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EL 747, EL 748 AND EL 749

BUNABIE ROCKHOLE, HUGHES AND NULLARBOR PLAIN

PROGRESS REPORTS AND FINAL REPORT FOR THE PERIOD 20/10/80 TO 19/10/82

Submitted by

The Shell Co. of Australia Ltd
1983

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101 Grenfell Street, Adelaide 5000

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Facsimile: (08) 8204 1880

PRIMARY INDUSTRIES AND RESOURCES SA

CONTENTS ENVELOPE 4046

Transparencies in Cylinder 4046/1

TENEMENT: E.L. 747 - Bunabie Rockhole, E.L. 748 - Hughes, E.L. 749 - Nullarbor Plain.

TENEMENT HOLDER: Shell Company Of Australia Ltd.

PLANS:

THE SHELL COMPANY OF AUSTRALIA LIMITED

Report on E.L. 747, Bunabie Rockhole, S.A.
E.L. 748, Hughes, S.A.
E.L. 749, Nullarbor Plain, S.A.

For the Quarter Ending January 20th, 1981.

Distribution: Copy 1 Department of Mines and Energy, S.A.
2 Shell, Melbourne
3/4/5 Shell, Adelaide

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1. INTRODUCTION

Exploration Licences 747, 748 and 749 were applied for on 6th May, 1980 and granted on 20th October, 1980 for a period of one year. The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250,000 sheet areas, South Australia adjacent to the border with Western Australia. (Figure 1).

The licences are referred to as Bunabie Rockhole (E.L. 747), Hughes (E.L. 748) and Nullarbor Plain (EL. 749) and cover areas of 2104,3051 and 2345 square kilometres respectively. (Figures 2,3 and 4).

2. REGIONAL GEOLOGY

The Eucla Basin evolved by subsidence of the Precambrian basement during the Mesozoic. It is a broad structure representing a gentle epeirogenic downwarp of the southern continental margin of Australia and is an area of Cretaceous and Tertiary deposition. The basin is bounded by the Gawler Block to the east, the Albany-Fraser Province to the west, the Officer Basin to the north and extends to the edge of the continental shelf of the Great Australian Bight. Before and possibly during the Proterozoic, the basement was tectonically deformed, enabling the accumulation of Proterozoic sediments and volcanics in deep basement troughs e.g. the Mallabie Depression to the east. A number of large deep-seated faults have been interpreted in or along the margins of the Eucla Basin.

Recent regional aeromagnetic surveying on the COOK and COOMPANA 1:250,000 sheet area has revealed an intense, broad, reversely magnetised magnetic anomaly derived from a deep, intrabasement source. A number of shallow (some less than 200m) negative anomalies and trends are distributed around this feature. (Figures 5 and 6). Many of the discrete anomalies are located along northeast or northwest striking faults indicated on the aeromagnetic data.

3. EXPLORATION TARGETS

The prime targets are:-

Base metals associated with regional magnetic and gravity anomalies of unknown origin in the basement. The linear and discrete magnetic anomalies may indicate mafic/ultramafic bodies with potential for nickel, chromium, platinum, vanadium etc.

Oil shales associated with the Lower Cretaceous Madura Formation.

Uranium associated with Tertiary lignites and sandstones.

4. WORK COMPLETED

During the quarter an assessment of available data was initiated.

Regional aeromagnetic data from surveys completed by the Bureau of Mineral Resources were obtained and reprocessed. Aeromagnetic contour plans and stacked profile plans for the Merdeyerrah and Coompana 1:100,000 sheets were produced (Appendix 1) and preliminary plans for the Bunburra and Bundulla 1:100,000 sheets completed.

A magnetic interpretation of the Merdeyerrah and Coompana sheets was completed by Layton Geophysical International on behalf of Shell and Depth to Magnetic Basement and Structural Interpretation plans produced (Appendix 2).

A review of magnetic features warranting investigation and further analysis of existing magnetic data were commenced.

An examination of Lower Cretaceous sequences intersected in drilling in the region was made to assist in the assessment of the oil shale potential of the area. A limited number of samples were selected for analysis. Results are not yet available.

5. EXPENDITURE

See details below.

THE SHELL COMPANY OF AUSTRALIA LIMITED - METALS DIVISION

QUARTERLY PROJECT COSTS - BUNABIE ROCKHOLE E.L. 747

PERIOD OCTOBER 1 - DECEMBER 31, 1980.

Item	Cost
Staffing	$ 148
Regional office expenses	$ 30
Vehicles - Rental	$ 27
Payment to Governments	$ 24
Airborne Geophysics	$ 1,000
Total Direct Costs	$ 1,229
Overheads	$ 97
Gross Costs	$ 1,326

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THE SHELL COMPANY OF AUSTRALIA LIMITED - METALS DIVISION

QUARTERLY PROJECT COSTS - HUGHES E.L. 748

PERIOD OCTOBER 1 - DECEMBER 31, 1980.

Item		Cost
Books, Maps and Publications	$	8
Payments to Governments	$	24
Airborne Geophysics	$	1,000
Total Direct Costs	$	1,032
Overheads	$	0
Gross Costs	$	1.032

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THE SHELL COMPANY OF AUSTRALIA LIMITED - METALS DIVISION

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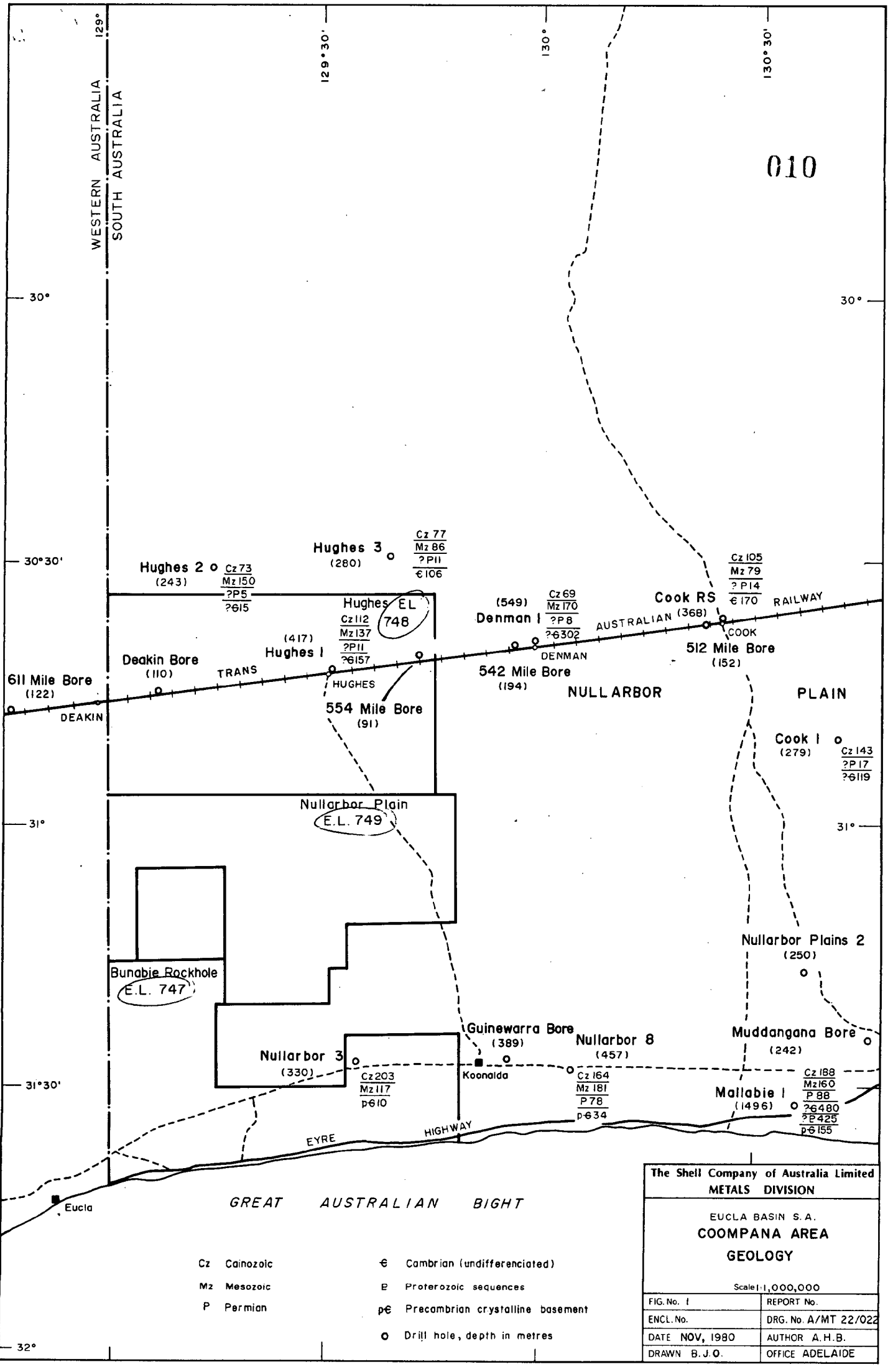
QUARTERLY PROJECT COSTS - NULLARBOR PLAIN E.L. 749

PERIOD OCTOBER 1 - DECEMBER 31, 1980.

Item	Cost
Staffing costs	$ 313
Professional Fees/Services	$ 5,750
Regional office expenses	$ 59
Vehicles - Rental	$ 54
Payment to Governments	$ 24
Airborne Geophysics	$ 1,000
Total Direct Costs	$ 7,200
Overheads	$ 193
Gross Costs	$ 7,393



The Shell Company of Australia Limited
METALS DIVISION

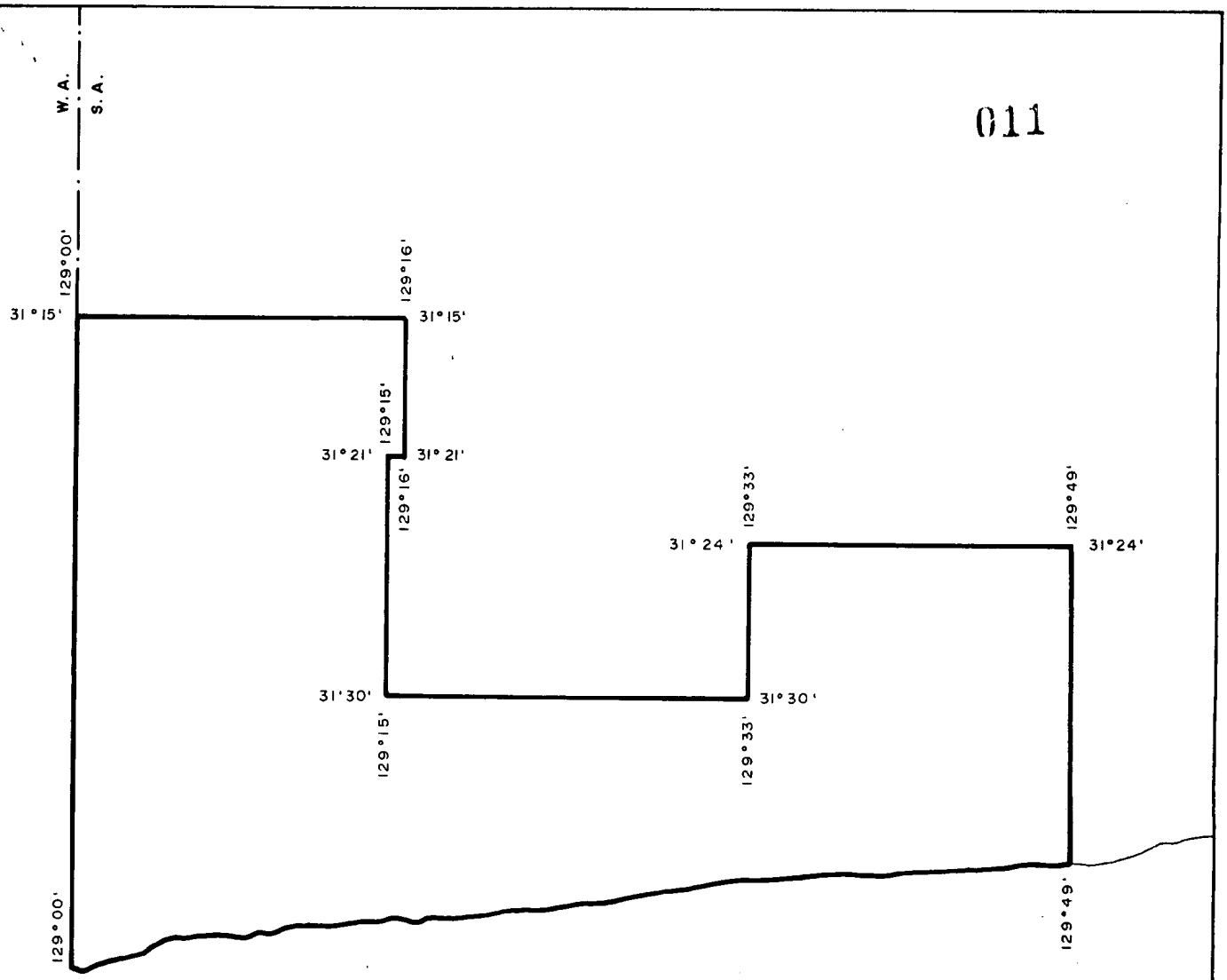
EUCLA BASIN S.A.

COOMPANA AREA GEOLOGY

Scale 1:1,000,000

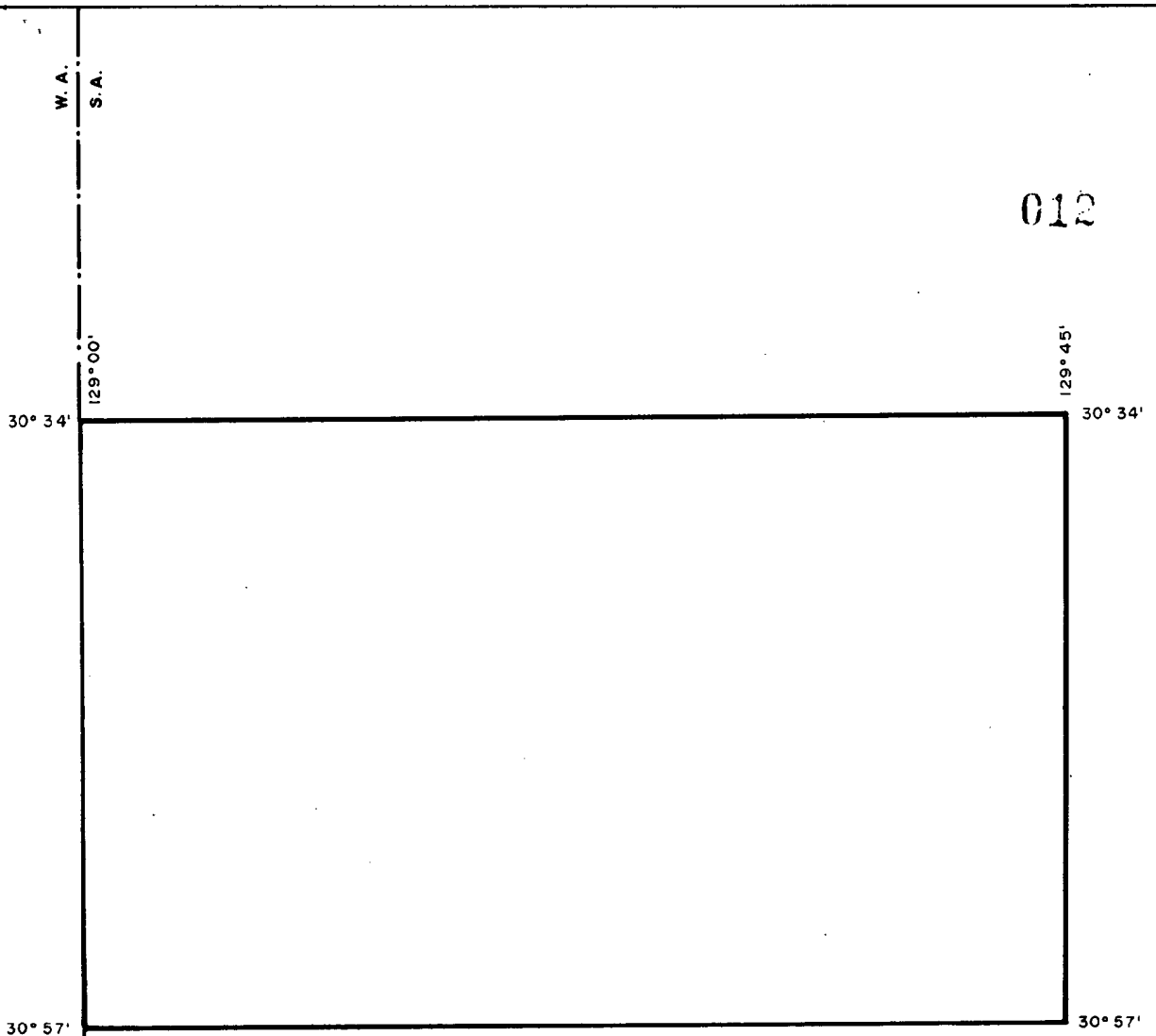
FIG. No. 1	REPORT No.
ENCL. No.	DRG. No. A/MT 22/022
DATE NOV, 1980	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

011

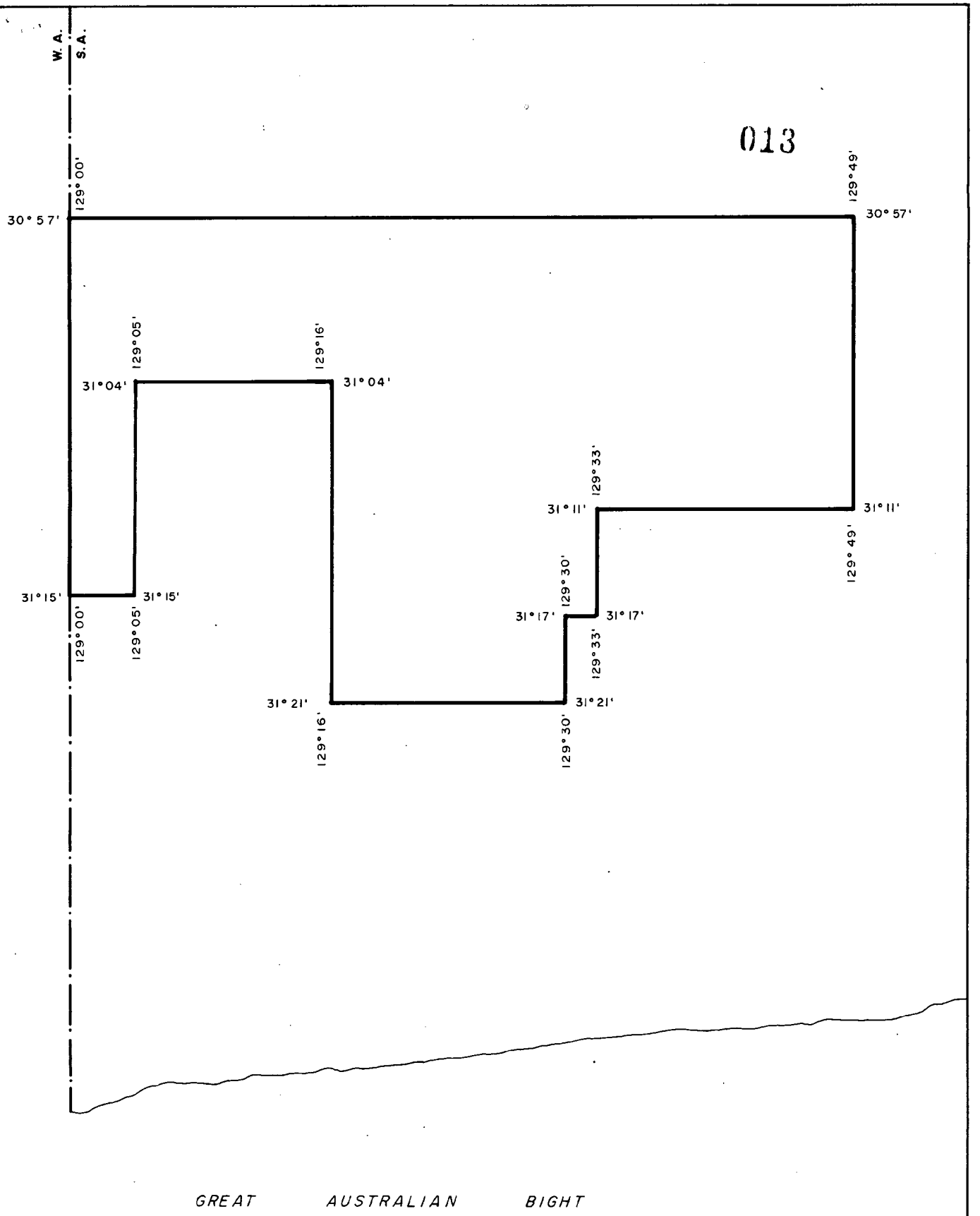


GREAT AUSTRALIAN BIGHT

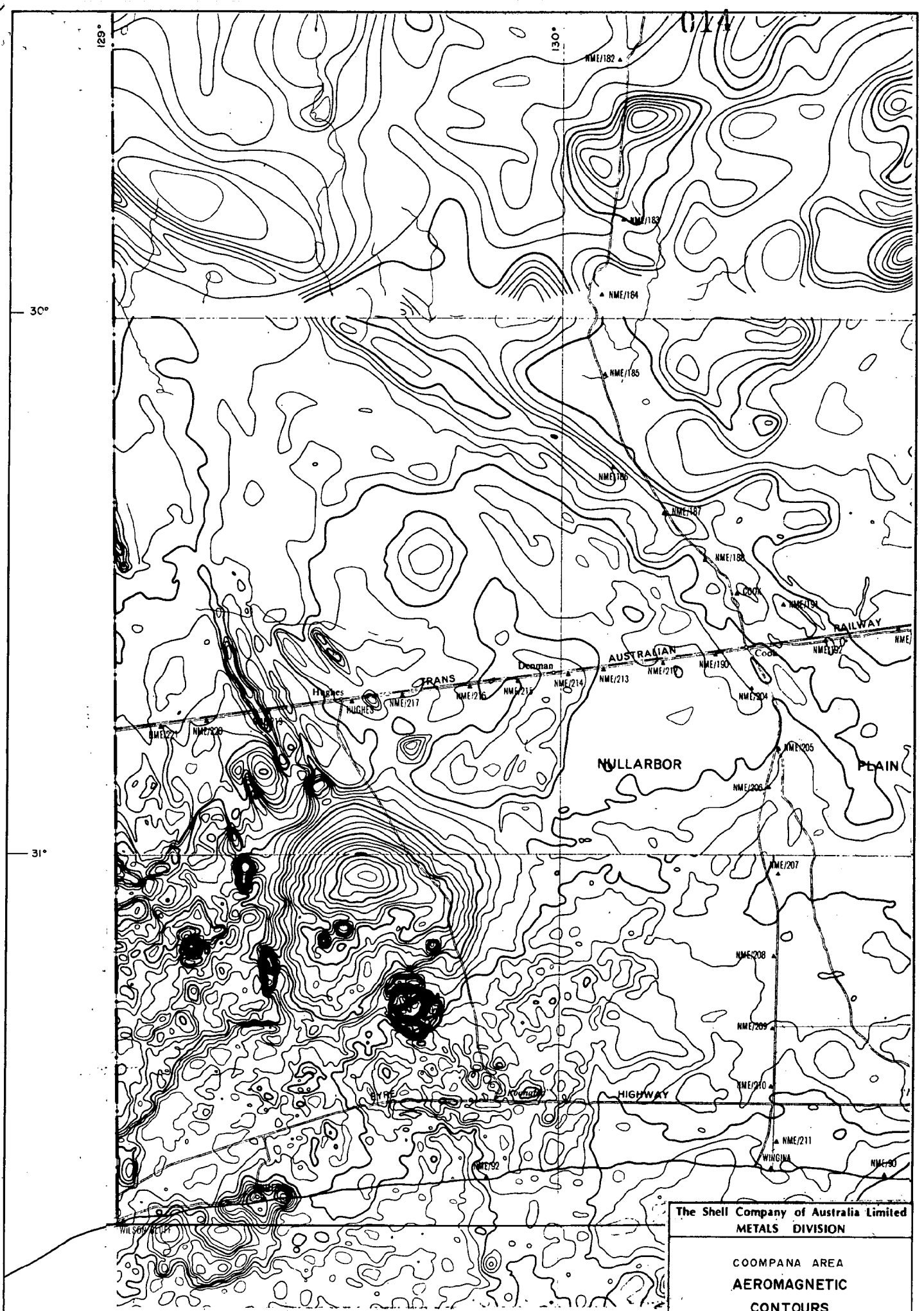
The Shell Company of Australia Limited METALS DIVISION	
LOCATION MAP COOMPANA AREA BUNABIE ROCKHOLE E.L. 747 Scale 1:500,000	
FIG. No. 2	REPORT No.
ENCL. No.	DRG. No. A/MT 22/021
DATE MAY 1980	AUTHOR
DRAWN B.J.O.	OFFICE ADELAIDE



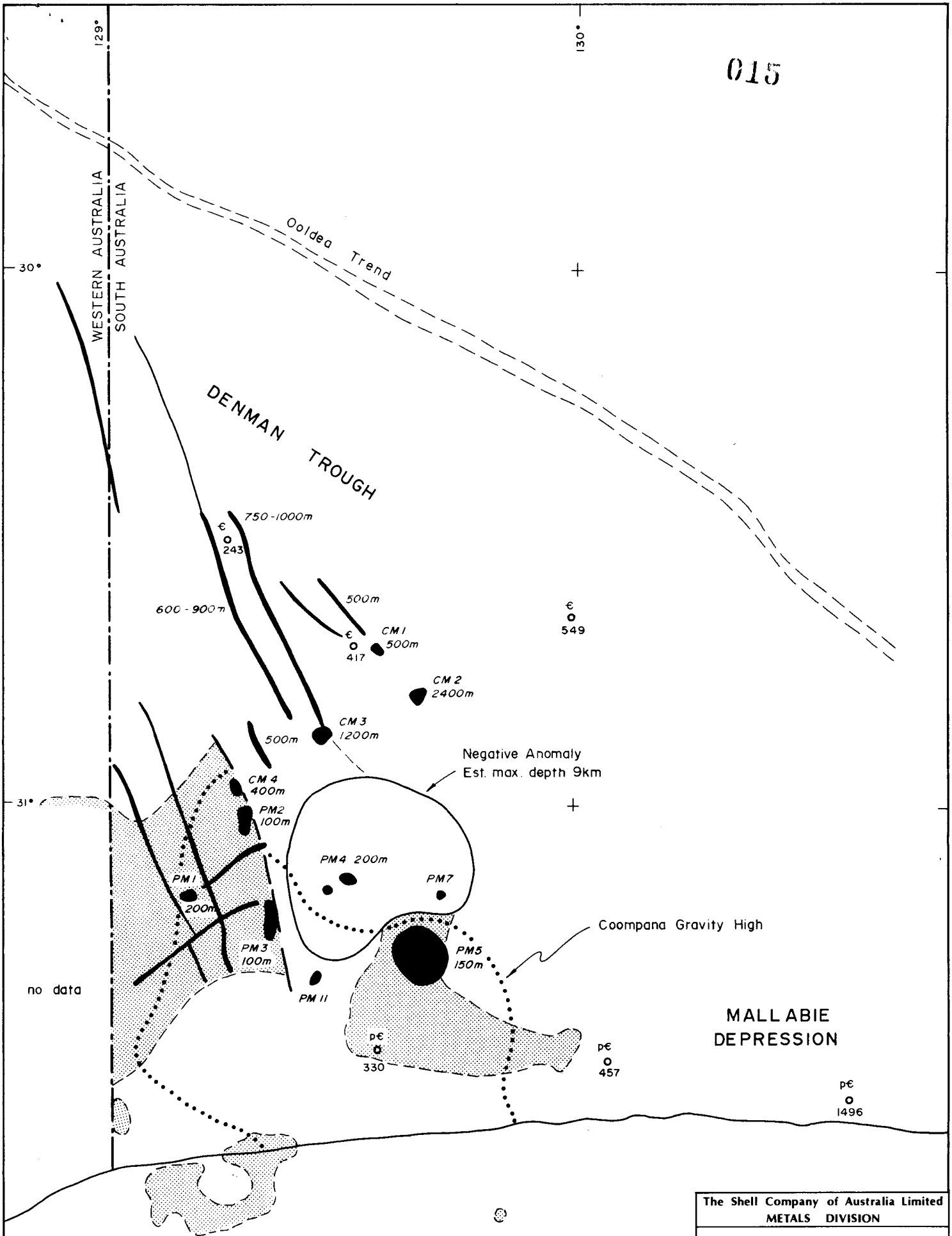
The Shell Company of Australia Limited METALS DIVISION	
LOCATION MAP COOMPANA AREA HUGHES E.L. 748 Scale 1: 500,000	
FIG. No. 3	REPORT No.
ENCL No	DRG No A/MT 22/019
DATE MAY 1980	AUTHOR
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
LOCATION MAP COOMPANA AREA NULLARBOR PLAINS E.L.749 Scale 1:500,000	
FIG. No 4	REPORT No.
ENCL No	DRG No. A/MT 22/020
DATE MAY 1980	AUTHOR
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA AREA AEROMAGNETIC CONTOURS Scale 1:1,000,000	
FIG No 5	REPORT No
ENCL. No.	DRG. No. A/MT 22/025
DATE MAY 1980	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA AREA-S.A. MAGNETIC FEATURES	
Scale 1:1,000,000	
FIG. No. 6	REPORT No.
ENCL. No.	DRG. No. A/MT 22/029
DATE MAY 1980	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

APPENDIX 1

REPROCESSED B.M.R. AEROMAGNETIC DATA

Coompana, Magnetic Contours	1:100,000
Coompana, Magnetic Profiles	1:100,000
Merdayerrah, Magnetic Contours	1:100,000
Merdayerrah, Magnetic Profiles	1:100,000

APPENDIX 2

MAGNETIC INTERPRETATION - COOMPANA AREA, S.A.

LAYTON GEOPHYSICAL INTERNATIONAL

THE SHELL COMPANY OF AUSTRALIA
LIMITED

MAGNETIC INTERPRETATION - COOMPANA AREA, SOUTH AUSTRALIA

DECEMBER, 1980

LAYTON GEOPHYSICAL INTERNATIONAL

P.O. Box 77
Campbell A.C.T. 2601
AUSTRALIA
Telephone (062) 47 0753
Telex: AA 61601 AUSTAS

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INTRODUCTION

Layton Geophysical International was asked by The Shell Company of Australia Limited (under contract No. 48154/PW09) to undertake Magnetic Interpretation on two 1:100,000 map sheets, namely the Coompana and Merdeyerrah sheets.

The objectives of the interpretation were to produce a detailed depth to magnetic basement map of the area and to outline minor and major basement structures (sub-basins, faults etc.)

The interpretation was undertaken by Mr. Ian Campbell (B.Sc.), a Senior Geophysicist who consults for Layton Geophysical International.

It should be noted that the B.M.R. report on this area indicates that the magnetic detector in the aircraft was 150 metres above ground surface, and not 90 metres as indicated on the maps supplied by Shell Company. Depths on the maps produced are based on the detector being 150 metres above ground surface and not 90 metres.

INTERPRETATION PROCEDURES

Depths to magnetic basement were determined using the 'straight' slope method on anomalies considered suitable for depth estimates. The horizontal extent of the 'straight' portion of the slope at the inflection point of an anomaly is related to the depth of the source by the relation: Depth = 1.1 x horizontal extent of 'straight' slope. A correction was also made where the strike of the anomaly was not perpendicular to the flight line.

Much of the Merdeyerrah and Coompana 1:100000 areas show high levels of magnetic disturbance with the result that most anomalies are distorted by the interference from magnetic sources adjacent to the primary source. As a result of this interference, many anomalies were not considered suitable for depth estimation. Because of this and the lack of anomalies in the northern parts the number of depth estimates is less than would permit the production of an accurate and detailed depth to basement map.

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INTERPRETATION

Maximum depths to basement over most of the region are shallow with most of the basement within the range 300 to 600m below ground level. The smoother contours suggest a deepening to the northeast of Merdeyerrah and to the north of Coompana. Alternatively, this may be due to basement of more uniform composition.

Strong gradients indicate a major basement division between the western and eastern side of Merdeyerrah. Positive and negative magnetic anomaly trends are also indicated on the map. They probably indicate the location of lineaments and faults within the basement. The position of other faults have been interpreted from the character of the anomaly pattern.

Respectfully submitted,

T.D.J. Pippett,
Managing Geophysicist.

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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

REPORT ON E.L. 747, BUNABIE ROCKHOLE, S.A.
E.L. 748, HUGHES, S.A.
E.L. 749, NULLARBOR PLAIN, S.A.

FOR THE QUARTER ENDING APRIL 20TH, 1981

AUTHOR: A.H. BRASH

REPORT NO.: 08/870

DATE: MAY, 1981

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6	B.H.P.

No field work was carried out during the reporting period.

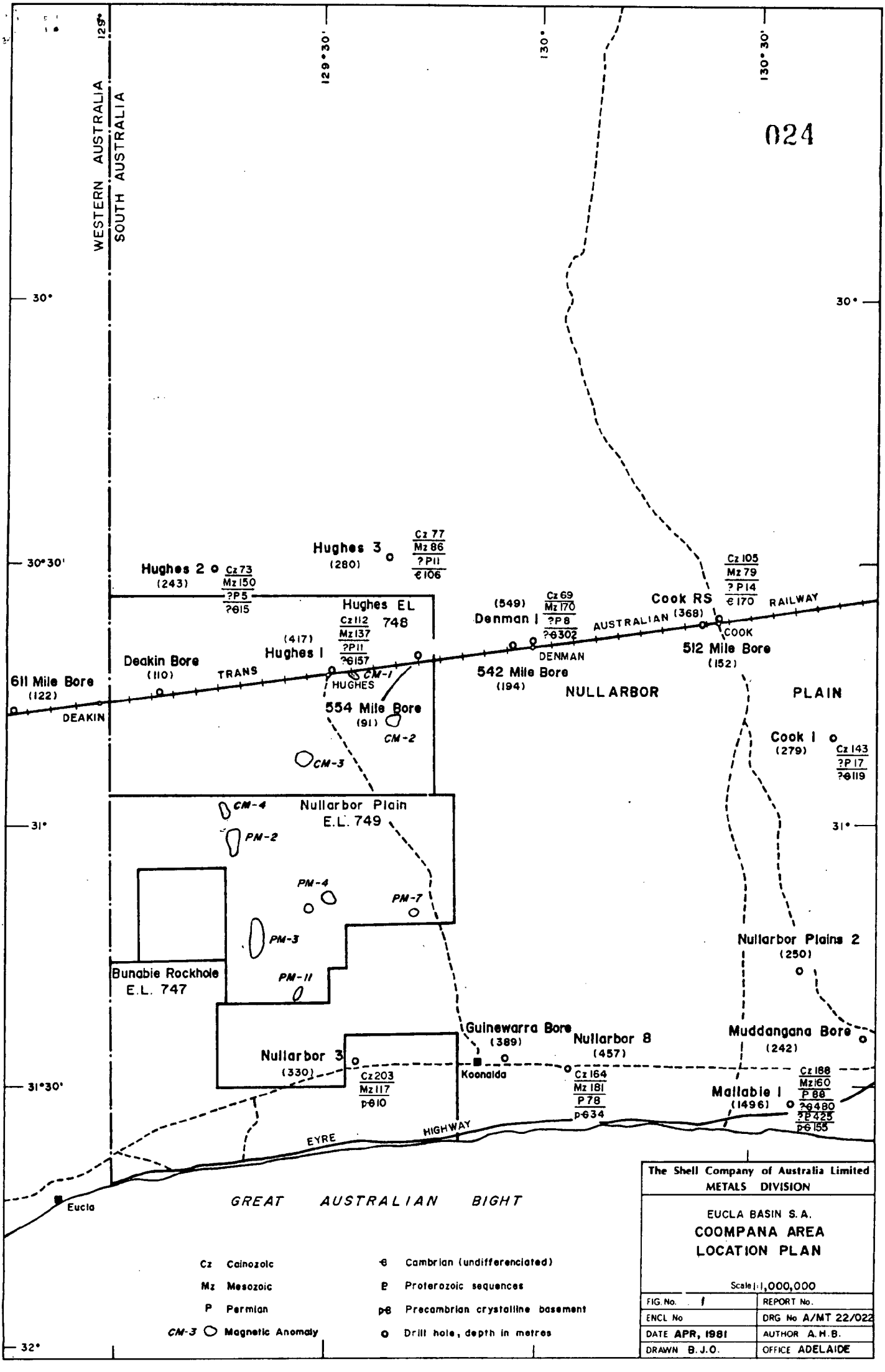
Preparations were made for a gridding and ground magnetic surveying over selected aeromagnetic anomalies (Fig. 1) in the Hughes and Nullarbor Plain E.L.'s scheduled to commence in May, 1981.

A contract was awarded to Solo Geophysics for gravity surveying over the gridded areas.

A contract was awarded to Peter Nitschke Drilling for percussion and diamond drilling scheduled to commence in August 1981.

Expenditures are summarised below:-

(in EL blocks)



The Shell Company of Australia Limited
METALS DIVISION

EUCLA BASIN S.A.
COOMPANA AREA
LOCATION PLAN

Scale 1:1,000,000

FIG. No. 1	REPORT No.
ENCL No	DRG No A/MT 22/022
DATE APR, 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

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THE SHELL COMPANY OF AUSTRALIA LIMITED
METALS DIVISION

REPORT ON E.L. 747, BUNABIE ROCKHOLE, S.A.
E.L. 748, HUGHES, S.A.
E.L. 749, NULLARBOR PLAIN, S.A.

FOR THE QUARTER ENDING JULY 20th, 1981.

AUTHOR: A.H. BRASH

REPORT NO.: 08/958

DATE: July, 1981

COPY NO.: 1

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2	Bunburra, Magnetic Profiles	1:100,000	A/PW08/006
3	Bundulla, Magnetic Contours	1:100,000	A/PW08/007
4	Bundulla, Magnetic Profiles	1:100,000	A/PW08/008
5	Anomaly CM1 Contours of Total Magnetic Intensity	1:25,000	A/PW08/03
6	Anomaly CM1 Total Magnetic Intensity Lines 3000N, 2500E, 2000E	1:25,000	A/PW08/04
7	Anomaly CM2 Contours of Total Magnetic Intensity	1:50,000	A/PW08/001
8	Anomaly CM2 Total Magnetic Intensity Lines 4000N, 4600E	1:25,000	A/PW08/002
Nullarbor Plains E.L. 749			
9	Anomaly CM4 Contours of Total Magnetic Intensity	1:25,000	A/PW09/001
10	Anomaly CM4 Total Magnetic Intensity Line 3500E - Baseline	1:25,000	A/PW09/002
11	Anomaly CM4 Total Magnetic Intensity Lines 1000N, 2000N	1:25,000	A/PW09/003
12	Anomaly CM4 Total Magnetic Intensity Line 3000N	1:25,000	A/PW09/04
13	Anomaly CM4 Total Magnetic Intensity Lines 4000N, 5000N	1:25,000	A/PW09/05
14	Anomaly PM2 Contours of Total Magnetic Intensity	1:25,000	A/PW09/06

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LIST OF ENCLOSURES (Cont.)

Enclosure No.	Title	Scale	Drawing No.
Nullarbor Plains E.L. 749 (Cont.)			
15	Anomaly PM2 Total Magnetic Intensity Line 0ON	1:25,000	A/PW09/07
16	Anomaly PM2 Total Magnetic Intensity Line 1000N	1:25,000	A/PW09/08
17	Anomaly PM2 Total Magnetic Intensity Line 2000N	1:25,000	A/PW09/09
18	Anomaly PM2 Total Magnetic Intensity	1:25,000	A/PW09/010
19	Anomaly PM2 Total Magnetic Intensity Line 4000N	1:25,000	A/PW09/011
20	Anomaly PM2 Total Magnetic Intensity Line 5000N	1:25,000	A/PW09/012
21	Anomaly PM2 Total Magnetic Intensity Line 2000E - Baseline	1:25,000	A/PW09/013
22	Anomaly PM3 Contours of Total Magnetic Intensity	1:25,000	A/PW09/022
23	Anomaly PM3 Total Magnetic Intensity Lines 4000N, 5000N	1:25,000	A/PW09/023
24	Anomaly PM3 Total Magnetic Intensity Line 1000N, 1500N	1:25,000	A/PW09/024
25	Anomaly PM3 Total Magnetic Intensity Line 2500E - Baseline	1:25,000	A/PW09/025
26	Anomaly PM3 Total Magnetic Intensity Line 2500N	1:25,000	A/PW09/026
27	Anomaly PM3 Total Magnetic Intensity Lines 6000N, 1700E	1:25,000	A/PW09/027

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LIST OF ENCLOSURES (Cont.)

Enclosure No.	Title	Scale	Drawing No.
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29	Anomaly PM4 Total Magnetic Intensity Line 2500N - Baseline	1:25,000	A/PW09/018
30	Anomaly PM4 Total Magnetic Intensity Lines 00E, 1000E, 2000E	1:25,000	A/PW09/019
31	Anomaly PM4 Total Magnetic Intensity Lines 5000E, 6000E	1:25,000	A/PW09/020
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33	Anomaly PM7 Contours of Total Magnetic Intensity	1:25,000	A/PW09/014
34	Anomaly PM7 Total Magnetic Intensity Lines 1000N, 00N, 2000E	1:25,000	A/PW09/015
35	Anomaly PM7 Total Magnetic Intensity Lines 4000N, 3000N, 2000N	1:25,000	A/PW09/016

1. INTRODUCTION

Exploration Licences 747, 748 and 749 were applied for on 6th May, 1980 and granted on 20th October, 1980 for a period of one year. The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250,000 sheet areas, South Australia adjacent to the border with Western Australia.

The licences are referred to as Bunabie Rockhole (E.L. 747), Hughes (E.L. 748) and Nullarbor Plain (E.L. 749) and cover a total area of 7,500 square kilometres.

The licences are the subject of a joint venture agreement with Dampier Mining Company Ltd.

2. WORK COMPLETED

2.1 Aeromagnetic Data

Final reprocessed aeromagnetic contour and stacked profile plans were produced for the Bunburra and Bundulla 1:100,000 sheets (Enclosures 1 - 4).

2.2 Ground Magnetic Surveying

214 line km of ground magnetic surveying was completed over magnetic anomalies CM-1, CM-2, CM-4, PMM-2, PM-3, PM-4 and PM-7 (Fig 1). A Geometrics G-816 was used for the survey. Station spacing was generally 50m. A summary of lines surveyed is presented in Appendix 1.

PM-2

Detailed analysis of the data is in progress. A summary of preliminary analysis is presented in Table 1. Maximum intensities lie in the range -500 to -2000 nT. The majority of sources are at depths of 250m to 500m with the exception of CM-1 and CM-2 which have interpreted depths exceeding 600m.

Profiles and contours of total magnetic intensity are presented in Enclosures 5 to 35.

2.3 Gravity Surveying

A programme of gravity surveying over anomalies CM-1, CM-4, PM-2, PM-3, PM-4 and PM-7 is in progress.

.../2

TABLE 1.

COOMPANA, SUMMARY OF GROUND MAGNETIC ANOMALIES

SHEET	E.L.	ANOMALY	MAX. INTENSITY nT	SIZE km	MEAN DEPTH EST. m	DEPTH RANGE m	COMMENTS
COOMPANA	472	PM-1	-6000	2.5 x 2.5	-		Held by CEC
	749	PM-2	-2000	2.5 x +4	480	440 - 560	
	749	PM-3 *	-1750	1.5 x 1.5	260 (N anomaly)	250 - 400	Multiple anomaly
			-2000		320 (S anomaly)	280 - 400	
	749	PM-4 *	-1400	1 x 2	440 (W anomaly)	360 - 520	
			-1300	2.5 x 2	500 (E anomaly)	480 - 520	
	503	PM-5			-		Held by CEC
	749	PM-7	-1000	2.5 x 1.4	470	380 - 560	Including A.O. data
					400		3D modelling
COOK	748	CM-1	- 550	2 x 1.5	620	450 - 680	
	748	CM-2	- 900	2.5 x 2	770	760 - 800	
	749	CM-4	-1900	2.5 x 1.7	450	400 - 500	

* Priority basement target

2.4 Drilling

Diamond and percussion drilling of basement and oil shale targets within the Cretaceous Madura Formation is scheduled to commence in August. A contract has been let to Peter Nitschke Drilling Ltd.

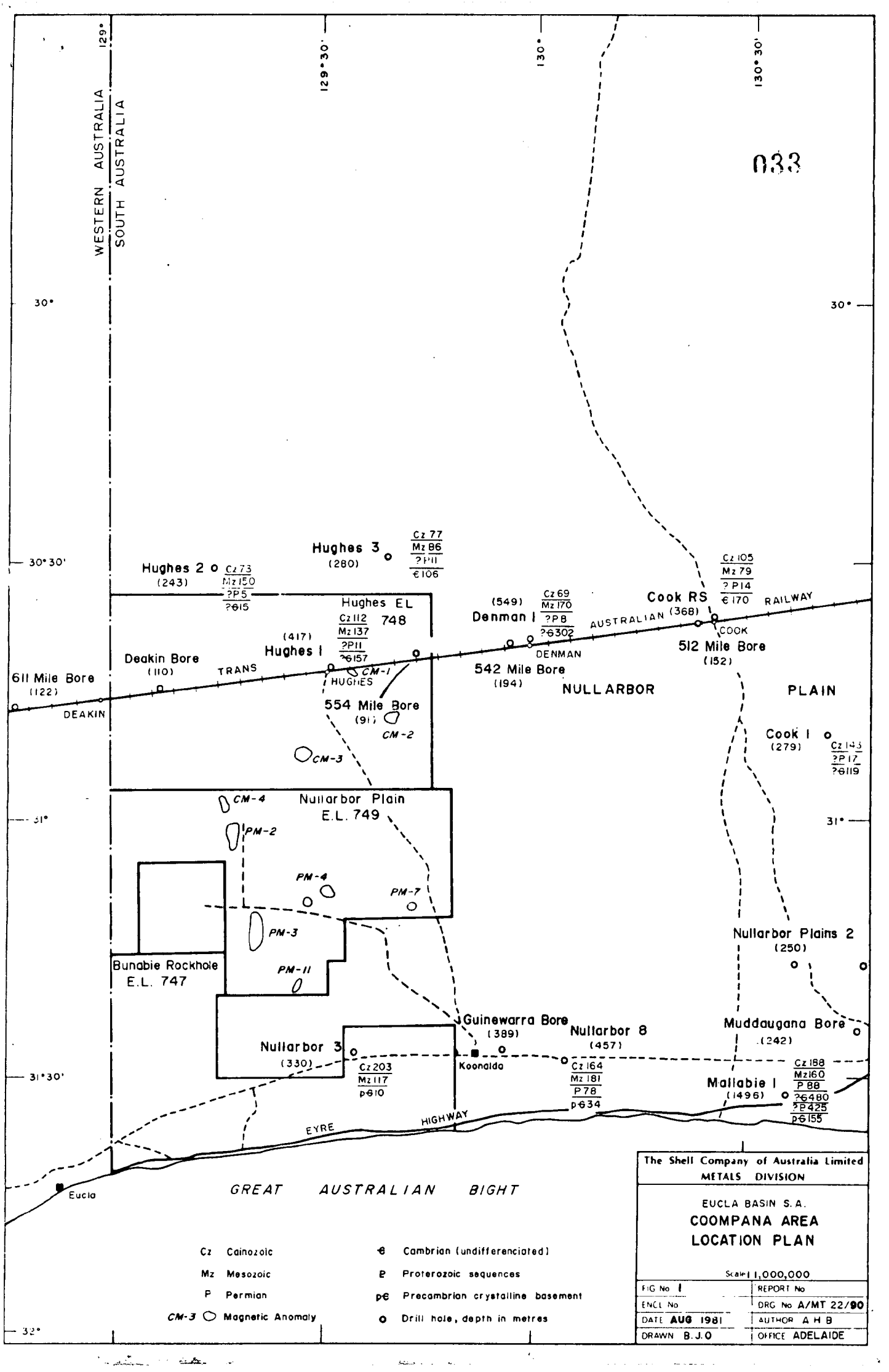
2.5 Analyses

Oil shale analyses for drill holes Hughes 1 and 2 were received and are presented in Appendix 2.

3. EXPENDITURE

A summary of expenditures for the quarter ending June 30, 1981 and total project figures are presented below.

E.L.	Quarter Apr/Jun	Project Total to Date
Bunabie Rockhole E.L. 747		
Personnel/Personnel Burden	0	340
Support Costs	148	1,285
Payments to Governments	0	24
Airborne Geophysics	833	1,333
Aerial Photography	100	100
Overheads	111-	97
Total	970	3,179
Hughes E.L. 748		
Personnel/Personnel Burden	520	520
Support Costs	5,078	5,122
Payments to Governments	0	24
Ground Geophysics	3,330	3,330
Airborne Geophysics	833	1,333
Aerial Photography	85	85
Overheads	236	236
Total	10,082	10,650
Nullarbor Plain E.L. 749		
Personnel/Personnel Burden	4,681	5,762
Support Costs	1,230	5,625
Payments to Governments	0	24
Airborne Geophysics	834	1,334
Topographical Surveying	3,635	3,635
Aerial Photography	85	85
Geological, Drawing & Computer	502	502
Overheads	189	828
Total	11,156	17,795



The Shell Company of Australia Limited
METALS DIVISION

EUCLA BASIN S.A.

COOMPANA AREA LOCATION PLAN

Scale 1:1,000,000

FIG No 1	REPORT No
ENCL No	DRG No A/MT 22/90
DATE AUG 1981	AUTHOR A H B
DRAWN B.J.O	OFFICE ADELAIDE

COOMPANA PROJECT, GROUND MAGNETIC LINES

ANOMALY	LINE	FROM	TO	TOTAL (KM)
PM7	2000E	00N	5000N	5
	1000N	00E	4000E	4
	2000N	00E	4000E	4
	3000N	00E	4000E	4
	4000N	00E	4000E	4
				21
PM4	2500N	00E	9000E	9
	00E	00N	5000N	5
	1000E	00N	5000N	5
	2000E	00N	5000N	5
	5000E	00N	5000N	5
	6000E	00N	5000N	5
	7000E	00N	5000N	5
	8000E	00N	5000N	5
				44
PM3	1700E	6000N	7000N	1
	2500E	00N	8000N	8
	1000N	500N	4500N	4
	1500N	1000N	4000N	3
	2500N	500N	4500N	4
	4000N	500N	5000N	4.5
	5000N	1000N	4500N	3.5
	6000N	00N	4500N	4.5
				31.5
PM2	2000E	00N	5000N	5
	00N	00E	7000E	7
	1000N	00E	7000E	7
	2000N	00E	7000E	7
	3000N	00E	7000E	7
	4000N	00	7000E	7
	5000N	00	7000E	7
				47
CM2	4600E	00N	8000N	8
	4000N	00E	9000E	9
				17
CM1	2000E	2000N	4000N	2
	2500E	00N	6000N	6
	3000N	00E	5000E	5
				13

COOMPANA PROJECT, GROUND MAGNETIC LINES

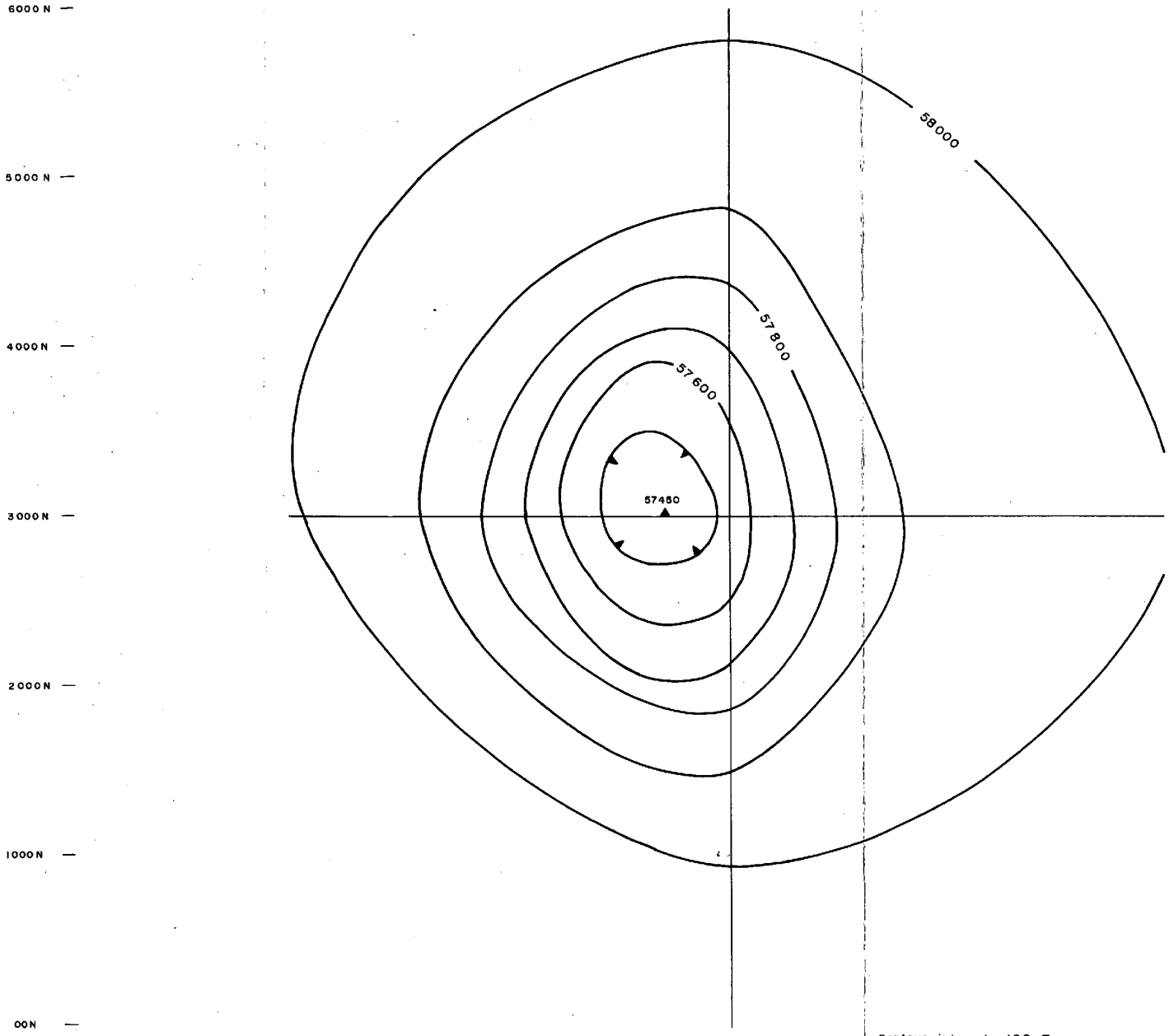
ANOMALY	LINE	FROM	TO	TOTAL (KM)
CM4	3500E	00N	5000N	5
	1000N	00E	7000E	7
	2000N	00E	7000E	7
	3000N	00E	7000E	7
	4000N	00E	7000E	7
	5000N	00E	7000E	7
				40
				213.5

APPENDIX 2

OIL SHALE ANALYSES HUGHES 1 AND 2

SAMPLE MARK	OIL YIELD	HOLE NUMBER	INTERVAL (M)
618	0.5 - 1.5	Hughes 1	410 - 420
619	0.5 - 1.5	" "	490 - 500
620	0.5 - 1.5	" "	587 - 588
621	0.5 - 1.5	Hughes 2	300 - 310
622	1.5 - 5	" "	428 - 430
623	0.5 - 1.5	" "	520 - 530
624	1.5 - 5	" "	720 - 730

Method: Oil Yield Estimate



Contour interval : 100 nT

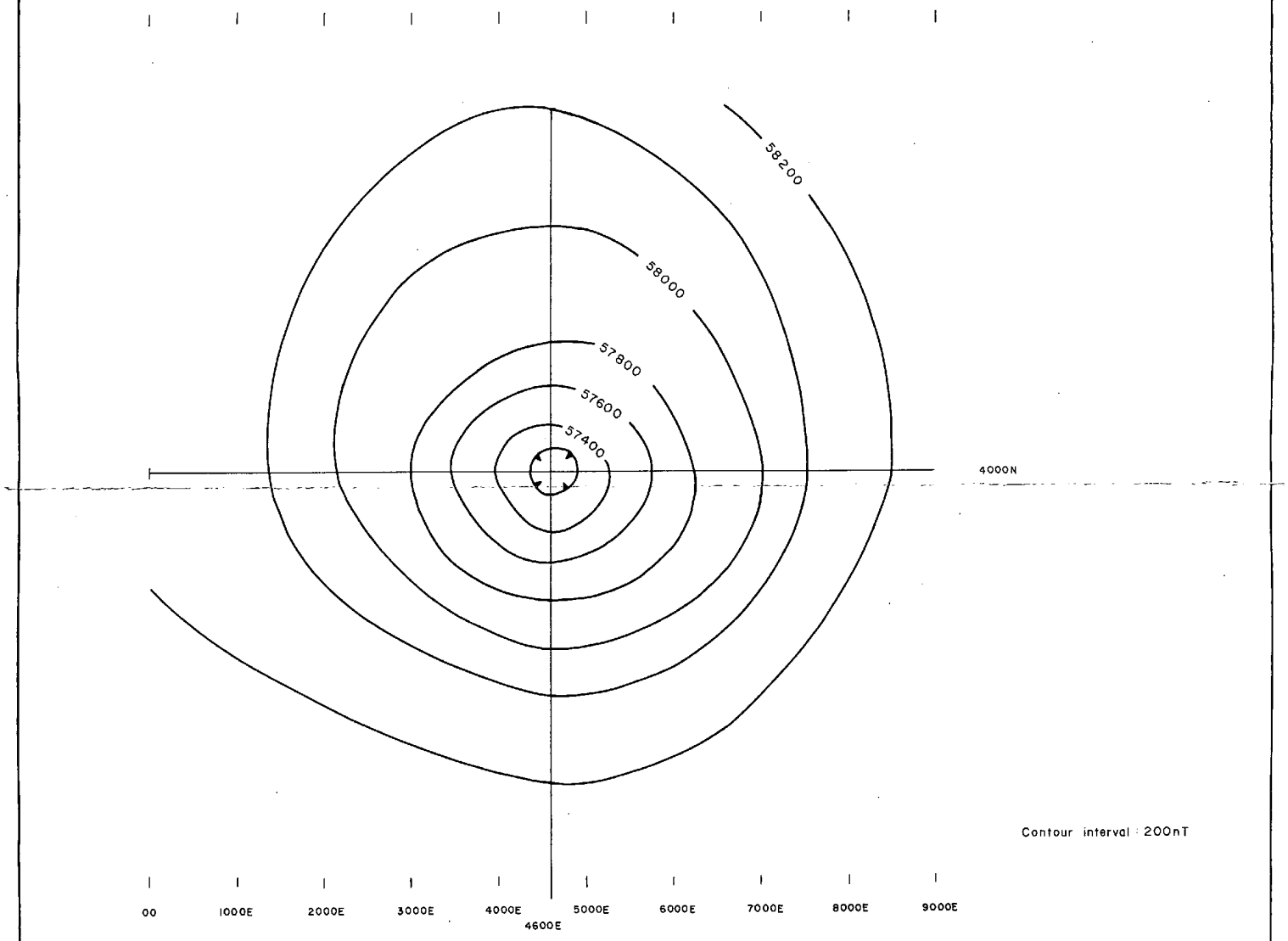
Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY CM1
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1 :25,000

FIG. No.	REPORT No.
ENCL. No. 5	DRG. No A/PW 08/03
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

038



Contour interval : 200nT

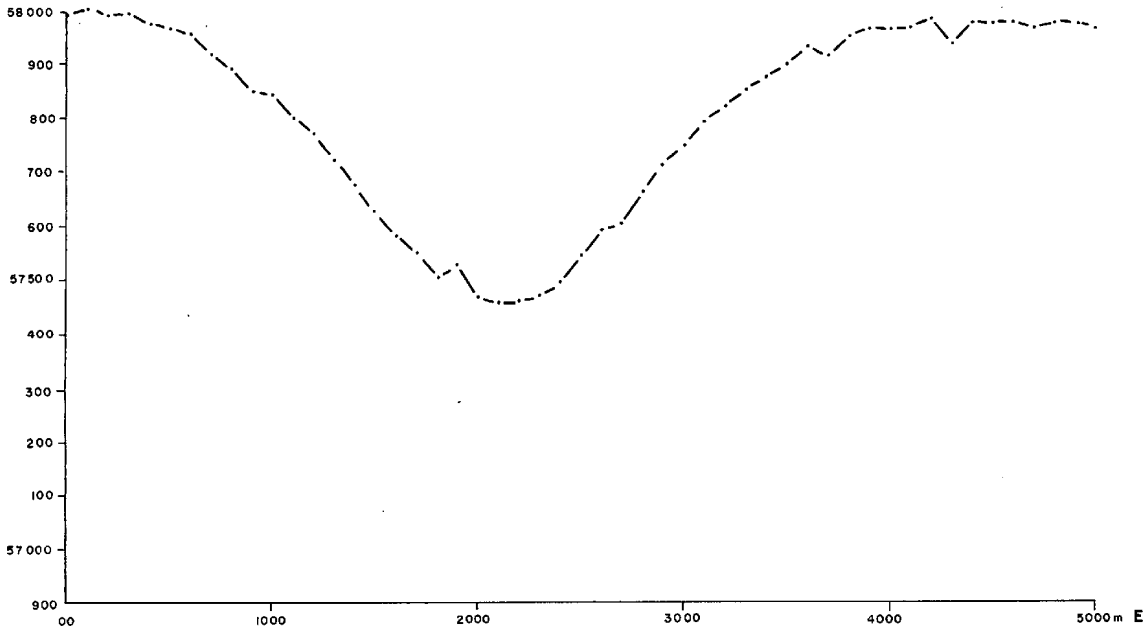
Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

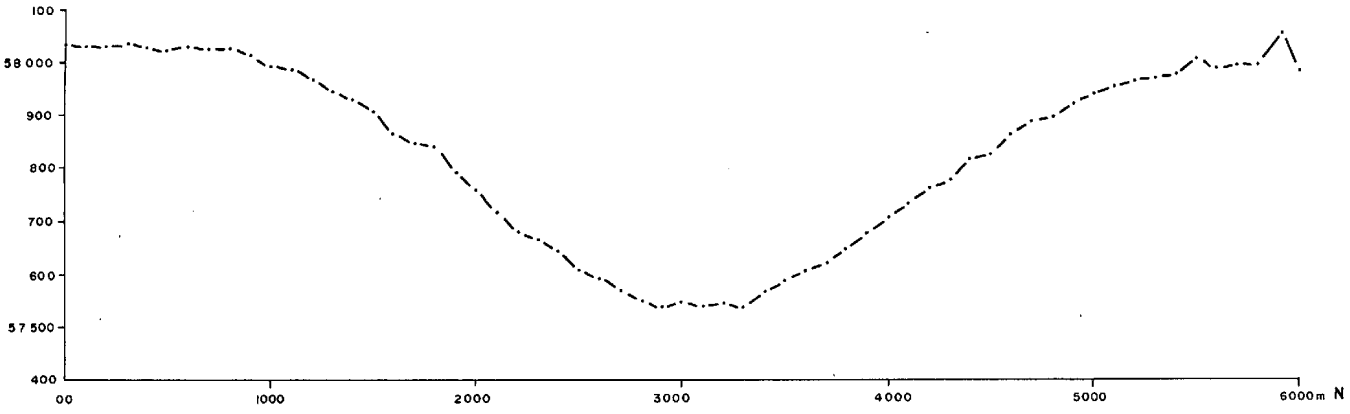
COOMPANA PROJECT
ANOMALY CM 2
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1:50,000

FIG. No.	REPORT No.
ENCL. No. 7	DRG. No. A/PW08/01
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

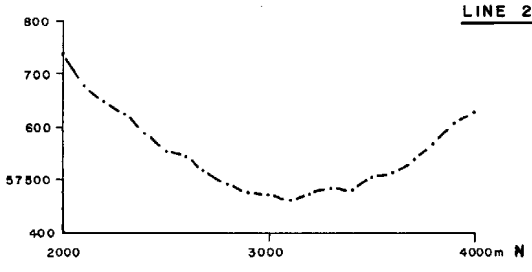
LINE 3000N



LINE 2500E



LINE 2000E

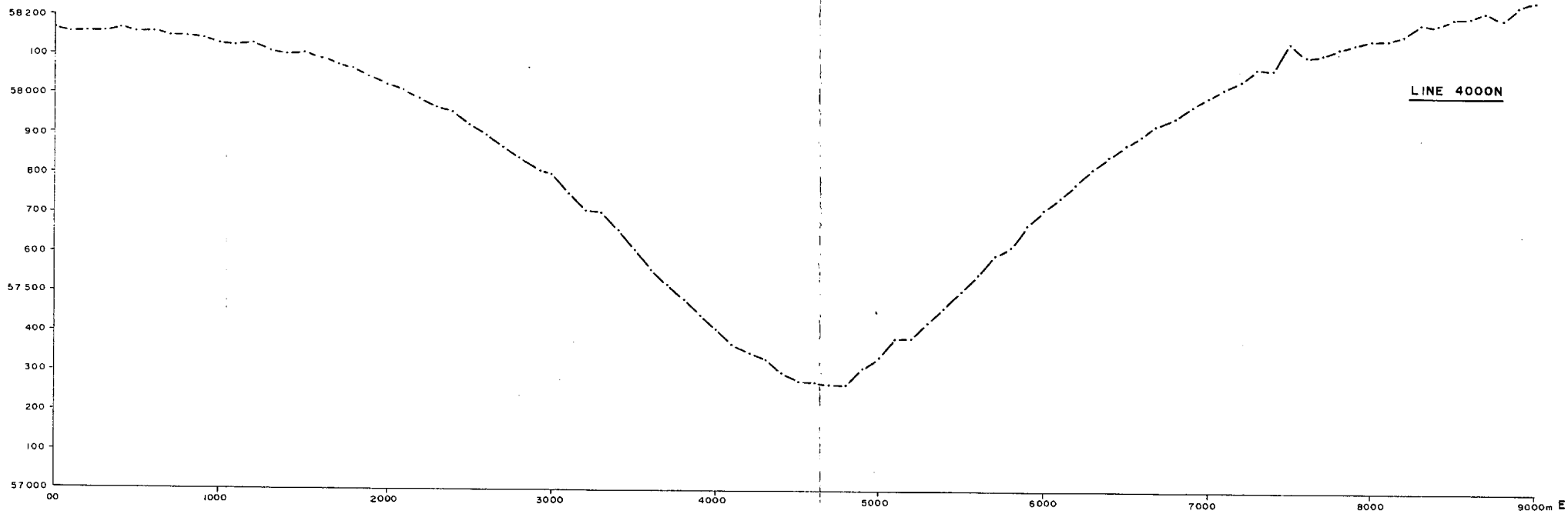


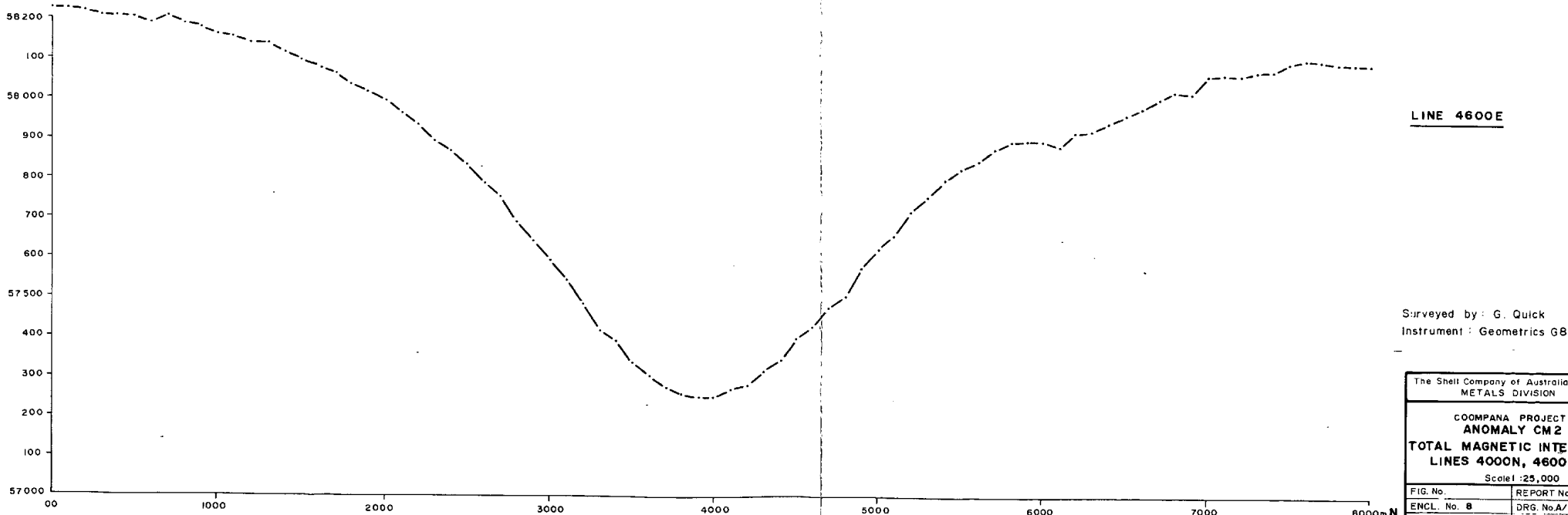
Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY CM 1
TOTAL MAGNETIC INTENSITY
LINES 3000N, 2500E, 2000E
Scale 1 : 25,000

FIG. No.	REPORT No.
ENCL. No. 6	DRG. No. A/PW 08/04
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

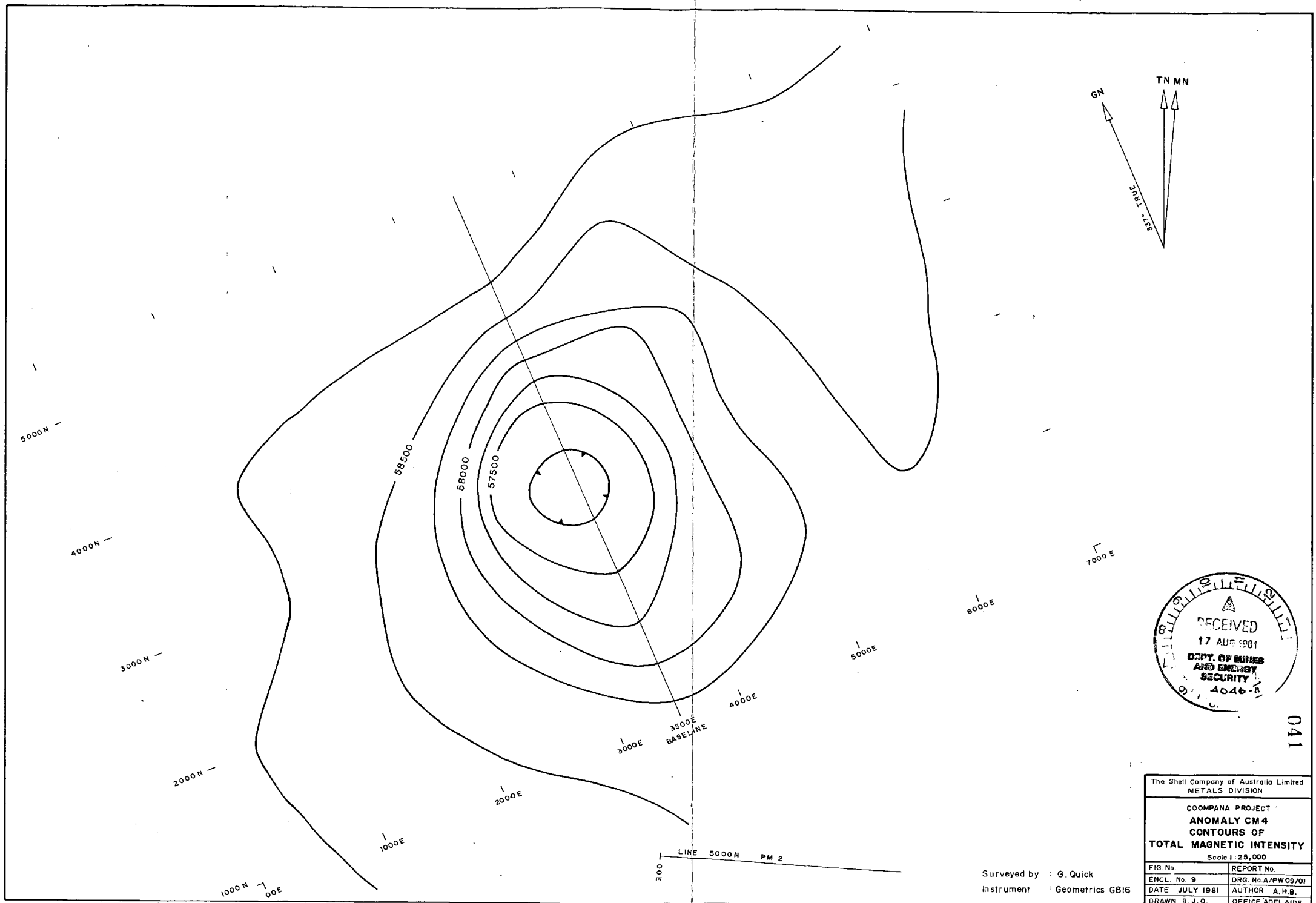




Surveyed by : G. Quick
Instrument : Geometrics G816

040

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT ANOMALY CM 2 TOTAL MAGNETIC INTENSITY LINES 4000N, 4600E Scale 1 :25,000	
FIG. No.	REPORT No.
ENCL. No. 8	DRG. No.A/PW 08/02
DATE JULY 1981	AUTHOR - A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



041

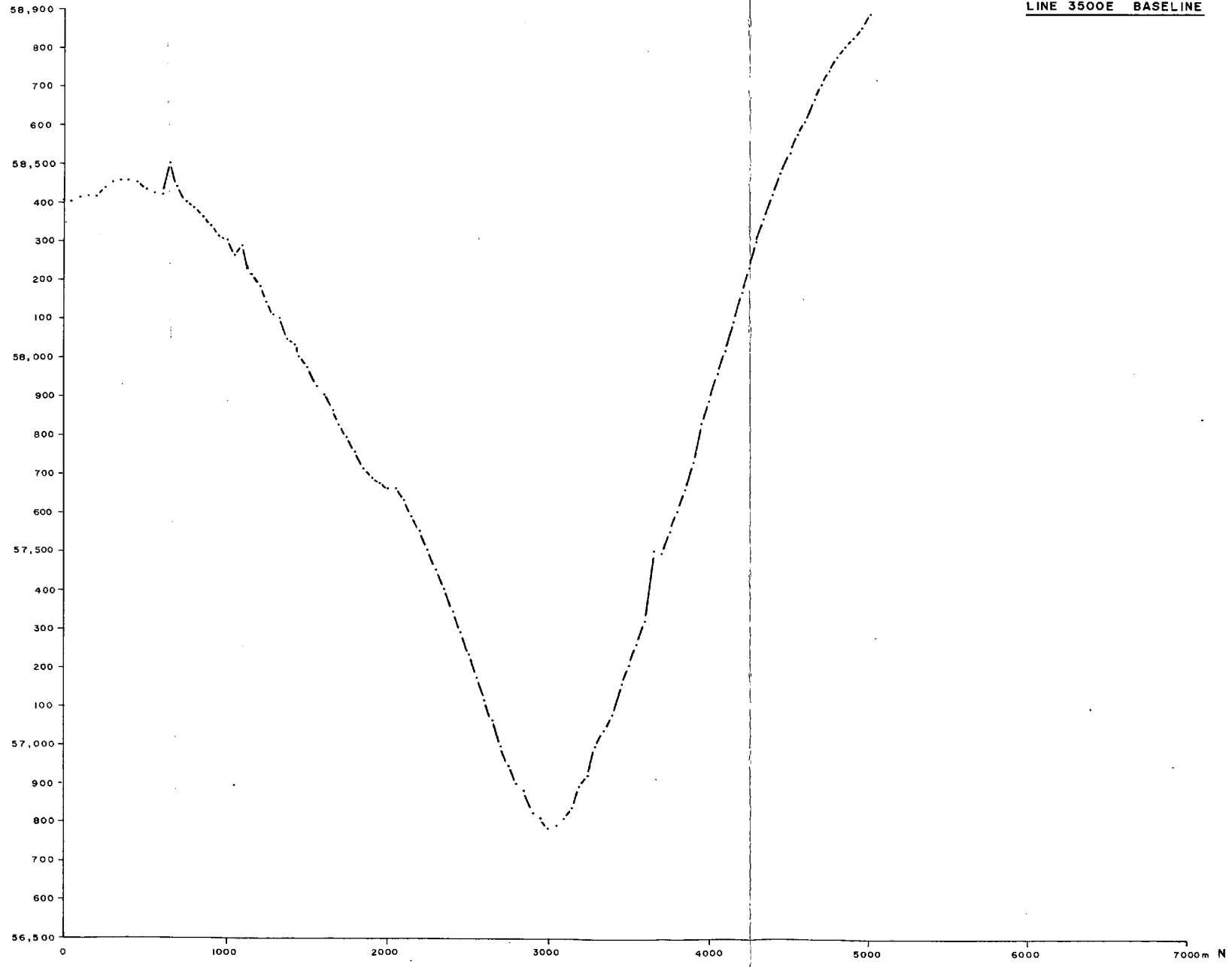
The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT

ANOMALY CM4
CONTOURS OF
TOTAL MAGNETIC INTENSITY

Scale 1:25,000

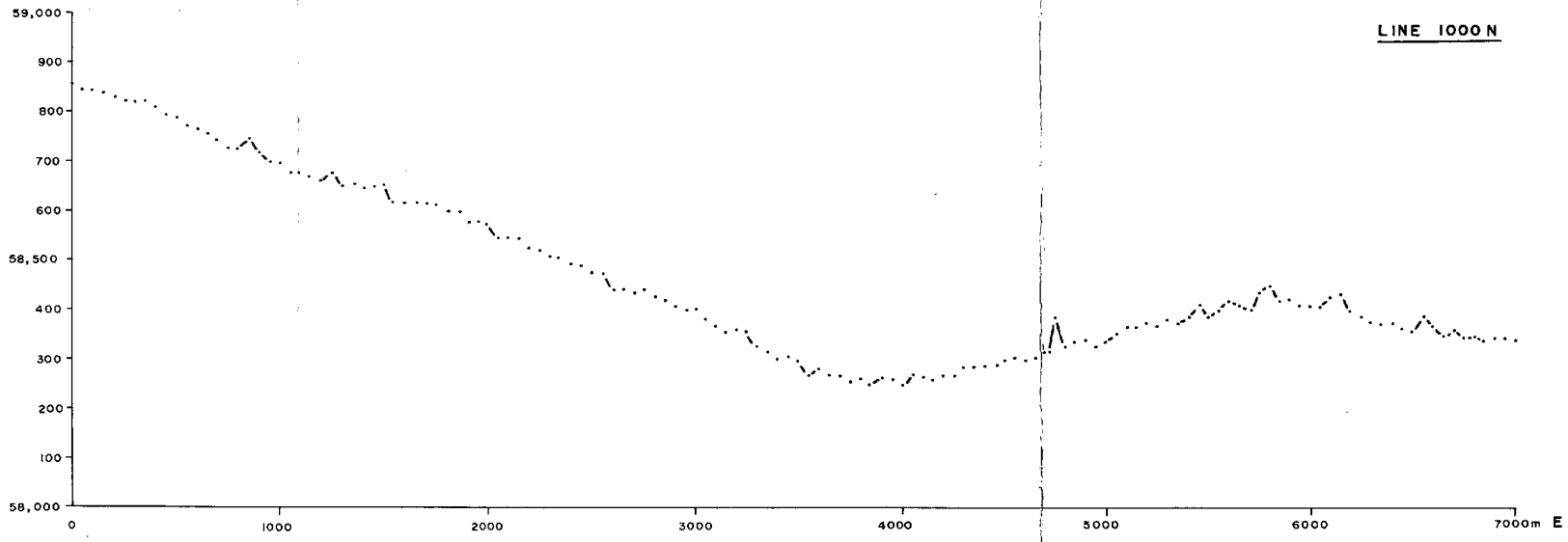
FIG. No.	REPORT No.
ENCL. No. 9	DRG. No. A/PW09/01
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

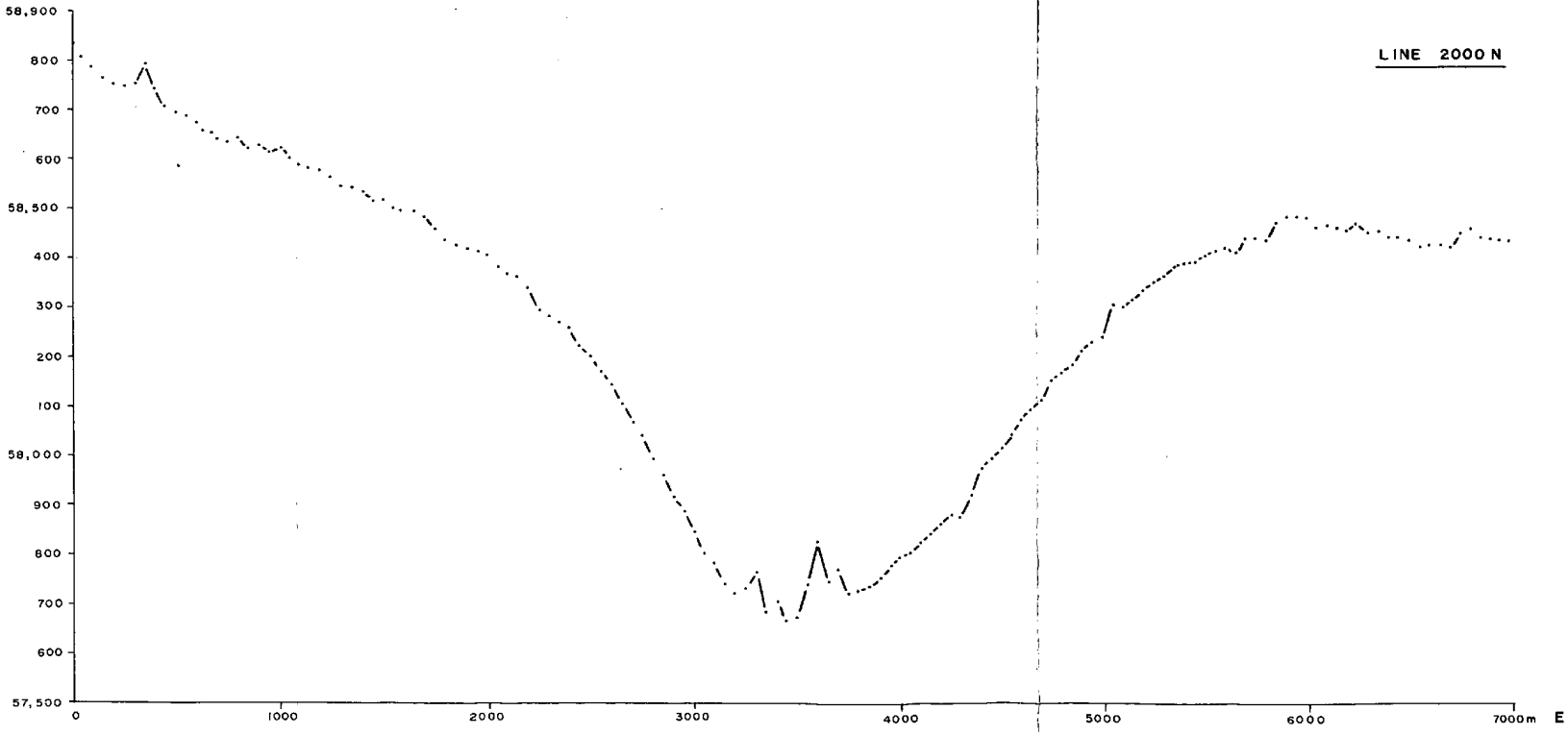


Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT ANOMALY CM4 TOTAL MAGNETIC INTENSITY LINE 3500E - BASELINE Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 10	DRG. No. A/PW 09/02
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

042





043

Surveyed by : G. Quick

Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT

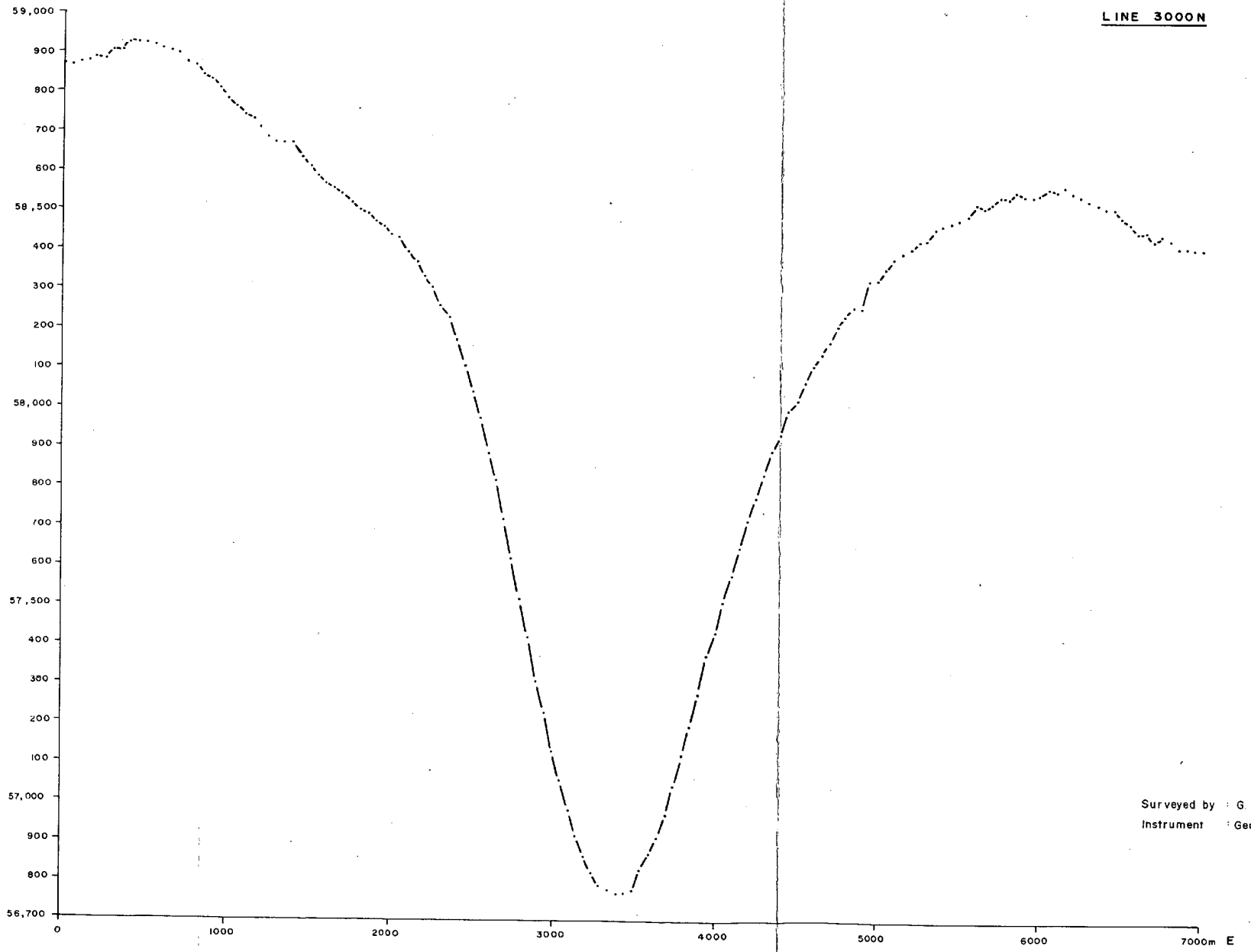
ANOMALY CM4

TOTAL MAGNETIC INTENSITY

LINES 1000N, 2000N

Scale 1 : 25,000

FIG. No.	REPORT No
ENCL. No. 11	ORG. No A/PW 09/03
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



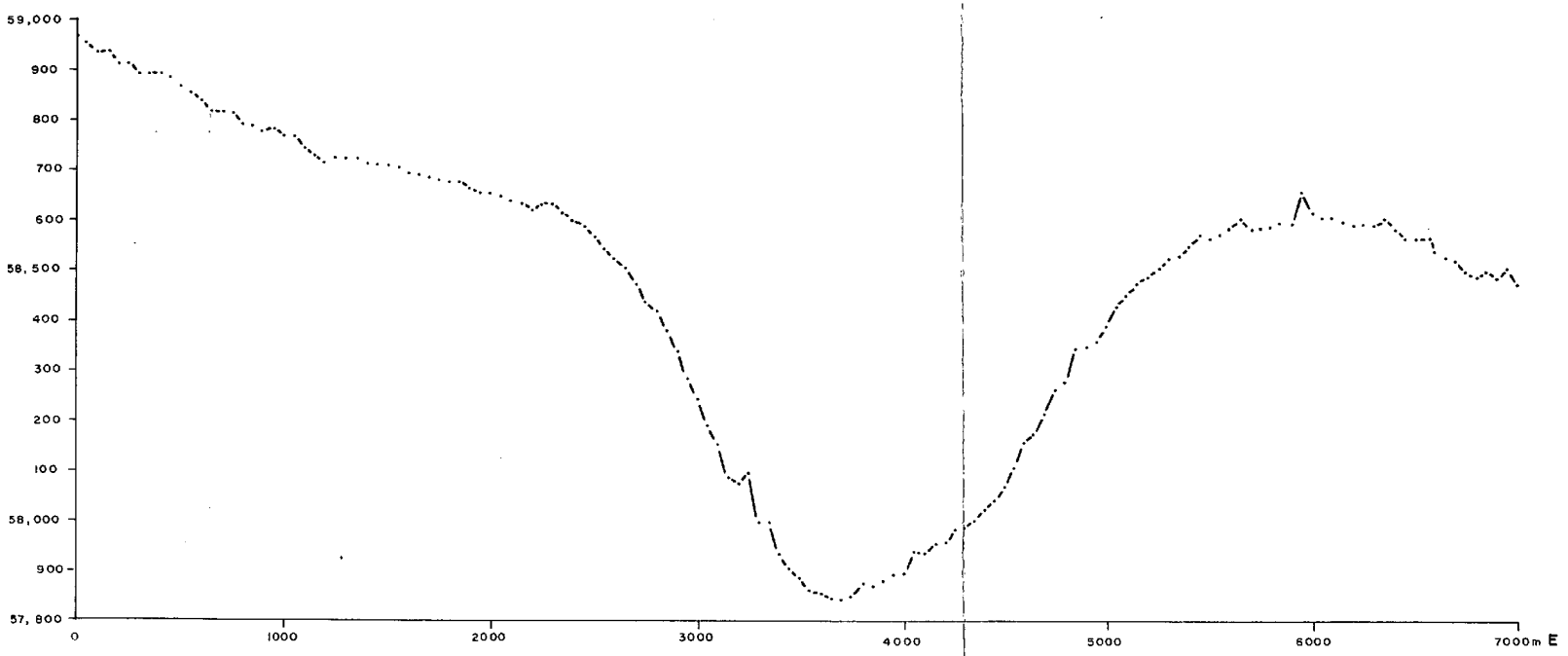
Surveyed by : G. Quick
Instrument : Geometrics G816

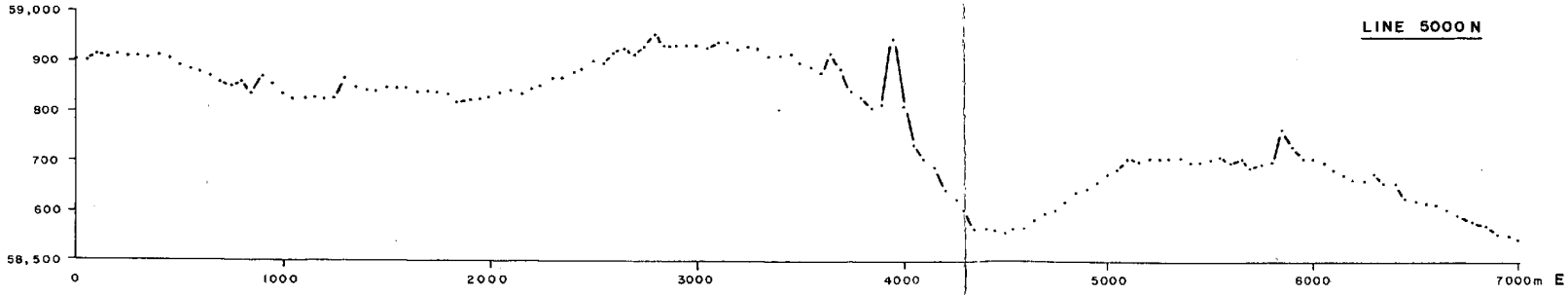
044

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY CM4
TOTAL MAGNETIC INTENSITY
LINE 3000N
Scale 1: 25,000

FIG. No.	REPORT No.
ENCL. No. 12	DRG. No. A/PW 09/04
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE





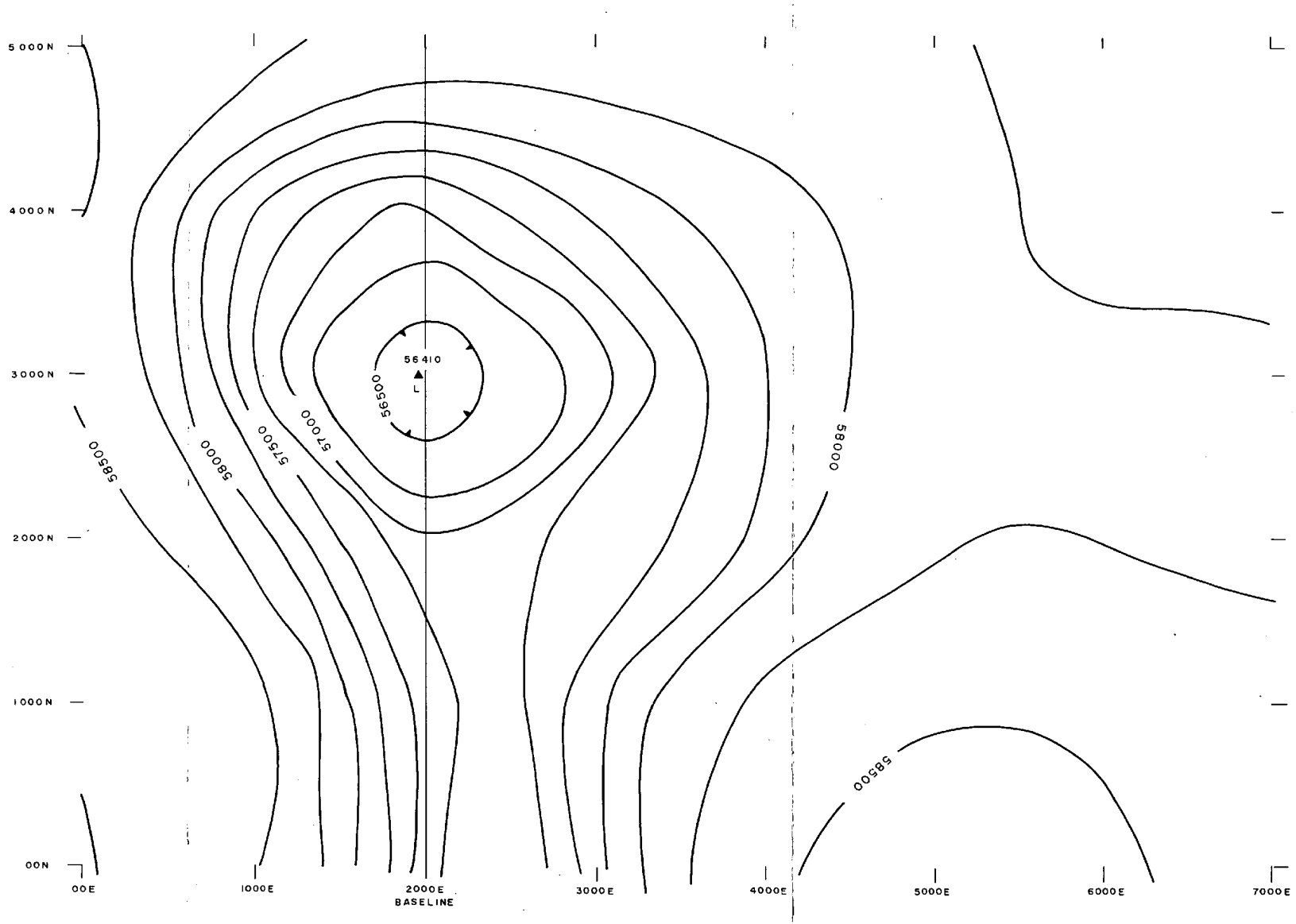
Surveyed by : G. Quick
Instrument : Geometrics G816

045

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY CM4
TOTAL MAGNETIC INTENSITY
LINES 4000N, 5000N
Scale 1:25,000

FIG. No.	REPORT No.
ENCL. No. 13	DRG. No. A/PW 09/05
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



046

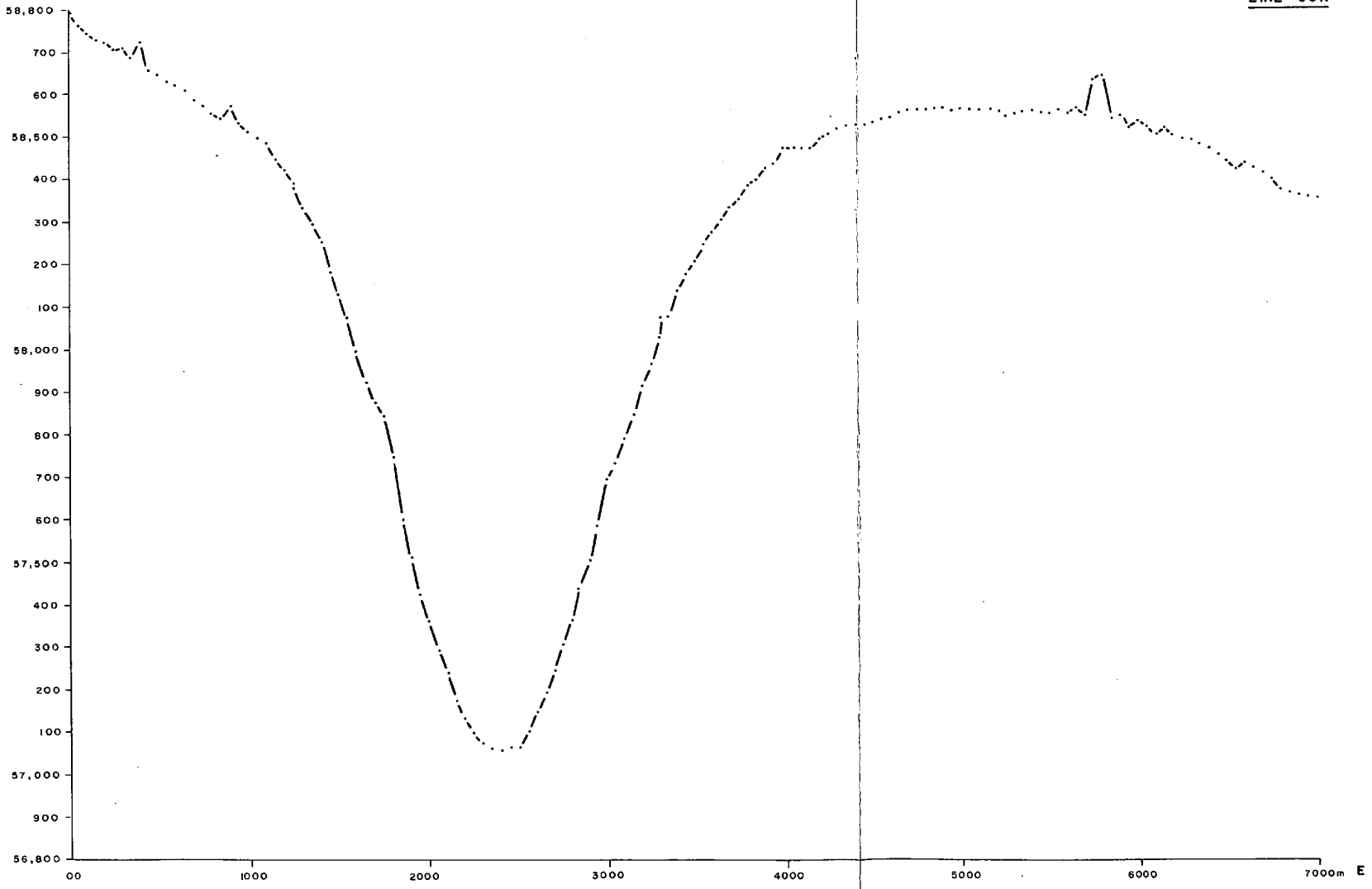
Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM2
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1 : 25,000

FIG. No.	REPORT No.
ENCL. No. 14	DRG. No. A/PW09/06
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE OON



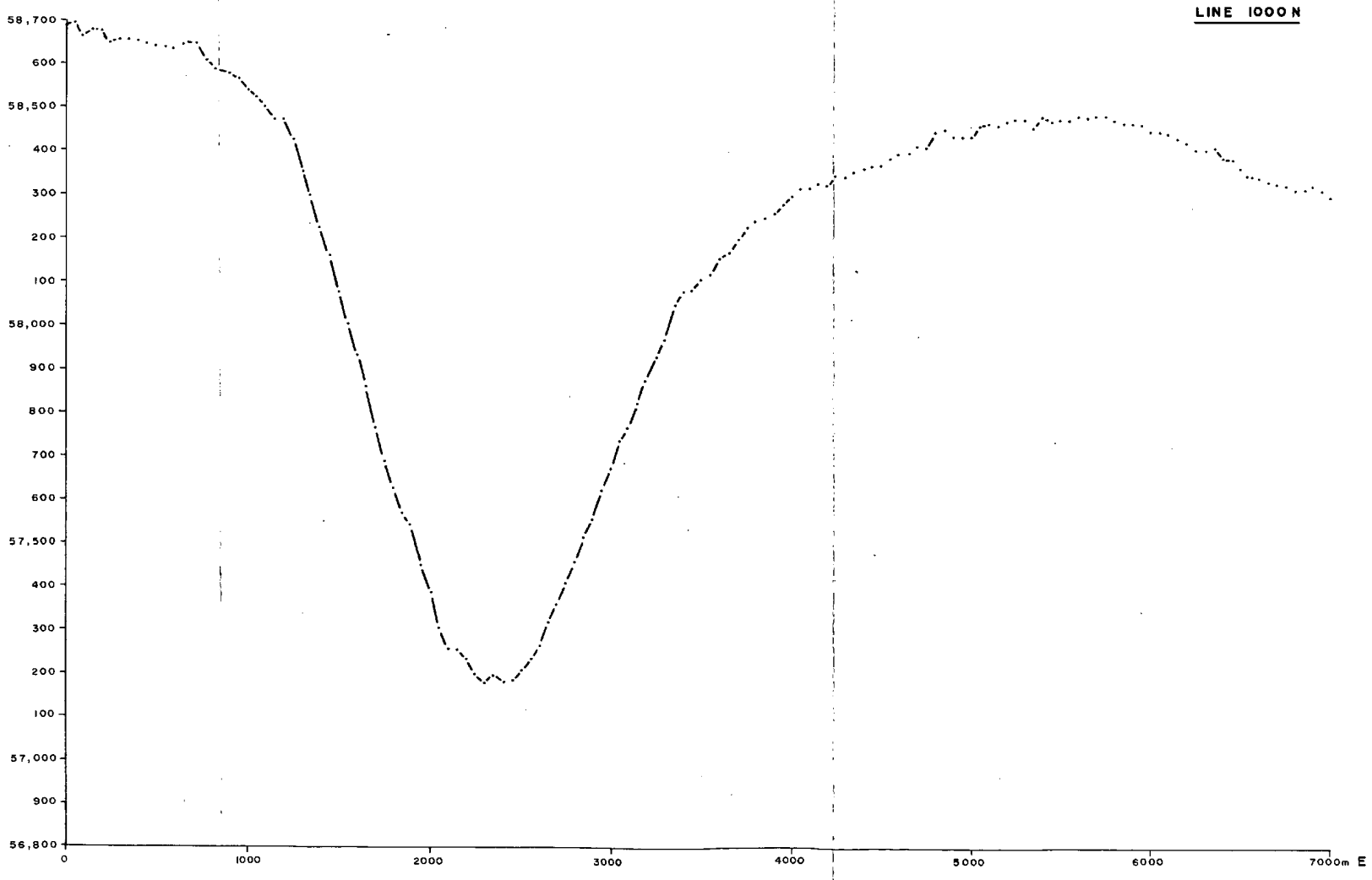
Surveyed by : G. Quick
Instrument : Geometrics G816

047

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM2
TOTAL MAGNETIC INTENSITY
LINE OON
Scale 1 : 25,000

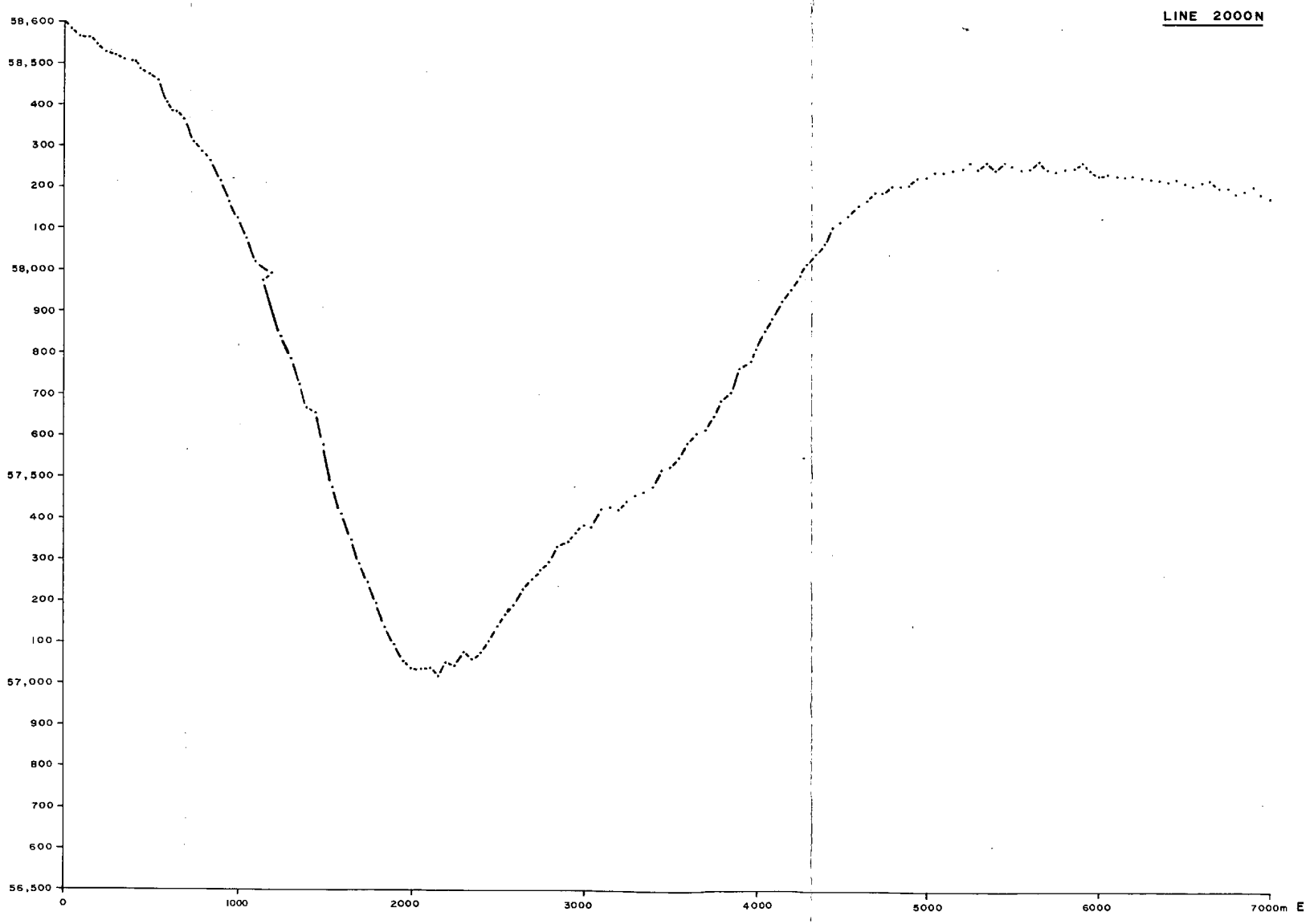
FIG. No.	REPORT No.
ENCL. No. 15	DRG. No. A/PW 09/07
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



Surveyed by : G. Quick
Instrument : Geometrics G816

048

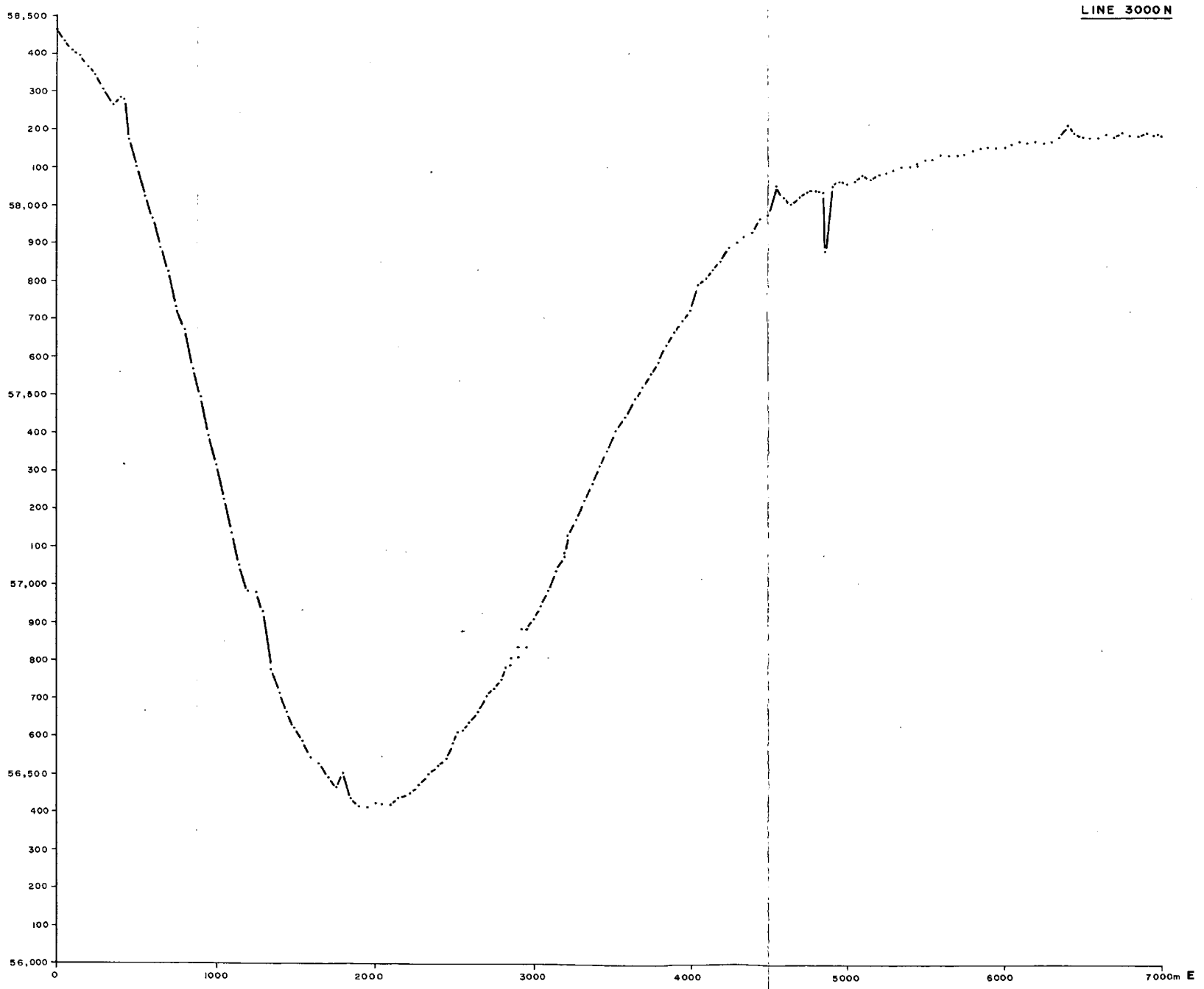
The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM2** **TOTAL MAGNETIC INTENSITY** **LINE 1000N** Scale 1:25,000	
FIG. No.	REPORT No.
ENCL. No. 16	DRG. No. A/PW09/08
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



Surveyed by : G. Quick
Instrument : Geometrics G816

049

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM2** **TOTAL MAGNETIC INTENSITY** **LINE 2000N** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 17	DRG. No. A/PW 09/09
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



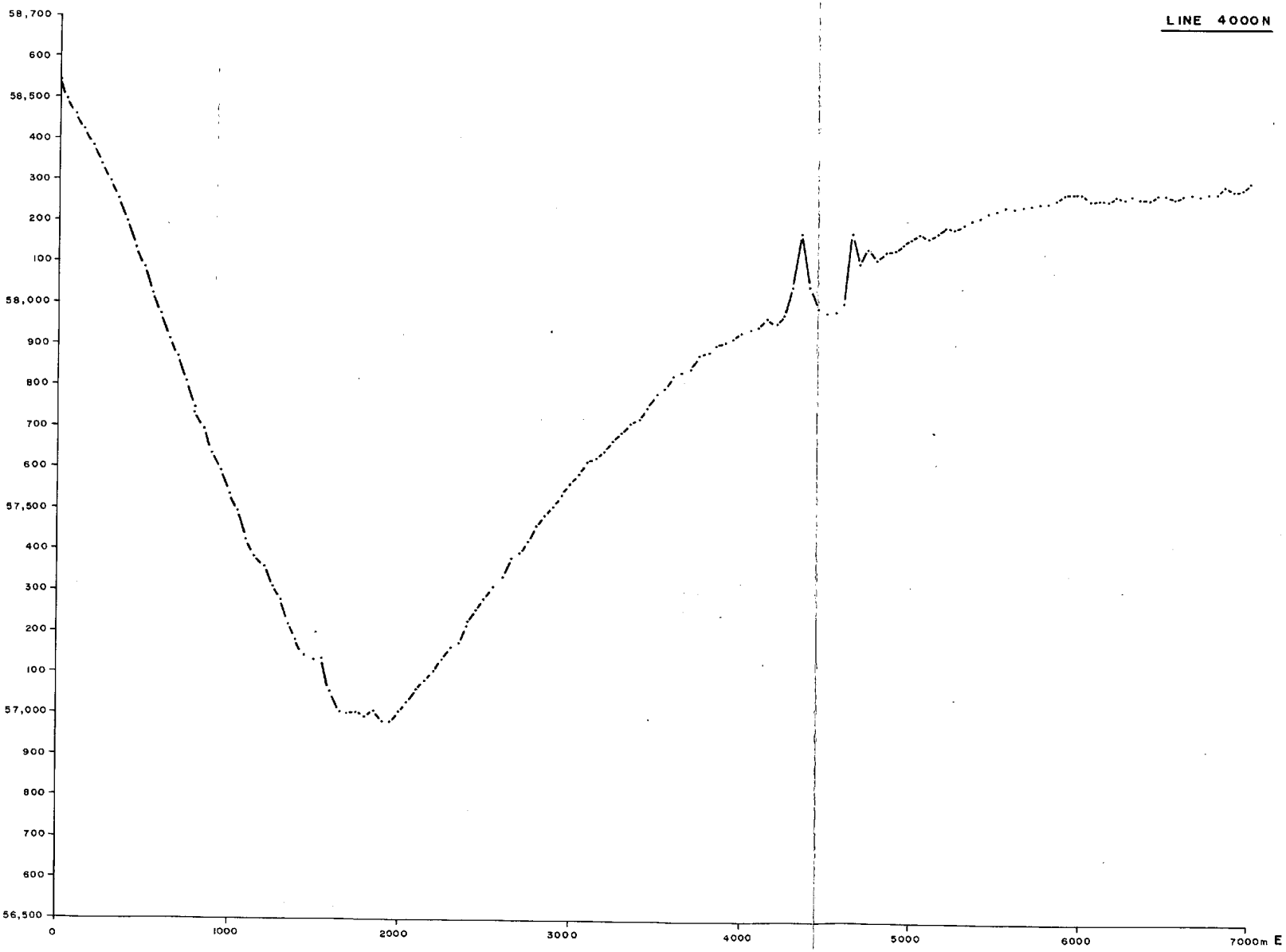
Surveyed by : G. Quick
Instrument : Geometrics G816

050

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM2
TOTAL MAGNETIC INTENSITY
LINE 3000N
Scale 1 : 25,000

FIG. No.	REPORT No.
ENCL. No. 18	DRG. No. A/PW 09/10
DATE JULY 1981	AUTHOR A. H. B.
DRAWN B.J.O.	OFFICE ADELAIDE

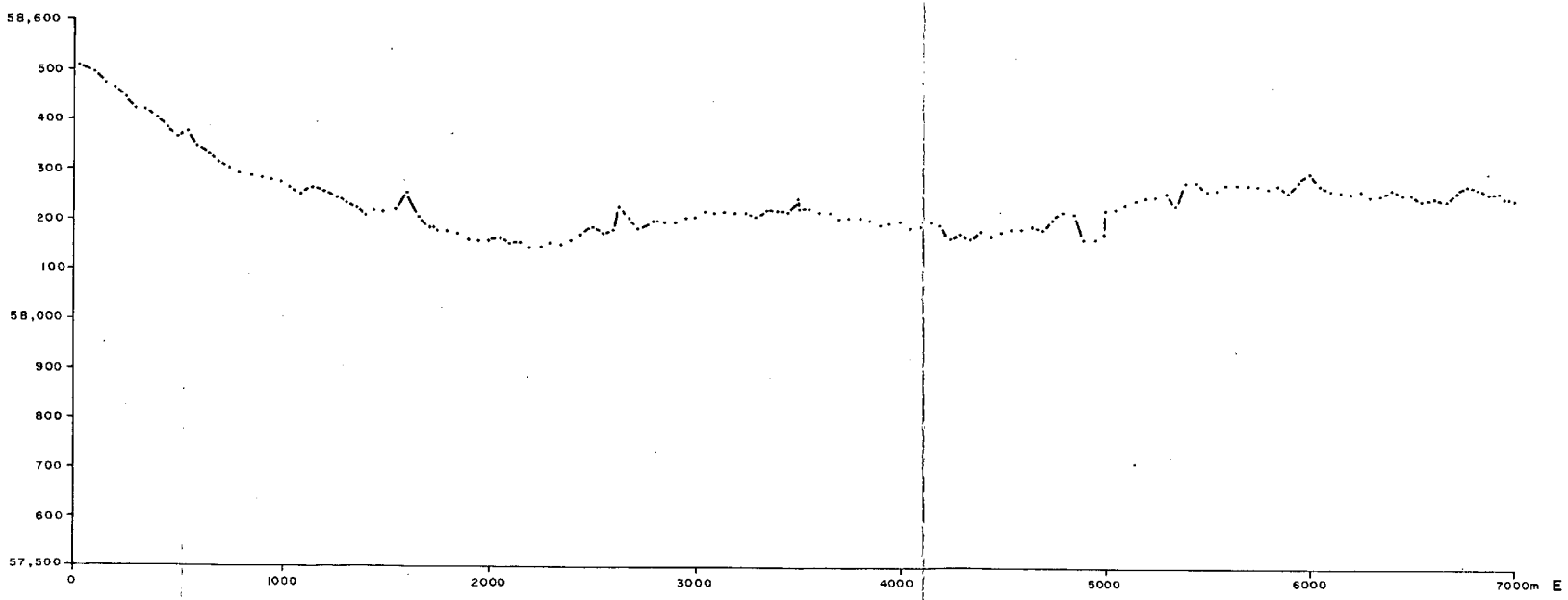


Surveyed by : G. Quick
Instrument : Geometrics G816

051

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT ANOMALY PM2 TOTAL MAGNETIC INTENSITY LINE 4000N Scale : 25,000	
FIG. No.	REPORT No.
ENCL. No. 19	DRG. No. A/PW 09/011
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE 5000N

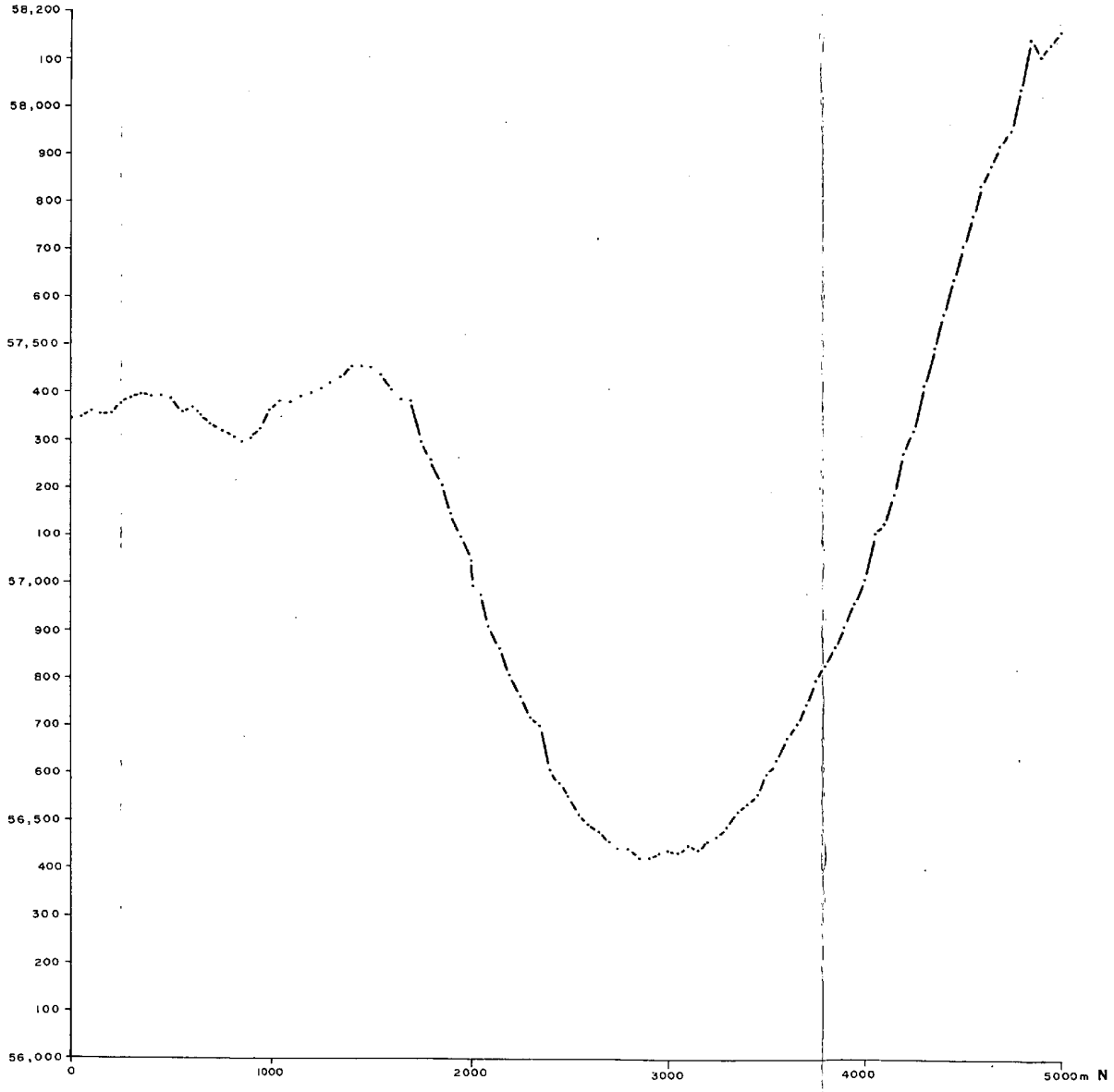


Surveyed by : G. Quick
Instrument : Geometrics G 816

The Shell Company of Australia Limited METALS DIVISION	
COMPANA PROJECT **ANOMALY PM2** **TOTAL MAGNETIC INTENSITY** **LINE 5000N** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 20	DRG. No. A/PW09/12
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	

052

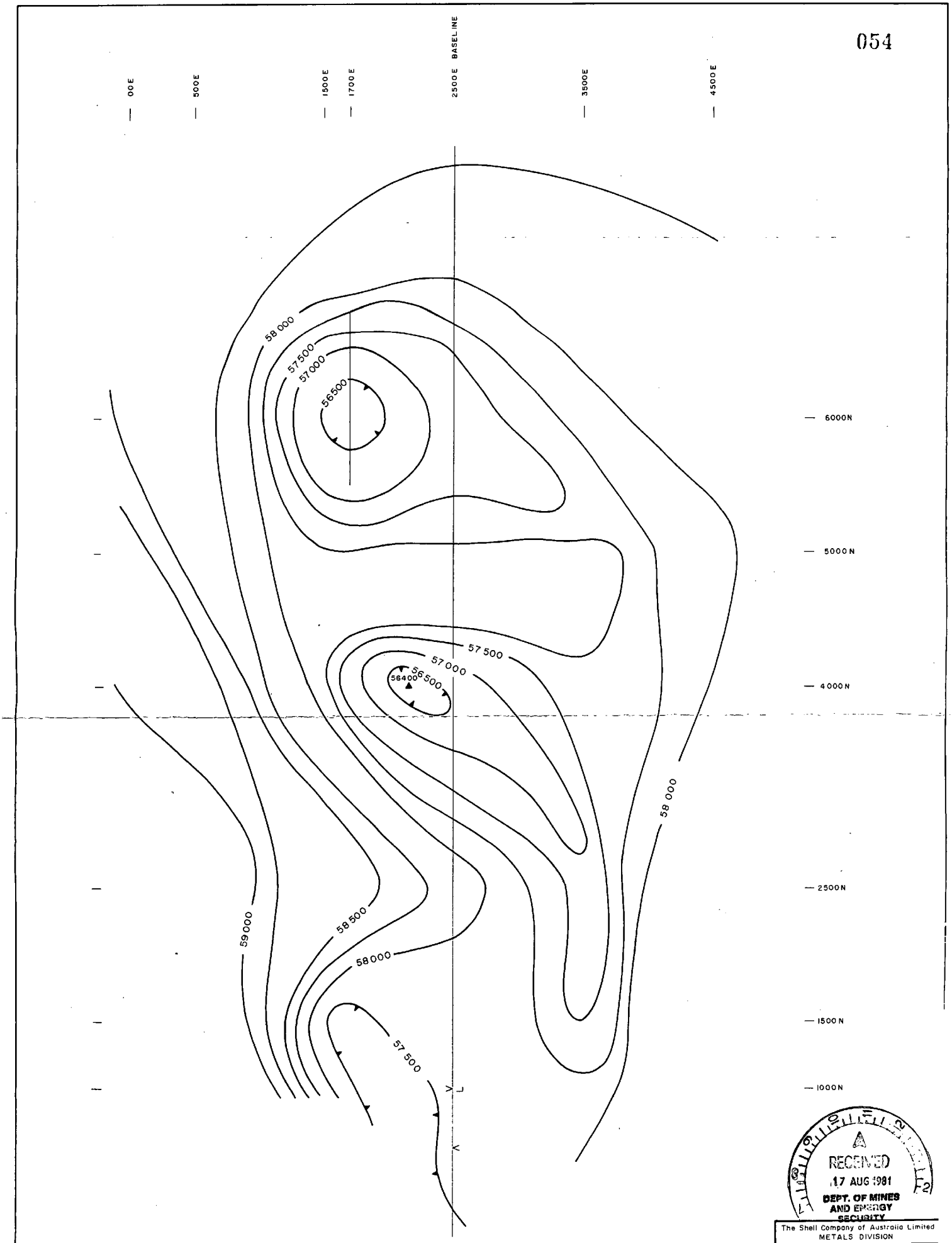
LINE 2000 E BASELINE



053

Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM2** **TOTAL MAGNETIC INTENSITY** **LINE 2000E-BASELINE** Scale 1:25,000	
FIG. No.	REPORT No.
ENCL. No. 21	DRG. No. A/PW 09/13
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



Surveyed by : G. Quick
Instrument : Geometrics G816

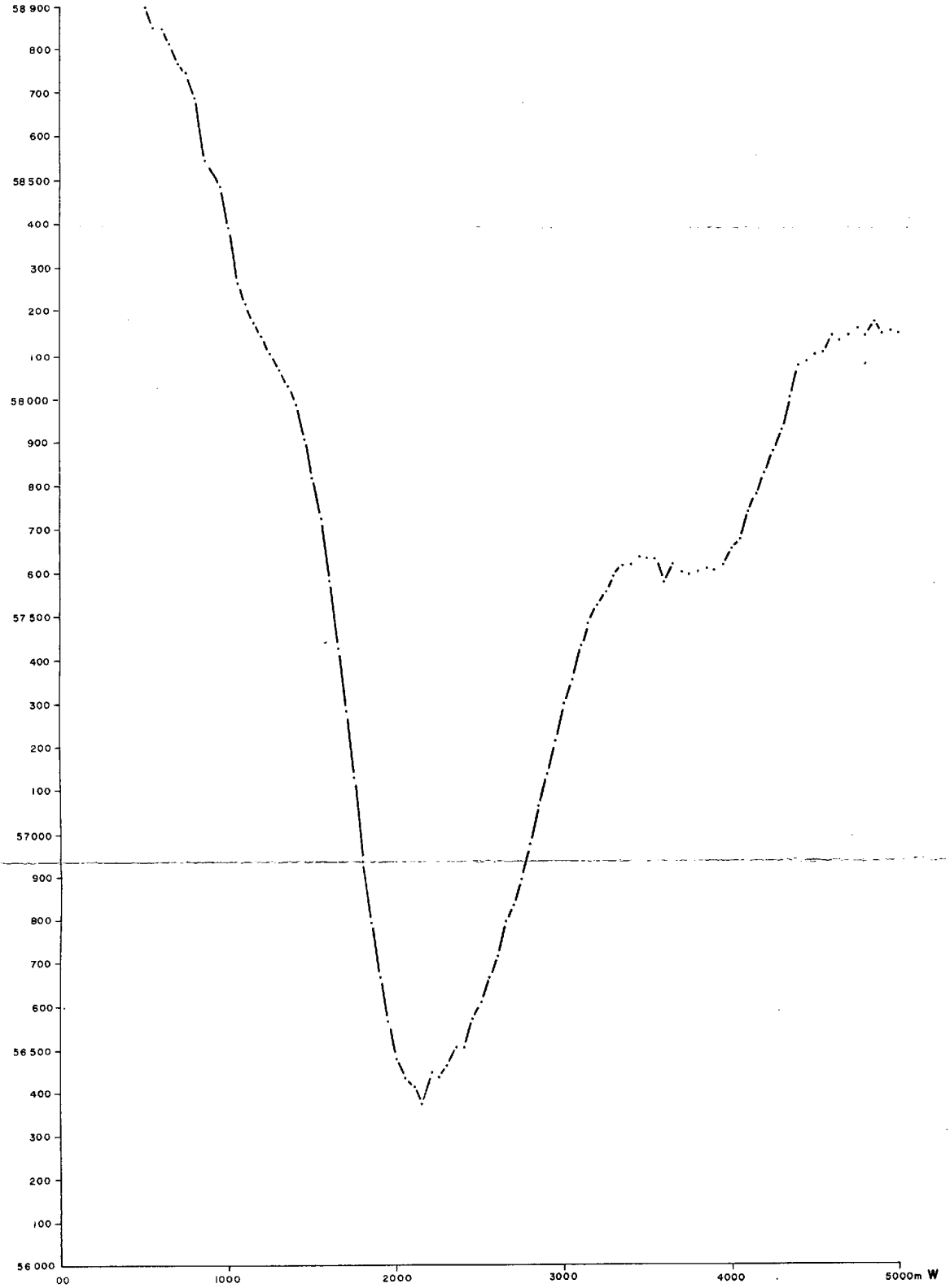
The Shell Company of Australia Limited
METALS DIVISION

4046-11
COOMPANA PROJECT
ANOMALY PM 3
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1:25,000

FIG. No.	REPORT No.
ENCL. No. 22	DRG. No. A/PW 09/2
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE 4000 N

055

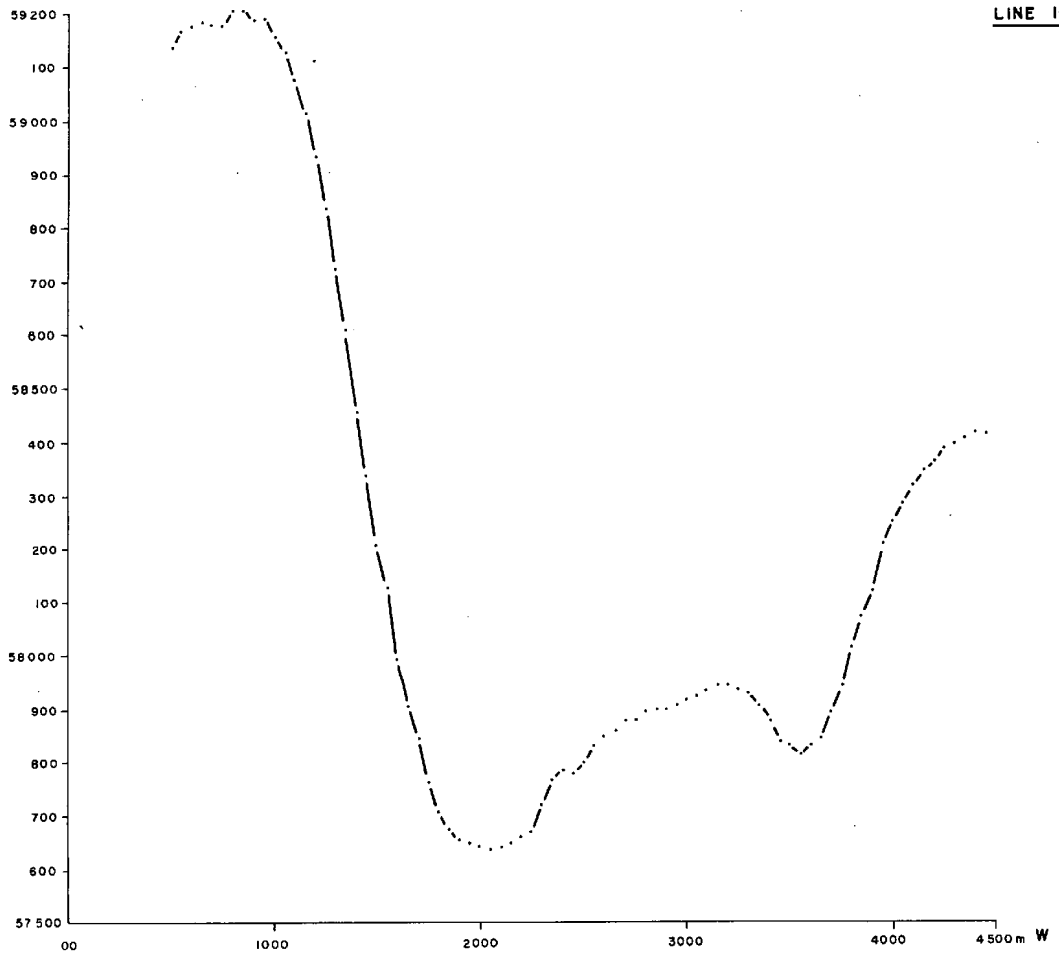


LINE 5000 N

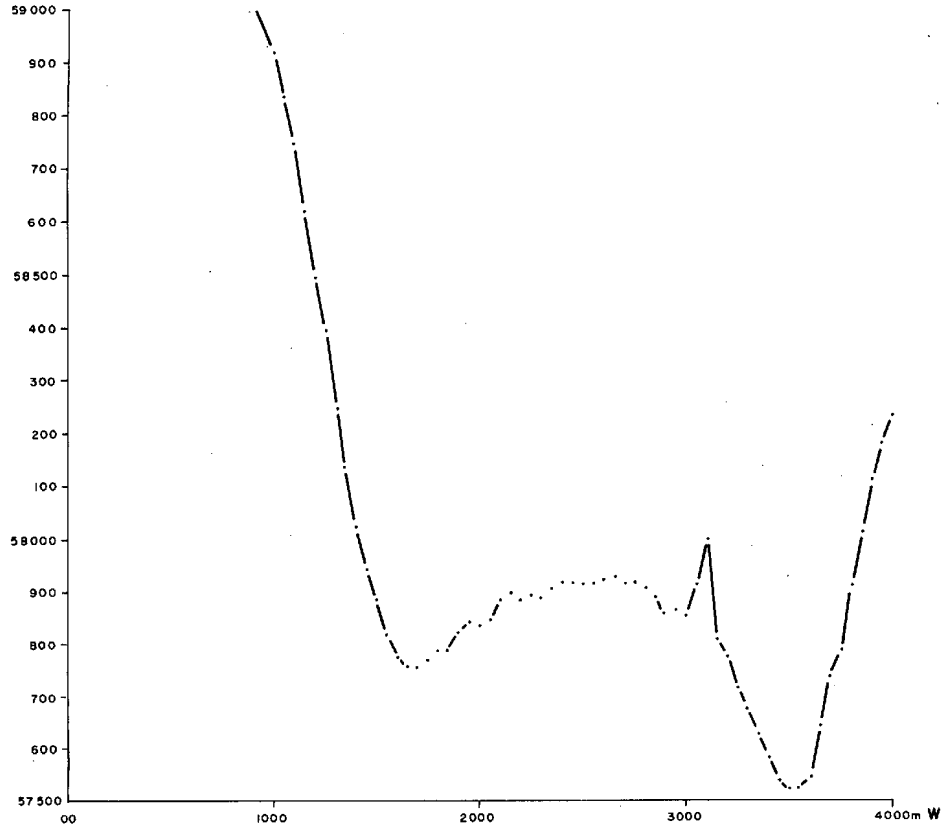
Surveyed by : G. Quick
Instrument : Geometrics G 816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM 3** **TOTAL MAGNETIC INTENSITY** **LINES 4000N, 5000N** Scale 1 : 25,000	
FIG. No. -	REPORT No.
ENCL. No. 23	DRG. No. A/PW 09/23
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE 1000N



LINE 1500N

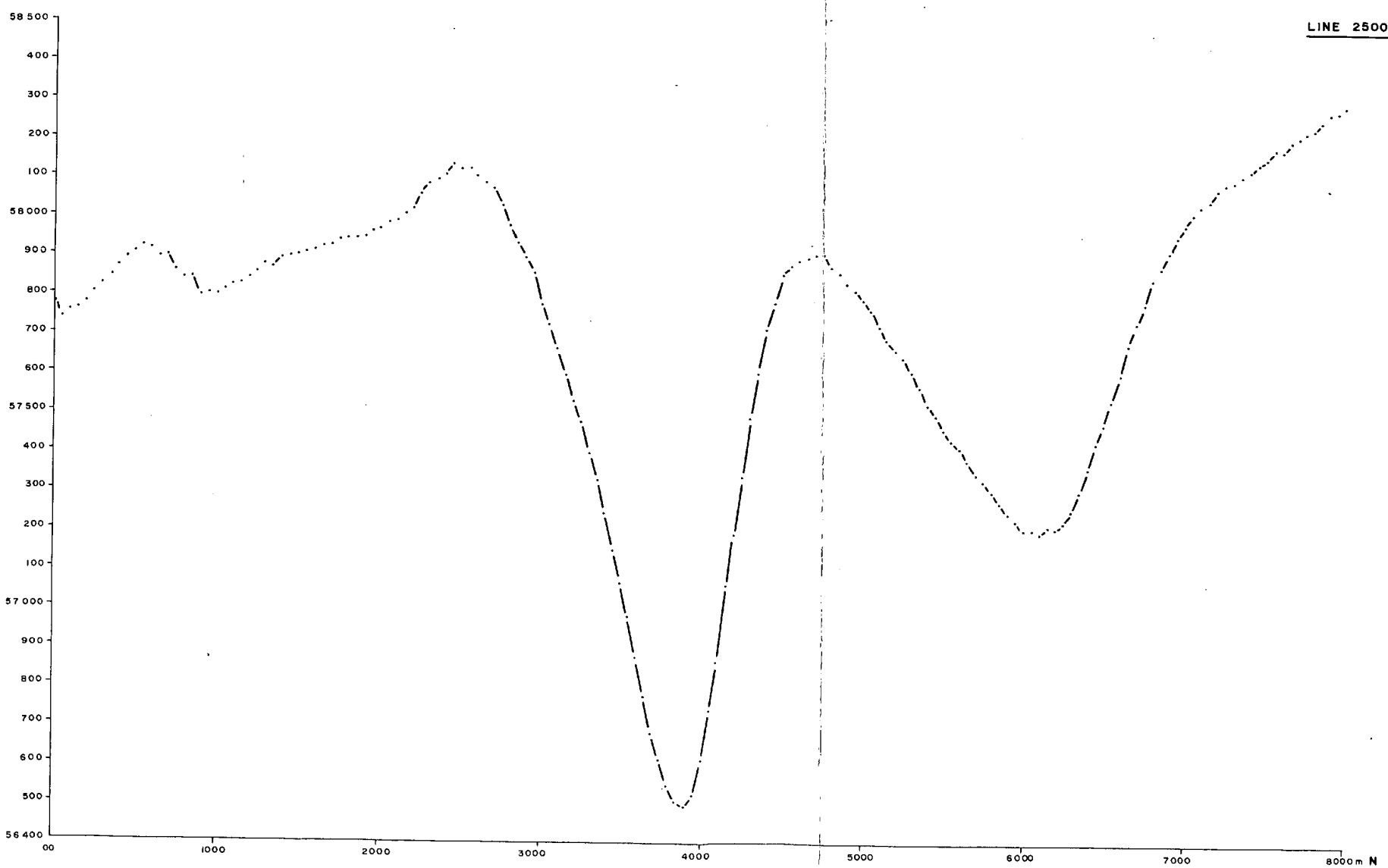


Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM3
TOTAL MAGNETIC INTENSITY
LINES 1000N, 1500N
Scale 1 : 25,000

FIG. No.	REPORT No.
ENCL. No. 24	DRG. No. A/PW09/24
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



057

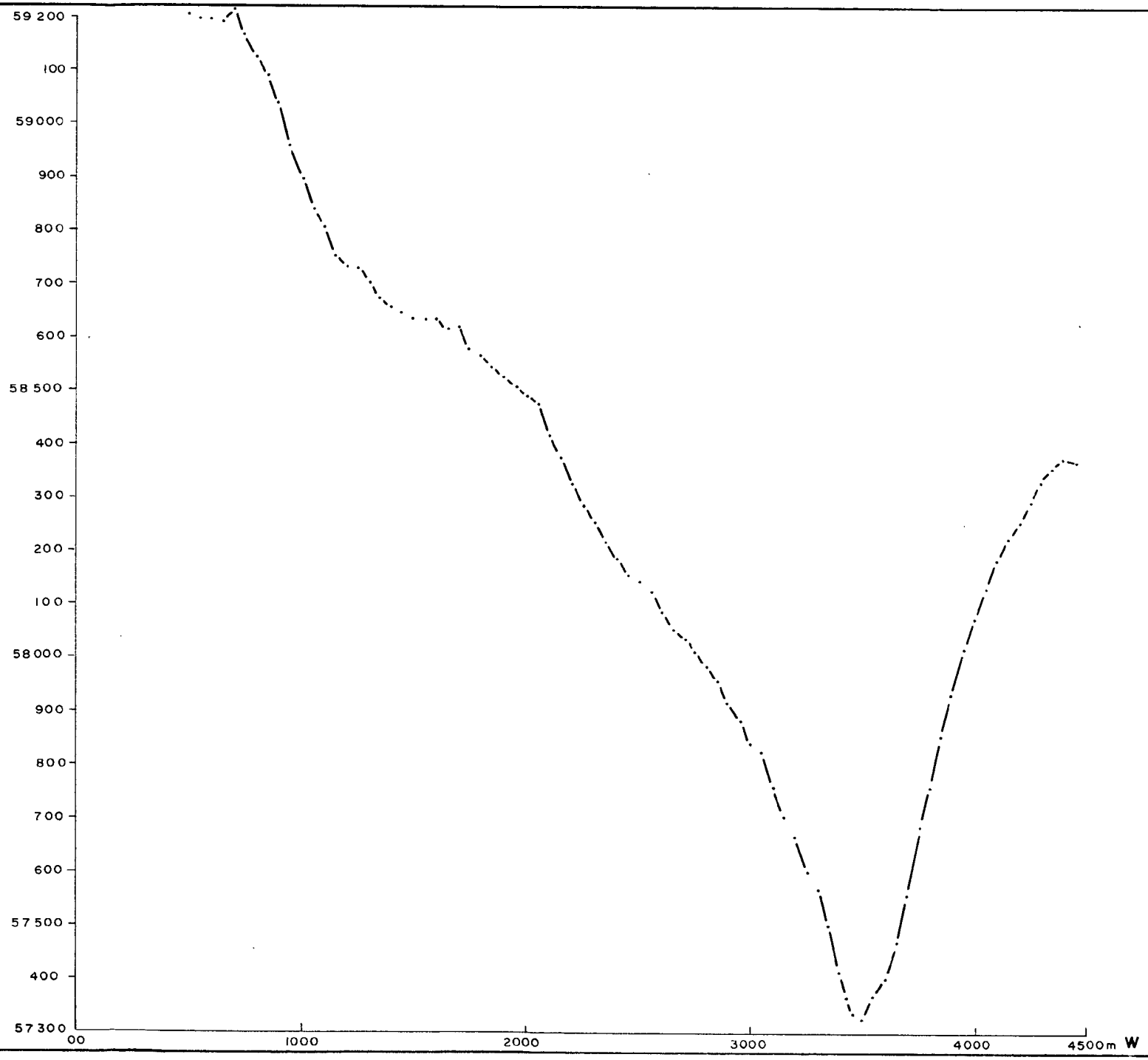
Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM3
TOTAL MAGNETIC INTENSITY
LINE 2500E-BASELINE
Scale 1 :25,000

FIG. No.	REPORT No.
ENCL. No. 25	DRG. No. A/PW 09/25
DATE JULY 1981	AUTHOR A.H.B.

LINE 2500N 058

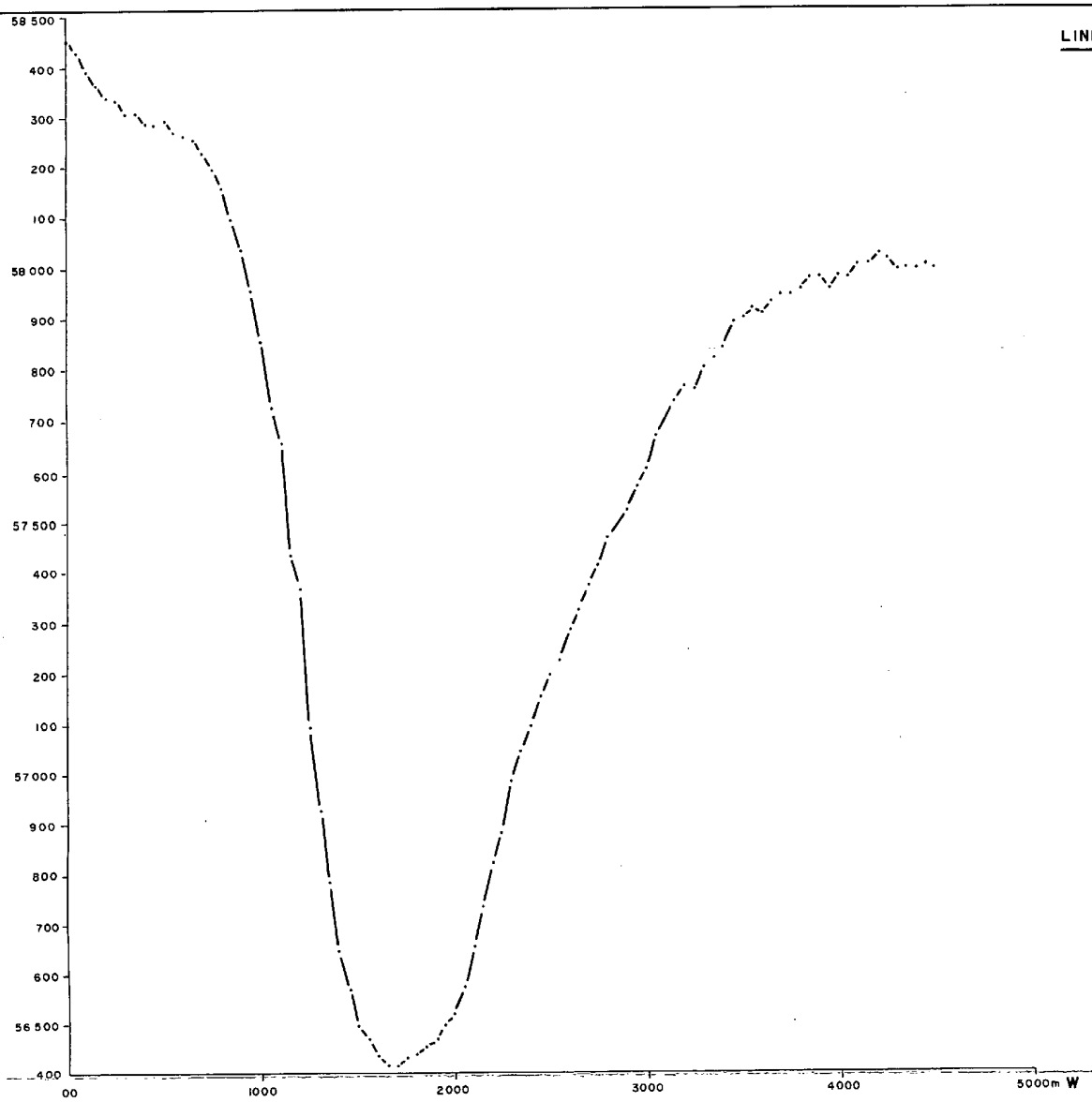


Surveyed by · G. Quick
Instrument : Geometrics G 816

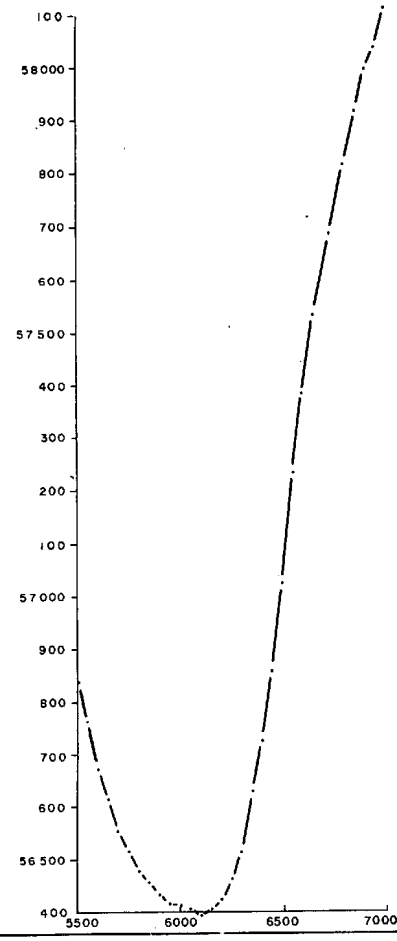
The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM 3** **TOTAL MAGNETIC INTENSITY** **LINE 2 500N** Scale 1 25,000	
FIG. No	REPORT No
ENCL No. 26	DRG No A/PW 09/26
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE 6000N

059

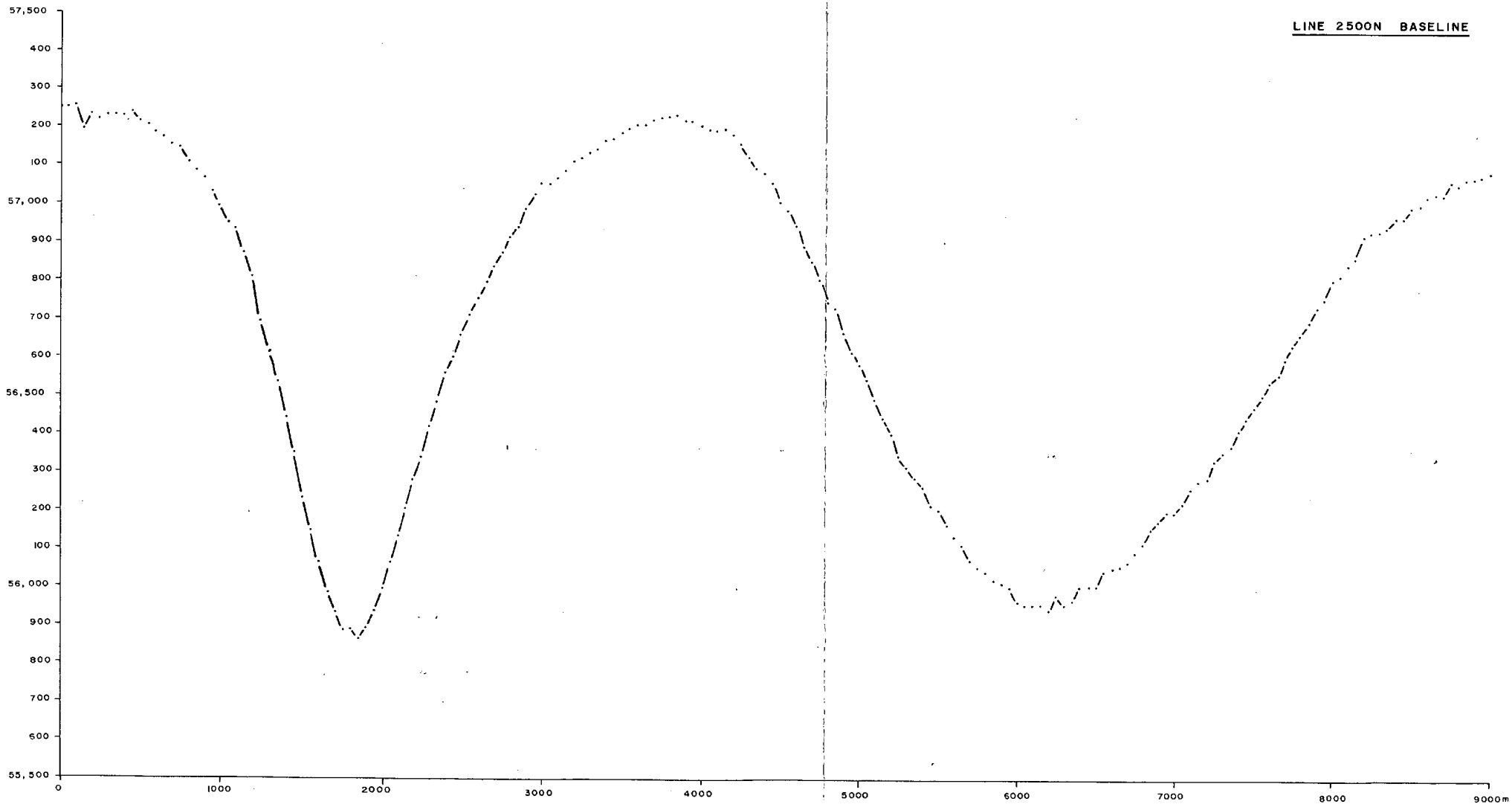


LINE 1700E



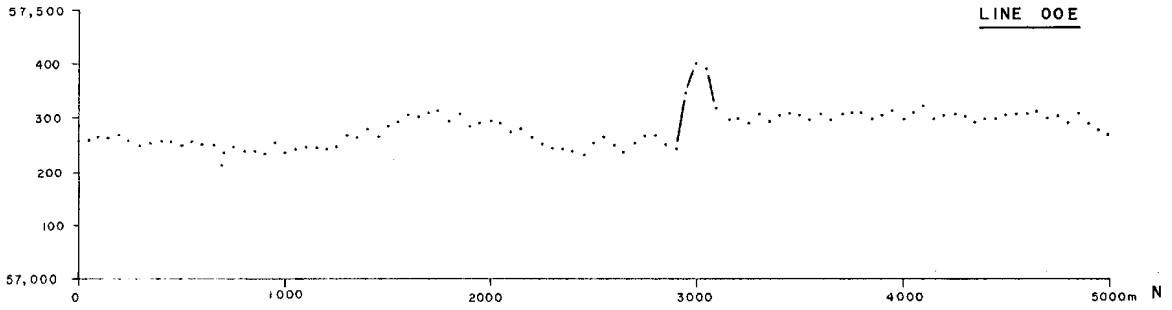
Surveyed by : G. Quick
Instrument : Geometrics G816

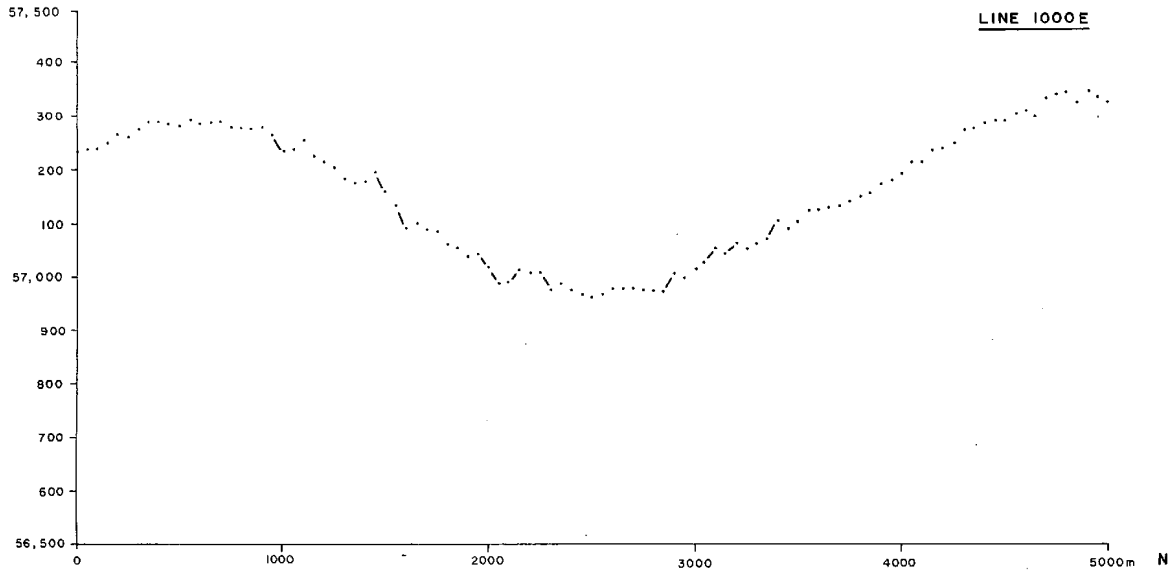
The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM 3** **TOTAL MAGNETIC INTENSITY** **LINES 6000N, 1700E** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 27	DRG. No. A/PW 09/27
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

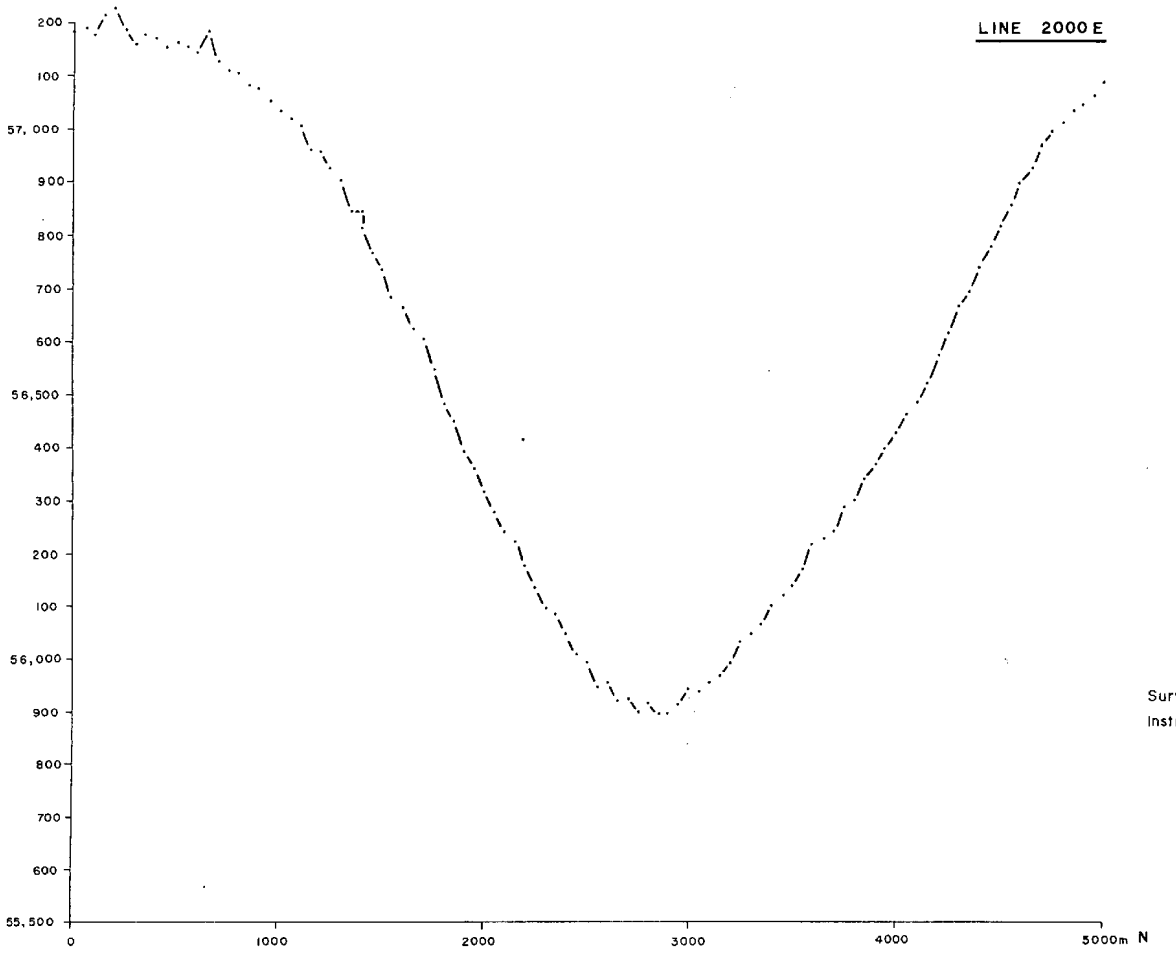


Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM4** **TOTAL MAGNETIC INTENSITY** **LINE 2500N-BASELINE** Scale 1:25,000	
FIG. No.	REPORT No.
ENCL. No. 29	DRG. No. A/PW 09/18
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

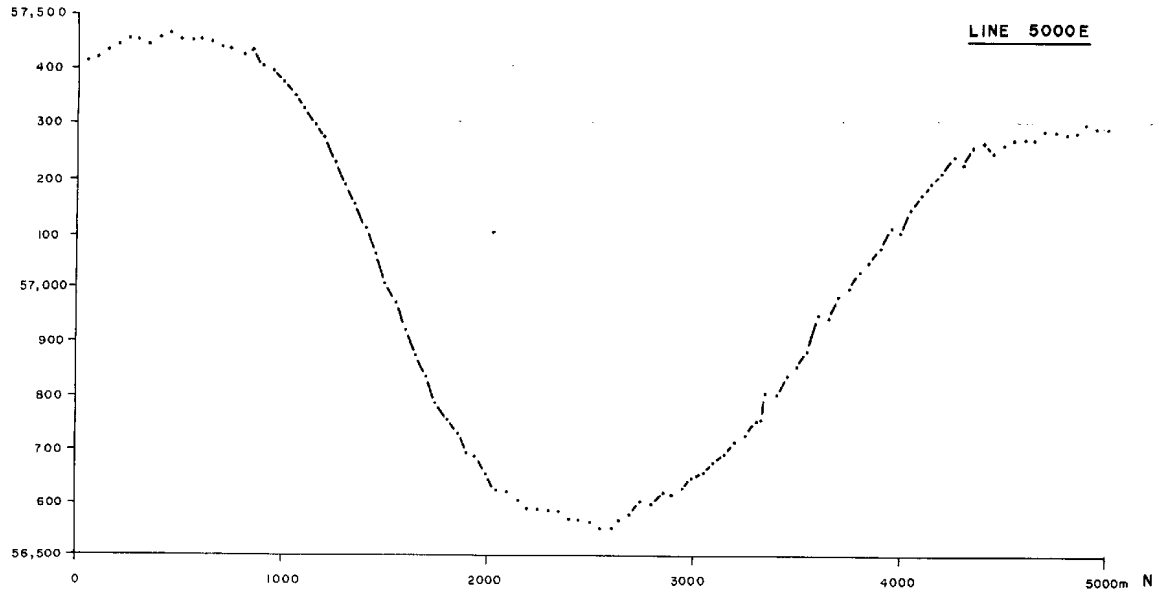


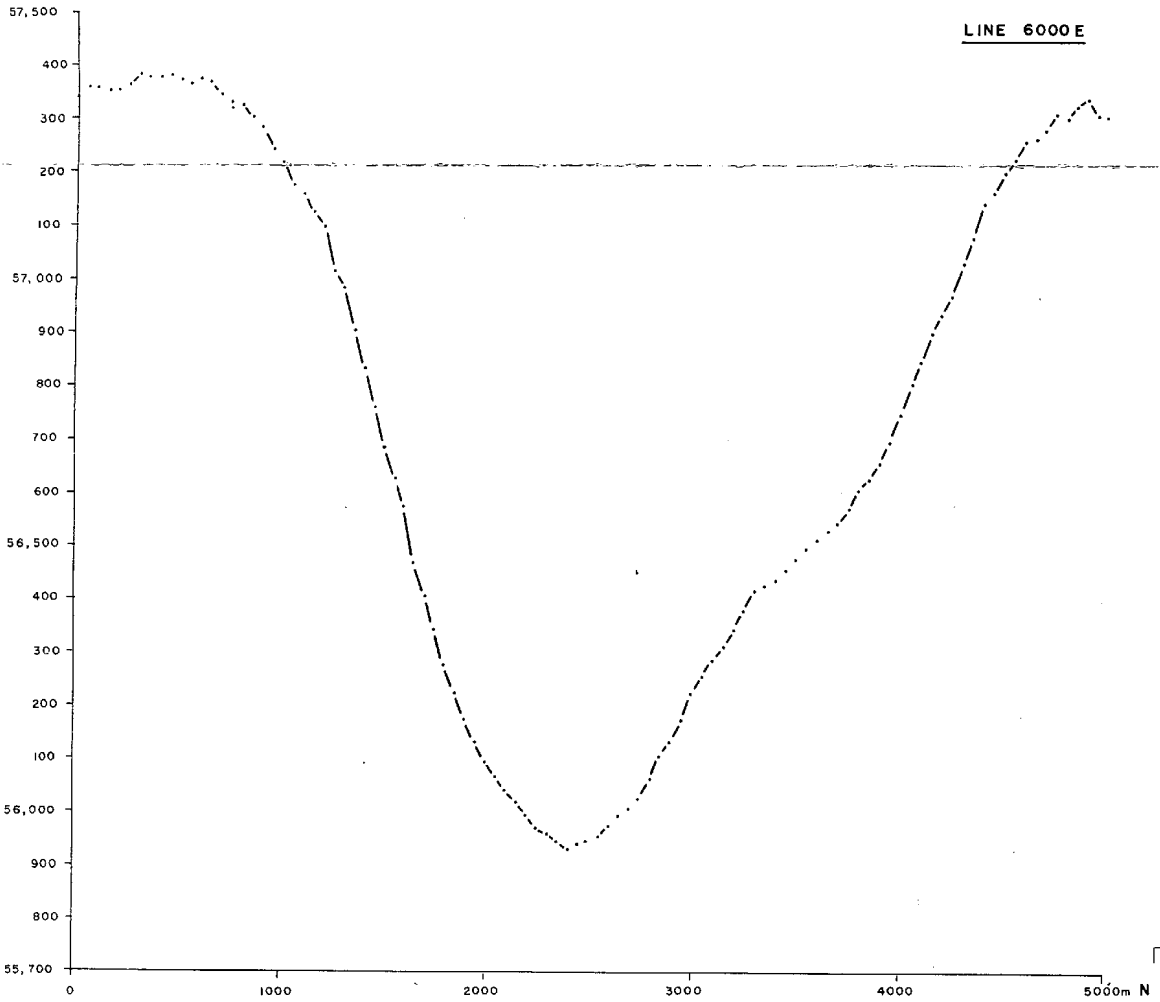




Surveyed by : G. Quick
Instrument : Geometrics G816

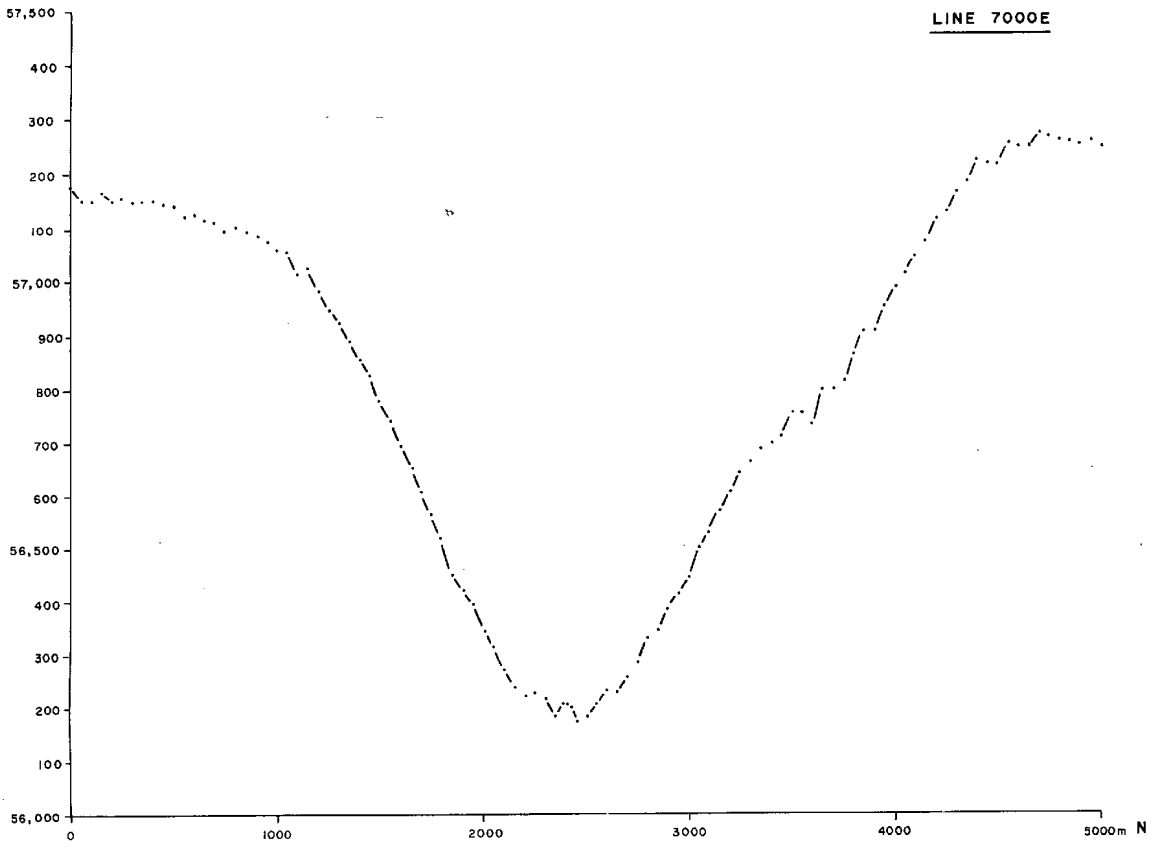
The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM4** **TOTAL MAGNETIC INTENSITY** **LINES 00E, 1000E, 2000E** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL No. 30	DRG. No. A/PW 09/19
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

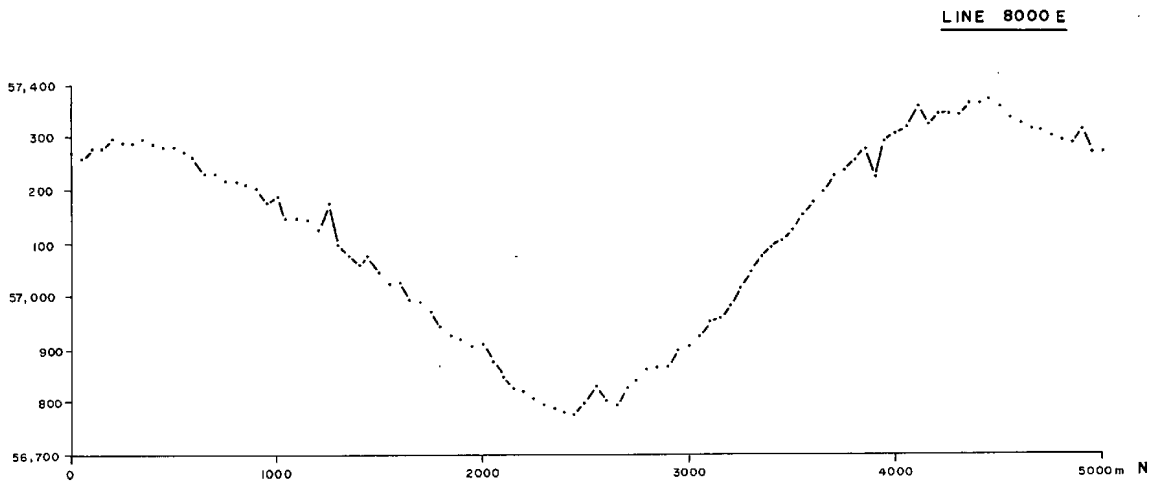




Surveyed by : G. Quick
Instrument : Geometrics G816

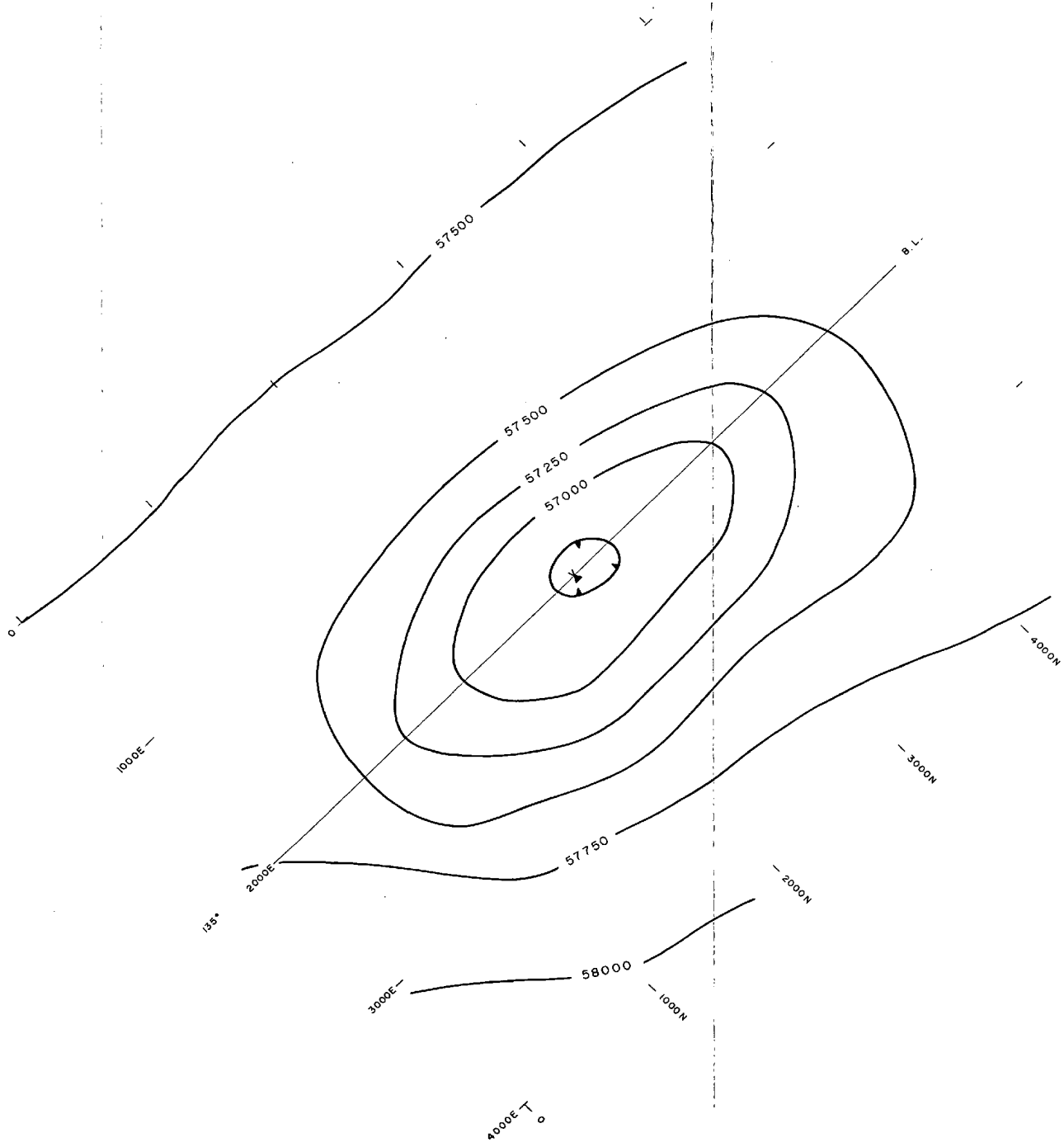
The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM4** **TOTAL MAGNETIC INTENSITY** **LINES 5000E, 6000E** Scale 1:25,000	
FIG. No.	REPORT No.
ENCL. No. 31	DRG. No. A/PW 09/20
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE





Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM4** **TOTAL MAGNETIC INTENSITY** **LINES 7000E, 8000E** Scale 1:25,000	
FIG. No.	REPORT No.
ENCL. No. 32	DRG. No. A/PW 09/21
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



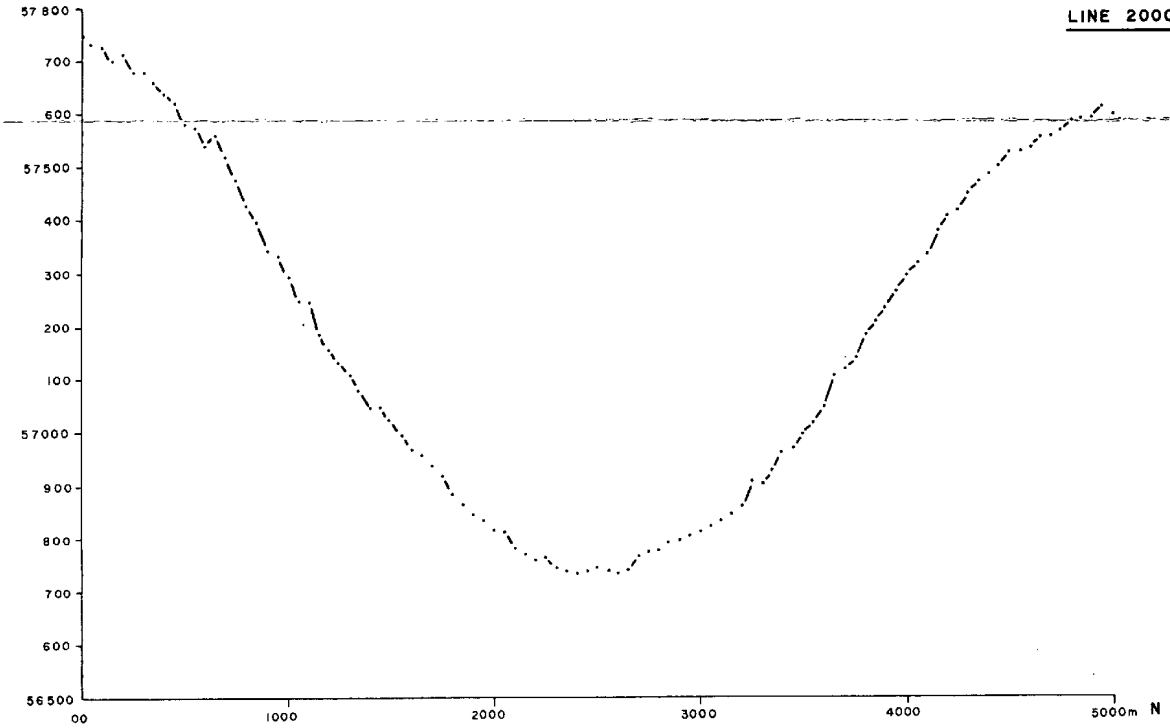
064

Surveyed by : G. Quick
Instrument : Geometrics G 816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM7** **CONTOURS OF** **TOTAL MAGNETIC INTENSITY** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 33	DRG. No. A/PW09/14
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

LINE 1000N

LINE 2000E

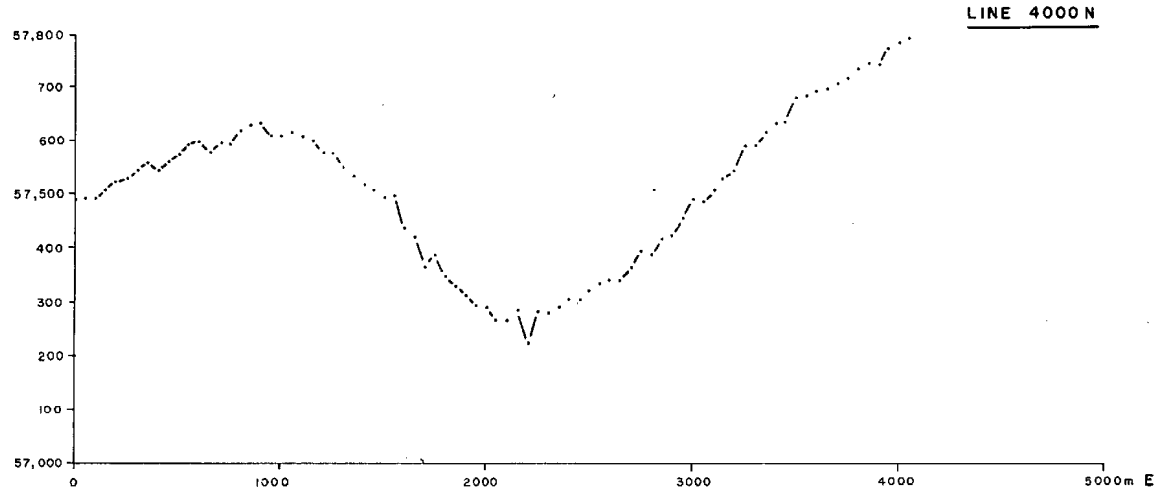


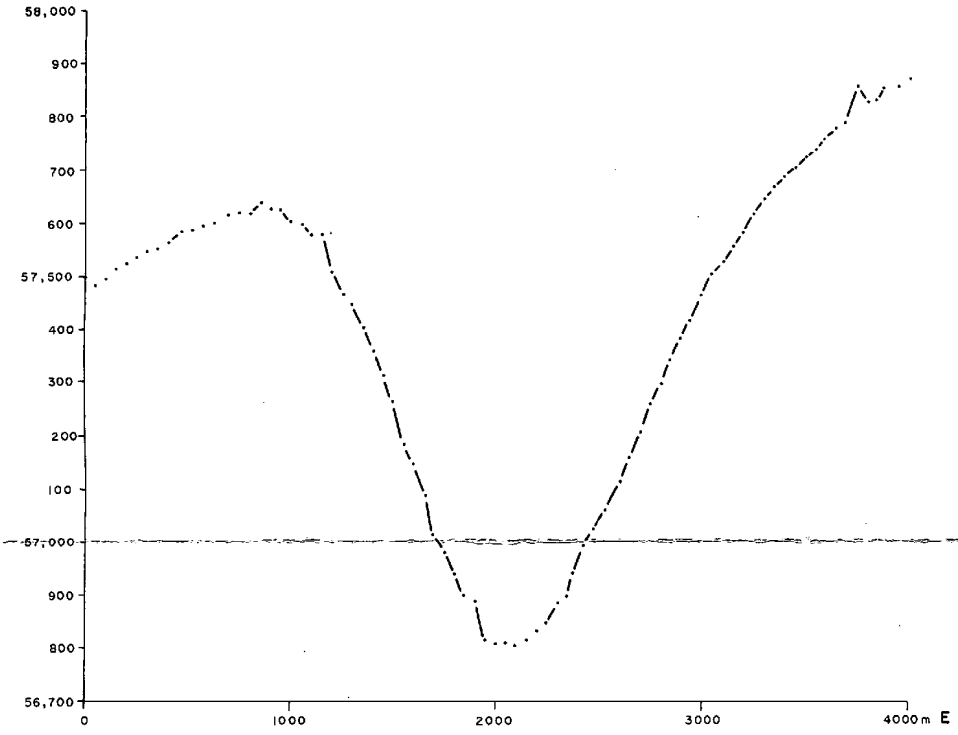
Surveyed by : G. Quick
Instrument : Geometrics G816

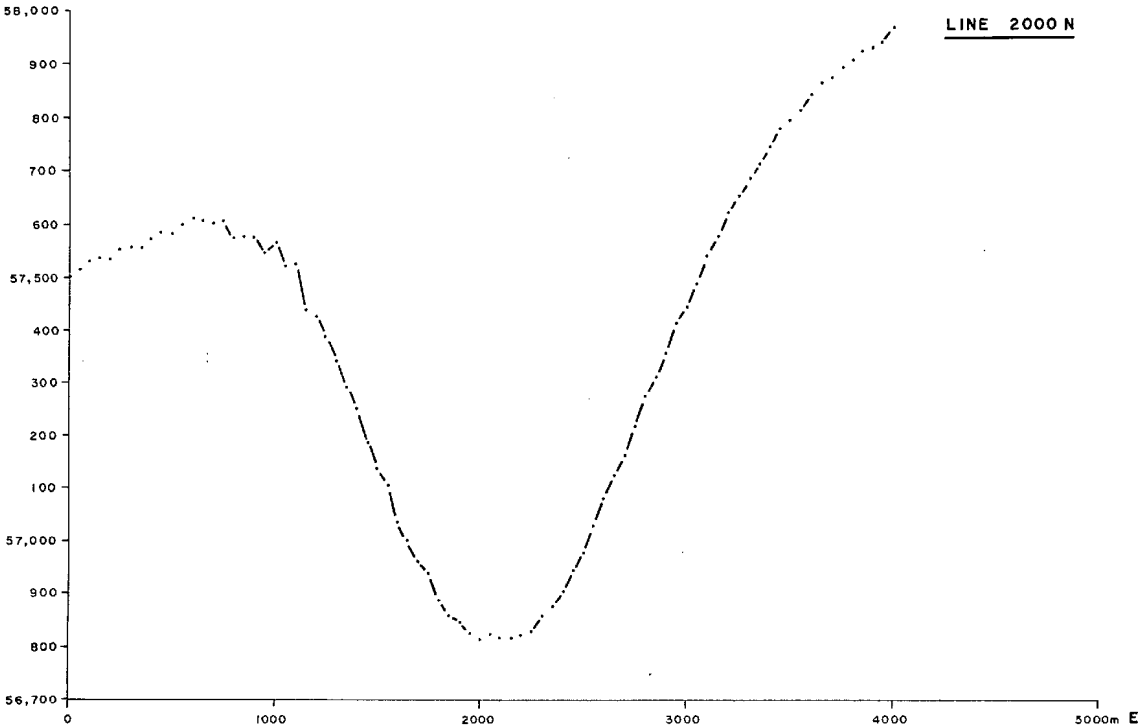
The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM7
TOTAL MAGNETIC INTENSITY
LINES 1000N, 2000E
Scale 1 25,000

FIG. No.	REPORT No.
ENCL No 34	DRG No A/PW09/15
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE







Surveyed by : G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM7** **TOTAL MAGNETIC INTENSITY** **LINES 4000N, 3000N, 2000N** Scale 1 :25,000	
FIG. No.	REPORT No.
ENCL. No. 35	DRG. No. A/PW09/16
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

THE SHELL COMPANY OF AUSTRALIA LIMITED
METALS DIVISION

REPORT ON E.L. 747, BUNABIE ROCKHOLE, S.A.
E.L. 748, HUGHES, S.A.
E.L. 749, NULLARBOR PLAIN, S.A.

FOR THE QUARTER ENDING OCTOBER 20th, 1981.

AUTHOR: A.H. BRASH

REPORT NO.: 08.1005

DATE: OCTOBER, 1981

COPY NO.: 1

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LIST OF FIGURES

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1. INTRODUCTION

Exploration Licences 747,748 and 749 were granted on the 20th October, 1980 for a period of one year. The term was extended for a further year on the 8th September, 1981.

The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250,000 sheet areas, South Australia adjacent to the border with Western Australia.

The licences are referred to as Bunabie Rockhole (E.L. 747) Hughes (E.L. 748) and Nullarbor Plain (E.L. 749) and collectively form the Coompana Project.

The licences are the subject of a joint venture with Dampier Mining Company Ltd.

Main exploration targets are oil shale within the Cretaceous Madura Formation and base metals associated with geophysical anomalies derived from sources in the Pre-cambriam basement.

2. WORK COMPLETED

2.1 Ground Magnetic Interpretation

Further analysis of the ground magnetic data reported in the last quarterly report has confirmed the depth estimates reported previously. Anomalies within E.L. 749 have depth estimates in the range 250 m to 500 m.

The presence of strong remanent magnetisation of un-certain orientation has precluded a detailed analysis of the geometry of the magnetic bodies. However, in general the source of the anomalies investigated appears to be depth limited implying sill-like sources.

2.2 Gravity Surveying

A total of 44 line km of gravity surveying was completed over magnetic anomalies PM-2, PM-3, PM-4, PM-7 and CM-4.

Preliminary modelling of the data has been carried out using the gravity model-fitting program GRAMOD. This program is supplied with a starting value of parameters to be fitted and adjusts these values in an iterative manner until it has satisfied a criterion for 'best fit'. The 'best fit' criterion is that the parameters must be such that the weighted sum of squared deviations between the observed and calculated gravity anomaly is reduced to a minimum.

A summary of the modelling is presented in Appendix 2.

No significant gravity responses were recorded over anomalies PM-7 and PM-4 (Southwest magnetic anomaly). Over anomalies PM-2, PM-3, PM-4 (Northeast anomaly) and CM-4 gravity responses were measured which are coincident with negative magnetic anomalies. A common source is thus inferred. Maximum residual gravity peaks lie between 2.5 and 4.5 milligal. Depths estimated from the gravity data are consistent with those estimated from magnetic data for anomalies PM-3, PM-4

(Northeast anomaly) and CM-4. For anomaly PM-2 the gravity source is inferred to be much deeper.

070

2.3 Drilling

The original proposal was to drill six holes within E.L. 748 and E.L. 749 to test the oil shale potential of the Cretaceous Madura Formation and/or the base metal potential of the underlying crystalline basement. Two proposed oil shale holes (CD 5 and CD 6) were located adjacent to and south of the Trans Australian Railway west of Hughes. Four holes (CD 1, CD 2, CD 3, and CD 4) were sited on magnetic/gravity anomalies PM-3, PM-4, PM-7 and CM-4.

The first phase of the programme involved pre-collaring through the Tertiary limestones and was supervised by R. Kelly of Robertson Research. A total of seven sites were pre-collared (Figure 1, Appendix 3).

Diamond drilling commenced on September 18, 1981 and holes DDH CD 7 and DDH CD 3 were completed. After a break from October 10-18, drilling recommenced in DDH CD1 on October 19.

The first phase of the diamond drilling was supervised by C. Coxhead of Robertson Research. (Appendix 4).

Both pre-collar percussion and diamond drilling was carried out by Peter Nitshke Drilling Pty. Ltd.

Drill core from the first two holes has been filleted and submitted for assaying. No assays are yet available.

Preliminary logs for DDH CD 7 and DDH CD 3 are presented in Appendix 4.

A summary of drilling progress is presented in Table 1.

T A B L E 1

COOMPANA PROJECT DRILLING PROGRESS

HOLE NO.	GRID ANOMALY	LOCATION	PRE-COLLAR DEPTH (m)	FINAL DEPTH (m)
CD 1	PM-3	6250N, 1700E	161	In progress
CD 2	PM-4	3000N, 2000E	128	To be drilled
CD 3	CM-4	3250N, 3500E	121	206.15
CD 4	PM 7	2500N, 2000E	141	To be drilled
CD 5**	Trans Aust. Railway	15 km W of Hughes	64	Abandoned
CD 6**	Trans Aust. Railway	30 km W of Hughes	176	176.0
CD 7	Trans Aust. Railway	22.5 km W of Hughes	105	159.45

October 20, 1981.

EXPENDITURE

A summary of expenditures for the quarter ending September 30, 1981.

BUNABIE ROCKHOLE E.L. 747

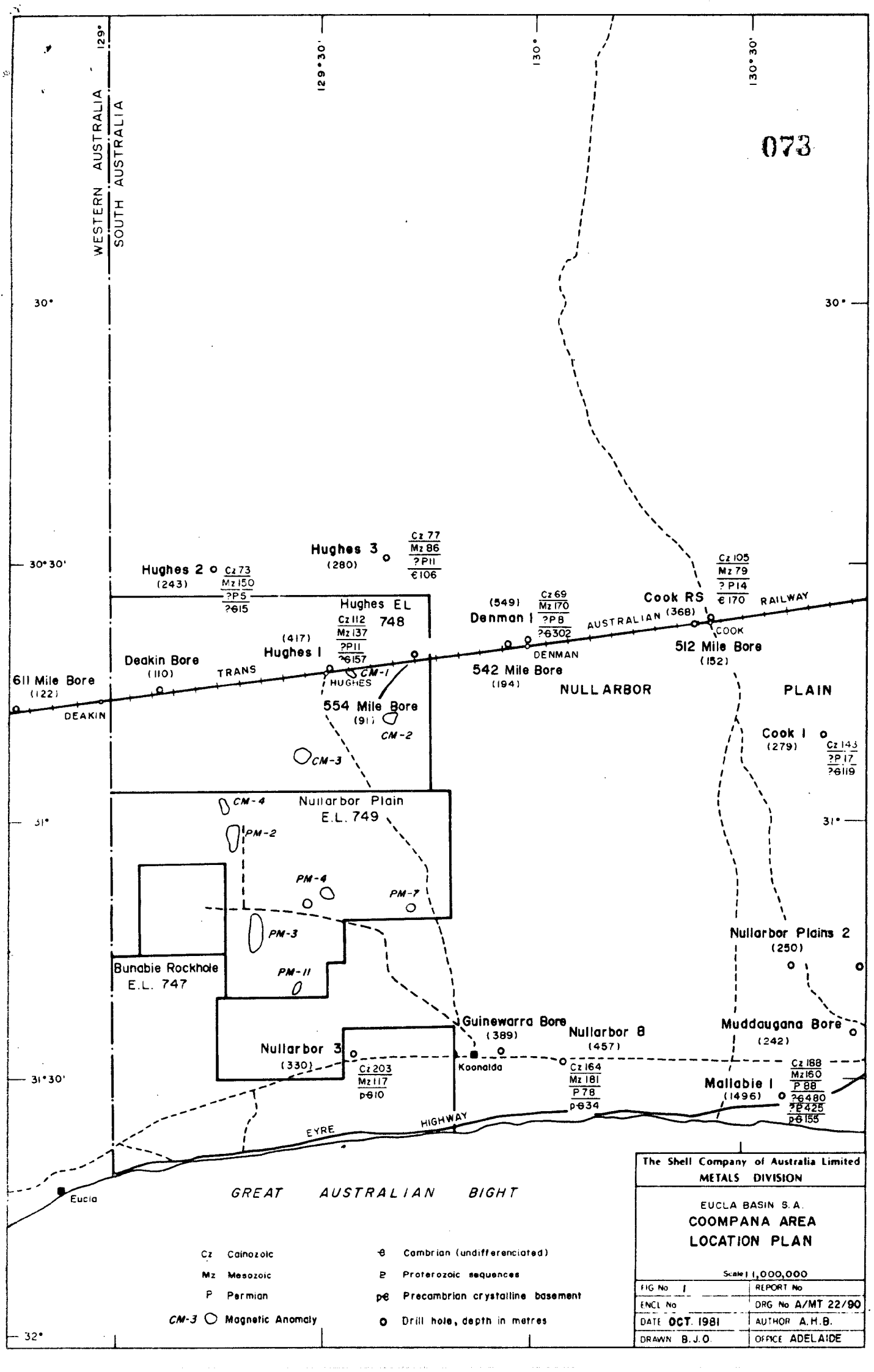
Books, Maps and Publications	$ 83
Regional office expenses	$ 161
Total Direct Costs	$ 244
Overheads	$ 40
Gross Costs	$ 284

HUGHES E.L. 748

Staffing	$ 319
Support	$ 529
Payments to Government	$ 2292
Total Direct Costs	$ 3140
Overheads	$ - 116
Gross Costs	$ 3024

NULLARBOR E.L. 749

Staffing	$ 5850
Support	$ 12199
Payments to Government	$ 1763
Geophysical Surveys	$ 8075
Analysis/Assays	$ 79
Diamond Drilling	$ 49219
Total Direct Costs	$ 77185
Overheads	$ 238
Gross Costs	$ 77423

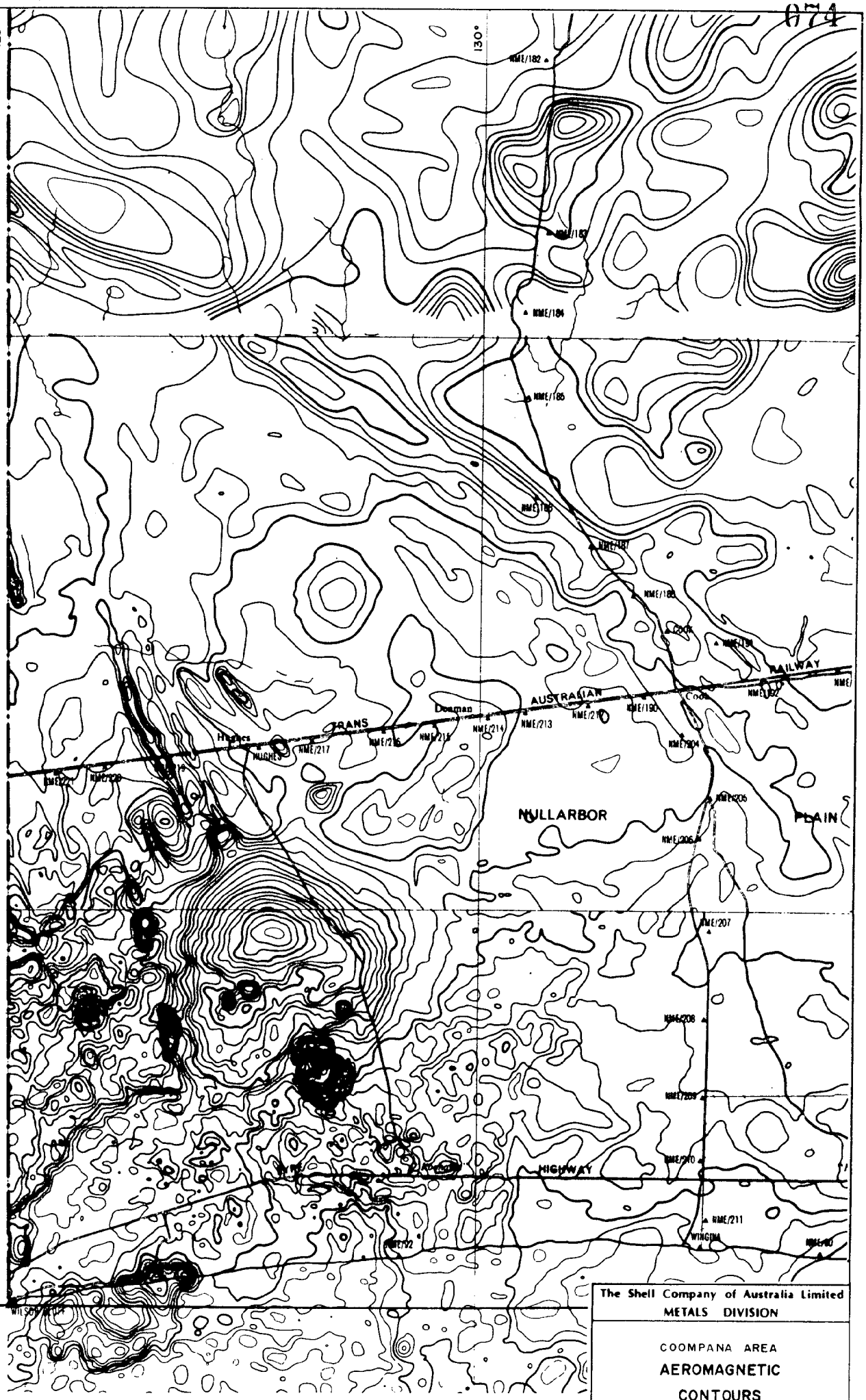


The Shell Company of Australia Limited
METALS DIVISION

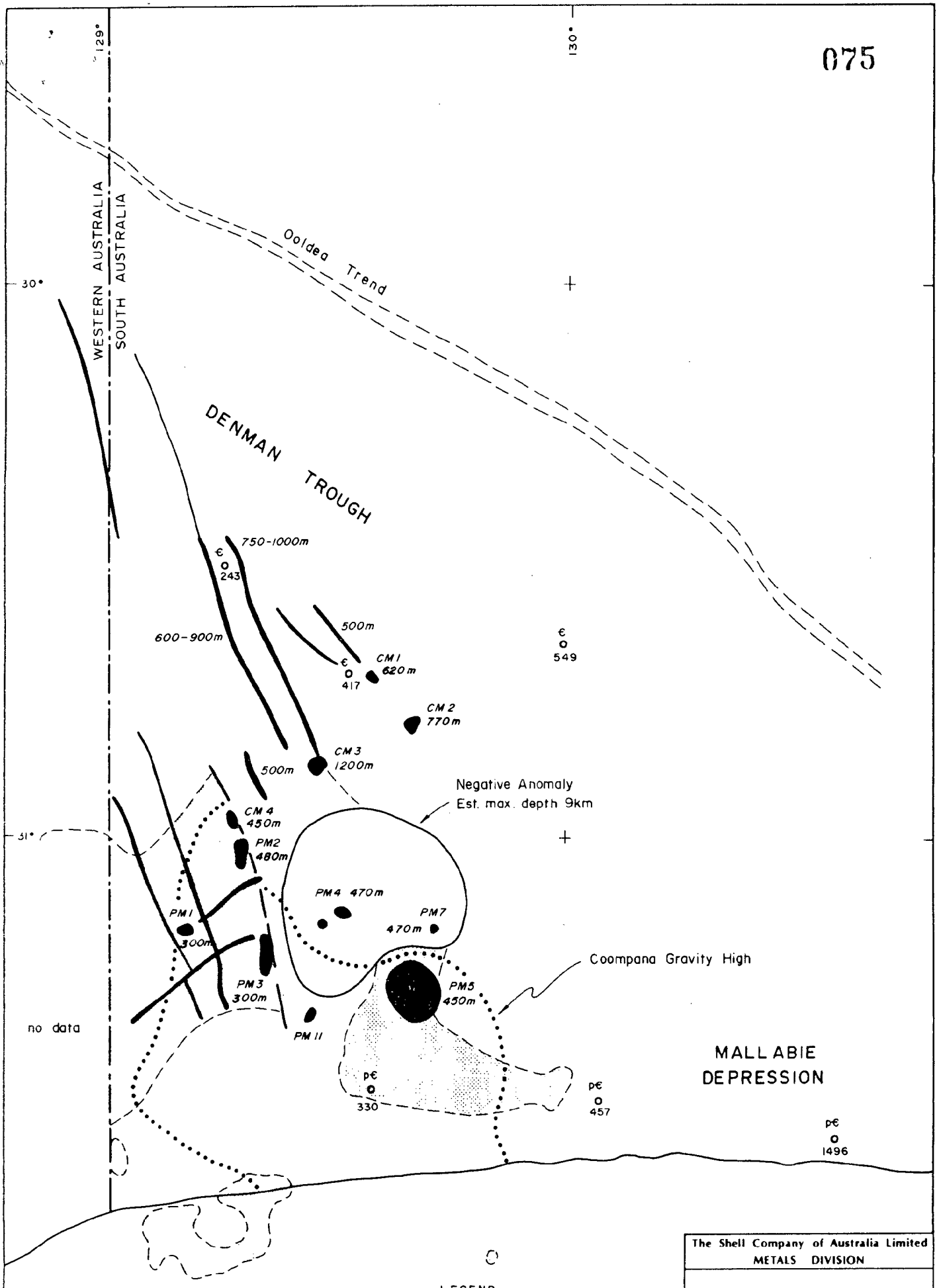
EUCLA BASIN S.A.
COOMPANA AREA
LOCATION PLAN

Scale 1,000,000

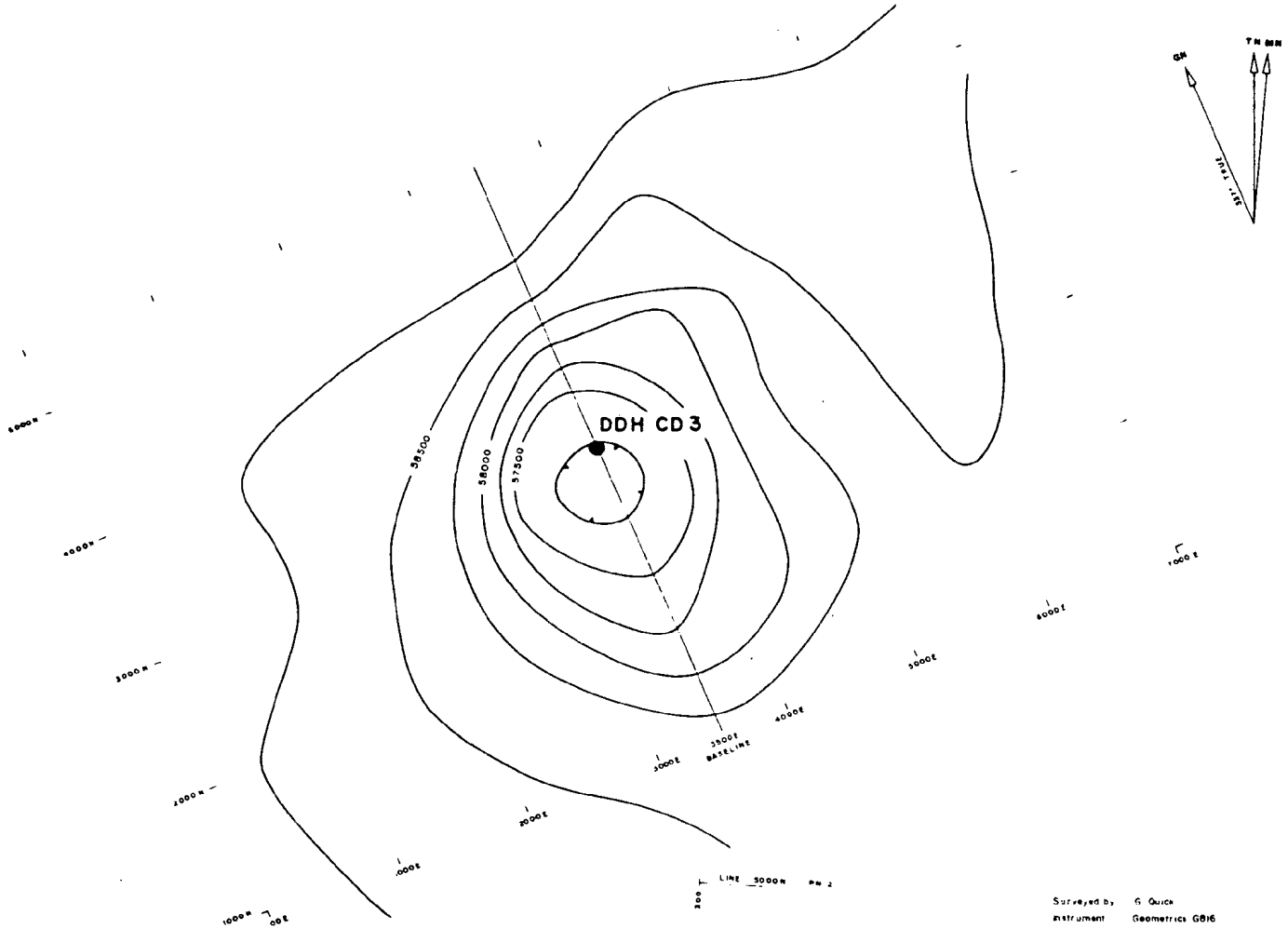
FIG No 1	REPORT No
ENCL No	DRG No A/MT 22/90
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA AREA AEROMAGNETIC CONTOURS Scale 1:1,000,000	
FIG. No 2	REPORT No
ENCL No	DRG No A/MT 22/025
DATE OCT 1980	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA AREA-S.A. MAGNETIC FEATURES	
Scale 1,000,000	
FIG. No 3	REPORT No
ENCL. No	DRG. No. A/MT 22/029
DATE OCT 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

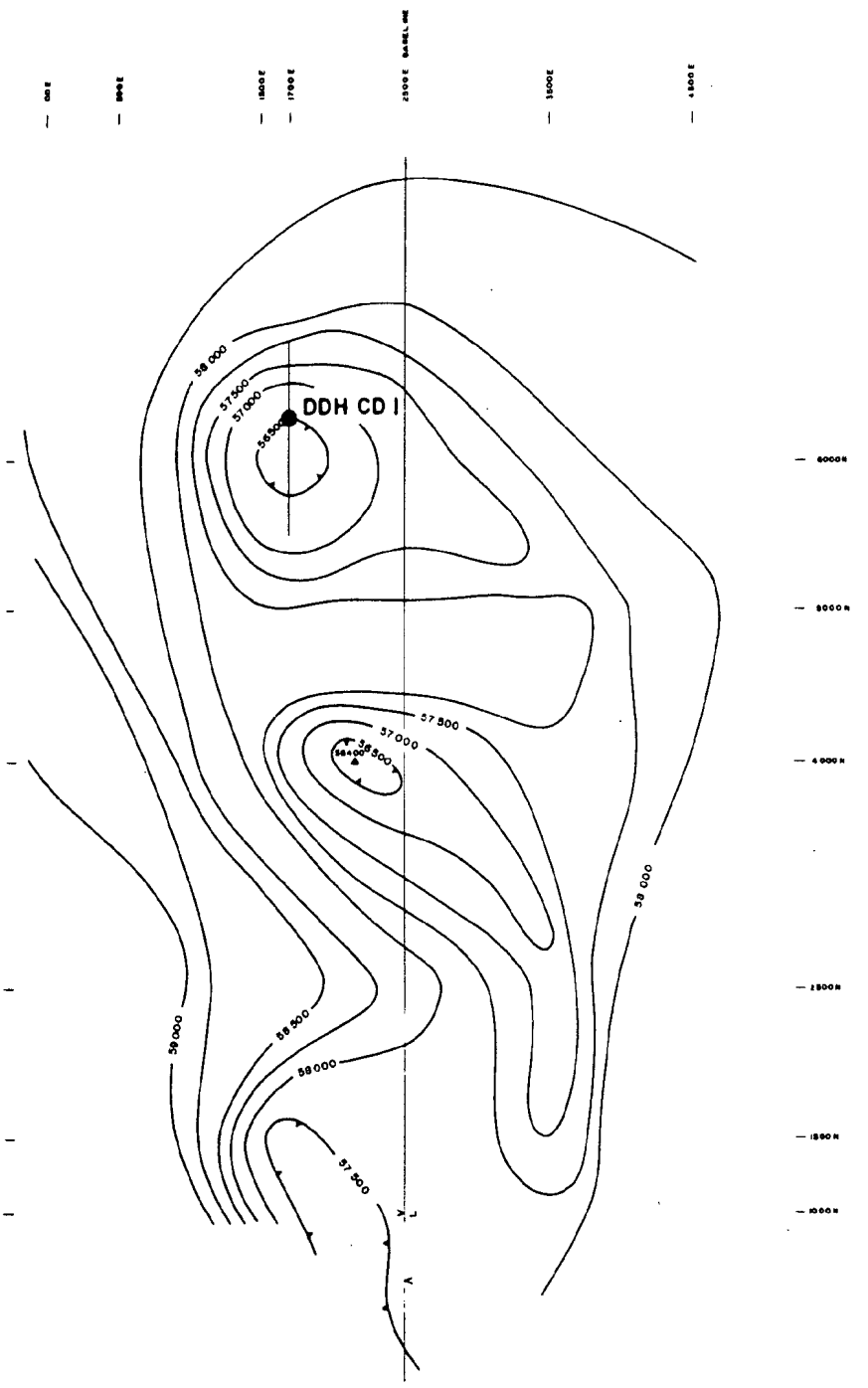


● PROPOSED DRILLHOLE

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY CM4
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1 50,000

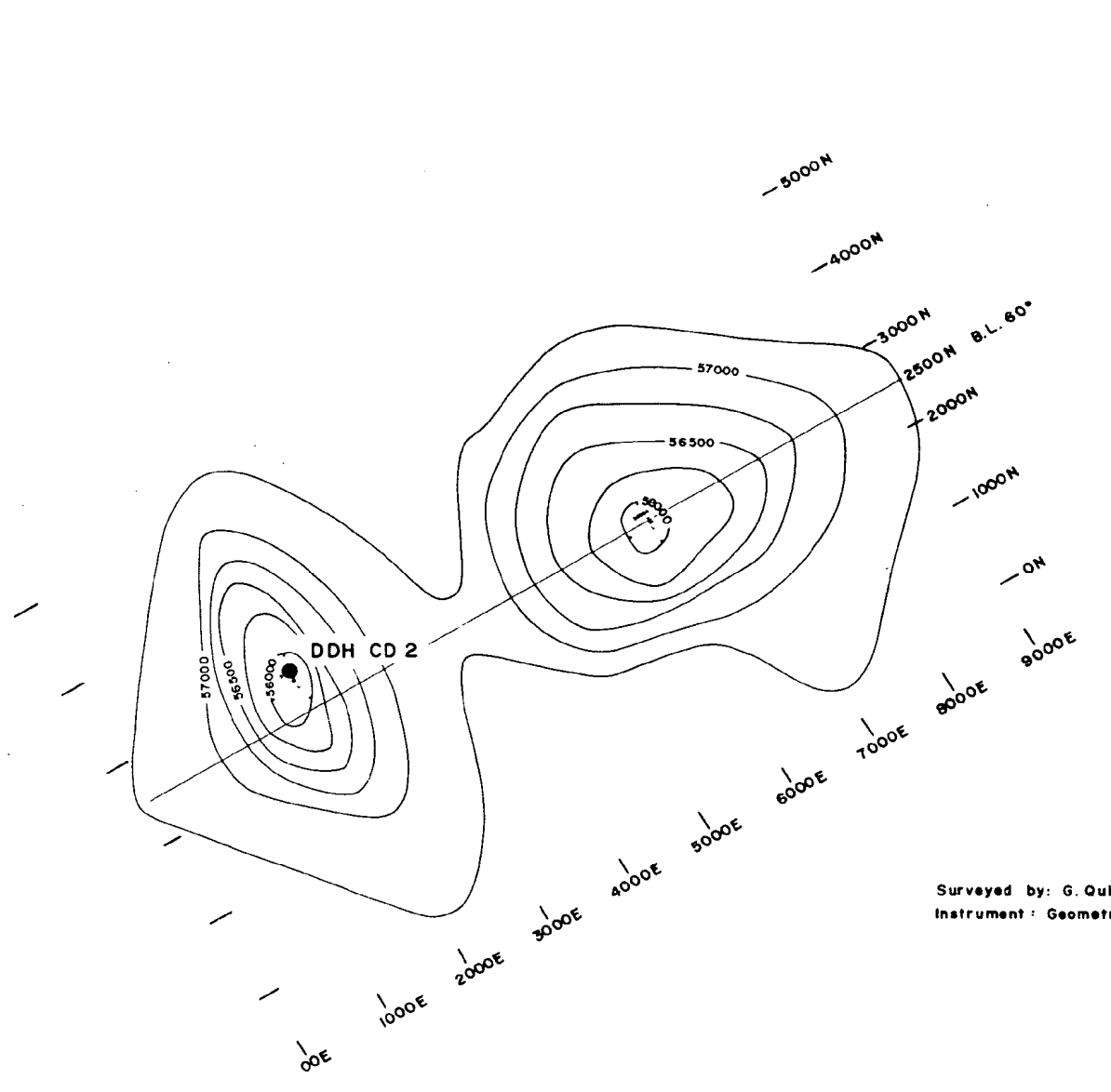
FIG No 4	REPORT No
ENCL No	ORG No A/PW 09/35
DATE OCT. 1981	AUTHOR A.H.B.
RAWN B.J.O.	OFFICE ADELAIDE



Surveyed by : G. Quick
Instrument : Geometrics G816

● PROPOSED DRILLHOLE

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM3** **CONTOURS OF** **TOTAL MAGNETIC INTENSITY** Scale 50,000	
FIG No 8	REPORT No
ENCL No	DRG No A/PW 09/34
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



Surveyed by: G. Quick
Instrument : Geometrics G816

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
ANOMALY PM4
CONTOURS OF
TOTAL MAGNETIC INTENSITY
Scale 1 : 75,000

FIG. No. 6	REPORT No.
ENCL. No.	DRG. No. A/PW 09/36
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

APPENDIX 1

Gravity Data and Operational Report - Solo Geophysics

COOMPANA PROJECT, NULLARBOR PLAIN, S.A.

GRAVITY AND LEVELLING PROGRAMME.

Anomaly	Line	From	To	Length (km)
CM-4	3000N	00	7000E	7
PM-2	3000N	00	7000E	7
PM-4	2000E	00	5000N	5
	6000E	00	5000N	5
	2500N	2000E	8000E	4
PM-7	3000N	00	4000E	4
PM-3	6000N	00	5000E	5
	4000N	00	5000E	5
	2500E	4000N	6000N	2
				44km

Station spacing: 100.
CM prefix denotes COOK sheet
PM prefix denotes COOMPANA sheet

Note: Co-ordinates in the accompanying listing and profile plots are prefixed by 1.

GOLIS GEOPHYSICS & CO

****
LOOP NUMBER 1
****

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR CM4

081

COVERAGE LINE 13000N FROM 13500E TO 17000E

Loop Time: 2.20 Hours Drift Rate: -.01 Gravimeter #G 047 Operator K.LEECH
Loop Drift: -.021 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 01/08/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.0
	BASE # 02			2073.75	11.56		3002.53					
13000	13500	0	0	2073.75	11.56	100.00	3002.53	979416.95	35.65	34.39	33.26	32.71
13000	13600	0	0	2073.72	11.52	99.80	3002.57	979416.97	35.62	34.36	33.23	32.69
13000	13700	0	0	2073.47	12.03	100.16	3002.24	979417.00	35.34	34.08	32.94	32.40
13000	13800	0	0	2073.33	12.07	100.22	3002.09	979417.03	35.17	33.93	32.79	32.25
13000	13900	0	0	2073.17	12.11	100.22	3001.92	979417.06	34.99	33.73	32.60	32.05
13000	14000	0	0	2073.00	12.15	100.20	3001.75	979417.07	34.77	33.51	32.38	31.83
13000	14100	0	0	2072.78	12.19	100.20	3001.52	979417.11	34.51	33.25	32.12	31.57
13000	14200	0	0	2072.62	12.23	100.07	3001.32	979417.14	34.30	33.01	31.91	31.36
13000	14300	0	0	2072.47	12.26	100.01	3001.19	979417.17	34.09	32.93	31.70	31.16
13000	14400	0	0	2072.32	12.32	99.70	3001.09	979417.20	33.93	32.80	31.55	31.00
13000	14500	0	0	2072.19	12.32	99.26	3001.90	979417.23	33.69	32.46	31.30	30.76
13000	14600	0	0	2072.02	12.36	99.78	3002.72	979417.25	33.42	32.23	31.10	30.56
13000	14700	0	0	2071.78	12.40	99.87	3002.47	979417.28	33.23	31.92	30.84	30.30
13000	14800	0	0	2071.58	12.44	100.03	3002.26	979417.31	33.04	31.78	30.65	30.10
13000	14900	0	0	2071.47	12.48	100.17	3002.15	979417.34	32.91	31.65	30.52	29.97
13000	15000	0	0	2071.42	12.51	99.25	3002.17	979417.37	32.86	31.60	30.47	29.93
13000	15100	0	0	2071.26	12.55	99.61	3002.45	979417.39	33.04	31.79	30.66	30.12
13000	15200	0	0	2071.01	12.58	99.57	3002.17	979417.42	32.74	31.47	30.37	29.82
13000	15300	0	0	2071.33	13.02	99.64	3002.01	979417.45	32.54	31.29	30.16	29.62
13000	15400	0	0	2071.35	13.05	99.37	3002.03	979417.48	32.47	31.22	30.10	29.56
13000	15500	0	0	2071.29	13.08	99.25	3006.96	979417.51	32.36	31.11	29.99	29.44
13000	15600	0	0	2071.30	13.12	99.08	3006.98	979417.53	32.39	31.06	29.94	29.40
13000	15700	0	0	2071.32	13.26	98.72	3007.00	979417.56	32.22	30.90	29.86	29.32
13000	15800	0	0	2071.30	13.22	98.55	3007.06	979417.59	32.21	30.90	29.86	29.32
13000	15900	0	0	2071.27	13.26	98.52	3006.95	979417.62	32.08	30.84	29.73	29.19
13000	16000	0	0	2071.26	13.30	98.53	3006.94	979417.65	32.03	30.77	29.68	29.14
13000	16100	0	0	2071.19	13.36	98.62	3006.86	979417.67	31.95	30.71	29.59	29.06
13000	16200	0	0	2070.78	13.36	98.05	3006.64	979417.70	31.75	30.51	29.39	28.85
13000	16300	0	0	2070.87	13.39	99.11	3006.53	979417.73	31.67	30.42	29.30	28.76
13000	16400	0	0	2070.72	13.42	99.42	3006.37	979417.76	31.55	30.30	29.17	28.63
13000	16500	0	0	2070.77	13.44	99.46	3006.42	979417.78	31.58	30.33	29.21	28.67
13000	16600	0	0	2070.60	13.47	99.41	3006.33	979417.81	31.45	30.20	29.08	28.53
13000	16700	0	0	2070.73	13.49	99.37	3006.38	979417.84	31.47	30.22	29.09	28.55
13000	16800	0	0	2070.65	13.52	99.22	3006.30	979417.87	31.34	30.07	28.97	28.42
13000	16900	0	0	2070.59	13.54	99.32	3006.24	979417.90	31.25	30.00	28.88	28.34
13000	17000	0	0	2070.58	13.58	99.32	3006.23	979417.92	31.22	29.97	28.84	28.30
13000	15000	0	0	2071.46	14.06	99.95	3002.15	979417.32	32.04	31.50	30.45	29.91
	BASE # 02			2073.73	14.10		3002.54					

GOLD GEOPHYSICS & CO

****
LOOP NUMBER 2
****

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR CM4

082

COVERAGE LINE 13000N FROM 13500E TO 12000E

Loop Time 1.78 Hours Drift Rate .04 Gravimeter #G 037 Operator K.LEECH
Loop Drift .073 Mgals Time Zone 9.500 Calibration Factor 1.048 Date 01/08/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2873.76	14.43		3009.53					
13000	13500	0	0	2873.76	14.43	100.00	3009.53	979416.95	35.65	34.39	33.26	32.71
13000	13400	0	0	2873.20	14.47	100.28	3009.46	979416.92	35.67	34.41	33.28	32.73
13000	13300	0	0	2873.06	14.50	100.61	3009.63	979416.89	35.94	34.67	33.54	32.99
13000	13200	0	0	2873.75	14.53	100.72	3009.51	979416.86	35.87	34.61	33.47	32.92
13000	13100	0	0	2873.29	14.56	100.57	3009.55	979416.83	35.91	34.64	33.51	32.96
13000	13000	0	0	2873.76	14.57	100.53	3009.73	979416.81	36.10	34.84	33.70	33.16
13000	12900	0	0	2873.89	15.02	100.49	3009.65	979416.78	36.05	34.78	33.65	33.10
13000	12800	0	0	2873.65	15.05	100.52	3009.40	979416.75	35.83	34.57	33.43	32.88
13000	12700	0	0	2873.45	15.08	100.53	3009.19	979416.72	35.65	34.38	33.25	32.70
13000	12600	0	0	2873.17	15.11	100.68	3008.91	979416.67	35.43	34.17	33.03	32.48
13000	12500	0	0	2873.00	15.13	100.74	3008.71	979416.67	35.28	34.01	32.87	32.32
13000	12400	0	0	2872.72	15.16	100.62	3008.63	979416.64	35.21	33.94	32.80	32.25
13000	12300	0	0	2872.81	15.19	100.70	3008.51	979416.61	35.14	33.87	32.73	32.18
13000	12200	0	0	2872.77	15.21	100.87	3008.49	979416.58	35.16	33.89	32.75	32.20
13000	12100	0	0	2872.48	15.24	100.02	3008.16	979416.55	34.85	33.59	32.44	31.90
13000	12000	0	0	2872.42	15.28	100.53	3008.10	979416.53	34.75	33.47	32.35	31.80
13000	11900	0	0	2872.45	15.31	100.20	3008.12	979416.50	34.74	33.48	32.34	31.80
13000	11800	0	0	2872.52	15.33	99.23	3008.20	979416.47	34.78	33.52	32.39	31.84
13000	11700	0	0	2872.49	15.37	99.78	3008.16	979416.44	34.74	33.48	32.35	31.81
13000	11600	0	0	2872.44	15.40	99.60	3008.11	979416.41	34.67	33.42	32.29	31.75
13000	11500	0	0	2872.52	15.43	99.49	3008.19	979416.39	34.76	33.51	32.38	31.84
13000	11400	0	0	2872.62	15.47	99.37	3008.29	979416.36	34.86	33.61	32.49	31.94
13000	11300	0	0	2872.57	15.51	99.43	3008.24	979416.33	34.85	33.60	32.47	31.93
13000	11200	0	0	2872.48	15.53	99.62	3008.14	979416.30	34.82	33.57	32.44	31.90
13000	11100	0	0	2872.48	15.57	99.57	3008.14	979416.27	34.83	33.58	32.46	31.91
13000	11000	0	0	2872.69	16.00	99.39	3008.36	979416.25	35.02	33.77	32.65	32.11
13000	10900	0	0	2872.87	16.04	98.87	3008.54	979416.22	35.14	33.90	32.78	32.24
13000	10800	0	0	2872.95	16.07	99.00	3008.62	979416.19	35.28	34.03	32.91	32.37
13000	10700	0	0	2872.89	16.10	99.16	3008.56	979416.16	35.28	34.03	32.91	32.37
13000	10600	0	0	2872.93	16.13	99.40	3008.60	979416.13	35.40	34.15	33.02	32.49
13000	10500	0	0	2872.95	16.15	99.54	3008.62	979416.11	35.47	34.22	33.10	32.55
13000	12000	0	0	2872.43	16.22	100.53	3008.08	979416.53	34.74	33.47	32.33	31.79
BASE # 02				2873.03	16.30		3009.53					

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Data computed on 06/10/81

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******** CATALOG OF RAW FIELD DATA ********

083

LOOP# 1 LINE 13000N FROM 13500E TO 17000E

LOOP# 2 LINE 13999N FROM 13500E TO 12000E

****

Data Computed on 05/10/81

********** DATA REDUCTION PARAMETERS **********

CLIENT THE SHELL COMPANY OF AUSTRALIA

084

LOCATION NULLARBOR CM4

Time Zone is 9.5

Grid Rotation Bearing is 23 degrees EAST

The Known Point of 31 degrees Latitude is located
at Line Number 13000 and Station Number 12000

The Base Station Observed Gravity Values are

BASE #	OBSERVED GRAVITY (mgals)
1	3009.53
2	3009.53

****

Data Computed on 06/10/81

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 1
****

SURVEYED FOR SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM2

085

COVERAGE LINE 13000N FROM 13500E TO 14000E

Loop Time 1.93 Hours Drift Rate .02 Gravimeter #G 037 Operator K LEECH
Loop Drift .042 Mgals Time Zone 9.500 Calibration Factor 1.048 Date 29/07/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.2	2.67	2.8
BASE # 02				2822.52	14.58		3013.43					
13000	13500	0	0	2877.59	13.58	99.80	3013.43	979430.07	39.94	38.69	37.56	37.01
13000	13600	0	0	2877.40	14.02	99.56	3013.23	979430.07	39.67	38.42	37.29	36.75
13000	13700	0	0	2877.38	14.05	99.07	3013.21	979430.07	39.54	38.30	37.17	36.64
13000	13800	0	0	2877.45	14.08	98.65	3013.20	979430.07	39.52	38.28	37.15	36.63
13000	13900	0	0	2877.25	14.11	98.64	3013.07	979430.07	39.31	38.07	36.95	36.41
13000	14000	0	0	2877.04	14.14	98.62	3012.85	979430.07	39.03	37.79	36.73	36.19
13000	14100	0	0	2876.92	14.16	98.66	3012.72	979430.07	38.86	37.62	36.61	36.07
13000	14200	0	0	2876.74	14.19	98.63	3012.53	979430.07	38.62	37.39	36.41	35.88
13000	14300	0	0	2876.58	14.22	98.25	3012.36	979430.07	38.63	37.39	36.27	35.73
13000	14400	0	0	2876.56	14.25	98.65	3012.34	979430.07	38.60	37.37	36.25	35.69
13000	14500	0	0	2876.50	14.27	98.65	3012.28	979430.07	38.52	37.29	36.16	35.60
13000	14600	0	0	2876.52	14.30	98.63	3012.30	979430.07	38.53	37.29	36.17	35.61
13000	14700	0	0	2876.12	14.33	98.28	3011.90	979430.07	38.13	36.89	35.78	35.24
13000	14800	0	0	2876.06	14.36	98.26	3011.80	979430.07	37.91	36.67	35.55	35.01
13000	14900	0	0	2875.69	14.39	97.28	3011.42	979430.07	37.81	36.56	35.42	34.89
13000	15000	0	0	2875.58	14.41	97.21	3011.31	979430.07	37.67	36.43	35.30	34.76
13000	15100	0	0	2875.64	14.45	98.79	3011.37	979430.07	37.68	36.38	35.26	34.73
13000	15200	0	0	2875.62	14.47	98.52	3011.35	979430.07	37.66	36.32	35.21	34.67
13000	15300	0	0	2875.52	14.49	98.58	3011.30	979430.07	37.58	36.28	35.17	34.63
13000	15400	0	0	2875.34	14.52	98.61	3011.05	979430.07	37.29	36.05	34.93	34.39
13000	15500	0	0	2875.18	14.55	98.86	3010.88	979430.07	37.12	35.93	34.81	34.27
13000	15600	0	0	2875.12	14.57	98.24	3010.82	979430.07	37.08	35.89	34.78	34.18
13000	15700	0	0	2875.32	15.03	98.20	3011.03	979430.07	37.17	35.91	34.82	34.29
13000	15800	0	0	2875.36	15.05	97.28	3011.07	979430.07	37.12	35.87	34.78	34.25
13000	15900	0	0	2875.33	15.08	97.58	3011.04	979430.07	37.04	35.80	34.71	34.18
13000	16000	0	0	2875.45	15.12	97.36	3011.16	979430.07	37.12	35.87	34.79	34.26
13000	16100	0	0	2875.40	15.15	97.23	3011.11	979430.07	37.04	35.81	34.71	34.18
13000	16200	0	0	2875.40	15.18	97.11	3011.11	979430.07	37.01	35.79	34.69	34.16
13000	16300	0	0	2875.46	15.20	96.96	3011.17	979430.07	37.04	35.82	34.72	34.19
13000	16400	0	0	2875.32	15.24	96.20	3011.09	979430.07	36.95	35.73	34.63	34.11
13000	16500	0	0	2875.29	15.26	96.92	3010.90	979430.07	36.85	35.63	34.53	34.00
13000	16600	0	0	2875.31	15.29	96.90	3011.01	979430.07	36.86	35.65	34.55	34.02
13000	16700	0	0	2875.17	15.31	96.95	3010.86	979430.07	36.73	35.51	34.41	33.88
13000	16800	0	0	2875.19	15.34	96.92	3010.88	979430.07	36.74	35.52	34.43	33.90
13000	16900	0	0	2875.02	15.36	96.93	3010.70	979430.07	36.56	35.35	34.25	33.72
13000	17000	0	0	2875.05	15.40	96.86	3010.73	979430.07	36.58	35.36	34.26	33.74
13000	15500	0	0	2875.16	15.45	98.86	3010.85	979430.07	37.13	35.89	34.77	34.23

GOLD GEOPHYSICS & CO

****
LOOP NUMBER 2
****

SURVEYED FOR SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM2

086

COVERAGE LINE 13000N FROM 13500E TO 11000E

Loop Time: 2.05 Hours Drift Rate: .04 Gravimeter #G 037 Operator K.LEECH
Loop Drift: .023 Mgals Time Zone: 9.500 Calibration Factor: 1.049 Date: 30/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2077.42	14.06		3013.43					
13000	13500	0	0	2077.42	14.06	99.00	3013.43	979430.07	39.94	38.69	37.56	37.01
13000	13400	0	0	2077.45	14.07	100.07	3013.41	979430.07	40.01	38.75	37.61	37.06
13000	13300	0	0	2077.50	14.12	100.11	3013.46	979430.07	40.09	38.82	37.69	37.14
13000	13200	0	0	2077.07	14.16	100.08	3013.86	979430.07	40.42	39.16	38.03	37.48
13000	13100	0	0	2078.16	14.20	99.29	3014.14	979430.07	40.64	39.39	38.25	37.71
13000	13000	0	0	2078.53	14.24	99.32	3014.53	979430.07	40.92	39.67	38.55	38.00
13000	12900	0	0	2078.67	14.26	98.69	3014.68	979430.07	40.92	39.68	38.57	38.03
13000	12800	0	0	2078.87	14.29	98.23	3014.88	979430.07	41.06	39.80	38.68	38.15
13000	12700	0	0	2079.16	14.32	98.13	3015.18	979430.07	41.31	40.09	38.97	38.43
13000	12600	0	0	2079.17	14.32	98.14	3015.21	979430.07	41.33	40.11	39.00	38.46
13000	12500	0	0	2079.11	14.30	98.40	3015.13	979430.07	41.33	40.09	38.98	38.44
13000	12400	0	0	2079.20	14.40	98.02	3015.22	979430.07	41.32	40.27	39.15	38.61
13000	12300	0	0	2079.20	14.43	99.00	3015.22	979430.07	41.60	40.35	39.23	38.69
13000	12200	0	0	2079.23	14.46	99.30	3015.25	979430.07	41.63	40.39	39.26	38.72
13000	12100	0	0	2079.27	14.49	99.60	3015.29	979430.07	41.74	40.49	39.36	38.82
13000	12000	0	0	2079.20	14.53	99.99	3015.21	979430.07	41.71	40.45	39.32	38.78
13000	11900	0	0	2079.31	14.57	99.06	3015.33	979430.07	41.84	40.58	39.45	38.91
13000	11800	0	0	2079.57	15.01	99.05	3015.60	979430.07	42.10	40.85	39.72	39.17
13000	11700	0	0	2079.25	15.04	100.03	3015.26	979430.07	41.81	40.55	39.42	38.89
13000	11600	0	0	2078.88	15.06	100.20	3014.87	979430.07	41.56	40.30	39.16	38.61
13000	11500	0	0	2079.22	15.09	101.21	3014.75	979430.07	41.56	40.29	39.14	38.59
13000	11400	0	0	2078.67	15.12	100.87	3014.65	979430.07	41.50	40.11	38.97	38.42
13000	11300	0	0	2078.66	15.15	100.50	3014.64	979430.07	41.20	40.02	38.88	38.34
13000	11200	0	0	2078.71	15.19	100.11	3014.69	979430.07	41.25	39.97	38.86	38.31
13000	11100	0	0	2078.69	15.23	100.16	3014.66	979430.07	41.24	39.98	38.84	38.30
13000	11000	0	0	2078.42	15.26	100.18	3014.38	979430.07	40.96	39.70	38.56	38.02
13000	10900	0	0	2078.02	15.29	100.20	3013.96	979430.07	40.54	39.28	38.15	37.60
13000	10800	0	0	2077.71	15.32	100.28	3013.63	979430.07	40.24	38.97	37.84	37.29
13000	10700	0	0	2077.39	15.36	100.22	3013.29	979430.07	39.88	38.62	37.49	36.94
13000	10600	0	0	2077.22	15.39	100.27	3013.12	979430.07	39.72	38.52	37.39	36.84
13000	10500	0	0	2077.05	15.41	100.26	3012.93	979430.07	39.53	38.27	37.13	36.58
13000	10400	0	0	2076.82	15.43	100.32	3012.74	979430.07	39.35	38.07	36.96	36.41
13000	10300	0	0	2076.58	15.46	100.30	3012.44	979430.07	39.04	37.78	36.65	36.10
13000	10200	0	0	2076.30	15.49	100.42	3012.14	979430.07	38.77	37.52	36.39	35.84
13000	10100	0	0	2075.90	15.51	100.66	3011.73	979430.07	38.41	37.15	36.01	35.46
13000	10000	0	0	2075.70	15.53	100.62	3011.60	979430.07	38.29	37.02	35.89	35.33
13000	12000	0	0	2079.20	16.01	99.29	3015.26	979430.07	41.75	40.50	39.37	38.82

**********---DATA-REDUCTION PARAMETERS----**********

CLIENT: SHELL COMPANY OF AUSTRALIA

LOCATION: NULLARBOR PM2

087

Time Zone is 9.5

Grid Rotation Bearing is 0 degrees EAST

The Known Point of 31.17 degrees Latitude is located
at Line Number 13000 and Station Number 12000

The Base Station Observed Gravity Values are:

BASE #	OBSERVED GRAVITY (mgals)
1	3013.41
2	3013.43

****

Data Computed on 06/10/81

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********* CATALOG OF RAW FIELD DATA *********

088

LOOP# 1 LINE 13000N FROM 13500E TO 16000E

LOOP# 2 LINE 13000N FROM 13500E TO 11000E

****

Data Computed on 06/10/01

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 1
****

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM3

089

COVERAGE LINE 16000N FROM 12500E TO 10100E

Loop Time 1.68 Hours Drift Rate .02 Gravimeter #G 032 Operator R.LEECH
Loop Drift .042 Mgals Time Zone: 9.500 Calibration Factor 1.048 Date: 25/07/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE $ 02				2901.50	10.45		3030.60					
16000	12500	0	0	2901.50	10.45	100.00	3030.60	979435.02	66.58	65.32	64.19	63.65
16000	12400	0	0	2901.82	10.50	99.81	3030.93	979435.02	66.87	65.62	64.49	63.94
16000	12300	0	0	2901.96	10.52	99.76	3030.08	979435.02	67.01	65.75	64.62	64.08
16000	12200	0	0	2901.75	10.57	99.81	3030.07	979435.02	67.00	65.75	64.62	64.08
16000	12100	0	0	2902.08	11.00	99.81	3030.20	979435.02	67.14	65.88	64.76	64.21
16000	12000	0	0	2901.25	11.03	100.37	3030.06	979435.02	67.13	65.86	64.73	64.18
16000	11900	0	0	2901.78	11.06	101.43	3030.00	979435.02	67.10	65.80	64.76	64.20
16000	11800	0	0	2901.55	11.09	102.38	3030.64	979435.02	67.15	65.86	64.70	64.14
16000	11700	0	0	2901.45	11.14	102.87	3030.54	979435.02	67.15	65.86	64.69	64.13
16000	11600	0	0	2901.37	11.18	102.98	3030.45	979435.02	67.07	65.77	64.63	64.07
16000	11500	0	0	2901.42	11.21	103.01	3030.50	979435.02	67.15	65.85	64.68	64.12
16000	11400	0	0	2901.38	11.24	103.02	3030.46	979435.02	67.10	65.81	64.64	64.08
16000	11300	0	0	2901.40	11.27	102.85	3030.48	979435.02	67.09	65.79	64.63	64.07
16000	11200	0	0	2901.27	11.30	102.70	3030.34	979435.02	66.96	65.65	61.46	63.90
16000	11100	0	0	2901.10	11.34	102.65	3030.16	979435.02	66.93	65.43	64.27	63.71
16000	11000	0	0	2900.89	11.37	102.58	3029.95	979435.02	66.10	65.17	64.03	63.47
16000	10900	0	0	2900.71	11.41	102.70	3029.75	979435.02	66.34	65.05	63.89	63.33
16000	10800	0	0	2900.60	11.45	102.54	3029.63	979435.02	66.17	64.89	63.72	63.16
16000	10700	0	0	2900.58	11.48	102.06	3029.61	979435.02	66.04	64.76	63.61	63.05
16000	10600	0	0	2900.62	11.51	102.00	3029.62	979435.02	66.04	64.76	63.60	63.05
16000	10500	0	0	2900.58	11.54	102.02	3029.61	979435.02	66.03	64.75	63.60	63.04
16000	10400	0	0	2900.49	12.01	102.05	3029.50	979435.02	65.93	64.65	63.49	62.94
16000	10300	0	0	2900.29	12.04	102.00	3029.30	979435.02	65.74	64.46	63.30	62.74
16000	10200	0	0	2899.93	12.06	102.12	3029.72	979435.02	65.15	64.16	63.00	62.43
16000	10100	0	0	2899.80	12.10	102.66	3029.70	979435.02	65.35	64.06	62.90	62.34
16000	10000	0	0	2899.25	12.13	102.50	3029.73	979435.02	65.26	63.97	62.81	62.25
16000	12500	0	0	2901.50	10.45	100.00	3030.60	979435.02	66.58	65.32	64.19	63.65
16000	11500	0	0	2901.44	12.21	103.01	3030.50	979435.02	67.14	65.85	64.68	64.12
BASE $ 02				2901.54	12.26		3030.60					

****

Data Computed on 06/10/81

SOLO GEOPHYSICS & CO

090

********** DATA REDUCTION PARAMETERS **********

CLIENT: THE SHELL COMPANY OF AUSTRALIA

LOCATION: NULLARBOR PM4

Time Zone is 9.5

Grid Rotation Bearing is 30 degrees EAST

The Known Point of 31.125 degrees Latitude is located
at Line Number 12500 and Station Number 16000

The Base Station Observed Gravity Values are:

BASE #	OBSERVED GRAVITY (mgals)
1	3025.34
2	3025.34

****

Data Computed on 06/10/81

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******** CATALOG OF RAW FIELD DATA ********

091

LOOP# 1	LINE 12500N	FROM 15000E TO 12300E
LOOP# 2	LINE 12000E	FROM 12500N TO 10100N
LOOP# 3	LINE 16000E	FROM 12500N TO 15000N
LOOP# 4	LINE 16000E	FROM 12500N TO 10000N
LOOP# 5	LINE 12000E	FROM 12500N TO 15000N
LOOP# 6	LINE 12500N	FROM 15000 TO 16000E

****

Data Computed on 06/10/81

HOLT GEOPHYSICS & CO

LOOP NUMBER 3

092

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR -PM4

COVERAGE LINE 12500N FROM 15000E TO 12300E

Loop Time 2.32 Hours Drift Rate 0.00 Gravimeter #G 047 Operator K.LEECH

Loop Drift 0.000 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 19/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2080.84	10.43		3025.34					
12500	15000	0	0	2080.84	10.43	100.00	3025.34	979426.12	52.24	50.98	49.05	48.38
12500	14900	0	0	2080.71	10.47	99.71	3025.20	979426.09	52.12	50.87	48.94	48.27
12500	14800	0	0	2080.50	10.52	100.11	3024.98	979426.05	51.90	50.72	48.79	48.04
12500	14700	0	0	2080.32	10.56	100.56	3024.80	979426.01	51.73	50.66	48.75	48.07
12500	14600	0	0	2080.11	10.59	101.04	3024.58	979425.98	51.85	50.58	48.83	48.08
12500	14500	0	0	2080.26	11.04	101.61	3021.42	979425.21	51.85	50.57	48.82	48.07
12500	14400	0	0	2080.92	11.07	101.52	3024.38	979425.91	51.83	50.55	48.80	48.05
12500	14300	0	0	2080.99	11.11	101.28	3024.45	979425.87	51.90	50.61	48.86	48.11
12500	14200	0	0	2080.10	11.13	101.26	3024.56	979425.83	52.02	50.76	49.01	48.26
12500	14100	0	0	2080.25	11.18	101.39	3024.41	979425.80	51.92	50.61	48.90	48.24
12500	14000	0	0	2080.70	11.22	101.61	3024.15	979425.76	51.76	50.48	48.73	48.08
12500	13900	0	0	2080.67	11.26	102.10	3024.11	979425.73	51.82	50.52	48.83	48.08
12500	13800	0	0	2080.69	11.30	102.22	3024.14	979425.69	51.95	50.69	49.01	48.26
12500	13700	0	0	2080.74	11.33	102.13	3024.19	979425.66	52.02	50.71	48.98	48.23
12500	13600	0	0	2080.79	11.36	102.10	3024.24	979425.62	52.10	50.80	49.07	48.31
12500	13500	0	0	2080.71	11.39	102.14	3024.37	979425.58	52.20	50.92	49.20	48.38
12500	13400	0	0	2080.92	11.45	102.01	3024.38	979425.55	52.29	51.01	49.26	48.50
12500	13300	0	0	2080.92	11.48	102.01	3024.40	979425.51	52.43	51.15	50.00	49.44
12500	13200	0	0	2080.09	11.51	101.93	3024.55	979425.48	52.53	51.24	50.09	49.54
12500	13100	0	0	2080.15	11.55	101.83	3024.62	979425.41	52.60	51.32	50.17	49.61
12500	13000	0	0	2080.27	11.58	101.85	3024.74	979425.40	52.72	51.49	50.34	49.78
12500	12900	0	0	2080.32	12.03	101.70	3024.85	979425.37	52.89	51.61	50.46	49.91
12500	12800	0	0	2080.33	12.07	101.60	3024.81	979425.33	52.87	51.59	50.44	49.88
12500	12700	0	0	2080.50	12.10	101.13	3024.98	979425.30	52.76	51.67	50.54	49.79
12500	12600	0	0	2080.79	12.14	100.35	3025.29	979425.26	53.13	51.86	50.73	50.10
12500	12500	0	0	2080.96	12.17	99.72	3025.57	979425.22	53.31	52.05	50.92	50.38
12500	12400	0	0	2080.20	12.30	99.42	3025.72	979425.19	53.42	52.17	51.05	50.51
12500	12300	0	0	2080.31	12.32	99.48	3025.83	979425.15	53.52	52.31	51.21	50.67
12500	12200	0	0	2080.45	12.36	99.65	3025.98	979425.12	53.60	52.55	51.42	50.88
12500	12100	0	0	2080.55	12.40	99.78	3026.08	979425.08	53.90	52.72	51.59	51.05
12500	12000	0	0	2080.55	12.44	100.21	3026.08	979425.05	54.11	52.85	51.71	51.17
12500	12000	0	0	2080.55	12.44	100.21	3026.08	979425.05	54.11	52.85	51.71	51.17
12500	13500	0	0	2080.94	12.53	102.14	3024.40	979425.50	52.31	51.02	49.97	49.31
BASE # 02				2080.84	13.02		3025.34					

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 22
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SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM4

093

COVERAGE LINE 12000E FROM 12500N TO 10100N

Loop Time 2.10 Hours Drift Rate .01 Gravimeter AC 037 Operator K.LELOIR

Loop Drift .021 Mgals Time Zone 2.500 Calibration Factor: 1.048 Date 20/02/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.2	2.67	2.8
BASE # 02				2888.82	2.59		3025.34					
12500	12000	0	0	2889.68	10.02	100.00	3026.17	979425.05	54.16	52.90	51.27	51.22
12400	12000	0	0	2889.82	10.08	99.62	3026.36	979425.11	54.21	52.95	51.32	51.28
12300	12000	0	0	2890.09	10.11	99.45	3026.59	979425.17	54.27	53.01	51.39	51.41
12200	12000	0	0	2890.13	10.11	99.22	3026.64	979425.23	54.26	53.02	51.39	51.35
12100	12000	0	0	2890.15	10.10	99.24	3026.66	979425.29	54.22	52.97	51.34	51.30
12000	12000	0	0	2890.22	10.22	99.01	3026.73	979425.36	54.18	52.24	51.31	51.27
11900	12000	0	0	2890.38	10.25	98.66	3026.90	979425.42	54.20	52.96	51.35	51.31
11800	12000	0	0	2890.63	10.22	98.32	3027.16	979425.48	54.25	53.11	52.00	51.46
11700	12000	0	0	2890.77	10.35	98.29	3027.30	979425.54	54.43	53.19	52.09	51.54
11600	12000	0	0	2890.83	10.38	98.41	3027.15	979425.60	54.22	52.98	51.87	51.23
11500	12000	0	0	2890.63	10.42	98.59	3026.94	979425.67	53.99	52.76	51.64	51.10
11400	12000	0	0	2890.65	10.45	98.17	3027.17	979425.73	54.06	52.83	51.72	51.18
11300	12000	0	0	2890.76	10.50	97.93	3027.29	979425.79	54.06	52.83	51.72	51.12
11200	12000	0	0	2890.84	10.54	97.70	3027.37	979425.85	54.08	52.85	51.74	51.20
11100	12000	0	0	2890.72	10.57	97.90	3027.25	979425.92	53.99	52.66	51.55	51.02
11000	12000	0	0	2890.66	10.57	98.04	3027.19	979425.98	53.99	52.56	51.45	50.92
10900	12000	0	0	2890.62	11.03	98.37	3027.14	979426.04	53.96	52.52	51.41	50.88
10800	12000	0	0	2890.65	11.06	98.31	3027.17	979426.10	53.92	52.48	51.37	50.83
10700	12000	0	0	2890.81	11.09	97.95	3027.34	979426.16	53.90	52.42	51.36	50.83
10600	12000	0	0	2890.98	11.13	97.71	3027.52	979426.23	53.89	52.40	51.38	50.85
10500	12000	0	0	2891.14	11.16	97.62	3027.68	979426.29	53.86	52.34	51.34	50.81
10400	12000	0	0	2891.24	11.20	96.58	3027.72	979426.35	53.80	52.42	51.38	50.82
10300	12000	0	0	2891.30	11.23	96.65	3027.85	979426.41	53.92	52.50	51.41	50.98
10200	12000	0	0	2891.52	11.26	96.61	3028.15	979426.42	53.95	52.21	51.64	51.12
10100	12000	0	0	2891.56	11.30	96.61	3028.12	979426.54	53.86	52.64	51.55	51.02
10000	12000	0	0	2891.54	11.34	96.61	3028.10	979426.60	53.79	52.56	51.42	50.94
12500	12000	0	0	2889.71	11.40	100.00	3026.10	979425.05	54.17	52.92	51.28	51.24
12500	12000	0	0	2889.71	11.40	100.00	3026.10	979425.05	54.17	52.92	51.28	51.24
BASE # 02				2888.91	12.01		3025.34					

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Data computed on 06/10/81

HOLT GEOPHYSICS A CO

LOOP NUMBER 4

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM4

094

COVERAGE LINE 16000E FROM 12500N TO 15000N

Loop Time 2.22 Hours | Drift Rate -.01 | Gravimeter #G 037 | Operator K.LEECH
Loop Drift -.021 Mgals | Time Zone: 9.500 | Calibration Factor: 1.048 | Date: 22/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2888.03	13.31		3025.34					
12500	16000	0	0	2889.22	13.51	99.11	3025.75	979426.40	52.09	50.85	49.73	49.19
12600	16000	0	0	2889.12	13.55	99.06	3025.65	979426.32	52.04	50.80	49.67	49.14
12700	16000	0	0	2889.01	13.59	99.23	3025.53	979426.36	52.03	50.78	49.66	49.12
12800	16000	0	0	2888.84	14.02	99.30	3025.36	979426.22	51.93	50.68	49.55	49.01
12900	16000	0	0	2888.69	14.05	99.40	3025.20	979426.23	51.87	50.62	49.50	48.95
13000	16000	0	0	2888.36	14.08	99.05	3024.85	979426.17	51.67	50.42	49.29	48.74
13100	16000	0	0	2889.18	14.12	100.09	3024.67	979426.11	51.60	50.34	49.21	48.66
13200	16000	0	0	2888.98	14.16	100.32	3024.48	979426.03	51.52	50.26	49.13	48.58
13300	16000	0	0	2887.66	14.21	100.23	3024.12	979425.98	51.38	50.05	48.91	48.37
13400	16000	0	0	2887.32	14.25	101.14	3023.77	979425.92	51.12	49.85	48.70	48.15
13500	16000	0	0	2887.00	14.29	101.35	3023.43	979425.86	50.89	49.62	48.47	47.92
13600	16000	0	0	2886.82	14.32	101.41	3023.24	979425.80	50.78	49.50	48.36	47.80
13700	16000	0	0	2886.62	14.36	101.32	3023.04	979425.73	50.61	49.34	48.19	47.64
13800	16000	0	0	2886.49	14.40	101.17	3022.81	979425.67	50.41	49.14	48.00	47.44
13900	16000	0	0	2886.22	14.43	101.02	3022.62	979425.61	50.25	48.98	47.84	47.27
14000	16000	0	0	2885.99	14.47	101.02	3022.38	979425.55	50.07	48.80	47.66	47.11
14100	16000	0	0	2885.59	14.51	101.00	3021.95	979425.49	49.70	48.43	47.29	46.74
14200	16000	0	0	2885.26	14.56	101.31	3021.61	979425.42	49.50	48.23	47.08	46.53
14300	16000	0	0	2884.97	14.59	101.17	3021.33	979425.36	49.25	47.98	46.83	46.28
14400	16000	0	0	2884.70	15.03	100.87	3021.24	979425.39	49.15	47.88	46.74	46.19
14500	16000	0	0	2884.74	15.08	100.53	3021.07	979425.24	48.99	47.71	46.57	46.02
14600	16000	0	0	2884.58	15.12	100.34	3020.90	979425.19	48.83	47.56	46.43	45.88
14700	16000	0	0	2884.38	15.16	100.41	3020.70	979425.11	48.69	47.43	46.30	45.75
14800	16000	0	0	2884.04	15.20	100.32	3020.34	979425.05	48.52	47.13	45.99	45.45
14900	16000	0	0	2883.80	15.23	100.30	3020.09	979424.99	48.21	46.94	45.81	45.26
15000	16000	0	0	2883.53	15.27	100.32	3019.81	979424.95	47.99	46.73	45.59	45.04
12500	16000	0	0	2889.20	15.33	99.11	3025.75	979426.40	52.09	50.84	49.72	49.18
12500	16000	0	0	2892.29	15.33	99.11	3025.75	979426.40	52.09	50.84	49.72	49.18
BASE # 02				2888.01	15.44		3025.34					

Data computed on 06/10/01

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 4
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095

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM4

OVERALL LINE 16000E FROM 12500N TO 10000N

Loop Time: 1.62 Hours Drift Rate 0.00 Gravimeter SG 037 Operator K.LEECH

Loop Drift: 0.000 Mgals Time Zone 9.500 Calibration Factor: 1.040 Date: 22/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2880.76	16.16		3025.34					
12500	16000	0	0	2889.12	16.20	92.11	3025.77	979426.40	52.11	50.82	42.74	42.20
12400	16000	0	0	2887.24	16.23	92.10	3025.84	979426.54	52.12	50.82	42.75	42.21
12300	16000	0	0	2889.20	16.26	92.10	3025.80	979426.60	52.10	50.85	42.73	42.19
12200	16000	0	0	2882.20	16.29	92.13	3025.80	979426.62	51.96	50.71	42.59	42.05
12100	16000	0	0	2887.12	16.32	92.32	3025.72	979426.73	51.86	50.61	42.48	48.24
12000	16000	0	0	2882.96	16.45	92.30	3025.65	979426.77	51.73	50.48	42.36	48.01
11900	16000	0	0	2889.07	16.38	92.16	3025.66	979426.85	51.69	50.48	42.29	48.24
11800	16000	0	0	2882.11	16.41	90.06	3025.21	979426.92	51.56	50.32	42.20	48.66
11700	16000	0	0	2889.12	16.43	90.20	3025.77	979426.98	51.54	50.30	42.18	48.64
11600	16000	0	0	2882.21	16.46	90.24	3025.81	979427.04	51.51	50.22	42.15	48.62
11500	16000	0	0	2882.01	16.49	90.05	3025.60	979427.10	51.26	50.02	40.90	48.36
11400	16000	0	0	2880.22	16.52	90.26	3025.58	979427.16	51.16	49.92	40.80	48.26
11300	16000	0	0	2882.04	16.55	90.61	3025.63	979427.23	51.12	49.89	40.76	48.23
11200	16000	0	0	2882.11	16.58	90.32	3025.71	979427.29	51.08	49.84	40.73	48.19
11100	16000	0	0	2882.04	17.02	90.36	3025.63	979427.35	50.94	49.70	40.59	48.05
11000	16000	0	0	2880.75	17.06	90.46	3025.54	979427.41	50.70	49.45	40.43	47.90
10900	16000	0	0	2880.91	17.08	90.31	3025.50	979427.47	50.67	49.43	40.32	47.78
10800	16000	0	0	2880.76	17.11	90.25	3025.55	979427.54	50.61	49.41	40.30	47.78
10700	16000	0	0	2880.92	17.14	90.17	3025.51	979427.60	50.52	49.22	40.18	47.64
10600	16000	0	0	2880.75	17.17	90.13	3025.54	979427.66	50.48	49.25	40.14	47.61
10500	16000	0	0	2880.90	17.21	90.18	3025.49	979427.72	50.38	49.14	40.03	47.50
10400	16000	0	0	2880.85	17.25	90.07	3025.43	979427.77	50.24	49.01	47.90	47.37
10300	16000	0	0	2880.85	17.28	92.90	3025.43	979427.85	50.16	48.93	47.82	47.20
10200	16000	0	0	2880.82	17.31	92.93	3025.48	979427.91	50.13	48.82	47.79	47.25
10100	16000	0	0	2880.82	17.36	92.86	3025.46	979427.97	50.03	48.80	47.69	47.16
10000	16000	0	0	2880.82	17.41	92.90	3025.46	979428.03	49.97	48.74	47.64	47.10
12500	16000	0	0	2889.20	17.52	92.11	3025.80	979426.40	52.14	50.90	42.70	42.24
12500	16000	0	0	2882.20	17.52	92.11	3025.80	979426.40	52.14	50.90	42.70	49.24
BASE # 02				2880.76	17.56		3025.34					

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Data computed on 06/10/01

GOLF GEOPHYSICS & CO

LOOP NUMBER 5

096

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM4

COVERAGE LINE 13000E FROM 12500N TO 15000N

Loop Time: 1.20 Hours | Drift Rate: -.02 | Gravimeter #G 037 | Operator K.LEECH
Loop Drift: -.031 Mgals | Time Zone: 9.500 | Calibration Factor: 1.048 | Date: 26/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2890.01	15.56		3025.34					
12500	12000	0	0	2889.63	15.46	100.08	3026.17	979425.05	54.16	52.91	51.77	51.23
12600	12000	0	0	2889.51	15.47	100.17	3026.05	979424.98	54.12	52.86	51.73	51.18
12700	12000	0	0	2889.52	15.53	100.19	3026.06	979424.92	54.20	52.94	51.81	51.26
12800	12000	0	0	2889.38	15.56	100.21	3025.93	979424.86	54.14	52.80	51.75	51.20
12900	12000	0	0	2889.35	16.00	100.28	3025.88	979424.80	54.17	52.91	51.77	51.23
13000	12000	0	0	2889.24	16.03	100.11	3025.77	979424.73	54.08	52.82	51.69	51.14
13100	12000	0	0	2889.13	16.06	100.23	3025.65	979424.67	54.08	52.81	51.68	51.13
13200	12000	0	0	2889.05	16.10	100.31	3025.57	979424.61	54.06	52.80	51.66	51.11
13300	12000	0	0	2889.01	16.13	100.35	3025.53	979424.56	54.08	52.82	51.68	51.14
13400	12000	0	0	2888.76	16.18	100.25	3025.27	979424.42	53.98	52.62	51.48	50.94
13500	12000	0	0	2888.65	16.22	100.42	3025.15	979424.42	53.85	52.53	51.45	50.90
13600	12000	0	0	2888.58	16.25	100.46	3025.09	979424.36	53.82	52.56	51.42	50.88
13700	12000	0	0	2888.50	16.28	100.45	3024.79	979424.30	53.61	52.35	51.21	50.67
13800	12000	0	0	2888.18	16.31	100.61	3024.66	979424.21	53.58	52.32	51.18	50.63
13900	12000	0	0	2887.97	16.34	100.24	3024.44	979424.18	53.50	52.23	51.09	50.54
14000	12000	0	0	2887.87	16.37	100.26	3024.34	979424.11	53.44	52.17	51.03	50.48
14100	12000	0	0	2887.83	16.41	100.62	3024.30	979424.05	53.41	52.14	51.01	50.46
14200	12000	0	0	2887.67	16.44	100.42	3024.13	979423.99	53.26	52.00	50.86	50.31
14300	12000	0	0	2887.56	16.47	100.32	3024.01	979423.93	53.19	51.93	50.79	50.25
14400	12000	0	0	2887.41	16.50	100.21	3023.76	979423.87	52.92	51.71	50.58	50.03
14500	12000	0	0	2887.13	16.52	100.41	3023.57	979423.80	52.80	51.62	50.48	49.94
14600	12000	0	0	2886.93	16.55	100.31	3023.36	979423.74	52.72	51.46	50.32	49.78
14700	12000	0	0	2886.62	16.58	100.40	3023.09	979423.68	52.52	51.26	50.13	49.59
14800	12000	0	0	2886.52	17.03	100.31	3022.93	979423.62	52.41	51.15	50.01	49.48
14900	12000	0	0	2886.44	17.06	100.24	3022.85	979423.56	52.37	51.11	49.99	49.45
15000	12000	0	0	2886.34	17.10	100.25	3022.75	979423.49	52.34	51.07	49.94	49.39
12500	12000	0	0	2889.60	17.21	100.08	3026.17	979425.05	54.16	52.90	51.77	51.22
12500	12000	0	0	2889.60	17.21	100.08	3026.17	979425.05	54.16	52.79	51.77	51.22
BASE # 02				2888.01	17.30		3025.34					

Data computed on 06/10/01

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 6
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097

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM4

COVERAGE: LINE 12500N FROM 15000 TO 16000E

Loop Time: .52 Hours Drift Rate: .00 Gravimeter #G 057 Operator K.LEECH
Loop Drift: -.042 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 02/08/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2888.92	11.19		3025.34					
12500	15000	0	0	2888.82	11.40	100.00	3025.34	979426.12	52.24	50.98	49.85	47.30
12500	15200	0	0	2889.08	11.41	99.82	3025.54	979426.12	52.34	51.09	47.96	49.41
12500	15400	0	0	2889.26	11.48	99.72	3025.74	979426.26	52.43	51.18	50.05	49.51
12500	15600	0	0	2889.22	11.52	99.75	3025.70	979426.34	52.33	51.08	49.95	49.40
12500	15800	0	0	2889.32	11.55	99.64	3025.81	979426.41	52.30	51.05	49.92	49.38
12500	16000	0	0	2889.29	12.01	99.15	3025.72	979426.40	52.19	50.82	49.77	49.23
12500	16000	0	0	2889.29	12.01	99.15	3025.79	979426.40	52.14	50.89	49.77	49.23
12500	15200	0	0	2889.05	12.22	99.82	3025.54	979426.12	52.34	51.09	49.96	49.41
BASE # 02				2888.05	12.11		3025.34					

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Data computed on 06/10/81

********** DATA REDUCTION PARAMETERS **********

CLIENT THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM2

098

Time Zone is 9.5

Grid Rotation Bearing is 45 degrees EAST

The Known Point of 31.125 degrees Latitude is located
at Line Number 13000 and Station Number 10000

The Base Station Observed Gravity Values are:

BASE #	OBSERVED GRAVITY (mgals)
1	3024.87
2	3024.87

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Data Computed on 06/10/81

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******** CATALOG OF RAW FIELD DATA ********

099

LOOP# 1 LINE 13000N FROM 12000E TO 14000E

LOOP# 2 LINE 13000N FROM 12000E TO 10000E

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Data Computed on 06/10/81

GULF GEOPHYSICS & CO

LOOP NUMBER 3.

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA 100

LOCATION NULLARBOR PMZ

COVERAGE: LINE 13000N FROM 12000E TO 14000E

Loop Time: 1.93 Hours Drift Rate: -.04 Gravimeter #G 037 Operator K.LEECH
Loop Drift: -.073 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 23/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2000.52	11.27		3024.87					
13000	12000	0	0	2000.52	11.27	100.00	3024.87	979427.49	50.39	49.13	48.00	47.48
13000	12100	0	0	2000.61	11.31	99.81	3024.99	979427.55	50.40	49.14	48.01	47.47
13000	12200	0	0	2000.74	11.39	99.34	3025.11	979427.60	50.38	49.13	48.01	47.47
13000	12300	0	0	2000.92	11.43	99.12	3025.30	979427.65	50.42	49.23	48.11	47.57
13000	12400	0	0	2002.10	11.42	98.04	3025.49	979427.70	50.38	49.14	48.04	47.50
13000	12500	0	0	2002.34	11.54	97.77	3025.75	979427.75	50.52	49.29	48.19	47.65
13000	12600	0	0	2002.33	11.52	97.43	3025.74	979427.80	50.39	49.16	48.06	47.53
13000	12700	0	0	2002.51	12.11	96.87	3025.93	979427.85	50.41	49.20	48.10	47.57
13000	12800	0	0	2002.61	12.15	96.50	3026.04	979427.90	50.39	49.17	48.08	47.55
13000	12900	0	0	2002.75	12.20	96.16	3026.19	979427.95	50.41	49.20	48.11	47.58
13000	13000	0	0	2002.85	12.22	95.98	3026.30	979428.00	50.42	49.22	48.13	47.61
13000	13100	0	0	2002.96	12.26	95.73	3026.42	979428.05	50.40	49.22	48.19	47.67
13000	13200	0	0	2003.03	12.30	95.56	3026.49	979428.10	50.51	49.31	48.22	47.70
13000	13300	0	0	2003.04	12.33	95.71	3026.50	979428.15	50.46	49.26	48.17	47.65
13000	13400	0	0	2003.09	12.37	95.79	3026.56	979428.21	50.44	49.24	48.15	47.63
13000	13500	0	0	2003.20	12.40	95.85	3026.68	979428.26	50.52	49.31	48.23	47.71
13000	13600	0	0	2003.31	12.46	95.85	3026.79	979428.31	50.59	49.38	48.30	47.78
13000	13700	0	0	2003.44	12.51	95.82	3026.93	979428.36	50.67	49.46	48.38	47.86
13000	13800	0	0	2003.60	12.55	95.75	3027.10	979428.41	50.77	49.57	48.49	47.96
13000	13900	0	0	2003.73	13.00	95.77	3027.25	979428.46	50.87	49.67	48.58	48.06
13000	14000	0	0	2003.78	13.03	95.74	3027.30	979428.51	50.87	49.66	48.58	48.06
13000	12900	0	0	2002.71	13.15	96.16	3026.10	979427.95	50.40	49.19	48.10	47.58
BASE # 02				2000.45	13.23		3024.87					

Data computed on 06/10/01

SOLO GEOPHYSICS & CO

LOOP NUMBER 12

101

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION KULLARBUK-PM7

COVERAGE LINE 13000N FROM 12000E TO 10000E

Loop time 1.23 Hours Drift Rate .05 Gravimeter NG 032 Operator K.LEECH

Loop Drift .063 Mgals Time Zone: 9.500 Calibration Factor: 1.040 Date: 05/08/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
	PASS # 02			2089.32	12.10		3024.87					
13000	12000	0	0	2089.32	12.10	100.00	3024.87	979427.49	50.39	49.13	48.00	47.46
13000	11900	0	0	2089.11	12.23	100.04	3024.87	979427.44	50.47	49.21	48.08	47.53
13000	11800	0	0	2089.56	12.25	100.03	3025.04	979427.39	50.67	49.41	48.28	47.74
13000	11700	0	0	2088.22	12.28	100.23	3024.76	979427.31	50.48	49.22	48.09	47.54
13000	11600	0	0	2088.24	12.31	100.14	3024.70	979427.29	50.46	49.20	48.07	47.52
13000	11500	0	0	2088.25	12.34	100.04	3024.71	979427.23	50.42	49.24	48.10	47.56
13000	11400	0	0	2089.13	12.36	99.95	3024.50	979427.19	50.40	49.14	48.01	47.47
13000	11300	0	0	2088.00	12.42	99.85	3024.44	979427.14	50.24	49.00	47.88	47.32
13000	11200	0	0	2087.92	12.42	99.81	3024.36	979427.09	50.20	48.95	47.83	47.28
13000	11100	0	0	2087.92	12.45	99.82	3024.43	979427.01	50.26	49.01	47.89	47.34
13000	11000	0	0	2087.97	12.48	99.76	3024.40	979426.99	50.29	49.04	47.92	47.38
13000	10900	0	0	2087.77	12.51	99.71	3024.12	979426.94	50.15	48.90	47.77	47.23
13000	10800	0	0	2087.78	12.54	99.76	3024.12	979426.89	50.13	48.88	47.75	47.21
13000	10700	0	0	2087.67	12.58	99.82	3024.10	979426.81	50.11	48.87	47.74	47.20
13000	10600	0	0	2087.67	20.00	99.86	3024.08	979426.78	50.11	48.86	47.74	47.20
13000	10500	0	0	2087.64	20.03	99.92	3024.05	979426.74	50.11	48.86	47.74	47.20
13000	10400	0	0	2087.48	20.07	99.85	3023.89	979426.63	50.01	48.77	47.65	47.11
13000	10300	0	0	2087.41	20.10	99.93	3023.80	979426.58	50.00	48.76	47.64	47.10
13000	10200	0	0	2087.37	20.13	99.87	3023.75	979426.53	49.99	48.75	47.63	47.09
13000	10100	0	0	2087.31	20.17	99.92	3024.71	979426.48	50.03	48.78	47.66	47.12
13000	10000	0	0	2088.00	20.25	99.85	3024.40	979426.99	50.29	49.04	47.92	47.38
	PASS # 02			2088.45	20.32		3024.87					

Data computed on 06/10/81

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 12
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102

SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM3

COVERAGE: LINE 16000N FROM 12500E TO 14500E

Loop Time: 1.67 Hours Drift Rate: -.03 Gravimeter RU 037 Operator K.LEECH

Loop Drift: -.052 Mgals Time Zone: 9.500 Calibration Factor 1.048 Date: 25/07/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2901.54	13.05		3038.60					
16000	12500	0	0	2901.54	13.05	100.00	3038.60	979435.02	66.58	65.32	64.19	63.65
16000	12600	0	0	2901.23	13.10	100.14	3038.28	979435.02	66.29	65.03	63.89	63.35
16000	12700	0	0	2901.02	13.13	99.57	3038.11	979435.02	66.00	64.75	63.62	63.08
16000	12800	0	0	2900.77	13.18	99.10	3038.01	979435.02	65.81	64.56	63.44	62.90
16000	12900	0	0	2900.61	13.24	99.02	3037.85	979435.02	65.61	64.36	63.24	62.70
16000	13000	0	0	2900.54	13.28	98.96	3037.55	979435.02	65.30	64.06	62.94	62.41
16000	13100	0	0	2900.35	13.32	98.99	3037.37	979435.02	65.12	63.88	62.76	62.22
16000	13200	0	0	2899.76	13.35	99.00	3036.75	979435.02	64.51	63.27	62.15	61.61
16000	13300	0	0	2899.49	13.39	99.04	3036.47	979435.02	64.24	62.99	61.87	61.33
16000	13400	0	0	2899.10	13.43	98.92	3036.06	979435.02	63.81	62.56	61.44	60.90
16000	13500	0	0	2898.91	13.47	98.80	3035.87	979435.02	63.59	62.34	61.22	60.68
16000	13600	0	0	2898.68	13.51	98.75	3035.63	979435.02	63.33	62.09	60.97	60.43
16000	13700	0	0	2898.45	13.54	98.78	3035.39	979435.02	63.03	61.80	60.68	60.14
16000	13800	0	0	2898.21	13.58	98.84	3035.14	979435.02	62.75	61.52	60.40	59.87
16000	13900	0	0	2897.80	14.02	98.84	3034.71	979435.02	62.33	61.09	59.98	59.44
16000	14000	0	0	2897.61	14.07	98.89	3034.52	979435.02	62.14	60.90	59.79	59.25
16000	14100	0	0	2897.50	14.11	98.93	3034.40	979435.02	62.04	60.80	59.68	59.15
16000	14200	0	0	2897.22	14.15	98.92	3034.11	979435.02	61.74	60.51	59.39	58.86
16000	14300	0	0	2896.99	14.20	98.90	3033.87	979435.02	61.50	60.26	59.15	58.61
16000	14400	0	0	2896.72	14.25	98.92	3033.59	979435.02	61.24	60.00	58.88	58.35
16000	14500	0	0	2896.51	14.30	98.89	3033.38	979435.02	61.00	59.76	58.65	58.11
16000	12500	0	0	2901.54	13.05	100.00	3038.60	979435.02	66.58	65.32	64.19	63.65
16000	13500	0	0	2898.89	14.38	98.80	3035.87	979435.02	63.59	62.35	61.23	60.69
BASE 1 02				2901.42	14.45		3038.60					

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Data computed on 06/10/81

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 3
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SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM3

103

COVERAGE LINE 14000N FROM 12500E TO 10500E

Loop Time: 1.70 Hours Drift Rate: -.02 Gravimeter #G 037 Operator K.LEECH
Loop Drift: -.042 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 25/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2901.47	14.45		3038.60					
14000	12500	0	0	2904.74	14.55	98.02	3042.01	979436.46	68.29	67.04	65.93	65.39
14000	12400	0	0	2904.86	14.58	98.22	3042.14	979436.46	68.41	67.17	66.07	65.53
14000	12300	0	0	2904.82	15.01	98.22	3042.09	979436.46	68.41	67.17	66.05	65.51
14000	12200	0	0	2904.98	15.05	98.22	3042.26	979436.46	68.58	67.34	66.22	65.68
14000	12100	0	0	2904.96	15.07	98.23	3042.24	979436.46	68.55	67.30	66.18	65.64
14000	12000	0	0	2904.83	15.12	98.22	3042.11	979436.46	68.43	67.18	66.06	65.52
14000	11900	0	0	2904.49	15.16	99.23	3041.76	979436.46	68.20	67.02	65.89	65.35
14000	11800	0	0	2904.16	15.23	100.06	3041.41	979436.46	68.14	66.87	65.73	65.18
14000	11700	0	0	2903.88	15.25	101.23	3041.12	979436.46	68.04	66.76	65.61	65.06
14000	11600	0	0	2903.86	15.27	101.35	3041.10	979436.46	68.05	66.77	65.61	65.06
14000	11500	0	0	2903.72	15.30	101.01	3040.95	979436.46	67.89	66.61	65.46	64.91
14000	11400	0	0	2903.62	15.32	101.06	3040.22	979436.46	67.87	66.57	65.44	64.88
14000	11300	0	0	2903.53	15.36	102.02	3040.76	979436.46	67.74	66.46	65.31	64.75
14000	11200	0	0	2903.25	15.42	102.30	3040.47	979436.46	67.53	66.24	65.09	64.53
14000	11100	0	0	2903.10	15.43	102.35	3040.31	979436.46	67.37	66.08	64.92	64.37
14000	11000	0	0	2902.95	15.47	102.15	3040.15	979436.46	67.17	65.88	64.73	64.17
14000	10900	0	0	2902.69	15.50	102.11	3039.88	979436.46	66.89	65.60	64.45	63.89
14000	10800	0	0	2902.62	15.54	101.55	3039.86	979436.46	66.75	65.47	64.32	63.77
14000	10700	0	0	2902.44	15.57	101.22	3039.62	979436.46	66.43	65.16	64.01	63.46
14000	10600	0	0	2902.20	16.00	101.18	3039.46	979436.46	66.26	64.99	63.84	63.29
14000	10500	0	0	2902.10	16.04	101.26	3039.27	979436.46	66.09	64.82	63.67	63.12
14000	12500	0	0	2904.65	16.12	98.23	3041.95	979436.46	68.25	67.01	65.89	65.35
14000	11500	0	0	2903.70	16.11	101.01	3040.95	979436.46	67.89	66.61	65.46	64.90
14000	10500	0	0	2904.65	16.12	98.23	3041.95	979436.46	68.25	67.01	65.89	65.35
BASE # 02				2901.45	16.27		3038.60					

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Data computed on 06/10/01

GOLD GEOPHYSICS & CO

****
LOOP NUMBER 4
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SURVEYED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM3

104

COVERAGE LINE 14000N FROM 12500E TO 15000E

Loop Time 1.90 Hours Drift Rate .02 Gravimeter SG 037 Operator K.LEECH
Loop Drift .042 Mgals Time Zone 9.500 Calibration Factor 1.048 Date 26/07/01

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2901.46	2.30		3038.60					
14000	12500	0	0	2904.68	9.37	90.93	3041.97	979436.46	68.27	67.03	65.91	65.37
14000	12600	0	0	2904.56	9.43	90.93	3041.84	979436.46	68.06	66.82	65.70	65.17
14000	12700	0	0	2904.39	9.47	90.11	3041.66	979436.46	67.79	66.55	65.44	64.91
14000	12800	0	0	2904.44	9.51	92.96	3041.71	979436.46	67.90	66.66	65.44	64.91
14000	12900	0	0	2904.17	9.54	92.91	3041.43	979436.46	67.51	66.20	65.17	64.64
14000	13000	0	0	2903.98	9.57	92.91	3041.23	979436.46	67.31	66.08	64.92	64.14
14000	13100	0	0	2903.72	10.00	92.83	3040.96	979436.46	67.00	65.79	64.68	64.15
14000	13200	0	0	2903.61	10.04	92.78	3040.84	979436.46	66.87	65.66	64.55	64.02
14000	13300	0	0	2903.19	10.06	92.72	3040.40	979436.46	66.45	65.22	64.11	63.58
14000	13400	0	0	2902.80	10.09	92.72	3040.02	979436.46	66.04	64.81	63.70	63.17
14000	13500	0	0	2902.62	10.15	92.84	3039.84	979436.46	65.90	64.62	63.57	63.03
14000	13600	0	0	2902.02	10.18	92.81	3039.22	979436.46	65.28	64.05	62.94	62.41
14000	13700	0	0	2901.66	10.22	92.76	3038.79	979436.46	64.88	63.65	62.54	62.01
14000	13800	0	0	2901.26	10.25	90.33	3038.37	979436.46	64.54	63.30	62.19	61.66
14000	13900	0	0	2900.78	10.29	90.57	3037.87	979436.46	64.09	62.85	61.73	61.20
14000	14000	0	0	2900.40	10.33	90.24	3037.47	979436.46	63.77	62.53	61.41	60.87
14000	14100	0	0	2900.13	10.36	90.36	3037.18	979436.46	63.56	62.12	61.01	60.47
14000	14200	0	0	2899.85	10.41	90.41	3036.89	979436.46	63.08	61.84	60.73	60.19
14000	14300	0	0	2899.52	10.46	90.42	3036.59	979436.46	62.76	61.52	60.41	59.88
14000	14400	0	0	2899.22	10.48	90.11	3036.30	979436.46	62.49	61.25	60.14	59.60
14000	14500	0	0	2898.93	10.52	90.00	3035.98	979436.46	62.02	60.79	59.68	59.14
14000	14600	0	0	2898.63	10.55	90.21	3035.60	979436.46	61.90	60.66	59.54	59.00
14000	14700	0	0	2898.31	10.58	89.85	3035.27	979436.46	61.60	60.35	59.23	58.69
14000	14800	0	0	2898.05	11.02	92.26	3034.99	979436.46	61.37	60.12	59.00	58.46
14000	14900	0	0	2897.78	11.05	99.44	3034.71	979436.46	61.13	59.88	58.75	58.21
14000	15000	0	0	2897.49	11.09	92.44	3034.40	979436.46	60.82	59.57	58.44	57.90
14000	12500	0	0	2904.73	11.12	90.93	3041.99	979436.46	68.29	67.05	65.93	65.39
14000	12500	0	0	2904.23	11.17	90.23	3041.79	979436.46	68.20	67.05	65.93	65.39
BASE # 02				2901.50	11.24		3038.60					

****

Data computed on 06/10/01

SOLO GEOPHYSICS & CO

****
LOOP NUMBER 5
****

105

CONDUCTED FOR THE SHELL COMPANY OF AUSTRALIA

LOCATION NULLARBOR PM3

COVERAGE LINE 12500E FROM 16000N TO 14000N

Loop Time: 85 Hours Drift Rate: 0.00 Gravimeter #C 057 Operator K.LEECH
Loop Drift: 0.000 Mgals Time Zone: 9.500 Calibration Factor: 1.048 Date: 26/07/81

GRID NORTH	GRID EAST	MERCATOR NORTHING	MERCATOR EASTING	METER READING	TIME	ELEVATION (metres)	OBSERVED GRAVITY	THEORETICAL GRAVITY	BOUGUER GRAVITY (gms/cc) 2.1	2.4	2.67	2.8
BASE # 02				2901.50	11.24		3030.60					
16000	12500	0	0	2901.50	11.24	100.00	3030.60	979435.02	66.50	65.32	64.19	63.65
15800	12500	0	0	2901.11	11.34	101.07	3030.19	979435.16	66.27	65.00	63.85	63.30
15600	12500	0	0	2901.00	11.38	101.46	3030.91	979435.31	66.93	65.65	64.50	63.95
15400	12500	0	0	2901.07	11.41	101.25	3030.99	979435.45	66.27	65.60	64.53	63.97
15200	12500	0	0	2902.20	11.44	102.23	3032.42	979435.59	67.31	66.03	64.87	64.31
15000	12500	0	0	2902.25	11.47	103.01	3032.59	979435.74	67.41	66.01	64.85	64.29
14800	12500	0	0	2902.64	11.51	102.63	3039.79	979435.88	67.42	66.20	65.04	64.40
14600	12500	0	0	2903.23	11.54	102.33	3040.41	979436.03	67.29	66.61	65.45	64.90
14400	12500	0	0	2904.00	11.57	99.65	3041.22	979436.17	67.92	66.67	65.55	65.01
14200	12500	0	0	2904.54	12.01	98.67	3041.78	979436.31	68.18	66.94	65.82	65.28
14000	12500	0	0	2904.71	12.05	98.93	3041.96	979436.46	68.27	67.02	65.90	65.36
14000	12500	0	0	2904.71	12.05	98.93	3041.96	979436.46	68.27	67.02	65.90	65.36
16000	12500	0	0	2901.50	11.24	100.00	3030.60	979435.02	66.50	65.32	64.19	63.65
15000	12500	0	0	2902.25	12.11	103.01	3032.32	979435.73	67.31	66.01	64.85	64.29
BASE # 02				2901.50	12.15		3030.60					

****

Data computed on 05/10/81

SULF GEOPHYSICS & CO

106

********** DATA REDUCTION PARAMETERS **********

CLIENT: THE SHELL COMPANY OF AUSTRALIA

LOCATION: NULLARBOR PM3

Time Zone is P.S

Grid Rotation Bearing is 0 degrees EAST

The Known Point of 31.25 degrees Latitude is located
at Line Number 14000 and Station Number 12500

The Base Station Observed Gravity Values are:

BASE #	OBSERVED GRAVITY (mgals)
1	3038.6
2	3038.6

****

Data Computed on 06/10/81

SOLAR GEOPHYSICS & CO

107

****

******** CATALOG OF RAW FIELD DATA ********

LOOP# 1 LINE 16000N FROM 12500E TO 10100E

LOOP# 2 LINE 16000N FROM 12500E TO 14500E

LOOP# 3 LINE 14000N FROM 12500E TO 10500E

LOOP# 4 LINE 14000N FROM 12500E TO 15000E

LOOP# 5 LINE 12500E FROM 16000N TO 14000N

****

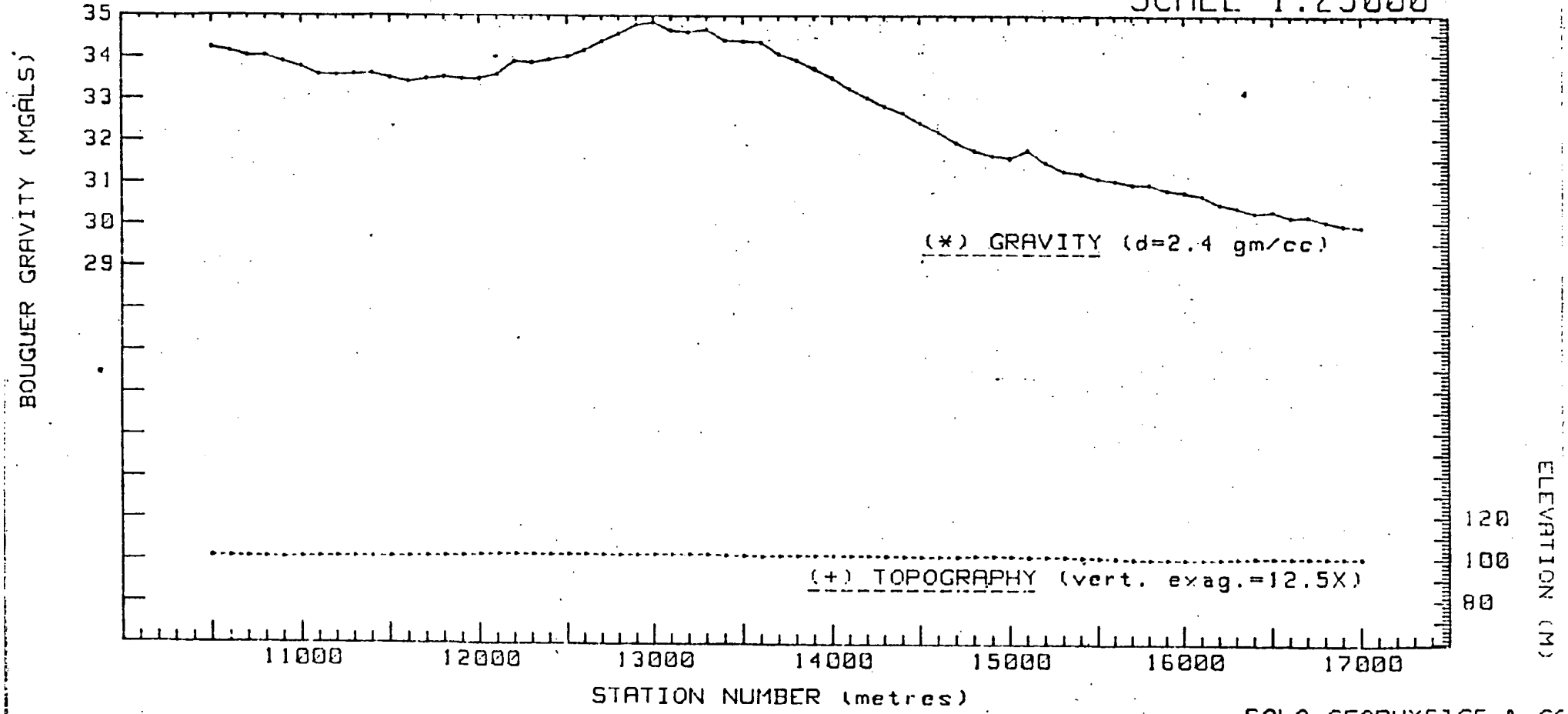
Data Computed on 06/10/81

CLIENT: THE SHELL COMPANY OF AUSTRALIA

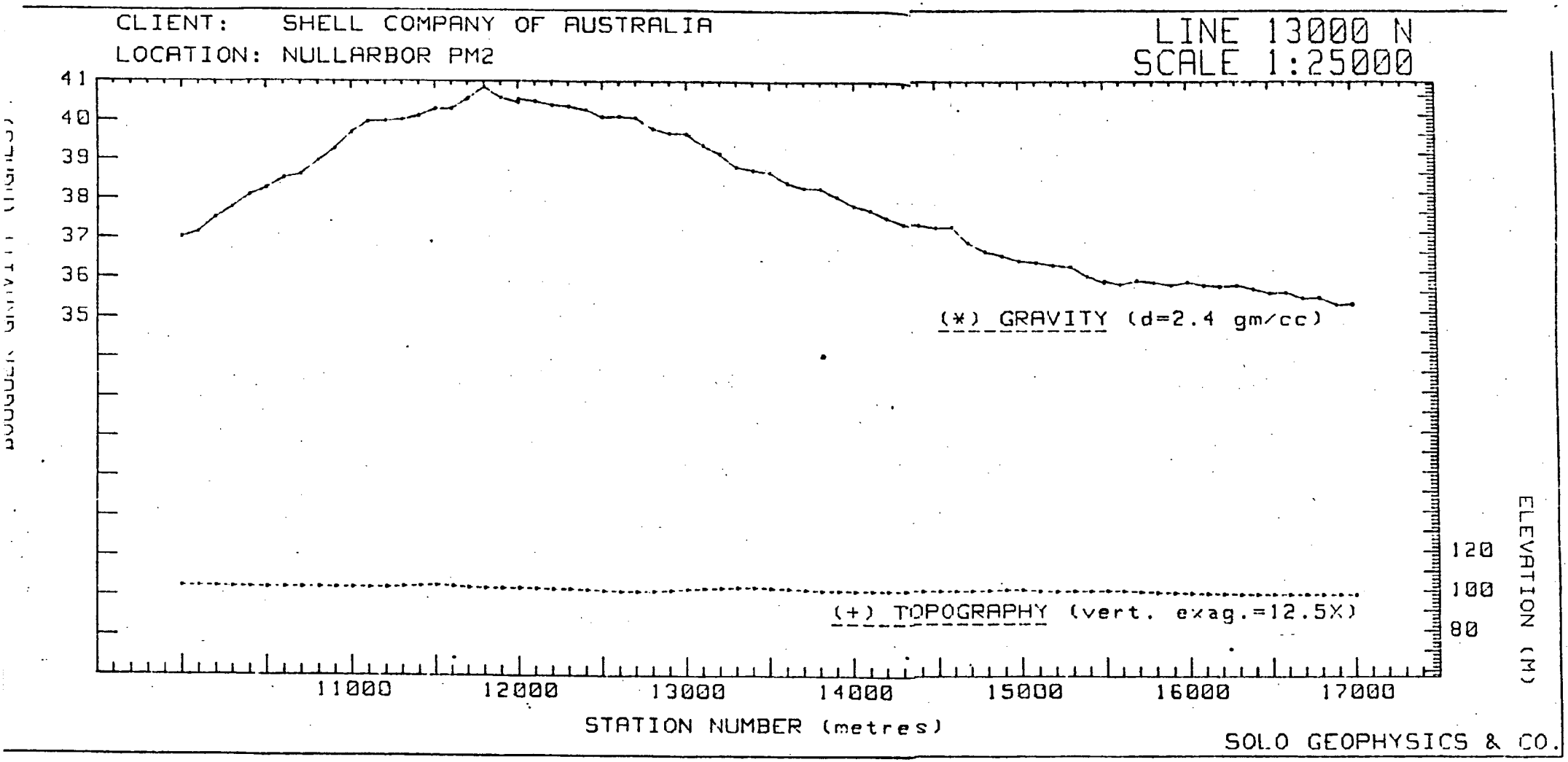
LOCATION: NULLARBOR CM4

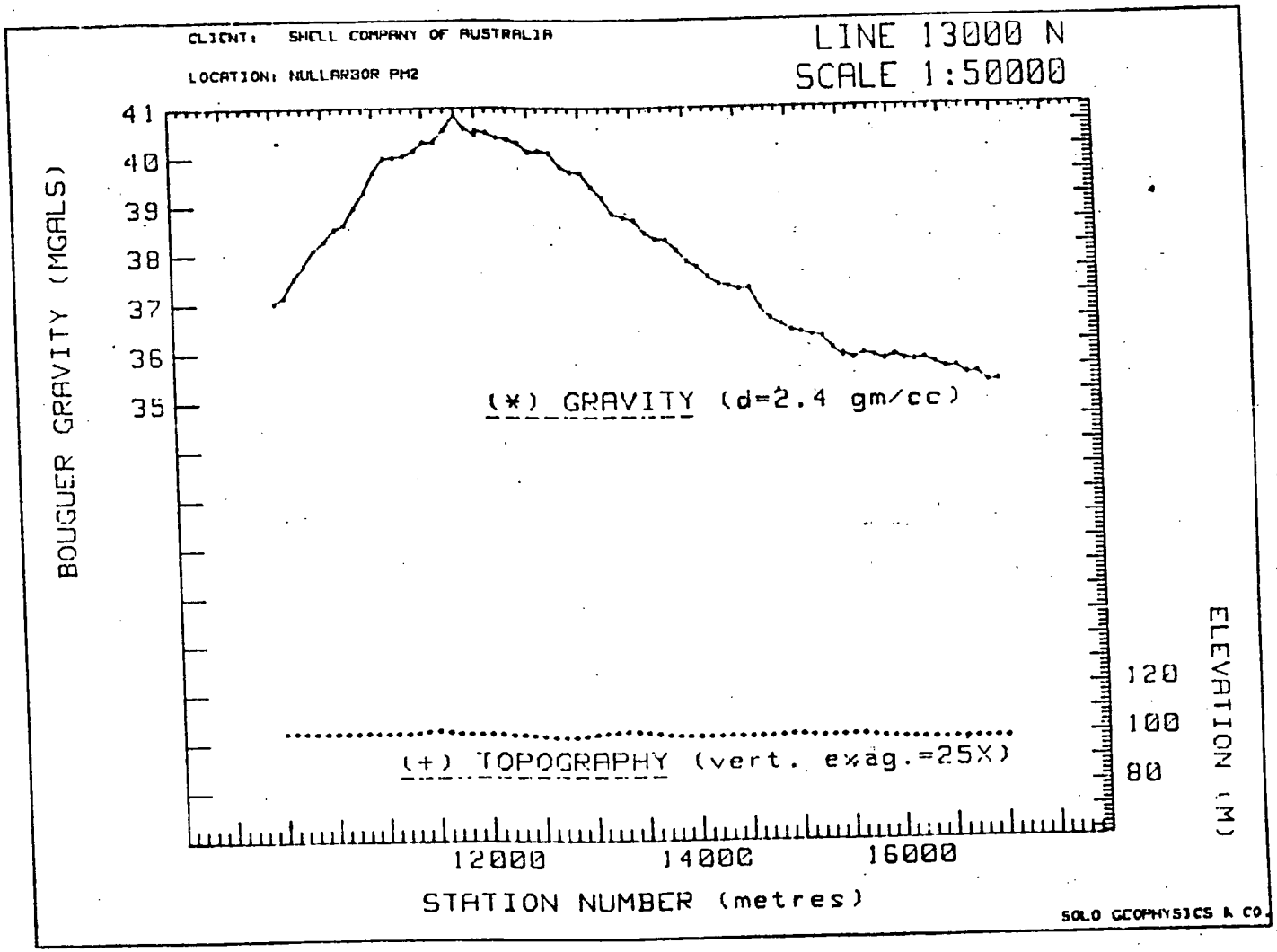
LINE 13000 N

SCALE 1:25000



SOLO GEOPHYSICS & CC

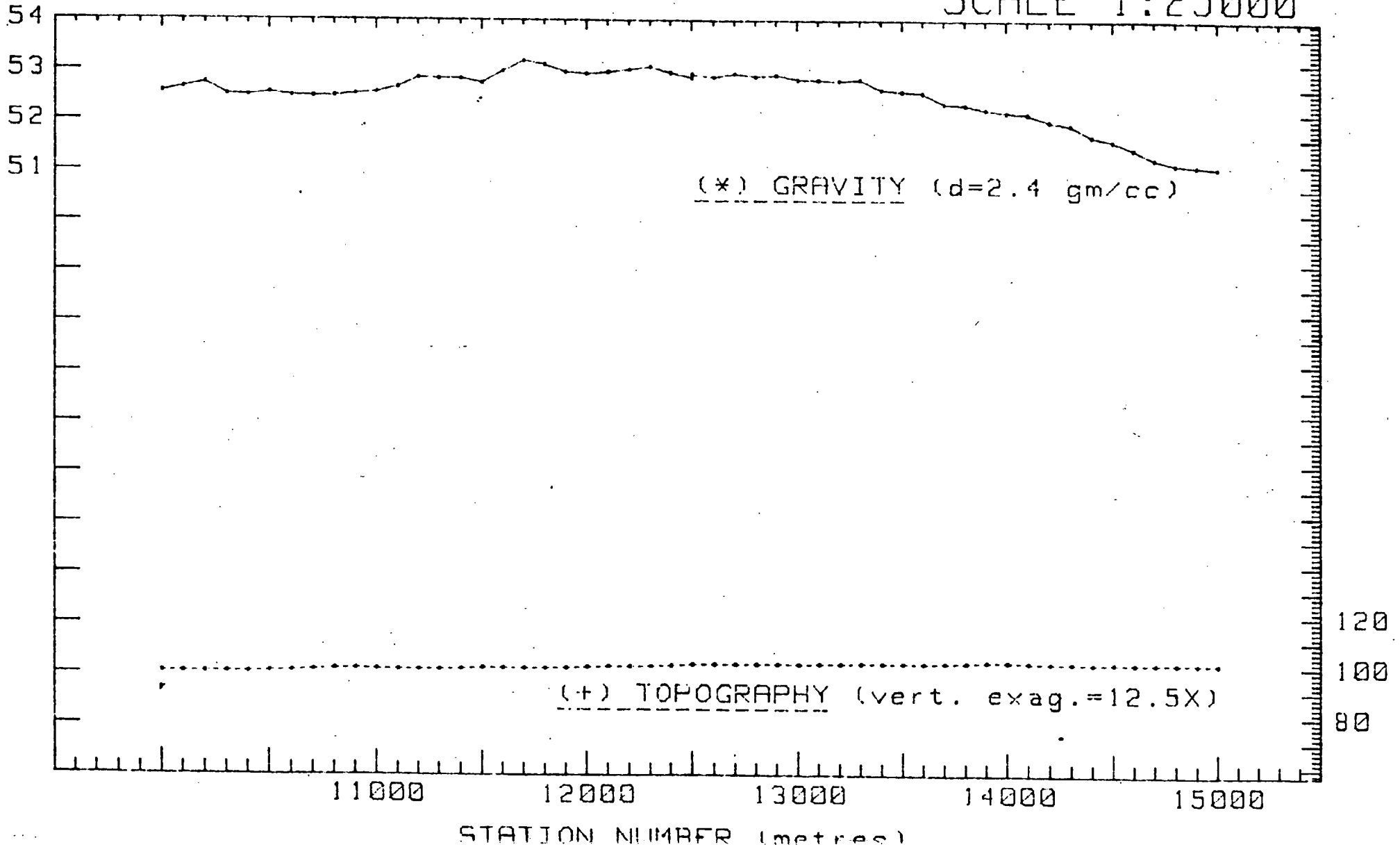

CLIENT: SHELL COMPANY OF AUSTRALIA
LOCATION: NULLARBOR PM2
LINE 13000 N
SCALE 1:25000
41
40
39
38
37
36
35
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
ELEVATION (M)
11000
12000
13000
14000
15000
16000
17000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

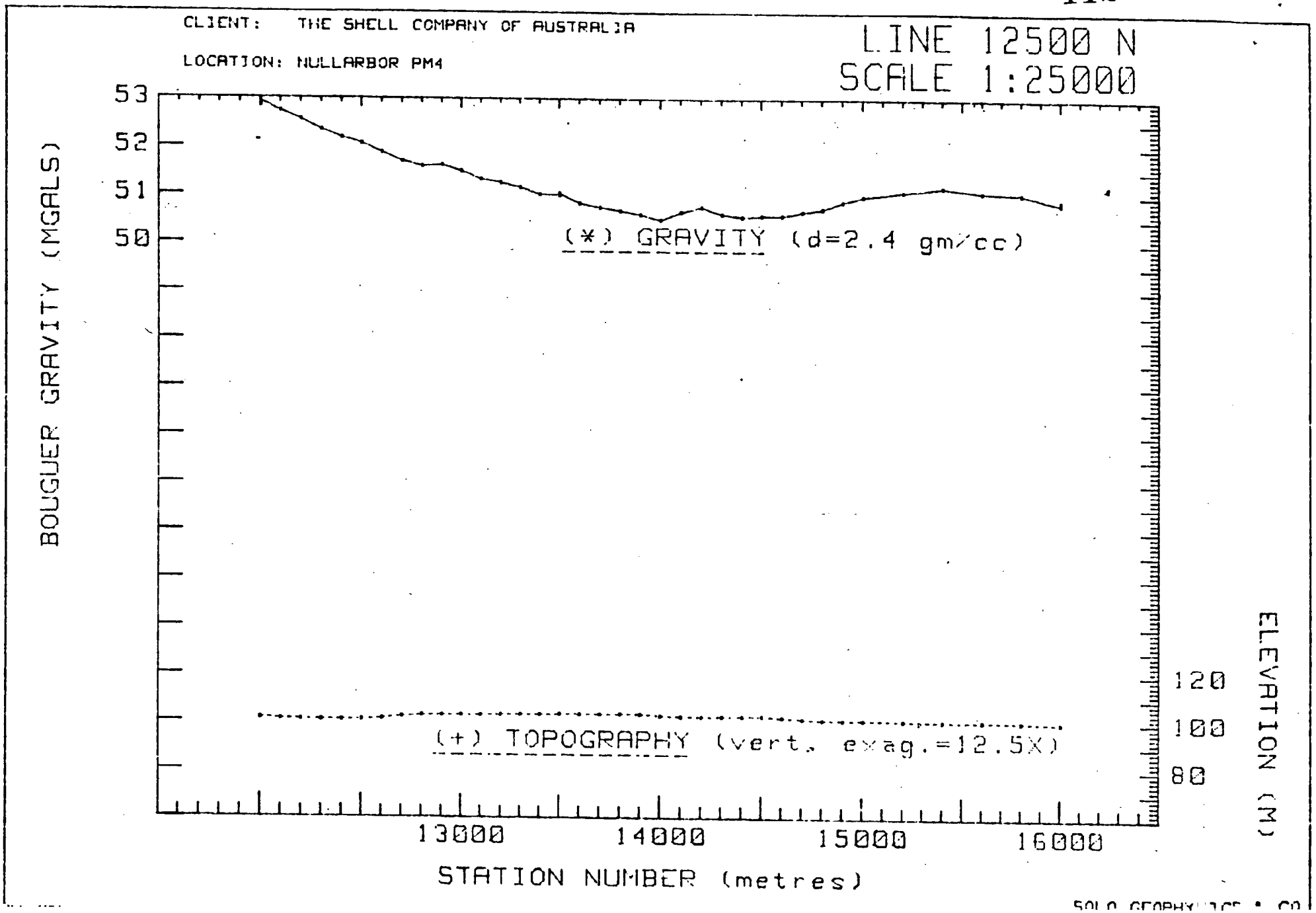

CLIENT: SHELL COMPANY OF AUSTRALIA
LOCATION: NULLARBOR PM2
LINE 13000 N
SCALE 1:50000
BOUGUER GRAVITY (MGALS)
41
40
39
38
37
36
35
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=25X)
120
100
80
ELEVATION (M)
12000
14000
16000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

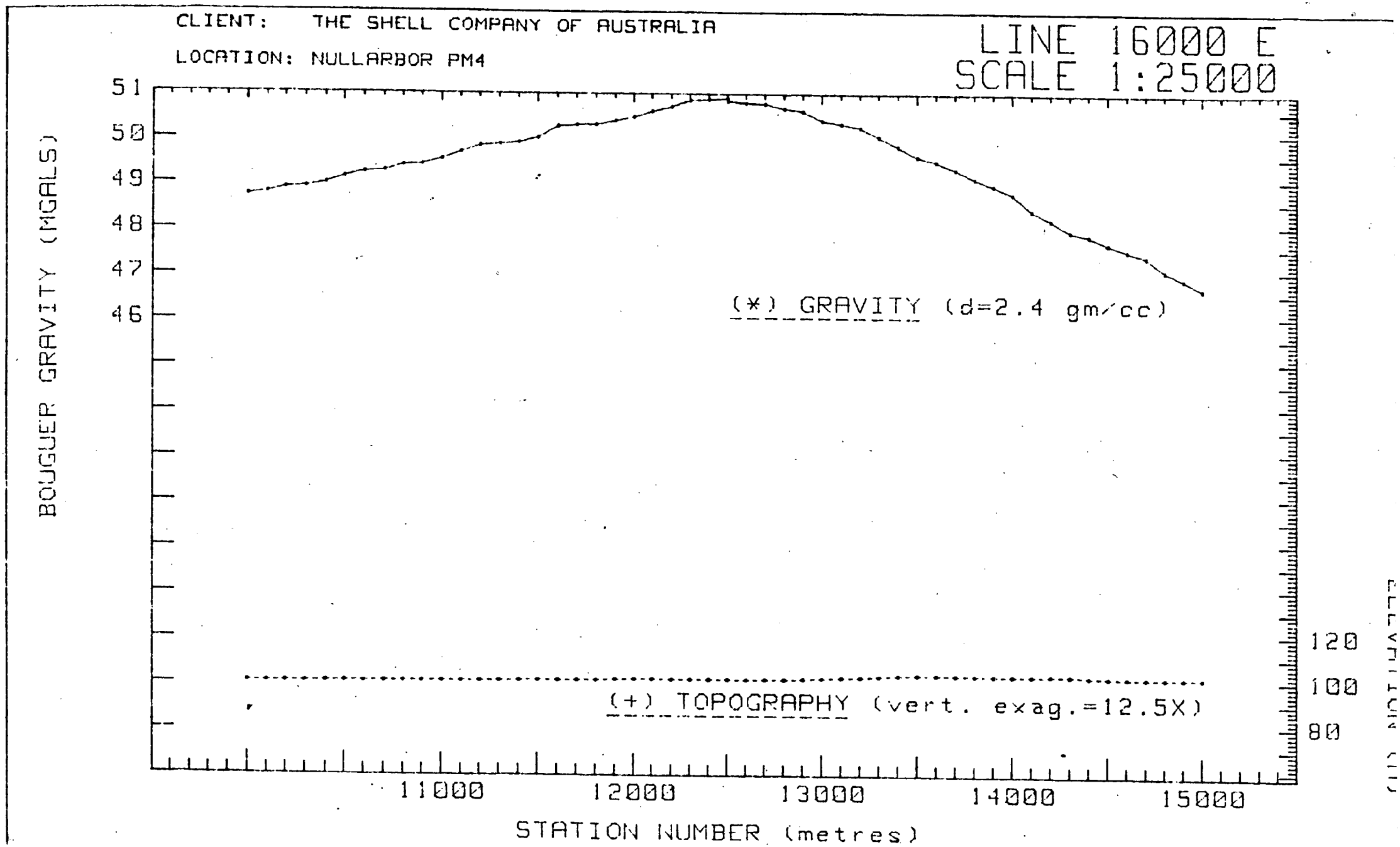
CLIENT: THE SHELL COMPANY OF AUSTRALIA

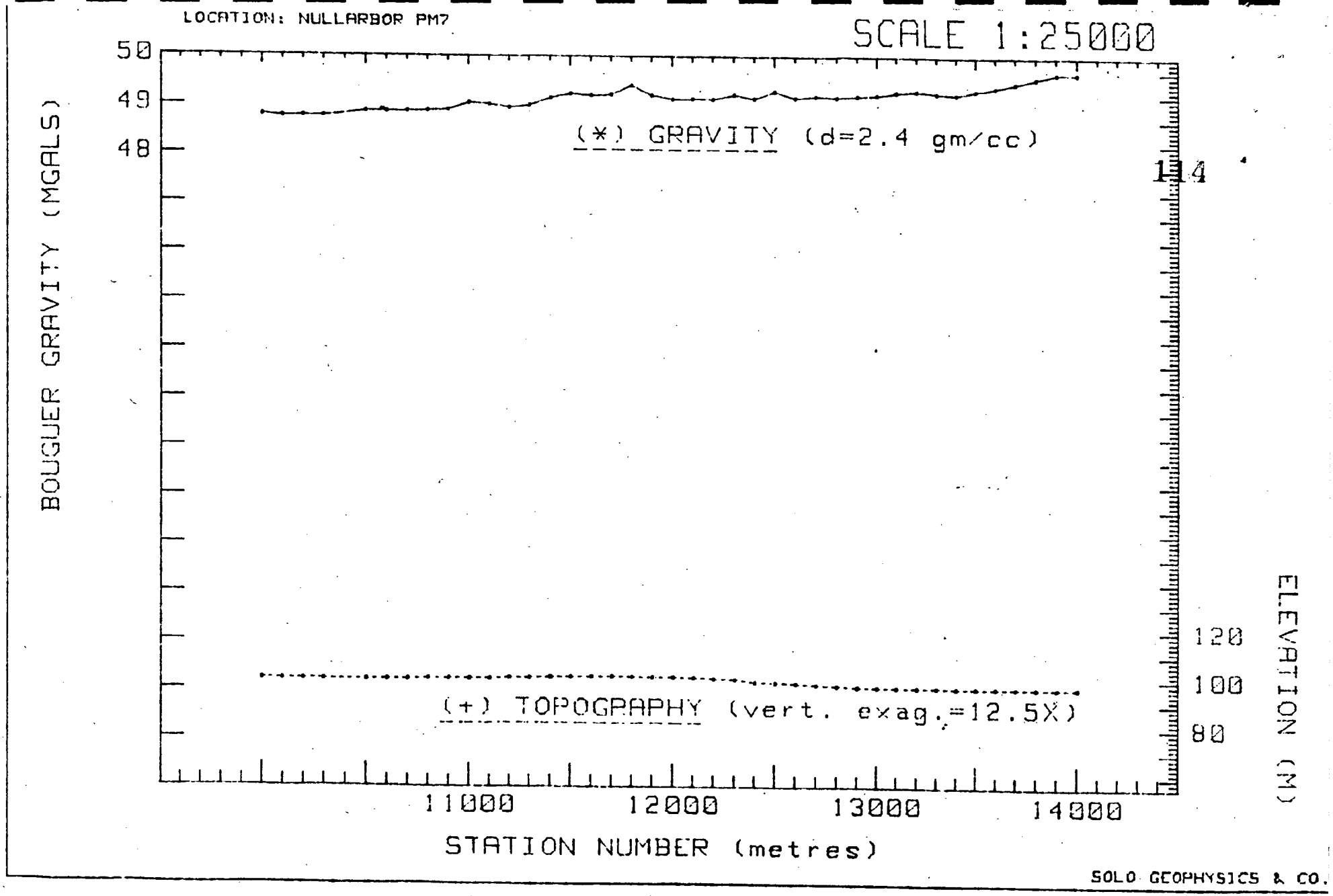
LOCATION: NULLARBOR PM4

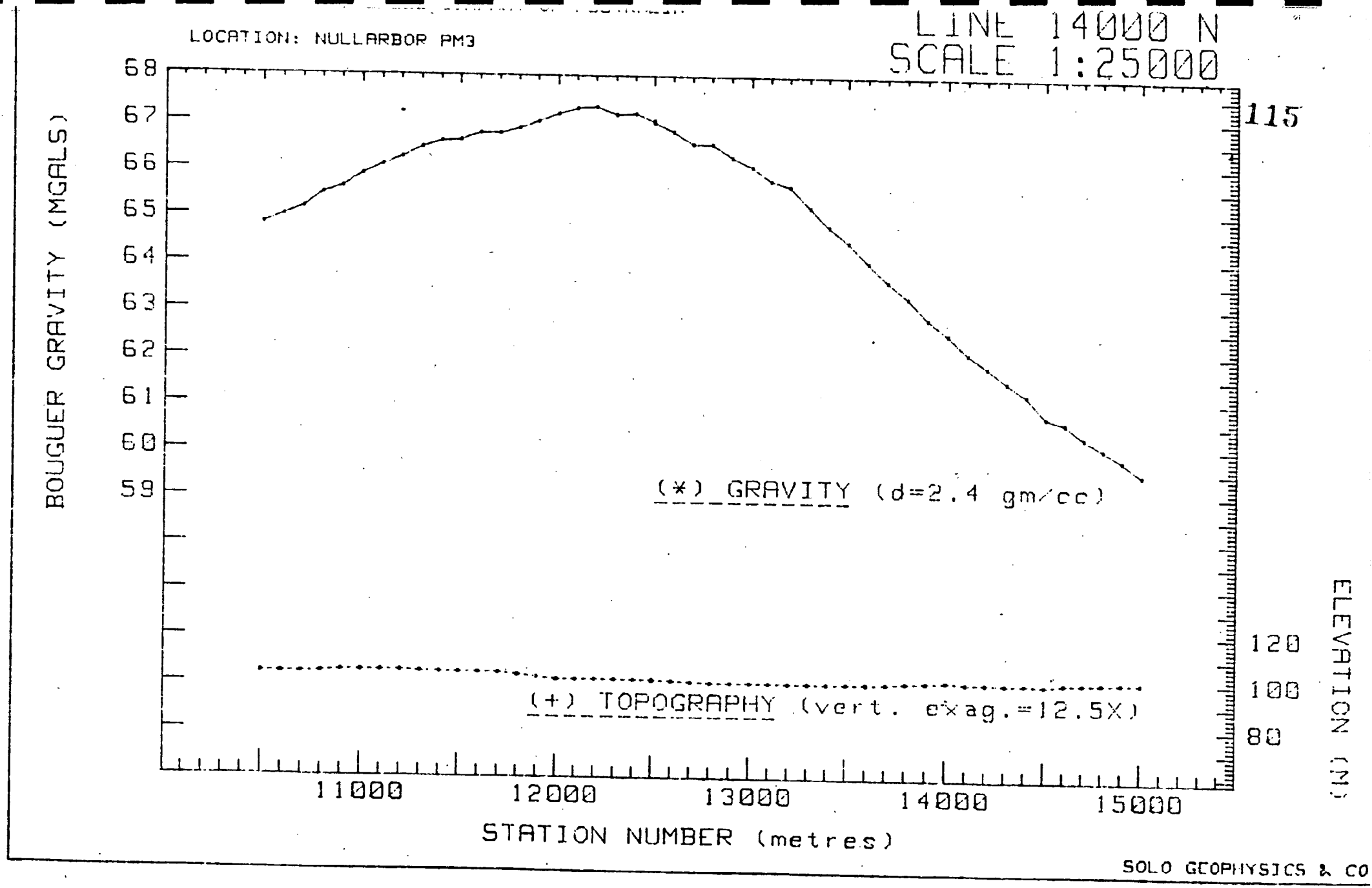
LINE 12000 E
SCALE 1:25000

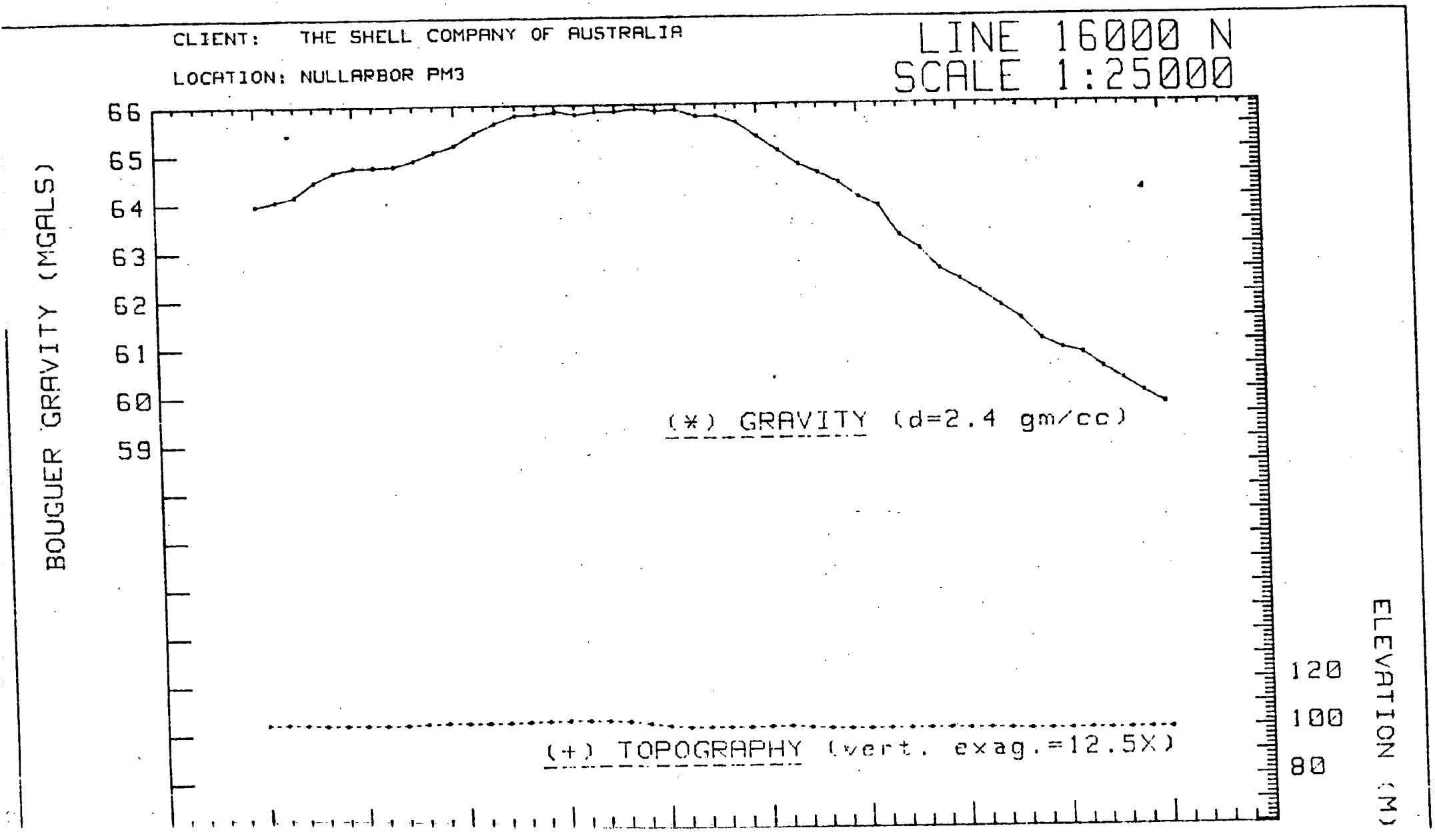



CLIENT: THE SHELL COMPANY OF AUSTRALIA
LOCATION: NULLARBOR PM4
LINE 12500 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
53
52
51
50
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
ELEVATION (M)
13000
14000
15000
16000
STATION NUMBER (metres)


CLIENT: THE SHELL COMPANY OF AUSTRALIA
LOCATION: NULLARBOR PM4
LINE 16000 E
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
51
50
49
48
47
46
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
11000
12000
13000
14000
15000
STATION NUMBER (metres)


LOCATION: NULLARBOR PM7
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
50
49
48
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
ELEVATION (M)
120
100
80
11000
12000
13000
14000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.


LOCATION: NULLARBOR PM3
LINE 14000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
68
67
66
65
64
63
62
61
60
59
115
120
100
80
ELEVATION (M)
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
11000
12000
13000
14000
15000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO


CLIENT: THE SHELL COMPANY OF AUSTRALIA
LOCATION: NULLARBOR PM3
LINE 16000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
66
65
64
63
62
61
60
59
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
ELEVATION (M)

FIELD REPORT COMPILED BY: GRAHAM L. RAU, DIRECTOR - SOLO GEOPHYSICS & CO.

FROM INFORMATION SUPPLIED BY: K. LEECH - GEOPHYSICAL ASSISTANT IN THE FIELD.

A combined optical levelling and gravity survey was carried out on the PM and CM series grids during July and August, 1981 by two surveyors.

The survey was completed in one Phase. CM-1 traverse was abandoned.

The survey areas were located from 26 to approximately 80 kms. along an access track running north west from Coonalda Cave on Koonalda Station. Koonalda stations is located on the Eyre Highway. All PM traverses are located on the Coompana 1:250,000 sheet. CM traverses are located on the 1:250,000 Cook sheet. See location maps. The survey area was mainly flat limestone country.

Gravity stations were read at 100 metre intervals along each traverse. No gravity ties were possible to the National Network so each traverse was made relative to a main base station indicated by a star picket and metal tags. Dumpy pegs were left at regular intervals for future recovery if necessary.

Each traverse was established by an independant surveyor contracting to the SHELL Company of Australia Pty. Ltd., Metals Division.

All gravity loops were less than two hours duration.

GRAVITY BASE STATIONS.	LOCATION.	ASSUMED ELEVATION.
PM-2	13000N/13500E	100 metres
PM-3	16000N/12500E	100 metres
PM-4	12500N/15000E	100 metres
PM-7	13000N/12000E	100 metres
CM-4	13000N/13500E	100 metres

The surveyors used a caravan as a main base camp for the duration of the survey.

All instrumentation, unless otherwise specified, is either owned or maintained by SOLO GEOPHYSICS.

INSTRUMENTATION AND EQUIPMENT PROVIDED FOR THE SURVEY:

One LaCoste and Romberg Gravity meter, serial No.037
One Sokisha engineers level and 5 metre staff.
One Toyota traytop four wheel drive vehicle fitted with winch.
One hire caravan.

INSTRUMENT DAMAGE: Nil.

EQUIPMENT DAMAGE:

Toyota F.W.D.: One tailshaft and transfer case destroyed on hitting large boulder. Crew stayed at Coonalda Station for several days until replacement parts and repairs effected by SOLO maintainance personnel.

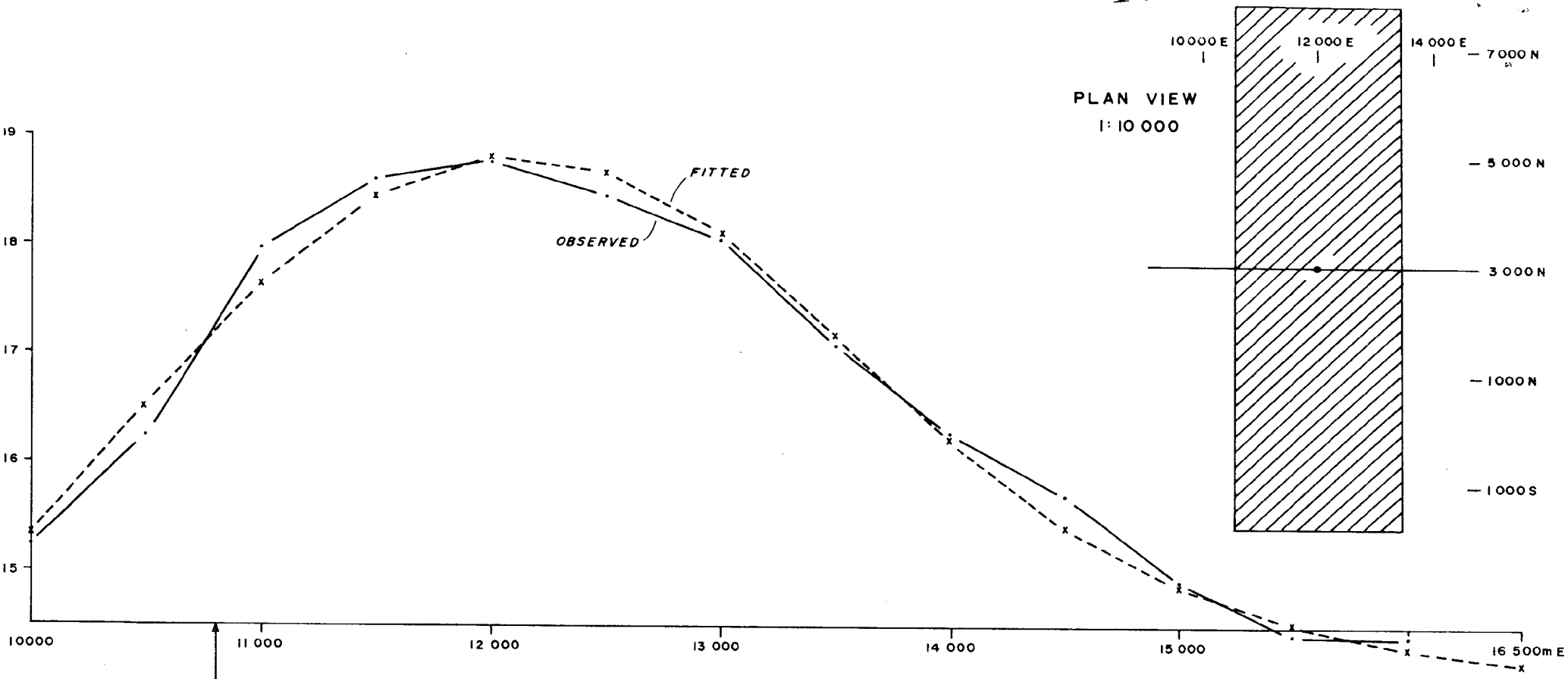
APPENDIX 2

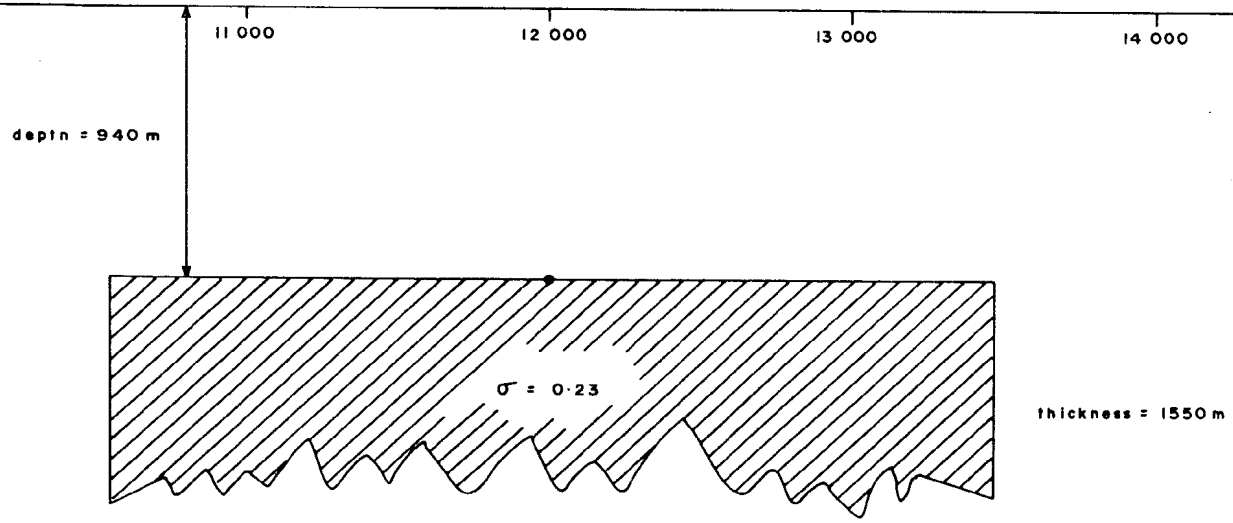
Summary of Gravity Modelling Results

APPENDIX 2

SUMMARY OF GRAVITY MODELLING RESULTS

Magnetic Anomaly	Line	Mag. Peak	Mag. depth est.	Location of Gravity Peak	Max. Residual Gravity m Gal	Depth Est. m	Density Contrast	Thickness	Width m
PM-2	3000N	2000E	440-560	1800E	4.5	940	0.23	1550	2900
PM-3	4000N	2100E		2200E	4.0	Not modelled			
*	6000N	1700E		1800E	4.0				
PM-4*	2000E	2800N	360-520	No significant anomaly					
	6000E	2400N	480-520	2500N	3.0	520	0.51	270	1960
PM-7	3000N		380-560	No significant anomaly					
CM-4	3000N	3400E	400-500	3200E	2.5	410	0.21	680	1570



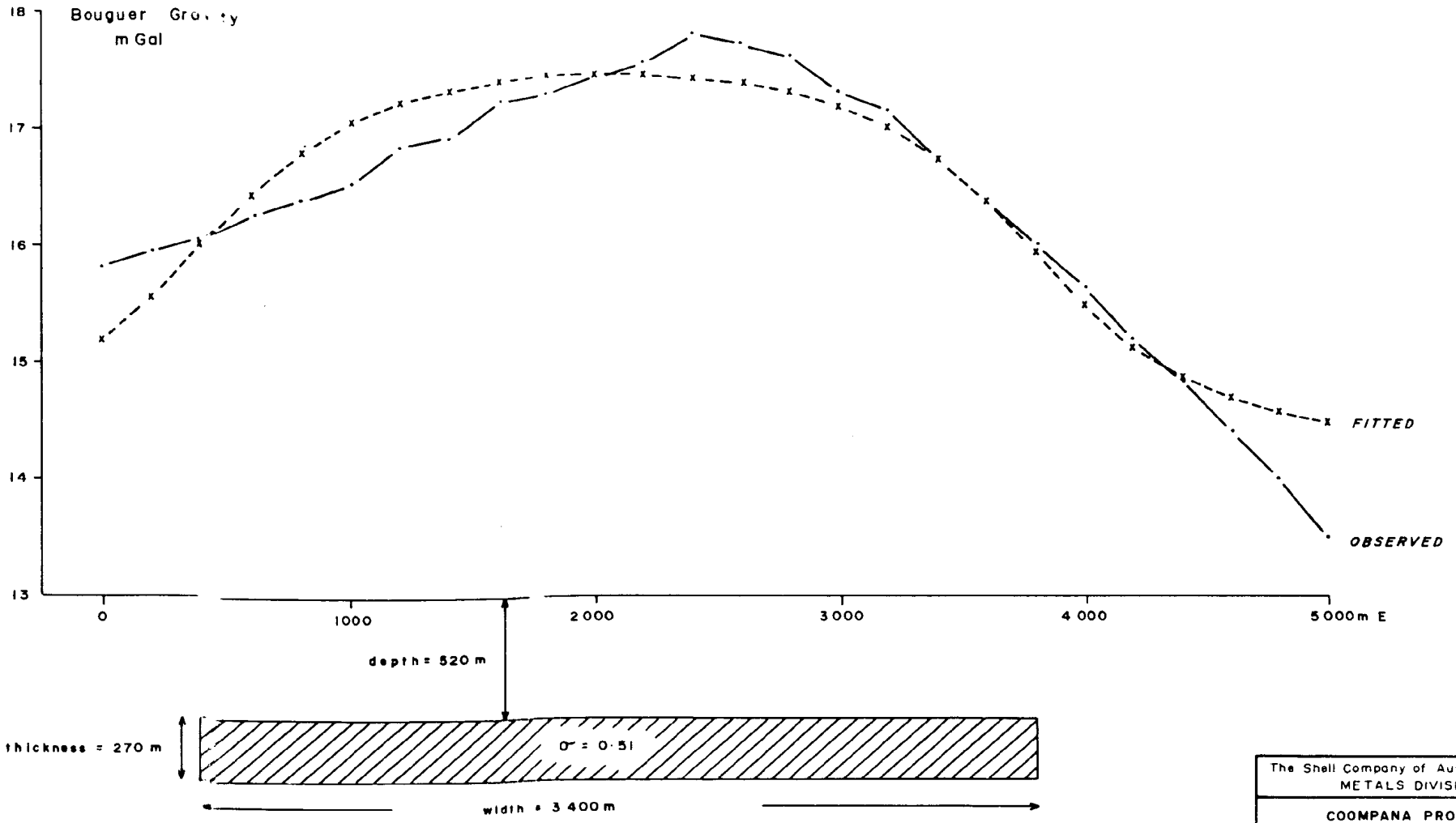


The Shell Company of Australia Limited
METALS DIVISION

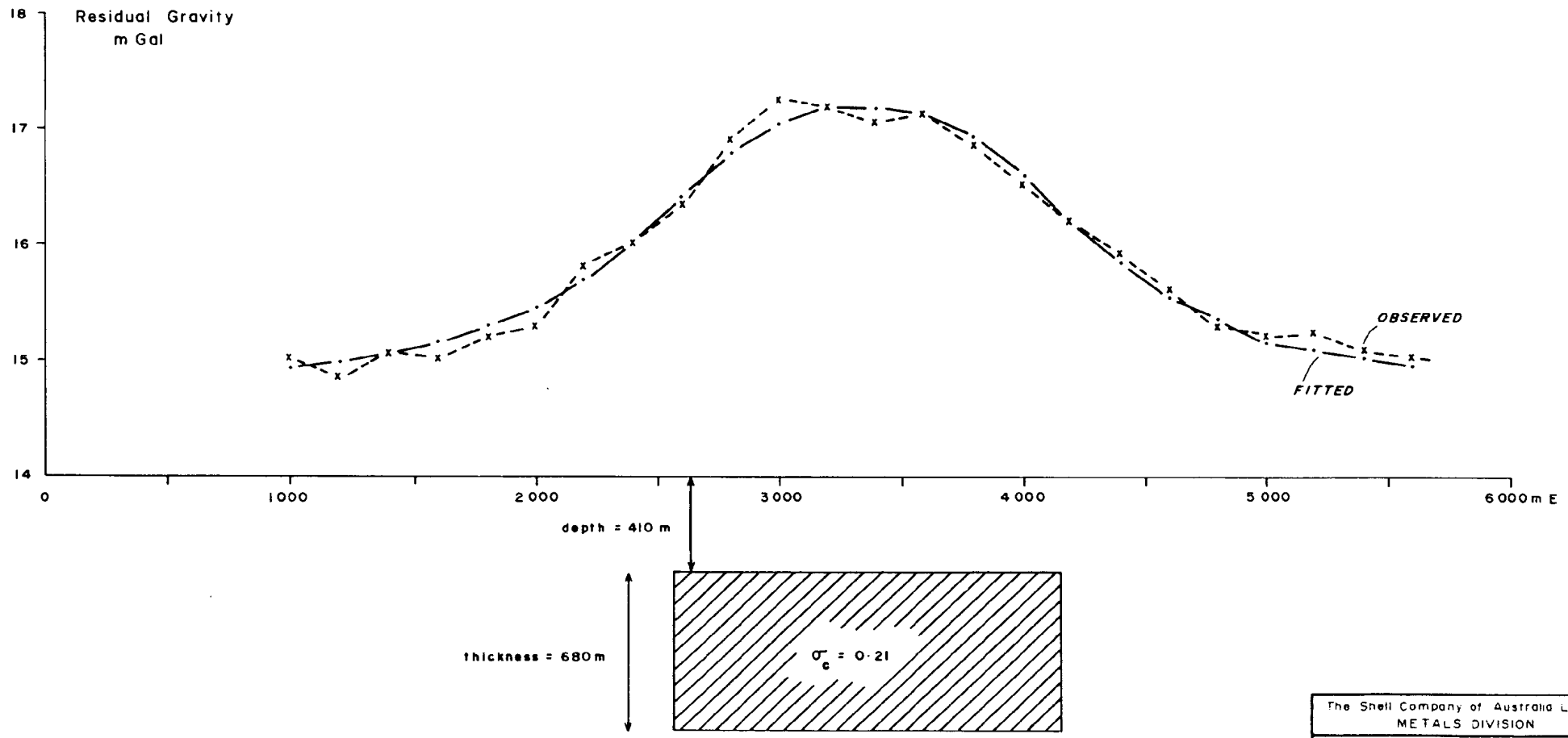
COOMPANA PROJECT
GRAVITY MODELLING
ANOMALY PM2

Scale 1 25 000

FIG. No	REPORT No
ENCL No	DRG No A/PW 09/37
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B. J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY PM4 LINE 6 000N Scale 1 25 000	
FIG. No.	REPORT No.
ENCL. No.	DRG No. A/PW 09/39
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY CM4 LINE 3000N Scale 1 25 000	
FIG No	REPORT No
ENCL No.	ORG No A/PW 09/39
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B. J. O.	OFFICE ADELAIDE

APPENDIX 3

Progress Report for Coompana Drilling Programme, Stage 1

ROBERTSON RESEARCH (AUSTRALIA) PTY LIMITED

PROJECT NO. 1712

124

REPORT NO. 828

PROGRESS REPORT FOR COOMPANA

DRILLING PROGRAMME

--

STAGE 1

By: R.W. Kelly, B.Sc., M.Aus.I.M.M.

Prepared for:

Shell (Aust.) Pty. Ltd.,
Metals Division,
222 East Terrace,
Adelaide, South Australia, 5000

September, 1981

CONTENTS

1. INTRODUCTION

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Robertson Research (Australia) Pty. Limited was engaged by Shell Australia Pty. Ltd. (Minerals Division, S.A.) to supervise a combined oil shale/base metal exploration programme within E.L. 748 and the adjacent E.L. 749 in the Eucla Basin, South Australia.

The initial proposed programme was for two drilling rigs to move into the area at the same time with a percussion rig pre-collaring the Tertiary Nullarbor and Wilson's Bluff limestones. The second rig was to follow and core underlying strata.

However, problems with the timing and availability of the drilling rigs meant that the programme had to be split into two stages.

This report is a brief summary of the initial percussion pre-collaring at the two limestone formations.

2. DESCRIPTION OF FIELD OPERATIONS

2.1 E.L. 748

This Exploration Licence (E.L.) is the northernmost of the two held by Shell Australia and has the Trans Australian Railway line bisecting it from east to west. Two oil shale holes (CD5 and 6) were proposed for this E.L., both of which were located adjacent and to the south of the railroad (see location map).

2.1.1 HOLE CD5

CD5 was the first hole drilled and progress was good to a depth of 64m. At this depth the drill rods became jammed. Whilst attempting to free the rods, the rig suffered a number of

mechanical breakdowns with the result that it took approximately three days to retrieve the drill stems.

At this point it was decided to attempt to ream the hole to 8". It was felt that the greater clearance between the walls of the hole and the drill stem would permit more efficient clearing of chips from the hammer and limit the chances of jamming the rods. However, during the reaming operation the rods became stuck again at a depth of 56m and another 2½ days were spent retrieving the drill rods from the hole.

In view of these problems it was decided to shift the rig onto a new site some 15km to the west (hole CD6).

2.1.2 HOLE CD6

A log of CD6 is contained in Appendix 1 along with those of the other holes drilled.

As it will be noted from the logs, a consistent feature of all holes was that circulation was lost within 12m of the surface. Consequently, information gained from chip samples was very poor.

CD6 was the second hole drilled in this E.L. and was drilled to a depth of 112m in the first day. Sample returns stopped at approximately 12m. Water injection was used to minimise the danger of jamming the rods, and no delays were experienced.

At this depth (112m) it was felt that the pre-collaring at the hole was completed. However, the author's previous experience (gained whilst working on a recent project in the Eucla Basin) had shown that the hammer bit was unable to penetrate the oil shale horizon due to its soft nature. Therefore it was decided to continue drilling to confirm the stratigraphic positioning of the base of the hole. As the hole progressed no soft material was encountered and the only impediment to the progress of the hammer was sections of very hard material. At 176m the drilling was halted and with

reference to the information available from holes previously drilled in the area it was decided that, despite the anomalous characteristics of the material encountered, the oil shale interval could well have been intersected, higher in the hole.

During discussions with Mr. Alan Brash it was decided that, rather than redrill CD6 and attempt to complete CD5, a third hole should be drilled between the first two.

2.1.3 HOLE CD7

This hole was drilled 22.5km west of Hughes Railway Siding. Sample return stopped at 10m and the hole was drilled to a depth of 104m without any problems. The hole was cased to a depth of 105.5m, the driller being able to push the casing down the extra 1.5m. This tends to suggest that the casing is set in either the Padinga Formation or the top of the Madura Formation, both of which are soft.

2.2 E.L. 749

The pre-collaring of the four holes in this E.L. (CD1, 2, 3 and 4) presented no problems and aside from a minor mechanical breakdown on the rig, progress was almost uninterrupted.

Water injection was used with air and as a result the holes remained clean and open allowing easy pulling of the drill stem and running of casing.

2.2.1 HOLE CD4

This hole was drilled and cased to a depth of 141m and it is expected that approximately 15m of limestone remains to be drilled before the underlying Padinga Formation is encountered.

Sample return was lost at 8m and a log for the hole is presented in the Appendix.

2.2.2 HOLE CD3

This hole was drilled and cased to a depth of 121m, with sample returns stopping at approximately 12m. It is anticipated that approximately 10m of limestone remains before the Padinga Formation is intersected.

2.2.3 HOLE CD2

This hole was drilled and cased to a depth of 128m, at which depth the hammer on the percussion rig "blocked off" (blocking of air ducts with soft material) thus rendering the hammer inoperative.

It is felt that the soft material which blocked the hammer is probably some mud collected at the bottom of a limestone cavity. Conversely, it is also possible that this soft material may originate from the Madura Formation as the base of the hole was, at that stage, only some 20-25m above the inferred base of the limestone formations.

This hypothesis led to the decision to terminate the hole at this point.

2.2.4 HOLE CD1

This hole was drilled and cased to a depth of 160m without any difficulties in retrieving rods or running casing. It is felt that approximately 10m of limestone remains to be drilled before the top of the Padinga Formation is intersected.

Sample return stopped at 8m and a log of this hole is presented in the Appendix.

3. CONCLUSIONS

With the exception of Holes CD5 and CD6, this drilling programme progressed in the most satisfactory manner and the drilling

contractor (Peter Nitschke Drilling Pty. Ltd.) carried out his work according to the highest technical standards.

It is anticipated that the second stage of the programme (diamond coring) will progress without any undue delays or problems, despite the coring of some limestone being necessary.

SUMMARY OF DRILLING COMPLETED, COOMPANA PROJECT

TABLE 1

Drill Hole	Anomaly/Location	Precollar Depth	Casing	Diamond Drilling	End of Hole	Finish Date of Hole
*DDH CD1	PM3 6250N/1700E	161	160	200.5	361.5	25/10/81
*DDH CD2	PM4 3000N/2000E	128	128	66.8	194.8	31/10/81
DDH CD3+	CM4 3250N/3500E	121	121	85.15	206.15	3/10/81
PDH CD4+	PM7 2500N/2000E	141	141	-	141	27/ 8/81
PDH CD5+	15 kmW of Hughes	64	-	-	64	17/ 8/81
PDH CD6+	30kmW of Hughes	176	-	-	176	24/ 8/81
DDH CD7+	22.5 kmW of Hughes	105	105	54.45	159.45	25/ 9/81
TOTALS		896		406.9	1302.9	

* Drilled during the quarter ending 20th January, 1982

+ Oil shale targets

APPENDIX 1

HOLE NO.	DEPTH	LITHOLOGY	%	DESCRIPTION
CD1	0 - 2m	Limestone	60%	Off-white to light grey, crystalline, hard.
		Clay	40%	Reddish brown, soft
	2 - 6m	Limestone	100%	Off-white to light grey, crystalline, hard.
	6 - 8m	Limestone	100%	Off-white and reddish brown, crystalline, hard (minor iron staining)
	8 - 160m	No sample return. Cased to this depth.		
CD2	0 - 2m	Limestone	60%	Off-white to light grey, hard, crystalline
		Clay	40%	Reddish brown
	2 - 8m	Limestone	95%	Off-white to light grey, hard, crystalline
		Clay	5%	Reddish brown
	8 - 128m	No sample return Cased to this depth		
CD3	0 - 2m	Clay	70%	Reddish brown, soft
		Limestone	30%	Hard, crystalline, off-white
	2 - 6m	Limestone	100%	Hard, Crystalline, off-white, minor iron staining
	6 - 12m	Limestone	100%	Off-white to light grey, crystalline, hard
	12 - 121m	No sample return Cased to this depth.		
CD4	0 - 8m	Limestone	100%	Off-white to light grey, hard, crystalline, minor reddish brown clay in top 2m
	8 - 141m	No Sample return Cased to this depth.		

HOLE NO.	DEPTH	LITHOLOGY	%	DESCRIPTION
CD5	0 - 10m	Limestone	100%	Off-white to light grey, hard, crystalline, minor reddish brown clay at top
	10- 64m	No Sample return. Hole stoped at the depth due to difficult drilling conditions Hole not cased.		
CD6	0 - 12m	Limestone	100%	Off-white to light grey, hard, crystalline, minor reddish brown clay at top
	12- 176m	No sample return. Hole not cased.		
CD7	0 - 10m	Limestone	100%	Off-white to light grey, hard, crystalline, minor reddish brown clay in top two metres
	10- 104m	No sample return Casing set to 105.5m		

A P P E N D I X 4

Coompana Diamond Drilling Programme, Memorandum No. 1213

ROBERTSON RESEARCH (AUSTRALIA) PTY LIMITED

MEMORANDUM NO. 1213

PROJECT NO. 1712

COOMPANA DIAMOND DRILLING PROGRAMME

FOR

SHELL COMPANY OF AUSTRALIA LIMITED,
METALS DIVISION,
222 EAST TERRACE, ADELAIDE, S.AUST.

The Coompana Prospect is located on the Nullarbor Plain, approximately 1,000 km northwest of Adelaide, South Australia.

Shell Metals are currently engaged in a drilling programme designed to investigate both the oil shale potential of the area and a number of geophysical anomalies possibly related to basement mineralisation.

The first phase of the programme involved pre-collaring through the Tertiary limestones, and was supervised by R. Kelly of Robertson Research (refer to RRA Report No. 828).

A total of seven sites were pre-collared. Robertson Research Australia were also engaged to supervise the second phase of diamond drilling. It was originally planned to extend three of the boreholes 50 metres into the Madura Formation (underlying the Tertiary limestones), a potential oil shale horizon. A further two holes were to penetrate the entire Eucla Basin sedimentary sequence in order to obtain samples of the basement rocks.

The author was on site from September 14 to October 6, 1981, during the initial stages of the diamond drilling programme.

Both pre-collaring and coring of the boreholes was contracted to Nitschke Drilling of Hahndorf, S.A. A Longyear 44 was supplied for the diamond drilling programme, and it was planned to work two shifts per day.

A brief summary of events is provided below:

SEPTEMBER

14th	Drill and crew arrived at Hughes.
15th	Move to Borehole CD7. Commence rigging up.
16th	Continue rigging up. Water truck despatched to Koonalda Caves (120km one-way trip).
17th	Continue rigging up. Water truck returned.
18th	Commence drilling.
19th	Drilled from 105.00 to 125.00m. Out of water.
20th	Drillers 'resigned' and departed for Adelaide.
21st	No work.
22nd	No work.
23rd	One load of water from Koonalda Caves. Peter Nitschke arrived on site.
24th	Continued drilling to 151.65m.
25th	CD7 completed at 159.45m. Rig dismantled. Moved to site CD3.
26th	Rig up. Submersible pump installed in Carpentaria borehole. Water truck left overnight to fill.
27th	One load of water on site from borehole (60km one-way trip). Commenced drilling from 120.00 to 161.20m.
28th	Continued drilling to 168.80m. Await water.
29th	One load water from Koonalda (one-way trip 90km). Continued drilling to 194.00m.
30th	Water truck broke down - no spare parts. No drilling.

OCTOBER

1st	No work
2nd	Truck repaired. One load of water from Koonalda.
3rd	Continued drilling. CD3 completed at 206.15m.
4th	Most of crew not on site during morning. Half shift only spent packing up. A.H. Brash (Shell Metals) arrived on site.
5th	Finished packing up, moved to site CD1, commenced rigging up.
6th	Difficulty experienced in setting up over borehole CD1. Apparently the top of the casing had been warped when set on completion of pre-collaring. Author and A.H. Brash left site.

Although it was hoped that the anticipated total of 700m of diamond drilling would be completed with three to four weeks, in fact only 140 metres was drilled during the period to October 6, 1981.

Four days were lost early in the programme when two drillers 'resigned' and returned to Adelaide.

Drilling resumed when Peter Nitschke arrived on site, but further delays were experienced throughout the programme as a result of difficulties in keeping the rig supplied with water.

It was originally planned that the bulk of the water required for drilling purposes would be supplied from pre-existing boreholes in the area. However, although despatched in good time from Adelaide, the polythene piping required for the pumping operations was not delivered (by Australian National Railways) until two weeks into the drilling programme (September 27).

Borehole CD7 was drilled with water carted from Koonalda Caves, approximately 120 km from the drill site, via poor roads.

Water for the remaining boreholes was to have been supplied from boreholes previously drilled by Carpentaria Exploration. Additional polythene pipe was brought on site by Mr. Peter Nitschke and a submersible pump installed in the most prospective of these holes. However, the hole was not cased and only one load was obtained before it sludged up and the pump had to be retrieved.

The other Carpentaria boreholes had either recorded minimal water yields, or had an excessively deep water table (in excess of 120m), and no other attempts to pump underground water were made.

The remaining water requirement for Borehole CD3 was also carted from Koonalda Caves, a distance of approximately 90km (one way), over poor roads.

Repeated breakdowns meant that it was seldom possible to drill even a single shift. This problem culminated in complete breakdown of the water truck and a further three days were lost with no drilling. Part of this

delay (perhaps half a shift) was attributable to the negligence of the haulage company engaged to bring up spare parts from Adelaide.

Further problems were being experienced at Borehole CD1 when the author left the site. The casing had apparently been 'kinked' when set, and the diamond drilling string could not be introduced into the hole.

The drill crew will remain on site until October 11, and drilling will resume after the break, on October 20. In order to avoid the major problem of the first month, water cartage, the proprietors of Koonalda Station have been engaged to deliver water to drillsites, thus supplementing the water hauled by Nitschke. Unfortunately, shearing was in progress at Koonalda during the first month and they were therefore unable to assist at that time.

The logs of the two boreholes completed during the first month of the programme are attached. It should be noted that the depths and thicknesses may have to be adjusted slightly when the boreholes are geophysically logged.

C. Coxhead.

Colin Coxhead,
Coal Geologist

October 8, 1981

BOREHOLE NO. CD7 (core log only) TOTAL DEPTH: 159.45m

LOCATION: 22 km west of Hughes, on Transcontinental Railway, Nullarbor Plain, South Australia.

DATE STARTED: 18.9.81 CORE SIZE: HQ

DATE FINISHED: 25.9.81 DRILLER: NITSCHKE

SAMPLES NOS:

Precollared to 105.00m (driller)

FROM (m)	TO (m)	THICKNESS (m)	DESCRIPTION
105.00	108.00	3.00	MUDSTONE. Dark grey, carbonaceous, silty and micaceous. Core badly broken - poor recovery.
108.00	110.80	2.80	MUDSTONE. Dark grey, carbonaceous, slightly micaceous. Silty, with thin fine-grained sandstone bands and lenses showing slump and flow structures, pyritic, possibly sideritic.
110.81	110.95	0.14	SILTSTONE. Red-brown. Ironstained/ cemented.
110.95	129.90	18.95	MUDSTONE. As previous mudstone unit. Slickensided at top, worm-burrowed in parts.
129.90	130.95	1.05	MUDSTONE. Dark grey, carbonaceous. Some silty lenses. Soft, greasy feel.
130.95	148.65	17.70	MUDSTONE. Dark grey, carbonaceous, slightly micaceous. Silty with thin fine-grained sandstone bands and lenses, showing slump and flow structures. Finely pyritic, possibly sideritic. Some bioturbation. Patchy zones of dark green ?glauconite grains from 136.19 to 136.95m and 139.70 to 141.28m. Slickensided at 148.45m.

BOREHOLE NO. CD7 (Continued)

FROM (m)	TO (m)	THICKNESS (m)	DESCRIPTION
148.65	159.45	10.80	MUDSTONE. Black to dark grey, carbonaceous, slightly micaceous. Slightly silty, with some fine sandy stringers. Core sub-vertically fractured from 148.65 to 150.00m, badly broken from 151.10 to 151.65m, subvertically fractured from 151.65 to 152.25m.

END OF HOLE

DRILLING RECORD

FROM (m)	TO (m)	CORE DRILLED (m)	CORE RECOVERED (m)	LOSS/GAIN (m)	
105.00	108.00	3.00	1.50	-1.50	Poor recovery
108.00	108.60	0.60	0.60	-	(18.9.81)
108.60	110.20	1.60	1.60	-	
110.20	111.60	1.40	1.30	-0.10	Slickensided
111.60	113.20	1.60	1.63	+0.03	
113.20	114.80	1.60	1.60	-	
114.80	116.30	1.50	1.50	-	
116.30	117.90	1.60	1.60	-	
117.90	119.40	1.50	1.50	-	
119.40	121.00	1.60	1.60	-	
121.00	122.60	1.60	1.55	-0.05	
122.60	124.10	1.50	1.45	-0.05	(19/23.9.81)
124.10	125.65	1.55	1.60	+0.05	
125.65	127.25	1.60	1.60	-	
127.27	127.70	0.45	0.51	+0.06	
127.70	129.30	1.60	1.60	-	
129.30	131.20	1.90	1.90	-	
131.20	132.75	1.55	1.55	-	
132.75	134.25	1.50	1.54	+0.04	
134.25	135.85	1.60	1.60	-	
135.85	137.45	1.60	1.55	-0.05	
137.45	139.05	1.60	1.62	+0.02	

DRILLING RECORD (Continued)

FROM (m)	TO (m)	CORE DRILLED (m)	CORE RECOVERED (m)	LOSS/GAIN (m)	
139.05	140.65	1.60	1.56	-0.04	
140.65	142.25	1.60	1.56	-0.04	
142.25	143.85	1.60	1.60	-	
143.85	145.45	1.60	1.60	-	
145.45	147.05	1.60	1.60	-	
147.05	148.65	1.60	1.51	-0.09	Slickensided (24.9.81)
148.65	150.15	1.50	1.55	+0.05	Fracture zone
150.15	151.65	1.50	1.23	-0.27	Core badly broken
151.65	153.25	1.60	1.55	-0.05	Fracture zone
153.25	154.75	1.50	1.50	-	
154.75	156.35	1.60	1.50	-0.10	
156.35	157.85	1.50	1.50	-	
157.85	159.45	1.60	1.53	-0.07	E.O.H. (25.9.81)

N.B.: Not yet reconciled with downhole geophysics.

BOREHOLE NO. CD3 (core log only) TOTAL DEPTH: 206.15m

LOCATION 3250N 3500E

DATE STARTED: 27.9.81 CORE SIZE: HQ

DATE FINISHED: 3.10.81 DRILLER: Nitschke

Pre-collared to 120.00m (driller)

FROM (m)	TO (m)	THICKNESS (m)	DESCRIPTION
120.00	151.00	31.00	LIMESTONE. White, chalky. Some coral-like cellular structures preserved. Irregular hard, dense chert bands and lenses common. Fine dark clastic grains in basal 1.00m increasing to base.
151.00	153.16	2.16	SANDSTONE. Pale grey to grey-green. Coarse to poorly sorted at base grading to fine at top. Quartz/lithic. Weak, highly calcareous cement.
153.16	185.50	32.34	MUDSTONE. Dark grey to black. Carbonaceous and micaceous. Silty with thin sandy streaks and lenses showing flow structures common. Often pyritic. Thin iron-rich bands (± 0.05m) Core badly broken between 155.00 and 158.10m. Core sub-vertically fractured between 175.80 and 176.27m, 177.20 and 177.62m.
185.50	185.55	0.05	SANDSTONE. Green. Fine-grained. Highly glauconitic. Lenticular agglomerations of glauconite in 0.10m above and below.
185.55	204.48	18.93	MUDSTONE. As above. Light brown sideritic band between 195.32 and 195.35m. Core badly broken between 191.40 and 194.10m. Core sub-vertically fractured between 199.35 and 200.60m. Some slickensiding in basal ± 1.00m.
204.48	206.15	1.67	SANDSTONE. Dark grey-green. Coarse-grained, poorly sorted. Mainly quartzose, some lithic grains. Sub-angular to sub-rounded. Some thin, angular, slickensided carbonaceous mudstone horizons at top. Highly glauconitic with abundant pyrite. Cemented. (Soft drilling).

BOREHOLE CD3 (Continued)

DRILLING RECORD

FROM (m)	TO (m)	CORE DRILLED (m)	CORE RECOVERED (m)	LOSS/GAIN (m)	
120.00	121.40	1.40	1.31	-0.09	
121.40	123.40	2.00	1.99	-0.01	
123.40	125.00	1.60	1.53	-0.07	
125.00	128.00	3.00	3.00	-	
128.00	131.00	3.00	2.98	-0.02	
131.00	134.00	3.00	3.03	+0.03	
134.00	137.00	3.00	2.97	-0.03	
137.00	140.00	3.00	2.99	-0.01	
140.00	143.00	3.00	2.95	-0.05	
143.00	146.00	3.00	3.00	-	
146.00	149.00	3.00	3.02	+0.02	
149.00	151.90	2.90	2.90	-	
151.90	155.00	3.10	2.64	-0.46	
155.00	158.10	3.10	3.56	+0.46	
158.10	161.10	3.00	2.83	-0.17	
161.10	164.20	3.10	3.11	+0.01	
164.20	167.20	3.00	3.00	-	
167.20	170.20	3.00	2.82	-0.18	
170.20	173.30	3.10	2.97	-0.13	
173.30	175.80	2.50	2.50	-	
175.80	176.40	0.60	0.60	-	
176.40	179.50	3.10	2.80	-0.30	
179.50	182.50	3.00	3.00	-	
182.50	185.20	2.70	2.67	-0.03	
185.20	188.30	3.10	3.10	-	
188.30	191.00	2.70	2.68	-0.02	
191.00	194.10	3.10	3.10	-	Core broken
194.10	196.75	2.65	2.65	-	
196.75	199.85	3.10	2.86	-0.24	Core fractured
199.85	203.35	3.50	3.47	-0.03	
203.35	206.15	2.80	2.80	-	

END OF HOLE

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

SOUTH AUSTRALIA

REPORT ON E.L. 747, BUNABIE ROCKHOLE
E.L. 748, HUGHES
E.L. 749, NULLARBOR PLAIN

FOR THE QUARTER ENDING JANUARY 20TH, 1982

AUTHOR: R.J. WEEDEN
REPORT NO: 08.1121
DATE: JANUARY 1982
COPY NO: 1

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LIST OF ENCLOSURES

Enclosure No.	Title	Drawing No.
1	Coompana Project Gravity Modelling Anomaly PM 3 Line 6000N	A/PW 09/ 42

1.0 INTRODUCTION

Exploration Licences 747, 748 and 749 were granted on the 20th October, 1980 for a period of one year. The term was extended for a further year on the 8th September, 1981.

The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250,000 sheet areas, South Australia adjacent to the border with Western Australia. (Figure 1).

The licences are referred to as Bunabie Rockhole (E.L. 747) Hughes (E.L. 748) and Nullarbor Plain (E.L. 749) and collectively form the Coompana Project.

The licences are the subject of a joint venture with Dampier Mining Company Limited.

Main exploration targets are oil shale within the Cretaceous Madura Formation and base metals associated with geophysical anomalies derived from sources in the Pre-cambriam basement.

2.0 WORK COMPLETED

2.1 Drilling

Drilling during the quarter was completed by Peter Nitschke Drilling Pty. Ltd. A summary of drilling done to date is presented in Table 1.

Diamond drill hole DDH CD 1 was continued during the quarter to test the coincident negative magnetic and gravity anomaly PM3 as well as testing for oil shale targets within the Cretaceous Madura Formation. A summary log and profile of the hole is presented in figure numbers 2 and 3 respectively. Assays for the oil yield within the Cainozoic sediments were very low 0.5 - 1.5 litres/tonne - (Appendix 2). Cu and Zn assays for DDH CD 1 (Appendix 2) were plotted with respect to lithology in Figure 3. No signigicant trends were indicated from the geochemistry, both core fillet and quarter core samples, for the Precambrian interbedded basaltic lava sequence. Petrology within the volcanic sequence, carried out by Pontifex and Associates Pty. Ltd., (Report No 3549 in Appendix 3) confirmed the low base metal values. Magnetic susceptibility for DDH CD 1 plotted against lithology (Figure 4) indicates magnetic lows for an amygdaloidal basaltic lava with bronze micaceous hematite and a highly vesicular basaltic lava. DDH CD 1 was terminated at 361.5m shortly before the hole collapsed.

DDH CD 2 was drilled to test the source of the coincident gravity and negative magnetic Anomaly PM4. After encountering considerable drilling difficulties, DDH CD 2 was abandoned at 194.8m within the Madura Formation (See summary log and profile in figures 5 and 6 respectively). Poor core recovery within the Madura Formation accounted for infrequent and unreliable samples. An oil yield of 5-15 litres tonne was obtained from 183.8 - 186.8m.

.../2

Assays for oil yield for DDH CD 7 and DDH CD 3 are presented in Appendix 2. Summary logs are presented in Figure Nos. 8 and 9 respectively. The sample location for the previous percussion pre-collaring program is presented in Appendix 1.

2.2 Geophysics

Geophysical logging was completed by Geoex Pty. Ltd, as summarised below:

Drill Hole	Depth of Casing (m)	Depth of Hole (m)	Interval Logged (m)
DDH CD 1	160	361.5	0 - 266.0
DDH CD 3	121	206.15	0 - 200.0
PDH CD 6	-	176.0	0 - 110.0
DDH CD 7	-	159.45	0 - 80.0
		Total	656.0 m

The computer logs for density, natural gamma, neutron, self potential and resistance for the above holes are included in Appendix 4. The interval logged in DDH CD 6 and DDH CD 7 did not penetrate beyond the Tertiary Limestones while in DDH CD 3 and DDH CD 1 only the Tertiary and Cretaceous sediments were logged. The survey in DDH CD 1 did not penetrate the Precambrian volcanics.

Preliminary modelling of data, collected during the last quarter was completed for Anomaly PM 3 on line 6000N by using the gravity model-fitting program GRAMOD. The model (Enclosure 1) suggests a sill (probably dolerite) within the volcanics, 380m beneath the surface, up to 2.0km in length and 570m thick.

3.0 KEYWORDS

COOMPANA, COOK, oil shale, base metals, Madura Formation, Diamond Drilling, Geophysical Logging, Gravity Survey

4.0 EXPENDITURE

A summary of expenditure for the quarter ending December 31, 1981.

BUNABIE ROCKHOLE E.L. 747

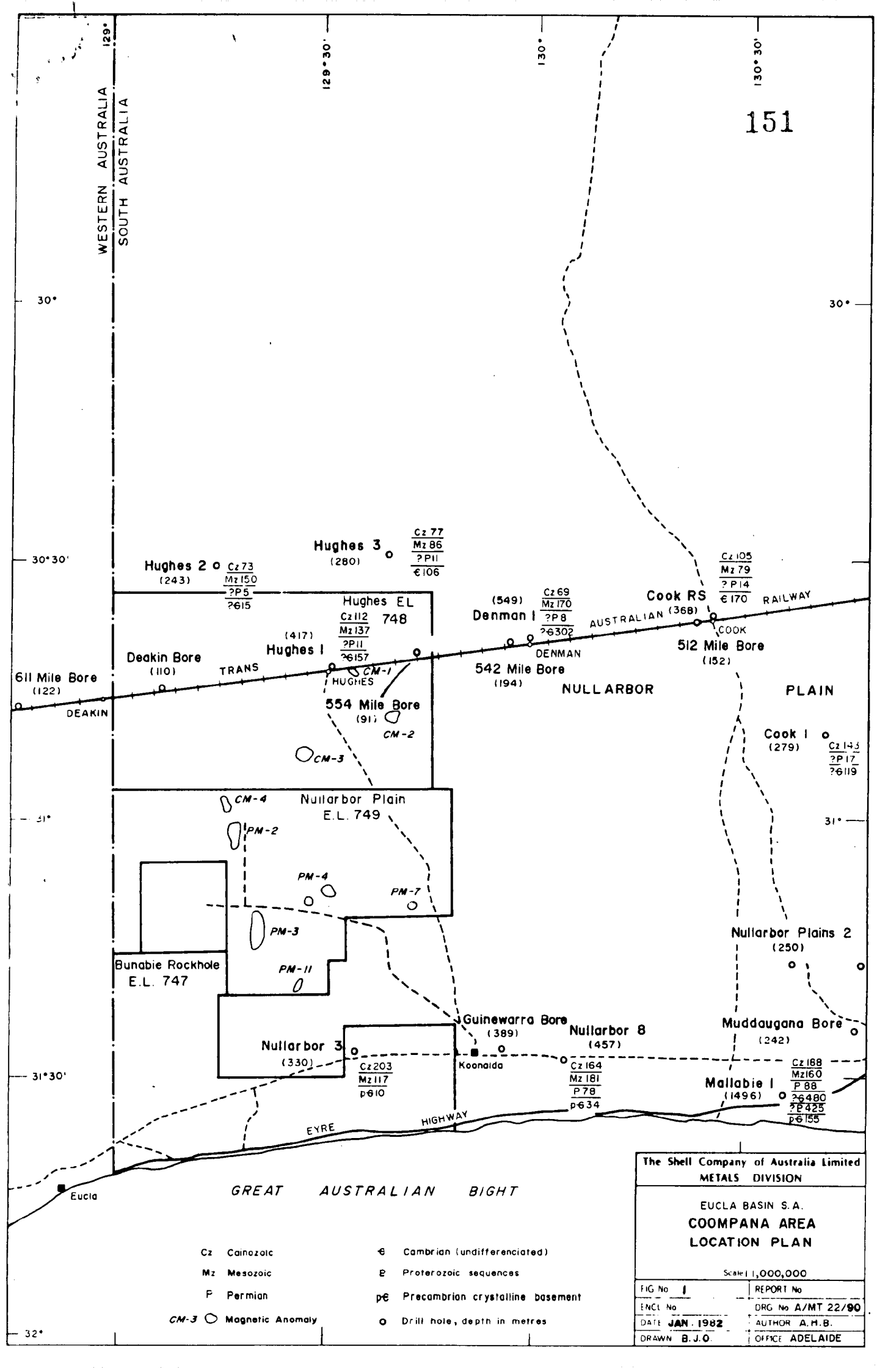
Personnel and Personnel Burden	$ 192
Support Costs	$ 620
Concession Payments	$ 1580
Geophysical Surveys	$ 1233
Other Costs	$ 100
General Admin. Services	$ 50
Total	$ 3775

HUGHES E.L. 748

Personnel and Personnel Burden	$ 874
Support Costs	$ 6203
Concession Payments	$ 2292
Geophysical Surveys	$ 3663
Drilling	$ 4230
Other Costs	$ 85
Geological. Drawing and Computer	$ 333
General Admin. Services	$ 192
Total	$ 17872

NULLARBOR E.L. 749

Personnel and Personnel Burden	$ 20843
Support Costs	$ 21755
Concession Payments	$ 1763
Geophysical Surveys	$ 12619
Analysis Assays	$ 3028
Drilling	$111382
Other Costs	$ 3720
Geological, Drawing and Computer	$ 291
General Admin. Services	$ 2512
Total	$177913



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EUCLA BASIN S.A.
COOMPANA AREA
LOCATION PLAN

Scale 1,000,000

FIG No 1	REPORT No
ENCL No	DRG No A/MT 22/90
DATE JAN. 1982	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

152

DEPTH (m)	GRAPHIC LOG			DESCRIPTION
		TERTIARY	8.0	
50				NO SAMPLE RETURN
100		TERTIARY LIMESTONES		
150			160.0	White massive chalky limestone
			171.8	
200		MADURA FORMATION		
		CRETACEOUS		

APPROX. COORDINATES Lat. 31° 11.5' Long. 129° 21'

AZIMUTH -

DEPTH 361.5 m

INCLINATION -90°

LOGGED BY R. J. Weeden

DATE DRILLED 6/10-25/10/81

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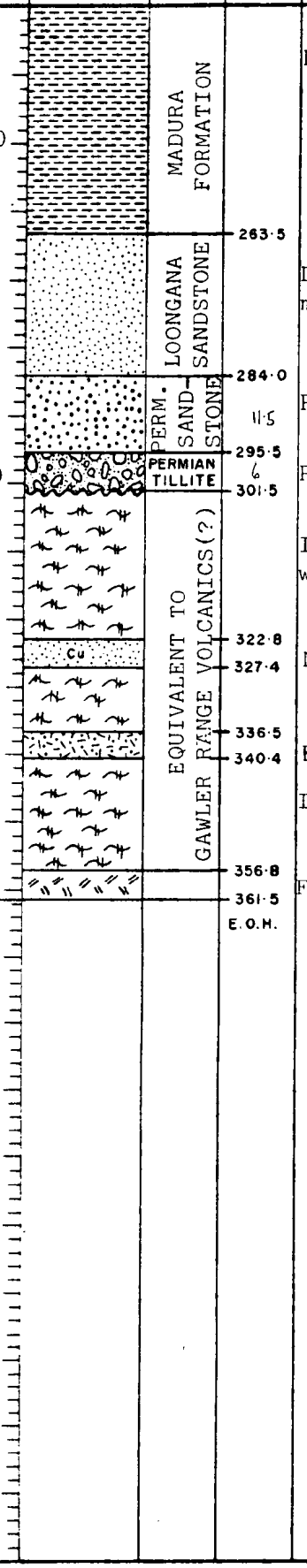
CORE DESCRIPTION
COOMPANA PROJECT
SUMMARY LOG
DDH CD 1
Scale 1:1000

FIG No 2	REPORT No
ENCL No	DRG No A/TF02/01
DATE 10/11/81	AUTHOR RJW
DRAWN	OFFICE ADELAIDE



	263·5	
	284·0	
11·5		
	295·5	
6		
	301·5	
	322·8	
	327·4	
	336·5	
	340·4	
	356·8	
	361·5	
	E.O.H.	

DESCRIPTION

Dark grey soft massive carbonaceous mudstone 153

Dark grey poorly sorted sandstone with minor mudstone units

Poorly cemented, poorly sorted glacial(?) sandstone

Poorly sorted and consolidated tillite

Interbedded basaltic lavas. Surface of lava flow with amygdales

Micaceous hematite associated with basaltic lava

Highly vesicular basalt

Interbedded basaltic lavas with amygdales

Fine grained dark grey/black basalt weakly magnetic

115623

APPROX. CO ORDINATES Lat. 31° 11.5' Long. 129° 21'

AZIMUTH -

DEPTH 361.5 m

INCLINATION -90°

LOGGED BY R. J. Weeden

DATE DRILLED 6/10-25/10/81

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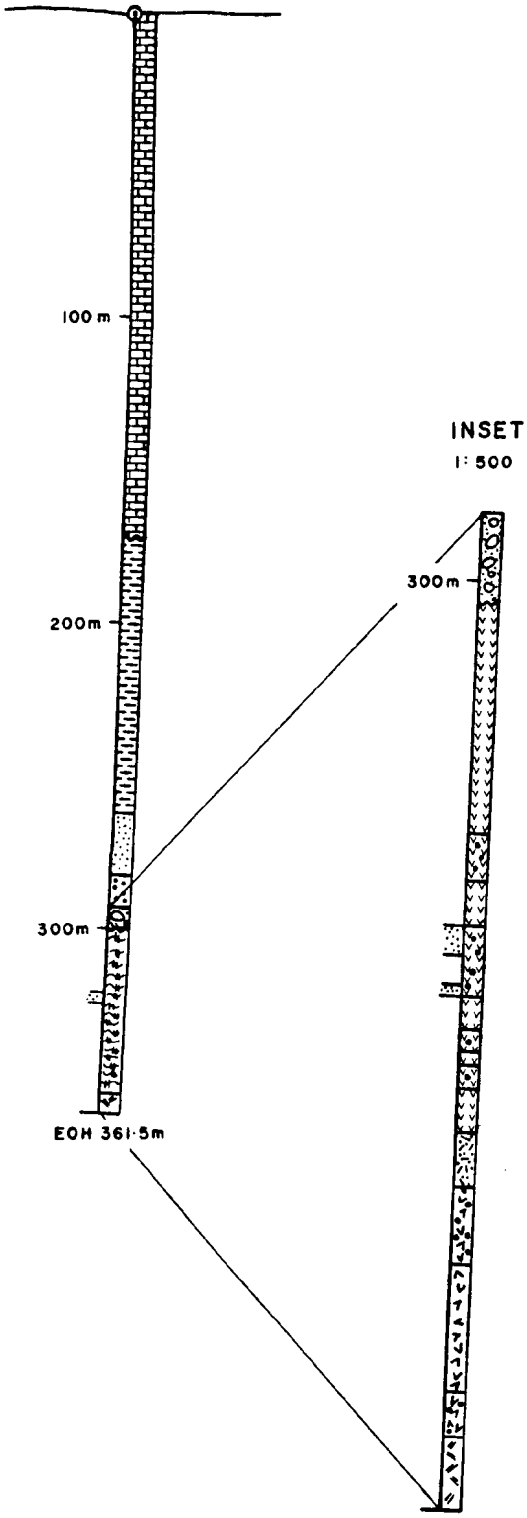
CORE DESCRIPTION
COOMPANA PROJECT
SUMMARY LOG
DDH CD 1
Scale 1:1000

FIG No 2	REPORT No
ENCL No	DRG No A/TF 02/01
DATE 10/11/81	AUTHOR RJW
DRAWN	OFFICE ADELAIDE

DDH CD 1

(1: 2500)



LEGEND

TERTIARY

- Limestone (Nullarbor & Wilson Bluff)

CRETACEOUS

- Madura Formation - Mudstones and clays
- Loongana Sandstone – Conglomeratic sandstone, glauconitic

PERMIAN

- Coarse grained (glacial ?) sands
- Tillite

PRECAMBRIAN

- Interbedded basaltic lavas
- Basaltic basement
- Massive basalt
- Vesicular basalt
- Highly vesicular basalt
- Weakly altered basaltic lava
- Amygdaloidal basaltic lava

- Micaceous hematite
- Unconformity
- Apparent conformable contact

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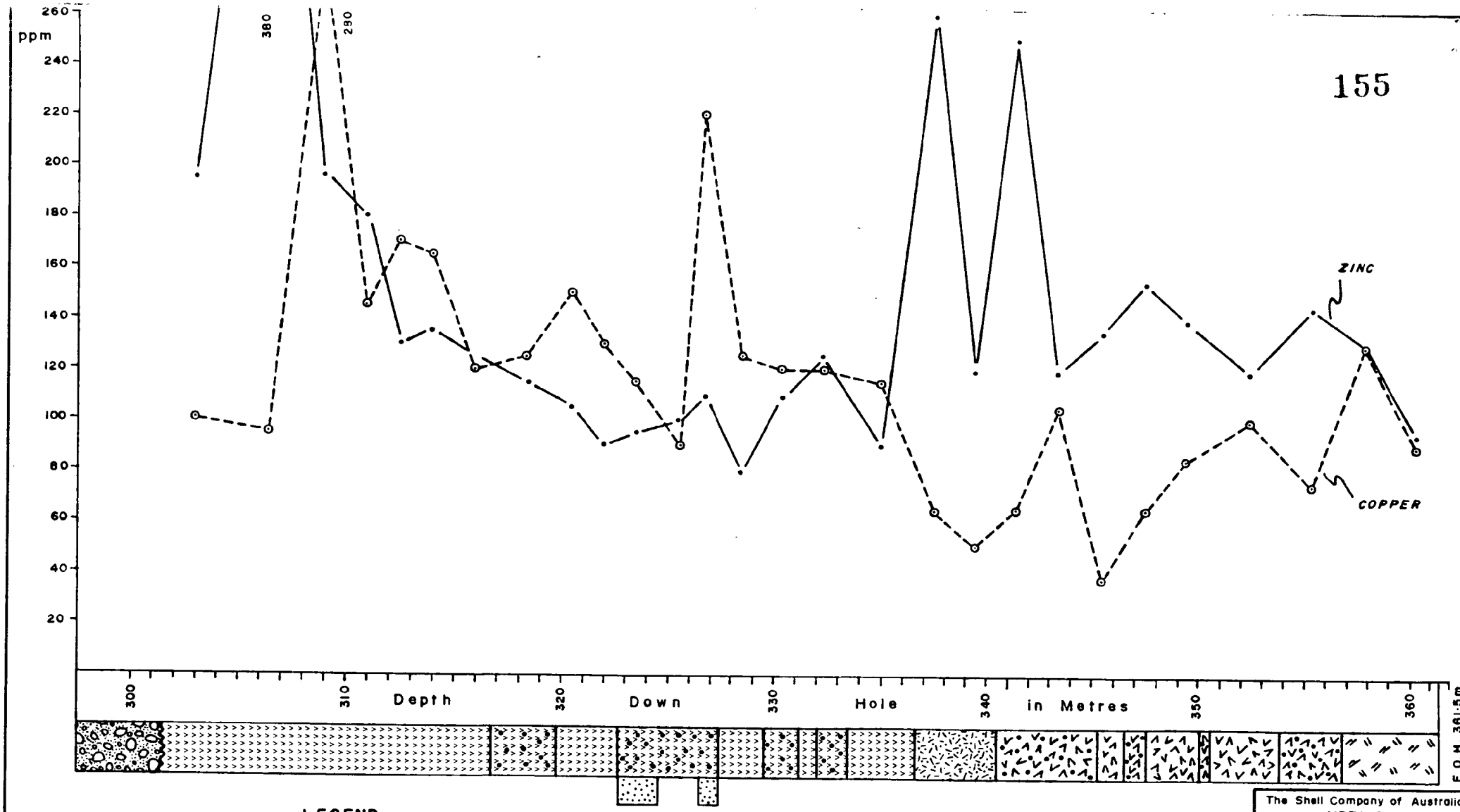
COOMPANA PROJECT DRILL HOLE PROFILE DDH CD1	
SCALE 1:2500	DATE JAN 1982
AUTHOR RW	DRAWN BJO
OFFICE ADELAIDE	REP.No.
DRG.No A/PW 09/40	FIG.No. 3



LEGEND

PERMIAN

- Tillite

PRECAMBRIAN

- Basaltic basement
- Massive basalt
- Vesicular basalt
- Highly vesicular basalt
- Weakly altered basaltic lava
- Amygdaloidal basaltic lava
- Micaceous hematite

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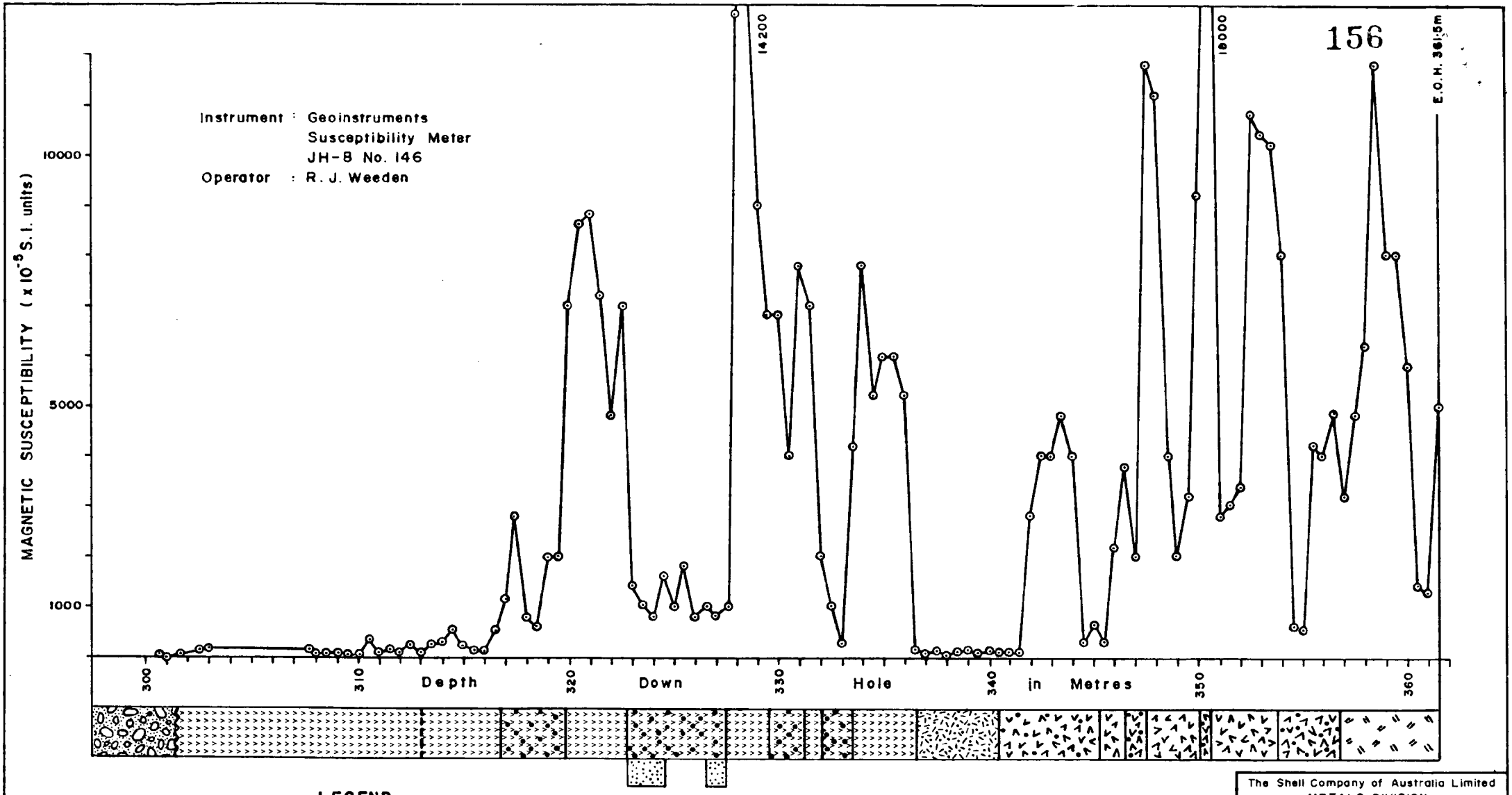
COOMPANA PROJECT
DDH CD 1
CU & ZN GEOCHEMISTRY
FOR CORE FILLET SAMPLES
Horizontal Scale 1 : 250

FIG. No. 4	REPORT No.
ENCL. No.	DRG. No A/TF 02/05
DATE JAN. 1982	AUTHOR R.J.W.
DRAWN B.J.O.	OFFICE ADELAIDE



LEGEND

PERMIAN

- Tillite
- Basaltic basement
- Massive basalt
- Vesicular basalt

PRECAMBRIAN

- Highly vesicular basalt
- Weakly altered basaltic lava
- Amygdaloidal basaltic lava
- Micaceous hematite

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COOMPANA PROJECT
DDH CD-1
MAGNETIC SUSCEPTIBILITY

Horizontal Scale 1:250

FIG. No. 5	REPORT No.
ENCL. No.	DRG. No. A/TF 02/04
DATE JAN. 1982	AUTHOR R.J.W.
DRAWN B.J.O.	OFFICE ADELAIDE

DEPTH (m)	GRAPHIC LOG		DESCRIPTION
			157
		8·0	
			NO SAMPLE RETURN
50			
100			
		127·8	
			White to off white chalky massive fossiliferous (predominantly bryozoans) limestone
150		Hampton Sandstone	
		170·3	Medium grained grey fossiliferous calcareous sandstone
		173·9	Lignite with fine grained siltstone throughout. Severe core loss.
		PIDINGA FM.	
		186·8	Pale grey medium grained quartz sandstone
		189·8	Grey/green massive carbonaceous sandstone
		194·8 E.O.H.	
		Madura Formation	

COORDINATES Lat. 31° 10'
Long. 129° 28'

AZIMUTH -

DEPTH 194.8 m

INCLINATION -90°

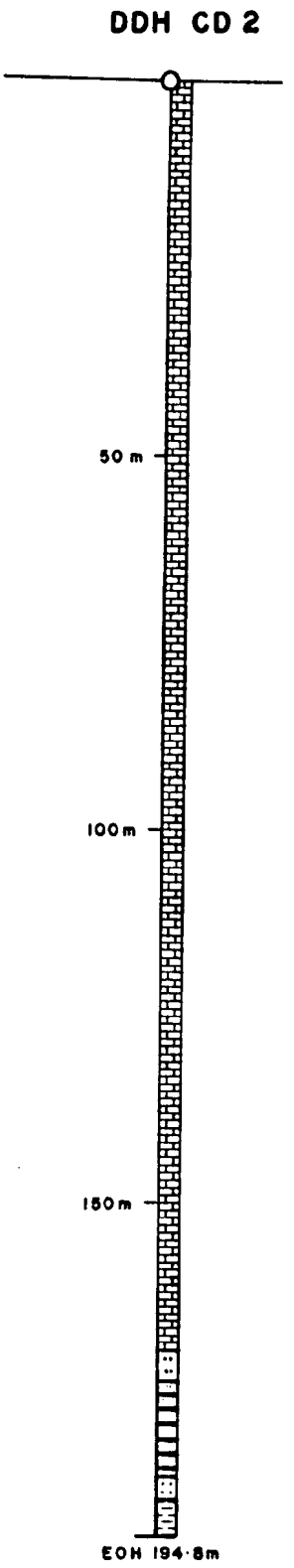
LOGGED BY R J Weeden

DATE DRILLED 26-31/10/81

The Shell Company of Australia Limited
METALS DIVISION

CORE DESCRIPTION
COOMPANA PROJECT
SUMMARY LOG
DDH CD 2
Scale 1:1000

FIG No 6	REPORT No
ENCL No	ORG No A/T F 02/02
DATE 10/11/81	AUTHOR RJW
DRAWN	OFFICE ADELAIDE



LEGEND

TERTIARY

- Limestone (Nullarbor & Wilson Bluff)
- Hampton Sandstone - fossiliferous sandstone.
- Pidinga Formation – lignite
- Poorly consolidated quartz sandstone

CRETACEOUS

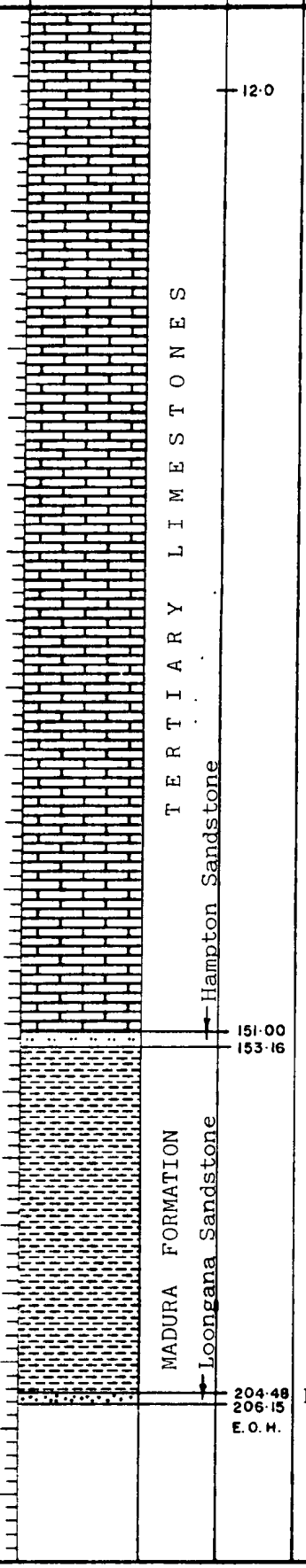
- Madura Formation – Mudstones and clays

——— Apparent conformable contact

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT DRILL HOLE PROFILE DDH CD 2	
SCALE 1:1000	DATE JAN. 1982
AUTHOR R.W.	DRAWN B.J.O.
OFFICE ADELAIDE	REP.No.
DRG.No A/PW 09/41	FIG.No. 7

DEPTH (m) | GRAPHIC LOG | DESCRIPTION

159



NO SAMPLE RETURN

White chalky fossiliferous limestone with minor chert bands

Pale grey/green calcareous sandstone

Dark grey to black carbonaceous, micaceous silty mudstone. Minor disseminated pyrite.

Dark grey green coarse grained poorly sorted quartz sandstone. Highly glauconitic.

COORDINATES Lat. 30° 58'
Long. 129° 16'

AZIMUTH -

DEPTH 206.15 m

INCLINATION -90°

LOGGED BY C. Coxhead (Robertson Research)

DATE DRILLED 27/9-3/10/81

The Shell Company of Australia Limited
METALS DIVISION

CORE DESCRIPTION
COOMPANA PROJECT
SUMMARY LOG
DDH CD 3
Scale 1:1000

FIG No. 8	REPORT No
ENCL No	DRG. No A/TF 02/03
DATE 10/11/81	AUTHOR RJW
DRAWN	OFFICE ADELAIDE

DEPTH (m)	GRAPHIC LOG			DESCRIPTION
		TERTIARY LIMESTONES	10.0	160
50				NO SAMPLE RETURN
100		MADURA FORMATION	105.00	Dark grey carbonaceous, micaceous silty mudstone
150			159.45 E.O.H.	

COORDINATES Lat. 30° 44' Long. 129° 17'

AZIMUTH -

DEPTH 159.45 m

INCLINATION -90°

LOGGED BY C. Coxhead (Robertson Research)

DATE DRILLED 18-25/9/81

The Shell Company of Australia Limited
METALS DIVISION

CORE DESCRIPTION
COOMPANA PROJECT
SUMMARY LOG
DDH CD 7

Scale

FIG. No 9	REPORT No
ENCL No.	DRG. No A/TF 01/001
DATE 10/11/81	AUTHOR RJW
DRAWN	OFFICE ADELAIDE

A P P E N D I X 1

Sample Record Sheets of Pre-collar drilling for CD 1, CD 2, CD 3, CD 4, CD 5, CD 6, CD 7

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___

162

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD1 COOMPANA SAMPLER: _____ DATE: 30/8/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH _____ ASSAY REPORT NOS: _____

ORDER NO: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6325	0	2	2		Tertiary Limestone
26	2	4	2		" "
27	4	6	2		" "
6328	6	7	2		" "
				END OF SAMPLE RETURN AT 7.0m	
				E.O.H. (PERCUSSION) 160m	

REMARKS: _____

SAMPLE RECORD

Shell METALS DIVISION

Sheet ___ of ___

163

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD2 COOMPANA SAMPLER: _____ DATE: 29/8/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH ORDER Nº: _____ ASSAY REPORT NOS: _____ _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6321	0	2			Tertiary Limestone
22	2	4			" "
23	4	6			" "
24	6	8			" "
				END OF SAMPLE RETURN AT 8.0m E.O.H. (PERCUSSION) 128m	

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___

164

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD3 COOMPANA SAMPLER: _____ DATE: _____ MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6329	0	2	2		Tertiary Limestone
30	2	4	2		" "
31	4	6	2		" "
32	6	8	2		" "
33	8	10	2		" "
34	10	12	2		" "
				END OF SAMPLE RETURN AT 12m	
				E.O.H. (PERCUSSION) 12m	

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___.

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD4 COOMPANA SAMPLER: _____ DATE: 27/8/81 MAP / PHOTO REF: 165

ASSAY LAB: _____ SAMPLE DESPATCH _____ ASSAY REPORT NOS: _____

ORDER NO: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6317	0	2			Tertiary Limestone
18	2	4			" "
19	4	6			" "
20	6	8			" "
			END OF SAMPLE RETURN AT 8m		
			E.O.H, (PERCUSSION) 141m		

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___.

166

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD5 COOMPANA SAMPLER: _____ DATE: 27/8/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH ORDER Nº: _____ ASSAY REPORT NOS: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6301	0	2	2		Tertiary Limestone
02	2	4	2		" "
03	4	6	2		" "
04	6	8	2		" "
05	8	10	2		" "
				END OF SAMPLE RETURN AT 10m	
				E.O.H. (PERCUSSION) 64m	

REMARKS: _____

SAMPLE RECORD

Shell METALS DIVISION

Sheet ___ of ___

167

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD6 COOMPANA SAMPLER: _____ DATE: 25/8/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6311	0	2			Tertiary Limestone
12	2	4			" "
13	4	6			" "
14	6	8			" "
15	8	10			" "
6316	10	12			" "
			END OF SAMPLE RETURN AT 12m		
			E.O.H. (PERCUSSION) 176m		

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___

168

SAMPLE TYPE: PERCUSSION LOCATION / PROJECT: PDH CD7 COOMPANA SAMPLER: _____ DATE: 25/8/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES	DESCRIPTION
6306	0	2	2		Tertiary Limestone
07	2	4	2		" "
08	4	6	2		" "
09	6	8	2		" "
10	8	10	2		" "
				END OF SAMPLE RETURN AT 10m	
				E.P.H. (PERCUSSION) 10.4m	

REMARKS: _____

A P P E N D I X 2

Sample Record Sheets of diamond drilling for CD 1, CD 2, CD 3 and CD 7

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___.

SAMPLE TYPE: FILLET LOCATION / PROJECT: DDH CD1 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH _____ ASSAY REPORT NOS: AC 2519/82

ORDER NO: _____ ~~170~~

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES											DESCRIPTION
				Oil yield litres/tonnes											
6396	171.8	174.0	2.2	0.5 - 1.5											
97	174.0	176.0	2.0	"	"										
98	176	178	"	"	"										
99	178	180	"	"	"										
6400	180	182	"	"	"										
01	182	184	"	"	"										
02	184	186	"	"	"										
03	186	188	"	"	"										
04	188	190	"	"	"										
05	190	192	"	"	"										
06	192	194	"	"	"										
07	194	196	"	"	"										
08	196	198	"	"	"										
09	198	200	"	"	"										
6410	200	202	"	"	"										
11	202	204	"	"	"										
12	204	206	"	"	"										
13	206	208	"	"	"										
14	208	210	"	"	"										
15	210	212	"	"	"										
16	212	214	"	"	"										
17	214	216	"	"	"										
18	216	218	"	"	"										
19	218	220	"	"	"										
6420	220	222	"	"	"										
21	222	224	"	"	"										
22	224	226	"	"	"										
23	226	228	"	"	"										
24	228	230	"	"	"										
25	230	232	"	"	"										
26	232	234	"	"	"										
27	234	236	"	"	"										
28	236	238	"	"	"										
6429	238	240	"	"	"										

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___.

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD1 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: ~~171~~

ASSAY LAB: AMDEL SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES		DESCRIPTION
				Oil yield litres/tonne		
6430	240	242	2.0	0.5	- 1.5	
31	242	244	"	"	"	
32	244	246	"	"	"	
33	246	248	"	"	"	
34	248	250	"	"	"	
35	250	252	"	"	"	
36	252	254	"	"	"	
37	254	256	"	"	"	
38	256	258	"	"	"	
39	258	260	"	"	"	
6440	260	262	"	"	"	
41	262	263.5	1.5	"	"	
42	263.5	265.5	2.0	"	"	
43	265.5	268.5	3.0	"	"	
44	268.5	271.5	3.0	"	"	
45	271.5	274.5	3.0	"	"	
46	274.5	277.3	2.8	"	"	
47	277.3	280.5	3.2	1.5	- 5.0	
48	280.5	286.5	6.0	0.5	- 1.5	
49	286.5	292.5	6.0	"	"	
6450	292.5	295.5	3.0	"	"	
51	295.5	310.5	6.0	"	"	

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

SAMPLE TYPE: Filleted Core LOCATION / PROJECT: DDH CD 1 COOMPANA SAMPLER: COMLABS DATE: 5/11/81 MAP / PHOTO REF: 172

ASSAY LAB: _____ SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: 811838

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES (ppm unless specified)												DESCRIPTION
				Cu	Pb	Zn	Bi	Co	Ag	Au						
6452	301.5	304.5	3.0	100	6	195	4	48	1	0.05						
53	304.5	308.0	3.5	95	6	380	4	70	1	0.05						
54	308.0	310.0	2.0	280	4	195	4	50	1	0.05						
6455	310.0	312.0	2.0	145	4	180	4	105	1	0.05						
56	312.0	313.0	1.0	170	4	130	4	80	1	0.05						
57	313.0	315.0	2.0	165	4	135	4	75	1	0.05						
58	315.0	317.0	2.0	120	4	125	4	55	1	0.05						
59	317.0	319.75	2.75	125	6	115	4	44	1	0.05						
6460	319.75	321.3	1.55	140	4	105	4	40	1	0.05						
61	321.3	322.8	1.5	130	12	90	4	44	1	0.05						
62	322.8	324.3	1.5	115	8	95	4	44	1	0.05						
63	324.3	325.8	1.5	90	10	100	4	48	1	0.05						
64	325.8	327.4	1.6	220	8	110	4	48	1	0.05						
6465	327.4	329.5	2.1	125	6	80	4	40	1	0.05						
66	329.5	331.2	1.7	120	4	110	4	40	1	0.05						
67	331.2	333.5	2.3	120	4	125	4	40	1	0.05						
68	333.5	336.5	3.0	115	4	90	4	40	1	0.05						
69	336.5	338.5	2.0	65	4	260	4	40	1	0.05						
6470	338.5	340.4	1.9	50	4	120	4	36	1	0.05						
71	340.4	342.4	2.0	65	12	250	4	40	1	0.05						
72	342.4	344.4	2.0	105	4	120	4	40	1	0.05						
73	344.4	346.5	2.1	38	8	135	4	48	1	0.05						
74	346.5	348.5	2.0	65	4	155	4	44	1	0.05						
6475	348.5	350.6	2.1	85	6	140	4	40	1	0.05						
76	350.6	353.8	3.2	100	4	120	4	40	1	0.05						
77	353.8	356.8	3.0	75	4	145	4	48	1	0.05						
78	356.8	359.0	2.2	130	4	130	4	44	1	0.05						
6479	359.0	361.5	2.5	90	4	95	4	40	1	0.05						
		E.O.H.														
METHODS	Cu,	Pb, Zn,	Bi,	Co,	AAS 1											
				Ag	AAS 3											
				Au	AAS 5A											

REMARKS: _____

SAMPLE RECORD

Sheet ___ of ___.

Shell METALS DIVISION

SAMPLE TYPE: QUARTER CORE | LOCATION / PROJECT: CD1 COOMPANA | SAMPLER: | DATE: 16/11/81 | MAP / PHOTO REF: ~~173~~

ASSAY LAB: COM | SAMPLE DESPATCH ORDER Nº: 3955 | ASSAY REPORT NOS: 811933

SAMPLE STORAGE:

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES (in ppm) Cu	Zn	DESCRIPTION Density gcm-3
18116	322.8	323.3	0.5	85	100	2.71
17	323.3	323.8	"	90	95	2.46
18	323.8	324.3	"	95	100	2.54
19	324.3	324.8	"	130	95	2.53
20	324.8	325.3	"	80	105	3.12
18121	325.3	325.8	"	75	95	2.66
22	325.8	326.3	"	80	105	2.64
23	326.3	326.8	"	50	110	2.67
24	326.8	327.3	"	115	100	2.48
25	327.3	327.8	"	120	100	2.67
18126	327.8	328.3	"	105	90	2.60

REMARKS:

SAMPLE RECORD

Shell METALS DIVISION

Sheet ___ of ___.

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD2 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: ~~174~~

ASSAY LAB: AMDEL SAMPLE DESPATCH _____ ASSAY REPORT NOS: AC 2519/82

ORDER NO: _____

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES Oil yield litres/tonnes		DESCRIPTION
6480	170	172	2	0.5 - 1.5		
81	172	174	2	"	"	
82	174	176.8	2.8	"	"	
83	176.8	177.8	1.0	1.5 - 5.0		
84	177.8	180.8	3.0	"	"	
	180.8	183.8	3.0	NO SAMPLE		NO CORE RECORDED Recovered
85	183.8	186.8	3.0	5 - 15		
	186.8	189.8	3.0	NO SAMPLE		NO CORE RECORDED "
86	189.8	191.8	2.0	1.5 - 5.0		
87	191.8	193.0	1.2	"	"	
88	193.0	194.8	1.8	0.5 - 1.5		
		E.O.H.				

REMARKS: _____

SAMPLE RECORD

Shell METALS DIVISION

Sheet ___ of ___.

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD3 COOMPANA SAMPLER: _____ DATE: 26.10.81 MAP / PHOTO REF: _____

ASSAY LAB: AMDEL SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: AC 1992/82

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SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES										DESCRIPTION
6369	152.67	155.0	2.33	Oil yield litres/tonnes										
70	155	157	2.0	"	"									
71	157	159	"	"	"									
72	159	161	"	"	"									
73	161	163	"	"	"									
74	163	165	"	"	"									
75	165	167	"	"	"									
76	167	169	"	"	"									
77	169	171	"	"	"									
78	171	173	"	"	"									
79	173	175	"	"	"									
80	175	177	"	"	"									
81	177	179	"	"	"									
82	179	181	"	"	"									
83	181	183	"	"	"									
84	183	185	"	"	"									
85	185	187	"	"	"									
86	187	189	"	"	"									

REMARKS: _____

SAMPLE RECORD

Sheet ___ of ___.

Shell METALS DIVISION

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD3 COOMPANA SAMPLER: _____ DATE: 26/10/81 MAP / PHOTO REF: _____

ASSAY LAB: AMDEL SAMPLE DESPATCH _____ ASSAY REPORT NOS: AC 1992/82

ORDER NO: _____ ~~176~~

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	Oil yield litres/tonne				ANALYSES Cu	Pb	Zn						DESCRIPTION
6387	189	191	2.0	0.5 - 1.5												
88	191	193	"	"	"											
89	193	195	"	"	"											
90	195	197	"	"	"											
91	197	199	"	"	"											
92	199	201	"	"	"											
93	201	203	"	"	"											
94	203	205.46	2.46	"	"											
95	205.46	206.15	0.7					200	5	100						

REMARKS: _____

SAMPLE RECORD

Shell METALS DIVISION

Sheet ___ of ___.

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD7 COOMPANA SAMPLER: _____ DATE: 26/10/81 MAP / PHOTO REF: _____

ASSAY LAB: AMDEL SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: AC 1991/82 177

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	Oil yield litres/tonne		ANALYSES	DESCRIPTION
6353	134.25	135.85	1.6	0.5 - 1.5			
54	135.85	137.45	"	"	"		
55	137.45	139.05	"	"	"		
56	139.05	140.65	"	"	"		
57	140.65	142.25	"	"	"		
58	142.25	143.85	"	"	"		
59	143.85	145.45	"	"	"		
60	145.45	147.05	"	"	"		
61	147.05	148.65	"	"	"		
62	148.65	150.15	1.5	"	"		
63	150.15	151.65	1.5	"	"		
64	151.65	153.25	1.6	"	"		
65	153.25	154.75	1.5	"	"		
66	154.75	156.35	1.6				
67	156.35	157.85	1.5	"	"		
6368	157.85	159.45	1.6	"	"		

REMARKS: _____

Shell METALS DIVISION

SAMPLE RECORD

Sheet ___ of ___.

SAMPLE TYPE: CORE FILLET . LOCATION / PROJECT: DDH CD7 COOMPANA SAMPLER: _____ DATE: _____ MAP / PHOTO REF: _____

ASSAY LAB: _____ SAMPLE DESPATCH _____ ASSAY REPORT NOS: _____

ORDER NO: _____ 178

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES											DESCRIPTION
				Oil yield litres/tonnes											
6335	105	108	3	0.5	- 1.5										
36	108	110.2	2.2	"	"										
37	110.2	111.6	1.4	"	"										
38	111.6	113.2	1.6	"	"										
39	113.2	114.8	1.4	"	"										
40	114.8	116.3	1.5	"	"										
41	116.3	117.9	1.6	"	"										
42	117.9	119.4	1.5	"	"										
43	119.4	121.0	1.6	"	"										
44	121.0	122.6	1.6	"	"										
45	122.6	124.1	1.5	"	"										
46	124.1	125.65	1.55	"	"										
47	125.65	127.25	1.6	"	"										
48	127.25	128.2	0.95	"	"										
49	128.2	129.62	1.42	"	"										
50	129.62	131.2	1.52	"	"										
51	131.2	132.75	1.55	"	"										
52	132.75	134.25	1.5	"	"										

REMARKS: _____

A P P E N D I X 3

Pontifex & Associates Pty. Ltd. Mineralogical Report No. 3549

Pontifex & Associates Pty. Ltd.

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

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MINERALOGICAL REPORT NO. 3549

23rd December, 1981

TO:	Mr. R. Weeden, Shell Co. of Australia Ltd., Metals Division, 230 East Terrace, ADELAIDE. 5000
YOUR REFERENCE:	3956/~~PW09~~ FO2/RJW
MATERIAL:	Drill Core samples (CD1)
IDENTIFICATION:	18127 to 18134
WORK REQUESTED:	Petrographic/mineragraphic descriptions
SAMPLES & SECTIONS:	Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

Each rock is described independently with some comparisons in the suite noted in the descriptions. The petrography confirms your basalt classification, however the native copper recorded in your field notes could not be confirmed in thin or polished section. It appears that this may be mistaken for ultrafine hematite permeating fine micas, possibly a primarily oxidised chlorite (although normal clear chlorite is ubiquitous through interstitial (intersertal ?) areas).

Fine dispersed hematite is fairly common, and may also be a primary component. Fine disseminated magnetite is oxidised, including leucoxenised. Sparse micro phenocrysts of plagioclase are altered to K-spar (shown on stained offcuts), together with hematite dust. (Note that the groundmass plagioclase stains a very pale yellow colour).

Samples 18127 and 18130 are almost identical, characterised by scattered, small, poikilitic pyroxene crystals.

Sample 18132 is a highly vesicular basalt enriched in deuteric quartz and epidote, (rather than the tuff suggested in the field notes).

18127 : coarse massive basalt or microdolerite, characterised by abundant ill-defined 'spots', as scattered poikilitic crystals of clinopyroxene;
also interstitial deuteric chlorite;
minor quartz filled vesicles, disseminated leucoxenised magnetite.

Field Note : Unmineralised lava above Cu-mineralisation.

About 50% of this rock consists of randomly interlocking plagioclase laths about 0.1 x 0.5 mm, with interstitial (or intersertal) chlorite, and very fine granular pyroxene altered to brownish turbid material. The chlorite may be deuteric, conceivably an altered glass (palagonite?), however some is seen to pseudomorphically replace probable amphibole.

The other 50% consists of highly irregular poikilitic grains of clinopyroxene, about 1 mm across, incorporating numerous randomly oriented plagioclase laths, with resultant ophitic texture.

Minor phenocrysts of plagioclase 1x5 mm, are largely replaced by K-spar and hematite dust and vesicles filled by deuteric quartz ± trace micaceous hematite. Accessory very fine leucoxenised magnetite, and trace fine micaceous hematite is disseminated.

18128 : vaguely layered, very fine vesicular basalt; weakly porphyritic in plagioclase, vesicles and minor fractures filled by chlorite and/or quartz; dispersed leucoxenitic and hematitic material, no evidence of native Cu.

Field Note : Native copper along fracture surfaces.

A vague layering is manifest by small (1 mm) vesicles, forming variably 5% to 25% of different ill-defined bands. Generally these vesicles are filled by extremely fine chlorite, but in some bands by fine quartz ± fine chlorite and rare epidote with fine micaceous hematite partly around rims. Rare irregular voids, caused by flow-top brecciation ?, are also filled by deuteric chlorite and quartz ± space hematite.

Minor (7-10%), small (0.1 x 1 mm) phenocrysts of plagioclase crystals are scattered.

These components all occur in a 'basaltic-textured' groundmass of slender plagioclase laths (microlites) with interstitial chlorite and ? actinolite after pyroxene, all clouded with extremely fine leucoxenitic material and dispersed equally fine hematite.

18129 : basalt, fairly extensive alteration of plagioclase, interstitial chlorite, irregular domains of deuteric quartz chlorite;
disseminated fine hematite/limonite.

Field note: Possible native Cu in groundmass.

This rock is more altered and has a more heterogeneous, less distinctive primary texture than in the two samples above. About 50% of it consists of plagioclase laths, partly altered to fine epidote, chloritic clays and sparse fine quartz, loosely packed, and random to locally similarly oriented.

Pale chlorite is interstitial to these laths, also occurs in highly irregular domains throughout, commonly with intergrown extremely fine quartz. These appear to be primary deuteric components, filling primary textural discontinuities which may well relate to flow brecciation.

Extremely fine limonite/hematite is dispersed throughout some essentially 'interstitial', some possibly replacing disseminated magnetite, and some penetrating extremely fine micas (? chlorite).

18130 : massive basalt, characterised by scattered poikilitic crystals of clinopyroxene, interstitial chlorite; one vesicle filled with chlorite and a fracture partly filled by quartz.

Field Note : Lava at base of copper mineralisation.

This rock is very similar to 18127, noteably the 'spottiness' produced by scattered poikilitic clinopyroxene.

About 70% of the rock consists of randomly interlocking plagioclase laths, spotted with sericite alteration, and with ubiquitous interstitial chlorite and altered extremely fine pyroxene. Accessory, fine, primary titaniferous magnetite is disseminated and extensively leucoxenised.

About 30% of the rock consists of clinopyroxene crystals about 1 mm across but highly irregular/poikilitic due to enclosure of numerous randomly oriented plagioclase laths. Minor plagioclase phenocrysts of this size are also scattered, altered as in 18127.

A single, large, spheroidal vesicle is filled by fine chlorite. A fracture is filled partly by fine quartz mosaic, partly by chalcedony, partly by micas stained with hematite/limonite. Trace fine, hematite is dispersed.

18131 : vesicular basalt;
intersticies within groundmass of chlorite altered pyroxene magnetite and hematite dust;
vesicles filled by chlorite epidote quartz, lesser K-spar and zeolite.

Field Note : Unmineralised hematite altered lava.

Most of this rock consists of a fairly homogeneous basalt, composed of small cloudy plagioclase laths, partly at random, and partly with a generalised common orientation. Chlorite and clouded (? uralitic) alteration products after very fine groundmass pyroxene are ubiquitous, more or less intergranular to the plagioclase. Fine (<0.1 mm) grains of magnetite, partly leucoxenised, are disseminated.

Vesicles (15%) up to 6 mm across are randomly disposed and filled by variable amounts of chlorite, coarse bipyramidal quartz crystals, fine granular epidote and an isotropic zeolite in one. Trace K-spar occurs in some vesicles, and this mineral also replaces some plagioclase laths.

Accessory hematite dust is dispersed and extremely fine micaceous hematite occurs as discontinuous rims around some vesicles.

18132 : very highly vesicular basalt;
vesicles filled with deuteric quartz ± epidote crystals,
groundmass almost completely replaced by saussuritic to
fine crystalline epidote lesser quartz and chlorite;
trace micaceous hematite.

Field Note : Lapilli tuff below copper mineralisation.

About 50% of this rock consists of a loosely packed aggregate of spheroidal vesicles, ranging in size from 0.15 to 3 mm diameter, and locally coalescing. These are filled by quartz some of which is radial and in sheaf-like mosaics, and commonly accompanied by minor, extremely small epidote prisms.

Minor, patchy, irregular voids (10%) are also filled by fine crystalline quartz.

These components are all crowded within a basaltic-crystalline groundmass which has been almost completely replaced by cloudy, saussuritic to extremely fine crystalline epidote, minor fine quartz and chlorite.

Accessory extremely fine micaceous hematite, occurs in the groundmass and rarely in vesicles.

18133, 18134 : basalts;
weakly altered including oxidised/leucoxenised disseminated magnetite;
K-spar + hematite dust after sparse plagioclase phenocrysts;
stringers of quartz, K-spar, chlorite.

Field Note : Basalts near base of sequence.

These rocks have essentially the same composition and texture, although 18134 is finer crystalline than 18133 (ie. plagioclase laths in the groundmass respectively about 0.2 mm compared with 0.4 mm).

These plagioclase laths form about 40% of the rock, and are randomly interlocking variable to a generalised similar orientation. Minor small plagioclase phenocrysts are replaced by K-spar and hematite dust.

Very small crystals of pyroxene (20-30%) are evenly scattered, and extremely fine but fairly clear chlorite (30%) is ubiquitous through interstitial areas within the plagioclase aggregate, also in irregular voids ± fine deuteric quartz.

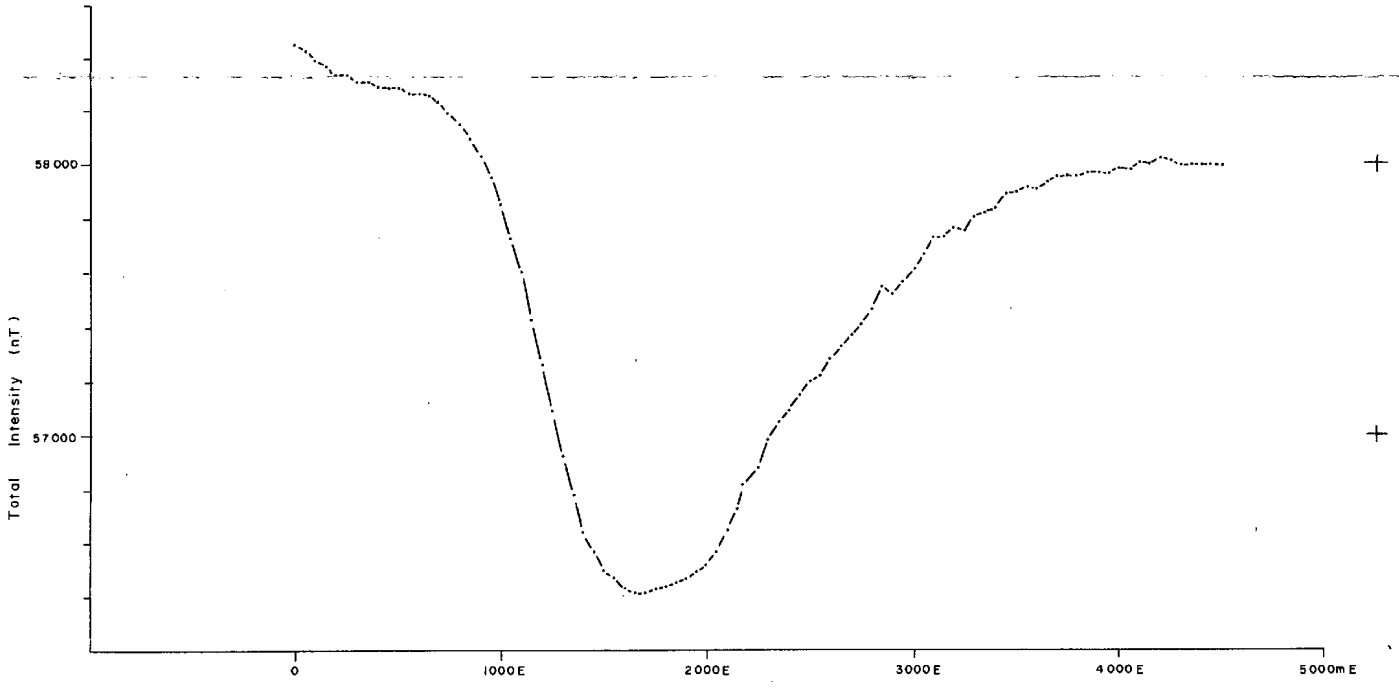
In 18134 pyroxene tends to form small poikilitic crystals partly enclosing plagioclase laths, the same as is developed to a greater extent in 18127 and 18130.

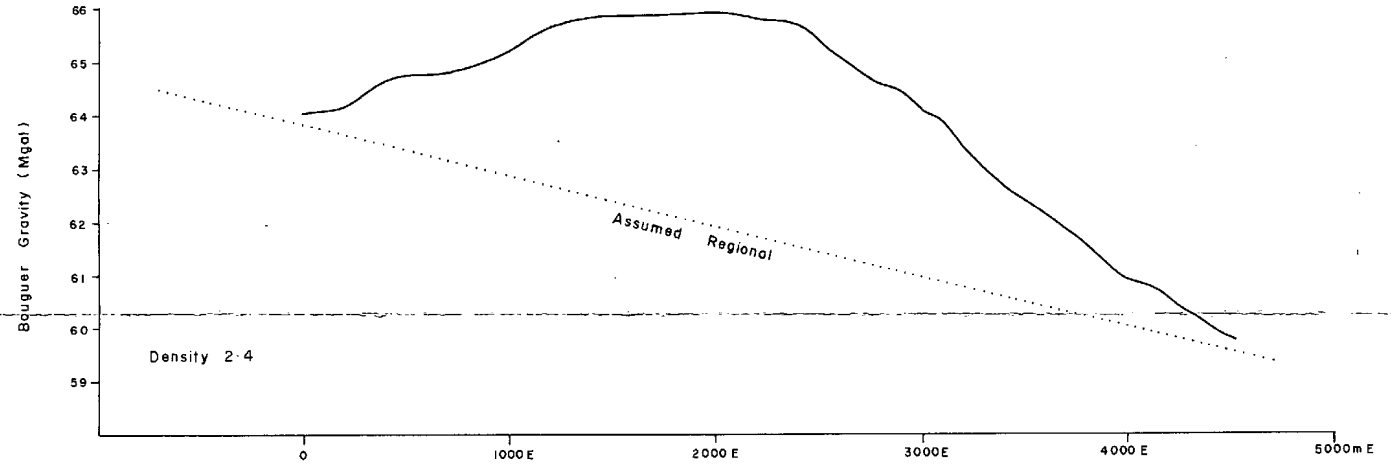
Fine disseminated magnetite is more abundant in 18134 than in 18133. In both the magnetite is oxidised and partly leucoxenised, with attendant limonite/hematite staining in 18134.

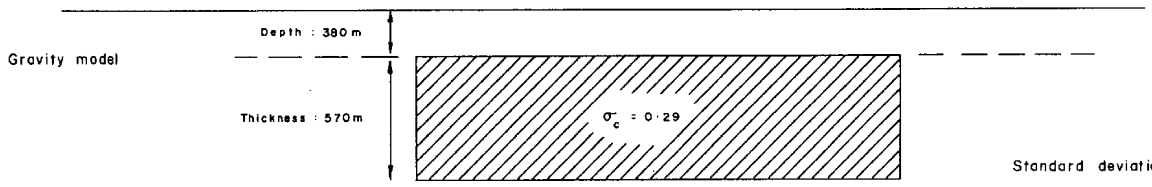
A thin stringer in 18133 consists of quartz and K-spar, a thin vein in 18134 consists of deuteric chlorite, extremely fine quartz clouded with hematite dust and minor K-spar.

APPENDIX 4

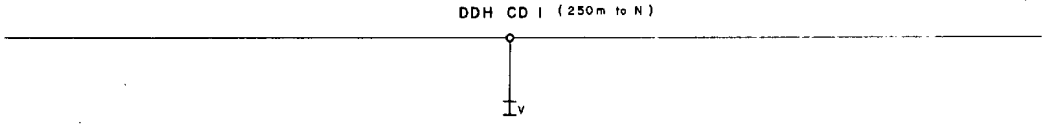
Computer Logs of Density, Gamma, Neutron, Self Potential and Resistance for CD 1, CD 3, CD 6 and CD 7.







Standard deviation of fit : 0·08



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY PM3 LINE 6000N	
SCALE 1:25000	DATE NOV. 1981
AUTHOR A.H.B.	DRAWN B.J.O.
OFFICE ADEL.	REP.No.
DRG.No A/PW09942	FIG.No.

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

SOUTH AUSTRALIA

REPORT ON E.L. 747, BUNABIE ROCKHOLE
E.L. 748, HUGHES
E.L. 749, NULLARBOR PLAIN

FOR THE QUARTER ENDING APRIL 20TH, 1982

AUTHOR: R.J. WEEDEN
DATE: APRIL, 1982
REPORT NO. 08.1129
COPY NO. 1

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1.0 INTRODUCTION

Exploration Licences 747, 748 and 749 were granted on the 20th October, 1980 for a period of one year. The term was extended for a further year on the 8th September, 1981.

The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250,000 sheet areas, South Australia adjacent to the border with Western Australia.

The licences are referred to as Bunabie Rockhole (E.L. 747) Hughes (E.L. 748) and Nullarbor Plain (E.L. 749) and collectively form the Coompana Project.

The licences are the subject of a joint venture with Dampier Mining Company Ltd.

Main exploration targets for the three licences are oil shale within the Cretaceous Madura Formation and base metals associated with geophysical anomalies derived from sources in the Pre-cambriam basement.

2.0 WORK COMPLETED

No field activity was carried out during the reporting period.

Detailed ICP AAS was carried out on three pieces of quarter core from DDH CD 1 to test for anomalous elements not detailed in routine analysis. (Refer to Appendix I). High tungsten values in all three samples are probably due to contamination as no tungsten minerals were identified in either thin or polished section.

Results from petrology, magnetic properties and geochemistry for DDH CD 1 were received from B.H.P. during the quarter.

A summary of the B.H.P. report is detailed below while the full report is attached in Appendix II.

2.0 Contd.

The volcanics between (318.6 and 360.2 m) were identified as alkali olivene basalts of non-orogenic continental origin with no deformation characteristics. The basalts consist of variably altered flows with amygdales containing altered chlorites and hematised magnetite. Traces of native copper have been detected within the more altered amygdaloidal oligoclase basalts associated with minor quartz and calcite. Traces of chalcopyrite were also recorded within the oligoclase amygdaloidal basalts. This tends to confirm work completed by Pontifex during the last quarter. (Refer to report 08.1121).

B.J. Gilbert, the senior petrologist within the research department of BHP suggests a late stage hydrothermal precipitation of native copper possibly derived from basement rocks and as such suggests extending the drill hole to test the basement for Roxby Downs' type mineralization.

Magnetic property measurements were conducted on some of the core from DDH CD 1 by the Earth Resources Foundation at the Sydney University.

Results indicate that a negative magnetic anomaly would be generated by the strong remanent magnetic polarisation almost directly opposite to the present earth's field.

Further gravity modelling on line 6000 E over anomaly PM 4 (Refer to Fig. 2) and Line 6400 E over anomaly PM 3 (Refer to Enclosure No. 1) was conducted using the revised density measurements from DDH CD 1 in conjunction with minor variations in the Shell GRAVMOD computer program.

Compilation and reassessment of data is currently in progress in order to delineate targets for further follow-up.

3.0 KEYWORDS

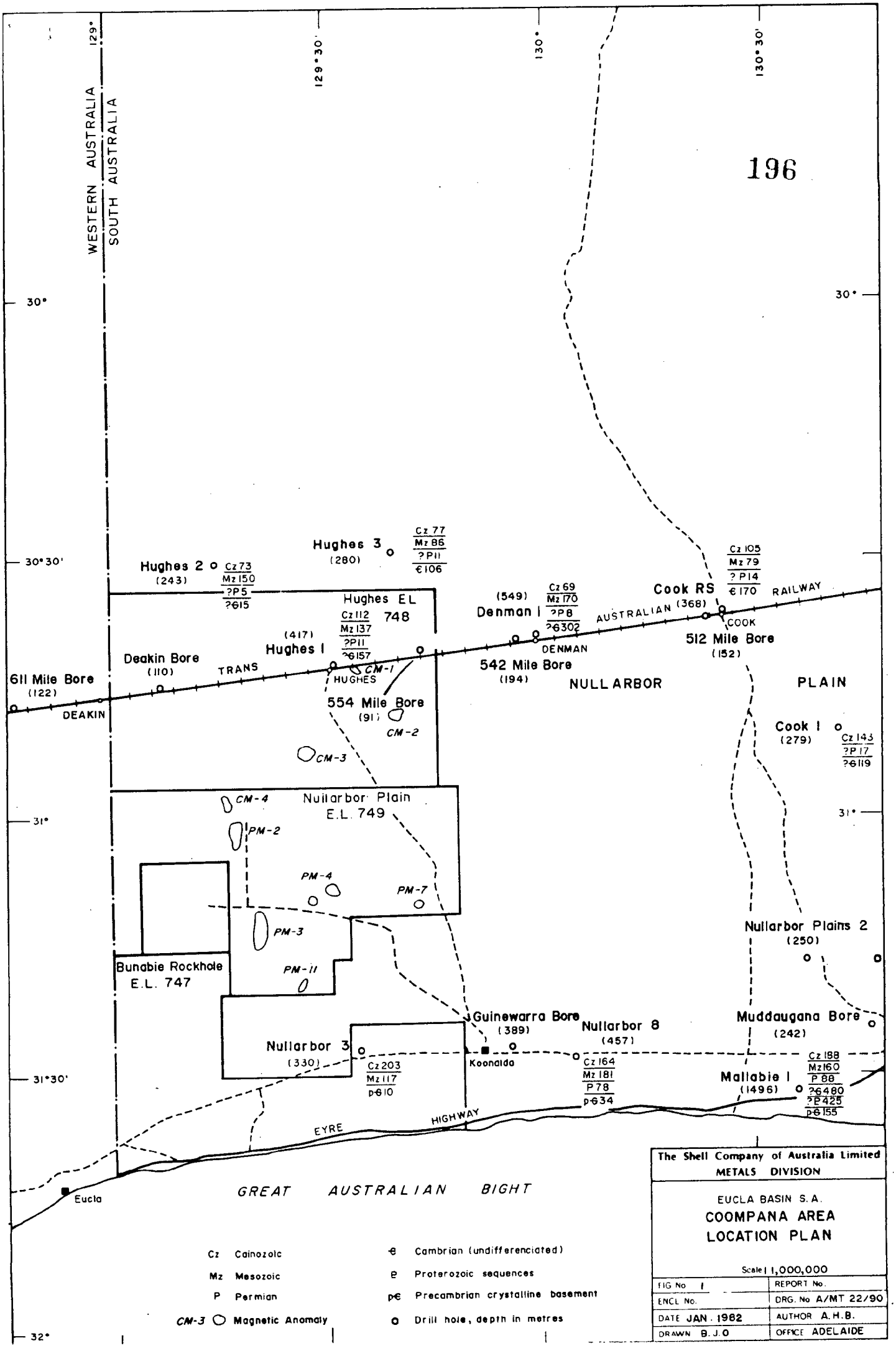
Coompana, Cook, Eucla Basin, Oil shale, base metals, diamond drilling, Gravity modelling.

3/..

4.0 EXPENDITURE

A summary of expenditure as at March 31, 1982 is detailed below.

	Jan/Mar 1982	Project to date
Bunabie Rockhole E.L. 747		
Total	0	3775
Nullarbor Plain E.L. 748		
Personnel and Personnel Burden	206	
Support Costs	1331	
Analysis/Assays	365	
Geological, Drawing and Computer	58	
General Admin.	196	
Total	2156	180069
Hughes E.L. 749		
Total	0	17872

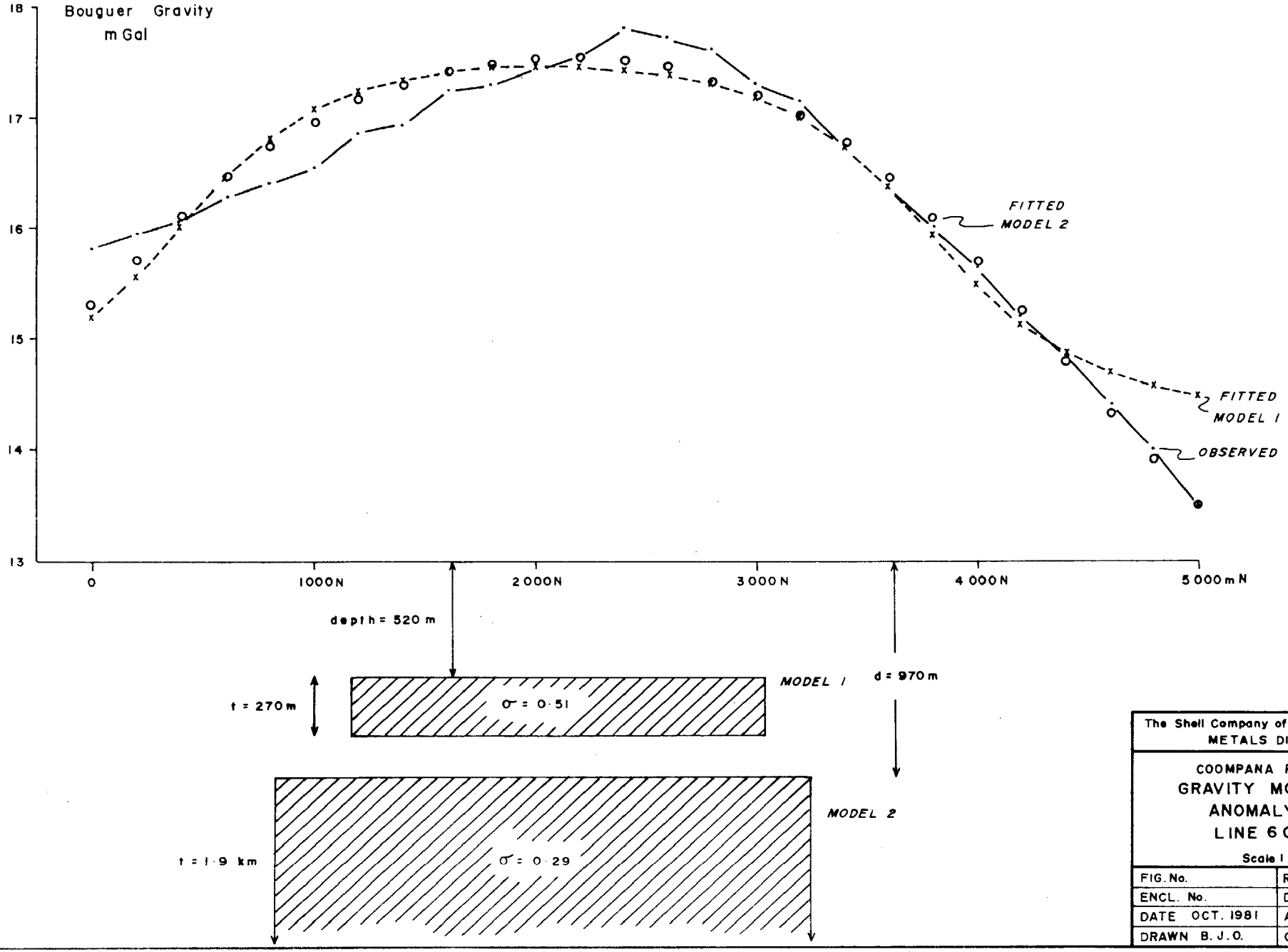


The Shell Company of Australia Limited
METALS DIVISION

EUCLA BASIN S.A.
COOMPANA AREA
LOCATION PLAN

Scale 1:1,000,000

FIG No. 1	REPORT No.
ENCL No.	DRG. No A/MT 22/90
DATE JAN. 1982	AUTHOR A.H.B.
DRAWN B.J.O	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY PM 4 LINE 6000E Scale 1:25 000	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. A/PW 09/3
DATE OCT. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

A P P E N D I X I

BHP Co. Ltd. Exploration Department Report E 1/15

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
Petrology Section

245-273 Wellington Road
Clayton, Victoria 3168
P.O. Box 264, Clayton
Telephone 560-7066

19 FEB 1982

Memo to: MR. F. BUNTING, EXPLORATION, CAMBERWELL.

Date 8th Feb., 1982.
Our Ref: DJG:DK 199
Your Ref:
File: M600
Date:

Subject: E1/15: Petrology of volcanics with an alkali olivine basalt/trachyte association with comments on the occurrence of native copper, diamond drill hole CD1, Coompana, South Australia.

	INFO	ACT
cc	RJW	
	24/2/82	
	COOMANA	

Introduction:

Several samples of diamond drill core from CD1, Coompana, S.A. were submitted for petrological examination. The samples were collected from the interval 318.55m to 360.15m.

The petrography of these samples is outlined in the Appendix.

Summary and conclusions:

1: These volcanics have been identified as altered amygdaloidal oligoclase basalt (mugearite), altered amygdaloidal oligoclase trachybasalt and incipiently altered ophitic chloritised olivine andesine basalt (hawaiite).

Petrogenetically, these volcanics can be classified as alkali olivine basalts of non-orogenic continental origin; they have an affiliation with the trachytes and may possibly be related to continental rifting. The volcanics are undeformed.

2: At least three and possibly four separate flows have been recognized; each flow unit comprises a basal ophitic chloritised olivine andesine basalt and an amygdaloidal oligoclase basalt towards the top. The amygdaloidal oligoclase basalts are more hematised and are generally more altered with a propylitic assemblage comprising chlorite epidote, calcite and quartz.

Supergene weathering may also have occurred in these amygdaloidal flow tops since some chlorite is altered to smectite and the magnetites have been hematised, though definite martites are absent.

3: Minute <1 to 90 µm grains of native copper have only been detected in the more deuterically altered amygdaloidal oligoclase basalts, where it occurs in the outer quartz rims of amygdales, as minute inclusions in plagioclase microlites and in post chloritisation/epidotization veinlets where it is closely associated with calcite and quartz. It is interesting to note that traces of chalcopyrite have been recorded within oligoclase basalt amygdales where it occurs between late stage epidote crystals associated with earthy hematite and also in the ophitic andesine basalt where it occurs as triangular interstitial patches between plagioclase microlites (possible magmatic origin?).

.../2

4: Two possible modes of origin are considered for the native copper:

(i) Supergene oxidation of pre-existing chalcopyrite.

(ii) Late stage hydrothermal precipitation.

200

The last mentioned mode of origin is favoured where native copper has precipitated under oxidizing and relatively high P_h conditions due to its co-existence with calcite.

The ultimate origin of this native copper is not fully understood but it is tantalising to consider its derivation from possible copper-bearing basement rocks.

5: Some of the ophitic chloritised olivine andesine basalts contain 7-10 vol.% disseminated high temperature subhedra/euhedra of magnetite with exsolution rutile.

Recommendation:

If there is any doubt that the magnetic anomaly over this Coompana occurrence cannot be entirely explained by the magnetite content of this volcanic sequence, the drill hole should be deepened to explore the underlying basement. Felsic volcanics (trachytes?) have been recorded by WMC, overlying the hematitic breccias of the Roxby Downs Deposit.

David J. Gilbert

D.J. Gilbert
Senior Petrologist.

cc: Dr. A. Goode)
Dr. C. Blain) Camberwell
Mr. J. Harms)
Dr. P. Haslett - Adelaide.
Mrs. D. Jenkinson - Camberwell
Office Library.

APPENDIX PETROGRAPHY OF VOLCANICS FROM CD1

COOMPANA, S.A.

MRL 13468

Drill Hole No. and Interval: CD1, 318.55m

Hand Specimen Description : Brecciated (in part) greenish fine grained amygdaloidal volcanic rock. The sample is non-magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Altered amygdaloidal fine grained volcanic rock of probable alkali basaltic composition. Relict igneous texture is evident with random microlites of feldspar, ferromagnesians now altered to epidote, chlorite and clay. Scattered amygdales are filled with epidote, quartz and clay; the breccia or fracture zone is also filled with subpolygonal unstrained quartz, epidote and calcite.

The sample contains about 2 vol.% disseminated patches of earthy hematite/leucoxene (after magnetite?) and displays a propylitic alteration assemblage comprising epidote, chlorite and calcite. This volcanic rock is undeformed and also shows signs of supergene weathering with hematisation of earlier magnetites and the replacement of some chlorites by clay (smectite?).

MRL 13469

Drill Hole No. and Interval: CD1, 323.1m

Hand Specimen Description: Reddish brown (hematitic) fine grained amygdaloidal volcanic rock with abundant scattered greenish amygdales. The sample is weakly magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Altered (chloritized and epidotized) amygdaloidal oligoclase* basalt (mugearite).

A well preserved igneous texture is evident with abundant random plagioclase microlites, abundant scattered amygdales and occasional larger plagioclase/alkali feldspar phenocrysts. The amygdales are generally filled with epidote, chlorite and quartz in varying amounts, often with an outer rim of quartz, an intermediate zone of chlorite and an inner core of epidote which has been last to crystallise.

Plagioclase in the igneous matrix is also partly replaced by chlorite and epidote indicating a propylitic alteration assemblage.

The reddish colouration is due to fine secondary hematite, probably after original magnetites, though no definite martites were observed.

---

* Plagioclase microlites mainly oligoclase but there is a range in composition from oligoclase to andesine (i.e. An_{15} - An_{32}).

Rare minute (<1 to 30 µm) native copper* grains were observed in the outer quartz rim of some amygdales and as occasional inclusions in plagioclase microlites.

The native copper may be related to late stage hydrothermal alteration, where oxidizing conditions would have prevailed. In the amygdale, native copper is clearly related to earlier formed quartz. Some amygdales are aligned roughly perpendicular to the core axis.

MRL 13470

Drill Hole No. and Interval: CD1, 323.7m

Hand Specimen Description : Reddish brown (hematitic) fine grained amygdaloidal volcanic rock with scattered green amygdales and veinlets of calcite with associated minute specks of native copper. The sample is non-magnetic, non-radioactive and shows very pale fluorescing calcite in the veinlets.

Rock Identification and Comments: Altered (chloritized and epidotized) amygdaloidal oligoclase** basalt (mugearite).

Well preserved igneous texture is evident with random microlites of plagioclase (some epidotised), occasional larger plagioclase phenocrysts, rare chloritised ferromagnesians and abundant chlorite/epidote/quartz filled amygdales. Both chlorite and epidote also occur as alteration products in the igneous groundmass.

The opaques comprise mainly fine earthy hematite, some with magnetite residuals and some pseudomorphing ferromagnesians. Subhedral hematite/rutile intergrowths probably represent earlier high temperature magnetites with rutile exsolution blades, subsequently martitized due to supergene effects. Scattered leucoxene is also evident,possibly after ferromagnesians.

A crosscutting veinlet of calcite (stain test) and quartz contains rare <1 - 90 µm grains of native copper. The close association of native copper with calcite suggests deposition under conditions of high p_h and moreover, this veinlet apparently post-dates the chlorite and epidote filled amygdales, indicating very late stage fluid circulation and deposition.

---

* Major Cu, trace Fe according to SEM.

** Plagioclase is mainly oligoclase but the composition ranges from oligoclase to andesine (i.e. An_{15} - An_{34}).

MRL 13471

Drill Hole No. and Interval: CD1, 329.4m

Hand Specimen Description : Grey "spotted" basaltic volcanic rock. The sample is strongly magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Ophitic chloritised olivine andesine* basalt (hawaiite).

A bulk sample of this rock was examined by XRD to determine possible presence of prehnite, zeolites and feldspathoids. These mineral phases were absent and the following were confirmed:

Andesine	(dominant)
Quartz	(sub-dominant)
Chlorite	(accessory)
Augite	(accessory)
Mica	(trace)

This sample appears to represent a relatively fresh alkali olivine basalt underlying an amygdaloidal flow, both representing one extrusive unit. The spotting observed in the hand specimen is due to very well developed ophitic texture of igneous origin in which subhedra of augite completely enclose plagioclase microlites and occasional chloritised olivine subhedra/euhedra. The augite shows part alteration to an unidentified brownish phase.

A micro porphyritic texture is also present where occasional large chloritized and sericitized carlsbad-twinned alkali feldspar phenocrysts (sanidine according to stain and optics), are enclosed in the groundmass.

Crosscutting veinlets of earthy hematite, chlorite, quartz and clay are also evident, without mineralisation.

In reflected light, about 7 vol.% subhedra/euhedra of high temperature magnetite with rutile exsolution intergrowths together with occasional patches of earthy hematite, are present. Only incipient hematisation of magnetite was observed.

Petrogenetically this rock type represents a non-orogenic continental alkali olivine basalt association. In this case, all the olivines have been altered to chlorite and secondary magnetite.

---

* The plagioclase is mainly andesine but shows a wide range in composition between oligoclase and labradorite (i.e. An_{13} - An_{54}).

MRL 13472

Drill Hole No. and Interval: CD1, 340.2m

Hand Specimen Description : Mottled very fine grained greenish grey to reddish-brown (hematitic) amygdaloidal volcanic rock. The sample is non-magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Altered (epidotised and chloritised) amygdaloidal oligoclase trachy basalt*.

A bulk sample of this rock was examined by XRD, where the following minerals were recorded:

Chlorite	(dominant)
Quartz	(sub-dominant)
Epidote	(accessory)
Potash feldspar	(accessory)
Smectite	(accessory)
Plagioclase	(trace)

The sample shows a relict igneous texture with abundant random epidotised oligoclase microlites, abundant potash feldspar microlites and chlorite/epidote/quartz/clay/earthy hematite filled amygdales. Some of these amygdales are aligned, making an angle of about 50^{o} to the core axis which indicates a dip of 40^{o}. Occasional scattered euhedral pseudomorphs of quartz after feldspar phenocrysts and chlorite after ferromagnesian phenocrysts, are also evident.

In reflected light, earthy hematite is the main opaque mineral, though a rare microveinlet of <1 to 6 µm chalcopyrite occurs between epidote grains inside some amygdales. This chalcopyrite is sometimes associated with intergranular earthy hematite. Native copper is absent and one 6 µm yellow metallic grain was recorded in the matrix.

MRL 13473

Drill Hole No. and Interval: CD1, 343.4m

Hand Specimen Description : Very fine grained grey "spotted" basaltic rock with occasional amygdales. The sample is moderately magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Fine grained ophitic chloritised olivine andesine basalt** (similar to MRL 13471, though finer grained).

Again the spotting is due to well developed ophitic texture in which augite subhedra wrap themselves around plagioclase microlites. Other igneous textures include scattered subhedral to euhedral chloritized and iron-oxide impregnated relict olivine phenocrysts, occasional large carlsbad-twinned potash feldspar phenocrysts and rare quartz/chlorite

---

* Roughly equal proportions of potash feldspar (XRD, stain test) and epidotised oligoclase (optics). Some residual oligoclase shows a composition An_{12} - An_{28}.

** The plagioclase is mainly andesine though it shows a range in composition from andesine to labradorite (i.e. An_{32} - An_{52}).

filled amygdales. The potash feldspar phenocrysts* show incipient alteration to sericite, chlorite, clay, calcite and rare epidote, indicating minor propylitic alteration. Chlorite also occurs in the groundmass between plagioclase microlites, some of which show a vague flow orientation. Rare crosscutting quartz veinlets are also evident.

In reflected light, about 10 vol.% opaques are evident; these comprise subhedra and euhedra of martitised magnetite with rutile exsolution lamellae (high temperature rapid cooling origin).

MRL 13474

Drill Hole No. and Interval: CD1, 344.65m.

Hand Specimen Description : Mottled fine grained reddish-brown (hematitic) amygdaloidal volcanic rock. The sample is non-magnetic, non-radioactive and contains no fluorescent minerals.

Rock Identification and Comments: Hematitic epidotised and chloritised amygdaloidal oligoclase**basalt (mugearite). Pronounced igneous texture with abundant felted vaguely aligned microlites of plagioclase, abundant epidote, chlorite and calcite filled amygdales together with scattered chloritised epidotized and possibly analcitized?***larger phenocrysts of plagioclase and carlsbad-twinned potash feldspar. Fine grained epidote and chlorite are also present in the groundmass indicating propylitic alteration.

In reflected light, the main opaque minerals are scattered patches of crystalline hematite, earthy hematite and rare possible chalcopyrite.

MRL 13475

Drill Hole No. and Interval: CD1, 360.15m

Hand Specimen Description: Fine grained grey "spotted" basaltic rock. The sample shows microfracture surfaces coated with chlorite and reddish earthy hematite. The sample is moderately magnetic, non-radioactive and contains no fluorescent minerals.

---

* Biaxial negative, with very small 2V which indicates sanidine.

** Mainly oligoclase, though the composition ranges from oligoclase to andesine (i.e. An_{30} - An_{32}).

*** Both plagioclase and potash feldspar show part alteration to a low relief isotropic phase, possibly analcite (optical identification).

Rock Identification and Comments: Ophitic chloritised olivine andesine* basalt. (hawaiite)

Well developed igneous ophitic texture is evident with subhedra of augite enclosing plagioclase microlites, which is the cause of the spotted texture in the hand-specimen.

Scattered larger phenocrysts of partly chloritised, sericitized and epidotised potash feldspar as well as scattered potash feldspar groundmass microlites are also evident. This ophitic basalt originally contained olivine subhedra, now completely altered to chlorite and magnetite. Chloritic alteration is also present in the groundmass.

As in previous samples of this rock type, the augite shows alteration to an unidentified brownish anisotropic phase and it seems that these ophitic basalts represent the flow bottoms.

Occasional veinlets of quartz, chlorite-quartz and calcite-quartz-hematite are also present.

In reflected light, the opaques (7 vol.%) comprise mainly subhedra and euhedra of hematised magnetite with exsolution blades of rutile (high temperature origin). One rare 60 µm grain of chalcopyrite occurs interstitially between plagioclase microlites (magmatic origin?). The magnetites in this sample are more hematised than those in MRL 13471.

---

* The plagioclase shows an andesine composition (i.e. An_{33} - An_{44}).

A P P E N D I X II

Amdel Report MD 4078/82 "Testing of Cores"

The Australian
Mineral Development
Laboratories

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

208

10 March 1982

3/114/0
MD 4078/82

Shell Company of Australia Limited
Metals Division
P.O. Box 1319
ADELAIDE SA 5000

Attention Mr R Weeden

REPORT MD 4078/82

YOUR REFERENCE:	Order No. 3585
SUBJECT:	Testing of Cores (DDH CD1)
MATERIAL:	18128, 18132 and 19134
DATE RECEIVED:	4 February 1982
INFORMATION REQUIRED:	Bulk Density and Chemical Analyses

Investigation and Report by: Lyn Day

Manager, Mineral & Materials Sciences Division: Dr William G. Spencer

for Norton Jackson
Managing Director

ja

Pilot Plant: Osman Place
Thebarton S.A.,
Telephone 43 8053

Branch Laboratories:
Perth W.A.
Telephone 325 7311
Melbourne Vic.
Telephone 645 3093

1. INTRODUCTION

Three samples of quarter core labelled 18128, 32 and 34 were submitted for bulk density determinations for gravity modelling and for chemical analysis.

2. PROCEDURES

The samples were tested on an as received basis. Bulk densities were determined by weighing the samples, soaking then im water for 24 hours and then reweighing them suspended in water and with surface water removed.

The chemical analyses were determined using inductively coupled plasma atomic emission spectrometry.

3. RESULTS

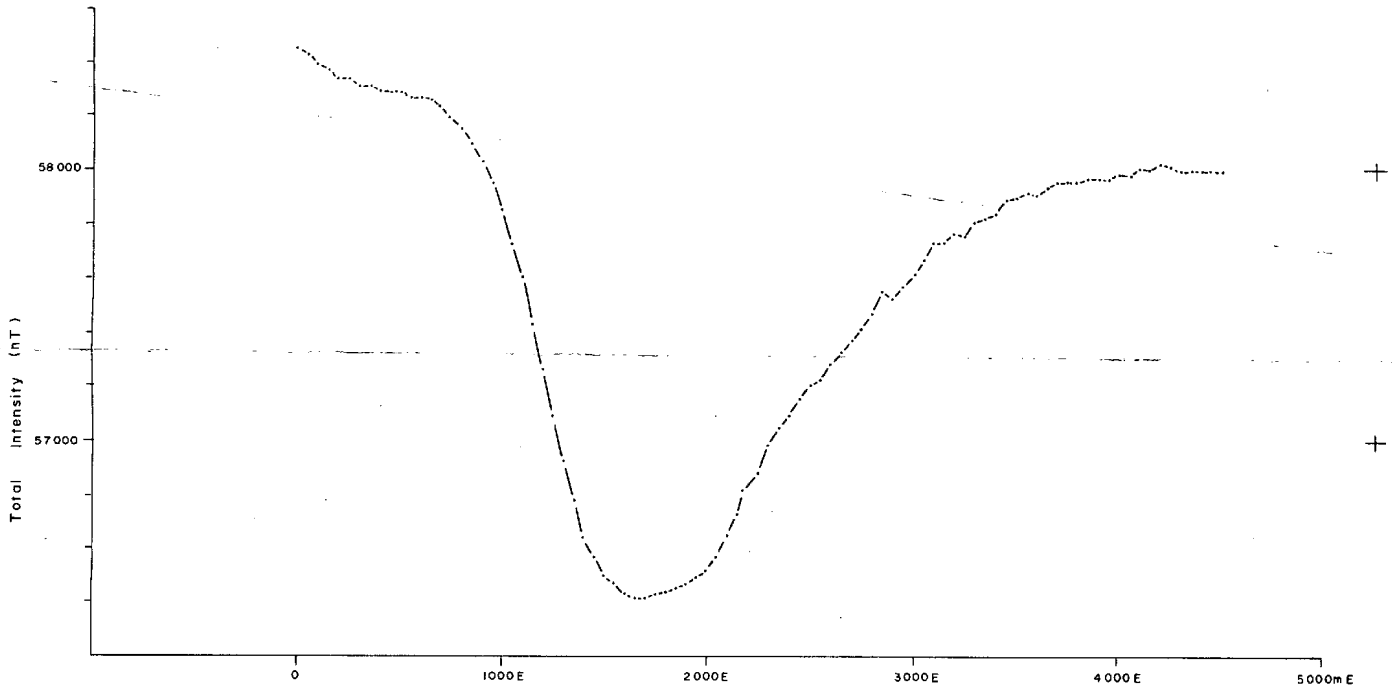
3.1 Bulk Densities

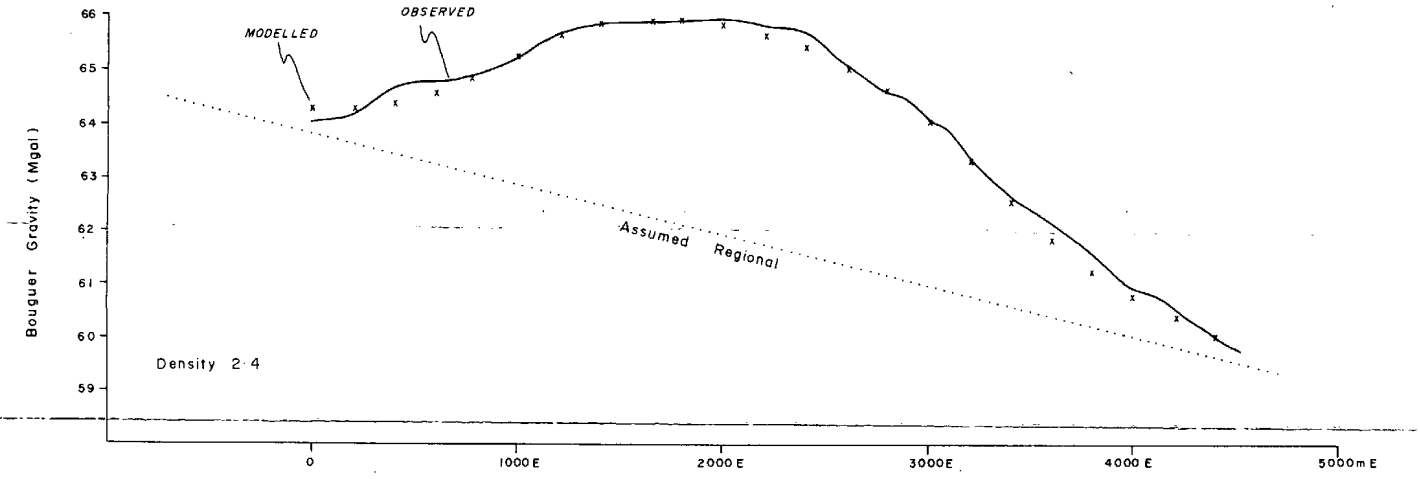
Sample		Bulk Density gm/cm^3
18128	322.8m	2.73
18132	337.9m	2.77
18134	360.8m	2.86

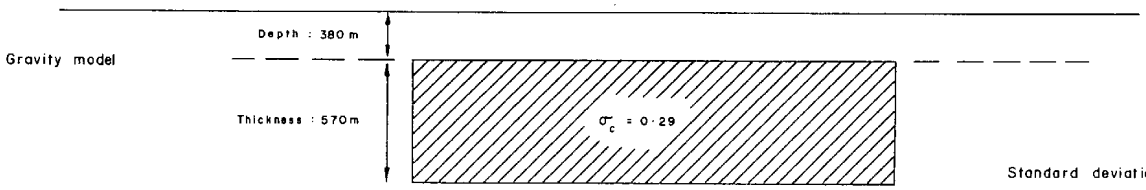
3.2 Chemical Analyses

CDL: 322·8m 337·9m 360·8m

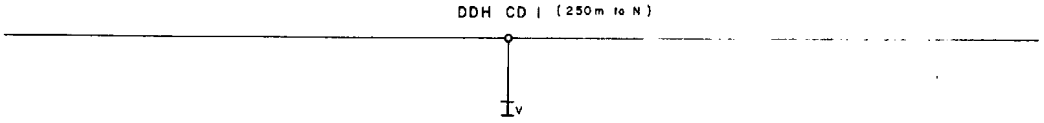
Element	18128	18132	18134
	ppm		
Ag	2	<1	2
As	<5	<5	<5
Bi	<10	10	10
Cd	<1	1	<1
Co	72	185	68
Cr	97	54	94
Cu	145	150	44
Fe	7.8%	4.4%	8.7%
Mn	1000	565	1270
Mo	3	2	<1
Ni	170	80	152
Pb	10	20	10
S	<50	<50	<50
V	236	137	242
W	260	305	85
Zn	88	52	93
La	14	18	14
Nb	2	5	5
Sb	<10	10	<10
Sn	7	15	8
Ta	<5	<5	<5
Ti	5410	2890	6300
Y	23	14	26







Standard deviation of fit : 0·08



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY PM3 LINE 6000N	
SCALE 1:25000	DATE NOV. 1981
AUTHOR A.H.B.	DRAWN B.J.O.
OFFICE ADEL.	REP.No.
DRG.No A/PW09442	FIG.No.

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

SOUTH AUSTRALIA

REPORT ON E.L.747, BUNABIE ROCKHOLE
E.L.748, HUGHES
E.L.749, NULLARBOR PLAIN

FOR THE QUARTER ENDING JULY 20TH, 1982

AUTHOR: R.J. WEEDEN
REPORT NO.08.1204
DATE: AUGUST, 1982
COPY NO. 1

DISTRIBUTION:

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4	B.H.P. Adelaide
5	B.H.P. Melbourne

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Exploration licences 747, 748 and 749 are due to expire on the 20th October, 1982.

The licences are located in the Eucla Basin and cover parts of COOMPANA and COOK 1:250 000 sheet areas, South Australia adjacent to the border with Western Australia.

The licences are referred to as Bunabie Rockhole (E.L.747) Hughes (E.L.748) and Nullarbor Plain (E.L.749) and collectively form the Coompana Project.

The licences are the subject of a joint venture with Dampier Mining Company Ltd.

Main exploration targets for the three licences are oil shale within the Cretaceous Madura Formation and base metals associated with geophysical anomalies derived from sources in the Pre-Cambrian basement.

2.0 WORK COMPLETED

No field work was carried out during the reporting period.

2.1. Magnetic Modelling

Because of the recognised presence of remanance and the unknown strength and inclination of the remanent vector prior to the drilling of DDH CD 1 (anomaly PM3) no detailed magnetic modelling was attempted on the Coompana ground magnetics. The emphasis in the preliminary interpretation was on estimating depths to the top of the source.

After completion of DDH CD 1 limited magnetic modelling was carried out by Shell and BHP assuming three-dimensional prisms, a field strength of 58500 T and an inclination of +64° (i.e.exactly opposite to the earth's magnetic field).

Modelling of PM3 by BHP indicates a deeper plug-like source at a depth of approximately 500 m overlain by a shallower more magnetic sill-like source at approximately 300 m depth and off-set to the west.

Similar combinations of pipe shaped bodies corresponding to mafic intrusives and sill shaped bodies corresponding to intrusives and/or extrusive lithologies can be postulated to explain most of the magnetic features in the Coompana region.

The results of the magnetic property measurements carried out by the Earth Resources Foundation at Sydney University are listed in Table 1.

...../2

Table 1: Magnetic property measurements for DDH CD 1

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Sample Name	Inclination of Remanent Vector (Degrees)	Strength of Remanent Vector (emu x 10^{-6})	Q	Magnetic susceptibility (cgs x 10^{-6})
CDI/321.3	-63	39500	14	5000, 5075, 5100
CDI/328.4	+62	43000	12	6200, 6500, 6800
CDI/352.9	+67	29700	11	4200, 5025, 5300
CDI/357.5	+85	4200	3	2400, 2600, 3000
CDI/3600	+54	9400	5	3250, 3300, 3600

Notes

1. The inclination of the present earths field at Coompana is approximately $+64^{o}$.
2. Q = remanent strength/induced strength.
3. The 3 susceptibilities quoted are minimum, mean and maximum.

Since drill hole DDH CD 1 was vertical the inclinations measured show that with the exception of CDI/3213, the rocks have a remanent magnetic polarization almost directly opposite to the present earths field. They would therefore, be expected to generate a negative magnetic anomaly.

The strength of the remanent magnetization ranges from 3 to 14 times that of the induced magnetization (due to magnetic susceptibility only). Treating the resultant magnetization as being caused by an "equivalent susceptibility" yields a value of around 30,000 x 10^{-6} cgs which is extremely high!

On the basis of these measurements, a substantial body of the rocks samples would be expected to generate a large and dominantly negative magnetic anomaly. Magnetic susceptibility measurements were also recorded on drill core from DDH CD 1. These are presented in figure 2.

2.2. Gravity Modelling

Density measurements on 14 basalt samples from DDH CD 1 (Table 2) show an average density of 2.67 gm/cc ranging from 2.46 - 3.12 over 6 metres.

This average density is probably not representative of the basalt sequence intersected as the density recorded is unlikely to be contributing to the source of the gravity anomaly recorded over magnetic anomaly PM 3.

Results of the preliminary gravity modelling completed prior to the drilling programme are summarised in Table 3. Modelling using vertical three dimensional prisms and best fit criterion suggested prism shaped sources with density contrasts in the range 0.2 - 0.3; depths of 400 m to 1000 m and thicknesses of 600 m - 2000 m.

Subsequent modelling of line 6000 N, anomaly PM 3 (Model 3) indicates the data can be fitted equally well with a prism 3000 m thick at a depth of 400 m having a density contrast of 0.15 (figure 3).

...../3

TABLE 2

SAMPLE TYPE: QUARTER CORE

Sample No.	Location		Interval	Description
	From	To	m	Density gcm-3
18116	322.8	323.3	0.5	2.71
18117	323.3	323.8	0.5	2.46
18118	323.8	324.3	0.5	2.54
18119	324.3	324.8	0.5	2.53
18120	324.8	325.3	0.5	3.12
18121	325.3	325.8	0.5	2.66
18122	325.8	326.3	0.5	2.64
18123	326.3	326.8	0.5	2.67
18124	326.8	327.3	0.5	2.48
18125	327.3	327.8	0.5	2.67
18126	327.8	328.3	0.5	2.60

TABLE 3

COOMPANA PROJECT - SUMMARY OF GRAVITY MODELLING RESULTS

Magnetic Anomaly	Line	Mag. Peak	Mag. depth est.	Location of Gravity Peak	Max. Residual Gravity m Gal	Depth Est. m	Density Contrast	Thickness	Width m	Standard Dev.of Gravity Model fit
PM-2	3000N	2000E	440-560	1800E	4.5	940	0.23	1550	2900	0.04
PM-3	4000N	2100E	330	2200E	4.0					
*	6000N	1700E	280	1800E	4.0	Model No.1 385m	0.29	570	1180	0.08
						Model No.2 760m	0.29	930	1120	0.05
						Model No.3 400m	0.15	3000		
PM-4*	2000E	2800N	360-520	no significant anomaly						
	6000E	2400N	480-520	2500N	3.0	520	0.51	270	1960	0.13
						970	0.29	1920	2500	0.03
PM-7	3000N		380-560	no significant anomaly						
CM-4	3000N	3400E	400-500	3200E	2.5	410	0.21	680	1570	0.07

The gravity data are consistent with mafic intrusive sources (gabbro, dolerite) with a density of 2.8 - 3.0 gm/cc having the form of thick sills or elongated pipe shaped bodies.

3.3. Diamond Drilling

Completed logs for DDH CD 1 and CD 2 are included in Appendix No.1.

3.0 PROPOSED PROGRAMME

An exploration programme in the Coompana Joint Venture area is dependent on the forthcoming results of BHP's proposal to deepen PDH BN 1. This hole, located on the adjoining E.L.849, will be extended by BHP as part of an agreement with CEC.

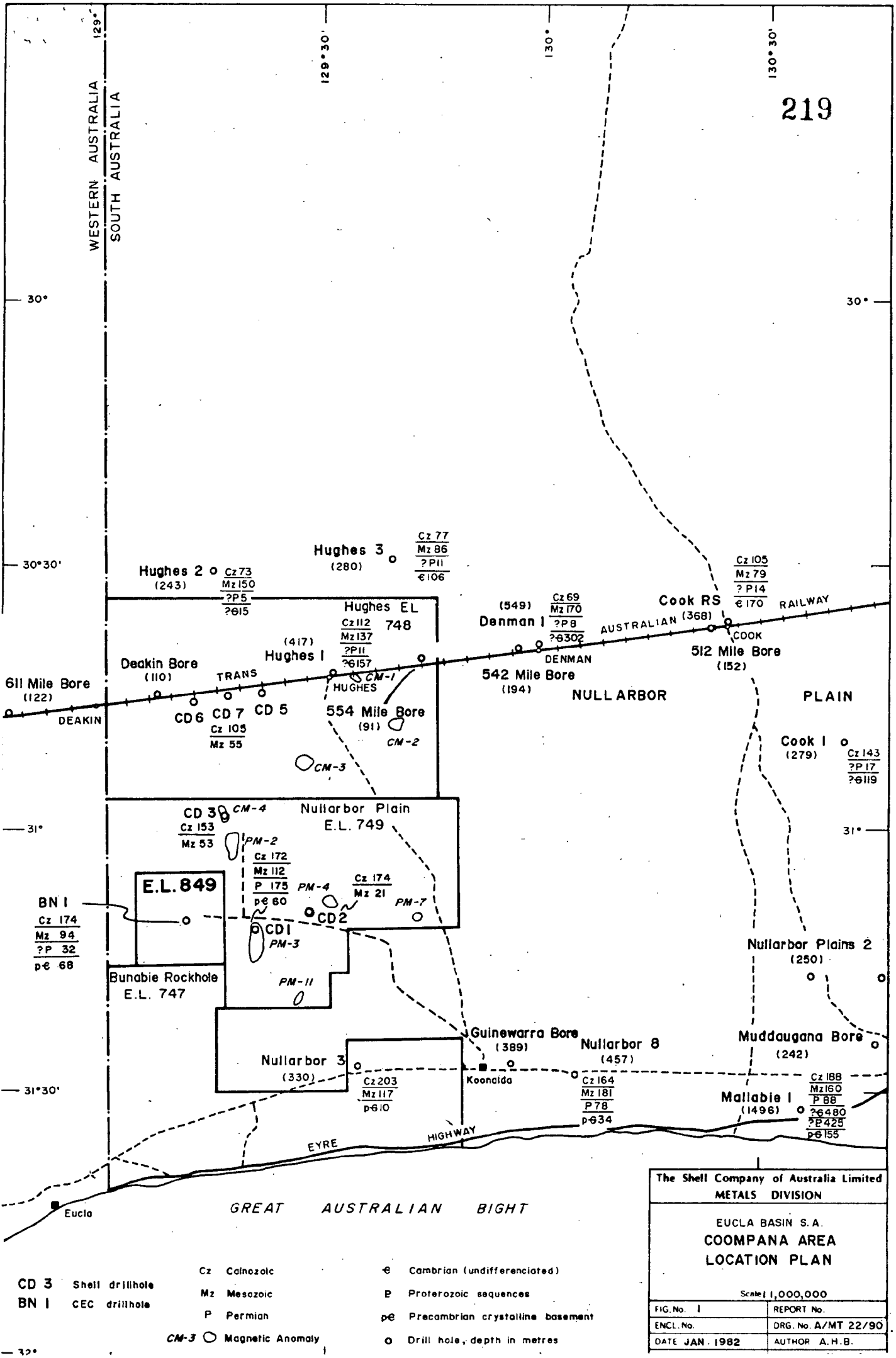
4.0 KEYWORDS

Coompana, Cook, Eucla Basin, base metals, oil shale, magnetic modelling, gravity modelling, diamond drilling.

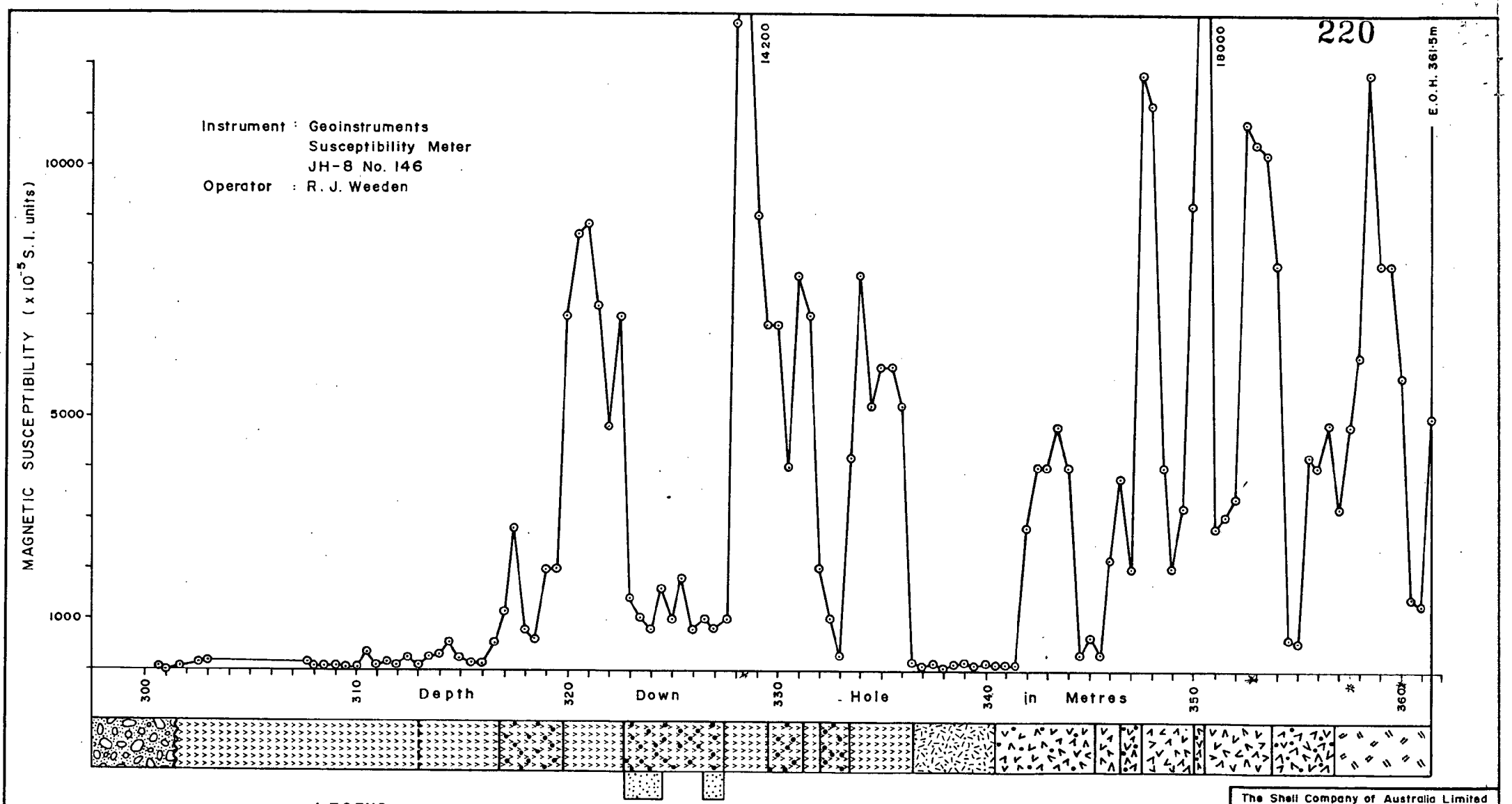
5.0 EXPENDITURE

A summary of expenditure since the 31st March 1982 is detailed below.

Hughes E.L.748	
Personnel/Personnel Burden	105
Support Costs	92
Drawing/Computer/Eng.	141
	338
Nullarbor E.L.749	
Personnel/Personnel Burden	567
Support Costs	99
Analyses/Assays	165
Drawing/Computer/Eng.	677
	1508
Bunabie Rockhole E.L.747	
Support Costs	104



The Shell Company of Australia Limited METALS DIVISION	
EUCLA BASIN S.A. COOMPANA AREA LOCATION PLAN Scale 1,000,000	
FIG. No. 1	REPORT No.
ENCL. No.	DRG. No. A/MT 22/90
DATE JAN. 1982	AUTHOR A.H.B.



LEGEND

PERMIAN

- Tillite
- Basaltic basement
- Massive basalt
- Vesicular basalt

PRECAMBRIAN

- Highly vesicular basalt
- Weakly altered basaltic lava
- Amygdaloidal basaltic lava
- Micaceous hematite

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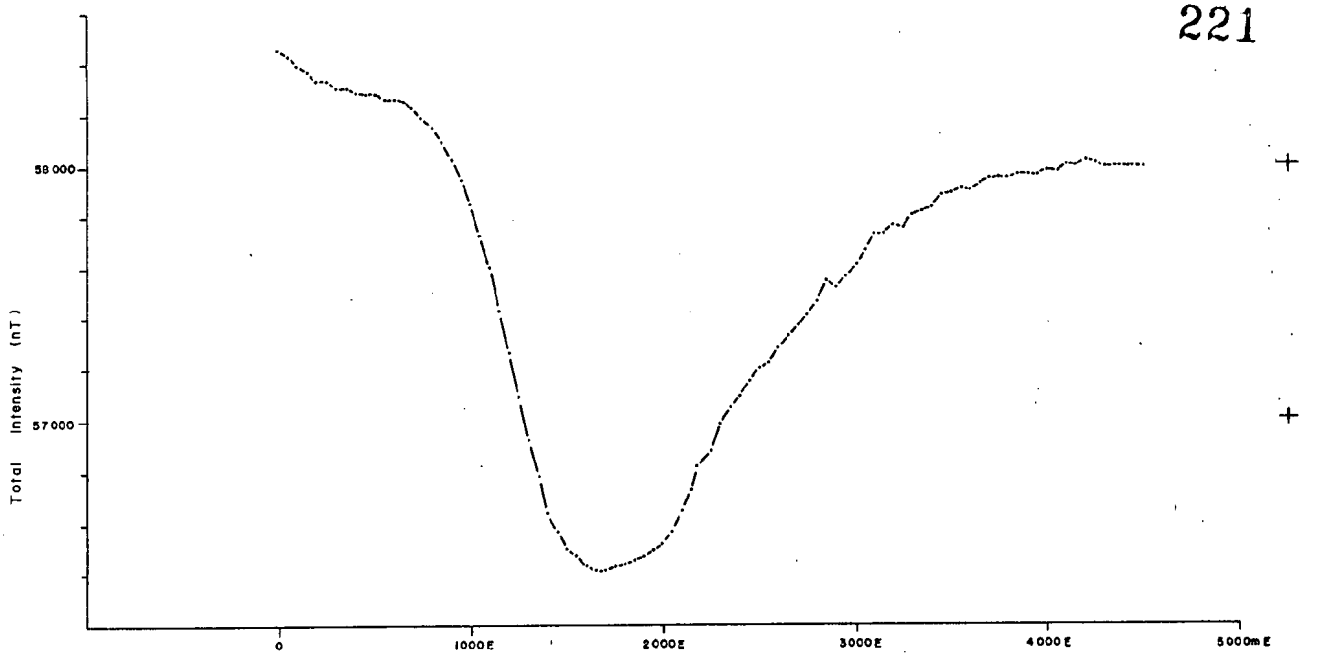
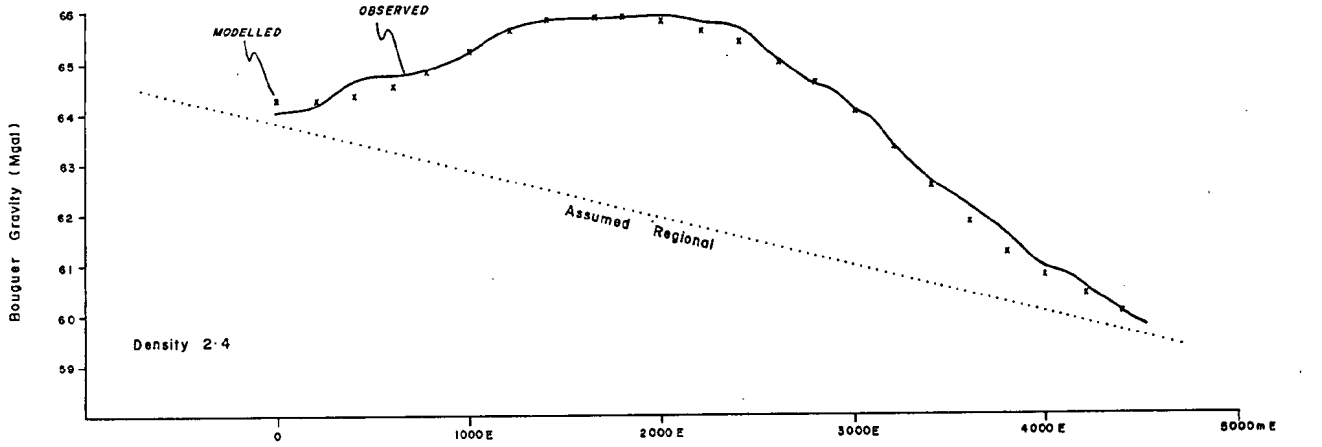
METALS DIVISION

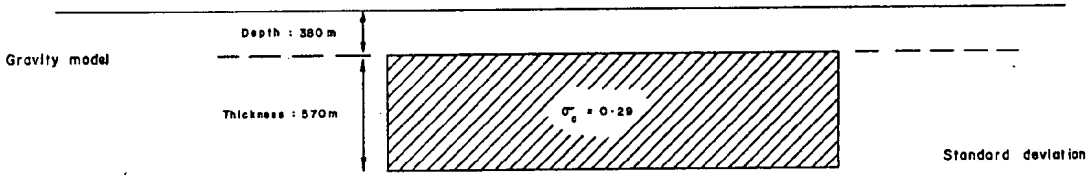
COOMPANA PROJECT
DDH CD-1
MAGNETIC SUSCEPTIBILITY

Horizontal Scale 1:250

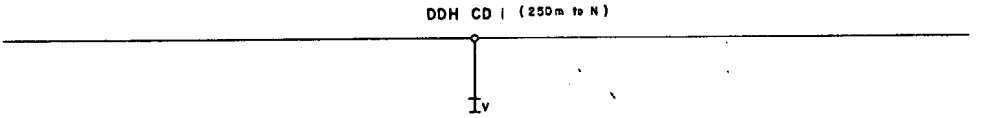
FIG. No. 2	REPORT No.
ENCL. No.	DRG. No. A/TF 02/04
DATE JAN. 1982	AUTHOR R. J. W.
DRAWN B. J. O.	OFFICE ADELAIDE







Standard deviation of fit : 0·08



The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT GRAVITY MODELLING ANOMALY PM3 LINE 6000N	
SCALE 1:25000	DATE NOV. 1981
AUTHOR A.H.B.	DRAWN B.J.O.
OFFICE ADEL.	REP.No.
DRG.No A/PW0542	FIG.No. 3

APPENDIX 1

The Shell Company of Australia Limited
METALS DIVISION (S.A.)

DIAMOND DRILL LOG

HOLE No. DDH CD 1
223

PROJECT	Coompana
AREA	Nullabor Plain
GRID CO-ORDS	LAT 31° 11·5' LONG 129° 21'
COLLAR ELEVATION	Not measured
TOTAL DEPTH	361·5 m
1:250 000 SHEET	Coompana
1:100 000 SHEET	Merdayerrah
1:50 000 SHEET	
S.D.O. No.	
ANALYSED BY	
CONTRACTOR	Peter Nitschke Drilling Pty Ltd
RIG TYPE	Longyear 44
DRILLERS	E Holt W Aherne J Treloar
DATE STARTED	6/10/81
DATE FINISHED	25/10/81

DOWNHOLE SURVEYING INSTRUMENT: EASTMAN

DEPTH	DIP	AZIMUTH
0	Vertical	—
200·5m	−88°	300° mag
358·5m	−87½°	340° mag

GENERAL COMMENTS

Hole stopped as rods beginning to tighten up.

DRILLING OBJECTIVE

To test coincident gravity and negative magnetic anomaly PM-3. To test the Madura formation for oil shale potential.

DRILLING RESULT

DDH CD 1 intersected basalts with a remnant magnetism in the opposite direction to the current earth's field.

DRILLING BREAKDOWN

CORE SIZE	QUOTED COST/M	INTERVAL DRILLED FROM	TO
PREC		0	160·0
HQ		160·0	182·0
NQ		182·0	361·5
BQ			

TOTAL COST OF SUNDRIES	
TOTAL COST OF HOLE	
TOTAL COST PER METRE	

[redacted] Th[redacted]hell[redacted]mp[redacted]of [redacted]tral[redacted]_im[redacted]

METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD 1

224

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D RUN	CORE REC'D SHORT
0 – 160.0 m : Pre collar in limestone. No chip recovery 8.0 – 160.0 m			0	
			160.0	160.0
			161.0	–
			164.0	–
			167.0	–
160.0 – 171.8 m TERTIARY LIMESTONE				
White to off-white chalky fine grained massive limestone with traces of Bryozoans & shell fragments. Clay pellets 171.5 – 171.8 m. Contact at 171.8 m very distinct		171.5 – 171.8 m : Traces of glauconite	170.0	–
			173.0	–
			176.0	–
			179.0	–
			182.0	–
			184.5	–
			187.5	–
171.8 m – 263.5 m MADURA FORMATION				
			190.5	–
			193.5	–
			196.5	–
			199.5	–
Dark grey to pale grey soft fine-grained micaceous mudstone. Relatively massive throughout with a tendency to dry out and crack on drying. Weakly carbonaceous in places. Minor sandy units throughout		at 197.1 m : Trace fine grained pyrite associated with slickensides	202.5	0.4
			205.6	–
			208.5	–
			211.6	–
			214.6	–
171.8 – 174.5 m minor iron stained sandstone lenses up to 1 – 2 cm thick			217.6	0.7
			220.6	–
			222.8	–
189.5 – 192.5 m clay pellets, rare quartz clasts and shell fragments (also at 200.5 m)			225.9	–
			226.5	–
			229.5	–
202.9 – 203.1 : massive limestone with narrow irregular calcite veining.			232.5	–
			235.5	–
			238.5	–
211.5 – 211.7 m Truncated cross bedding and graded bedding ⇒ younging UP the hole (also at 241.7 m)			241.5	–
			244.5	–
			247.5	–

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METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD 1 Sheet 2 of 5

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D RUN	CORE REC'D SHORT
263.5m – 284.0m LOONGANA SANDSTONE fine to coarse grained dark green grey glauconitic interbedded poorly sorted conglomeratic sandstone and mudstones. Mudstone units near the top of the unit have minor sandstone lenses. Slickensides 268.4 – 268.5m. Lode casts 273.0 – 274.6m ⇒ young-ing up hole. Grain size increases down hole to 277.3m 277.3 – 280.5m : dark green grey massive mudstone with minor sandstone lenses 280.5 – 283.5m poorly sorted & cemented conglomeratic sandstone 284.0 – 301.5m PERMIAN TILLITES(?) Pale grey to off white fine to coarse grained poorly sorted & cemented, friable conglomerate with rounded fragments up to 3 cm in diameter Unconformable contact with underlying basic volcanics as indicated by weathering in the underlying volcanics.		225	250.5	–
			253.5	0.1
			256.5	0.1
			259.5	–
			262.5	–
			265.5	0.2
			268.5	1.9
			271.5	1.6
			274.5	1.3
			277.5	0.5
			280.5	0.1
			283.5	2.6
			286.5	1.5
			289.5	2.0
			292.5	0.8
			295.5	1.2
			298.3	2.8
			301.5	1.8
			304.5	1.1
			307.5	2.6
			310.6	–
			313.7	–
			316.75	–
			319.75	–
			322.75	–
			325.5	–
			328.5	–
			331.5	–
			334.5	–
			337.5	–
			340.5	–
			343.5	–
			346.5	–

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD 1 Sheet 3 of 5

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D RUN	CORE REC'D SHORT
301.5 – 361.5 m: BASIC VOLCANICS (Gawler Range Volcanics(?)) (E.OH)		226	349.5	-
Green to grey variable, massive to amygdaloidal basaltic flows with chlorite, plagioclase & clinopyroxene throughout. Vesicles contain varying amounts of chlorite, epidote quartz, K-feldspar, zeolite and hematite			352.5	-
301.5 – 313.0m: weathered friable green grey feldspathic chloritic basalt.			355.5	-
313.0 – 316.8 m: Dark green relatively massive chloritic basaltic.			358.5	-
316.8 – 319.75m: Amygdaloidal basalt with minor hematite on fractures			361.5	-
319.75 – 322.8 m: Massive basalt with clinopyroxene & chlorite. Vesicles with quartz and leucoxenized magnetite [Thin section No 18127 at 321.1 m]			EOH	
322.8 – 327.4 m: Vaguely layered very fine vesicular basalt with extensive plagioclase alteration and interstitial chlorite. Disseminated fine hematite and limonite. Speckled appearance throughout. [Thin sections No 18128 at 322.8 and No 18129 at 326.0]		322.8 – 327.4m: bronze-copper coloured hematite rich mica flakes up to 2-3mm wide scattered throughout. Generally in the order of 1% of volume of core.		

The Shell Company of Australia Limited
METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD 1 Sheet 4 of 5

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D
327.4 - 329.5m: Massive basalt with scattered clinopyroxene and minor interstitial chlorite [Thin Section No 18130 at 327.9m]		227	
329.5 - 331.2m: Amygdaloidal basalt - mottled appearance			
331.2 - 332.0m: Mottled appearance - massive basalt			
332.0 - 333.5m: Vesicular basalt with interstitial chlorite, altered pyroxene and magnetite plus traces of hematite. Vesicles filled with chlorite, epidote, quartz, K-feldspar and zeolite [Thin Section No 18131 at 333.2m]			
333.5 - 336.5m: Mottled generally massive basalt			
336.5 - 340.4m: Very highly vesicular basalt with vesicles filled with quartz and epidote. Groundmass of epidote, minor quartz and chlorite plus traces of micaceous hematite [Thin Section No 18132 at 337.9m]			
340.4 - 361.5m: Weakly altered basalt with oxidized and leucoxenised magnetite. K-feldspar and hematite. Plagioclase phenocrysts with minor quartz and chlorite. Poorly developed amygdaloidal basalt from 340.4 - 345.3m, 346.5 - 347.4, 350.1 - 350.6m and 353.8 - 356.7m			

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METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD 1 Sheet 5 of 5

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D
[Thin Sections No 18133 at 352.3 m and No 18134 at 360.8 m]			228

SAMPLE RECORD

METALS DIVISION

MPLE TYPE: FILLET LOCATION / PROJECT: DDH CD1 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: _____

\SSAY LAB: _____ SAMPLE DESPATCH _____ ASSAY REPORT NOS: AC 2519/82

ORDER NO: _____

SAMPLE STORAGE: _____

229

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES										DESCRIPTION
				Oil yield litres/tonnes										
6396	171.8	174.0	2.2	0.5	1.5									
97	174.0	176.0	2.0	"	"									
98	176	178	"	"	"									
99	178	180	"	"	"									
6400	180	182	"	"	"									
01	182	184	"	"	"									
02	184	186	"	"	"									
03	186	188	"	"	"									
04	188	190	"	"	"									
05	190	192	"	"	"									
06	192	194	"	"	"									
07	194	196	"	"	"									
08	196	198	"	"	"									
09	198	200	"	"	"									
6410	200	202	"	"	"									
11	202	204	"	"	"									
12	204	206	"	"	"									
13	206	208	"	"	"									
14	208	210	"	"	"									
15	210	212	"	"	"									
16	212	214	"	"	"									
17	214	216	"	"	"									
18	216	218	"	"	"									
19	218	220	"	"	"									
6420	220	222	"	"	"									
21	222	224	"	"	"									
22	224	226	"	"	"									
23	226	228	"	"	"									
24	228	230	"	"	"									
25	230	232	"	"	"									
26	232	234	"	"	"									
27	234	236	"	"	"									
28	236	238	"	"	"									
6429	238	240	"	"	"									

REMARKS: _____

SAMPLE RECORD

Shell METALS DIVISION

AMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD1 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: _____

ASSAY LAB: AMDEL SAMPLE DESPATCH ORDER Nº: _____ ASSAY REPORT NOS: _____

230

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES Oil yield litres/tonne		DESCRIPTION
6430	240	242	2.0	0.5 - 1.5		
31	242	244	"	"	"	
32	244	246	"	"	"	
33	246	248	"	"	"	
34	248	250	"	"	"	
35	250	252	"	"	"	
36	252	254	"	"	"	
37	254	256	"	"	"	
38	256	258	"	"	"	
39	258	260	"	"	"	
6440	260	262	"	"	"	
41	262	263.5	1.5	"	"	
42	263.5	265.5	2.0	"	"	
43	265.5	268.5	3.0	"	"	
44	268.5	271.5	3.0	"	"	
45	271.5	274.5	3.0	"	"	
46	274.5	277.3	2.8	"	"	
47	277.3	280.5	3.2	1.5 - 5.0		
48	280.5	286.5	6.0	0.5 - 1.5		
49	286.5	292.5	6.0	"	"	
6450	292.5	295.5	3.0	"	"	
51	295.5	310.5	6.0	"	"	

EMARKS: _____

SAMPLE RECORD

METALS DIVISION

SAMPLE TYPE: Filleted Core LOCATION / PROJECT: DDH CD 1 COOMPANA SAMPLER: COMLABS DATE: 5/11/81 MAP / PHOTO REF:

ASSAY LAB: SAMPLE DESPATCH ORDER NO: ASSAY REPORT NOS: 811838

231

SAMPLE STORAGE:

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES (ppm unless specified)							DESCRIPTION
				Cu	Pb	Zn	Bi	Co	Ag	Au	
6452	301.5	304.5	3.0	100	6	195	4	48	1	0.05	
53	304.5	308.0	3.5	95	6	380	4	70	1	0.05	
54	308.0	310.0	2.0	280	4	195	4	50	1	0.05	
6455	310.0	312.0	2.0	145	4	180	4	105	1	0.05	
56	312.0	313.0	1.0	170	4	130	4	80	1	0.05	
57	313.0	315.0	2.0	165	4	135	4	75	1	0.05	
58	315.0	317.0	2.0	120	4	125	4	55	1	0.05	
59	317.0	319.75	2.75	125	6	115	4	44	1	0.05	
6460	319.75	321.3	1.55	140	4	105	4	40	1	0.05	
61	321.3	322.8	1.5	130	12	90	4	44	1	0.05	
62	322.8	324.3	1.5	115	8	95	4	44	1	0.05	
63	324.3	325.8	1.5	90	10	100	4	48	1	0.05	
64	325.8	327.4	1.6	220	8	110	4	48	1	0.05	
6465	327.4	329.5	2.1	125	6	80	4	40	1	0.05	
66	329.5	331.2	1.7	120	4	110	4	40	1	0.05	
67	331.2	333.5	2.3	120	4	125	4	40	1	0.05	
68	333.5	336.5	3.0	115	4	90	4	40	1	0.05	
69	336.5	338.5	2.0	65	4	260	4	40	1	0.05	
6470	338.5	340.4	1.9	50	4	120	4	36	1	0.05	
71	340.4	342.4	2.0	65	12	250	4	40	1	0.05	
72	342.4	344.4	2.0	105	4	120	4	40	1	0.05	
73	344.4	346.5	2.1	38	8	135	4	48	1	0.05	
74	346.5	348.5	2.0	65	4	155	4	44	1	0.05	
6475	348.5	350.6	2.1	85	6	140	4	40	1	0.05	
76	350.6	353.8	3.2	100	4	120	4	40	1	0.05	
77	353.8	356.8	3.0	75	4	145	4	48	1	0.05	
78	356.8	359.0	2.2	130	4	130	4	44	1	0.05	
6479	359.0	361.5	2.5	90	4	95	4	40	1	0.05	
		E.O.H.									
METHODS	Cu,	Pb, Zn,	Bi,	Co,	AAS 1						
				Ag	AAS 3						
				Au	AAS 5A						

REMARKS:

SAMPLE RECORD

Sheet ___ of ___

shell METALS DIVISION

SAMPLE TYPE: QUARTER CORE LOCATION / PROJECT: CD1 COOMPANA SAMPLER: _____ DATE: 16/11/81 MAP / PHOTO REF: _____

ASSAY LAB: COM SAMPLE DESPATCH ORDER Nº: 3955 ASSAY REPORT NOS: 811933 232

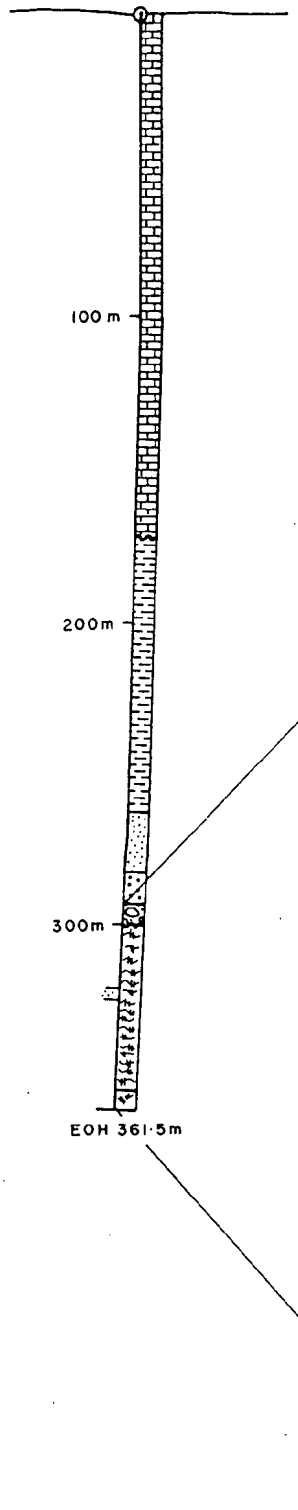
SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES (in ppm)												DESCRIPTION
				Cu		Zn										Density gcm-3
18116	322.8	323.3	0.5	85		100										2.71
17	323.3	323.8	"	90		95										2.46
18	323.8	324.3	"	95		100										2.54
19	324.3	324.8	"	130		95										2.53
20	324.8	325.3	"	80		105										3.12
18121	325.3	325.8	"	75		95										2.66
22	325.8	326.3	"	80		105										2.64
23	326.3	326.8	"	50		110										2.67
24	326.8	327.3	"	115		100										2.48
25	327.3	327.8	"	120		100										2.67
18126	327.8	328.3	"	105		90										2.60

REMARKS: _____

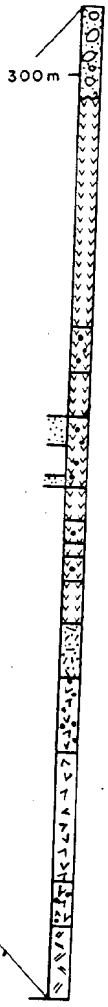
DDH CD 1

(1: 2500)



INSET

1: 500



LEGEND

TERTIARY

- Limestone (Nullarbor & Wilson Bluff)

CRETACEOUS

- Madura Formation – Mudstones and clays
- Loongana Sandstone – Conglomeratic sandstone, glauconitic

PERMIAN

- Coarse grained (glacial?) sands
- Tillite

PRECAMBRIAN

- Interbedded basaltic lavas
- Basaltic basement
- Massive basalt
- Vesicular basalt
- Highly vesicular basalt
- Weakly altered basaltic lava
- Amygdaloidal basaltic lava
- Micaceous hematite
- Unconformity
- Apparent conformable contact

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT DRILL HOLE PROFILE DDH CD1	
SCALE 1:2500	DATE JAN 1982
AUTHOR RW	DRAWN BJO
OFFICE ADELAIDE	REP.No.
DRG.No A/PW 09440	FIG.No. 3

SHELL COMPANY OF AUSTRALIA LTD.

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

PAGE ...1..OF..4.. PAGES

AREA [C O O M P A N A] (3 – 26)

DATE (Y Y M M D D) [8 1 1 0 2 7] (27 – 32)

DRILL HOLE N° [D D H][C D 1] (33 – 40)

COLLAR COORDS [ ] (41 – 47) N [ ] (48) [ ] (49 – 55) E [ ] (56)

INSTRUMENT [J H - 8] (57 – 61)

RECORDED BY [R. J. W.] (62 – 65)

DEPTH (METRES)	① READING 10^{-5} SI UNIT (cgs)	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① x ② x ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
301.7	75					
302.5	65					
303.0	80					
(No core)						
304.7	70					
308.1	30					
308.6	40					
310.0	0					
300.7	5					
309.9	43					
309.5	25					
310.0	15					
310.5	60					
311.0	50					
311.5	80					
312.0	50					
312.5	110					
313.0	50					
313.5	125					
314.0	150					
314.5	260					
315.0	110					
315.5	75					
316.0	60					
316.5	260					
317.0	580					
317.5	1400					
318.0	400					
318.5	300					
319.6	1000					
319.5	1000					
320.0	3500					
320.5	4300					
321.0	4400					
317.5	3600					
322.0	2400					

(1 2 – 6 7 – 11 12 – 18 19 – 21 22 – 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-8
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS.

SHELL COMPANY OF AUSTRALIA LTD.

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

23
5

AREA (3–26): COMPANA

DATE (27–32): Y Y M M D D = 8 1 1 0 2 7

DRILL HOLE N° (33–40): DDH CBI

COLLAR COORDS (41–47): N (48) E (49–55) (56)

INSTRUMENT (57–61): JH-8

RECORDED BY (62–65): R.J.W

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
3225	3500					
3230	700					
3235	500					
3240	400					
3245	800					
3250	500					
3255	900					
3260	400					
3265	500					
3270	400					
3275	500					
3280	6400					
3285	7100					
3290	4500					
3295	3400					
3300	3400					
3305	2000					
3310	3900					
3315	3500					
3320	1000					
3325	500					
3330	250					
3335	2100					
3340	3900					
3345	2600					
3350	3000					
3355	3000					
3360	2600					
3365	700					
3370	290					
3375	650					
3380	310					
3385	610					
3390	740					
3395	500					
3400	550					

1 2 | 6 7 | 11 12 | 18 19 | 21 22 | 26

SIZE CORRECTION (MULTIPLY READING)

METER	SM-5	JH-8
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS.

SHELL COMPANY OF AUSTRALIA LTD.

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

AREA (3–26): COMPANA

DATE (YY MM DD, 27–32): 81 10 27

DRILL HOLE N° (33–40): DDH CD1

COLLAR COORDS (41–47): N (48) (49–55): E (56)

INSTRUMENT (57–61): JH-8

RECORDED BY (62–65): R.J.W

DEPTH (METRES)	① READING 10^{-5} SI UNITS (10^{-6} cgs)	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
340.5	49					
341.0	48					
341.5	50					
342.0	1400					
342.5	2000					
343.0	2000					
343.5	2400					
344.0	2000					
344.5	1500					
345.0	330					
345.5	1500					
346.0	1100					
346.5	1900					
347.0	1000					
347.5	590					
348.0	560					
348.5	2000					
349.0	1000					
349.5	1600					
350.0	4600					
350.5	900					
351.0	1400					
351.5	1500					
352.0	1700					
352.5	5400					
353.0	5200					
353.5	5600					
354.0	4000					
354.5	300					
355.0	260					
355.5	2100					
356.0	2000					
356.5	2400					
357.0	1600					
357.5	2400					
358.0	3100					

(1 2 — 6 7 — 11 12 — 18 19 — 21 22 — 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-8
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS

SHELL COMPANY OF AUSTRALIA LTD.

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

PAGE 4 OF 4 PAGES

AREA COOMPANA (3 – 26)

DATE (Y Y M M D D) 8 1 1 0 2 7 (27 – 32)

DRILL HOLE N° DDH C01 (33 – 40)

COLLAR COORDS [ ][ ][ ][ ][ ][ ][ ] (41 – 47) N [ ] (48) [ ][ ][ ][ ][ ][ ][ ] (49 – 55) E [ ] (56)

INSTRUMENT JH-8 (57 – 61)

RECORDED BY RJW (62 – 65)

DEPTH (METRES)	① READING 10^{-5} SI UNITS. cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① x ② x ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
358.5	5900					
359.0	4000					
359.5	4000					
360.0	2900					
360.5	700					
361.0	650					
361.5	2600					

(1 2 — 6 7 — 11 12 — 18 19 — 21 22 — 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-8
NQ	x 1·6	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS.

The Shell Company of Australia Limited
METALS DIVISION (S.A.)

DIAMOND DRILL LOG

HOLE No. DDH CD 2

238

PROJECT	Coompana
AREA	Nullabor Plain
GRID CO-ORDS	LAT 31° 10' LONG 129° 28'
COLLAR ELEVATION	Not measured
TOTAL DEPTH	194·8m
1:250 000 SHEET	Coompana.
1:100 000 SHEET	Mordayerrah
1:50 000 SHEET	
S.D.O. No.	
ANALYSED BY	
CONTRACTOR	Peter Nitschke Drilling Pty Ltd
RIG TYPE	Longyear 44
DRILLERS	E Holt J Treloar
DATE STARTED	26/10/81
DATE FINISHED	31/10/81

DOWNHOLE SURVEYING INSTRUMENT :

DEPTH	DIP	AZIMUTH
0	Vertical	—
Not Surveyed		

GENERAL COMMENTS

Hole abandoned at 194·8m as hole collapsed. 45m of rods lost down hole.

DRILLING OBJECTIVE

To test concident gravity and negative magnetic anomaly PM-4. To test the Madura formation for oil shale potential.

DRILLING RESULT

Hole abandoned short of target.

DRILLING BREAKDOWN

CORE SIZE	QUOTED COST/M	INTERVAL DRILLED FROM	TO
PREC		0	128·0m
HQ		128·0m	194·8m
NQ			
BQ			

TOTAL COST OF SUNDRIES	
TOTAL COST OF HOLE	
TOTAL COST PER METRE	

[redacted] Th[redacted]hell [redacted]mpa[redacted] of [redacted]tral [redacted]Lim[redacted]

METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD2 Sheet 1 of 2

239

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS	CORE REC'D RUN	CORE REC'D SHORT
0 – 128.0 : Precollar in Tertiary Limestone No sample return 0 – 128m.			0	
			128	128
128.0 – 170.3m TERTIARY LIMESTONE			130.8	–
			133.8	–
			136.4	–
White to off-white massive fossiliferous chalky limestone. Friable throughout with minor pug in places. Chalky nodules scattered throughout unit – up to 5cm wide. Shell fragments and Bryozoans			139.4	–
			142.5	–
			145.5	–
			148.5	0.1
			151.5	–
			154.5	–
			156.5	–
			158.5	–
170.3 – 173.9 m HAMPTON SANDSTONE (?)			161.5	–
			164.6	–
Grey sandy medium grained friable calcareous sediment with Bryozoans and shell fragments		at 173.8 – 173.9m : Glauconite	167.7	–
			170.3	–
			173.8	0.1
			176.8	1.6
			177.8	–
173.9 – 186.8 m PIDINGA FORMATION (?)			180.8	1.6
			183.8	3.0
173.9 – 176.8m : Dark brown black carbonaceous lignitic sandstone			186.8	2.3
			189.8	3.0
176.8 – 180.5m : Black fine grained massive clayey lignite. Slickensides developed at 177.9 and 178.8m.			191.8	–
			194.8	–
			EOH	
180.5 – 186.8m : Dark brown black carbonaceous lignitic sandstone Puggy ground 180.4 – 180.5m.		186.8 – 186.7m : Pyrite band with minor concretions of pyrite (1cm in diam)		
186.8 – 189.8 : Pale grey unconsolidated quartz sandstone				

The Shell Company of Australia Limited
METALS DIVISION (S.A.)

FIELD DIAMOND DRILL LOG

DRILL HOLE : DDH CD2 Sheet 2 of 2

ROCK DESCRIPTION	CORE ANGLES	MINERALIZATION/COMMENTS 240	CORE REC'D
189·8 – 194·8 m (E.O.H) MADURA FORMATION Grey green fine grained massive mudstone. Carbonaceous with minor glauconite. Unit tends to develop 'Mud cracks' on drying out. 189·8 – 189·85: Poorly cement quartz sandstone		189·8 – 189·85: fine grained diss pyrite (20%)	

SAMPLE RECORD

Sheet ___ of ___

METALS DIVISION

SAMPLE TYPE: CORE FILLET LOCATION / PROJECT: DDH CD2 COOMPANA SAMPLER: _____ DATE: 26/11/81 MAP / PHOTO REF: 241

ASSAY LAB: AMDEL SAMPLE DESPATCH ORDER NO: _____ ASSAY REPORT NOS: AC 2519/82

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES Oil yield litres/tonnes		DESCRIPTION
6480	170	172	2	0.5 - 1.5		
81	172	174	2	"	"	
82	174	176.8	2.8	"	"	
83	176.8	177.8	1.0	1.5 - 5.0		
84	177.8	180.8	3.0	"	"	
	180.8	183.8	3.0	NO SAMPLE		NO CORE RECORDED
85	183.8	186.8	3.0	5 - 15		
	186.8	189.8	3.0	NO SAMPLE		NO CORE RECORDED
86	189.8	191.8	2.0	1.5 - 5.0		
87	191.8	193.0	1.2	"	"	
88	193.0	194.8	1.8	0.5 - 1.5		
		E.O.H.				

REMARKS: _____

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

SOUTH AUSTRALIA

REPORT ON E.L.748, HUGHES

E.L.749, NULLARBOR PLAIN

FOR THE QUARTER ENDING OCTOBER 20TH, 1982

FINAL REPORT

AUTHOR: M.L. HIGGINS
DATE: JANUARY, 1983

REPORT NO. 08.1244
COPY NO. 1

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5	B.H.P. Melbourne

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2.	Aeromagnetic Contours	1: 1 000 000	A/MT22/025
3.	Coompana Area - S.A. Magnetic Features	1: 1 000 000	A/MT22/029

LIST OF ENCLOSURES

1.	Grid and Drillhole Location Map	1: 250 000	A/MT22/092

1.0 INTRODUCTION

Exploration Licences 748 and 749 expired on the 20th October, 1982 after a two year term of tenure. They were, along with E.L.747 which was relinquished separately on the 3rd September, 1982, the subject of a joint venture agreement with Dampier Mining Company Ltd., with Shell acting as the manager.

The licences mentioned above are referred to as Bunabie Rockhole (E.L.747), Hughes (E.L.748) and Nullarbor Plain (E.L.749) and cover areas of 2104, 3051 and 2345 km^2 respectively (see figure 1).

No field work was undertaken in the final quarter year period of tenure, however a data assessment and re-evaluation of geological interpretation and concepts was undertaken. This led to the decision to allow the licences to lapse.

This report does not detail previous work but provides an overview of the exploration programme. It also represents the Final Report for both E.L.748 and 749.

2.0 REGIONAL GEOLOGY

The Eucla Basin evolved by subsidence of the Precambrian basement during the Mesozoic. It is a broad structure representing a gentle epeirogenic downwarp of the southern continental margin of Australia and is an area of Cretaceous and Tertiary deposition. The basin is bounded by the Gawler Block to the east, the Albany-Fraser Province to the west, the Officer Basin to the north and extends to the edge of the continental shelf of the Great Australian Bight. Before and possibly during the Proterozoic, the basement was tectonically deformed, enabling the accumulation of Proterozoic sediments and volcanics in deep basement troughs e.g. the Mallabie Depression to the east. A number of large deep-seated faults have been interpreted in or along the margins of the Eucla Basin.

Recent regional aeromagnetic surveying on the COOK and COOMPANA 1:250,000 sheet area has revealed an intense, broad, reversely magnetised magnetic anomaly derived from a deep, intrabasement source. A number of shallow (some less than 200m) negative anomalies and trends are distributed around this feature. (Figures 2 and 3). Many of the discrete anomalies are located along northeast or northwest striking faults indicated on the aeromagnetic data.

3.0 EXPLORATION TARGETS

The prime targets were: -

Base metals associated with regional magnetic and gravity anomalies of unknown origin in the basement. The linear and discrete magnetic anomalies may indicate mafic/ultramafic bodies with potential for nickel, chromium, platinum, vanadium etc.

.../2

3.0 EXPLORATION TARGETS (Continued)

Oil shales associated with the Lower Cretaceous Madura Formation.

Uranium associated with Tertiary lignites and sandstones.

4.0 SUMMARY OF PREVIOUS EXPLORATION

The two-year exploration programme has been detailed at length in interim quarterly reports; a summary of these follows with report number included for easy reference.

4.1 Quarter Ending 20th January, 1981

- . data assessment
- . BMR aeromagnetics obtained and reprocessed, resulting in aeromagnetic contour plans and stacked profiles for the Merdeyerrah, Coompana, Bunburra and Bundulla 1:100 000 sheets.
- . magnetic/structural interpretation of Merdeyerrah and Coompana sheets completed by Layton.
- . assessment and limited sampling of previous drilling through Lower Cretaceous to assess oil shale potential.

4.2 Quarter Ending 20th April, 1981 (08.870)

- . no fieldwork
- . preparations made for gridding, ground magnetics, gravity and percussion/diamond drilling.

4.3 Quarter Ending 20th July, 1981 (08.958)

- . ground magnetics completed over selected aeromagnetic anomalies CM-1, CM-2, CM-4, PMM-2, PM-3, PM-4 and PM-7 (Encl. 1).
- . maximum intensities lie in the range -500 nT to -2000 nT with estimated source depths at between 250m to 600m.
- . gravity in progress.

4.4 Quarter Ending 20th October, 1981 (08.1005)

- . interpretation of ground magnetic data indicated the general source of anomalies appeared to be depth limited implying sill-like sources.
- . gravity completed over anomalies PM-2, PM-3, PM-4, PM-7 and CM-4.
- . gravity anomalies coincidentwith magnetic anomalies detected at four sites, and the depth estimates are consistent with those interpreted from magnetics.
- . percussion/diamond drilling was started; the proposal included three holes (DDH's CD5, 6 and 7, see Encl. 1) located to test oil shale potential and another four to test the geophysical anomalies.
- . to date, holes DDH CD3, 6 and 7 have been completed, DDH CD5 was abandoned.

4.5 Quarter Ending 20th January, 1982 (08.1121)

- DDH CD1 completed; it tested both oil shale potential, which was very low, and the geophysical anomaly PM3; a Precambrian interbedded basaltic lava sequence was intercepted and its magnetic susceptibility is in accord with the recorded surface response. No anomalous geochemistry.
- DDH CD2 completed; it was sited on dual targets as for CD1, however had to be abandoned before intersecting basement; negative oil shale results in Madura Formation.
- geophysical logging of holes DDH CD1, 3, 6 and 7 completed.
- planned hole DDH CD4 deleted from programme.

4.6 Quarter Ending 20th April, 1982 (08.1129)

- no fieldwork
- detailed ICP AAS on limited samples to test for elements not routinely analysed.
- detailed petrological work and geophysical modelling undertaken by BHP for the J.V. partners.
- magnetic property measurements on core from DDH CD1 indicate that a magnetic anomaly of the type observed could be expected to be generated by the strong remanent polarisation recorded in the core.
- compilation and assessment of data in progress.

4.7 Quarter Ending 20th July, 1982 (08.1204)

- no fieldwork
- further, more detailed, magnetic and gravity modelling by both Shell and BHP.

5.0 SUMMARY

Following the intensive review of geophysical data which was undertaken during the last two quarter periods of tenure, the decision was made to relinquish both EL's 748 and 749.

Though there remained an element of doubt as to the source of the recorded magnetic/gravity anomalies, Shell's modelling indicated with reasonable confidence that the intersected volcanic sequence could explain these features. The fact that the core samples recorded negative remanent magnetic polarisation was a strong factor in reaching this conclusion.

A geological scenario may be postulated whereby a deep seated mafic magma chamber was tapped by feeder dykes/pipes of basic (dolerite-gabbro) composition and resulted in extrusion of continental basaltic flows of limited areal extent. This may explain the limited extent of some of the strong aeromagnetic anomalies.

6.0 EXPENDITURE

A summary of total expenditure for the term of the tenure of EL's 748 and 749 is detailed below: -

	$
HUGHES EL 748	
Staffing/Support	7 921
Payments to Govts.	2 292
Aerial Photography	85
Geophysical Surveys	3 663
Borehole Logging	4 230
Drawing, Computer	518
Total Direct Cost	18 709
Admin	935
Total Project Cost	19 649

NULLARBOR EL 749	
Staffing/Support	45 362
Payments to Govts.	1 763
Topographical Surveys	3 720
Ground Geophysics	8 685
Airborne	3 934
Analysis/Assays	3 558
RAB Drilling	44 416
Diamond Drilling	62 738
Borehole Logging	4 228
Drawing Engineering Computer	1 005
Total Direct Cost	179 409
Admin Services	8 970
Total Project Cost	188 379

7.0 KEYWORDS

Eucla Basin, intrabasement, mafic/ultramafic, oil shale, gravity, magnetic susceptibility, ICP AAS, feeder dykes.

Envelope 4046

Transparencies of the 1:100,000 scale

Merdayerrah

Coompana

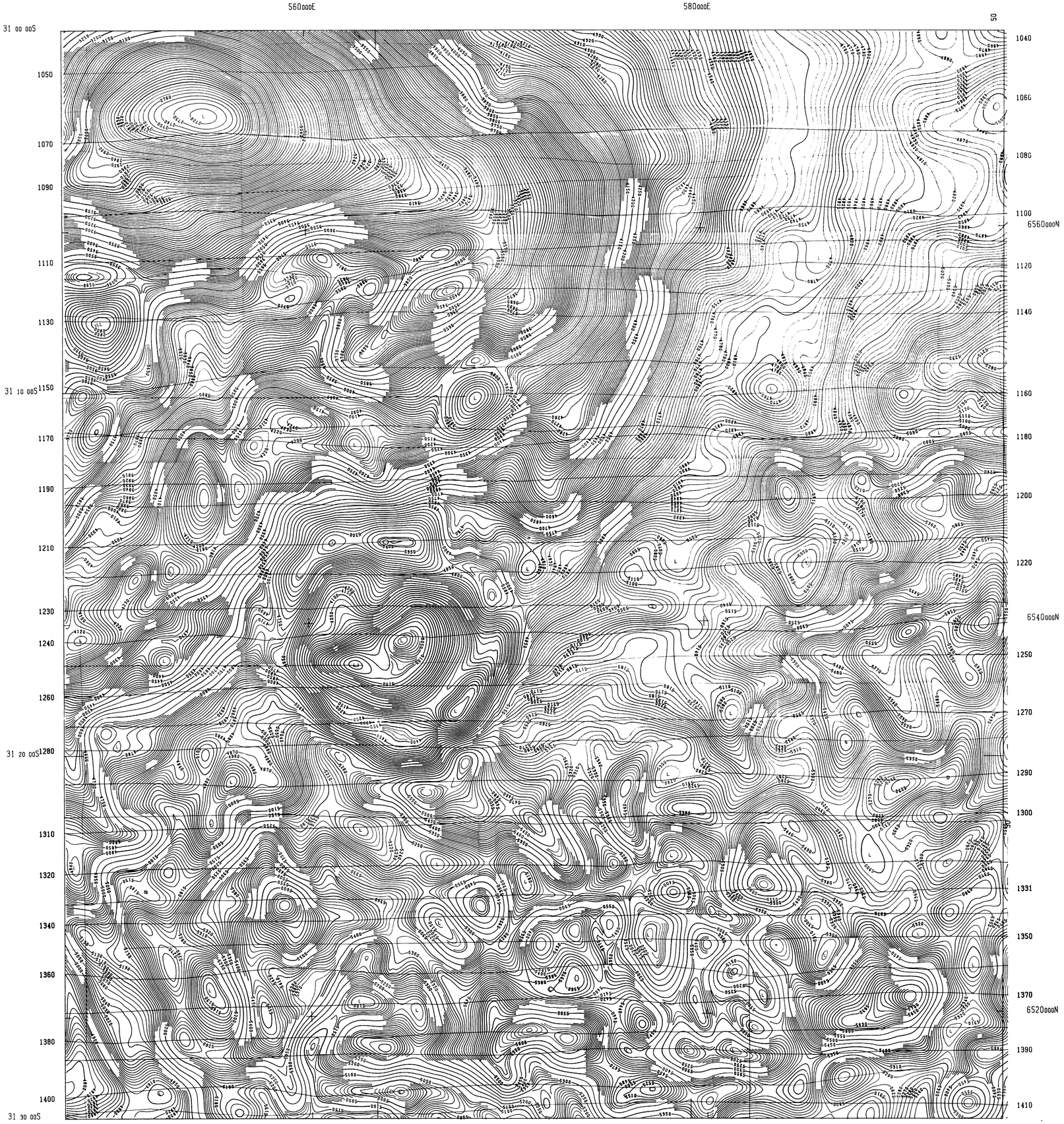
Bunburra

Bundulla sheets

- Magnetic contours
- Magnetic profiles

From reprocessing of BMR data.

Held in transparency cylinder 4046/1



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AIRBORNE SURVEY SPECIFICATIONS

SURVEY FLOWN BY: BUREAU OF MINERAL RESOURCES CANBERRA

DATA RECORDING INTERVAL : 1.0 SEC., APPROX 50M LINEAR SAMPLING AT MEAN GROUND SPEED OF 100 KNOTS

DETECTOR MEAN TERRAIN CLEARANCE : DETECTOR IN AIRCRAFT AT 150 METRES MTC

NOMINAL FLIGHT LINE SPACING : 1500m East - West

PROCESSING SPECIFICATIONS

GRID MESH :150m by 210m

CONTOUR INTERVAL : 5 nT

HORIZONTAL SCALE 1 : 100000

SHEET 4835

GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km

SCALE 1:100000

DEPT OF MINES AND ENERGY SECURITY 4046

REPROCESSED BY:

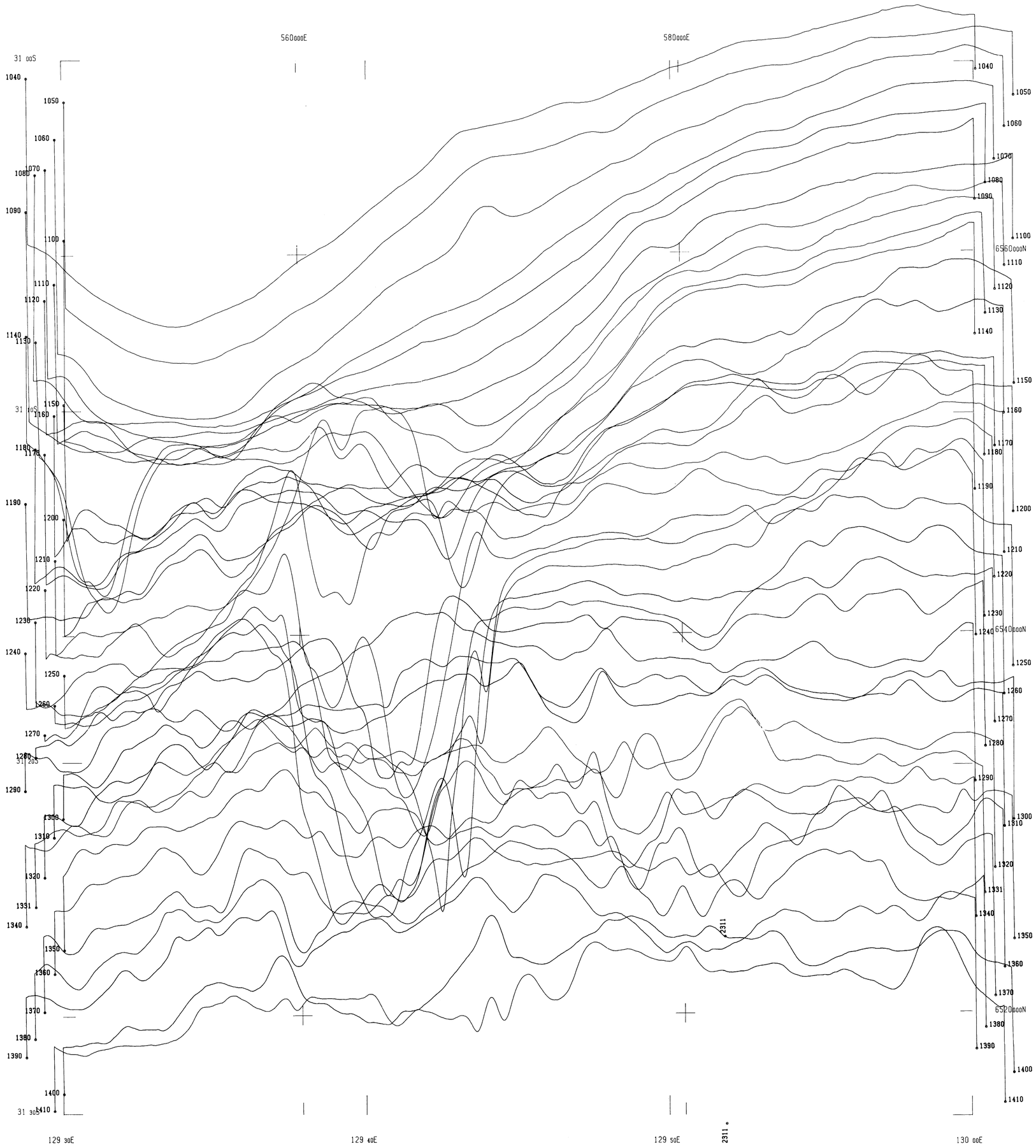
EXPLORATION COMPUTER SERVICES

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA S.A.
SHEET 4835
MAGNETIC CONTOURS

PROJ NO.	DATE: 13-OCT-80

4046(I)-1



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AIRBORNE SURVEY SPECIFICATIONS

SURVEY FLOWN BY: BUREAU OF MINERAL RESOURCES CANBERRA

DATA RECORDING INTERVAL : 1.0 SEC., APPROX 50M LINEAR SAMPLING AT MEAN GROUND SPEED OF 100 KNOTS

DETECTOR MEAN TERRAIN CLEARANCE : DETECTOR IN AIRCRAFT AT 150 METRES MTC

NOMINAL FLIGHT LINE SPACING : 1500m East - West

PROCESSING SPECIFICATIONS

VERTICAL SCALE=120 nT per cm

HORIZONTAL SCALE 1 : 100000

SHEET 4835

GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km

SCALE 1:100000

REPROCESSED BY:

EXPLORATION COMPUTER SERVICES

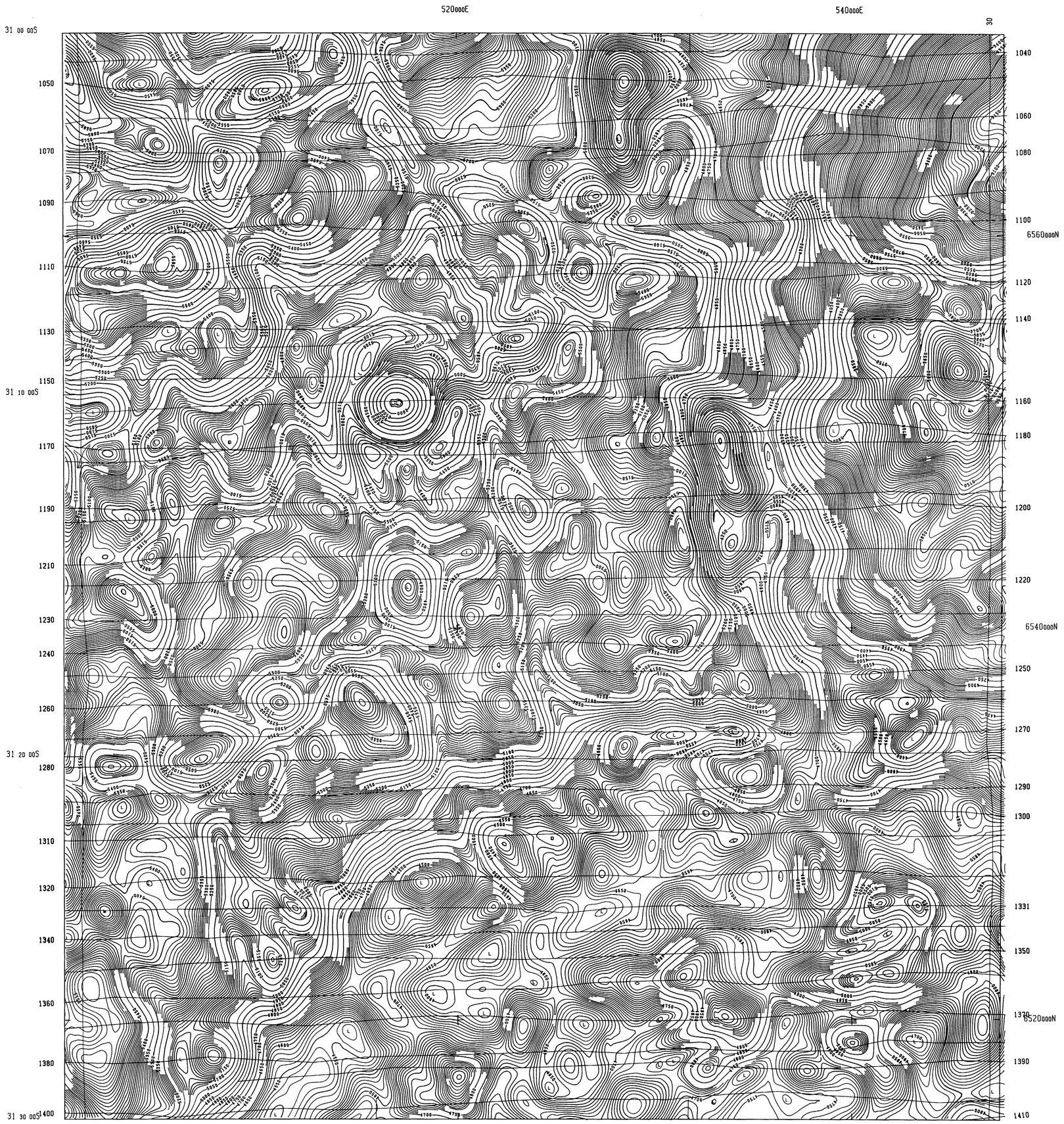
The Shell Company of Australia Limited
METALS DIVISION

COOMPANA S.A.
SHEET 4835
MAGNETIC PROFILES

PROJ NO.

DATE: 09-OCT-80

4046-(I)-2



AIRBORNE SURVEY SPECIFICATIONS

SURVEY FLOWN BY: BUREAU OF MINERAL RESOURCES CANBERRA

DATA RECORDING INTERVAL : 1.0 SEC., APPROX 50M LINEAR SAMPLING AT MEAN GROUND SPEED OF 100 KNOTS

DETECTOR MEAN TERRAIN CLEARANCE : DETECTOR IN AIRCRAFT AT 150 METRES MTC

NOMINAL FLIGHT LINE SPACING : 1500m East - West

PROCESSING SPECIFICATIONS

GRID MESH :150m by 210m

CONTOUR INTERVAL : 5 nT

HORIZONTAL SCALE 1 : 100000

SHEET 4735

GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km

SCALE 1:100000

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EXPLORATION COMPUTER SERVICES

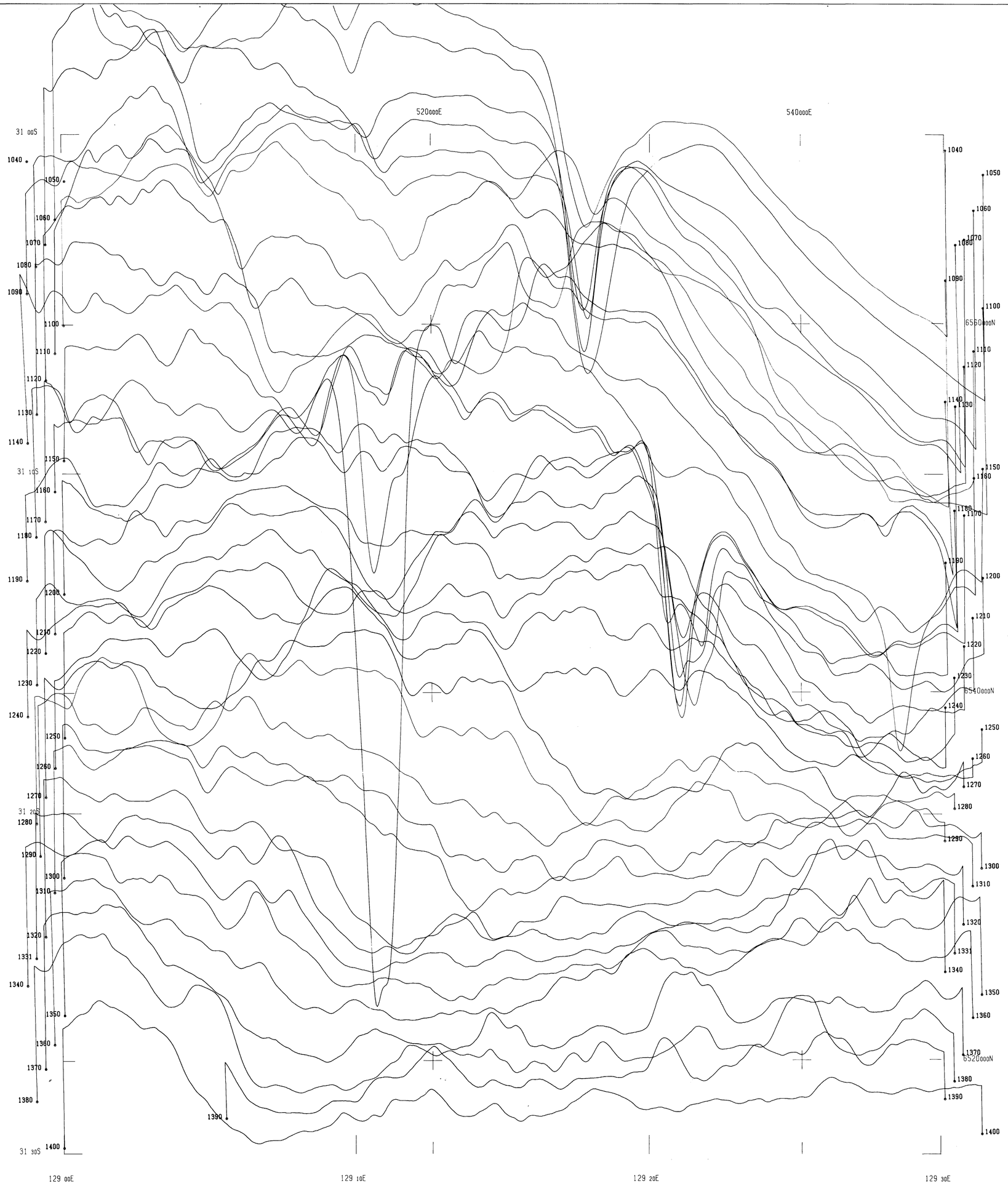
The Shell Company of Australia Limited
METALS DIVISION

MERDAYERRAH S.A.
SHEET 4735
MAGNETIC CONTOURS

PROJ NO.

DATE: 13-OCT-80

4046(I) ~3



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AIRBORNE SURVEY SPECIFICATIONS

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DETECTOR MEAN TERRAIN CLEARANCE :	DETECTOR IN AIRCRAFT AT 150 METRES MTC
NOMINAL FLIGHT LINE SPACING :	1500m East - West

PROCESSING SPECIFICATIONS

VERTICAL SCALE=120 nT per cm
HORIZONTAL SCALE 1 : 100000
SHEET 4735
GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km

SCALE 1:100000

REPROCESSED BY:

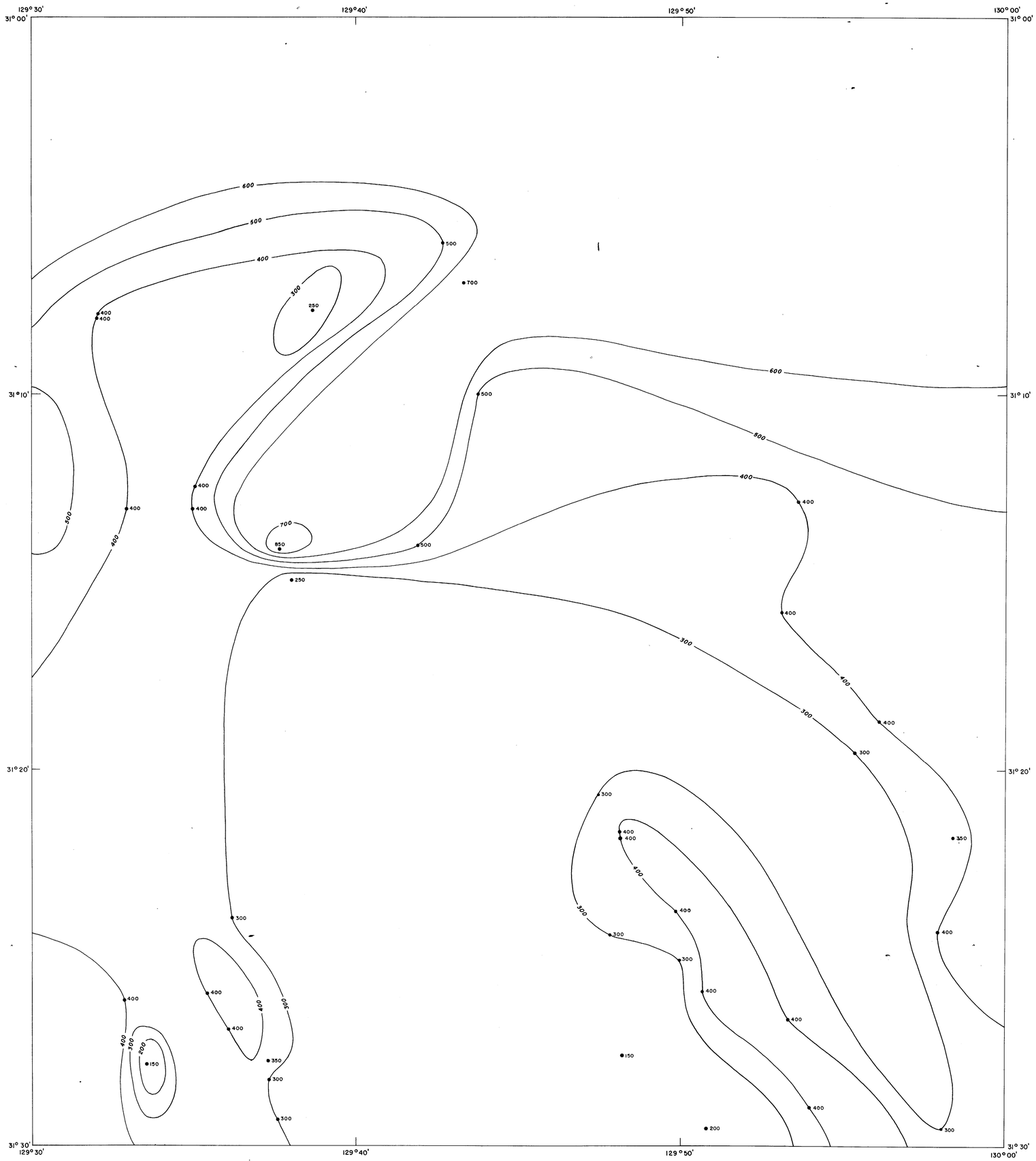
EXPLORATION COMPUTER SERVICES

The Shell Company of Australia Limited
METALS DIVISION

MERDAYERRAH S.A.
SHEET 4735
MAGNETIC PROFILES

PROJ NO.	DATE: 09-OCT-80

4046(I)-4



LEGEND

500 — MAXIMUM DEPTH TO BASEMENT (metres)

●500 POSITION WHERE DEPTH DETERMINED

SCALE 1:100 000

0 1 2 3 4 5 6 7 8 9 10

KILOMETRES

THE SHELL COMPANY OF AUSTRALIA (METALS DIVISION)

INTERPRETATED DEPTH TO BASEMENT MAP

COOMPANA AREA S.A.

CONTOUR INTERVAL 100 meters

AIRBORNE SURVEY SPECIFICATIONS

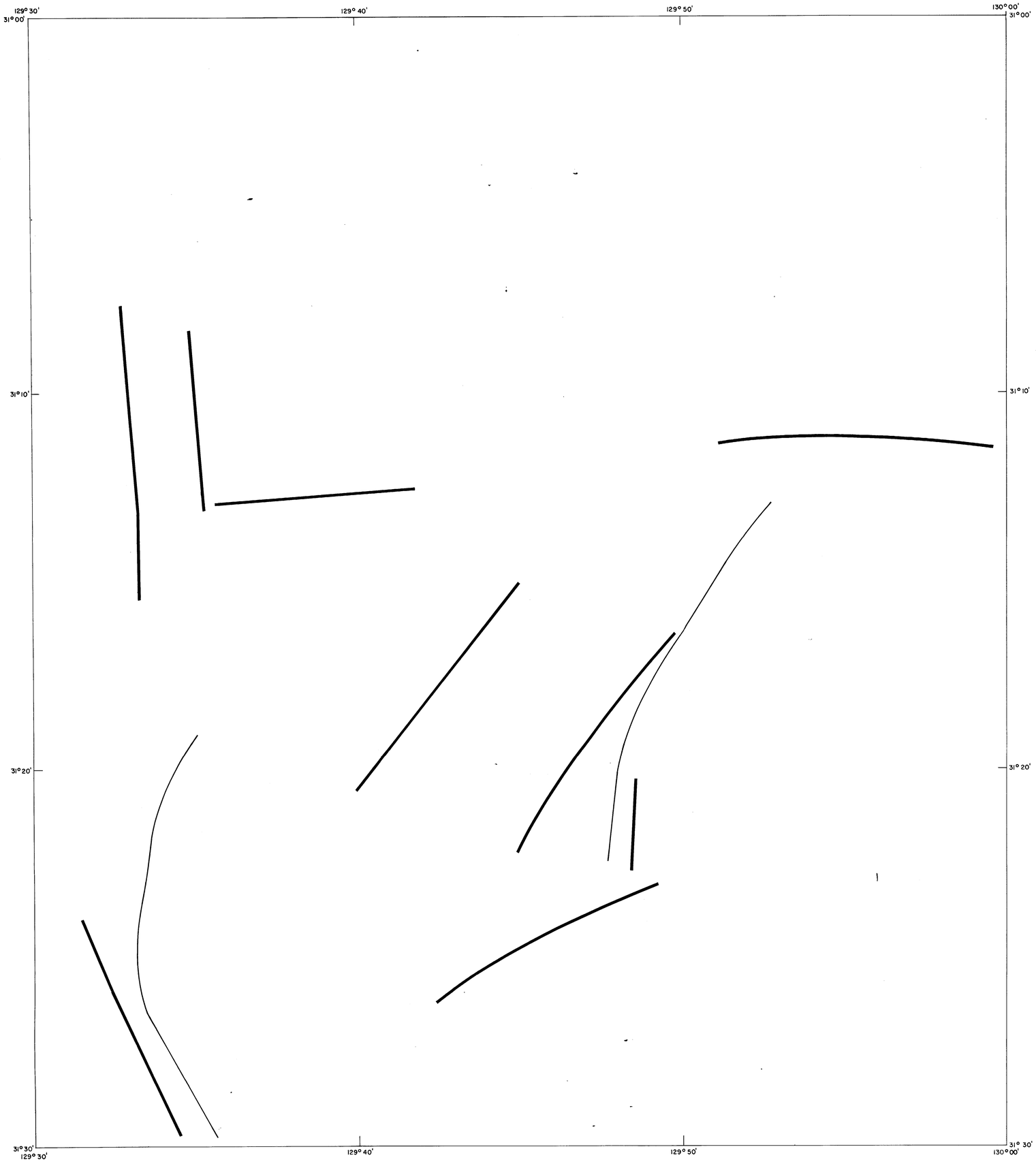
Survey Flown by : Bureau of Mineral Resources, Canbarra.

Detector Mean Terrain Clearance : 150m detector in aircraft

LAYTON GEOPHYSICAL INTERNATIONAL, CANBARRA

Drawn by G.A. & J.E. ROE

December 1980



LEGEND

- NEGATIVE MAGNETIC TREND
- POSITIVE MAGNETIC TREND
- INTERPRETED FAULT
- MAJOR BASEMENT BOUNDARY

SCALE 1:100 000

1 0 1 2 3 4 5 6 7 8 9 10

KILOMETRES

THE SHELL COMPANY OF AUSTRALIA (METALS DIVISION)

STRUCTURAL INTERPRETATION MAP

COOMPANA AREA S.A.

AIRBORNE SURVEY SPECIFICATIONS

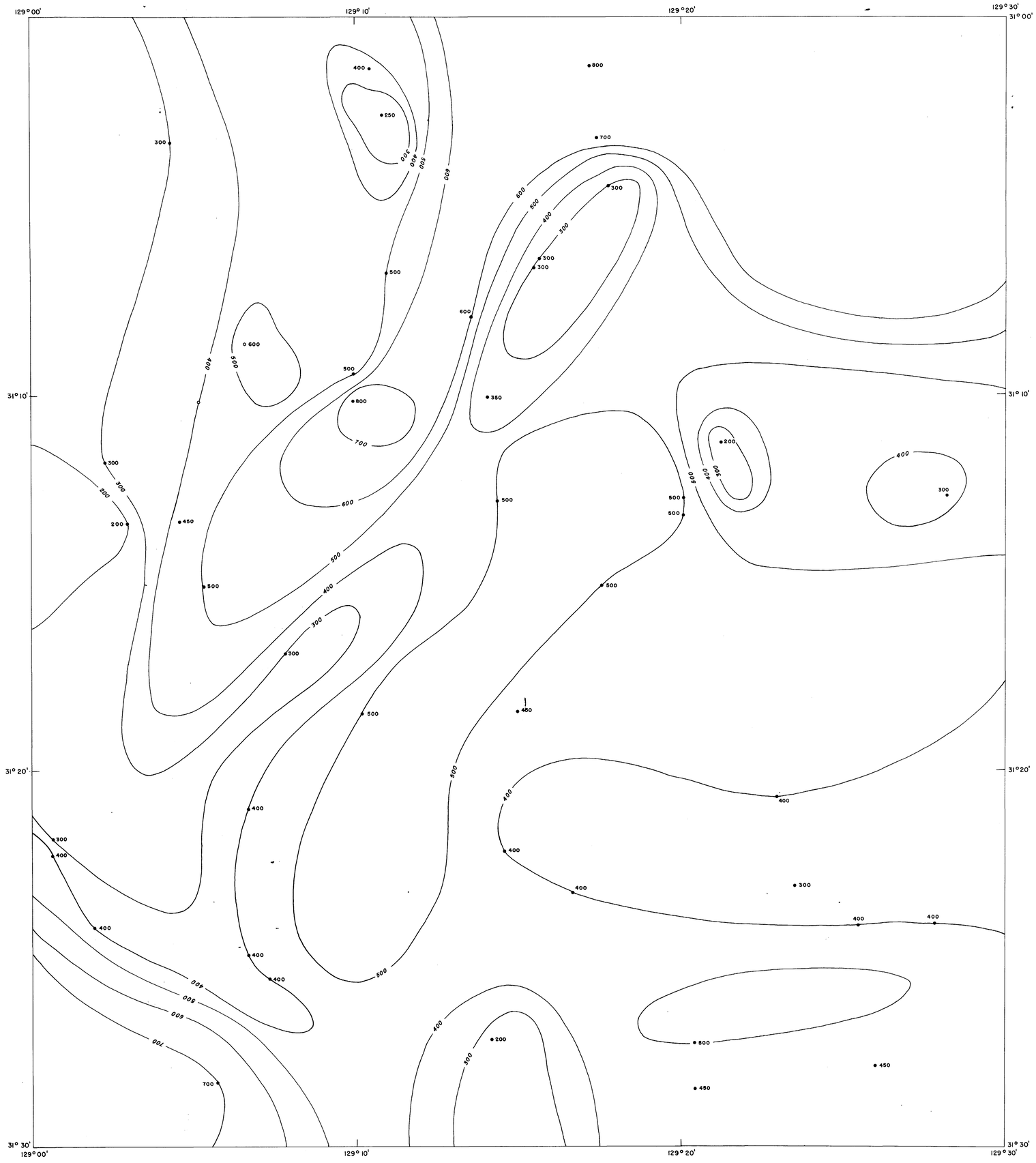
Survey Flown by : Bureau of Mineral Resources, Canbarra.

Detector Mean Terrian Clearance : 150 detector in aircraft

LAYTON GEOPHYSICAL INTERNATIONAL, CANBARRA

Drawn by G.A. & J.E. ROE

December 1980



LEGEND

500 — MAXIMUM DEPTH TO BASEMENT (metres)

• 500 POSITION WHERE DEPTH DETERMINED

SCALE 1:100 000

0 1 2 3 4 5 6 7 8 9 10

KILOMETRES

THE SHELL COMPANY OF AUSTRALIA (METALS DIVISION)

INTERPRETATED DEPTH TO BASEMENT MAP

MERDAYERRAH AREA S.A.

CONTOUR INTERVAL 100 metres

AIRBORNE SURVEY SPECIFICATIONS

Survey Flown by : Bureau of Mineral Resources, Canberra.

Detector Mean Terrain Clearance : 150m detector in aircraft

LAYTON GEOPHYSICAL INTERNATIONAL, CANBARRA

Drawn by G.A.& J.E. ROE

December 1980

LEGEND

- NEGATIVE MAGNETIC TREND
- POSITIVE MAGNETIC TREND
- INTERPRETED FAULT
- MAJOR BASEMENT BOUNDARY

SCALE 1:100 000

1 0 1 2 3 4 5 6 7 8 9 10

KILOMETRES

THE SHELL COMPANY OF AUSTRALIA (METALS DIVISION)

STRUCTURAL INTERPRETATION MAP

MERDAYERRAH AREA S.A.

AIRBORNE SURVEY SPECIFICATIONS

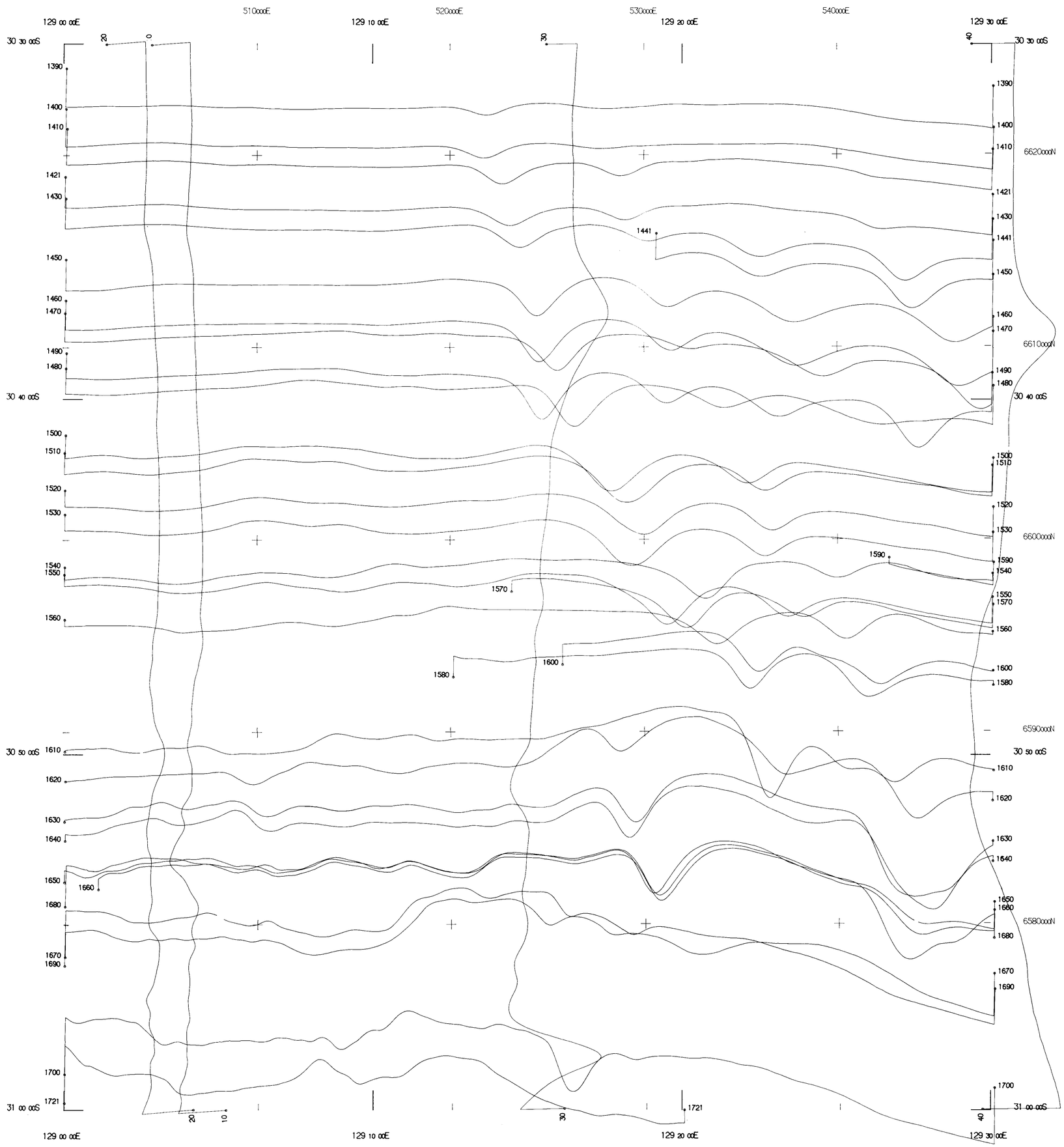
Survey Flown by : Bureau of Mineral Resources, Canbarra.

Detector Mean Terrian Clearance : 150m detector in aircraft

LAYTON GEOPHYSICAL INTERNATIONAL, CANBARRA

Drawn by G.A. & J.E. ROE

December 1980



AIRBORNE SURVEY SPECIFICATIONS

SURVEY FLOWN BY: BUREAU OF MINERAL RESOURCES CANBERRA

DATA RECORDING INTERVAL : 1.0 SEC., APPROX 50M LINEAR SAMPLING AT MEAN GROUND SPEED OF 100 KNOTS

DETECTOR MEAN TERRAIN CLEARANCE : DETECTOR IN AIRCRAFT AT 150 METRES MTC

NOMINAL FLIGHT LINE SPACING : 1500m East - West

PROCESSING SPECIFICATIONS

VERTICAL SCALE = 120 nT per cm

HORIZONTAL SCALE 1 : 100000

SHEET 4736

GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km

SCALE 1:100000

REPROCESSED BY:

EXPLORATION COMPUTER SERVICES

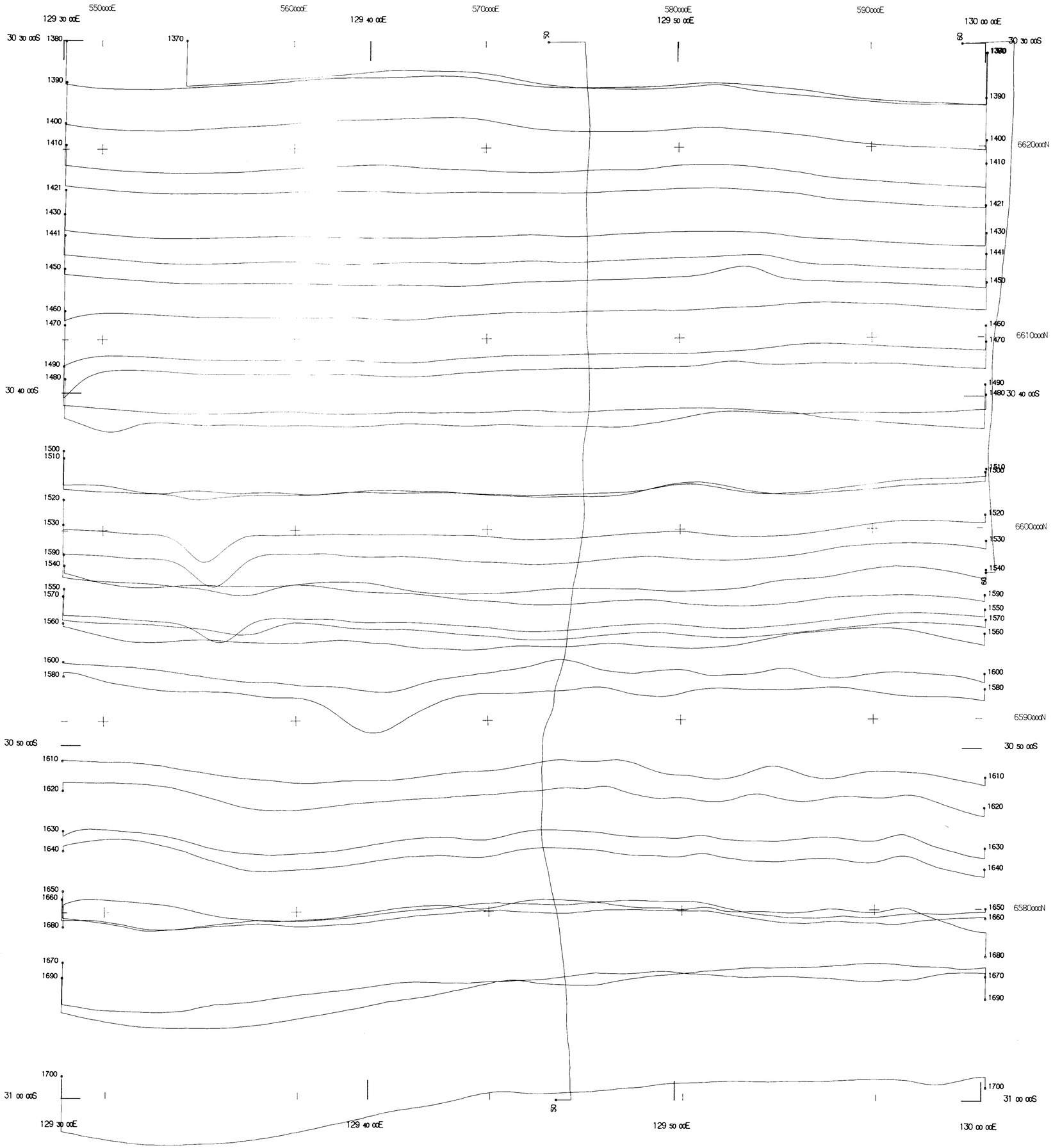
The Shell Company of Australia Limited
METALS DIVISION

BUNBURRA S.A.
SHEET 4736
MAGNETIC PROFILES

ENCL No. 2
DRG No. A/PW 08/006

PROJECT COOMPANA | DATE: 13-OCT-80

4046(II)-2



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AIRBORNE SURVEY SPECIFICATIONS

SURVEY FLOWN BY: BUREAU OF MINERAL RESOURCES CANBERRA
DATA RECORDING INTERVAL : 1.0 SEC., APPROX 50M LINEAR SAMPLING AT MEAN GROUND SPEED OF 100 KNOTS
DETECTOR MEAN TERRAIN CLEARANCE : DETECTOR IN AIRCRAFT AT 150 METRES MTC
NOMINAL FLIGHT LINE SPACING : 1500m East - West

PROCESSING SPECIFICATIONS

VERTICAL SCALE = 120 nT per cm
HORIZONTAL SCALE 1 : 100000
SHEET 4836
GRID NOTATION REFERS TO AUSTRALIAN METRIC GRID

0 1 2 3 4 5 6 7 8 9 10 Km
SCALE 1:100000

REPROCESSED BY:

EXPLORATION COMPUTER SERVICES

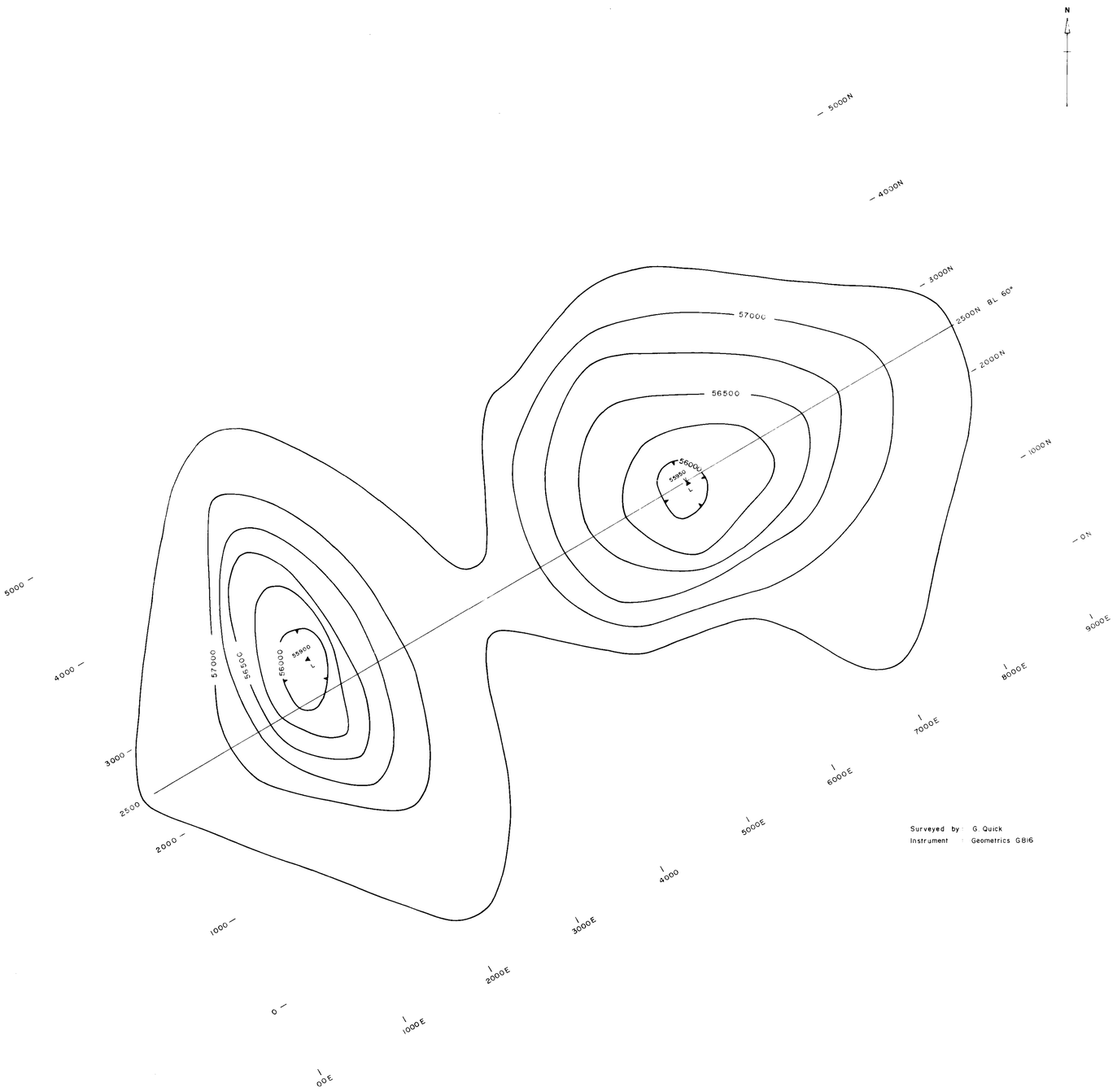
The Shell Company of Australia Limited
METALS DIVISION

BUNDULLA S.A.
SHEET 4836
MAGNETIC PROFILES

ENCL. No. 4
DRG.No. A/PW 08/008

PROJECT: COOMPANA | DATE: 13-OCT-80

4046 (II) -4



Surveyed by G. Quick
Instrument Geometrics G816

The Shell Company of Australia Limited METALS DIVISION	
COOMPANA PROJECT **ANOMALY PM 4** **CONTOURS OF** **TOTAL MAGNETIC INTENSITY** Scale 1 : 25,000	
FIG. No.	REPORT No.
ENCL. No. 28	DRG. No. A/PW 09/017
DATE JULY 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

4046(II)-5

GEOEX
PTY LTD COMPUTERISED BOREHOLE LOGGING

A-046 (III) - 1

BOREHOLE NO. CD-1

SHELL AUST. LTD. METALS DIVISION.

NULLARBOR. EUCLA BASIN AREA

OPERATOR: P. VILLA

DATA LOG VER: 1.08(03.03

DATA PLOT VER: 1.08(03.02

LOGGING SPEEDS:
DENSITY PROBE 5 M/MIN
NEUTRON PROBE 5 M/MIN
DEVIATION PROBE 10M/MIN

DATUM ABOVE GROUND LEVEL 0.00 M.
WATER LEVEL 105.5 M.

DEPTH LOGGED 268.03 M.
DATE LOGGED 10/26/81
DATE PROCESSED 27/10/81

CALIPER CM
0 10 20 30
CAL CM 10 20 30

SHORT SPACED DENSITY CPS
120 110 100 90 80
CAL dv/cc 1.19 1.74

LONG SPACED DENSITY CPS
120 100 80 60 40
CAL GM/CC 1.19 1.74

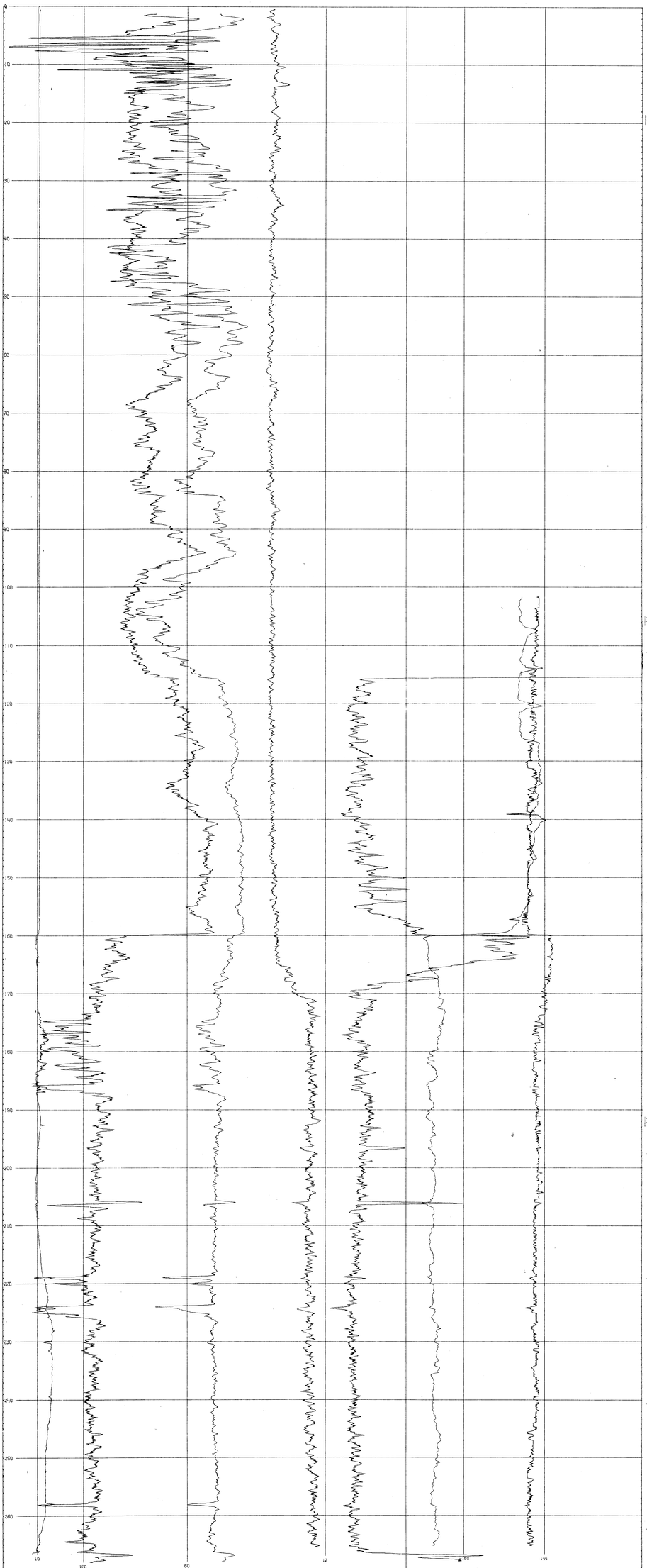
NATURAL GAMMA CPS
4 8 12 16 20 24
CAL 0 API 200 API

SELF POTENTIAL MV
-40 -80 -120 -160 -200
-40 -80 -120 -160 -200

NEUTRON CPS
50 60 70 80 90 100
CAL +1

RESISTANCE OHMS
130 140 144 148 152
+2 +3

DEPTH (M.)



GEOEX
PTY LTD COMPUTERISED BOREHOLE LOGGING

4046(III)-2

BOREHOLE NO. CD-3

SHELL AUST. LTD. METALS DIVISION.

NULLARBOR.EUCLA BASIN AREA

OPERATOR: P.VILLA

DATA LOG VER : 108109.03

DATA PLOT VER: 108103.02

LOGGING SPEEDS:
DENSITY PROBE 5 M/MIN
NEUTRON PROBE 5 M/MIN
DEVIATION PROBE 10M/MIN

DATUM ABOVE GROUND LEVEL 0.30 M.
WATER LEVEL 98.0 M.

DEPTH LOGGED 203.35 M.
DATE LOGGED 10/24/81
DATE PROCESSED 26/10/81

CALIPER CM
0 10 20 30
CAL CM 10 20 30

SHORT SPACED DENSITY CPS
120 110 100 90 80
CAL GM/CC 1.19 1.74

LONG SPACED DENSITY CPS
120 100 80 60 40
CAL GM/CC 1.19 1.74

NATURAL GAMMA CPS
4 8 12 16 20 24
CAL 0 API 200 API

SELF POTENTIAL MV
-520 -480 -440 -400 -360

NEUTRON CPS
30 40 50 60 70 80
CAL ×1

RESISTANCE OHMS
172 176 180 184 188
×2 ×3

DEPTH (M.)

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210

10 100 60 12 50 440 180

COMPLOT
HOUSTON INSTRUMENT
AUSTIN, TEXAS
CHART NO. RC-30000
PRINTED IN U.S.A.

GEOEX PTY LTD COMPUTERISED BOREHOLE LOGGING

4046 (III)-3

BOREHOLE NO. CD-6

SHELL AUST. LTD. METALS DIVISION.

NULLARBOR. EUCLA BASIN AREA

OPERATOR: P. VILLA

DATA LOG VER : 108109.03

DATA PLOT VER: 109103.02

LOGGING SPEEDS:

DENSITY PROBE 5 M/MIN

NEUTRON PROBE 5 M/MIN

DEVIATION PROBE 10M/MIN

DATUM ABOVE GROUND LEVEL 0.00 M.

WATER LEVEL 73.2 M.

DEPTH LOGGED 109.97 M.

DATE LOGGED 10/23/81

DATE PROCESSED 26/10/81

CALIPER CM
0 10 20 30
CAL CM 10 20 30

SHORT SPACED DENSITY CPS
120 110 100 90 80
CAL GM/CC 1.19 1.74

LONG SPACED DENSITY CPS
120 100 80 60 40
CAL GM/CC 1.19 1.74

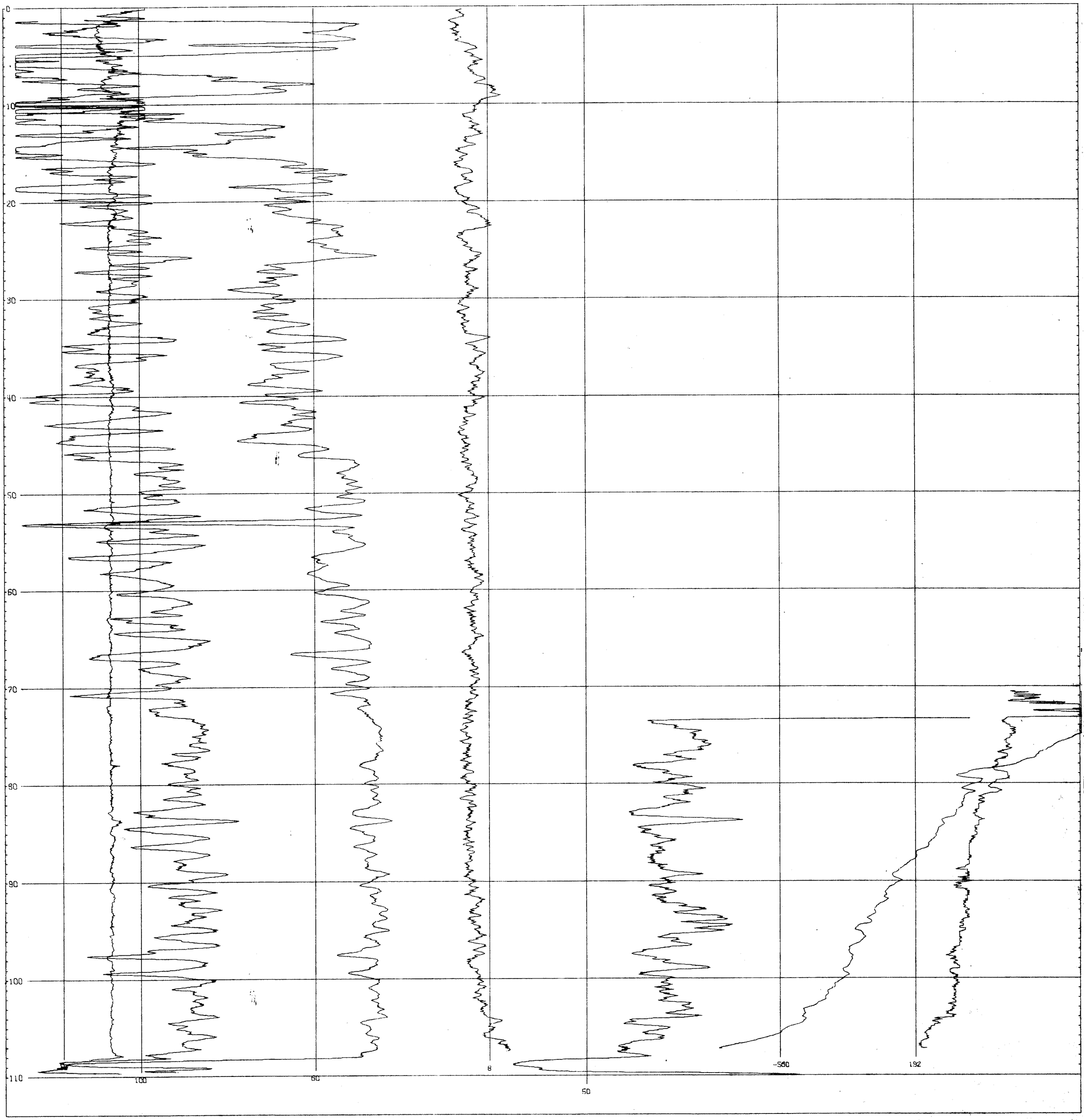
NATURAL GAMMA CPS
0 4 8 12 16 20
CAL 0 API 200 API

NEUTRON CPS
30 40 50 60 70 80
CAL #1

SELF POTENTIAL MV
-640 -600 -560 -520 -480

RESISTANCE OHMS
184 188 192 196 200
#2 #3

DEPTH (M.)



GEOEX
PTY LTD COMPUTERISED BOREHOLE LOGGING

4046 (III)-4

BOREHOLE NO. CD-7

SHELL AUST. LTD. METALS DIVISION.

NULLARBOR. EUCLA BASIN AREA

OPERATOR: P. VILLA

DATA LOG VER : 108109.03

DATA PLOT VER: 108103.02

LOGGING SPEEDS:

DENSITY PROBE	5 M/MIN
NEUTRON PROBE	5 M/MIN
DEVIATION PROBE	10M/MIN

DATUM ABOVE GROUND LEVEL 0.34 M.

WATER LEVEL 60.1 M.

DEPTH LOGGED 78.13 M.

DATE LOGGED 10/23/81

DATE PROCESSED 26/10/81

CALIPER CM
0 10 20 30
CAL CM 10 20 30

SHORT SPACED DENSITY CPS
120 110 100 90 80
CAL GM/CC 1.19 1.74

LONG SPACED DENSITY CPS
120 100 80 60 40
CAL GM/CC 1.19 1.74

NATURAL GAMMA CPS
0 4 8 12 16 20
CAL 0 API 200 API

NEUTRON CPS
40 50 60 70 80 90
CAL #1 #2 #3

DEPTH (M.)

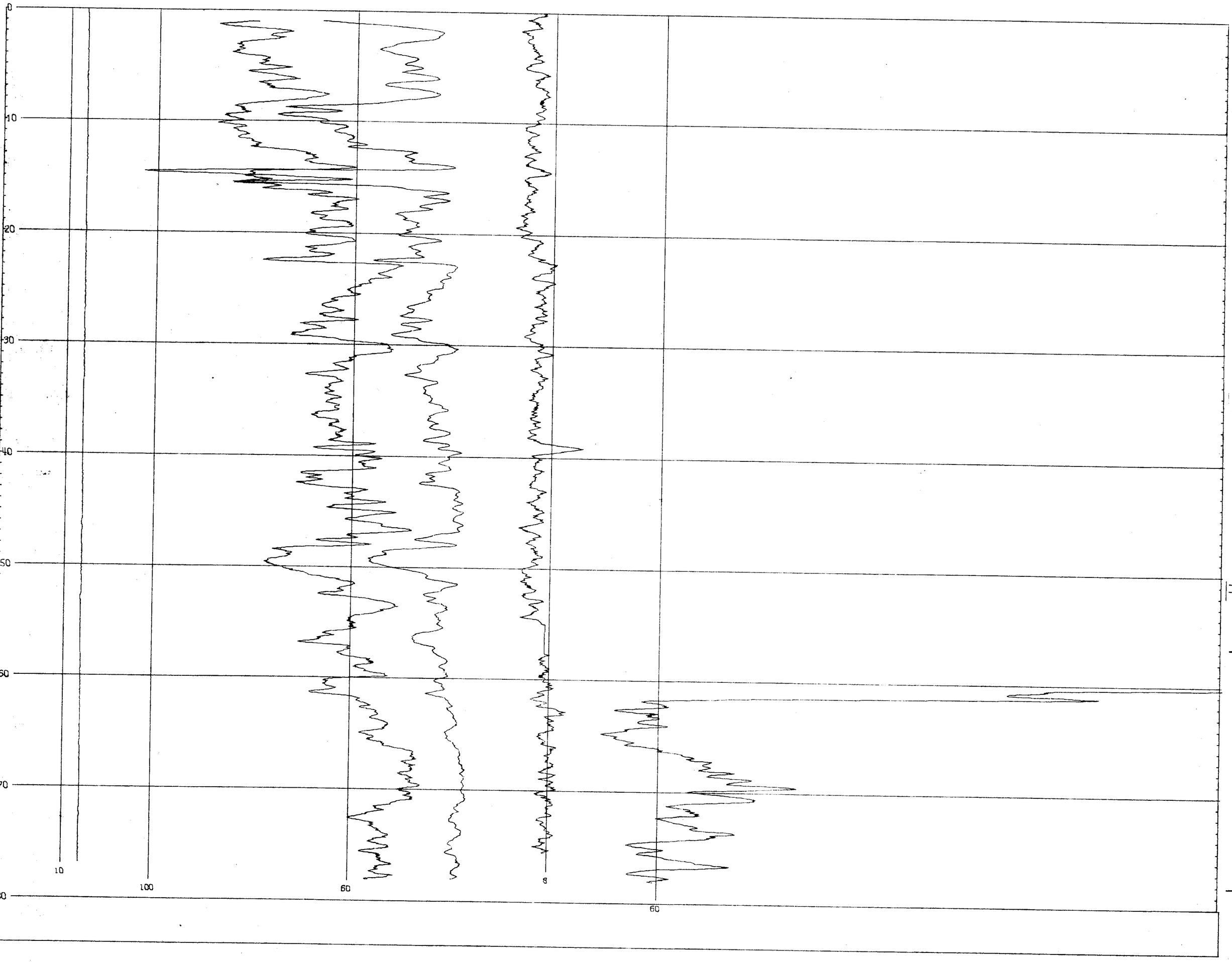


CHART NO. MC-00009
PRINTED IN U.S.A.
COMPLOT
HOUSTON INSTRUMENT
DIVISION OF
AUSTIN, TEXAS

129°00'
129°15'
129°30'
129°45'
130°00'
130°15'
30°00'
30°15'
30°30'
30°45'
31°00'
31°15'
31°30'
31°45'

WESTERN AUSTRALIA
SOUTH AUSTRALIA

E.L. 748
E.L. 749
E.L. 747

TRANS AUSTRALIA RAILWAY

DEAKIN
HUGHES
DENMAN

PDH CD 6
DDH CD 7
PDH CD 5

CM-1
3000N
2500E

CM-2
4500E
4000N

CM-3

DDH CD 3
3500E
3000N
CM-4

PM-2
2000E
3000N

PM-1

PM-4
DDH CD 2
2500N
2000E

DDHCD 1
2500E
6000N
PM-3

PM-7
C04
3000N
2000E

PM-5

Koonalda Cave
Koonalda
EYRE HIGHWAY

OLD EYRE HIGHWAY

Eucla Motel
Eucla

Location of tracks approximate only

PM-5 — Approximate outline of aeromagnetic anomaly

DDH CD 1 — Diamond drillhole – location approximate

PDH CD 6 — Percussion drillhole – location approximate

3000N / 3500E — Grid baselines and local co-ordinates

The Shell Company of Australia Limited
METALS DIVISION

COOMPANA PROJECT
SOUTH AUSTRALIA

GRID AND DRILLHOLE LOCATION MAP

Scale 1 250,000

FIG No.	REPORT No. 08-1244
ENCL No.	ORG. No. A/MT 22/092
DATE NOV. 1981	AUTHOR R.J.W.
DRAWN B.J.O.	OFFICE ADELAIDE

Env. 4046.

4046(III)-5