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BILLITON AUSTRALIA

THE METALS DIVISION OF
THE SHELL COMPANY OF AUSTRALIA LTD.

E.L. 46/88 - WARATAH

Progress Report on Exploration to 23rd December 1989

MICROFILMED

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SUMMARY

Exploration Licence 46/88 was acquired by Billiton Australia through the ETA system in which a programme was proposed to explore for both stratabound replacement and exo-granitic skarn tin mineralization. Two prospect areas, Stonedam Creek and Butlers Road, were identified as the main areas of interest.

Exploration during 1989 has focused on the Stonedam Creek prospect where a combination of gridding, mapping, ground magnetic and UTEM surveying has delineated a magnetic - EM anomaly of geophysical character consistent with a massive sulphide source.

A diamond drill hole is currently testing the source of this anomaly.

1.0 INTRODUCTION

This report details results of exploration carried out within exploration licence 46/88 during the first year of tenure. All exploration has been completed by Billiton Australia utilizing the company's staff and other geotechnical contractors.

2.0 LOCATION & ACCESS

The licence surrounds the township of Waratah, 45 kms south west of Burnie, and the Mt. Bischoff Tin Mine immediately north of the town.

Access is gained via the Waratah and Corinna Roads and thence by old logging tracks. Deeply incised gullies preclude vehicular access away from the Tertiary basalt plateau and walking is made difficult by the extensive rainforest especially east of Mt. Bischoff.

Access to the Stonedam Creek area is gained by vehicle from the Waratah Road, thence by the HEC line 3kms east of Waratah and by numerous old logging tracks that transect the basalt plateau.

3.0 LAND TENURE

Exploration licence 46/88 of 70 km² was granted to Billiton Australia on 23rd December 1988 for a period of ten years renewable every twelve months. The licence was acquired after a tender was submitted and accepted by the Department of Mines under the ETA system.

A retention licence, R.L. 8807, surrounds the Mt. Bischoff tin mine and this ground is excluded from the exploration title (see Fig. 1).

The majority of the tenement is covered by Uncommitted Crown Land but approximately 11km², including the Waratah township, is occupied as Private Freehold Land.

4.0 PREVIOUS WORK

Aeromagnetics

In 1981 Tasmanian Mines Department flew a (helicopter) survey with nominal line spacings of 500 metres and terrain clearance of 150 metres. Geox also flew the area for CRA in 1979. Figure 2 is a contour magnetic map over the E.L. and Figure 3 is a perspective plot of the magnetic field over the same area from the North East. Mt. Bischoff stands out in the non-magnetic Precambrian sedimentary inlier, with another weaker anomaly (B) to the southeast. A major magnetic anomaly occurs

006

370 000 E

380 000 E

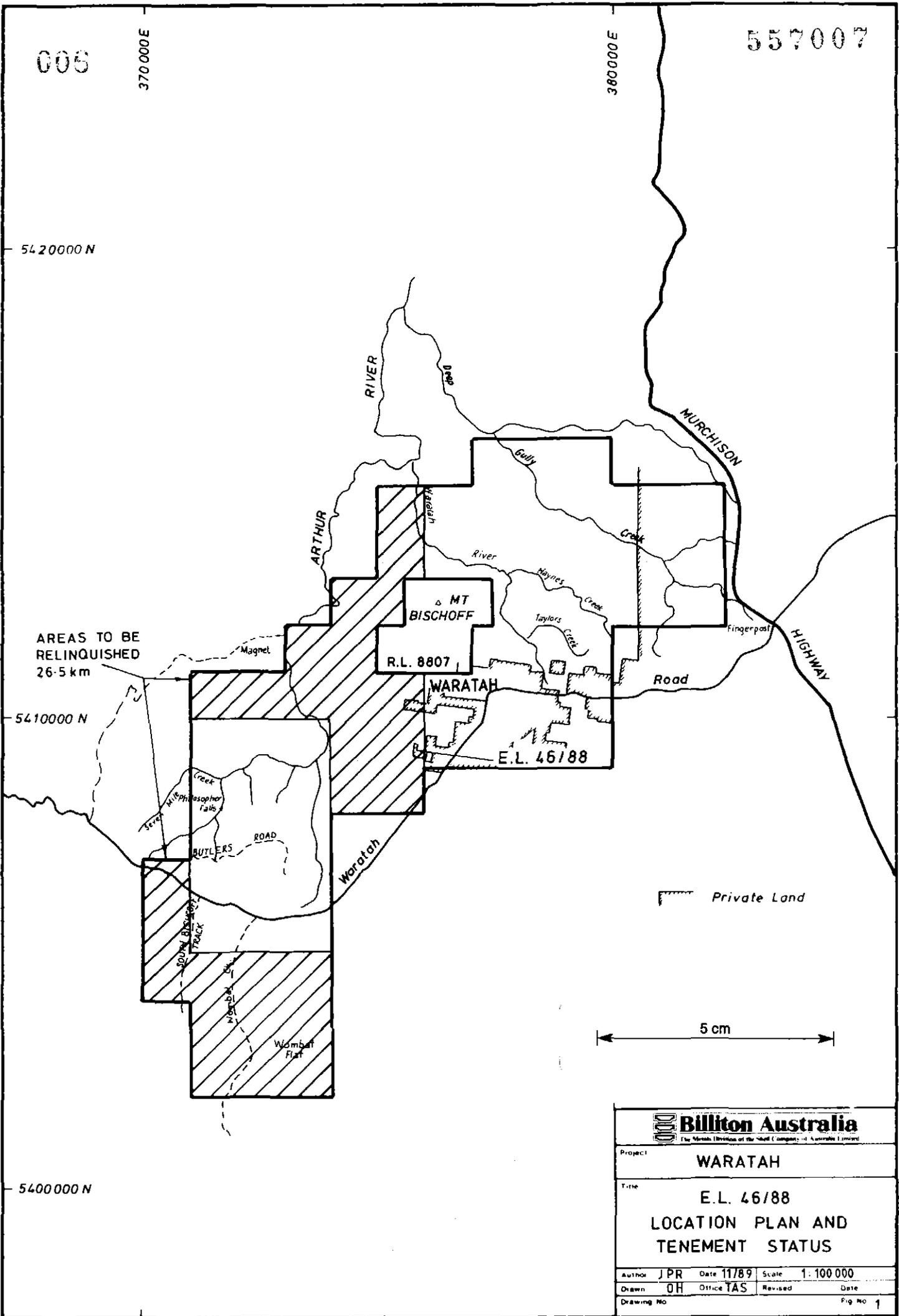
557007

5420000 N

AREAS TO BE
RELINQUISHED
26.5 km

5410000 N

5400000 N



Private Land

5 cm

 Billiton Australia <small>The Metals Division of the Shell Companies of Australia Limited</small>			
Project	WARATAH		
Title	E.L. 46/88 LOCATION PLAN AND TENEMENT STATUS		
Author	JPR	Date	11/89
Scale	1: 100 000		
Drawn	OH	Office	TAS
Revised		Date	
Drawing No			Fig No 1

to the north-east, that may be due to Tertiary basalt or underlying Cambrian mafic rocks, such as occur further west. Generally the Tertiary basalts are relatively weakly magnetic with either positive or negative remanence as is apparent south-east of Mt. Bischoff. In the south-west part of the aeromagnetic maps very strong magnetic anomalies occur around the Meredith granite. This feature can be attributed to hornfelsing of the Cambrian (predominantly shale) sediments around the granite although there could be a contribution from Cambrian mafic rocks which can also be very magnetic.

Airborne EM

Dighem flew a helicopter AEM and aeromagnetic survey for Comstaff in 1983. Specifications were more detailed than for the previous Mines Department survey with line spacing of 200 metres. The magnetometer was at nominal 50 metres height and EM bird at 35m height. Thus detail of the magnetic features is much clearer than from previous data.

As expected from massive pyrrhotite both the EM and magnetic response from Mt. Bischoff is strong. The magnetic anomaly on Figure 2 has a peak of several hundred nT, and the conductivity is in excess of 100 mhos. These responses may be particularly high since the mineralization occurs on a hill and detector height may have been less than nominal (no Dighem profiles or digital tapes are available).

Very few AEM responses occur elsewhere in the EL. Those of note are at Butlers Road, and Anomaly B (Stone Dam Creek).

Ground Geophysics

In 1981 CRA put in a grid covering much of the southern part of the EL.

This grid is called the Housego grid covering predominantly Tertiary Basalt but also the small tin-pyrrhotite Fooks Lode close to the town of Waratah. Ground magnetics and limited Max-Min and Pulse EM surveys were also carried out in 1981 with auger soil sampling. Most of the anomalous assays related to Fooks Lode. However on the easternmost lines a strong magnetic and EM anomaly was recorded. This was drilled by MBD62 through 70 metres of Basalt into Cambrian (?) sediments, and did not explain the EM anomaly.

Comstaff also followed up an aeromagnetic anomaly at Deep Gully Creek (3.5 kms NE of Mt. Bischoff) with magnetic surveys and drilling. Five drill holes through the basalt and into bedrock failed to intersect mineralization.

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5.0 REGIONAL SETTING

The licence covers a sequence of Devonian to Pre-Cambrian lithologies whose distribution allows separation into two geologically distinct areas to which different target concepts apply. (Figure 4).

The area north of 5410000mN includes a sequence of EoCambrian sediments and mafic intrusives with a central inlier of PreCambrian quartzite, shale and dolomite. A cover of Tertiary basalt obscures these Paleozoic-Proterozoic units in the eastern portion of this area. The PreCambrian inlier forms a doubly plunging E-W striking antiform at the fold axis of which is situated the Mt. Bischoff tin deposit. This is one of the classic stratabound replacement tin deposits of western Tasmania and historical records place the overall size of the deposit at 10-11Mt at an average grade of 0.9% Sn. Massive pyrophyllite replacement of the host dolomite units has occurred by the influx of stanniferous fluids along Devonian dyke swarms into the PreCambrian hosts.

Two prospect areas have been delineated by previous explorers and are the focus of Billiton's exploration programme. The prime target area, Stonedam Creek, is essentially basalt covered and the main interest lies in the recognition of an aeromagnetic anomaly of similar characteristics to that which overlies Mt. Bischoff. Billiton's exploration in 1989 has focussed on this area as an excellent target for Mt. Bischoff style

mineralization. A secondary area of interest is that of Deep Gully Creek. Here previous explorers have drilled several holes and intersected PreCambrian dolomite (Mt. Bischoff mineralization host). Although barren, the presence of the host unit and of geochemically anomalous rock chip samples in nearby Ethol Creek (up to 1.3% Sn) warrants further exploration.

The area south of 5410000mN covers a sequence of EoCambrian sediments, minor basic intrusives that have been intruded by the Devonian Meredith Granite. Several Devonian quartz porphyry dykes emanate from this main granite mass. A series of Dighem EM anomalies occur adjacent to the Meredith but have been inconclusively tested, despite the intersection of anomalous geochemistry in one short drill hole. The mineralization anticipated here is that of exogranitic pyrrhotitic skarn style and as such, would be relatively high grade but perhaps low tonnage. In terms of Billiton's exploration philosophy this target is of secondary importance.

6.0 EXPLORATION COMPLETED

Exploration has been carried out solely at Stonedam Creek where:

- a) 13 line kms gridding has been completed over a series of aeromagnetic anomalies.
- b) the entire grid has been surveyed using two G-856 proton magnetometers.
- c) the grid has been geologically mapped and limited (7 samples) rock chip sampling completed.

- d) 1.2 line kms UTEM has been completed over the area of the southern magnetic anomaly using a fixed 400m x 400m transmitter loop.
- e) a diamond drill hole, WD 89-1, is currently being drilled to test a combined magnetic-UTEM target.

7.0 EXPLORATION RESULTS - Stonedam Creek

7.1 Geological Setting

Mapping of the Stone Dam Creek grid (Figs. 5,6) has shown that the predominant feature of the geology is a 50-70m thick sequence of Tertiary basalt flows. The underlying geology is exposed within gullies eroded to levels below the basalt plateaus. This consists of Late PreCambrian siltstones, sandstones and shales of the Burnie-Oonah Formation. Outcrop of these sediments is poor due to abundant basaltic scree and thick alteration is evident. A narrow quartz-muscovite porphyry dyke occurs in the northern portion of the grid, presumably of similar origin to the Devonian porphyries located at Mt. Bischoff. Indeed, the extension of this dyke has been mapped to the southwest and may correlate with known mineralization at Fooks Lode.

7.2 Geophysical Results

A strong positive aeromagnetic anomaly of comparable amplitude and size to that at Mt. Bischoff occurs at this location (Figs. 2, 3, Anomaly B). Weak Dighem anomalies occur in the vicinity also.

A grid was cut to cover the area and a magnetic survey was carried out on 100 metre spaced lines and using 10 metre station intervals. Two G-856 proton magnetometers were used, one as a stationary base station with readings taken every minute for diurnal corrections.

Stacked profiles are shown on Fig. 7, and contours on Fig. 8. Grid co-ordinates are approximate AMG co-ordinates. The contour plan shows more clearly the magnetic anomalies. These appear to relate to the edge of the Tertiary basalt which forms an escarpment in this area. (The Basalt overlies PreCambrian sediments which are evident in outcrop beneath the basalt cliff - see the geological map, Figs 5 and 6).

The magnetic anomaly could be dismissed as being due solely to the basalt cover. However, it is a strong positive which is unlikely to be caused by the basalt, which is known from many measurements, as well as the surrounding aeromagnetic data, to have negative remanence.

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Computer modelling by Billiton of the anomaly on line 378500E indicated a magnetic source with a shallow dip to the north. Further work by CSIRO confirmed that this anomaly is unlikely to be caused by the basalt and is more likely to have a bedrock (ie pyrrhotite) source (see Appendix A).

A UTEM survey was carried out on lines 378300E, 378400E, 378500E over the southern part of the magnetic anomaly. A fixed transmitter loop (400 x 400m) was used and the vertical (Z) component of the secondary magnetic field was measured. The profiles are attached as Appendix B, and include continuously normalised, point normalised and Fraser Filtered data.

On all 3 profiles 2 parallel anomalies are apparent, although the nature of the causative conductors is not clear. They could be interpreted as being due to the edge of a flat lying conductor (ie the basalt layer). These conductors correlate with the magnetic anomaly so almost certainly have the same source (Fig. 8). It is not possible to numerically model 3D or 2D thick flat conductive layers with available computer programs so that one cannot categorically say that the UTEM response is due to the basalt layer. Despite this possibility and the ambiguity of the magnetic and UTEM anomalies, a drill hole test is recommended (note that the nearby CRA drill hole only extended 15 metres beneath the basalt which was 80 metres

thick, and may have drilled down the dip of the PreCambrian stratigraphy). This drill hole is in progress at the time of this report writing and the results will be reported in the next annual report. ||

7.3 Diamond Drilling

Diamond drill hole, WD 89-1, was collared on 23rd November at Billiton grid co-ordinates 411220N 378580E (Fig. 6) and is designed to test the magnetic-UTEM source at grid co-ordinates 411150N 378440E, 130m below surface.

Results of this drilling will be available for inclusion in the 1990 Annual Report.

8.0 CONCLUSIONS & RECOMMENDATIONS

Initial ground magnetic and UTEM survey results and interpretations indicate that the Stonedam Creek anomaly is not due to Tertiary basalt and is not inconsistent with a massive sulphide source. Diamond drill hole WD 89-1 will provide a direct answer to the anomaly source.

Further work at Stonedam Creek is recommended only if the current diamond drill hole intersects mineralization or indications of mineralization (ie prospective host dolomites). The northern magnetic anomaly warrants additional work again only if positive encouragement is gained from this current diamond drill hole.

APPENDIX A

Report by Dr. D. Clarke,
CSIRO Division of Exploration GeoSciences

TOPOGRAPHIC ANOMALIES DUE TO THE BASALT CLIFF

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The order of magnitude of the spiky topographic anomaly arising from a ground magnetic profile over a steep cliff can be simply estimated. It can be shown that the difference between the anomalies observed at the top and at the foot of a vertical cliff is equal to half the self-demagnetising field of an infinite horizontal slab. That is, $(B_z)_{\text{top}} - (B_z)_{\text{bottom}} = 2 \times \pi \times J_z$, where B_z and J_z are the vertical components of the anomalous field and the magnetisation respectively. Given the above magnetic properties, the field magnitude measured at the foot of a vertical cliff of basalt with reversed magnetisation should be higher than that measured at the top by:

$$\text{Topographic anomaly} = -2 \times \pi \times 208 \sin(63^\circ) \times \sin(-72^\circ)$$

$$\sim 1100 \text{ nT.}$$

Modelling of the aeromagnetic expression of the basalt was carried out using a 2.5D finite depth prism model. A ~400 nT topographic anomaly due to the basalt cliff is predicted, assuming a constant barometric altitude survey, 50 m above the plateau.

Detailed modelling of the actual topography of the basalt is shown in the accompanying figures, with the measured ground magnetic profiles for comparison. It appears that the form of the observed anomaly qualitatively resembles the magnetic expression expected from the basalt cliff, given the reversed polarity of the basalt magnetisation, but that the observed anomaly amplitude is much greater than the predicted topographic anomaly in the vicinity of line 8500E. Unless the basalt along this part of the cliff is substantially more magnetic than any of the samples collected for this study, or any of the basalt samples from 41 nearby sites which have been collected previously, then the observed anomaly along 8500E cannot be attributed to the basalt. The modelling was carried out using 2D tabular bodies, but checks with prism models showed that the effects of finite strike length were not very great because of the proximity of the sensor to the source relative to the strike length. It appears that the persistent anomaly of lower amplitude, which follows the cliff edge, is essentially a topographic anomaly. The considerable enhancement of anomaly amplitude along 8500E and adjacent lines appears to require an additional intensely magnetic source. Assuming magnetisation subparallel to the present field, a shallow sheet-like body, with moderate northerly dip, can account for the anomaly, as shown in the accompanying figure. The intense magnetisation required to match the anomaly amplitude is consistent with a massive pyrrhotite zone, with magnetisation dominated either by induction or by a steeply upward directed remanence. Such a remanence has been found at Renison and Cleveland mines and is attributed to a Cretaceous overprint magnetisation. However, there appears to be a problem with the geological plausibility of such a body occurring so close to the cliff, and at very shallow depths, without having surface

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expression as outcrop or float.

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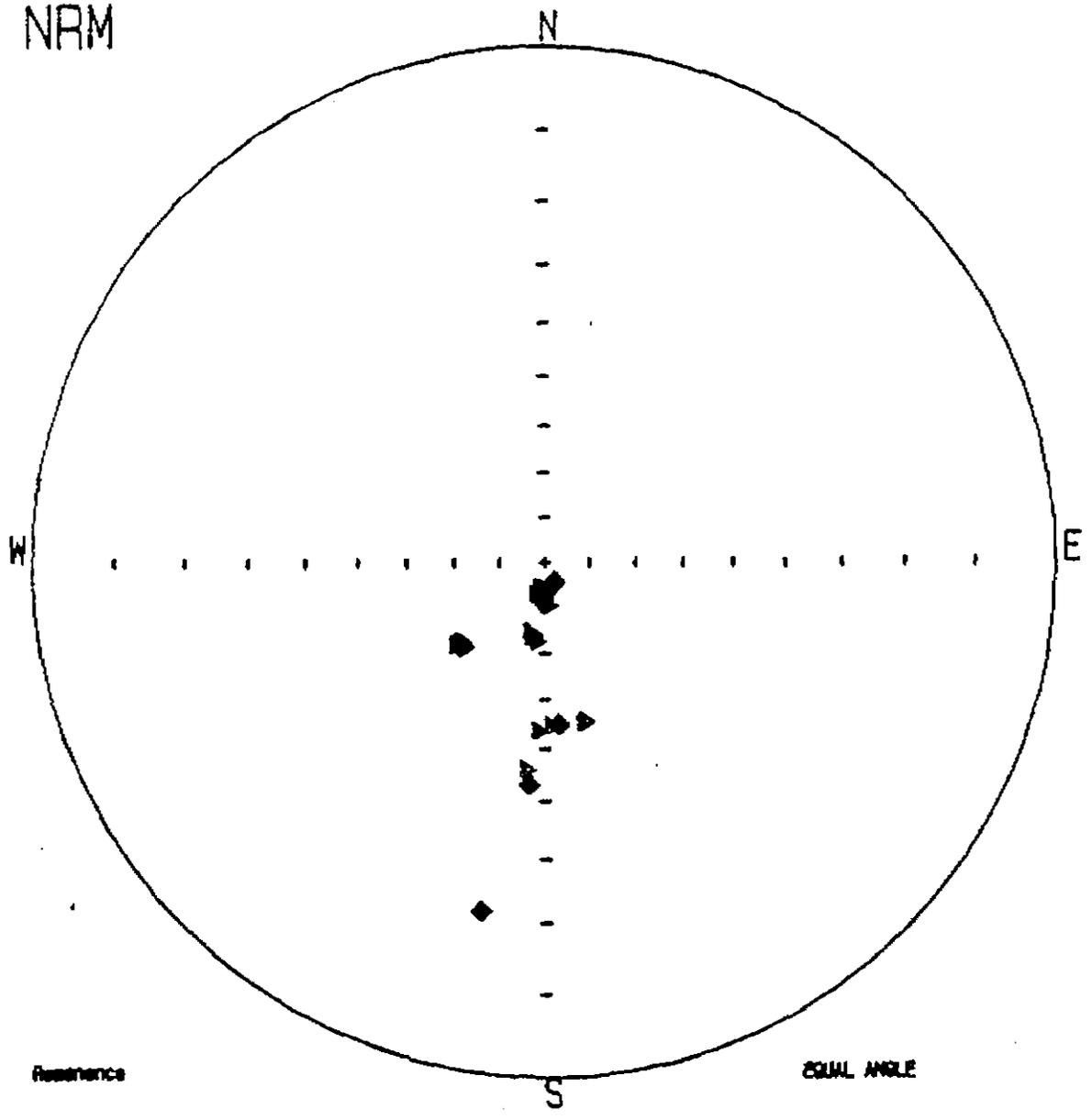
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WARATAH.rem

NRM



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MAGNETIC PROPERTIES AND MAGNETIC SIGNATURES OF TERTIARY
 BASALTS OF THE WARATAH/MOUNT BISCHOFF AREA, TASMANIA
 -A PRELIMINARY REPORT BY D.A. CLARK

Sample	k (uG/Oe)	NRM (J(uG);D, I)	Q
1	380	(3350;189°, +73°)	14.0
2	280	(1220;227°, +64°)	6.9
3	480	(2360;174°, +52°)	7.8
4	530	(3170;184°, +82°)	9.6
5	300	(2320;180°, +54°)	12.5
6	380	(1720;179°, +83°)	7.2
7	570	(2920;185°, +40°)	8.2
Mean	420	(2340;185°, +64°)	8.9

k = cgs (emu) susceptibility $\times 10^6$

J = NRM intensity in microgauss

Q = Koenigsberger ratio = J/kF , where $F = 0.63$ Oe

D = NRM declination, positive clockwise from TN

I = NRM inclination, positive downwards

NRM directions of all specimens are plotted in the accompanying stereonet.

The resultant magnetisation (remanent plus induced) is dominated by the remanence of reversed polarity and has intensity 2080 uG (=208 gammas), declination 184° and inclination +63°.

020

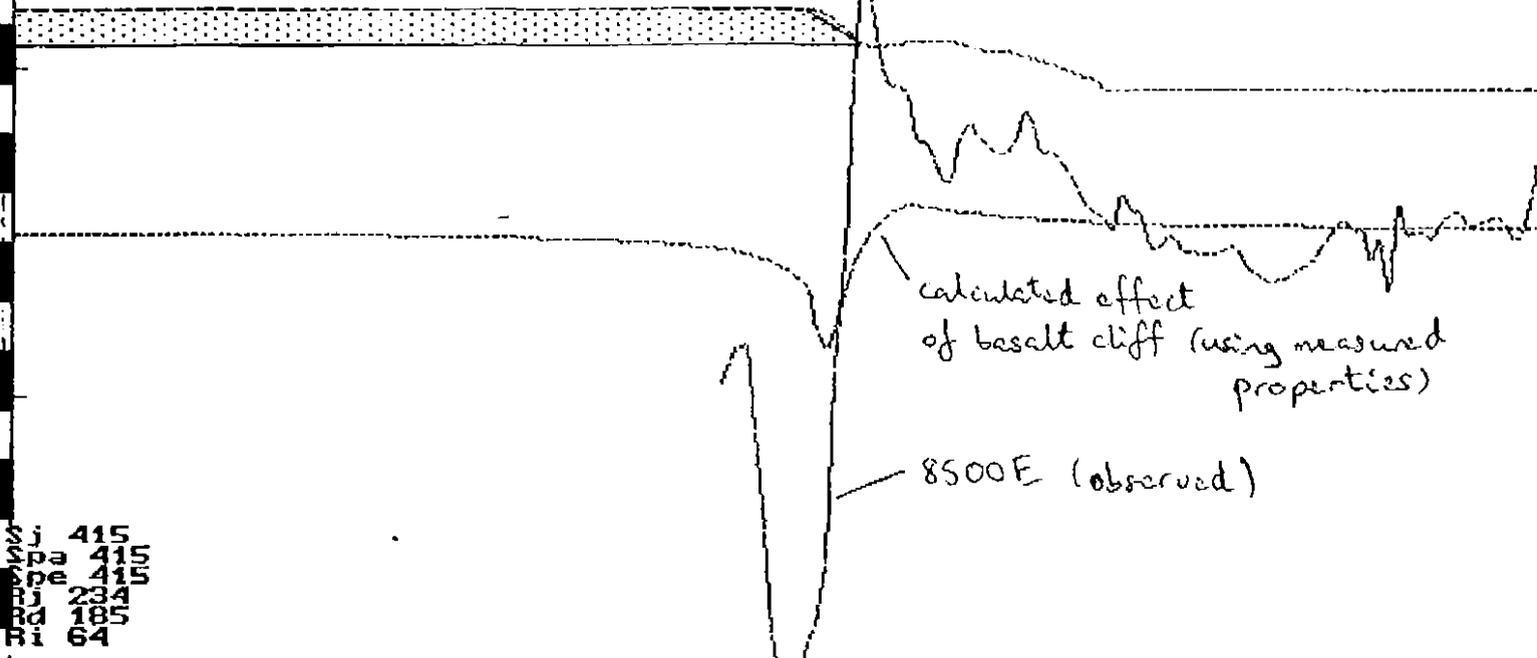
557021

x 411100.00 y

isotr
reman
Bm

Fj 6300
Fb 0
Fi -71

Jres 208
Bres 185
Ires 63.1



uit M_enu D_raw profile S_creeg plot

02

557022

x 411100.00 y

sotr
eman
n

Fj 6300
Fb 0
Fi -71

Jres 974.
Bres 185.
Ires 63.8

calculated effect of cliff
assuming very intense remanence (10,000 μ G)

8500E

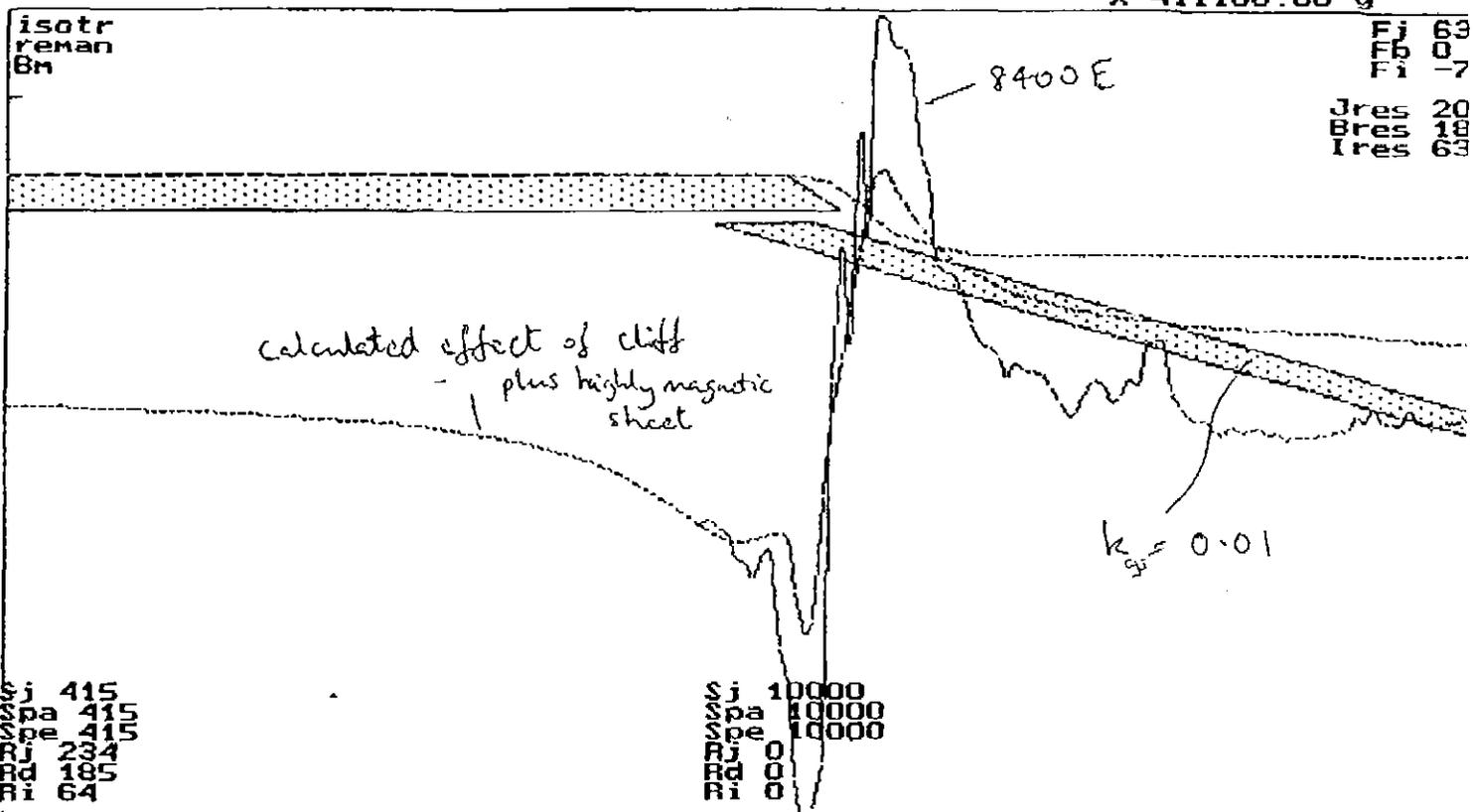
j 415
pa 415
pe 415
d 1000
d 185
i 64

hit M_enu D_raw profile S_screen plot

022

557023

x 411100.00 y



Quit Menu D_raw profile S_screen plot

557024

025

x 411100.00 y

isotr
reman
BH

Fj 6300
Fb 0
Fi -71

Jres 208.
Bres 185.
Ires 63.1

calculated effect of cliff
/ plus magnetic sheet

$k_{cs} = 0.01$

9500E

Sj 415
Spa 415
Spb 415
Lp 234
Rp 185
Ri 64

Sj 10000
Spa 10000
Spb 10000
Rj 0
Rp 0
Ri 0

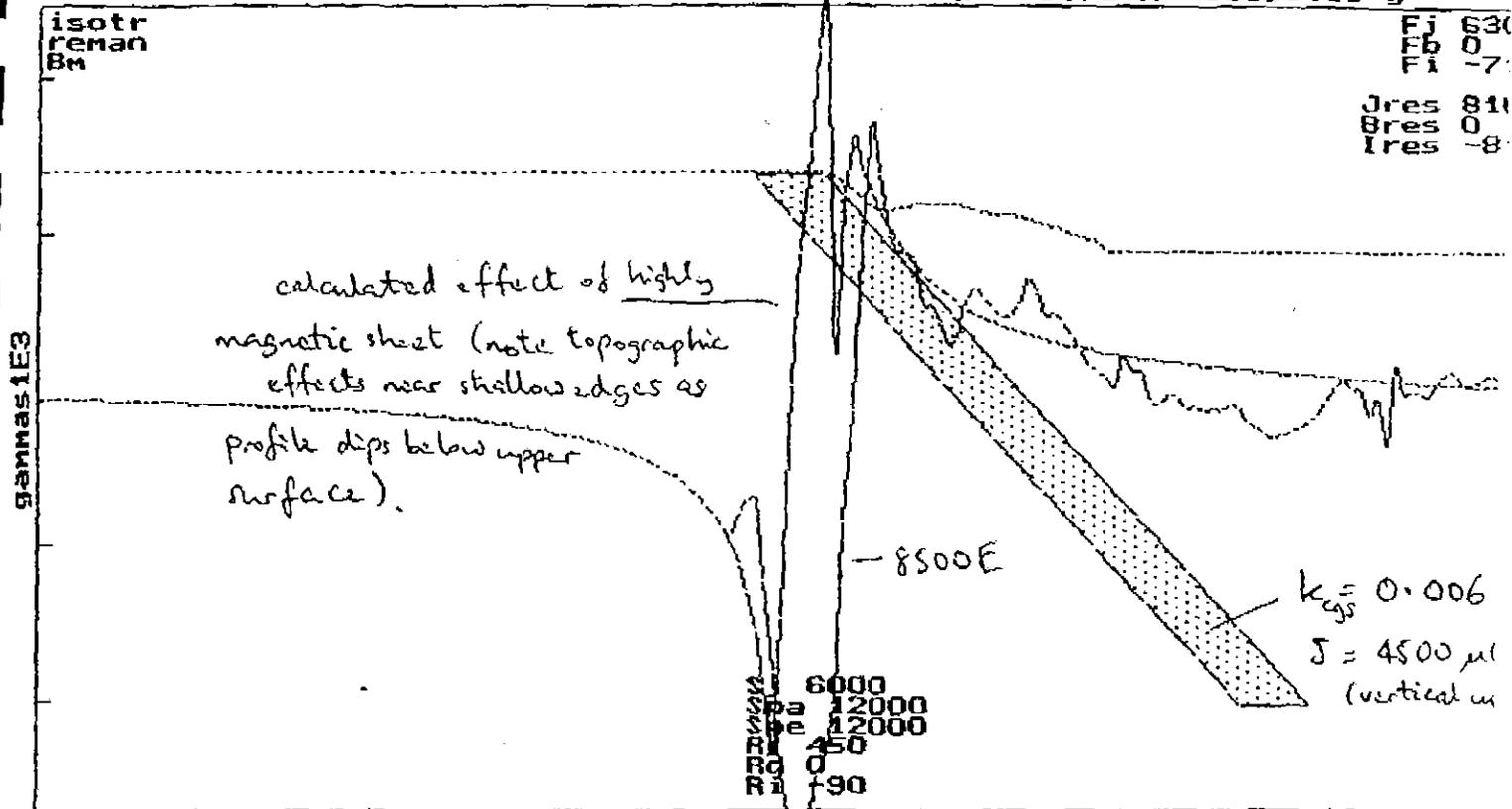
uit M_enu D_raw profile S_creeg plot

024

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dip 0.08 x 41100.00 g

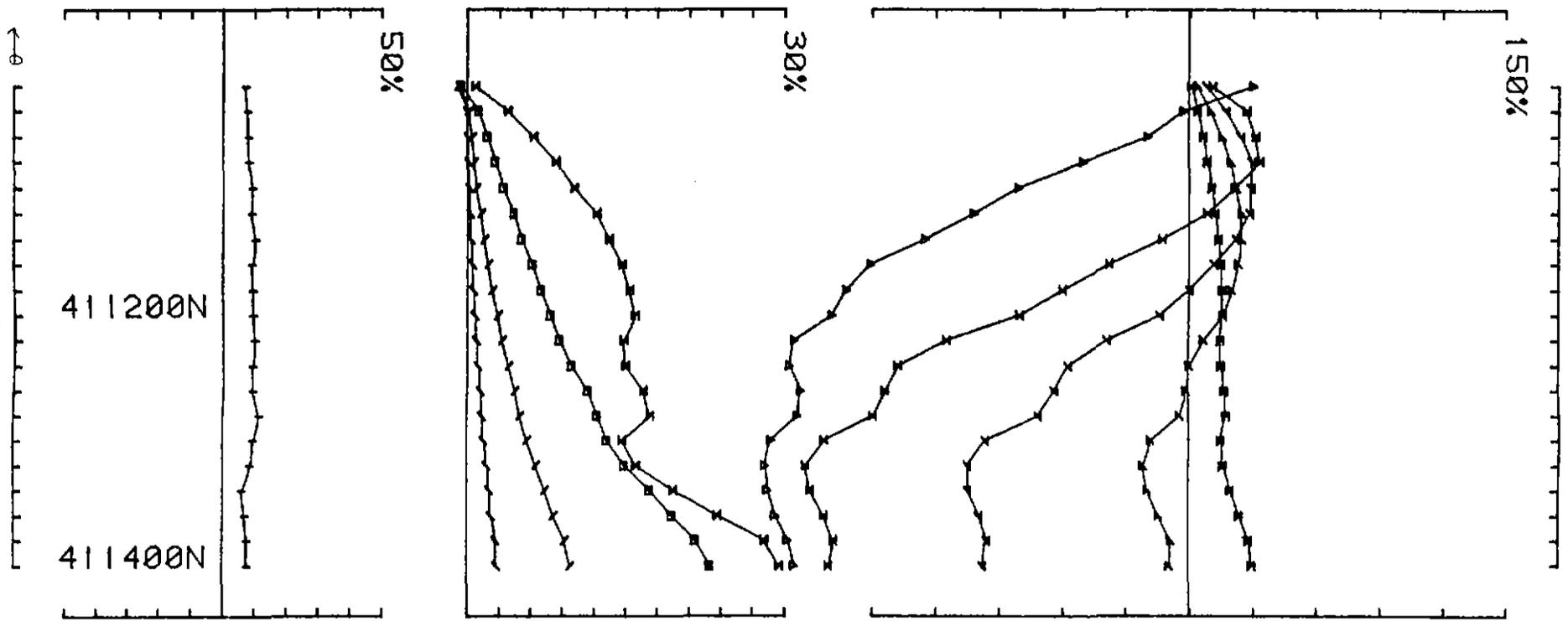
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Bres	0
Ires	-8



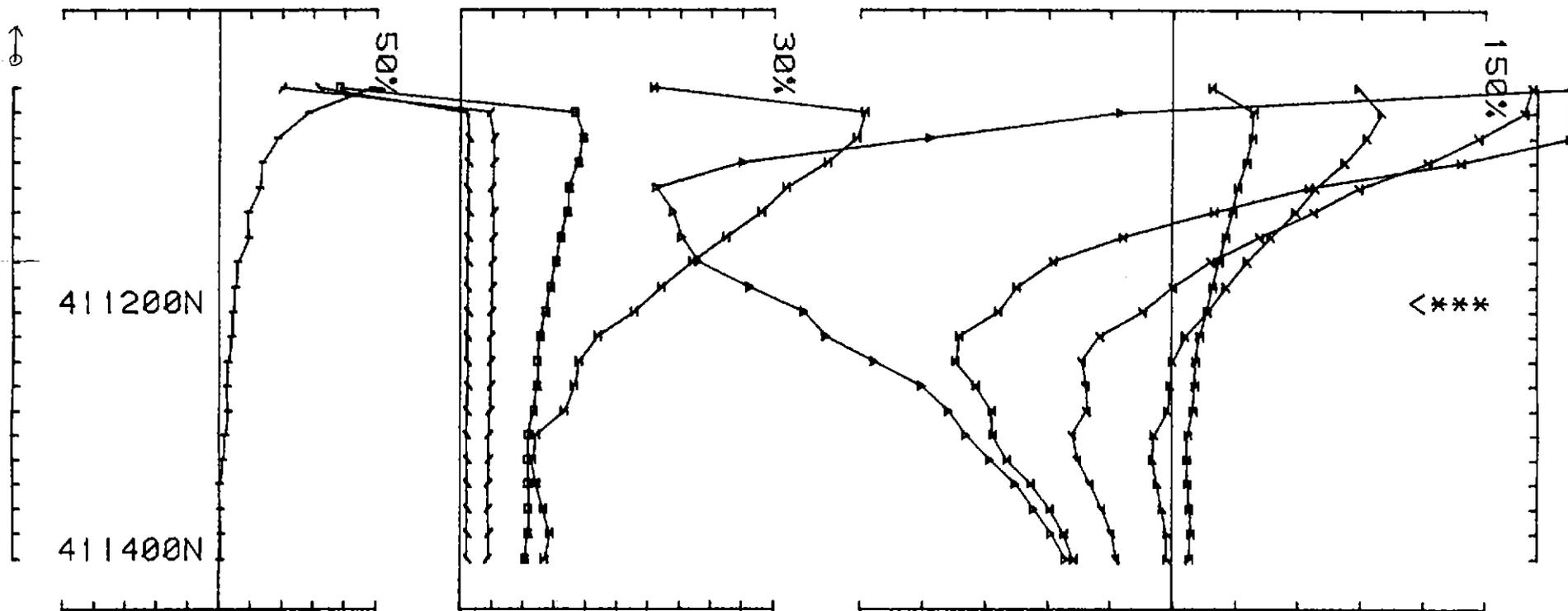
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APPENDIX B

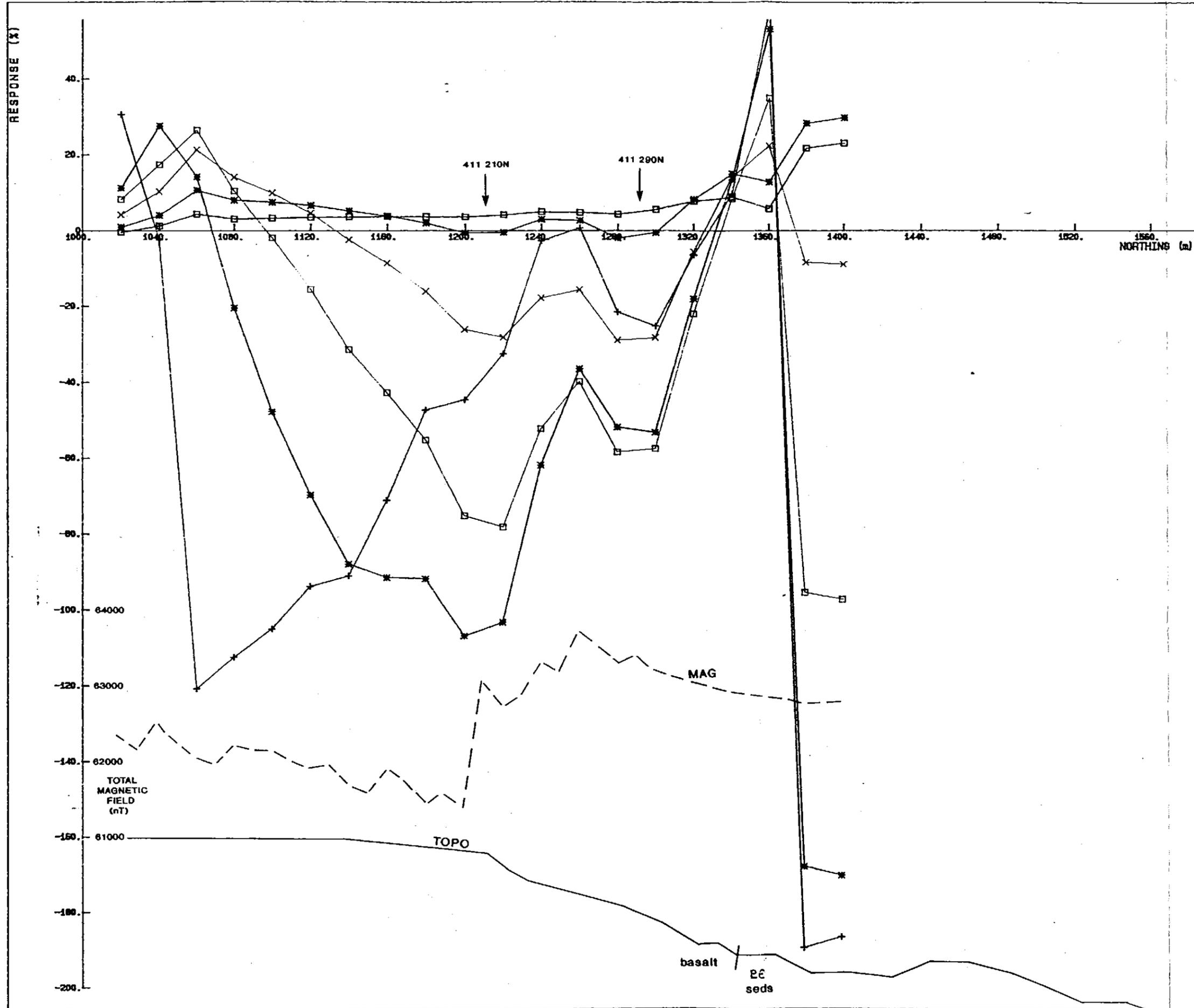
UTEM Profiles lines 378300E, 378400E, 378500E;
continuously and point normalised, Fraser filtered



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 loop no 9 line 378300E component Hz secondary field Ch 1 contin. norm.



UTEM SURVEY at WARATAH PROSPECT for BILLITON AUSTRALIA (SHELL)
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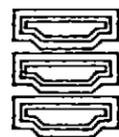
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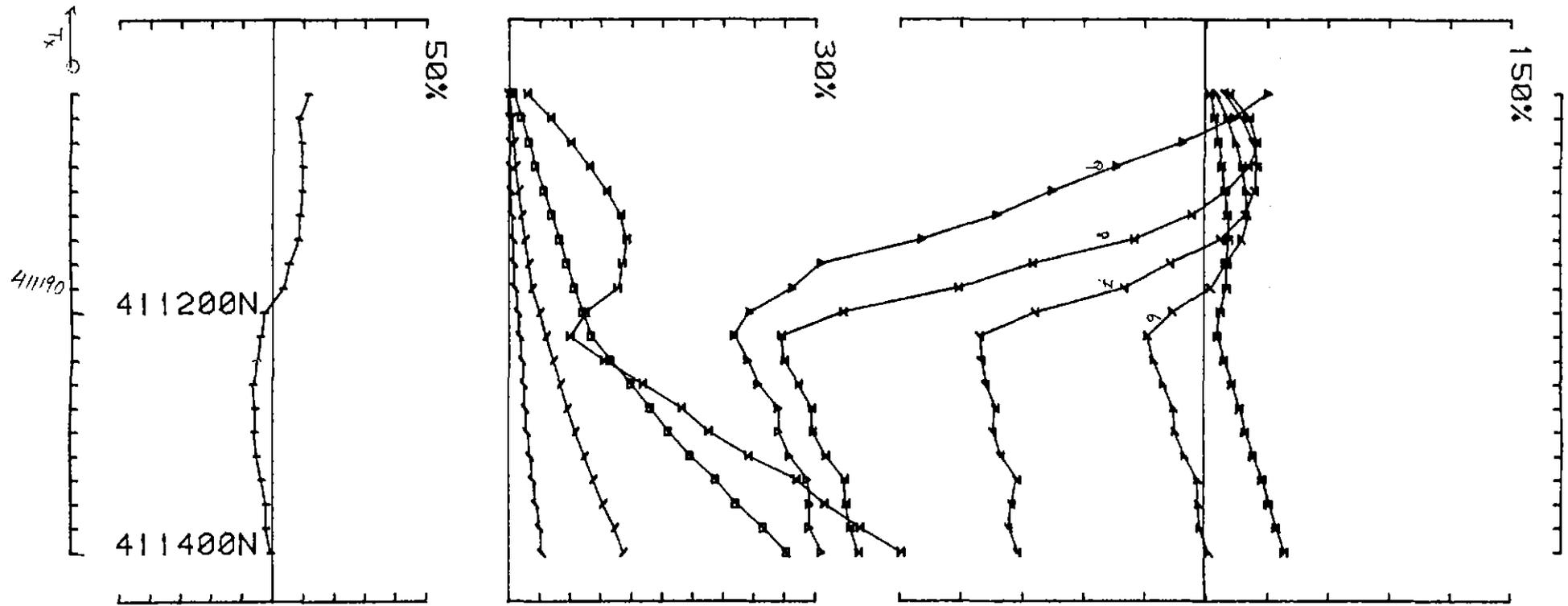
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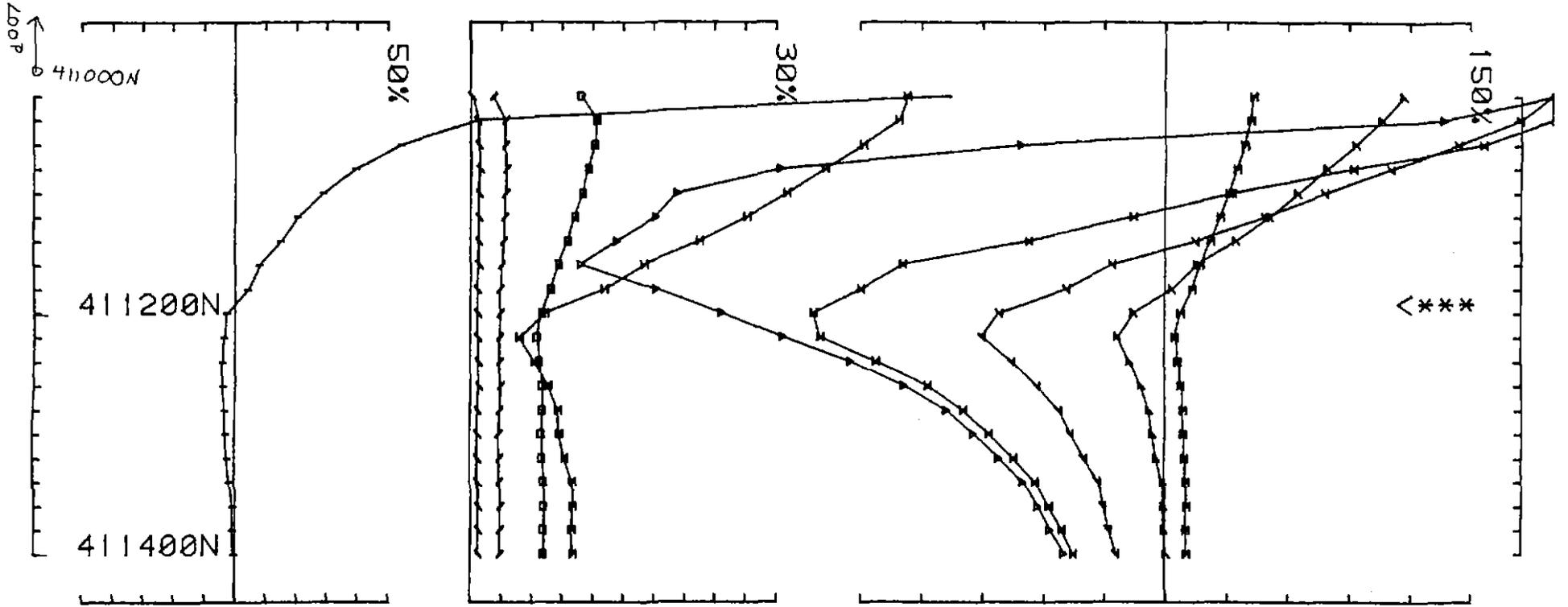
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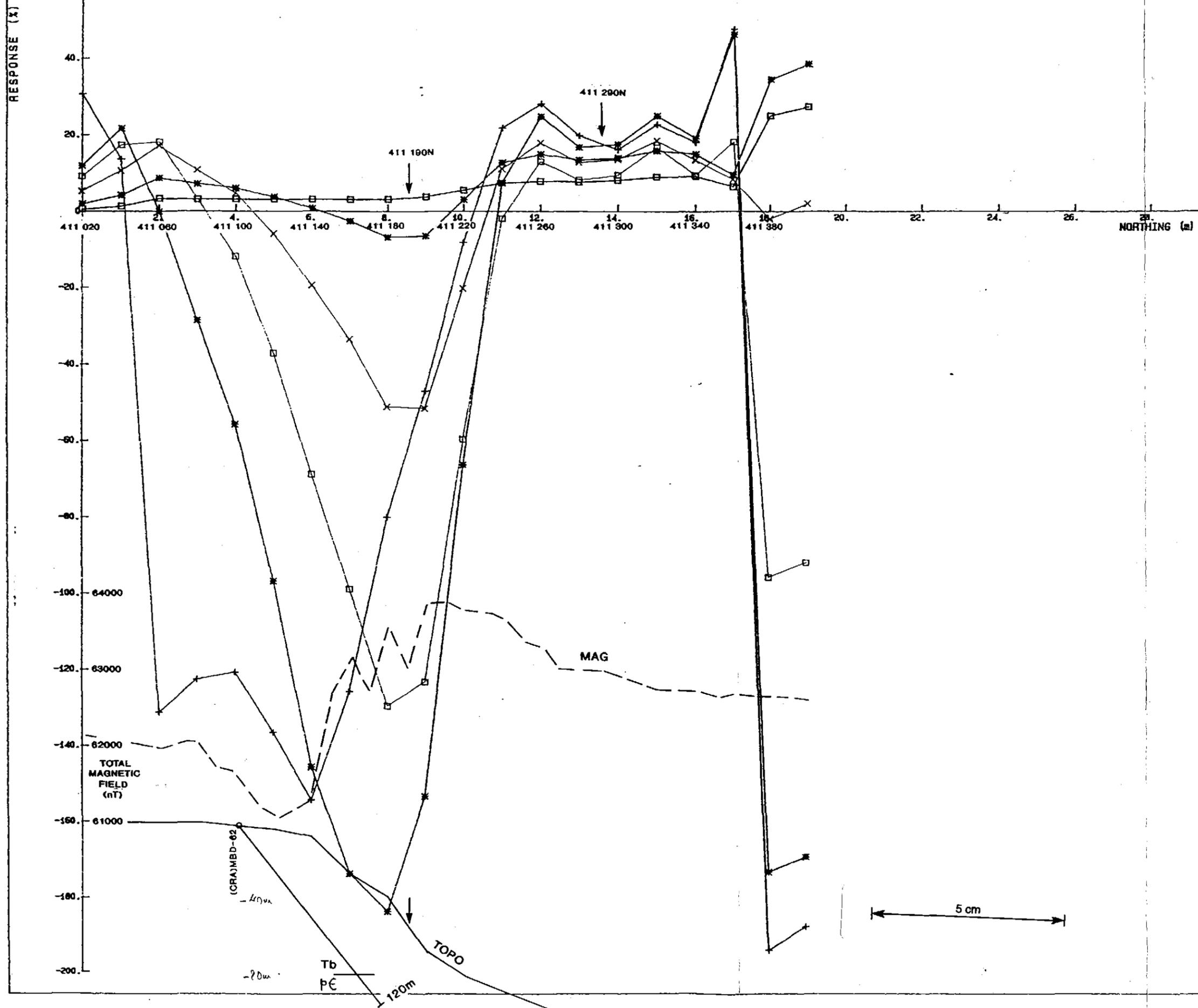
BILLITON AUSTRALIA	
WARATAH, TAS	
STONEDAM CREEK	
UTEM, FRASER FILTER	
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DATE: 5/89	AUTHOR: N.H.
DRAWN: 1:2000	OFFICE: AHO



UTEM SURVEY at WARATAH PROSPECT for BILLITON AUSTRALIA (SHELL)
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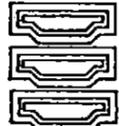


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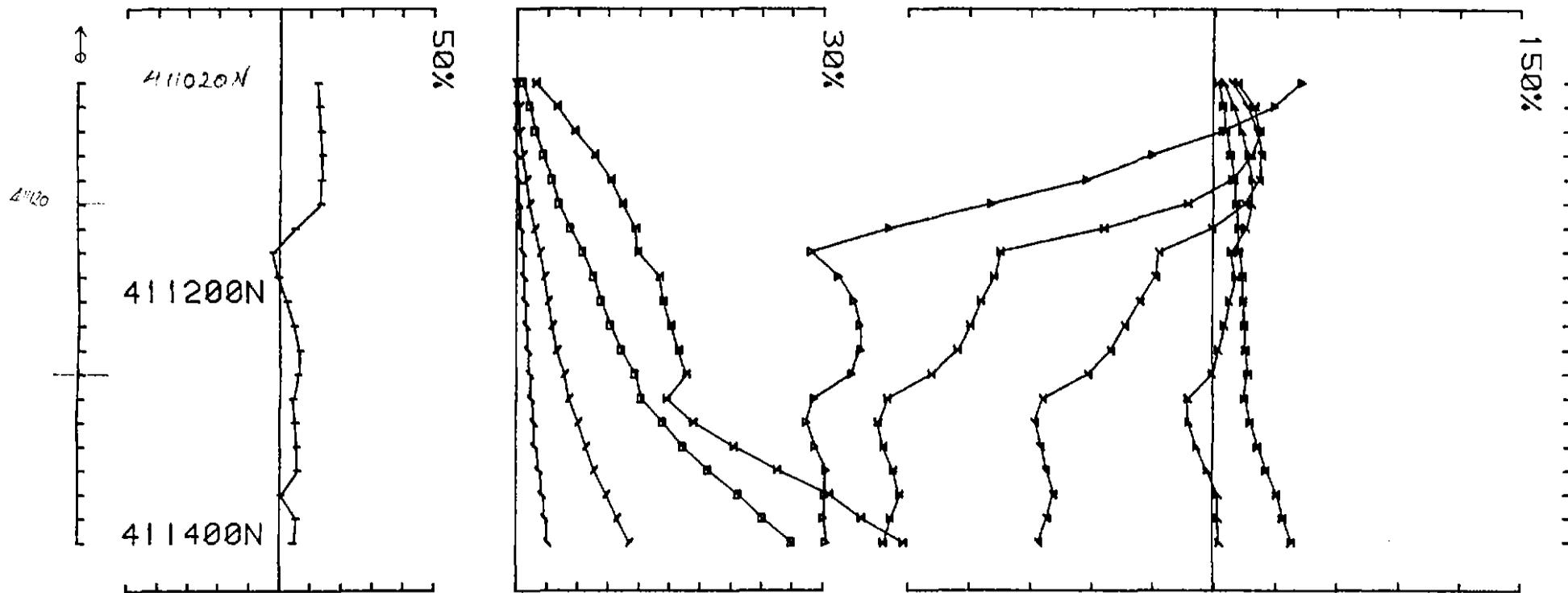


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89-3053



BILLITON AUSTRALIA	
WARATAH, TAS.	
STONEDAM CREEK	
UTEM, FRASER FILTER	
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DATE: 5/89	AUTHOR: N.H.
DRAWN: 1:2000	OFFICE: AHO



UTEM SURVEY at WARATAH PROSPECT for BILLITON AUSTRALIA (SHELL)

conducted by LAMONTAGNE GEOPHYSICS. Job 8902 base freq (hz) 33.409 Mar 89

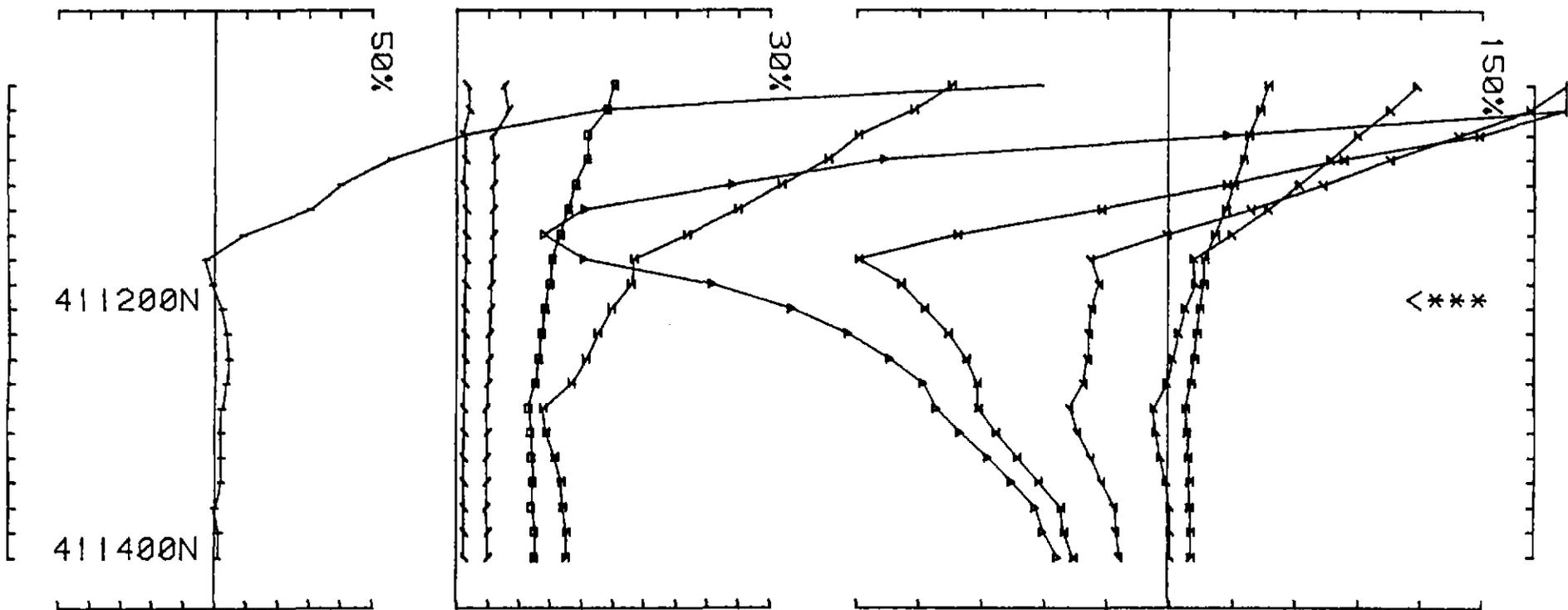
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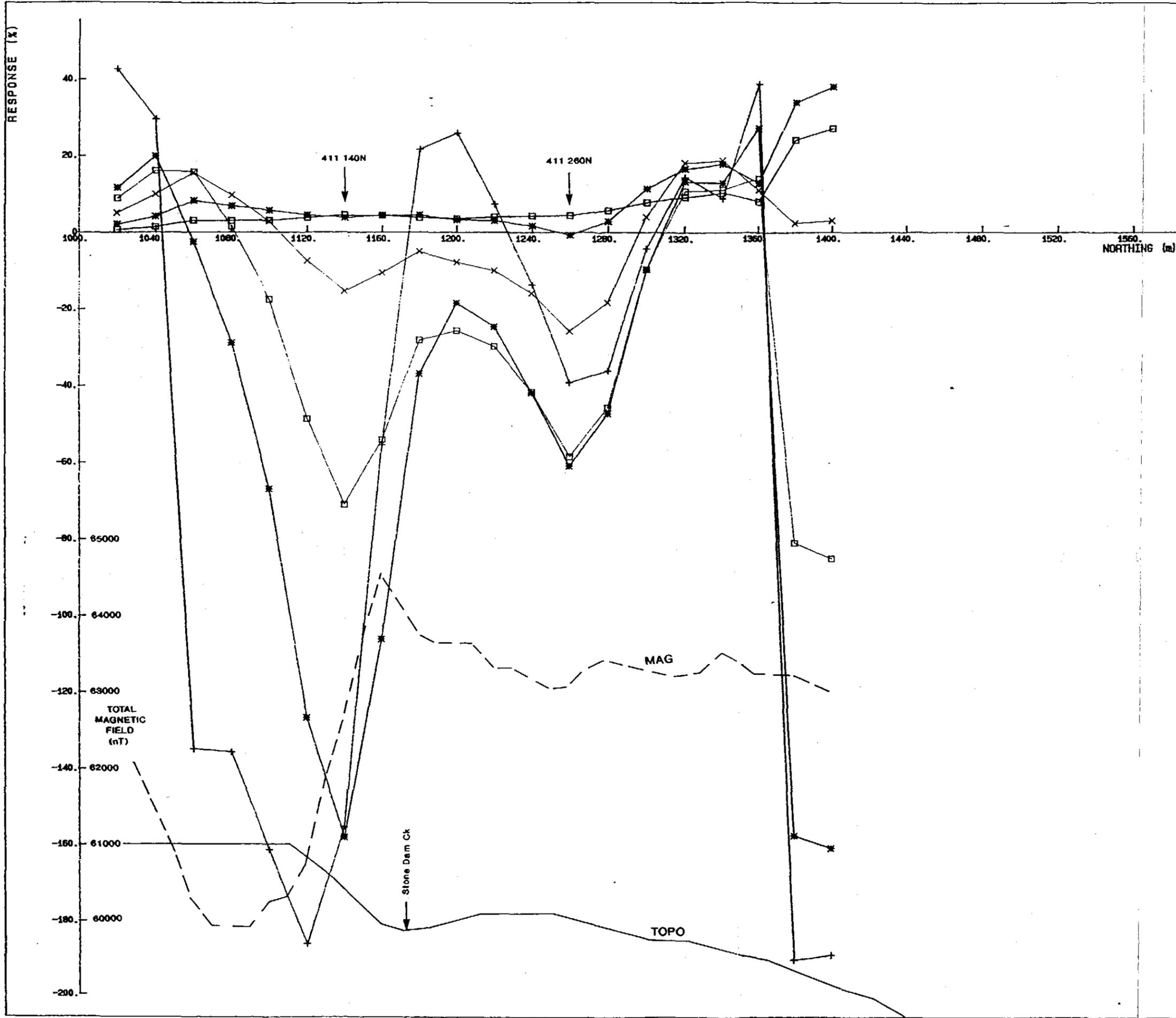
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410500N, 378600E

410630N, 378200E



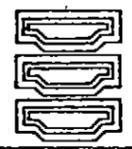
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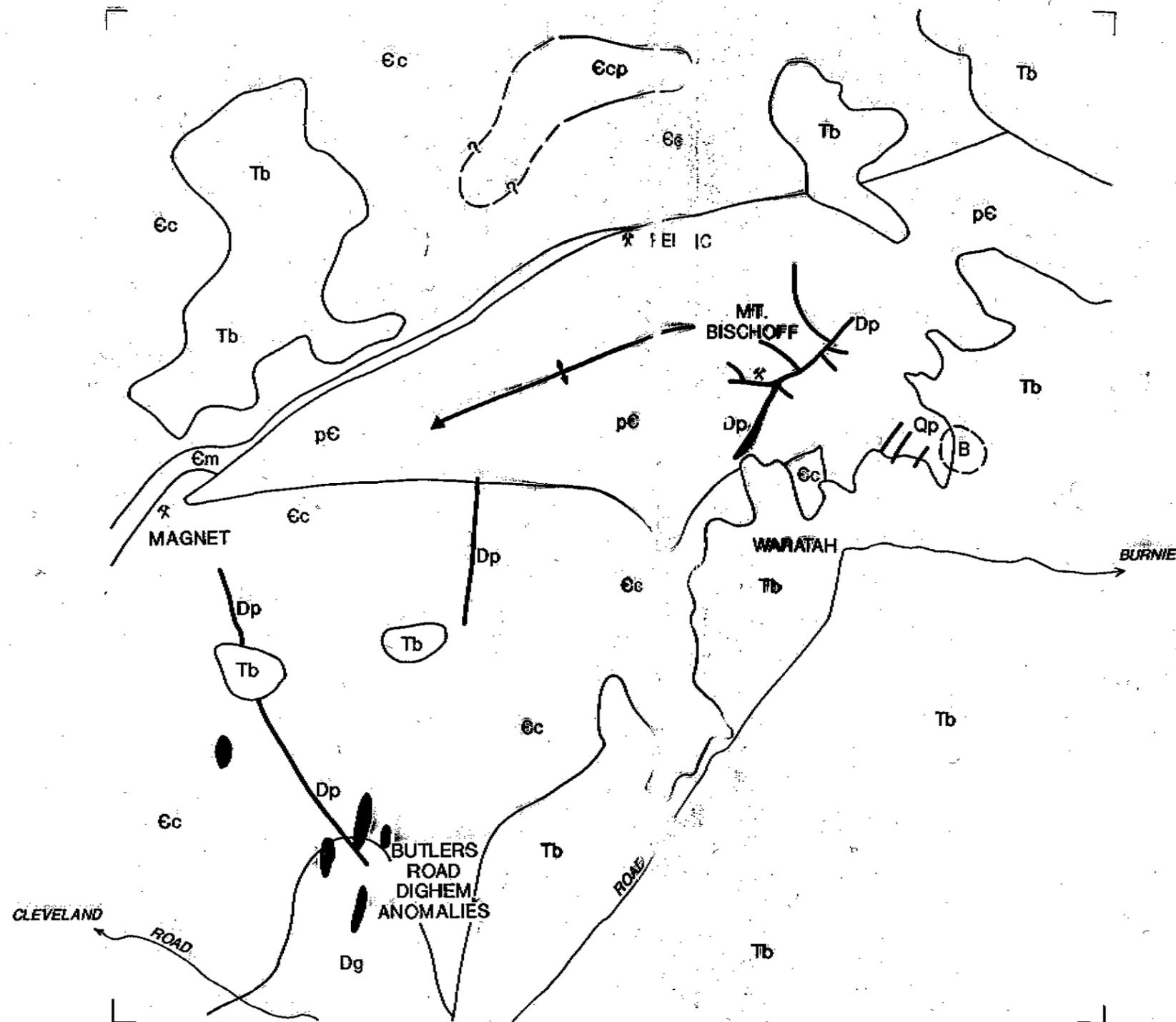
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 Channel 5: 0.3636ms
 Channel 4: 0.7272ms
 Channel 3: 1.4545ms

557035

89-3053



BILLITON AUSTRALIA	
WARATAH, TAS	
STONEDAM CREEK	
UTEM, FRASER FILTER	
LINE 8500E, Z COMP	
FIG. NO: 15	REPT. NO:
ENCL. NO:	DRG. NO: LD13/1005
DATE: 5/89	AUTHOR: N.H.
DRAWN: 1:2000	OFFICE: AMO



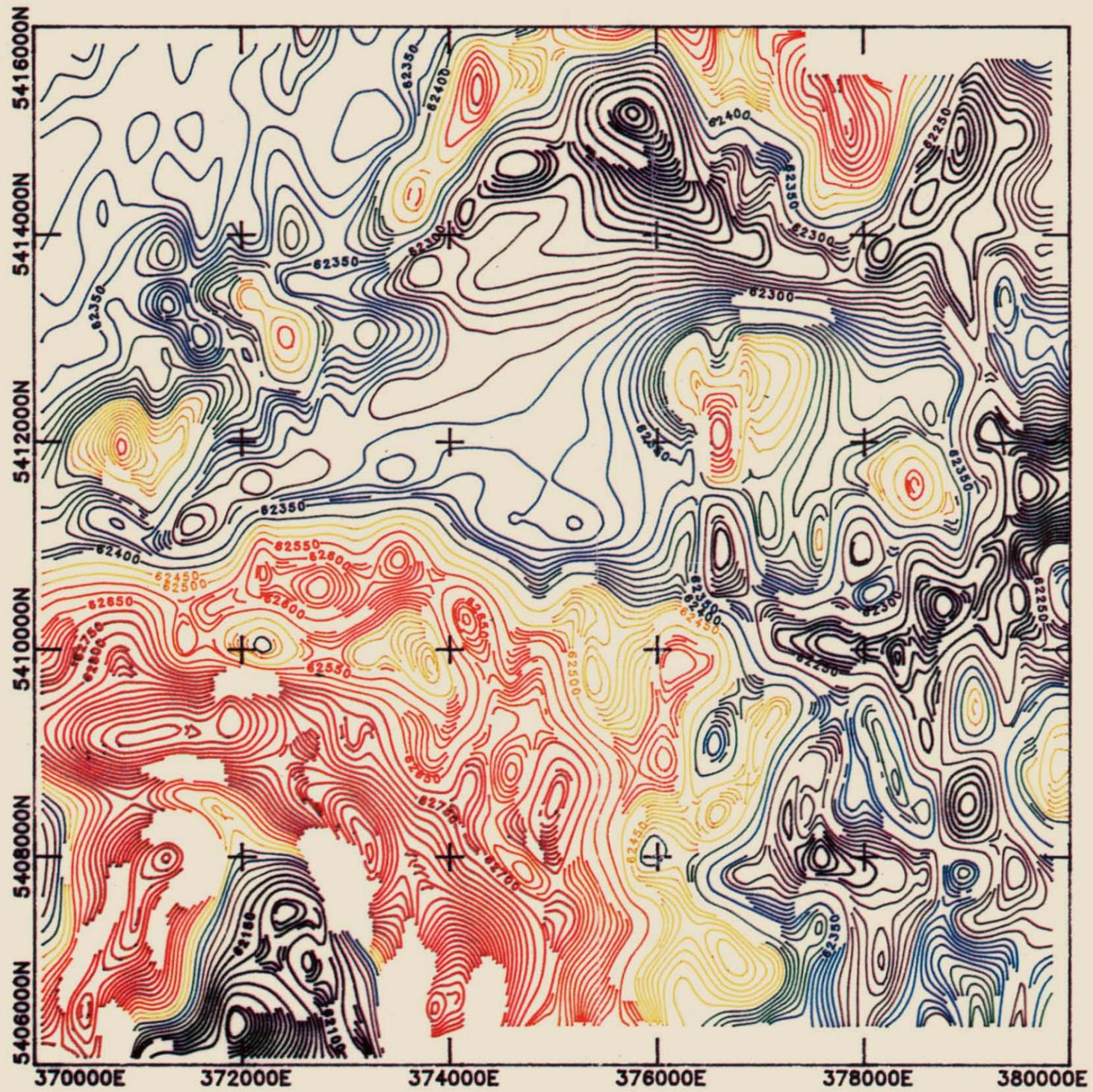
- Tb = TERTIARY BASALT (+ve & -ve anomalies)
- Dp = QUARTZ PORPHYRY DYKES
- Dg = DEVONIAN MEREDITH GRANITE (non-magnetic)
- Ec = CAMBRIAN CRIMSON CREEK SEDIMENTS (non-magnetic except where hornfelsed around Dg)
- Em = MAFIC INTRUSIVES (magnetic?)
- Ecp = BASALT LAVAS (magnetic)
- pC = PRE CAMBRIAN SEDIMENTS (non-magnetic)

DRAWN BY GEOTEX 1981
 FLIGHT LINE SEPN = 500m
 MAGNET SENSOR HEIGHT = 135m
 CONT = 100T

 The Metals Division of the Shell Company of Australia Limited		
Project		
N.W. TASMANIA		
Title		
E.L.A. (ex 13/79 & 5/63 Pt. 1) AEROMAGNETIC CONTOURS (MINES DEPT) + OUTCROP GEOLOGY (after Mines Dept. & Constaff)		
Author	Date	Scale
N.H.	8/88	1:50,000
Drawn	Office	Revised
	MELB	
Drawing No.	Fig. No.	
MT24/1178		

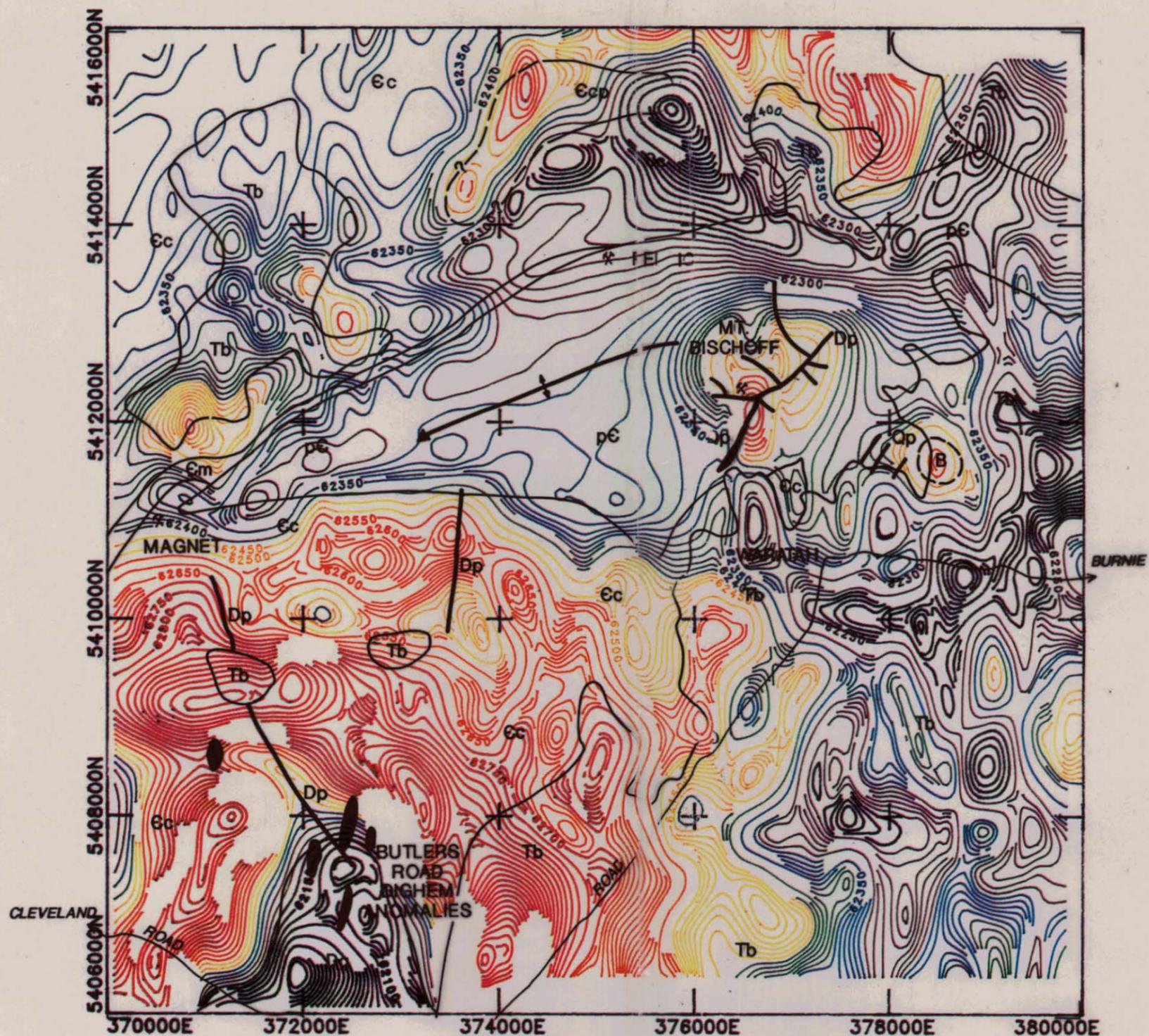
557037

9094



5 cm

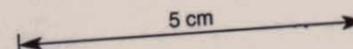
89-3053



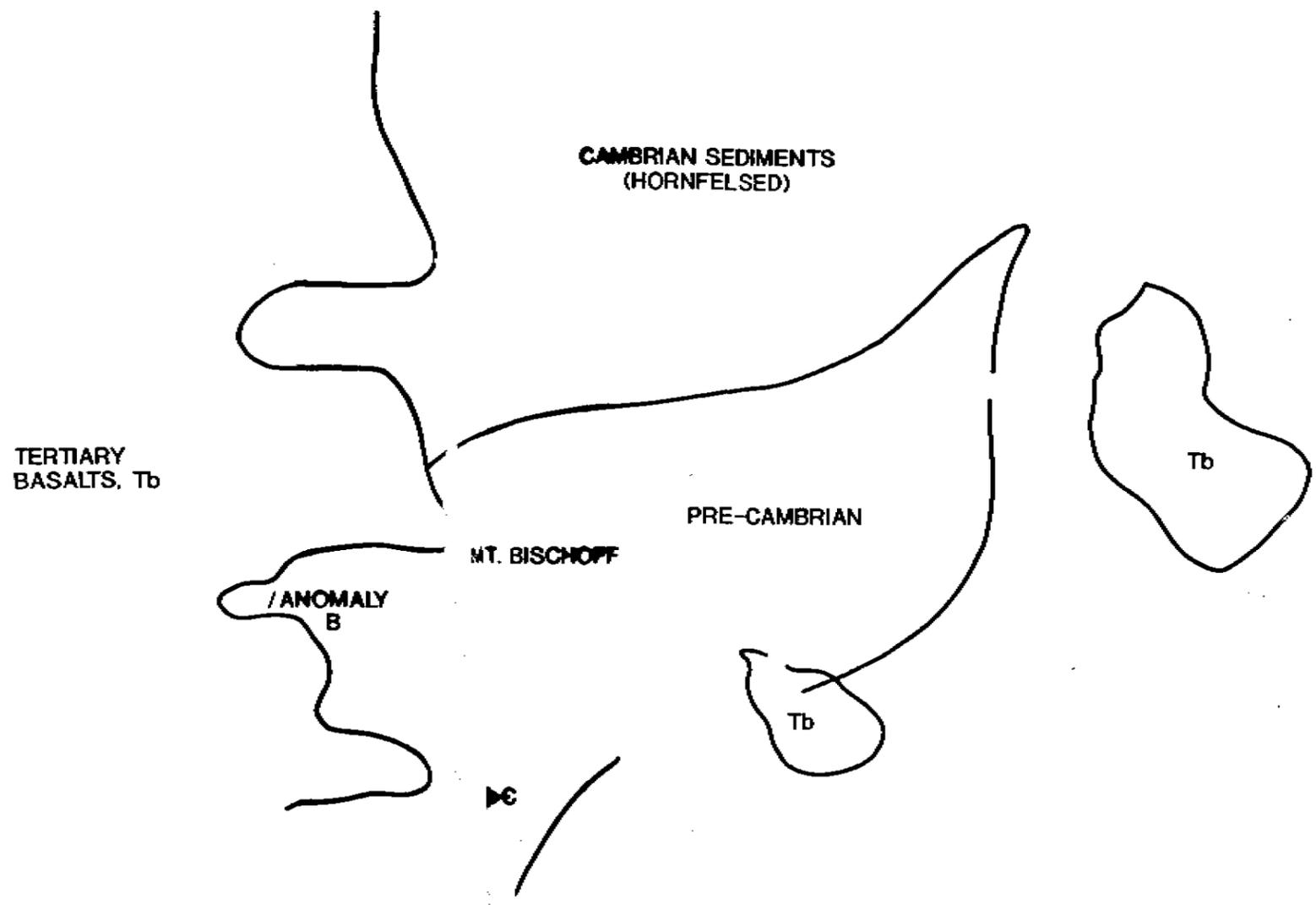
- Tb = TERTIARY BASALT (+ve & -ve anomalies)
- Dp = QUARTZ PORPHYRY DYKES
- Dg = DEVONIAN MEREDITH GRANITE (non-magnetic)
- Ec = CAMBRIAN CRIMSON CREEK SEDIMENTS (non-magnetic except where hornfelsed around Dg)
- Cm = MAFIC INTRUSIVES (magnetic?)
- Ecp = BASALT LAVAS (magnetic)
- pC = PRE CAMBRIAN SEDIMENTS (non-magnetic)

89-3053

DRAWN BY GEOTEX 1981
 FLIGHT LINE SEPN = 500m
 MAGNETIC SENSOR HEIGHT = 135m
 G = 10nT



Billiton Australia <small>The Metals Division of the Shell Company of Australia Limited</small>			
Project		N.W. TASMANIA	
Title		E.L.A. (ex 13/79 & 5/63 Pt.1) AEROMAGNETIC CONTOURS (MINES DEPT) + OUTCROP GEOLOGY (after Mines Dept. & Constaff)	
Author N.H.	Date 8/88	Scale 1:50,000	
Drawn	Office MELB	Revised	Date
Drawing No. MT24/1178			Fig. No. 2

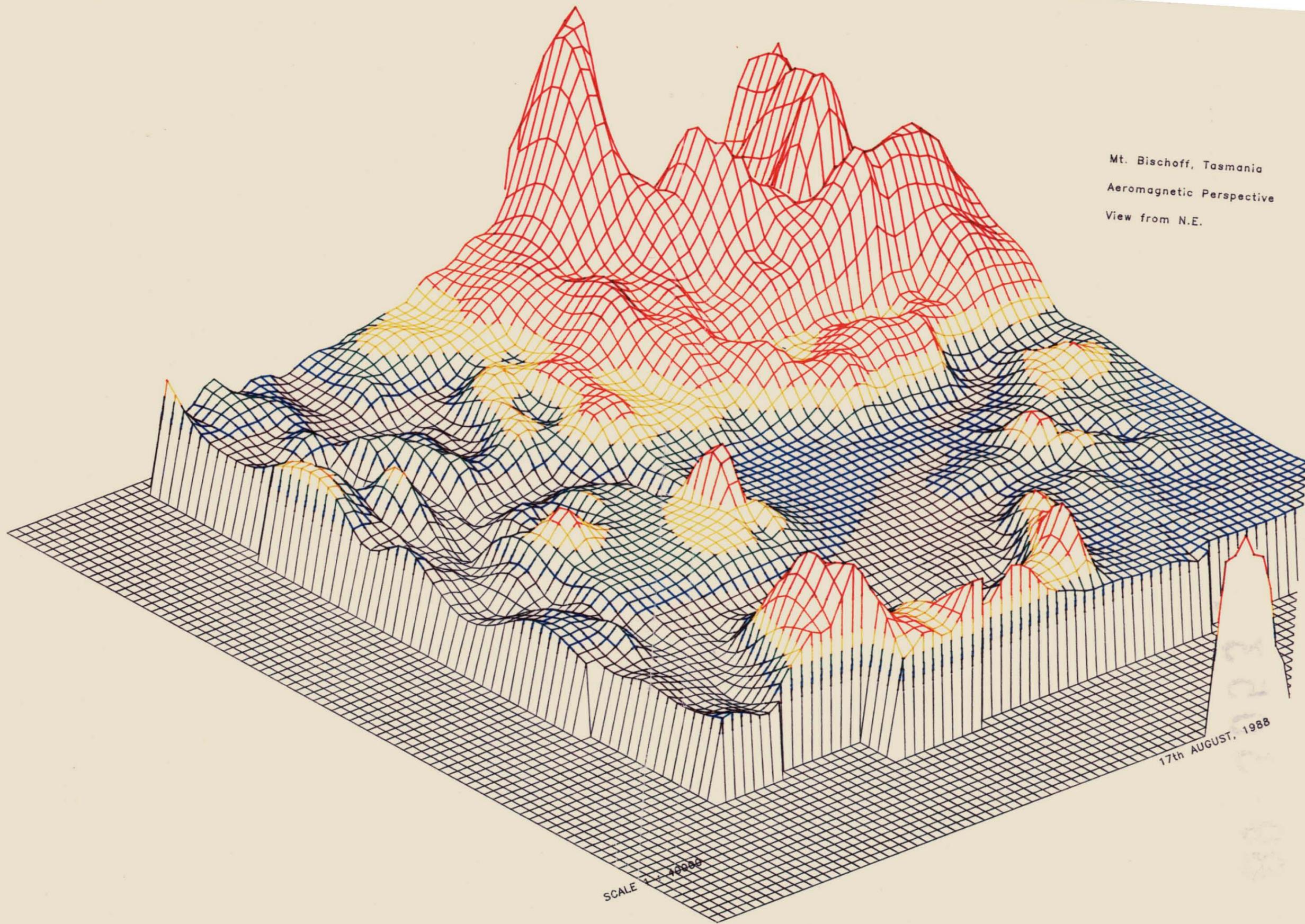


Project			
N.W. TASMANIA			
Title			
E.L.A. (ex 13/79 & 5/63 Pt.1)			
AEROMAGNETICS PERSPECTIVE PLOT FROM NE			
Author	N.H	Date	8/88
Scale	1:40,000		
Drawn	Office	MELB	Revised
Date			
Drawing No.	MT24/1177		Fig. No.

557039

9093

Mt. Bischoff, Tasmania
Aeromagnetic Perspective
View from N.E.



SCALE

10000

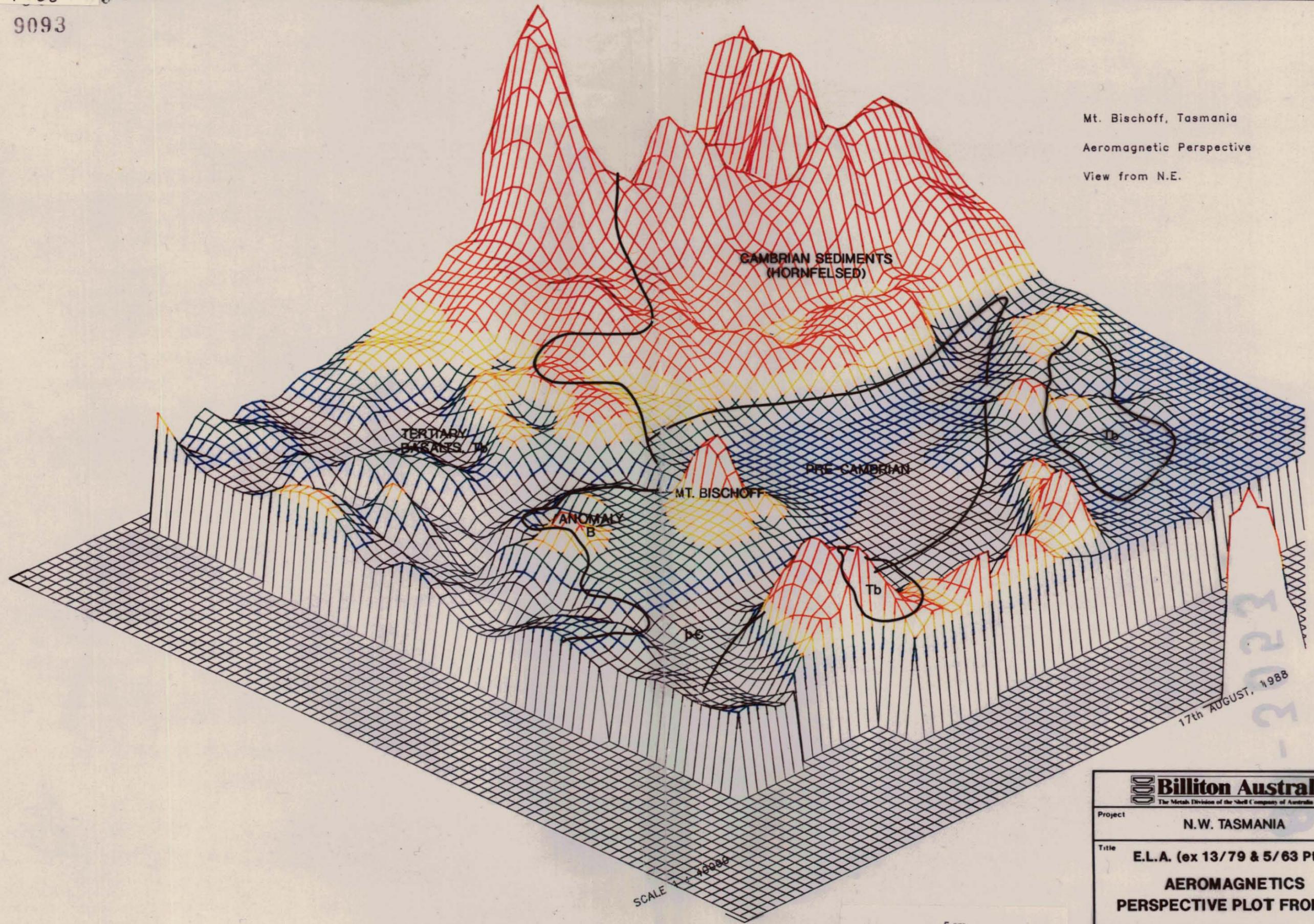
5 cm

17th AUGUST, 1988

557038

9093

Mt. Bischoff, Tasmania
Aeromagnetic Perspective
View from N.E.



17th AUGUST, 1988

SCALE 1:40000

5 cm

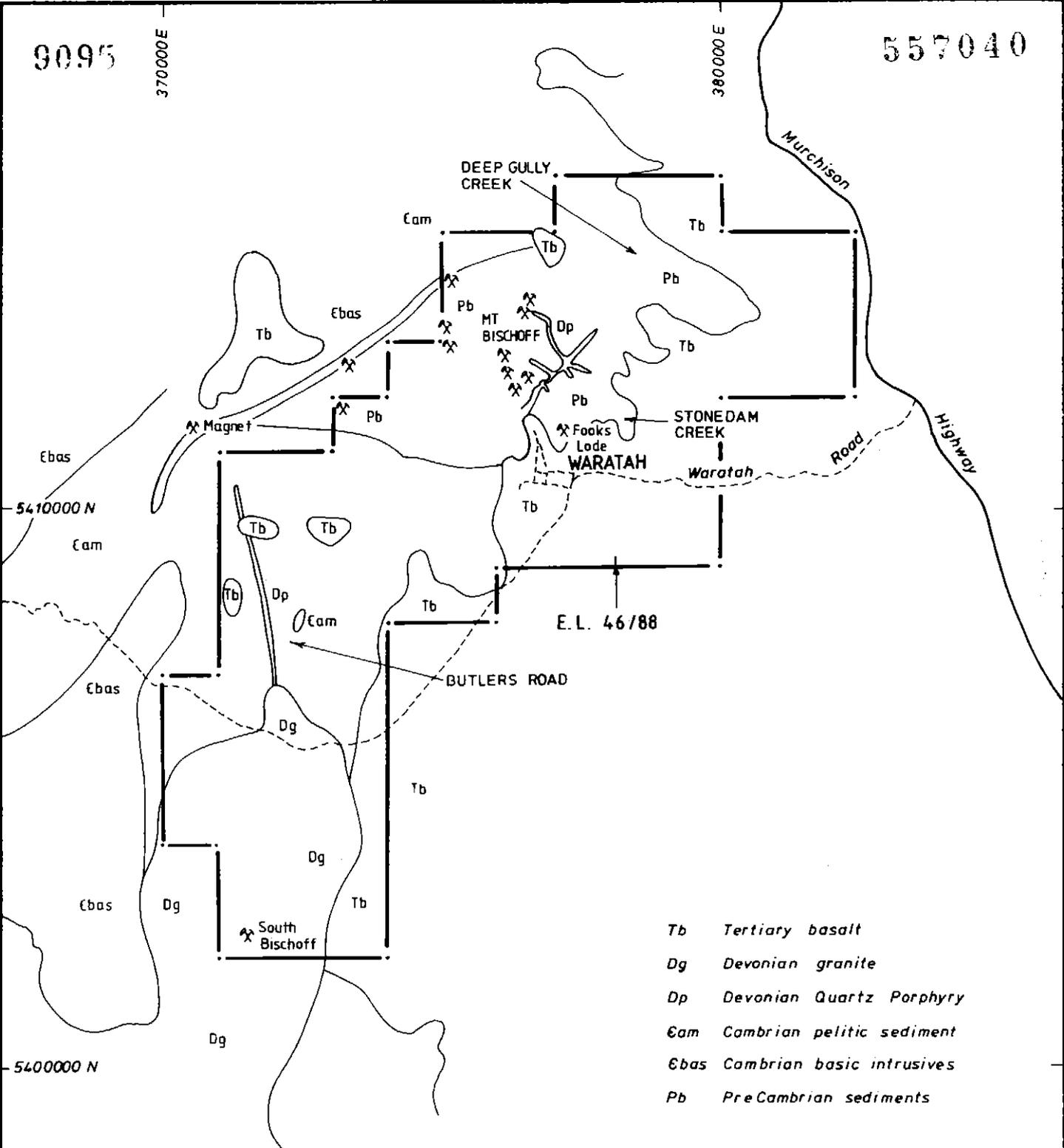
 Billiton Australia <small>The Metals Division of the Shell Company of Australia Limited</small>			
Project	N.W. TASMANIA		
Title	E.L.A. (ex 13/79 & 5/63 Pt.1)		
AEROMAGNETICS PERSPECTIVE PLOT FROM NE			
Author N.H.	Date 8/88	Scale 1:40,000	
Drawn	Office MELB	Revised	Date
Drawing No. MT24/1177			Fig. No. 3

9095

370000E

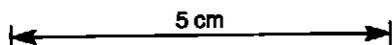
557040

380000E



- Tb Tertiary basalt
- Dg Devonian granite
- Dp Devonian Quartz Porphyry
- Cam Cambrian pelitic sediment
- Ebas Cambrian basic intrusives
- Pb PreCambrian sediments

Geology after Groves (1972)



Billiton Australia <small>The Metals Division of the Steel Company of Australia Limited</small>			
Project WARATAH			
Title E. L. 46/88 REGIONAL SETTING			
Author	JPR	Date	11/89
Scale	1:100 000		
Drawn	OH	Office	TAS
Revised	Date		
Drawing No	Fig. No. 4		

9096

378 000 m E

379 000 m E

5 412 000 m N

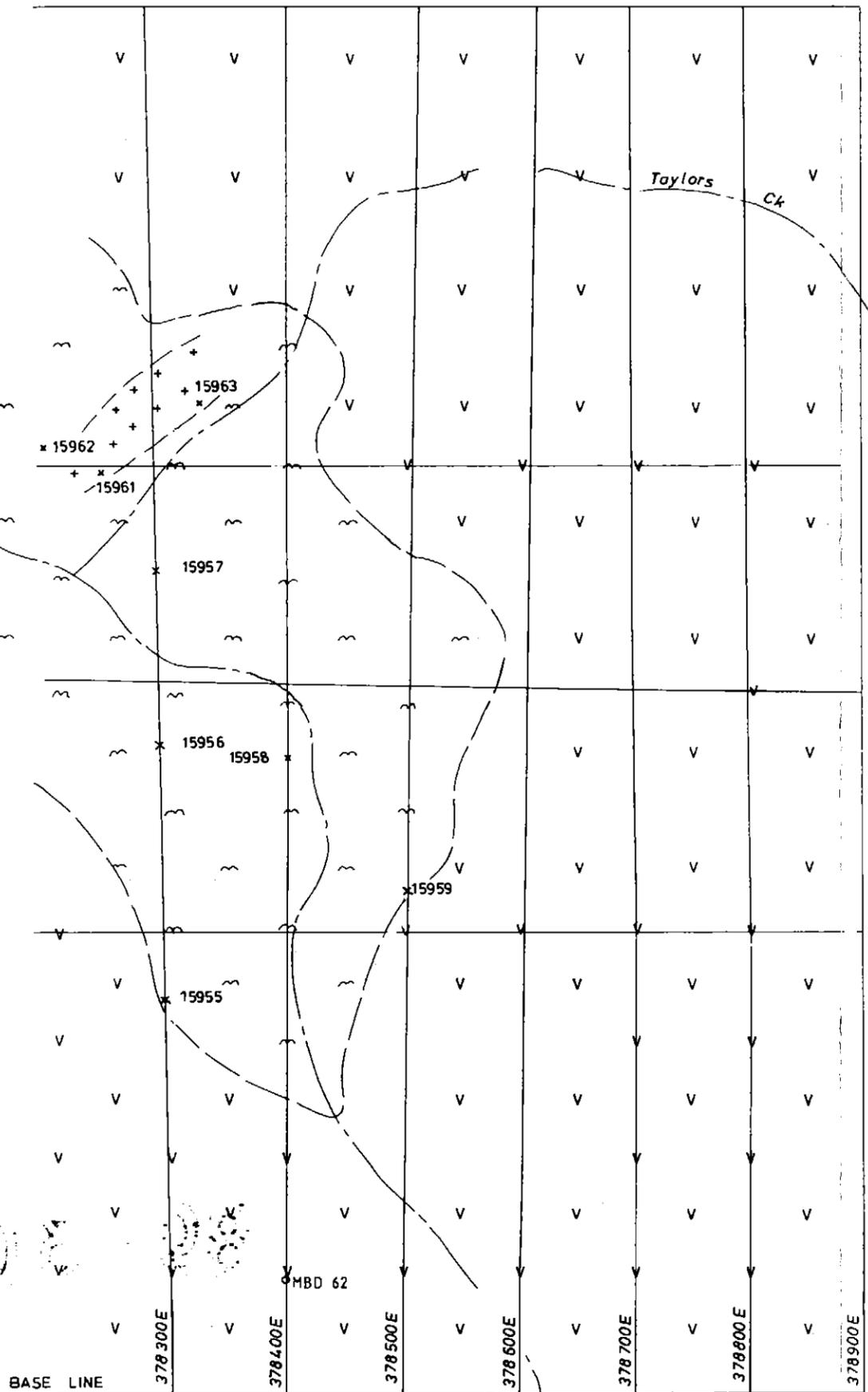
412 200 N

411 800 N

411 600 N

411 400 N

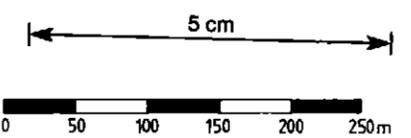
5 411 000 m N



- TERTIARY v v Basalt
- DEVONIAN + + Quartz-feldspar-muscovite intrusive porphyry
- LATE PRE-CAMBRIAN m m Quartzites and shales
- Geological boundary (inferred)
- ~ Stream
- Grid line
- + Rock chip sample sites

Sample	Au avg	Ag	Cu	Pb	Zn	As	Ba	Sn	W	Bi	Sb
15955	<0.01	1	4	22	24	26	210	8	<10	<4	10
15956	<0.01	<1	13	16	30	19	70	6	<10	<4	10
15957	<0.01	<1	20	12	19	26	95	<4	<10	8	8
15958	<0.01	1	11	14	10	17	120	<4	<10	8	12
15961	0.01	1	4	46	5	22	440	8	<10	<4	10
15962	<0.01	1	<2	175	11	36	155	14	10	4	14
15969	<0.01	<1	2	145	12	66	470	10	<10	6	16

ppm



89-3053

557041

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: **WARATAH**

Title: **STONE DAM CREEK GRID GEOLOGY**

Author: CJC Date: 6/89 Scale: 1:5000

Drawn: OH Office: TAS Revised: Date:

Drawing No: D/LB 13/001 Fig. No: 5



- LEGEND**
- Tb Tertiary Basalt
 - Dp(+) Devonian Quartz Porphyry Dykes
 - EE EoCambrian Greywacke
 - Pss sh PreCambrian sandstone, shale
 - Pdol PreCambrian dolomite
 - Stanniferous Lodes
 - ⊙ UTEM Anomaly
 - Magnetic Anomaly
 - ⊕ Diamond drill hole

NOTE 1. Geology Mt. Bischoff after D.I. Groves 1970.
 2. Geology grid after C. Creagh.

5cm

557042

Billiton Australia
 The Metals Division of the Shell Company of Australia Limited

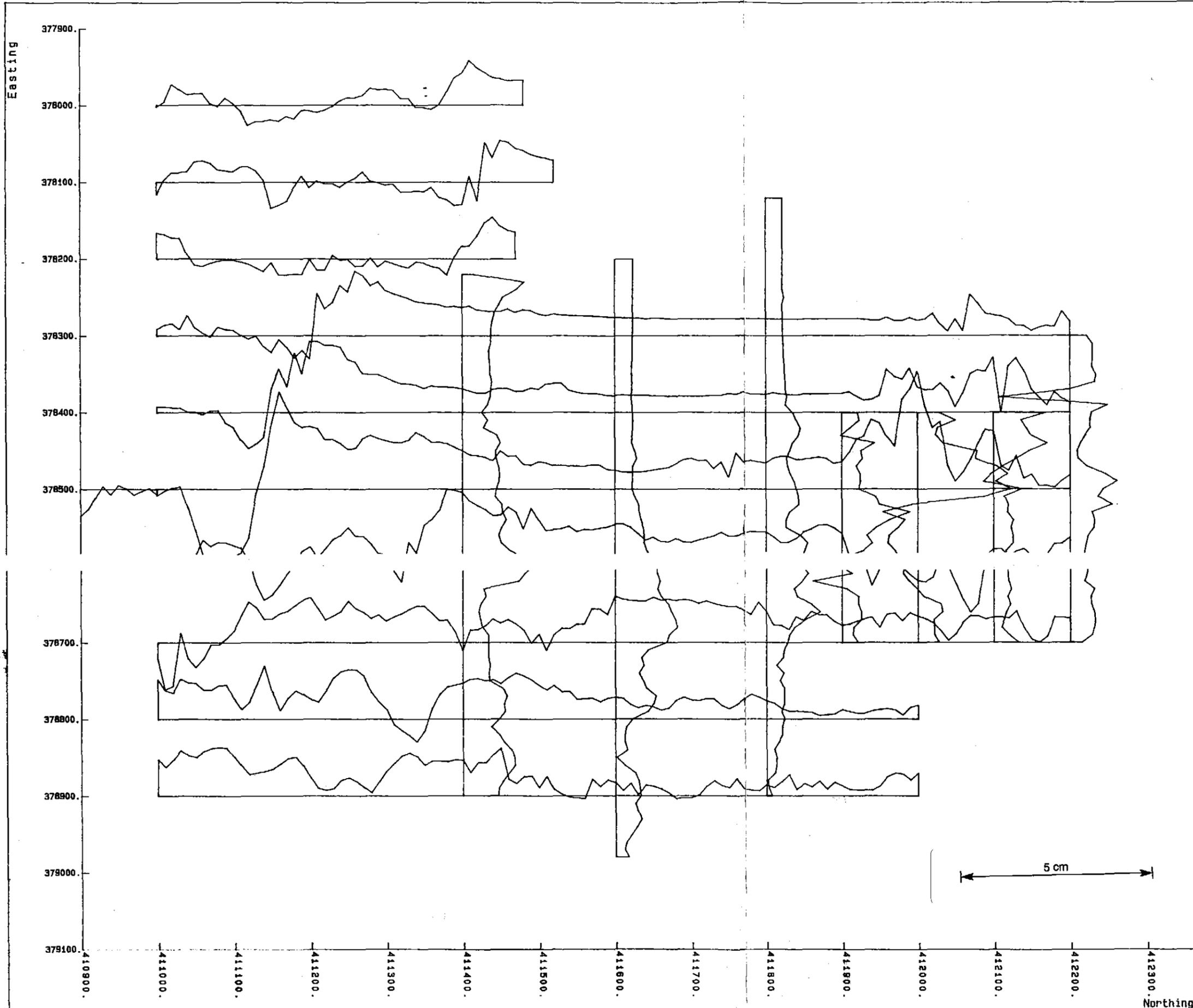
Project: WARATAH - E.L. 46/88

Title: STONEDAM CREEK LOCAL GEOLOGICAL SETTING

Author	JPR	Dept.	TAS	Scale	1:5000
Drawn	OH	Date	11/89	Revised	Date
Checked	Date	Sceded	Date		
Sheet No.	FIG 6	Drawing No.			

9098

Base Level : 62000.0
Plan Scale 1: 5000.0
Profile Scale (units/cm):
1000.0

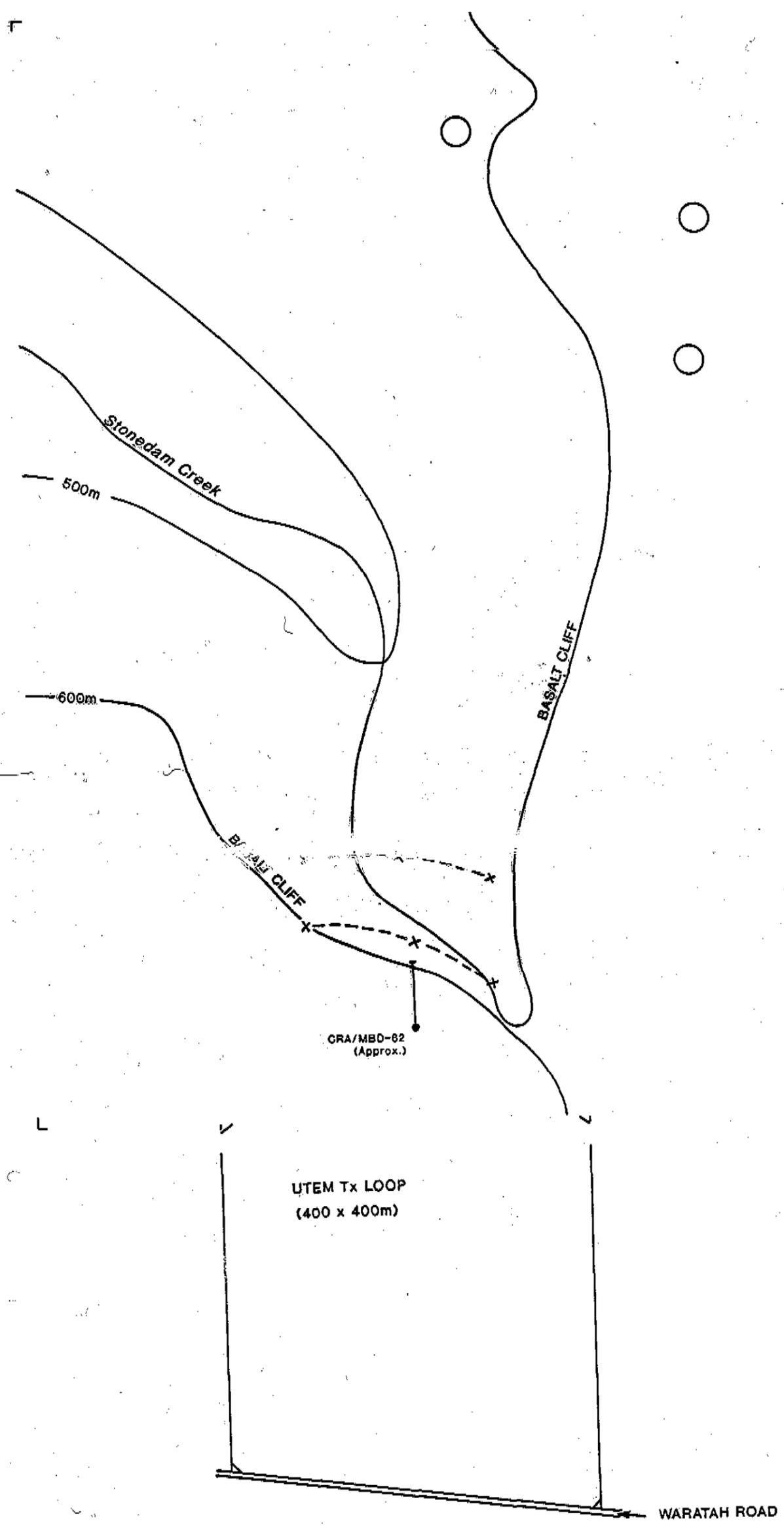


89-3053



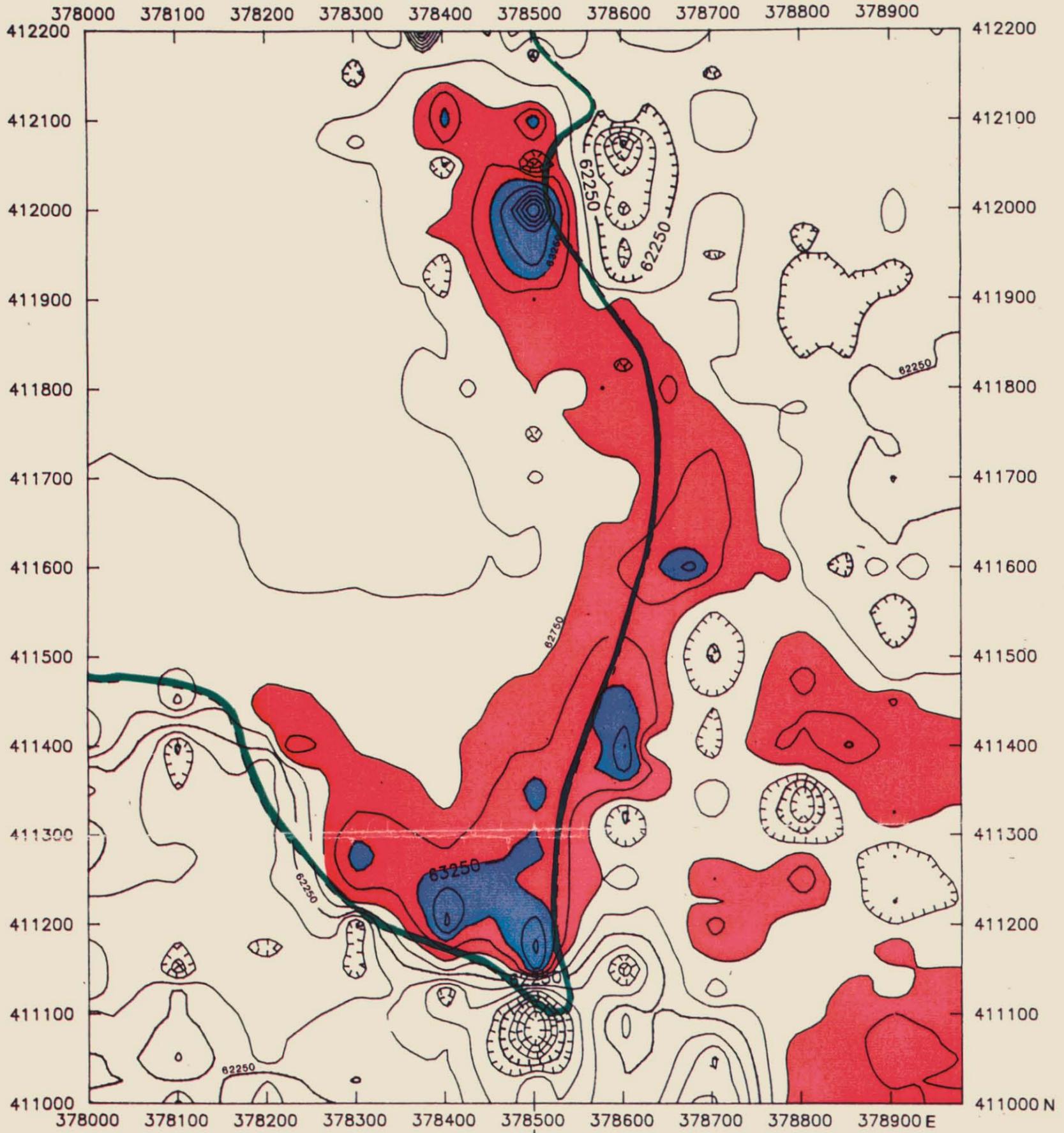
557043

WARATAH, TAS STONEDAM CREEK GROUND MAGNETICS BASE62000, 1000nT/cm	
FIG. NO: 4	REPT. NO:
ENCL. NO:	DRG. NO: FIG. 7
DATE: 24/8/'89	AUTHOR: N.H.
SCALE: 1:5000	OFFICE: MLB.



- X UTEM ANOMALIES (Z COMP)
- O DIGHEM EM ANOMALIES
- CRA HOLE MBD-62
- @ 10 920E, 10 310N (CRA coords.)
- = approx. Billiton coords.
- 376 410mE, 411 100mN

9099

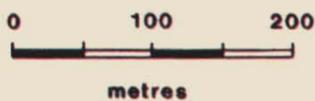


S57045

- Mesh = 25 x 25 m
- Scan = 300 m
- C.I. = 250 nT
-  600 m contour (from topo map)
-  >63250 nT
-  63250 - 62750 nT
-  Low

WARATAH ROAD

5 cm



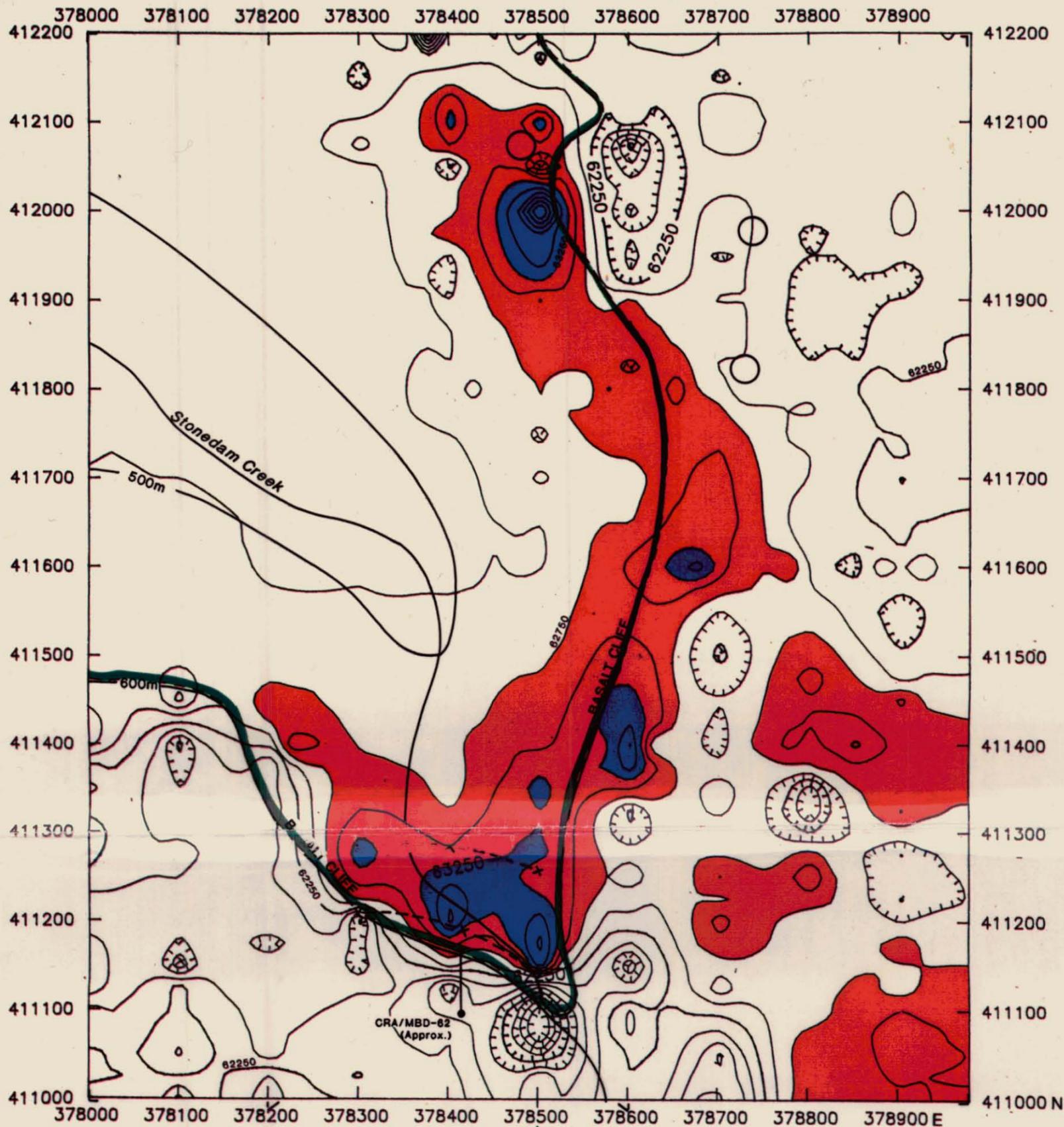
89-3053

 Billiton Australia <small>The Metals Division of the Shell Companies of Australia Limited</small>			
Project		WARATAH, TAS.	
Title		STONEDAM CREEK GROUND MAGNETICS	
Author	N.H.	Date	5/89
Scale	1:5000		
Drawn	A.M.	Office	AHO
Revised	Date		
Drawing No.	LD13/1002		Fig. No. 8

9099

557044

557045



UTEM Tx LOOP
(400 x 400m)

Mesh = 25 x 25 m

Scan = 300 m

C.I. = 250 nT

600 m contour
(from topo map)

>63250 nT

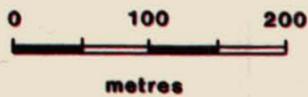
63250 - 62750 nT

Low

WARATAH ROAD

WARATAH ROAD

5 cm



X UTEM ANOMALIES (Z COMP)

O DIGHEM EM ANOMALIES

89 - 3053
 CRA HOLE 100-62
 @ 10 920E 10 50N (CRA coords.)
 = approx. Billon coords.
 378 410E, 411 100N

Billiton Australia <small>The Metals Division of the Shell Company of Australia Limited</small>			
Project	WARATAH, TAS.		
Title	STONEDAM CREEK GROUND MAGNETICS UTEM PLAN		
Author	N.H.	Date	5/89
Scale	1:5000		
Drawn	A.M.	Office	AHO
Revised		Date	
Drawing No.	LD13/1002	Fig. No.	8