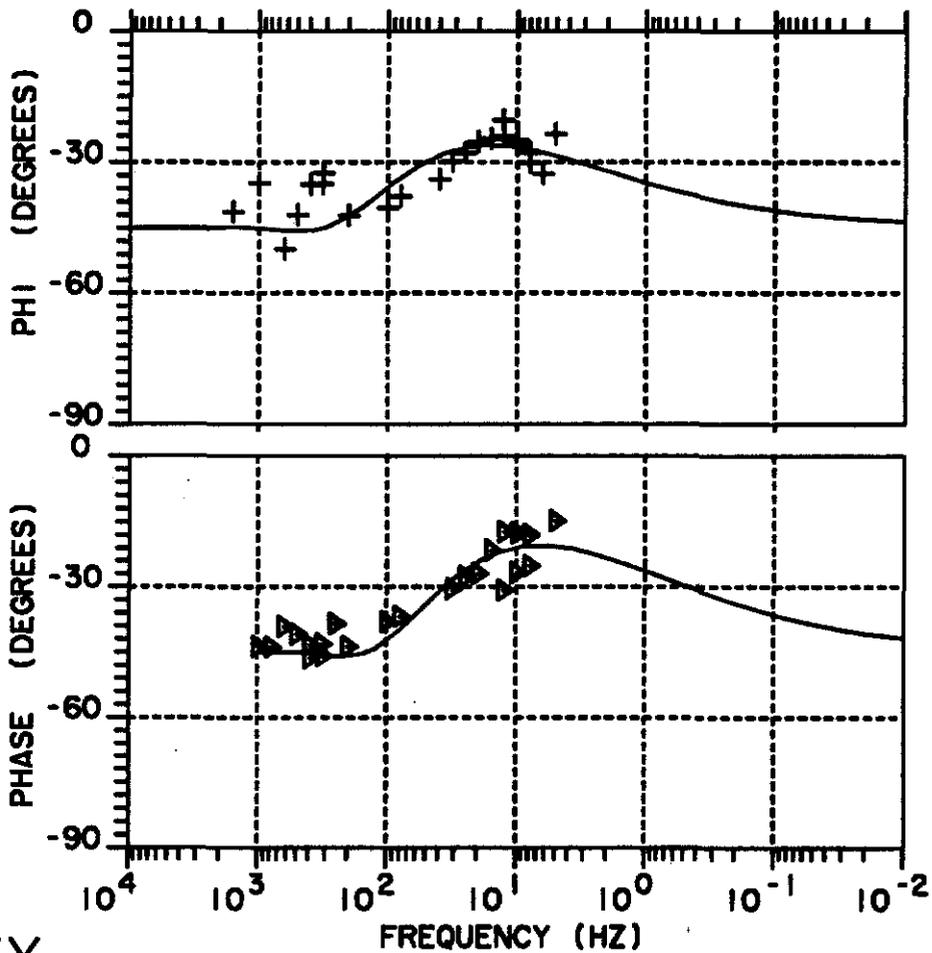
449118

FIGURE 16



YX:

LAYERS. 2
 THICKNESS. 232, (METERS)
 RHO. 26.8, 241.0 (OHM-M)

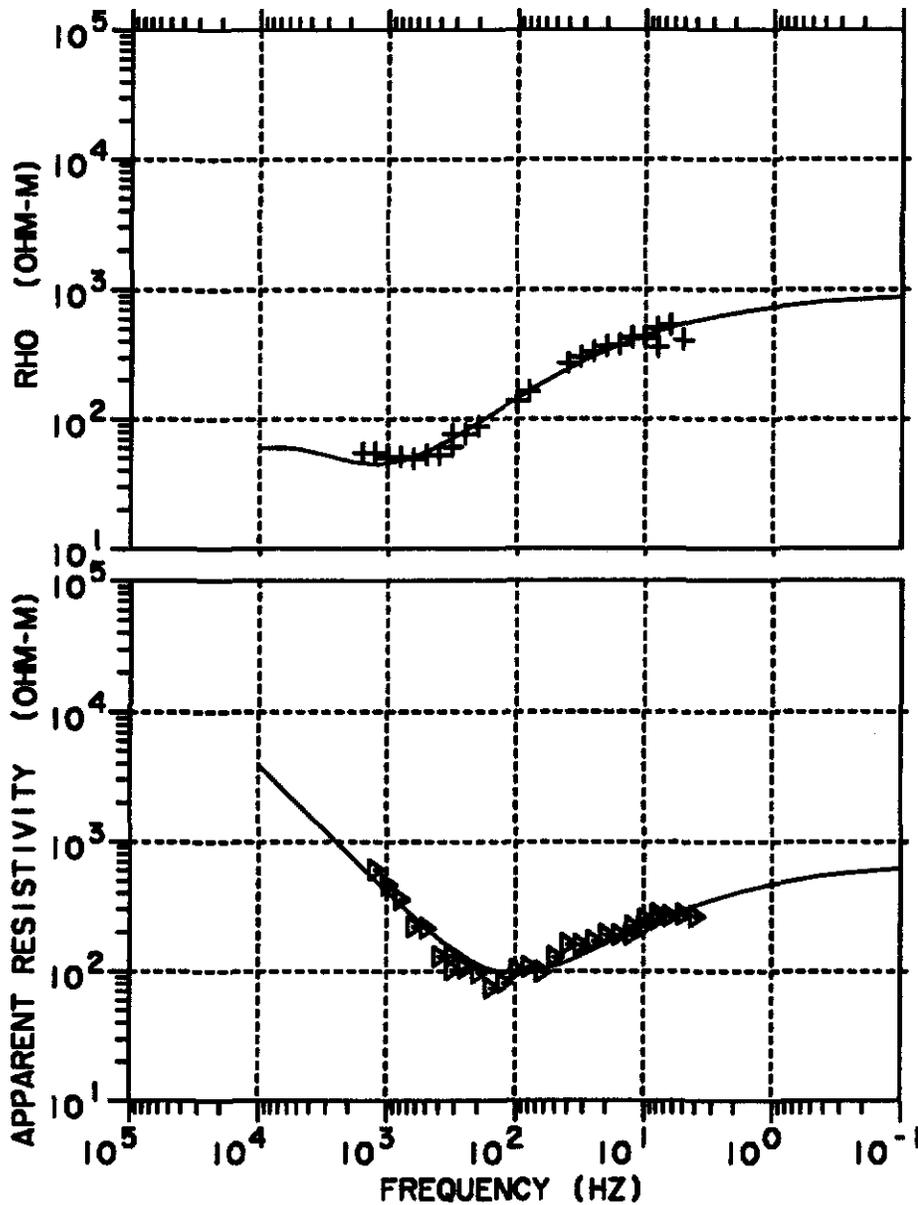


XY:

LAYERS. 2
 THICKNESS. 410, (METERS)
 RHO. 38.2, 792.0 (OHM-M)

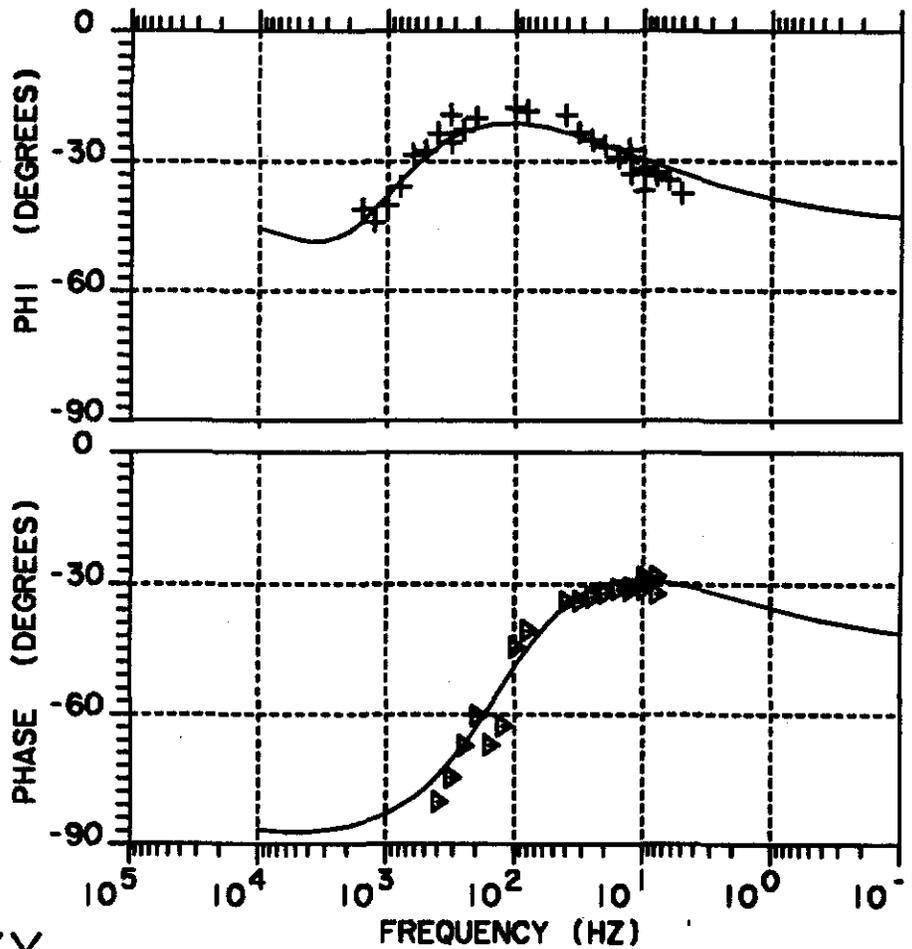
449119

FIGURE 17



YX:

LAYERS. 3
 THICKNESS. 53, 45, (METERS)
 RHO. 58.0, 34.6, 946.6 (OHM-M)



XY:

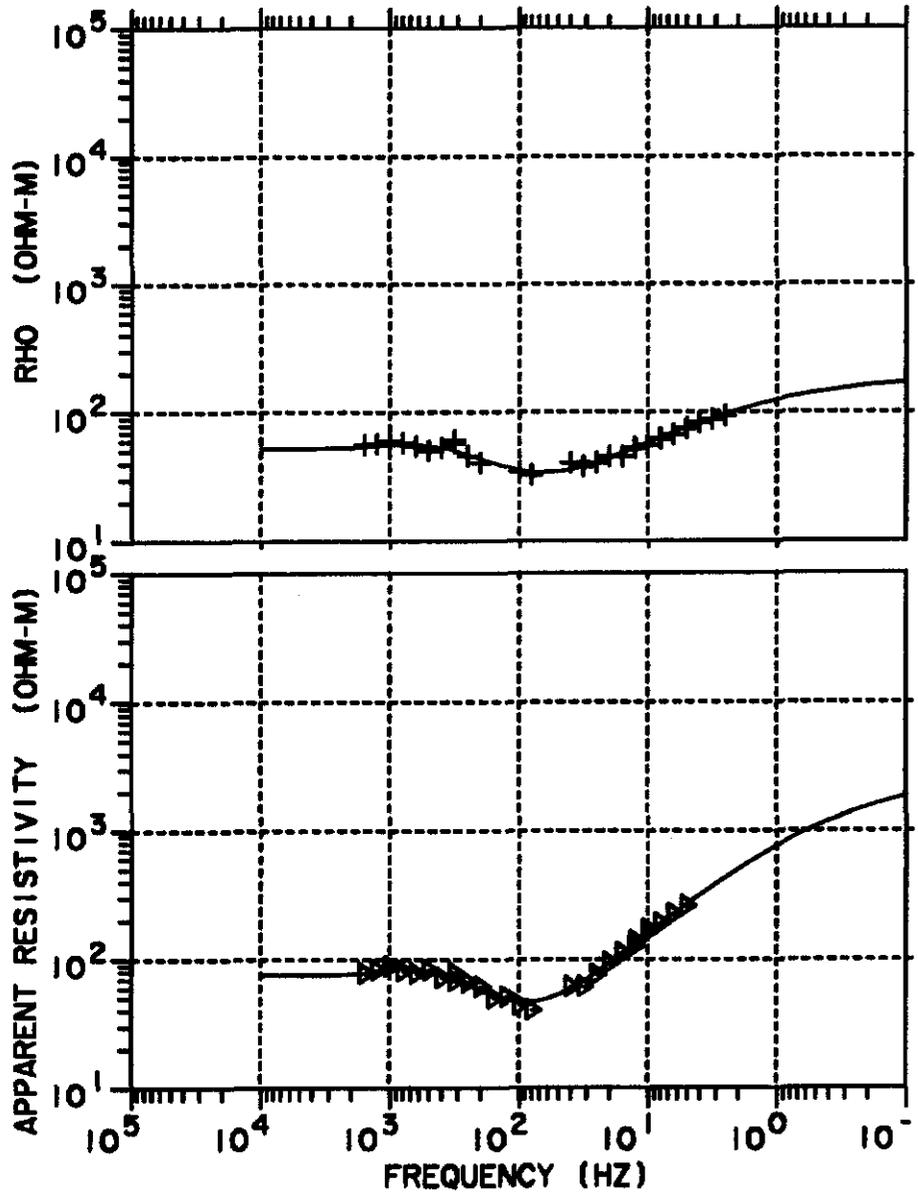
LAYERS. 3
 THICKNESS. 219, 12, (METERS)
 RHO. 30681.7, 2.7, 712.2 (OHM-M)

119

CGER MACQUARIE UNI . 26-JAN-84 12.02.54
 SITE 5 CAGNIARD AMT MODELLING

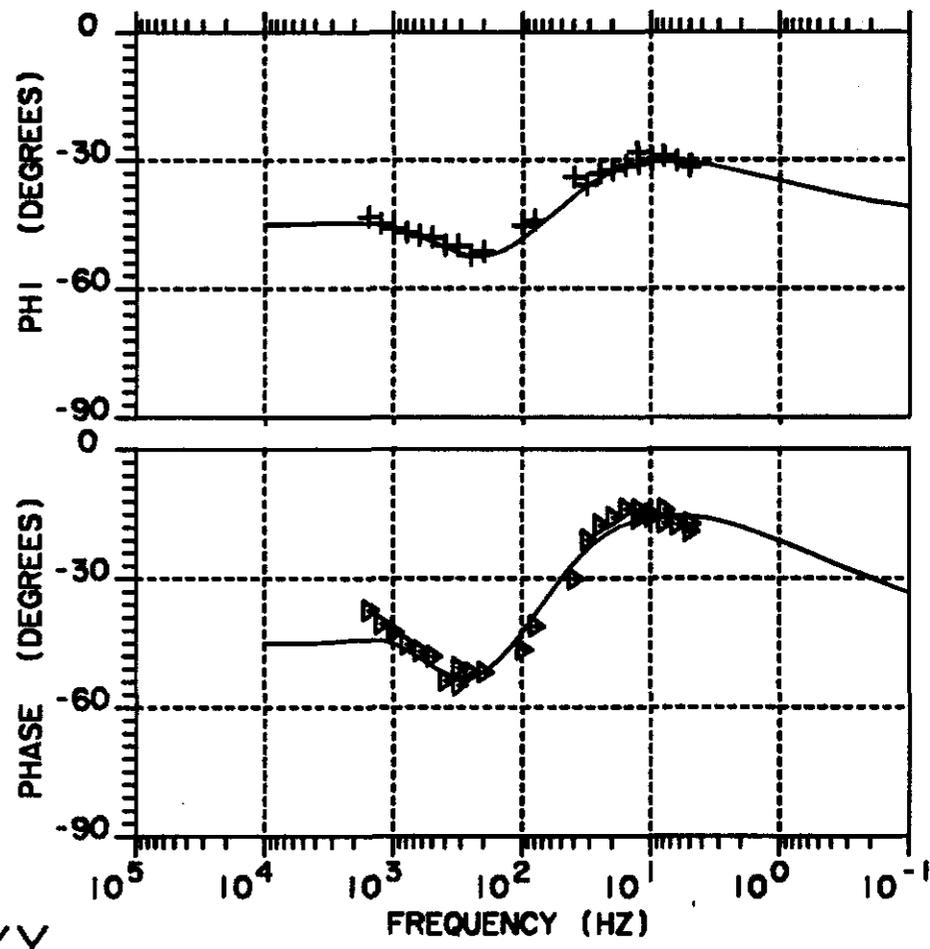
449190

FIGURE 18



YX :

LAYERS, 3
 THICKNESS, 156, 148, (METERS)
 RHO, 52.4, 20.0, 198.7 (OHM-M)

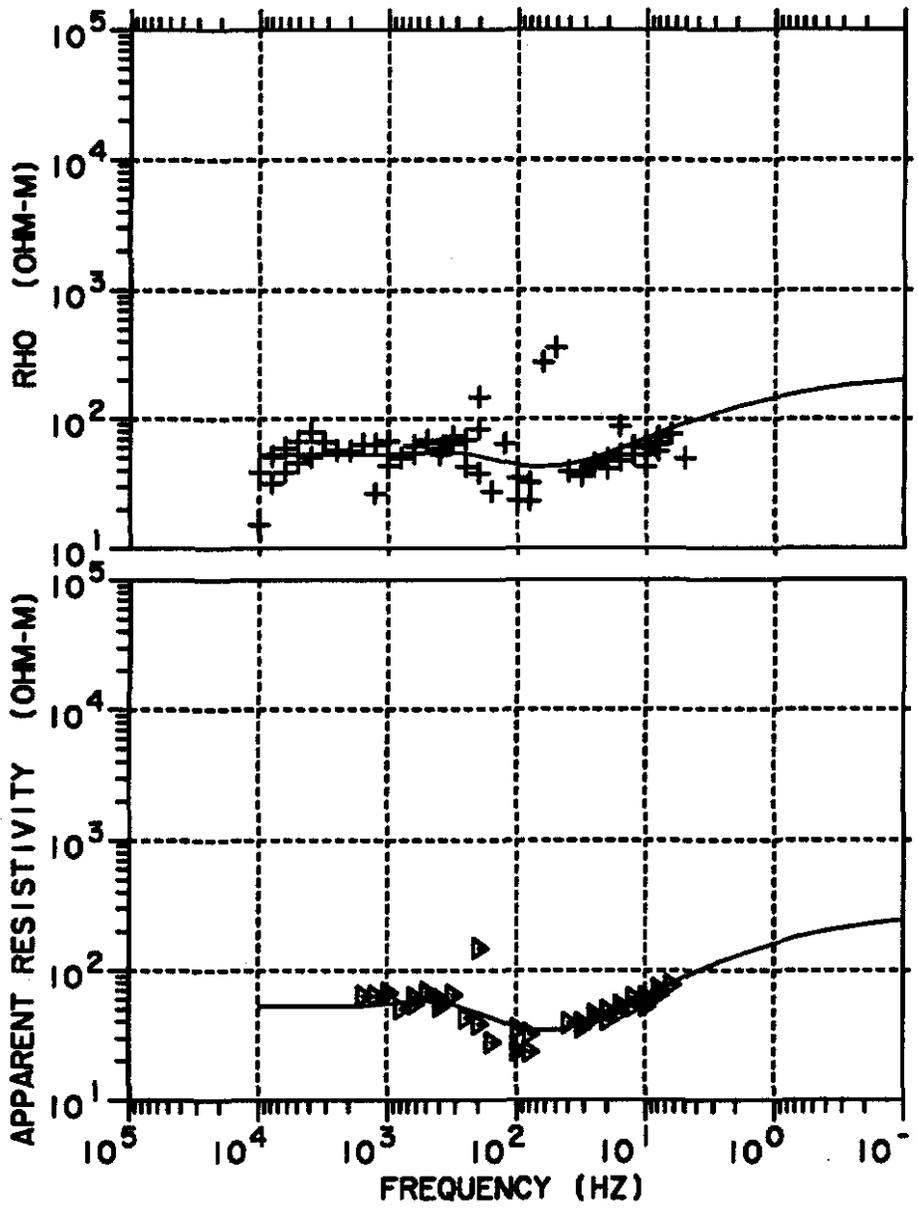


XY :

LAYERS, 3
 THICKNESS, 228, 35, (METERS)
 RHO, 76.4, 7.5, 3083.1 (OHM-M)

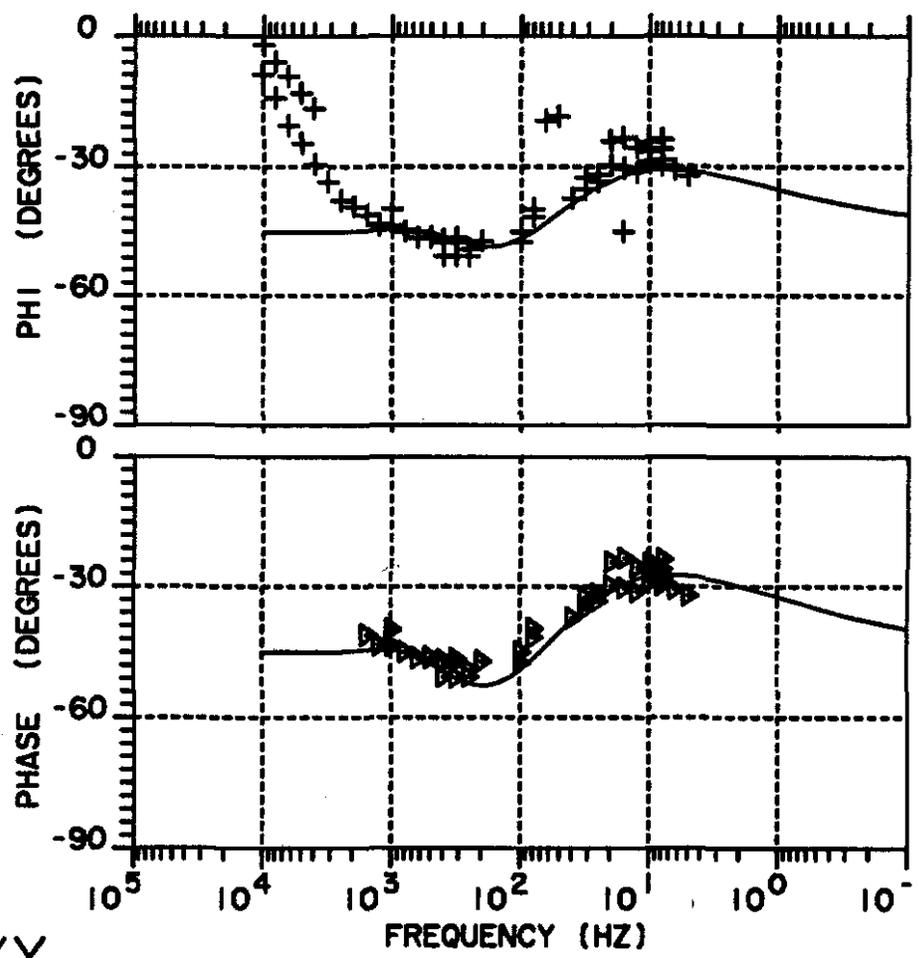
449121

FIGURE 19



YX:

LAYERS. 3
 THICKNESS. 275, 53, (METERS)
 RHO. 52.7, 12.7, 232.2 (OHM-M)

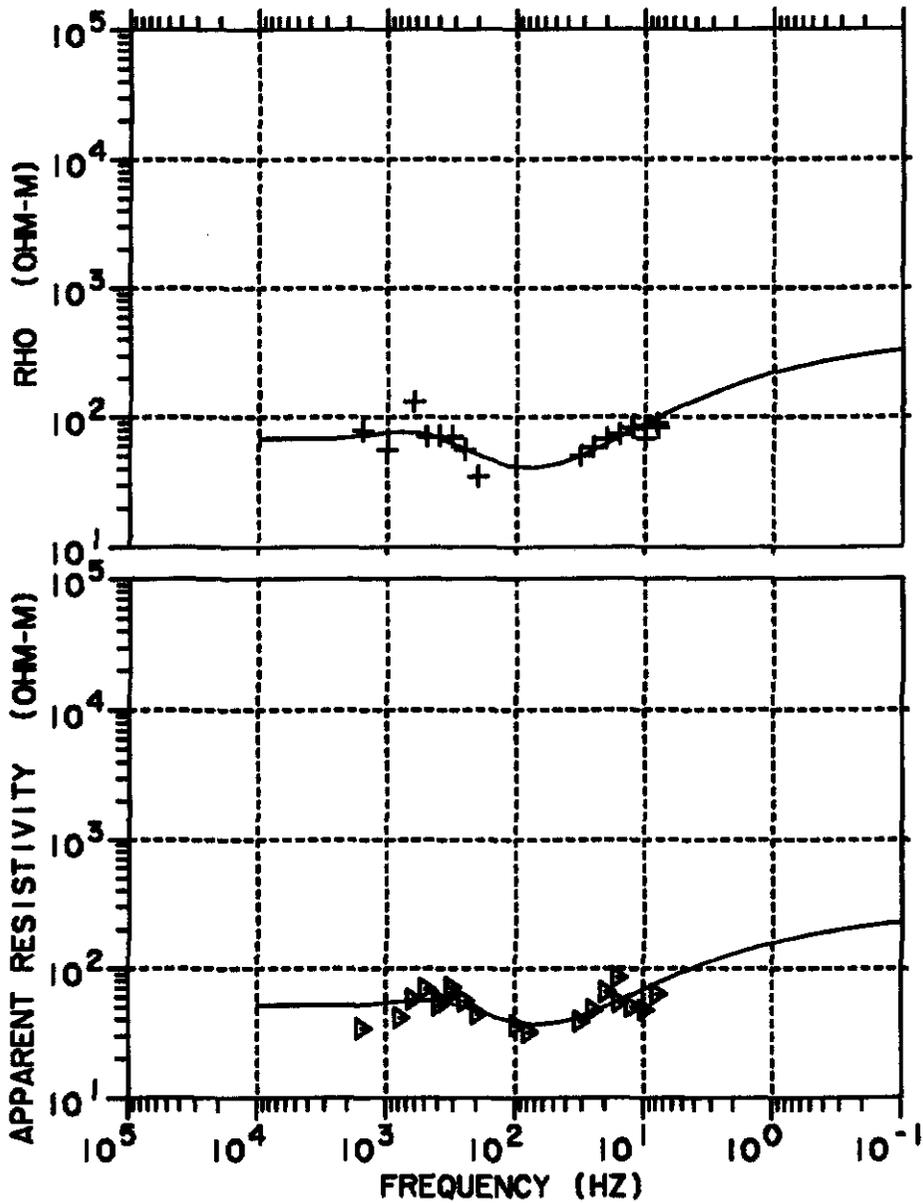


XY:

LAYERS. 3
 THICKNESS. 215, 51, (METERS)
 RHO. 52.8, 8.1, 299.7 (OHM-M)

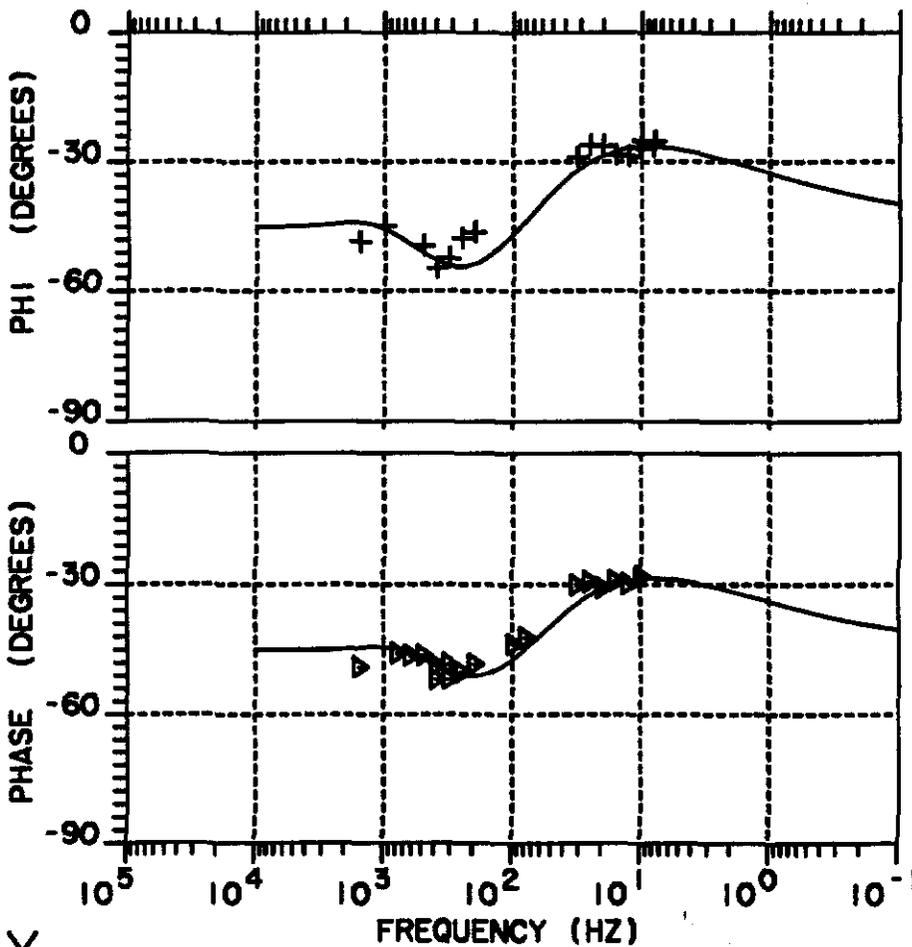
449122

FIGURE 20



YX:

LAYERS, 3
 THICKNESS, 201, 40, (METERS)
 RHO, 68.7, 7.4, 397.1 (OHM-M)



XY:

LAYERS, 3
 THICKNESS, 230, 34, (METERS)
 RHO, 52.3, 6.6, 271.8 (OHM-M)

122

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 SITE 8 CAGNIARD AMT MODELLING

449123

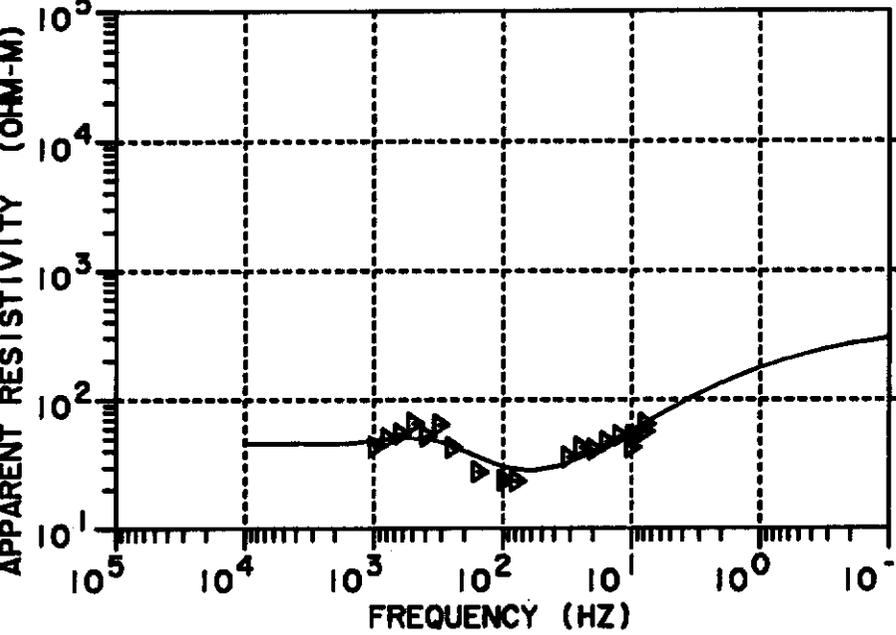
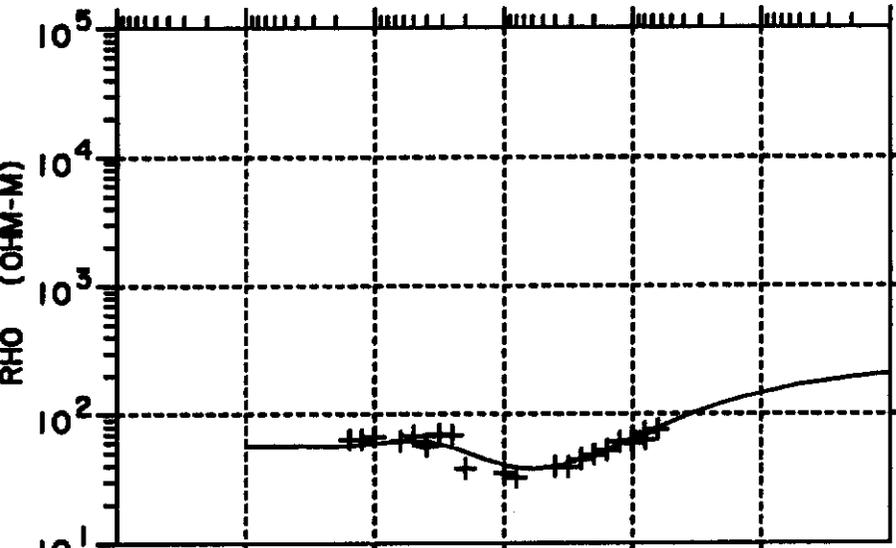
FIGURE 21

YX:

LAYERS. 3

THICKNESS. 221, 62, (METERS)

RHO. 56.5, 10.3, 247.2 (OHM-M)

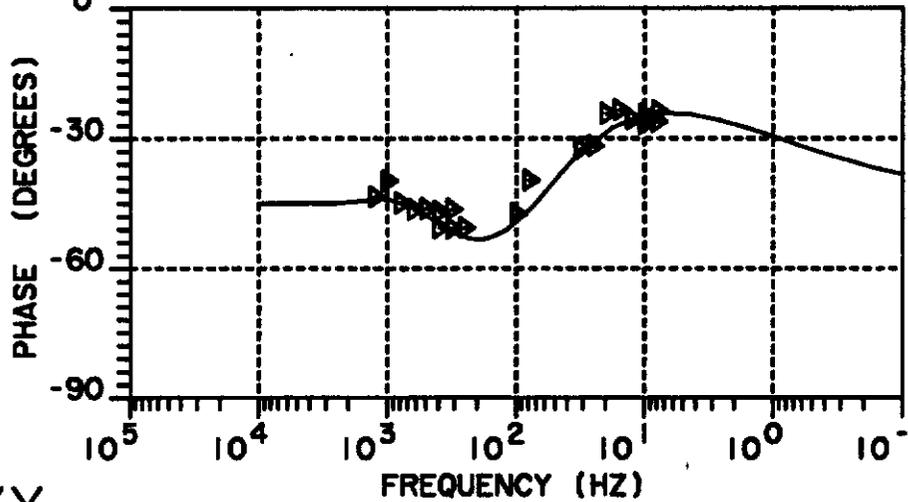
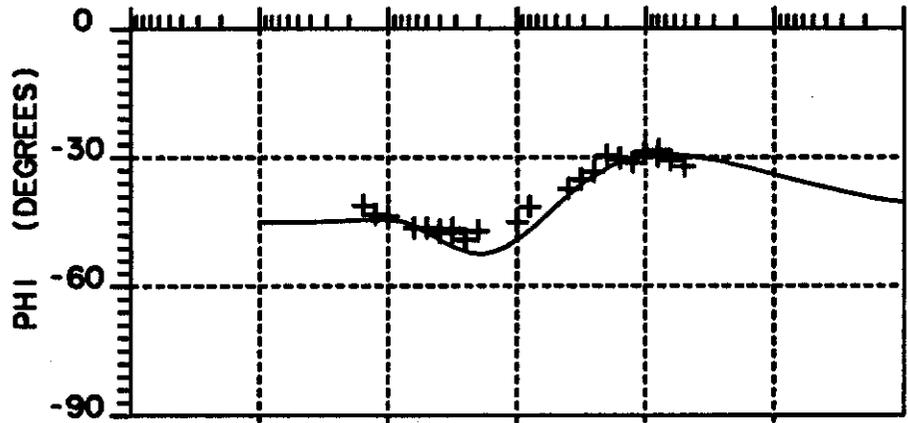


XY:

LAYERS. 3

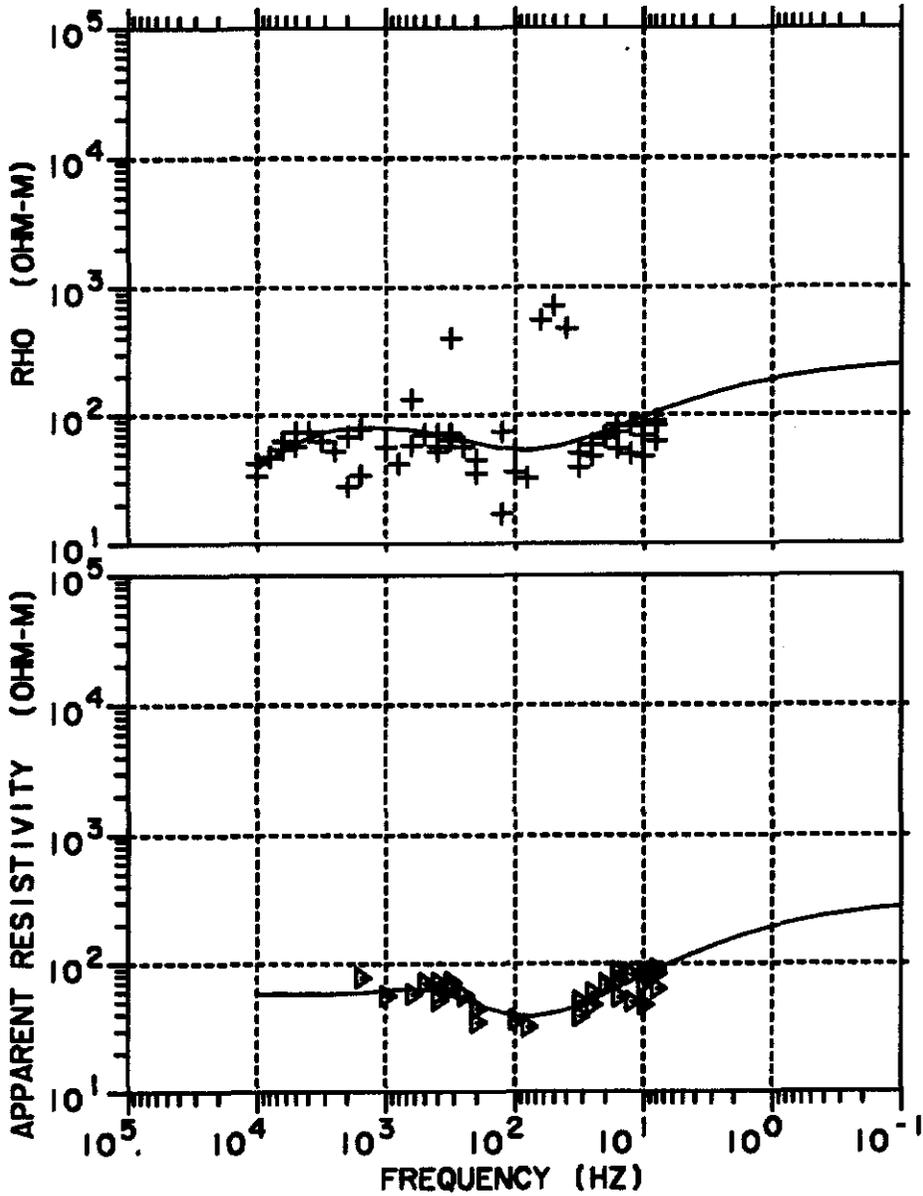
THICKNESS. 205, 26, (METERS)

RHO. 45.9, 3.7, 389.2 (OHM-M)



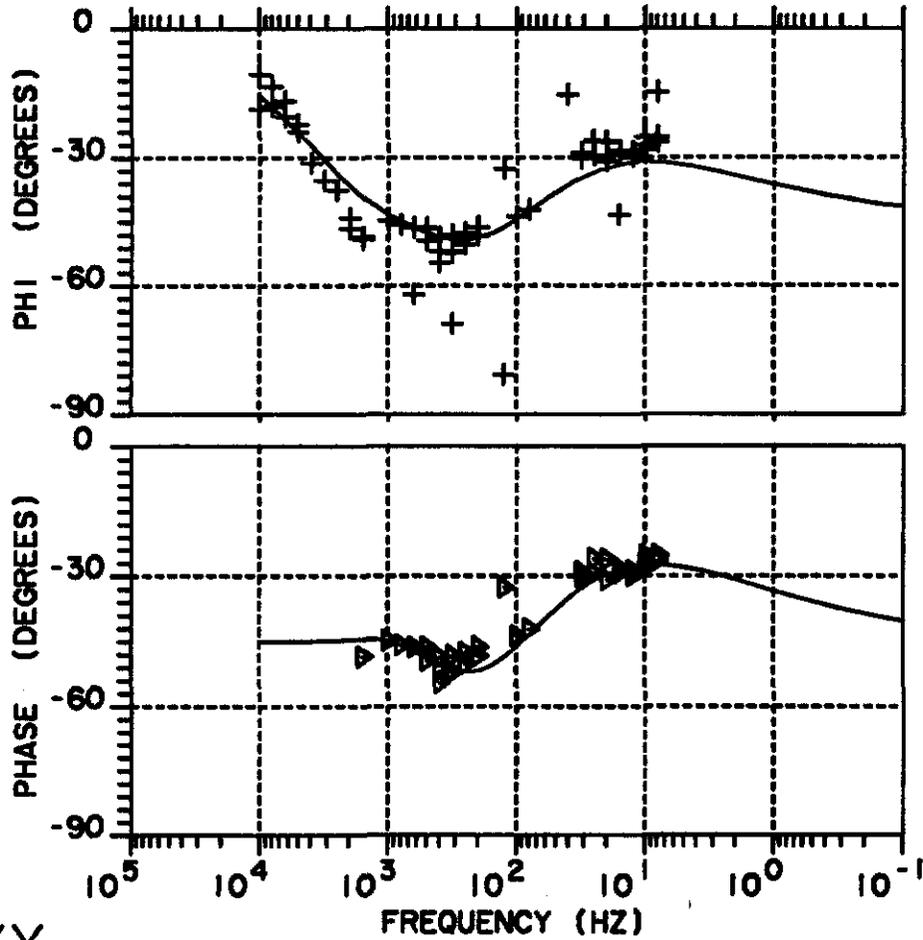
449124

FIGURE 22



YX:

LAYERS, 5
 THICKNESS, 1, 8, 59, 333, (METERS)
 RHO, 1.1, 378.2, 1976.2, 47.0, 279.7 (OHM-M)

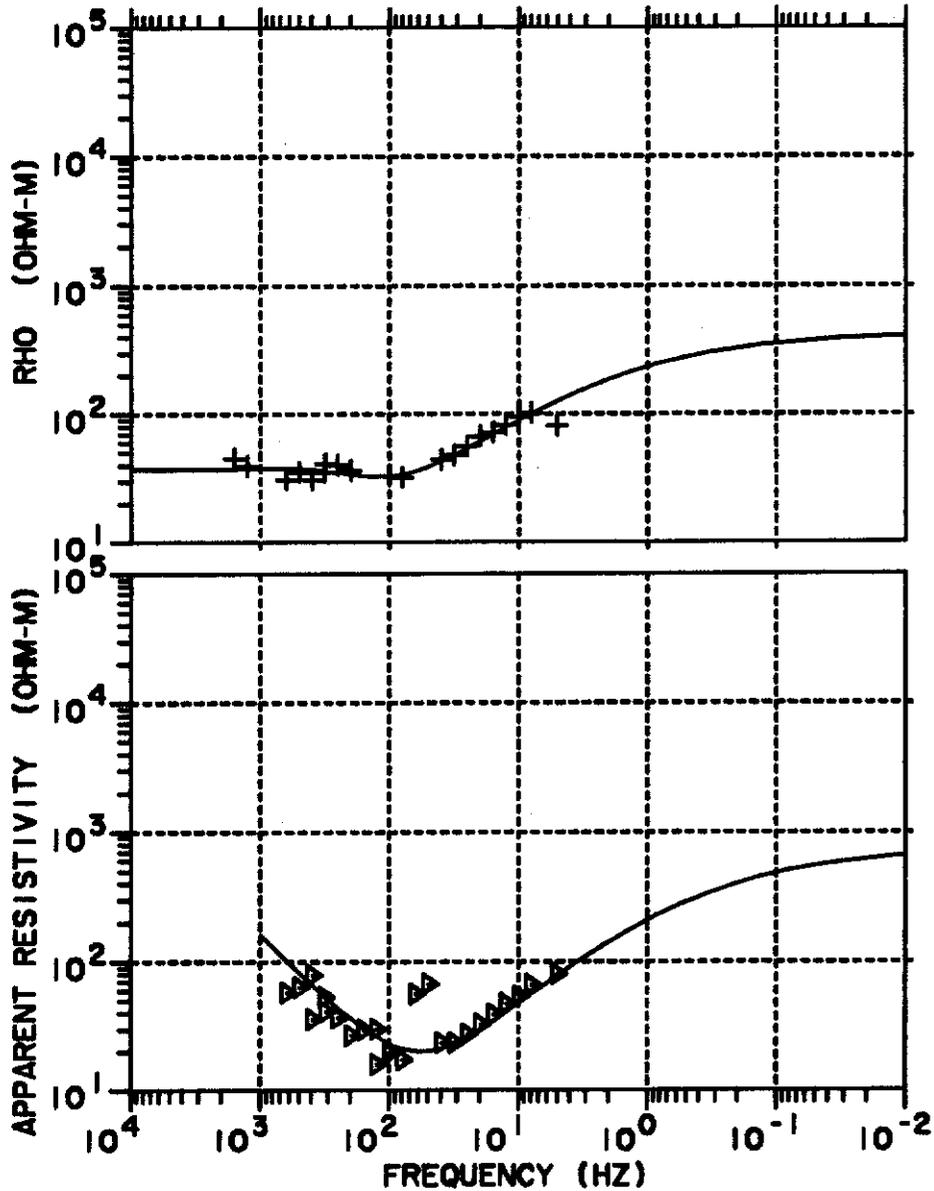


XY:

LAYERS, 3
 THICKNESS, 196, 77, (METERS)
 RHO, 58.2, 14.1, 335.6 (OHM-M)

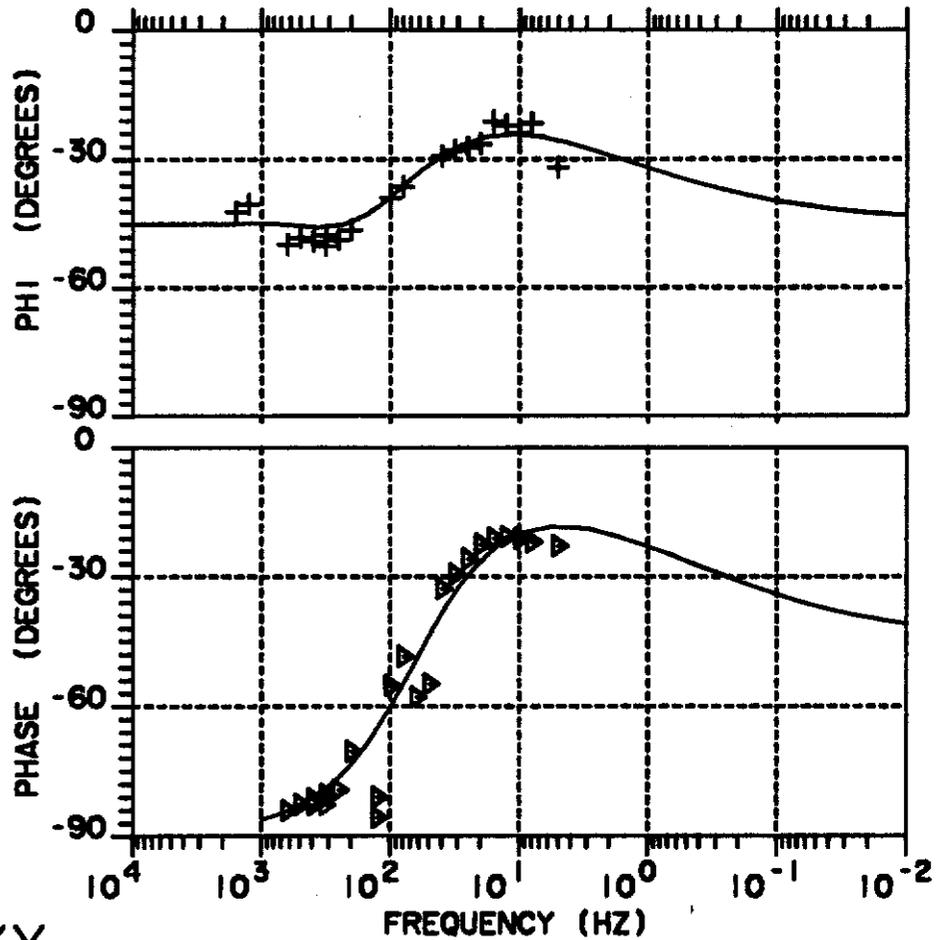
AA0195

FIGURE 23



YX:

LAYERS: 3
 THICKNESS: 297, 20, (METERS)
 RHO: 37.5, 27.3, 431.3 (OHM-M)

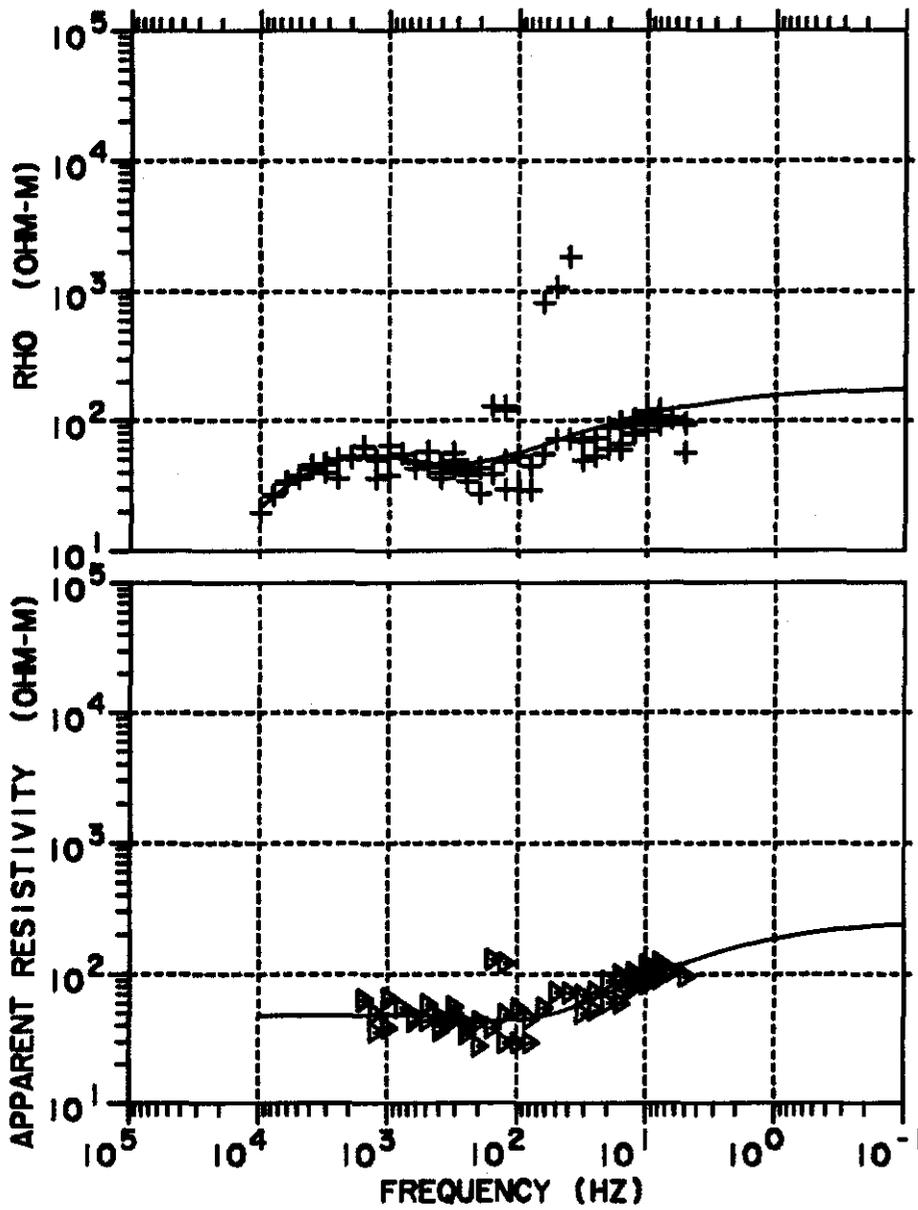


XY:

LAYERS: 3
 THICKNESS: 140, 8, (METERS)
 RHO: 24172.0, 0.6, 763.0 (OHM-M)

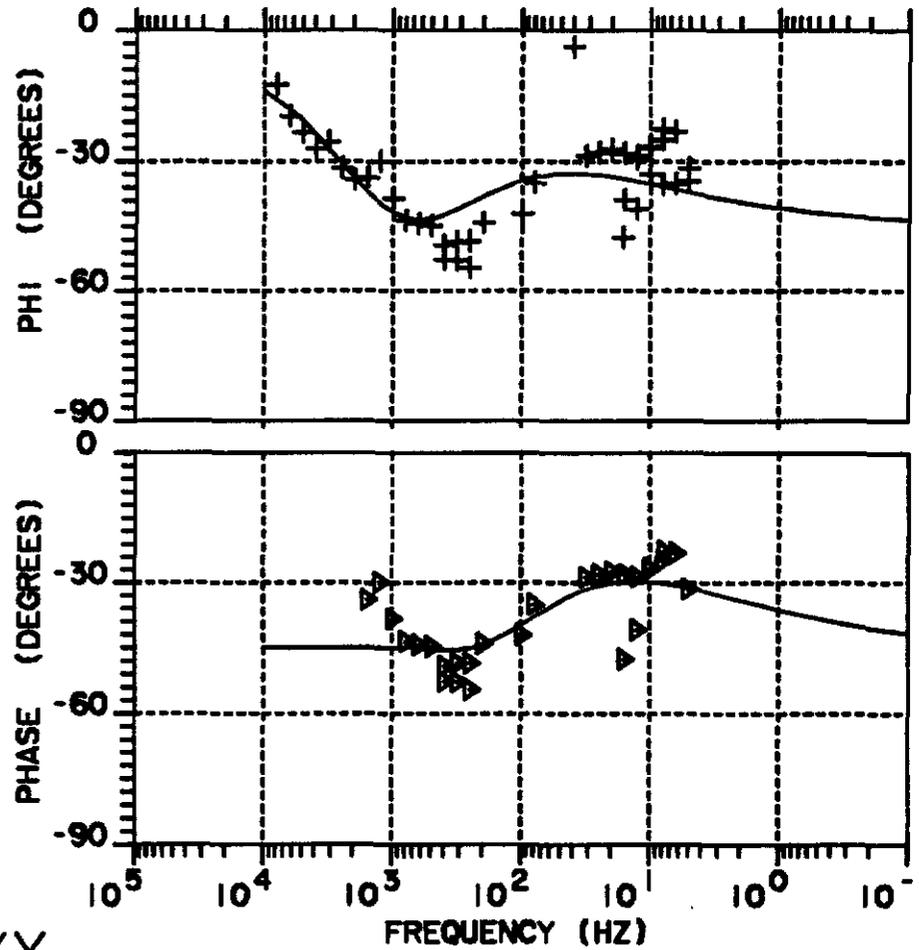
AA049G

Figure: 24.



YX:

LAYERS, 5
 THICKNESS, 2, 69, 88, 81, (METERS)
 RHO, 2.4, 491.5, 29.0, 140.5, 185.3 (OHM-M)

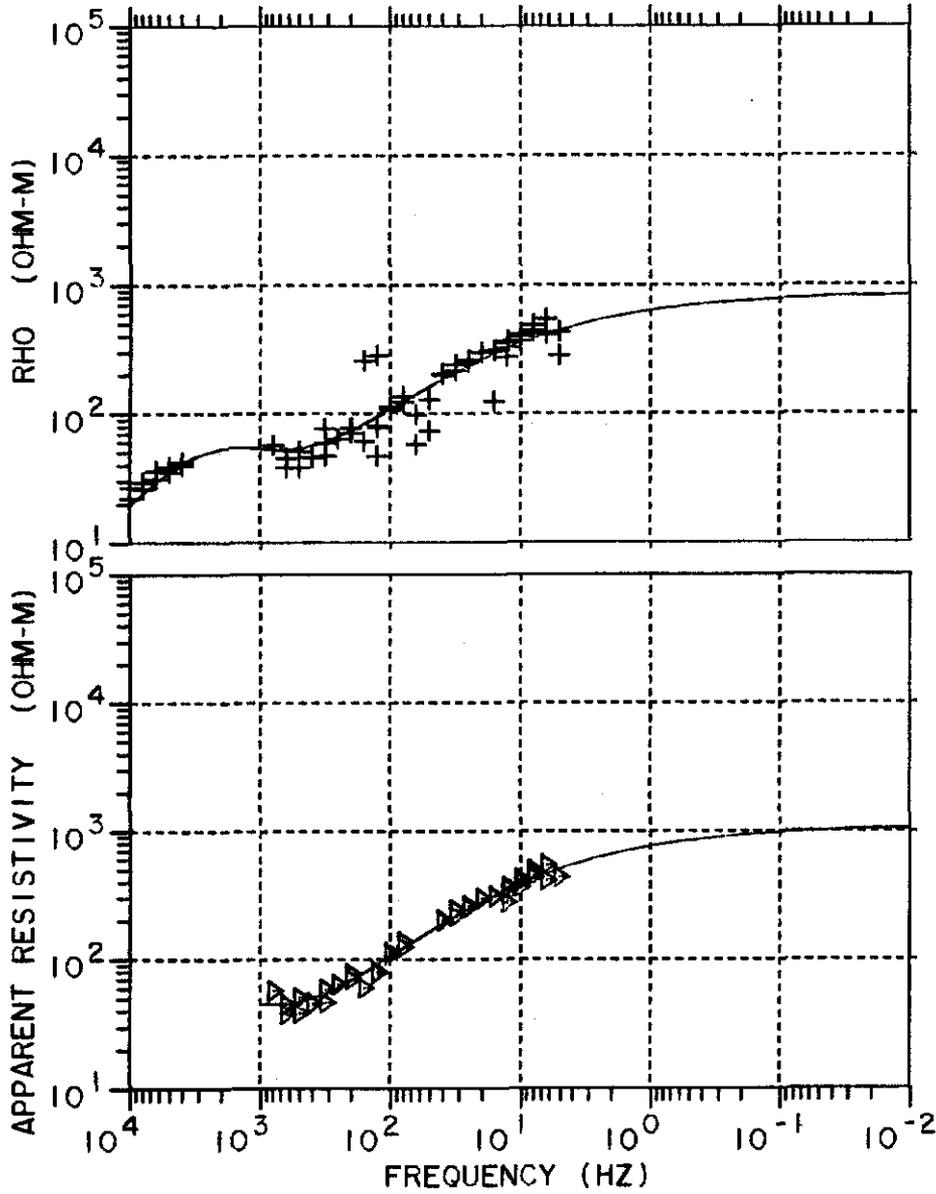


XY:

LAYERS, 3
 THICKNESS, 310, 39, (METERS)
 RHO, 48.2, 39.7, 272.8 (OHM-M)

449127

FIGURE 25
CAGNIARD

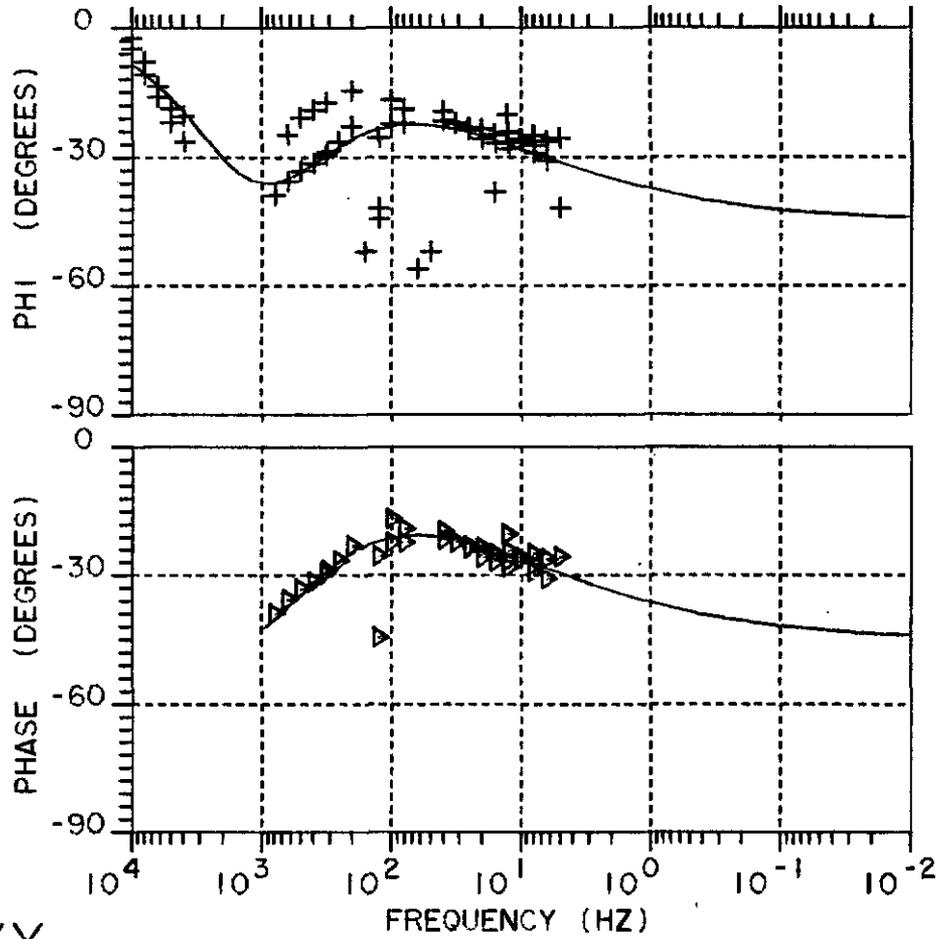


YX:

LAYERS: 5

THICKNESS: 0, 5, 95, 13, (METERS)

RHO: 0.2, 303.5, 6564.2, 6.7, 851.8 (OHM-M)



XY:

LAYERS: 2

THICKNESS: 156, (METERS)

RHO: 53.1, 1079.8 (OHM-M)

449128

*

* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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*

SITE 1 CAGNIARD XY TABLE 1A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	87.0000	87.0000	87.0000	0.0000
2	26.0000	26.0000	26.0000	0.0000
3	477.6631	351.8072	648.5430	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	119.0000	119.0000	119.0000	0.0000
2	245.0000	245.0000	245.0000	0.0000

449129

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 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
 *

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*

SITE 1 CAGNIARD YX TABLE 1B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	85.0000	85.0000	85.0000	0.0000
2	32.5371	28.8233	36.7293	1.0000
3	9050.7969	1922.1765	42616.7539	0.9962

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	114.0000	114.0000	114.0000	0.0000
2	264.0000	264.0000	264.0000	0.0000

449130

129

 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
 *

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SITE 1 COMBINED H/M DATA CAGNIARD XY TABLE 2A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	87.0000	87.0000	87.0000	0.0000
2	26.0000	26.0000	26.0000	0.0000
3	734.0734	565.9930	952.0678	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	119.0000	119.0000	119.0000	0.0000
2	245.0000	245.0000	245.0000	0.0000

449131

130



 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
 *

449132

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SITE 1 COMBINED H/M DATA CAGNIARD YX TABLE 2B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	85.0000	85.0000	85.0000	0.0000
2	16.0000	16.0000	16.0000	0.0000
3	912.8349	698.0937	1193.6328	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	114.0000	114.0000	114.0000	0.0000
2	164.0000	164.0000	164.0000	0.0000

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 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
 *

449133

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SITE 2 COMBINED XY/YX CAGNIARD XY TABLE 3A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	46.9000	41.7091	52.7370	1.0000
2	63.2000	28.9396	138.0197	0.5001
3	435.0000	292.9740	645.8765	0.9999

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	242.0000	39.2389	1492.4988	0.8833
2	352.0000	144.7626	855.9119	0.9800

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 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
 *

449134

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SITE 2 COMBINED XY/YX CAGNIARD YX TABLE 3B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	46.9000	41.7091	52.7370	1.0000
2	63.2000	28.9396	138.0197	0.5001
3	435.0000	292.9740	645.8765	0.9999

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	242.0000	39.2389	1492.4988	0.8833
2	352.0000	144.7626	855.9119	0.9800

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *

SITE 3 CAGNIARD XY TABLE 4A

SHLTAS03. INV; 1

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LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	44.2884	41.8383	46.8821	1.0000
2	1213.8229	1018.2134	1447.0110	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	279.9089	259.3499	302.0976	1.0000

449135

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 3 CAGNIARD YX TABLE 4B

SHLTAS03. INV; 1

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LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	30.5332	28.9433	32.2106	1.0000
2	377.2025	328.5948	433.0006	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	249.0998	230.1704	269.5860	1.0000

449136

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 *
 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 4 CAGNIARD XY TABLE 5A

SHLTAS04. INV; 1

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LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	38.2000	36.4986	39.9807	1.0000
2	792.0001	792.0001	792.0001	0.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	410.0000	385.1012	436.5087	1.0000

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 4 CAGNIARD YX TABLE 5B

SHLTAS04. INV; 1

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LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	26.8000	25.1181	28.5946	1.0000
2	241.0000	195.7220	296.7525	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	232.0000	207.2524	259.7026	1.0000

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SHLTAS05. INV; 1

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SITE 5 CAGNIARD XY TABLE 6A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

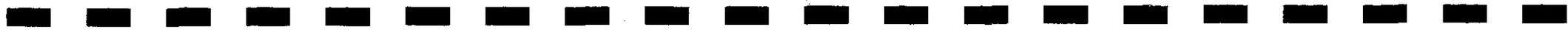
I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	30681.7344	30675.3906	30688.0801	0.0025
2	2.7086	2.7069	2.7104	0.0391
3	712.2378	653.2591	776.5413	0.5139

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	219.1792	211.3094	227.3421	0.9946
2	231.2740	223.2818	239.5522	0.9941

449139

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 5

CAGNIARD YX

TABLE 6B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	58.0150	44.6967	75.3019	0.9956
2	34.6243	21.2543	56.4047	0.7284
3	946.6019	870.3801	1029.4985	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	53.0387	31.9656	88.0043	0.6794
2	98.0367	73.4145	130.9170	0.9803

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 6 CAGNIARD XY TABLE 7A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	76.3799	73.5377	79.3319	0.9999
2	7.4864	7.4747	7.4981	0.1066
3	3083.0957	2679.5894	3547.3643	0.9773

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	227.7468	215.3025	240.9104	0.9969
2	263.1897	251.6975	275.2066	0.9953

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 6

CAGNIARD YX

TABLE 7B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	52.4327	51.0411	53.8623	1.0000
2	19.9897	14.9917	26.6539	0.9943
3	198.6761	184.8641	213.5201	0.9999

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	155.5296	134.0781	180.4131	0.9987
2	303.4355	267.5461	344.1391	0.9990

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 8 COMBINED XY/YX CAGNIARD XY TABLE 8A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	52.7593	50.4970	55.1230	1.0000
2	8.0574	7.9926	8.1227	0.1642
3	299.6515	251.1696	357.4915	0.9987

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	215.0729	199.1964	232.2147	0.9948
2	266.4490	250.5445	283.3631	0.9917

449143

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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CTASOB. INV: 1

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SITE B COMBINED XY/YX CAGNIARD XY TABLE BB

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	52.6882	46.1783	60.1159	1.0000
2	12.6791	12.4516	12.9109	0.1440
3	232.1743	108.9552	494.7437	0.9995

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	274.6377	151.9601	496.3530	0.9952
2	327.4691	207.5251	516.7374	0.9941

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 8

CAGNIARD XY

TABLE 9A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	45.9229	43.8499	48.0939	0.9999
2	3.7251	3.7126	3.7376	0.0902
3	389.1541	312.8622	484.0500	0.9734

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	205.2164	191.1569	220.3100	0.9979
2	231.6093	217.6172	246.5011	0.9964

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 8 CAGNIARD YX TABLE 9B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	56. 5034	54. 4926	58. 5883	1. 0000
2	10. 2942	10. 0046	10. 5921	0. 1936
3	247. 2130	213. 6606	286. 0343	0. 9993

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	220. 9725	205. 4731	237. 6412	0. 9926
2	282. 8873	267. 2188	299. 4745	0. 9888

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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* SITE 9 COMBINED XY/YX CAGNIARD XY TABLE 10A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	58.1697	55.7376	60.7079	0.9999
2	14.1190	12.6042	15.8159	0.2687
3	335.6241	285.6009	394.4090	0.9991

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	196.4978	181.0374	213.2784	0.9836
2	273.5164	257.8001	290.1909	0.9816

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 9 COMBINED XY/YX CAGNIARD XY TABLE 10B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

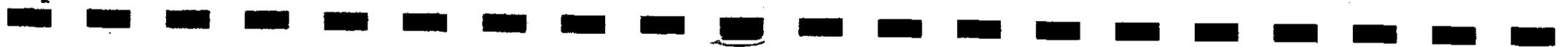
I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	1.1414	0.8899	1.4639	0.7120
2	378.1783	358.9991	398.3820	0.0261
3	1976.1991	1705.6992	2289.5964	0.0275
4	46.9802	34.8948	63.2511	1.0000
5	279.6708	145.0273	539.3176	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	0.5659	0.4432	0.7227	0.7016
2	8.1732	7.5979	8.7919	0.0212
3	67.1774	50.2445	89.8168	0.9996
4	399.6903	265.4514	601.8141	1.0000

449148

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 9 CAGNIARD XY TABLE 11A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	52.2505	49.7103	54.9204	1.0000
2	6.6447	6.6072	6.6824	0.1060
3	271.7857	200.9555	367.5812	0.9919

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	229.6883	206.2865	255.7449	0.9977
2	263.7000	240.2436	289.4466	0.9961

449149

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* 'ERROR BOUNDS' FOR DEPTH TO BASE *

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SITE 9

CAGNIARD YX

TABLE 11B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	68.7011	64.5080	73.1668	1.0000
2	7.4268	7.3948	7.4590	0.1374
3	397.0793	326.1355	483.4555	0.9976

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	200.8851	183.0466	220.4619	0.9964
2	241.2368	223.5369	260.3383	0.9938

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SHLTAS10R. INV: 1

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SITE 10 [RESTACKED]

CAGNIARD XY

TABLE 12A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RD(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	24172.0371	24165.8750	24178.2012	0.0014
2	0.5997	0.5989	0.6004	0.0430
3	762.9545	738.4932	788.2261	0.0502

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	139.5514	129.7631	150.0781	0.9969
2	147.9648	138.2075	158.4108	0.9966

449151

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*
* 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SHLTAS10R. INV: 1

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SITE 10 [RESTACKED] CAGNIARD YX TABLE 12B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	37.4659	36.0846	38.9001	1.0000
2	27.2689	26.3507	28.2191	0.0681
3	431.2870	368.0304	505.4162	0.9994

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	296.5734	213.8327	411.3297	0.2850
2	317.0692	286.1946	351.2745	0.9610

449152

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 11 [HX REVERSED] COMBINED XY/YX CAGNIARD XY TABLE 13A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	48.1767	45.7743	50.7052	1.0000
2	39.6972	27.8545	56.5749	0.1536
3	272.8220	213.8864	347.9970	0.9995

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	310.3563	97.1655	991.3085	0.3140
2	349.7845	260.8569	469.0281	0.9741

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 11 [HX REVERSED] COMBINED XY/YX CAGNIARD XY TABLE 13B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	2.4016	0.6473	8.9105	0.7379
2	491.5251	174.6007	1383.7117	0.1760
3	29.0038	7.4894	112.3215	0.9789
4	140.5477	25.2719	781.6445	0.2724
5	185.2936	130.8349	262.4202	0.9998

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	1.6335	0.4638	5.7538	0.7102
2	70.2219	37.2057	132.5369	0.9924
3	158.1100	66.1104	378.1365	0.9766
4	238.8212	23.4107	2436.2981	0.3125

449154

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 12 COMBINED XY/YX CAGNIARD XY TABLE 14A

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

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I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	53.0602	50.3856	55.8769	1.0000
2	1079.7998	1013.6807	1150.2317	1.0000

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	155.8397	146.0335	166.3045	1.0000

449155

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 * 'ERROR BOUNDS' FOR DEPTH TO BASE *
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SITE 12 COMBINED XY/YX CAGNIARD XY TABLE 14B

LAYER RESISTIVITIES - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	RO(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	0.1711	0.1650	0.1776	0.7082
2	303.5385	303.3269	303.7503	0.0134
3	6564.1802	6559.8423	6568.5210	0.0056
4	6.6535	6.6346	6.6726	0.0889
5	851.8133	711.0865	1020.3904	0.9963

LAYER DEPTHS (TO BASE) - 95 PERCENT CONFIDENCE INTERVAL (DAMPED)

I	Z(I)	BOUND(1)	BOUND(2)	IMPORTANCE
1	0.1314	0.1267	0.1363	0.7057
2	4.7639	4.7607	4.7671	0.0126
3	100.0294	88.4716	113.0972	0.9974
4	113.2313	101.1921	126.7029	0.9960

449156

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PERCUSSION DRILL HOLE RESULTS

APPENDIX 5

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

PROJECT : GUILDFORD

Hole No : HRW 1

COLLAR CO-ORDINATES :

LOCATION CODE : MQ 02

COLLAR R.L. :

LOCATION : HELLYER RIVER WEST

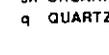
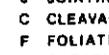
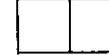
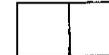
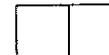
MAP/PHOTO REFERENCE : HELLYER 1:100 000

HOLE SURVEY DATA

INSTRUMENT :

DATE STARTED	22-12-82	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT
DATE FINISHED	9-1-83	NON CORE	PERC.	OO	109-0	109-0	NO OF TRAYS	
TOTAL DEPTH	196.4m						SAMPLE STOPAGE	DEVONPORT
LOGGED BY	J.J LAWTON	CORE	BQ	109-0	196.4	87.4m	ASSAY LAB.	COMLABS
CONTRACTOR	OVERLAND						ASSAY REPORTS	DEVONPORT
RIG	F30							
DRILL CREW		CASING					MIN. & PET. LAB.	--
		CASING LEFT					MIN. & PET. REPORTS	

GRAPHIC/LETTER SYMBOL LOGGING KEY



STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY :

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449158

PROJECT: GUILDFORD

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: PDH HRW 1

From	To	Interl (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays							SUSCEPTIBILITY (x 10 ⁻⁵ S.I.)		% Estimates		Core Angles		T.S		Description
							Sn	W	CaF ₂	Cu	Pb	Zn	Mo	Au							Alt	
0.00	1.5				4060									600								Yellow/brown soil and basalt chips.
1.5	2.0				4061									470								Soil/basalt chips
2.0	4.0				4062									670								Basalt with thin clay interbeds.
4.0	6.0				4063									2000								Strongly weathered basalt - red/purple soil, limonite.
6.0	8.0				4064									1600								Red/purple/brown clay: weathered basalt.
8.0	10.0				4065									1100								Red/white/brown clay.
10.0	12.0				4066									1700								WATER TABLE 11.5m. Fresh basalt with some hem. Minor yellow clay.
12.0	14.0				4067									1900								Slightly weathered basalt with minor yellow/red clay.
14.0	16.0				4068									1800								Weathered basalt.
16.0	18.0				4069									1900								Strongly weathered basalt yellow/red/brown clay.
18.0	20.0				4070									2400								Red/yellow clay, blue amyg. basalt and c.g. basalt (Dolerite?)
20.0	22.0				4071									1800								C.g. basalt (or dolerite)
22.0	24.0				4072									1700								Sl amyg. basalt, minor qtz veins, yellow clay.
24.0	26.0				4073									2000								FLOW TOP - weathered amyg. basalt - red/yellow clay.
26.0	28.0				4074									1900								Basalt becoming fresher and less amyg.
28.0	30.0				4075									1100								Fresh c.g. massive basalt
30.0	32.0				4076									970								Fresh (amyg.) basalt.
32.0	34.0				4077									1600								Slightly amyg. basalt.
34.0	36.0				4078									480								Predom. fresh massive basalt.
36.0	38.0				4079									730								FLOW TOP Coarse amyg. basalt (weathered) and interflow green/brown clay (36.8-37.1m)
38.0	40.0				4080									760								Weathered amyg. basalt.
40.0	42.0				4081									710								Weathered (amyg.) basalt.
42.0	44.0				4082									610								Red weathered (amyg.) basalt with grey clay.
44.0	46.0				4083									1300								Red weathered amyg. basalt, fresher towards base.
46.0	48.0				4084									2000								Weathered basalt (red)
48.0	50.0				4085									1200								Weathered basalt (red) becoming fresher. Some brown clay (20cm)
50.0	52.0				4086									770								Brown clay (50-51m) grading to fresh predom. massive basalt at 51.5m.
52.0	54.0				4087									510								Fresh (amyg.) basalt, minor brown clay.
54.0	56.0				4088									440								Fresh (amyg.) basalt.
56.0	58.0				4089									200								Mod. weathered (speckled) massive basalt. Minor amyg.
58.0	60.0				4090									250								Predom. massive slightly weathered basalt with some strongly weathered (red) amyg. basalt.
60.0	62.0				4091									350								FLOW TOP Mod. weathered (pale grey) amyg. basalt.
62.0	64.0				4092									350								Slightly weathered (speckled) massive basalt. Minor amyg.
64.0	66.0				4093									450								Slight-mod. weathered massive basalt. Minor amyg.
66.0	68.0				4094									450								? FLOW TOP Mod-strongly weathered (red-brown) amyg. basalt and massive basalt.
68.0	70.0				4095									550								Slight-mod. weathered (speckled-pale grey) massive basalt. Minor amyg. only.
70.0	72.0				4096									550								Mod. weathered (pale grey) amyg. basalt.
72.0	74.0				4097									1000								Predom. fresh-slightly weathered massive basalt. Trace mod. weathered and strongly weathered basalt. Minor amyg.
74.0	76.0				4098									1000								Slight-mod. weathered massive basalt with some amyg.
76.0	78.0				4099									1000								Massive fresh basalt. Minor amyg.
78.0	80.0				4100									850								FLOW TOP Strongly amyg. weathered basalt.
80.0	82.0				4101									500								Strongly weathered amyg. basalt.
82.0	84.0				4102									350								Strongly weathered basalt and some mod. fresh basalt. Strong bleaching some amyg. Poor recovery.
84.0	86.0				4103									350								? FLOW TOP Strongly amyg. basalt, mod. to strongly weathered. Poor recovery.
86.0	88.0				4104									300								Predom. fresh massive basalt. Minor bleaching and amyg. (trace)
88.0	90.0				4105									400								Predom. massive basalt with some amyg. basalt and strongly weathered (clay) amyg. basalt. Poor recovery.
90.0	92.0				4106									250								Mod. fresh amyg. basalt.
92.0	94.0				4107									300								Mod. fresh amyg. basalt with minor clay and sst?
94.0	96.0				4108									250								Pred. fresh amyg. grey blk. basalt. Minor sediment some weathering.
96.0	98.0				4109									250								Weathered amyg. basalt & mod. fresh amyg. basalt. Weathering & amyg. increasing.
98.0	100.0				4110									200								Contact at 98m between cream clays with abundant wood frag. at cont. & overlying basalt.
100.0	102.0				4111									50								Interbedded cream clay & v.f.g. sst. Some lignite but minor.
102.0	104.0				4112									10								Cream clay / v.f.g. sst. overlying predom. qz pebble bed (103m). Mature grains - 5mm
104.0	106.0				4113									140								Pebble bed as above.
106.0	108.0				4114									40								
108.0	110.0				4115									10								
110.0	112.0				4116																	
112.0	114.0				4117																	grading to brown clay (11m) - weathered basalt.
																						Brown clay grading to hard mod. fresh (amyg.) basalt.

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NOTED

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays							Weighted Assays/Ratios			% Estimates			Core Angles		T.S Alt/P.S	Description
							Sn	W	CaF ₂	Cu	Pb	Zn	Mo	Au									
109.8	119.5																						Massive dark grey-green basalt
119.5	125.3																						Flow top Strongly amyg/vesicular basalt at top of interval. 121.5-122.5m approx then massive [Note core loss 119.5-121.5m] basalt.
125.3	136.6																						? Flow top Strongly (amyg)/vesicular basalt at top of interval (125.3-127.5m) passing downward into massive mod fresh basalt.
136.6	145.2																						Vesicular dark green-grey-black basalts at top of interval 136.6-139.8m (with minor lava breccia) passing downward into massive fresh basalt.
145.2	146.2																						Strongly vesicular basalt (weathered) core loss
146.2	146.5																						? 'Peat' bed (or strongly weathered Mn basalt) Some f.g.-m.g. sand assoc.
146.5	152.2																						Strongly vesicular basalt at top (with some bleaching, core loss) becoming more massive towards bottom of interval. Minor py in vesicles.
152.2	156.0																						Strongly vesicular basalt at top becoming more massive towards bottom of interval.
156.0	160.3																						Strongly vesicular basalt at top becoming more massive towards bottom of interval.
160.3	169.0																						Predom vesicular basalt over upper half of interval with strong weathering, bleaching. Lava breccia suggests possible pillow lava. Bottom 2m of interval massive.
169.0	172.7																						Strongly vesicular basalt at top half of interval then becoming massive
172.7	186.4																						Sequence of predominantly stronger vesicular basalt (some amygdales) some core loss, and thin ~0.5m massive basalt units. Some basalt rotten.
END OF HOLE																							

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449161

DRILL LOG SHEET

PROJECT : GUILDFORD
LOCATION CODE : MQ 02

Hole No : SH1

COLLAR CO-ORDINATES : 5421100m N 392000m E
COLLAR R.L. :

LOCATION : GUILDFORD : BUNKERS ROAD					DATE STARTED	9 - 12 - 82	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT
IAP/PHOTO REFERENCE : HELLYER 1:100000					DATE FINISHED	18 - 12 - 82	NON CORE	PERC.	00	64.0		NO OF TRAYS	
HOLE SURVEY DATA					TOTAL DEPTH	210.50m						SAMPLE STORAGE	DEVONPORT
					LOGGED BY	P. RUXTON J. LAWTON	CORE	NO	64.0	92.8		ASSAY LAB.	COMLABS
INSTRUMENT :					CONTRACTOR	OVERLAND DRILLING		BQ	92.8	210.5		ASSAY REPORTS	DEVONPORT
					RIG	WARMAN 250 SCOUT							
DEPTH	INSTRUMENT		ACID ETCH		REMARKS	DRILL CREW	CASING	CASING LEFT				MIN. & PET. LAB.	C.M.S.
COLLAR	VERTICAL												

GRAPHIC / LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE
 B BEDDING O OXIDATION
 J JOINTING
 C CLEAVAGE
 F FOLIATION
 sh SHEARING
 q QUARTZ VEINS

DRILLING SUMMARY :

PROJECT: GUILDFORD

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: SH 1

From	To	Inter (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays								Weighted Assays Ratios			% Estimate	Core Angles	T.S P.S	Description
							Sn	W	CaF ₂	Cu	Pb	Zn	Mn	Al							
64.0	71.60																		Strongly weathered basalt → clay		
71.60	75.50																		Massive mod. fresh m.g.-c.g. basalt with thin (10cm) weathered band at 73.4m.		
75.50	82.9																		Basalt becoming strongly amygdaloidal/vesicular. Fe staining 76.25-77.0m. Mod. weathered in part. Amygdales decreasing downwards.		
82.9	89.3																		Massive fresh m.g.-c.g. basalt (Mn on joint planes)		
89.3	91.1																		Strongly vesicular, weathered basalt		
91.1	94.3																		Massive m.g. basalt (upper 'contact' gradational)		
94.3	96.5																		Vesicular/amyg. dark green/black basalt		
96.5	103.2																		Massive and vesicular basalt bleached to pale grey in part.		
103.2	119.15																		Massive black to dark green basalt - minor amygdales. Strongly weathered band (20cm thick) 106.1-106.3 Calcite in some amygdales. Generally mod. fresh.		
119.15	123.4																		Generally strongly vesicular (+amyg.) basalt (minor calcite amyg.) Mod. fresh. Slightly bleached in part.		
123.4	133.4																		Massive fresh basalt predom. Minor amyg. basalt 128.4-129.6m with assoc. bleaching.		
133.4	142.2																		Predominantly amygdaloidal (& some vesicles) mod. fresh basalt. Calcite in amyg. Minor bleaching.		
142.2	146.7																		Sand bed m.g.-c.g. moderately sorted lithic sand. Some pea-size pebbles. Basal 20cm pebble bed (~1-2cm diam.)		
146.7	150.8																		Strongly bleached/weathered massive basalt.		
150.8	161.5																		Dark grey/black pred. massive basalt with some amyg. basalt 157.5-158.5m (calcite fillings). Degree of weathering decreasing with depth. Note thick (80cm) pebble bed at 156.5m at top of amyg. basalt (poor recovery).		
161.5	169.7																		Strongly amyg. basalt (calcite) mod. fresh. Pebble beds predom. qzite at 165.0 (10cm thick) and 165.4m (30-40cm thick). One Moina Sst. (0m) pebble. Av. size ~ 2cm diam.		
169.7	172.6																		Massive dark grey/black fresh basalt.		
172.6	174.2																		Pebble-bed. Very poor recovery. Pebbles predom. qzite (PE?) and possible E acid volcanic. Av. size ~ 2cm.		
174.2	174.5																		Dark green grey-black mod. fresh basalt. Some amyg.		
174.5	174.8																		Pebble bed - very poor recovery. Moina Sst. (0m) and possible E volcanic pebbles (Congl. ss) & acid volc.		
174.8	181.5																		Predominantly amygdaloidal (calcite) dark green grey-black basalt. Mod. fresh.		
181.5	188.0																		Predominantly massive green-grey basalt. Minor amyg. & calcite veins. Vario lithic near base of interval.		
188.0	198.5																		Predom. massive basalt with amyga at top (gradational) otherwise monotonous.		

49166

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: SH 1

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PROJECT: _____

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays							Weighted Assays/Ratios		% Estimates		Core Angles		T.S alt	P.S	Description
							Sn	W	CaF ₂	Cu	Pb	Zn	Mo	Au								
196.5	203.8																					Amyg. basalt. Variabl weathered & bleached esp near base of interval.
203.8	210.5																					Pred massive dark green-grey - black basalt. Minor amygdales and calcite veining.
END OF HOLE																						

449167

SOIL GEOCHEMISTRY RESULTS

APPENDIX 6

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

449176

JOB COM811477

O/E : 4060/M002/JJL/45

SHOOTERS HILL

Results in ppm

SAMPLE		Cu	Pb	Zn	Ni	Bi	Sn	W
8100E	350N	55	10	165	220	<4	6	<10
8100E	400N	70	6	160	230	<4	4	15
8100E	500N	60	18	135	190	<4	8	<10
8100E	700N	70	10	165	280	<4	8	<10
8100E	800N	65	16	110	190	<4	<4	<10
8100E	850N	70	14	120	210	<4	6	<10
4950E 5500N		60	10	115	220	<4	<4	<10
MT PEARSE 4950F 5600N		44	8	160	195	<4	<4	<10
4950E	5700N	65	4	160	160	<4	<4	<10
4950E	5900N	60	4	140	250	<4	<4	<10
4950E	6000N	80	6	190	340	<4	4	15
4950E	6100N	55	4	160	210	<4	10	<10

Method of Analysis : Cu Pb Zn Ni Bi : AAS1
Sn W : XRF1

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

449177

JOE COM811144

SHOOTERS HILL

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
8400E 200N	48	8	85	160	<4	<4	<10
8400E 300N	65	<4	100	180	<4	<4	15
8400E 400N	36	<4	105	155	<4	<4	20
8400E 500N	40	<4	120	150	<4	<4	15
8400E 600N	70	<4	85	175	<4	4	<10
8400E 700N	60	<4	105	165	<4	<4	<10
8400E 800N	70	<4	100	160	<4	6	<10
8400E 900N	44	<4	95	130	<4	6	<10
8400E 1000N	60	<4	115	165	<4	10	<10
8200E 200N	48	4	90	150	<4	4	10
8200E 300N	42	4	180	240	<4	<4	<10
8200E 400N	60	4	120	180	<4	8	<10
8200E 500N	70	<4	140	270	<4	12	<10
8200E 600N	65	12	155	220	<4	<4	<10
8200E 700N	65	8	85	160	<4	<4	10
8200E 800N	60	4	150	175	<4	<4	10
8200E 900N	65	4	95	180	<4	<4	<10
8200E 1000N	70	<4	110	185	<4	6	<10
8000E 200N	80	<4	165	275	<4	12	10
8000E 300N	85	<4	120	240	<4	<4	<10
8000E 400N	85	<4	180	280	<4	<4	10
8000E 500N	65	<4	120	190	<4	<4	15
8000E 600N	65	4	100	160	<4	4	<10
8000E 700N	50	8	120	155	<4	<4	10
8000E 800N	44	<4	160	165	<4	<4	<10

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COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COM811144

SHOOTERS HILL

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
8000E 900N	60	<4	130	210	<4	4	<10
8000E 1000N	65	<4	150	210	<4	8	<10
8000E 1100N	65	<4	130	175	<4	6	<10
7750E 300N	60	<4	125	185	<4	<4	15
7750E 400N	50	<4	120	175	<4	8	<10
7750E 500N	46	<4	105	165	<4	4	15
7750E 600N	70	<4	135	220	<4	4	10
7750E 700N	70	4	95	145	<4	8	<10
7750E 800N	65	4	80	140	<4	12	10
7750E 900N	55	<4	85	95	<4	6	<10
7750E 1000N	55	<4	105	150	<4	12	<10
600N 7600E	65	<4	110	190	<4	4	<10
600N 7700E	60	<4	120	170	<4	4	<10
600N 7800E	34	<4	90	110	<4	10	<10
600N 7900E	60	<4	125	180	<4	8	<10
600N 8100E	65	<4	135	195	<4	6	<10
600N 8300E	60	<4	130	155	<4	6	<10
600N 8500E	70	<4	70	145	<4	<4	<10
600N 8600E	34	<4	125	150	<4	4	<10
600N 8700E	65	<4	50	100	<4	<4	<10

Method of Analysis : Cu Pb Zn Ni Bi : AAS1
Sn W : XRF1

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449179



COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOE COME11025

O/N : 4054/H002/JJL/39

HELLYER RIVER WEST

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
3841/1 8000E 9700N	65	12	85	255	<4	6	<10
3841/1 8000E 9800N	70	10	95	280	<4	8	<10
3841/1 8000E 9900N	55	12	80	195	<4	<4	<10
3841/1 8000E 10000N	46	4	75	270	<4	4	<10
3841/1 8000E 10100N	36	6	85	170	<4	<4	<10
3841/1 8000E 10200N	65	8	85	170	<4	6	10
3841/1 8000E 10300N	55	4	90	310	<4	8	<10
3841/1 8000E 10400N	60	4	50	240	<4	6	<10
3841/1 8000E 10500N	55	14	36	400	<4	4	<10
3841/1 8000E 10600N	60	16	100	205	<4	4	<10
3841/1 8000E 10700N	105	12	80	235	<4	<4	<10
3841/1 8000E 10800N	100	10	85	290	<4	<4	<10
3841/1 8000E 10900N	55	10	75	300	<4	6	10
3841/1 10200N 7600E	60	14	80	200	<4	<4	<10
3841/1 10200N 7700E	85	8	110	240	<4	8	<10
3841/1 10200N 7800E	60	4	115	420	<4	<4	<10
3841/1 10200N 7900E	125	26	115	130	<4	6	10
3841/1 10200N 8100E	65	10	85	400	<4	14	10
3841/1 10200N 8200E	70	4	80	285	<4	<4	<10
3841/1 10200N 8300E	80	10	125	280	<4	<4	<10
3841/1 10200N 8400E	110	8	75	340	<4	<4	<10
3841/1 10400N 7600E	55	8	65	200	<4	4	<10
3841/1 10400N 7700E	65	10	60	180	<4	4	<10
3841/1 10400N 7800E	90	10	125	230	<4	6	<10
3841/1 10400N 7900E	95	14	120	220	<4	4	<10

... / 2



COMLABS Pty Ltd

ANALYTICAL REPORT

COMPUTERISED ANALYTICAL LABORATORIES

JOB COM811025

O/N : 4054/H002/JJL/39

HELLYER RIVER WEST

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
3841/1 10400N 8100E	100	10	95	230	<4	10	<10
3841/1 10400N 8200E	60	4	65	205	<4	8	<10
3841/1 10400N 8300E	75	8	75	200	<4	8	10
3841/1 10400N 8400E	65	10	75	190	<4	8	10
3841/1 10600N 7600E	130	6	60	260	<4	8	<10
3841/1 10600N 7700E	90	10	115	220	<4	<4	<10
3841/1 10600N 7800E	120	12	95	240	<4	<4	<10
3841/1 10600N 7900E	85	12	115	210	<4	8	10
3841/1 10600N 8100E	95	16	115	360	<4	6	<10
3841/1 10600N 8200E	80	8	100	220	<4	4	<10
3841/1 10600N 8300E	80	10	120	220	<4	8	<10
3841/1 10600N 8400E	55	6	95	195	<4	6	<10

HELLYER RIVER EAST

3841/2 11000N 8700E	75	<4	120	310	<4	8	<10
3841/2 11000N 8800E	85	<4	135	280	<4	8	<10
3841/2 11000N 8900E	80	10	130	260	<4	<4	<10
3841/2 11000N 9100E	90	<4	190	250	<4	12	<10
3841/2 11000N 9300E	90	10	80	170	<4	6	<10
3841/2 11000N 9500E	65	<4	130	150	<4	6	10
3841/2 11000N 9700E	50	6	135	135	<4	8	<10
3841/2 11000N 9800E	46	8	120	125	<4	<4	10
3841/2 9000E 10600N	60	10	125	200	<4	6	<10
3841/2 9000E 10700N	80	<4	100	350	<4	<4	10
3841/2 9000E 10800N	95	<4	100	330	<4	<4	<10
3841/2 9000E 10900N	55	<4	145	145	<4	<4	<10
3841/2 9000E 11000N	80	<4	165	240	<4	<4	<10

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COMLABS Pty Ltd

COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COME11025

O/R : 4054/MC02/JJL/39

HELLYER RIVER EAST

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
3841/2 9000E 11100N	75	<4	130	200	<4	<4	10
3841/2 9000E 11200N	42	<4	120	115	<4	4	<10
3841/2 9000E 11300N	40	6	100	110	<4	12	<10
3841/2 9000E 11400N	50	4	110	145	<4	<4	<10
3841/2 9000E 11500N	30	8	140	125	<4	<4	<10
3841/2 9000E 11600N	60	4	95	175	<4	4	<10
3841/2 9200E 10100N	70	8	110	160	<4	<4	<10
3841/2 9200E 10200N	46	8	115	180	<4	<4	<10
3841/2 9200E 10300N	65	<4	115	250	<4	6	<10
3841/2 9200E 10400N	60	<4	125	210	<4	6	<10
3841/2 9200E 10500N	95	<4	150	280	<4	<4	<10
3841/2 9200E 10600N	38	<4	210	220	<4	<4	<10
3841/2 9200E 10700N	50	<4	120	135	<4	4	<10
3841/2 9200E 10800N	48	<4	140	125	<4	10	<10
3841/2 9200E 10900N	44	22	85	65	4	12	<10
3841/2 9200E 11000N	70	8	95	165	<4	4	<10
3841/2 9200E 11100N	70	6	210	200	<4	4	<10
3841/2 9200E 11200N	80	10	145	180	<4	<4	<10
3841/2 9200E 11300N	65	10	140	180	<4	<4	<10
3841/2 9200E 11400N	75	12	210	250	<4	<4	<10
3841/2 9200E 11500N	60	12	125	195	<4	<4	<10
3841/2 9200E 11600N	60	10	95	155	<4	<4	<10
3841/2 9400E 10100N	105	6	95	195	<4	12	10
3841/2 9400E 10200N	60	8	125	310	<4	<4	<10
3841/2 9400E 10300N	50	8	110	180	<4	4	10

COMLABS Pty Ltd
COMPUTERISED ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB COME11025

O/R : 4054/H002/JJL/39

HELLYER RIVER EAST

Results in ppm

SAMPLE	Cu	Pb	Zn	N1	B1	Sn	W
3841/2 9400E 10400N	50	14	100	115	<4	4	<10
3841/2 9400E 10500N	70	6	125	170	<4	4	<10
3841/2 9400E 10600N	100	4	170	310	<4	<4	<10
3841/2 9400E 10700N	70	8	125	205	<4	<4	<10
3841/2 9400E 10800N	65	10	115	155	<4	4	<10
3841/2 9400E 10900N	75	10	110	170	<4	6	<10
3841/2 9400E 11000N	46	10	210	140	<4	6	<10
3841/2 9400E 11100N	55	8	185	180	<4	6	<10
3841/2 9400E 11200N	50	10	210	100	<4	<4	<10
3841/2 9400E 11300N	60	10	135	205	<4	8	<10
3841/2 9400E 11400N	40	8	85	100	<4	6	<10
3841/2 9400E 11500N	26	6	44	60	<4	8	<10
3841/2 9400E 11600N	70	10	75	270	<4	6	<10
3841/2 9600E 10300N	50	8	85	155	<4	<4	<10
3841/2 9600E 10400N	60	8	155	240	<4	8	<10
3841/2 9600E 10500N	70	10	150	250	<4	<4	<10
3841/2 9600E 10600N	65	10	110	240	<4	12	<10
3841/2 9600E 10700N	38	10	105	135	<4	10	<10
3841/2 9600E 10800N	50	12	115	115	<4	6	<10
3841/2 9600E 10900N	55	12	115	125	<4	4	10
3841/2 9600E 11000N	70	12	145	240	<4	4	<10
3841/2 9600E 11100N	85	14	75	280	<4	8	<10
3841/2 9600E 11200N	38	10	80	80	<4	6	<10
3841/2 9600E 11300N	55	10	85	165	<4	6	<10
3841/2 9600E 11400N	34	8	50	120	<4	<4	<10

ANALYTICAL REPORT

COMLABS Pty Ltd

COMPUTERISED ANALYTICAL LABORATORIES

JOB COM811025

O/N : 4054/MQ02/JJL/39

HELLYER RIVER EAST

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
3841/2 9600E 11500N	44	8	85	90	<4	<4	<10
PARRAWE 3842/1 4500E 2300N	65	<4	90	175	<4	<4	<10
3842/1 4500E 2400N	46	<4	60	130	<4	4	<10
3842/1 4500E 2500N	60	6	75	160	<4	<4	<10
3842/1 4500E 2600N	60	4	85	220	<4	<4	<10
3842/1 4500E 2700N	36	4	80	160	<4	10	<10
3842/1 4500E 2800N	48	6	85	175	<4	<4	<10
3842/1 4500E 2900N	38	16	80	115	<4	<4	<10
3842/1 4500E 3000N	40	16	55	105	<4	<4	<10
3842/1 4500E 3200N	42	6	70	150	<4	8	<10
3842/1 4500E 3300N	50	10	90	175	<4	<4	10
3842/1 3100N 4200E	22	6	24	46	<4	4	<10
3842/1 3100N 4300E	90	14	85	200	<4	6	<10
3842/1 3100N 4400E	26	18	36	70	<4	<4	<10
3842/1 3100N 4500E	34	10	48	105	<4	4	<10
3842/1 3100N 4600E	50	24	44	190	<4	<4	10
3842/1 3100N 4700E	22	18	42	30	<4	<4	<10
3842/1 3100N 4800E	44	22	50	130	<4	4	<10
3842/1 3100N 4900E	34	16	44	80	<4	6	<10
3842/1 3100N 5000E	40	10	48	90	<4	8	<10
3842/1 2900N 4100E	42	16	50	110	<4	<4	<10
3842/1 2900N 4200E	50	14	46	205	<4	<4	<10
3842/1 2900N 4300E	18	8	22	26	<4	6	10
3842/1 2900N 4400E	30	14	65	125	<4	<4	<10
3842/1 2900N 4600E	46	10	90	165	<4	<4	<10

COMLABS Pty Ltd

ANALYTICAL REPORT

COMPUTERISED ANALYTICAL LABORATORIES

JOE COM811025

O/N : 4054/HO02/JJL/39

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Bi	Sn	W
3842/1 2900N 4700E	65	12	120	170	<4	6	<10
3842/1 2900N 4800E	55	14	75	160	<4	<4	<10
3842/1 2900N 4900E	32	24	50	80	<4	8	<10
3842/1 2900N 5000E	36	10	60	80	<4	<4	<10
3842/1 2700N 4100E	50	<4	110	175	<4	6	<10
3842/1 2700N 4200E	50	4	70	150	<4	<4	<10
3842/1 2700N 4300E	46	6	95	180	<4	6	<10
3842/1 2700N 4400E	65	<4	85	180	<4	<4	<10
3842/1 2700N 4600E	60	4	125	110	<4	<4	<10
3842/1 2700N 4700E	65	10	105	190	<4	8	<10
3842/1 2700N 4800E	55	10	75	145	<4	10	<10
3842/1 2700N 5000E	65	12	85	155	<4	4	<10
3842/1 2500N 4100E	36	14	75	70	<4	<4	10
3842/1 2500N 4200E	22	16	65	46	<4	4	<10
3842/1 2500N 4300E	46	14	85	120	<4	<4	<10
3842/1 2500N 4400E	55	10	115	190	<4	10	<10
3842/1 2500N 4600E	65	<4	115	215	<4	<4	<10
3842/1 2500N 4700E	60	4	110	240	<4	<4	15
3842/1 2500N 4800E	65	8	105	210	<4	8	10
3842/1 2500N 4900E	55	10	85	190	<4	<4	<10

Method of Analysis : Cu Pb Zn Ni Bi : AAS1
 Sn W : XRF1

TABLE 1

LIST OF GROUND FOLLOW UP OF ANOMALIES ON
GUILDFORD E.L. 1/76

TABLE 1

GROUND FOLLOW-UP OF ANOMALIES IN GUILDFORD EL

Anomaly Number	Name	(A.M.G) Location	Anomaly Description	Geology	Work Done	Interpretation
3840/1	Mt Pearse East	387,000E 5,405,300N	110nT Aeromag	Tertiary basalt	Ground mag.	Basalt hill
3840/2	Mt Pearse	385,500E 4,096,150N	280nT Aeromag	Tertiary basalt.	Ground mag Magnetic remanence Gravity Soil geochem.	Basalt hill
3841/1	Hellyer River West	388,000E 5,410,400N	400nT Aeromag	Tertiary basalt	Ground mag Gravity Magnetic Remanence EM-VLF & Max-Min Soil geochem, Soundings Diamond/Percussion D.H.	Basalt filled valley or plug
3841/2	Hellyer River East	389,500E 5,410,900N	310nT Aeromag	Tertiary basalt	Ground mag Gravity Max-Min EM Soil geochem.	Basalt filled valley.
3841/3	Wandle River	415,600E 5,384,900n	200nT Aeromag	Tertiary basalt	Ground mag. SIROTEM sounding	Basalt hill
3841/4	Guildford Rd	385,800E 5,414,300N	150nT Aeromag	Tertiary basalt	Ground mag	Basalt

.../cont'd

Table 1 (cont'd)

186

GROUND FOLLOW-UP OF ANOMALIES IN GUILDFORD EL

Anomaly Number	Name	(A.M.G.) Location	Anomaly Description	Geology	Work Done	Interpretation
3841/5	Chilton Bridge	388,500E 5,414,500N	110nT Aeromag	Tertiary basalt	Ground mag.	Basalt hill
3842/1	Parrawe	384,500E 5,422,700N	670nT Aeromag	Tertiary basalt	Ground mag. Gravity Soil sampling	Basalt hill; underlying granite?
3842/2	Shooters Hill	388,000E 5,420,500N	400nT Aeromag.	Tertiary basalt	Ground mag. Gravity Soil geochem.	Basalt
3941/3	Peak Plain	395,250E 5,418,800N	350-400nT Aeromag.	Tertiary basalt over- lying Ordovician Conglomerate. Gordon Limestone.	Ground mag. IP (dipole-dipole) Soil geochem. Percussion/Diamond Drillhole	Basalt filled valley
3941/4	Old Park Rd	398,500E 5,417,900N	90nT Aeromag.	Tertiary Basalt	Ground mag.	Basalt
3942/1	St Valentine's	396,700E 5,423,000N	400nT Aeromag	Roland Conglomerate Ordovician sediments Magnetite skarns.	Ground mag.	Known skarn accounts for magnetic anomaly.
3942/2	Basils Rd	5,426,000N	Regional cross- section	Tertiary basalt Cambrian sediments	Ground mag. IP (Dipole-dipole) Soil sampling SIROTEM sounding.	Basalt valley.

.../cont'd

449187

Table 1

187

GROUND FOLLOW-UP OF ANOMALIES IN GUILDFORD EL

Anomaly Number	Name	(A.M.G.) Location	Anomaly Description	Geology	Work Done	Interpretation
3942/3	Bunkers Rd	392,000E 5,421,000N	Stratigraphic drill-hole	Tertiary basalt	Percussion/Diamond Drill hole AMT sounding SIROTEM sounding	Basalt valley
3942/6	Reservoir West	392,100E 5,423,100N	200nT Aeromag.	Tertiary basalt Cambrian sediments	Ground mag.	Basalt hill
3942/7	Emu River	393,300E 5,425,500N	400nT Aeromag	Tertiary basalt	Ground mag.	Basalt valley.
3941/IL10	Wey Rd	393,250E 5,416,200N	6 channel INPUT	Tertiary basalt	VLF-EM Max-Min EM IP (Dipole-dipole)	Basalt related weathering

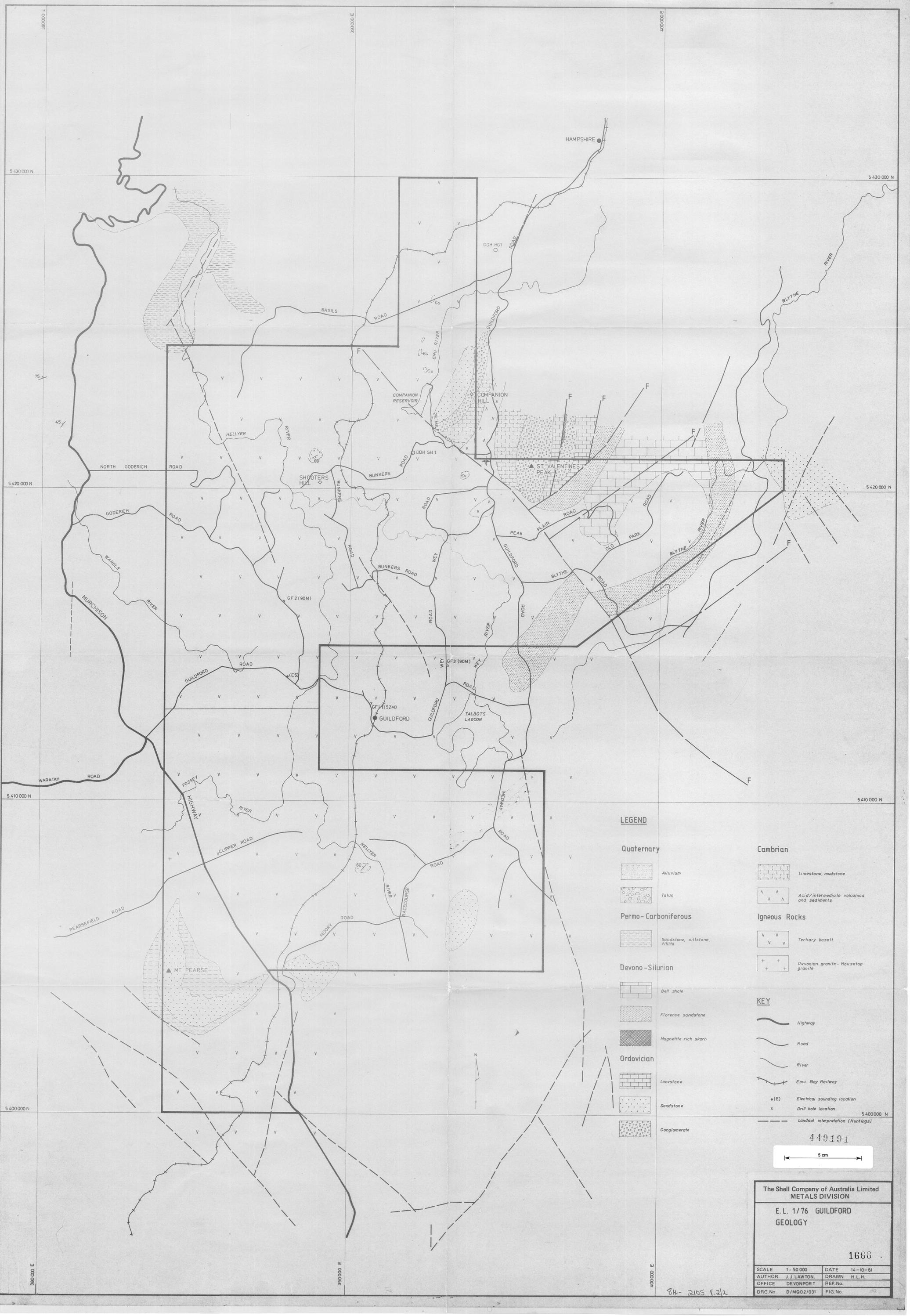
449188

OPEN FILE

LIST OF PLANS

<u>DRAWING NO.</u>	<u>TITLE</u>	<u>SCALE</u>
D/MQ 02/031 ✓	E.L. 1/76 - Guildford, Geology	1:50,000
D/MQ 02/067 ✓	St. Valentines Interpretive Geology - Sub Basalt	1:50,000
D/MQ 02/054 ✓	E.L. 1/76 - Guildford, Grid & Anomaly Locations	1:50,000
D/MQ 02/056 ✓	E.L. 1/76 - Guildford, Aeromagnetic Contour Map	1:50,000
MQ 00/1006 ✓	E.L. 1/76 - Guildford, Aeromagnetic Contour Map Upward Continuation to 500m	1:50,000
D/MQ 02/057 ✓	E.L. 1/76 - Guildford, Radiometric - Total Count	1:50,000
D/MQ 02/066 ✓	E.L. 1/76 - Guildford, Bouguer Gravity	1:50,000
D/MQ 02/055 ✓	E.L. 1/76 - Guildford, Basalt Thickness	1:50,000
D/MQ 02/011 ✓	Mt. Pearse East, Anomaly 19, Proton Precession Magnetometry	1:2,500
D/MQ 02/013 ✓	Mt. Pearse 3840/2, Ground Magnetics	1:2,500
D/MQ 02/012 ✓	Mt. Pearse 3840/2, Ground Magnetics	1:2,500
D/MQ 02/015 ✓	Mt. Pearse 3840/2, Ground Magnetics	1:2,500
D/MQ 02/028 ✓	Mt. Pearse 3840/2, Magnetic Profiles	1:2,500
D/MQ 02/062 ✓	Mt. Pearse Anomaly 3840/2, Slope Corrections	1:5,000
D/MQ 02/019 ✓	Hellyer River West 3841/1, Ground Magnetics	1:2,000
D/MQ 02/032 ✓	Hellyer River West 3841/1, Ground Mangetic Contours	1:2,000
D/MQ 02/017 ✓	Hellyer River West, Line 8000E	1:2,000
D/MQ 02/018A ✓	Hellyer River West 3841/1, Magnetic Profiles	1:2,000
D/MQ 02/018B ✓	Hellyer River West 3841/1, Magnetic Profiles	1:2,000
D/MQ 02/060 ✓	Hellyer River West 3841/1, Slope Corrections	1:5,000
D/MQ 02/022 ✓	Hellyer River East 3841/2, Ground Magnetics	1:2,500
D/MQ 02/021 ✓	Hellyer River East 3841/2, Magnetic Profiles Lines 11000N and 10600N	1:2,500
D/MQ 02/023 ✓	Hellyer River East 3841/2, Magnetic Profiles	1:2,500
D/MQ 02/061 ✓	Hellyer River East 3841/2, Slope Corrections	1:5,000
D/MQ 02/016 ✓	Parrawe 3842/1, Ground Mangetics	1:2,000
D/MQ 02/024 ✓	Parrawe 3842/1, Magnetic Profiles	1:2,000
D/MQ 02/020 ✓	Parrawe 3842/1, Magnetic Profile, Line 4500E	1:2,000
D/MQ 02/058 ✓	Parrawe 3842/1, Slope Corrections	1:5,000
D/MQ 02/027 ✓	Shooters Hill 3842/2, Ground Magnetics	1:2,000
D/MQ 02/025 ✓	Shooters Hill 3842/2, Magnetic Profile Line 600N	1:2,000
D/MQ 02/026 ✓	Shooters Hill 3842/2, Magnetic Profiles	1:2,000
D/MQ 02/059 ✓	Shooters Hill 3842/2, Slope Corrections	1:5,000

<u>DRAWING NO.</u>	<u>TITLE</u>	<u>SCALE</u>
D/MQ 02/047 ✓	Peak Plain Anomaly 3941/3, Soil Geochemistry, Cu, Pb, Zn, Ni	1:5,000
D/MQ 02/049 ✓	Peak Plain Anomaly 3941/3, Slope Corrections	1:5,000
D/MQ 02/048 ✓	Old Park Road Anomaly 3941/4, Slope Corrections	1:5,000
D/MQ 02/099 ✓	Basils Road Section 1700E - 3200W	1:10,000
D/MQ 02/036 ✓	IL 10 - Wey Road, Line 100N, Max-Min & Ground Magnetics	1:2,500
D/MQ 02/037 ✓	IL 10 - Wey Road, Line 0N, Max-Min, Ground Magnetics & IP/Resistivity	1:2,500
D/MQ 02/038 ✓	IL 10 - Wey Road, Line 100S, Max-Min & Ground Magnetics	1:2,500



LEGEND

Quaternary

- Alluvium
- Talus

Permo-Carboniferous

- Sandstone, siltstone, siltite

Devono-Silurian

- Bell shale
- Florence sandstone
- Magnetite rich skarn

Ordovician

- Limestone
- Sandstone
- Conglomerate

Cambrian

- Limestone, mudstone
- Acid/intermediate volcanics and sediments

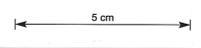
Igneous Rocks

- Tertiary basalt
- Devonian granite - House top granite

KEY

- Highway
- Road
- River
- Emu Bay Railway
- Electrical sounding location
- Drill hole location
- Landsat interpretation (Huntings)

449191



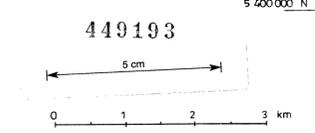
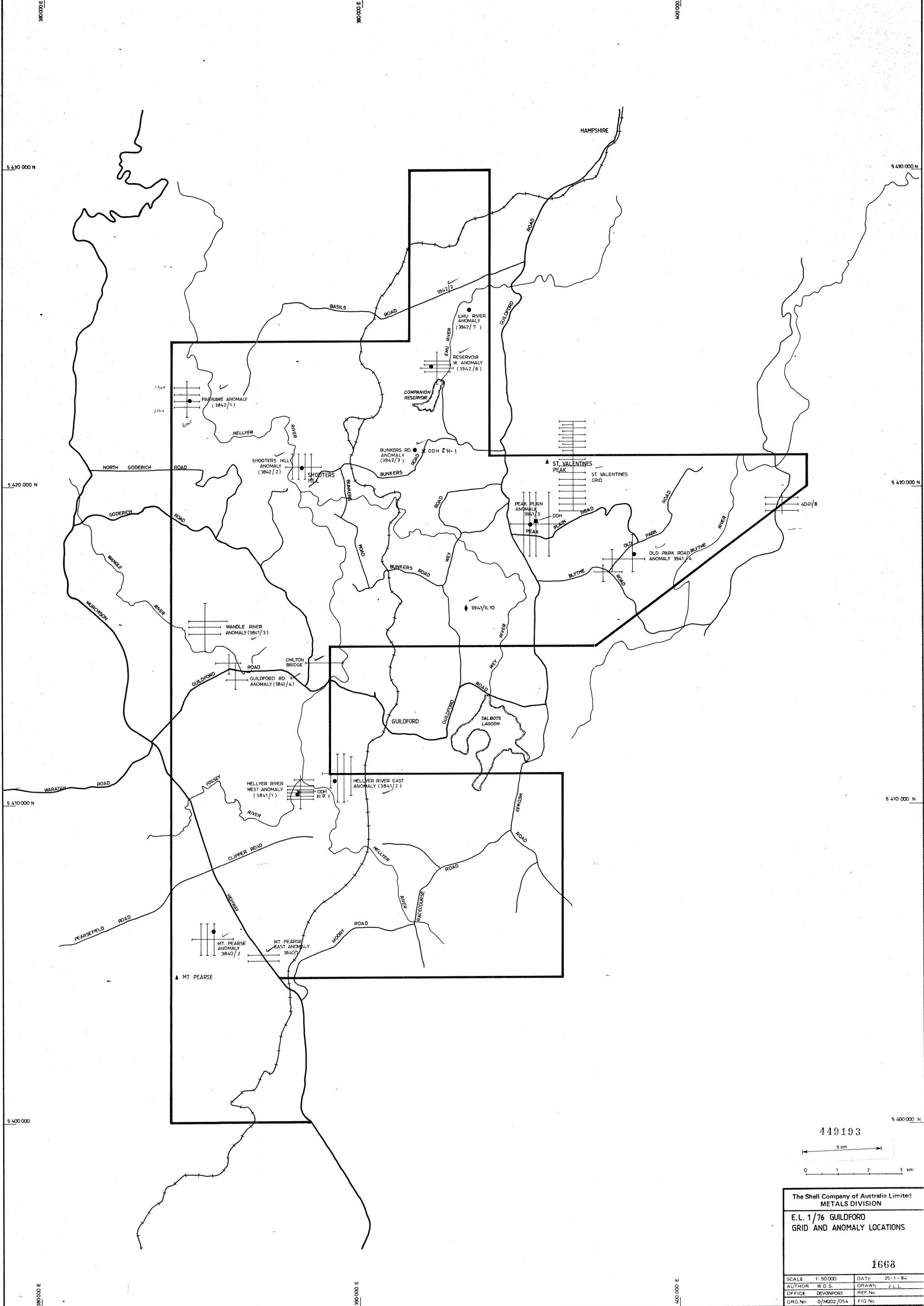
The Shell Company of Australia Limited
METALS DIVISION

E.L. 1/76 GUILDFORD
GEOLOGY

1666

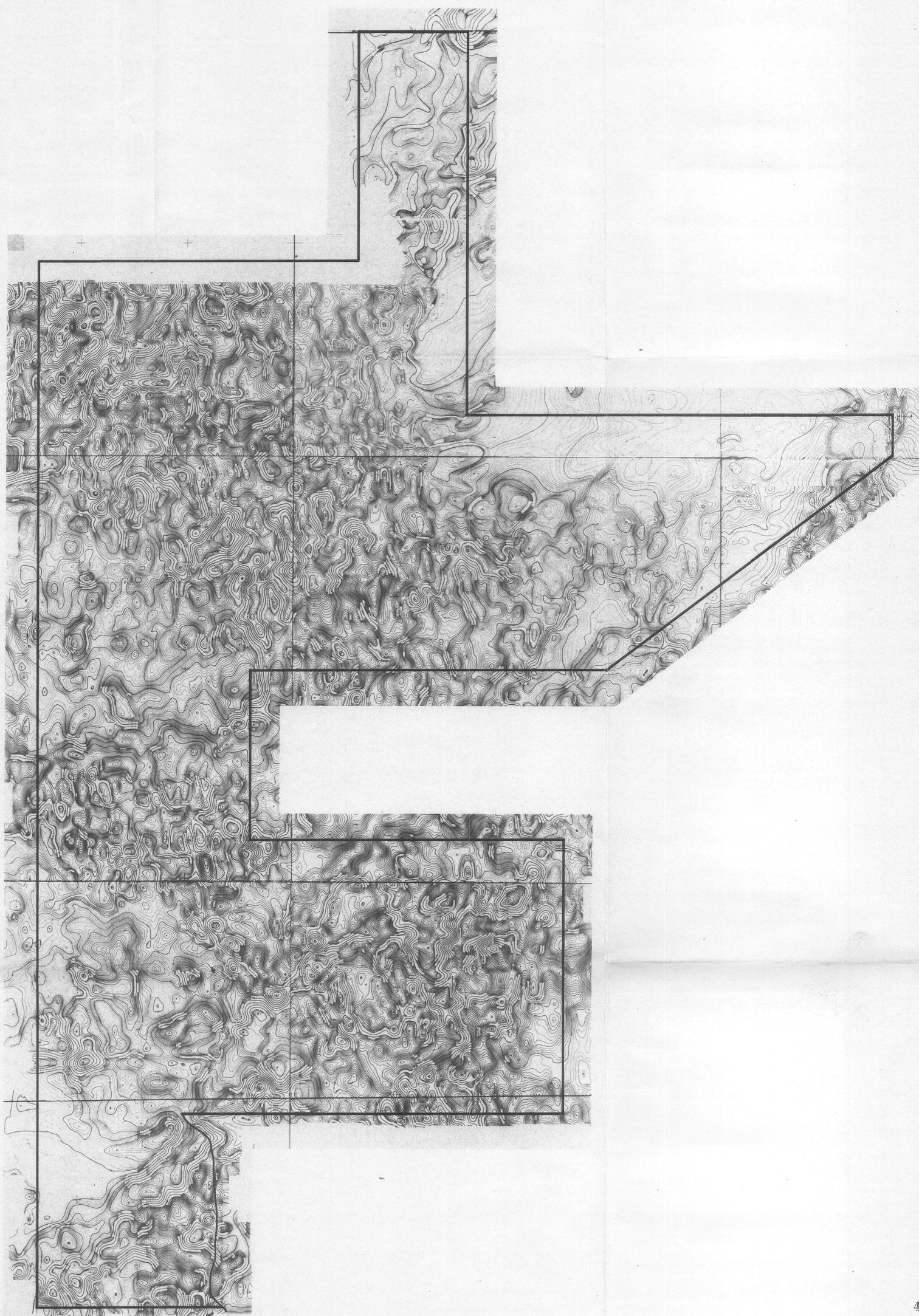
SCALE 1: 50 000	DATE 14-10-81
AUTHOR J.J. LAWTON	DRAWN H.L.H.
OFFICE DEVONPORT	REP.No.
DRG.No. D/MQ02/031	FIG.No.

84-2105 v.2.2



The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD GRID AND ANOMALY LOCATIONS			
1668			
SCALE	1:50 000	DATE	25-1-84
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. No.	
DRG. No.	D/MQ02/054	FIG. No.	

84-2155 v.212



390 000 E 390 000 E 400 000 E 400 000 E

5 430 000 N 5 430 000 N

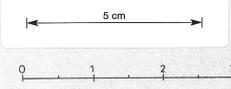
5 420 000 N 5 420 000 N

5 410 000 N 5 410 000 N

5 400 000 N 5 400 000 N

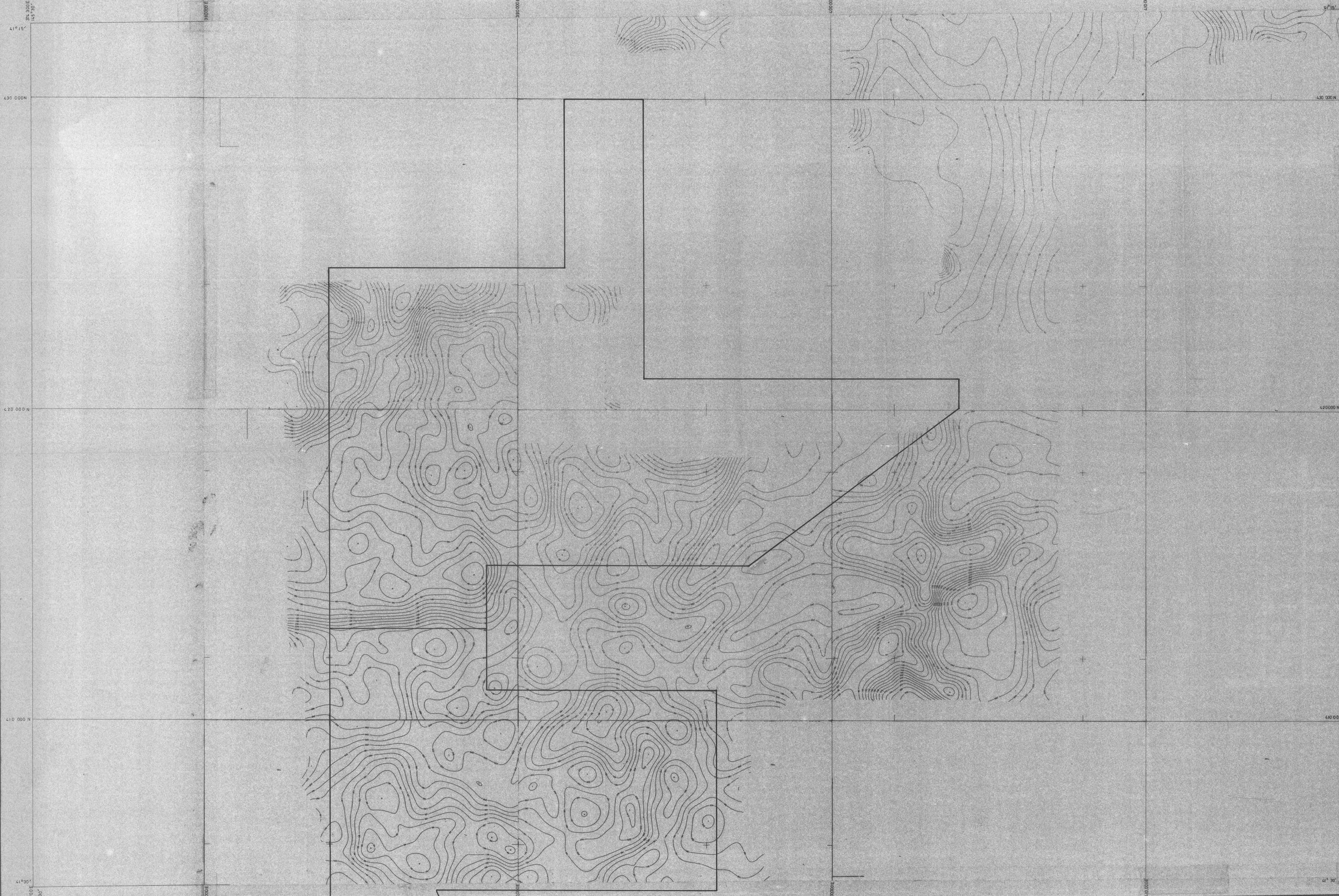
5 400 000 N 5 400 000 N

449194

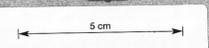


The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD AEROMAGNETIC CONTOUR MAP			
1663			
SCALE	1:50 000	DATE	26-1-84
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
DRG.No.	D/MQ 02/056	FIG.No.	

84-2155 v.2/2

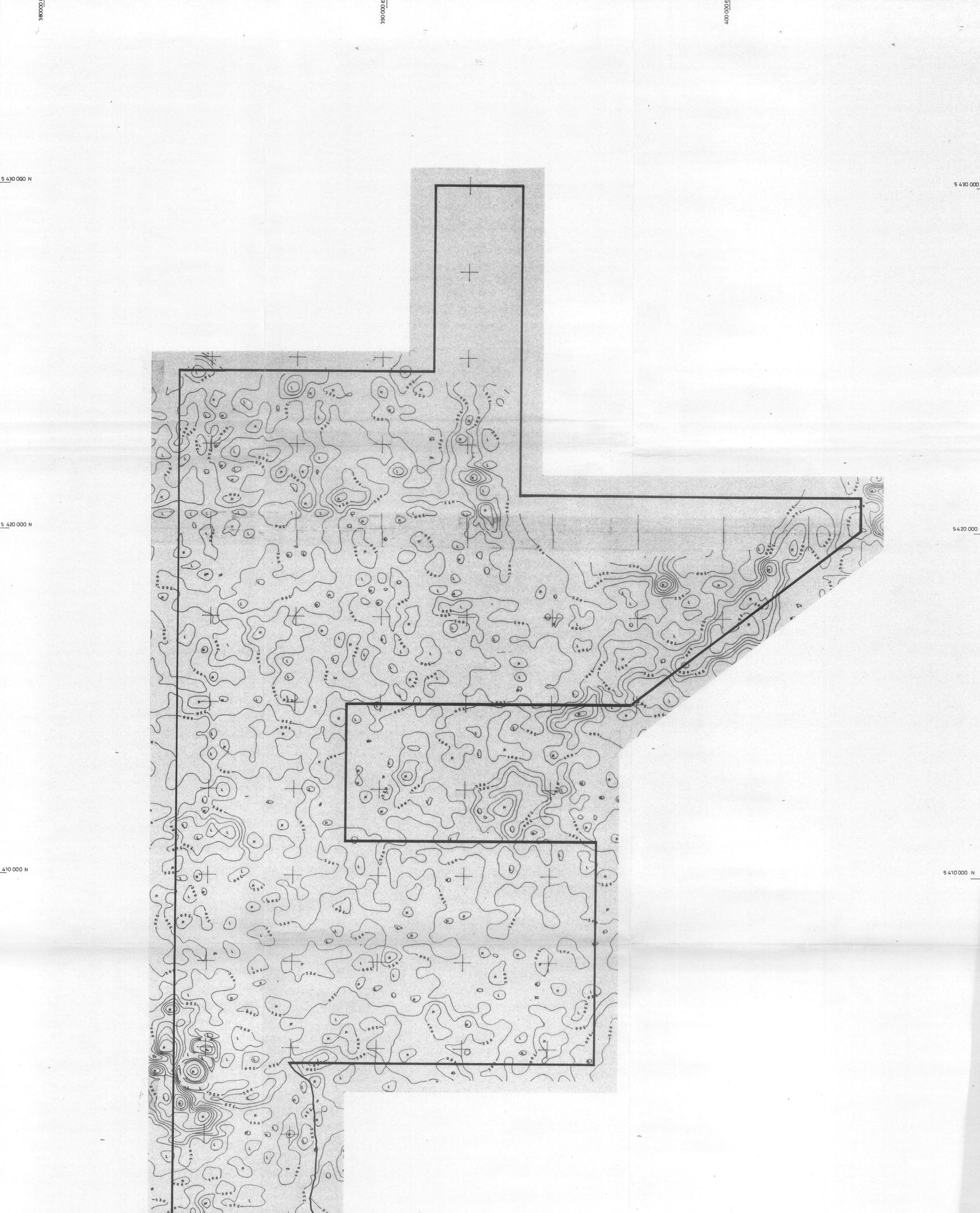


449155



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD	
1670	
Aeromagnetic Contour Map Upward Continuation to 500m	
SCALE 1:50,000	DATE MAY 1983
AUTHOR NH	DRAWN WP
OFFICE AHO	REP.No.
ENCL No.	DRG No M000/1006

34-215 V.2/2



449196

5 cm

0 1 2 3 kms

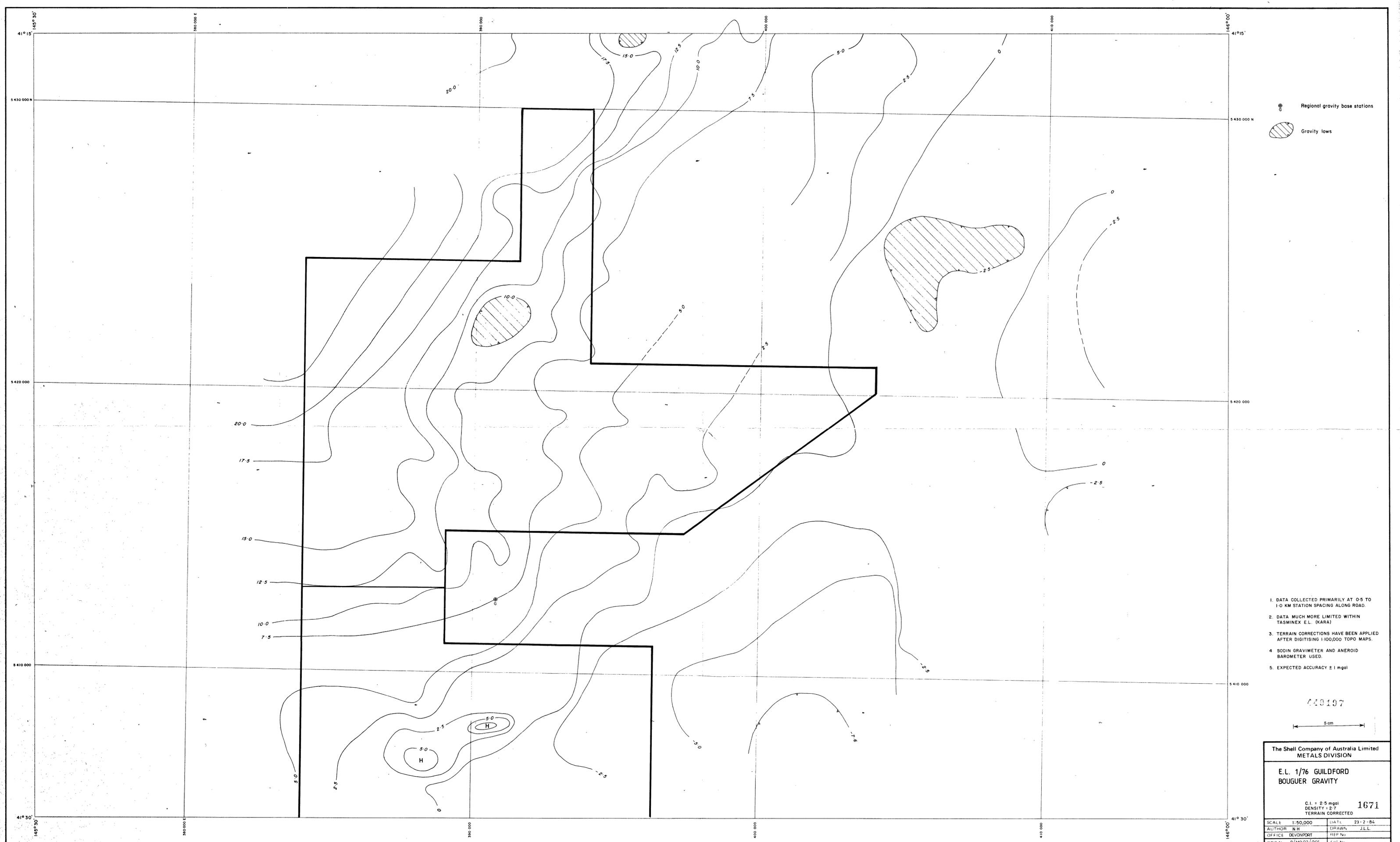
The Shell Company of Australia Limited
METALS DIVISION

E.L. 1/76 GUILDFORD
RADIOMETRICS - TOTAL COUNT
C.I. = 1000 CPS.

1672

SCALE	1:50 000	DATE	26-1-84
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
DRG.No.	D/MQ.02/057	FIG.No.	

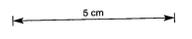
34-2105 v.2/2



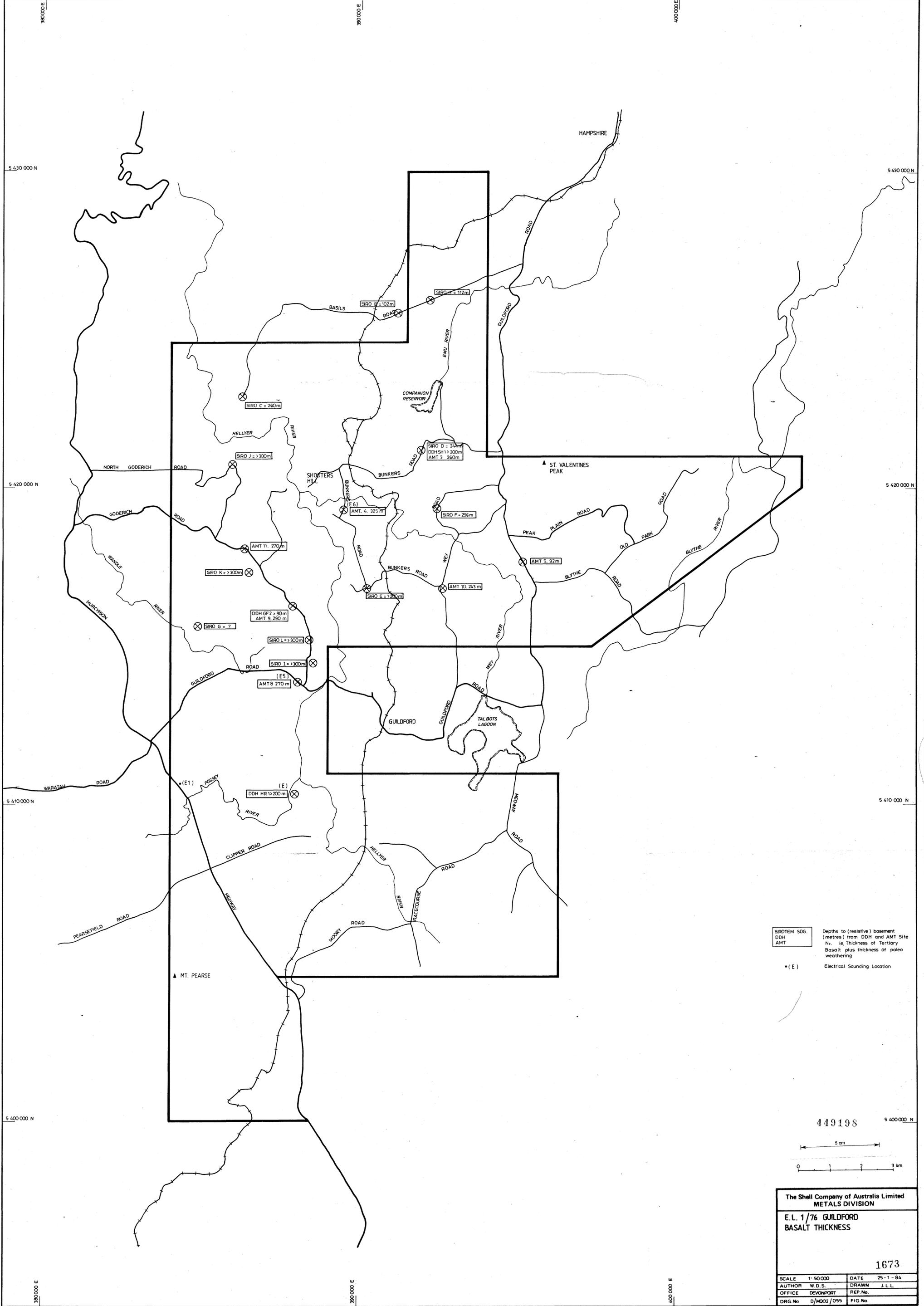
 Regional gravity base stations
 Gravity lows

1. DATA COLLECTED PRIMARILY AT 0.5 TO 1.0 KM STATION SPACINGS ALONG ROAD.
2. DATA MUCH MORE LIMITED WITHIN TASMINEK E.L. (KARA)
3. TERRAIN CORRECTIONS HAVE BEEN APPLIED AFTER DIGITISING 1:100,000 TOPO MAPS.
4. SODIN GRAVIMETER AND ANEROID BAROMETER USED.
5. EXPECTED ACCURACY ± 1 mgal

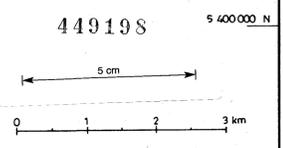
443197



The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD BOUGUER GRAVITY			
C.I. = 2.5 mgal DENSITY = 2.7 TERRAIN CORRECTED		1671	
SCALE 1:50,000	DATE 23-2-84	AUTHOR NH	DRAWN JLL
OFFICE DEVONPORT	REP No	DRG No D/MG02/066	FIG No



SIROTEM SDG. Depths to (resistive) basement (metres) from DDH and AMT Site No. ie. Thickness of Tertiary Basalt plus thickness of paleo weathering
 DDH
 AMT
 (E) Electrical Sounding Location



The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD BASALT THICKNESS			
1673			
SCALE	1:50000	DATE	25-1-84
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
DRG.No.	D/M002/055	FIG.No.	

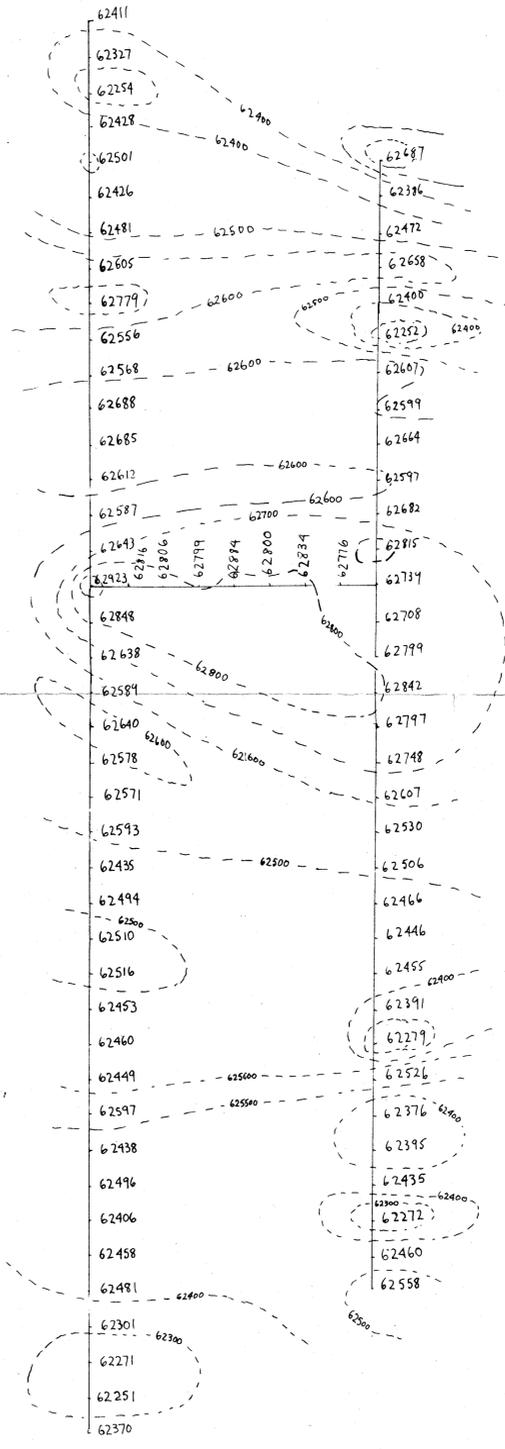
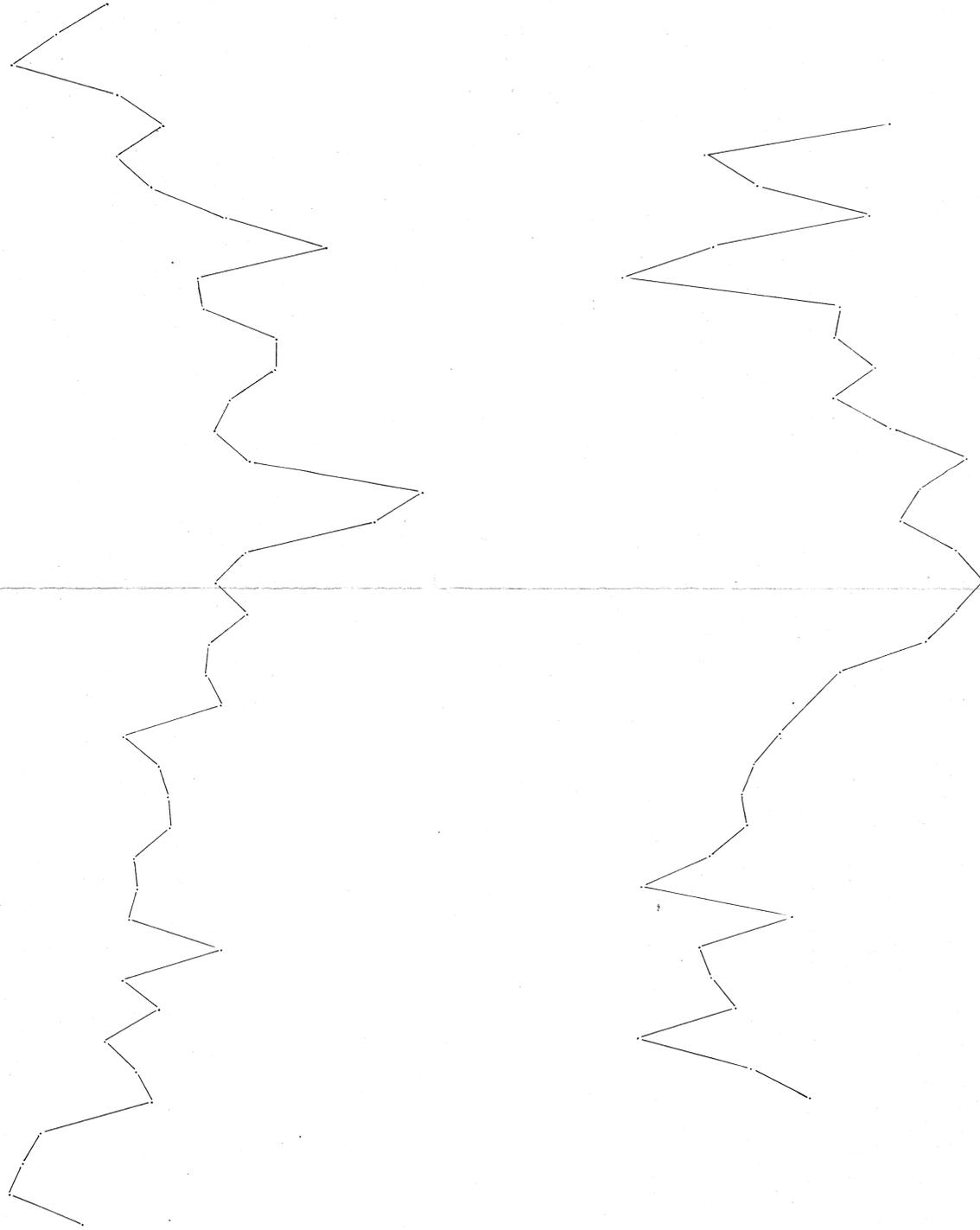
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LINE 1200E

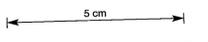
LINE 1000E

LINE 1200E

N



449199



84-215 V2/2

The Shell Company of Australia Limited METALS DIVISION	
GUILDFORD E.L.1/76 MT. PEARSE EAST, ANOMALY 19 PROTON PRESSION MAGNETOMETRY	
1674	
Scale 1:2500	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ 02/011
DATE 15-12-80	AUTHOR A. Slate
DRAWN A. Slate	OFFICE Devonport

00009

00509

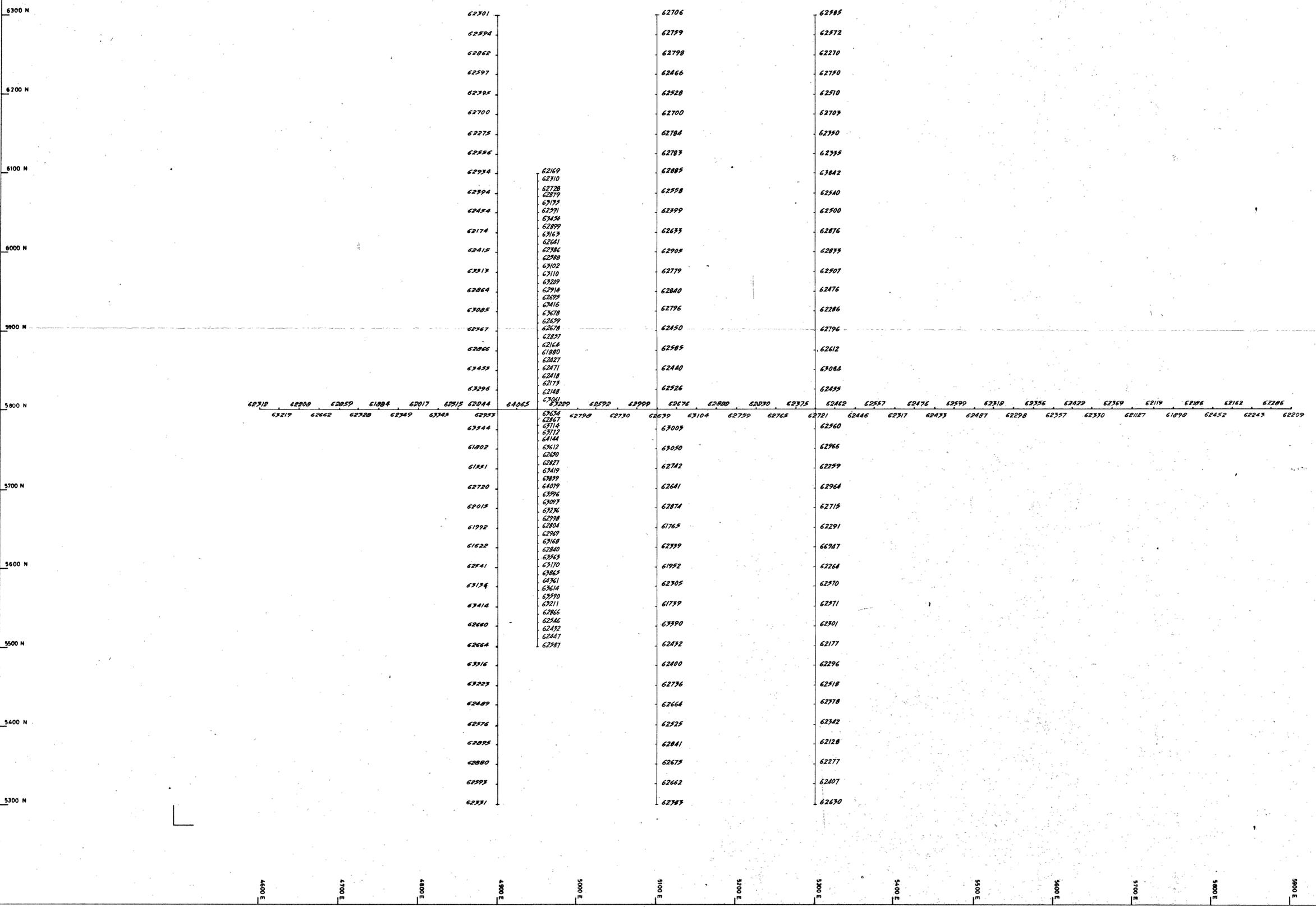
00600

00609

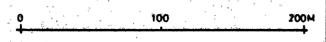
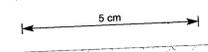
00600

LINE 1000E

LINE 1200E

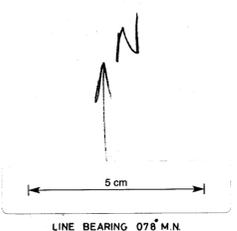
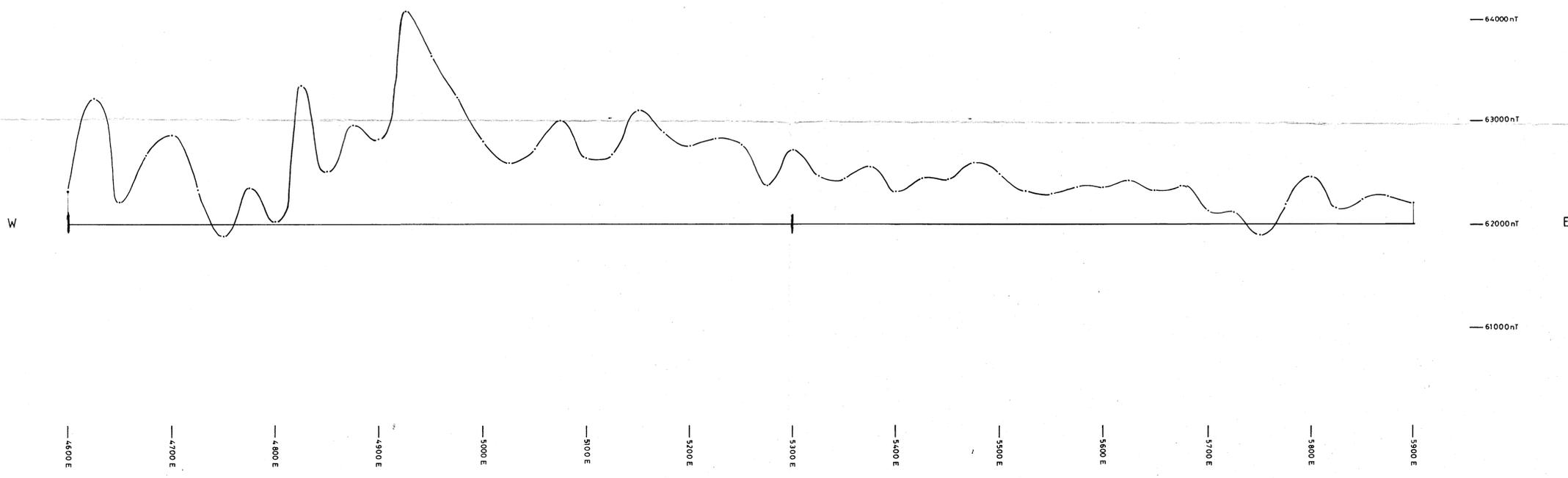


449200



The Shell Company of Australia Limited METALS DIVISION	
EL 1/76 GUILDFORD MT. PEARSE 3840/2 GROUND MAGNETICS	
Scale : 1:2500 1675	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/013
DATE 15-6-81	AUTHOR I. BUCHHORN
DRAWN H.L.M.	OFFICE DEVONPORT

84-2155 v.2r



449201

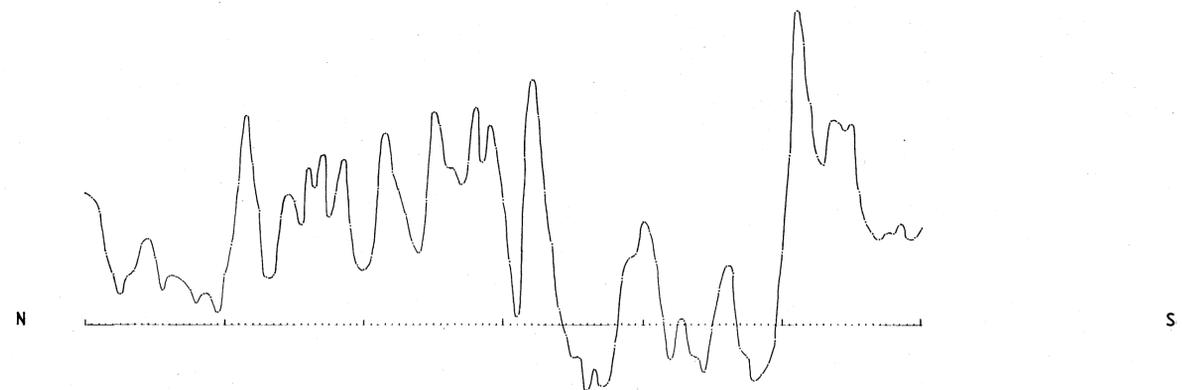


0 100 200 M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD MT. PEARSE 3840/2 GROUND MAGNETICS 1676	
Scale: Vertical 1cm = 250nT Horizontal 1: 2500	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/012
DATE 9-6-81	AUTHOR I.J. BUCHHORN
DRAWN H.L.H.	OFFICE DEVONPORT

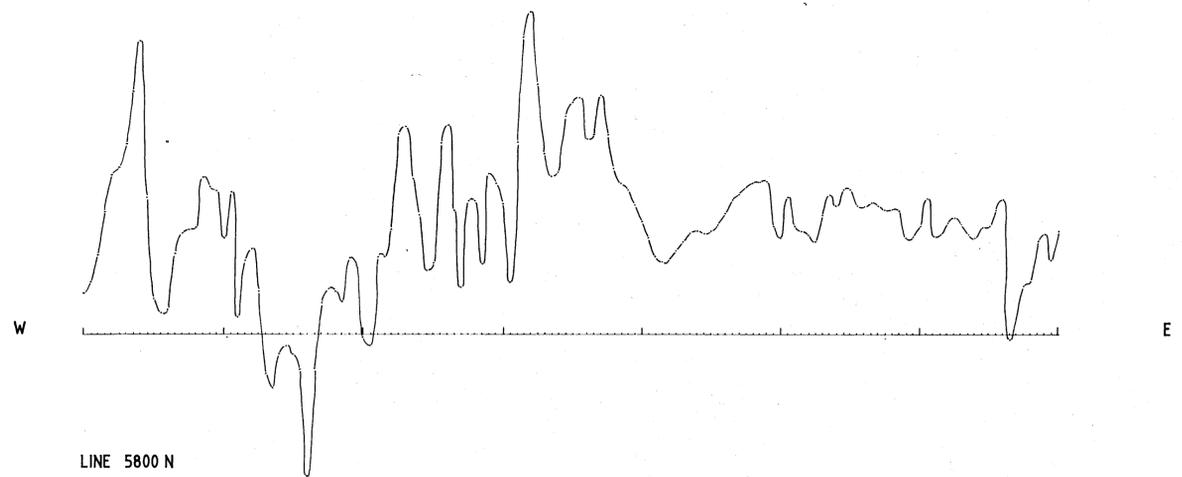
LINE 5800N

SH-2105 v.2/2



LINE 4900 E

6100 N 6000 N 5900 N 5800 N 5700 N 5600 N 5500 N



LINE 5800 N

4600 E 4700 E 4800 E 4900 E 5000 E 5100 E 5200 E 5300 E

64 000 nT
63 000 nT
62 000 nT
61 000 nT
64 000 nT
63 000 nT
62 000 nT
61 000 nT

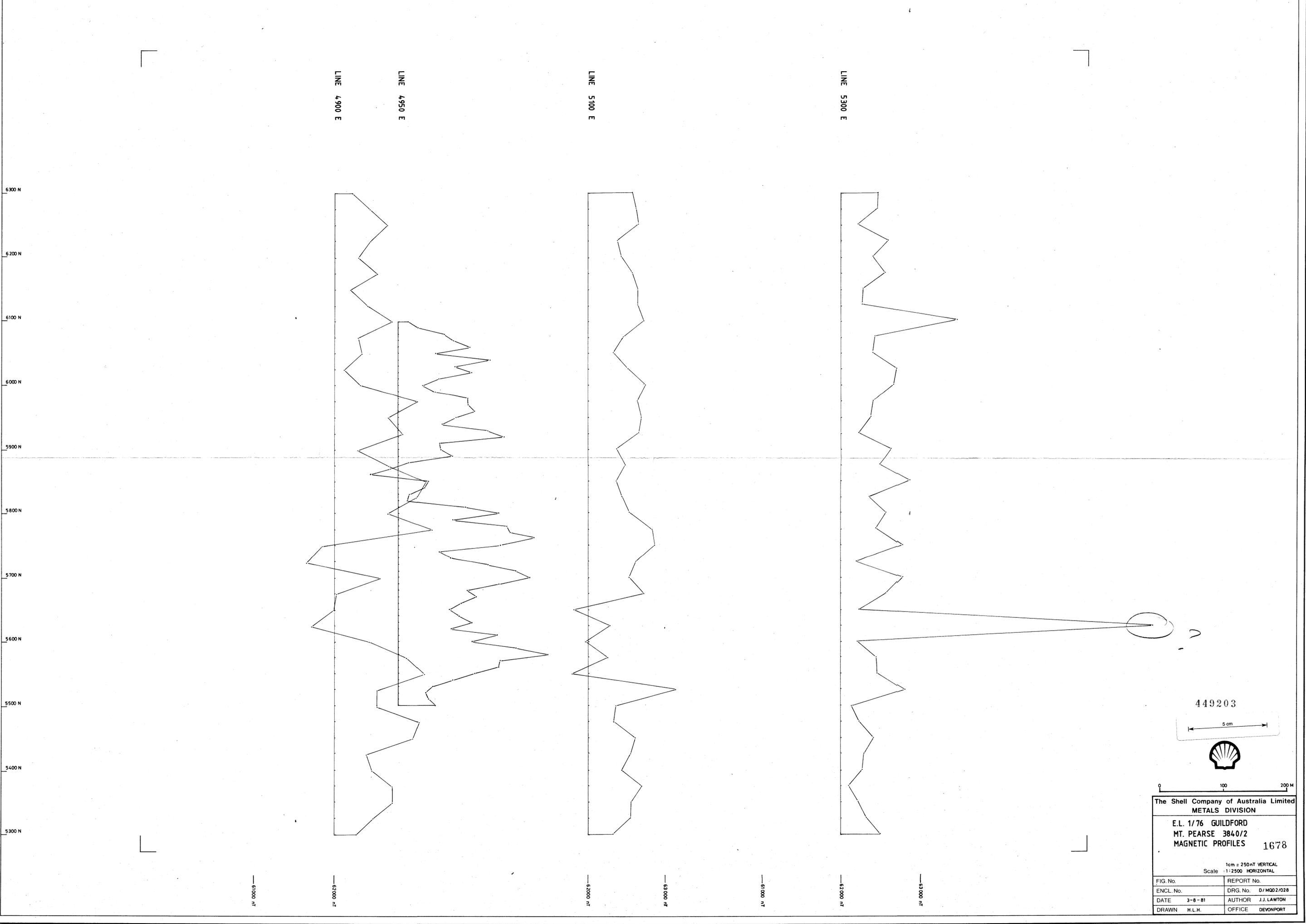
449202



5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD MT. PEARSE 3840/2 GROUND MAGNETICS 1677	
Scale 1cm = 250 nT Vertical 1:2500 Horizontal	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/015
DATE 8-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

SH-2105 v.2/2



LINE 4900 E

LINE 4950 E

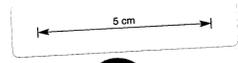
LINE 5100 E

LINE 5300 E

6300 N
6200 N
6100 N
6000 N
5900 N
5800 N
5700 N
5600 N
5500 N
5400 N
5300 N

51000 M
52000 M
53000 M
53000 M
53000 M
53000 M
53000 M
53000 M

449203



0 100 200 M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD MT. PEARSE 3840/2 MAGNETIC PROFILES 1678	
1cm = 250nT VERTICAL Scale 1:2500 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/028
DATE 3-8-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

4600 E

4950 E

5900 E

385 000 E

386 000 E

5 406 000 N

5 405 000 N

MT. PEARSE
3840/2

SCALE 1: 20 000

449204

5 cm

T.N. M.N.

0 100 200 300 m

The Shell Company of Australia Limited
METALS DIVISION

E.L. 1/76 GUILDFORD
MOUNT PEARSE
ANOMALY 3840/2
SLOPE CORRECTIONS 1679

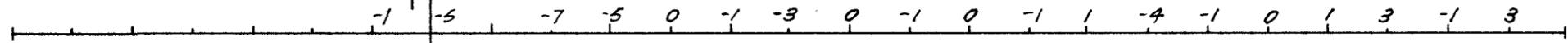
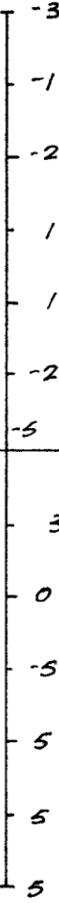
SCALE 1: 5000	DATE 2-2-84
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REP.No.
DRG.No. D/MQ 02/062	FIG.No.

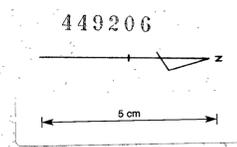
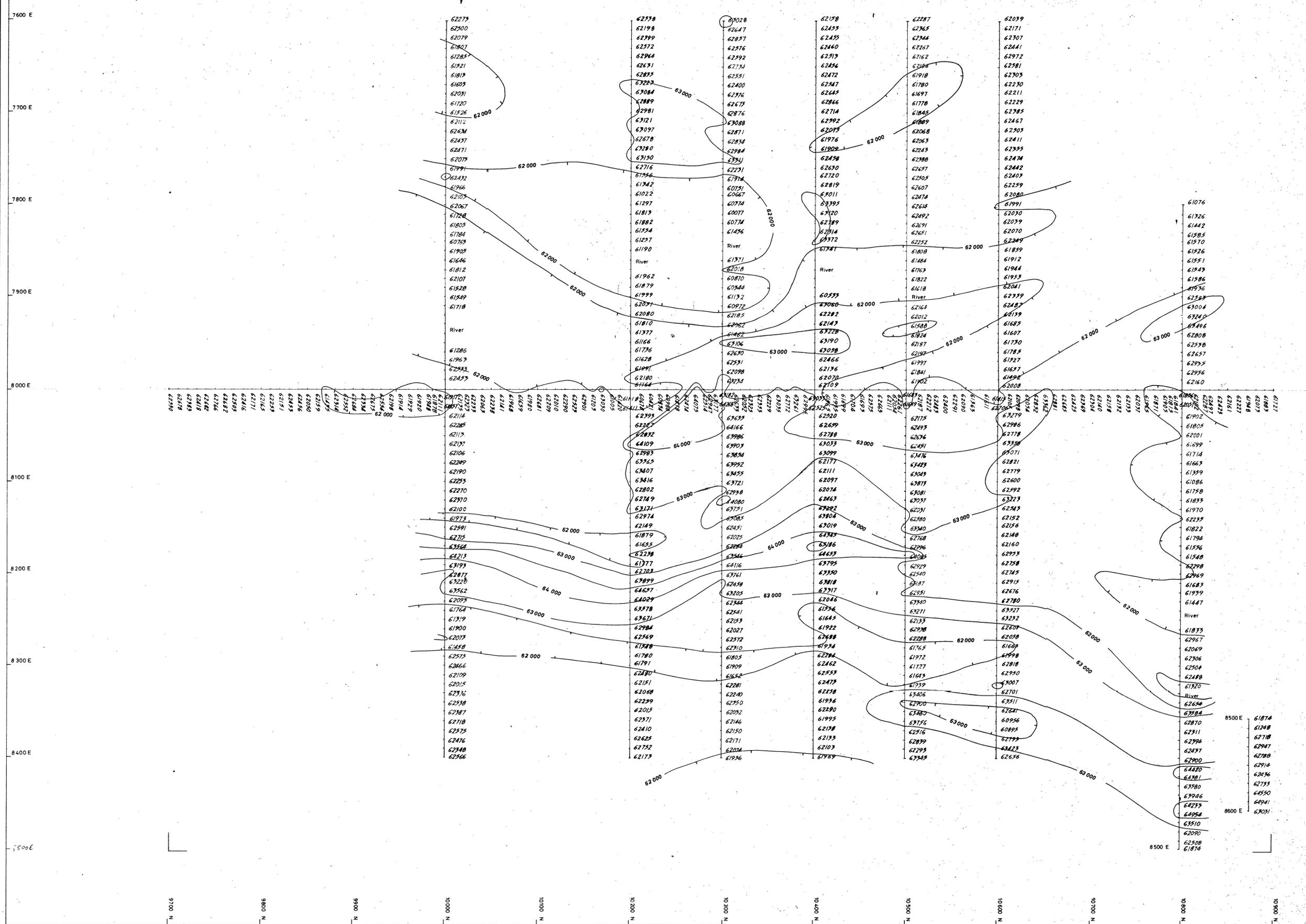
34-2105 v.2/2

6100 N

5800 N

5500 N





449206

The Shell Company of Australia Limited
METALS DIVISION

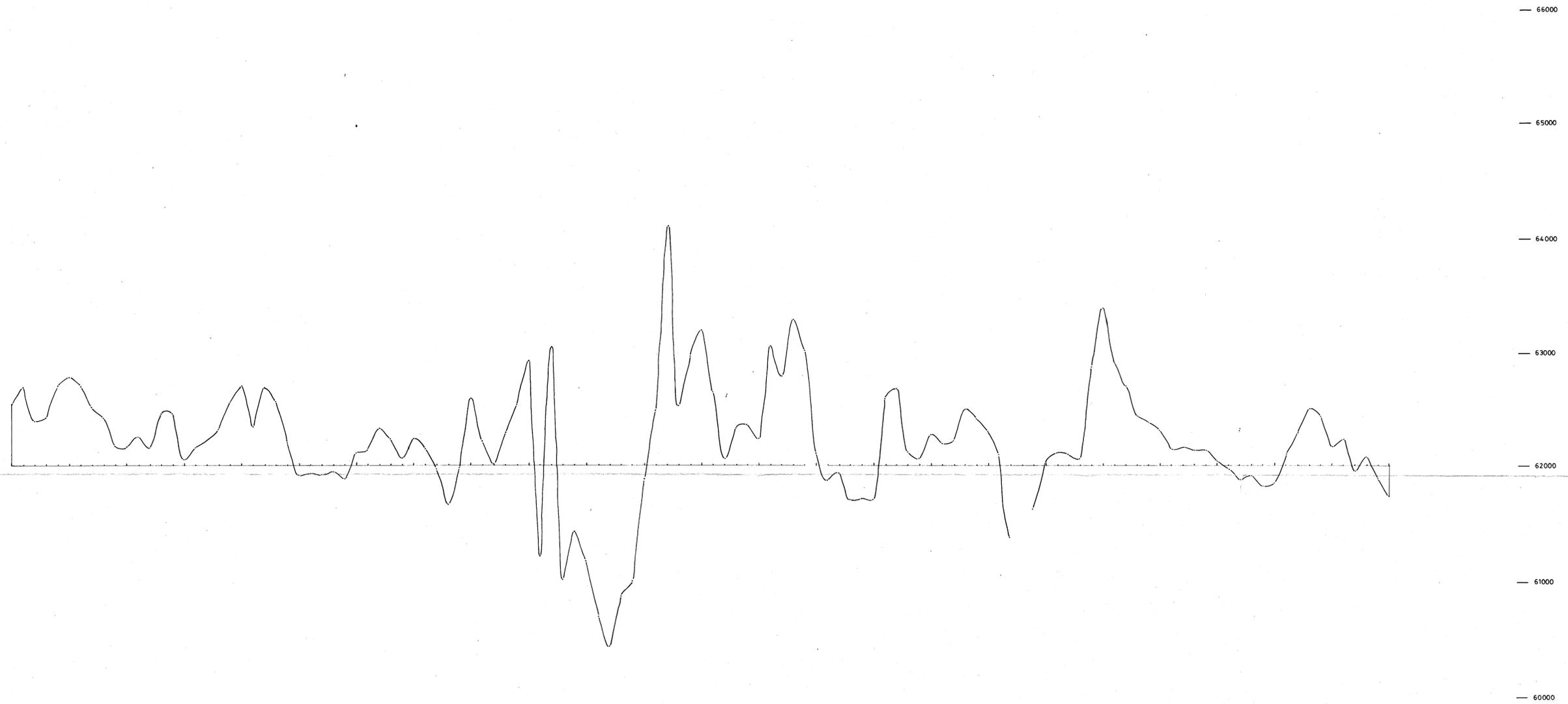
E.L. 1/76 GUILDFORD
HELLYER RIVER WEST 3841/1
GROUND MAGNETICS

1681

Scale 1:2000

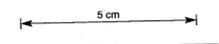
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/032
DATE 20-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

8500 E 61874
 62870
 62718
 62947
 62788
 62914
 62436
 62733
 64550
 64941
 63031
 8600 E 61874
 62900
 64480
 64381
 63580
 63946
 64233
 64954
 63510
 62090
 62508
 61874



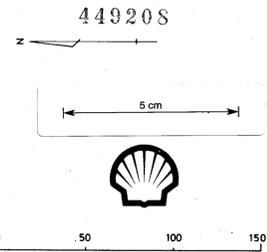
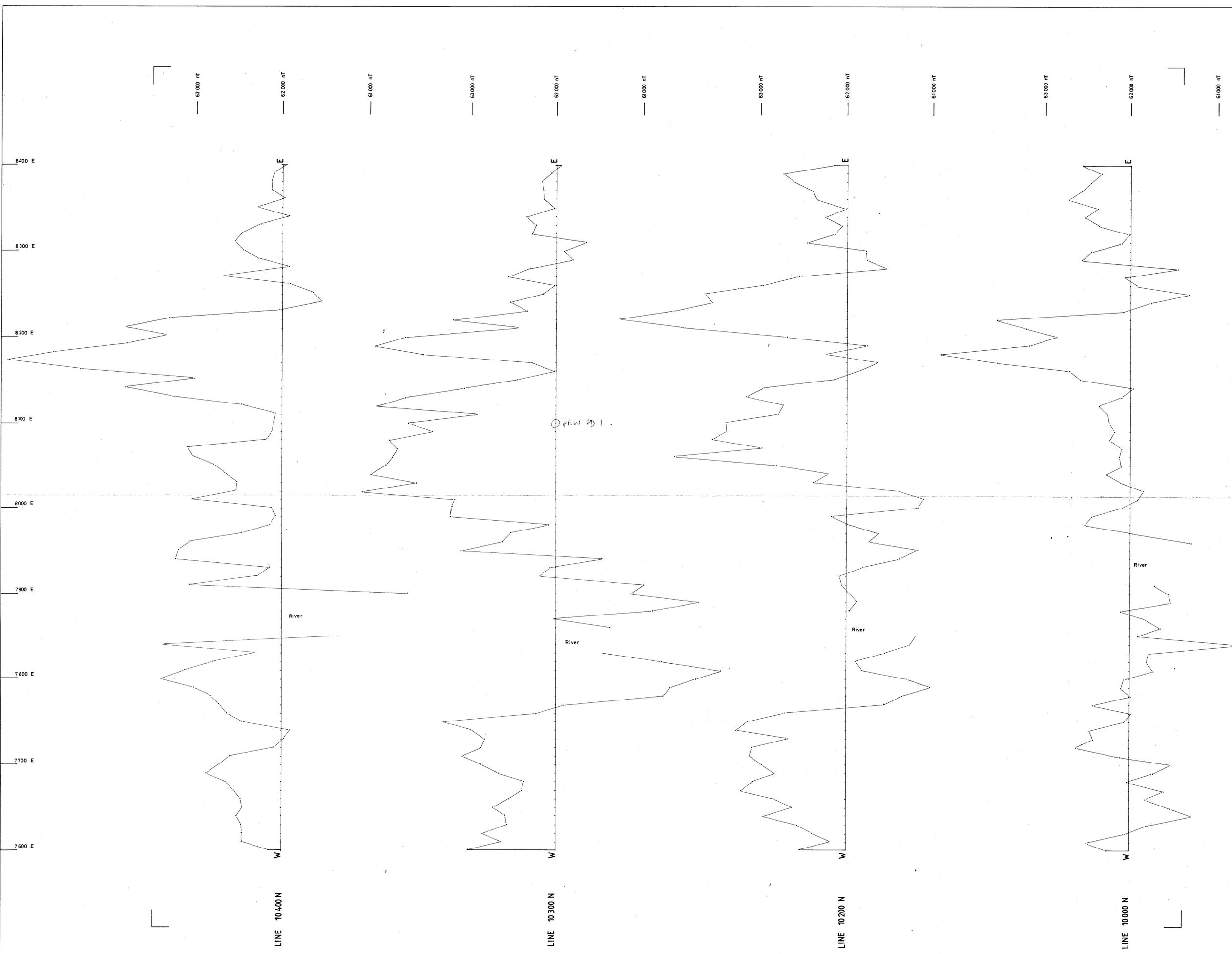
N 0015 N 0036 N 0056 N 0076 N 0096 N 0116 N 0136 N 0156 N 0176 N 0196 N 0216 N 0236 N 0256

449207



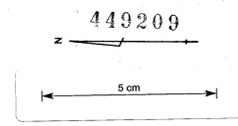
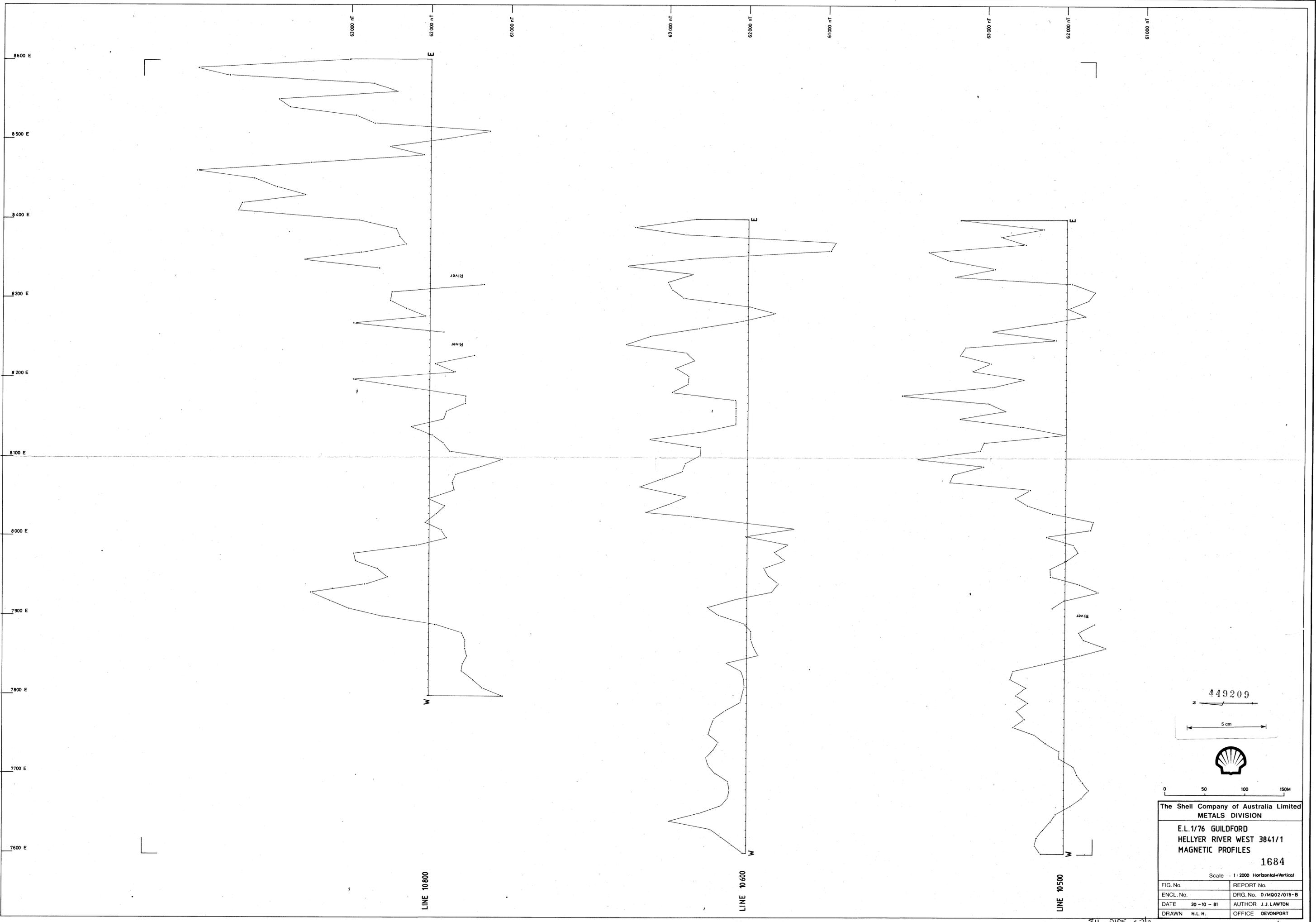
0 50 100 150M

The Shell Company of Australia Limited METALS DIVISION	
E.L.1/76 GUILDFORD HELLYER RIVER WEST LINE 8000 E	
1682	
Scale: 1cm = 200m VERTICAL 1:2000 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/017
DATE 17-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT



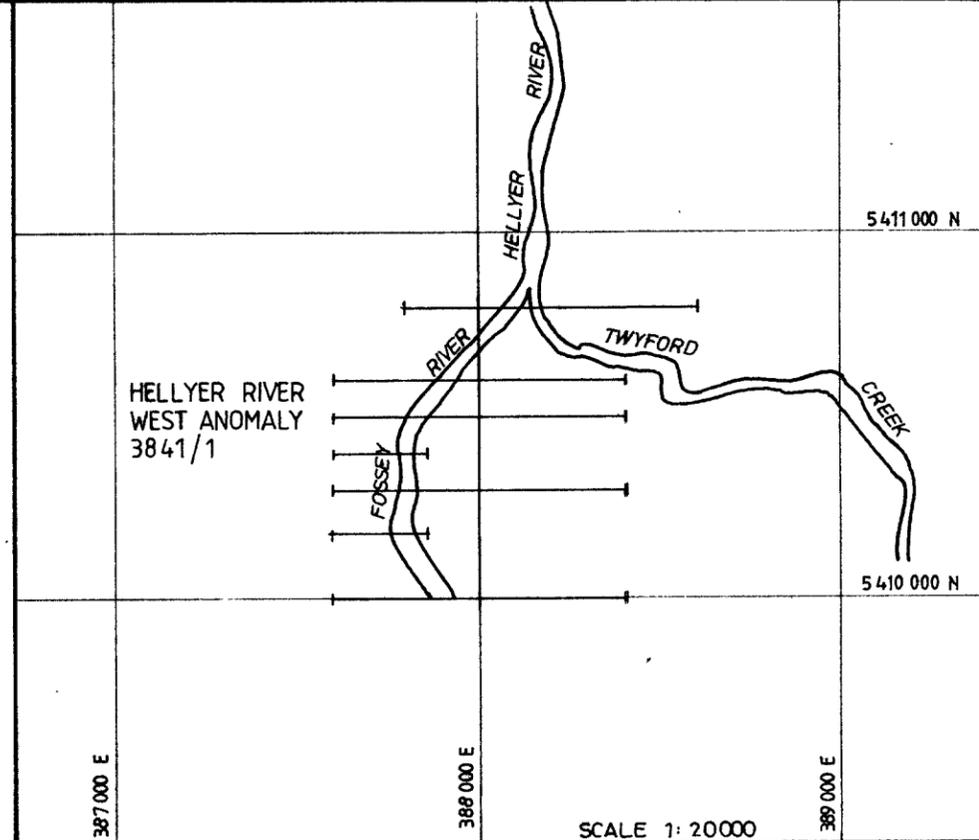
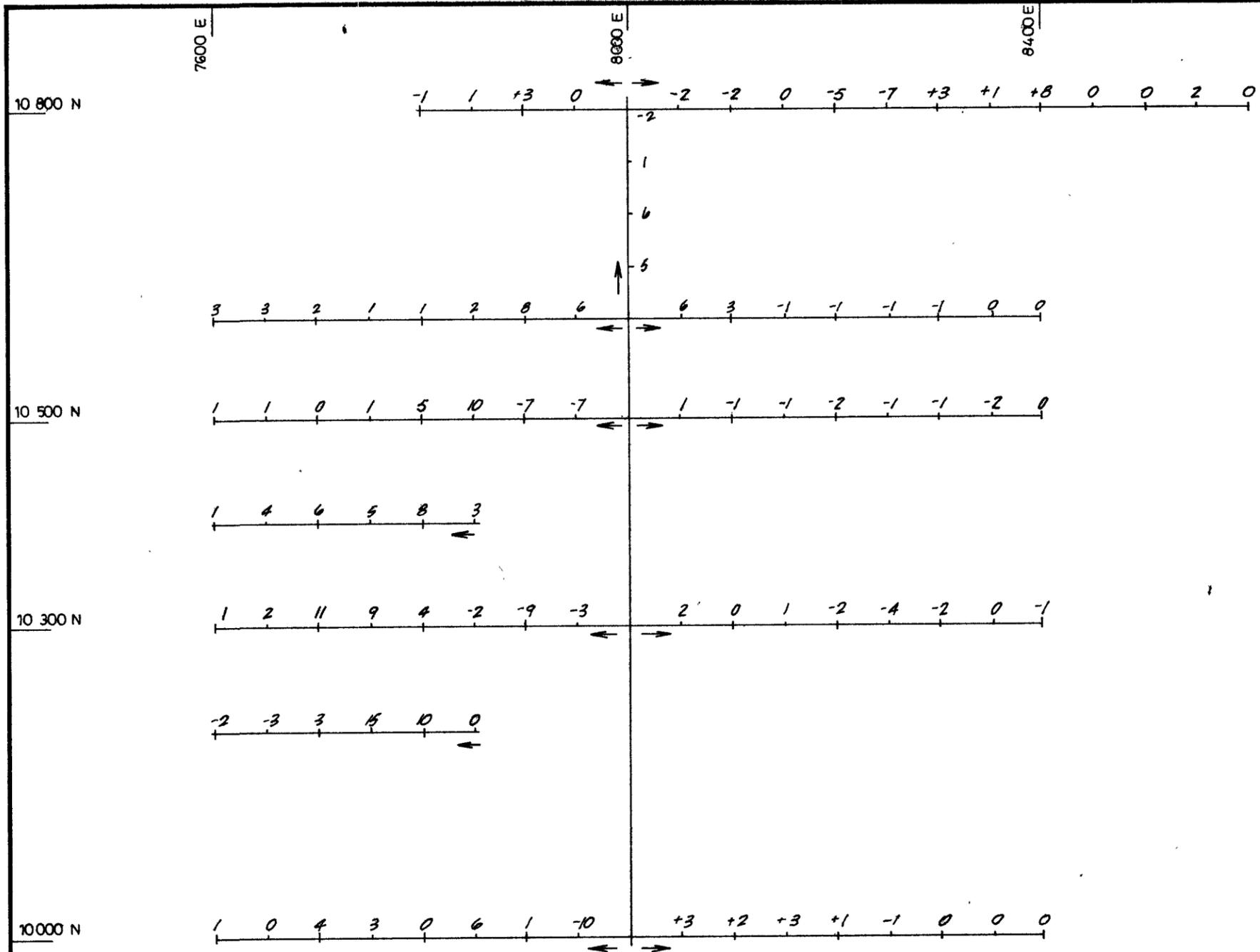
The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GULDFORD HELLYER RIVER WEST 3841/1 MAGNETIC PROFILES	
1683	
Scale: 1:2000 Horizontal + Vertical	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/018-A
DATE 29-10-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

84-2105 v.2/2

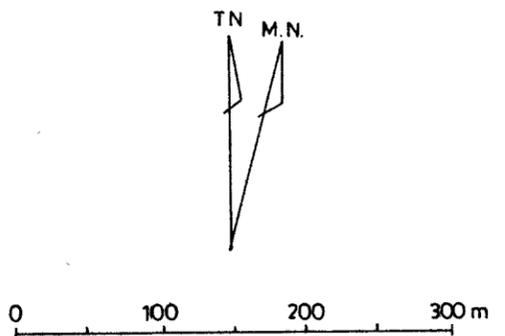
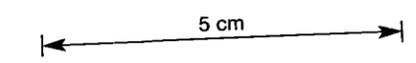


The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD HELLYER RIVER WEST 3841/1 MAGNETIC PROFILES	
1684	
Scale 1:2000 Horizontal-Vertical	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/018-B
DATE 30-10-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

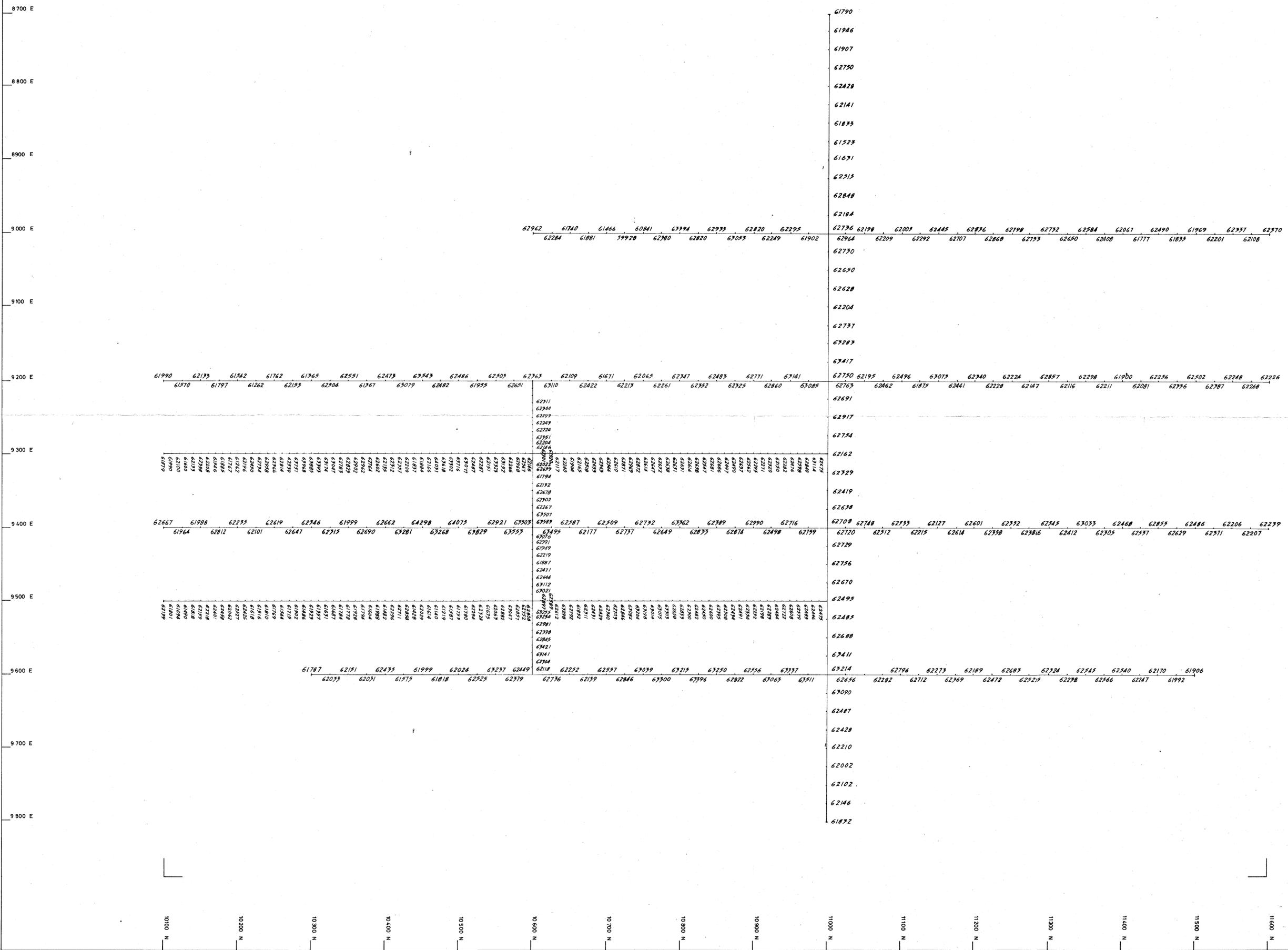
34-2105 v.2/2



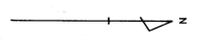
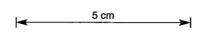
449210



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD HELLYER RIVER WEST ANOMALY 3841/1 SLOPE CORRECTIONS 1685	
SCALE 1: 5000	DATE 1 - 2 - 84
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REP.No.
DRG.No.	FIG.No. D/MQ02/060



449211



0 100 200M

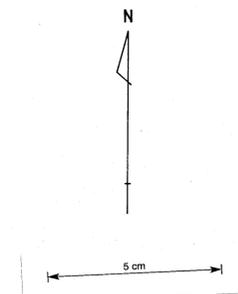
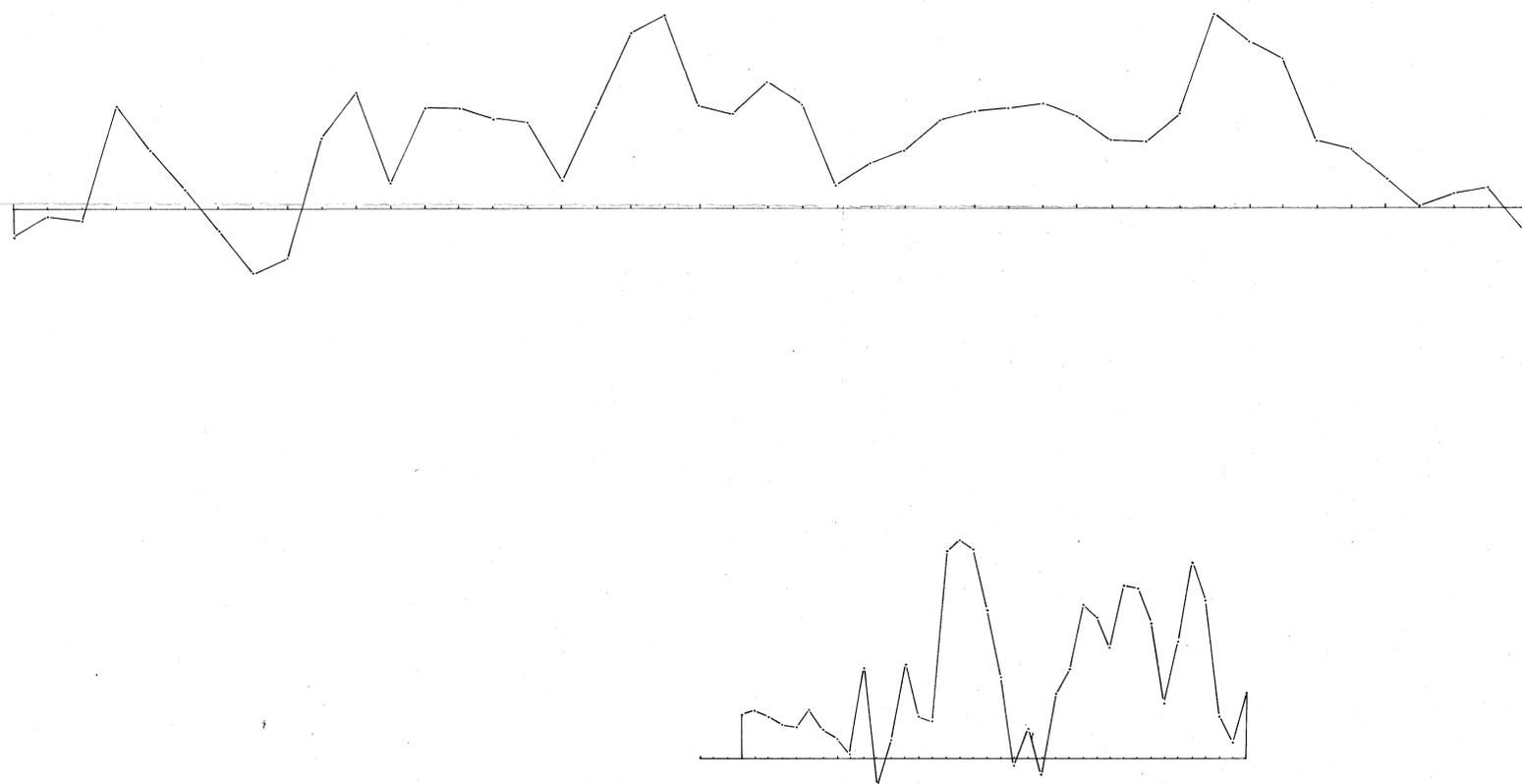
The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD HELLYER RIVER EAST 3841/2 GROUND MAGNETICS	
1686	
Scale 1:2500	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/022
DATE 21-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.N.	OFFICE DEVONPORT

34-2105 v.2/2

LINE 11000 N

LINE 10600 N

64000 nT
 63000 nT
 62000 nT
 61000 nT
 64000 nT
 63000 nT
 62000 nT
 61000 nT

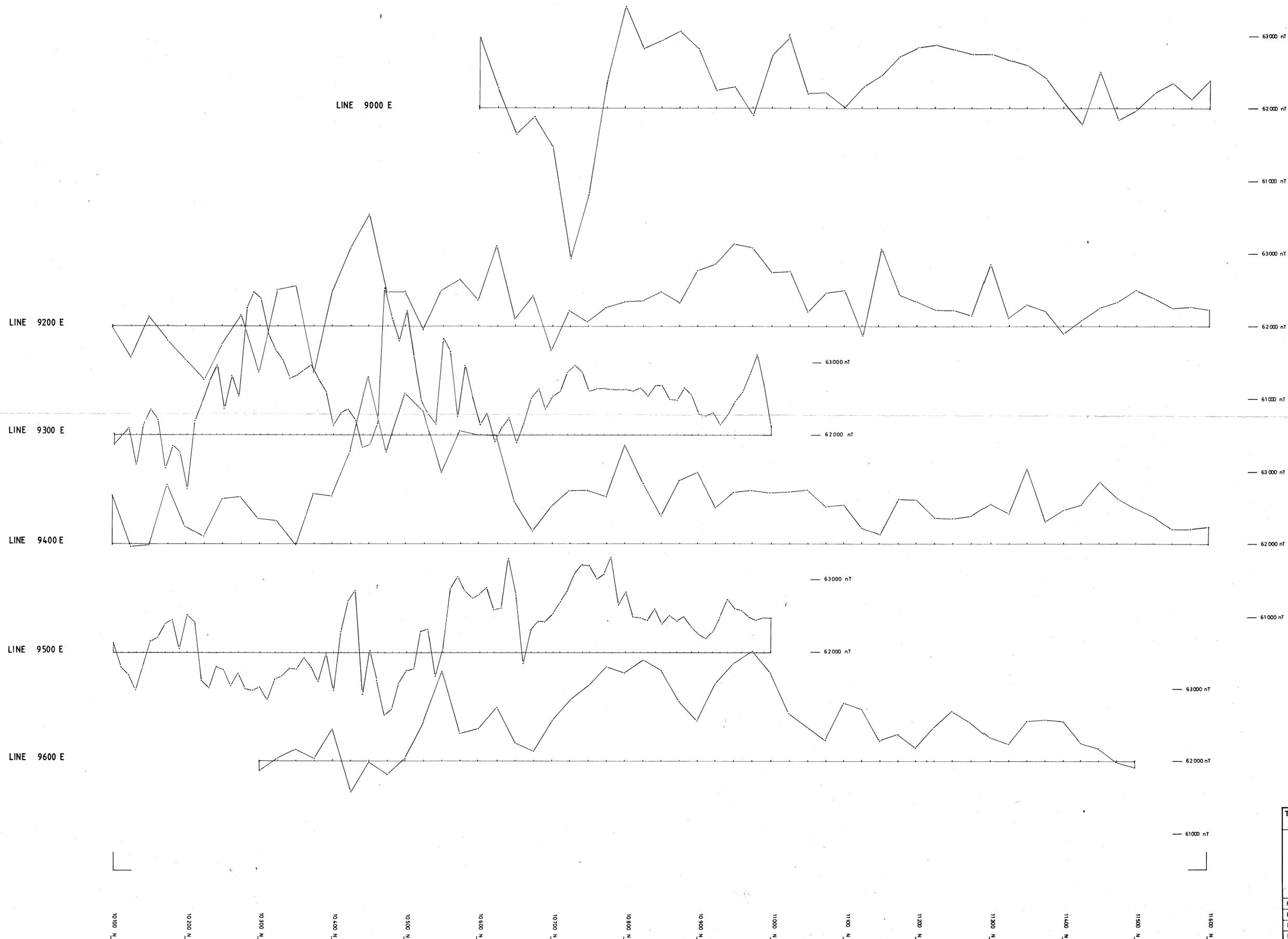


449212

The Shell Company of Australia Limited METALS DIVISION	
E.L.1/76 GUILDFORD HELLYER RIVER EAST 3841/2 MAGNETIC PROFILE LINE 11000 N, 10600 N 1687	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/021
DATE 21-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

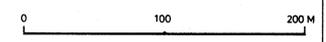
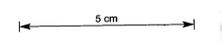
8700 E 8800 E 8900 E 9000 E 9100 E 9200 E 9300 E 9400 E 9500 E 9600 E 9700 E 9800 E

34-2185 v.212



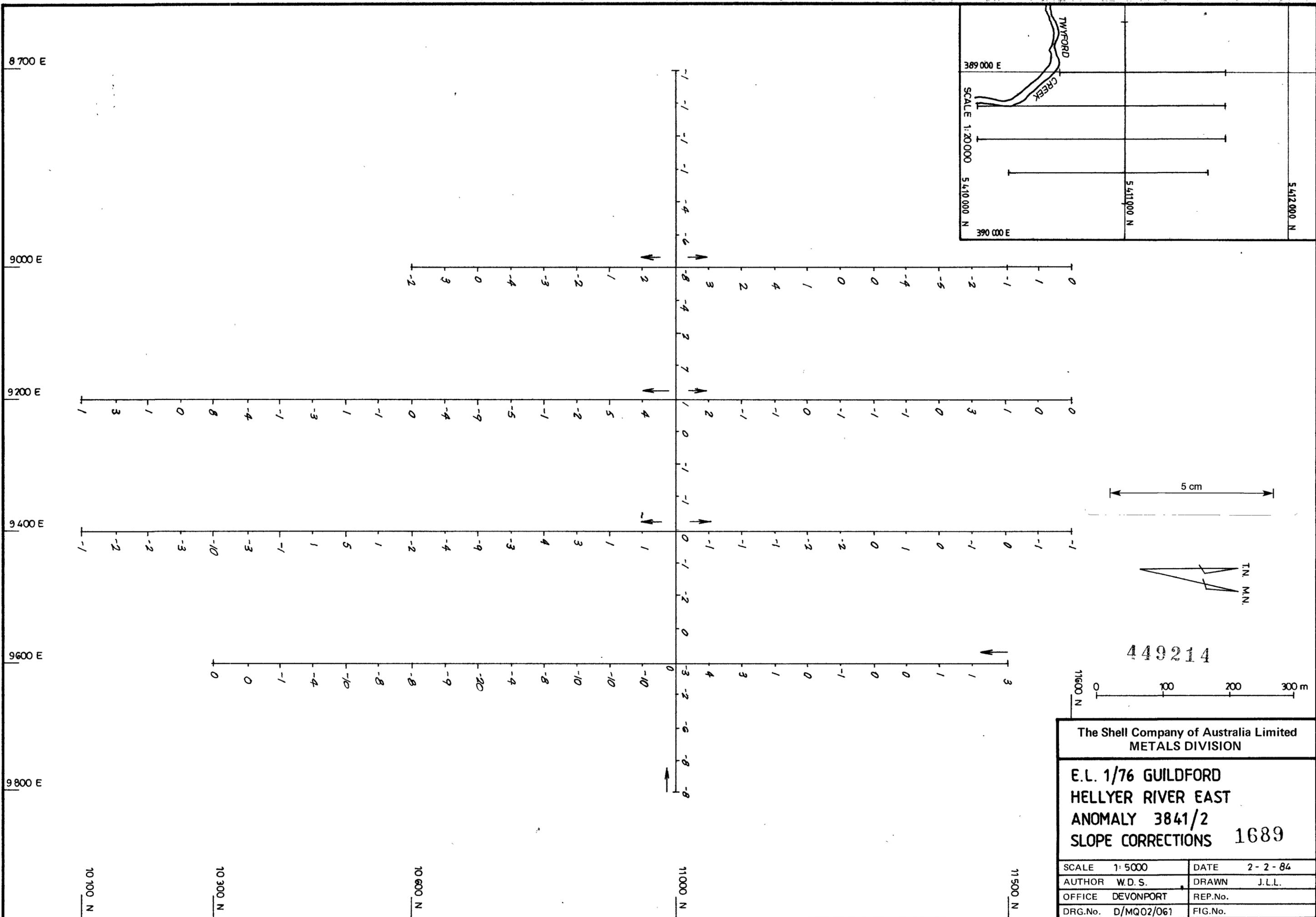
63000 nT
 62000 nT
 61000 nT
 63000 nT
 62000 nT
 61000 nT

449213



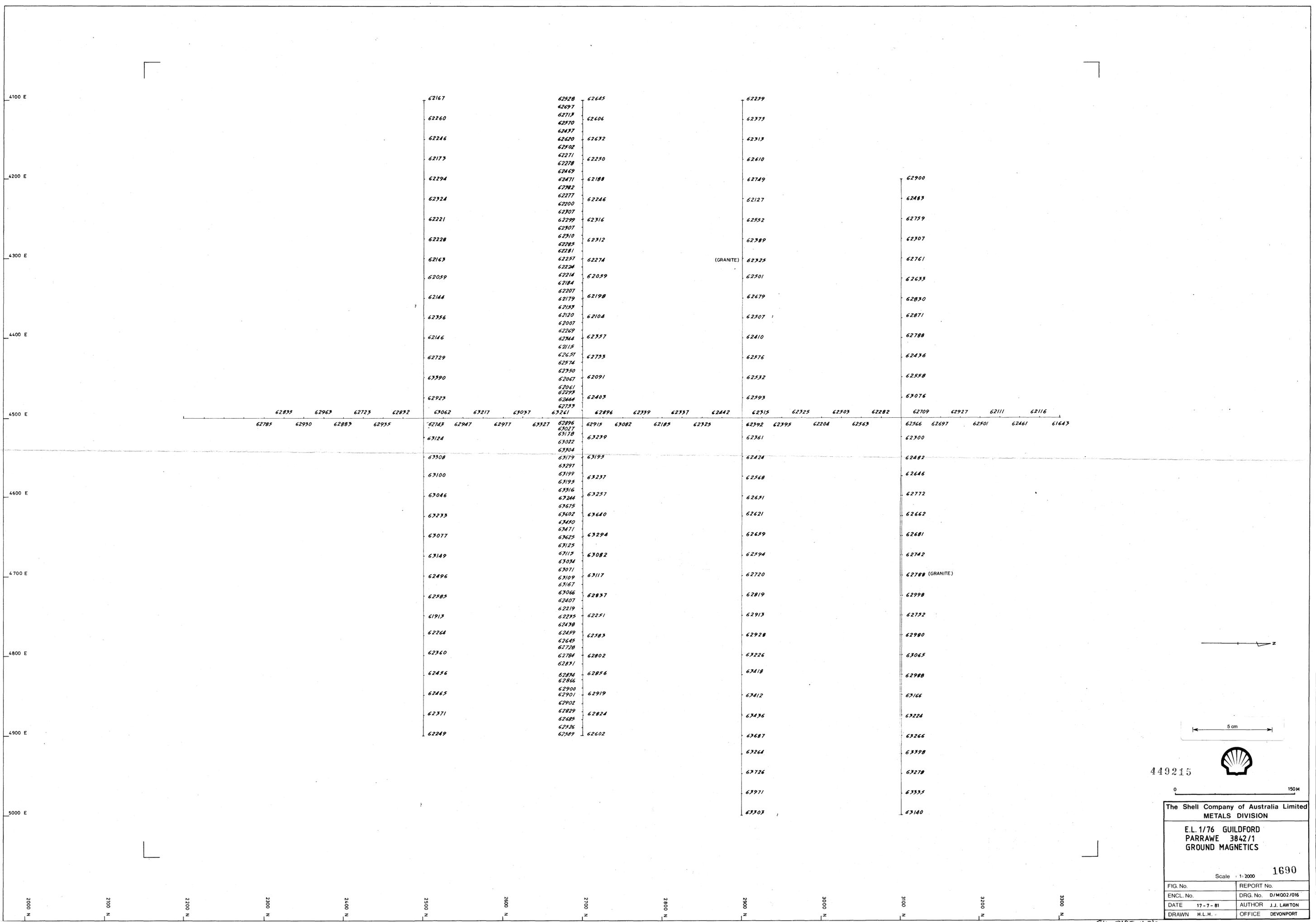
The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD HELLYER RIVER EAST 3841/2 MAGNETIC PROFILES 1688	
Scale: 1cm = 250nT VERTICAL 1:2500 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/023
DATE 22-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

84-205 2/2



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD HELLYER RIVER EAST ANOMALY 3841/2 SLOPE CORRECTIONS 1689	
SCALE 1:5000	DATE 2-2-84
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REP.No.
DRG.No. D/MQ02/061	FIG.No.

84-2105 v.2/2

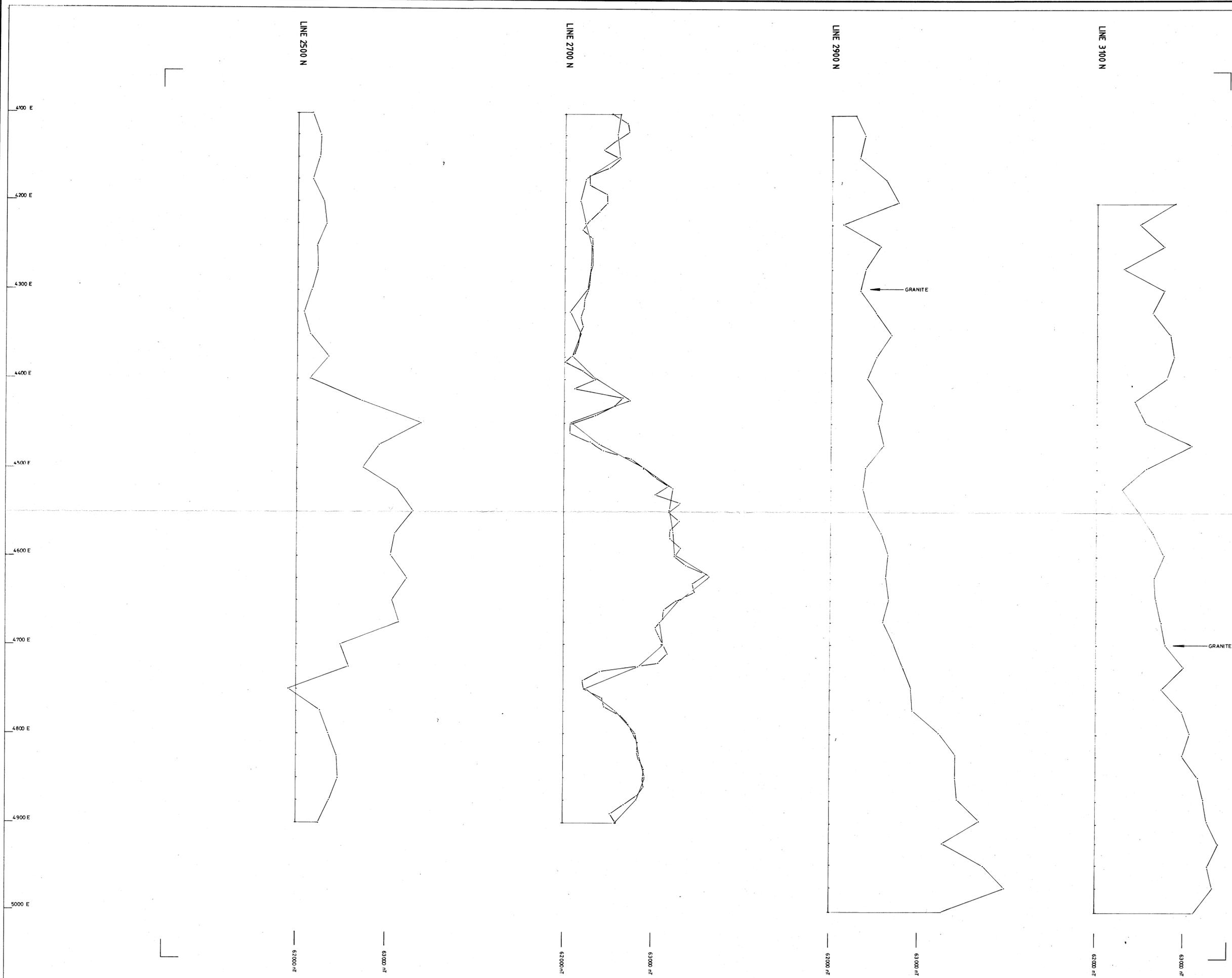


449215



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD PARRAWE 3842/1 GROUND MAGNETICS	
Scale 1:2000 1690	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/016
DATE 17-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

34-2105 v.22



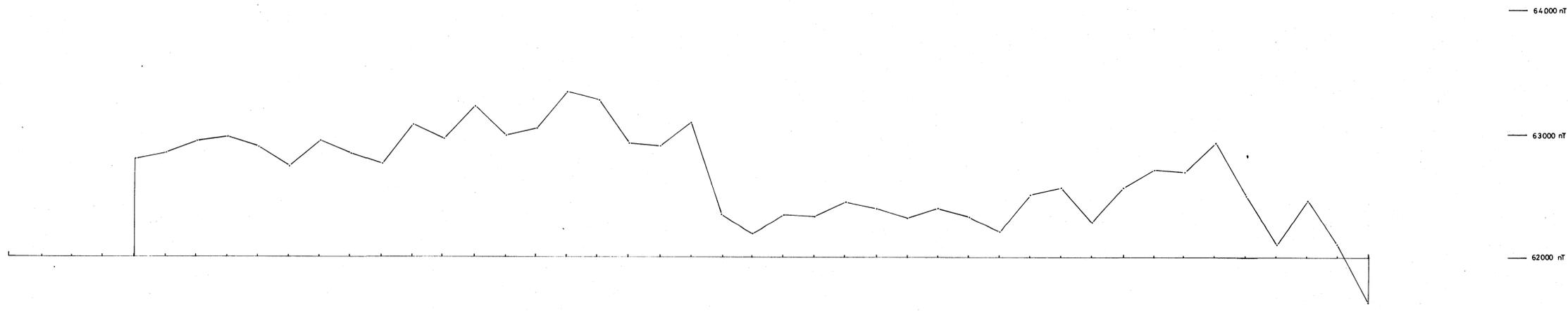
449216
5 cm



0 50 100 150 M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD PARRAWA 3842/1 MAGNETIC PROFILES 1691	
1cm = 200nT VERTICAL Scale 1:2000 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/024
DATE 29-7-81	AUTHOR J.J.LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

LINE 4500 E



64 000 nT
63 000 nT
62 000 nT
61 000 nT
60 000 nT

2000 N 2100 N 2200 N 2300 N 2400 N 2500 N 2600 N 2700 N 2800 N 2900 N 3000 N 3100 N 3200 N 3300 N

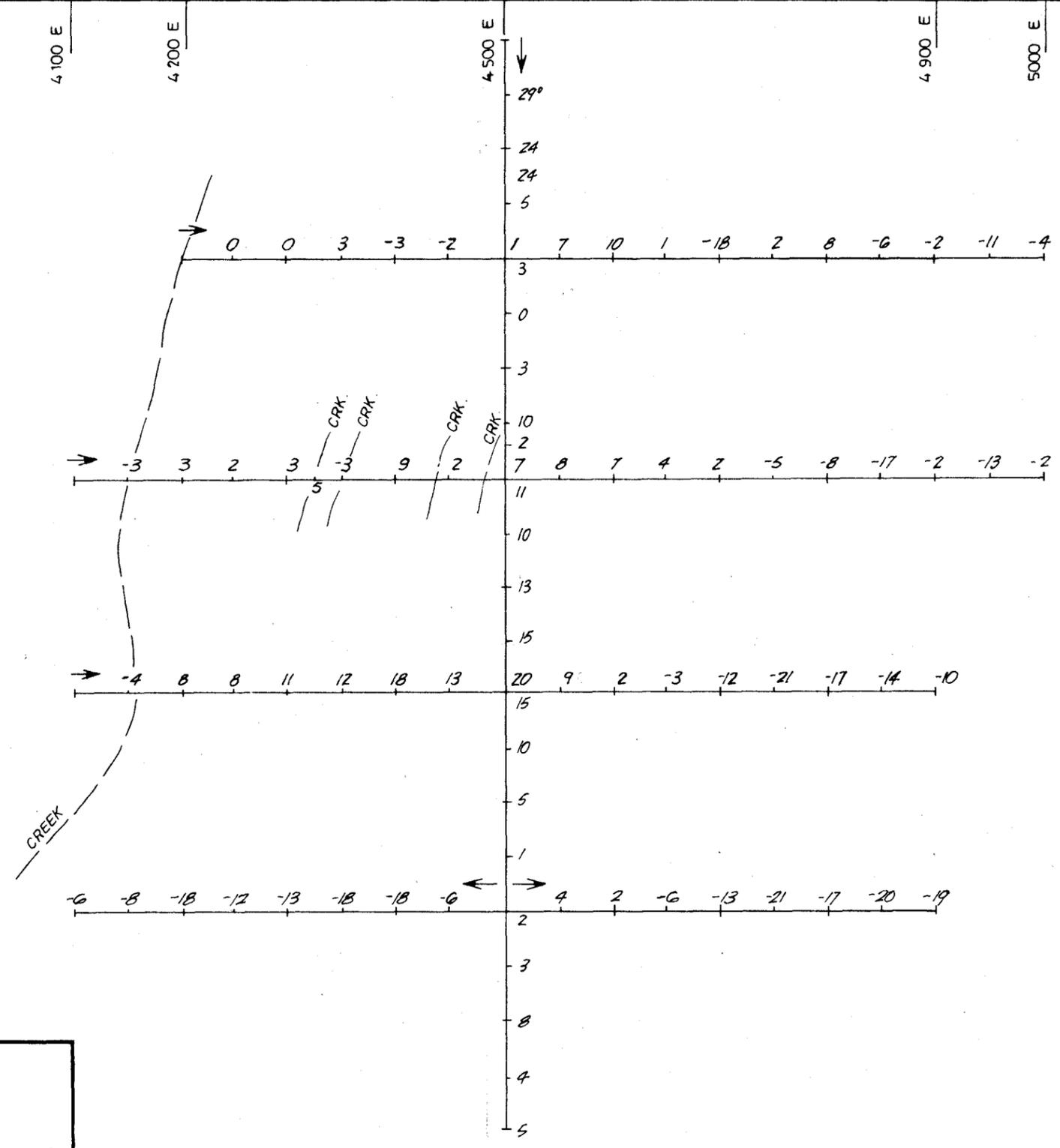
449217
5 cm



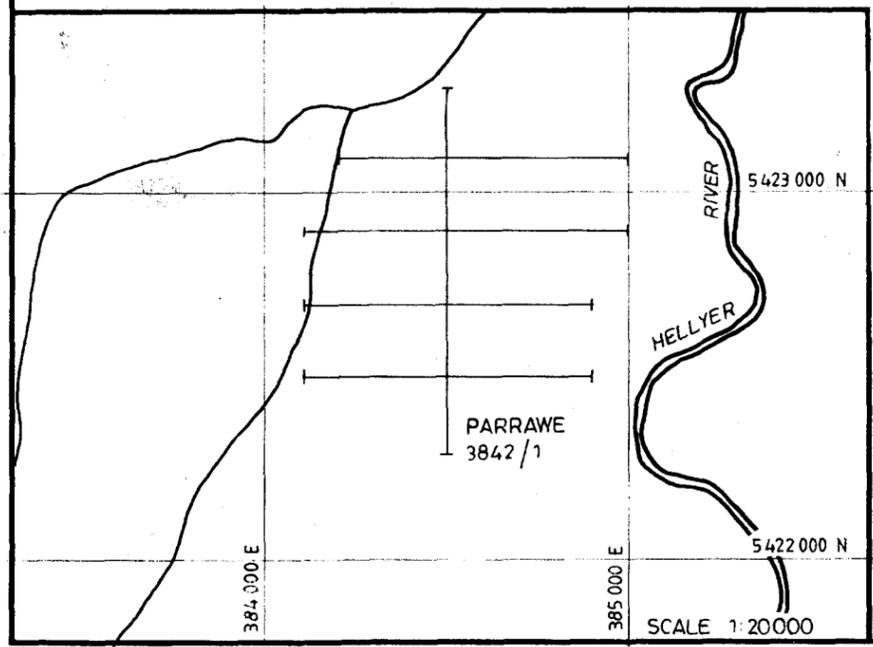
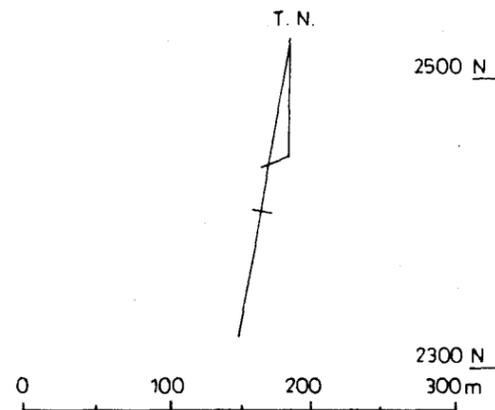
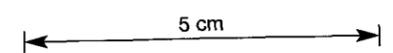
0 50 100 150 M

The Shell Company of Australia Limited METALS DIVISION	
E.L.1/76 GULDFORD PARRAWE 3842/1 MAGNETIC PROFILE LINE 4500 E	
Scale 1:2000 1692	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/020
DATE 21-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

34-2105 v.212



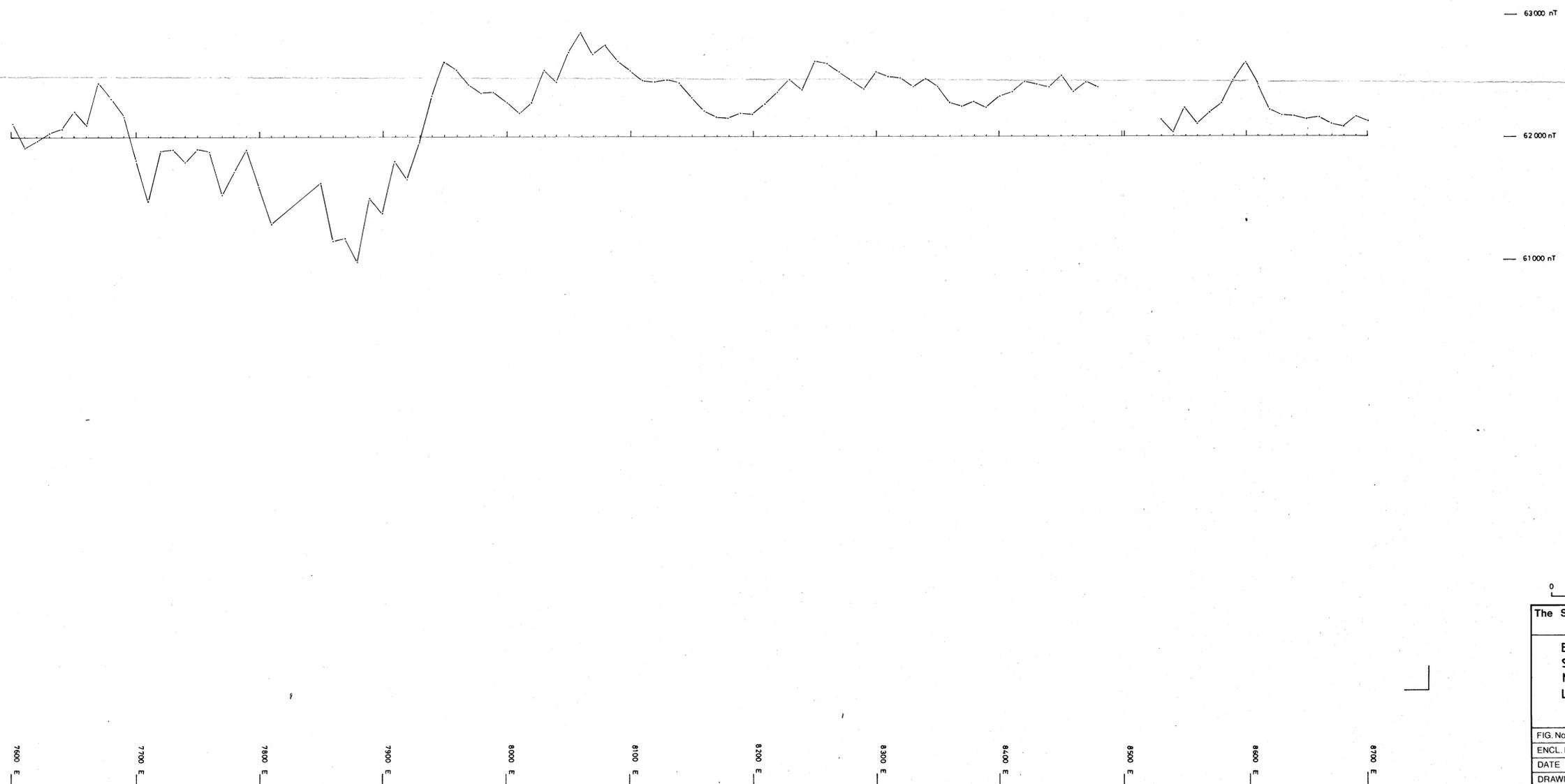
449218



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD ANOMALY 3842/1 PARRAWE SLOPE CORRECTIONS 1693	
SCALE 1:5000	DATE 26-1-83
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REP.No.
DRG.No. D/MQ 02/58	FIG.No.

84-2105 v.2/2

LINE 600 N



449220

5 cm



0 50 100 150 M

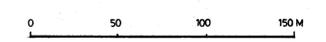
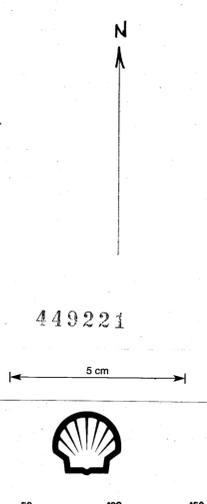
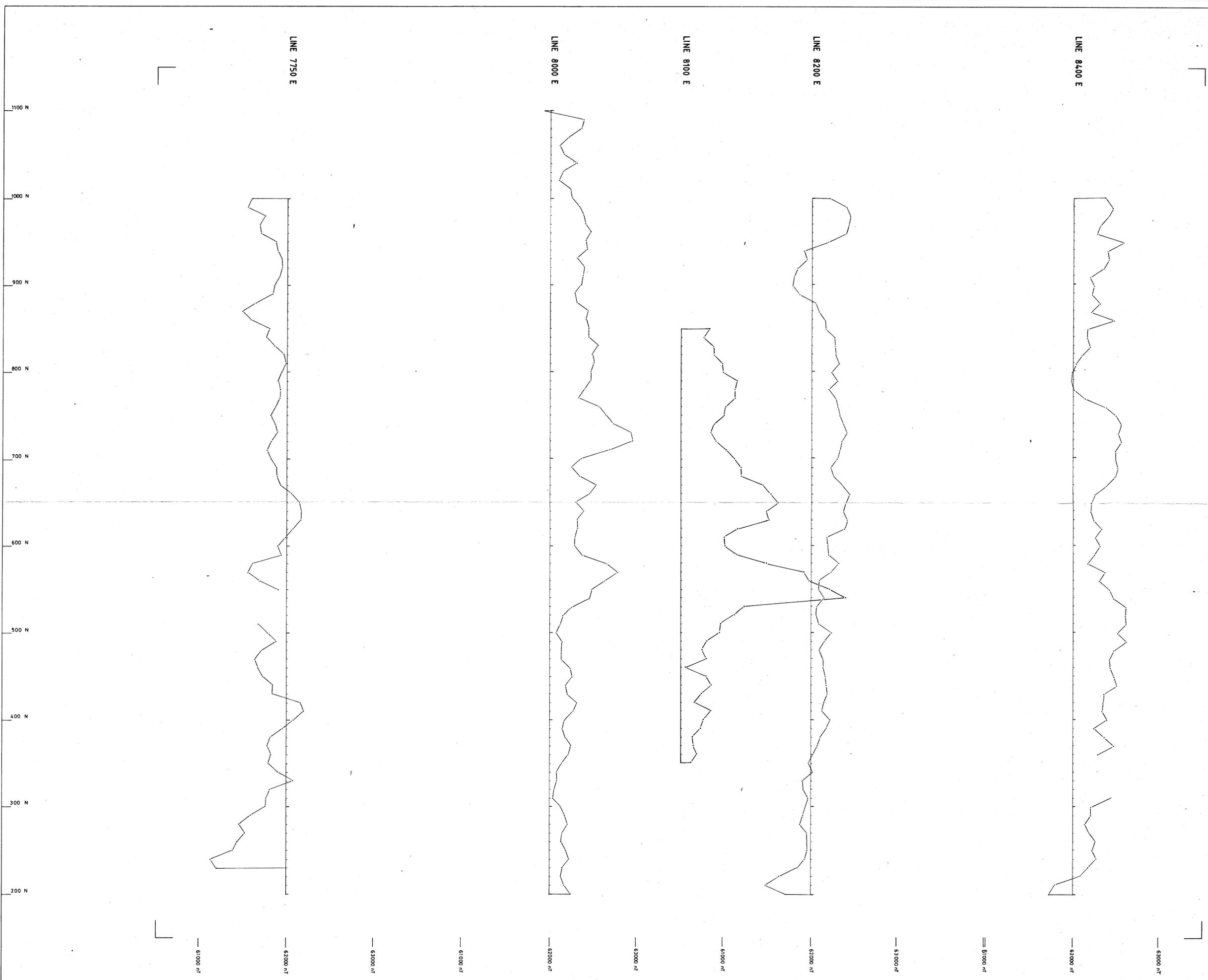
The Shell Company of Australia Limited
METALS DIVISION

E.L. 1/76 GUILDFORD
SHOOTERS HILL 3842/2
MAGNETIC PROFILE
LINE 600 N 1695

Scale: 1cm = 200 nT VERTICAL
1: 2000 HORIZONTAL

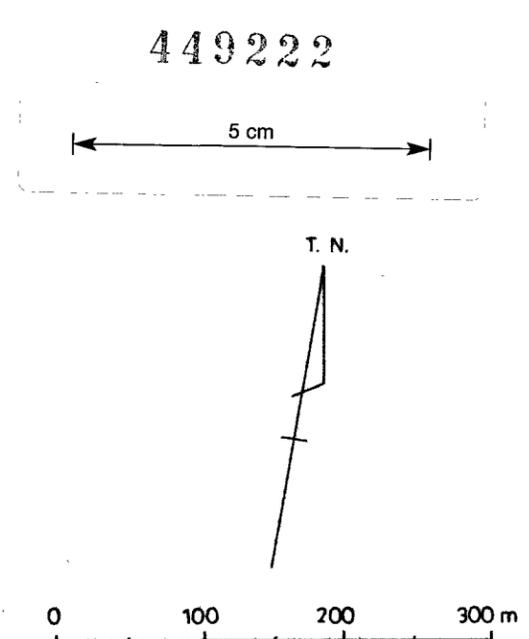
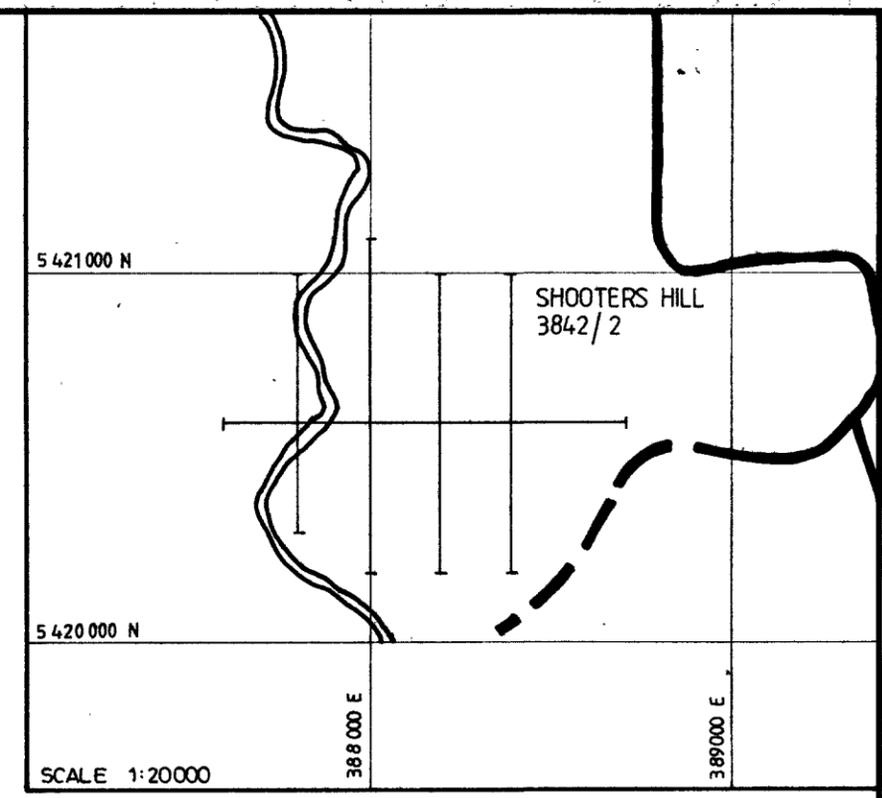
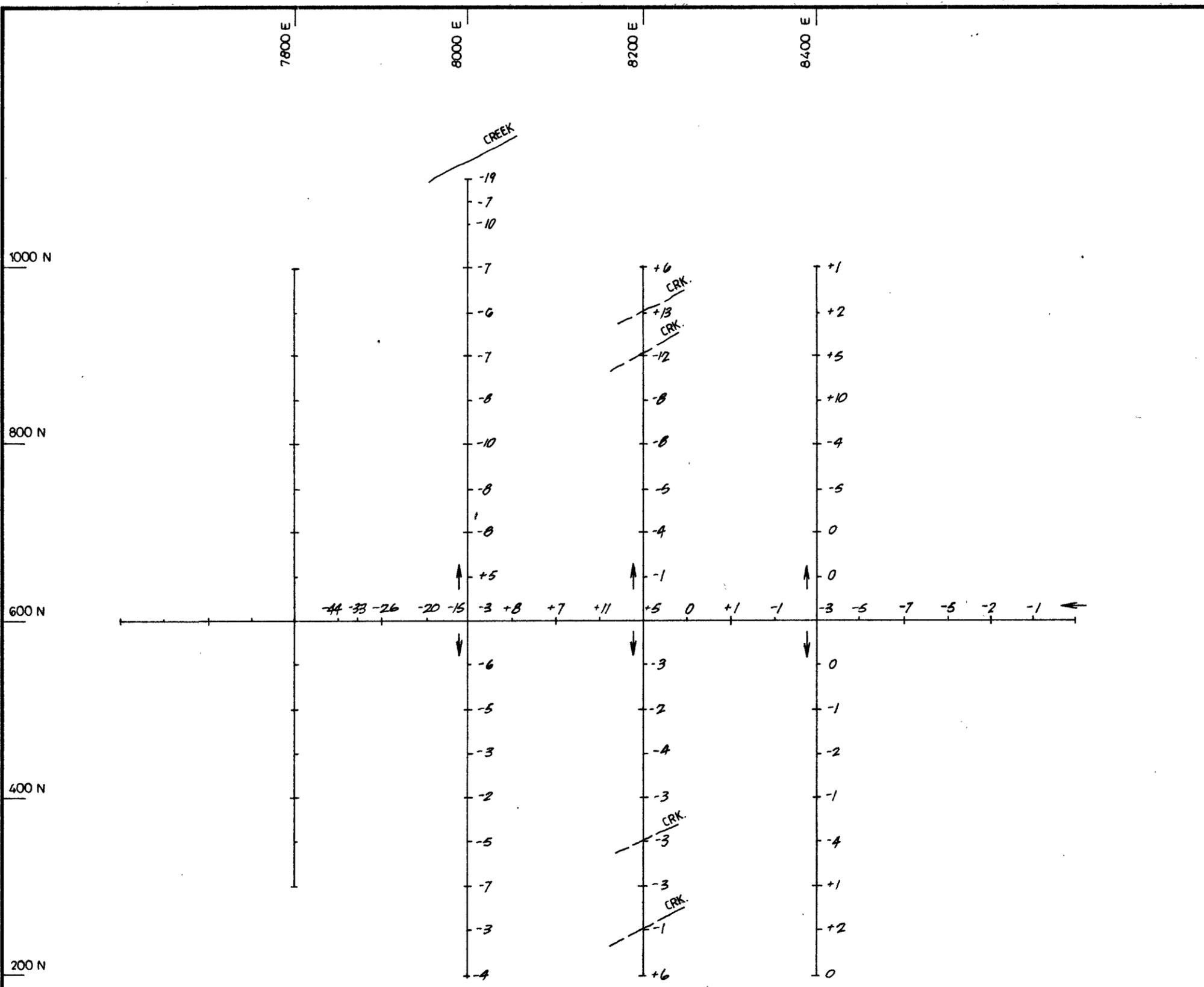
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ02/025
DATE 30-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

SH-2105 v.02



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD SHOOTERS HILL 3842/2 MAGNETIC PROFILES 1696	
Scale: 1cm = 200nT VERTICAL 1:2000 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M002/026
DATE 31-7-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT.

34-2105 v.2/2



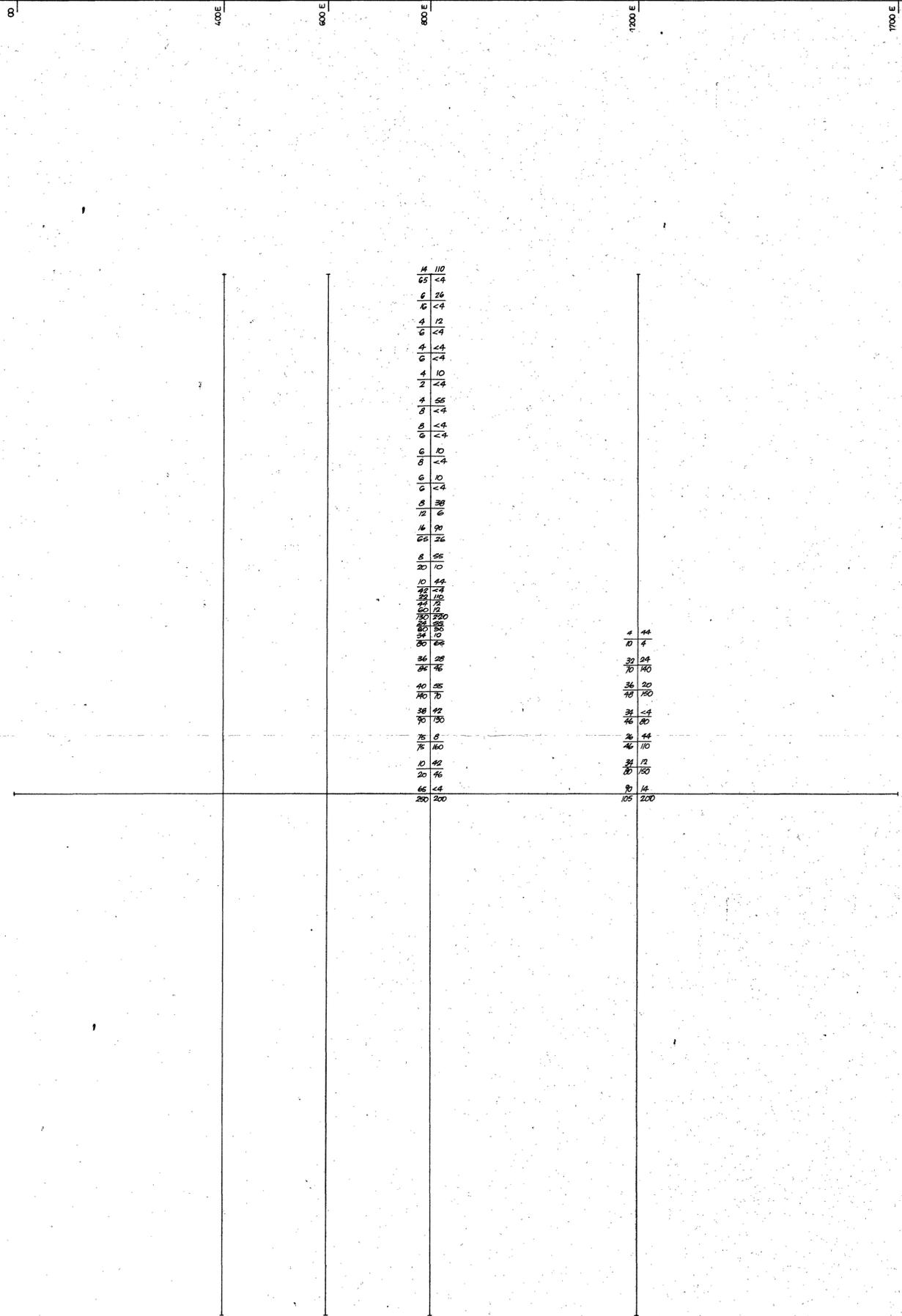
The Shell Company of Australia Limited METALS DIVISION			
E.L. 1/76 GUILDFORD ANOMALY 3842/2 1697 SHOOTERS HILL SLOPE CORRECTIONS			
SCALE	1:5000	DATE	31-1-83
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
DRG.No.	D/MQ 02/059	FIG.No.	

84-2105 V.2/2.

1000 N

00

1000 S

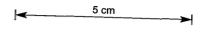


T.N



Cu | Pb
Zn | Ni

Analyses in ppm.



5 cm

449223

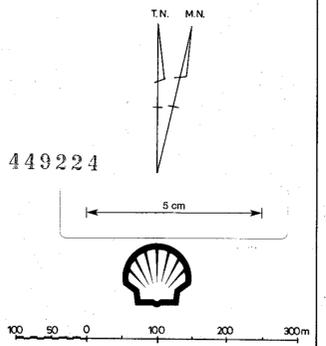
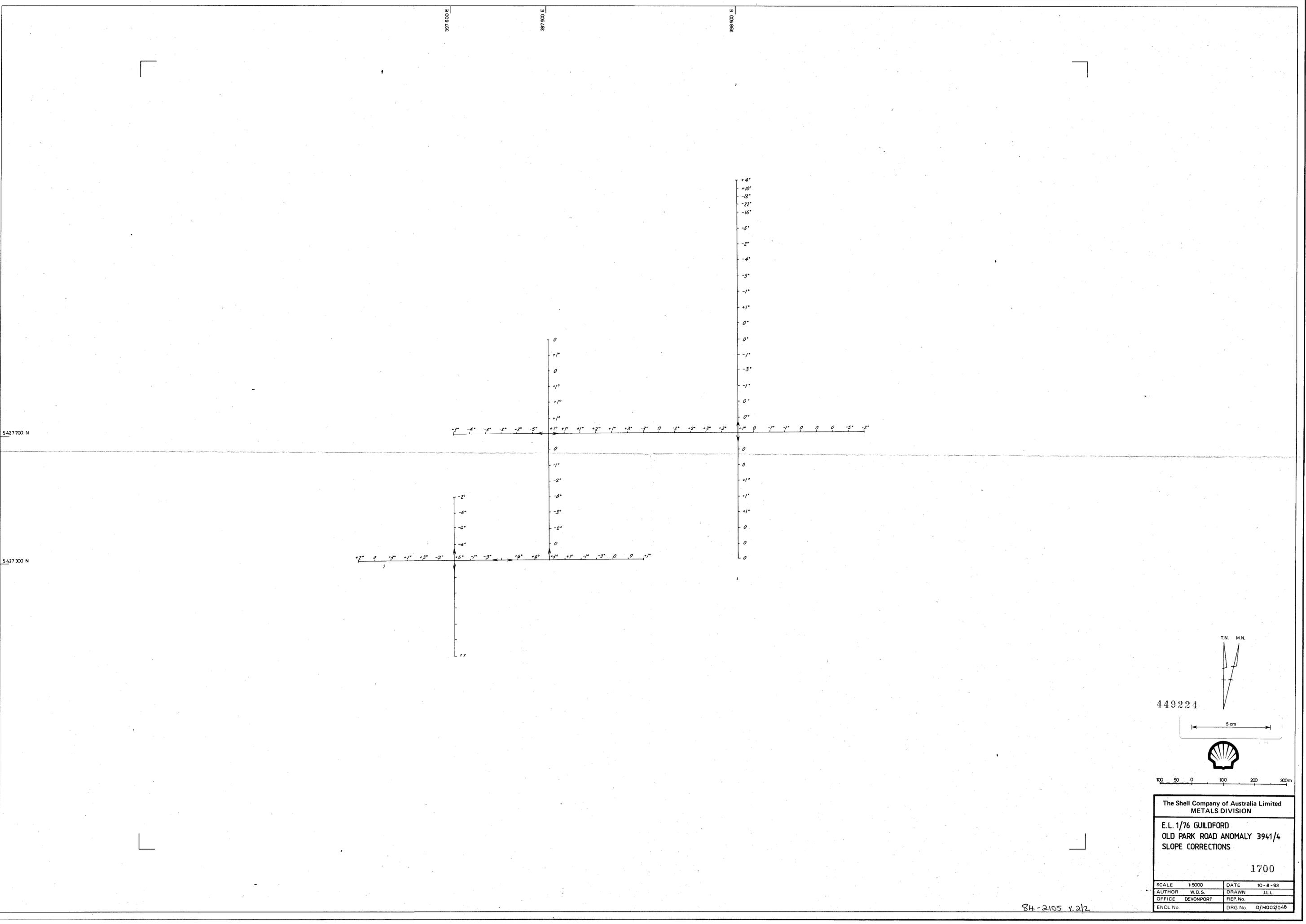


The Shell Company of Australia Limited
METALS DIVISION

E.L. 1/76 GUILDFORD
PEAK PLAIN ANOMALY 3941/3
SOIL GEOCHEMISTRY
Cu, Pb, Zn, Ni. 1698

SCALE	1:5000	DATE	10-8-83
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP.No.	
ENCL No		DRG No	D/M002/047

84-2105 valz



449224

The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD OLD PARK ROAD ANOMALY 3941/4 SLOPE CORRECTIONS	
1700	
SCALE 1:5000	DATE 10-8-83
AUTHOR W.D.S.	DRAWN J.L.L.
OFFICE DEVONPORT	REP. No.
ENCL No.	DRG No. D/MQ02/048

84-2105 v.2/2

3200 W 3000 W 2500 W 2000 W 1500 W 1000 W 500 W 00 500 E 1000 E

449226



5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE
BASIL ROAD
1700 E - 3200 W

1701

SCALE	1:30000	DATE	24-1-84
AUTHOR	W.D.S.	DRAWN	J.L.L.
OFFICE	DEVONPORT	REP. NO.	
ENCL. NO.		DRG. NO.	D/M003/089

SIRO ± 102 m

SIRO ± 112 m

Topography & Geology



Soil Sampling Results

Analyses in p.p.m.

NICKEL

LEAD

64 000 nT

63 000 nT

Total Magnetic Intensity

61 000 nT

60 000 nT

APPARENT CHARGEABILITY (M6)

- 1 -
- 2 -
- 3 -
- 4 -
- 5 -
- 6 -
- 7 -
- 8 -

APPARENT CHARGEABILITY (M7)

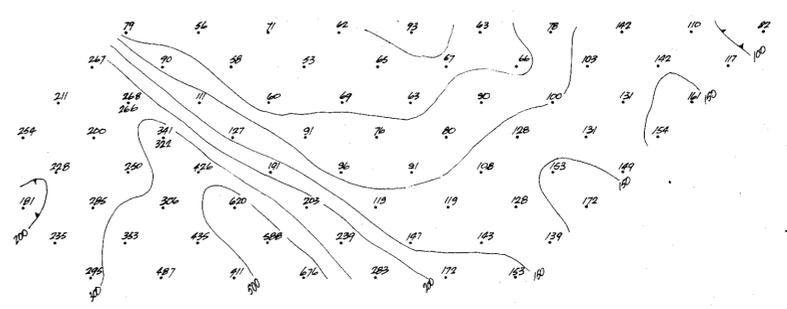
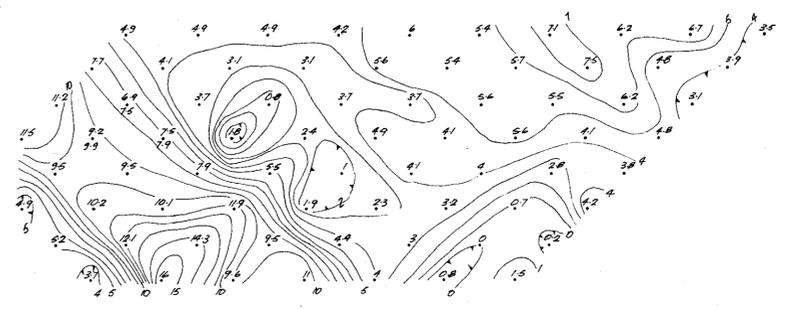
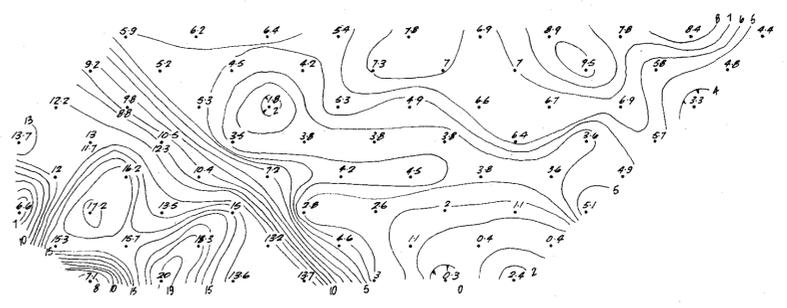
- 1 -
- 2 -
- 3 -
- 4 -
- 5 -
- 6 -
- 7 -
- 8 -

I.P./ Resistivity Survey

Timing: 2 Sec
Array: Dipole - Dipole
Dipole Length: 200 m

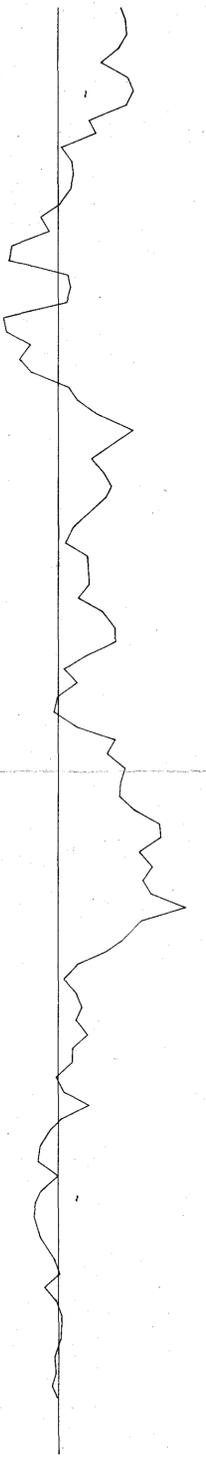
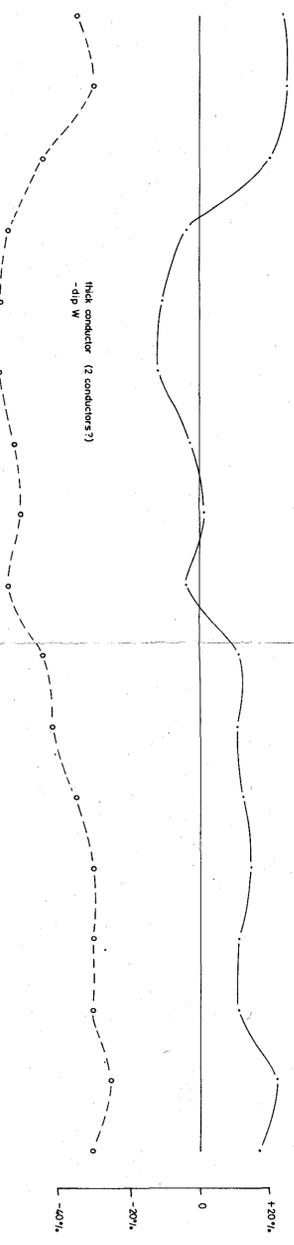
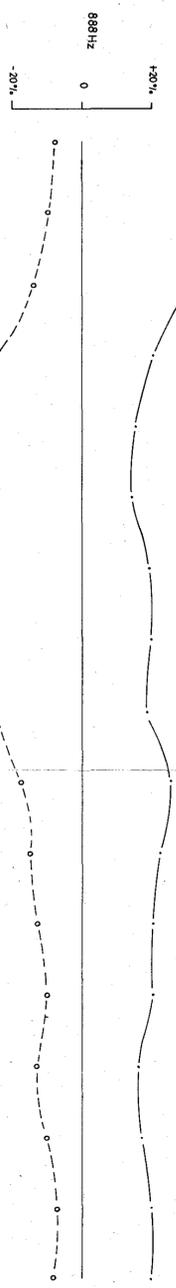
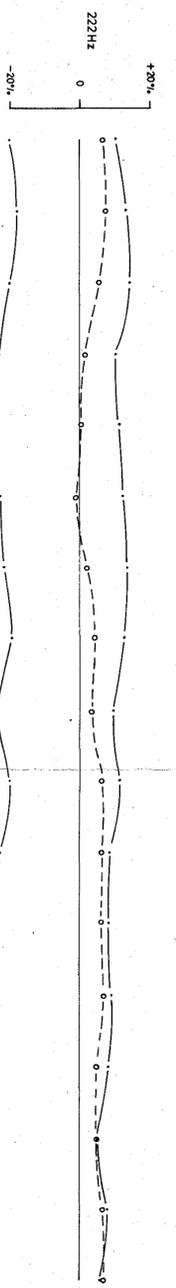
APPARENT RESISTIVITY

- 1 -
- 2 -
- 3 -
- 4 -
- 5 -
- 6 -
- 7 -
- 8 -



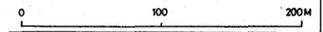
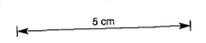
MAX-MIN
 COIL SEPARATION=200M
 IN PHASE ————
 OUT PHASE - - - - -

400 W
 200 W
 00 E
 200 E
 400 E



thick conductor (2 conductors)
 -dip W

449227



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD IL10-WEY RD. -LINE 100N - MAX-MIN - GROUND MAGNETICS	
1702	
SCALE 1:2500	DATE 4-10-82
AUTHOR G.OAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP.No.
ENCL No.	DRG No. D/M002/036

GROUND MAGNETICS
 READING SCALE = 200 nT/cm

SH-2105 v.2/2

400 W 200 W 00 E 200 E 400 E

440228
5 cm
200M

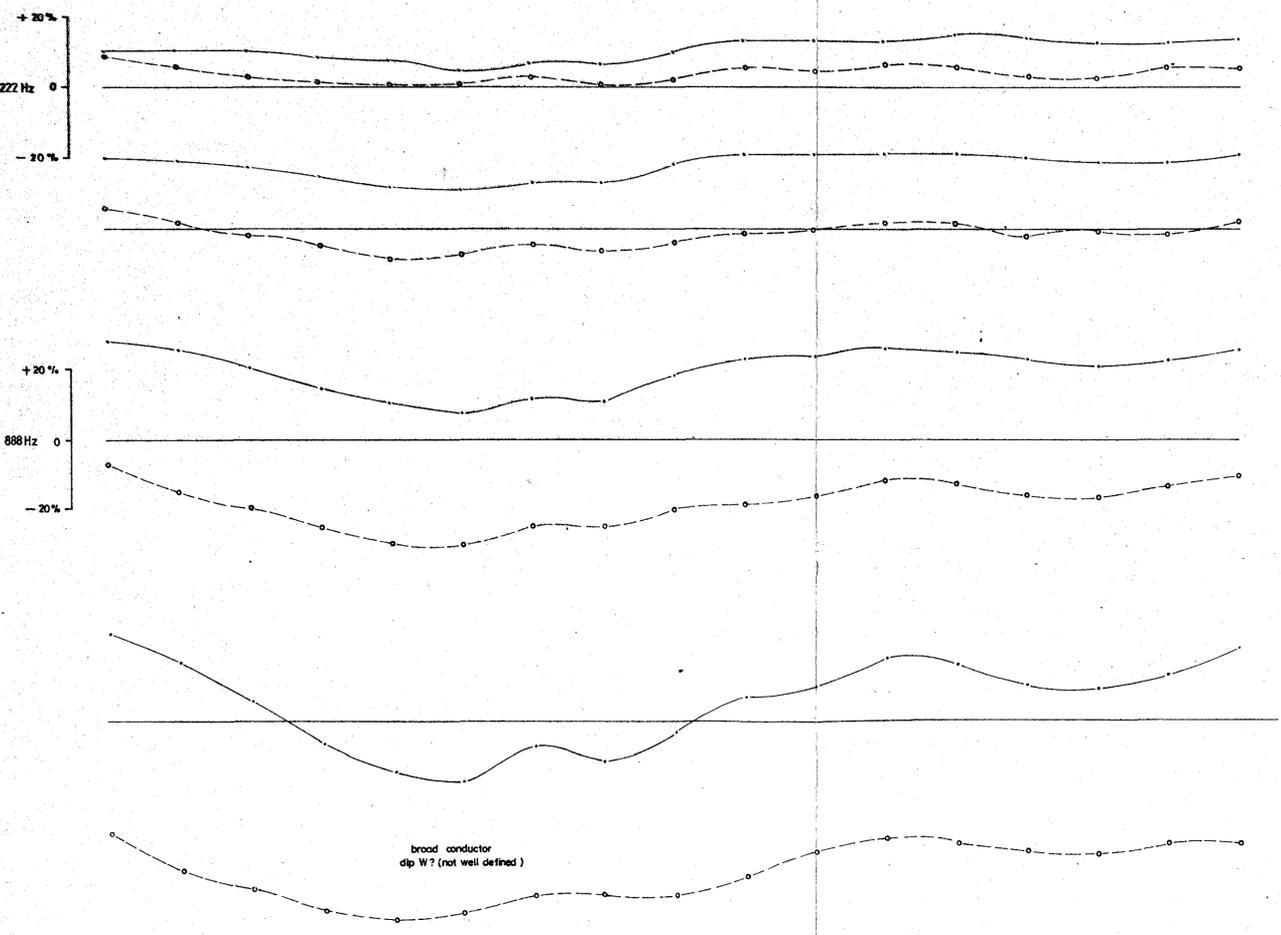


The Shell Company of Australia Limited
METALS DIVISION
E.L. 1776 GUILDFORD
11.10-WEY RD.-LINE 0 N
MAX-MIN
GROUND MAGNETICS
IP/RESISTIVITY 1703

SCALE	1:2500	DATE	4-10-82
AUTHOR	G. OAKES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/M002/037

MAX-MIN

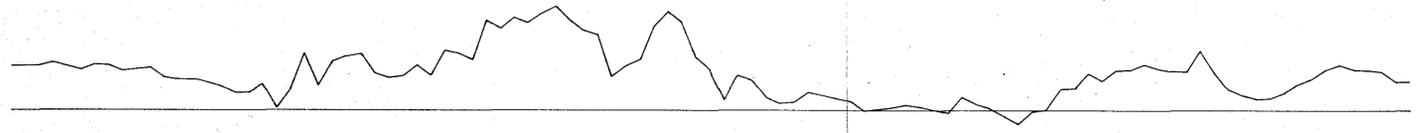
COIL SEPARATION = 200M
IN PHASE
OUT PHASE



+20%
0
-20%
222 Hz

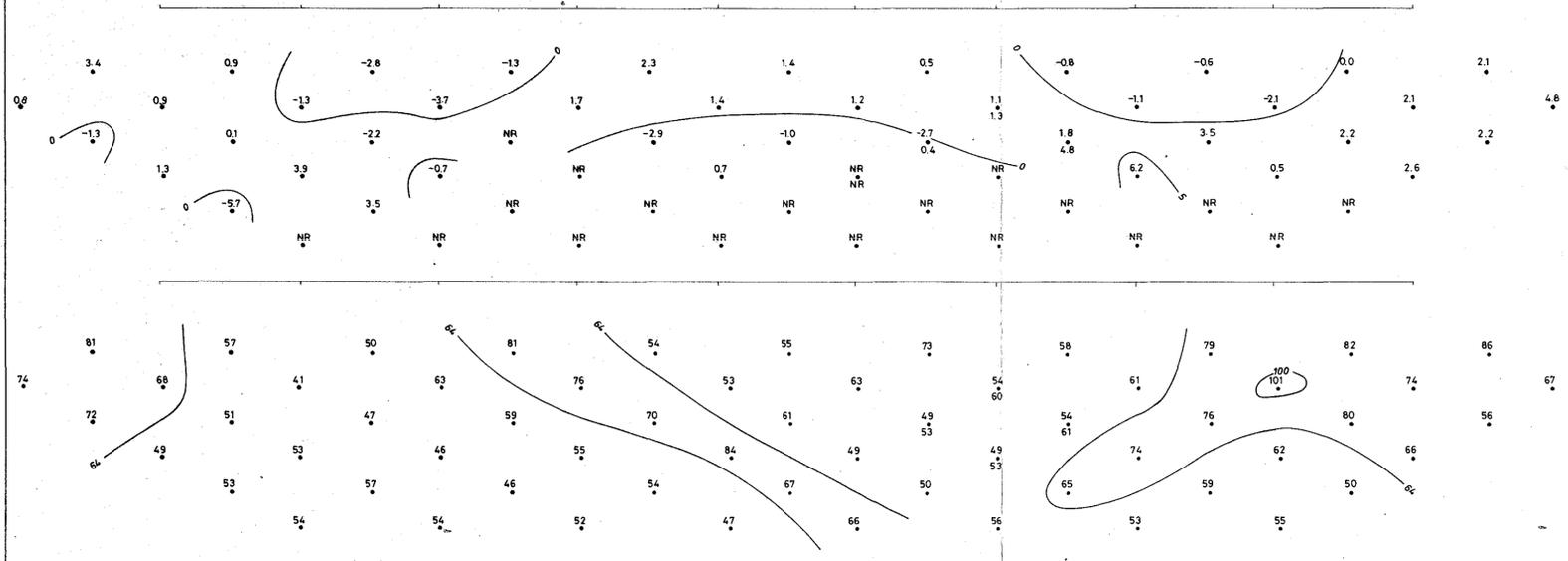
+20%
0
-20%
-40%
444 Hz
888 Hz
1777 Hz

GROUND MAGNETICS
READING SCALE = 200nT/cm



63000nT
62000nT

IP/RESISTIVITY

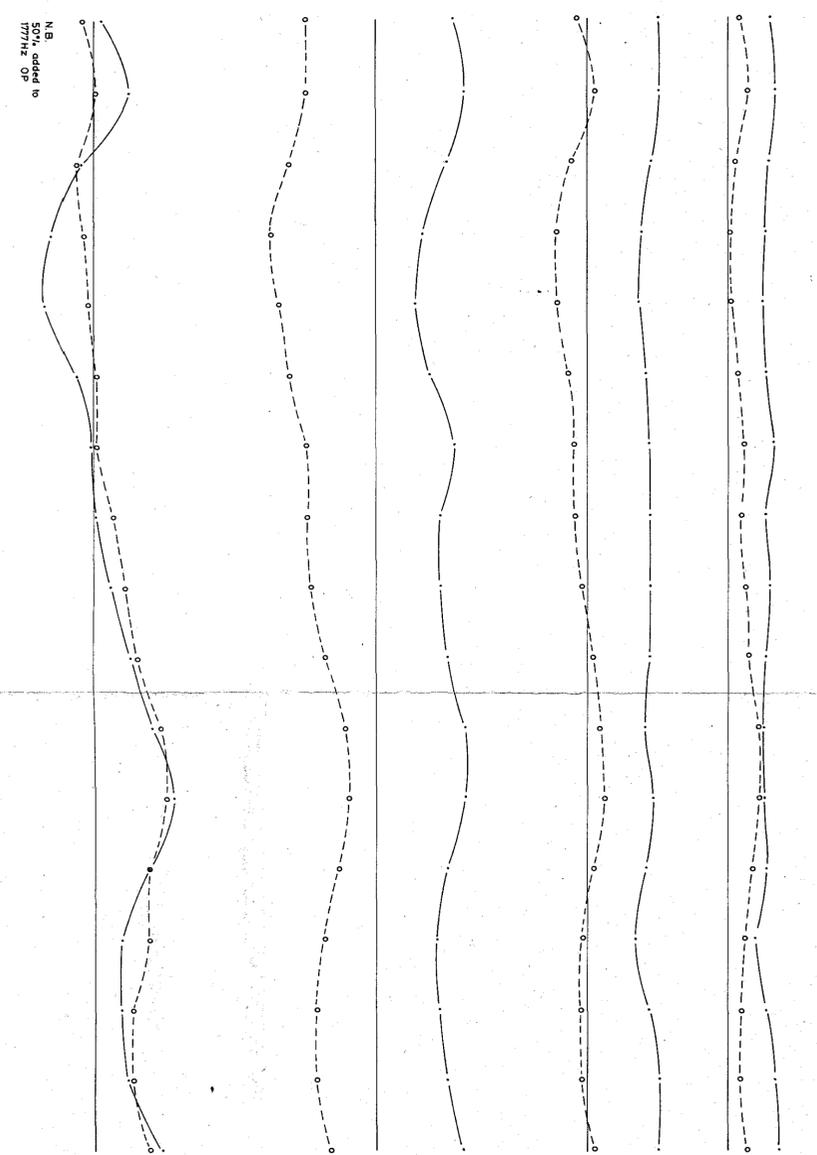
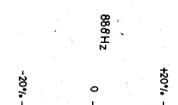


APPARENT CHARGEABILITY

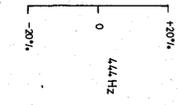
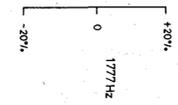
APPARENT RESISTIVITY

Contractor : SCINTREX
Date : 6-10-82
Timing : 2 SEC
Transmitter : IPC 7 25kw 25EC
Receiver : IPR 8
Array : DIPOLE-DIPOLE
Dipole length : 100 M

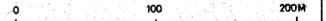
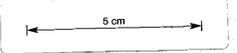
MAX - MIN
 COIL SEPARATION = 300M
 IN PHASE
 OUT PHASE



conductor
 - dip E
 - fairly broad



449229



The Shell Company of Australia Limited METALS DIVISION	
E.L. 1/76 GUILDFORD IL10-WEY RD. - LINE 100 S - MAX-MIN - GROUND MAGNETICS	
1704	
SCALE 1:2500	DATE 5-10-82
AUTHOR G. OAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP No.
ENCL No.	DRG No. D/M002/038

GROUND MAGNETICS
 READING SCALE = 200nT/cm

