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EXPLORATION LICENCE 21/87 - BALFOUR

ANNUAL REPORT : YEAR 1

(20 January, 1988 - 19 January, 1989)

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF PLANS

TENEMENT INFORMATION

EL 21/87 (Balfour) of 231 km^2 (Figure 1 & Plan 1) was granted to Aureole Resources Pty. Ltd., Winston Resources Pty. Ltd. and Sierra Nevada Resources Pty. Ltd. on 20 January 1988. Aureole Resources is operator.

The area comprises (guide only) : -

180.6 km^2	State Forest
30.6 km^2	Private Property
11.9 km^2	Crown Land
4.0 km^2	Arthur Pieman Protected Area
3.3 km^2	Balfour Track Forest Reserve

and excludes : -

1.8 km^2	Roger River State Reserve
0.5 km^2	Crown Reserve

EXPLORATION PHILOSOPHY AND OBJECTIVES

Aureole's primary target is to explore for platinum group metals, gold, and base metals, hosted mainly in receptive rocks along the eastern and southern margins of the Smithton Trough. Anomalous base metal and platinum values have been reported for mafic volcanics and carbonates from the district. The intense aeromagnetic anomalies along the trough margin correspond in part to known mafic volcanics and may also indicate the presence of ultramafics within early Cambrian sequences.

The southern part of the tenement is also considered prospective for copper-tin mineralisation of the Balfour style.

SUMMARY OF WORK COMPLETED IN YEAR 1

Activity in Year 1 has included : -

(a) Review of previous exploration and compilation of a 1:50,000 interpretative map of the EL based on available data.

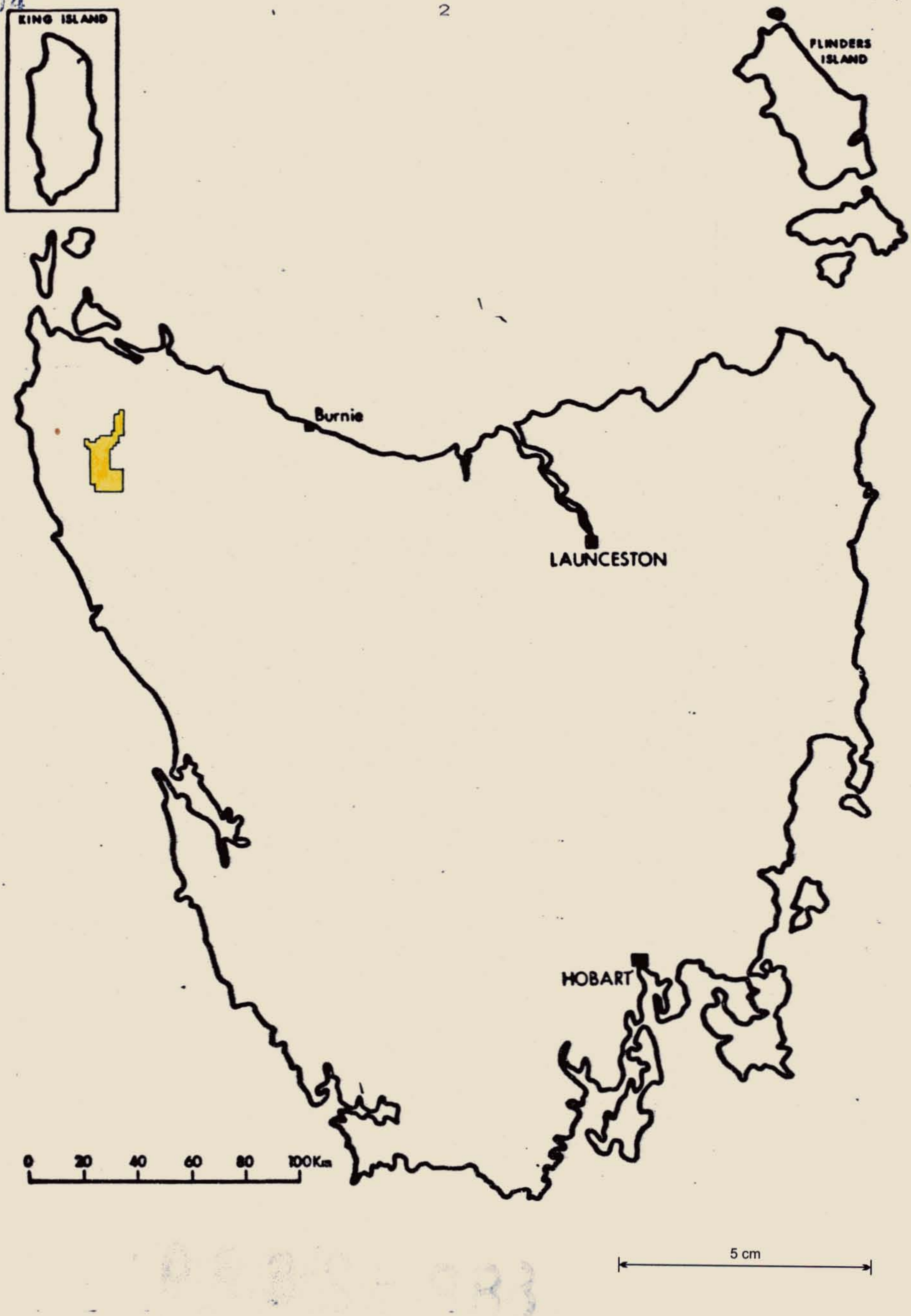

Figure 1. Location Map - EL 21/87, Balfour

(b) Evaluation of regional geophysics to high grade prospective areas for mafic and ultramafic rocks and to assist in structural interpretation of the tenement.

(c) Reconnaissance geological mapping to confirm broad rock types, coupled with regional rock chip sampling and assaying for Cu, Pb, Zn, As, Ag, Au, Pt and Ba.

(d) Petrological studies of selected rock types.

SPECIFIC SURVEYS

Literature Review of Previous Exploration

The Smithton Trough has seen regional exploration activity since the mid 1960's. Locally detailed exploration has occurred since 1977, conducted mainly by CRA Exploration Pty. Ltd. and BHP Pty. Co. Ltd.

During the mid 1960's, Pickands Mather & Co. International held EL 12/65 over a large part of north-west Tasmania, including EL 21/87. An extensive regional stream geochemical survey was conducted and although a number of geochemical anomalies were detected, and some resampling occurred later, no further work was undertaken (Anon., 1966).

An investigation of chromite occurrences in the Salmon River area, immediately west and north of EL 21/87 was conducted by Ocean Mining and Exploration N.L. in 1969. Seventy-three holes were drilled, with two showing economic grades (Volker, 1969). No detailed geology was done.

In 1972, ANZ Exploration Co. took out EL 6/72 over an area north of the Arthur River. Anzeco's primary target appeared to be tungsten, based on the similarity between the dolomite and dolomitic sediments observed on the EL and the carbonates on King Island (Kinnane, 1972). A panned concentrate survey and mapping programme was completed and approximately 100 samples were collected and analysed for Cu, Pb, Zn, Cr, W, Mo and Sn. Several anomalies were obtained, most of which were attributed to Tertiary sediments and black shales. Some tungsten anomalies around Trowutta were recommended for follow-up.

CRA commenced investigations in EL 1/77, which included part of EL 21/87. The target was shale-hosted lead - zinc deposits, following recommendations (Legge, 1980) that the Rocky Cape rocks showed some similarities in stratigraphic and tectonic style to the Selwyn Basin, Canada. Computer reprocessing of previous stream sediment data (Weir, 1982) indicated that the Trowutta-Dempster plains district was a prime target having elevated values of lead (18 ppm), zinc (125 ppm), copper and cobalt. A programme of reconnaissance mapping, including a photogeological interpretation of the country between the Arthur and Pieman River Valley (Carey, 1981), rock chip sampling and stream sediment geochemistry was undertaken in the northern part of EL 1/77 (Weir, 1982). A density of one stream sediment sample per 2 km^2 was achieved. Lead - zinc stream sediment sediment anomalies were obtained at Julius River [349433] (340 ppm Pb; 2,500 ppm Zn) and Stephens Rivulet [280427] (440 ppm Pb; 1,000 ppm Zn; 180 ppm Cu; 260 ppm Ni; 130 ppm Co). An arsenic anomaly was picked up in the Sumac Rivulet area [372392] (89 ppm As; 480 ppm Ni; 107 ppm Co; 580 ppm Zn) and a lead anomaly (195 ppm Pb) was obtained from Wents Creek [367445] near Lake Chisholm.

Follow up of the Julius River anomaly included detailed stream sediment sampling, gridding, 'C'horizon soil sampling and ground geophysics. It was concluded that the anomaly was derived from a disseminated source within the dolomite or from minor shears (Weir, 1983). Resampling of the other three anomalies failed to repeat the initial anomalous lead and arsenic values.

CRA Exploration relinquished the northern part of EL 1/77 in 1983 concluding that the black shale sequences exposed at the eastern margin of the trough were too thin to have produced economic mineralisation from brines (Weir, 1983).

EL 10/79 was operated as a joint venture by CRAE and Mineral Holdings Australia Pty. Ltd. (Anon., 1985). The target was initially dolomite, but when some anomalous gold and platinum values were obtained, greater emphasis was given to the metals aspect of exploration. Grades of 3.09 g/t [410732] and 4.06 g/t Au with 0.46 g/t Pt [408726] were obtained from dolomite chip sampling and, although resampling returned results of only 0.04 g/t Pt, the partners concluded that there was a significant gold occurrence in the dolomites. However, EL 10/79 was relinquished in 1984 with no follow-up work.

In response to some CRAE tin stream sediment anomalies located during 1977, and some INPUT aeromagnetic anomalies detected by Esso in 1973, CRA Exploration took out EL 12/80 in an area south of EL 21/87 (Dickson, 1985). The northern margin of an altered Cambrian basalt [340275] produced soil geochemical anomalies of lead (4,050 ppm), zinc (1,100 ppm) and gold (50 ppb) Within the basalt, anomalous copper (560 ppm), zinc (125 ppm), manganese (2,800 ppm) and gold (65 ppb) were reported (Weir, 1985). These assay results represent the best soil geochemical results obtained from the Rocky Cape Block. CRAE proposed a Besshi-style mafic volcanic hosted Cu-Zn-Au mineralisation within the basalt and a carbonate hosted Pb-Zn mineralisation at the northern margin of the block. Ground EM work failed to establish any significant conducting bodies attributable to the presence of sulphides and CRAE relinquished the EL in August 1985 (Dickson, 1985).

BHP Co. Pty. Ltd. obtained EL 18/80, on the eastern side of EL 21/87 to explore for carbonate-hosted cassiterite (Anon., 1983). While several aeromagnetic anomalies were investigated, one anomaly, which lies to the northeast of EL 21/87 [423650], was not accessed due to thick scrub. The EL was relinquished in 1983 due to poor results and difficult access.

Further exploration for tin/tungsten skarn type mineralisation was carried out by the EZ Co. Ltd. on EL 52/80 (Ferguson & Mathieson, 1987). EL 52/80 lies to the west of Smithton and includes a small part of the northernmost section of EL 21/87. No evidence of granitic intrusives was located. The EL was relinquished in 1982.

EL 15/86 lies to the north-west of EL 22/87 and was investigated by EZ Co. Pty. Ltd. Interest in a poorly exposed haematitic ironstone body occurring within the Cambrian sediments resulted in 3 costeans being excavated and 63 samples taken (McDonald, 1982). One gold value (17 ppb, fire assay), three arsenic anomalies and one silver anomaly (6 ppm) were obtained. EZ concluded however that there was no association between the ironstone body and precious or base metal mineralisation.

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Evaluation of Regional Geophysics

Aureole has completed a regional interpretation of existing aeromagnetic and gravity data over the southern part of the Smithton Trough, with particular reference to the prospectivity for copper and tin mineralisation near Balfour, and base metals and gold in mafic piles in the Cambrian sequence along the eastern margin of the Trough. The interpretation, by D.E. Leaman, is included as Appendix 2 to this report.

The main conclusions of the study are :

(1) The Pieman Granite extends at least as far as Balfour but existing data have not enabled definition of cupola forms or identification of structural loci upon it.

(2) Mafic and dolomitic rocks of the Smithton trough persist beneath an overthrust cover of Precambrian rocks. The margin of the trough sequence occurs a little east of Balfour. It is probably that the granite has locally intruded such materials. The dolomites are potential hosts.

(3) Copper mineralisation may be directly related to the granite and associated fracture systems or to extraction of trace copper from intruded mafics which have been subsequently concentrated in receptive rocks.

Reconnaissance Rock Chip Geochemistry

Fifteen samples including Cambrian mafic lavas, Cambrian and Precambrian sediments and vein quartz were collected from the tenement. Brief sample descriptions and locations are presented in Table 1. Locations are shown in Plan 1.

Eleven samples were selected for assay for Cu, Pb, Zn, Ag, As, Au, Pt and Ba. Original assay results are listed in Table 2 and Appendix 1, and assay results for major rock types are presented in Table 2.

Table 3 shows threshold element values adopted for the main rock types on ELs 21 & 22/87 based on the assay results of previous surveys (e.g., Weir, 1983; Cromer, 1988). Although the assay data are sparse, several generalisations can be made, especially when the results are considered in relation to Aureole's assay results from the adjacent tenement (22/87; Cromer, 1988).

Copper : In common with results from EL 22/87, consistently elevated anomalous copper values were returned from the Cambrian mafic lavas and all the other rock types throughout the tenement. This is not unexpected since native copper has been reported in these rocks throughout the district. Native copper, either disseminated throughout the rock or associated with carbonate veins and blebs, was recorded in tholeiitic basalt on EL 22/87 in the Drive Creek area at [410615] and [406618]. The highest copper value was not unexpectedly returned from a pyrite sample from black shales. The same sample shows the highest lead, arsenic and barium values.

Lead : Average lead for all samples is elevated, with the highest average in sediments. Cambrian mafic lavas are relatively depleted, showing only background values.

Zinc : Average zinc values are marginally elevated over all rock types; sediments show only background values; assays for mafic lavas are elevated.

Silver : With the notable exception of pyrite from black shale (210ppm), all rocks retained slightly ? elevated to elevated arsenic. Mafic lavas show only background values.

Gold : Only background values were returned

Platinum : A siltstone (AB3) showed anomalous platinum but all other samples returned only background values.

Barium : Barium is evenly distributed throughout all rock types. No values are anomalous.

Petrological Studies

Aureole is undertaking petrological studies of mafic lavas from EL 21/87 and the adjoining EL 22/87. Most of the work has been concentrated on EL 22/87 and one thin section description is available to date from EL 21/87.

AB1 [306463], Kanunnah Bridge, Arthur River

> *Probably from quenched flow margin or pillow rim. Considerably altered basalt, formerly very glassy, with glass now replaced by chlorite and secondary Fe, Ti oxides. Plagioclase microphenocrysts and microlites entirely albitized, patches of secondary albite filling fractures with calcite, and some aggregates of albitized plagioclase phenocrysts. Abundant leucoxene spots after tiny FeTi oxides. High abundance of oxides indicates this could even be from pillow/flow unit margin. Small grains of chalcopyrite are scattered through the rock.*

CONCLUSIONS AND RECOMMENDATIONS

Aureole, through its Year 1 activities of structural - geophysical interpretation, reconnaissance rock chip sampling and assaying has not varied its exploration philosophy but has upgraded the prospectivity of parts of the tenement. Two concepts remain to be further tested :

(a) Leaman's geophysical interpretation has highlighted the potential of the southern part of the tenement. There is untested prospectivity for Balfour-style copper-tin mineralisation sourced from a buried extension of the Pieman Granite and hosted in receptive Precambrian carbonates, possibly controlled by E-W structuring and the major Precambrian thrust sheet.

(b) While the assay work has not pointed to obviously anomalous areas and rock types, Aureole still regards the Cambrian mafic lavas as potential hosts for base and precious metal mineralisation. Considerable Year 2 work needs to be done to sort out the Cambrian succession, and current Department of Mines mapping will be very useful in this regard.

PROPOSED FUTURE EXPLORATION

It is proposed that further activities in Year 2 on EL 21/87 will consist of all or part of the following : -

(a) **Acquisition of further gravity data.** Present spacings of about 1 value per several km^2 are an inadequate base for detailed interpretation. The proposed coverage will be concentrated in the southern part of EL 21/87 in the Balfour area, and will be combined with coverage on Aureole's adjacent EL 53/88.

(b) **Detailed assessment of gravity data,** coupled with existing magnetics.

(c) **Mapping and sampling of prospective rock types** - particularly the Precambrian rocks north and east of Balfour, and Cambrian rocks further north along the margin of the Smithton Trough.

The aim of Year 2 mapping is to investigate the structural relationships between the various Cambrian rocks coupled with sampling and assaying which may lead to target definition for Year 3 drilling. This will test the concept that copper-gold mineralisation is associated with particular mafic rock facies.

Table 1. Rock sample descriptions, EL 21/87.

Locations are shown on Plan 1. "PTS" or "a" following description indicates polished thin section or assay (Cu, Pb, Zn, Ag, As, Au, Pt, Ba) respectively. Original assay results of those indicated "a" are listed in Appendix 1.

Sample No.	AMG	Description	Labwork
AB1	306463	Altered mafic lava	PTS
AB2	309463	Altered mafic lava	a
AB3	347343	Siltstone	a
AB4	345324	Sandstone	
AB5	345320	Clayey vein quartz	a
AB6	339305	Non-pyritic ? black shale	a
AB7	339305	Pyrite from bedding planes	a
AB7a	339305	Pyritic black shale	
AB8	304464	Altered mafic lava	a
AB9	304464	Altered mafic lava	a
AB10	334531	Altered, amygdaloidal, mafic lava	a
AB11	334531	Mudstone	a
AB12	334531	Silicified quartz-epidote rock	a
AB13	334531	Sheared mudstone	
AB14	345545	Mafic lava	PTS
AB15	344543	Amygdaloidal mafic lava	a

Table 2. Assay Results, EL 21/87.

ml = mafic lava
s = sediment
q = quartz
p = pyrite

Refer to Table 1 for brief descriptions

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Au ppb	Pt ppb	Ba ppm
AB 2 (ml)	430	35	245	<0.5	5	5	6	556
AB 3 (s)	165	40	130	<0.5	12	5	19	191
AB 5 (q)	30	25	20	<0.5	3	<5	<1	273
AB 6 (s)	30	65	25	<0.5	58	<5	2	697
AB 7 (p)	610	75	110	<0.5	210	<5	<1	730
AB 8 (ml)	75	20	160	<0.5	11	<5	1	322
AB 9 (ml)	165	35	90	<0.5	8	<5	10	544
AB10 (ml)	80	15	135	<0.5	6	<5	4	243
AB11 (s)	105	35	135	<0.5	8	<5	2	206
AB12 (q,s)	120	25	120	<0.5	7	<5	<1	114
AB15 (ml)	630	25	90	<0.5	4	<5	9	265
Averages								
mafic lavas	276	26	144	<0.5	7	<5	6	386
sediments	100	47	97	<0.5	26	<5	8	365
all rocks	222	36	115	<0.5	12*	<5	5	376

* excludes pyrite sample (AB7)

Table 3. Selected Element Thresholds, ELs 22/87 and 21/87 (Cromer, 1988).

B - background
E - elevated
A - anomalous

Є LAVAS, VOLCANICLASTICS

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Au ppb	Pt ppb
B	<100	<25	<100	<0.5	<8	<5	<25
E	100-200	25-50	100-250	0.5-2.0	8-20	5-10	25-50
A	>200	>50	>250	>2.0	>20	>10	>50

Є SEDIMENTS

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Au ppb	Pt ppb
B	<50	<25	<100	<0.5	<10	<5	<5
E	50-100	25-50	100-250	0.5-2.0	10-30	5-10	5-10
A	>100	>50	>250	>2.0	>30	>10	>10

Є CARBONATES

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Au ppb	Pt ppb
B	<20	<10	<50	<1	<5	<5	<5
E	20-40	10-20	50-100	1-2	5-10	5-10	5-10
A	>40	>20	>100	>2	>10	>10	>10

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APPENDIX 1

ASSAY RESULTS EL 21/87

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ANALABS

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ANALYTICAL REPORT No. 999.46.08.05731

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

W. Cromer
Aureole Resources NL
190 Macquarie St.,
Hobart
Tasmania 7000

ORDER No.	PROJECT
18501	

DATE RECEIVED	RESULTS REQUIRED
19/09/88	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	17/10/88	1	41

STATE OF SAMPLES (REFER BELOW)	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS (REFER TO ANALYSIS SECTION)	PREPARATION	METHOD
	Various	RO	Prep: 006,010,011,012,013,016						Cu,Pb,Zn,Ag/101,As/114		
	Various	RO							Au/313,Pt/311,Ba/401		

RESULTS TO:

W. Cromer
Aureole Resources NL
190 Macquarie St.,
Hobart
Tasmania 7000

RESULTS TO:

REMARKS

STATE OF SAMPLES	
whole core	WC
split core	SC
cutting	CU
rock	Ro
soil	SO
pulp	PU
water	WA
tissue	TI
stream sediment	SS
heavy mineral	HM

ANALYSIS — PREPARATION			
perchloric acid	A1	cold acid	CA
hydrochloric acid	A2	specific sulphide	SS
nitric acid	A3	other mixed acids	Ma
aqua regia	A4	alkaline attack	AA
nitric-perchloric	A5	volatilization	VO
HF mixture	A6	ignition	IG
HF under pressure	A7	pressed powder (XRF)	PP
fusion	A8	glass fusion (XRF)	GF

ANALYSIS — METHOD	
atomic absorbtion	AAS
x-ray fluorescence	XRF
spectrophotometry	SPEC
colorimetry	COL
chromatography	CHR
titration	TTN
other chemicals means	CHEM
miscellaneous	MISC
fluorescence	FLUOR
inductively coupled plasma	ICP

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.46.08.05731	17/10/88	18501	2 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Pt	Ba	
6	AB 02	430	35	245	<0.5	5	0.005	0.006	556	
7	AB 03	165	40	130	<0.5	12	0.005	0.019	191	
8	AB 05	30	25	20	<0.5	3	<0.005	<0.001	273	
9	AB 06	30	65	25	<0.5	58	<0.005	0.002	697	
10	AB 07	610	75	110	<0.5	210	<0.005	<0.001	730	
11	AB 08	75	20	160	<0.5	11	<0.005	0.001	322	
12	AB 09	165	35	90	<0.5	8	<0.005	0.010	544	
13	AB 10	80	15	135	<0.5	6	0.010	0.004	243	
14	AB 11	105	35	135	<0.5	8	<0.005	0.002	206	
15	AB 12	120	25	120	<0.5	7	<0.005	<0.001	114	
16	AB 15	630	25	90	<0.5	4	<0.005	0.009	265	
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	1	0.005	0.001	10	
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
25	METHOD	101	101	101	101	114	313	311	401	

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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BALFOUR-TROWUTTA AREA
NORTH WEST TASMANIA

EVALUATION OF REGIONAL GEOPHYSICS
IMPLICATIONS SPECIFIC TO EL 21/87

by
Dr. D.E. Leaman

for
Aureole Resources

September 1988

BALFOUR

CONTENTS

FIGURES

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SUMMARY

Regional, conceptual analysis and review of available gravity and magnetic data in the Smithton - Balfour region of north west Tasmania was undertaken to provide an overview of this little understood region. In the absence of uniform or detailed mapping, some perspective on structure, structural control, mineralising sources, potential host rocks and prospectivity was sought in broad terms. Such perspective is necessary if a reasonable exploration and relinquishment programme is to be accomplished.

Although the data sets, especially gravity, leave something to be desired - and should be upgraded in the near future - it is clear that established mineralisation has a locus at Balfour. Copper and tin mineralisation near Balfour have always appeared enigmatic and, as a result, the prospectivity of the area has not been appreciated. The present work shows that the mineralisation can be readily explained but that the structural setting is complex.

The available data cannot resolve details of the cupola or spine which projects from the Pieman granite toward Mt Balfour but this mass, at some 2 km maximum depth, has controlled most of the mineralisation near Balfour. E-W fracture systems near its northern tip have also played a part in the location of vein systems. Tin mineralisation appears to be directly related to the nose of granite while the copper prospects are aligned along a fracture system which is sympathetic to a major thrust and which is mineralised in the region where the granite has intruded rocks of the Smithton Trough beneath the overthrust *Precambrian Temma sequence*.

Materials of the Smithton Trough extend west of Balfour but are concealed by up to 3 km of Precambrian rocks. All units are folded consistently with the patterns which can be inferred from the exposed part of the Trough but the overall thickness of the Trough section is rarely more than 3 km. Mafic rocks, basalt and spilite, extend right across the Trough but the data indicate that these rocks are rarely massive or present as thick piles.

It has been concluded that the Balfour area is highly prospective and that potential for a substantial blind deposit exists; either tin or copper-gold. The presence of concealed Trough rocks, including dolomites, offer opportunities for replacement deposits as well as vein deposits. Any free ground in the Balfour area should be claimed immediately.

INTRODUCTION

The Balfour - Trowutta area (Figure 1), indeed much of the Smithton Trough, has attracted limited previous exploration. Little mineralisation is known outside the immediate environs of Balfour but traces of exotic and precious metals have been recorded from the rocks of, or adjacent to, the Trough.

Aureole Resources has acquired EL 21 and 22/87 (see Figure 1) with special emphasis on precious metals although it was thought there may be some potential for base metals.
The initial programme on these licences has been directed toward a better understanding of structural setting and general distribution of mineralisation. This report forms a significant part of such appraisal. Gravity and magnetic data have been used to formulate an assessment of potential sources of mineralisation, nature of primary structures and fracture styles and patterns.

Geological control and mapping information tends to be patchy, old or of doubtful reliability (e.g., Williams and Turner, 1973). Significant geophysical or structural contributions have been dependent on magnetic or gravity data. Bishop (1986) provided an outline of magnetic coverage, tests of data presentation and a description of principal anomaly features. Leaman (1988 b) combined this information with the TASGRAV data base to generate a first order view of crustal structures and Precambrian and Lower Palaeozoic relationships in NW Tasmania. The study reported here is built on that foundation.

This report provides a regional analysis relevant to both licence areas held by Aureole Resources and the treatment was intended to assist appraisal of features within the held areas. It also contains specific comments on those features which are of particular importance to the prospectivity of EL 21/87.

DATA

The magnetic data used were acquired by the Bureau of Mineral Resources to specifications comparable to those of Tasmanian Mines Department surveys in western Tasmania. Lines were flown E-W with a spacing of about 500 metres and a ground clearance of 150 metres. The sample spacing is of the order of 50 m. Survey details and a range of presentations of the magnetic field have been given by Bishop (1986). Extracts from this compilation are shown in Figures 4A and 4B. The relief presentation provides an indication of trends and key features while the contour maps offer a smoothed quantitative outline for evaluation.

A clearer presentation of anomaly character is provided by the profiles of Figures 5A to C. These samples, about 2.5 km apart, of the survey show how much the contour presentation, and its gridding bias, have filtered some important character. A subset of these profiles, based on each fourth or fifth observation, have been used for regional modelling. This has limited resolution of near surface features but such detail is not justified so early in a regional programme or exploration and cannot, in any event, be properly assessed without a coarser framework and evaluation of major geometric and source effects. Bishop (1986) has offered little information of this type which might assist structural evaluation.

The gravity data used were extracted from the Mines Department TASGRAV data base (Richardson and Leaman, 1987). This area has not been favoured by any recent surveys and coverage is relatively poor. Most stations were observed as part of the BMR statewide helicopter survey of fifteen years ago. The station spacing is of the order of 7 km. This naturally limits definition and resolution of sources and structures. Figure 2 has been reproduced from a Mines Department compilation prepared for the new volume of the Geology of Tasmania and, although slightly smoothed, provides a regional outline of the gravity field. The data in this form was interpreted by Leaman (1988 b) to generate a view of the Smithton Trough and the nature of the adjacent Precambrian rocks.

The regional interpretation suggested that the rocks of the Smithton Trough were gently folded and never more than 3 or 4 km thick. This estimate was a refinement of work by Richardson (1987). The Precambrian rocks to the east form a crustal unit of siliceous basement style while those nearer the coast (west and north west of Balfour) which appear similar at surface are certainly different on crustal scale. Two solutions have been offered for this enigma; a varied but not exposed denser and more magnetic lithology, or the surface materials are not representative of the Precambrian of the area. No Tasmanian Precambrian rocks possess the combination of magnetic and density properties required and it has to be concluded that the surface rocks are atypical of the section. The possibility that these were overthrust on the rocks of the Smithton Trough was mooted but not established. The style of structure implied was described for similar but smaller Precambrian blocks at Cape Sorell (Leaman, 1988 a).

Two other issues are relevant to the present study. Leaman (1988 b) indicated that the present gravity data, in the format used, could not resolve with certainty any granites in the Balfour area and thus the tin mineralisation there may be anomalous. (The format was derived from Figure 2 and not raw data.) The gross, regional study, however, also defined a general integrated form for the Moho across NW Tasmania and this was subsequently checked and refined independently. This concept was then presented as Mantle 88 (Leaman, 1988 c) and may now be used to generate the crustal component of the regional field. Calculation of this component essentially frees the residual from all effects other than shallow geology or granites and means that the process and reliability of interpretation is transformed. The residual map generated for the stations in the Smithton - Balfour area is presented in Figure 3. This map forms the basis of the present interpretation and contains no crustal component.

GENERAL ANALYSIS

FEATURES OF THE POTENTIAL FIELDS

This brief commentary suggests those features of the fields which appear unusual or of geological interest and which any satisfactory interpretation must evaluate and account. Some have direct lithological or formational origin but others may be geometric. Explanation and assessment may reveal those elements which are abnormal and of exploration interest.

The gravity field presented in Figure 3 contains few high amplitude or high frequency features since the station spacing is coarse. There are four principal elements. A strong NE-SW gradient bisects the area; north of it the field is generally positive and but is negative to the south - until the Arthur Lineament is approached. It is strongly negative south of Balfour and there is generally no equivalent massive positive feature. The strong gradient near the coast at 5415 000 mN can be associated with the northern boundary of the Pieman Granite but the lesser continuation of this gradient lies within the Rocky Cape core but significantly east of a line of small magnetic anomalies (see Figure 4A).
A more subtle NW-SE gradient also bisects the area but the effect is only obvious near the intersection with the Arthur Lineament south east of Balfour. Rocks of the Smithton Trough and the coastal Precambrian materials west of them present comparable anomalies. This pattern is disturbed only near Marrawah and at Edith Creek. The large positive anomaly near Edith Creek has a magnetic analogue. Both are localised. The general response of the Temma or coastal Precambrian rocks can be contrasted with that of Rocky Cape core rocks which present a slightly negative anomaly. Slightly negative values are wholly consistent with known density information which suggests a bulk density of about 2.65 t/ cu m for these rocks. Negative values result from use of 2.67 t/cu m in the Bouguer reduction.

The features of the magnetic field are best viewed in Figure 4B. The rocks of the body of the Smithton Trough are essentially non anomalous although, importantly, the field is not flat but increases westward. This property persists to the coast, at least. The major anomalies south of Smithton and north of Balfour can be related to a sequence of mafic volcanics. Some of the larger anomalies NE of Marrawah are of similar origin. No ready explanation is, however, possible for the features within the coastal Precambrian block or the more subtle alignments within the Rocky Cape Block. The opposing character of the trends is stressed by this presentation.

TRENDS

Subjective assessments of trends, offsets and alignments evident in Figures 2, 3, 4A and 4B have been compiled in Figure 6. The clearest presentation of many features if offered by the relief view of the magnetic field. There is little evident in the derivative formats provided by Bishop (1986) which is not apparent in Figure 4B. The gravity data lack equivalent definition but major elements can be recorded. Some features appear offset from magnetic features. The separation may be real or it may reflect up to 3.5 km error in plotting position due to coarse station spacings. Most weight has therefore been assigned to magnetic features in all subsequent discussion and conclusions but it must be noted that the gravity data do reflect major structural or lithological changes even if imperfectly located.

The peak gravity-magnetic feature near Edith Creek occupies a critical position. The exposed mafic volcanic suite is distinguishable as a whole and many members can also be recognised. Not all of these are shown in Figure 6.
It is clear that dyke swarms within the Rocky Cape Group to the east of Balfour reflect a persistent trend set and the E-W features mapped near Balfour are related to gross structural controls.

GRAVITY INTERPRETATION

Seven profiles were randomly selected which encompass all significant aspects of the residual field. Resolution is restricted by assumptions about densities (not especially critical here) and coverage. The data have proven so valuable in their implication that this interpretation represents the maximum reasonable extraction of information.

A range of options has been tested in each case until a uniform density pattern was recovered which also generated consistent relationships both in geological terms and shift parameters. The latter are shown in the upper right of each figure. In this study a differential between observed and calculated profiles of one mGal was noted. This is wholly believable since the residual (obs) profile was created using the crustal shape and excluded the regional effects of ocean water nearby. The effect of water amounts to about 1.25 mGal in this area.

Line 320E (Figures 7A and 7B) tackles the problems of the western Precambrian block and the major negative anomaly south of Balfour. The mass balance depends on near neutral Precambrian responses and a continuity of Smithton Trough materials. The bulk density of the latter can only be estimated at this stage in the absence of reliable sampling and property determinations.
Two solutions have been offered. In each case it is clear that

the rocks of the Smithton Trough must be continuous and that the western Precambrian (south of Marrawah and east of Temma) dip shallowly over them. Thrusting is the only solution.
A bulk contrast of about 2.76 t/cu m has been assumed for the Trough sequence. This is based on the established mafic and dolomitic content. Each of these lithologies could be expected to possess bulk densities in excess of 2.80 t/cu m and any interbedded mudstones or shales in excess of 2.74 t/cu m. The value used may thus understate the contrast and overstate the thickness of section, but the form of the solution is relatively unambiguous.
The distinct step in anomaly near 5430N, the site of intersection of NE-SW or E-W trends (see Figure 6) represents offset of the trough section (Figure 7A) or its absence (Figure 7B). In either case the ultimate negative depression south of 5410N cannot be explained by other than a large negative contrast or rock volume and the extension of this line onto the Pieman Granite leaves little doubt as to the origin of the response.
No solution could be found which explained the anomaly forms using granite alone in the absence either of continued trough section or a dense metamorphic halo.

Line 330E (Figure 8) reinforces these comments for a profile more distant from the apparent granite. It does appear that either the granite is dominant at this easting or the slab of overthrust material is terminated. The granite is certainly overpowering but it would be possible to find solutions comparable to Figures 7A or B although the volume of Trough material would be much reduced and the granite interpreted at shallower depth. Improved coverage is required for complete resolution of this problem. The slab form of the Trough section north of Balfour reflects orientation of the profile along a fold axis and consistent residual values. The thrust is much steeper in this region.

Line 340E (Figure 9) presents an oblique view of the rocks near the margin of the Smithton Trough and the large anomaly near Edith Creek. The section confirms the subtle negative contrast of the Rocky Cape Group basement (available determinations suggest a maximum density of 2.65 t/cu m) although there is a contrasting and ill-defined denser core. The content and form of the mafic volcanic section cannot be resolved in detail but there are alternations of massive, high density members and the densest accumulation is in the Edith Creek - Trowutta area.

Line 5430N (Figure 10), although not ideally located with respect to the granite implied beneath - or south of - Balfour, nevertheless confirms the implications of lines 320 and 330E (Figures 7 and 8). A stepped, overthrust slab of Trough sequence is present and possibly intruded by the granite. The general form of the profile reflects the nearness of a large cupola or spine and is not related to any subtle variations in Precambrian rocks. The implied granite density of 2.62 t/cu m is consistent with a typical Devonian adamellite or "tin" granite. The abrupt

increase in anomaly at the east end of the profile reflects nearness of the rocks of the Arthur Lineament and a major change in lithology.
Although the anomaly steps near 325E are not well defined the model easily generates their form.

Line 5440N (Figure 11) samples the apparently narrow closure at the south end of the Smithton Trough. The form of the anomaly is clearly independent of the exposed materials, notably Precambrian west ot 324E, and related to the shape (of folding) of the Trough section. The deficiency east of the margin based on mapped limits indicates a possible mapping flaw, a faulted or very steeply dipping marginal contact for at least 200 m. The discussion assumes a reasonable validity for the data set and contours based on it.

Line 5450N (Figure 12) confirms the general form implied at 5440N and tests the possibility of a steeper margin near 340E. The model also provides a more substantial test of the thrust concept. The model also includes a test of the effect of the Middle/Upper Cambrian rocks of the syncline axis as exposed near Christmas Hills. These modify basal depth estimates by about 200 m. No other stratification can be inferred with certainty using extant gravity data. The Figure comments a stratigraphy within the Trough fold but details cannot be resolved. The density distribution is compatible. It is clear that some of the model boundaries near South Trowutta are artificial and that the dense volcanic members interfinger with the sequence as a whole. The presence of such members and estimates of their contrast are only reliably noted where fold limbs are steeply dipping and sub horizontal situations offer little scope for resolution, especially when data spacing with respect to the fold wavelength is coarse.

Line 5460N (Figure 13) confirms the implications of lines 5440, 5450N and shows that the exceptional anomaly near Edith Creek is related to a thick, steeply dipping, dense mafic pile within the Trough sequence. The pile is tightly folded and may not persis far to the west (see also comments above). The small fold shown near the contrast contact is an essential element of the model and the style of structure near the primary trend intersection and pinch point between Roger River and Edith Creek (see Figures 4A, B; 6).
The observed anomaly is exceptional and localised and fortunately based on some additional coverage. It can be accepted as a real feature whose effect diminishes rapidly to the north - as seen in extensions of the data base. Proper definition of structures around the pinch point and the volume of dense mafic rocks is dependent on acquisition of additional observations.
The model also suggests that the dolomitic sequences thin rapidly onto the Precambrian basement but a steep margin may be disguised beneath the section near Nabageena.

MAGNETIC INTERPRETATION

Only four profiles were examined. Each was based on actual data (E-W lines) and no attempt was made to generate profiles by interpolation from Figure 4A. Note that the magnetic models/ profiles are shorter than their gravity counterparts and relate only to the eastern half of the equivalent gravity model. A consistent shift differential of 50 nT is required to balance all solutions with the effective base level of the survey.

Line 5430N (Figure 14) contains four features; a near base level plateau to the east, a large depression, two spikes and a broad rise to the west.
The eastern base level response indicates that the western magnetic part - essentially the mafic component of the Smithton Trough sequence - is terminated near 332E. The spikes represent local and probably very narrow sources (dykes or oxidised fractures) whose location may ultimately be crucial to understanding of control of mineralisation.
Assessment of the low anomaly zones shows that no source near this section can generate it and comparison with other profiles (Figure 5C) indicates that the effect is a geometric response from sources exposed to the north.

Line 5440N (Figure 15) samples the volcanic section and shows that only about half of the section at this northing is either mafic or volcanic. The envelope indicated, and folded into the Trough, is based on response limits. No continuity can be established within the east-dipping limb but the bulk contrast establishes significant mafic content and implies continuity or overlap of some mafic members.

Line 5450N (Figure 16) which samples more of the Trough section than the previous line shows that significant mafic units do persist across the fold. The crude shape modelled could be refined but the mismatch has been presented in order to demonstrate just how, and how much, sources related to observed patterns in the field - even when sub horizontal and not easily resolved gravimetrically. Note that at this northing the mafic section is at least two thirds massive, magnetic volcanics. A clearer view of the variations in flow content, volume and response can be gauged from these models and comparison with profiles (Figures 5A to C). The features of Figures 4A and B can thus be converted into surface mapping guides for exposed volcanics and substantial igneous members.

Line 5460N (Figure 17) transects the sequence near the structural constriction south of Edith Creek (see Figures 4A, B; 6) and provides a broad assessment of structural form. The model provides an indication of the envelope containing mafic rocks. Although the profile fit is imperfect near 338E (it is equivalent to that on profile 2380, 2.5 km south - see Figure 5A) the general style is evident. That such a solution should fit the adjacent profile further removed from the structural constriction suggests a valid formal solution unsatisfactory in terms of fine detail only.

STRUCTURAL INTEGRATION

The gravity-magnetic models, although based on data sets of differing quality and assessing different aspects of the stratigraphy and structure, are consistent. It is possible to insert the magnetic envelope for the volcanics within the mass envelope of the gravity model for the Trough sequence and also demonstrate equivalent structural forms for each envelope.

The mafic suite is continuous across the Trough.

The large magnetic anomalies and mass anomaly north of Trowutta and west and south of Edith Creek are related to a massive pile of volcanics or a relative absence of intercalated sediments. The observation of responses west of the Duck River Fault at Edith Creek, and to a lesser extent near Ekberg Creek, represents offset and tight folding near the fault. In each case major cross structures or intersections are established or inferred (see also trends, Figure 6).

Both data sets are consistent with a thrust solution for the western Precambrian rocks and for continuations of the Smithton Trough to the SW. It is certainly not a closed off or pinched out structure near Balfour. The Trough sequence is folded and the pattern of folds impliedj is suggested in Figure 18. This is consistent with exposures and shows that the domal structures north of Marrawah lie on a plunging anticlinal axis which persist beneath the thrust block. Figure 18 also suggests the thickness of the thrust cap.

Although the data, methods and models which are the basis for this diagram are not ideal they do show that the thrust surface is irregular and probably faulted or folded. The changes in form of the surface can be correlated with major trends evident in all data (compare Figure 6).

The present work, made possible by the availability of a sound regional separation - Mantle 88 (Leaman, 1988 c), has established that the Pieman Granite extends into the Balfour region and intrudes a concealed extension of the Smithton Trough.

Relatively modest magnetic trends or alignments of anomalies can be related to discontinuities within the overthrust block or the concealed sequence and indicate alteration or some fracture systems. These features are thus valid indicators of fluid transfer and several are obviously associated with the limits of the granite spine.

DISCUSSION
MATTERS SPECIFIC TO EL 21/87

The present interpretation changes considerably any previous assessment of the prospectivity of the Balfour region. The somewhat enigmatic trends of copper and tin prospects west of Balfour are wholly explained and placed in a prospective context for the first time.

The tin mineralisation is clearly related to the protrusion from the Pieman Granite. This extends at least a far as Balfour but extant data have not enabled definition of cupola forms or identification of structural loci upon it.

Mafic and dolomitic rocks of the Smithton Trough persist beneath an overthrust cover of Precambrian rocks translated from the west. The margin of the trough sequence, or at least the steep sole of the thrust occurs a little east of Balfour. It is probable that the granite has locally intruded such materials. This may have significant consequences for exploration and traget styles. The dolomites offer excellent host conditions or replacement opportunities and some of the lesser magnetic anomalies may flag such alteration. Certainly some fracture systems appear to have been altered and now present a magnetic signature.

Copper mineralisation may be directly related to the granite and an appropriate fracture system (NW-SE from an E-W intersection west of Balfour). Or it may be related to extraction of trace copper from intruded mafics which have been subsequently concentrated. Again, the dolomites present optimum targets.

Suitable fracture systems have been identified and, given the presence of mineralisation, must be examined.

The vicinity of Balfour must be considered highly prospective and worthy of detailed exploration.

CONCLUSIONS

Regional assessment of available gravity and magnetic data in the Smithton - Balfour region has established that the

1 mafic volcanics are continuous across the Smithton Trough,

2 Trough rocks extend to the SW beneath an overthrust slab of Precambrian rocks,

3 exposed fold patterns persist beneath the thrust which is itself distorted,

4 thrust is generally low angle although the high angle side of the sheet may be developed a little east of Balfour,

5 most substantial mafic accumulations occur in the Trowutta North region and may be mafic piles,

6 possible mafic piles are tightly folded and disrupted between Roger River and Edith Creek,

7 Pieman Granite extends into the Balfour region,

8 impressed fracture sets are either parallel to the Trough axis (and margin of the Rocky Cape Group basement) or oblique to the thrust. There are several large sub E-W features and many other critical intersections or changes in structural style or scale are related to these,

9 many lesser magnetic features and trends can be associated with implied faults and fracture alteration,

10 Balfour mineralisation can be explained and that its setting is largely blind and highly prospective. There is scope for large deposits given the concealed dolomitic host potential.

RECOMMENDATIONS

There is little scope for improved resolution using the extant gravity data base although the potential of the magnetic data has not been exhausted. This interpretation shows, however, that the two methods must be coupled if all aspects of the structure are to be defined.

It is therefore essential that the gravity coverage be improved.

A nominal station spacing of 1 to 2 km is the maximum desired spacing for any useful resolution of the form of the granite and inter-related structures. The preferred spacing for infill coverage leading to target definition is about 1 km. 3D analysis will be required for reliable interpretation.

In view of the implications of the interpretation and, in particular, the existence of the granite, concealed hosts and an explanation for the known surface mineralisation at Balfour it is clear that Aureole Resources does not hold prime or sufficient area for exploration. Inspection of Figure 1B shows that the important Mt Balfour area is unclaimed. This should be applied for immediately.

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Report submitted on behalf of
Leaman Geophysics
by

D. Leaman

Dr. D.E. Leaman, B.Sc., Ph.D
M.Aus.I.M.M., M.M.I.C.A

26/9/88

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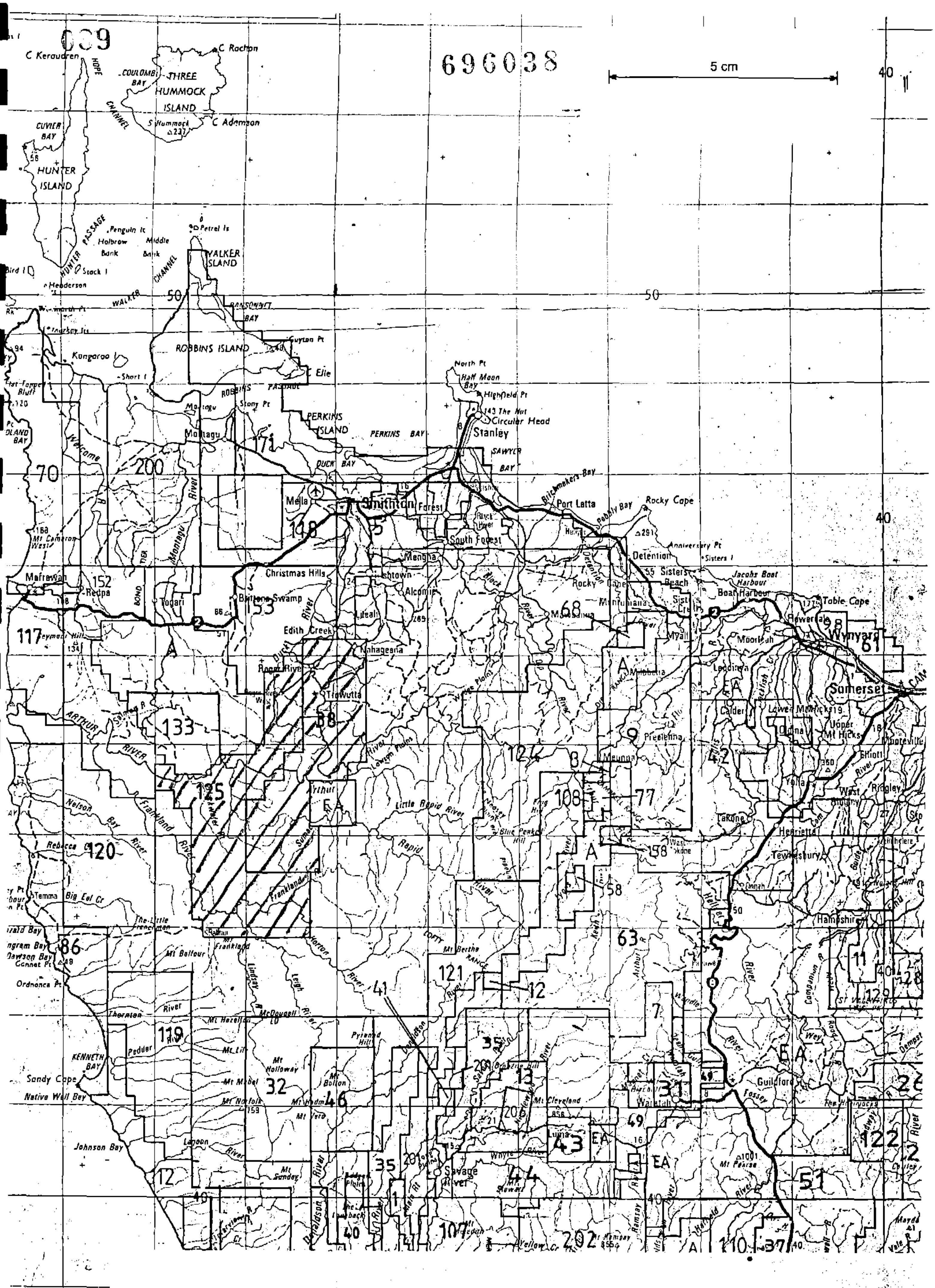

FYPLORATION I ICENCE LOCALITY MAP 1·500 000

FIGURE 1A

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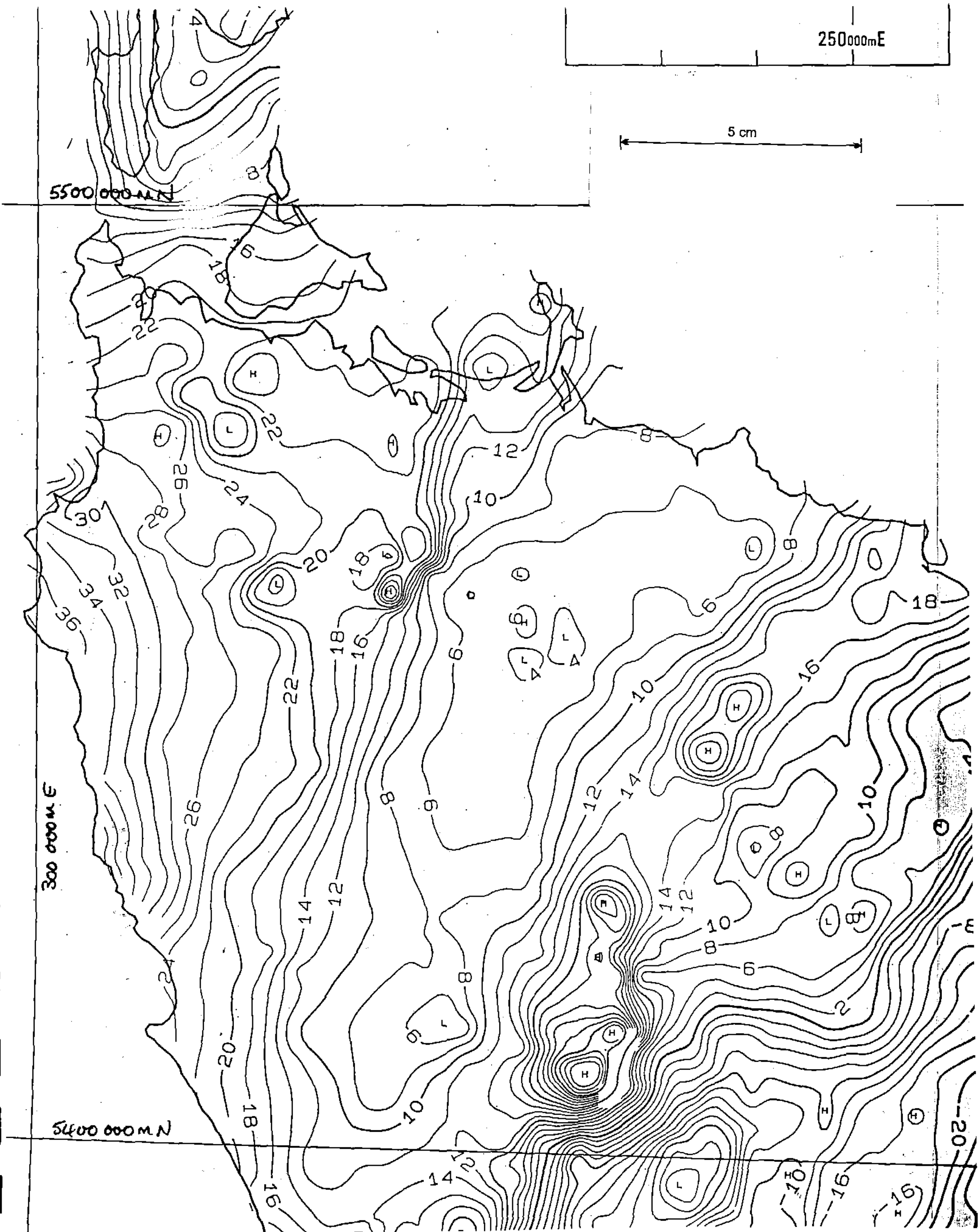
EXPLORATION LICENCE LOCALITY MAP 1:250 000
(Geology from Williams and Turner, 1973)

FIGURE 1B



BOUGUER ANOMALY MAP 1:500 000 MINES DEPARTMENT COMPILATION
(2 mGal interval, density 2.67 t/cu m)

FIGURE 2

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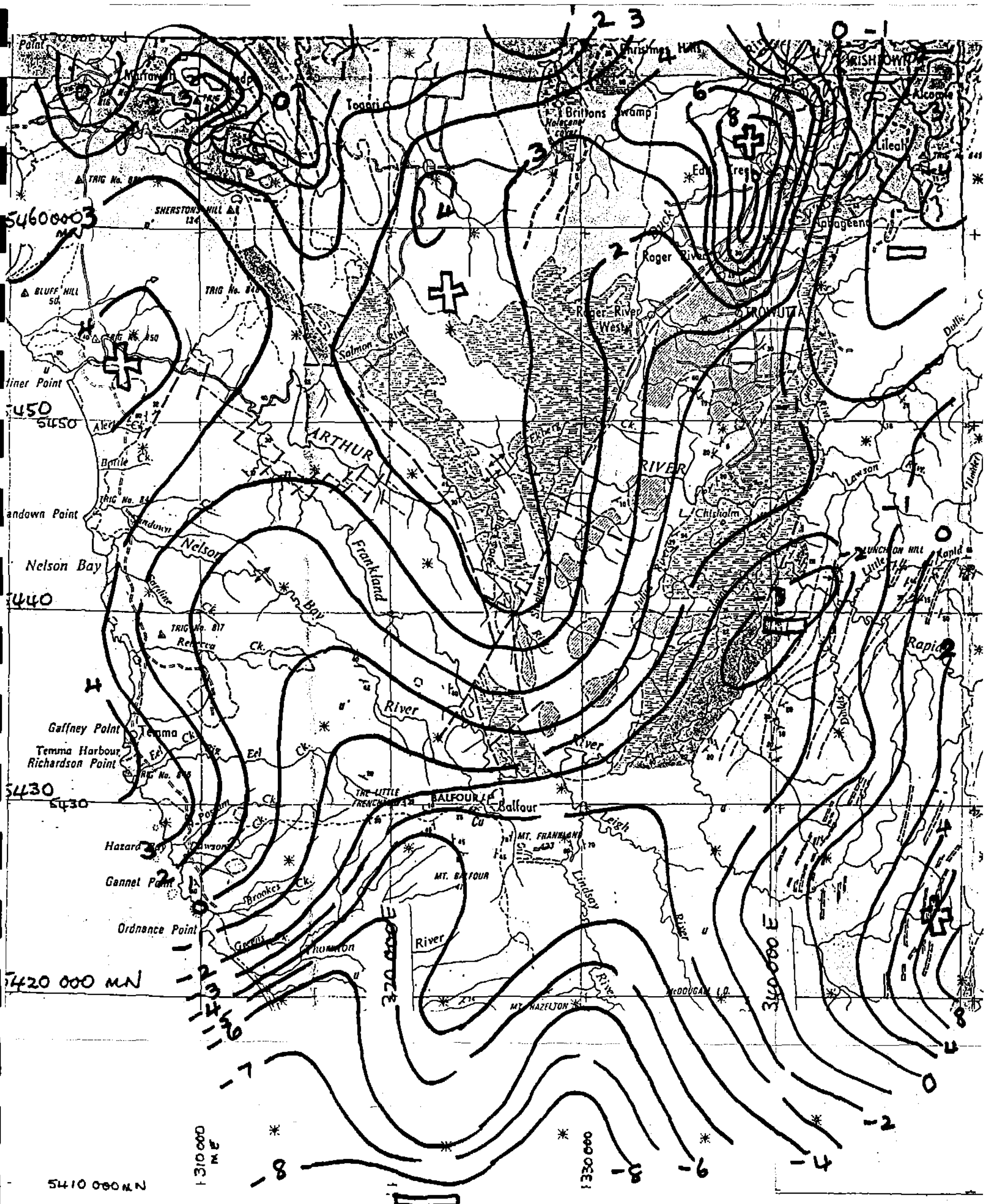
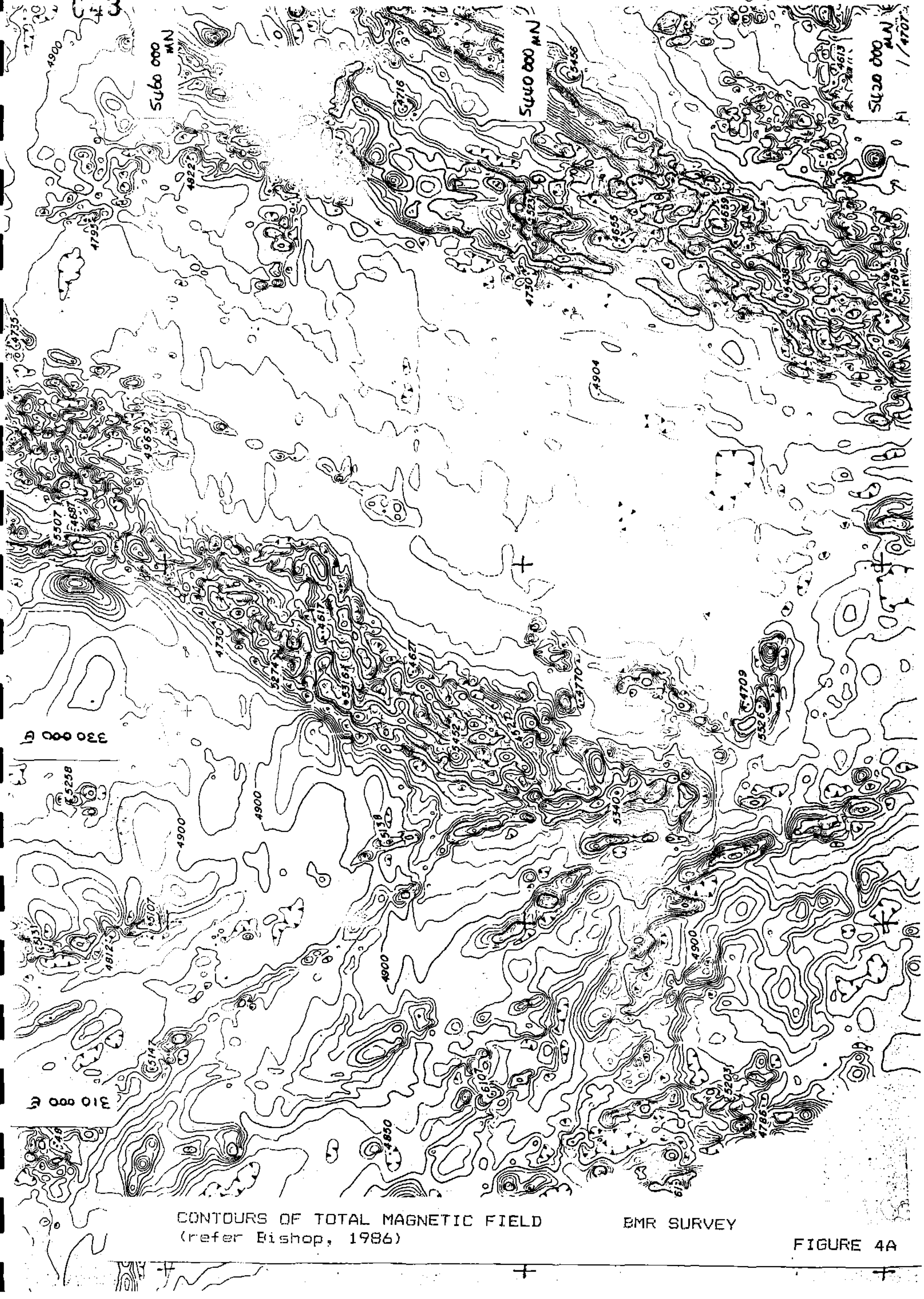
RESIDUAL BOUGUER ANOMALY SMITHTON-BALFOUR REGION
(separation based on Mantle88, Leaman (1988c)
(in mGal)

FIGURE 3



250000
ORIGIN: 300000 410000
GRAVITY STATIONS BALFOUR-TROWUTTA REGION



CONTOURS OF TOTAL MAGNETIC FIELD   BMR SURVEY
(refer Bishop, 1986)

FIGURE 4A

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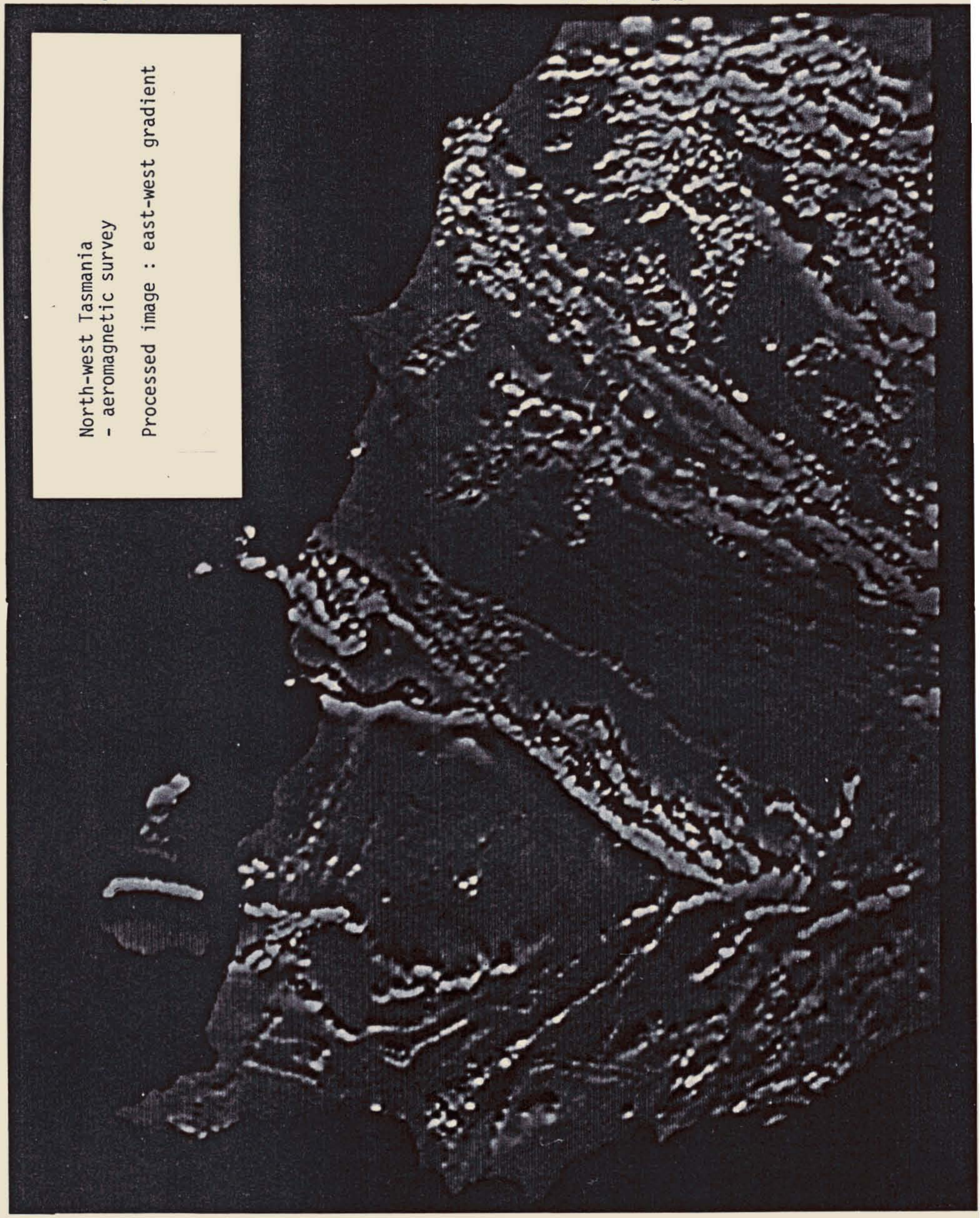
CONTOURS OF TOTAL MAGNETIC FIELD BMR SURVEY
(refer Bishop, 1986)

FIGURE 4A



ROCKY CAPE BLOCK : PROCESSED MAGNETIC FIELD AND STRUCTURES

PROCESSED RELIEF MAP OF TOTAL MAGNETIC FIELD NW TASMANIA
(refer Bishop, 1986)

FIGURE 4B.

046

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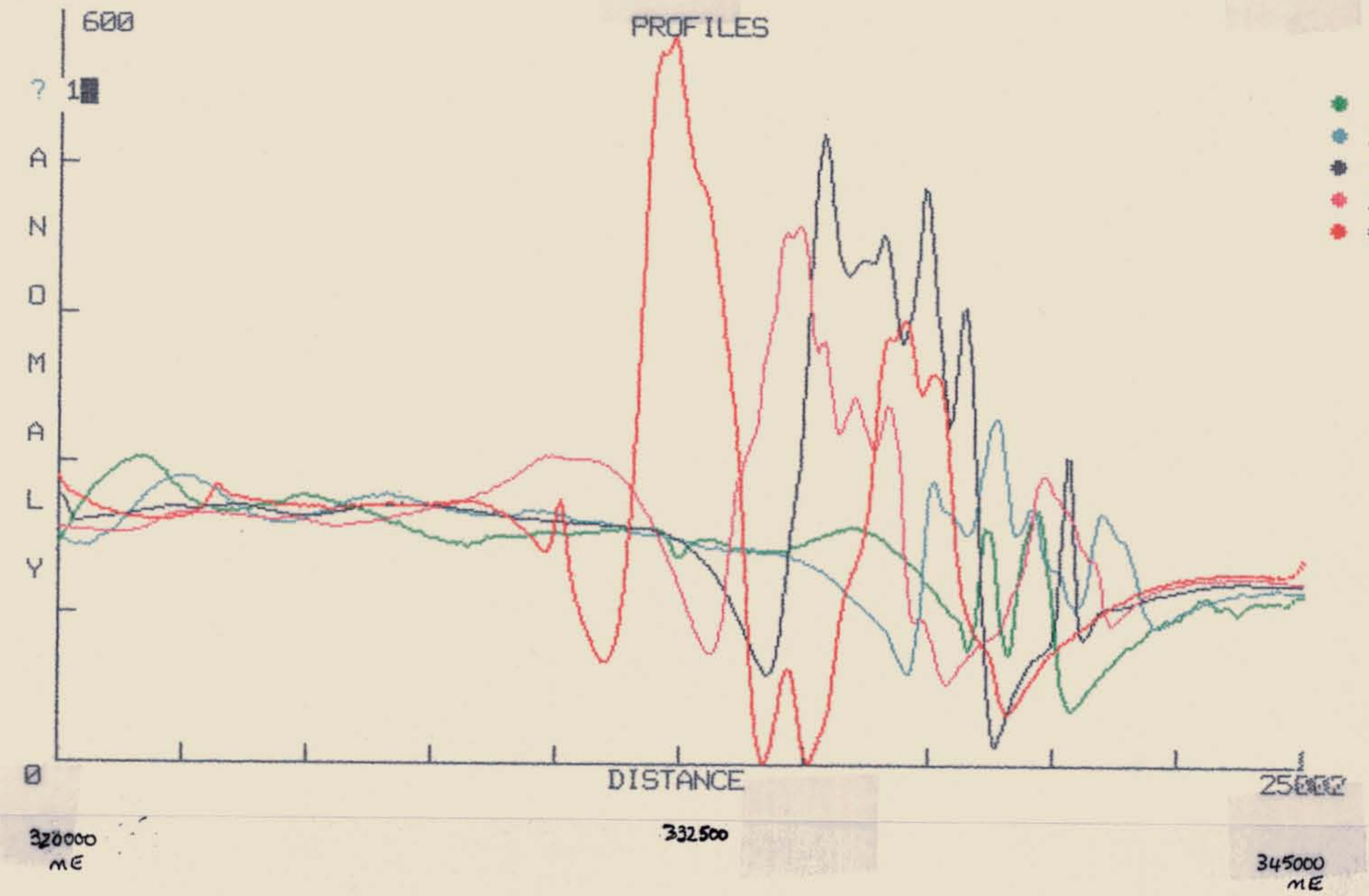
696045

1	B:M2341	BALFOUR PROJECT LINE 2341	~ 5460 200 N
2	B:M2380	BALFOUR PROJECT LINE 2380	~ 5458
3	B:M2440	BALFOUR PROJECT LINE 2440	~ 5455
4	B:M2490	BALFOUR PROJECT LINE 2490	~ 5452 500
5	B:M2540	BALFOUR PROJECT LINE 2540	~ 5450 100 N

ZERO SHIFT : 98.18994



OBSERVED MAGNETIC PROFILES 5450 – 5460 000 mN FIGURE 5A

047

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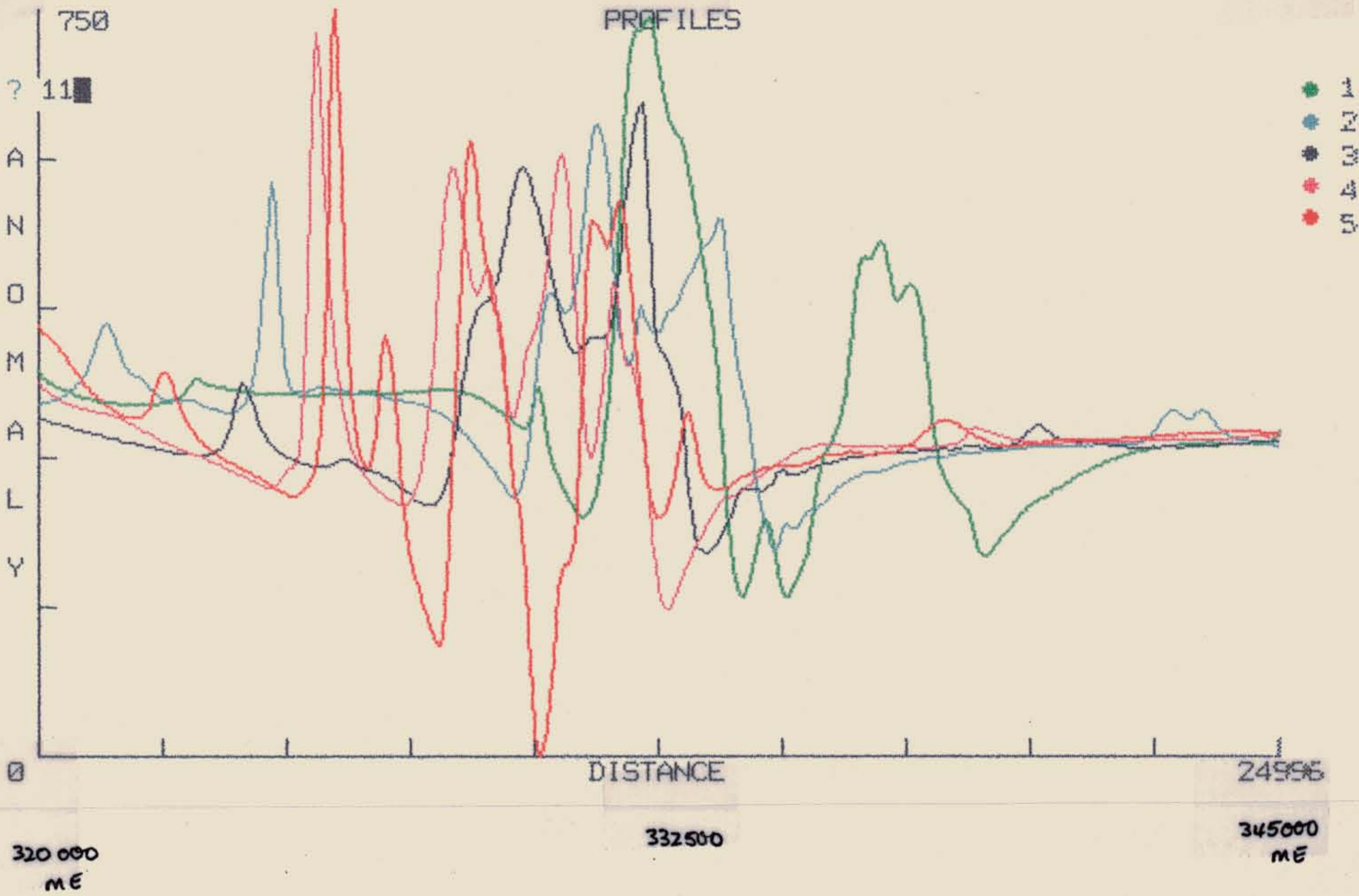
1	B:M2540	BALFOUR PROJECT LINE 2540	~ 5450 100 mN
2	B:M2590	BALFOUR PROJECT LINE 2590	~ 5447 800
3	B:M2640	BALFOUR PROJECT LINE 2640	~ 5445
4	B:M2690	BALFOUR PROJECT LINE 2690	~ 5442 700
5	B:M2730	BALFOUR PROJECT LINE 2730	~ 5440 400 mN

ZERO SHIFT : 257.3901



OBSERVED MAGNETIC PROFILES 5440 - 5450 000 mN FIGURE 5B

048

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Hobart, Tasmania 7001

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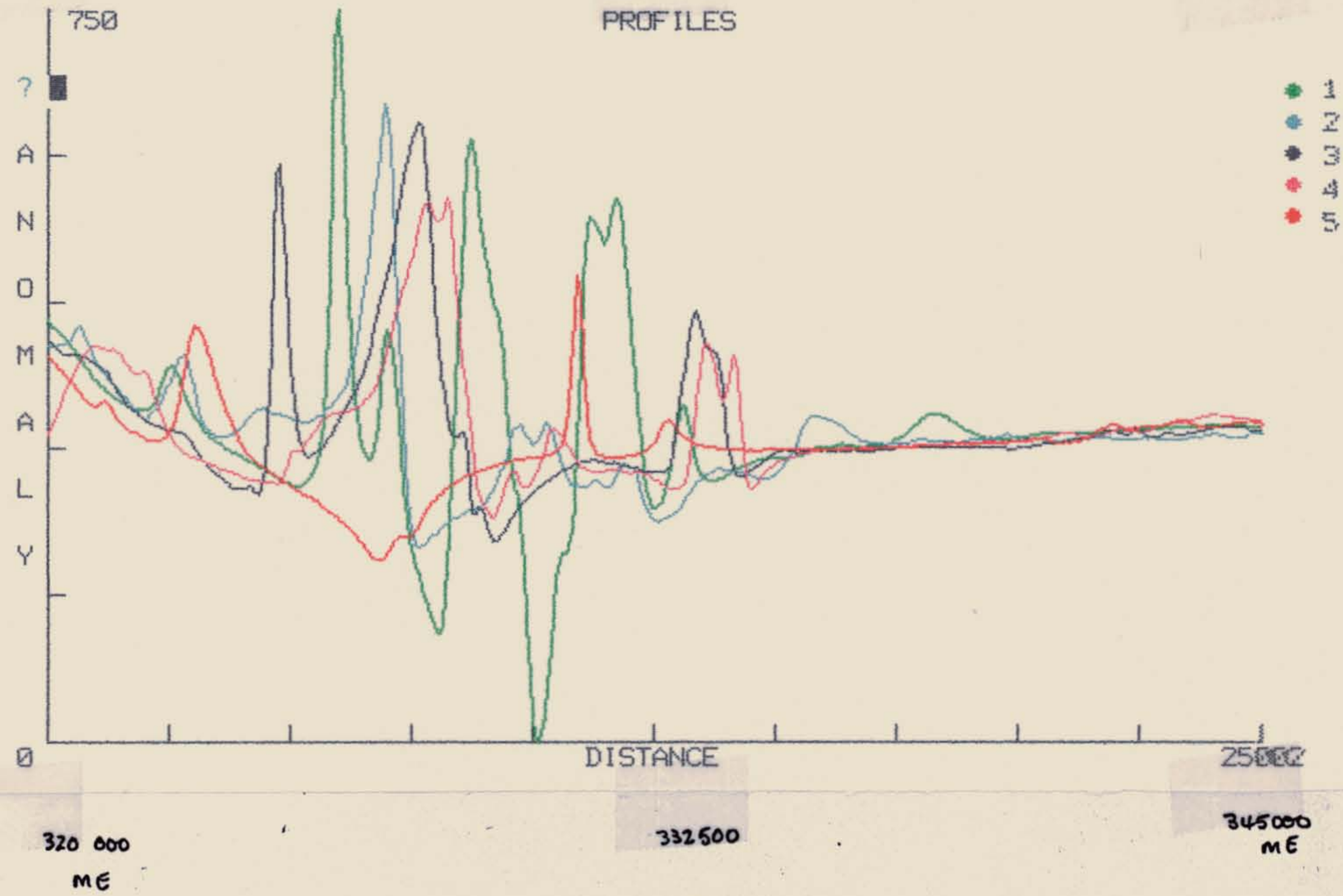
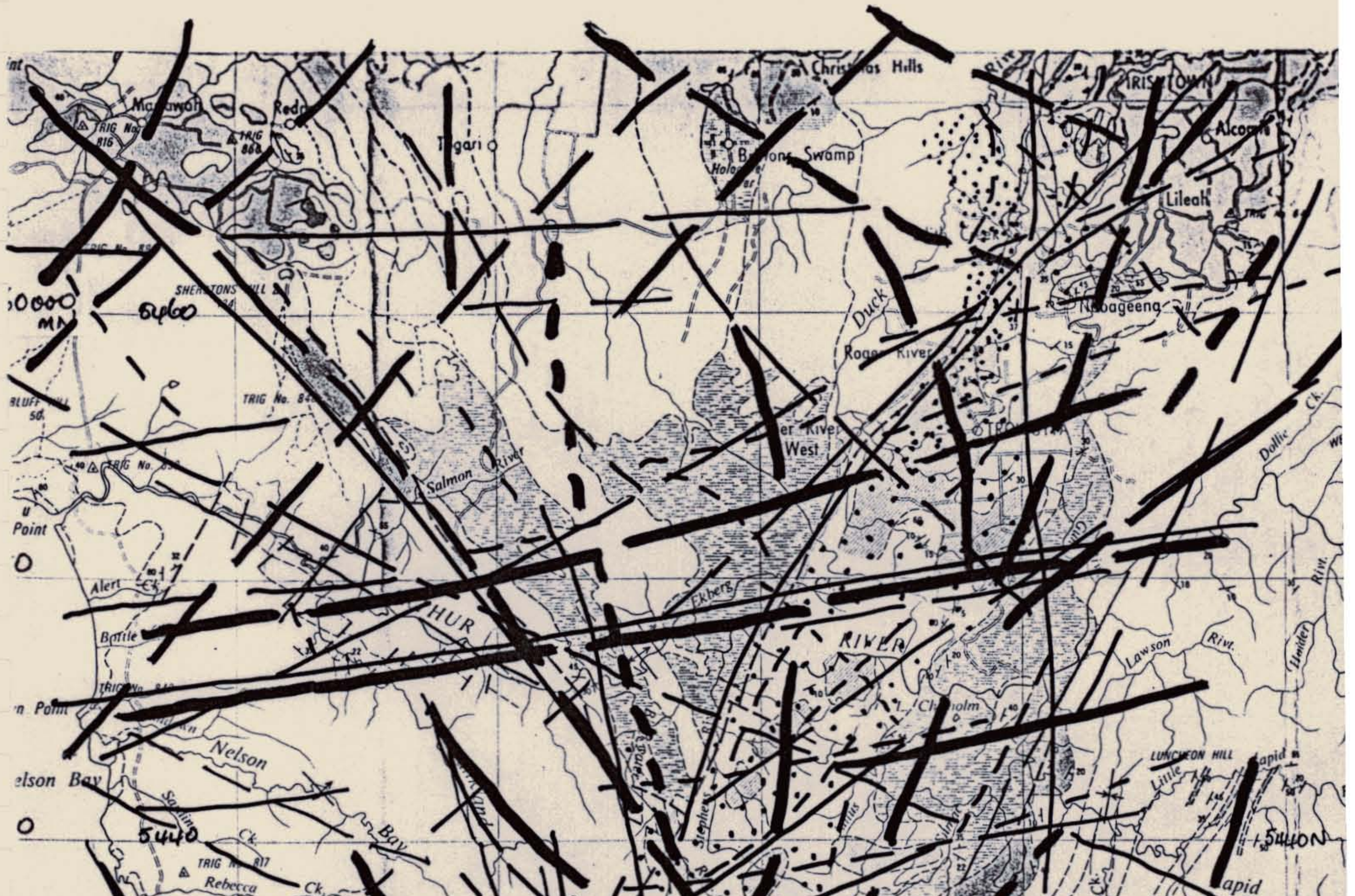
1	B:M2730	BALFOUR PROJECT LINE 2730	~ 5440 400 mN
2	B:M2790	BALFOUR PROJECT LINE 2790	~ 5437 500
3	B:M2841	BALFOUR PROJECT LINE 2841	~ 5434 900
4	B:M2880	BALFOUR PROJECT LINE 2880	~ 5432 750
5	B:M2930	BALFOUR PROJECT LINE 2930	~ 5430 700 mN

ZERO SHIFT : 257.3901



OBSERVED MAGNETIC PROFILES 5430 - 5440 000 mN FIGURE 5C



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SUMMARY MAP: TRENDS SUGGESTED IN OBSERVED OR RESIDUAL DATA

FIGURE 6

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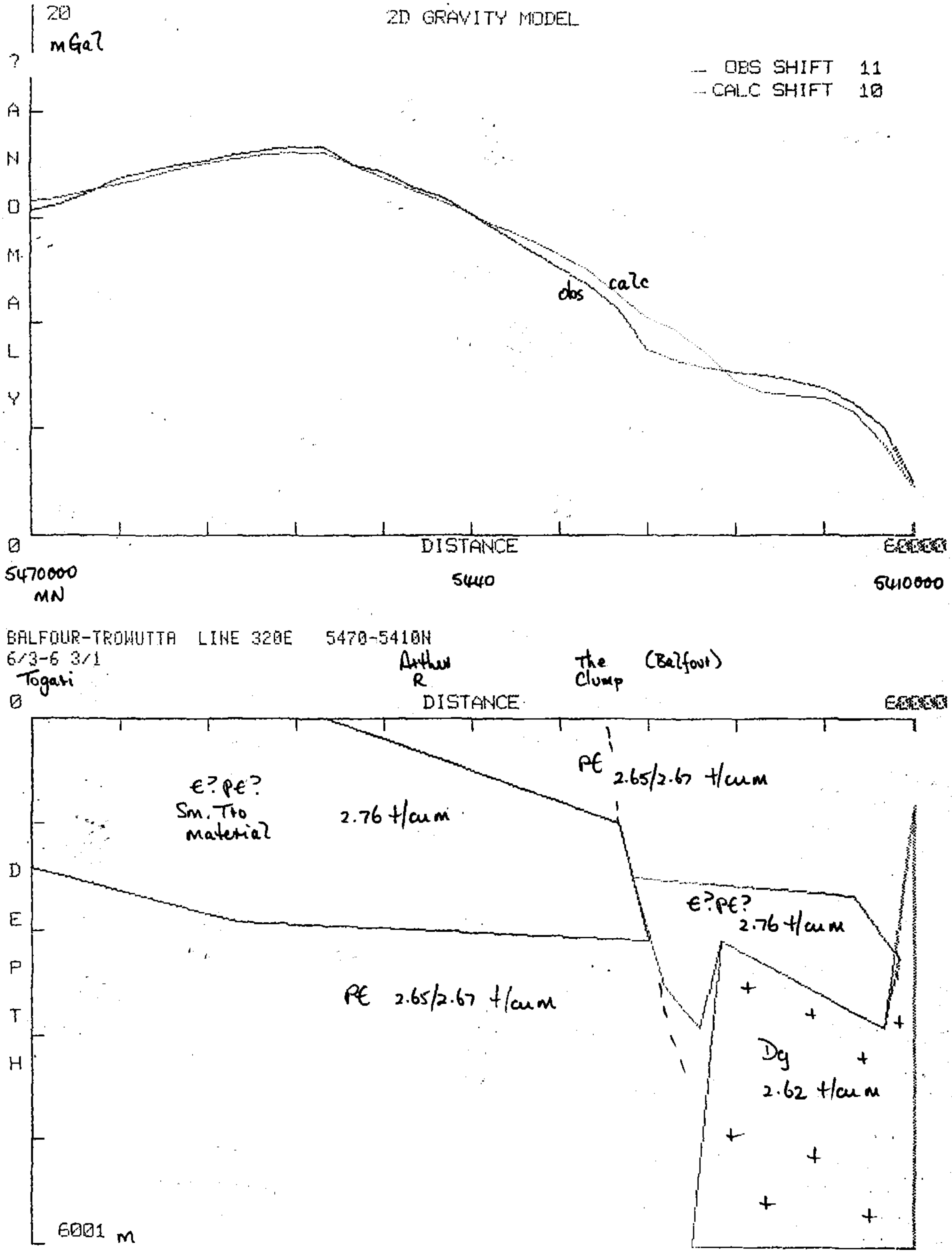

GRAVITY INTERPRETATION LINE 320 E FIGURE 7A

C51

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LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 60000 2000

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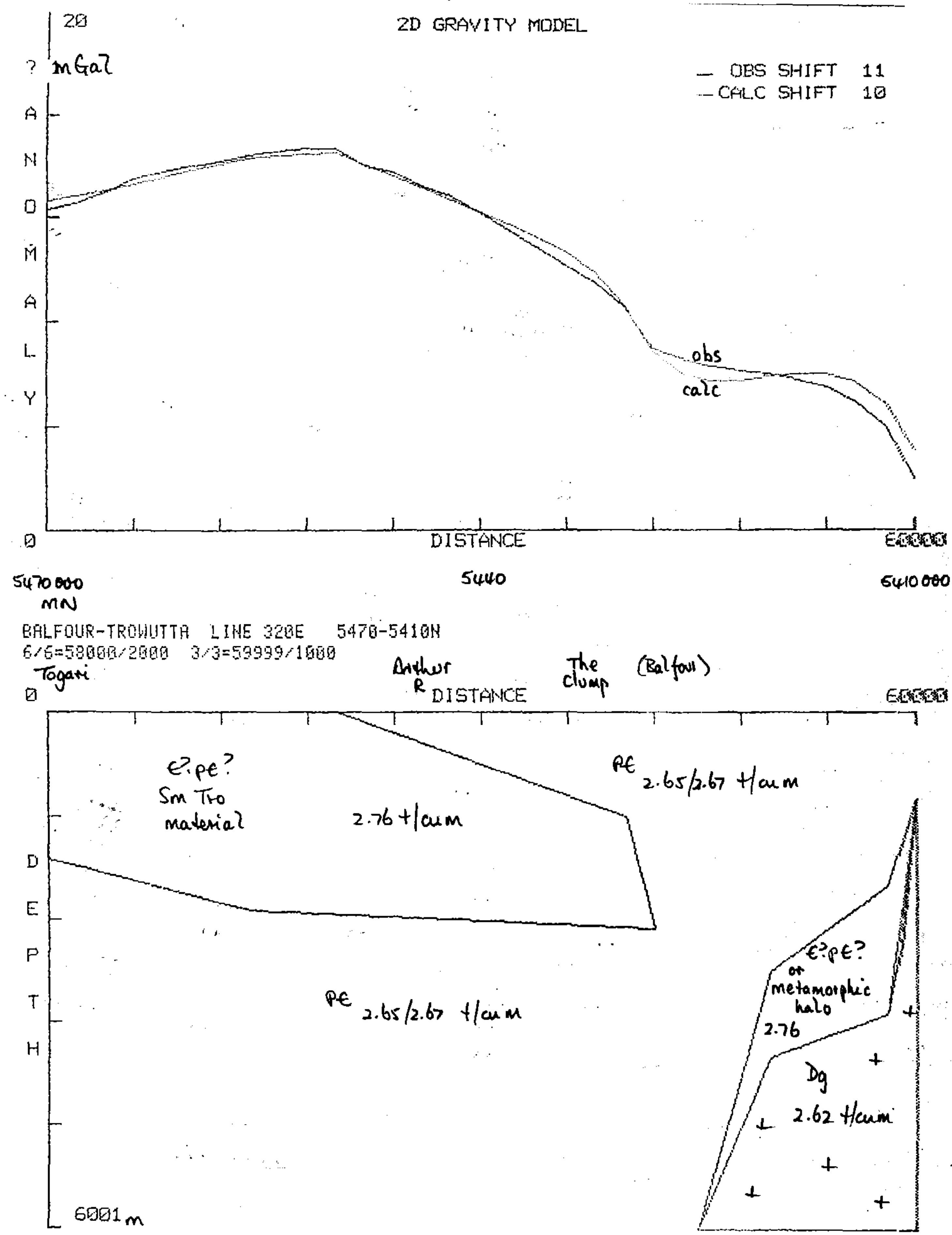
G.P.O. Box 320 D,
Hobart, Tasmania 7001

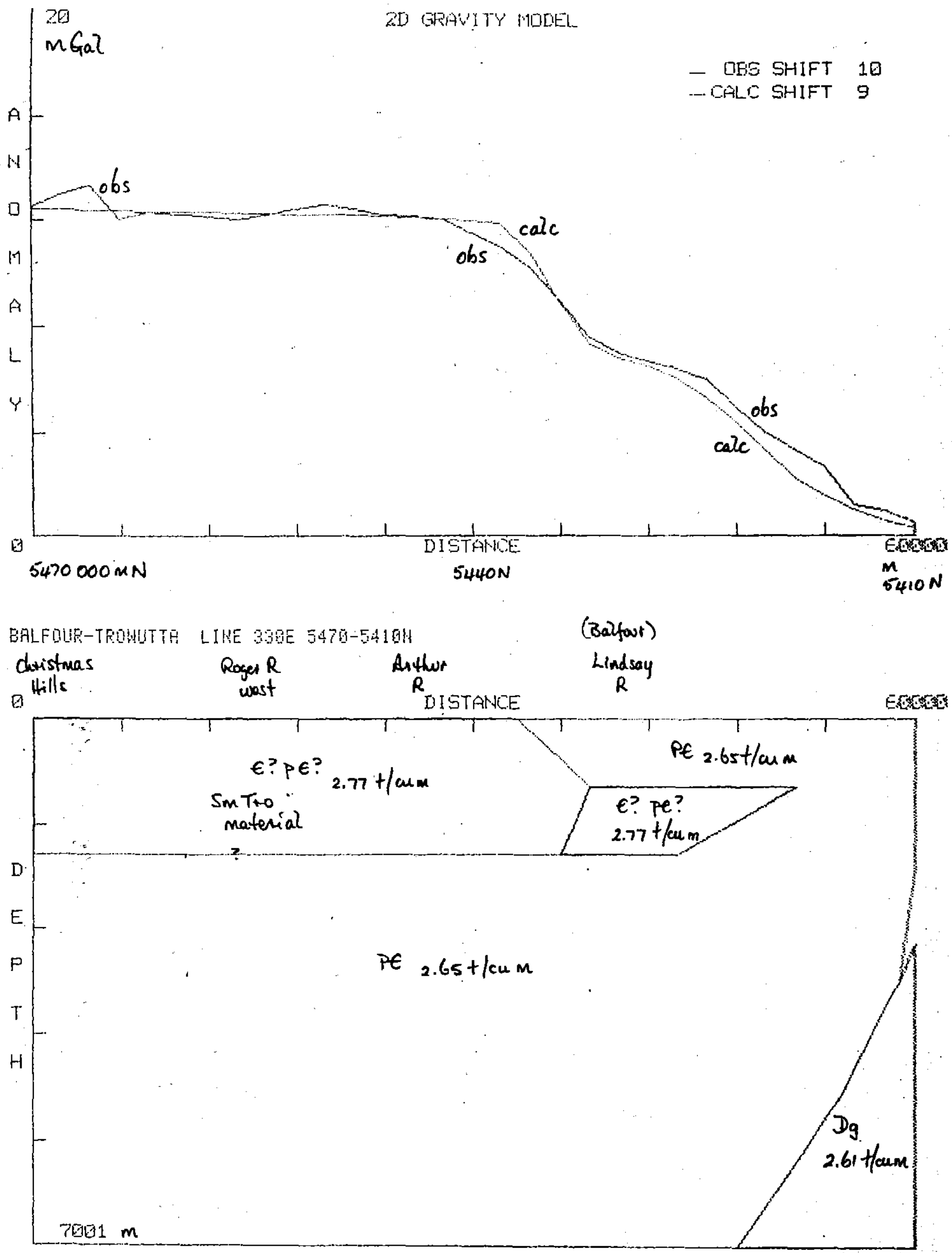


GRAVITY INTERPRETATION LINE 320 E FIGURE 7B

652

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 60000 2000

696051



GRAVITY INTERPRETATION LINE 330 E FIGURE 8

653

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 60000 2000

696052

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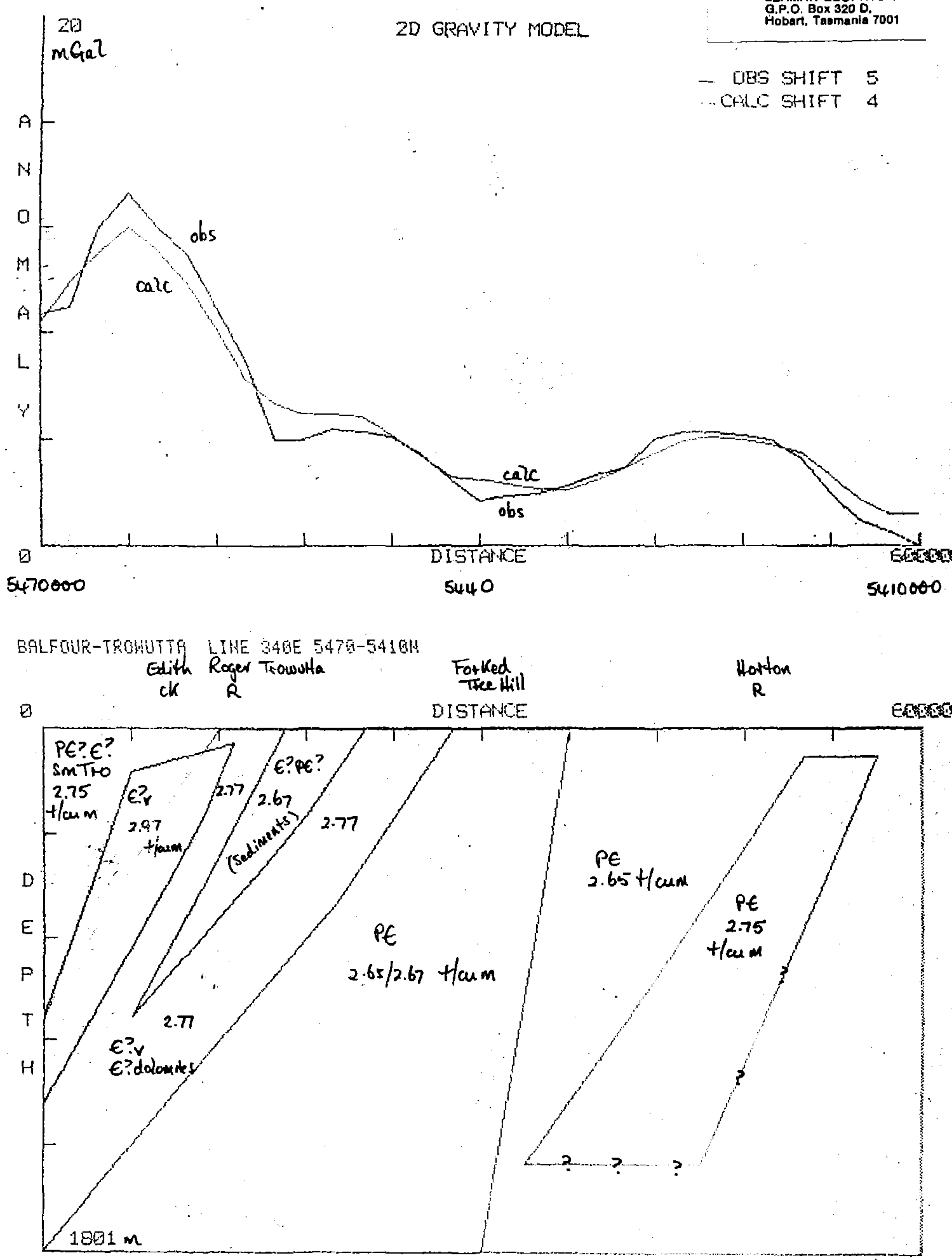
G.P.O. Box 320 D.
Hobart, Tasmania 7001



GRAVITY INTERPRETATION LINE 340 E FIGURE 9

696053

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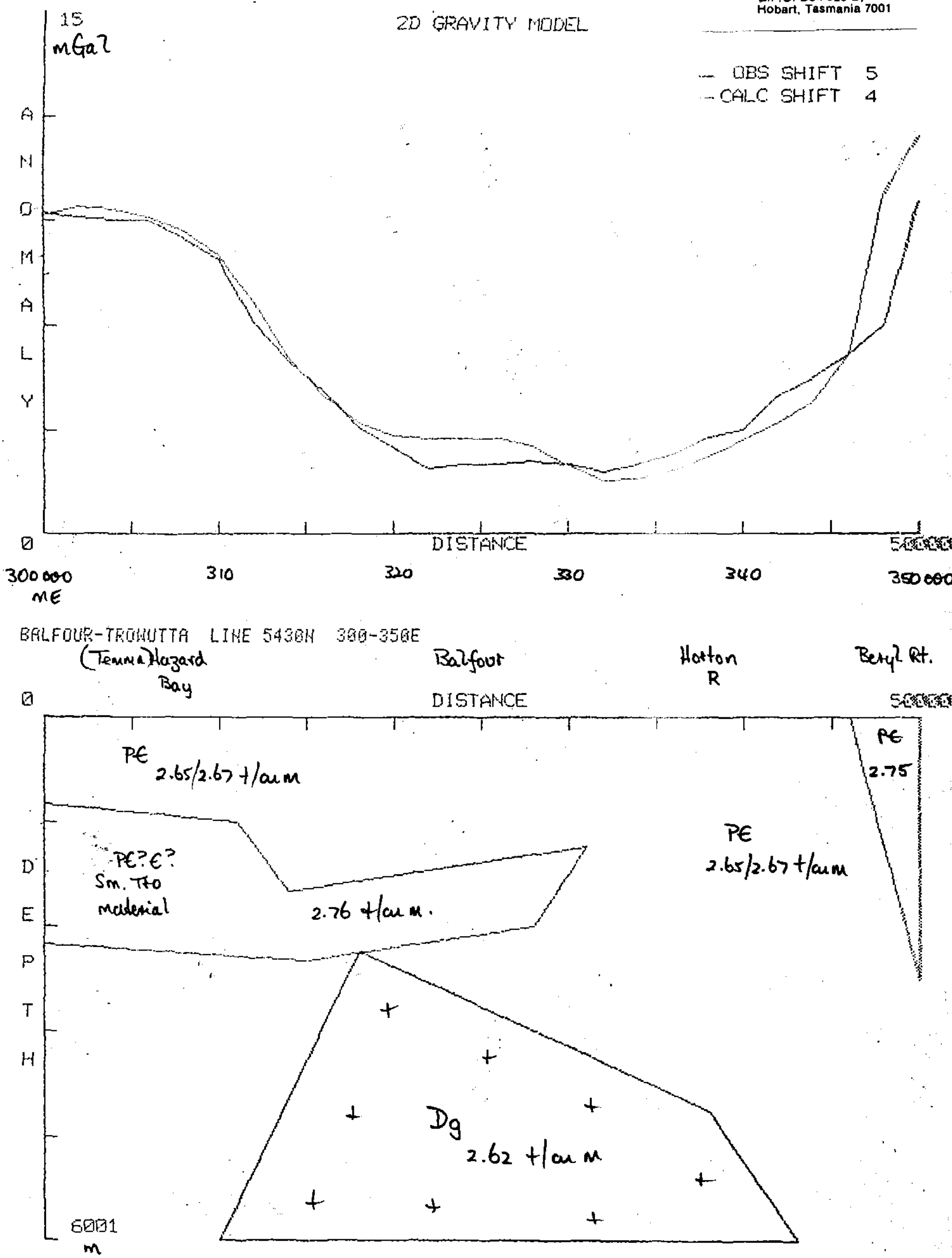
Hobart, Tasmania 7001



GRAVITY INTERPRETATION LINE 5430 000 N FIGURE 10

C35 .

696054

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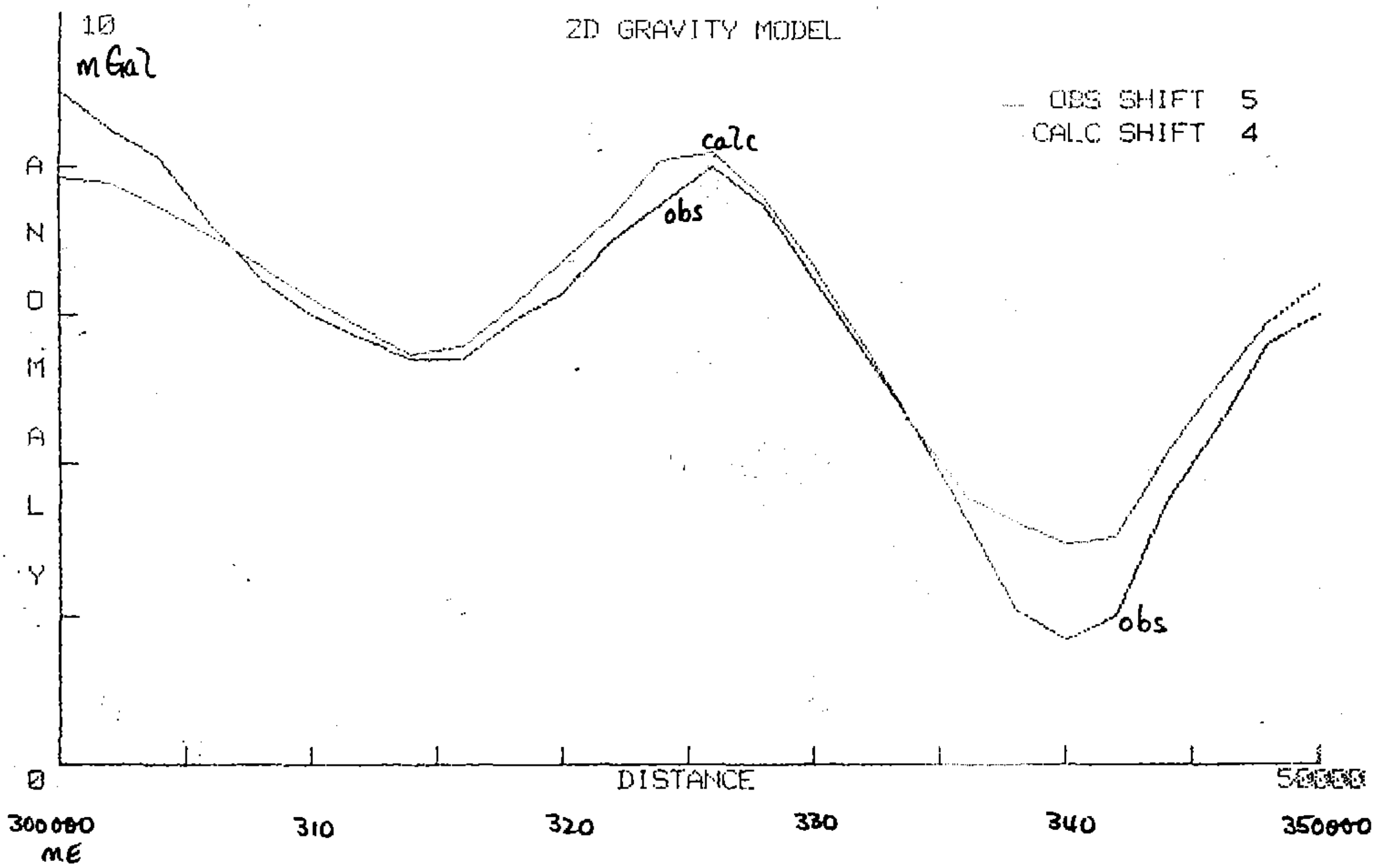
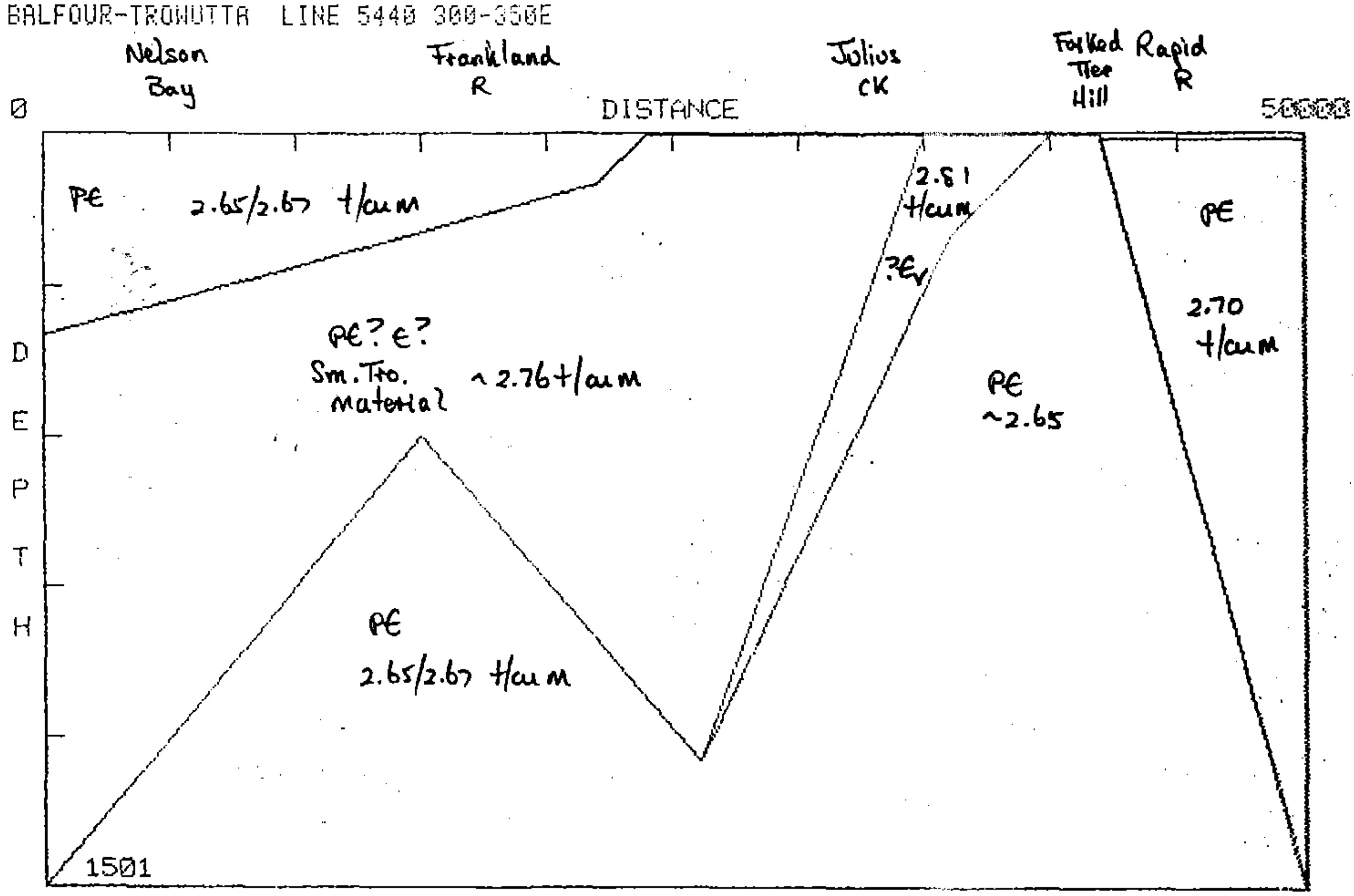
Hobart, Tasmania 7001



BALFOUR-TROWUTTA LINE 5440 300-350E



GRAVITY INTERPRETATION LINE 5440 000 N FIGURE 11

C56

696055

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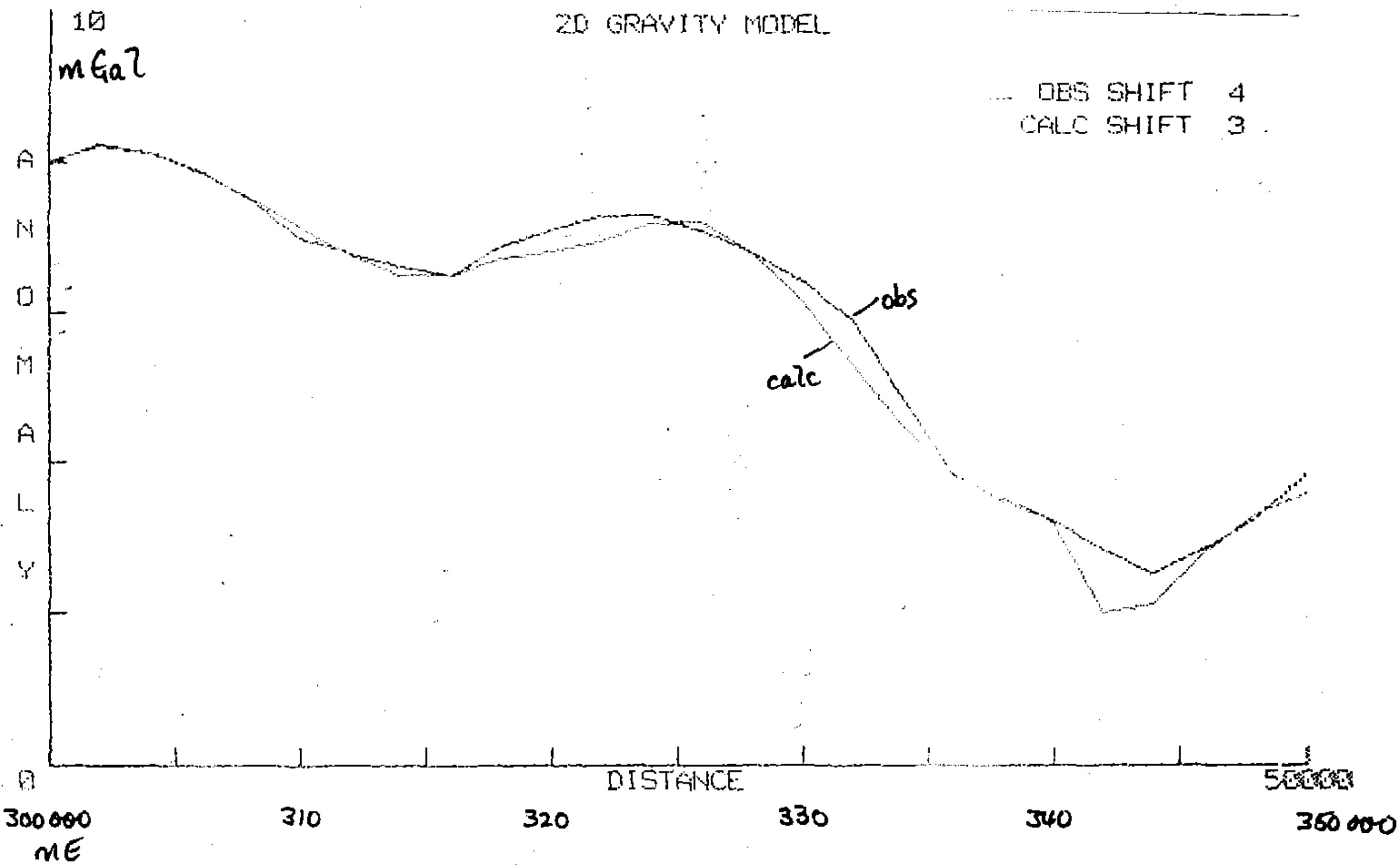
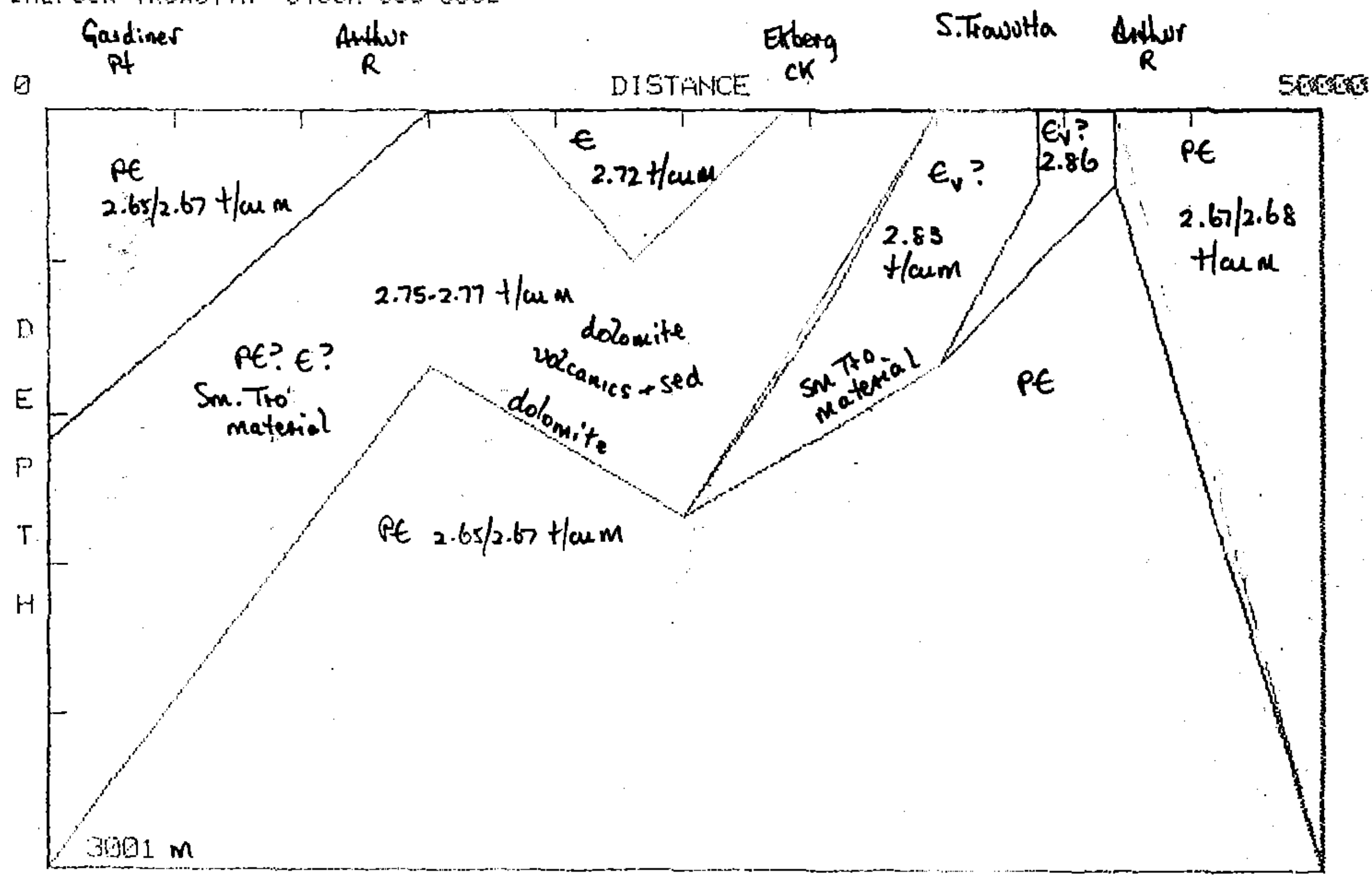
G.P.O. Box 320 D,
Hobart, Tasmania 7001

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 . 50000 2000



BALFOUR-TROWUTTA 5450N 300-350E

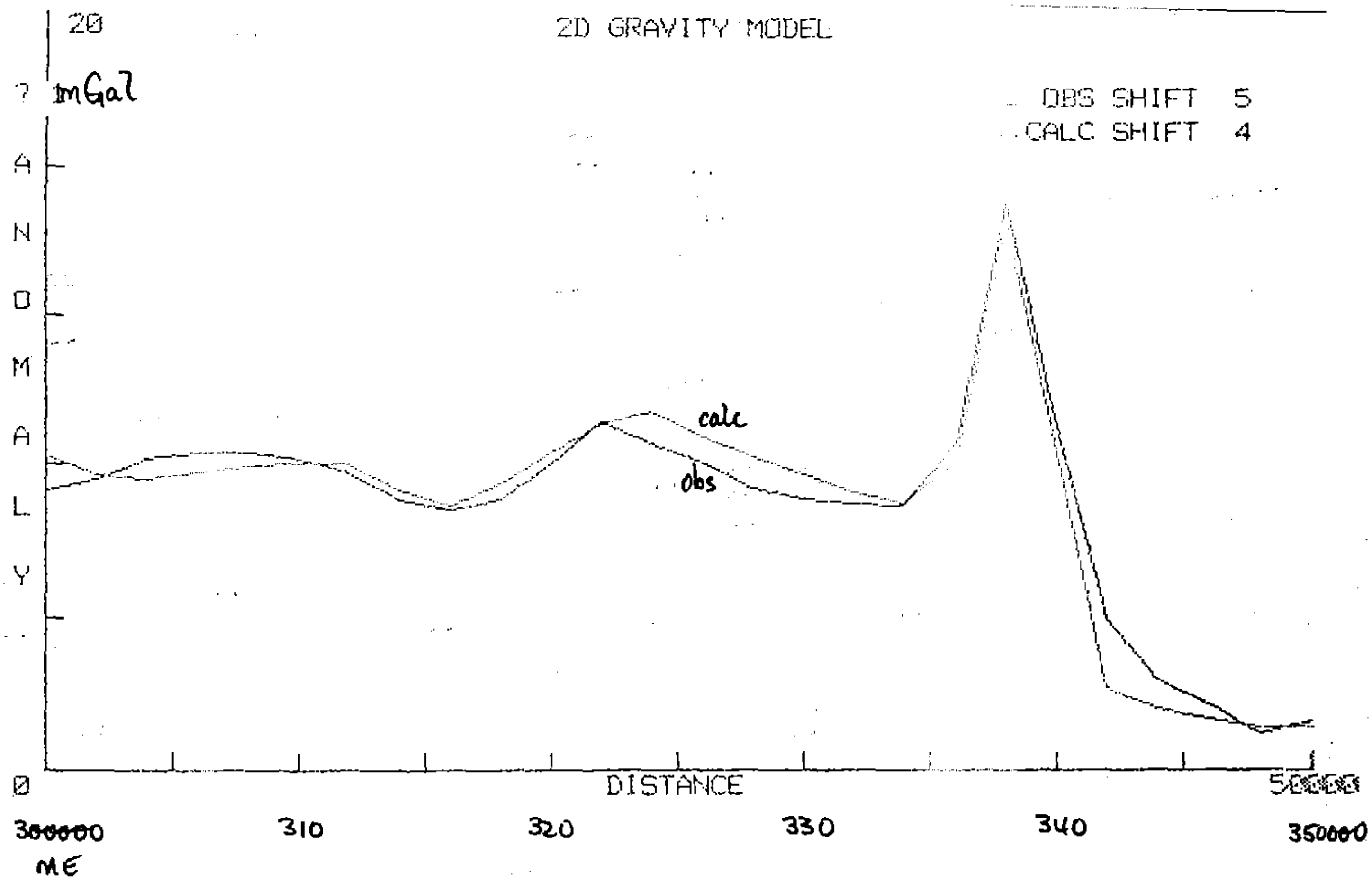


GRAVITY INTERPRETATION LINE 5450 000 N FIGURE 12

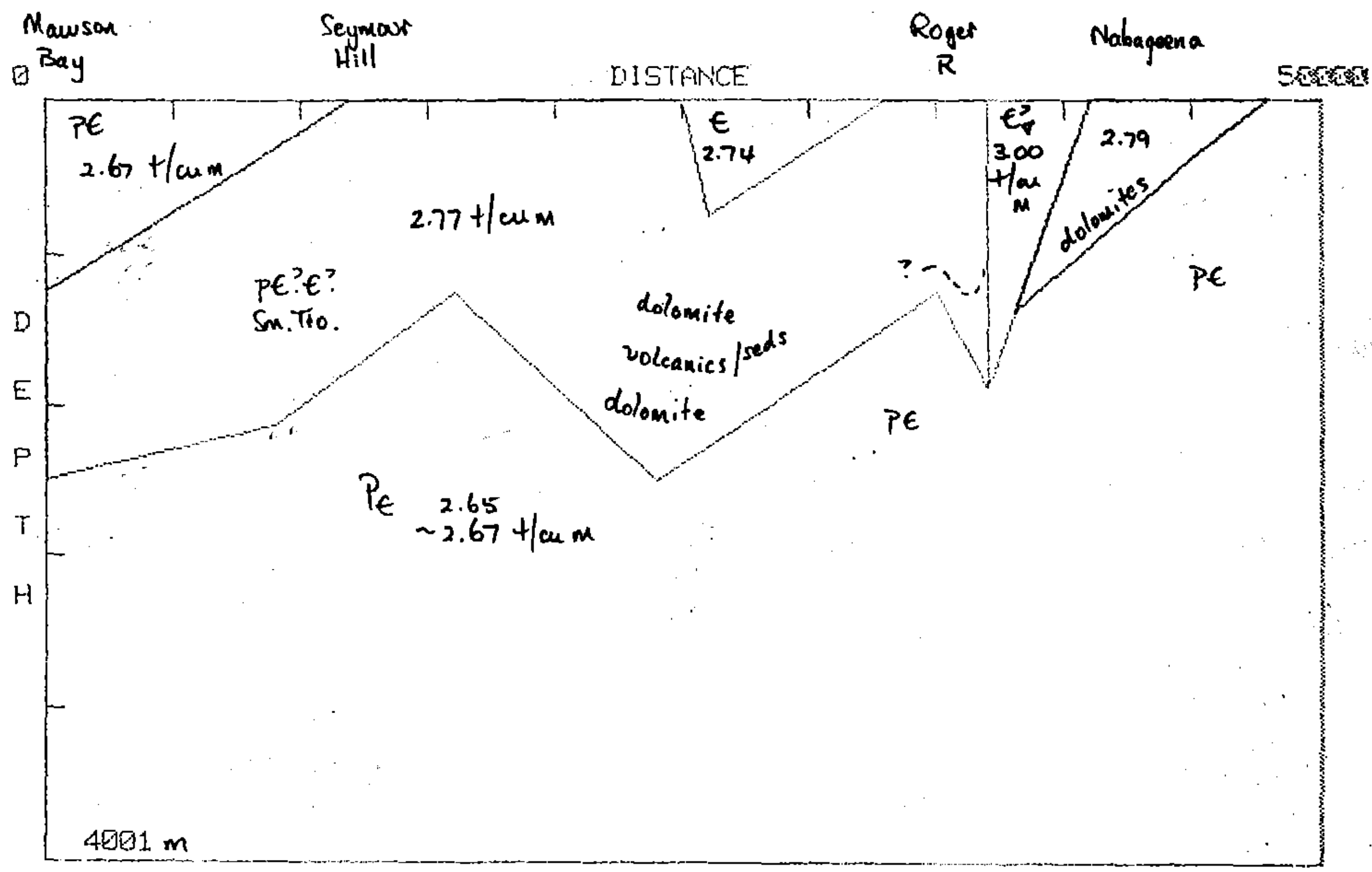
037

696056
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 50000 2000



BALFOUR-TROWUTTA LINE 5460N 300-350E



GRAVITY INTERPRETATION LINE 5460 000 N FIGURE 13

C38

696057

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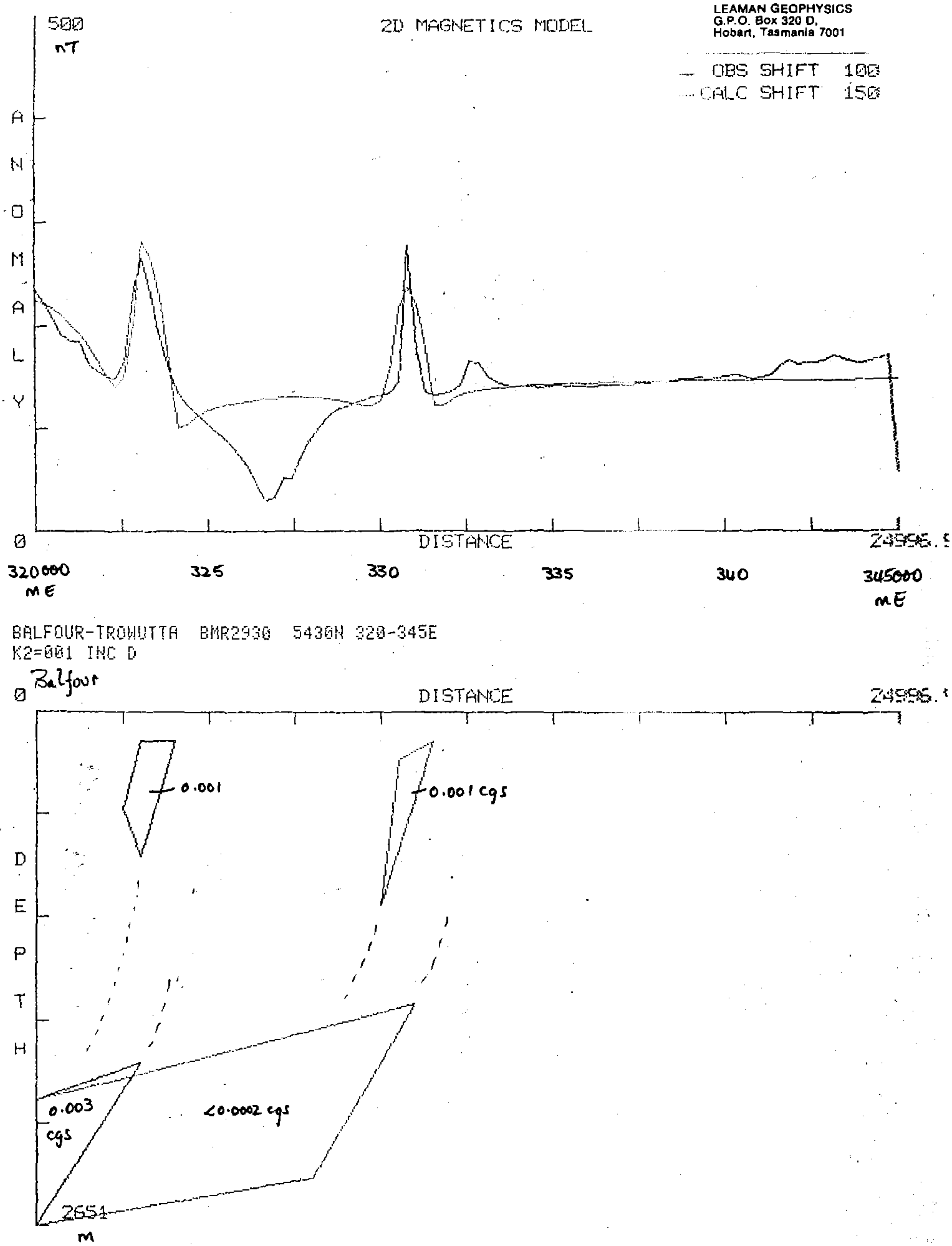
Hobart, Tasmania 7001



MAGNETIC INTERPRETATION LINE 5430 000 N FIGURE 14

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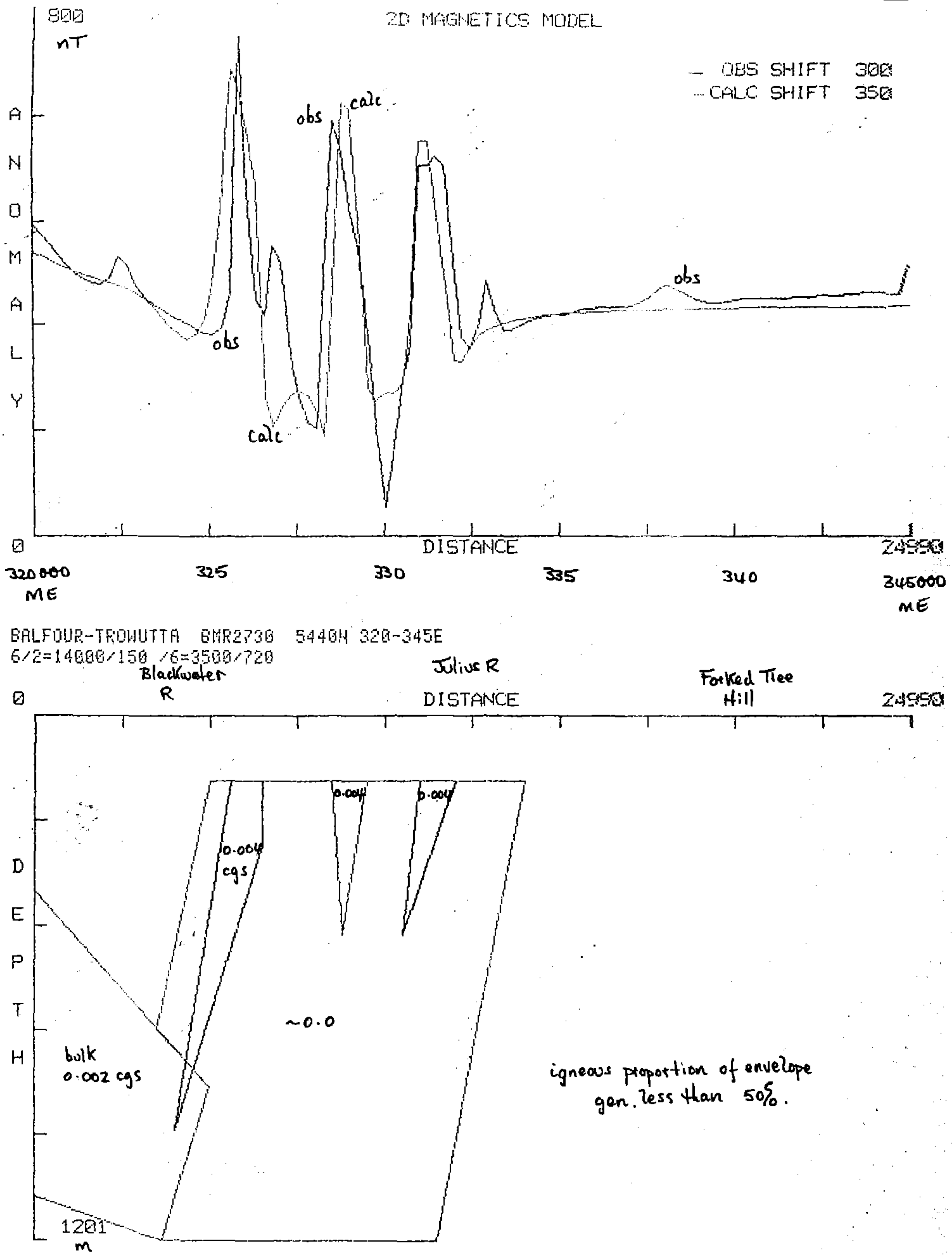
Hobart, Tasmania 7001

LINE PARAMETERS - ORIGIN/LIMIT/INCR : 0 24990 245



MAGNETIC INTERPRETATION LINE 5440 000 N FIGURE 15

0 3500 800 10000 1100 10000 1400 3500 1100

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 24996.9 257.7

696059

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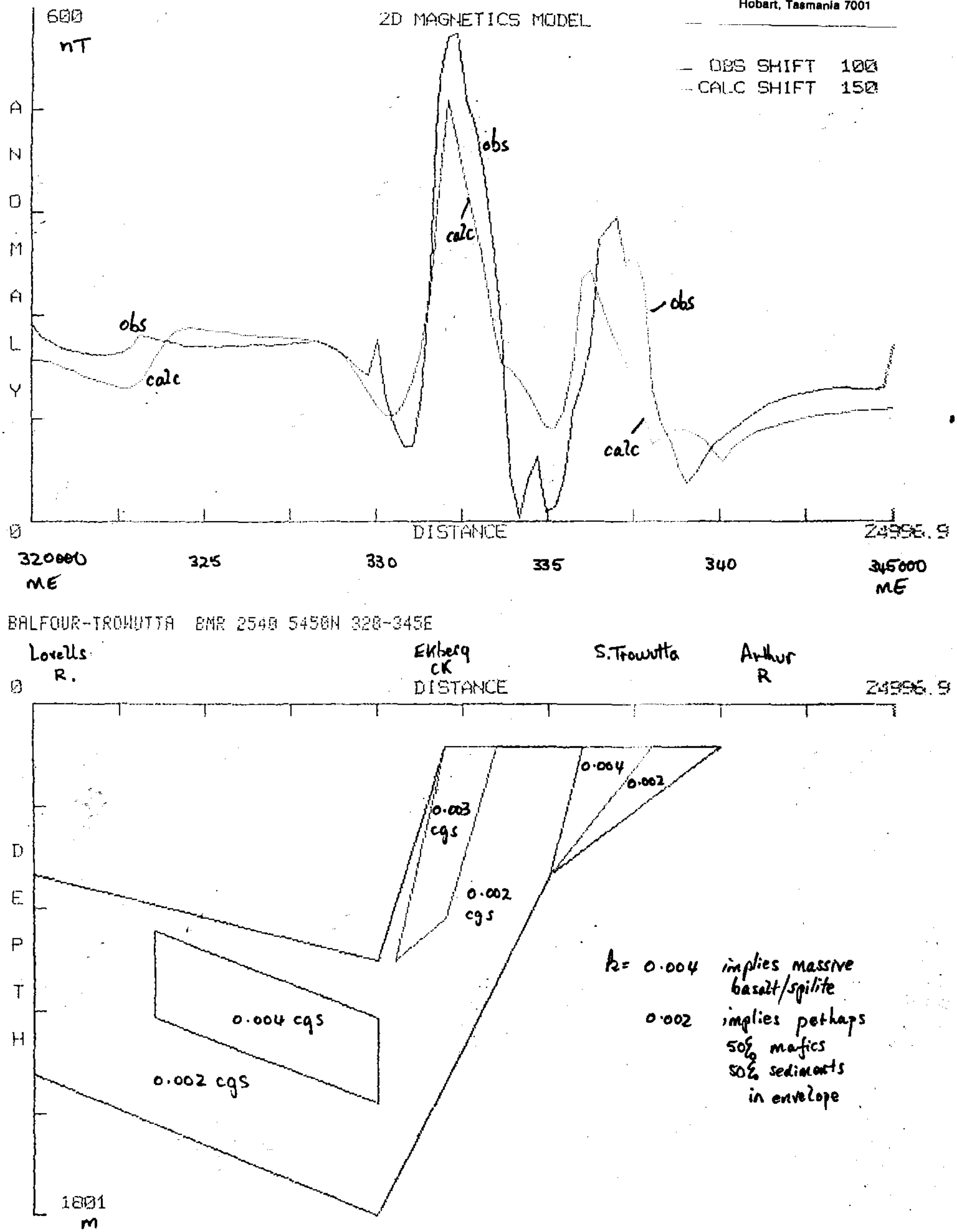
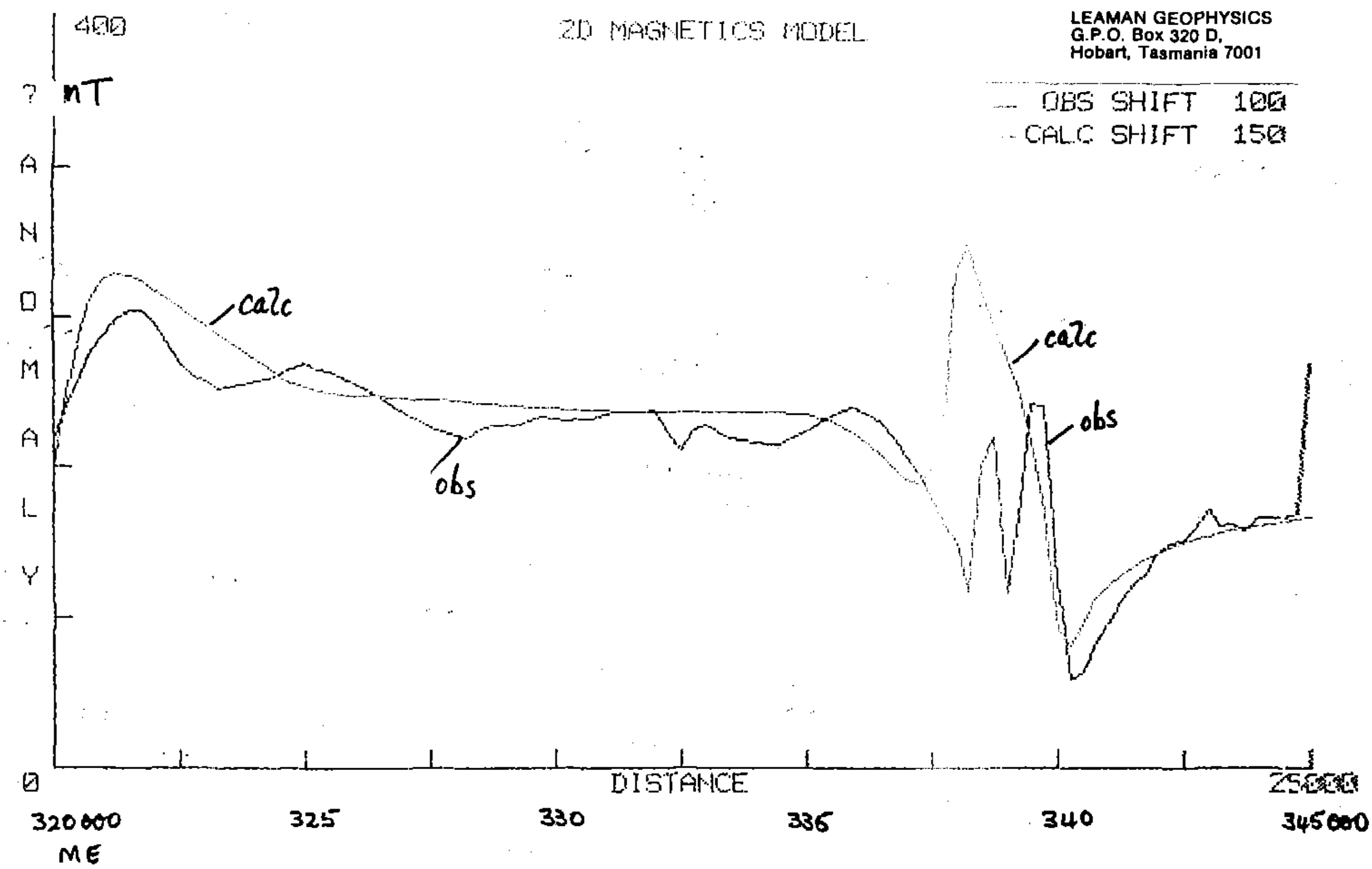


MAGNETIC INTERPRETATION LINE 5450 000 N FIGURE 16

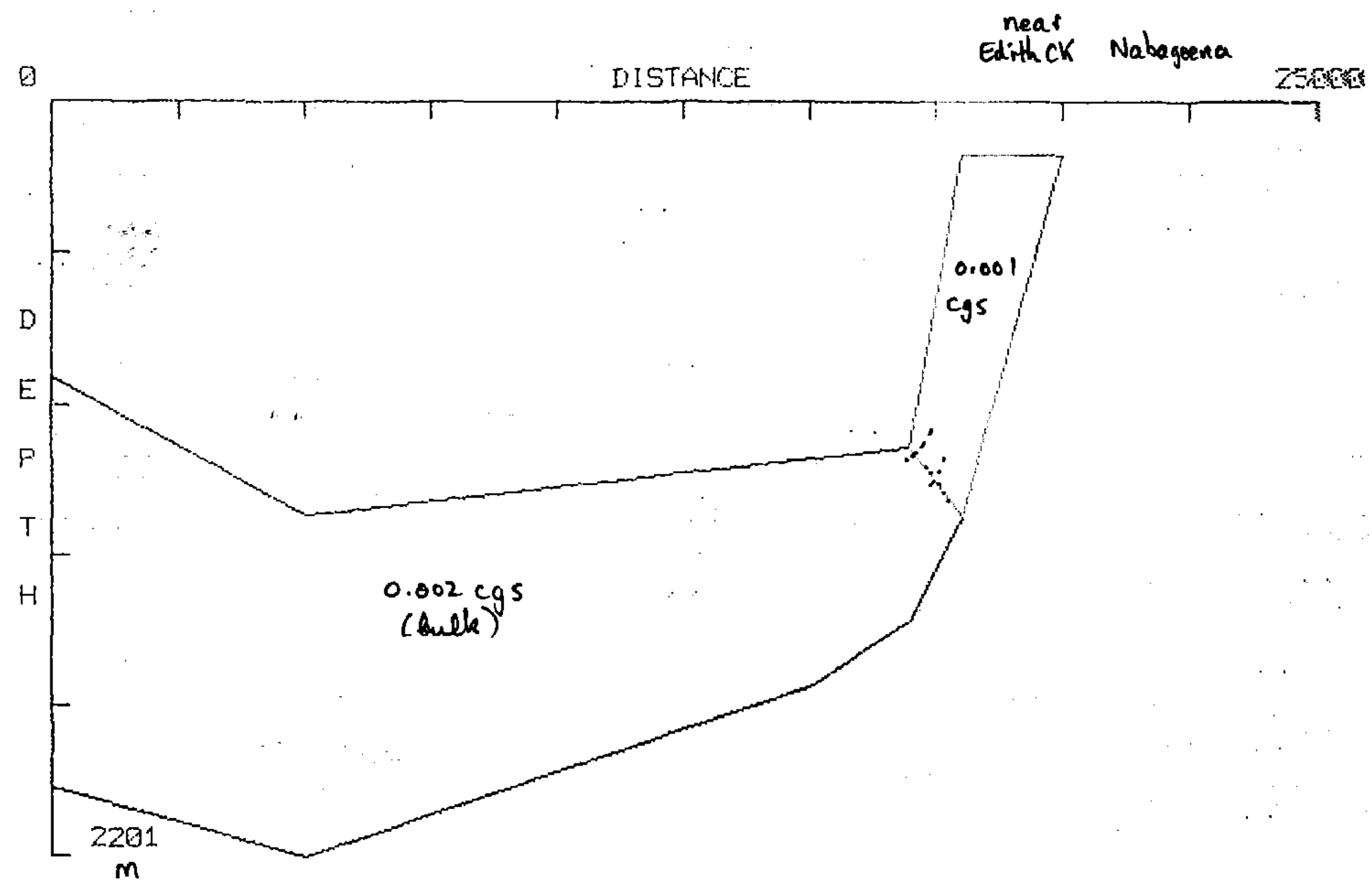
001 2.0 18000 150 1.0 20000 150 0.0 18000 1200 0.0 17000 1000 0.0

696060

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 25000 250



BALFOUR-TROWUTTA BMR2341 5460N 320-345E



MAGNETIC INTERPRETATION LINE 5460 000 N FIGURE 17

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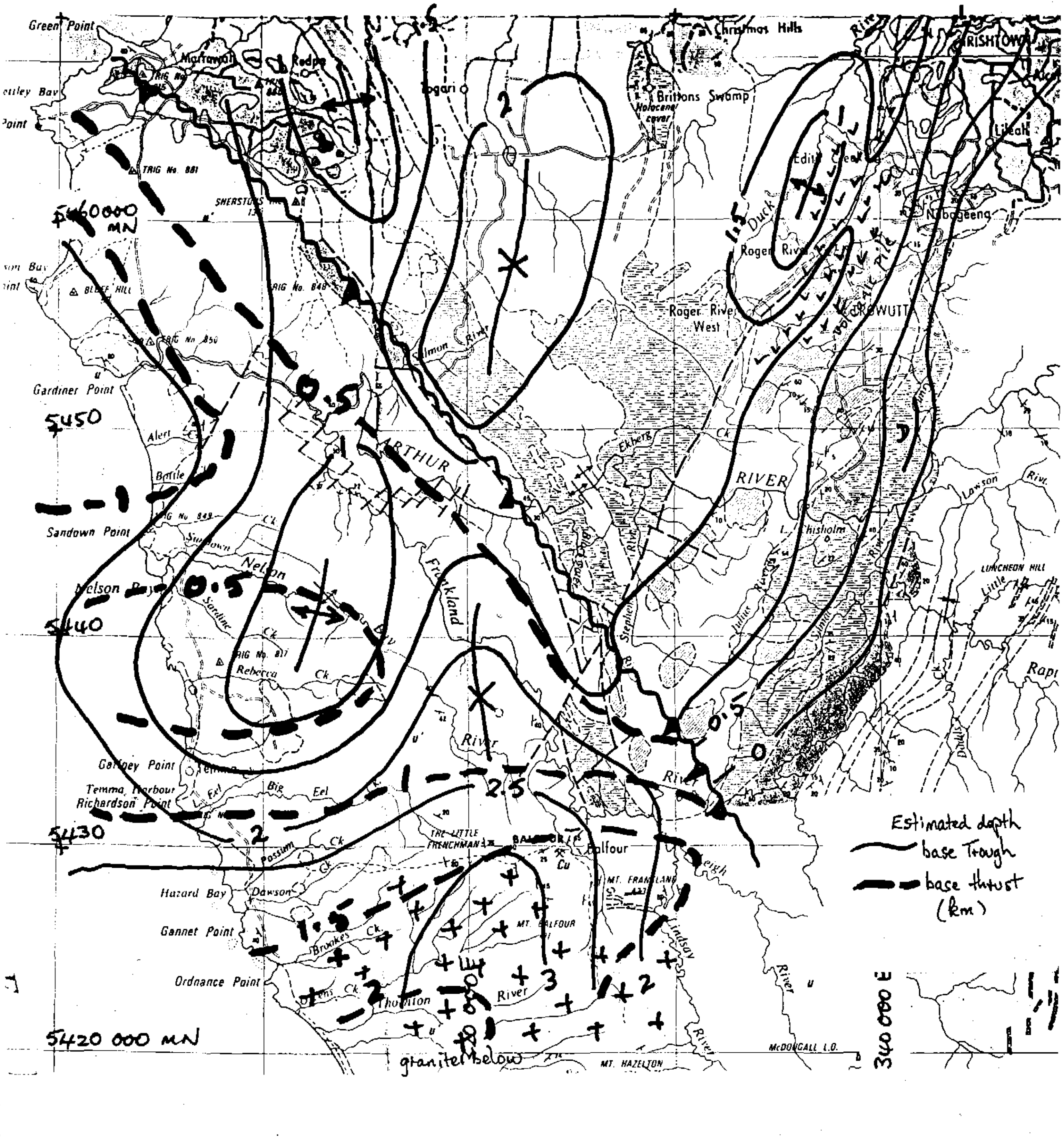
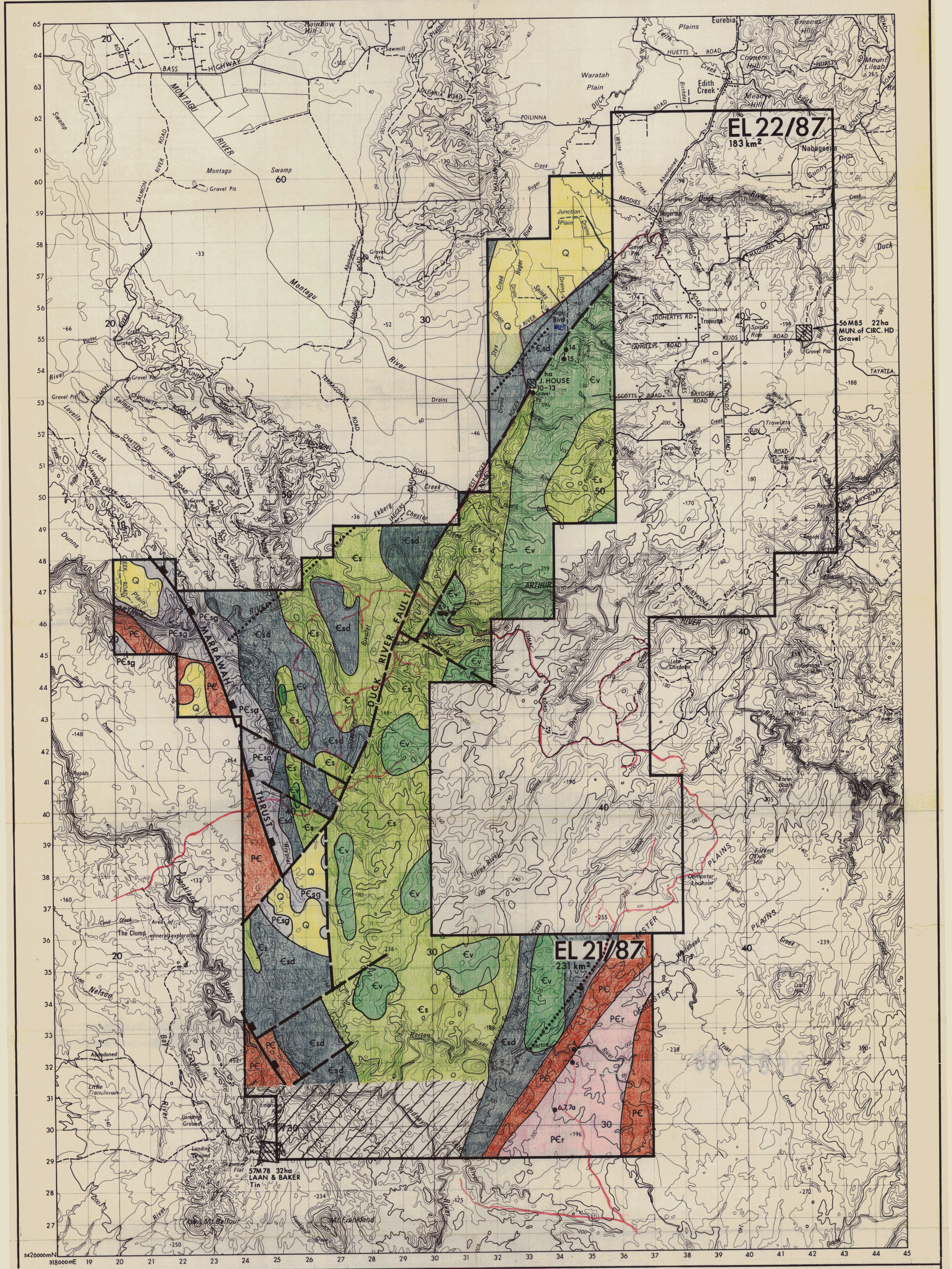
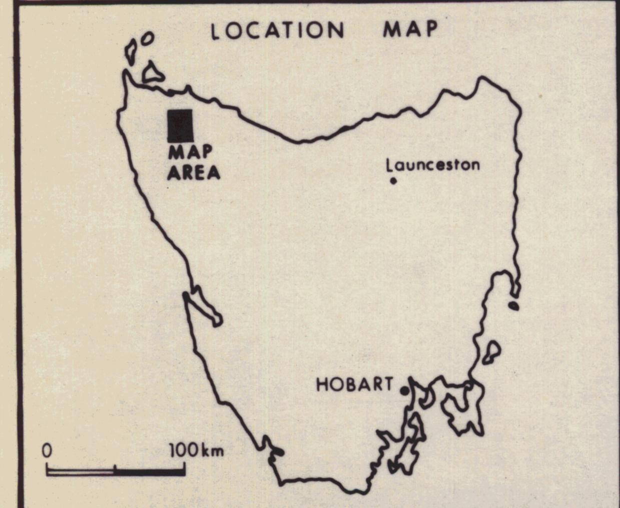


SUMMARY OF STRUCTURAL INTERPRETATION

FIGURE 18





GN
TN
MN
1.2°
10.9°

0 1 2 4 6 8 10 km

1 : 50,000

KEY

Q	Quaternary – undifferentiated
T	Tertiary – basalt
CAMBRIAN	
€v	Interbedded sediments and basic volcanics (incl. spilites vv)
€s	Undifferentiated sediments
€sb	Dolomite breccias
EO-CAMBRIAN?	
€sd	Smithton Dolomite
PRECAMBRIAN	
P€sg	Siltstone, greywacke, quartzite
P€r	Siltstone, quartzite
P€	Undifferentiated sediments (Rocky Cape Block)
(hatched)	Undifferentiated Precambrian - Cambrian
	Fault; approx., inferred
	Thrust fault, (overridden block indicated)
	Interpreted lineament
2 ●	Rock chip sample and number

696062

Geology compiled from Lennox et al (1982), various Dept. Mines Tasmania open file reports and interpretation by Aureole Resources.

5 cm

WILLIAM C. CROMER PTY LTD
CONSULTING GEOLOGISTS

190 Macquarie St., Hobart, 7000, Tasmania. (002) 31·0656

AUREOLE RESOURCES
WINSTON RESOURCES, SIERRA NEVADA RESOURCES

EL 21/87 - BALFOUR GEOLOGICAL COMPILATION

REF.	2101
DATE	Dec., '88
COMP.	R. F.
DRAWN	T. K. D. Contracting
SCALE	1 : 50,000

7746

PLAN 1